Regular Session RS

Milwaukie City Council

Part 1 of 2 of the
December 6, 2022
Online Packet

CITY OF **MILWAUKIE**

2370th Meeting

COUNCIL REGULAR SESSION

AGENDA

DECEMBER 6, 2022

City Hall Council Chambers, 10722 SE Main Street
& Zoom Video Conference (www.milwaukieoregon.gov)

Council will hold this meeting in-person and through video conference. The public may attend the meeting by coming to City Hall or joining the Zoom webinar, or watch the meeting on the city's YouTube channel or Comcast Cable channel 30 in city limits. **For Zoom login** visit https://www.milwaukieoregon.gov/citycouncil/city-council-regular-session-337.

To participate in this meeting by phone dial **1-253-215-8782** and enter Webinar ID **831 8669 0512** and Passcode: **023745**. To raise hand by phone dial *9.

Written comments may be delivered to City Hall or emailed to ocr@milwaukieoregon.gov. Council will take verbal comments.

Note: agenda item times are estimates and are subject to change. **Page #**

1. CALL TO ORDER (6:00 p.m.)

A. Pledge of Allegiance

B. Native Lands Acknowledgment

2. ANNOUNCEMENTS (6:01 p.m.) 2

3. PROCLAMATIONS AND AWARDS

A. None Scheduled.

4. SPECIAL REPORTS

A. None Scheduled.

5. COMMUNITY COMMENTS (6:05 p.m.)

To speak to Council, please submit a comment card to staff. Comments must be limited to city business topics that are not on the agenda. A topic may not be discussed if the topic record has been closed. All remarks should be directed to the whole Council. The presiding officer may refuse to recognize speakers, limit the time permitted for comments, and ask groups to select a spokesperson. **Comments may also be submitted in writing before the meeting, by mail, e-mail (to ocr@milwaukieoregon.gov), or in person to city staff.**

6. CONSENT AGENDA (6:10 p.m.)

Consent items are not discussed during the meeting; they are approved in one motion and any Council member may remove an item for separate consideration.

A. Approval of Council Meeting Minutes of: 4
  1. **October 18, 2022, work session,**
  2. **October 18, 2022, regular session,**
  3. **November 1, 2022, work session, and**
  4. **November 1, 2022, regular session.**

B. Authorization of a Janitorial Services Contract – Resolution 18

C Authorization of a Seismic Rehabilitation Services Contract – Resolution 38

D. Authorization of a Signage Services Contract – Resolution 537

E. Authorization of a Deferred Compensation Contract Renewal – Resolution 542

F. Authorization of Bonding for Capital Projects – Resolution 544

G. Authorization of a Good Neighbor Program Agreement – Resolution 559

Agenda Note: after the consent agenda, Council will recess the regular session to meet as the Milwaukie Redevelopment Commission (MRC); Council will reconvene after the MRC meeting. For information about the MRC meeting visit https://www.milwaukieoregon.gov/bc-rc/redevelopment-commission-11.

Agenda Order Note: Council will proceed to the hearing items before the business items.

8. **PUBLIC HEARINGS** (moved up the agenda)

   A. **Camping Ordinance Adoption – Ordinance** (6:30 p.m.) **644**
   Staff: Luke Strait, Police Chief

   B. **High Density Residential Zones Adoption – Ordinance** (6:50 p.m.) **653**
   Staff: Vera Kolias, Senior Planner, and
   Adam Heroux, Associate Planner

7. **BUSINESS ITEMS** (moved down the agenda)

   A. **Transportation System Plan Advisory Committee (TSPAC) Formation – Discussion** (7:10 p.m.) **574**
   Staff: Laura Weigel, Planning Manager

   B. **New Building Energy – Resolutions (2) (continued)** (8:00 p.m.) **578**
   Staff: Natalie Rogers, Climate & Natural Resources Manager

   C. **Neighborhood Parks Master Plans Adoption – Resolutions (3)** (8:30 p.m.) **602**
   Staff: Adam Moore, Parks Development Coordinator

   D. **Stormwater Code Amendments – Ordinance** (9:30 p.m.) **612**
   Staff: Peter Passarelli, Public Works Director

9. **COUNCIL REPORTS** (9:55 p.m.)

10. **ADJOURNMENT** (10:00 p.m.)

Meeting Accessibility Services and Americans with Disabilities Act (ADA) Notice
The city is committed to providing equal access to public meetings. To request listening and mobility assistance services contact the Office of the City Recorder at least 48 hours before the meeting by email at ocr@milwaukieoregon.gov or phone at 503-786-7502. To request Spanish language translation services email espanol@milwaukieoregon.gov at least 48 hours before the meeting. Staff will do their best to respond in a timely manner and to accommodate requests. Most Council meetings are broadcast live on the city's YouTube channel and Comcast Channel 30 in city limits.

Servicios de Accesibilidad para Reuniones y Aviso de la Ley de Estadounidenses con Discapacidades (ADA)
La ciudad se compromete a proporcionar igualdad de acceso para reuniones públicas. Para solicitar servicios de asistencia auditiva y de movilidad, favor de comunicarse a la Oficina del Registro de la Ciudad con un mínimo de 48 horas antes de la reunión por correo electrónico a ocr@milwaukieoregon.gov o llame al 503-786-7502. Para solicitar servicios de traducción al español, envíe un correo electrónico a espanol@milwaukieoregon.gov al menos 48 horas antes de la reunión. El personal hará todo lo posible para responder de manera oportuna y atender las solicitudes. La mayoría de las reuniones del Consejo de la Ciudad se transmiten en vivo en el canal de YouTube de la ciudad y el Canal 30 de Comcast dentro de los límites de la ciudad.

Executive Sessions
The City Council may meet in executive session pursuant to Oregon Revised Statute (ORS) 192.660(2); all discussions are confidential; news media representatives may attend but may not disclose any information discussed. Final decisions and actions may not be taken in executive sessions.

RS Agenda Item 2

Announcements

Mayor's Announcements – Dec. 6, 2022

- **Leaf Drop – Saturdays - Dec. 10 & 17 (7 AM - 2 PM)**
  - Free leaf disposal events for Milwaukie residents
  - Bring along utility bill (e-bill or paper bill) as proof or residency
  - Service is free, but city will collect non-perishable food for local families in need.
  - Johnson Creek Building, 6101 SE Johnson Creek Blvd.

- **Christmas at the Museum – Sat., Dec. 10 (11 AM – 3 PM)**
  - Join the Milwaukie Museum for live music, treats, pictures with Santa, and more!
  - Milwaukie Museum, 3737 SE Adams St.

- **Winter Solstice and Christmas Ships – Sat., Dec. 17 (4:30 - 7:30 PM)**
  - Annual celebration at Milwaukie Bay Park that includes warm fires and tasty treats for purchase as neighborhood fundraiser
  - Check the website below for more information about what food and drinks will be available for purchase, what times we expect the ships to sail by, and the best ways to get to and from this popular event.

- **Winter Card Craft – Tue., Dec. 20 (1 – 4 PM)**
  - Welcome winter with some drop-in cardmaking.
  - All ages are welcome.
  - Ledding Library, 10660 SE 21st Ave.

- **Winter Scavenger Hunt – Mon., Dec. 26 to Sat., Dec. 31 (Anytime library is open)**
  - Snowflake scavenger hunt for all ages.
  - Ledding Library, 10660 SE 21st Ave.

- **LEARN MORE AT WWW.MILWAUKIEOREGON.GOV OR CALL 503-786-7555**

RS2

RS Agenda Item 5

Community Comments

Scott Stauffer

From: C Booker <cbooker76@hotmail.com>
Sent: Tuesday, December 6, 2022 9:34 AM
To: OCR
Subject: Enacting New Fees

Attn: Milwaukie City Council

It has come to my attention that Milwaukie City Council very nearly added a new "climate fund fee" to our already high water/sewer bill. I want you to know that both my husband and I oppose the City Council unilaterally enacting new fees to be added to our city water/sewer bill. We feel that citizens of Milwaukie should have a say in this, before adding to our financial burden.

Have a Blessed Day!
Carol Booker

RS Agenda Item 6

Consent Agenda

CITY OF MILWAUKIE

COUNCIL WORK SESSION

City Hall Council Chambers, 10722 SE Main Street
& Zoom Video Conference (www.milwaukieoregon.gov)

MINUTES

OCTOBER 18, 2022

Council Present:	Councilors Adam Khosroabadi, Lisa Batey, Desi Nicodemus, Council President Kathy Hyzy, and Mayor Mark Gamba	
Staff Present:	Joseph Briglio, Community Development Director	Ann Ober, City Manager
	Justin Gericke, City Attorney	Scott Stauffer, City Recorder
	Adam Heroux, Associate Planner	Laura Weigel, Planning Manager
	Vera Kolias, Senior Planner	

Mayor Gamba called the meeting to order at 4:00 p.m.

1. High Density Residential (HDR) Zones – Discussion

Kolias explained that the evening's discussion was in advance of a public hearing scheduled for December on consolidation of HDR zones. **Kolias** presented the review schedule, the current zoning map, a map of the zones that would be consolidated and explained why this project was separate from the original Comprehensive Plan implementation. **Kolias** noted how the HDR zones are mostly in and around commercial areas, that the total acreage of HDR zones in the city is approximately 330 acres, provided aerial view examples, stated that most of HDR lots are already developed with multi-unit developments and named some of the developments in those zones.

Kolias stated that the intention of the code changes was to consolidate and simplify the map as well as streamline definitions. **Councilor Batey** asked if the R2.5 lots had been redeveloped and **Kolias** responded that they were currently not, but they were intended to be rebuilt as duplexes but that had not yet happened.

Heroux presented the reasons why Milwaukie's HDR zones needed to be updated and current existing terms listed in the code that staff had proposed to update. **Kolias** presented the Rusk Road senior development project as an example of when the out of date and inconsistent terms negatively affected the development process. **Mayor Gamba** and **Kolias** discussed the type of permits needed for the Rusk Road project and the permit process.

Councilor Batey and **Kolias** discussed zoning for outpatient treatment type facilities in correlation to adult foster homes and the process for building or modifying an existing home to become an adult foster care facility.

Heroux presented the proposed terms that would replace the out of date and inconsistent terms for care facilities. **Council President Hyzy** and **Heroux** discussed how multi-service care facilities are defined for zoning. **Heroux** asked if Council concurred with the proposed consolidation and changes. **Councilor Batey** and **Kolias** discussed the proposed changes and the availability of handout materials.

Heroux presented the current definition for a boarding house, advised that there were no boarding houses within the city that staff were aware of, provided an overview, history, and current examples of the single room occupancy (SRO) term that staff proposed to replace boarding house with. **Heroux** and **Kolias** presented the new SRO definition and **Heroux** asked if Council supported replacing the term boarding house with SRO. The group discussed SROs versus extended stay hotels, inspections for existing homes offering boarding and short-term rentals, the possibility of organizing a landlord committee for planning changes, why five residential units was the trigger for a SRO, that this proposed change would not eliminate options for residential homes that rent out rooms, and shared kitchen building requirements.

Kolias proposed an amendment to remove “traditional office” from the types of office uses, stated that “traditional office” is repetitive, confusing, and the professional and administrative office type is similar and had been used interchangeably, and briefly explained the different office use types. **Mayor Gamba**, **Kolias,** and **Councilor Batey** discussed the difference in office types, where offices would be allowed, and what office types would be permitted in which zones. The group discussed whether further consolidations should be made to allow more services and offices within more neighborhoods.

Kolias presented the code with the proposed changes, noted that 11 lots would be rezoned, mentioned staff wanted to eliminate the minimum site size requirements for multi-family dwelling units, and presented the Planning Commission’s recommendations to Council. **Kolias** expanded on the Commission’s recommendation for Council to find ways to protect and preserve manufactured dwelling parks that included noting where the only park is within the city limits and citing state law regarding manufactured dwelling parks. **Kolias** and **Councilor Batey** commented on an option to circumvent the state’s law prohibiting a city from enforcing local regulation. **Kolias** shared information regarding services provided by Clackamas County for those displaced by a closing manufactured dwelling park and believed that code revisions for manufactured dwelling parks should not be included in this package as furthers steps would need to be taken.

Kolias asked if Council had any questions or thoughts about the proposed changes, if Council wanted to discuss the conditional use allowance of hotels and motels, and if Council would provide direction on the consolidation for the upcoming hearing. **Mayor Gamba**, **Councilor Batey** and **Kolias** discussed where the code currently allowed for hotels and the need for hotels versus housing. **Councilor Batey** had no issue with the office type definitions but expressed hesitation regarding offices in areas where they had not been previously allowed and believed that the consolidation discussion may be better suited to be included in the neighborhood hubs discussion. **Mayor Gamba** and **Council President Hyzy** were both in agreement to move forward with consolidation. **Batey** shared complaints heard regarding the height of the Monroe Street apartments.

2. Adjourn

Mayor Gamba announced that after the work session Council would meet in executive session pursuant to Oregon Revised Statute (ORS) 192.660 (2)(i) to review and evaluate the employment-related performance of the chief executive officer of any public body, a public officer, employee, or staff member who does not request an open hearing.

Mayor Gamba adjourned the meeting at 5:20 p.m.

Respectfully submitted,

Nicole Madigan, Deputy City Recorder

CITY OF MILWAUKIE

2367th Meeting

COUNCIL REGULAR SESSION

MINUTES

City Hall Council Chambers, 10722 SE Main Street
& Zoom Video Conference (www.milwaukieoregon.gov)

OCTOBER 18, 2022

Council Present: Councilors Adam Khosroabadi, Lisa Batey, Desi Nicodemus, Council President Kathy Hyzy, and Mayor Mark Gamba

Staff Present:
Steve Adams, City Engineer
Kelly Brooks, Assistant City Manager
Justin Gericke, City Attorney
Ben Green, Engineering Technician
Adam Moore, Parks Development Coordinator
Ann Ober, City Manager
Peter Passarelli, Public Works Director
Natalie Rogers, Climate & Natural Resources Manager
Scott Stauffer, City Recorder

Mayor Gamba called the meeting to order at 6:04 p.m.

1. CALL TO ORDER

A. Pledge of Allegiance.

B. Native Lands Acknowledgment.

2. ANNOUNCEMENTS

Mayor Gamba announced upcoming community activities, including a city manager open door session, the 42nd/43rd Avenue improvements celebration, Arbor Day events, a spooky storyteller event, and the Haunted Forest at Homewood Park event. **Councilor Batey** noted an ivy pull event and a fundraiser event at the Davis Graveyard.

The group noted that the city did not know if there would be a downtown business trick-or-treating event this year.

3. PROCLAMATIONS AND AWARDS

A. Milwaukie High School (MHS) Outstanding Student Achievement – Award

Kim Kellogg, MHS Principal, introduced Lupita Aguilar-Soto and Council congratulated them on their academic and extra-curricular activities.

B. MHS Update – Report

Kellogg provided an update on activities at the school, including a career day, the Portland Opera's use of the school facilities, college visits, and parent survey.

C. Arbor Day – Proclamation

Rogers noted Arbor Day plans and remarked on the importance of planting and protecting trees. **Mayor Gamba** proclaimed October 22, 2022, to be Arbor Day.

D. American Archives Month – Proclamation

Stauffer and **Greg Hemer**, with the Milwaukie Historical Society, remarked on the importance of local archives. **Mayor Gamba** proclaimed October to be Archives Month.

E. Community Planning Month – Proclamation

Ober remarked on the importance of community planning and thanked the city's planning staff for their work. **Mayor Gamba** proclaimed October to be Planning Month.

4. SPECIAL REPORTS

A. None Scheduled.

5. COMMUNITY COMMENTS

Mayor Gamba reviewed the public comment procedures and **Ober** reported that there was no follow-up report from the October 4 community comments. No audience member wished to address Council.

6. CONSENT AGENDA

It was moved by Councilor Batey and seconded by Council President Hyzy to approve the Consent Agenda as presented.

A. City Council Meeting Minutes:
  1. **September 20, 2022, Work Session, and**
  2. **September 20, 2022, Regular Session.**

B. Resolution 67-2022: A resolution of the City Council of the City of Milwaukie, Oregon, authorizing a cooperative agreement with the North Clackamas Urban Watershed Council (NCWC) for the Kellogg Creek Restoration and Community Enhancement project.

Motion passed with the following vote: Councilors Khosroabadi, Batey, Nicodemus, and Hyzy and Mayor Gamba voting "aye." [5:0]

7. BUSINESS ITEMS

A. Public Safety Advisory Committee (PSAC) – Annual Update

Adams provided an overview of the committee's work, noting PSAC's interest in focusing on emergency response work and helping update the city's Transportation System Plan (TSP) in 2023. **Mayor Gamba** and **Adams** remarked on why the city's TSP consultant contracts had to be reviewed by the state before being executed.

PSAC Vice Chair **Stephan Lashbrook** commented on the role the committee would like to play in TSP update project. **Adams** suggested the geographic representation of PSAC members would help the TSP update process.

Lashbrook commented on the contract review process when state and federal funds are involved in a project as they are for the TSP update. The group noted the role of the Oregon Department of Transportation (ODOT) in transportation infrastructure projects.

B. Bowman-Brae Park Resolution of Necessity – Resolution

Moore provided an overview of the Bowman-Brae Park master planning work and efforts to purchase a property west of the park that has been closed to public access, cutting off the western access point to the park. **Moore** noted that residents were frustrated by the lack of park access and reported that staff recommended Council adopt declare the necessity of acquiring the property to restore the access point.

Moore briefly reviewed the park's master plan and current concept design.

Gericke concurred with staff's assessment of the Bowman-Brae Park situation and explained the legal actions the city had taken to-date and what the proposed resolution would do to begin the condemnation process to acquire the property.

Councilor Batey and **Moore** clarified that Where Else Lane was public right-of-way (ROW) up to the 12-foot private property between the street and park.

Councilor Batey and **Gericke** noted next steps that would be taken to purchase the property if a resolution was adopted. **Moore** and **Gericke** noted that through a condemnation process the city would be purchasing the property for fair market value.

Mayor Gamba announced that public comment would be taken on the proposed action.

Lupin Hipp, Milwaukie resident, asked for clarification about the action Council would take to acquire the property and if the action could fail to restore park access. **Gericke** explained the purpose of the condemnation process.

Paul Anderson, Milwaukie resident, presented a series of photos showing the current route to the park due to the western access point closure.

Mona Thomason, Milwaukie resident, concurred with Anderson's assessment of the current route to the park and encouraged the city to acquire the private property. **Mayor Gamba** and **Thomason** agreed on the importance of active transportation planning.

It was moved by Councilor Nicodemus and seconded by Councilor Khosroabadi to approve the resolution declaring the public necessity to acquire a public right-of-way (ROW) and temporary construction easement to construct a multi-use trail and provide public access to Bowman-Brae Park from Where Else Lane. Motion passed with the following vote: Councilors Khosroabadi, Batey, Nicodemus, and Hyzy and Mayor Gamba voting "aye." [5:0]

> **Resolution 68-2022:**
>
> **A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, DECLARING THE PUBLIC NECESSITY TO ACQUIRE A PUBLIC RIGHT-OF-WAY (ROW) AND TEMPORARY CONSTRUCTION EASEMENT TO CONSTRUCT A MULTI-USE TRAIL AND PROVIDE PUBLIC ACCESS TO BOWMAN-BRAE PARK FROM WHERE ELSE LANE.**

C. New City Hall Construction Manager / General Contractor (CMGC) Process – Resolution

Brooks explained that to best use the city's fiscal resources staff had requested that Council approve a resolution allowing the city to use a CMGC process for the redevelopment of the new city hall building. **Brooks** noted project management benefits of pursuing a CMGC alternative contracting method.

It was moved by Councilor Khosroabadi and seconded by Council President Hyzy to approve the resolution acting as the Local Contract Review Board, adopting findings to allow alternative contracting for the new city hall project. Motion passed with the following vote: Councilors Khosroabadi, Batey, Nicodemus, and Hyzy and Mayor Gamba voting "aye." [5:0]

> **Resolution 69-2022:**
>
> **A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, ACTING AS THE LOCAL CONTRACT REVIEW BOARD, ADOPTING FINDINGS TO ALLOW ALTERNATIVE CONTRACTING FOR THE NEW CITY HALL PROJECT.**

Ober and **Brooks** thanked staff for their work to prepare for a CMGC process.

8. PUBLIC HEARING

A. None Scheduled.

9. COUNCIL REPORTS

A. Support for Ballot Measures – Resolutions (2)

Mayor Gamba explained that resolutions supporting two proposed statewide ballot measures had been prepared for Council to consider adopting. **Gamba** commented on why Council should encourage voters to approve Measure 113, which would add attendance requirements for state legislators, and read the resolution into the record. **Councilor Khosroabadi** expressed support for Measure 113.

It was moved by Councilor Nicodemus and seconded by Councilor Khosroabadi to approve the resolution recommending support for Hold Politicians Accountable – Measure 113. Motion passed with the following vote: Councilors Khosroabadi, Batey, Nicodemus, and Hyzy and Mayor Gamba voting "aye." [5:0]

Resolution 70-2022:

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, RECOMMENDING SUPPORT FOR HOLD POLITICIANS ACCOUNTABLE – MEASURE 113.

Mayor Gamba asked that the city issue a press release after adoption of the ballot measure resolutions.

Councilor Batey noted a presentation Council had received earlier in the year regarding Measure 114 and remarked on what the measure would require. The group discussed adding language to the resolution underscoring the need for gun safety measures due to increasing violence in schools. It was Council consensus to add a whereas clause highlighting the recent surge in school shootings as a reason why voters should approve Measure 114.

Councilor Batey read the resolution in support of Measure 114 into the record. The group noted two additional minor grammatical errors in the resolution text.

Council President Hyzy and **Councilor Batey** remarked on the support Measure 114 had from gun owners.

It was moved by Council President Hyzy and seconded by Councilor Khosroabadi to approve the resolution urging Milwaukie voters to vote yes on Measure 114 to enhance the safety of our schools and our community. Motion passed with the following vote: Councilors Khosroabadi, Batey, Nicodemus, and Hyzy and Mayor Gamba voting "aye." [5:0]

Resolution 71-2022:

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, URGING MILWAUKIE VOTERS TO VOTE YES ON MEASURE 114 TO ENHANCE THE SAFETY OF OUR SCHOOLS AND OUR COMMUNITY.

Ober reported that the city's press release regarding the ballot measure resolutions would direct inquiries to Mayor Gamba and Councilor Batey.

10. ADJOURNMENT

Mayor Gamba announced that after the regular session Council would meet in executive session pursuant to Oregon Revised Statute (ORS) 192.660 (2)(i) to review and evaluate the employment-related performance of the chief executive officer of any public body, a public officer, employee or staff member who does not request an open hearing.

It was moved by Councilor Nicodemus and seconded by Council President Hyzy to adjourn the Regular Session. Motion passed with the following vote: Councilors Khosroabadi, Batey, Nicodemus, and Hyzy and Mayor Gamba voting "aye." [5:0]

Mayor Gamba adjourned the meeting at 7:59 p.m.

Respectfully submitted,

Scott Stauffer, City Recorder

COUNCIL WORK SESSION

City Hall Council Chambers, 10722 SE Main Street
& Zoom Video Conference (www.milwaukieoregon.gov)

MINUTES

NOVEMBER 1, 2022

Council Present: Councilors Adam Khosroabadi, Lisa Batey, Desi Nicodemus, Council President Kathy Hyzy, and Mayor Mark Gamba

Staff Present:

Justin Gericke, City Attorney
Nicole Madigan, Deputy City Recorder
Adam Moore, Parks Development Coordinator
Ann Ober, City Manager
Peter Passarelli, Public Works Director
Natalie Rogers, Climate & Natural Resources Manager
Scott Stauffer, City Recorder

Mayor Gamba called the meeting to order at 4:02 p.m.

1. Neighborhood Park Projects Update – Report

Moore reported that the park project focus groups had found that members of Milwaukie's Black and Indigenous People of Color (BIPOC) and disabled community did not always feel safe in Milwaukie parks due to unclean spaces, vandalism, and drug paraphernalia. Focus group participants suggested posting a welcome sign in many languages and **Moore** shared thoughts on hosting more cultural events and including more murals. Participants commented on feeling unwelcome in parks due to some parks feeling more like an extension of someone else's backyard.

Moore stated that the park plans should strive to be more universally inclusive and go beyond the Americans with Disabilities Act (ADA) code requirements by making paths wide enough for wheelchair users to be able to pass one another or companions to walk alongside wheelchair/walker users. **Moore** shared that focus group participants wanted to see parks be more accessible for people of all ages and to install well designed bathrooms that provide ample room and options for all needs. Participants also commented on equal amenities across the whole city and how unleashed dogs caused more feelings of unwelcomeness.

Moore and **Councilor Batey** shared experiences and thoughts of dogs off leash and why following leash rules were important. **Council President Hyzy** pointed out the value of the focus groups, was distressed by community members not feeling welcome, and commented on the North Clackamas Parks and Recreation District's (NCPRD) parks signs. **Moore** acknowledged the discussion around signage and other visual avenues that could be used to promote inclusion and feelings of welcome.

Moore provided an engagement update that included data from completed surveys.

Moore presented the engagement summary for Bowman-Brae Park and **Councilor Nicodemus**, **Moore**, and **Council President Hyzy** commented on a ball pit feature used at the open houses. **Moore** provided feedback received for Bowman-Brae Park that included changes because of budget concerns. **Moore** presented the most recent design draft concept, advised that it would be changing, and shared what survey participants ranked as the most important features.

Moore mentioned conversations had with neighbors regarding the lack of sidewalks to the park and how disabled residents could not navigate the streets and would therefore need parking. **Moore** noted that the park's multiuse path would need to shrink, and

Councilor Batey asked if that was due to cost. **Moore** responded yes and continued to discuss other budgetary challenges. **Mayor Gamba** expressed concern regarding the lack of trees, especially around the playground. **Moore** replied that there was focused discussion and comments on the importance of trees in the park and their location.

Moore presented the engagement summary, concept feedback, and challenges for Balfour Park. A recurring design issue for Balfour Park was the community garden placement which had been difficult due to existing trees. The group discussed options for where the garden could go and what would have to move, including placing the garden outside of the park. **Moore** asked Council for direction on what should be done with community garden. The group discussed new community gardens in the new Clackamas County Hillside Manor design, the garden at Providence Milwaukie Hospital, the addition of fruit trees, and whether planting next to a train track is an acceptable location for a garden. **Ober** summarized that if the community garden needs are going to be met elsewhere, to keep the trees in Balfour Park and prioritize other amenities. The group discussed what the threshold would be for moving on without the community garden in Balfour Park and other features that were nonnegotiable to remove.

Moore described the features of the water table and mentioned that it was an affordable and cool amenity, but not a destination amenity like a splash pad. **Moore** advised Council that half street improvements such as the sidewalk and drop off area would be added later through the Safe Access for Everyone (SAFE) project on Balfour Street.

Moore presented the engagement summary and concept feedback on both concepts for Scott Park. **Moore** commented on conversations around the veteran's memorial within the park. The group discussed what renovations the veteran's group were interested in regarding the current memorial that is within the park. **Moore** added that Scott Park is a good location for an accessible playground, but the cost could be an issue, detailed the differences between the two draft design concepts, and pointed out challenges that are being evaluated.

Mayor Gamba expressed interest in playgrounds over a pergola in Scott Park and **Moore** believed that without the pergola and a few other amenities there could be hybrid playground features for both accessibility and nature-based play. **Council President Hyzy** and **Moore** discussed accessible playground surfacing and accessible playgrounds.

Moore advised there would be a special Park and Recreation Board (PARB) meeting on November 16 where the final plans would be shared and then brought to Council on December 6. **Ober** congratulated Moore on the work with the community and park planning and **Moore** commended the team and the community for all their engagement.

Moore and **Councilor Batey** discussed Ardenwald neighborhood's fundraising for Balfour Park.

~~2. Downtown Design Review – Discussion~~ (removed from the agenda)

3. Adjourn

Mayor Gamba adjourned the meeting at 5:20 p.m.

Respectfully submitted,

Nicole Madigan, Deputy City Recorder

CITY OF **MILWAUKIE**

2368th Meeting

COUNCIL REGULAR SESSION

MINUTES

City Hall Council Chambers, 10722 SE Main Street
& Zoom Video Conference (www.milwaukieoregon.gov)

NOVEMBER 1, 2022

Council Present: Councilors Adam Khosroabadi, Lisa Batey, Desi Nicodemus, Council President Kathy Hyzy, and Mayor Mark Gamba

Staff Present:

Damien Farwell, Fleet & Facilities Supervisor	Peter Passarelli, Public Works Director
Justin Gericke, City Attorney	Natalie Rogers, Climate & Natural Resources Manager
Brett Kelver, Associate Planner	Scott Stauffer, City Recorder
Ann Ober, City Manager	

Mayor Gamba called the meeting to order at 6:01 p.m.

1. CALL TO ORDER

A. Pledge of Allegiance.

B. Native Lands Acknowledgment.

2. ANNOUNCEMENTS

Mayor Gamba announced upcoming community activities, including the city's leaf drop events, an online watershed workshop, a parks community forum, the special pre-thanksgiving Milwaukie Farmers Market, and a city manager open door session.

Stauffer, **Gamba**, and **Council President Hyzy** noted the location of ballot boxes in the city that were open for the November 8 general election and that ballots needed to be postmarked on election day to count if sent by mail.

Councilor Batey announced a habitat clean-up event and **Councilor Nicodemus** noted that Milwaukie residents who were part of the air pollution lawsuit against Precision Castparts would be receiving their settlement checks soon.

Ober reported that the city's public works department had sandbags available for residents who may need them during the upcoming wet weather.

3. PROCLAMATIONS AND AWARDS

A. Veterans Day – Proclamation

Jerry Craig, American Legion Post 180 member, remarked on the services provided by Post 180 and **Stauffer** thanked Post 180 for their work in the community. **Mayor Gamba** proclaimed November 11, 2022, to be Veterans Day in Milwaukie.

4. SPECIAL REPORTS

~~A. City Manager Updates – Report~~ (removed from the agenda)

5. COMMUNITY COMMENTS

Mayor Gamba reviewed the public comment procedures and **Ober** reported that there was no follow-up report from the October 18 community comments.

6. CONSENT AGENDA

It was moved by Councilor Batey and seconded by Councilor Khosroabadi to approve the Consent Agenda as presented.

A. City Council Meeting Minutes:
   1. October 4, 2022, Work Session, and
   2. October 4, 2022, Regular Session.

B. ~~A resolution making appointments to the Transportation System Plan Advisory Committee (TSPAC)~~ (removed from the agenda)

C. Resolution 72-2022: A resolution of the City Council of the City of Milwaukie, Oregon, making an appointment to the Ledding Library Board.

Motion passed with the following vote: Councilors Nicodemus, Hyzy, Khosroabadi, and Batey and Mayor Gamba voting "aye." [5:0]

7. BUSINESS ITEMS

A. Annexation of 5731 SE Laurel Street – Ordinance

Kelver reported that the annexation had been triggered by a sewer system connection.

It was moved by Councilor Khosroabadi and seconded by Council President Hyzy for the first and second readings by title only and adoption of the ordinance annexing a tract of land identified as Tax Lot 1S2E30AD04400 and located at 5731 SE Laurel St into the city limits of the City of Milwaukie (File #A-2022-001). Motion passed with the following vote: Councilors Nicodemus, Hyzy, Khosroabadi, and Batey and Mayor Gamba voting "aye." [5:0]

Ober read the ordinance two times by title only.

Stauffer polled the Council with Councilors Nicodemus, Hyzy, Khosroabadi, and Batey, and Mayor Gamba voting "aye." [5:0]

Ordinance 2220:

AN ORDINANCE OF THE CITY OF MILWAUKIE, OREGON, ANNEXING A TRACT OF LAND IDENTIFIED AS TAX LOT 1S2E30AD04400 AND LOCATED AT 5731 SE LAUREL ST INTO THE CITY LIMITS OF THE CITY OF MILWAUKIE (FILE #A-2022-001).

B. New Building Energy and Climate – Resolutions, continued

Rogers explained that staff had reviewed the building energy resolutions proposed at the September 6, 2022, regular session and reported that the resolutions would not require natural gas users to change anything. **Rogers** discussed how the resolutions related to the city's Climate Action Plan (CAP) programs and goals.

Council President Hyzy, **Rogers**, and **Farwell** clarified that the resolution addressing city-owned buildings would impact the new city hall building and remarked on what "service impact" meant in terms of electrifying a city-owned building. **Ober** noted that the Milwaukie Community Center was city-owned but operated by the North Clackamas Parks and Recreation District (NCPRD) which would impact when it would be electrified. **Rogers** noted when city-owned facilities may be exempt from being electrified.

Councilor Batey asked about the effective date for city-owned buildings being electrified. **Rogers** and **Passarelli** remarked on the staff processes that determine when the city moves forward with electrification projects. **Mayor Gamba** suggested the resolution would require staff to replace gas equipment with electric equipment as older equipment fails, and **Ober** agreed that the resolution included that requirement.

Rogers discussed the resolution that would establish a voluntary electrification program for existing buildings, reporting that staff supported the proposed programming. **Rogers** observed that Council would need to provide future input on and identify funding for the programming. **Council President Hyzy** and **Rogers** remarked that the programming could be city-run or offered by other governments, utilities, and community partners.

Rogers reviewed the resolution that would require new buildings be electrified. **Councilor Batey** and **Rogers** noted that a similar proposal under consideration by the City of Eugene, Oregon, focused only on low-rise residential buildings. **Rogers** recommended that Milwaukie wait to see what Eugene adopts before proceeding with the resolution addressing the electrification of new buildings.

It was noted that Council would take community comments on the proposed resolutions.

Dave Adams, Milwaukie resident, asked if staff had investigated the weatherization needs of city-owned buildings and whether those buildings would need to be brought up to code. **Ober** and **Passarelli** replied that staff had investigated those issues and would do so in more depth if the resolution addressing city-owned buildings was adopted.

Ashley Haight, Portland resident, remarked on personal experiences dealing with the effects of climate change and encouraged Council to adopt the resolutions.

Ali Lee, Climate Solutions, encouraged Council to adopt the resolutions and commented on the negative health impacts of using natural gas.

Laura Edmonds, North Clackamas Chamber of Commerce, suggested the business community's voice had not been heard on the use of natural gas, expressed concern about the unknown impacts of banning natural gas, and urged Council to refer the issue to voters and include business groups in the community conversation.

Alma Pinto, Community Energy Project (CEP), noted CEP's work to electrify homes and encouraged Council to adopt the resolutions.

Ann Pernick, Safe Cities at Stand.Earth, noted the pro-electrification work done by other local governments and encouraged Council to adopt the resolutions.

Xanthia Wolland, Oregon Environmental Council, remarked on the impact of buildings on climate change and encouraged Council to adopt the resolutions.

Greer Ryan, Climate Solutions, encouraged Council to adopt the resolutions and commented on the negative health impacts of natural gas.

Councilor Khosroabadi asked about the impact of a natural gas ban on businesses. **Rogers** commented that the resolutions would not require existing gas users to stop using gas and encouraged businesses to participate in an online survey. **Mayor Gamba** explained that the resolution would not stop current gas users from getting new pipes, it would prevent new gas lines to new buildings.

Councilor Nicodemus, **Rogers**, and **Passarelli** remarked on existing incentive programs that encourage building owners to switch to electric energy and whether a ban on new gas lines would be limited to residential or commercial buildings.

The group discussed the resolution addressing the electrification of city-owned buildings, noting that revisions to the resolution were needed. **Mayor Gamba** and **Councilor Batey** concurred with the staff recommendations regarding city-owned buildings. Staff clarified what situations would trigger a city facility being electrified, confirmed that all city facilities participated in energy savings programs, and explained how the cost estimates for electrifying city buildings had been determined to-date.

Rogers and **Passarelli** asked for Council feedback on whether city-owned buildings should be electrified when it was part of a donation process. **Council President Hyzy** and **Mayor Gamba** believed it would be hard to draft a policy for all donated properties and suggested the city should consider donations on a case-by-case basis.

The group discussed the resolution establishing a voluntary electrification program for existing buildings. **Councilors Batey, Khosroabadi, and Nicodemus** and **Council President Hyzy** supported electrification but believed the resolution addressing the electrification of existing buildings had created confusion and more community engagement was needed. **Mayor Gamba** observed that a campaign had been undertaken to cause confusion and noted that the resolution only underscored the city CAP requirement that buildings in the city be net-zero by 2035. The group remarked on what community outreach about electrification could look like in the next year and discussed the impact of banning natural gas as new housing units were built.

Council President Hyzy and **Gericke** noted that the city's right-of-way (ROW) franchise agreement with NW Natural Gas would expire in February 2024. The group remarked on how banning new gas lines could impact new building construction.

The group remarked on the inclusion of businesses in conversations about natural gas use and whether the resolution addressing the use of natural gas in existing buildings should just focus on residential buildings.

The group discussed the resolution addressing the use of natural gas in new buildings. **Council President Hyzy** expressed concern about the legal and fiscal impacts of the city banning natural gas and suggested Milwaukie should wait to see what Eugene does. The group remarked on the legal processes that NW Natural Gas could take to counter any action taken by Council to stop the use of natural gas.

Councilor Khosroabadi remarked that NW Natural's push survey had undermined its relationship with the city. **Khosroabadi** and **Council President Hyzy** observed that NW Natural had tried to raise its rates.

The group noted that the intent of the Council resolutions related to natural gas use were to direct staff to pursue policy goals and did not carry the weight of an ordinance. **Councilor Batey** and **Council President Hyzy** suggested building code and natural gas use issues might be more appropriately addressed by the state legislature. **Mayor Gamba** noted the city had the authority to regulate the use of public ROWs.

Council discussed how to proceed with the resolutions. It was Council consensus that the resolution electrifying city-owned buildings should be brought for adoption.

The group discussed the resolution addressing natural gas use in existing buildings. **Councilors Batey and Khosroabadi** and **Council President Hyzy** suggested further community conversation was necessary on the resolution before Council adopted it. **Mayor Gamba** remarked on the threat of climate change. The group discussed what actions the resolution called for and the impact of those actions on staff workload. They discussed community engagement steps needed and the timing of promoting the electrification of buildings and banning new natural gas lines.

The group summarized that Council supported considering the resolutions addressing the electrification of city-owned buildings and a revised version of the resolution addressing natural gas use in new buildings at the December 6 regular session.

Mayor Gamba and **Rogers** noted that part of the resolution addressing the use of natural gas in existing buildings would be discussed at the November 15 regular session. Council briefly discussed whether the resolution should only address the use of natural gas in existing residential buildings. It was Council consensus to structure a resolution addressing existing buildings' use of natural gas based on what actions were taken by the City of Eugene.

8. PUBLIC HEARING

A. None Scheduled.

9. COUNCIL REPORTS

None.

10. ADJOURNMENT

It was moved by Councilor Nicodemus and seconded by Councilor Batey to adjourn the Regular Session. Motion passed with the following vote: Councilors Nicodemus, Hyzy, Khosroabadi, and Batey and Mayor Gamba voting "aye." [5:0]

Mayor Gamba adjourned the meeting at 9:19 p.m.

Respectfully submitted,

Scott Stauffer, City Recorder

CITY OF **MILWAUKIE**

RS 6. B.
12/6/22
OCR USE ONLY

COUNCIL STAFF REPORT

To: Mayor and City Council
Ann Ober, City Manager

Date Written: Nov. 23, 2022

Reviewed: Peter Passarelli, Public Works Director,
Karin Gardner, Administrative Specialist III, and
Sasha Freeman, Administrative Specialist II

From: Damien Farwell, Fleet & Facilities Supervisor

Subject: **Janitorial Contract Award**

ACTION REQUESTED

Council is asked to authorize the city manager to sign a contract with Diversified Abilities for janitorial services for city owned buildings, in the amount of $219,910.92 per year for five years, with the option to renew for one, two-year extension. The total value of this contract, if extended through five years, is not to exceed $1,099,554.60.

HISTORY OF PRIOR ACTIONS AND DISCUSSIONS

October 2016: The city solicited bids from four qualified rehabilitation facility firms (QRF) for janitorial services known to service the Clackamas County area. The city selected TVW, Inc., who was determined to be the most qualified QRF to provide service to the city's five buildings. The contract between TVW, Inc. and the city has reached the end of its six-year period, which is expiring December 31, 2022.

In October 2022, the city solicited QRF bids and received two submissions.

ANALYSIS

In accordance with Oregon Revised Statute 279.845(1)(a), the city contracts with a QRF for janitorial services. The QRF program empowers disabled individuals to gain independence through vocational placement and provides long-term employment opportunities. The QRF program is managed by the State of Oregon.

In October 2022, the city solicited bids from four QRF's known to service the Clackamas County area. The city received two submissions that were scored by our stated method, with Diversified Abilities determined to be the winner.

It is the intention of staff to enter into a contract with Diversified Abilities for five years, with the option to renew for one, two-year extension.

BUDGET IMPACT

The facilities maintenance budget includes funding for this contract. For each subsequent year of this contract, the necessary funds will be requested in the biennium budget.

WORKLOAD IMPACT

The facilities division oversees the janitorial service within its work program. The callbacks facilities has historically experienced did not have a significant impact on the department workload.

CLIMATE IMPACT

Not applicable.

COORDINATION, CONCURRENCE, OR DISSENT

Not applicable.

STAFF RECOMMENDATION

Staff recommends that Council authorize the city manager to sign the contract with Diversified Abilities.

ALTERNATIVES

Council could decide to:

1. Approve with amendments to scope and resolicit bids
2. Reject recommendation

ATTACHMENTS

1. QRF Description
2. Scope of Work
3. Janitorial Services Proposal
4. Resolution

Attachment 1

QRF Description

10.095 Required Procurement from Qualified Non-profit Agency for Individuals with Disabilities

A. Purpose is to encourage and assist individuals with disabilities to achieve maximum personal independence through useful and productive gainful employment by assuring an expanded and constant market for sheltered workshop and activity center products and services, thereby enhancing their dignity and capacity for self-support and minimizing their dependence on welfare and need for costly institutionalization.

B. In accordance with ORS 279.850(1), if the City intends to procure goods or services on the Oregon Forward Program (OFP) procurement list that the State of Oregon Department of Administrative Services (DAS) established under ORS 279.845, then the goods or services must be procured at the price DAS establishes from an OFP qualified non-profit agency, provided the product or service is of the appropriate specifications and is available within the period the City requires.

C. To the extent competition exists among OFP qualified non-profit agencies, the City will select the non-profit agency offering the lowest price for an acceptable level of goods or services.

D. The OFP procurement list may be reviewed at the Oregon Forward Program website at https://ofp.dasapp.oregon.gov/.

E. The Public Contracting Code does not apply to OFP procurements under ORS 279A.025(4).

Attachment 2

JANITORIAL SERVICES
(SCOPE OF WORK)

Area 1 (Total = 27,885 Square Feet)

Facilities:

City Hall
10722 SE Main Street
Milwaukie, OR 97222
9,885 sq. ft.

Ledding Library
10660 SE 21st Avenue
Milwaukie, OR 97222
18,000 sq. ft.

Area 2 (Total = 22,000 Square Feet)

Facility:

Public Safety Building
3200 SE Harrison Street
Milwaukie, OR 97222
22,000 sq. ft.

Area 3 (Total = 10,635 Square Feet)

Facilities:

JCB-Community Development Building
6101 SE Johnson Creek Blvd
Milwaukie, OR 97206
4,200 sq. ft. office space

JCB-Fleet Office areas
6101 SE Johnson Creek Blvd
Milwaukie, OR 97206
535 sq. ft. office space

JCB – Public Works & Facilities Building
6101 SE Johnson Creek Blvd
Milwaukie, OR 97206
5,600 sq. ft. office space

JCB – Annex Building
6101 SE Johnson Creek Blvd
Milwaukie, OR 97206
300 sq. ft. office space

EXHIBIT B

Section 1 – Standard Specifications and Conditions

1.1 GENERAL

Contractor shall provide janitorial services for the City of Milwaukie (City) facilities. Contractor shall furnish all equipment, materials and services necessary to perform the janitorial duties specified in a satisfactory manner and at not less than the frequencies set forth in the following specifications. The premises shall be maintained in a neat, clean, and orderly condition according to Cleaning Performance Standards (Section 1.27) contained in this package.

1.2 SCOPE OF WORK

There are six (6) City facilities included in this specification, which are located at various locations throughout City limits. City spaces in this specification total approximately 60,520 square feet of offices, and libraries, as listed under "Facility Descriptions". These facilities are divided into three (3) areas. These facilities operate five (5) to seven (7) days a week, eight (8) to twenty-four (24) hours a day. Janitorial service for all facilities shall be scheduled as called for in this specification.

These facilities will receive cleaning five (5) to seven (7) days a week. These facilities shall be cleaned according to the Cleaning Performance Standards (Section 1.27). The service for these facilities is monitored on a daily basis by building staff and routinely inspected by Facilities Management for adherence to specifications. Janitorial staff working in these facilities shall have office related experience, as well as specialized training in the handling of infectious waste, contaminated sharps, communicable diseases and tuberculosis training and testing.

1.3 QUESTIONS ON TECHNICAL INFORMATION

Questions relating to materials in these Standard Specifications and Conditions shall be addressed to:

Damien Farwell, Fleet & Facilities Supervisor
City of Milwaukie Public Service Facility
6101 SE Johnson Creek Blvd.
Milwaukie, OR 97206
Phone: 503-786-7680
Email: farwelld@milwaukieoregon.gov

1.4 NATURE AND EXTENT OF SERVICES

The City serves the public in varying degrees depending on the function of each facility. Janitorial services in these facilities are required on a regularly scheduled basis coinciding with the days of operation and shall be completed during the times specified by the Contract Administrator. Days of operation shall be noted for each facility, while hours of operation vary at each building according to its use. All cleaning is to be accomplished during closed hours at each location, with the exception of facilities that operate 24-hours per day. Specific schedules shall be approved by Facilities Management prior to starting Contract.

The highest standards of cleanliness shall be maintained. It is the intent of these specifications that all facilities present a consistently clean condition. The services outlined in these specifications are to be considered as minimum requirements but in no instance are they to limit the level of cleanliness in buildings.

City's Cleaning Performance Standards are included in this specification in Section 1.27. Contractor shall include at a minimum the cleaning standards set forth in this specification and all additional requirements as detailed.

EXHIBIT B

1.5 EMERGENCY RESPONSE

Contractor shall provide seven-day a week emergency coverage to the City facilities included in this specification. Emergency corrections called in before or after the regularly scheduled janitorial hours shall be considered emergency after-hours calls. Afterhours calls shall be submitted on a separate invoice designating the number of hours and the facility requiring such service. After-hours calls will be charged at an agreed rate. During normal janitorial hours, emergency janitorial corrections shall be taken care of at no additional charge.

NOTE: Exception cleaning such as major floods or contamination by bodily fluids shall be billed separately. Justifiable emergency calls are defined as follows:

A. Floods related to plumbing, roof leaks or other sources, when flooded area cannot be isolated (closed) or continuing damage is occurring due to flood remaining overnight.

B. Blood spills, vomit, urine, or other human bodily fluids that cannot be isolated or blocked off.

Emergency after-hours calls shall be made directly to the Contractor. Emergency requests shall require Contractor to call within thirty (30) minutes after placing the first call and work started within two (2) hours.

Emergency correction needed during normal janitorial working hours shall be available by calling emergency numbers.

Non-emergency corrections shall be registered in the daily logbook for janitorial complaints. Non-emergency corrections shall be completed within twenty-four (24) hours. Examples of non-emergency corrections include such items as:

i. Trash can full
ii. Liquid spill presenting no safety hazard
iii. Toilet paper or other dispensers empty (when other rest rooms are stocked and available)

1.6 FACILITY DESCRIPTIONS

ALL SQUARE FOOTAGES ARE APPROXIMATE AND CONTRACTOR SHALL VERIFY DIMENSIONS TO THEIR SATISFACTION.

AREA 1

A. City Hall contains approximately 9,885 sq. ft. of carpeted and hard surface floors. Janitorial services shall be performed 5 Days per week. Days of operation are Monday through Friday, 7:00am to 5:00pm. Some evening meetings are scheduled during the week. This schedule will be available to the janitorial service provider. No janitorial work will be performed during meeting hours. Mid-day cleaning at City Hall is referenced in Section 1.6(B).

B. Ledding Library contains approximately 18,000 sq. ft. of carpeted and hard surface floors. Janitorial services shall be performed 7 Days per week. Days of operation are 7 days per week. Hours of operation are Monday through Thursday 10:00am through 8:00pm, Friday and Saturday 10:00am through 6:00pm, Sunday 12:00pm through 6:00pm. Staff arrives generally by 8:30am on all days except Sunday, they arrive at 9:00am in the morning.

In addition to evening cleanings there shall be mid-day cleanings (excluding holidays) at City Hall and the Ledding Library. The following checklist shall be completed for each mid-day cleaning of two (2) public restrooms at City Hall and three (3) public restrooms (men, women & family) and one (1) staff bathroom at the Ledding Library:

EXHIBIT B

1. Wipe down counter, fixtures/door handles, and walls around sink area
2. Clean and disinfect toilets
3. Wipe down stall areas, unplug any toilets, report any plumbing issues to City staff
4. Restock paper products and soap, if needed
5. Sweep and dry mop restroom floors
6. Remove trash, wipe down trash cans
7. Close restroom for no more than 10 minutes at a time
8. Disinfect building entry door handles
9. Wipe down glass of building entry doors inside and out, including fingerprints
10. Check outside trash, grounds for trash, and overflowing trashcans. Gather trash and replace liner, if needed

Contractor shall keep checklist supplied outside janitorial closet door at each location. Contractor shall complete checklist daily after completion of every mid-day cleaning at each location.

AREA 2

C. Public Safety Building (PSB) contains approximately 22,000 sq. ft. of carpeted and hard surface floors. Janitorial services shall be performed 6 Days per week. Days of operation are 7 days per week, 24 hours per day. The office and reception area are open from 8:00am to 5:00pm, Monday through Friday. The community room is used during the day from 8:00am to as late as 10:00pm. Cleaning of these areas will have to be done after hours.

AREA 3

D. JCB/Community Development Office contains approximately 4,200 sq. ft. of office space consisting of carpeted and hard surface floors. Janitorial services shall be performed 5 days per week. The CD building office is open from 8:00am to 5:00pm, Monday through Friday. Cleaning of these areas shall be done after hours and on weekends.

E. JCB/Fleet Shop Offices contains approximately 535 sq. ft. of carpeted and hard surface floors. Janitorial services shall be performed 2 days per week. The Fleet shop office is open from 6:00am to 4:30pm, Monday through Friday. Cleaning of these areas shall be done after hours and on weekends.

F. JCB/Public Works Building contains approximately 5,600 sq. ft. of office space consisting of carpeted and hard surface floors. Janitorial services shall be performed 5 days per week. The Public Works office is open from 6:00am to 5:00pm, Monday through Friday. Cleaning of these areas shall be done after hours and on weekends.

G. JCB/Annex Building contains approximately 300 sq. ft. of office space consisting of hard surface floors and one (1) bathroom. Janitorial services shall be performed 2 days per week. The Annex office is open from 7:00am to 3:30pm, Monday through Friday. Cleaning of these areas shall be done after hours and on weekends.

1.7 DAILY/PERIODIC SERVICES SCHEDULE

Contractor shall provide City of Milwaukie Facilities Management with specific dates and times for items designated in the Building Cleaning/Task Schedule, Section 1.28.
Such dates and times are subject to the approval of Facilities Management. The unique operations conducted in some City facilities require that all areas be serviced according to the needs of the facility.

All services scheduled to be performed quarterly, semiannually, and annually shall be performed and scheduled at appropriate intervals during the term of the Contract.

1.8 SUPERVISION

The Contractor shall be responsible for the direct on-site inspection of the custodians through its supervisor(s), and the supervisor(s) shall be available at reasonable times to report to and confer with the Facilities Management Contract Administrator with respect to services. The telephone number of the responsible supervisor shall be provided to the City for daily, emergency, and/or non-routine service.

The Contractor shall provide an on-site supervisor whose primary task is to see to it that all of the Contractor's employees, in all buildings, understand and carry out what is required to satisfy the specifications of the Contract.

The on-site supervisor shall also schedule and coordinate the maintaining/restoring of all resilient/hard surface floor finishes and carpet cleaning. All floor restoration projects shall be scheduled seven days in advance with the Contract Administrator.

1.9 QUARTERLY CITY STAFF & CONTRACTOR MEETING

Contractor shall regularly schedule a quarterly meeting with a City representative. The location of the meeting shall be determined by the City representative. The purpose of the meeting shall be to discuss janitorial services during the previous quarter.

1.10 EXCEPTION CLEANING SERVICE

Contractor may occasionally be required to perform cleaning services on an exception basis for items or areas not covered by the cleaning schedule. Such services shall be requested by the Contract Administrator on an individual basis and shall be billed separately on a monthly basis as applicable.

1.11 CONTRACTOR SUPPLIED ITEMS

All labor, janitorial tools, equipment, machines, and cleaning supplies necessary for the performance of daily janitorial services shall be furnished by the Contractor.

Contractor shall furnish at the City’s expense the following supplies for the performance of daily janitorial services:

- hand soap & sanitizer
- urinal mats
- seat covers
- toilet paper
- facial tissue
- garbage bags/can liners
- paper towels
- feminine products (pads, tampons & waste liners)

Any supplies purchased by Contractor, other than those identified in the above paragraph shall be at the Contractor’s expense. Contractor to provide distribution of supplies throughout City facilities, as needed.

It is expressly understood that not all items listed here in Exhibit B may be needed. City shall have complete discretion to select only those goods or services needed at any time. All prices are in U.S. dollars.

EXHIBIT B

The City requires current safety data sheets (SDS) for all chemicals being used on-site in all City Facilities. The Contractor shall provide SDS and product labels to the Contract Administrator prior to the use of any chemicals.

1.12 CITY SUPPLIED ITEMS

The City shall furnish janitorial supplies not identified in Section 1.11.

1.13 JANITORIAL LOG

The Contractor shall furnish a janitorial log for each facility and/or work site as designated by the City Facilities Management Department. The log shall be reviewed daily by the contractor's personnel. Contractor's personnel shall acknowledge in writing any entry made by City personnel. This log shall remain in City designated areas of each facility.

1.14 GENERAL NOTATION

Contractor shall not operate or adjust the setting of any of the heating, ventilating or air conditioning systems in facilities without written approval of Facilities Management.

Contractor shall leave only designated lights on and shall check windows and doors for security upon completion of janitorial work.

Contractor shall learn and carefully operate building security systems according to instructions.

Contractor shall report any damaged or broken plumbing, glass, light fixtures, furniture, paint, floor, lavatory fixtures, etc., to Facilities Management.

Contractor shall be responsible to oversee, maintain, and purchase janitorial supplies, as needed per Sections 1.11.

Contractor shall report any unusual security problems to Facilities Management.
Contractor shall use designated janitorial closets and areas for storage of equipment and supplies. Janitorial closet areas shall be kept clean and orderly.

Contractor shall not permit visitors and children inside buildings at any time.
Contractor shall check the Logbook daily/nightly for instructions and cleaning problems.

Contractor shall repair/replace, at Contractor's cost, any furnishings or fixtures damaged by Contractor's employees.

The Contractor shall turn in lost and found articles to Facilities Management within twenty-four (24) hours.

1.15 IDENTIFICATION OF EMPLOYEES

Contractor shall provide uniforms and identification of its employees. All employees shall wear uniforms at all times while in City facilities so that each employee is readily identifiable. All Contractors' personnel shall be clean and neat at all times. Minimum requirement of a uniform shall be a shirt with company name, logo and employee name permanently attached. City supplied picture ID badges shall also be worn and displayed at all times Contractor's employees are in City facilities.

1.16 CERTIFIED PAYROLL

Contractor shall provide monthly-certified payroll verification for all Contractors' employees used in the performance of this Contract, if requested by City.

1.17 MINIMUM QUALIFICATIONS

Contractor shall completely meet the following minimum qualifications:

A. Contractor Experience - Contractor and Contractor's key personnel who will have supervisory roles in this Contract shall have a minimum of three (3) years of recent and continuous, comparable experience.
B. 24-Hour Response - Contractor shall have 24-hour, 7-day emergency response capability. Contractor will provide a complete description of response system, e.g., pagers, mobile phone, answering service, etc.

1.18 INSURANCE

Contractor shall obtain, at Contractor's expense, and keep in effect during the term of this Contract, insurance for not less than the dollar limits contained in the "Agreement Form Section" of this package.

1.19 SECURITY CLEARANCES

Contractor shall provide names and other requested information to Facilities Management on all principals and employees being used in the execution of this Contract for the purpose of obtaining a Security Clearance. No principal or employee shall be allowed to enter any City facility for work purposes until a Security Clearance is completed. Contractor shall allow a minimum of two (2) weeks for security clearance.

1.20 SDS

Contractor shall supply Safety Data Sheets for all products supplied by the Contractor for use in performance of this Contract. No products shall be approved for use, which contain lasting fragrance. These Data Sheets, along with the products, shall be kept up-to-date and properly labeled. No product shall be used in City Facilities until SDS have been reviewed and approved by Facilities Management.

1.21 REQUIRED TRAINING

Contractor shall provide copies of all required programs as listed below. The programs shall be complete and include the names of all employees to be used in the performance of this Contract.

Note: All employees shall be trained prior to beginning work in City facilities.

A. Certified HIV/Hepatitis training and vaccination program per OR-OSHA regulations OAR 437, Division
B. General Occupational Safety and Health Rules (29 CFR 1910.1 030) blood-borne pathogens.
C. Hazardous Communications Program. (SDS)
D. Tuberculosis (TB) training and optional testing program. (OSHA)
E. Janitorial/Housekeeping training program on proper techniques and cleaning methods including training on the use of non-fragranced supplies complete with all related safety warnings.

EXHIBIT B

1.22 NON-PERFORMANCE RESOLUTION

If Contractor fails to perform services as described in this Exhibit B, the City may withhold payment, in part or whole, for services not rendered. In the event services are not rendered, the City shall provide written communication to the Contractor that includes short-payment details, explanation of reason, and contact information for further communication prior to any partial payment being issued. If a resolution is agreed upon by both parties that results in issuance of the short-payment amount, then the City shall issue payment to the Contractor within 20 days of resolution.

If a resolution is agreed upon by both parties that results in a waiver of the invoiced amount, in part or whole, then the Contractor shall remove the agreed amount owed by the City from its receivable records.

1.23 DISPUTES

In case of any doubt or differences of opinions as to the items or service to be furnished hereunder, or the interpretation of the provisions of the specifications, the decision of the City shall be final and binding upon all parties.

1.24 EMPLOYMENT STANDARDS

The Contractor is expected to use prudent judgment in the selection of a work force. Proven judgment, integrity, work habits and skill proficiency of employees are essential employee requirements.

All janitorial personnel must have a security clearance. There will be no exceptions and no substitutions of personnel without prior security clearance checks.
The Contractor shall not assign to the facilities any employees who have been convicted of any felonies, or misdemeanors, which reflect negatively upon the honesty, reliability, general trustworthiness, or prudent judgment of the employees.

All Contractors' employees shall be bonded.

The Contractor is expected to adhere to "Equal Opportunity" principles and practices in relationships with his/her employees.
Employees of Contractor shall not be accompanied or assisted by non-employees during work shifts (including their own children).

Contractor shall provide the City Facilities Management Department an accurate, typed roster of all management and janitorial work force personnel who have any relationship with the work to be performed at the City's facilities. Roster data must include full names, job title, employee number, date of birth and if approved, CJIS clearance date. The roster shall be continuously updated to reflect any personnel changes.

In the interest of safety, Contractor's employees must be able to communicate in English both orally and in writing or be accompanied at all times by an employee of Contractor who is able to do so.

1.25 SECURITY

Any disclosure or removal of any matter and/or property from City facilities on the part of the Contractor shall be cause for immediate cancellation of the Contract. Any liability, including, but not limited to, attorney's fees, resulting from any such action or suit brought against the City as a result of the Contractor's willful or negligent release of information, documents or property contained in the building shall be borne by the Contractor. All information, documents and property contained within these facilities shall be considered privileged and confidential and should be treated as such.

1.26 ASSIGNMENT

Neither the resultant Contract nor any of the requirements, rights or privileges demanded by it may be sold, assigned, Contracted or transferred by the Contractor without express written consent of the City.

1.27 CLEANING PERFORMANCE STANDARDS

The following standards shall apply to all facilities.

A. INSPECTIONS

i. CONTRACTOR'S ON-SITE SUPERVISION

Contractor's performance shall be maintained by continuing onsite supervision of work performed to ensure that standards of cleanliness and preservation are being attained by janitorial crews.

The following standards represent a high level of cleanliness, which defines the minimum level of service. If portions of this attachment appear to reduce the service level required by another portion, Contractors shall use the higher standard.

ii. INSPECTION BY CITY REPRESENTATIVE

All services required to be performed under this Contract shall be subject to inspection at any time by a representative of the City. If any such services are found to be unsatisfactory and not in accordance with the Task Schedule, the City shall notify the Contractor and the Contractor shall take immediate steps for corrective action at no additional cost to the City. Written notices of unsatisfactory conditions or need for corrections shall be transmitted to the Contractor as described in "JANITORIAL SERVICE AND COMPLAINT CORRECTIVE ACTION PROCEDURE", listed below. Notices for corrections sent by Facilities Management shall be considered official notices.

iii. JANITORIAL SERVICE COMPLAINT AND CORRECTIVE ACTION PROCEDURE FOR USE IN ALL CITY FACILITIES

This procedure has been developed to assist Facilities Management Contract variations. Action shall be taken against the Contractor should problems persist and not be corrected as required by the Contract. Your help in monitoring the service provided is essential to the success of the Contractor's adherence to janitorial specifications. Thank you for your time and assistance.

a. Should a problem with the cleaning occur:
All facilities shall have a logbook located in a designated area. This logbook shall be read by the Contractor each night. Log the complaint with the date and area of the problem. The Contractor shall check the log each night, take corrective action and sign the logbook.

b. If the problem is not corrected by the next working day:
Call 503-786-7621, 503-786-7663 or 503-786-7693 and speak to one of the facility representatives or leave specific information about the complaint and give your name and number where you can be reached.

c. If the problem is corrected but consistently reoccurs:
Always log the complaint in the logbook. Call Facilities Management at 503-786-7621, 503-786-7663, or 503-786-7693 and a work order will be processed with the information you give. Please be specific with the complaint and give your name and phone number where you can be reached. You will be contacted regarding your complaint.

d. If you are requested for emergency response for clean up:
Call 503-786-7621, 503-786-7663, or 503-786-7693 during regular office hours. An emergency contact number will be provided for after-hours calls.

B. CLEANING QUALITY DEFINITIONS - All items shall be done at intervals noted in task schedule

i. FLOOR MAINTENANCE:

- Vacuum thoroughly all carpeted areas, using professionally appropriate vacuuming equipment. This shall include all areas of each facility, under chairs and tables.
- Edge vacuum all carpeted areas. Spot clean all carpeted areas.
- Vinyl tile in all buildings shall be dusted with treated dust mops.
- Spills and spots shall be removed.
- Damp mop all hard flooring with appropriate cleaning agents.
- Sweep, wet mop and disinfect all kitchen/dining room, restroom/locker room and shower room floors. Edge all hard surface floors.
- Vacuum entrance mats and all other separate mats as may be required throughout the building. Clean under entrance mats.
- Sweep or vacuum stairways.
- Steam extract high traffic area carpet and rugs and all carpets.

ii. WASTE & RECYCLING MATERIALS:

- Empty all centrally located trash containers into the dumpsters located outside each building. Empty the centrally located recycling bins at each facility, as needed, into the recycle container located outside of each building. Clean indoor trash, recycling, and compost containers, as applicable, (inside and outside container) as necessary to maintain clean, odor-free containers. Replace can liners as necessary. All trash liners shall be replaced daily.
- Empty and clean all outside ashtrays and trash receptacles.

iii. DUSTING:

- Dust tops of partitions, tops of doorways, tops of vending machines, legs on bottom of chairs, filing cabinets, bookcases, other furniture, counter tops, windowsills, and window ledges, from floor to a height of seventy-two (72) inches.
- Dust high (over 72 inches) moldings, shelves, bookcases, door casings, window casings, hanging light fixtures, partition tops, ledges, etc. There shall be no cobwebs visible in any areas.
- Low dust all baseboards and ledges.

iv. RESTROOMS and KITCHENS:

- Clean and disinfect inside and outside of all urinals and toilets using appropriate cleanser for the removal of stains. Remove hard water stains inside and outside of toilet.
- Wash and disinfect bathroom stall partitions and doors, sheetrock walls, tile walls and showers. Remove hard water stains from showers and showerheads.
- Remove all graffiti.
- Detail all bathroom stalls.
- Clean and disinfect all sinks, faucets, and counter tops. Remove all hard water stains.
- Service and clean all soap, towel, toilet tissue and seat cover dispensers.
- Clean mirrors and empty refuse. Service as required to maintain high standards of cleanliness.
- Clean inside and outside of microwaves and refrigerators.
- Wipe down/disinfect tables and chairs.

v. DOORS, DOORKNOBS, DOOR JAMBS, WALLS, FINISH MOLDINGS AND ELEVATORS:

- Remove all fingerprints and other smudges from all doors, doorknobs and doorjambs, walls, (especially around switch and electrical outlet cover plates) and finish moldings.
- Clean and polish bright metal, entrance doors and kick/push plates.
- Vacuum or wet mop elevator floors and wipe down walls.
- Remove graffiti.
- Elevator floor tracks shall be clean and free of all foreign materials and dirt.
- Clean and polish elevator doors, floors, control panels and floor indicator plates where applicable.

vi. FURNITURE:

- Vacuum all upholstery and fabric partitions. Spot clean upholstery stains.
- Clean leather, plastic and vinyl furniture and furniture covers.

vii. GLASS:

- Clean mirrors, reception counter glass, and door windows.

viii. INCIDENTALS:

- Check and acknowledge entries in janitorial logs.
- Notify Facilities Management of any irregularities noted during servicing (e.g., defective plumbing, burned-out lights, graffiti which cannot be removed, unlocked doors, supply shortages, etc.).
- In kitchen areas, clean exteriors of cooking appliances, kitchen fixtures and counter tops.

EXHIBIT B

- Wipe and thoroughly clean lunch and conference room tables with appropriate cleaning agents.
- Check entry areas and clean as necessary both sides of all entry related glass doors and associated interior glass panels and frames.
- Spot-check and clean high traffic and heavily soiled areas. Spot shampoo carpeted areas.
- Clean and disinfect all drinking fountains and remove hard water stains.
- Turn off all lights except those required to be left on.
- Close and lock all entrance doors and windows.
- Reset alarm system in each building as necessary.

EXHIBIT B

1.28 Building Cleaning/Task Schedules (All City buildings)

City Buildings: City Hall (CH), Library (LIB), Public Safety Building (PSB), JCB/CD and JCB/PW & FF

CLOSING INSTRUCTIONS PRIOR TO DEPARTURE
All exterior doors are secure (unless there is a meeting in progress)
Turn off all lights except those to be left on, close and lock all entrance doors and windows
Alarm system to be set, if applicable
Make sure all furniture has been arranged neatly
Janitorial closets are to be kept neat and clean
Check and acknowledge entries in janitorial logbook
Notify Facilities Management of irregularities, supply shortages, defective plumbing, unarmed building, lights out, unlocked doors, etc.
DAILY - GENERAL CLEANING
Empty trash receptacles. Replace liners and clean as necessary to maintain clean, odor-free containers.
Wipe/Sanitize light switches, stair railings, door and cabinet handles
Sanitize/clean work surfaces including conference tables, counters and cabinets
Dust mop hard surface flooring, including stairwells. Spot clean as needed.
Vacuum carpeting and floor mats in all areas
Empty and clean outside entry trash cans and ash containers
Empty central recycling containers to trash company recycle container outside
DAILY - RESTROOOMS
Clean urinals, toilets and washbasins using disinfectant cleaner. Wash/disinfect toilet seats on both sides. Clean outside of toilet, top to floor
Clean and fill all dispensers (soap, toilet paper, feminine products (including pads, tampons, and paper feminine product waste liner) paper towels, etc. as applicable)
Clean mirrors, shelves, bright metal and other restroom fixtures
Empty waste containers, wash as necessary and insert liners as required
DAILY & WEEKLY - LOCKER ROOMS
Daily = See Daily Restroom Cleaning (see Locker Room Cleaning Section 1.29)
Weekly = Clean and sanitize locker room showers, benches and floors (see Locker Room Cleaning Section 1.29)
DAILY - KITCHEN AREA / LUNCHROOMS
Wipe down/disinfect tables and chairs, sinks and appliance exteriors
Empty and disinfect trash receptacles and replace liners
Clean and fill all dispensers (soap, paper towels, etc.)
Sweep and wet mop all floors using disinfectant cleaner
Vacuum carpeted areas (in JCB/PW Lunchroom Only)

EXHIBIT B

WEEKLY - ALL AREAS
Dust chairs and table legs, office furniture, and tops of space dividers
Clean glass doors of all entries, adjoining glass panels and reception/counter security glass
Spot clean walls and cabinets
Spot clean all carpeted areas and upholstered furniture
Wipe down non-upholstered lobby furniture with disinfectant cleaner
Clean/sanitize drinking fountains (N/A @ JCB/CD)
Remove cobwebs from walls and ceiling areas
Wipe down and disinfect walls, doors and partitions in restrooms
Sweep all outside doorway entrances
Clean/disinfect exercise equipment (PSB Only)
Sweep and wet mop all floors using a disinfectant cleaner
Clean main entrance and employee rear entrance of cobwebs
Clean inside and outside of trash receptacles as needed
Mop all floor surfaces and entire stairwells
MONTHLY - ALL AREAS
Vacuum upholstered furniture
Clean elevator door tracks on each floor
Clean washable furniture and chair arms with disinfectant cleaner
Clean and remove all hard water stains from fixtures (faucets, sinks, toilets, showers, shower heads, etc.) if applicable to building
Clean towel and feminine products dispensers/receptacles
Detail bathroom stalls from top to bottom including underside of ADA handrails
Clean kick plates
EVERY THREE (3) MONTHS - ALL AREAS
Wipe down inside of microwaves and refrigerators
Dust and clean ceiling air vents
Low dust all baseboards and ledges
High dust horizontal surfaces (shelves, ledges, lights, blinds, etc.)
EVERY SIX (6) MONTHS - ALL AREAS
Steam extract all carpets in high traffic areas
Steam extract all carpets
Deep clean/scrub all hard surface flooring and tile & grout

JCB = Johnson Creek Blvd Facility (Public Service Facility)
CD = JCB Front Office/Community Development Building
PW/FF = Public Works and Fleet/Facilities Building

EXHIBIT B

1.29 JCB/CD & PW, City Hall (2nd floor restroom shower) and Public Safety Building (PSB)

Locker Room Cleaning (Daily)

See Daily Restroom Cleaning:

Clean urinals, toilets and washbasins using disinfectant cleaner. Wash/disinfect toilet seats on both sides. Clean outside of toilet, top to floor.
Clean and fill all dispensers (soap, toilet paper, feminine products (including pads, tampons, and paper feminine product waste liner) paper towels, etc. as applicable)
Clean mirrors, shelves, bright metal and other restroom fixtures
Wipe down and disinfect walls, doors and partitions
Empty waste containers, wash as necessary and insert liners as required
Sweep all floors using a disinfectant cleaner

Locker Room Cleaning (Weekly)

Showers

1. Clean/sanitize all showers
2. Spray with appropriate cleaner (can use hose end sprayer available in the PSB men's locker room only)
3. Scrub shower walls with scrub brush (cover every tile top to bottom)
4. Scrub shower floors with scrub brush (cover every tile)
5. Rinse thoroughly to remove all debris from floor (spray every tile) (can use hose end sprayer available in the PSB men's locker room only)
6. Clean floor drains out (hair, etc.)

Benches

1. Clean/sanitize all benches
2. Spray/scrub all bench surfaces with appropriate cleaner
3. Rinse thoroughly

Floors

1. Clean/sanitize all floors
2. Spray with appropriate cleaner
3. Scrub floor with scrub brush (cover all concrete)
4. Rinse thoroughly to remove all debris from floor (can use hose end sprayer available in the PSB men's locker room only)
5. Clean floor drains out (hair, etc.)

Once scrubbing has been done, clean mirrors and counter tops. Make sure everything is clean and stocked.

1.30 ESCALATION CLAUSE

Pricing of goods may, through express written approval of City, increase annually at a rate not exceeding the percentage change in the Consumer Price Index for Urban Wage Earners and Clerical Workers, US city average, during the previous year.

Attachment 3

Diversified Abilities

PO Box 2273 Clackamas, Or 97015
503-760-7500

City of Milwaukie

10722 SE Main Street
Milwaukie OR, 97222
503-786-7535

Janitorial Cleaning Proposal Combined Buildings

January 1, 2023 Start Date

Building Site	Total
City Hall **5 Day a Week Service**	$3,013.02 A Month $36,156.24 A Year
Ledding Library **7 Day a Week Service**	$6,735.14 A Month $80,821.68 A Year
Public Safety Building **6 Days a Week Service**	$4,994.80 A Month $59,937.60 A Year
Public Works/JCB Community Development **5 Day a Week Service**	$2,408.89 A Month $28,906.68 A Year
JCB Fleet Shop/Annex **2 Day A Week Service**	$1,174.06 a Month $14,088.72 A Year
All Paper Supplies will be Purchased By Diversified Abilities and Invoiced out for Reimbursement to the City of Milwaukie	
Proposal Based on RFP Provided By The City of Milwaukie	
Total Monthly	**$18,325.91**
Total Yearly	**$219,910.92**

Sincerely; Ann Toth (Executive Director)

Thank You

Attachment 4

COUNCIL RESOLUTION No.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, AUTHORIZING THE CITY MANAGER TO EXECUTE A CONTRACT WITH DIVERSIFIED ABILITIES TO PROVIDE JANITORIAL SERVICES FOR FIVE YEARS FOR AN AMOUNT NOT TO EXCEED $219,910.92 PER YEAR.

WHEREAS the city is not equipped or sufficiently staffed to provide in-house janitorial services at five of its major building sites; and

WHEREAS the city is required to contract with qualified nonprofit agencies employing individuals with disabilities under Oregon Revised Statutes 279.835 to 279.855; and

WHEREAS funds are budgeted in the facilities maintenance division for fiscal years 2022-2024.

Now, Therefore, be it Resolved by the City Council of the City of Milwaukie, Oregon, that the city manager or their designee is authorized to execute a five-year contract with Diversified Abilities in the amount of $219,910.92 per year with the amount not to exceed $1,099,554.60 over the five years.

Introduced and adopted by the City Council on December 6, 2022.

This resolution is effective **immediately**.

Mark F. Gamba, Mayor

ATTEST:

APPROVED AS TO FORM:

Scott S. Stauffer, City Recorder

Justin D. Gericke, City Attorney

CITY OF **MILWAUKIE**

RS 6. C.
12/6/22

OCR USE ONLY

COUNCIL STAFF REPORT

To:	Mayor and City Council Ann Ober, City Manager	Date Written:	Nov. 23, 2022
Reviewed:	Peter Passarelli, Public Works Director, Karin Gardner, Administrative Specialist III, and Sasha Freeman, Administrative Specialist II		
From:	Damien Farwell, Facilities Supervisor		
Subject:	Public Safety Building Final Design of Seismic Retrofits Contract		

ACTION REQUESTED

Council is asked to authorize the city manager to sign an engineering services agreement with Peterson Structural Engineers (PSE) in the amount of $229,511 to provide engineering services for final design of seismic retrofits (Phase 1) for the Public Safety Building (PSB).

HISTORY OF PRIOR ACTIONS AND DISCUSSIONS

PSE previously completed a 60% conceptual retrofit design dated February 24, 2022, in support of the city's application for the Business Oregon Seismic Rehabilitation Grant Program (SRGP). The grant application was successful, and the awarded grant ($1,222,817) will be used to fund the bid and construction documents, construction administration, and construction costs.

ANALYSIS

A previously completed evaluation report and supporting documents outlined structural and nonstructural retrofits required to meet seismic performance requirements found in American Society of Civil Engineers (ASCE) 41-17. These upgrades include retrofits to the building structure and mechanical, electrical, plumbing, elevator, and architectural upgrades.

PSE was selected through a request for qualifications process in September 2022 to provide a range of services that include design services, bid assistance, and construction management. This agreement will cover the design services and bid assistance phase of the project. This phase of the project is expected to be completed in the late Spring of 2023 and the construction phase should commence in the summer of 2023. PSE will provide construction management services under a separate contract.

BUDGET IMPACT

The grant award is $1,233,817, with $229,511 allocated for final design of seismic retrofits. The total design and construction management services are expected to total $433,193.

WORKLOAD IMPACT

Facilities division oversees the contract and work. Workload impact is anticipated to be minimal.

CLIMATE IMPACT

None.

COORDINATION, CONCURRENCE, OR DISSENT

Not applicable.

STAFF RECOMMENDATION

Staff recommends that Council authorize the city manager to sign an engineering services agreement with PSE in the amount of $229,511 for final design of the seismic retrofits to the PSB.

ALTERNATIVES

Council could decide to:

1. Approve with amendments to the scope, or
2. Reject recommendations and defer project.

ATTACHMENTS

1. RFQ for PSB Seismic Design & Construction Services
2. ASCE 41-17 Evaluation & Retrofit Design Report Dated 2/24/22
3. Engineering Services Agreement with PSE
4. PSE Scope & Fee Proposal
5. Seismic Project Resolution

Attachment 1

CITY OF MILWAUKIE

REQUEST FOR QUALIFICATIONS

FOR

PUBLIC SAFETY BUILDING SEISMIC RETROFIT DESIGN & CONSTRUCTION MANAGEMENT SERVICES

Issue Date	Proposal Due Date
August 8, 2022	Thursday, September 8, 2022 @ 2:30 p.m. PST

City of Milwaukie
Damien Farwell
Public Works Facilities
6101 SE Johnson Creek Blvd.
Milwaukie, OR 97206
503-786-7621

TABLE OF CONTENTS

SECTION 1: ANNOUNCEMENT

The City of Milwaukie (City) is seeking proposals from qualified and experienced firms or individuals for seismic design and construction management services of its Public Safety Building (PSB). Proposing firms should possess strong qualities in communication, timeliness and competency. A complete description of services is provided under Section 3 of this document. The City's objective is to enter into an agreement that will provide these comprehensive services.

The Request for Qualifications (RFQ) documents may be obtained at no cost at http://bids.milwaukieoregon.gov/. Proposers will be required to login in order to access the bid documents.

The City's expectation of any consultant the City contracts with is that the consultant's values align with the City's values of highly ethical conduct, fiscal responsibility, respect for the City and others, and responsiveness to the City's customers.

The City is committed to ensuring equity and fairness in its contracting and purchasing process and increasing opportunities for minority-owned, women-owned, service-disabled veteran-owned, and emerging small businesses enterprises. Furthermore, the City strongly encourages its consultants to utilize these businesses when providing services and materials for city contracts and projects.

Proposals will be submitted electronically to the City of Milwaukie, Attn: Damien Farwell, Facilities Supervisor, 6101 SE Johnson Creek Blvd., Milwaukie, OR 97206, farwelld@milwaukieoregon.gov. Proposals will be received until 2:30 p.m. (PST), on Thursday, September 8, 2022, for the purpose of selecting a proposal who evidences the highest level of qualifications to provide seismic design and construction management services. Proposals received after the deadline will not be considered.

SECTION 2: GENERAL INFORMATION

2.1 City Information

Milwaukie is a community where citizens, businesses and city government work together to ensure that the community retains its small-town character, natural beauty, and thriving public events. The City incorporated in 1903 and serves a population of over 20,000. The City provides a rich and vibrant atmosphere and is close to the region's business core and urban amenities. The City is comprised of seven neighborhood districts and two business industrial districts.

The City is a full-service municipality that operates under a council-manager form of government. The four elected councilors and the elected mayor comprise the City Council and act as representatives of the citizens. City Council sets policies for city government, enacts ordinances and hires, directs and evaluates the city manager, city attorney and municipal judge. In turn, the city manager is the City's chief executive officer, responsible for overall management and administration.

Municipal services are provided by city employees and headed by the city manager. The City operates its own police department, municipal court, community development, water, sewer and stormwater utilities, street operations, planning, engineering, fleet management and library.

2.2 Issuance of RFQ Documents

RFQ documents may be obtained at no cost from the City's Bid Management System at http://bids.milwaukieoregon.gov/. Proposers will be required to login in order to access the solicitation documents.

Damien Farwell, Facilities Supervisor is the sole point of contact for this RFQ and may be reached at 503-786-7621 or farwelld@milwaukieoregon.gov. All questions and clarifications for this RFQ must be addressed through the City's Bid Management System.

2.3 Proposal Submission

Proposals must be submitted by 2:30 p.m. PST, on September 8, 2022 in one of the following electronic methods:

- Proposers may provide a link to a secure, shared file transfer site where the proposal document (in PDF format) may be retrieved by the City. The email notice of the shared link will act as the timestamp for when a proposal is received; therefore, the email notice must be received by the City by the deadline. Proposers may utilize a file transfer site of their choosing; or
- Electronic submissions may be sent directly by email when the file size does not exceed 25MB (City's maximum size allowance for incoming email). Proposers should submit their complete proposals as an attachment within a single email. Multiple emails with parts of proposal documents may not be accepted.

Proposals must be submitted electronically to:

Damien Farwell, Facilities Supervisor
City of Milwaukie/Public Works
farwelld@milwaukieoregon.gov

2.4 Schedule of Events

The City anticipates the following general timeline for receiving and evaluating the proposals. This schedule is subject to change if it is in the City's best interest to do so.

RFQ release	Monday, August 8, 2022
Deadline for changes/clarifications/questions	Monday, August 22, 2022 @ 2:30 p.m. PST
Deadline for protests of solicitation	Monday, August 22, 2022 @ 2:30 p.m. PST
Deadline to issue addenda	Monday, August 29, 2022 @ 2:30 p.m. PST
Proposals due	Thursday, September 8, 2022 @ 2:30 p.m. PST
Initial evaluations of proposals complete	Friday, September 16, 2022
Posting of notice of intent to award	Monday, September 19, 2022
Deadline for protests of award	Monday, September 26, 2022 @ 2:30 p.m. PST
City Council hearing	Tuesday, October 4, 2022
Commencement of Agreement	Wednesday, October 5, 2022

2.5 Changes to Solicitation by Addenda

The City reserves the right to make changes to the RFQ by written addenda. Addenda will be sent to all prospective proposers known to have obtained the solicitation documents at the time addenda is issued.

Proposers should consult the City's Bid Management System (http://bids.milwaukieoregon.gov/) regularly until the proposal due date and time to assure that they have not missed any addendum announcements. By submitting a proposal, each Proposer thereby agrees that it accepts all risks, and waives all claims, associated with or related to its failure to obtain addendum information.

A prospective Proposer may request a change in the RFQ by submitting a written request to the address set forth in Subsection 2.2. The request must specify the provision of the RFQ in question and contain an explanation of the requested change. All requests for changes to the RFQ must be submitted to the City no later than the date set forth in Subsection 2.4.

The City will evaluate any request submitted, but reserves the right to determine whether to accept the requested change. Changes that are accepted by the City will be issued in the form of an addendum to the RFQ. All addenda will have the same binding effect as though contained in the main body of the RFQ. Written or oral instructions or information concerning the scope of work of the project given out by anyone other than Damien Farwell will not bind the City.

No addenda will be issued later than the date set in Subsection 2.4, except an addendum, if necessary, postponing the date for receipt of proposals, withdrawing the invitation, modifying elements of the proposal resulting from delayed process, or requesting additional information, clarification, or revisions of proposals leading to obtaining best offers or best and final offers. Each Proposer is responsible for obtaining all addenda prior to submitting a proposal. Receipt of each addendum must be acknowledged in writing in the Standard Proposal Form (Attachment A) as part of the proposal.

2.6 Confidentiality

All information submitted by Proposers will be public record and subject to disclosure pursuant to the Oregon Public Records Act, except such portions of the proposals for which Proposer requests exception from disclosure consistent with Oregon Law. All requests must be in writing, noting specifically which portion of the proposal the Proposer requests exception from disclosure. Proposer will not copyright, or cause to be copyrighted, any portion of any said document submitted to the City as a result of this RFQ. Proposer should not mark the entire proposal document "confidential."

2.7 Cancellation

The City reserves the right to cancel contract award for PSB seismic design and construction management services at any time before execution of the contract by both parties if cancellation is deemed to be in the City's best interest. In no event will the City have any liability for the cancellation of contract award.

2.8 Late Proposals

All proposals that are not received by the proposal due date in Subsection 2.4 will not be considered. Delays due to email delivery, including, but not limited to delays within the City's internal distribution systems, do not excuse the Proposer's responsibility for submitting the proposal to the correct location by the proposal due date.

2.9 Disputes

In case of any doubt or differences of opinion as to the items or service to be furnished hereunder, or the interpretation of the provisions of the RFQ, the decision of the City will be final and binding upon all parties.

2.10 Proposer's Representation

Proposer, by the act of submitting a proposal, represents that:

A. They have read and understand the proposal documents and their proposal is made in accordance therewith;

B. They have familiarized themselves with the local conditions under which the work will meet their satisfaction;

C. Their proposal is based upon the requirements described in the proposal documents without exception, unless clearly stated in the response.

2.11 Submittal Conditions

By the act of submitting a proposal in response to this RFQ, the Proposer certifies that:

A. The Proposer and each person signing on behalf of any Proposer certifies, and in the case of a sole proprietorship, partnership or corporation, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief, no elected official, officer, employee, or person, whose salary is payable in whole or part by the City, has a direct or indirect financial interest in the proposal, or in the services to which it relates, or in any of the profits thereof other than as fully described in the Proposer's response to this solicitation.

B. The Proposer has examined all parts of the RFQ, including all requirements and contract terms and conditions thereof, and, if its proposal is accepted, the Proposer will accept the contract documents thereto unless substantive changes are made in same without the approval of the Proposer.

C. The Proposer, if an individual, is of lawful age; is the only one interested in this proposal; and that no person, firm, or corporation, other than that named, has any interest in the proposal, or in the proposed contract.

D. The Proposer has quality experience providing professional services to government entities in a capacity similar to the duties outlined within the scope of services.

2.12 Interpretation of RFQ Documents

Proposer will promptly notify the City of any ambiguity, inconsistency or error, which they may discover upon examination of the proposal documents. Proposers requiring clarification or interpretation of the proposal documents will make a written request for the same to the City's sole point of contact.

The City will make interpretations, corrections, or changes to the proposal documents in writing by published addenda in accordance with Subsection 2.5. Interpretations, corrections, or changes to the proposal documents made in any other manner will not be binding, and Proposer will not rely upon such interpretations, corrections and changes.

2.13 Requests for Additional Information

Requests for information regarding City services, programs, or personnel, or any other information must be submitted in writing to the City's sole point of contact, prior to the deadline to request additional information stated in Subsection 2.4.

The City will respond to requests for additional information in writing by published addenda in accordance with Subsection 2.5. Responses to requests for additional information made in any other manner will not be binding.

2.14 Competition

Proposers are encouraged to comment, either with their proposals or at any other time, in writing, on any specification or requirement with this RFQ, which the Proposer believes, will inordinately limit competition.

2.15 Complaints and Inequities

All complaints or perceived inequities related to the RFQ or award of work referenced herein must be in writing and directed to the City's sole point of contact. Such submittals will be reviewed upon receipt and will be answered in writing.

2.16 Cost of RFQ and Associated Responses

The City is not liable for any costs incurred by a Proposer in the preparation and/or presentation of a proposal. The City is not liable for any cost incurred by a Proposer in protesting the City's selection decision.

2.17 Requests for Clarification, Additional Research, and Revisions

The City reserves the right to obtain clarification of any point in a proposal or to obtain additional information necessary to properly evaluate a particular Proposal. Failure of a Proposer to respond to such a request for additional information or clarification may result in a finding that the Proposer is non-responsive and consequent rejection of the proposal.

The City may obtain information from any legal source for clarification of any proposal or for information of any Proposer. The City need not inform the Proposer of any intent to perform additional research in this respect or of any information thereby received.

The City may perform, at its sole option, investigations of the responsible Proposer. Information may include, but will not necessarily be limited to current litigation and contracting references. All such documents, if requested by the City, become part of the public records and may be disclosed accordingly.

The City reserves the right to request revisions of proposals after the submission of proposals and before award for the purpose of obtaining best offers or best and final offers.

2.18 Solicitation Protest Procedures

Any and all complaints regarding this solicitation must be presented in writing no less than seven (7) calendar days prior to the proposal due date, as identified in Section 2.4. The City will address all timely submitted protests within a reasonable time following the City's receipt of the protest and will issue a written decision to the protesting Proposer.

Protests must be addressed as follows:

Damien Farwell, Facilities Supervisor
City of Milwaukie/Public Works
farwelld@milwaukieoregon.gov

Protests must include:

A. The identity of the Proposer;
B. A clear reference to this RFQ;
C. Reason for the protest;
D. Proposed changes to the RFQ provisions and/or statement of work; and
E. All required information as described in ORS 279B.405(4).

Protests that do not include the required information will not be considered by the City.

2.19 Rejection of Proposals

The City reserves the right to reject any or all Proposals received as a result of this RFQ. Proposals may be rejected for one or more of the following reasons, including but not limited to:

A. Failure of the Proposer to adhere to one or more of the provisions established in the RFQ.

B. Failure of the Proposer to submit a proposal in the format specified herein.

C. Failure of the Proposer to submit a proposal within the time requirements established herein.

D. Failure of the Proposer to adhere to ethical and professional standards before, during, or following the proposal process.

The City may reject any proposal not in compliance with all prescribed public procurement procedures and requirements, and may reject for good cause any or all proposals upon a finding of the City that it is in the public interest to do so.

2.20 Modification or Withdrawal of Proposal by Proposer

A Proposal may not be modified, withdrawn, or canceled by the proposer for 60 calendar days following the time and date designated for the receipt of proposals. Proposals submitted early may be modified or withdrawn only by notice to the City, at the proposal submittal location, prior to the proposal due date. Such notice must be in writing over the signature of the Proposer and submitted to the City's point of contact. All such communication must be so worded as not to reveal material contents of the original Proposal.

Withdrawn proposals may be resubmitted up to the proposal due date and time, provided that they are then fully in conformance with the RFQ.

2.21 Proposal Ownership

All Proposals submitted become and remain the property of the City and, as such, are considered public information and subject to public disclosure within the context of the federal Freedom of Information Act and Oregon Revised Statutes (ORS) 192.345 and 192.355.

Unless certain pages or specific information are specifically marked “proprietary” and qualify as such within the context of the regulations stated in the preceding paragraph, the City will make available to any person requesting information through the City processes for disclosure of public records, any and all information submitted as a result of this RFQ without obtaining permission from any Proposer only after the contract has been executed.

2.22 Duration of Proposal

Proposal terms and conditions will be firm for a period of at least 60 days from the proposal due date. The successful proposal will not be subject to changes of terms if accepted during the 60-day period. Changes in terms by others after the acceptance of a proposal will not be considered.

2.23 Affirmative Action/Nondiscrimination

By submitting a proposal, the Proposer agrees to comply with the Fair Labor Standard Act, Civil Rights Act of 1964, Executive order 11246, Fair Employment Practices, Equal Employment Opportunity Act, Americans with Disabilities Act, and Oregon Revised Statutes. By submitting a proposal, the Proposer specifically certifies, under penalty of perjury, that the Proposer has not discriminated against minority-owned, women-owned, service-disabled veteran-owned businesses or emerging small business enterprises in obtaining any required subcontracts.

SECTION 3: SCOPE OF WORK

3.1 Term of Service

The agreement resulting from this RFQ will commence on or about October 5, 2022, extending through December 31, 2023.

3.2 Scope of Work

A. Project Background

The City’s Public Safety Building (PSB) is located at 3200 SE Harrison Street in Milwaukie. During typical operation, the PSB houses city administrative offices, police offices, records storage, police holding cells, fire department offices, fire department dormitories, locker rooms, a gym, and fire department service vehicle bays. The building was constructed circa 1992 and consists of two stories above grade. The ground level is at grade, and is approximately 22,500 square feet, while the 2nd level is approximately 12,400 square feet.

The construction of the PSB includes reinforced masonry shear walls for the main lateral force resisting system and structural steel framing and reinforced masonry bearing walls for the primary gravity force resisting system. Some reinforced masonry shear walls are also part of the gravity force resisting system. The roof assembly is comprised of a light-gage metal deck with rigid insulation, protection board, and membrane roofing. The floor construction is comprised of slabs-on-grade at the main level and light-gage metal pan deck topped with 4.5” of concrete reinforced with 12x12 W2.9 welded wire mesh at the 2nd level.

The roof and 2nd level floor decks are supported on open web steel joists. Most of the exterior wall construction is partially grouted reinforced Concrete Masonry Unit (CMU) block with a brick masonry veneer on the exterior face and a cold-formed stud furring wall on the interior face. Note that not all exterior faces have brick masonry veneer and not all interior faces have cold-formed stud furring. Most of the ceiling is an acoustical drop ceiling, and the foundation consists of a concrete slab-on-grade and stem walls on a continuous strip footing. The building is founded on a relatively flat site without any nearby adjacent structures. To the south of the existing building exists a partially grouted reinforced CMU block screen enclosure around the existing parking lot. The CMU blocks are fully grouted below grade and supported by 24-inch wide reinforced concrete strip footings. The CMU block screen wall is not connected to the main building structure and is not considered part of the primary gravity or lateral force resisting system for the main building structure. The evaluation of the CMU block screen wall is not included in the scope of this the ASCE 41-17 Report nor the project.

The City desires to complete this project by late Fall of 2023.

B. Scope of Services

Selected firm's specific duties activities and key deliverables under the contract may include, but are not limited to, the below tasks. This project in general consists of three major phases:

1. Design Finalization
   The City seeks a firm or team of firms to finalize the design for seismic improvements at its PSB, based on the City's ASCE 41-17 Seismic Evaluation and Preliminary Retrofit Design report dated February 24, 2022 (Attachment D included in this RFQ for reference).

2. Creation of Construction Specifications and Construction Bid Documents.
   Based on structural and non-structural mitigation methods as prescribed in the ASCE 41-17 Evaluation & Retrofit Design Report dated 2/24/22.

3. Bid and Construction Management Services.
   3.1 <u>Construction Specifications, Solicitation Documents, & Bid Assistance</u>
   Once final designs are approved, the selected firm(s) will produce construction specifications and construction solicitation documents in compliance with the City's Public Contracting Rules for use by the City in the public bid process. Firm(s) will also provide documents and support through the project's building permit process. The firm(s) will also provide bid assistance to the City which may include, but is not limited to, conducting pre-bid meetings, answering bidder questions, preparing any required addendums to the bid documents and assistance in evaluating bids. The City will use the specification documents and assistance to hire a construction contractor to develop and construct the seismic improvements. Successful firm(s) will demonstrate an ability to produce such documents as well as an awareness of the public procurement process.

   3.2 <u>Construction Management Services</u>
   If requested by the City, firm(s) may have an opportunity to provide the following construction phase services. The City may request any of the professional services below or none at all.

   A. Construction Meetings: facilitate the pre-construction meeting as well as a formal construction meeting held every two weeks. The firm(s) will facilitate the meeting and prepare a summary in conjunction with a site visit. Attend a pre-construction meeting prior to commencement of work.

   B. Construction Observation: provide construction observation services at intervals as directed by the City's project manager. Respond to reasonable and appropriate requests for information and issue necessary clarifications and interpretations of the contract documents to the City as appropriate to the orderly completion of work. Provide daily inspection reports to the City whenever on-site construction observation is performed.

C. Submittal Review: review shop drawings and submittals, and provide written comments to the construction contractor.
D. Request for Information Review: review and provide written response to requests for information/clarifications from the construction contractor or from the City.

E. Review Change Orders: review change orders and prepare documents to be signed.

F. Record Drawings: based upon mark-ups provided by the construction contractor and the City inspector, and known changes from change orders, the firm(s) will prepare record drawings and provide electronic PDF files and three (3) hard copies (11x17) to the City.

A. Final Notice of Acceptability of Work: conduct a final site visit with the Project Manager to determine if the completed work is generally in accordance with the contract documents and the final punch list. Provide notice that the work is generally in accordance with the contract documents and recommend for or against final payment. Provide stamped as-built drawings to the City's project manager. Track all changes to the approved plans during the construction process and provide red-line documents to the City's project manager at the conclusion of construction. The firm(s) will also be required to provide electronically stamped PDFs of the final, as-built drawings.

The City also reserves the right to adjust this project based on its needs. This may include adding or subtracting different items, projects, properties, activities, or deliverables, or tasks from this scope of work.

SECTION 4: PROPOSAL AND PROPOSER REQUIREMENTS

4.1 Proposal Submittal

Proposals, including attachments, must be addressed and delivered in PDF format as identified in Subsection 2.3. A person who has been authorized to make such a commitment on behalf of the proposing firm must sign the proposal. Proposals must be addressed and submitted by the deadline. Phone, facsimile, mail delivery, and in-person proposals will not be accepted. There will be no formal opening of proposals.

4.2 Proposer Requirements

Any firm submitting a proposal must meet the following minimum requirements:

A. Must be a legal entity, currently registered to do business in the State of Oregon (per ORS 60.701);

B. Must have been in business for at least five (5) years;

C. Must have relevant experience with other public sector clients of similar scope and complexity;

D. Ability to best respond to various needs contained within this RFQ; and

E. Agree to execute the City's engineering services agreement, if awarded.

4.3 Proposal Format

Proposals must be type-written with body text consisting of a 10- or 11-point font. Proposals must be submitted electronically in PDF format.

4.4 Proposal Requirements

The following items are a minimum content requirement of a proposal submitted in response to this RFQ:

A. Cover Letter. A letter must include the following: Proposer's legal name, address, phone, federal tax ID#, website address, and name of the individual authorized to represent the proposing firm regarding the proposal.

B. Qualifications. Describe experience in seismic design & construction management. Describe capabilities and resources in relation to the requested professional services, including the qualifications of key staff that would likely provide these services. Describe the experience and competence with governmental and municipal agencies. Include resumes on each person involved in the project with verifiable references, as well as a description of organizational framework, special resources, and any other information to demonstrate that the firm or individual can effectively and efficiently provide the requested service.

C. Project Understanding and Approach. Review the scope of work and describe the firm's approach for collaborating with city staff to conduct the work described. Based on the scope of work and any proposed revisions, outline the specific tasks to be performed, indicating which team members will be conducting the work. Please identify a project manager and key members of the team and include an assessment of the capacity of each staff member to perform the work given their workload forecast.

D. Service Timeframe. Describe the approach to scheduling tasks in order to meet deadlines and achieve timely completion of the project. Provide an overall schedule for major tasks.

E. Diversity, Equity and Inclusion. Describe the firm's recent efforts to increase diversity, offer equity for all, and ensure a vibrant culture of inclusiveness within its organization.

F. Attachment A – Standard Proposal Form. Complete and sign the form to certify representation in the submitted proposal is accurate and true. The form includes confirmation whether the proposing firm is certified as a minority-owned, women-owned, service-disabled veteran-owned and/or emerging small business enterprise.

G. Attachment B – Sample Agreement. Written objections (if any) to the sample engineering services agreement should be included in the proposal, as the City will review content of any such objection or request during the evaluation process. Final contract terms will be negotiated with the selected proposer.

H. Attachment C – References. Proposer shall provide three (3) references from similar contractual engagements performed for clients within the last five (5) years. Information provided must include:

- Client name, telephone number and address;
- Description of services provided; and
- Contract term (starting and ending dates)

IMPORTANT: UNDER NO CIRCUMSTANCES WILL THE CITY DISCUSS OR CONSIDER PRICING POLICIES OR ANY PRICING INFORMATION FROM A PROPOSER UNTIL AFTER A PROPOSER IS SELECTED AS MOST QUALIFIED.

SECTION 5: PROPOSAL SELECTION AND EVALUATION

5.1 General

Each proposal will be judged on its completeness and quality of its content. The City reserves the right to reject any and all proposals or to negotiate individually with one or more firms, and to select one or more firms if determined to be in the best interest of the City. The City is not liable for any cost the Proposer incurs while preparing or presenting the proposal. All proposals will become part of the public file, without obligation to the City. Upon the completion of the evaluations, the City intends to negotiate an agreement with the Proposer whose proposal is deemed to be most advantageous to the City.

5.2 Selection Panel

A Selection Panel will be comprised of at least three (3) members from the City. The role of the Selection Panel is to evaluate all responsive proposals and select from the respondents a minimum of three (3) Proposers whose proposals evidence the highest level of qualification.

Scoring of the top selected proposals will be completed covering all areas listed in Subsection 4.4. If additional information is deemed necessary as part of the evaluations, such information will be solicited to allow the Selection Panel to complete the evaluation process.

5.3 Evaluation Criteria

In accordance with Subsection 4.4, the criteria listed below will be used to determine the apparent successful Proposer. Proposals will be scored by the Selection Panel as follows:

A. Proposal submitted on time with cover letter (pass/fail)
B. Qualifications (40 points)
C. Project Understanding and Approach (25 points)
D. Service Timeframe (10 points)
E. Diversity, Equity and Inclusion (20 points)
F. Certification Office for Business Inclusion and Diversity (COBID) Certified (5 points)

5.4 Ranking of Proposals

The Selection Panel will provide an initial screening of responsive proposals. This evaluation step will consider the criteria in Subsection 5.3(A-F), but no scores will be applied; instead a forced-ranking methodology will be applied to this initial screening.
The Selection Panel will evaluate the top proposals and score accordingly for criteria in Section 5.3(B-F). The Selection Panel will apply final scoring and make a recommendation of award.

Proposals will be ranked based on evaluation of responses with the highest-ranked proposal being that Proposer which is deemed to be the most appropriate and fully able to perform the services, and the second highest-ranked proposal being the Proposer next most appropriate, all in the sole judgment of the City.
Evaluation scores will be combined with the intent to award to the highest-ranked Proposer. Any proposal in response to this RFQ will be considered de facto permission to the City to disclose the results, when completed, to selected reviewers at the sole discretion of the City.

5.5 Proposal Rejection

The City reserves the right to:

A. Reject any and all proposals not in compliance with all public procedures and requirements;
B. Reject any proposal not meeting the specifications set forth herein;
C. Waive any or all irregularities in proposals submitted;
D. Award any or all parts of any proposal; and
E. Request references and other data to determine responsiveness.

5.6 Intent of Award

Upon completion of the evaluations, the City will provide written notice of its intent to award the contract to the firm who best meets the overall needs of the City.

5.7 Protest of Award

In accordance with the City's Public Contracting Rule 70.015(A)(4)(c) and ORS 279B.410, any adversely affected or aggrieved proposers has seven (7) calendar days from the date of the written selection notice to file a written protest, as identified in Section 2.4.

SECTION 6: CONTRACT REQUIREMENTS

6.1 Contract

Selected Proposer will be asked to sign an engineering services agreement with the City. A sample contract is attached as part of these RFQ documents. The City will require specific levels of insurance, a Milwaukie business registration, and a federal tax identification number.

6.2 Contract Negotiations

The City reserves the right to negotiate final terms of the agreement as the City determines to be in its best interest. The City will begin negotiations once the highest-ranked proposer is selected and issued a notice of intent to award. Only after the City has selected the most qualified proposer and notified that firm in writing will the City request compensation requirements. The City may enter into mutual negotiations with the selected firm regarding pricing and refined scope of services for the project. If the City cannot come to terms with the highest-ranked proposer, the City will formally terminate negotiations and enter into negotiations with the second highest-ranked proposer. This process will continue until the City reaches an agreement which the City deems appropriate for the services or determines a new solicitation is necessary.

6.3 Contract Award

The award of a contract is accomplished by executing a written engineering services agreement that incorporates the proposal, clarifications, addenda, additions, and insurance. All such materials constitute the complete contract documents. City Council may be required to authorize the award of contract at a regular session, as identified in Section 2.4.

ATTACHMENT A

STANDARD PROPOSAL FORM

Proposer Representations
The undersigned and authorized representative hereby certifies and represents the following:

1. Proposer is properly licensed and adequately experienced, equipped, organized and financed to furnish and deliver the equipment specified and perform the services required.
2. Proposer has examined and is thoroughly familiar with the solicitation and fully understands its intent, has carefully reviewed for accuracy all statements in this proposal and attachments, and agrees that the City will not be responsible for any errors or omissions of the Proposer in preparing this proposal. Proposer agrees that this proposal may not be revoked or withdrawn for 60 calendars days after the date on which proposals are received.
3. Proposer agrees that if this proposal is accepted it will promptly execute and return to the City the formal contract in the form provided and will, at or before that time, deliver any other documentation as required.
4. Proposer acknowledges that it has received the following Addenda No(s): _______, and agrees that all addenda issued are a part of the RFQ documents and have been considered in preparing this proposal. (Proposer: insert the number of each addendum received; if no addenda were received, write "none" or "zero" in the space.)

Compliance with Laws
Proposer hereby agrees to comply with all applicable federal, state and local laws, rules and regulations, the provisions of which are hereby made a part of the awarded contract.

Cooperative Purchasing

Proposer _____ agrees / _____ disagrees to extend the terms, conditions and prices of the original City of Milwaukie contract to any other governmental agency. Pursuant to ORS 279A.215, other governmental agencies may establish contracts or price agreements under the terms, conditions and prices of the original contract. Other public agencies will have the power and authority to contract directly with the awarded Proposer.

Noncollusion
Proposer certifies that the proposal has been arrived at by the proposer, independently, and has been submitted without collusion with, and without any agreement, understanding or planned course of action with, any other contractor, proposer, or vendor on materials, supplies, equipment or services, described in the solicitation documents, designed to limit independent offers or competition. The contents of the proposal herein presented and made have not been communicated by the Proposer or their employees or agents to any person not an employee or agent of the Proposer or its surety on any bond furnished with the solicitation, and will not be communicated to any such person prior the closing time of the solicitation.

Conflict of Interest
Proposer and each person signing on behalf of the Proposer certifies, and in the case of sole proprietorship, partnership, or corporation, each party thereto certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief, no member of the City Council, officer, employee, or person, whose salary in whole or in part by the City, has a direct or indirect financial interest in the award of this proposal, or in the services to which this proposal relates, or in any of the profits, real or potential, thereof, except as noted otherwise herein.

COBID Certification

The State of Oregon's Certification Office for Business Inclusion and Diversity (COBID) certifies minority-owned, women-owned, and service-disabled veteran-owned businesses and emerging small businesses interested in contracting with state, county and city government agencies.

The City is committed to ensuring equity and fairness in its contracting and purchasing processes and increase opportunities for minority-owned, women-owned and emerging small businesses and service-disabled veteran-owned business enterprises to promote growth, capacity-building, and economic success of these businesses.

Proposer must acknowledge the following:

☐ YES Proposer certifies that they are a State of Oregon COBID-certified business.

Certification No. ____________

☐ NO Proposer is not a COBID-certified business with the State of Oregon.

☐ WAIVER Proposer certifies that they have a current City of Milwaukie COBID Waiver.

Waiver No. _______________________

THEREFORE, the undersigned hereby certifies that the information contained in these certifications and representations is accurate, complete and current.

____
Firm Name

____
Address, City, State, Zip

____
Phone Number

____ ____
Printed Name of Authorized Representative Email Address

____ ____
Authorizing Signature Date

ATTACHMENT B

EXAMPLE ENGINEERING SERVICES AGREEMENT
WITH THE CITY OF MILWAUKIE, OREGON
FOR PUBLIC SAFETY BUILDING SEISMIC RETROFIT DESIGN & CONSTRUCTION MANAGEMENT SERVICES

THIS AGREEMENT, made and entered into this ____ day of __________ 2022, by and between the City of Milwaukie, a municipal corporation, hereinafter referred to as the "City," and [Name of Firm], whose authorized representative is [Name of Representative], and having a principal being a registered engineer of the State of Oregon, hereinafter referred to as the "Engineer."

RECITALS

WHEREAS, the City's budget provides for the seismic retrofit design and construction management services of the Public Safety Building; and

WHEREAS, the accomplishment of the work and services described in this Agreement is necessary and essential to the public works improvement program of the City; and

WHEREAS, the City desires to engage the Engineer to render professional engineering services for the project described in this Agreement, and the Engineer is willing and qualified to perform such services.

THEREFORE, in consideration of the promises and covenants contained herein, the parties hereby agree as follows:

1. ENGINEER'S SCOPE OF SERVICES

   The Engineer shall perform professional engineering services relevant to the project as specified in the Scope of Work labeled as Exhibit A and in accordance with the terms and conditions set forth herein, which is attached hereto and by this reference made a part of this Agreement.

2. EFFECTIVE DATE AND DURATION

   This Agreement shall become effective upon the date of execution by the City and shall expire, unless otherwise terminated or extended, by December 31, 2023. All work under this Agreement shall be completed prior to the expiration.

3. COMPENSATION

   City agrees to pay Engineer not to exceed [amount in written form] dollars ($amount in numerical form) for performance of those services described in the Scope of Work, which payment shall be based upon the following applicable terms:

   A. Payment by City to Engineer for performance of services under this Agreement includes all expenses incurred by Engineer, with the exception of any expenses identified in this Agreement as separately reimbursable.

   B. As compensation for services as described in Exhibit A, the Engineer shall be paid at an hourly rate based upon the Schedule of Rates in Exhibit B of this Agreement, which shall constitute full and complete payment for said services and all expenditures which may be made and expenses incurred, except as otherwise expressly provided in this Agreement. Hourly rates may be increased by Engineer once each calendar year and must be provided to City no less than 30 days prior to the effective date of the new rates.

C. Payment will be made in installments based on Engineer's invoice, subject to the approval of the City Manager, or designee, and not more frequently than monthly. Payment shall be made only for work actually completed as of the date of invoice. Payment terms shall be net 30 days from date of invoice.

D. Payment by City shall release City from any further obligation for payment to Engineer, for services performed or expenses incurred as of the date of the invoice. Payment shall not be considered acceptance or approval of any work or waiver of any defects therein. The Parties hereto do expressly agree that the compensation is based upon the Scope of Work provided in Exhibit A and is not necessarily related to the estimated construction cost of the project. In the event that the actual construction cost differs from the estimated construction cost, the Engineer's compensation will not be adjusted unless the Scope of Work changes and is authorized and accepted by the City.

E. Only when directed in writing by the City and signed by both parties as an amendment to this Agreement, the Engineer shall furnish or acquire for the City the professional and technical services based upon a mutually agreeable rate schedule for minor project additions and/or alterations.

F. The Engineer shall furnish certified cost records for all billings pertaining to other than lump sum fees to substantiate all charges. For such purposes, the books of account of the Engineer shall be subject to audit by the City. The Engineer shall complete work and cost records for all billings in accordance with generally accepted accounting principles.

G. The Engineer shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

H. If Engineer fails, neglects or refuses to make prompt payment of any claim for labor, materials, or services furnished to Engineer, sub-consultant or subcontractor by any person as such claim becomes due, City may pay such claim and charge the amount of the payment against funds due or to become due to the Engineer. The payment of the claim in this manner shall not relieve Engineer or its surety from obligation with respect to any unpaid claims.

I. The Engineer shall pay employees at least time and a half pay for all overtime worked in excess of 40 hours in any one week except for individuals under the contract who are excluded under ORS 653.010 to 653.261 or under 29 USC SS 201-219 from receiving overtime.

J. The Engineer shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention incident to sickness or injury to the employees of Engineer or all sums which Engineer agrees to pay for such services and all moneys and sums which Engineer collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

K. Engineer shall make payments promptly, as due, to all persons supplying services or materials for work covered under this Agreement. Engineer shall not permit any lien or claim to be filed or prosecuted against the City on any account of any service or materials furnished.

L. The City certifies that sufficient funds are available and authorized for expenditure to finance costs of this contract.

4. OWNERSHIP OF PLANS AND DOCUMENTS: RECORDS

A. The field notes, design notes, and original drawings of the construction plans, as instruments of service, are and shall remain, the property of the Engineer; however, the City shall be furnished, at no additional cost, one set of previously approved reproducible drawings, on 3 mil minimum thickness mylar as well as diskette in "DWG" or "DXF" format, of the original drawings of the work. The City shall have unlimited authority to use the materials received from the Engineer in any way the City deems necessary. Any use, re-use or alteration of any materials other than as contemplated by the applicable Scope of Work shall be at the City's sole risk, unless written permission has been received from Engineer prior to any such use.

B. The City shall make copies, for the use of and without cost to the Engineer, of all of its maps, records, laboratory tests, or other data pertinent to the work to be performed by the Engineer pursuant to this Agreement, and also make available any other maps, records, or other materials available to the City from any other public agency or body.

C. The Engineer shall furnish to the City, copies of all maps, records, field notes, and soil tests which were developed in the course of work for the City and for which compensation has been received by the Engineer at no additional expense to the City except as provided elsewhere in this Agreement.

5. ASSIGNMENT/DELEGATION

Neither party shall assign, sublet or transfer any interest in or duty under this Agreement without the written consent of the other and no assignment shall be of any force or effect whatsoever unless and until the other party has so consented. If City agrees to assignment of tasks to a subcontract, Engineer shall be fully responsible for the negligent acts or omissions of any subcontractors and of all persons employed by them, and neither the approval by City of any subcontractor nor anything contained herein shall be deemed to create any contractual relation between the subcontractor and City.

6. ENGINEER IS INDEPENDENT CONTRACTOR

A. The City's project manager, or designee, shall be responsible for determining whether Engineer's work product is satisfactory and consistent with this agreement, but Engineer is not subject to the direction and control of the City. Engineer shall be an independent contractor for all purposes and shall be entitled to no compensation other than the compensation provided for under Section 3 of this Agreement.

B. Engineer is an independent contractor and not an employee of City. Engineer acknowledges Engineer's status as an independent contractor and acknowledges that Engineer is not an employee of the City for purposes of workers compensation law, public employee benefits law, or any other law. All persons retained by Engineer to provide services under this contract are employees of Engineer and not of City. Engineer acknowledges that it is not entitled to benefits of any kind to which a City employee is entitled and that it shall be solely responsible for workers compensation coverage for its employees and all other payments and taxes required by law. Furthermore, in the event that Engineer is found by a court of law or an administrative agency to be an employee of the City for any purpose, City shall be entitled to offset compensation due, or to demand repayment of any amounts paid to Engineer under the terms of the agreement, to the full extent of any benefits or other remuneration Engineer receives (from City or third party) as a result of said finding and to the full extent of any payments that City is required to make (to Engineer or to a third party) as a result of said finding.

C. The undersigned Engineer hereby represents that no employee of the City or any partnership or corporation in which a City employee has an interest, has or will receive any remuneration of any description from the Engineer, either directly or indirectly, in connection with the letting or performance of this Agreement, except as specifically declared in writing.

D. If this payment is to be charged against Federal funds, Engineer certifies that he/she is not currently employed by the Federal Government and the amount charged does not exceed his/her normal charge for the type of service provided.

E. Engineer and its employees, if any, are not active members of the Oregon Public Employees Retirement System and are not employed for a total of 600 hours or more in the calendar year by any public employer participating in the Retirement System.

F. Engineer certifies that it currently has a Milwaukie or Metro business license or will obtain one prior to delivering services under this Agreement. A business license is required for the duration of this Agreement.

G. Engineer is not an officer, employee, or agent of the City as those terms are used in ORS 30.265.

7. INDEMNITY

A. The City has relied upon the professional ability and training of the Engineer as a material inducement to enter into this Agreement. Engineer represents to the City that the work under this contract will be performed in accordance with the professional standards of skill and care ordinarily exercised by members of the engineering profession under similar conditions and circumstances as well as the requirements of applicable federal, state and local laws, it being understood that acceptance of Engineer's work by the City shall not operate as a waiver or release. Acceptance of documents by City does not relieve Engineer of any responsibility for negligent or wrongful design deficiencies, errors, or omissions.

B. Claims for other than Professional Liability. Engineer shall defend, save and hold harmless the City of Milwaukie, its officers, agents, and employees from all claims, suits, or actions and all expenses incidental to the investigation and defense thereof, of whatsoever nature, including intentional acts to the extent resulting from or arising out of the activities of Engineer or its subcontractors, sub-consultants, agents or employees under this contract. If any aspect of this indemnity shall be found to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of this indemnification.

C. Claims for Professional Liability. Engineer shall defend, save and hold harmless the City of Milwaukie, its officers, agents, and employees from all claims, suits, or actions and all expenses incidental to the investigation and defense thereof, to the extent arising out of the professional negligent acts, errors or omissions of Engineer or its subcontractors, sub-consultants, agents or employees in performance of professional services under this agreement. Any design work by Engineer that results in a design of a facility that is not readily accessible to and usable by individuals with disabilities shall be considered a professionally negligent act, error or omission.

D. As used in subsections B and C of this section, a claim for professional responsibility is a claim made against the City in which the City's alleged liability results directly from the quality of the professional services provided by Engineer, regardless of the type of claim made against the City. A claim for other than professional responsibility is a claim made against the City in which the City's alleged liability results from an act or omission by Engineer unrelated to the quality of professional services provided by Engineer.

8. INSURANCE

The Engineer and its subcontractors shall maintain insurance acceptable to City in full force and effect throughout the term of this contract. Such insurance shall cover risks arising directly or indirectly out of Engineer's activities or work hereunder, including the operations of its subcontractors of any tier. Such insurance shall include provisions that such insurance is primary insurance with respect to the interests of City and that any other insurance maintained by City is excess and not contributory insurance with the insurance required hereunder.

The policy or policies of insurance maintained by the Engineer and its subcontractors shall provide at least the following limits and coverages:

A. Commercial General Liability Insurance

Engineer shall obtain, at Engineer's expense, and keep in effect during the term of this contract, Commercial General Liability Insurance covering Bodily Injury and Property Damage on an "occurrence" form. This coverage shall include Contractual Liability insurance for the indemnity provided under this contract and Product and Completed Operations. Such insurance shall be primary and non-contributory. The following insurance will be carried:

Coverage	Limit
General Aggregate	$3,000,000
Products-Completed Operations Aggregate	3,000,000
Personal & Advertising Injury	2,000,000
Each Occurrence	2,000,000
Damage to Rented Premises (each occurrence)	500,000
Medical Expense (Any one person)	5,000

B. Professional Liability

Engineer shall obtain, at Engineer's expense, and keep in effect during the term of this contract, Professional Liability Insurance covering any damages caused by an error, omission or any negligent act. Combined single limit per occurrence shall not be less than $2,000,000, or the equivalent. Annual aggregate limit shall not be less than $3,000,000 and filed on a "claims-made" form.

C. Commercial Automobile Insurance

Engineer shall also obtain, at engineer's expense, and keep in effect during the term of the contract Commercial Automobile Liability coverage on an "occurrence" form including coverage for all owned, hired, and non-owned vehicles. The Combined Single Limit per occurrence shall not be less than $2,000,000.

D. Workers' Compensation Insurance

The Engineer, its subcontractors, if any, and all employers providing work, labor or materials under this Contract who are subject employers under the Oregon Workers' Compensation Law shall comply with ORS 656.017, which requires them to provide workers' compensation coverage that satisfies Oregon law for all their subject workers. Out-of-state employers must provide Oregon workers' compensation coverage for their workers that complies with ORS 656.126. This shall include Employer's Liability Insurance with coverage limits of not less than $500,000 each accident.

E. Additional Insured Provision

The Commercial General Liability Insurance Policy and Automobile Policy shall include the City its officers, directors, and employees as additional insureds with respect to this contract. Coverage will be endorsed to provide a per project aggregate.

F. Extended Reporting Coverage

If any of the aforementioned liability insurance is arranged on a "claims made" basis, Extended Reporting coverage will be required at the completion of this contract to a duration of 24 months or the maximum time period the Engineer's insurer will provide such if less than 24 months. Engineer will be responsible for furnishing certification of Extended Reporting coverage as described or continuous "claims made" liability coverage for 24 months following contract completion. Continuous "claims made" coverage will be acceptable in lieu of Extended Reporting coverage, provided its retroactive date is on or before the effective date of this contract. Coverage will be endorsed to provide a per project aggregate.

G. Notice of Cancellation

There shall be no cancellation, material change, or intent not to renew insurance coverage without 30 days written notice to the City. Any failure to comply with this provision will not affect the insurance coverage provided to the City. Notice shall be provided to the City at the address listed below in the event of cancellation or non-renewal of the insurance.

H. Insurance Carrier Rating

Coverage provided by the Engineer must be underwritten by an insurance company deemed acceptable by the City. The City reserves the right to reject all or any insurance carrier(s) with an unacceptable financial rating.

I. Certificates of Insurance

As evidence of the insurance coverage required by the contract, the Engineer shall furnish a Certificate of Insurance to the City. No contract shall be effective until the required certificates have been received and approved by the City. A renewal certificate will be sent to the address below ten days prior to coverage expiration.

Certificates of Insurance should read "Insurance certificate pertaining to contract for Public Safety Building Seismic Retrofit Design & Construction Management Services." The City of Milwaukie, its officers, directors and employees shall be added as additional insureds with respects to this contract. "Insured coverage is primary" should read in the description portion of certificate.

J. Primary Coverage Clarification

The parties agree that Engineer's coverage shall be primary to the extent permitted by law. The parties further agree that other insurance maintained by the City is excess and not contributory insurance with the insurance required in this section.

K. Cross-Liability Clause

A cross-liability clause or separation of insureds clause will be included in general liability.

A copy of each insurance policy, certified as a true copy by an authorized representative of the issuing insurance company, or at the discretion of City, in lieu thereof, a certificate in form satisfactory to City certifying to the issuance of such insurance shall be forwarded to:

City of Milwaukie
Attn: Finance
10722 SE Main Street
Milwaukie, Oregon 97222

Business Phone: 503.786.7555
Email: finance@milwaukieoregon.gov

Such policies or certificates must be delivered prior to commencement of the work. The procuring of such required insurance shall not be construed to limit Engineer's liability hereunder. Notwithstanding said insurance, Engineer shall be obligated for the total amount of any damage, injury, or loss to the extent caused by negligence or wrongful acts in the performance of services with this contract.

9. TERMINATION WITHOUT CAUSE

At any time and without cause, City shall have the right, in its sole discretion, to terminate this Agreement by giving notice to Engineer. If City terminates the contract pursuant to this paragraph, it shall pay Engineer for services rendered to the date of termination.

10. TERMINATION WITH CAUSE

A. City may terminate this Agreement effective upon delivery of written notice to Engineer, or at such later date as may be established by City, under any of the following conditions:

1) If City funding from federal, state, local, or other sources is not obtained and continued at levels sufficient to allow for the purchase of the indicated quantity of services. This Agreement may be modified to accommodate a reduction in funds.

2) If Federal or State regulations or guidelines are modified, changed, or interpreted in such a way that the services are no longer allowable or appropriate for purchase under this Agreement.

3) If any license or certificate required by law or regulation to be held by Engineer, its subcontractors, agents, and employees to provide the services required by this Agreement is for any reason denied, revoked, or not renewed.

4) If Engineer becomes insolvent, if voluntary or involuntary petition in bankruptcy is filed by or against Engineer, if a receiver or trustee is appointed for Engineer, or if there is an assignment for the benefit of creditors of Engineer.

Any such termination of this agreement under paragraph (A) shall be without prejudice to any obligations or liabilities of either party already accrued prior to such termination.

B. City, by written notice of default (including breach of contract) to Engineer, may terminate the whole or any part of this Agreement:

1) If Engineer fails to provide services called for by this Agreement within the time specified herein or any extension thereof;

2) If Engineer fails to perform any of the other provisions of this Agreement, or so fails to pursue the work as to endanger performance of this Agreement in accordance with its terms, and after receipt of written notice from City, fails to correct such failures within ten days or such other period as City may authorize; or

3) If the City determines at any time during the term of this Agreement that the Engineer, or a subconsultant to the Engineer, to which the City awarded this Agreement, in whole or in part, on the basis of any equity criteria as described in the solicitation document, including but not limited to Oregon COBID-certification, was never compliant or is no longer compliant.

The rights and remedies of City provided in the above clause related to defaults (including breach of contract) by Engineer shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

If City terminates this Agreement under paragraph (B), Engineer shall be entitled to receive as full payment for all services satisfactorily rendered and expenses incurred, an amount which bears the same ratio to the total fees specified in this Agreement as the services satisfactorily rendered by Engineer bear to the total services otherwise required to be performed for such total fee; provided, that there shall be deducted from such amount the amount of damages, if any, sustained by City due to breach of contract by Engineer. Damages for breach of contract shall be those allowed by Oregon law, reasonable and necessary attorney fees, and other costs of litigation at trial and upon appeal.

11. NON-WAIVER

The failure of either party to insist upon or enforce strict performance by the other party of any of the terms of this Agreement or to exercise any rights hereunder, should not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights on any future occasion.

12. CONTACT INFORMATION

A. All invoices shall be provided in writing and given by personal delivery, mail, or email. Payments may be made by check or electronic transfer. The following addresses shall be used to transmit invoices, payments, and other financial information, and when so addressed, shall be deemed given upon deposit in the United States mail or postage prepaid. In all other instances, invoices and payments shall be deemed given at the time of actual delivery. Changes may be made to the addresses of the departments to whom invoices and payments are to be given by giving written notice pursuant to this paragraph.

City – Accounts Payable	Engineer – Accounts Receivable
10722 SE Main Street Milwaukie, Oregon 97222	[insert address]
Phone: 503.786.7535	Phone: [insert #]
Email: ap@milwaukieoregon.gov	Email: [insert address]

B. All notices and project correspondence shall be provided in writing and given by personal delivery, mail, or email. The following addresses shall be used to transmit notices and project-related information, and when so addressed shall be deemed given upon deposit in the United States mail or postage prepaid. In all other instances, notices and correspondence shall be deemed given at the time of actual delivery. Changes may be made in the names and addresses of the person to who notices and correspondence are to be given by giving written notice pursuant to this paragraph.

City – Project Manager	Engineer – Project Manager
Attn: Damien Farwell	Attn: [Project Manager Name]
6101 SE Johnson Creek Blvd. Milwaukie, Oregon 97206	[insert address]
Phone: 503.786.7621	Phone: [insert #]
Email: farwelld@milwaukieoregon.gov	Email: [insert address]

13. MERGER
This writing is intended both as a final expression of the Agreement between the parties with respect to the included terms and as a complete and exclusive statement of the terms of the Agreement. No modification of this Agreement shall be effective unless and until it is made in writing and signed by both parties.

14. FORCE MAJEURE
Neither City nor Engineer shall be considered in default because of any delays in completion and responsibilities hereunder due to causes beyond the control and without fault or negligence on the part of the parties so disenabled, including but not restricted to, an act of God or of a public enemy, civil unrest, volcano, earthquake, fire, flood, epidemic, pandemic, public health emergency, quarantine restriction, area-wide strike, freight embargo, unusually severe weather or delay of subcontractor or supplies due to such cause; provided that the parties so disenabled shall within ten days from the beginning of such delay, notify the other party in writing of the cause of delay and its probable extent. Such notification shall not be the basis for a claim for additional compensation. Each party shall, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon cessation of the cause, diligently pursue performance of its obligation under the Agreement.

15. NON-DISCRIMINATION
Engineer agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statues, rules, and regulations. Engineer also shall comply with the Americans with Disabilities Act of 1990, as amended, ORS 659A.142, and all regulations and administrative rules established pursuant to those laws.

16. ERRORS
Engineer shall perform such additional work as may be necessary to correct negligent errors in the work required under this Agreement without undue delays and without additional cost.

17. EXTRA (CHANGES) WORK
Only the Facilities Supervisor may authorize extra (and/or change) work. Failure of Engineer to secure authorization for extra work shall constitute a waiver of all right to adjustment in the contract price

or contract time due to such unauthorized extra work and Engineer thereafter shall be entitled to no compensation whatsoever for the performance of such work.

18. GOVERNING LAW
The provisions of this Agreement shall be construed in accordance with the provisions of the laws of the State of Oregon. Any action or suits involving any question arising under this Agreement must be brought in the appropriate court of the State of Oregon.

19. COMPLIANCE WITH APPLICABLE LAW
Engineer shall comply with all applicable federal, state, local laws and ordinances, including but not limited to ORS 279B.020, 279B.220, 279B.225, 279B.230, and 279B.235, which are incorporated herein. If Engineer is a foreign contractor as defined in ORS 279A.120, Engineer shall comply with that section and the City must satisfy itself that the requirements of ORS 279A.120 have been complied with by Engineer before City issues final payment under this agreement. Engineer shall not provide or offer to provide any appreciable pecuniary or material benefit to any officer or employee of City in connection with this Agreement in violation of ORS Chapter 244.

20. CONFLICT BETWEEN TERMS
It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument in the proposal of the contract, this instrument shall control and nothing herein shall be considered as an acceptance of the said terms of said proposal conflicting herewith.

21. ACCESS TO RECORDS
City shall have access to such books, documents, papers and records of Engineer as are directly pertinent to this Agreement for the purpose of making audit, examination, excerpts and transcripts.

22. AUDIT
Engineer shall maintain records to help assure conformance with the terms and conditions of this Agreement, and to help assure adequate performance and accurate expenditures within the contract period. Engineer agrees to permit City, the State of Oregon, the federal government, or their duly authorized representatives to audit all records pertaining to this Agreement to help assure the accurate expenditure of funds.

23. SEVERABILITY
In the event any provision or portion of this Agreement is held to be unenforceable or invalid by any court of competent jurisdiction, the validity of the remaining terms and provisions shall not be affected to the extent that it did not materially affect the intent of the parties when they entered into the agreement.

24. COMPLETE AGREEMENT
This Agreement and attached exhibit(s) constitutes the entire Agreement between the parties. No waiver, consent, modification, or change of terms of this Agreement shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification, or change if made, shall be effective only in specific instances and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Agreement. Engineer, by the signature of its authorized representative, hereby acknowledges that they have read this Agreement, understands it and agrees to be bound by its terms and conditions.

IN WITNESS WHEREOF, City has caused this Agreement to be executed by its duly authorized undersigned officer and Engineer has executed this Agreement on the date hereinabove first written.

CITY OF MILWAUKIE	ENGINEER
______________________________	______________________________
Signature	*Signature*
______________________________	______________________________
Print Name & Title	*Print Name & Title*
______________________________	______________________________
Date	*Date*

EXHIBIT A
SCOPE OF WORK (SERVICES TO BE PROVIDED)

[see Section 3: Scope of Work in RFQ]

A. AMENDMENT PROCESS

If the scope of the project or the services are changed materially, Engineer shall request in writing an amendment to the Agreement before additional services are provided and before compensation is adjusted. All legally required approvals must be obtained in writing by both parties for any contract amendment before the amendment is effective and before services may be performed or payment made under the Agreement.

D. INCLUSIVE LANGUAGE

The City is deliberately playing its part to increase awareness for equity and inclusion in its organization, community and beyond. The Engineer shall make all efforts to update, remove or change any non-inclusive terminology, phrases or words to inclusive and equitable language for any written and presented deliverables resulting from this Agreement.

EXHIBIT B
SCHEDULE OF RATES

[insert engineer's current rate schedule]

ATTACHMENT C

REFERENCES

Provide three (3) references from similar contractual engagements performed for clients within the last five (5) years. Information provided must include:

1. Client Name: ____

   Phone # & address: ____

   Description of Services Provided: ____________________________

   ____

   ____

   Contract/Agreement Term (start & end dates) ____________________

==

2. Client Name: ____

   Phone # & address: ____

   Description of Services Provided: ____________________________

   ____

   ____

   Contract/Agreement Term (start & end dates) ____________________

==

3. Client Name: ____

   Phone # & address: ____

   Description of Services Provided: ____________________________

   ____

   ____

   Contract/Agreement Term (start & end dates) ____________________

ATTACHMENT D

ASCE 41-17 EVALUATION & RETROFIT DESIGN REPORT DATED 2/24/22

[see separate attachment on city bid site]

Attachment 2

February 24, 2022

City of Milwaukie Public Safety Building

ASCE 41-17 Seismic Evaluation and Preliminary Retrofit Design

PSE Project Number 2102-0070

CITY OF MILWAUKIE

PSE
PETERSON STRUCTURAL ENGINEERS

City Of Milwaukie Public Safety Building

3200 SE Harrison St. Milwaukie, Oregon

ASCE 41-17 Seismic Evaluation and Preliminary Retrofit Design

PSE Project 2102-0070

February 24, 2022

Report Author: Nicholas Welling, P.E. (WA)

Nick.Welling@psengineers.com

Endorsement: Travis McFeron, P.E., S.E.

Travis.McFeron@psengineers.com

Portland Office - Headquarters

9400 SW Barnes Road, Suite 100

Portland, OR 97225

(503) 292-1635

PSE
PETERSON STRUCTURAL ENGINEERS

1 Project Summary Page

Building Part	Building Part Name	Included in Retrofit – Y/N	Year Built	Building Type	Nonstructural Retrofits Included in Scope - Y/N	Previous Seismic Retrofits – Y/N (Year if Yes)
A	Public Safety Building	Y	1992	RM1	Y	N

Total Retrofit Cost	$1,233,817
Retrofit Square Feet	34,900
Retrofit Cost per Square Foot	$35.35
Is the building within a tsunami, FEMA flood zone, landslide/slope instability, liquefaction potential or other high hazard area?	No

2 Engineering Report Checklist

Check	Section	Page
✓	Engineering Report Cover Page	
✓	Project Summary Page	i
✓	Building Parts Identification	4
✓	Statement of Performance Objective	10
✓	Summary of Deficiencies	26
✓	Structural Seismic Deficiencies	26
✓	Nonstructural Seismic Deficiencies	26
✓	Summary of Mitigation/Retrofit	28
✓	Structural Mitigation/Retrofit	28
✓	Nonstructural Mitigation/Retrofit	29
✓	Summary Construction Cost Estimate	31
✓	Direct Cost	31
✓	Indirect Soft Cost	31
✓	Certification Statement by Engineer	31
✓	ASCE 41-17 Tier 1 Checklist	47
✓	Basic Configuration Checklist	47
✓	Building System Structural Checklist	49
✓	Nonstructural Checklist	52
✓	Retrofit Drawings & Sketches	426
✓	DOGAMI or Geotechnical Report	230
✓	Itemized Construction Cost Estimate	331

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3 Project Summary

3.1 Purpose of Assessment

The following report has been generated to summarize a seismic evaluation performed by Peterson Structural Engineers (hereafter referred to as PSE) of the existing Milwaukie Public Safety Building located at 3200 SE Harrison St. in Milwaukie, Oregon constructed circa 1992. Included in the report is a description of the building evaluated, a summary of the means and methodology used in the evaluation, as well as a summary of our findings and subsequent recommendations.

The evaluation of the subject structure was performed at the behest of the City of Milwaukie Public Works Department (hereafter referred to as The Owner) in support of their application for the Business Oregon Seismic Rehabilitation Grant Program (SRGP). PSE understands that SRGP is a competitive grant program in the State of Oregon that provides funding for seismic rehabilitation of critical public buildings. The purpose of PSE's evaluation was to identify potential structural and nonstructural deficiencies related to the seismic performance, provide preliminary retrofit and mitigation measures to address deficiencies identified in the evaluation, and prepare an engineering report to be submitted by The Owner as part of their application for the SRGP.

It is our understanding that The Owner's participation in SRGP is voluntary, and that structural evaluation and retrofits have not been mandated through specific law or ordinance or triggered by building code requirements due to major remodel, change of occupancy, or damage to existing structural systems. The following seismic evaluation of the subject structure has been performed per the SRGP guidelines using the American Society of Civil Engineers (ASCE) standard 41-17, "Seismic Evaluation and Retrofit of Existing Buildings".

PSE's evaluation was performed based on ASCE 41-17 combined Tier 1 and Tier 2 procedures. The intent of a Tier 1 evaluation is to quickly identify structural and nonstructural systems and elements that may perform poorly for a given performance objective level based on historical data. Elements identified to be in conformance under the Tier 1 screening are assumed to be in conformance with the performance objectives idented in ASCE 41 and do not require further evaluation with more detailed Tier 2 procedures. The intent of a Tier 2 deficiency-based evaluation is to perform a more detailed evaluation of elements identified as potentially deficient in the Tier 1 screening to determine if retrofits are required to achieve a specific performance objective. Tier 2 procedures can also be used to evaluate elements that could not be properly evaluated under the scope of Tier 1 due to building or component complexity. Based on Section 1604.5 of the 2019 Oregon Structural Specialty Code (OSSC), PSE has completed the evaluation of the Public Safety Building based on a designation as a Risk Category IV structure, i.e. an essential facility.

The elements of the subject structure that have been identified as non-conforming based on the ASCE 41 Tier 1 and Tier 2 evaluations have been summarized herein. Preliminary conceptual retrofit designs and mitigation measures have been provided to bring the expected seismic performance of deficient items into conformance with the performance objective levels outlined in ASCE 41-17. Preliminary construction cost estimates are provided for the implementation of the retrofits and mitigation measures outlined within.

3.2 Limitations of Assessment

This evaluation is limited to a Tier 1 and Tier 2 seismic evaluation as outlined by SRGP and ASCE 41-17. Though components of the gravity force resisting system are analyzed using ASCE 41 for seismic conditions, this evaluation is only representative of seismic performance and does not explicitly include performance considerations for wind or gravity loads unless otherwise noted herein.

This evaluation is limited to information obtained during a visual structural assessment as well as from original building plans prepared by Mackenzie/Saito & Associates, P.C., that have been provided by The Owner and are included as an appendix to this report.

3.3 Project Team

Select elements covered in the ASCE 41 Tier 1 evaluation are outside of PSE's expertise and were evaluated by other specialists for general conformance. The following provided technical input on the evaluation of the building:

- Structural – Peterson Structural Engineers (PSE)
- Geotechnical – Aspect Consulting
- Mechanical/Electrical/Plumbing – R&W Engineering
- Elevator Specialist – Elevator Consulting Services

Evaluation reports for the for the project disciplines other than PSE are appended to this report.

3.4 Disclaimer

Please note that an ASCE 41-17 evaluation is not directly analogous to current code requirements for new buildings and is specifically intended to mitigate and reduce seismic hazards within existing buildings. An ASCE 41 evaluation and retrofit does not guarantee a specific seismic performance. A review of the existing building for current code requirements may reveal additional non-compliant areas, many of which may not be adequately addressed and mitigated to an equivalent level as that of a building constructed using current code requirements, construction practices and materials. However, the above referenced standard utilizes deficiency and performance-based procedures developed based on observations from past seismic events to identify, design, and detail retrofits for existing structures to perform in a comparable manner to a building constructed under the current code requirements.

Based on discussions with The Owner, it is our understanding that the "Community Room" is planned to be used as the emergency operations center (EOC) for the city of Milwaukie. In addition to the recommendations included herein, we recommend a comprehensive review of the EOC and all necessary equipment and facilities to support its function following a seismic event. The EOC should be established in accordance with FEMA requirements. The following is a partial list of items that FEMA requires for EOCs.

- Communications systems that are redundant and interoperable
- Accessibility to information necessary for EOC operations
- Availability of systems, utilities, and equipment for EOC operations
- Survivability of the structure for possible catastrophic and emergency events

We recommend consulting FEMA for additional information on the requirements for an EOC. Please note that our review is limited to the seismic performance of structural and select non-structural elements as required by ASCE 41-17, and the evaluation of the Community Room for EOC requirements is outside of the purview of this evaluation. Additional considerations of other catastrophic and emergency events should be considered in planning of the EOC and its requirements.

3.5 Endorsement

This report was prepared by Travis McFeron, PE, SE or under his direct supervision while an employee of Peterson Structural Engineers. All work is original and represent the findings of a Structural Engineer registered in the State of Oregon.

63186PE
OREGON
NOV. 9, 2004
TRAVIS GREGORY McFERON
EXPIRES 12 / 31 / 22

4 Building Description

4.1 General Building Description

The building considered in this assessment is the Public Safety Building located at 3200 SE Harrison Street in Milwaukie, Oregon. During typical operation, the Public Safety Building houses City administrative offices, police offices, records storage, police holding cells, fire department offices, fire department dormitories, locker rooms, a gym, and fire department service vehicle bays. Based on available information, it is our understanding that the building was constructed circa 1992 and consists of two stories above grade. The ground level is at grade, and is approximately 22,500-square-feet, while the 2nd level is approximately 12,400-square-feet. To PSE's understanding, the building does not have any below-grade areas.

The construction of the Public Safety Building includes reinforced masonry shear walls for the main lateral force resisting system and structural steel framing and reinforced masonry bearing walls for the primary gravity force resisting system. Some reinforced masonry shear walls are also part of the gravity force resisting system. The roof assembly is comprised of a light-gage metal deck with rigid insulation, protection board, and membrane roofing. The floor construction is comprised of slabs-on-grade at the main level and light-gage metal pan deck topped with 4.5" of concrete reinforced with 12x12 W2.9 welded wire mesh at the 2nd level. The roof and 2nd level floor decks are supported on open web steel joists. Most of the exterior wall construction is partially grouted reinforced CMU block with a brick masonry veneer on the exterior face and a cold-formed stud furring wall on the interior face. Note that not all exterior faces have brick masonry veneer and not all interior faces have cold-formed stud furring. Most of the ceiling is an acoustical drop ceiling, and the foundation consists of a concrete slab-on-grade and stem walls on a continuous strip footing. The building is founded on a relatively flat site without any nearby adjacent structures. Refer to the appendix for pictures of the subject structure.

To the south of the existing building exists a partially grouted reinforced CMU block screen enclosure around the existing parking lot. The CMU blocks are fully grouted below grade and supported by 24-inch wide reinforced concrete strip footings. The CMU block screen wall is not connected to the main building structure and is not considered part to be part of the primary gravity or lateral force resisting system for the main building structure. The evaluation of the CMU block screen wall is not included in the scope of this report.

The follow section of this report includes figures to identify key features of the existing building. The appendix of this report includes photographs and select historical drawings of the subject structure.

4.2 Building Parts Identification

The entirety of the Milwaukie Public Safety Building is included in the evaluation and is identified as "Building Part A." No other buildings are included in the subject evaluation. PSE understands that there have been no additions to the building since the initial construction. The following figures are used to identify the primary building features.

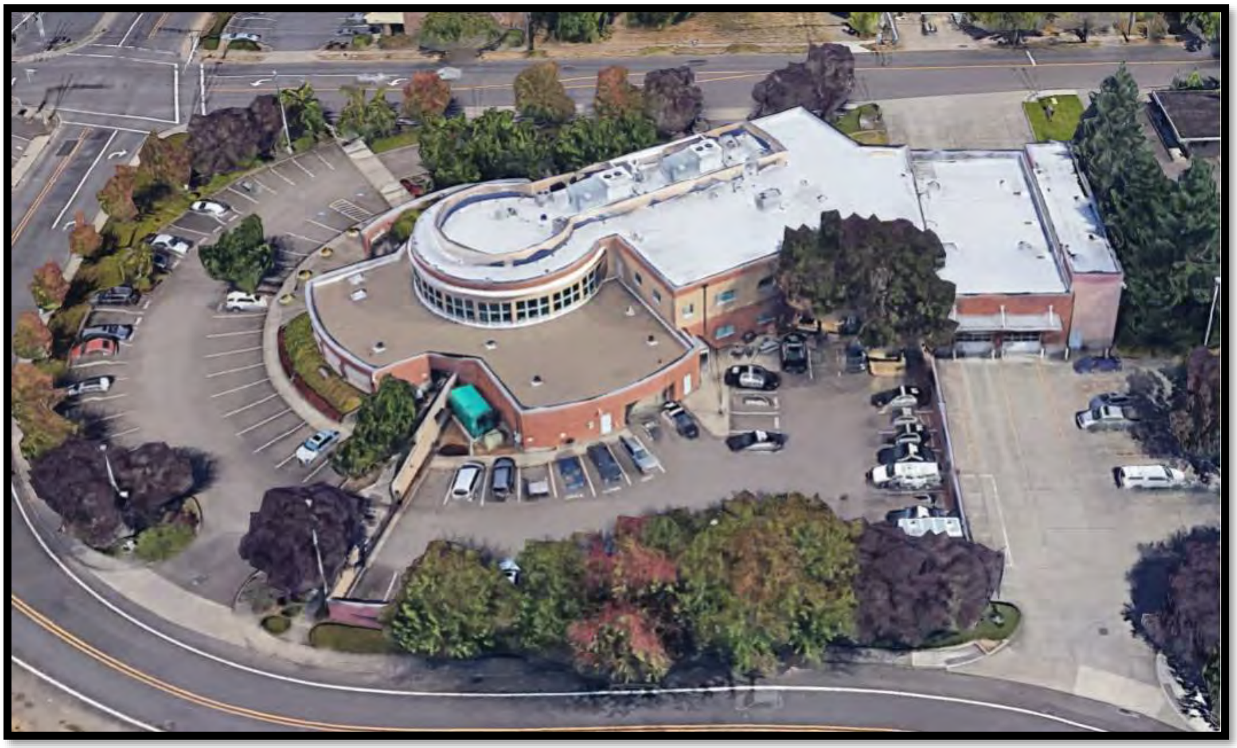


Figure 1: Perspective Building Overview (Google Maps)

Figure 2: Map Building Overview (Google Maps)

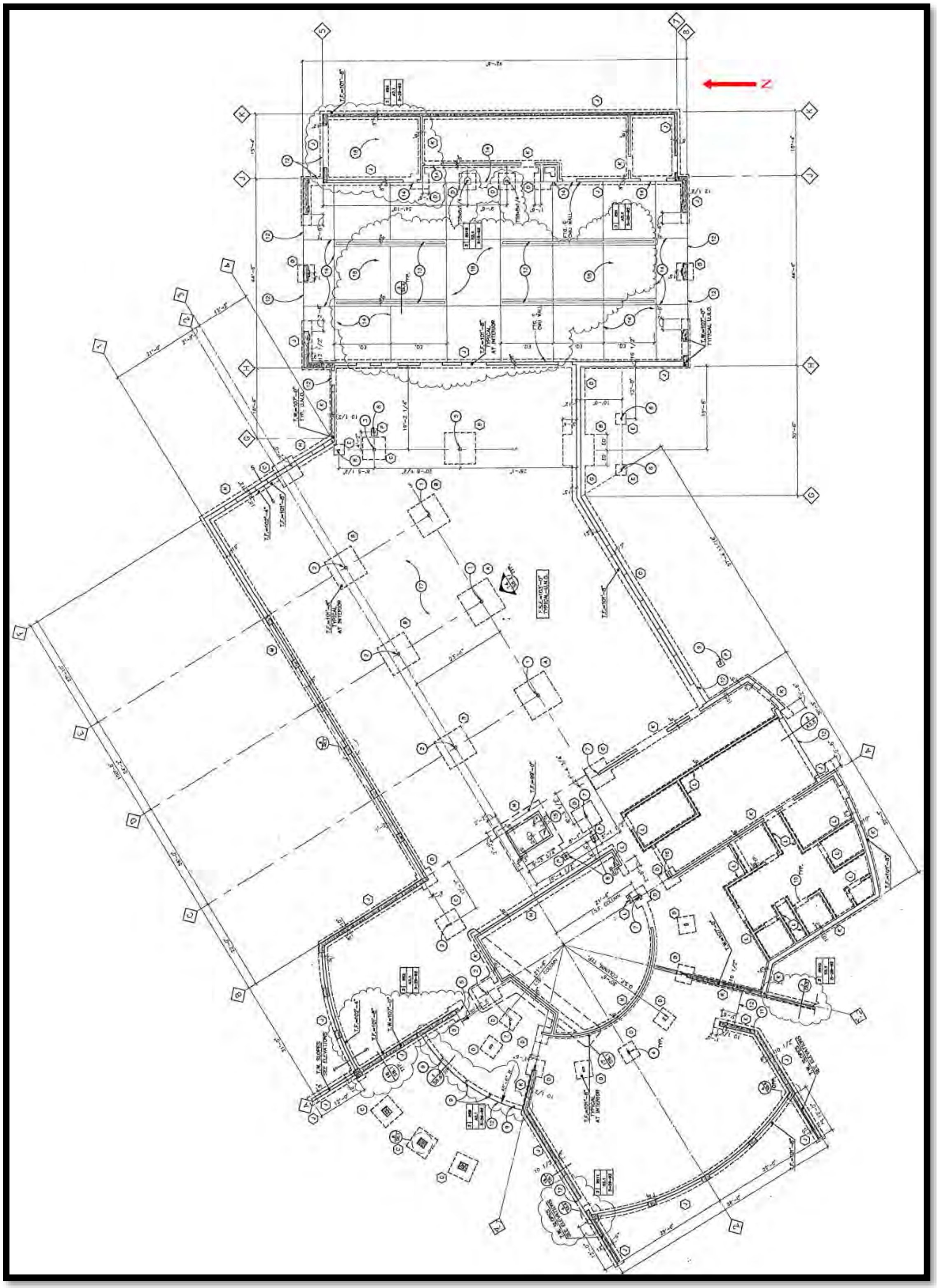


Figure 3: Foundation Plan

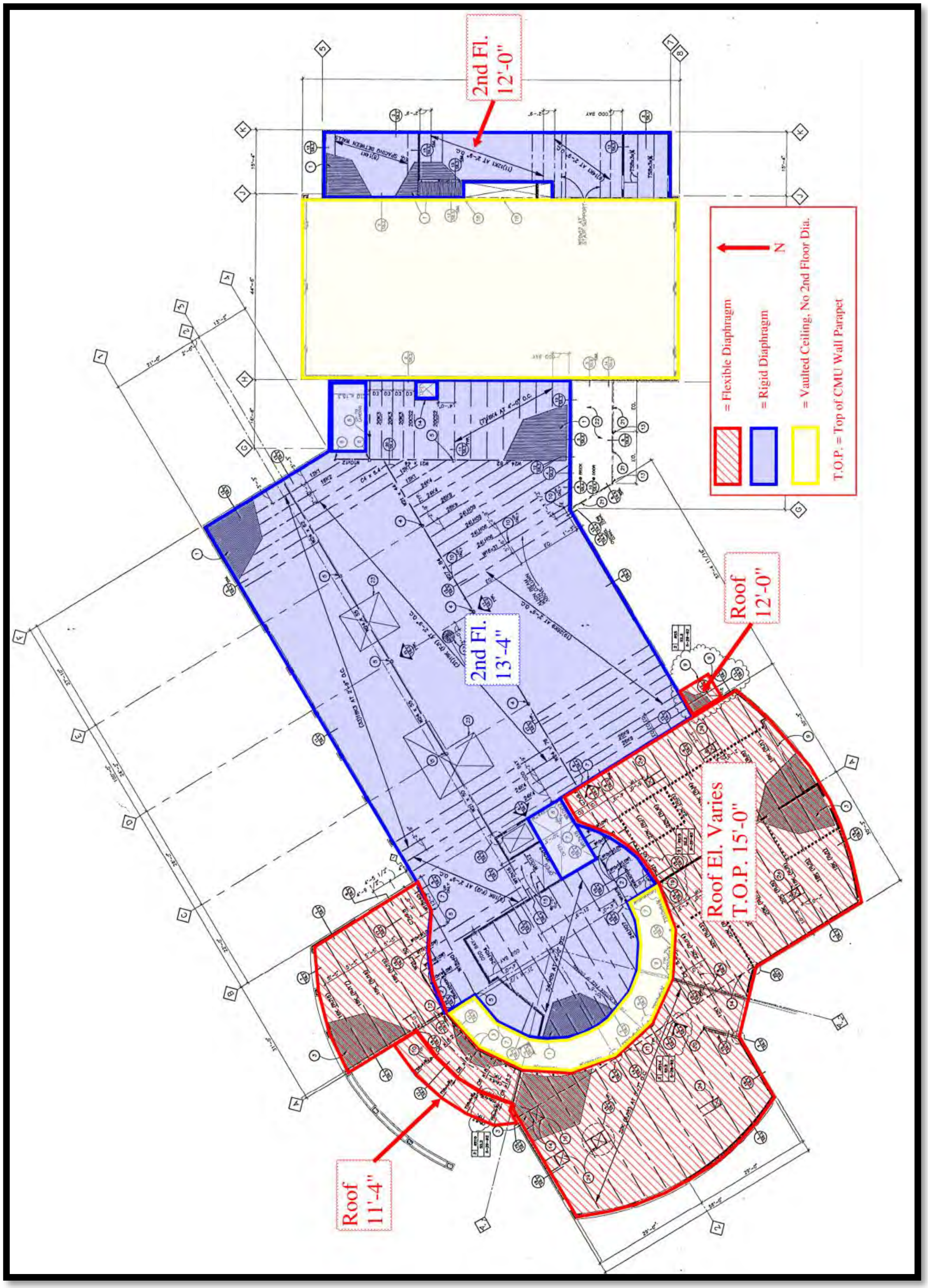


Figure 4: 2nd Floor and Lower Roof Plan

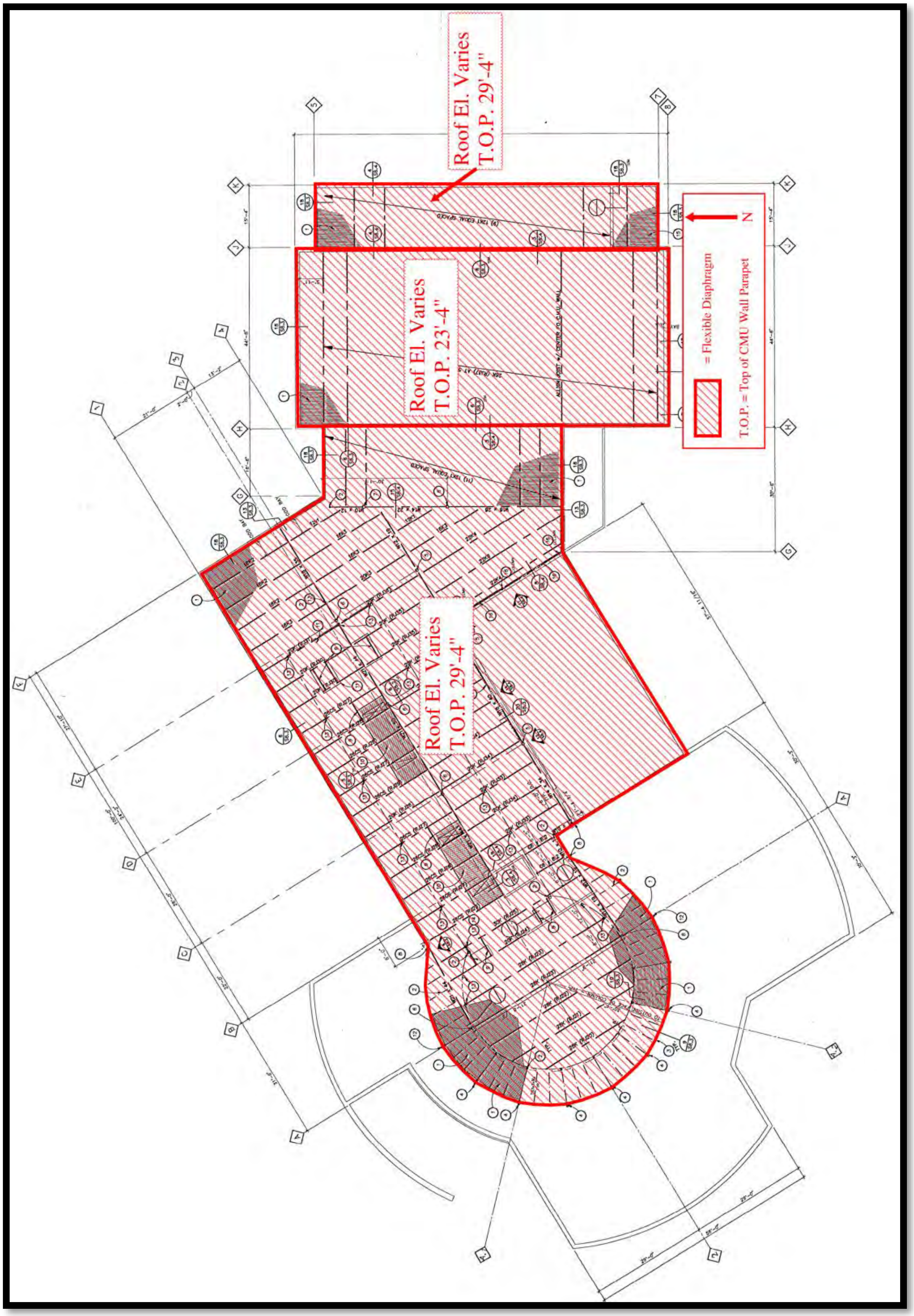


Figure 5: Upper Roof Plan

5 Evaluation Overview

5.1 Basis of Approach

PSE used a combined Tier 1 screening and Tier 2 deficiency-based evaluation per ASCE 41-17 to identify structural and nonstructural elements that may perform poorly during a seismic event. Remaining deficient elements and their associated preliminary retrofit designs and mitigation measures are summarized in the following sections of the report.

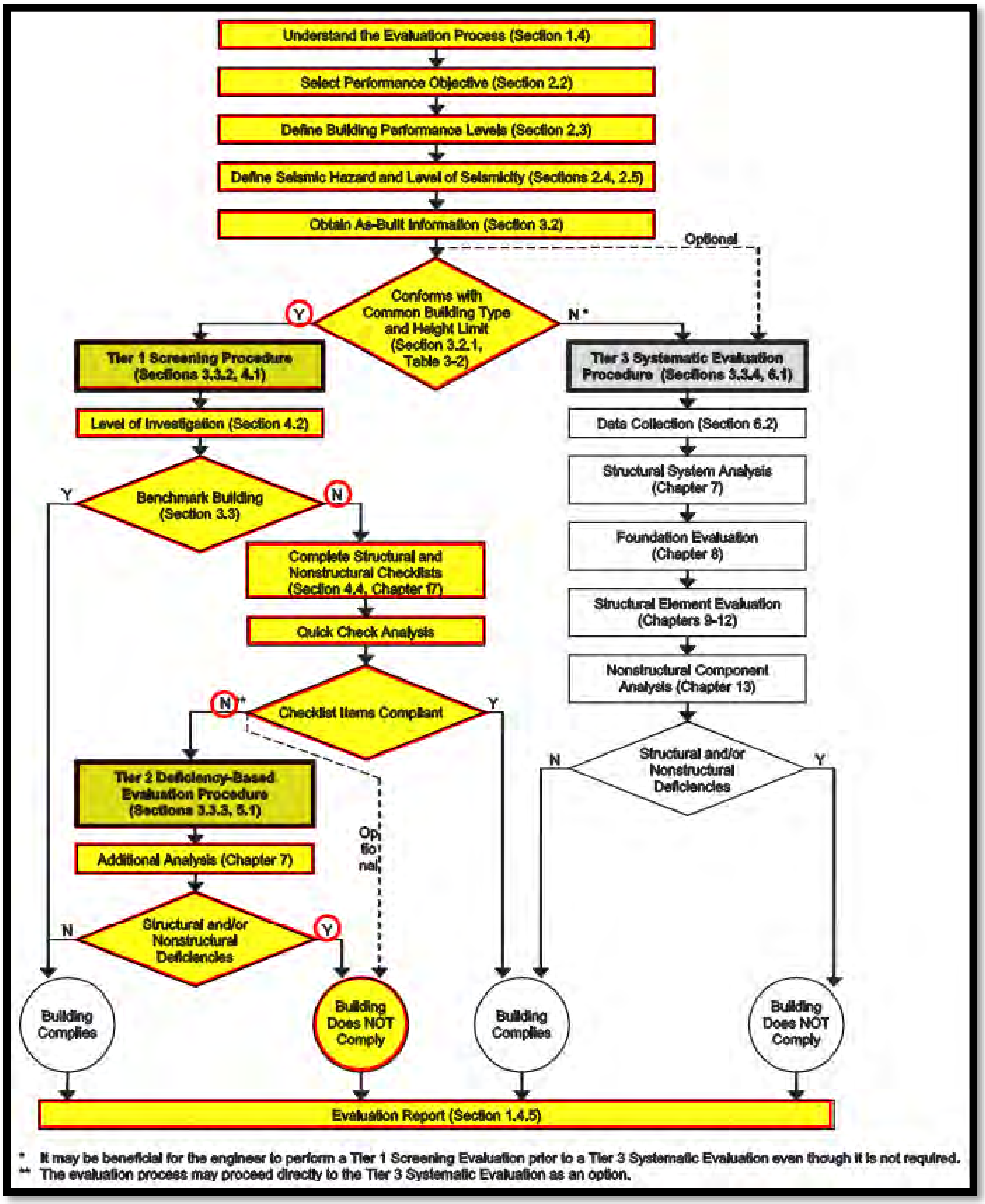


Figure 6: ASCE 41 Evaluation Process [ASCE 41-17 Figure C1-1]

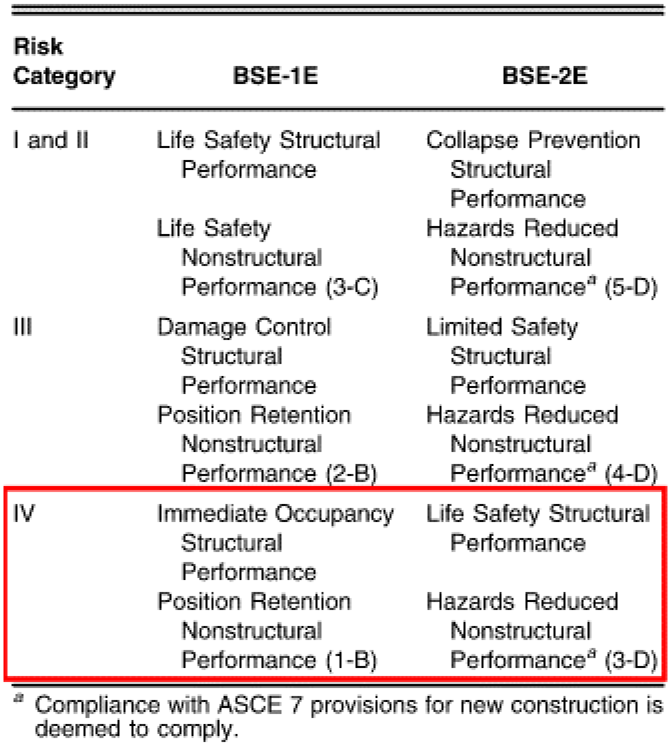
5.2 Statement of Performance Objective

Per Table 2-1 of ASCE 41-17, Section 3403.3 of the 2019 OSSC, and Table 303.3.2 of the 2018 International Existing Building Code (IEBC), the Basic Performance Objective Levels for Existing Buildings (BPOE) for a Risk Category IV building (essential facility) shall be as follows:

- BSE-1E Seismic Event (expected mean return period of 225-years and an expected probability of exceedance of 20% in 50-years): Immediate Occupancy Structural Performance (S-1) and Position Retention Nonstructural Performance (N-B).
- BSE-2E Seismic Event (expected mean return period 975-years and an expected probability of exceedance of 5% in 50-years): Life Safety Structural Performance Level (S-3) and Hazards Reduced Nonstructural Performance Level (N-D).

Ground accelerations for the BSE-1E and BSE-2E seismic events were provided by Aspect Consulting (project geotechnical engineer). A summary of the ground acceleration data is included in the appendix of this report.

Table 1: Basic Performance Objective for Existing Buildings (BPOE) [ASCE 41-17, Table 2-1]



Risk Category	BSE-1E	BSE-2E
I and II	Life Safety Structural Performance Life Safety Nonstructural Performance (3-C)	Collapse Prevention Structural Performance Hazards Reduced Nonstructural Performance[a] (5-D)
III	Damage Control Structural Performance Position Retention Nonstructural Performance (2-B)	Limited Safety Structural Performance Hazards Reduced Nonstructural Performance[a] (4-D)
IV	Immediate Occupancy Structural Performance Position Retention Nonstructural Performance (1-B)	Life Safety Structural Performance Hazards Reduced Nonstructural Performance[a] (3-D)

[a] Compliance with ASCE 7 provisions for new construction is deemed to comply.

5.2.1 Basic Performance Object Level for Existing Building (BPOE)

Per Section 2.3.1.1 of ASCE 41-17, "Structural Performance Level S-1, Immediate Occupancy, is defined as the post-earthquake damage state in which a structure remains safe to occupy and essentially retains its pre-earthquake strength and stiffness." Further, per Section C2.3.1.1, "Structural Performance Level S-1, Immediate Occupancy, means the postearthquake damage state in which only limited structural damage has occurred." An Immediate Occupancy performance level assumes that the building is safe to immediately occupy following the design seismic event and that risks to life-safety are very low.

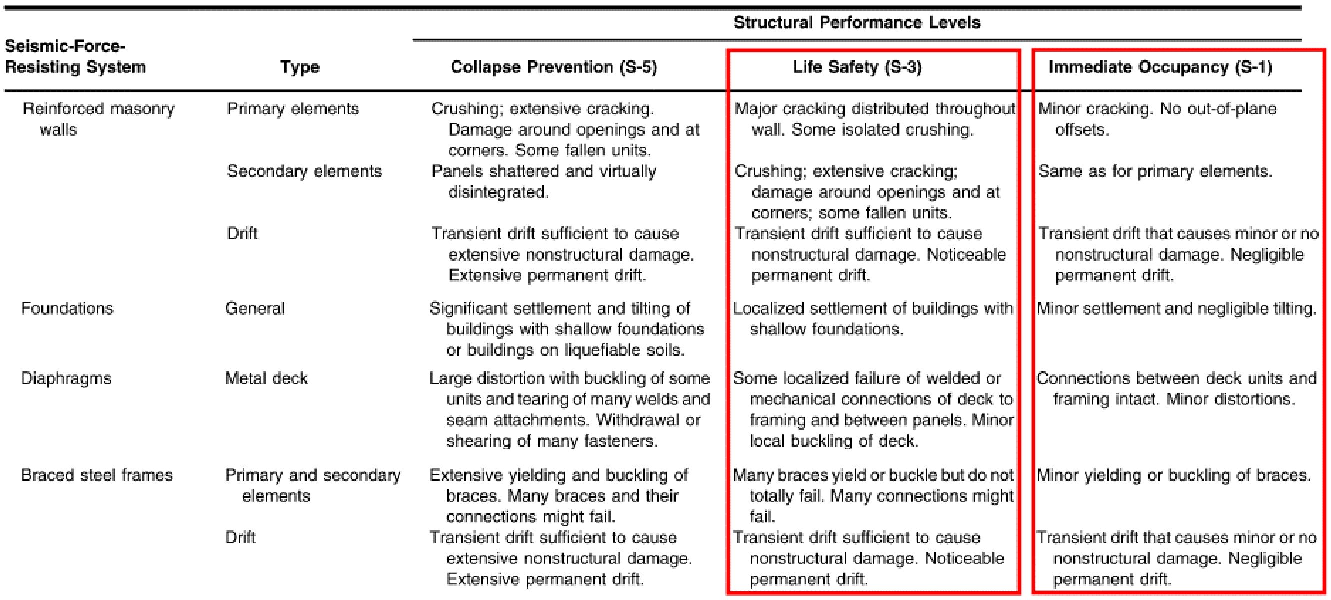
The Position Retention Nonstructural Performance level is intended to reduce the risk of falling nonstructural elements; however, it does not evaluate whether all nonstructural elements necessary for operation of the building remain operational following the design seismic event. For this level of performance, minor damage to the structure is expected even if the structure is upgraded to address the issues identified in the ASCE 41-17 evaluation.

The Life Safety Performance level is based on the expectation that the incurred structural and nonstructural damages will not present life-safety risks to the occupants of the building or nearby persons. Per Section 2.3.1.3 of ASCE 41-17, "Structural Performance Level S-3, Life Safety, is defined as the post-earthquake damage state in which a structure has damaged components but retains a margin of safety against the onset of partial or total collapse." A Life Safety performance level assumes that extensive damages to the structural and nonstructural components may occur that necessitate repairs prior to people reoccupying the building.

The Hazards Reduced Nonstructural Performance level is based on the expectation that extensive damage to nonstructural components may occur but elements are prevented from falling which pose a risk to a large number of people.

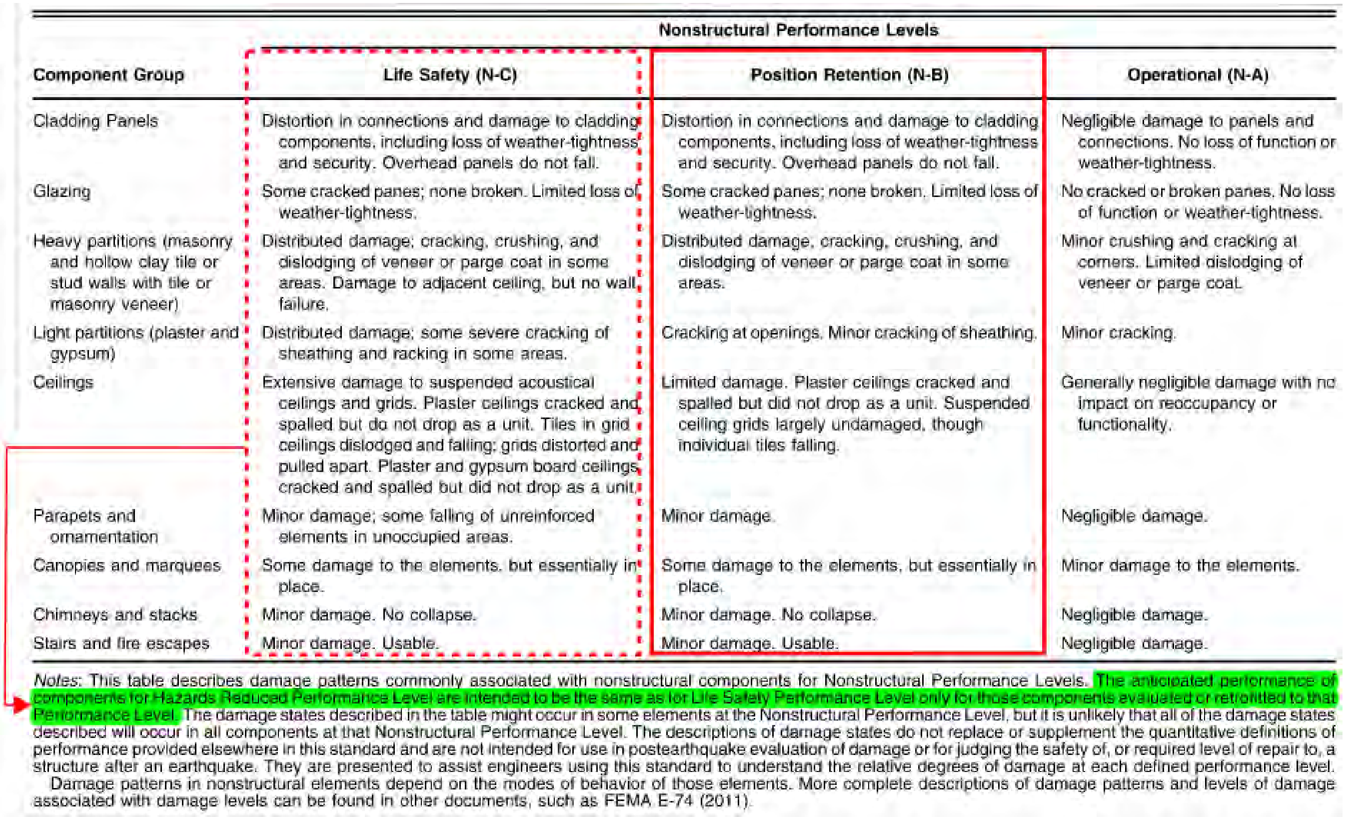
ASCE 41-17 provides a qualitative summary of the expected structural and nonstructural performances associated with a given performance objective level. The expected performance is representative of a structure that meets the requirements of a Tier 1 evaluation and/or that has had deficiency based seismic upgrades completed per Tier 2 procedures. Below is a summary of the expected structural and nonstructural damages for a Risk Category IV reinforced masonry bearing wall structure following the completion of any required deficiency-based upgrades. Please note that these descriptions of expected performance are based on the limited review of structural and nonstructural elements covered by Tier 1 and Tier 2 evaluations, and actual performance may vary.

Table 2: Structural Performance Levels and Illustrative Damage [ASCE 41-17, Table C2-4]



Seismic-Force-Resisting System	Type	Structural Performance Levels		
		Collapse Prevention (S-5)	Life Safety (S-3)	Immediate Occupancy (S-1)
Reinforced masonry walls	Primary elements	Crushing; extensive cracking. Damage around openings and at corners. Some fallen units.	Major cracking distributed throughout wall. Some isolated crushing.	Minor cracking. No out-of-plane offsets.
	Secondary elements	Panels shattered and virtually disintegrated.	Crushing; extensive cracking; damage around openings and at corners; some fallen units.	Same as for primary elements.
	Drift	Transient drift sufficient to cause extensive nonstructural damage. Extensive permanent drift.	Transient drift sufficient to cause nonstructural damage. Noticeable permanent drift.	Transient drift that causes minor or no nonstructural damage. Negligible permanent drift.
Foundations	General	Significant settlement and tilting of buildings with shallow foundations or buildings on liquefiable soils.	Localized settlement of buildings with shallow foundations.	Minor settlement and negligible tilting.
Diaphragms	Metal deck	Large distortion with buckling of some units and tearing of many welds and seam attachments. Withdrawal or shearing of many fasteners.	Some localized failure of welded or mechanical connections of deck to framing and between panels. Minor local buckling of deck.	Connections between deck units and framing intact. Minor distortions.
Braced steel frames	Primary and secondary elements	Extensive yielding and buckling of braces. Many braces and their connections might fail.	Many braces yield or buckle but do not totally fail. Many connections might fail.	Minor yielding or buckling of braces.
	Drift	Transient drift sufficient to cause extensive nonstructural damage. Extensive permanent drift.	Transient drift sufficient to cause nonstructural damage. Noticeable permanent drift.	Transient drift that causes minor or no nonstructural damage. Negligible permanent drift.

Table 3: Nonstructural Performance Levels and Illustrative Damage – Architectural Components [ASCE 41-17, Table C2-5]

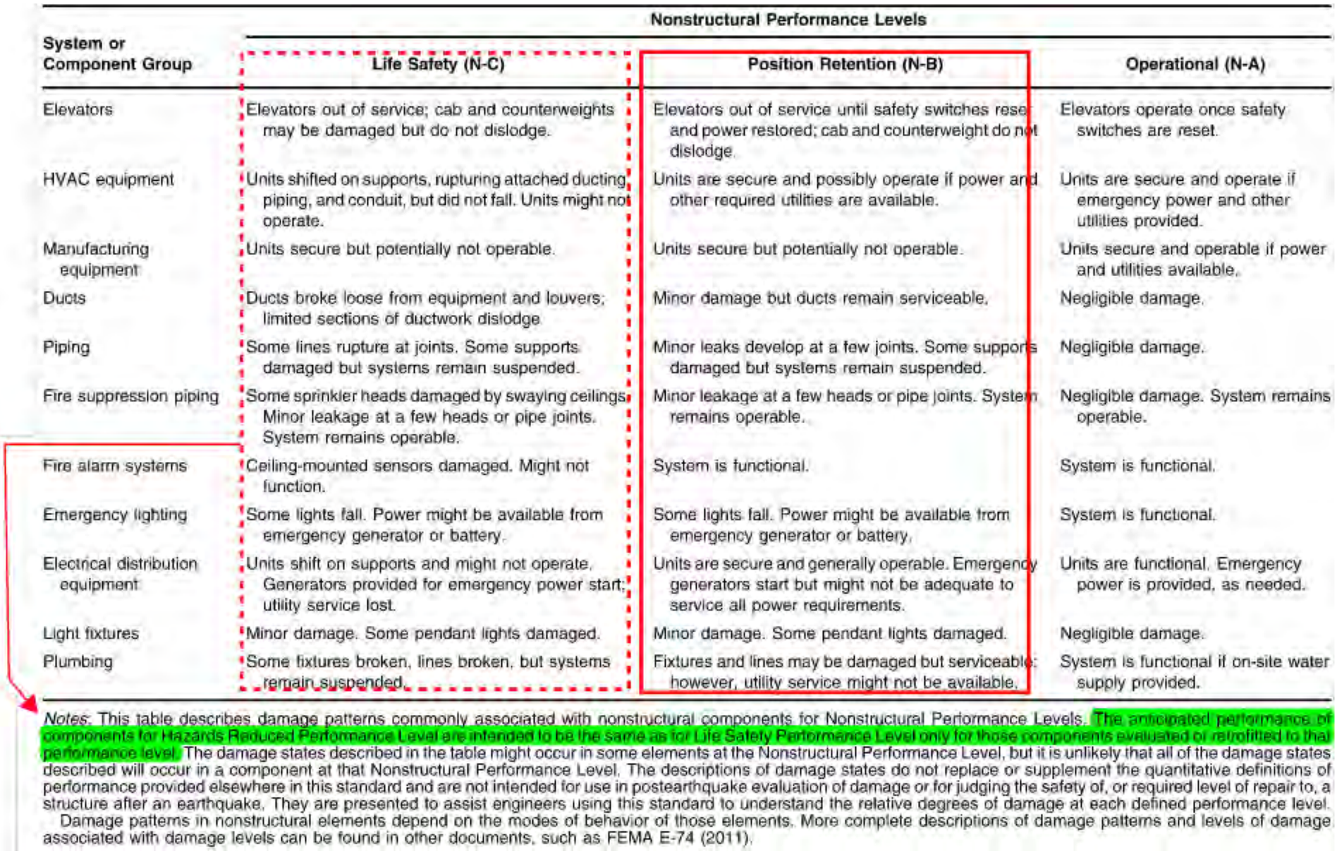


	Nonstructural Performance Levels		
Component Group	**Life Safety (N-C)**	**Position Retention (N-B)**	**Operational (N-A)**
Cladding Panels	Distortion in connections and damage to cladding components, including loss of weather-tightness and security. Overhead panels do not fall.	Distortion in connections and damage to cladding components, including loss of weather-tightness and security. Overhead panels do not fall.	Negligible damage to panels and connections. No loss of function or weather-tightness.
Glazing	Some cracked panes; none broken. Limited loss of weather-tightness.	Some cracked panes; none broken. Limited loss of weather-tightness.	No cracked or broken panes. No loss of function or weather-tightness.
Heavy partitions (masonry and hollow clay tile or stud walls with tile or masonry veneer)	Distributed damage; cracking, crushing, and dislodging of veneer or parge coat in some areas. Damage to adjacent ceiling, but no wall failure.	Distributed damage, cracking, crushing, and dislodging of veneer or parge coat in some areas.	Minor crushing and cracking at corners. Limited dislodging of veneer or parge coat.
Light partitions (plaster and gypsum)	Distributed damage; some severe cracking of sheathing and racking in some areas.	Cracking at openings. Minor cracking of sheathing.	Minor cracking.
Ceilings	Extensive damage to suspended acoustical ceilings and grids. Plaster ceilings cracked and spalled but do not drop as a unit. Tiles in grid ceilings dislodged and falling; grids distorted and pulled apart. Plaster and gypsum board ceilings cracked and spalled but did not drop as a unit.	Limited damage. Plaster ceilings cracked and spalled but did not drop as a unit. Suspended ceiling grids largely undamaged, though individual tiles falling.	Generally negligible damage with no impact on reoccupancy or functionality.
Parapets and ornamentation	Minor damage; some falling of unreinforced elements in unoccupied areas.	Minor damage.	Negligible damage.
Canopies and marquees	Some damage to the elements, but essentially in place.	Some damage to the elements, but essentially in place.	Minor damage to the elements.
Chimneys and stacks	Minor damage. No collapse.	Minor damage. No collapse.	Negligible damage.
Stairs and fire escapes	Minor damage. Usable.	Minor damage. Usable.	Negligible damage.

Notes: This table describes damage patterns commonly associated with nonstructural components for Nonstructural Performance Levels. The anticipated performance of components for Hazards Reduced Performance Level are intended to be the same as for Life Safety Performance Level only for those components evaluated or retrofitted to that Performance Level. The damage states described in the table might occur in some elements at the Nonstructural Performance Level, but it is unlikely that all of the damage states described will occur in all components at that Nonstructural Performance Level. The descriptions of damage states do not replace or supplement the quantitative definitions of performance provided elsewhere in this standard and are not intended for use in postearthquake evaluation of damage or for judging the safety of, or required level of repair to, a structure after an earthquake. They are presented to assist engineers using this standard to understand the relative degrees of damage at each defined performance level.

Damage patterns in nonstructural elements depend on the modes of behavior of those elements. More complete descriptions of damage patterns and levels of damage associated with damage levels can be found in other documents, such as FEMA E-74 (2011).

Table 4: Nonstructural Performance Levels and Illustrative Damage – Mechanical, Electrical, and Plumbing Systems and Components [ASCE 41-17, Table C2-6]

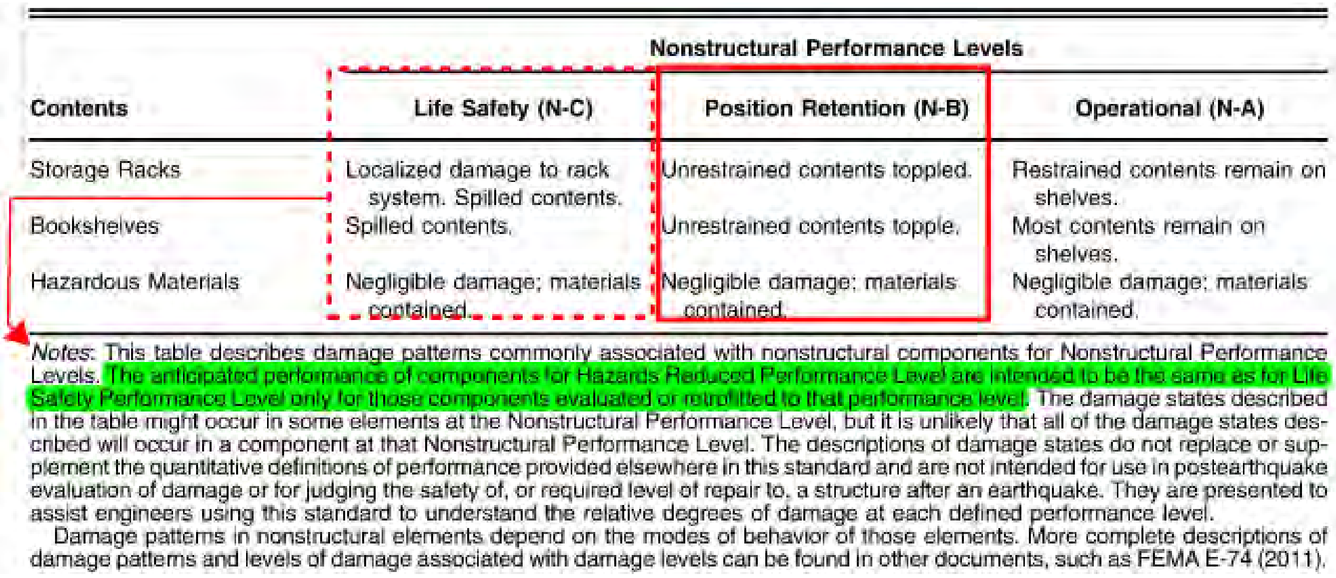


System or Component Group	Nonstructural Performance Levels		
	Life Safety (N-C)	Position Retention (N-B)	Operational (N-A)
Elevators	Elevators out of service; cab and counterweights may be damaged but do not dislodge.	Elevators out of service until safety switches reset and power restored; cab and counterweight do not dislodge.	Elevators operate once safety switches are reset.
HVAC equipment	Units shifted on supports, rupturing attached ducting, piping, and conduit, but did not fall. Units might not operate.	Units are secure and possibly operate if power and other required utilities are available.	Units are secure and operate if emergency power and other utilities provided.
Manufacturing equipment	Units secure but potentially not operable.	Units secure but potentially not operable.	Units secure and operable if power and utilities available.
Ducts	Ducts broke loose from equipment and louvers; limited sections of ductwork dislodge.	Minor damage but ducts remain serviceable.	Negligible damage.
Piping	Some lines rupture at joints. Some supports damaged but systems remain suspended.	Minor leaks develop at a few joints. Some supports damaged but systems remain suspended.	Negligible damage.
Fire suppression piping	Some sprinkler heads damaged by swaying ceilings. Minor leakage at a few heads or pipe joints. System remains operable.	Minor leakage at a few heads or pipe joints. System remains operable.	Negligible damage. System remains operable.
Fire alarm systems	Ceiling-mounted sensors damaged. Might not function.	System is functional.	System is functional.
Emergency lighting	Some lights fall. Power might be available from emergency generator or battery.	Some lights fall. Power might be available from emergency generator or battery.	System is functional.
Electrical distribution equipment	Units shift on supports and might not operate. Generators provided for emergency power start; utility service lost.	Units are secure and generally operable. Emergency generators start but might not be adequate to service all power requirements.	Units are functional. Emergency power is provided, as needed.
Light fixtures	Minor damage. Some pendant lights damaged.	Minor damage. Some pendant lights damaged.	Negligible damage.
Plumbing	Some fixtures broken, lines broken, but systems remain suspended.	Fixtures and lines may be damaged but serviceable; however, utility service might not be available.	System is functional if on-site water supply provided.

Notes: This table describes damage patterns commonly associated with nonstructural components for Nonstructural Performance Levels. The anticipated performance of components for Hazards Reduced Performance Level are intended to be the same as for Life Safety Performance Level only for those components evaluated or retrofitted to that performance level. The damage states described in the table might occur in some elements at the Nonstructural Performance Level, but it is unlikely that all of the damage states described will occur in a component at that Nonstructural Performance Level. The descriptions of damage states do not replace or supplement the quantitative definitions of performance provided elsewhere in this standard and are not intended for use in postearthquake evaluation of damage or for judging the safety of, or required level of repair to, a structure after an earthquake. They are presented to assist engineers using this standard to understand the relative degrees of damage at each defined performance level.

Damage patterns in nonstructural elements depend on the modes of behavior of those elements. More complete descriptions of damage patterns and levels of damage associated with damage levels can be found in other documents, such as FEMA E-74 (2011).

Table 5: Nonstructural Performance Levels and Illustrative Damage – Contents [ASCE 41-17, Table C2-7]



Contents	Nonstructural Performance Levels		
	Life Safety (N-C)	Position Retention (N-B)	Operational (N-A)
Storage Racks	Localized damage to rack system. Spilled contents.	Unrestrained contents toppled.	Restrained contents remain on shelves.
Bookshelves	Spilled contents.	Unrestrained contents topple.	Most contents remain on shelves.
Hazardous Materials	Negligible damage; materials contained.	Negligible damage; materials contained.	Negligible damage; materials contained.

Notes: This table describes damage patterns commonly associated with nonstructural components for Nonstructural Performance Levels. The anticipated performance of components for Hazards Reduced Performance Level are intended to be the same as for Life Safety Performance Level only for those components evaluated or retrofitted to that performance level. The damage states described in the table might occur in some elements at the Nonstructural Performance Level, but it is unlikely that all of the damage states described will occur in a component at that Nonstructural Performance Level. The descriptions of damage states do not replace or supplement the quantitative definitions of performance provided elsewhere in this standard and are not intended for use in postearthquake evaluation of damage or for judging the safety of, or required level of repair to, a structure after an earthquake. They are presented to assist engineers using this standard to understand the relative degrees of damage at each defined performance level.

Damage patterns in nonstructural elements depend on the modes of behavior of those elements. More complete descriptions of damage patterns and levels of damage associated with damage levels can be found in other documents, such as FEMA E-74 (2011).

5.2.2 Level of Seismicity

Seismic demands generated for the analysis of the subject structure are based on the following ground motion parameters as provided by the Geotechnical Report and OSSC minimums noted below:

- BSE-1E Seismic Event (expected mean return period of 225-years and an expected probability of exceedance of 20% in 50-years):
    - S_{XS} = 0.531 (Spectral response acceleration parameter at short periods for the selected Seismic Hazard Level and damping, adjusted for Site Class)
    - S_{X1} = 0.293 (Spectral response acceleration parameter at 1-s period for the selected Seismic Hazard Level and damping, adjusted for Site Class)
- BSE-2E Seismic Event (expected mean return period of 975-years and an expected probability of exceedance of 5% in 50-years):
    - S_{XS} = 0.797 (Spectral response acceleration parameter at short periods for the selected Seismic Hazard Level and damping, adjusted for Site Class)
    - S_{X1} = 0.439 (Spectral response acceleration parameter at 1-s period for the selected Seismic Hazard Level and damping, adjusted for Site Class)

Per 2019 OSSC section 3403.3, BSE-1E spectral acceleration values at any period shall be taken as the minimum of 75% of BSE-1N seismic values and 100% of BSE-1E seismic values. For the BSE-1E Seismic Event, 75% of BSE-1N values controlled. Per 2019 OSSC section 3403.3, BSE-2E spectral acceleration values at any period shall be taken as the minimum of 75% of BSE-2N values and 100% of BSE-2E seismic values. For the BSE-2E Seismic Event, 75% of BSE-2N values controlled. The values listed above have been adjusted accordingly.

Per Section 2.5 of ASCE 41-17, the Level of Seismicity was determined based on BSE-2N response acceleration parameters, though this evaluation does not evaluate seismic performance for a BSE-2N seismic event. The BSE-2N seismic event is equivalent to the Risk-Targeted Maximum Considered Earthquake (MCE_R) per ASCE 7-16.

- S_S = 0.886 (Spectral response acceleration parameter at short periods)
- S_1 = 0.390 (Spectral response acceleration parameter at a 1-s)
- S_{DS} = 0.708 (Design short-period spectral response acceleration parameter, adjusted for Site Class)
- S_{D1} = 0.390 (Design spectral response acceleration parameter at a 1-s period, adjusted for Site Class)
- Level of Seismicity = High (Per ASCE 41-17 Table 2-4)

See the appendix for a summary of the ground motion parameters used in this evaluation.

5.3 Seismic Analysis Assumptions

5.3.1 Tier 1 Analysis Assumptions

The Tier 1 evaluation uses a pseudo seismic force that is calculated per Section 4.4.2 of ASCE 41-17 based on the estimated seismic mass of the building. The effective seismic mass of the building is estimated based on the element weights summarized below.

- Average Exterior CMU Wall Unit Weight = 50psf
    - Note: This varies by wall type throughout the building.
- Interior Partition Wall Unit Smear Weight
    - 2nd floor = 15psf
    - Roof = 7.5psf

- Masonry Veneer Unit Weight = 39psf
- Upper Roof and Framing Unit Weight = 15psf
- Lower Roof and Framing Unit Weight = 20psf
- 2nd Floor and Framing Unit Weight = 56psf
- Total Effective Seismic Mass = 4,000kips
  - Note: This is the same value used in Tier 2 evaluation based on the calculated weight in the 3D RISA model.
- Approximate Building Period = 0.243s (ASCE 41-17 Eq. 4-4)
- Site Class = C (per Geotech)
- Total Base Shear – Tier 1:
  - BSE-1E = 2,550kip
  - BSE-2E = 3,826kip

Typically, limited structural calculations are required for quick checks included in Tier 1 evaluation procedures. However, due to the complexity of the building, all of the Tier 1 structural checks which require structural calculations per the quick check procedures were deemed unknown and further evaluated using Tier 2 procedures. As such, the Tier 1 pseudo seismic forces calculated above were not used in the evaluation of structural elements as a Tier 2 approach was required. See the appendix for Tier 1 base shear calculations.

5.3.2 Tier 2 Analysis Assumptions

5.3.2.1 General Assumptions

A summary of the pertinent Tier 2 evaluation assumptions are provided below. See the Tier 2 structural calculations appended to this report for a full description of assumptions analysis procedures performed.

- Only elements deemed non-compliant or unknown per the Tier 1 evaluation are analyzed per Tier 2 procedures. See Section 7 of this report for the scope of the Tier 2 assessment.
- Per Section 7.3.1.2 of ASCE 41-17, a Linear Static Procedure (LSP) is not applicable to the subject structure due to the nonorthogonal shearwalls. PSE used a Linear Dynamic Procedure (LDP) instead.
- PSE used RISA 3D to generate in-plane demands to primary elements of LFRS covered in the scope of the Tier 2 evaluation using the LDP Response Spectrum Analysis. LDP evaluations were performed for the following cases:
  - BSE-1E:
    - Lower-bound material properties considered (for force-controlled components)
    - Expected material properties considered (for deformation-controlled components)
  - BSE-2E:
    - Lower-bound material properties considered (for force-controlled components)
    - Expected material properties considered (for deformation-controlled components)
- (22) modes were considered in the Response Spectrum Analyses in order to achieve a minimum of 90% mass participation in each direction as required by Section 7.4.2.2.3 of ASCE 41-17.
- PSE used deformation-controlled and force-controlled acceptance criteria per Section 7.5.2.2 of ASCE 41 to evaluate the adequacy of elements considered in the scope of the Tier 1 evaluation. Demands and capacities from RISA 3D model outputs were modified accordingly.
- Per Section 7.2.11 of ASCE 41-17, out-of-plane behaviors of the components were not evaluated using the RISA 3D model. Out-of-plane effects on wall anchorage and walls are evaluated individually for demands prescribed by ASCE 41-17.

- Due to the asymmetry of the building and the presence of nonorthogonal walls, the subject building was evaluated for seismic loads applied in two perpendicular directions and combined using concurrent multi-directional procedures per Section 7.2.5.1 of ASCE 41-17.
- Diaphragm in-plane behavior is approximated in the RISA 3D model by using orthotropic meshed plates capable of resisting only in-plane forces. Plate properties are based on the in-plane stiffness properties as provided by the manufacturer.

5.3.2.2 Linear Static Procedure Base Shears

Below are the linear static procedure pseudo seismic base shears generated per Section 7.4.1.3.1.

- BSE-1E = 2,968kip
- BSE-2E = 4,453kip

Note that the seismic forces for the linear static procedure were not used to directly evaluate the adequacy of the elements covered in the scope of the Tier 2 evaluation. Rather, the seismic forces were generated to calculate the linear dynamic procedure scaling factors to ensure that the dynamic forces generated exceeded 85% of the static forces per Section 7.4.2.3.2 of ASCE 41-17. Furthermore, PSE used the linear static seismic forces for internal quality assurance to confirm that the results of the dynamic analysis were producing reasonable results.

5.3.2.3 Linear Dynamic Procedure Base Shears

Below are the unscaled base shears generated by the response spectrum analysis performed using RISA 3D. Note that scaling factors were applied within RISA 3D in order to ensure that the dynamic forces generated exceeded 85% of the static forces per Section 7.4.2.3.2 of ASCE 41-17.

Seismic Event	**Case**	**Z-Direction**		**X-Direction**	
		Unscaled Base	**Effective**	**Unscaled Base**	**Effective**
BSE-1E	Lower-Bound Material	1523kip	= C_1C_2*1.183	1454kip	= C_1C_2*1.240
	Expected Material	1461kip	= C_1C_2*1.234	1412kip	= C_1C_2*1.274
BSE-2E	Lower-Bound Material	2287kip	= C_1C_2*1.187	2183kip	= C_1C_2*1.245
	Expected Material	2194kip	= C_1C_2*1.232	2124kip	= C_1C_2*1.273

*Section 7.4.2.3.1 of ASCE 41-17 requires LDP demands to be multiplied by modification factors C_1 and C_2. In this case, the product of C_1 and C_2 is equal to 1.4.

6 ASCE 41-17 Tier 1 Screening Evaluation

6.1 General Tier 1 Evaluation Summary

6.1.1 Building Configuration

ASCE 41-17 structural Tier 1 checks are generally intended for and most accurate when applied to relatively simple structures that are regular in plan with continuous diaphragms. The subject structure has several structural complexities, such as combined flexible and rigid diaphragms, diaphragm offsets, and nonorthogonal shearwalls, that make ASCE 41-17 Tier 1 procedures less practical and accurate for evaluating seismic performance. As such, Tier 1 checks containing quick check procedures for evaluating elements of the seismic force resisting system were deemed unknown, and therefore the elements were evaluated per Tier 2 procedures. See Section 7 of this report for findings from the Tier 2 evaluation.

6.1.2 Foundation System and Geotechnical Considerations

The building is constructed on a shallow foundation on a relatively flat site. Per the Oregon Department of Geology and Mineral Industries, the subject building is shown to be located in a high liquefaction potential hazard zone and near a known fault line. To further evaluate these risks, Aspect Consulting was consulted to perform a site-specific geotechnical investigation. Per the report prepared by Aspect Consulting, the soils at the project site were found to be generally not liquefiable for the considered seismic events. Furthermore, the risks associated with surface fault rupture were found to be low. As such, liquefaction and surface fault rupture checks were deemed compliant in the Tier 1 screening. The full Aspect Consulting report is included in the appendix.

6.1.3 Lateral Force Resisting System

6.1.3.1 Reinforced Masonry Shear Walls

Due to the complexity of the structure, accurate shearwall shear stress checks required a more detailed analysis than those included in the scope of a Tier 1 analysis. As such, the reinforced masonry shearwalls were evaluated using Tier 2 procedures. See Section 7 of this report for Tier 2 evaluation results.

6.1.3.2 Roof Diaphragms

The roof diaphragms consist of untopped metal pan decking. Based on PSE’s review of the project drawings, there appears to be continuous cross ties between roof diaphragm chords in each principal direction (trusses in one direction and lapped continuous decking in the other). A 3D building analysis was performed per Tier 2 procedures in order to determine the adequacy of the diaphragms and connections to transfer in-plane forces to the shearwalls. See Section 7 of this report for Tier 2 evaluation results.

6.1.3.3 Floor Diaphragms

The 2nd level floor diaphragm is metal pan decking with a concrete topping slab. While the diaphragm span requirements of the Tier 1 screening appear to be met, the current floor diaphragm includes reentrant corners and openings in the diaphragm that could result in high localized stresses during a seismic event. A 3D building analysis was performed per Tier 2 procedures in order to determine the adequacy of the diaphragms and connections to transfer in-plane forces to the shearwalls.

6.1.4 Non-Structural Components

6.1.4.1 Life Safety Systems

Fire suppression piping, fire suppression piping couplers, and sprinkler ceiling clearance were evaluated by R&W Engineering for conformance with NFPA-13 and as outlined by the Tier 1 checks. Per their reporting, all items were deemed to be in conformance. The R&W Engineering report is included in the appendix.

Emergency equipment used for power appeared to be anchored and braced. Emergency egress lighting was observed by PSE to be anchored to the building structure.

6.1.4.2 Hazardous Materials

In general, very few hazardous materials were observed to be present. As such, most Tier 1 checks were deemed not applicable. Hazardous materials (where observed) were located in cabinets with latched doors, in compliance with Tier 1 checks.

6.1.4.3 Partitions

Tops of ceiling high partitions were noted in the project drawings to be braced at 8-feet on center, which is greater than the 6-foot maximum spacing permitted by the Tier 1 screening. As such, the “Tops” check was found to be non-compliant per Tier 1, however, was further evaluated and found to be compliant per Tier 2 procedures. All other Tier 1 checks related to bracing of partitions were found to be either compliant or not applicable.

6.1.4.4 Ceilings

Integrated suspended ceilings were observed without non-parallel free edges during PSE’s site visit. Mitigation measures are required to provide two non-parallel free edges with adequate edge clearance and edge support.

6.1.4.5 Light Fixtures

Light fixtures penetrating integrated ceilings were observed to have proper bracing and support independent of the ceiling system. Lights which contain lens covers were observed without safety devices. Mitigation is required to add safety devices.

6.1.4.6 Cladding and Glazing

All Tier 1 checks related to cladding and glazing were deemed not applicable for the subject structure.

6.1.4.7 Masonry Veneer

Much of the exterior walls of the building has a masonry veneer. Masonry veneer ties were shown representatively in the building drawings to occur at approximately 24-inches on center, though this was not fully detailed in the drawings. Three representative areas of existing veneer were removed to provide PSE visual access to observe and confirm the typical tie spacing as constructed. PSE observed tie spacing and locations of ties to be generally in conformance with the Tier 1 checks. The building drawings were detailed such that the additional Tier 1 checks related to masonry veneer were deemed compliant or not applicable.

6.1.4.8 Parapets, Cornices, Ornamentation, and Appendages

Per the building drawings, parapets appear to be reinforced consistent with the typical exterior wall reinforcing. No unreinforced parapets appear to be present. Canopies are detailed in the building drawings to be braced to the main building structure.

6.1.4.9 Masonry Chimneys

There are no masonry chimneys in the subject building structure.

6.1.4.10 Contents and Furnishing

Based on our site observations, there are several unbraced tall narrow and fall prone contents (e.g. bookcases, file cabinets, etc.). ASCE 41-17 requires that contents more than 6-feet high and or contents with a height-to-width ratio greater than 3:1 are anchored to the structure or each other. Additionally, fall prone contents that weigh more than 20-lbs and with a center of mass greater than 4-feet above the adjacent floor level are required to be braced or otherwise restrained. Additionally, PSE observed multiple instances of suspended contents that were not adequately braced. Mitigation is required to provide proper bracing.

6.1.4.11 Mechanical And Electrical Equipment

Similar to Contents and Furnishing, PSE observed multiple instances of tall narrow equipment and fall-prone equipment without bracing or with missing anchors. Additionally, PSE observed instances of large suspended equipment with inadequate bracing as well as equipment installed in-line with the duct system without independent bracing. Mitigation is required to provide proper bracing.

A Tier 1 evaluation for Position Retention requires that mechanical doors are detailed to operate at a story drift ratio of 0.01. The story drift ratio is the lateral displacement of a story of the building relative to its height, e.g. for a 10-foot (120-inch) story height a 0.01 story drift ratio corresponds a 1.2-inch lateral displacement of the top of the story relative to the bottom of the story. Mechanical doors are located on each end of the apparatus bay, in the tool shop, as well as the sallyport, but no technical information or specifications for these components were provided. As such, PSE was unable to ascertain any information regarding the allowable drift limits of the in-place doors and have assumed them to be noncompliant based on the age of construction. It should be noted that the mechanical doors in the apparatus bay could become damaged and delay the emergency vehicles and firetrucks from exiting the building following a seismic event if they are not drift compatible. As such, PSE recommends that the doors be replaced with modern doors that are drift compatible.

Based on what was visible during the time of the site visit, PSE believes that the emergency generator on the south side of the exterior of the building does not have proper vibration isolators with snubbers and restraints to resist horizontal movement and overturning. Mitigation is recommended to provide conforming vibration isolators.

During our site visit, PSE noted that some of the existing rooftop HVAC equipment appears to be unanchored or inadequately anchored due to the (presumed) removal of original screw connections between the equipment and its supporting curb. Mitigation is necessary to properly secure the rooftop equipment to the structure.

6.1.4.12 Piping

Fluid and gas pipe couplings, support, and bracing were evaluated by R&W Engineering and found to be in compliance with Tier 1 procedures. The R&W Engineering report is included in the appendix.

6.1.4.13 Ducts

Bracing and support of ducts were found to be in general conformance with the Tier 1 checks. Some Tier 1 checks were deemed not applicable.

6.1.4.14 Elevators

Evaluation of elevators for compliance with Tier 1 procedures was performed by Elevator Consulting Services. Per their reporting, the only nonconforming element was for the "Retainer Plate" check. Mitigation is necessary to provide proper retainer plates. The Elevator Consulting Services report is included in the appendix.

6.2 Summary of Tier 1 Deficiencies

The table below summarizes the structural checklist items deemed non-compliant in the Tier 1 evaluation. See later sections for Tier 2 evaluation, results, and conceptual retrofit solutions for items deemed deficient in the Tier 1 evaluation.

6.2.1 Structural Deficiencies

Table 6: Summary of Tier 1 Structural Deficiencies

Check	Checklist	Item	ASCE 41-17 Description	Description of Deficiency
1.	Collapse Prevent – Basic Checklist & Immediate Occupancy – Basic Checklist	Vertical Irregularities	All vertical elements in the seismic-force-resisting system are continuous to the foundation.	There are vertical irregularities in elements of the Lateral Force Resisting System (LFRS). Example: masonry shearwalls supported by steel beams and are therefore not continuous to the foundation. Evaluate per Tier 2 procedures.
2.	Collapse Prevent – Basic Checklist & Immediate Occupancy – Basic Checklist	Geometry	There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories.	The 2nd-story footprint does not align with the 1st-story footprint creating setbacks in building geometry. Evaluate per Tier 2 procedures.
3.	Collapse Prevent – Basic Checklist & Immediate Occupancy – Basic Checklist	Openings at exterior masonry shear walls	Diaphragm openings immediately adjacent to exterior masonry shearwalls are not greater than (8ft-CP, 4ft-IO) long.	Diaphragm openings exist on the north end of the building directly adjacent to an exterior masonry shearwall. Evaluate per Tier 2 procedures.
4.	Immediate Occupancy - RM1 and RM2	Nonconcrete filled diaphragms	Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	There are multiple diaphragms with spans greater than 40 ft or with high aspect ratios. Evaluate per Tier 2 procedures.

6.2.3 Nonstructural Deficiencies

The table below summarizes the nonstructural checklist items deemed non-compliant in the Tier 1 evaluation. See later sections for conceptual retrofits and mitigation measures to address nonconforming items.

Table 7: Summary of Tier 1 Nonstructural Deficiencies

Check	Checklist	Item	ASCE 41-17 Description	Description of Deficiency
1.	Nonstructural - Partitions	Tops	The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	Per Detail (16/A8.3) of original plans, bracing is spaced at 8'-0" o.c.
2.	Nonstructural - Ceilings	Edge Clearance	The free edges of integrated suspended ceilings with continuous areas greater than 144ft^2 (13.4 m^2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	PSE did not observe free edges while on site.
3.	Nonstructural - Ceilings	Edge Support	The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	PSE did not observe free edges while on site.
4.	Nonstructural – Light Fixtures	Lens Covers	Lens covers on light fixtures are attached with safety devices.	PSE noted some lens covers without safety devices
5.	Nonstructural – Contents and Furnishings	Tall Narrow Contents	Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	PSE observed unanchored tall narrow contents during the site visit.
6.	Nonstructural – Contents and Furnishings	Fall-Prone Contents	Equipment, stored items, or other contents weighting more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	PSE observed unbraced/unrestrained fall-prone contents during the site visit.
7.	Nonstructural – Contents and Furnishings	Suspended Contents	Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	PSE observed suspended noncompliant elements during the site visit.
8.	Nonstructural – Mechanical and Electrical Equipment	Fall-Prone Equipment	Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft ((1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	PSE observed unbraced fall-prone equipment during the site visit.
9.	Nonstructural – Mechanical and Electrical Equipment	In-Line Equipment	Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	PSE observed noncompliant elements during the site visit.
10.	Nonstructural – Mechanical and Electrical Equipment	Tall Narrow Equipment	Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the floor slab or adjacent structural walls.	PSE observed unanchored tall narrow contents during the site visit.
11.	Nonstructural – Mechanical and Electrical Equipment	Mechanical Doors	Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	Based on PSE's observations, we do not believe the mechanical doors to be able to accommodate the necessary story drift

Check	Checklist	Item	ASCE 41-17 Description	Description of Deficiency
12.	Nonstructural – Mechanical and Electrical Equipment	Suspended Equipment	Equipment suspended without lateral bracing is free to swing from or move with the structure from which they are suspended without damaging itself or adjoining components.	PSE observed suspended noncompliant elements during the site visit.
13.	Nonstructural – Mechanical and Electrical Equipment	Vibration Isolators	Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	The observed generator did not have vibration isolators.
14.	Nonstructural – Mechanical and Electrical Equipment	Electrical Equipment	Electrical equipment is laterally braced to the structure.	PSE observed noncompliant elements during the site visit.
15.	Nonstructural - Elevators	Retainer Plate	A retainer plate is present at the top and bottom of both car and counterweight.	Elevator specialist did not observe to be present during their evaluation.

6.3 Summary of Tier 1 Unknowns

6.3.1 Structural Unknowns

The table below summarizes the structural checklist items deemed unknown in the Tier 1 evaluation. See later sections for Tier 2 evaluation, results, and conceptual retrofit solutions for items deemed unknown in the Tier 1 evaluation.

Table 8: Summary of Structural Tier 1 Unknowns

Check	Checklist	Item	ASCE 41-17 Description	Description of Unknown
1.	Collapse Prevention – Basic Checklist & Immediate Occupancy Basic Checklist	Torsion	The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimensions.	Due to the complexity of the structure, a more detailed analysis than what is included in a Tier 1 evaluation is required to determine if this check is compliant. See Tier 2 evaluation for findings.
2.	Collapse Prevention – RM1 and RM2 & Immediate Occupancy RM1 and RM2	Shear Stress Check	The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in^2. (0.48 MPa).	Due to the complexity of the structure, a more detailed analysis than what is included in a Tier 1 evaluation is required to determine if this check is compliant. See Tier 2 evaluation for findings.
3.	Collapse Prevention – RM1 and RM2 & Immediate Occupancy RM1 and RM2	Wall Anchorage	Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection forces calculated in the Quick Check procedure of Section 4.4.3.7.	Due to the complexity of the structure, a more detailed analysis than what is included in a Tier 1 evaluation is required to determine if this check is compliant. See Tier 2 evaluation for findings.
4.	Collapse Prevention – RM1 and RM2 & Immediate Occupancy RM1 and RM2	Transfer to shear Walls	Diaphragms are connected for transfer of seismic forces to the shear walls.	Due to the complexity of the structure, a more detailed analysis than what is included in a Tier 1 evaluation is required to determine if this check is compliant. See Tier 2 evaluation for findings.
5.	Immediate Occupancy – RM1 and RM2	Plan Irregularities	There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	Due to the complexity of the structure, a more detailed analysis than what is included in a Tier 1 evaluation is required to determine if this check is compliant. See Tier 2 evaluation for findings.

6.3.2 Nonstructural Unknowns

There are no nonstructural unknowns remaining after completing the Tier 1 evaluation.

7 ASCE 41-17 Tier 2 Deficiency-Based Evaluation

7.1 Scope of Tier 2 Assessment

The scope of the Tier 2 evaluation is limited to the structural and nonstructural items deemed noncompliant and unknown in the Tier 1 evaluation. Items deemed compliant or not applicable in the Tier 1 evaluation need not be evaluated per Tier 2 procedures.

In general, items included in the Tier 2 deficiency-based evaluation are as follows:

- Evaluation of masonry shearwalls for in-plane effects (3D)
- Evaluation of masonry walls for out-of-plane effects
- Evaluation of 2nd floor and roof diaphragms for in-plane effects (3D)
- Evaluation of 2nd floor and roof diaphragm connections to transfer in-plane seismic forces to masonry shearwalls (3D)
- Evaluation of 2nd floor and roof diaphragm connections for resisting out-of-plane seismic forces from masonry shearwalls
- Evaluation of interior light partition walls for out-of-plane effects

Elements which relied on the 3D model for generation of seismic forces are noted above with the "(3D)" marking. Other elements were evaluated against demands prescribed by ASCE 41-17 Tier 2 checks.

7.2 Summary of Tier 2 Compliant Elements

7.2.1 Structural Elements

Masonry walls were evaluated as force-controlled components for out-of-plane effects per Section 7.2.11 of ASCE 41-17. PSE considered (3) special wall cases where specific detailing was provided in the original design to resist atypically high demands (e.g. at a pilaster). PSE also evaluated (3) typical wall cases for 6-inch CMU walls, 8-inch CMU walls, and 12-inch CMU walls. Cases were selected for evaluation based on regions most likely to control due to a combination of the highest loads and/or greatest spans. Per PSE's evaluation (see appendix for detailed calculations), the controlling wall cases were deemed adequate for out-of-plane effects. No out-of-plane masonry wall retrofits are required.

2nd floor and roof diaphragm connections were evaluated as force-controlled components for resisting out-of-plane seismic forces from masonry walls. Demands for out-of-plane effects were prescribed by Section 7.2.11.1 of ASCE 41-17. PSE considered a total of (13) unique connection cases and evaluated the connections most likely to control with the highest demands. Per PSE's evaluation (see appendix for detailed calculations), the controlling diaphragm anchors were deemed adequate for out-of-plane effects. No out-of-plane diaphragm anchorage retrofits are required.

7.2.2 Nonstructural Elements

The only nonstructural elements evaluated under Tier 2 deficiency-based procedures were interior light partition walls for out-of-plane effects. Per the Tier 1 checklists, walls with top bracing spaced greater than 6-feet on center need to be evaluated or retrofitted for demands prescribed per Section 13.4.3 of ASCE 41-17. PSE evaluated the typical light partition wall as detailed in the building drawings (Ref. Detail 16/A8.3) for bracing at 8-feet on center. Based on PSE's evaluation, the walls were deemed to be compliant per Tier 2 procedures and do not require retrofit.

7.3 Summary of Tier 2 Deficiencies

The following structural and nonstructural items were deemed to be noncompliant per the Tier 2 evaluation. See Section 8 for conceptual retrofit designs and mitigation methods.

7.3.1 Structural Deficiencies

Table 9: Summary of Tier 2 Structural Deficiencies

Check	Checklist	Item	ASCE 41-17 Tier 1 Description	Description of Deficiency
1.	Collapse Prevent – RM1 and RM2 & Immediate Occupancy – RM1 and RM2	Shear Stress Check	The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in^2. (0.48 MPa).	Per Tier 2 evaluation, some CMU shear walls are overutilized for in-plane shear and/or in-plane flexure. Retrofits required.
2.	Collapse Prevent – RM1 and RM2 & Immediate Occupancy – RM1 and RM2	Transfer to Shear Walls	Diaphragms are connected for transfer of seismic forces to the shear walls.	Per Tier 2 evaluation, some diaphragm connections are inadequate to transfer the required seismic forces to the shearwalls. Retrofits required.
3.	Immediate Occupancy – RM1 and RM2	Nonconcrete filled diaphragms	Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	Per Tier 2 evaluation, multiple diaphragm regions in the upper roof are inadequate to resist the in-plane seismic forces. Retrofits required

7.3.2 Nonstructural Deficiencies

Table 10: Summary of Tier 2 Nonstructural Deficiencies

Check	Checklist	Item	ASCE 41-17 Tier 1 Description	Description of Deficiency
4.	Nonstructural - Ceilings	Edge Clearance	The free edges of integrated suspended ceilings with continuous areas greater than 144ft^2 (13.4 m^2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	PSE did not observe free edges while on site. Retrofit is required.
5.	Nonstructural - Ceilings	Edge Support	The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	PSE did not observe free edges while on site. Retrofit is required.
6.	Nonstructural – Light Fixtures	Lens Covers	Lens covers on light fixtures are attached with safety devices.	PSE noted some lens covers without safety devices. Retrofit is required.
7.	Nonstructural – Contents and Furnishings	Tall Narrow Contents	Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	PSE observed unanchored tall narrow contents during the site visit. Retrofit is required.
8.	Nonstructural – Contents and Furnishings	Fall-Prone Contents	Equipment, stored items, or other contents weighting more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	PSE observed unbraced/unrestrained fall-prone contents during the site visit. Retrofit is required.

Check	Checklist	Item	ASCE 41-17 Tier 1 Description	Description of Deficiency
9.	Nonstructural – Contents and Furnishings	Suspended Contents	Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	PSE observed suspended noncompliant elements during the site visit. Retrofit is required.
10.	Nonstructural – Mechanical and Electrical Equipment	Fall-Prone Equipment	Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft ((1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	PSE observed unbraced fall-prone equipment during the site visit. Retrofit is required.
11.	Nonstructural – Mechanical and Electrical Equipment	In-Line Equipment	Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	PSE observed noncompliant elements during the site visit. Retrofit is required.
12.	Nonstructural – Mechanical and Electrical Equipment	Tall Narrow Equipment	Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the floor slab or adjacent structural walls.	PSE observed unanchored tall narrow contents during the site visit. Retrofit is required.
13.	Nonstructural – Mechanical and Electrical Equipment	Mechanical Doors	Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	Based on PSE's observations, we do not believe the mechanical doors to be able to accommodate the necessary story drift. Retrofit is required.
14.	Nonstructural – Mechanical and Electrical Equipment	Suspended Equipment	Equipment suspended without lateral bracing is free to swing from or move with the structure from which they are suspended without damaging itself or adjoining components.	PSE observed suspended noncompliant elements during the site visit. Retrofit is required.
15.	Nonstructural – Mechanical and Electrical Equipment	Vibration Isolators	Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	The observed generator did not have vibration isolators. Retrofit is required.
16.	Nonstructural – Mechanical and Electrical Equipment	Electrical Equipment	Electrical equipment is laterally braced to the structure.	PSE observed noncompliant elements during the site visit. Retrofit is required.
17.	Nonstructural - Elevators	Retainer Plate	A retainer plate is present at the top and bottom of both car and counterweight.	Per Elevator Consulting Services, retainer plates are not present. Retrofit is required.

8 ASCE 41-17 Tier 2 Retrofit Design

8.1 Scope of Seismic Retrofit

Preliminary retrofit solutions and mitigation strategies have been developed by PSE to address elements that were deemed deficient in the Tier 2 evaluation in order to bring the expected building seismic performance into conformance with ASCE 41-17 standards as previously outlined in this report. The following sections of this report summarize the scope of preliminary structural and nonstructural retrofit solutions to address all known seismic deficiencies.

See the appendix of this report for preliminary structural and nonstructural retrofit markups and details.

8.1.1 Structural Elements

Table 11: Scope of Structural Seismic Retrofits

Check	Checklist	Item	Retrofit Mark	Markup	Detail Ref.	Retrofit Solution Description	Length (ft)	Area (ft^2)
1.	Collapse Prevent – RM1 and RM2 & Immediate Occupancy – RM1 and RM2	Shear Stress Check	1A	🟩	1A/SR2	Remove existing finishes to access interior and/or exterior face(s) of (E) wall. Prepare wall surface per manufacturer instructions. Install FRP or FRCM composite strengthening systems per manufacturer installation instructions. Restore wall finishes in kind. Use Simpson or equivalent composite strengthening systems for retrofit.	N/A	1000*
			1B	🟦	1B/SR2		N/A	500*
2.	Collapse Prevent – RM1 and RM2 & Immediate Occupancy – RM1 and RM2	Transfer to Shear Walls	2A	🟥	2A/SR2	Weld (N) L2.5x1.5x0.25 to (E) 4" TS blocking between trusses. Weld (N) 0.375"x8"x8" plate to (N) Angle. Install (N) 1/2" mechanical anchors to (N) plate at approx. 16" o.c. into grouted CMU cells beyond.	32.5	N/A
			2B	🟥	2B/SR2	Install (N) 1/2" mechanical anchors to (E) angle between (E) flute openings at approx. 16" o.c.	85.84	N/A
			2C	🟥	2C/SR2	Install (N) C10x15.3 welded/screwed to (E) decking between (E) trusses. Connect (N) channel to (E) CMU grouted blocking with 1/2" mechanical anchors at approx. 16" o.c.	16	N/A
			2D	🟥	2D/SR2	Weld (N) L3.5x2.5"x0.25 to (E) 2.5" TS blocking between trusses. Weld (N) 0.375"x8"x8" plate to (N) Angle. Install (N) 1/2" mechanical anchors to (N) plate at approx. 16" o.c. into grouted CMU cells beyond.	60.33	N/A

Check	Checklist	Item	Retrofit Mark	Markup	Detail Ref.	Retrofit Solution Description	Length (ft)	Area (ft^2)
			2E	▬	2E/SR2	Install (N) 1/2" mechanical anchors to (E) angle between (E) flute openings at approx. 16" o.c.	135	N/A
3.	Immediate Occupancy – RM1 and RM2	Nonconcrete filled diaphragms	3	▨	N/A	Remove existing roofing to expose top of metal decking. Provide additional welding at panel sidelaps (approx. 12" o.c.) to improve diaphragm in-plane shear strength. Replace/repair roof following installation of upgrade.	N/A	2500

*Wall regions identified in the markups are representative of the minimum amount of upgrades anticipated. Retrofit wall areas tabulated above are conservative estimates of retrofitted wall regions based on practical considerations.

8.1.2 Nonstructural Elements

Table 12: Scope of Nonstructural Seismic Retrofits

Check	Checklist	Item	Retrofit Mark	Detail Ref.	Retrofit Solution Description	No. of Occurrences
4.	Nonstructural - Ceilings	Edge Clearance	4	1/SR3	Trim edges at two nonparallel sides and support with approved angle.	Approximately 2,500 linear ft
5.	Nonstructural - Ceilings	Edge Support	5	1/SR3	Trim edges at two nonparallel sides and support with approved angle.	Approximately 2,500 linear ft
6.	Nonstructural – Light Fixtures	Lens Covers	6	N/A	Add safety devices to lights with lens covers.	Approx. up to 50
7.	Nonstructural – Contents and Furnishings	Tall Narrow Contents	7	2/SR3	Anchor/restrain tall narrow contents to prevent overturning	Approx. 25
8.	Nonstructural – Contents and Furnishings	Fall-Prone Contents	8	2/SR3	Anchor/restrain contents to prevent overturning	Approx. 10
9.	Nonstructural – Contents and Furnishings	Suspended Contents	9	N/A	Provide minimum 4 clips to restrain movement of large hanging trampoline.	1 (Trampoline)
10.	Nonstructural – Mechanical and Electrical Equipment	Fall-Prone Equipment	10	2/SR3	Confirm mechanical and/or electrical equipment is anchored. If not, provide anchorage or lateral restraint.	Approx. 5
11.	Nonstructural – Mechanical and Electrical Equipment	In-Line Equipment	11	3/SR3	Provide independent lateral bracing using Unistrut or equivalent system for HVAC equipment in-line with duct of piping system without lateral bracing.	Approx. up to 20
12.	Nonstructural – Mechanical and Electrical Equipment	Tall Narrow Equipment	12	2/SR3	Provide anchorage to slab below for tall unanchored electrical racks.	Approx. 10
13.	Nonstructural – Mechanical	Mechanical Doors	13	N/A	Replace the existing mechanical doors with drift-compatible doors.	6

Check	Checklist	Item	Retrofit Mark	Detail Ref.	Retrofit Solution Description	No. of Occurrences
	and Electrical Equipment					
14.	Nonstructural – Mechanical and Electrical Equipment	Suspended Equipment		4/SR3	Provide lateral bracing using unistrut or equivalent system for suspended equipment without bracing.	Approx. 5
15.	Nonstructural – Mechanical and Electrical Equipment	Vibration Isolators		N/A	Confirm if existing generator anchorage has snubbers. Replace generator anchorage with equivalent or better vibration isolated anchors with snubbers if not.	1
16.	Nonstructural – Mechanical and Electrical Equipment	Electrical Equipment		N/A	Provide anchorage and/or lateral bracing for currently unanchored/braced equipment. Generally applicable to RTUs and other large MEP equipment that is currently unbraced.	Approx. 5
17.	Nonstructural - Elevators	Retainer Plate		N/A	Install retainer plates per elevator modernization report.	1

8.2 Summary Construction Cost Estimate

Jimale Technical Services, LLC (JTS) was consulted to provide a construction cost estimate (hard and soft construction costs) to implement the preliminary retrofit solutions outlined in this report. PSE generated cost estimates for architecture and engineering fees to complete the 100% retrofit design and specifications, construction administration costs, and additional contingency costs to account for unforeseen changes during construction and time escalation.

The total project retrofit cost is estimated to be $1,233,817.

Summarized in the following sections are the project direct costs and indirect soft costs. See the appendix for the itemized cost estimate reporting.

8.2.1 Direct Cost

Project construction direct costs as generated by JTS are estimated to be $665,427.

8.2.2 Indirect Soft Cost

The following indirect project costs were generated by JTS and PSE.

- Engineering fees for 100% retrofit design and specifications (estimated by PSE): $95,000
- Construction administration/management (estimated by PSE): $120,000
- Construction soft costs (estimated by JTS): $202,633
- 10% construction contingency (estimated by JTS): $75,379
- Additional 10% construction contingency (estimated by PSE): $75,379

The total project indirect soft costs are estimated to be: $568,390.

8.2.3 Certification of Cost Estimate

Peterson Structural Engineers certifies that the preliminary retrofit solutions outlined in the retrofit scope of work of this report address all known structural and nonstructural seismic deficiencies for the Milwaukie Public Safety Building based on ASCE 41-17 Tier 1 and Tier 2 evaluation standards and performance objective levels outlined herein.

Peterson Structural Engineers has reviewed the cost estimates generated by Jimale Technical Services (JTS) to satisfy grant application requirements. The construction cost information provided by JTS was generated based on review of preliminary structural and nonstructural seismic retrofit solutions for the Milwaukie Public Safety Building generated as part of this report and application. The JTS estimate is inclusive of hard and soft construction costs for retrofits and upgrades as outlined in the retrofit scope of work. The cost estimate is based on standard accepted estimating practices with contingencies as noted based on current market conditions. Final project costs are subject to future market conditions and final design and bidding.

9 Conclusion

The information contained within this report is intended to support the City of Milwaukie Public Works Department application for the Business Oregon Seismic Rehabilitation Grant Program. Peterson Structural Engineers has completed a detailed Tier 1 and Tier 2 seismic analysis per ASCE 41-17 procedures, including a response spectrum analysis in finite element structural modeling software to evaluate the structural performance of the building. Geotechnical hazards were reviewed by a geotechnical subconsultant and the site was determined to be not prone to surface fault rupture or liquefaction. Engineering analysis for select non-structural seismic elements was provided by a mechanical engineering sub-consultant and elevator specialist.

Following the results of the analysis, preliminary seismic retrofit details were developed for elements that require retrofit per the Tier 1 and Tier 2 analysis outcomes for both structural and non-structural components. The proposed details were reviewed by a cost estimating consultant and PSE has verified the estimate is inclusive of the identified proposed upgrades and retrofits and soft construction costs.

Based on our evaluation of the subject building, and considering the important services the subject building provides to the local community, PSE believes the proposed retrofits are cost effective solutions to address known structural and nonstructural deficiencies to improve seismic performance.

10 Appendices

10.1 Appendix A: Definitions

- **BPOE** – Basic Performance Objective for Existing Buildings
- **BSE-1E** – Basic Safety Earthquake-1 for use with the Basic Performance Objective for Existing Buildings, taken as a seismic hazard with a 20% probability of exceedance in 50-years, but not greater than the BSE-2N, at a site.
- **BSE-2E** – Basic Safety Earthquake -2 for use with the Basic Performance Objective for Existing Buildings, taken as a seismic hazard with a 5% probability of exceedance in 50 years, but not greater than the BSE-2N, at a site.
- **Building Performance Level** – A limiting damage state for a building, considering structural and non-structural components, used in the definition of Performance Objectives.
- **Building Type** – A building classification defined in Section 3.2.1 (Table 3-1) that groups buildings with common seismic force resisting systems and performance characteristics in past earthquakes.
- **Hazards Reduced** – The postearthquake damage state in which nonstructural components are damaged and could potentially create falling hazards, but high-hazard nonstructural components identified in Chapter 13, Table 13-1, are secured to prevent falling into areas of public assembly or those falling hazards from those components could pose a risk to life safety for many people.
- **Immediate Occupancy** – The postearthquake damage state in which a structure remains safe to occupy and essentially retains its prearthquake strength and stiffness.
- **Level of Seismicity** – A degree of expected seismic hazard. For this standard, levels are categorized as very low, low, moderate, or high, based on mapped acceleration values and site amplification factors, as defined in ASCE41 section 2.5 (Table 2.5)
- **Life Safety** – The postearthquake damage state in which a building has damaged components but retains a margin against the onset of partial or total collapse; structure remains stable and has significant reserve capacity; hazardous non-structural damage is controlled.
- **Performance Objective** – One or more pairings of a selected Seismic Hazard Level with both an acceptable or desired Structural Performance Level and an acceptable or desired Nonstructural Performance Level.
- **Position Retention –** The postearthquake damage state in which nonstructural components might be damaged to the extent that they cannot immediately function but are secured in place so that damage caused by falling, toppling, or breaking of utility connections is avoided. Building access and Life Safety systems, including doors, stairways, elevators, emergency lighting, fire alarms, and fire suppression systems, generally remain available and operable, provided that power and utility services are available.
- **Site Class** – A classification assigned to a site based on the types of soils present and their engineering properties, as defined in Section 2.4.1.6.1.
- **Structural Performance Level** – A limiting structural damage state, used in the definition of Performance Levels.

10.2 Appendix B: Select Building Photographs

Figure 7: Milwaukie Public Safety Building Exterior

Figure 8: Milwaukie Public Safety Building Exterior

Figure 9: Milwaukie Public Safety Building Exterior

Figure 10: Milwaukie Public Safety Building Exterior

Figure 11: Milwaukie Public Safety Building Exterior

Figure 12: Example of Ceiling Without Free Edge Clearance

Figure 13: Example of Light Fixture Without Lens Cover Safety Devices

Figure 14: Example of Tall Narrow Contents

Figure 15: Example of Fall Prone Contents

Figure 16: Example of Suspended Contents Without Bracing

Figure 17: Example of Fall-Prone Equipment

Figure 18: Example of In-Line Equipment without Independent Bracing

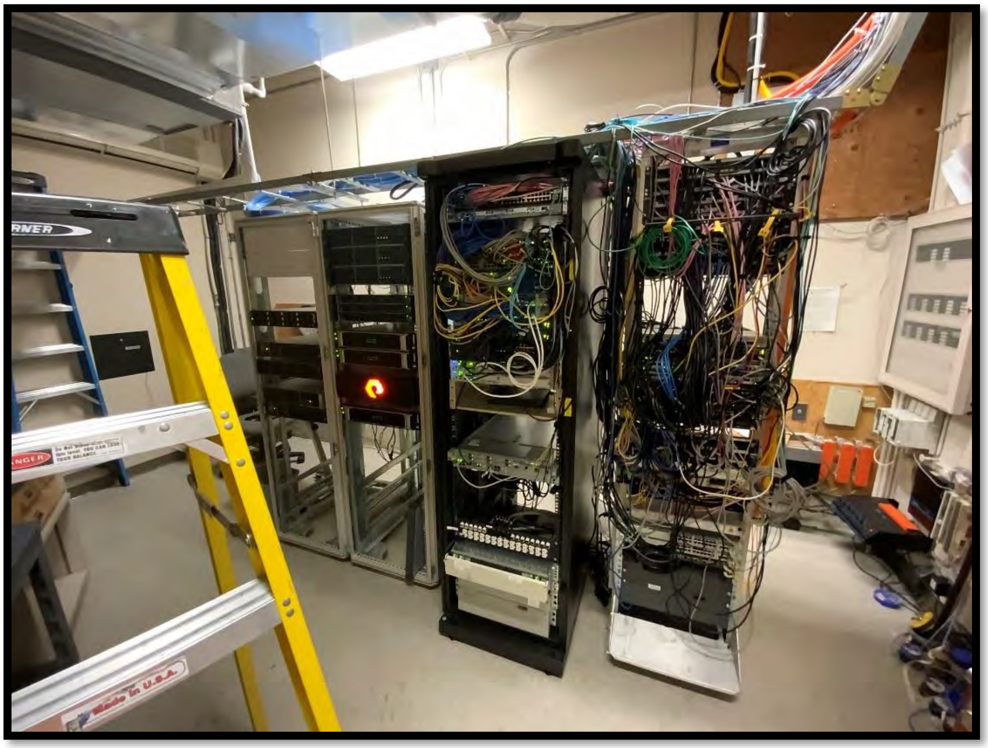


Figure 19: Example of Tallow Narrow Equipment

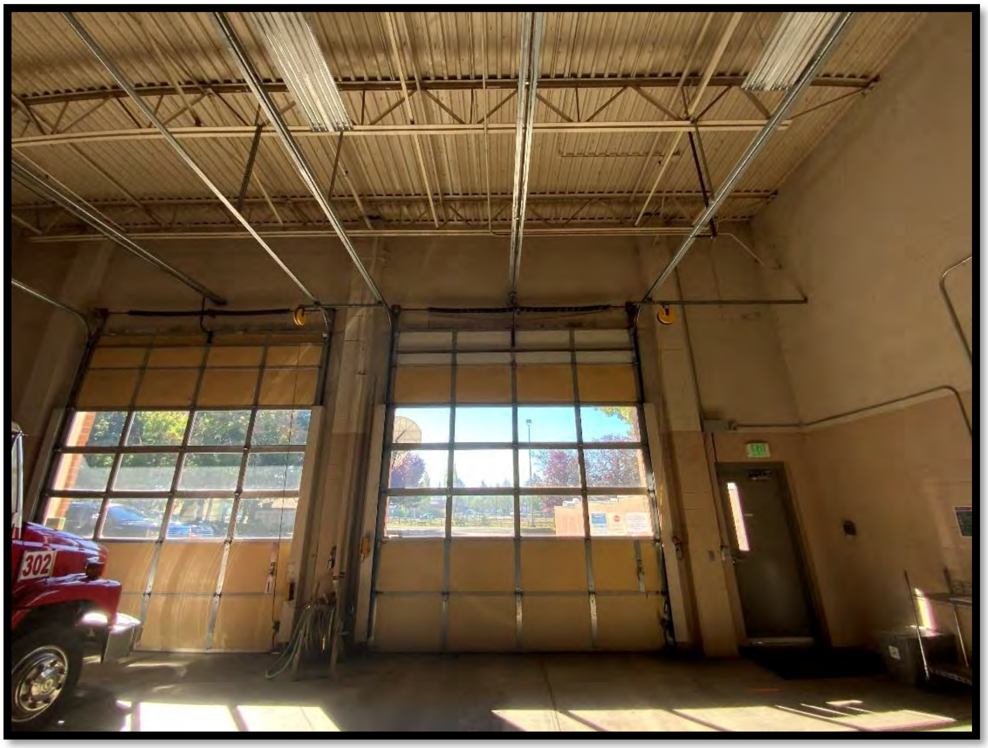


Figure 20: Example of Mechanical Doors

Figure 21: Example of Suspended Equipment without Sway Bracing

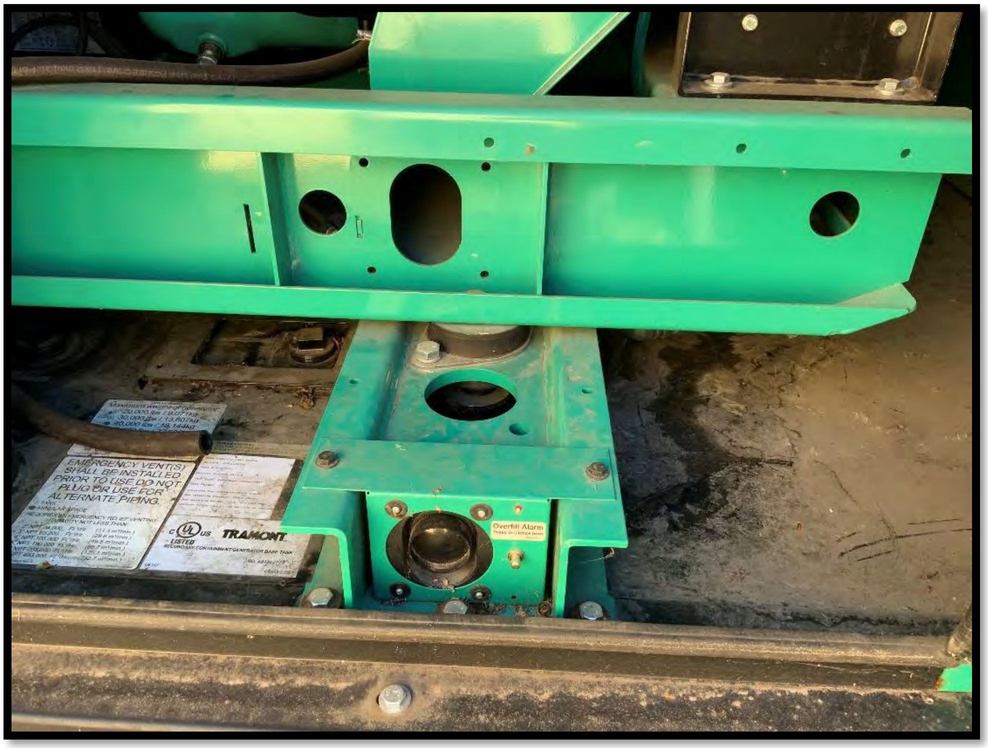


Figure 22: Example of Equipment Mounted on Vibration Isolators without Visible Snubbers

Figure 23: Example of Unraced/Unanchored Electrical Equipment

Figure 24: Example of Rooftop HVAC Equipment Missing Anchors

Figure 25: Example of Roof Top HVAC Equipment with Missing Anchorage to Curb

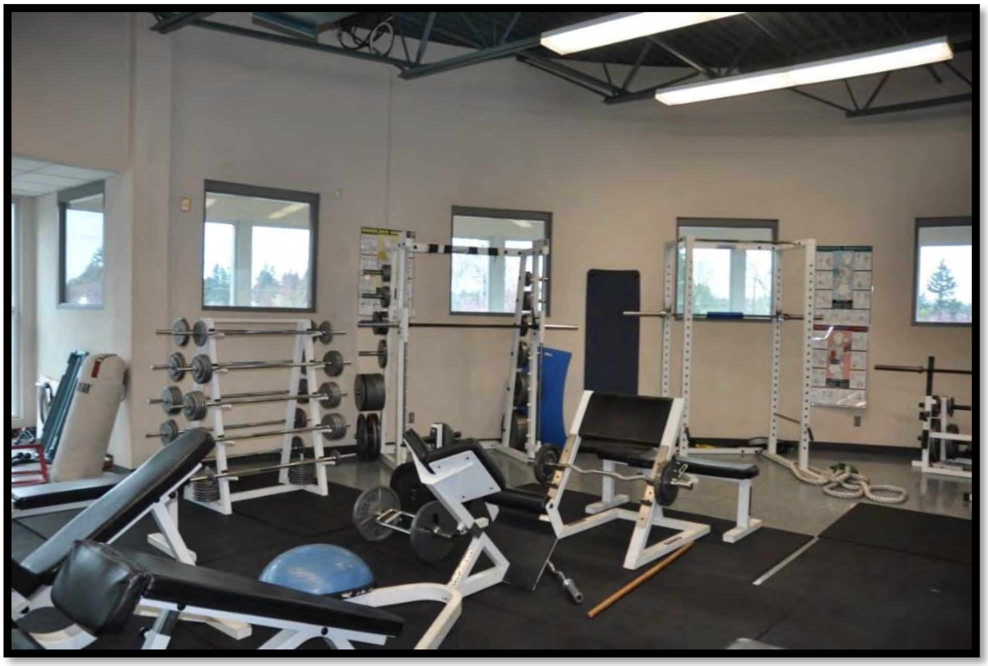


Figure 26: Example of Fall Prone Contents

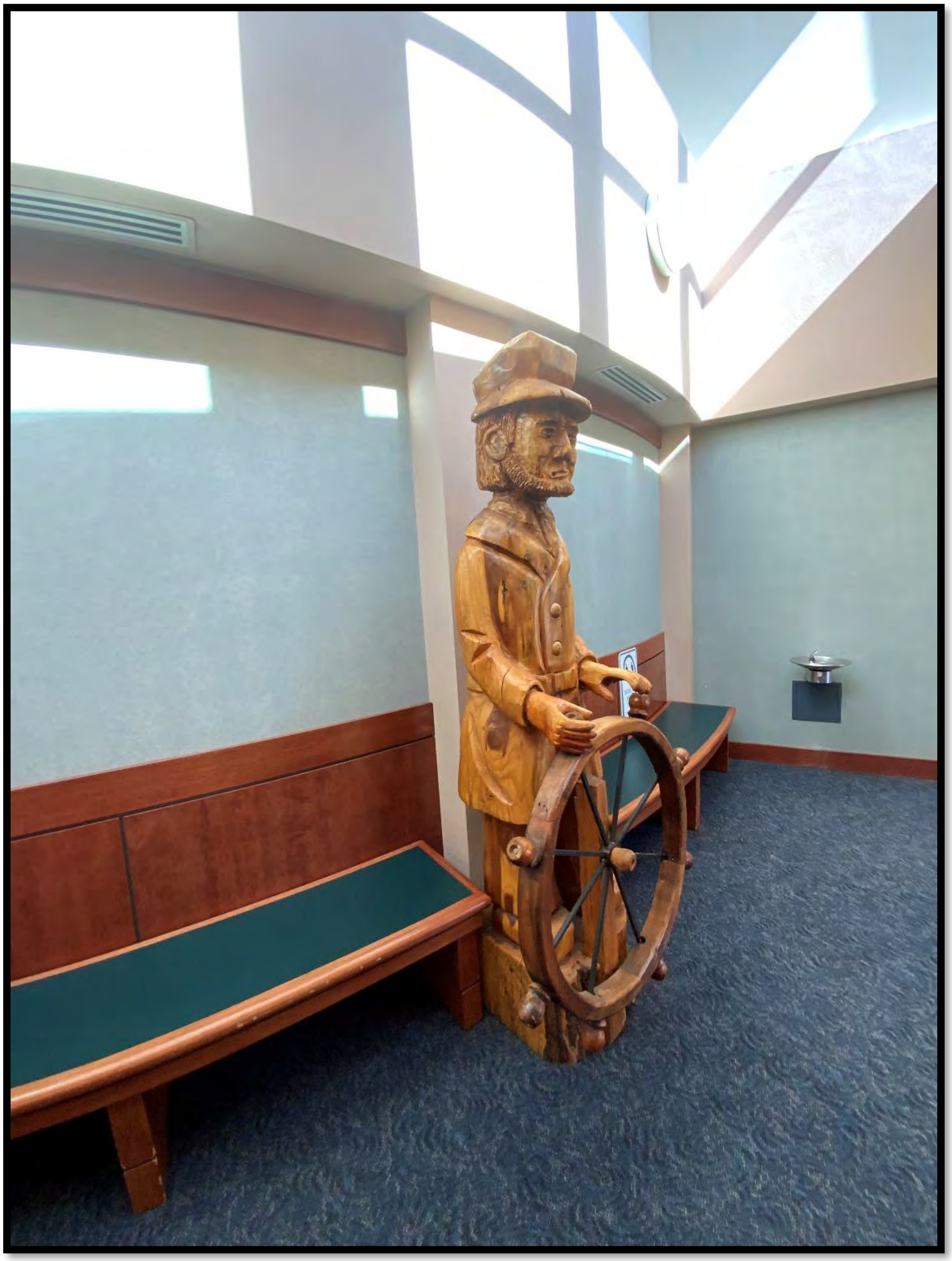


Figure 27: Example of Tall Narrow Contents

10.3 Appendix C: USGS Design Maps Summary Report

1/26/22, 2:23 PM ATC Hazards by Location

Hazards by Location

Search Information

Coordinates:	45.446158, -122.6286449
Elevation:	105 ft
Timestamp:	2022-01-26T21:06:26.028Z
Hazard Type:	Seismic
Reference Document:	ASCE41-17
Site Class:	C
Custom Probability:	

Horizontal Response Spectrum - Hazard Level BSE-2N

Hazard Level BSE-2N

Name	Value	Description
SsUH	0.999	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR_S	0.887	Coefficient of risk (0.2s)
SsRT	0.886	Probabilistic risk-targeted ground motion (0.2s)
SsD	1.5	Factored deterministic acceleration value (0.2s)
S_S	0.886	MCE_R ground motion (period=0.2s)
F_a	1.2	Site amplification factor at 0.2s
S_{XS}	1.063	Site modified spectral response (0.2s)
S1UH	0.449	Factored uniform-hazard spectral acceleration (2% probability of exceedance in 50 years)
CR_1	0.869	Coefficient of risk (1.0s)
S1RT	0.39	Probabilistic risk-targeted ground motion (1.0s)
S1D	0.6	Factored deterministic acceleration value (1.0s)
S_1	0.39	MCE_R ground motion (period=1.0s)
F_v	1.5	Site amplification factor at 1.0s
S_{X1}	0.585	Site modified spectral response (1.0s)

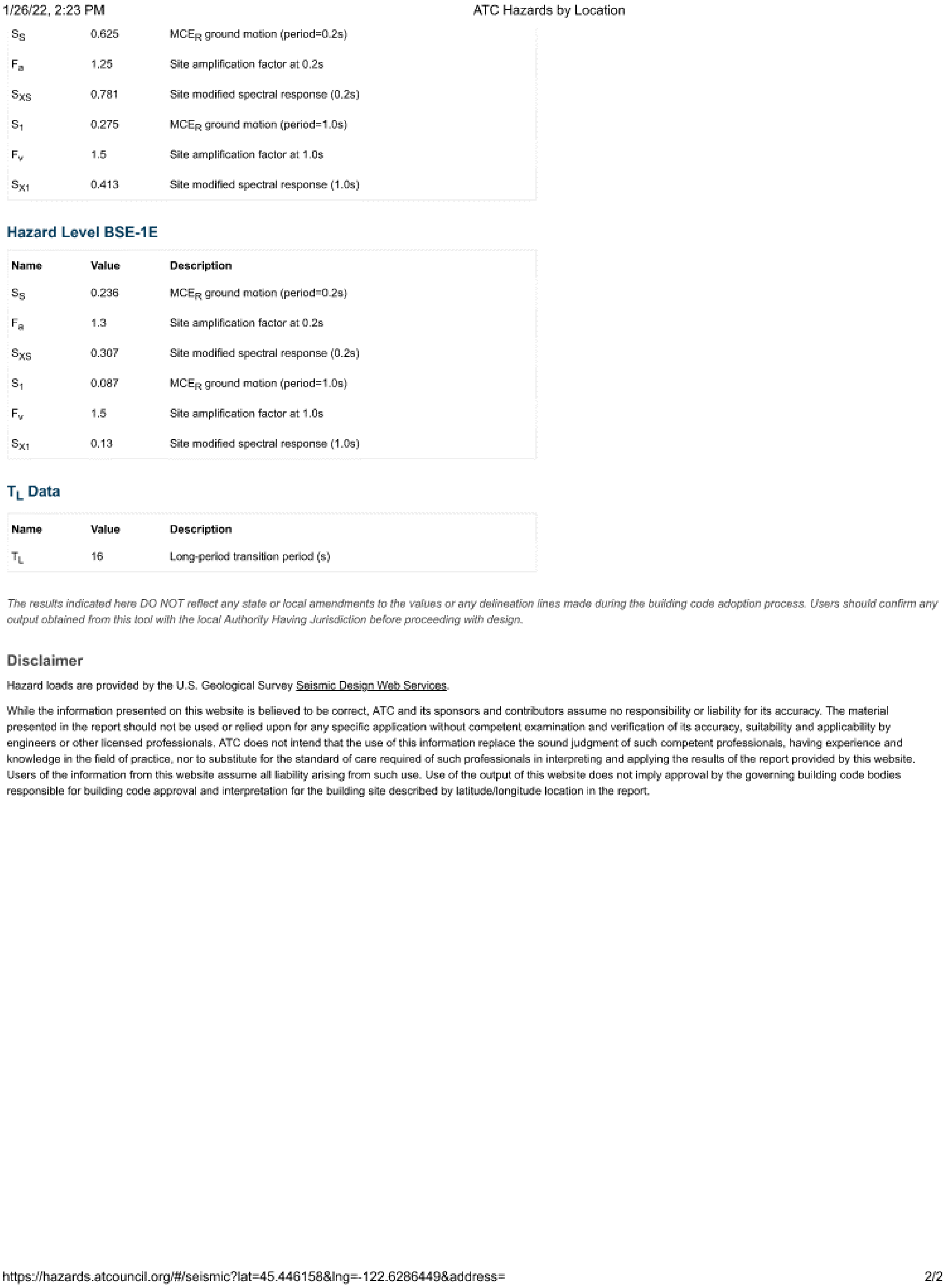
Hazard Level BSE-1N

Name	Value	Description
S_{XS}	0.708	Site modified spectral response (0.2s)
S_{X1}	0.39	Site modified spectral response (1.0s)

Hazard Level BSE-2E

Name	Value	Description

https://hazards.atcouncil.org/#/seismic?lat=45.446158&lng=-122.6286449&address= 1/2



S_S	0.625	MCE_R ground motion (period=0.2s)
F_a	1.25	Site amplification factor at 0.2s
S_{XS}	0.781	Site modified spectral response (0.2s)
S_1	0.275	MCE_R ground motion (period=1.0s)
F_v	1.5	Site amplification factor at 1.0s
S_{X1}	0.413	Site modified spectral response (1.0s)

Hazard Level BSE-1E

Name	Value	Description
S_S	0.236	MCE_R ground motion (period=0.2s)
F_a	1.3	Site amplification factor at 0.2s
S_{XS}	0.307	Site modified spectral response (0.2s)
S_1	0.087	MCE_R ground motion (period=1.0s)
F_v	1.5	Site amplification factor at 1.0s
S_{X1}	0.13	Site modified spectral response (1.0s)

T_L Data

Name	Value	Description
T_L	16	Long-period transition period (s)

The results indicated here DO NOT reflect any state or local amendments to the values or any delineation lines made during the building code adoption process. Users should confirm any output obtained from this tool with the local Authority Having Jurisdiction before proceeding with design.

Disclaimer

Hazard loads are provided by the U.S. Geological Survey Seismic Design Web Services.

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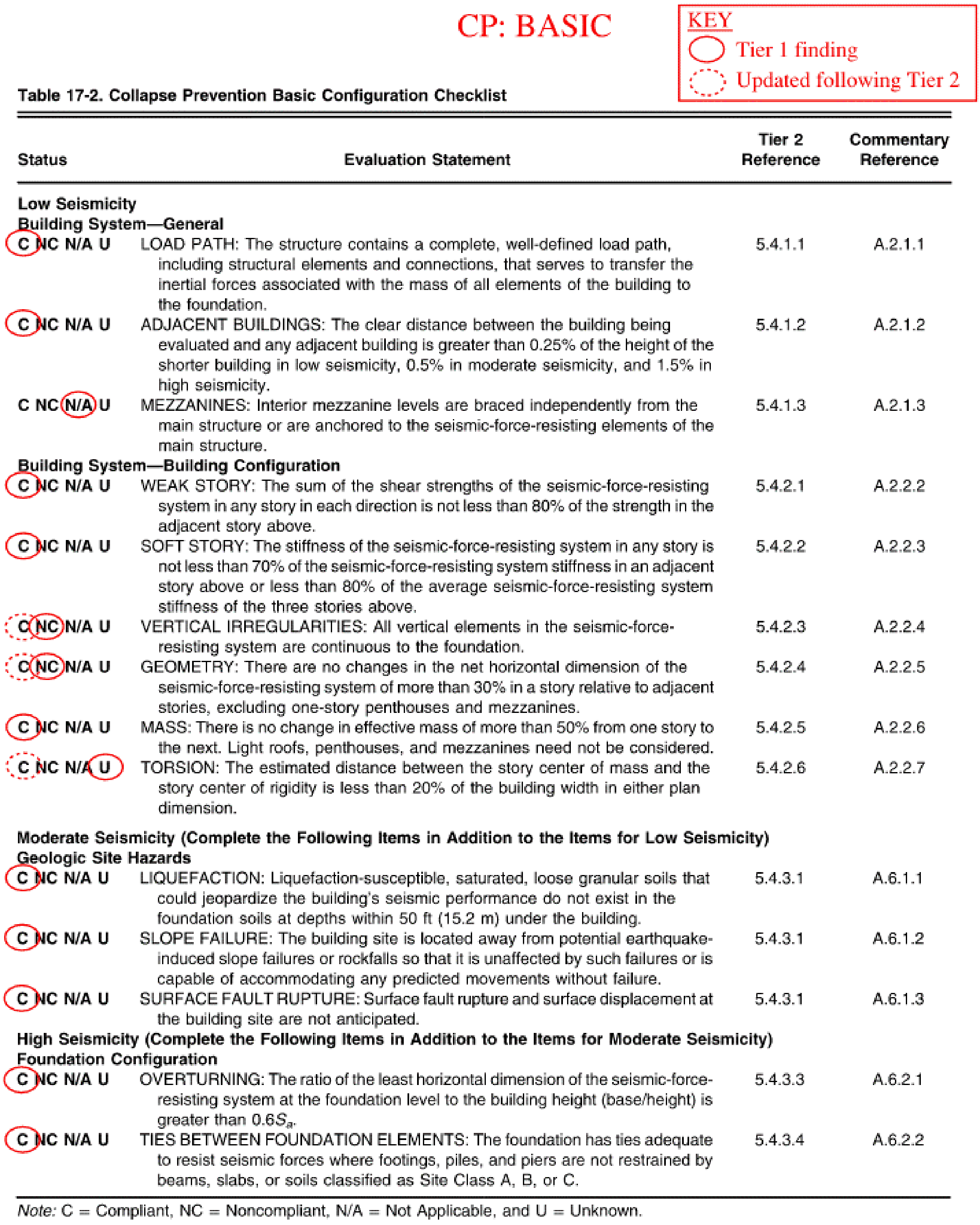
10.4 Appendix D: ASCE 41-17 Tier 1 Checklists

10.4.1 Basic Configuration Checklists



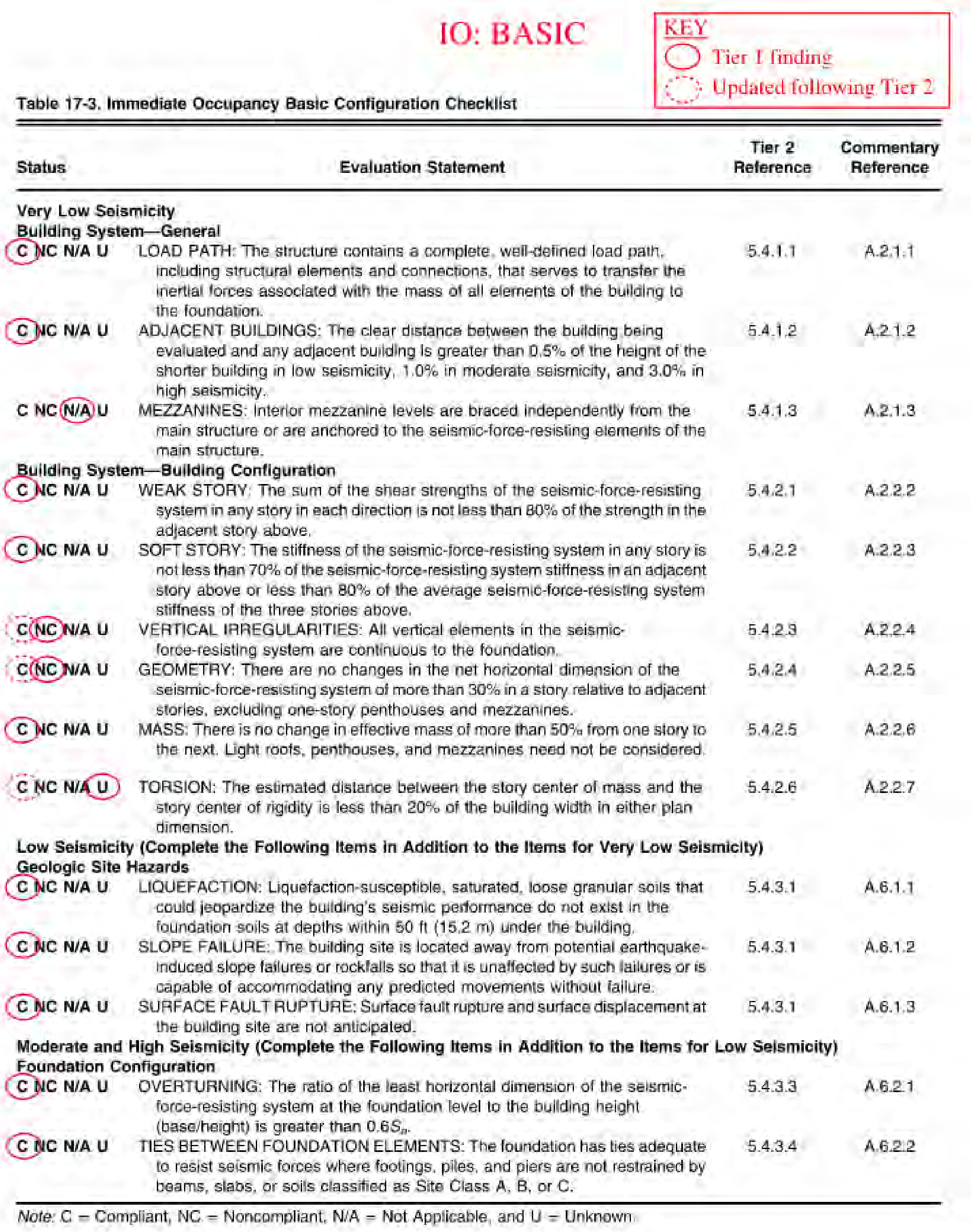
CP: BASIC

KEY
◯ Tier 1 finding
◌ Updated following Tier 2

Table 17-2. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low Seismicity			
Building System—General			
[✓ C] NC N/A U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1
[✓ C] NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% in high seismicity.	5.4.1.2	A.2.1.2
C NC [✓ N/A] U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3
Building System—Building Configuration			
[✓ C] NC N/A U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	5.4.2.1	A.2.2.2
[✓ C] NC N/A U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	5.4.2.2	A.2.2.3
[◌ C] [✓ NC] N/A U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4
[◌ C] [✓ NC] N/A U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
[✓ C] NC N/A U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6
[◌ C] NC N/A [✓ U]	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7
Moderate Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)			
Geologic Site Hazards			
[✓ C] NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
[✓ C] NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
[✓ C] NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
High Seismicity (Complete the Following Items in Addition to the Items for Moderate Seismicity)			
Foundation Configuration			
[✓ C] NC N/A U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$.	5.4.3.3	A.6.2.1
[✓ C] NC N/A U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.



IO: BASIC

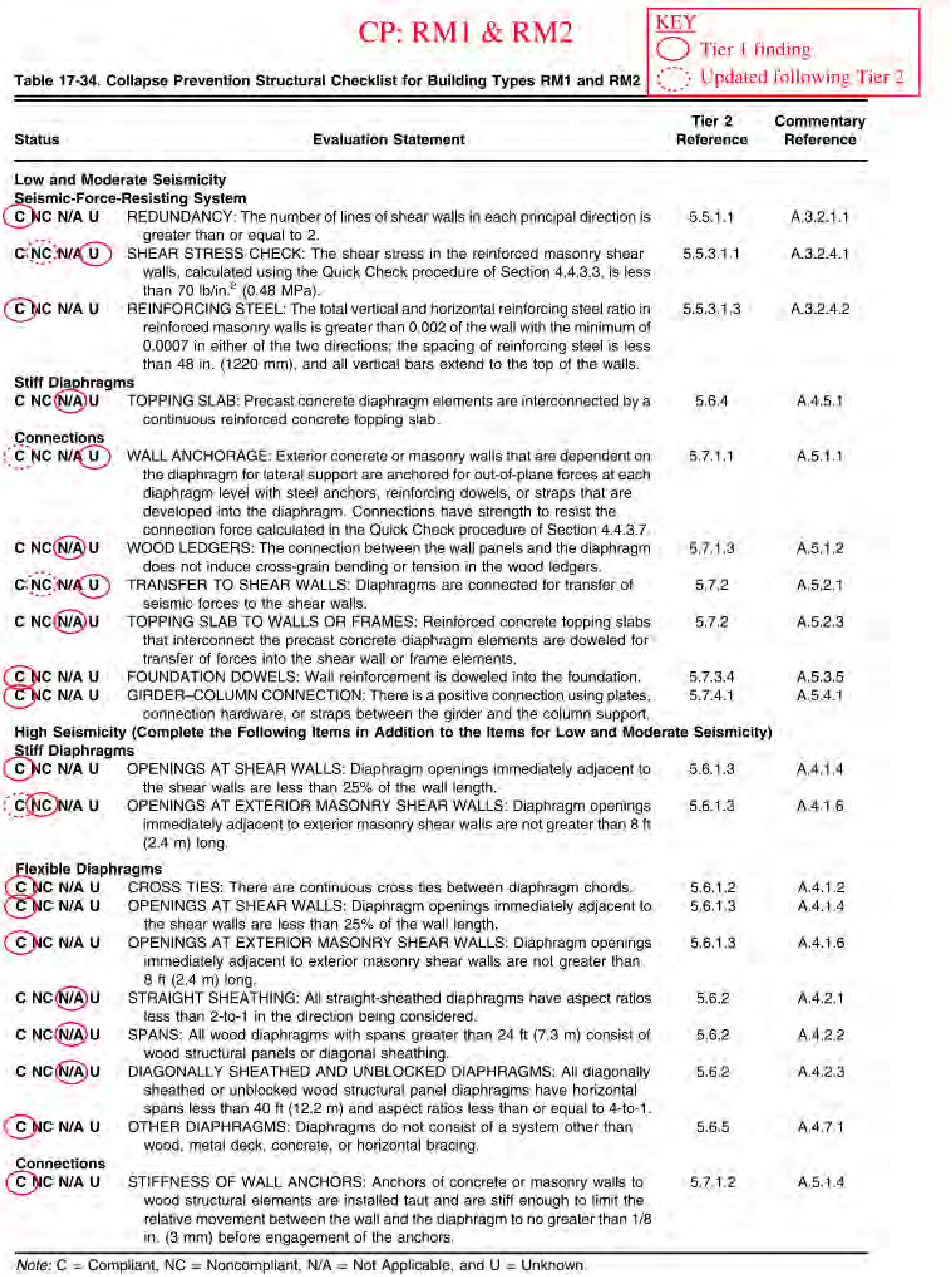
KEY
○ Tier 1 finding
◌ Updated following Tier 2

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Very Low Seismicity			
Building System—General			
[✓ C] NC N/A U	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1
[✓ C] NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	5.4.1.2	A.2.1.2
C NC [✓ N/A] U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3
Building System—Building Configuration			
[✓ C] NC N/A U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	5.4.2.1	A.2.2.2
[✓ C] NC N/A U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	5.4.2.2	A.2.2.3
[✓ C] [✓ NC] N/A U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4
[✓ C] [✓ NC] N/A U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
[✓ C] NC N/A U	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6
[✓ C] NC N/A [✓ U]	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7
Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)			
Geologic Site Hazards			
[✓ C] NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
[✓ C] NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
[✓ C] NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)			
Foundation Configuration			
[✓ C] NC N/A U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$.	5.4.3.3	A.6.2.1
[✓ C] NC N/A U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

10.4.2 Building System Structural Checklists



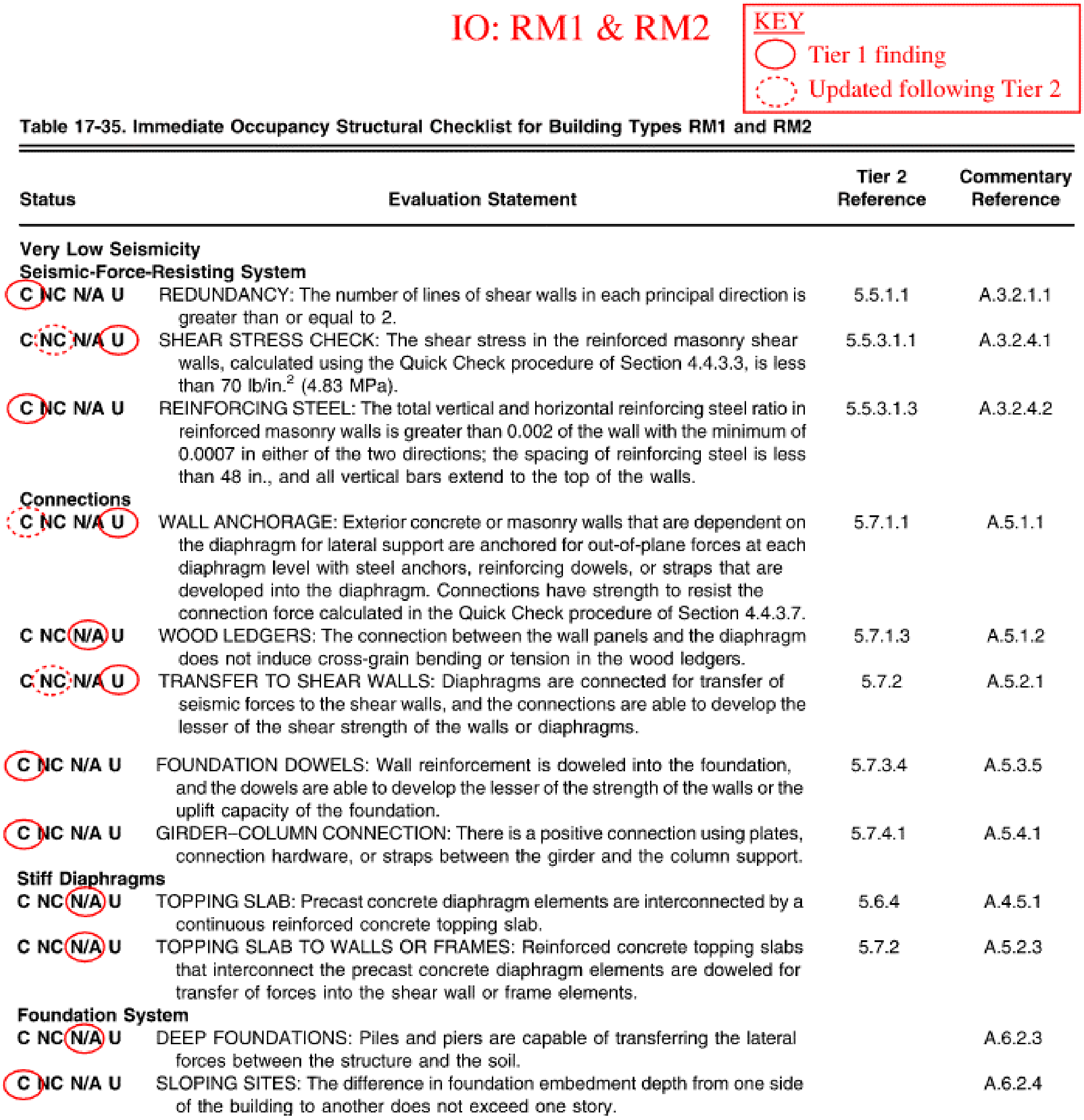
CP: RM1 & RM2

KEY
○ Tier 1 finding
◌ Updated following Tier 2

Table 17-34. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate Seismicity			
Seismic-Force-Resisting System			
[✓ C] NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
[✓ C] NC N/A [✓ U]	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in.^{2} (0.48 MPa).	5.5.3.1.1	A.3.2.4.1
[✓ C] NC N/A U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in. (1220 mm), and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2
Stiff Diaphragms			
C NC [✓ N/A] U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1
Connections			
[✓ C] NC N/A [✓ U]	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1
C NC [✓ N/A] U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
[✓ C] NC N/A [✓ U]	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	5.7.2	A.5.2.1
C NC [✓ N/A] U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
[✓ C] NC N/A U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation.	5.7.3.4	A.5.3.5
[✓ C] NC N/A U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Stiff Diaphragms			
[✓ C] NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
[✓ C] [✓ NC] N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
Flexible Diaphragms			
[✓ C] NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
[✓ C] NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
[✓ C] NC N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
C NC [✓ N/A] U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered.	5.6.2	A.4.2.1
C NC [✓ N/A] U	SPANS: All wood diaphragms with spans greater than 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
C NC [✓ N/A] U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
[✓ C] NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections			
[✓ C] NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors.	5.7.1.2	A.5.1.4

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

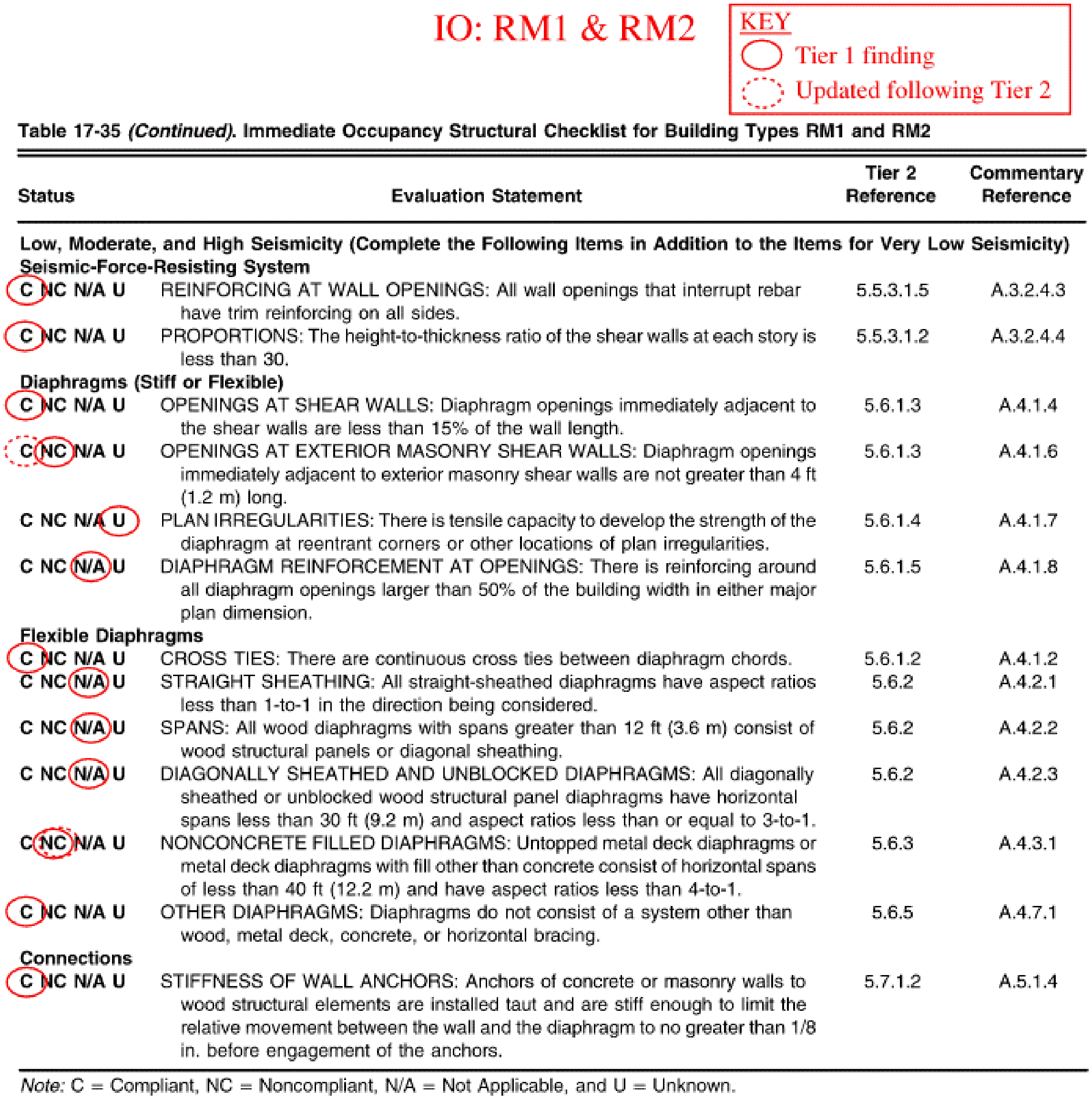


IO: RM1 & RM2

KEY
○ Tier 1 finding
◌ Updated following Tier 2

Table 17-35. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Very Low Seismicity			
Seismic-Force-Resisting System			
[✓ C] NC N/A U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1
C [✓ NC] N/A [✓ U]	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in.^{2} (4.83 MPa).	5.5.3.1.1	A.3.2.4.1
[✓ C] NC N/A U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2
Connections			
[✓ C] NC N/A [✓ U]	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1
C NC [✓ N/A] U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
C [✓ NC] N/A [✓ U]	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1
[✓ C] NC N/A U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation.	5.7.3.4	A.5.3.5
[✓ C] NC N/A U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1
Stiff Diaphragms			
C NC [✓ N/A] U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1
C NC [✓ N/A] U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
Foundation System			
C NC [✓ N/A] U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3
[✓ C] NC N/A U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.		A.6.2.4



IO: RM1 & RM2

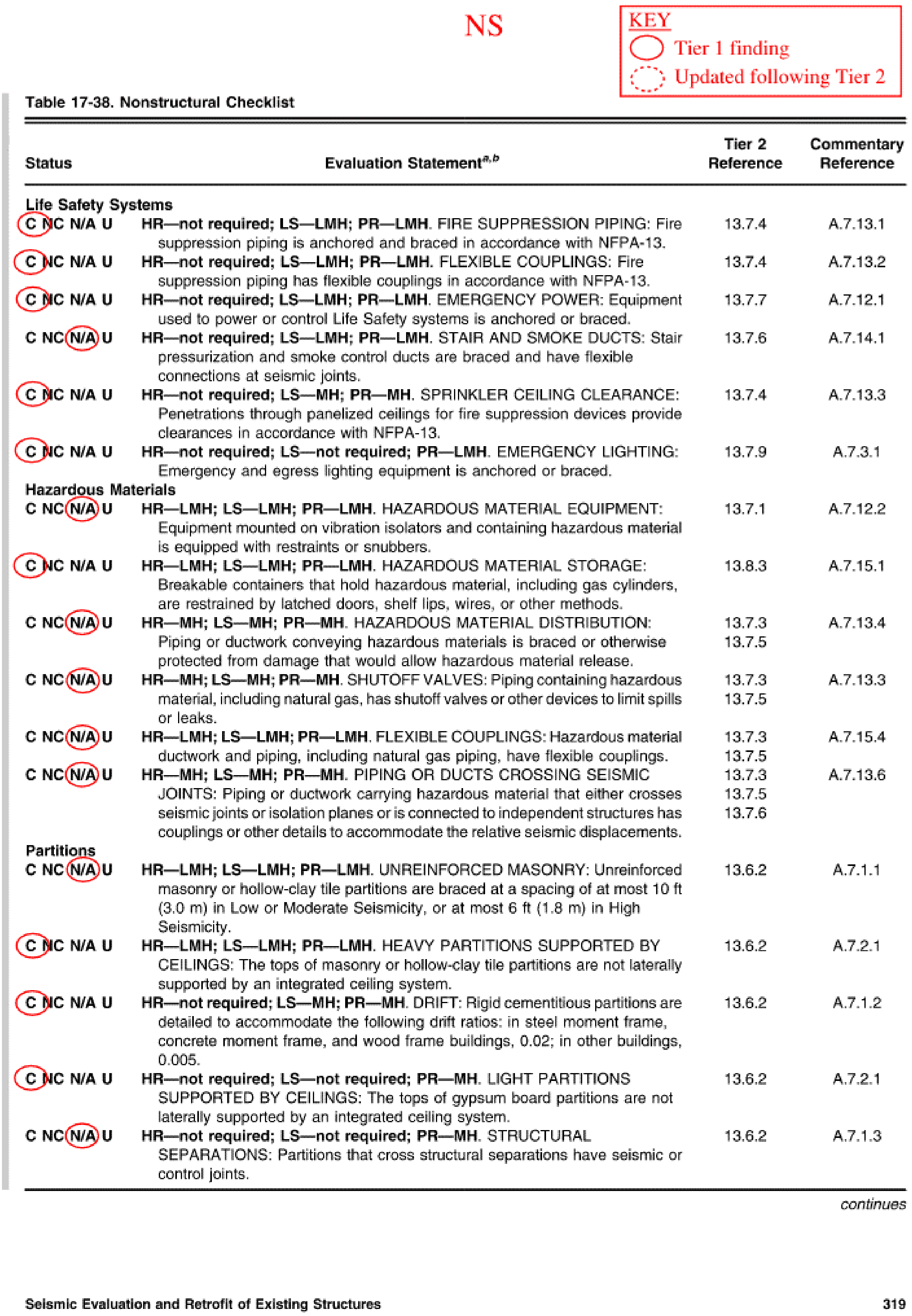
KEY
○ Tier 1 finding
◌ Updated following Tier 2

Table 17-35 *(Continued)*. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)			
Seismic-Force-Resisting System			
[✓ C] NC N/A U	REINFORCING AT WALL OPENINGS: All wall openings that interrupt rebar have trim reinforcing on all sides.	5.5.3.1.5	A.3.2.4.3
[✓ C] NC N/A U	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30.	5.5.3.1.2	A.3.2.4.4
Diaphragms (Stiff or Flexible)			
[✓ C] NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length.	5.6.1.3	A.4.1.4
[✓ C] [✓ NC] N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 4 ft (1.2 m) long.	5.6.1.3	A.4.1.6
C NC N/A [✓ U]	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	5.6.1.4	A.4.1.7
C NC [✓ N/A] U	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	5.6.1.5	A.4.1.8
Flexible Diaphragms			
[✓ C] NC N/A U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
C NC [✓ N/A] U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	5.6.2	A.4.2.1
C NC [✓ N/A] U	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2
C NC [✓ N/A] U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3
C [✓ NC] N/A U	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	5.6.3	A.4.3.1
[✓ C] NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections			
[✓ C] NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. before engagement of the anchors.	5.7.1.2	A.5.1.4

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

10.4.3 Nonstructural Checklists



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KEY
◯ Tier 1 finding
◌ Updated following Tier 2

Table 17-38. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
Life Safety Systems			
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13.	13.7.4	A.7.13.1
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13.	13.7.4	A.7.13.2
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** EMERGENCY POWER: Equipment used to power or control Life Safety systems is anchored or braced.	13.7.7	A.7.12.1
C NC [✓ N/A] U	**HR—not required; LS—LMH; PR—LMH.** STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints.	13.7.6	A.7.14.1
[✓ C] NC N/A U	**HR—not required; LS—MH; PR—MH.** SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13.	13.7.4	A.7.13.3
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—LMH.** EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	13.7.9	A.7.3.1
Hazardous Materials			
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers.	13.7.1	A.7.12.2
[✓ C] NC N/A U	**HR—LMH; LS—LMH; PR—LMH.** HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods.	13.8.3	A.7.15.1
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release.	13.7.3 13.7.5	A.7.13.4
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks.	13.7.3 13.7.5	A.7.13.3
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings.	13.7.3 13.7.5	A.7.15.4
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5 13.7.6	A.7.13.6
Partitions			
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	13.6.2	A.7.1.1
[✓ C] NC N/A U	**HR—LMH; LS—LMH; PR—LMH.** HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
[✓ C] NC N/A U	**HR—not required; LS—MH; PR—MH.** DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	13.6.2	A.7.1.2
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—MH.** LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—MH.** STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	13.6.2	A.7.1.3

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KEY
◯ Tier 1 finding
◌ Updated following Tier 2

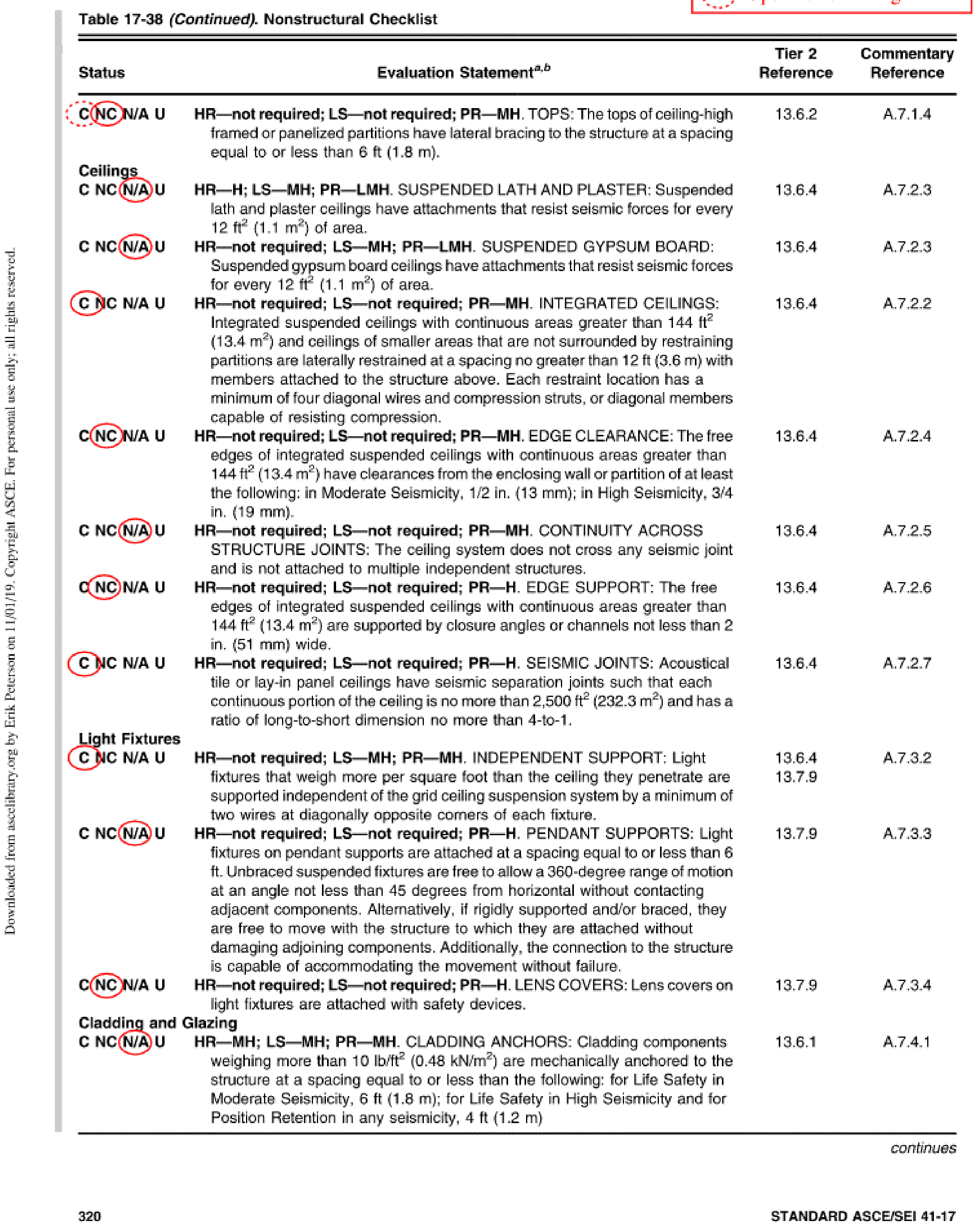

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
[✓ C] [✓ NC] N/A U	**HR—not required; LS—not required; PR—MH.** TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	13.6.2	A.7.1.4
Ceilings			
C NC [✓ N/A] U	**HR—H; LS—MH; PR—LMH.** SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
C NC [✓ N/A] U	**HR—not required; LS—MH; PR—LMH.** SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—MH.** INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression.	13.6.4	A.7.2.2
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—MH.** EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	13.6.4	A.7.2.4
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—MH.** CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.	13.6.4	A.7.2.5
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—H.** EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	13.6.4	A.7.2.6
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H.** SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft^2 (232.3 m^2) and has a ratio of long-to-short dimension no more than 4-to-1.	13.6.4	A.7.2.7
Light Fixtures			
[✓ C] NC N/A U	**HR—not required; LS—MH; PR—MH.** INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	13.6.4 13.7.9	A.7.3.2
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.	13.7.9	A.7.3.3
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—H.** LENS COVERS: Lens covers on light fixtures are attached with safety devices.	13.7.9	A.7.3.4
Cladding and Glazing			
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft^2 (0.48 kN/m^2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)	13.6.1	A.7.4.1

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KEY
◯ Tier 1 finding
◌ Updated following Tier 2

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement^{a,b}	Tier 2 Reference	Commentary Reference
C NC [✓ N/A] U	**HR—not required; LS—MH; PR—MH.** CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4
C NC [✓ N/A] U	**HR—not required; LS—MH; PR—MH.** THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	13.6.1	A.7.4.9
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	13.6.1.4	A.7.4.5
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6
C NC [✓ N/A] U	**HR—MH; LS—MH; PR—MH.** INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7
C NC [✓ N/A] U	**HR—not required; LS—MH; PR—MH.** OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft^2 (1.5 m^2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8
Masonry Veneer			
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft^2 (0.25 m^2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	13.6.1.2	A.7.5.1
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.	13.6.1.2	A.7.5.2
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	13.6.1.2	A.7.5.3
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2
C NC [✓ N/A] U	**HR—not required; LS—MH; PR—MH.** STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.1 13.6.1.2	A.7.6.1

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KEY
○ Tier 1 finding
◌ Updated following Tier 2

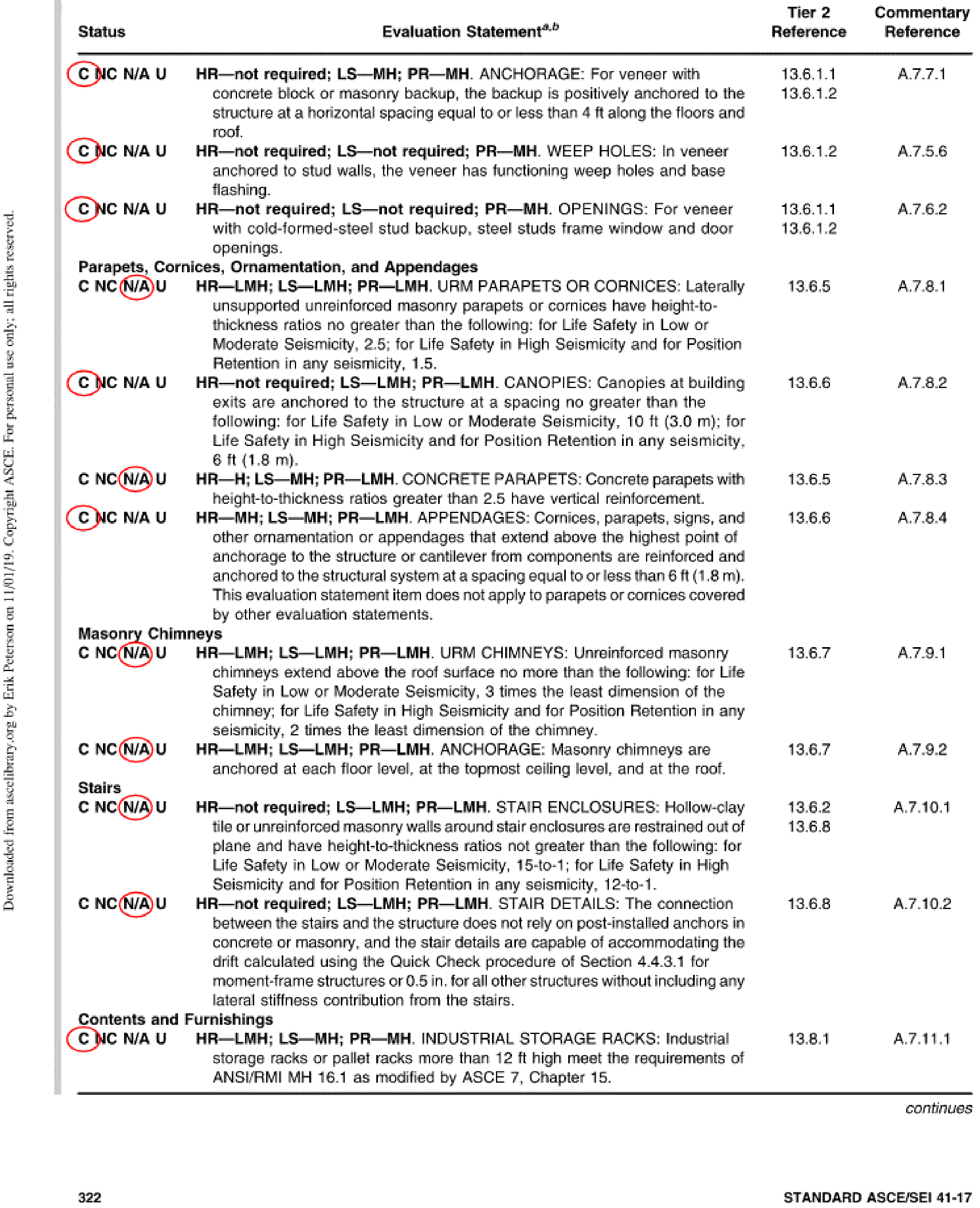

Table 17-38 *(Continued)*. **Nonstructural Checklist**

Status	Evaluation Statement^{a,b}	Tier 2 Reference	Commentary Reference
[✓ C] NC N/A U	**HR—not required; LS—MH; PR—MH.** ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.1 13.6.1.2	A.7.7.1
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—MH.** WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—MH.** OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2
Parapets, Cornices, Ornamentation, and Appendages			
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	13.6.5	A.7.8.1
[✓ C] NC N/A U	**HR—not required; LS—LMH; PR—LMH.** CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	13.6.6	A.7.8.2
C NC [✓ N/A] U	**HR—H; LS—MH; PR—LMH.** CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3
[✓ C] NC N/A U	**HR—MH; LS—MH; PR—LMH.** APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	13.6.6	A.7.8.4
Masonry Chimneys			
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** URM CHIMNEYS: Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.	13.6.7	A.7.9.1
C NC [✓ N/A] U	**HR—LMH; LS—LMH; PR—LMH.** ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.	13.6.7	A.7.9.2
Stairs			
C NC [✓ N/A] U	**HR—not required; LS—LMH; PR—LMH.** STAIR ENCLOSURES: Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out of plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1.	13.6.2 13.6.8	A.7.10.1
C NC [✓ N/A] U	**HR—not required; LS—LMH; PR—LMH.** STAIR DETAILS: The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs.	13.6.8	A.7.10.2
Contents and Furnishings			
[✓ C] NC N/A U	**HR—LMH; LS—MH; PR—MH.** INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.	13.8.1	A.7.11.1

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KEY
○ Tier 1 finding
◌ Updated following Tier 2

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement^{a,b}	Tier 2 Reference	Commentary Reference
C [✓ NC] N/A U	**HR—not required; LS—H; PR—MH**. TALL NARROW CONTENTS: Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	13.8.2	A.7.11.2
C [✓ NC] N/A U	**HR—not required; LS—H; PR—H**. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	13.8.2	A.7.11.3
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—MH**. ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.	13.6.10	A.7.11.4
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—MH**. EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor.	13.7.7 13.6.10	A.7.11.5
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—H**. SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	13.8.2	A.7.11.6
Mechanical and Electrical Equipment			
C [✓ NC] N/A U	**HR—not required; LS—H; PR—H**. FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	13.7.1 13.7.7	A.7.12.4
C [✓ NC] N/A U	**HR—not required; LS—H; PR—H**. IN-LINE EQUIPMENT: Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	13.7.1	A.7.12.5
C [✓ NC] N/A U	**HR—not required; LS—H; PR—MH**. TALL NARROW EQUIPMENT: Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls.	13.7.1 13.7.7	A.7.12.6
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—MH**. MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	13.6.9	A.7.12.7
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—H**. SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components.	13.7.1 13.7.7	A.7.12.8
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—H**. VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	13.7.1	A.7.12.9
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H**. HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure.	13.7.1 13.7.7	A.7.12.10
C [✓ NC] N/A U	**HR—not required; LS—not required; PR—H**. ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure.	13.7.7	A.7.12.11
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H**. CONDUIT COUPLINGS: Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections.	13.7.8	A.7.12.12
Piping			
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H**. FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	13.7.3 13.7.5	A.7.13.2

continues

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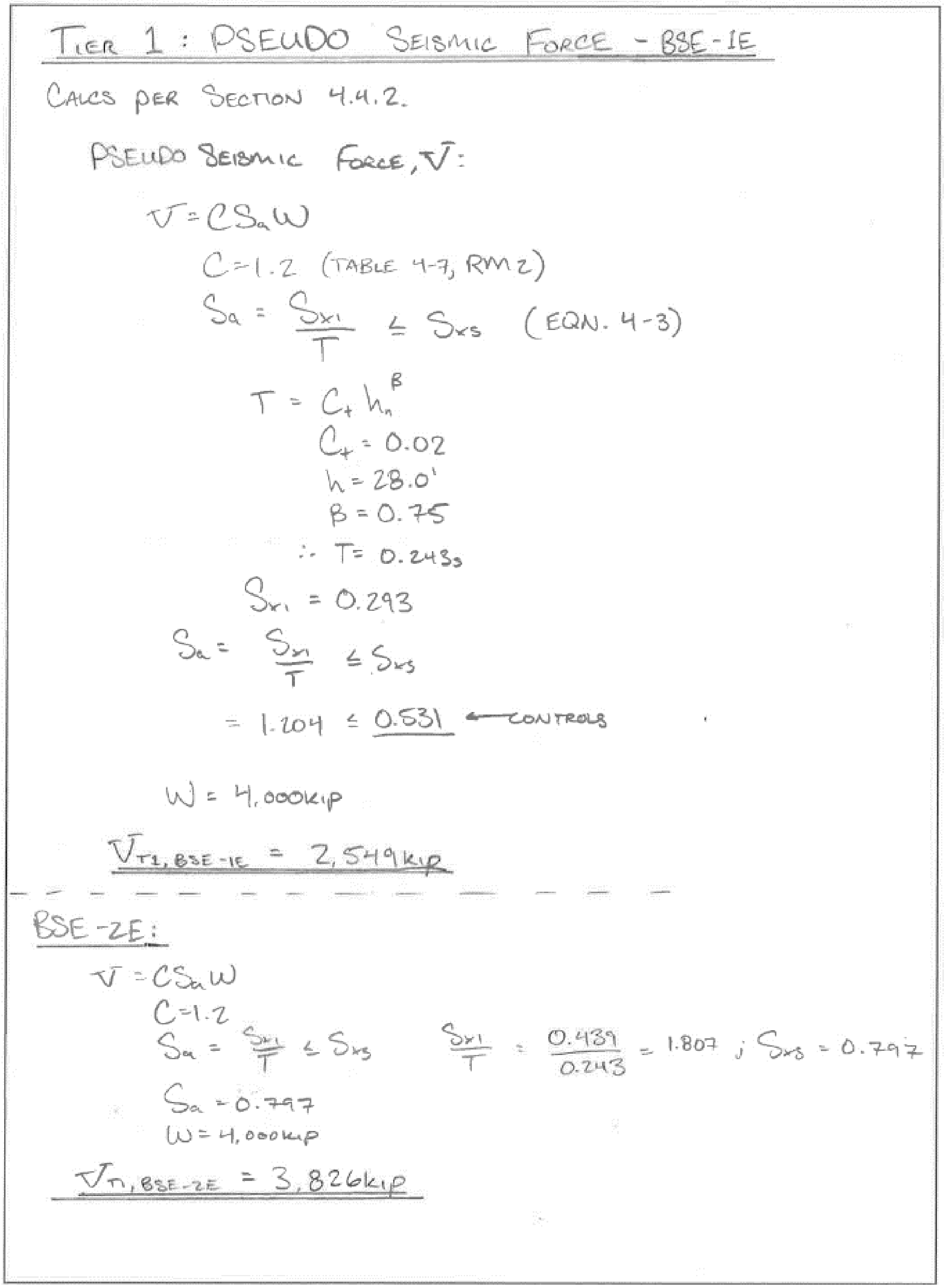
KEY
○ Tier 1 finding
◌ Updated following Tier 2

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement^{a,b}	Tier 2 Reference	Commentary Reference
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H.** FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	13.7.3 13.7.5	A.7.13.4
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	13.7.3 13.7.5	A.7.13.5
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5	A.7.13.6
Ducts			
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** DUCT BRACING: Rectangular ductwork larger than 6 ft^2 (0.56 m^2) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m).	13.7.6	A.7.14.2
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H.** DUCT SUPPORT: Ducts are not supported by piping or electrical conduit.	13.7.6	A.7.14.3
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements.	13.7.6	A.7.14.4
Elevators			
C NC [✓ N/A] U	**HR—not required; LS—H; PR—H.** RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1
C [✓ NC] N/A U	**HR—not required; LS—H; PR—H.** RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	13.7.11	A.7.16.2
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H.** ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	13.7.11	A.7.16.3
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.	13.7.11	A.7.16.4
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H.** SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.	13.7.11	A.7.16.5
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.	13.7.11	A.7.16.6
[✓ C] NC N/A U	**HR—not required; LS—not required; PR—H.** BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.	13.7.11	A.7.16.7
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.	13.7.11	A.7.16.8
C NC [✓ N/A] U	**HR—not required; LS—not required; PR—H.** GO-SLOW ELEVATORS: The building has a go-slow elevator system.	13.7.11	A.7.16.9

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.
[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.
[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

10.5 Appendix E: ASCE 41-17 Tier 1 Supporting Calculations



TIER 1 : PSEUDO SEISMIC FORCE - BSE-1E

CALCS PER SECTION 4.4.2.

PSEUDO SEISMIC FORCE, $\bar{V}$:

$\bar{V} = CS_aW$

$C = 1.2$ (TABLE 4-7, RM2)

$S_a = \frac{S_{X1}}{T} \le S_{XS}$ (EQN. 4-3)

$T = C_t h_n^{\beta}$

$C_t = 0.02$

$h = 28.0'$

$\beta = 0.75$

$\therefore T = 0.243s$

$S_{X1} = 0.293$

$S_a = \frac{S_{X1}}{T} \le S_{XS}$

$= 1.204 \le \underline{0.531}$ ← CONTROLS

$W = 4,000kip$

$\underline{\bar{V}_{T1,BSE-1E} = 2,549kip}$

BSE-2E:

$\bar{V} = CS_aW$

$C = 1.2$

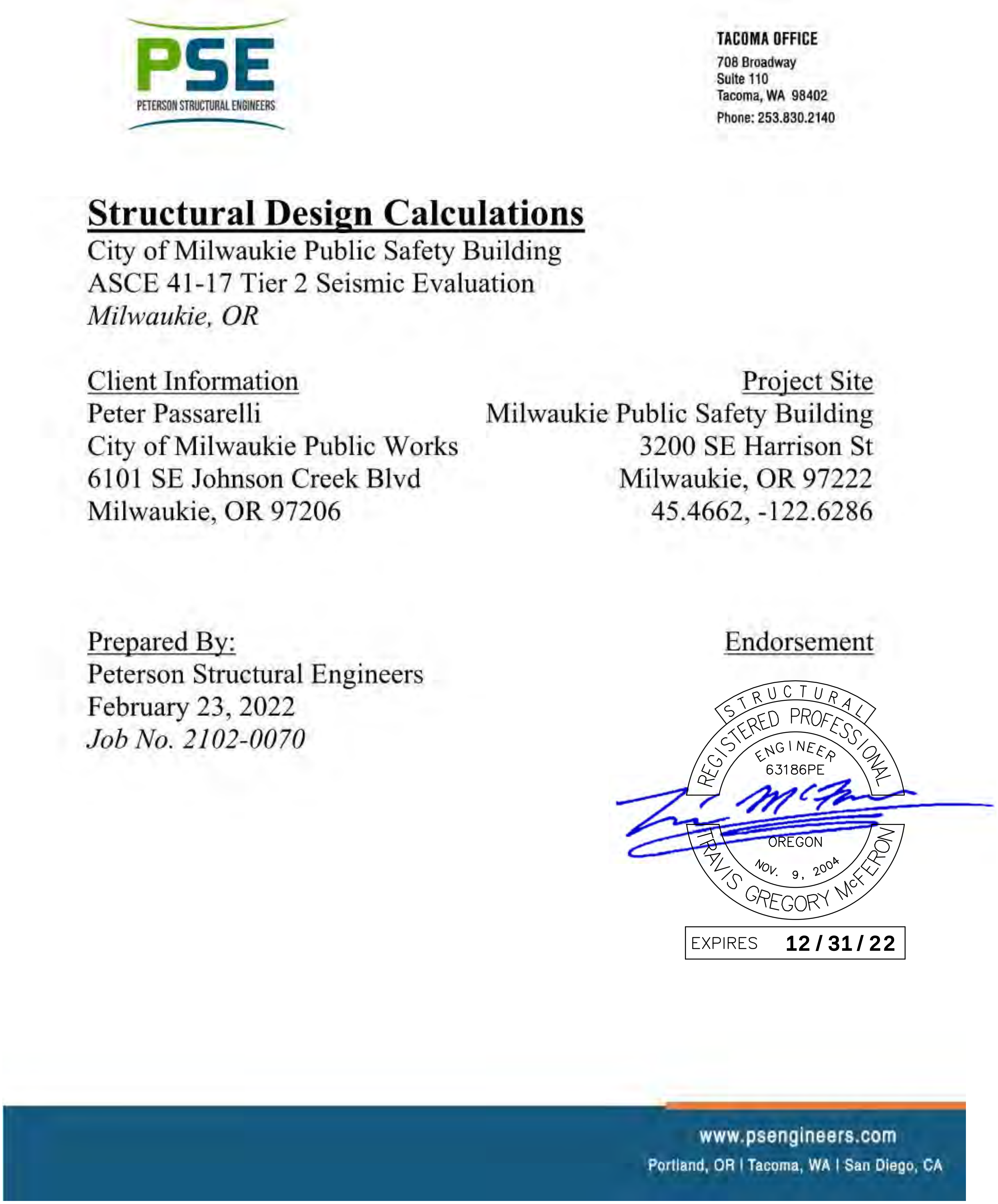
$S_a = \frac{S_{X1}}{T} \le S_{XS}$ $\frac{S_{X1}}{T} = \frac{0.439}{0.243} = 1.807$; $S_{XS} = 0.797$

$S_a = 0.797$

$W = 4,000kip$

$\underline{\bar{V}_{T1,BSE-2E} = 3,826kip}$

10.6 Appendix F: Tier 2 Supporitng Calculations



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Structural Design Calculations

City of Milwaukie Public Safety Building
ASCE 41-17 Tier 2 Seismic Evaluation
Milwaukie, OR

Client Information
Peter Passarelli
City of Milwaukie Public Works
6101 SE Johnson Creek Blvd
Milwaukie, OR 97206

Project Site
Milwaukie Public Safety Building
3200 SE Harrison St
Milwaukie, OR 97222
45.4662, -122.6286

Prepared By:
Peterson Structural Engineers
February 23, 2022
Job No. 2102-0070

Endorsement

63186PE
NOV. 9, 2004
TRAVIS GREGORY McFERON
EXPIRES 12 / 31 / 22

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Scope To provide structural calculations for the ASCE 41-17 Tier 2 seismic evaluation of the existing public safety building at the location given on the cover page. Elements under review include structural and nonstructural elements previously deemed noncompliant or unknown in the Tier 1 evaluation. Any other elements not specifically referenced in these calculations are outside the purview of these calculations and are designed by others.

References

1. 2019 Oregon Structural Specialty Code (OSSC)
2. 2018 International Building Code (IBC)
3. 2018 International Existing Building Code (IEBC)
4. ASCE/SEI 41-17, Third Edition, Minimum Design Loads for Buildings and Other Structures, American Society of Civil Engineers (ASCE 41)
5. ASCE/SEI 7-16, Seismic Evaluation and Retrofit of Existing Buildings, American Society of Civil Engineers (ASCE 7)
6. 2014 Building Code Requirements for Structural Concrete, ACI 318-14, and Commentary (ACI)
7. 2017 Manual of Steel Construction, 15th Edition, American Institute of Steel Construction (AISC)
8. 2016 Building Code for Masonry Structures, TMS 402-16, The Masonry Society (TMS)
9. 2016 North American Specification for Cold-formed Steel Structural Members, AISI S200-12/16, American Iron and Steel Institute (AISI)
10. Geotechnical Report Prepared by Aspect Consulting and Dated 02/23/2022
11. Drawings provide by client dated April 15, 1992

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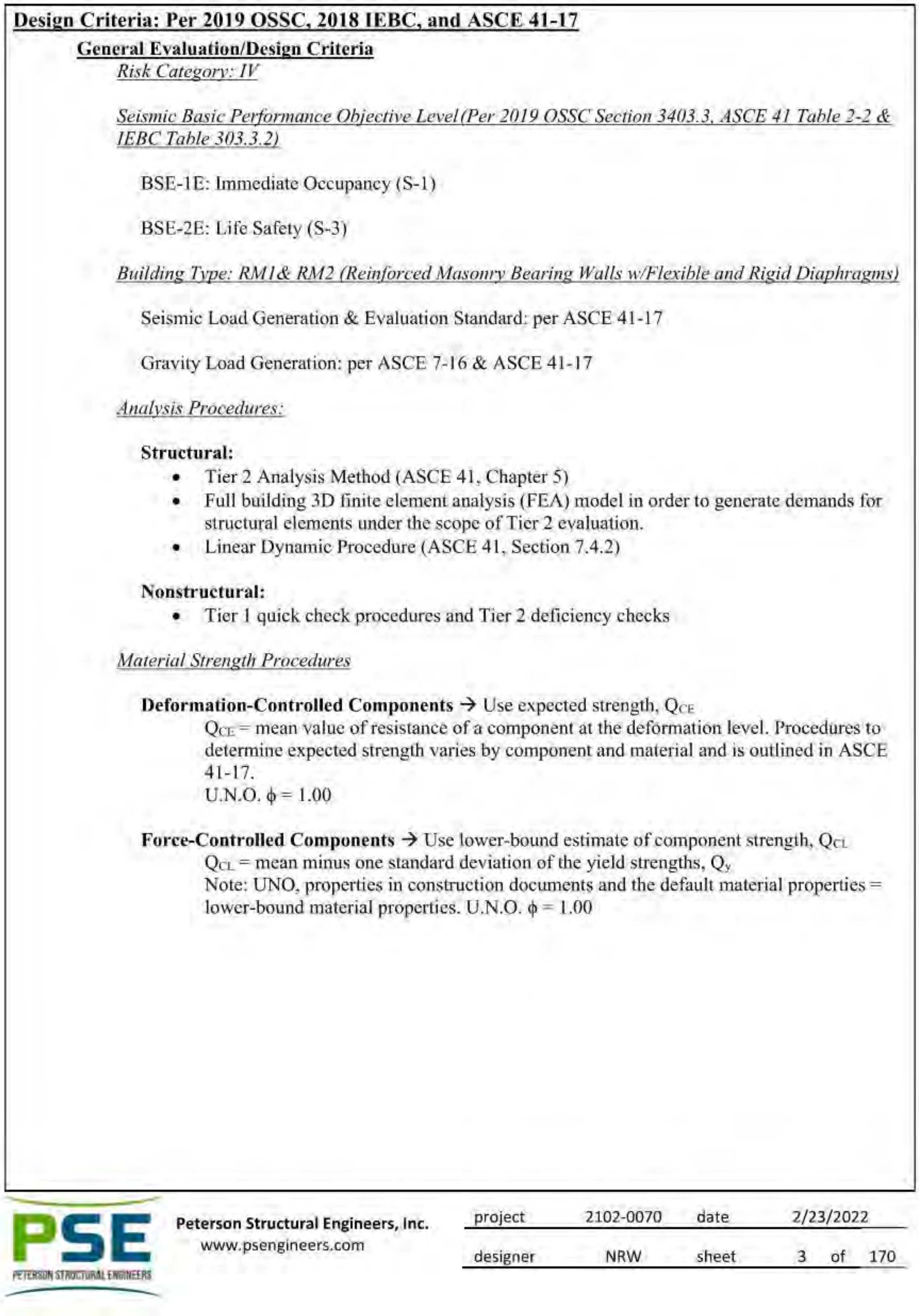


Design Criteria: Per 2019 OSSC, 2018 IEBC, and ASCE 41-17

General Evaluation/Design Criteria

Risk Category: IV

Seismic Basic Performance Objective Level (Per 2019 OSSC Section 3403.3, ASCE 41 Table 2-2 & IEBC Table 303.3.2)

BSE-1E: Immediate Occupancy (S-1)

BSE-2E: Life Safety (S-3)

Building Type: RM1& RM2 (Reinforced Masonry Bearing Walls w/Flexible and Rigid Diaphragms)

Seismic Load Generation & Evaluation Standard: per ASCE 41-17

Gravity Load Generation: per ASCE 7-16 & ASCE 41-17

Analysis Procedures:

Structural:

- Tier 2 Analysis Method (ASCE 41, Chapter 5)
- Full building 3D finite element analysis (FEA) model in order to generate demands for structural elements under the scope of Tier 2 evaluation.
- Linear Dynamic Procedure (ASCE 41, Section 7.4.2)

Nonstructural:

- Tier 1 quick check procedures and Tier 2 deficiency checks

Material Strength Procedures

Deformation-Controlled Components → Use expected strength, Q_{CE}

Q_{CE} = mean value of resistance of a component at the deformation level. Procedures to determine expected strength varies by component and material and is outlined in ASCE 41-17.
U.N.O. $\phi = 1.00$

Force-Controlled Components → Use lower-bound estimate of component strength, Q_{CL}

Q_{CL} = mean minus one standard deviation of the yield strengths, Q_y
Note: UNO, properties in construction documents and the default material properties = lower-bound material properties. U.N.O. $\phi = 1.00$

General Acceptance Criteria

Deformation-Controlled Components – Section 7.5.2.2.1

$mkQ_{CE} > Q_{UD}$

m = Component capacity modification factor to account for ductility, determined on a case-by-case basis depending on material and subject element.

k = knowledge factor

k = 0.90 U.N.O.

ASCE 41 Table 6-1, Minimum material properties specified on design drawings

Q_{UD} = Deformation-controlled action caused by gravity and seismic demands

$Q_{UD} = Q_G + Q_E$

$Q_G = 1.1(Q_D + Q_L + Q_S)$

OR

$0.9Q_D$

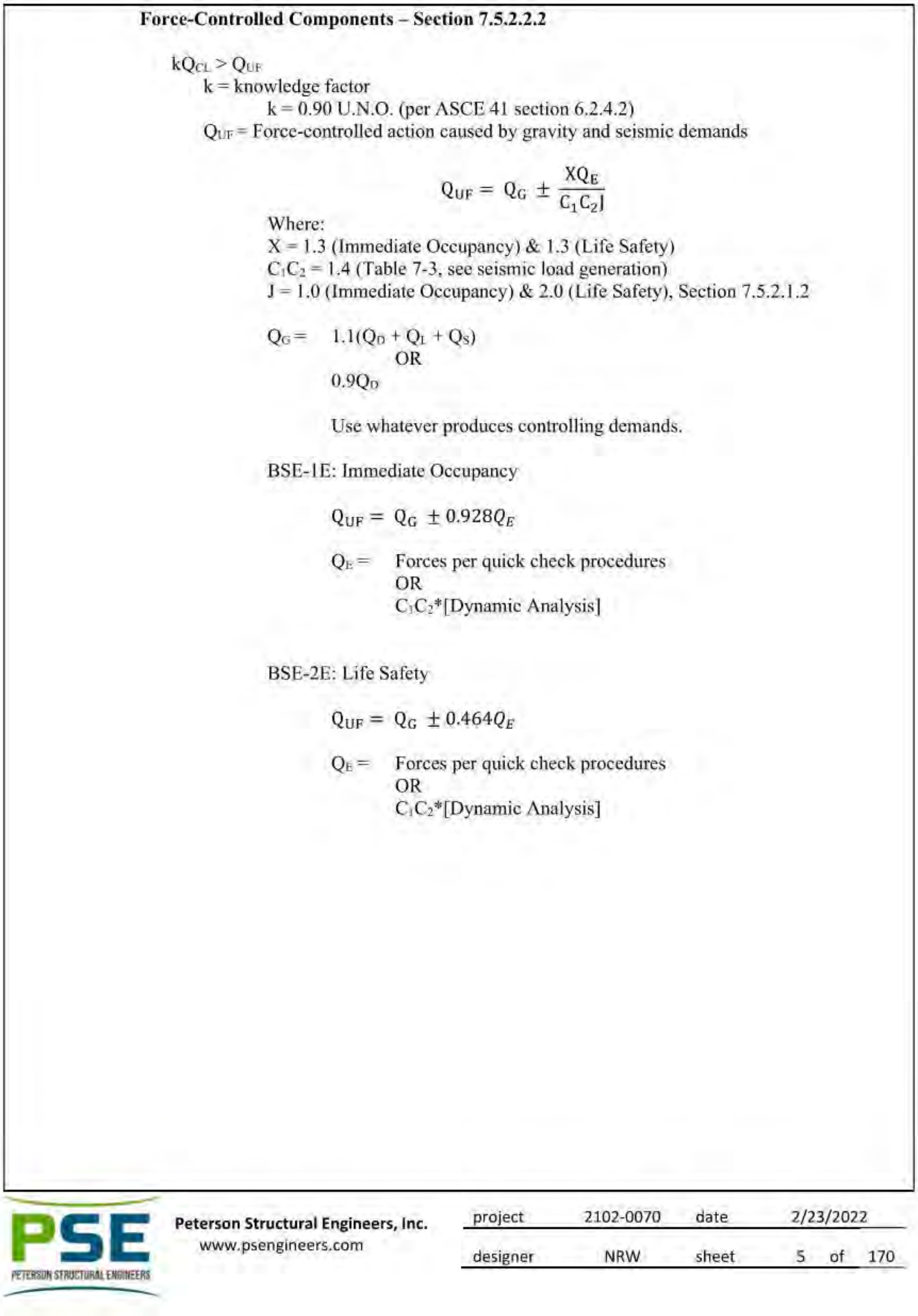
Use whatever produces controlling demands.

$Q_E =$ Out-of-plane effects per Ch. 7

OR

$\text{Max}(C_1C_2{*}[LDP], 0.85{*}LSP)$

$\mathbf{0.9mQ_{CE} > Q_G + Q_E}$



Force-Controlled Components – Section 7.5.2.2.2

$kQ_{CL} > Q_{UF}$

k = knowledge factor

k = 0.90 U.N.O. (per ASCE 41 section 6.2.4.2)

Q_{UF} = Force-controlled action caused by gravity and seismic demands

$$Q_{UF} = Q_G \pm \frac{XQ_E}{C_1C_2J}$$

Where:
X = 1.3 (Immediate Occupancy) & 1.3 (Life Safety)
C_1C_2 = 1.4 (Table 7-3, see seismic load generation)
J = 1.0 (Immediate Occupancy) & 2.0 (Life Safety), Section 7.5.2.1.2

$Q_G =$ $1.1(Q_D + Q_L + Q_S)$
OR
$0.9Q_D$

Use whatever produces controlling demands.

BSE-1E: Immediate Occupancy

$$Q_{UF} = Q_G \pm 0.928Q_E$$

$Q_E =$ Forces per quick check procedures
OR
C_1C_2*[Dynamic Analysis]

BSE-2E: Life Safety

$$Q_{UF} = Q_G \pm 0.464Q_E$$

$Q_E =$ Forces per quick check procedures
OR
C_1C_2*[Dynamic Analysis]

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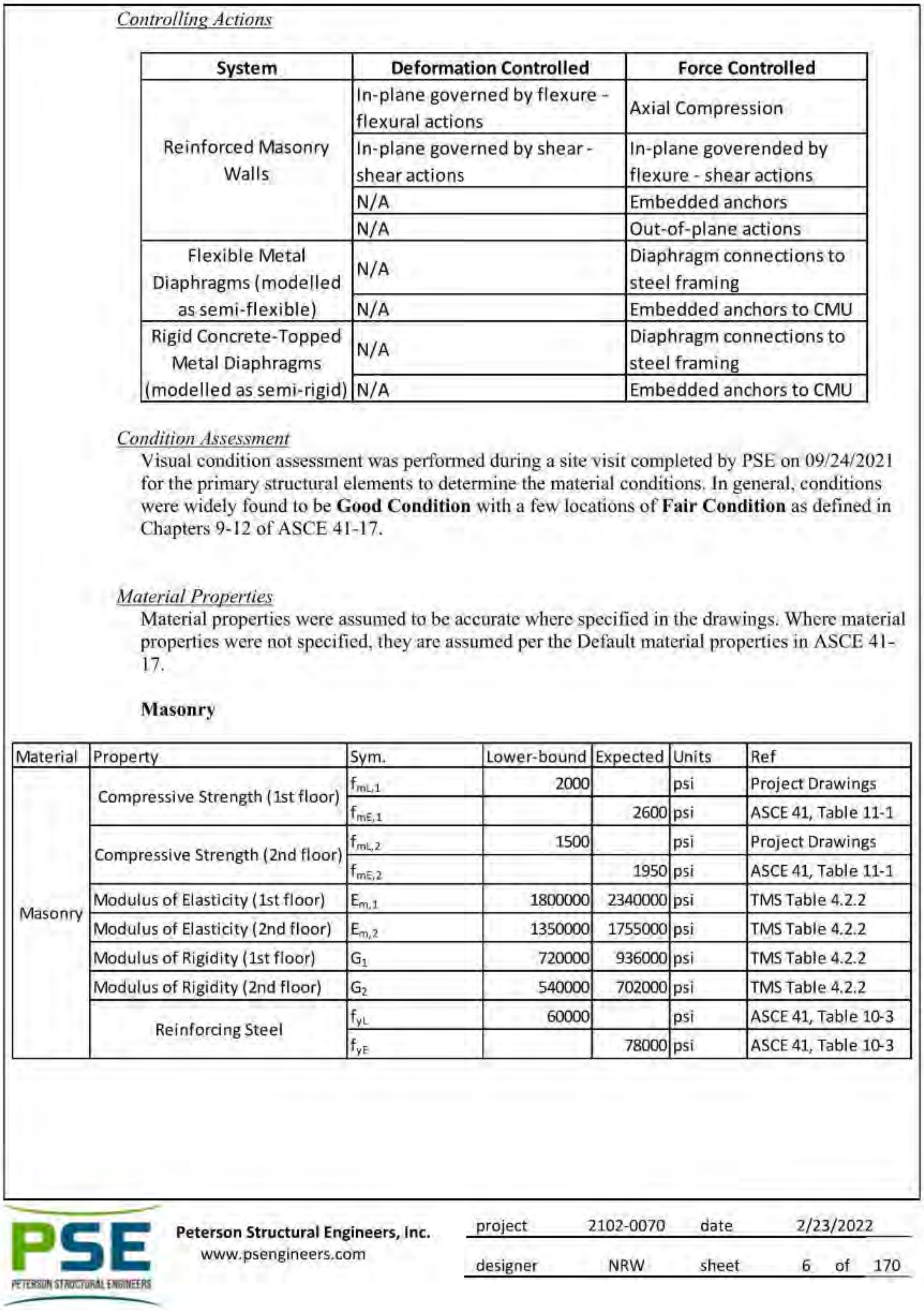

Controlling Actions

System	Deformation Controlled	Force Controlled
Reinforced Masonry Walls	In-plane governed by flexure - flexural actions	Axial Compression
	In-plane governed by shear - shear actions	In-plane goverended by flexure - shear actions
	N/A	Embedded anchors
	N/A	Out-of-plane actions
Flexible Metal Diaphragms (modelled as semi-flexible)	N/A	Diaphragm connections to steel framing
	N/A	Embedded anchors to CMU
Rigid Concrete-Topped Metal Diaphragms (modelled as semi-rigid)	N/A	Diaphragm connections to steel framing
	N/A	Embedded anchors to CMU

Condition Assessment

Visual condition assessment was performed during a site visit completed by PSE on 09/24/2021 for the primary structural elements to determine the material conditions. In general, conditions were widely found to be **Good Condition** with a few locations of **Fair Condition** as defined in Chapters 9-12 of ASCE 41-17.

Material Properties

Material properties were assumed to be accurate where specified in the drawings. Where material properties were not specified, they are assumed per the Default material properties in ASCE 41-17.

Masonry

Material	Property	Sym.	Lower-bound	Expected	Units	Ref
Masonry	Compressive Strength (1st floor)	$f_{mL,1}$	2000		psi	Project Drawings
		$f_{mE,1}$		2600	psi	ASCE 41, Table 11-1
	Compressive Strength (2nd floor)	$f_{mL,2}$	1500		psi	Project Drawings
		$f_{mE,2}$		1950	psi	ASCE 41, Table 11-1
	Modulus of Elasticity (1st floor)	$E_{m,1}$	1800000	2340000	psi	TMS Table 4.2.2
	Modulus of Elasticity (2nd floor)	$E_{m,2}$	1350000	1755000	psi	TMS Table 4.2.2
	Modulus of Rigidity (1st floor)	G_1	720000	936000	psi	TMS Table 4.2.2
	Modulus of Rigidity (2nd floor)	G_2	540000	702000	psi	TMS Table 4.2.2
	Reinforcing Steel	f_{yL}	60000		psi	ASCE 41, Table 10-3
		f_{yE}		78000	psi	ASCE 41, Table 10-3

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Dead Loads

Upper Roof, **$D_{Roof,2}$ = 15psf** (rounded up)

- Untopped Deck = 2.3psf (Verco 20Ga. HSB-36)
- Roofing = 5psf
- Roof Framing = 5psf
- Misc. superimposed dead load (insulation, MEP, rooftop screen, etc.) = 2.5psf

Lower Roof, **$D_{Roof,1}$ = 20psf** (rounded up)

- Untopped Deck = 2.3psf (Verco 20Ga. HSB-36)
- Roofing = 10psf (gravel topped)
- Roof Framing = 5psf
- Misc. superimposed dead load (insulation, MEP, etc.) = 2.5psf

2nd Floor, **D_{2nd} = 56psf** (rounded up)

- 4.5" Topped Metal Deck = 43psf (Verco w/4.5" Conc.)
- Misc. superimposed dead load (insulation, MEP, etc.) = 2.5psf
- Flooring = 5psf
- Floor Framing = 5psf

Light Interior Partitions, **$D_{part,L}$ = 15psf** (horizontally distributed)

- Roof: 7.5psf
- 2nd floor/Lower Roof: 15psf

Heavy Interior Partitions, $D_{part,H}$ (horizontally distributed)

- Roof: N/A (no 2nd story heavy partitions)
- 2nd floor/Lower Roof: 30psf (only in prisoner processing region)

Walls: (Vertical)

- Self Weight: Built into model
- Brick Veneer: 39psf

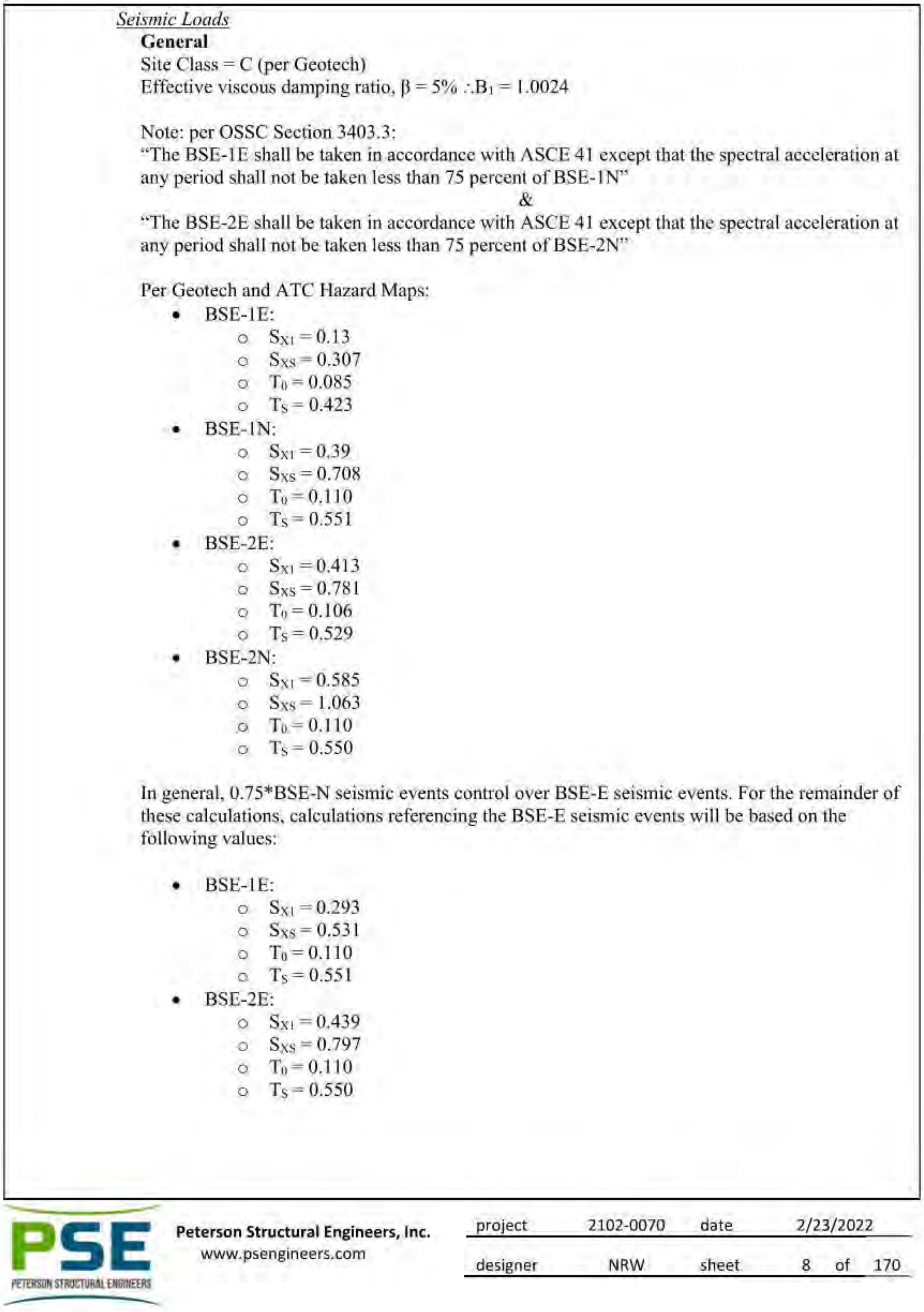
Live Loads

2nd Floor Areas: 50psf

Roof: 20psf

Snow Loads

Ground Snow Load, p_g = 9psf (SEAO Snow Load Lookup Tool)
Minimum Flat Roof Snow Load, p_f = I_s*20psf = 24psf
Rain-on-Snow Surcharge = 5psf
Design Snow Load = 29psf



Seismic Loads

General

Site Class = C (per Geotech)
Effective viscous damping ratio, $\beta = 5\% \therefore B_1 = 1.0024$

Note: per OSSC Section 3403.3:
"The BSE-1E shall be taken in accordance with ASCE 41 except that the spectral acceleration at any period shall not be taken less than 75 percent of BSE-1N"
&
"The BSE-2E shall be taken in accordance with ASCE 41 except that the spectral acceleration at any period shall not be taken less than 75 percent of BSE-2N"

Per Geotech and ATC Hazard Maps:

- BSE-1E:
  - $S_{X1} = 0.13$
  - $S_{XS} = 0.307$
  - $T_0 = 0.085$
  - $T_S = 0.423$
- BSE-1N:
  - $S_{X1} = 0.39$
  - $S_{XS} = 0.708$
  - $T_0 = 0.110$
  - $T_S = 0.551$
- BSE-2E:
  - $S_{X1} = 0.413$
  - $S_{XS} = 0.781$
  - $T_0 = 0.106$
  - $T_S = 0.529$
- BSE-2N:
  - $S_{X1} = 0.585$
  - $S_{XS} = 1.063$
  - $T_0 = 0.110$
  - $T_S = 0.550$

In general, 0.75*BSE-N seismic events control over BSE-E seismic events. For the remainder of these calculations, calculations referencing the BSE-E seismic events will be based on the following values:

- BSE-1E:
  - $S_{X1} = 0.293$
  - $S_{XS} = 0.531$
  - $T_0 = 0.110$
  - $T_S = 0.551$
- BSE-2E:
  - $S_{X1} = 0.439$
  - $S_{XS} = 0.797$
  - $T_0 = 0.110$
  - $T_S = 0.550$

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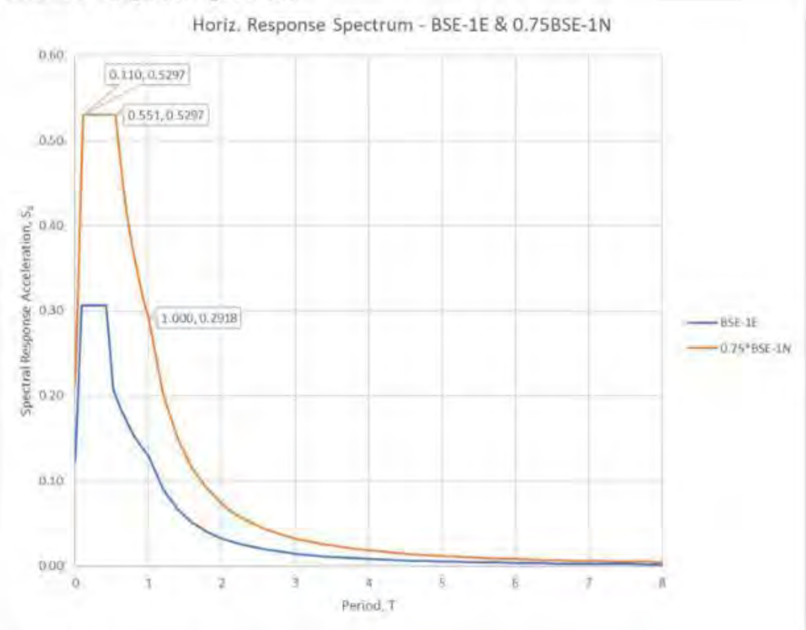
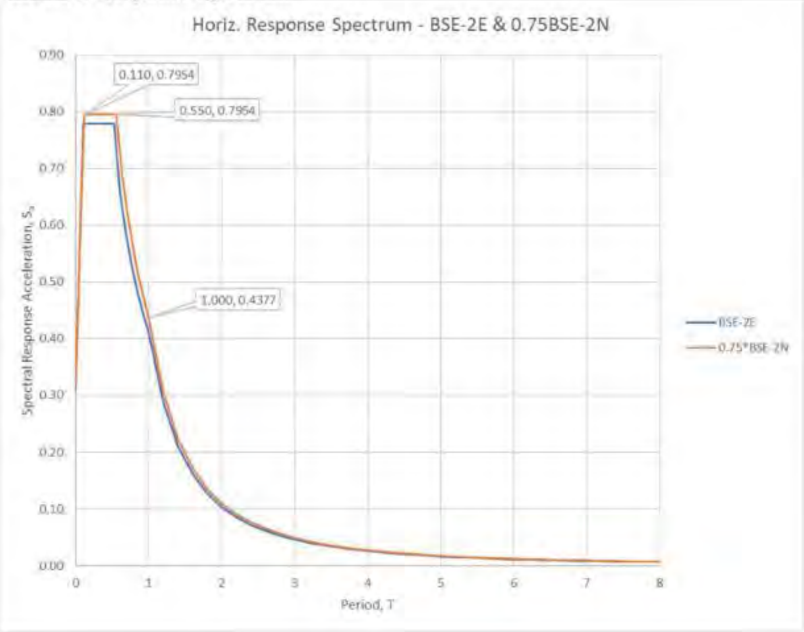
BSE-1E Response Spectrum



BSE-2E Response Spectrum



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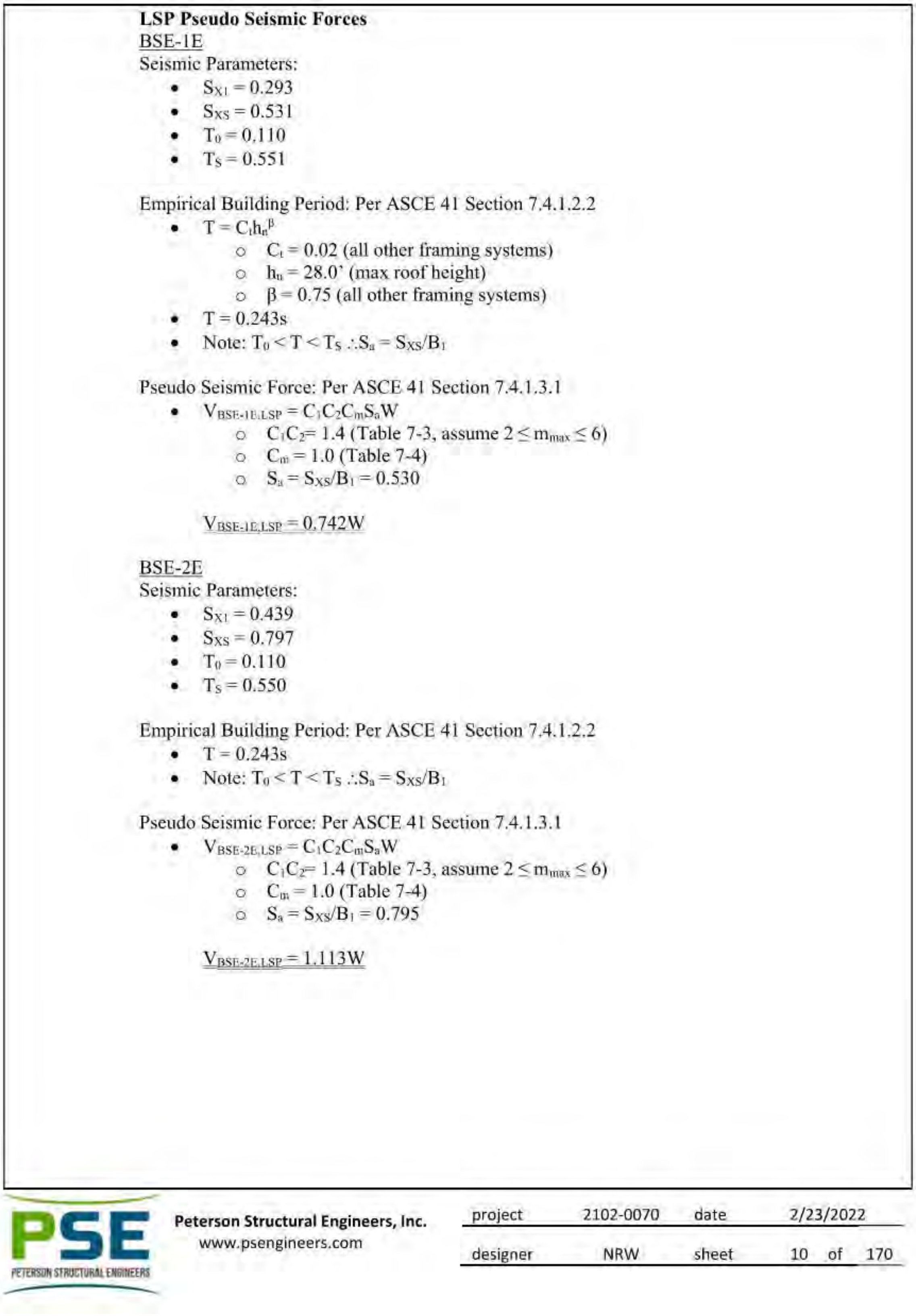

LSP Pseudo Seismic Forces

BSE-1E

Seismic Parameters:

- $S_{X1} = 0.293$
- $S_{XS} = 0.531$
- $T_0 = 0.110$
- $T_S = 0.551$

Empirical Building Period: Per ASCE 41 Section 7.4.1.2.2

- $T = C_t h_n^{\beta}$
    - $C_t = 0.02$ (all other framing systems)
    - $h_n = 28.0'$ (max roof height)
    - $\beta = 0.75$ (all other framing systems)
- $T = 0.243s$
- Note: $T_0 < T < T_S \therefore S_a = S_{XS}/B_1$

Pseudo Seismic Force: Per ASCE 41 Section 7.4.1.3.1

- $V_{BSE\text{-}1E,LSP} = C_1C_2C_mS_aW$
    - $C_1C_2 = 1.4$ (Table 7-3, assume $2 \le m_{max} \le 6$)
    - $C_m = 1.0$ (Table 7-4)
    - $S_a = S_{XS}/B_1 = 0.530$

$\underline{V_{BSE\text{-}1E,LSP} = 0.742W}$

BSE-2E

Seismic Parameters:

- $S_{X1} = 0.439$
- $S_{XS} = 0.797$
- $T_0 = 0.110$
- $T_S = 0.550$

Empirical Building Period: Per ASCE 41 Section 7.4.1.2.2

- $T = 0.243s$
- Note: $T_0 < T < T_S \therefore S_a = S_{XS}/B_1$

Pseudo Seismic Force: Per ASCE 41 Section 7.4.1.3.1

- $V_{BSE\text{-}2E,LSP} = C_1C_2C_mS_aW$
    - $C_1C_2 = 1.4$ (Table 7-3, assume $2 \le m_{max} \le 6$)
    - $C_m = 1.0$ (Table 7-4)
    - $S_a = S_{XS}/B_1 = 0.795$

$\underline{V_{BSE\text{-}2E,LSP} = 1.113W}$

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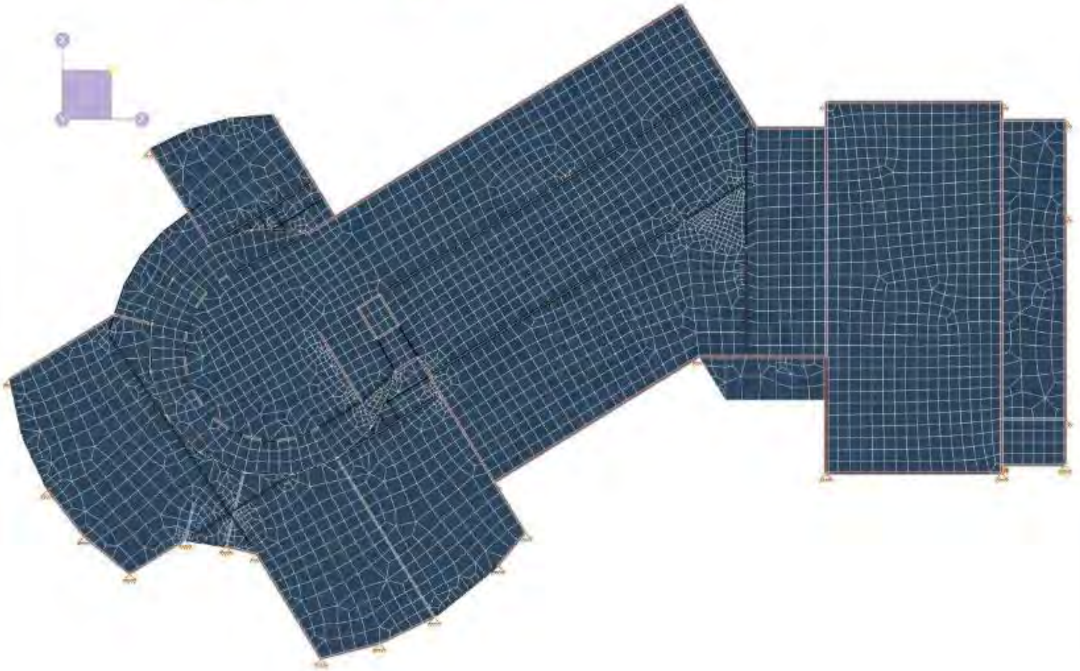
3D Model Building Evaluation

The sections to follow summarize the assumptions, inputs, and outputs from the RISA 3D model used to analyze the building seismic behavior.



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Model Assumptions

Model Basics:

1. Use RISA 3D to generate in-plane demands to primary elements of LFRS covered in the scope of the Tier 2 evaluation using the Linear Dynamic Procedure (LDP) Response Spectrum Analysis.
2. Out-of-plane component behaviors are not evaluated using the RISA 3D model. See following sections of out-of-plane evaluation of components.
3. Modify RISA 3D provided element capacities per ASCE 41 deformation-controlled and force-controlled procedures. Compare modified capacities to demands generated in RISA 3D.
4. Primary Elements of LFRS:
    a. Partially grouted, reinforced CMU shearwalls
    b. Flexible diaphragms
    c. Rigid diaphragms
    d. Beams (at vertical irregularities)
5. Secondary components need not be included in model so long as the sum of the stiffnesses of secondary components does not exceed 25% of the stiffness of the primary components. (ASCE 41-17, Section 7.2.3.3).
6. Stiffnesses of LFRS:
    a. Concrete Topped Metal Decks: Semi-rigid per diaphragm manufacturer
    b. Untopped Metal Decks: Semi-flexible per diaphragm manufacturer
    c. Reinforced Masonry Shear Walls: Calculated per RISA 3D
7. By default, RISA 3D compares the input demands to the calculated capacities of the elements in the program based on the IBC and applicable standards. However, the ASCE 41 acceptance criteria considers higher demands and modified capacities of elements (increased) based on deformation-controlled and force-controlled actions. Because RISA 3D does not consider these modified capacities per ASCE 41, the RISA 3D model outputs need to be modified in post-processing. As such, any elements deemed adequate by the RISA 3D program (considering unfactored capacities), is also adequate per ASCE 41 due to the inherent conservatism. Elements that are deemed overutilized by RISA 3D are further evaluated using the ASCE 41 acceptance criteria in the subsequent sections.
8. Building evaluated for seismic loads applied in two perpendicular directions and combined using concurrent multi-directional effects due to the asymmetry of the building and the nonorthogonal walls. As such, load combinations considered 100% forces in Direction 1 plus 30% of forces in Direction 2 as well as 30% forces in Direction 1 plus 100% forces in direction 2. Note that positive and negative load lateral loads were also considered.

Diaphragm Info

1. Diaphragm in-plane behavior is approximated in the RISA 3D model by using orthotropic meshed plates capable of resisting only in-plane forces.
2. Plate properties are based on the in-plane stiffness properties as provided by the metal decking manufacturer for topped and untopped diaphragm respectively based on the original date of construction.
3. For simplicity, apply gravity forces directly to framing and walls supporting diaphragm plates. As such, diaphragm plates do not have any gravity forces applied directly to them. Furthermore, plates are considered weightless in the model.
    a. Note: This can conservatively result in higher localized diaphragm stresses near where gravity loads are applied.
4. Maximum diaphragm mesh size = 4'-0".
5. Maximum spacing of diaphragm connections to supporting framing = 4'-0".

Diaphragm Properties:

					RISA 3D Plate Properties								
					Thickness (in)	G' (kip/in)	G_{12} (ksi)	G_{13} (ksi)	G_{23} (ksi)	E_1 (ksi)	E_2 (ksi)	N_{12}	
Diaphragm	Elevation (ft)	General Description	Diaphragm Member	Joist Spacing (ft)	Per Manu.	Per Manu.	In-Plane Shear Modulus	Transerse Shear Modulus for XZ plane	Transerse Shear Modulus for YZ plane	Modulus of Elast. in longitudinal dir., per Manu.	Modulus of Elast. in transverse dir.	Poisson's ratio	Density (kip/ft^3)
1	12	2nd Floor, Fire Storage, East of Apparatus Bay	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c. 4.5" conc. Slab with 12x12 W2.9 W. W Mech at centerline.	2.75	4.5	3069	682	682	0	29500	0	0.3	0
2	12.33	Lower roof, West side	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams at 12" o.c.. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	5.0 - 5.583	0.0359	217	6045	6045	0	29500	0	0.3	0
3	13.33	2nd Floor, Center	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c. 4.5" conc. Slab with 12x12 W2.9 W. W Mech at centerline.	2.75	4.5	3069	682	682	0	29500	0	0.3	0
4	20	Roof, Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	5.916	0.0359	207	5766	5766	0	29500	0	0.3	0
5	28	Upper Roof, Center	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	6	0.0359	207	5766	5766	0	29500	0	0.3	0
6	28	Upper Roof, East of Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	7.25	0.0359	195	5432	5432	0	29500	0	0.3	0
7	28	Hose Tower	VERCO 18 gage Type N-4 roof w/Sheartranze. (4) 0.5" dia. Puddle welds per sheet to end supports. 0.5" dia. Puddle welds @10" o.c. to side suports. 1.5" long top seam welds at all side seams.	10.67	0.0478	91	1904	1904	0	29500	0	0.3	0

Note: $G_{12} = G'/t = G_{23}$

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Wall Info

CMU walls are "built into" the RISA 3D model. See below for a summary of the Wall Panel Parameters used.

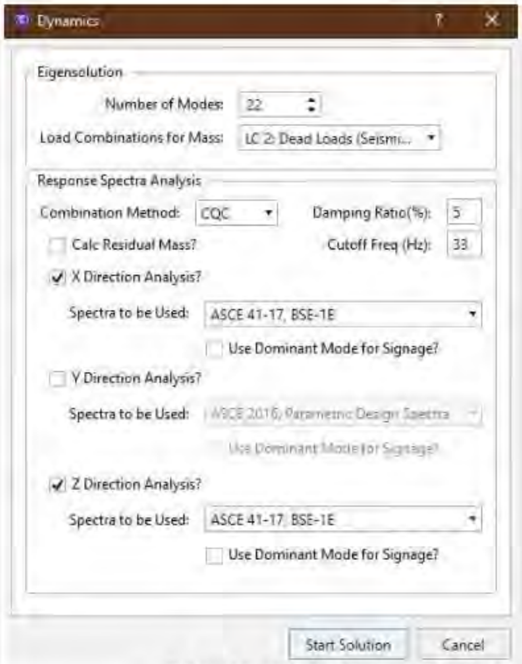
Label	Block Nom Width	Block Grouting	Reinforced	Wall Area Method	Edge. Vert. Rein.	Field Vert. Rein.	Horiz. Rein.	1.5x Shear Increase (TMS 402 Section 7.3.2.6.1.2)
CMU 12" Typ	12"	Partially Grouted	TRUE	NCMA	(2) #5 Ea. Cell	(2) #5 Ea. Cell @32" o.c.	#5	YES
CMU 12" High Cap	12"	Fully Grouted	TRUE	NCMA	(2) #5 Ea. Cell	(2) #5 Ea. Cell @32" o.c.	#4	YES
CMU 10" Typ	10"	Partially Grouted	TRUE	NCMA	(1) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 10" Col	10"	Fully Grouted	TRUE	NCMA	(2) #6 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#3	YES
CMU 8" Typ	8"	Partially Grouted	TRUE	NCMA	(1) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 8" FG	8"	Fully Grouted	TRUE	NCMA	(1) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 6" FG	6"	Fully Grouted	TRUE	NCMA	(1) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 6" Typ	6"	Partially Grouted	TRUE	NCMA	(1) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 6" Dbl Vert @ edge	6"	Partially Grouted	TRUE	NCMA	(2) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 8" Dbl Vert @ edge	8"	Partially Grouted	TRUE	NCMA	(2) #5 Ea. Cell	(1) #5 Ea. Cell @32" o.c.	#5	YES
CMU 6" Vert at 24"	6"	Partially Grouted	TRUE	NCMA	(1) #5 Ea. Cell	(1) #5 Ea. Cell @24" o.c.	#5	YES

Note: horizontal reinforcing spacing cannot be defined in RISA. RISA determines horizontal reinforcing spacing based on what is required to resist in-plane demands. Wall sections are evaluated in post-processing to confirm that the reinforcing provided by RISA does not exceed that which is present as detailed in the original design.

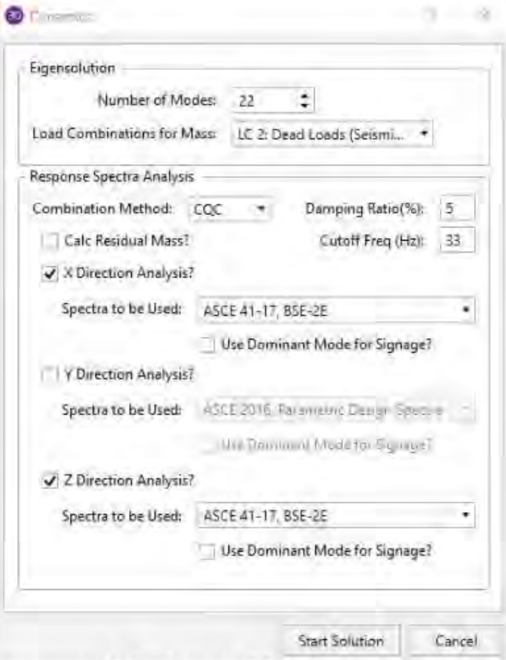
Linear Dynamic Procedure Assumptions

RISA Inputs

PSE utilized the built in Dynamics solver tools in RISA 3D to run a Response Spectrum Analysis for both seismic events. Below are the general inputs:



Eigensolution
Number of Modes: 22
Load Combinations for Mass: LC 2: Dead Loads (Seismi...
Response Spectra Analysis
Combination Method: CQC
Damping Ratio(%): 5
☐ Calc Residual Mass?
Cutoff Freq (Hz): 33
☑ X Direction Analysis?
Spectra to be Used: ASCE 41-17, BSE-1E
☐ Use Dominant Mode for Signage?
☐ Y Direction Analysis?
Spectra to be Used: ASCE 2016, Parametric Design Spectra
Use Dominant Mode for Signage?
☑ Z Direction Analysis?
Spectra to be Used: ASCE 41-17, BSE-1E
☐ Use Dominant Mode for Signage?



Eigensolution
Number of Modes: 22
Load Combinations for Mass: LC 2: Dead Loads (Seismi...
Response Spectra Analysis
Combination Method: CQC
Damping Ratio(%): 5
☐ Calc Residual Mass?
Cutoff Freq (Hz): 33
☑ X Direction Analysis?
Spectra to be Used: ASCE 41-17, BSE-2E
☐ Use Dominant Mode for Signage?
☐ Y Direction Analysis?
Spectra to be Used: ASCE 2016, Parametric Design Spectra
Use Dominant Mode for Signage?
☑ Z Direction Analysis?
Spectra to be Used: ASCE 41-17, BSE-2E
☐ Use Dominant Mode for Signage?

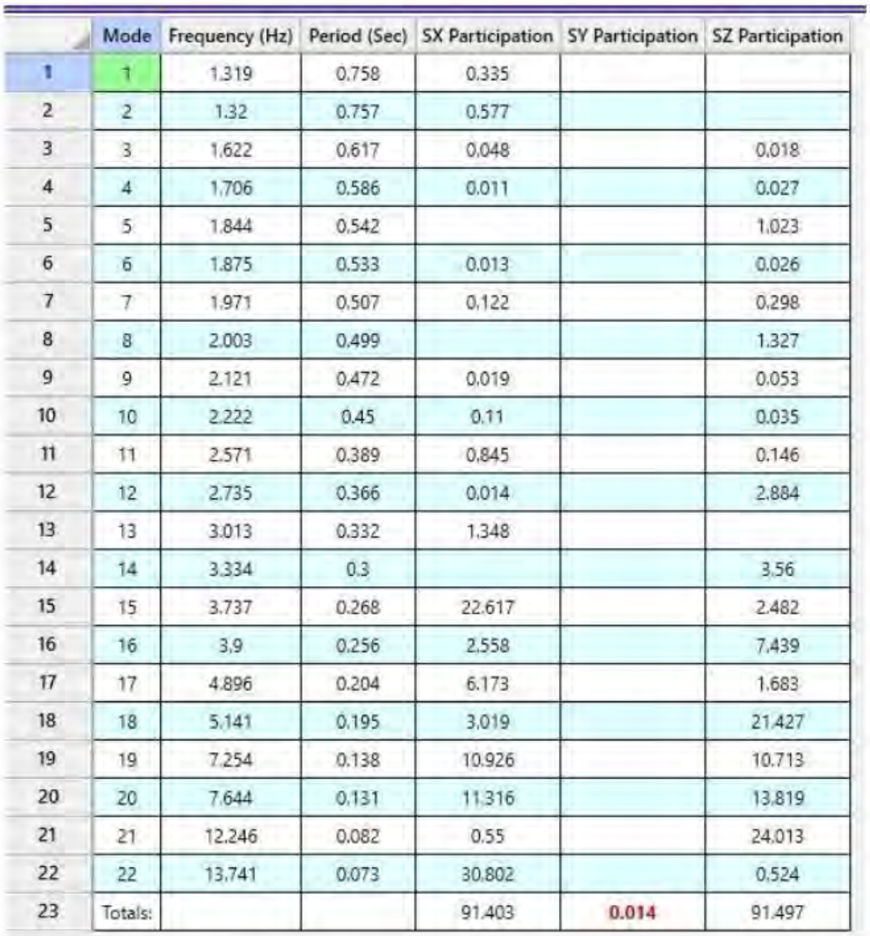
Solver Used: Ritz Vector. This is the recommended solver per RISA for models containing plates to simulate diaphragm behavior. Other solvers are less effective for the desired purposes as they can produce many modes with little participation due to out-of-plane plate effects.

Building Modes

Per Section 7.4.2.2.3 of ASCE 41, minimum 90% mass participation is required in each direction. For both seismic events, 22 mode shapes were required to achieve 90% participation.

Note: material properties impact the stiffness of the building and thus impact the building response to a subject seismic event. As such, an RSA analysis was performed for both lower-bound material properties for force-controlled actions as well as expected material properties for deformation-controlled actions.

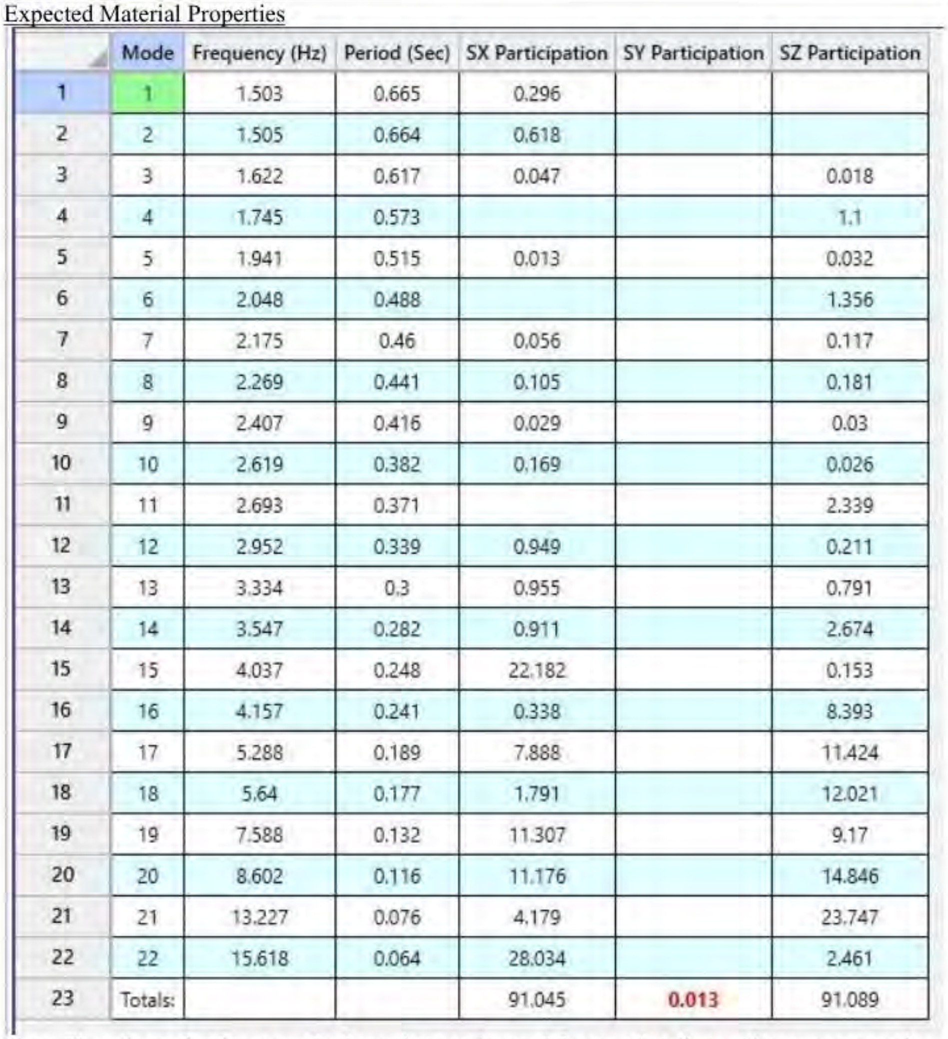
Lower-Bound Material Properties



	Mode	Frequency (Hz)	Period (Sec)	SX Participation	SY Participation	SZ Participation
1	1	1.319	0.758	0.335		
2	2	1.32	0.757	0.577		
3	3	1.622	0.617	0.048		0.018
4	4	1.706	0.586	0.011		0.027
5	5	1.844	0.542			1.023
6	6	1.875	0.533	0.013		0.026
7	7	1.971	0.507	0.122		0.298
8	8	2.003	0.499			1.327
9	9	2.121	0.472	0.019		0.053
10	10	2.222	0.45	0.11		0.035
11	11	2.571	0.389	0.845		0.146
12	12	2.735	0.366	0.014		2.884
13	13	3.013	0.332	1.348		
14	14	3.334	0.3			3.56
15	15	3.737	0.268	22.617		2.482
16	16	3.9	0.256	2.558		7.439
17	17	4.896	0.204	6.173		1.683
18	18	5.141	0.195	3.019		21.427
19	19	7.254	0.138	10.926		10.713
20	20	7.644	0.131	11.316		13.819
21	21	12.246	0.082	0.55		24.013
22	22	13.741	0.073	30.802		0.524
23	Totals:			91.403	0.014	91.497

Note: There is no dominant mode shape that can be used for reaction signage because no mode has greater than 70% participation. Also, the frequencies used by RISA can vary slightly each time the modal analysis is performed producing slightly different mass participations and unscaled base shears, though the impacts are negligible.

Expected Material Properties



	Mode	Frequency (Hz)	Period (Sec)	SX Participation	SY Participation	SZ Participation
1	1	1.503	0.665	0.296		
2	2	1.505	0.664	0.618		
3	3	1.622	0.617	0.047		0.018
4	4	1.745	0.573			1.1
5	5	1.941	0.515	0.013		0.032
6	6	2.048	0.488			1.356
7	7	2.175	0.46	0.056		0.117
8	8	2.269	0.441	0.105		0.181
9	9	2.407	0.416	0.029		0.03
10	10	2.619	0.382	0.169		0.026
11	11	2.693	0.371			2.339
12	12	2.952	0.339	0.949		0.211
13	13	3.334	0.3	0.955		0.791
14	14	3.547	0.282	0.911		2.674
15	15	4.037	0.248	22.182		0.153
16	16	4.157	0.241	0.338		8.393
17	17	5.288	0.189	7.888		11.424
18	18	5.64	0.177	1.791		12.021
19	19	7.588	0.132	11.307		9.17
20	20	8.602	0.116	11.176		14.846
21	21	13.227	0.076	4.179		23.747
22	22	15.618	0.064	28.034		2.461
23	Totals:			91.045	0.013	91.089

Note: There is no dominant mode shape that can be used for reaction signage because no mode has greater than 70% participation. Also, the frequencies used by RISA can vary slightly each time the modal analysis is performed producing slightly different mass participations and unscaled base shears, though the impacts are negligible.

Gravity Loads

Load Cases and Combinations

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Nodal	Point	Distributed	Area(Member)	Surface(Plate/Wall)
1	Self Weight	DL		-1						
2	Dead Lower Roof	DL						36		
3	Dead 2nd Floor	DL						82		37
4	Dead Upper Roof	DL						68		
5	Dead 1st Veneer	DL								30
6	Dead 2nd Veneer	DL								34
7	Dead Partition 2nd (GRAV)	DL								
8	Dead Partition 2nd (LAT)	DL								
9	Dead Partition Roof (LAT)	DL						114		
10	Dead Misc.	DL								
11	Live 2nd	LL						63		37
12	Live Roof	RLL						132		
13	Snow Roof	SL						127		37
14	EQx LSP BSE-1E	EL								4458
15	EQz LSP BSE-1E	EL								4458
16	EQx LSP BSE-2E	EL								4456
17	EQz LSP BSE-2E	EL								4458

Load Combinations

	Description	Solve	P-Delta	SRSS	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Seismic Mass	☐																		
2	Dead Loads (Seismic Mass)	☐			[illegible]	1														
3	P-delta investigation	☐	Y		DL															
4	QD (Gravity Only)	☐			1	1	2	1	3	1	4	1	5	1	6	1	7	1	10	1
5	QL	☐			11	1	12	1												
6	QS	☐			13	1														
7	QG = 1.1(QD+QL+QS)	☐			14	1.1	13	1.1	13	1.1										

Structure Dead Weight

Dead loads are "built into" the RISA 3D model based on material properties.

Steel Members:

- Total Members: 242
- Length: 2837.9ft
- Weight: 61.143kip

Cold Formed Steel:

- Weight: 2.103kip

CMU:

- Total Members: 103
- Length: 545.3ft
- Weight: 1177.737kip

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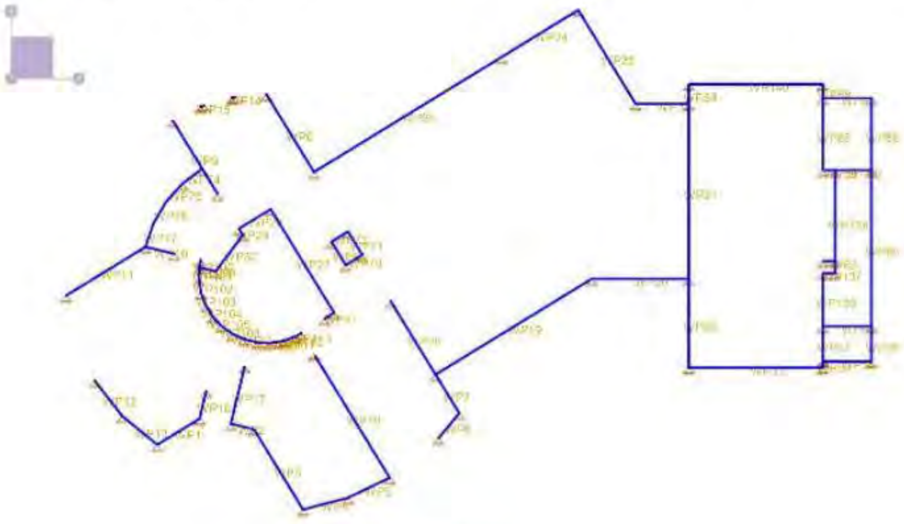
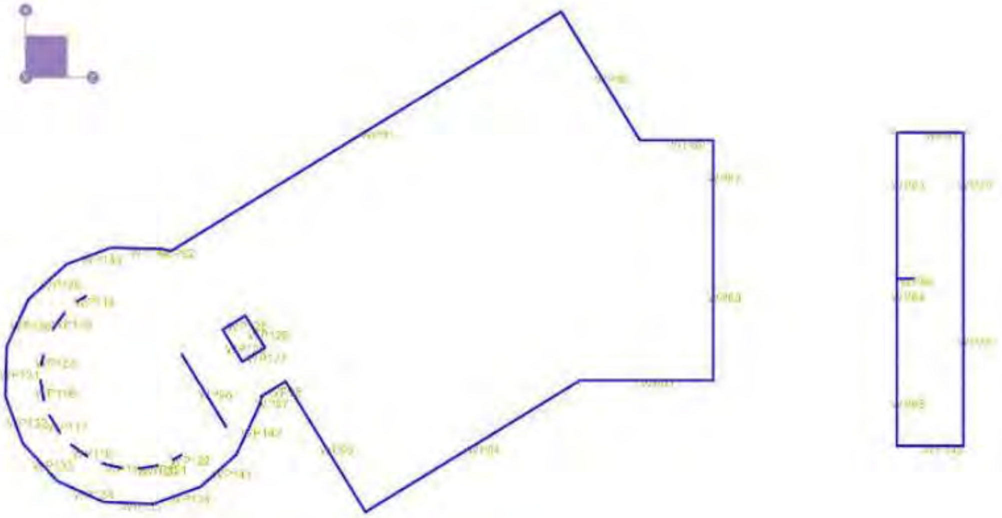
Walls

Superimposed dead loads, live loads, and snow loads are applied to the wall elements based on tributary widths and areas. See figures below for the wall layout. See Appendix for the applied loads summary tables.



1st Floor



2nd Floor

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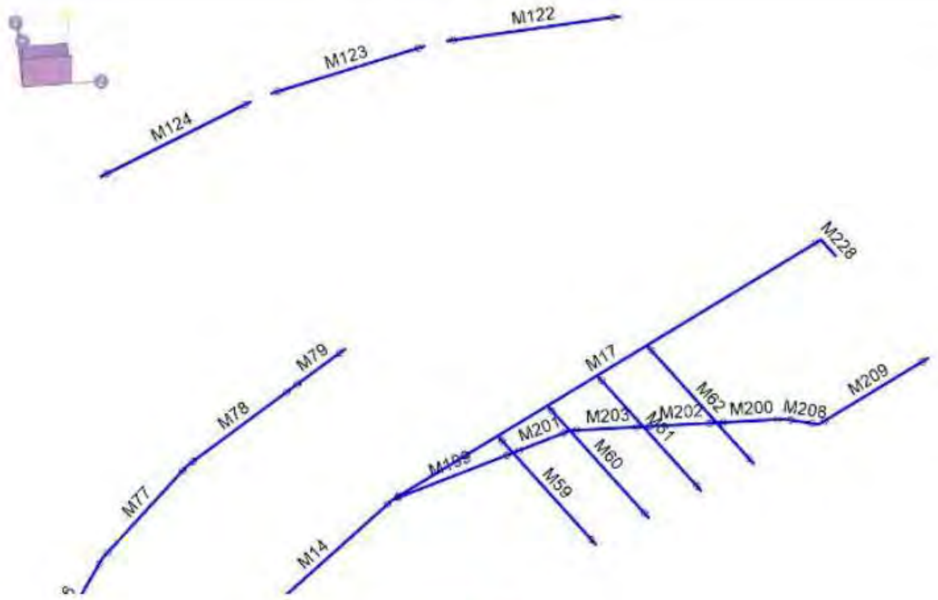
Beams

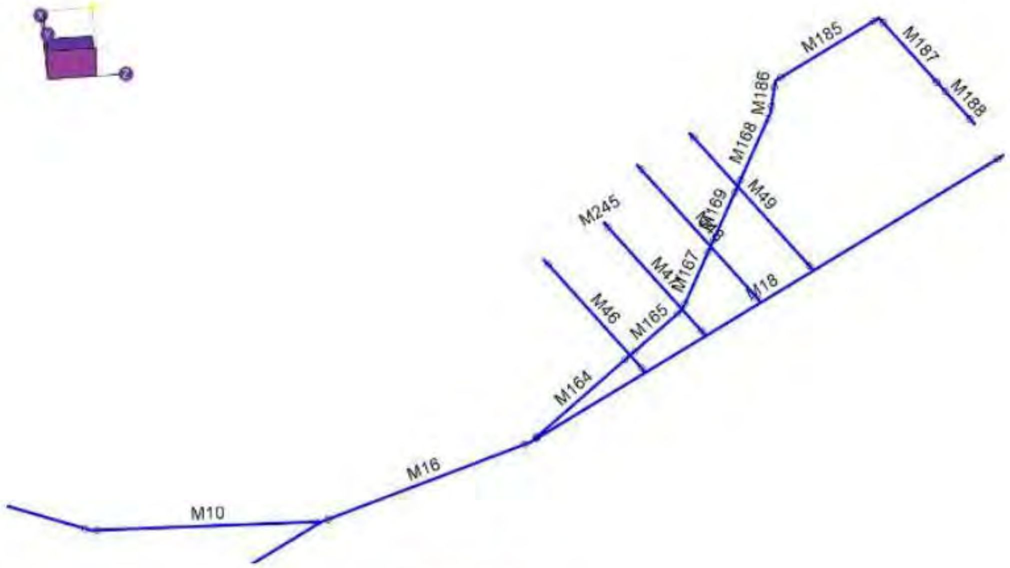
Superimposed dead loads, live loads, and snow loads are applied to the beam elements based on tributary widths and areas. See following pages for the framing layout. See Appendix for the applied loads summary tables.

Lower Roof & Below

Lower Roof



Lower Roof



Lower Roof

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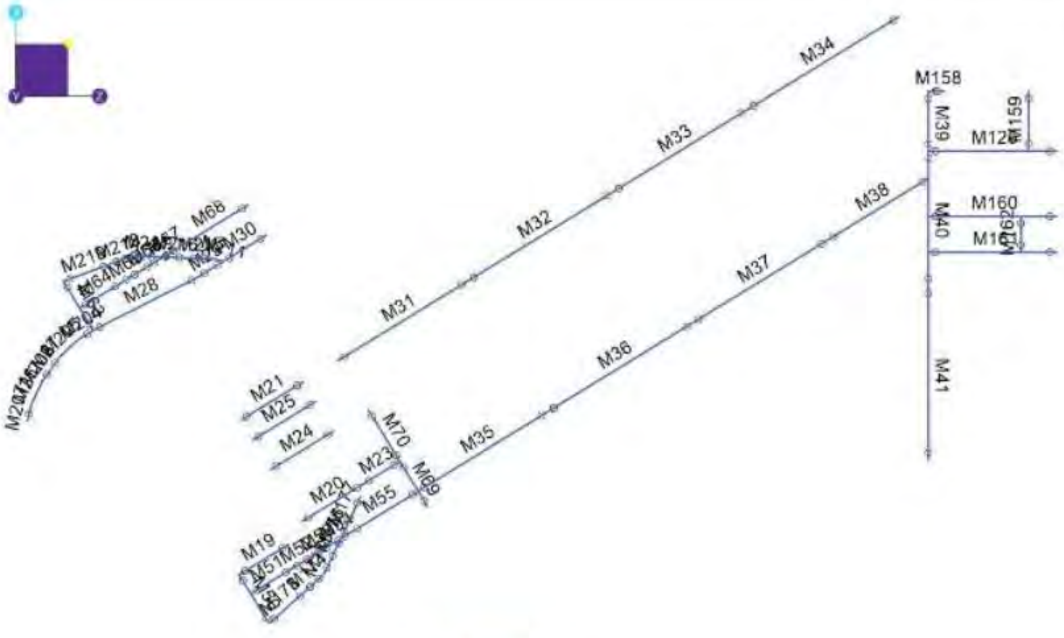
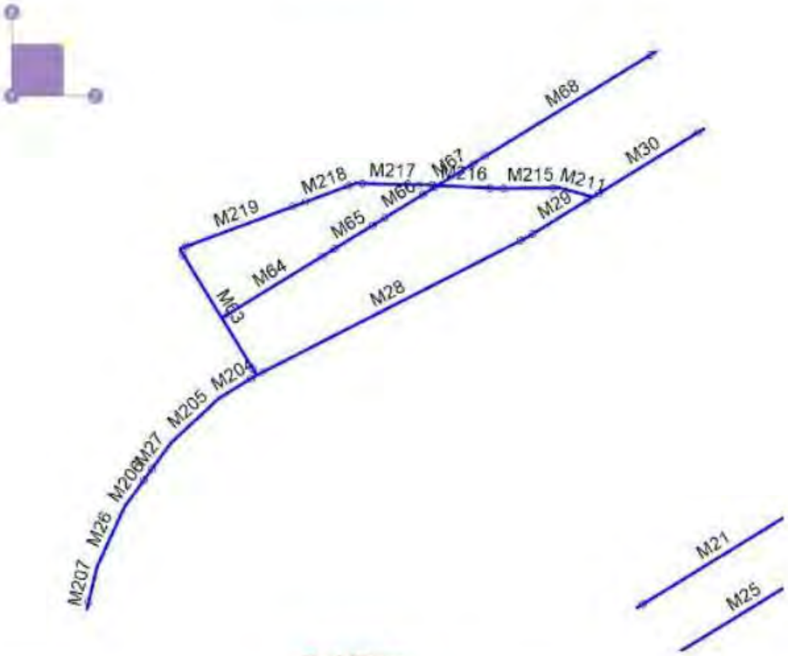


2nd Floor



2nd Floor

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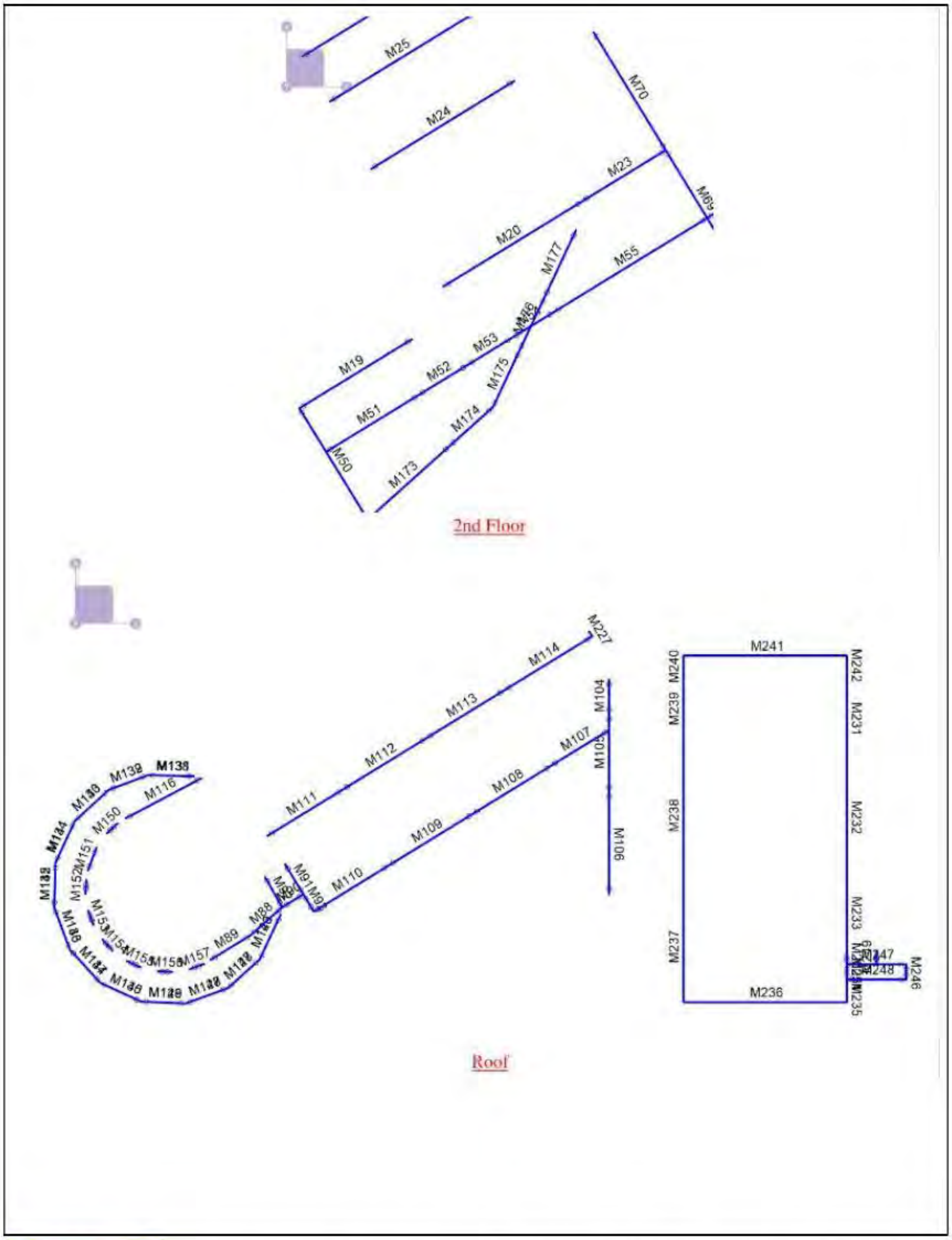

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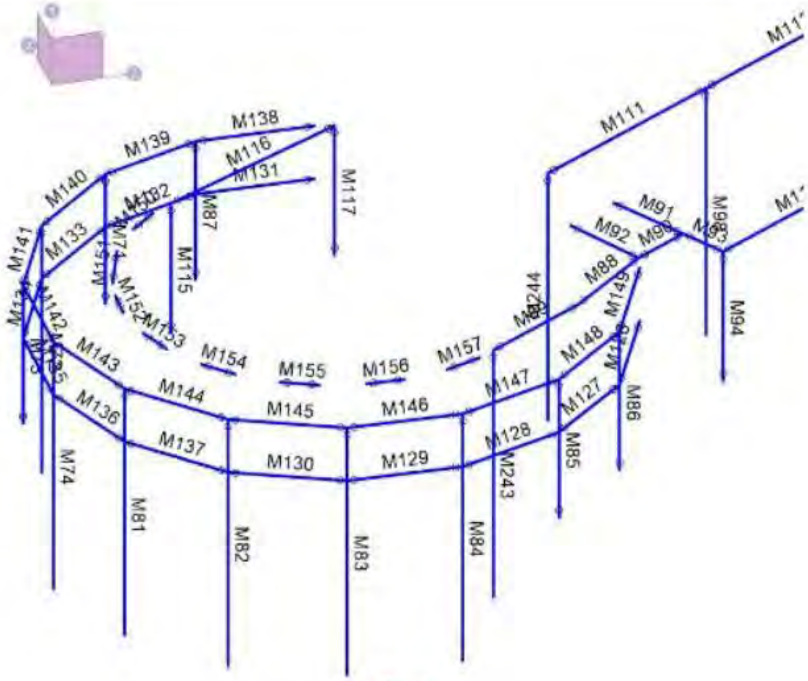

Roof

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Linear Static Procedure Lateral Loads

Base shears and story shears were generated per the Pseudo Seismic Forces for the Linear Static Procedure (LSP) per ASCE 41 Section 7.4.1.3.

The purpose of generating the Pseudo Seismic Forces is to compare to the demands generated per RISA 3D as part of the Linear Dynamic Procedure (LDP). Demands were compared to determine the LDP scaling factors (see future calculations) and to backcheck that demands calculated by RISA 3D using LDP for each element are in the same range as those calculated using the LSP. Elements were not evaluated for the demands generated per LSP.

Story Shears

Tributary masses were calculated to each diaphragm level based on approximate wall weights, tributary brick veneer, steel component weights, and superimposed dead loads. Below is an example of the tabulated masses tributary to Diaphragm 2 – Low Roof, West Side.

Wall ID	Type	Wall Length (ft)	Trib Height (ft)	Weight (kip)	Σ Wall Weight (kip)
WP8	CMU 6" Typ	29.351	8.835	10.891	116.287
WP14	CMU 10" Col	1.334	8.835	1.155	
WP15	CMU 10" Col	1.334	8.835	1.155	
WP9	CMU 6" Dbl Vert @	27.751	8.835	10.298	
WP10	CMU 6" Typ	9.501	8.835	3.526	
WP11	CMU 6" Dbl Vert @	30.061	8.835	11.155	
WP12	CMU 6" Typ	14.535	8.835	5.394	
WP13	CMU 6" Typ	14.535	8.835	5.394	
WP1	CMU 6" Typ	16	8.835	5.937	
WP18	CMU 6" Typ	9.25	6.165	2.395	
WP17	CMU 6" Typ	18.75	6.165	4.855	
WP2	CMU 6" Typ	7.667	8.835	2.845	
WP3	CMU 6" Typ	30.287	8.835	11.239	
WP4	CMU 6" Typ	14.943	8.835	5.545	
WP5	CMU 6" Typ	14.942	8.835	5.545	
WP16	CMU 6" Typ	45.917	6.165	11.889	
WP6	CMU 6" Typ	10.487	8.835	3.891	
WP7	CMU 6" Typ	14.591	8.835	5.414	
WP26	CMU 6" Typ	27.742	6.665	7.766	

Dia. Area (ft^2)	Dia. Load (ksf)	Dia. Weight (kip)
6153	0.0316	194.205

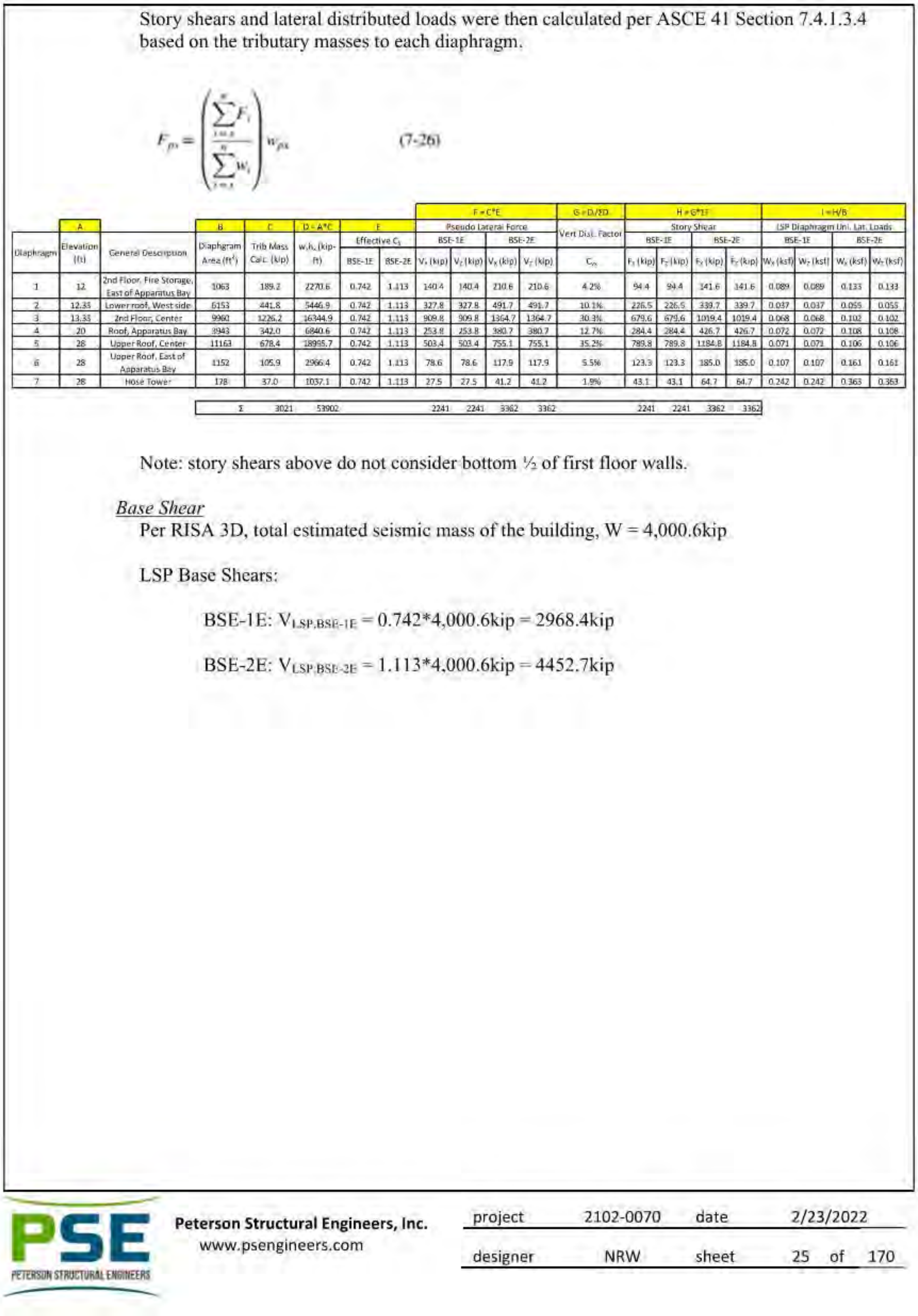
Dia. Area w/veneer (ft^2)	Veneer Weight (kip)
6153	117.484

Dia. Area w/steel (ft^2)	Steel Weight (kip)
6153	13.787

Total Weight Tributary to Diaphragm
441.764 kip

Note:

- Diaphragm weight is calculated based on the average tributary mass of the diaphragm + the interior partition wall loads. For Diaphragm 2, the interior partition wall loads were higher than that of other diaphragms because it is the only region with heavy partitions.
- Veneer and steel framing weights were scaled based on the subject diaphragm area relative to the areas with (veneer/steel). See below:
  - Veneer Weight = Total veneer weight*(Dia Area/ΣDia. Areas with veneer)
  - Steel Weight = Total steel weight*(Dia Area/ΣDia. Areas with steel framing)



Story shears and lateral distributed loads were then calculated per ASCE 41 Section 7.4.1.3.4 based on the tributary masses to each diaphragm.

$$F_{px} = \left(\frac{\sum_{i=x}^{n} F_i}{\sum_{i=x}^{n} w_i} \right) w_{px} \qquad (7\text{-}26)$$

	A		B	C	D = A*C	E		F = C*E				G = D/ΣD	H = G*ΣF				I = H/B			
						Effective C_s		Pseudo Lateral Force				Vert Dist. Factor	Story Shear				LSP Diaphragm Uni. Lat. Loads			
								BSE-1E		BSE-2E			BSE-1E		BSE-2E		BSE-1E		BSE-2E	
Diaphragm	Elevation (ft)	General Description	Diaphgram Area (ft²)	Trib Mass Calc. (kip)	$w_i h_i$ (kip-ft)	BSE-1E	BSE-2E	V_x (kip)	V_z (kip)	V_x (kip)	V_z (kip)	C_{vx}	F_x (kip)	F_z (kip)	F_x (kip)	F_z (kip)	W_x (ksf)	W_z (ksf)	W_x (ksf)	W_z (ksf)
1	12	2nd Floor, Fire Storage, East of Apparatus Bay	1063	189.2	2270.6	0.742	1.113	140.4	140.4	210.6	210.6	4.2%	94.4	94.4	141.6	141.6	0.089	0.089	0.133	0.133
2	12.33	Lower roof, West side	6153	441.8	5446.9	0.742	1.113	327.8	327.8	491.7	491.7	10.1%	226.5	226.5	339.7	339.7	0.037	0.037	0.055	0.055
3	13.33	2nd Floor, Center	9960	1226.2	16344.9	0.742	1.113	909.8	909.8	1364.7	1364.7	30.3%	679.6	679.6	1019.4	1019.4	0.068	0.068	0.102	0.102
4	20	Roof, Apparatus Bay	3943	342.0	6840.6	0.742	1.113	253.8	253.8	380.7	380.7	12.7%	284.4	284.4	426.7	426.7	0.072	0.072	0.108	0.108
5	28	Upper Roof, Center	11163	678.4	18995.7	0.742	1.113	503.4	503.4	755.1	755.1	35.2%	789.8	789.8	1184.8	1184.8	0.071	0.071	0.106	0.106
6	28	Upper Roof, East of Apparatus Bay	1152	105.9	2966.4	0.742	1.113	78.6	78.6	117.9	117.9	5.5%	123.3	123.3	185.0	185.0	0.107	0.107	0.161	0.161
7	28	Hose Tower	178	37.0	1037.1	0.742	1.113	27.5	27.5	41.2	41.2	1.9%	43.1	43.1	64.7	64.7	0.242	0.242	0.363	0.363
			Σ	3021	53902			2241	2241	3362	3362		2241	2241	3362	3362				

Note: story shears above do not consider bottom ½ of first floor walls.

Base Shear

Per RISA 3D, total estimated seismic mass of the building, W = 4,000.6kip

LSP Base Shears:

BSE-1E: $V_{LSP,BSE\text{-}1E}$ = 0.742*4,000.6kip = 2968.4kip

BSE-2E: $V_{LSP,BSE\text{-}2E}$ = 1.113*4,000.6kip = 4452.7kip

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Linear Dynamic Procedure – General Info

Load Combinations

Gravity Effects

Per Section 7.2.2 of ASCE 41, all load combinations with lateral loads shall consider the greater of the effects caused by the following gravity loads.

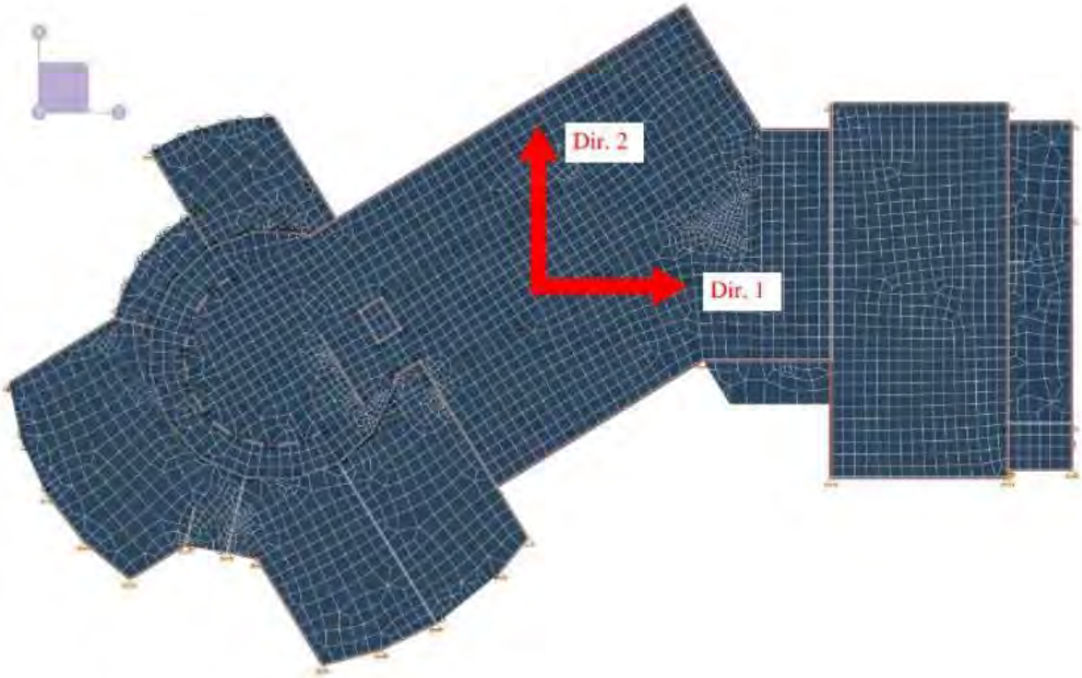
$$Q_G = 1.1(Q_D + Q_L + Q_S)$$

OR

$$0.9Q_D$$

Concurrent Seismic Effects

Due to the building asymmetry and non-orthogonal walls, concurrent multi-directional seismic effects shall be considered per Section 7.2.5.1 of ASCE 41. As such, load combinations considered 100% forces in Direction 1 plus 30% of forces in Direction 2 as well as 30% forces in Direction 1 plus 100% forces in direction 2. Note that positive and negative load lateral loads were also considered.

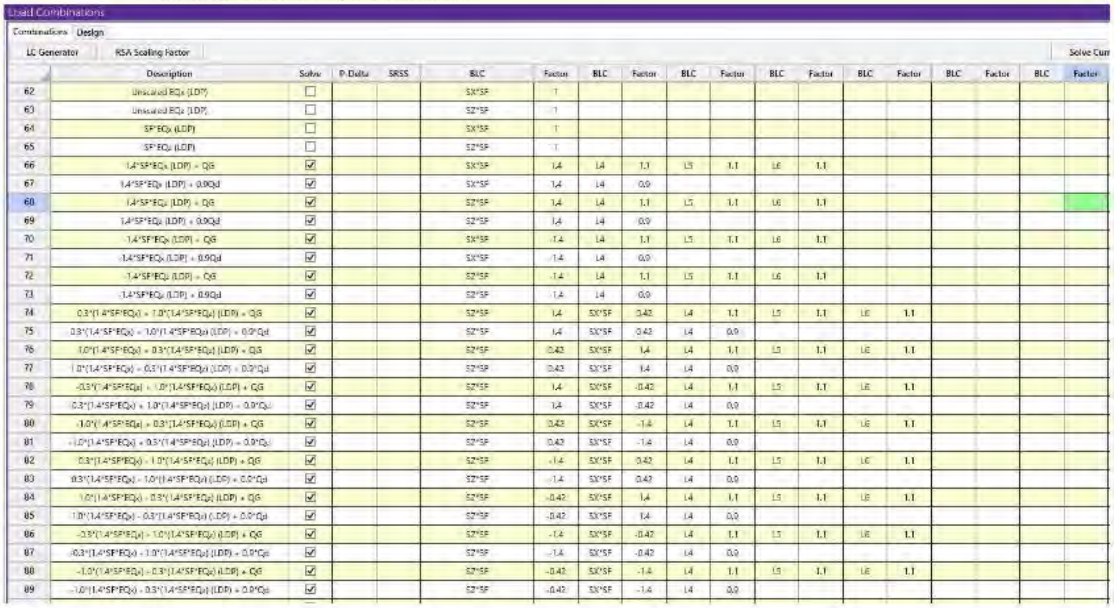


Modification of LDP Demands

Per Section 7.4.2.3.1, forces generated per RSA shall be multiplied by modification factors C_1 and C_2. As previously noted in this report, the product of $C_1C_2 = 1.4$.

Note that effects of torsion were not considered per Section 7.2.3.2 of ASCE 41 because the building contains flexible diaphragms.

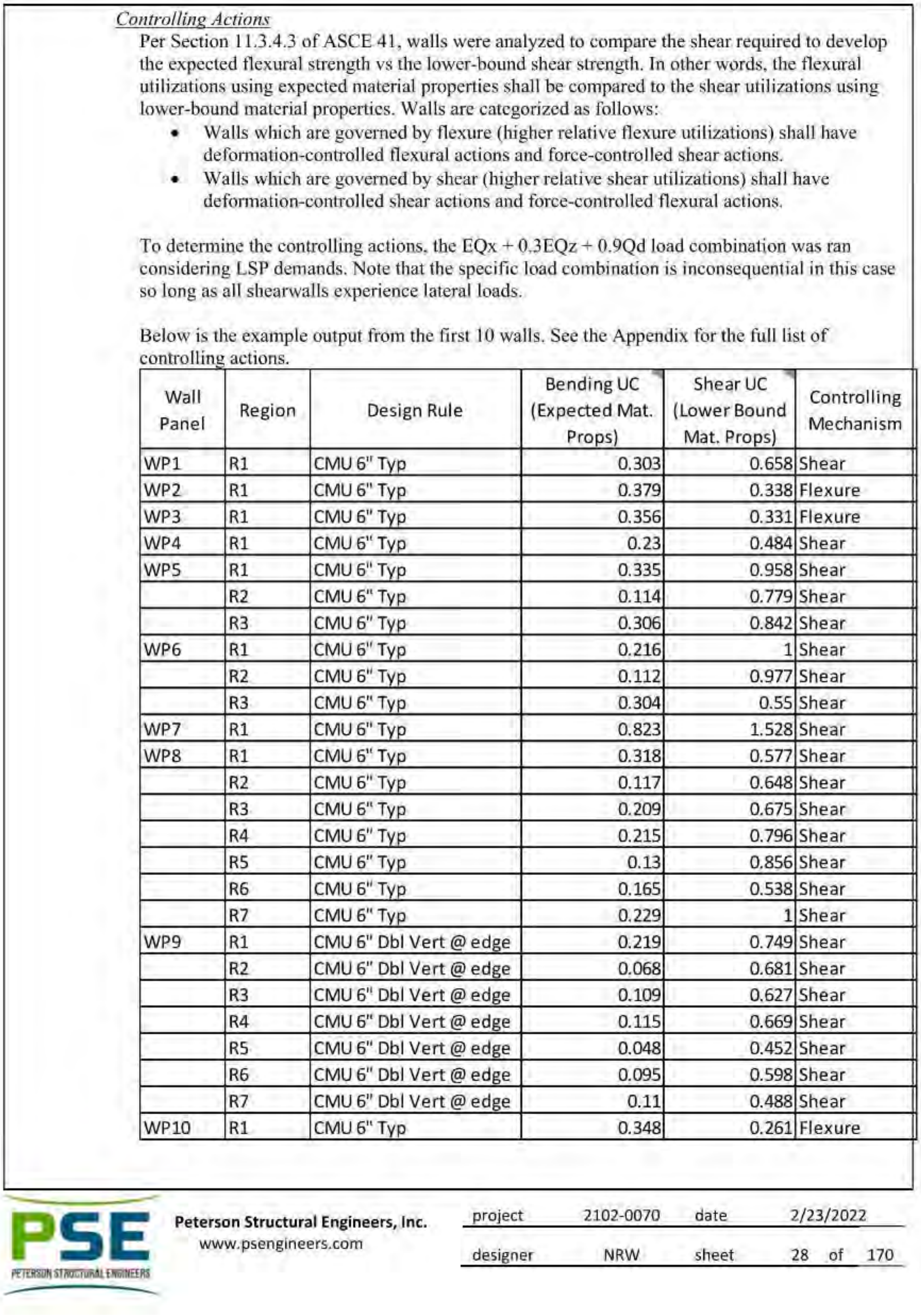
RISA 3D Load Combinations



	Description	Solve	P-Delta	SRSS	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
62	Unscaled EQx (LDP)	☐			SX*SF	1												
63	Unscaled EQz (LDP)	☐			SZ*SF	1												
64	SF*EQx (LDP)	☐			SX*SF	1												
65	SF*EQz (LDP)	☐			SZ*SF	1												
66	1.4*SF*EQx (LDP) + QG	☑			SX*SF	1.4	L4	1.1	L5	1.1	L6	1.1						
67	1.4*SF*EQx (LDP) + 0.9Qd	☑			SX*SF	1.4	L4	0.9										
68	1.4*SF*EQz (LDP) + QG	☑			SZ*SF	1.4	L4	1.1	L5	1.1	L6	1.1						
69	1.4*SF*EQz (LDP) + 0.9Qd	☑			SZ*SF	1.4	L4	0.9										
70	-1.4*SF*EQx (LDP) + QG	☑			SX*SF	-1.4	L4	1.1	L5	1.1	L6	1.1						
71	-1.4*SF*EQx (LDP) + 0.9Qd	☑			SX*SF	-1.4	L4	0.9										
72	-1.4*SF*EQz (LDP) + QG	☑			SZ*SF	-1.4	L4	1.1	L5	1.1	L6	1.1						
73	-1.4*SF*EQz (LDP) + 0.9Qd	☑			SZ*SF	-1.4	L4	0.9										
74	0.3*(1.4*SF*EQx) + 1.0*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	1.4	SX*SF	0.42	L4	1.1	L5	1.1	L6	1.1				
75	0.3*(1.4*SF*EQx) + 1.0*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	1.4	SX*SF	0.42	L4	0.9								
76	1.0*(1.4*SF*EQx) + 0.3*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	0.42	SX*SF	1.4	L4	1.1	L5	1.1	L6	1.1				
77	1.0*(1.4*SF*EQx) + 0.3*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	0.42	SX*SF	1.4	L4	0.9								
78	-0.3*(1.4*SF*EQx) + 1.0*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	1.4	SX*SF	-0.42	L4	1.1	L5	1.1	L6	1.1				
79	-0.3*(1.4*SF*EQx) + 1.0*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	1.4	SX*SF	-0.42	L4	0.9								
80	-1.0*(1.4*SF*EQx) + 0.3*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	0.42	SX*SF	-1.4	L4	1.1	L5	1.1	L6	1.1				
81	-1.0*(1.4*SF*EQx) + 0.3*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	0.42	SX*SF	-1.4	L4	0.9								
82	0.3*(1.4*SF*EQx) - 1.0*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	-1.4	SX*SF	0.42	L4	1.1	L5	1.1	L6	1.1				
83	0.3*(1.4*SF*EQx) - 1.0*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	-1.4	SX*SF	0.42	L4	0.9								
84	1.0*(1.4*SF*EQx) - 0.3*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	-0.42	SX*SF	1.4	L4	1.1	L5	1.1	L6	1.1				
85	1.0*(1.4*SF*EQx) - 0.3*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	-0.42	SX*SF	1.4	L4	0.9								
86	-0.3*(1.4*SF*EQx) - 1.0*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	-1.4	SX*SF	-0.42	L4	1.1	L5	1.1	L6	1.1				
87	-0.3*(1.4*SF*EQx) - 1.0*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	-1.4	SX*SF	-0.42	L4	0.9								
88	-1.0*(1.4*SF*EQx) - 0.3*(1.4*SF*EQz) (LDP) + QG	☑			SZ*SF	-0.42	SX*SF	-1.4	L4	1.1	L5	1.1	L6	1.1				
89	-1.0*(1.4*SF*EQx) - 0.3*(1.4*SF*EQz) (LDP) + 0.9*Qd	☑			SZ*SF	-0.42	SX*SF	-1.4	L4	0.9								

Load Combinations Simplified:
+/-0.3[(C_1C_2)*SF*EQx)] +/-[1.0[(C_1C_2)*SF*EQz)] +(Q_G or $0.9Q_D$)
+/-1.0[(C_1C_2)*SF*EQx)] +/-[0.3[(C_1C_2)*SF*EQz)] +(Q_G or $0.9Q_D$)

Note: SF = RSA Scaling factor, which is calculated in later sections



Controlling Actions

Per Section 11.3.4.3 of ASCE 41, walls were analyzed to compare the shear required to develop the expected flexural strength vs the lower-bound shear strength. In other words, the flexural utilizations using expected material properties shall be compared to the shear utilizations using lower-bound material properties. Walls are categorized as follows:

- Walls which are governed by flexure (higher relative flexure utilizations) shall have deformation-controlled flexural actions and force-controlled shear actions.
- Walls which are governed by shear (higher relative shear utilizations) shall have deformation-controlled shear actions and force-controlled flexural actions.

To determine the controlling actions, the EQx + 0.3EQz + 0.9Qd load combination was ran considering LSP demands. Note that the specific load combination is inconsequential in this case so long as all shearwalls experience lateral loads.

Below is the example output from the first 10 walls. See the Appendix for the full list of controlling actions.

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP1	R1	CMU 6" Typ	0.303	0.658	Shear
WP2	R1	CMU 6" Typ	0.379	0.338	Flexure
WP3	R1	CMU 6" Typ	0.356	0.331	Flexure
WP4	R1	CMU 6" Typ	0.23	0.484	Shear
WP5	R1	CMU 6" Typ	0.335	0.958	Shear
	R2	CMU 6" Typ	0.114	0.779	Shear
	R3	CMU 6" Typ	0.306	0.842	Shear
WP6	R1	CMU 6" Typ	0.216	1	Shear
	R2	CMU 6" Typ	0.112	0.977	Shear
	R3	CMU 6" Typ	0.304	0.55	Shear
WP7	R1	CMU 6" Typ	0.823	1.528	Shear
WP8	R1	CMU 6" Typ	0.318	0.577	Shear
	R2	CMU 6" Typ	0.117	0.648	Shear
	R3	CMU 6" Typ	0.209	0.675	Shear
	R4	CMU 6" Typ	0.215	0.796	Shear
	R5	CMU 6" Typ	0.13	0.856	Shear
	R6	CMU 6" Typ	0.165	0.538	Shear
	R7	CMU 6" Typ	0.229	1	Shear
WP9	R1	CMU 6" Dbl Vert @ edge	0.219	0.749	Shear
	R2	CMU 6" Dbl Vert @ edge	0.068	0.681	Shear
	R3	CMU 6" Dbl Vert @ edge	0.109	0.627	Shear
	R4	CMU 6" Dbl Vert @ edge	0.115	0.669	Shear
	R5	CMU 6" Dbl Vert @ edge	0.048	0.452	Shear
	R6	CMU 6" Dbl Vert @ edge	0.095	0.598	Shear
	R7	CMU 6" Dbl Vert @ edge	0.11	0.488	Shear
WP10	R1	CMU 6" Typ	0.348	0.261	Flexure

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Linear Dynamic Procedure – BSE-1E

Unscaled Base Shears

Lower-Bound Material Properties

RISA 3D generates unscaled base shears based on the seismic response spectrum and mass contributions. Below are the unscaled base shears (UBS) for BSE-1E:

- Z-Direction: 1523.092kip
- X-Direction: 1454.078kip

Expected Material Properties

RISA 3D generates unscaled base shears based on the seismic response spectrum and mass contributions. Below are the unscaled base shears (UBS) for BSE-1E:

- Z-Direction: 1461.185kip
- X-Direction: 1414.833kip

Note: There will be some slight variance in Unscaled Base Shears (+/-0.5%) each time the model is ran due to slight differences in the frequencies chosen by RISA for the model analysis. Variation in unscaled base shears will have a negligible impact on the final model outputs.

RSA Scaling Factor

RSA Scaling Factors (SF) needs to be applied to ensure that the forces generated using the RSA exceed 85% of the forces generated per the LSP per Section 7.4.2.3.2 of ASCE 41. Because the load combinations used in RISA 3D factor in C_1C_2, they must be factored out when calculating the RSA Scaling factors as to not double count it.

$C_1C_2[USB] > 0.85[LSP]$

$\therefore SF = 0.85*[LSP]/1.4[USB]$

Lower-Bound Material Properties

Recall: $[LSP] = V_{LSP,BSE\text{-}1E} = 2968.4kip$
$[USB]_Z = 1523.092kip$
$[USB]_X = 1454.078kip$

$\therefore SF_Z = 1.183$

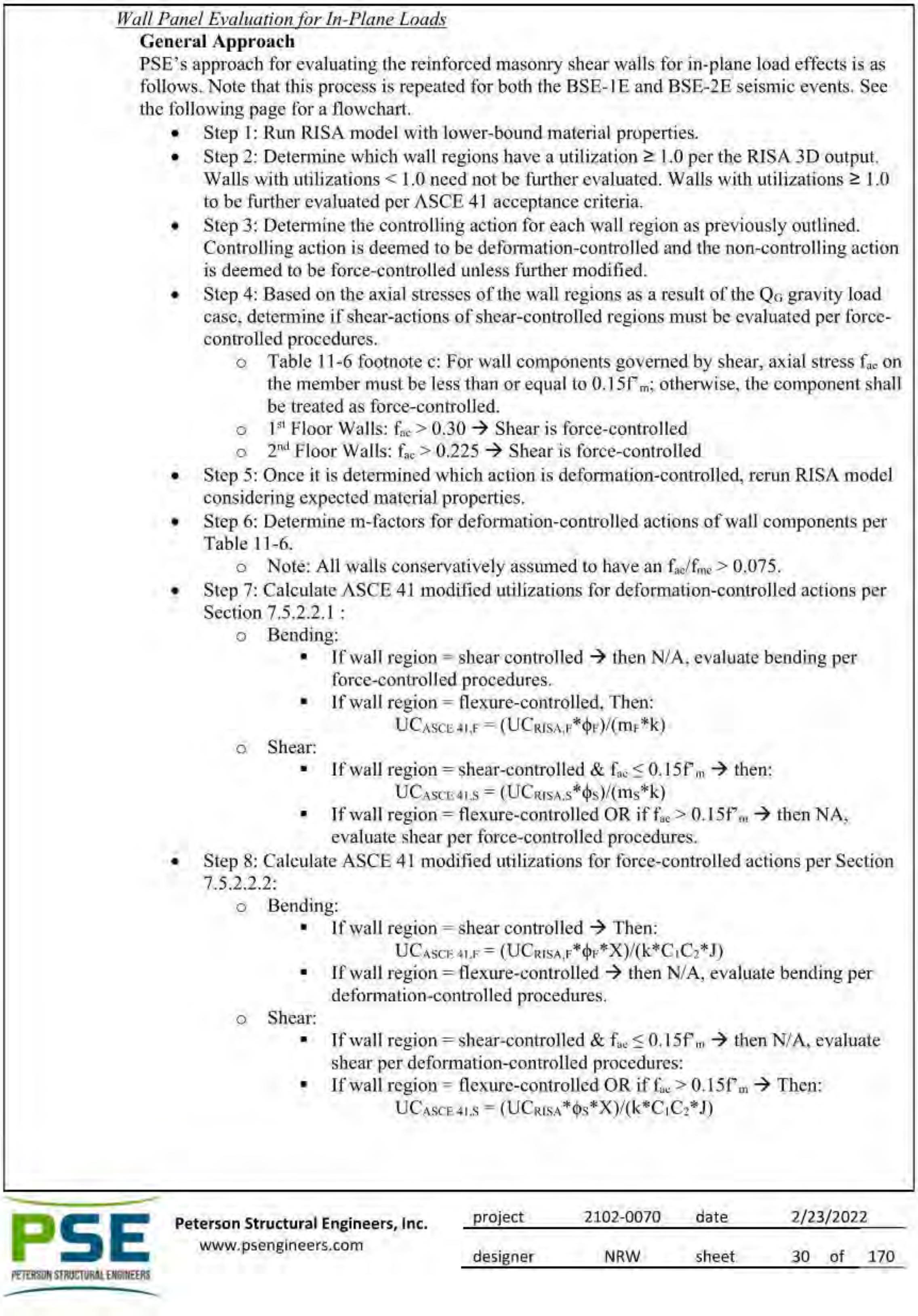
$\therefore SF_X = 1.240$

Expected Material Properties

Recall: $[LSP] = V_{LSP,BSE\text{-}1E} = 2968.4kip$
$[USB]_Z = 1461.185kip$
$[USB]_X = 1414.833kip$

$\therefore SF_Z = 1.234$

$\therefore SF_X = 1.274$



Wall Panel Evaluation for In-Plane Loads

General Approach

PSE's approach for evaluating the reinforced masonry shear walls for in-plane load effects is as follows. Note that this process is repeated for both the BSE-1E and BSE-2E seismic events. See the following page for a flowchart.

- Step 1: Run RISA model with lower-bound material properties.
- Step 2: Determine which wall regions have a utilization ≥ 1.0 per the RISA 3D output. Walls with utilizations < 1.0 need not be further evaluated. Walls with utilizations ≥ 1.0 to be further evaluated per ASCE 41 acceptance criteria.
- Step 3: Determine the controlling action for each wall region as previously outlined. Controlling action is deemed to be deformation-controlled and the non-controlling action is deemed to be force-controlled unless further modified.
- Step 4: Based on the axial stresses of the wall regions as a result of the Q_G gravity load case, determine if shear-actions of shear-controlled regions must be evaluated per force-controlled procedures.
    - Table 11-6 footnote c: For wall components governed by shear, axial stress f_{ac} on the member must be less than or equal to $0.15f'_m$; otherwise, the component shall be treated as force-controlled.
    - 1st Floor Walls: $f_{ac} > 0.30$ → Shear is force-controlled
    - 2nd Floor Walls: $f_{ac} > 0.225$ → Shear is force-controlled
- Step 5: Once it is determined which action is deformation-controlled, rerun RISA model considering expected material properties.
- Step 6: Determine m-factors for deformation-controlled actions of wall components per Table 11-6.
    - Note: All walls conservatively assumed to have an $f_{ac}/f_{me} > 0.075$.
- Step 7: Calculate ASCE 41 modified utilizations for deformation-controlled actions per Section 7.5.2.2.1 :
    - Bending:
        - If wall region = shear controlled → then N/A, evaluate bending per force-controlled procedures.
        - If wall region = flexure-controlled, Then:
          $UC_{ASCE\ 41,F} = (UC_{RISA,F}*\phi_F)/(m_F*k)$
    - Shear:
        - If wall region = shear-controlled & $f_{ac} \leq 0.15f'_m$ → then:
          $UC_{ASCE\ 41,S} = (UC_{RISA,S}*\phi_S)/(m_S*k)$
        - If wall region = flexure-controlled OR if $f_{ac} > 0.15f'_m$ → then NA, evaluate shear per force-controlled procedures.
- Step 8: Calculate ASCE 41 modified utilizations for force-controlled actions per Section 7.5.2.2.2:
    - Bending:
        - If wall region = shear controlled → Then:
          $UC_{ASCE\ 41,F} = (UC_{RISA,F}*\phi_F*X)/(k*C_1C_2*J)$
        - If wall region = flexure-controlled → then N/A, evaluate bending per deformation-controlled procedures.
    - Shear:
        - If wall region = shear-controlled & $f_{ac} \leq 0.15f'_m$ → then N/A, evaluate shear per deformation-controlled procedures:
        - If wall region = flexure-controlled OR if $f_{ac} > 0.15f'_m$ → Then:
          $UC_{ASCE\ 41,S} = (UC_{RISA}*\phi_S*X)/(k*C_1C_2*J)$

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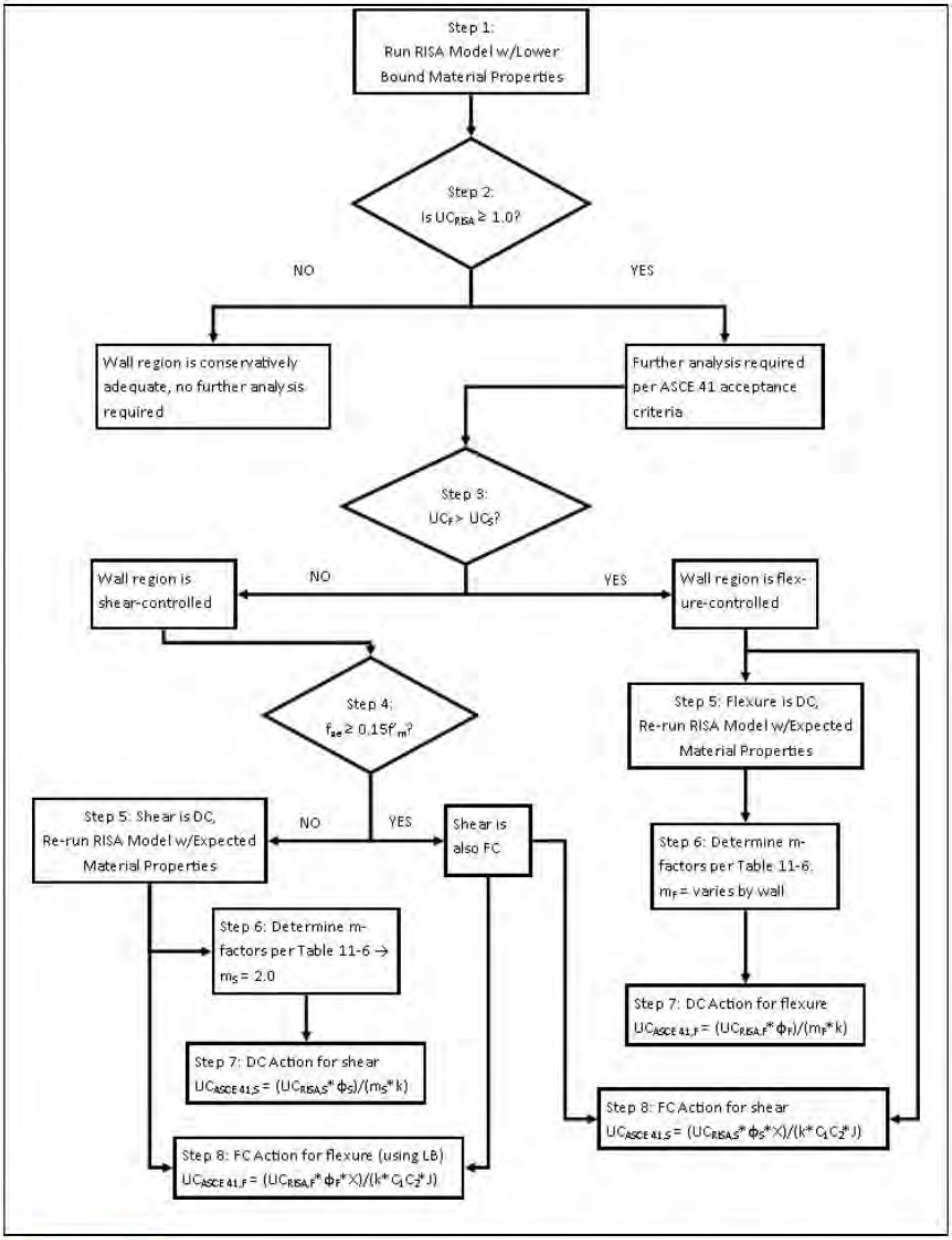

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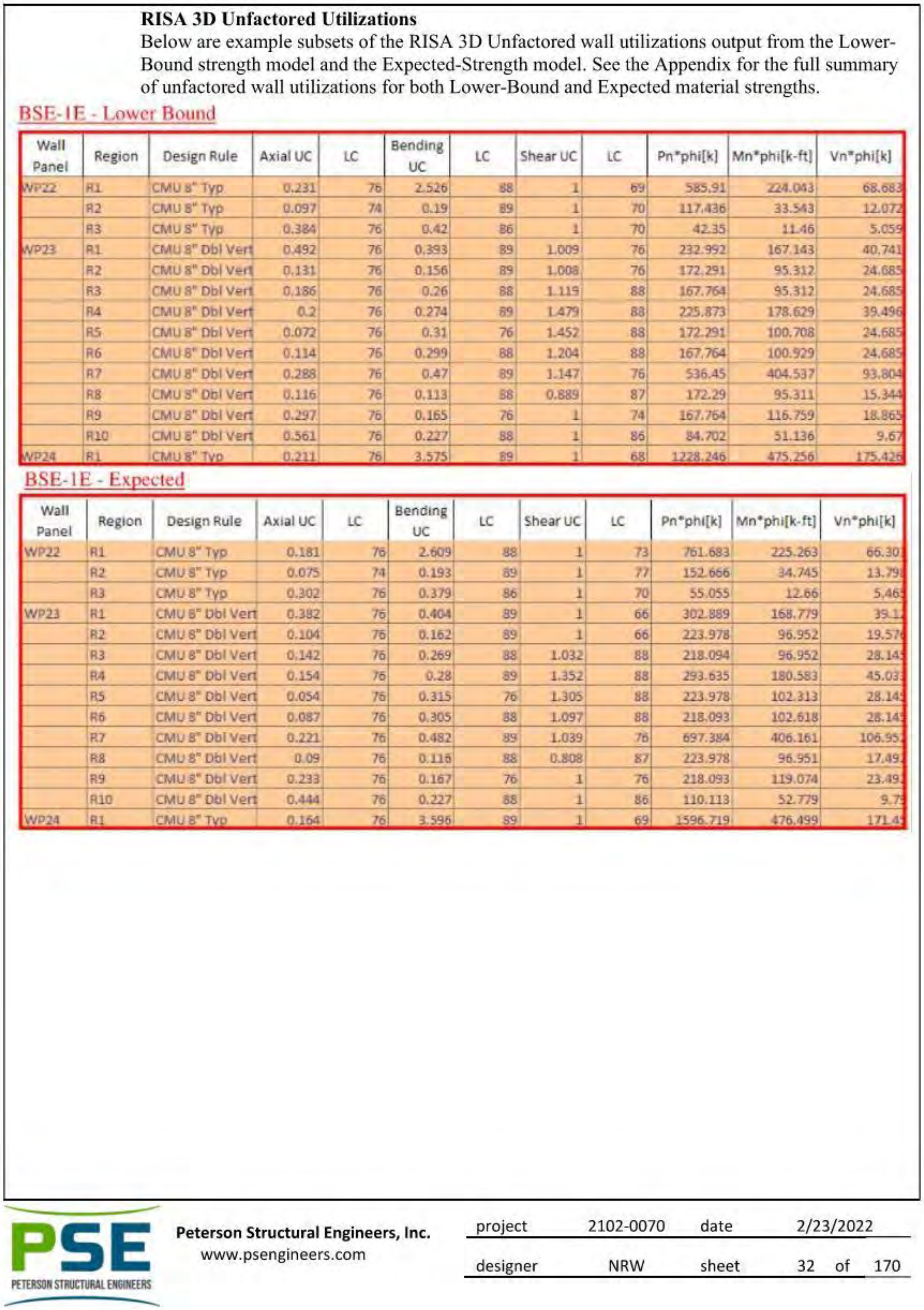

RISA 3D Unfactored Utilizations

Below are example subsets of the RISA 3D Unfactored wall utilizations output from the Lower-Bound strength model and the Expected-Strength model. See the Appendix for the full summary of unfactored wall utilizations for both Lower-Bound and Expected material strengths.

BSE-1E - Lower Bound

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP22	R1	CMU 8" Typ	0.231	76	2.526	88	1	69	585.91	224.043	68.683
	R2	CMU 8" Typ	0.097	74	0.19	89	1	70	117.436	33.543	12.072
	R3	CMU 8" Typ	0.384	76	0.42	86	1	70	42.35	11.46	5.059
WP23	R1	CMU 8" Dbl Vert	0.492	76	0.393	89	1.009	76	232.992	167.143	40.741
	R2	CMU 8" Dbl Vert	0.131	76	0.156	89	1.008	76	172.291	95.312	24.685
	R3	CMU 8" Dbl Vert	0.186	76	0.26	88	1.119	88	167.764	95.312	24.685
	R4	CMU 8" Dbl Vert	0.2	76	0.274	89	1.479	88	225.873	178.629	39.496
	R5	CMU 8" Dbl Vert	0.072	76	0.31	76	1.452	88	172.291	100.708	24.685
	R6	CMU 8" Dbl Vert	0.114	76	0.299	88	1.204	88	167.764	100.929	24.685
	R7	CMU 8" Dbl Vert	0.288	76	0.47	89	1.147	76	536.45	404.537	93.804
	R8	CMU 8" Dbl Vert	0.116	76	0.113	88	0.889	87	172.29	95.311	15.344
	R9	CMU 8" Dbl Vert	0.297	76	0.165	76	1	74	167.764	116.759	18.865
	R10	CMU 8" Dbl Vert	0.561	76	0.227	88	1	86	84.702	51.136	9.67
WP24	R1	CMU 8" Typ	0.211	76	3.575	89	1	68	1228.246	475.256	175.426

BSE-1E - Expected

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP22	R1	CMU 8" Typ	0.181	76	2.609	88	1	73	761.683	225.263	66.30
	R2	CMU 8" Typ	0.075	74	0.193	89	1	77	152.666	34.745	13.79
	R3	CMU 8" Typ	0.302	76	0.379	86	1	70	55.055	12.66	5.46
WP23	R1	CMU 8" Dbl Vert	0.382	76	0.404	89	1	66	302.889	168.779	39.1
	R2	CMU 8" Dbl Vert	0.104	76	0.162	89	1	66	223.978	96.952	19.57
	R3	CMU 8" Dbl Vert	0.142	76	0.269	88	1.032	88	218.094	96.952	28.14
	R4	CMU 8" Dbl Vert	0.154	76	0.28	89	1.352	88	293.635	180.583	45.03
	R5	CMU 8" Dbl Vert	0.054	76	0.315	76	1.305	88	223.978	102.313	28.14
	R6	CMU 8" Dbl Vert	0.087	76	0.305	88	1.097	88	218.093	102.618	28.14
	R7	CMU 8" Dbl Vert	0.221	76	0.482	89	1.039	76	697.384	406.161	106.95
	R8	CMU 8" Dbl Vert	0.09	76	0.116	88	0.808	87	223.978	96.951	17.49
	R9	CMU 8" Dbl Vert	0.233	76	0.167	76	1	76	218.093	119.074	23.49
	R10	CMU 8" Dbl Vert	0.444	76	0.227	88	1	86	110.113	52.779	9.7
WP24	R1	CMU 8" Typ	0.164	76	3.596	89	1	69	1596.719	476.499	171.4

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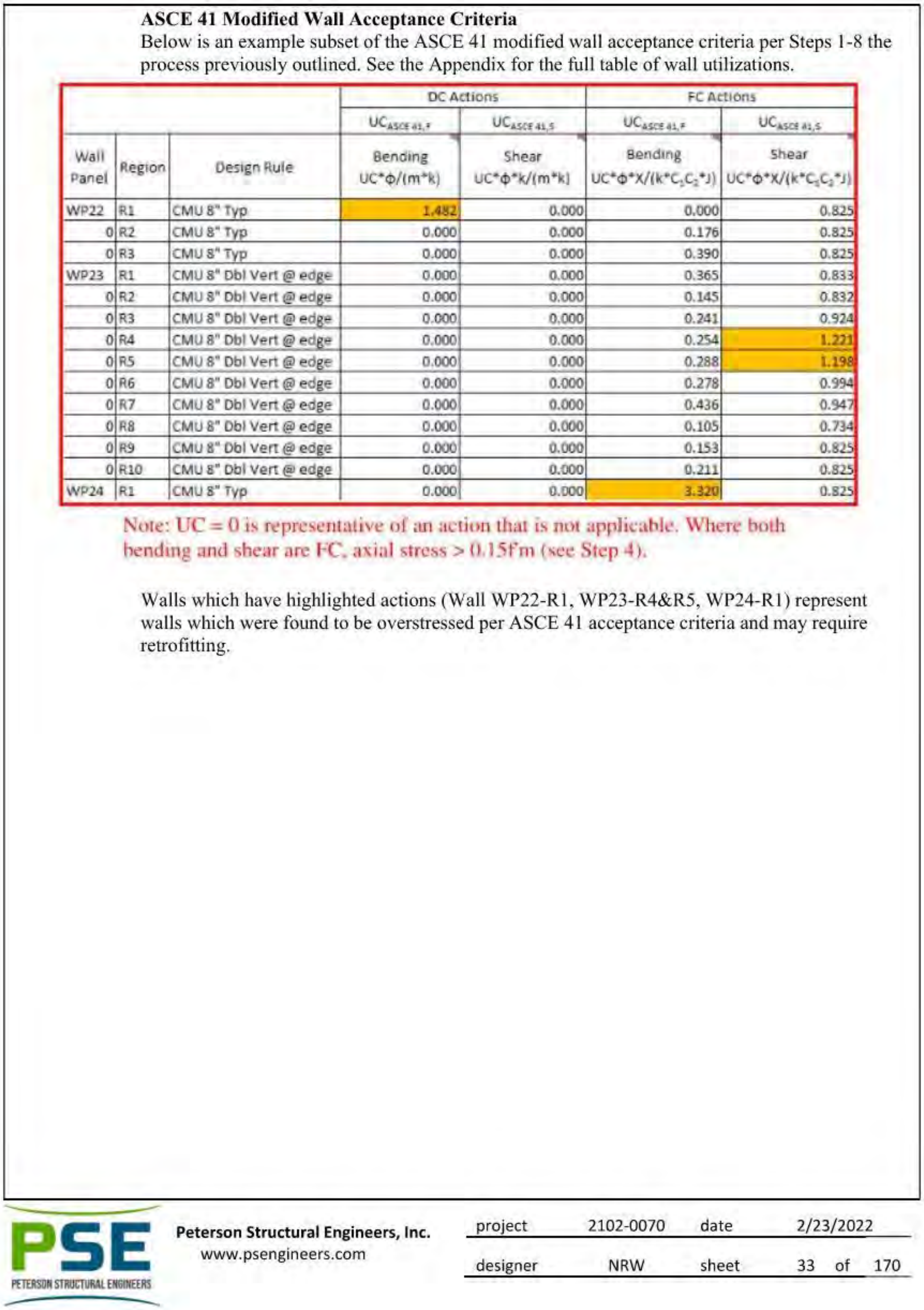

ASCE 41 Modified Wall Acceptance Criteria

Below is an example subset of the ASCE 41 modified wall acceptance criteria per Steps 1-8 the process previously outlined. See the Appendix for the full table of wall utilizations.

			DC Actions		FC Actions	
			$UC_{ASCE\ 41,F}$	$UC_{ASCE\ 41,S}$	$UC_{ASCE\ 41,F}$	$UC_{ASCE\ 41,S}$
Wall Panel	Region	Design Rule	Bending $UC*\phi/(m*k)$	Shear $UC*\phi*k/(m*k)$	Bending $UC*\phi*X/(k*C_1C_2*J)$	Shear $UC*\phi*X/(k*C_1C_2*J)$
WP22	R1	CMU 8" Typ	1.482	0.000	0.000	0.825
0	R2	CMU 8" Typ	0.000	0.000	0.176	0.825
0	R3	CMU 8" Typ	0.000	0.000	0.390	0.825
WP23	R1	CMU 8" Dbl Vert @ edge	0.000	0.000	0.365	0.833
0	R2	CMU 8" Dbl Vert @ edge	0.000	0.000	0.145	0.832
0	R3	CMU 8" Dbl Vert @ edge	0.000	0.000	0.241	0.924
0	R4	CMU 8" Dbl Vert @ edge	0.000	0.000	0.254	1.221
0	R5	CMU 8" Dbl Vert @ edge	0.000	0.000	0.288	1.198
0	R6	CMU 8" Dbl Vert @ edge	0.000	0.000	0.278	0.994
0	R7	CMU 8" Dbl Vert @ edge	0.000	0.000	0.436	0.947
0	R8	CMU 8" Dbl Vert @ edge	0.000	0.000	0.105	0.734
0	R9	CMU 8" Dbl Vert @ edge	0.000	0.000	0.153	0.825
0	R10	CMU 8" Dbl Vert @ edge	0.000	0.000	0.211	0.825
WP24	R1	CMU 8" Typ	0.000	0.000	3.320	0.825

Note: UC = 0 is representative of an action that is not applicable. Where both bending and shear are FC, axial stress > 0.15f'm (see Step 4).

Walls which have highlighted actions (Wall WP22-R1, WP23-R4&R5, WP24-R1) represent walls which were found to be overstressed per ASCE 41 acceptance criteria and may require retrofitting.

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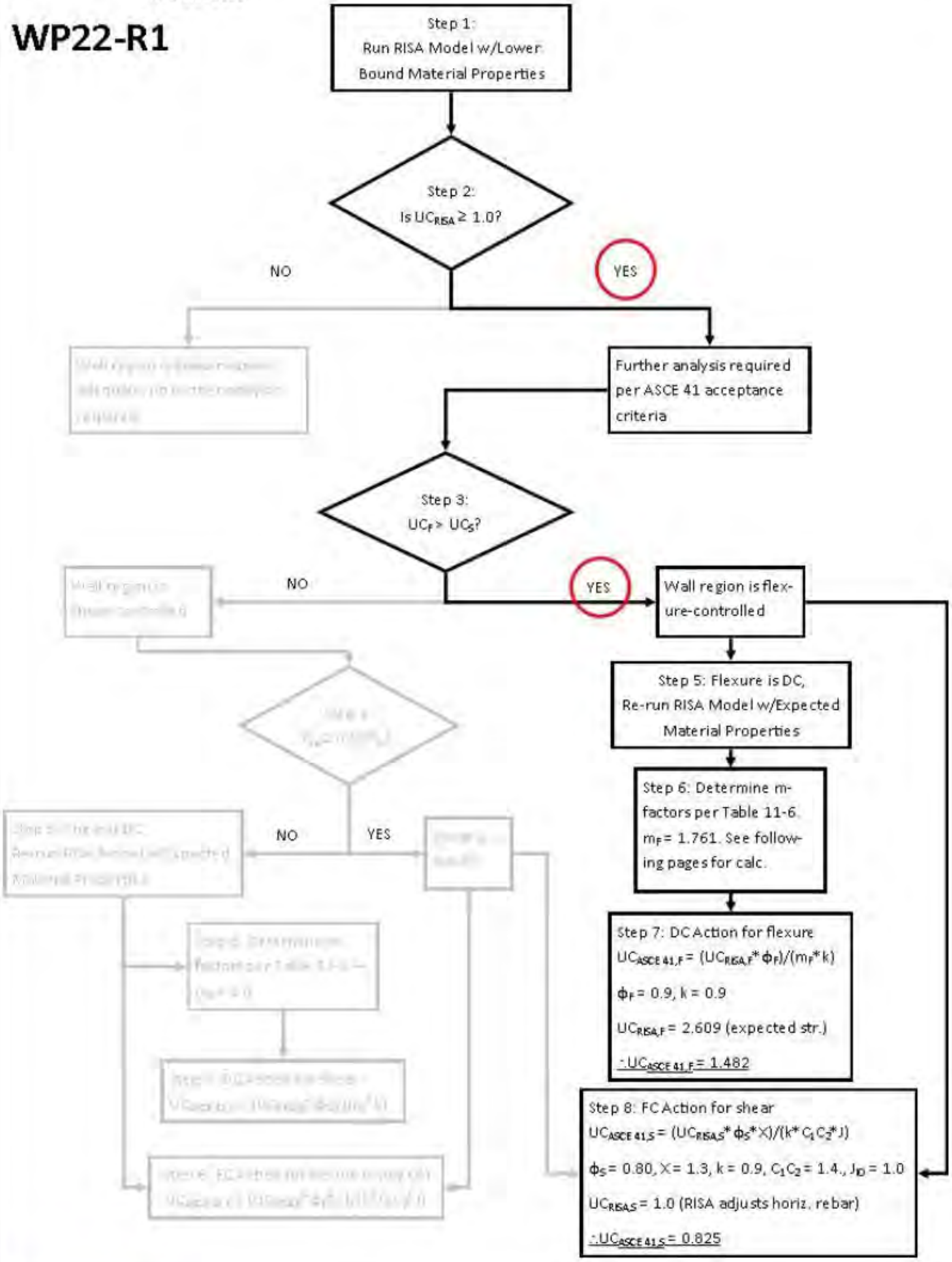
Example Calculations
WP22-R1:



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m-factor determination:

Double interpolate the m-factor using Table 11-6 based on the effective aspect ratio (h/L) and the modified reinforcing ratio.

Subject wall is on the 1st floor, ∴f'$_m$ = 2,000psi

Expected rebar strength, f_{ye} = 78ksi

Expected masonry strength, f_{me} = 2.6ksi

Wall Type: CMU 8" Typ.:

- #5 verts @32" o.c.
- #5 horiz. @48" o.c.
- Partially grouted

Wall height, h = 13.33'

Wall pier length, L = 13.834'

h/L = 0.9636

Modified reinforcing ratio, $\rho*f_{ye}/f_{me}$ = 0.004234*78ksi/2.6ksi = 0.127

Interpolate m-factor for $\rho*f_{ye}/f_{me}$ = 0.127:

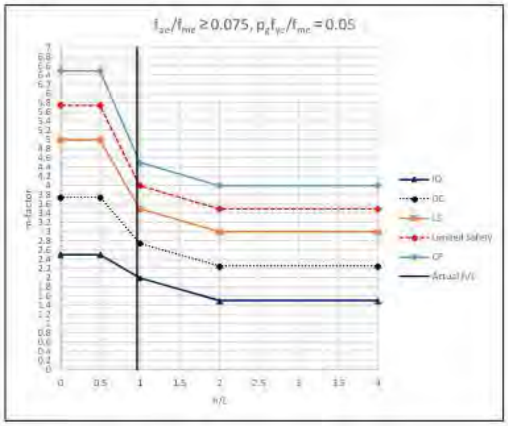
- Where: $\rho*f_{ye}/f_{me}$ = 0.05: m = 2.036 (IO)

h	13.33	ft	
L	13.834	ft	
h/L	0.963568		0
	0.963568		7

$p_g f_{ye}/f_{me} = 0.05$					
h_{eff}/L	IO	DC	LS	Limit Safe	CP
4	1.5	2.25	3	3.5	4
2	1.5	2.25	3	3.5	4
1	2	2.75	3.5	4	4.5
0.5	2.5	3.75	5	5.75	6.5
0	2.5	3.75	5	5.75	6.5

x1	3	1	2	2.75	3.5	4	4.5
x2	4	0.5	2.5	3.75	5	5.75	6.5

	IO	DC	LS	Limited Sa	CP
m-interp	2.036	2.823	3.609	4.128	4.646



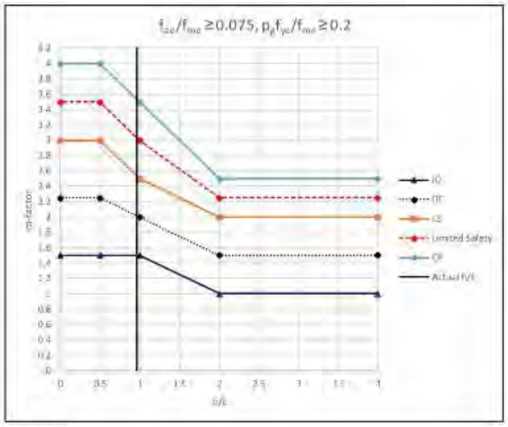
- Where: $\rho*f_{ye}/f_{me}$ = 0.2: m = 1.50 (IO)

h	13.33	ft	
L	13.834	ft	
h/L	0.963568		0
	0.963568		4.2

$p_g f_{ye}/f_{me} = 0.2$					
h_{eff}/L	IO	DC	LS	Limit Safe	CP
4	1	1.5	2	2.25	2.5
2	1	1.5	2	2.25	2.5
1	1.5	2	2.5	3	3.5
0.5	1.5	2.25	3	3.5	4
0	1.5	2.25	3	3.5	4

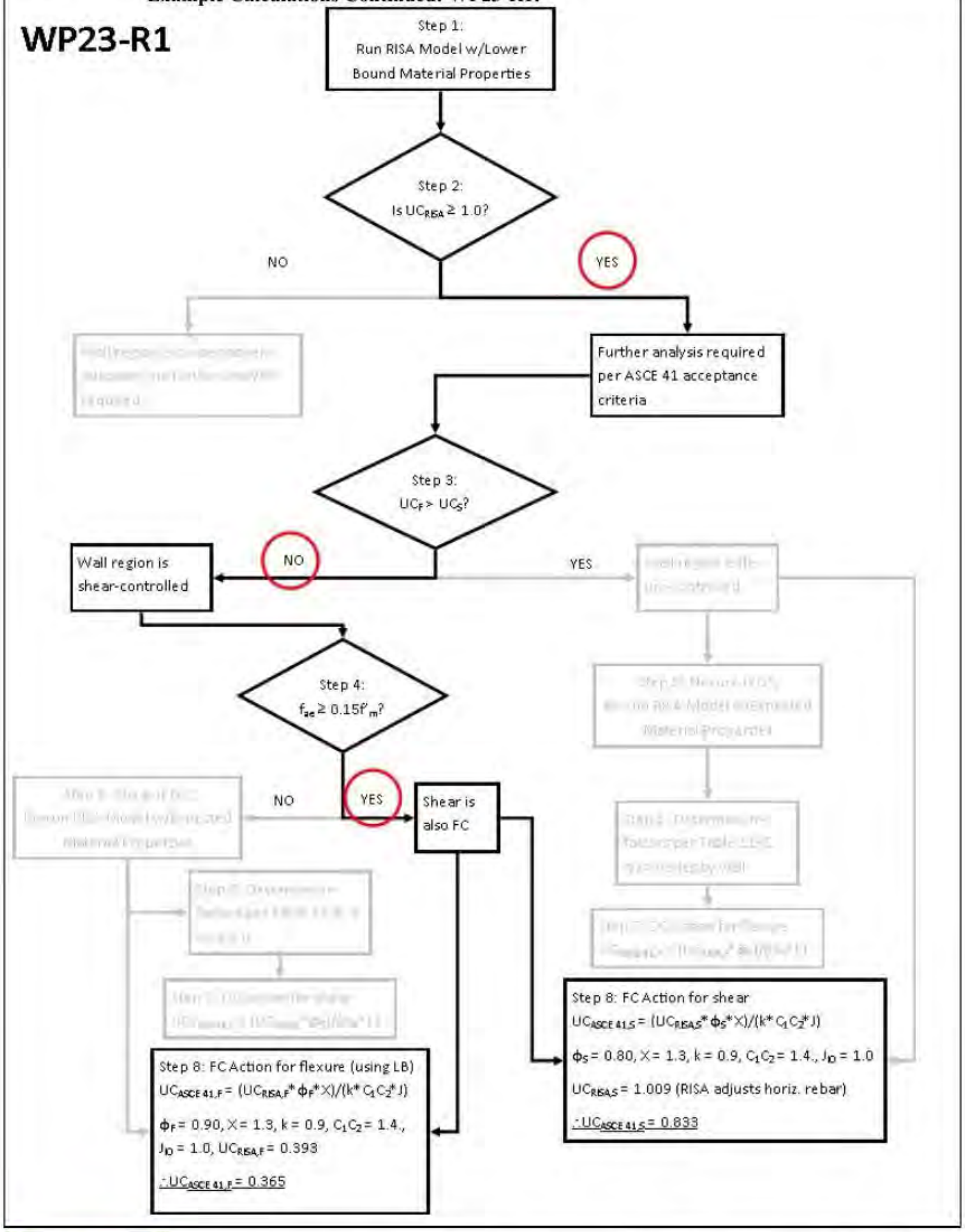
x1	3	1	1.5	2	2.5	3	3.5
x2	4	0.5	1.5	2.25	3	3.5	4

	IO	DC	LS	Limited Sa	CP
m-interp	1.500	2.018	2.536	3.036	3.536



- ∴via. linear interpolation, m = 1.761 (IO)

Example Calculations Continued: WP23-R1:



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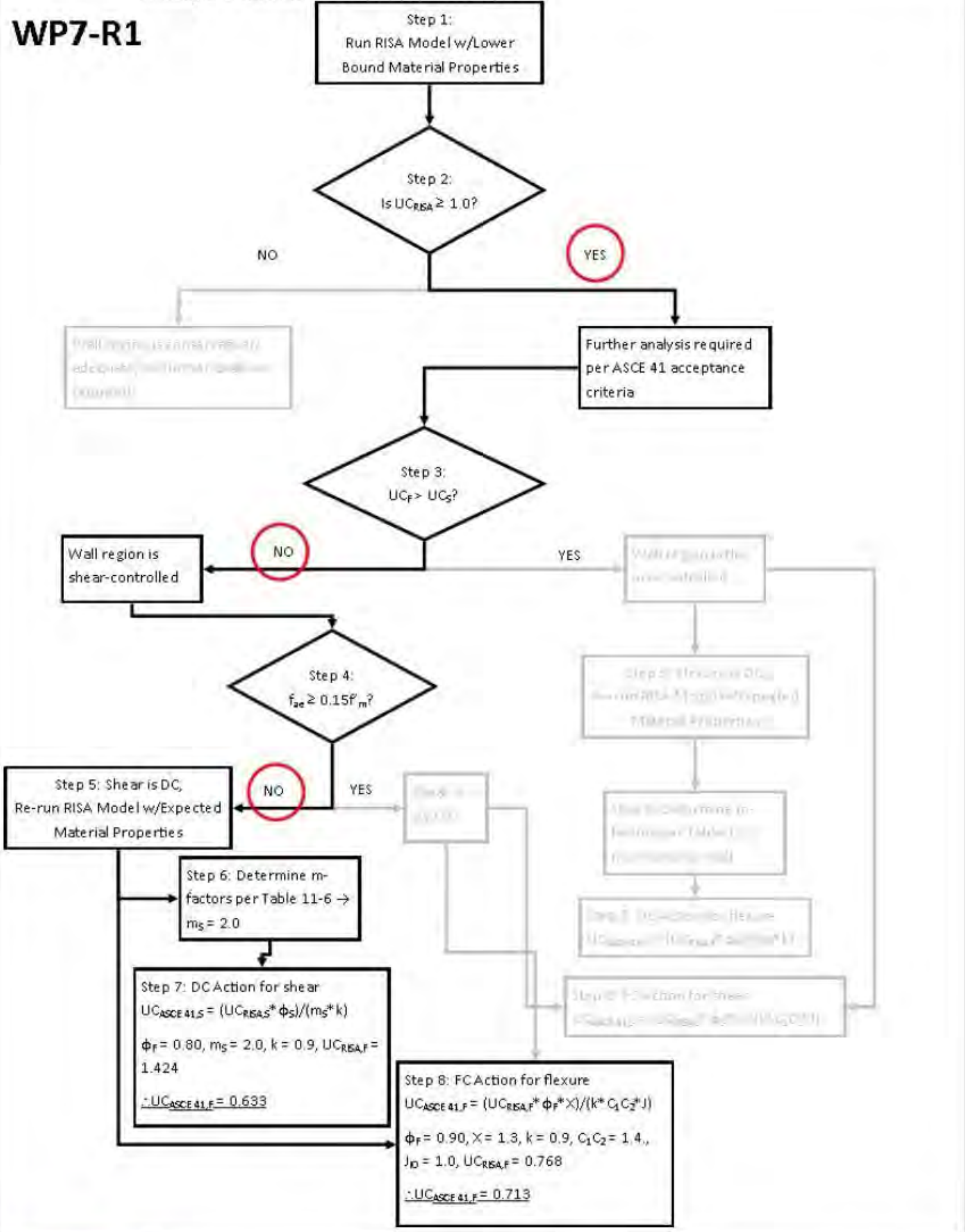
Example Calculations Continued: WP7-R1:



Step 7: DC Action for shear

$UC_{ASCE\ 41,S} = (UC_{RISA,S} * \phi_S)/(m_S * k)$

$\phi_F = 0.80$, $m_S = 2.0$, $k = 0.9$, $UC_{RISA,F} = 1.424$

$\underline{\therefore UC_{ASCE\ 41,F} = 0.633}$

Step 8: FC Action for flexure

$UC_{ASCE\ 41,F} = (UC_{RISA,F} * \phi_F * X)/(k * C_1C_2 * J)$

$\phi_F = 0.90$, $X = 1.3$, $k = 0.9$, $C_1C_2 = 1.4$., $J_D = 1.0$, $UC_{RISA,F} = 0.768$

$\underline{\therefore UC_{ASCE\ 41,F} = 0.713}$

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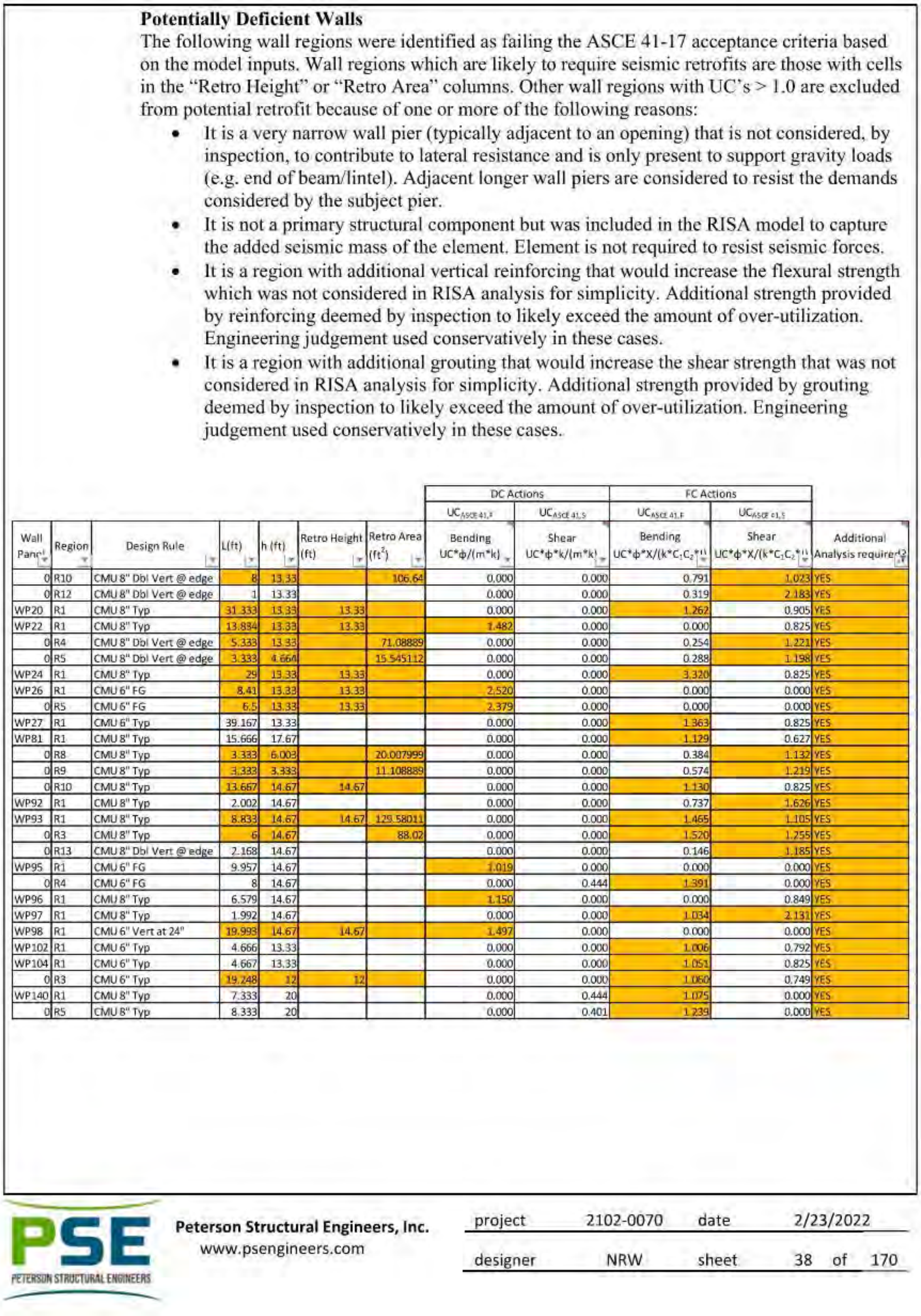

Potentially Deficient Walls

The following wall regions were identified as failing the ASCE 41-17 acceptance criteria based on the model inputs. Wall regions which are likely to require seismic retrofits are those with cells in the "Retro Height" or "Retro Area" columns. Other wall regions with UC's > 1.0 are excluded from potential retrofit because of one or more of the following reasons:

- It is a very narrow wall pier (typically adjacent to an opening) that is not considered, by inspection, to contribute to lateral resistance and is only present to support gravity loads (e.g. end of beam/lintel). Adjacent longer wall piers are considered to resist the demands considered by the subject pier.
- It is not a primary structural component but was included in the RISA model to capture the added seismic mass of the element. Element is not required to resist seismic forces.
- It is a region with additional vertical reinforcing that would increase the flexural strength which was not considered in RISA analysis for simplicity. Additional strength provided by reinforcing deemed by inspection to likely exceed the amount of over-utilization. Engineering judgement used conservatively in these cases.
- It is a region with additional grouting that would increase the shear strength that was not considered in RISA analysis for simplicity. Additional strength provided by grouting deemed by inspection to likely exceed the amount of over-utilization. Engineering judgement used conservatively in these cases.

							DC Actions		FC Actions		
							$UC_{ASCE 41,F}$	$UC_{ASCE 41,S}$	$UC_{ASCE 41,F}$	$UC_{ASCE 41,S}$	
Wall Pan	Region	Design Rule	L(ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending UC*ϕ/(m*k)	Shear UC*ϕ*k/(m*k)	Bending UC*ϕ*X/(k*C₁C₂*	Shear UC*ϕ*X/(k*C₁C₂*	Additional Analysis require
0	R10	CMU 8" Dbl Vert @ edge	8	13.33		106.64	0.000	0.000	0.791	1.023	YES
0	R12	CMU 8" Dbl Vert @ edge	1	13.33			0.000	0.000	0.319	2.183	YES
WP20	R1	CMU 8" Typ	31.333	13.33	13.33		0.000	0.000	1.262	0.905	YES
WP22	R1	CMU 8" Typ	13.884	13.33	13.33		1.482	0.000	0.000	0.825	YES
0	R4	CMU 8" Dbl Vert @ edge	5.333	13.33		71.08889	0.000	0.000	0.254	1.221	YES
0	R5	CMU 8" Dbl Vert @ edge	3.333	4.664		15.545112	0.000	0.000	0.288	1.198	YES
WP24	R1	CMU 8" Typ	29	13.33	13.33		0.000	0.000	3.320	0.825	YES
WP26	R1	CMU 6" FG	8.41	13.33	13.33		2.520	0.000	0.000	0.000	YES
0	R5	CMU 6" FG	6.5	13.33	13.33		2.379	0.000	0.000	0.000	YES
WP27	R1	CMU 6" Typ	39.167	13.33			0.000	0.000	1.363	0.825	YES
WP81	R1	CMU 8" Typ	15.666	17.67			0.000	0.000	1.129	0.627	YES
0	R8	CMU 8" Typ	3.333	6.003		20.007999	0.000	0.000	0.384	1.132	YES
0	R9	CMU 8" Typ	3.333	3.333		11.108889	0.000	0.000	0.574	1.219	YES
0	R10	CMU 8" Typ	13.667	14.67	14.67		0.000	0.000	1.130	0.825	YES
WP92	R1	CMU 8" Typ	2.002	14.67			0.000	0.000	0.737	1.626	YES
WP93	R1	CMU 8" Typ	8.833	14.67	14.67	129.58011	0.000	0.000	1.465	1.105	YES
0	R3	CMU 8" Typ	6	14.67		88.02	0.000	0.000	1.520	1.255	YES
0	R13	CMU 8" Dbl Vert @ edge	2.168	14.67			0.000	0.000	0.146	1.185	YES
WP95	R1	CMU 6" FG	9.957	14.67			1.019	0.000	0.000	0.000	YES
0	R4	CMU 6" FG	8	14.67			0.000	0.444	1.391	0.000	YES
WP96	R1	CMU 8" Typ	6.579	14.67			1.150	0.000	0.000	0.849	YES
WP97	R1	CMU 8" Typ	1.992	14.67			0.000	0.000	1.034	2.131	YES
WP98	R1	CMU 6" Vert at 24"	19.993	14.67	14.67		1.497	0.000	0.000	0.000	YES
WP102	R1	CMU 6" Typ	4.666	13.33			0.000	0.000	1.006	0.792	YES
WP104	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	1.051	0.825	YES
0	R3	CMU 6" Typ	19.248	12	12		0.000	0.000	1.060	0.749	YES
WP140	R1	CMU 8" Typ	7.333	20			0.000	0.444	1.075	0.000	YES
0	R5	CMU 8" Typ	8.333	20			0.000	0.401	1.239	0.000	YES

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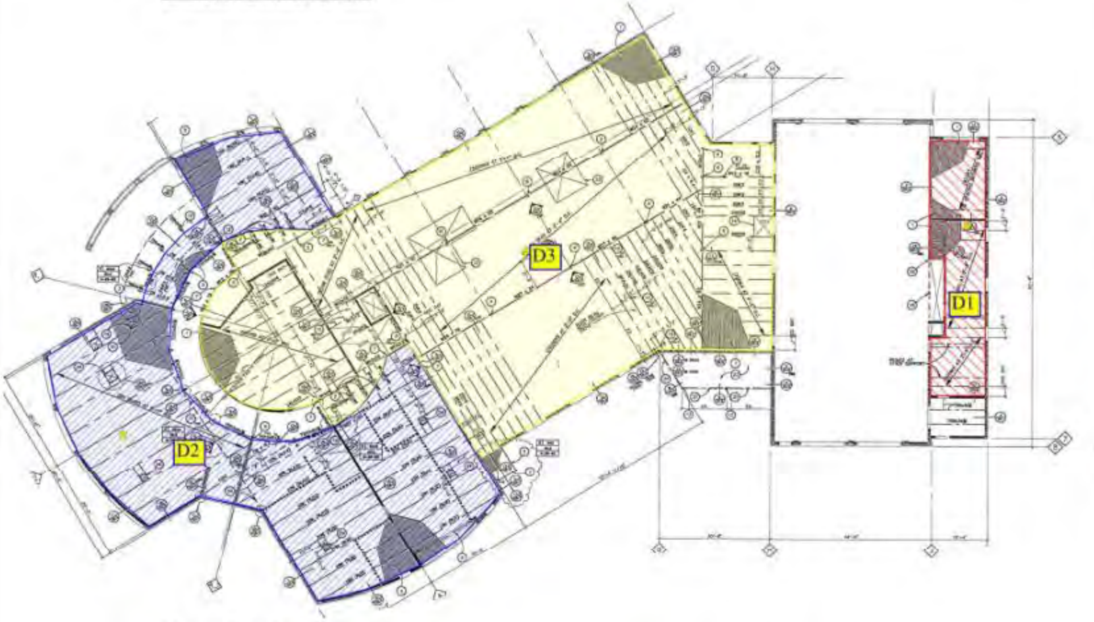
Diaphragm Evaluation for In-Plane Loads

Diaphragm Layout

2nd Floor/Lower Roof



Upper Roof

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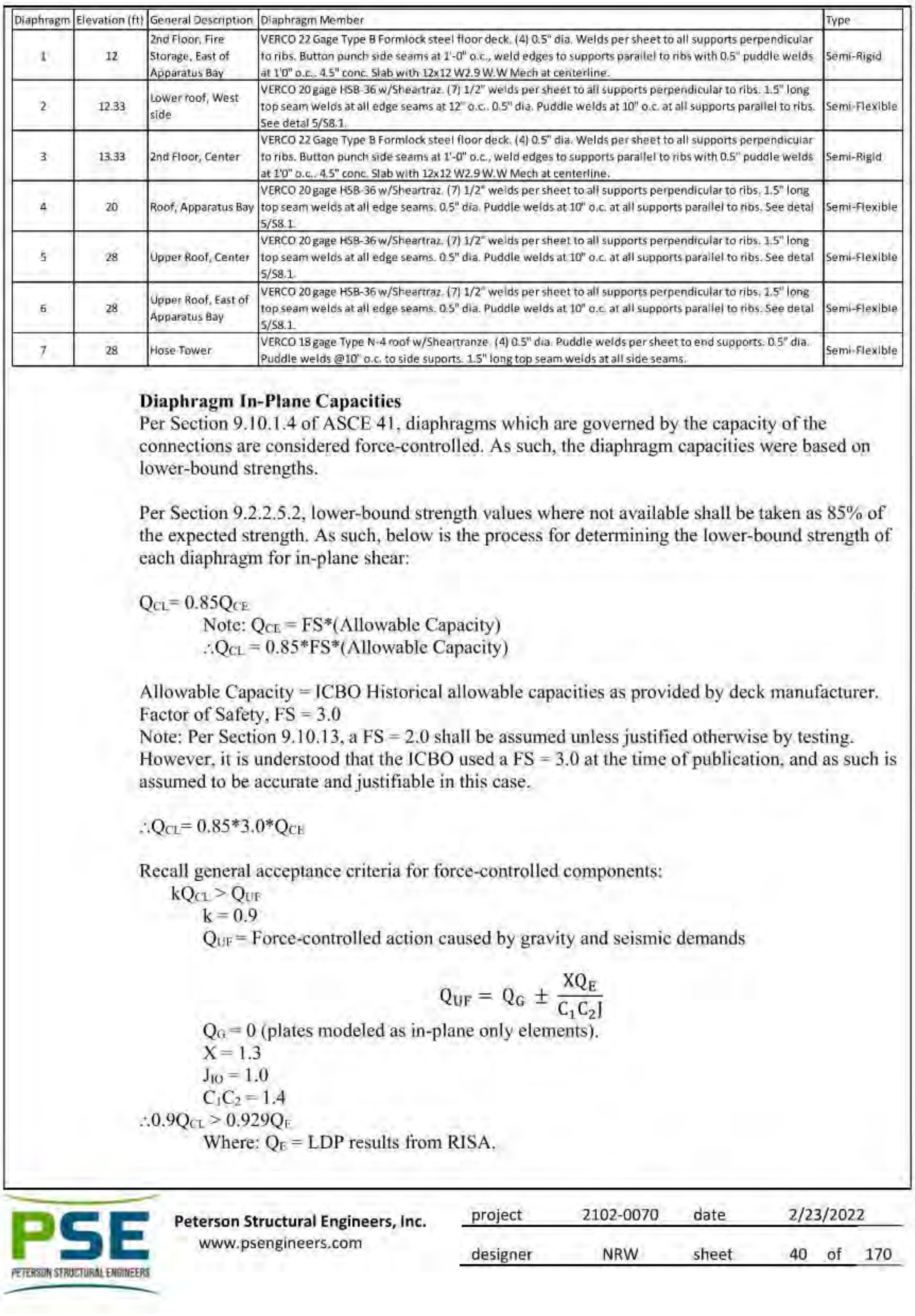

Diaphragm	Elevation (ft)	General Description	Diaphragm Member	Type
1	12	2nd Floor, Fire Storage, East of Apparatus Bay	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c.. 4.5" conc. Slab with 12x12 W2.9 W.W Mech at centerline.	Semi-Rigid
2	12.33	Lower roof, West side	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams at 12" o.c.. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	Semi-Flexible
3	13.33	2nd Floor, Center	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c.. 4.5" conc. Slab with 12x12 W2.9 W.W Mech at centerline.	Semi-Rigid
4	20	Roof, Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	Semi-Flexible
5	28	Upper Roof, Center	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	Semi-Flexible
6	28	Upper Roof, East of Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	Semi-Flexible
7	28	Hose Tower	VERCO 18 gage Type N-4 roof w/Sheartranze. (4) 0.5" dia. Puddle welds per sheet to end supports. 0.5" dia. Puddle welds @10" o.c. to side suports. 1.5" long top seam welds at all side seams.	Semi-Flexible

Diaphragm In-Plane Capacities

Per Section 9.10.1.4 of ASCE 41, diaphragms which are governed by the capacity of the connections are considered force-controlled. As such, the diaphragm capacities were based on lower-bound strengths.

Per Section 9.2.2.5.2, lower-bound strength values where not available shall be taken as 85% of the expected strength. As such, below is the process for determining the lower-bound strength of each diaphragm for in-plane shear:

$Q_{CL}= 0.85Q_{CE}$

Note: $Q_{CE} = FS*(\text{Allowable Capacity})$

$\therefore Q_{CL} = 0.85*FS*(\text{Allowable Capacity})$

Allowable Capacity = ICBO Historical allowable capacities as provided by deck manufacturer.
Factor of Safety, FS = 3.0
Note: Per Section 9.10.13, a FS = 2.0 shall be assumed unless justified otherwise by testing. However, it is understood that the ICBO used a FS = 3.0 at the time of publication, and as such is assumed to be accurate and justifiable in this case.

$\therefore Q_{CL}= 0.85*3.0*Q_{CE}$

Recall general acceptance criteria for force-controlled components:

$kQ_{CL} > Q_{UF}$

$k = 0.9$

Q_{UF} = Force-controlled action caused by gravity and seismic demands

$$Q_{UF} = Q_G \pm \frac{XQ_E}{C_1C_2J}$$

$Q_G = 0$ (plates modeled as in-plane only elements).

$X = 1.3$

$J_{IO} = 1.0$

$C_1C_2 = 1.4$

$\therefore 0.9Q_{CL} > 0.929Q_E$

Where: Q_E = LDP results from RISA.

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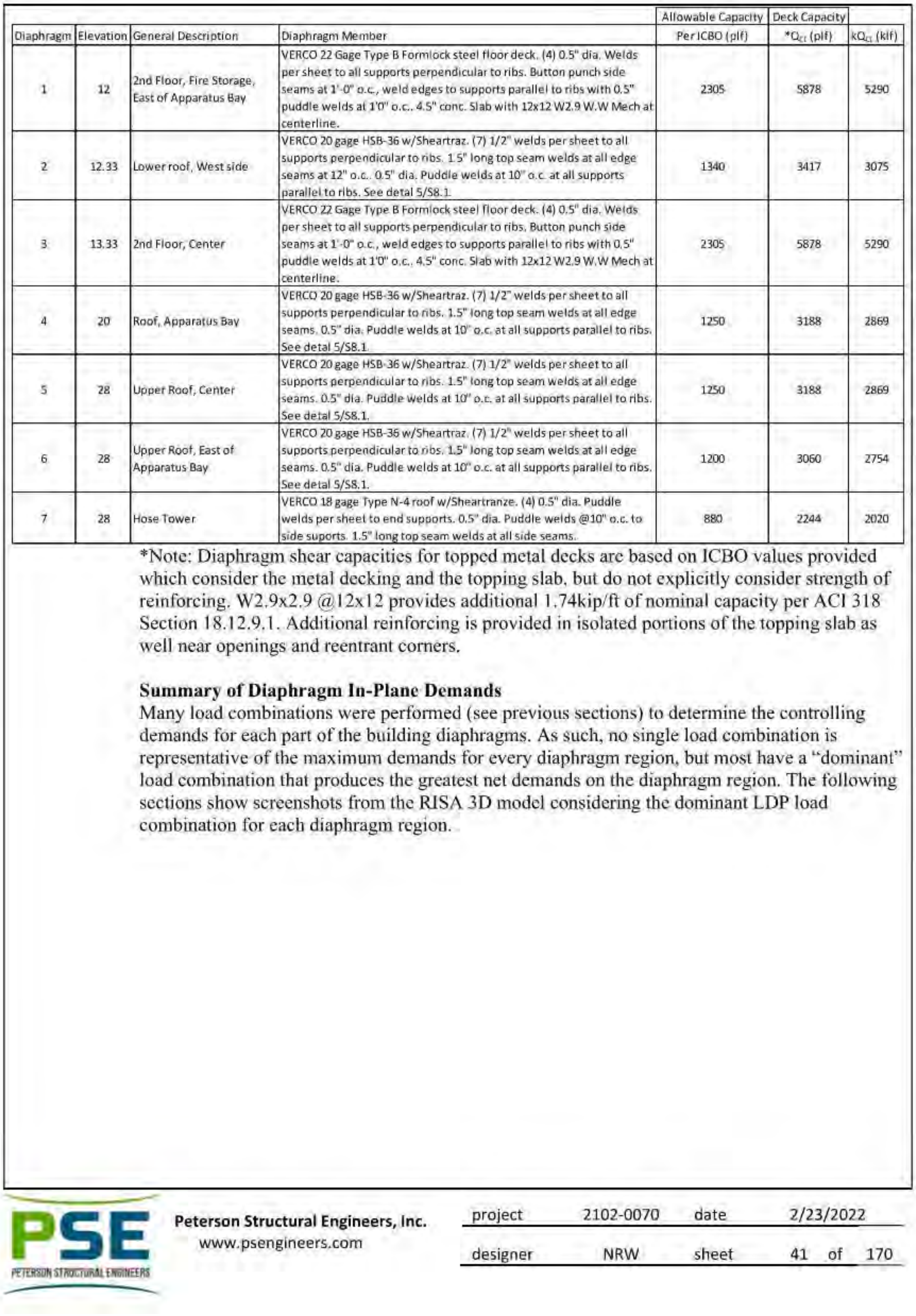

				Allowable Capacity	Deck Capacity	
Diaphragm	Elevation	General Description	Diaphragm Member	Per ICBO (plf)	$^{*}Q_{CE}$ (plf)	kQ_{CE} (klf)
1	12	2nd Floor, Fire Storage, East of Apparatus Bay	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c.. 4.5" conc. Slab with 12x12 W2.9 W.W Mech at centerline.	2305	5878	5290
2	12.33	Lower roof, West side	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams at 12" o.c.. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1	1340	3417	3075
3	13.33	2nd Floor, Center	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c.. 4.5" conc. Slab with 12x12 W2.9 W.W Mech at centerline.	2305	5878	5290
4	20	Roof, Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1	1250	3188	2869
5	28	Upper Roof, Center	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	1250	3188	2869
6	28	Upper Roof, East of Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	1200	3060	2754
7	28	Hose Tower	VERCO 18 gage Type N-4 roof w/Sheartranze. (4) 0.5" dia. Puddle welds per sheet to end supports. 0.5" dia. Puddle welds @10" o.c. to side suports. 1.5" long top seam welds at all side seams.	880	2244	2020

*Note: Diaphragm shear capacities for topped metal decks are based on ICBO values provided which consider the metal decking and the topping slab, but do not explicitly consider strength of reinforcing. W2.9x2.9 @12x12 provides additional 1.74kip/ft of nominal capacity per ACI 318 Section 18.12.9.1. Additional reinforcing is provided in isolated portions of the topping slab as well near openings and reentrant corners.

Summary of Diaphragm In-Plane Demands

Many load combinations were performed (see previous sections) to determine the controlling demands for each part of the building diaphragms. As such, no single load combination is representative of the maximum demands for every diaphragm region, but most have a "dominant" load combination that produces the greatest net demands on the diaphragm region. The following sections show screenshots from the RISA 3D model considering the dominant LDP load combination for each diaphragm region.

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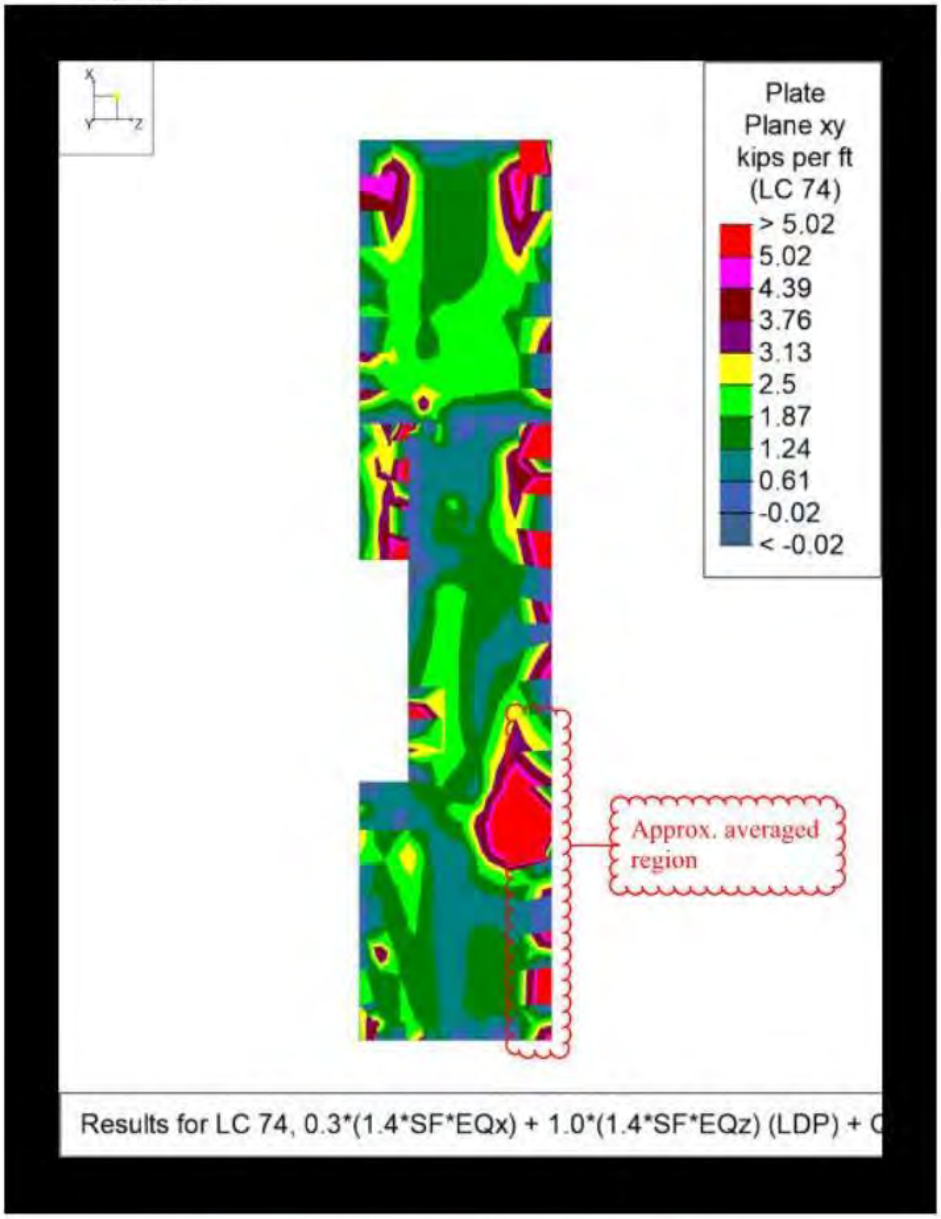
Diaphragm 1



Note: (9) plates were averaged in the highest stress region to account for local peak stresses. Diaphragm is considered adequate.

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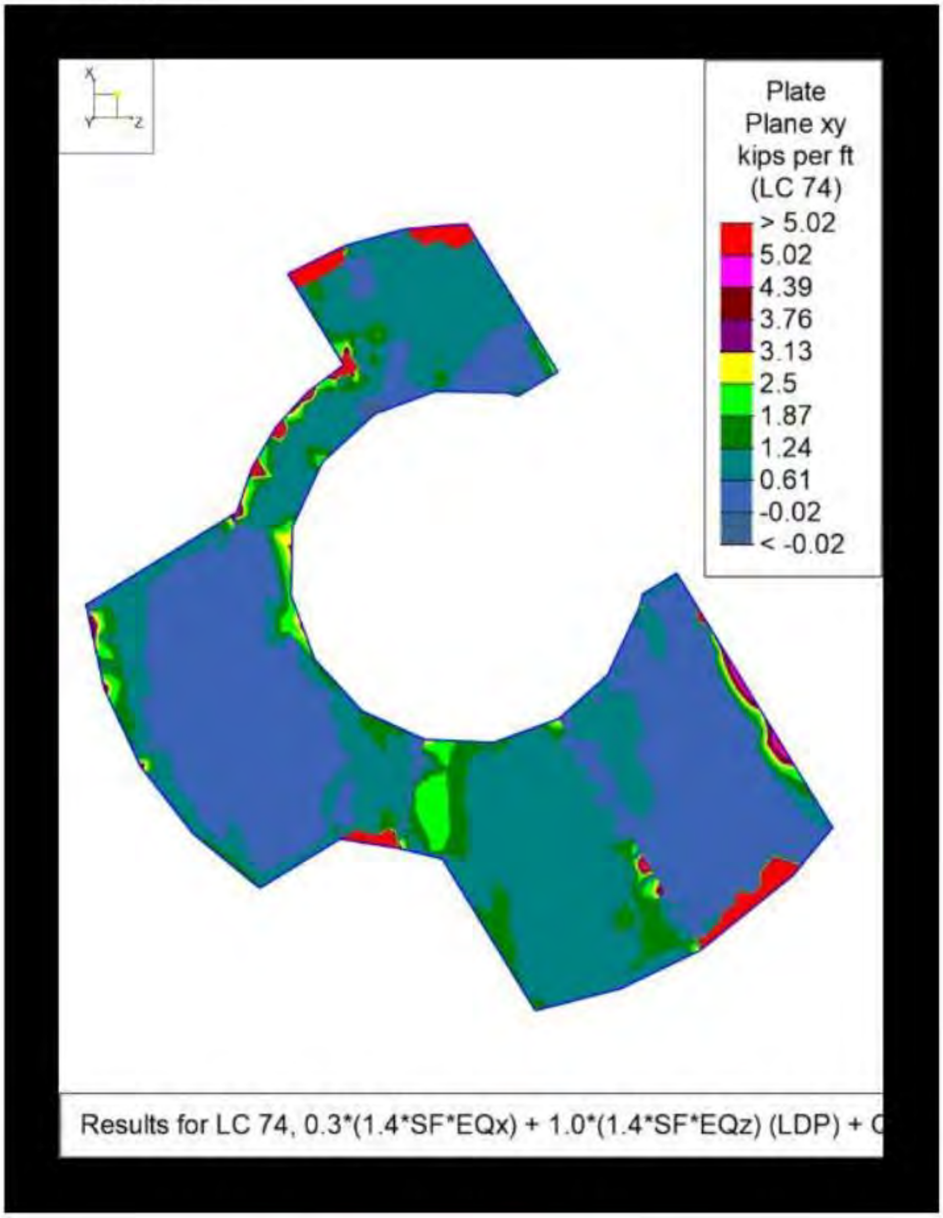
Diaphragm 2



Results for LC 74, 0.3*(1.4*SF*EQx) + 1.0*(1.4*SF*EQz) (LDP) + C

Note: (3) plates were excluded where a concentrated load is applied. All other plates have an average force < the capacity. As such, diaphragm is considered adequate.

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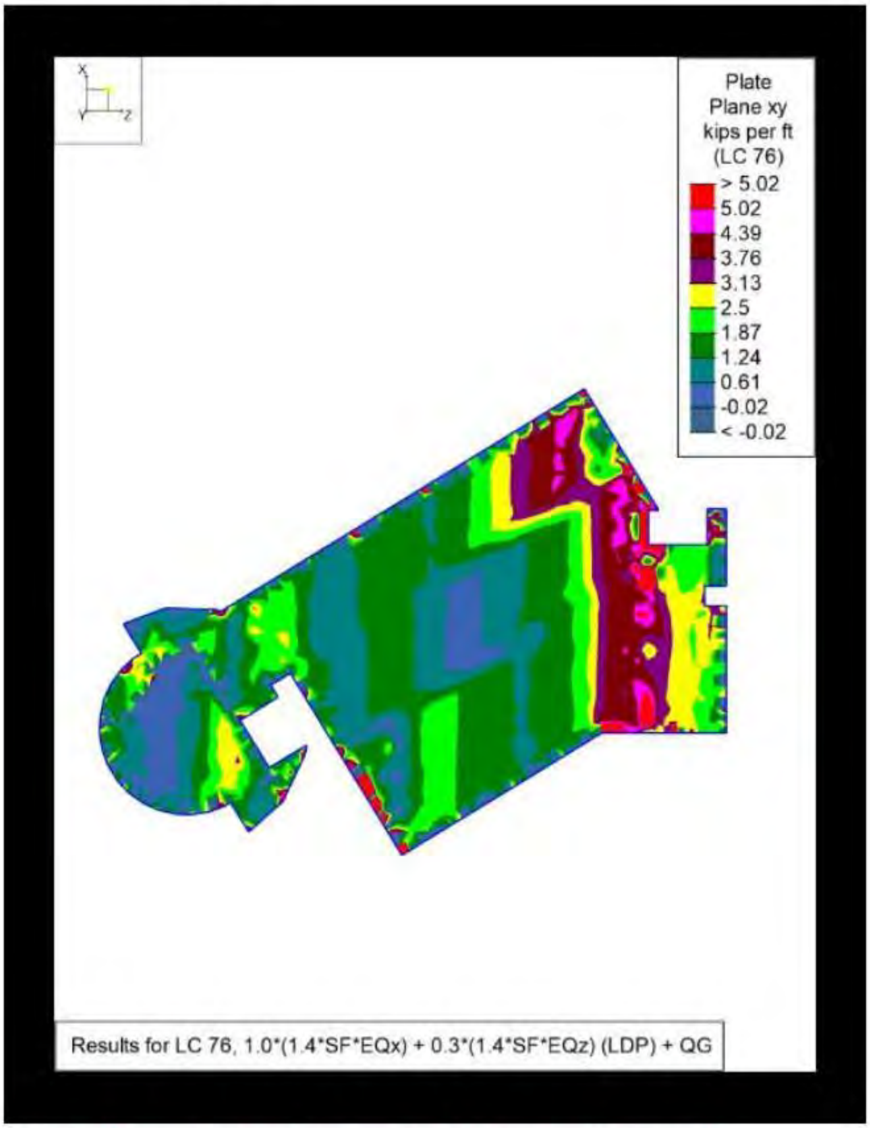
Diaphragm 3



Results for LC 76, 1.0*(1.4*SF*EQx) + 0.3*(1.4*SF*EQz) (LDP) + QG

Note: Maximum region of overstressing when compared to previously tabulated capacities is appoximately 1.44kip/ft. Typical reinforcing in diaphragm (W2.9x2.9 @12x12 WWM) provides an additional 1.74kip/ft of capacity per ACI 318 Section 18.12.9.1 beyond what is previously tabulated in the diaphragm capacities. Also, in regions where plates experience the highest demands near diaphragm openings and reentrant corners, there is additional reinforcing provided within the concrete topping deck. The strength of the typical reinforcing and the additional #5 bars are sufficient for the peak stress regions in the diaphragms. Diaphragm is considered to be adequate.

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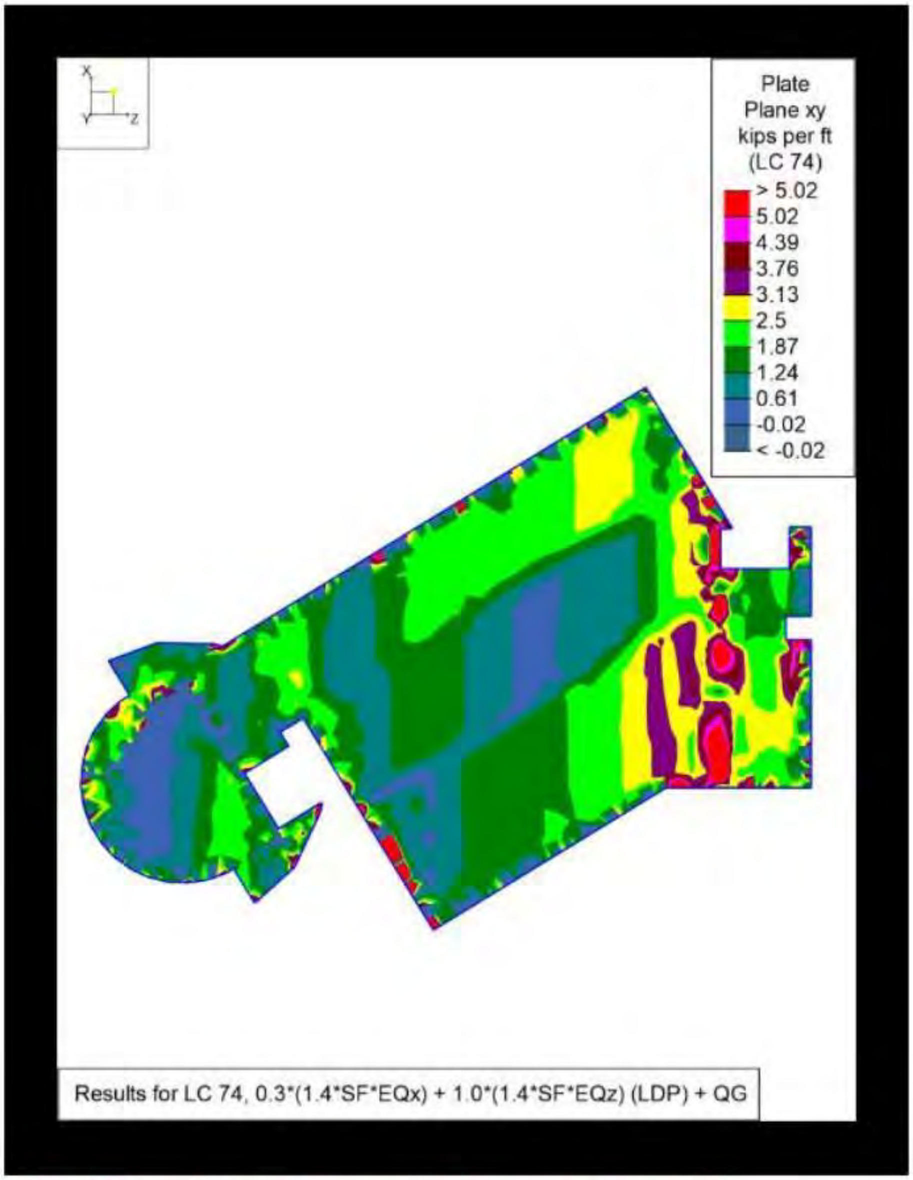

Note: Maximum region of overstressing when compared to previously tabulated capacities is appoximately 1.44kip/ft. Typical reinforcing in diaphragm (W2.9x2.9 @12x12 WWM) provides an additional 1.74kip/ft of capacity per ACI 318 Section 18.12.9.1 beyond what is previously tabulated in the diaphragm capacities. Also, in regions where plates experience the highest demands near diaphragm openings and reentrant corners, there is additional reinforcing provided within the concrete topping deck. The strength of the typical reinforcing and the additional #5 bars are sufficient for the peak stress regions in the diaphragms. Diaphragm is considered to be adequate.

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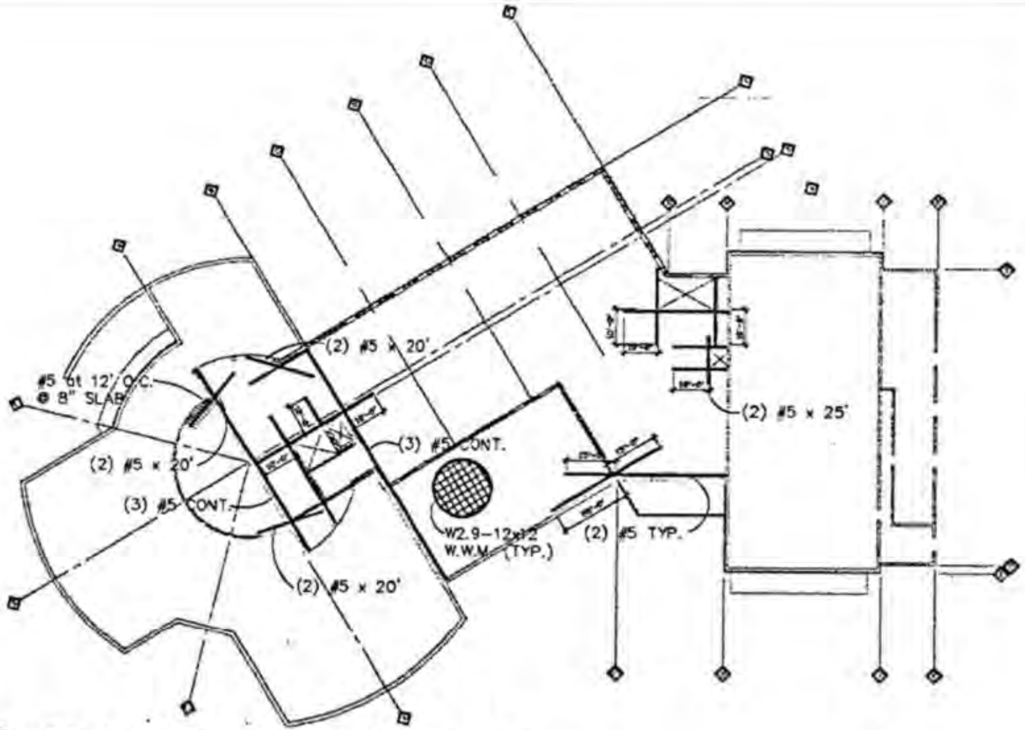

1 / S2.2 **SLAB REINFORCING PLAN**

NOT TO SCALE

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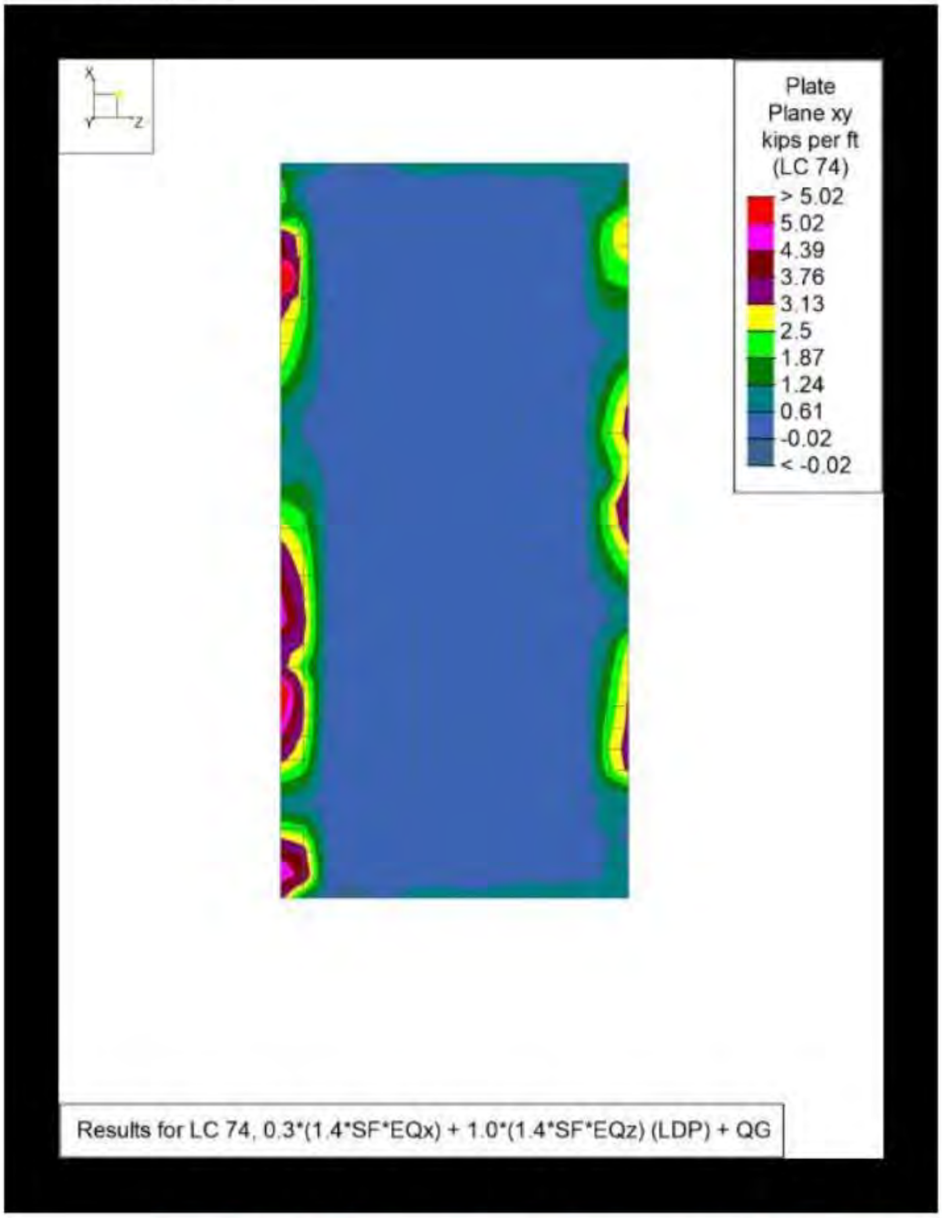
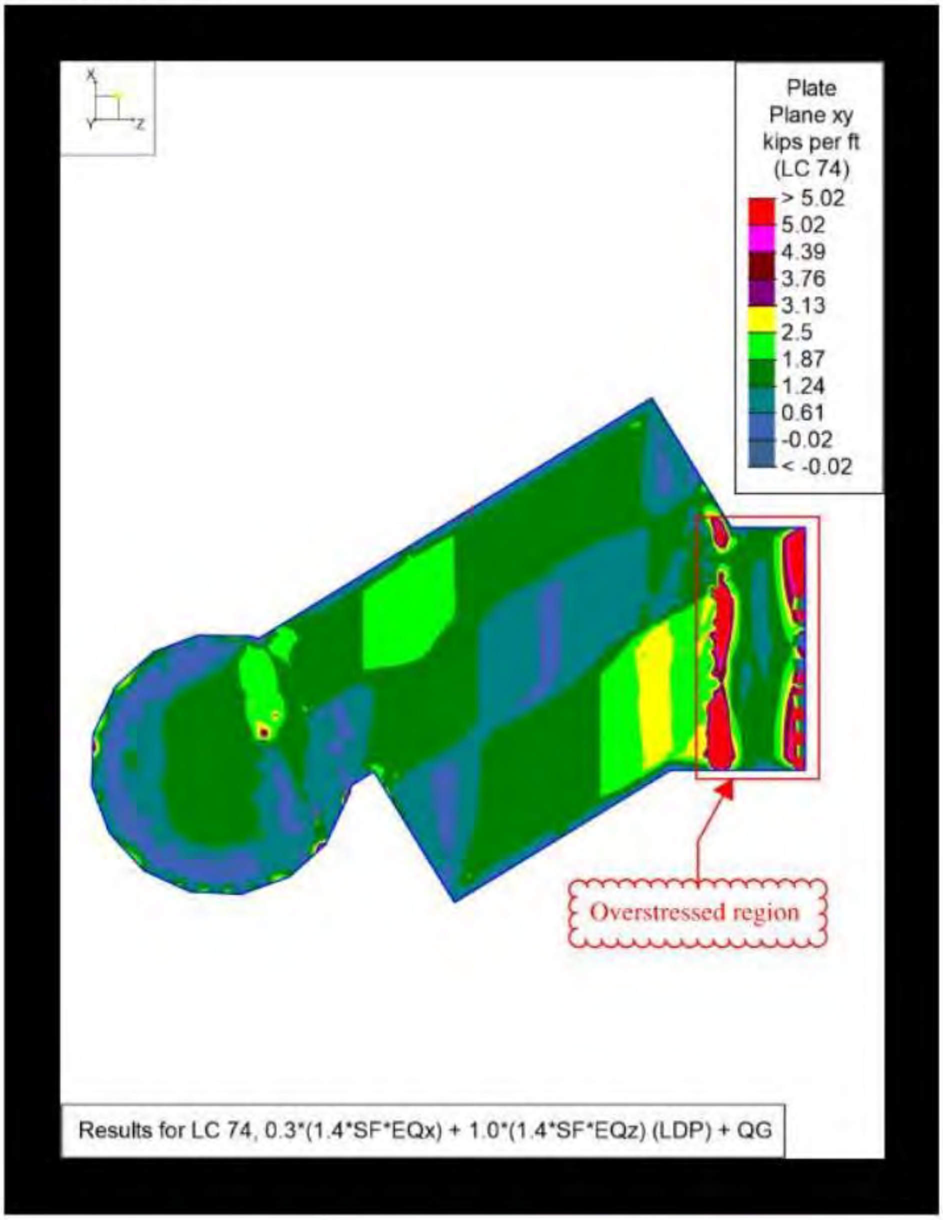
Diaphragms 4

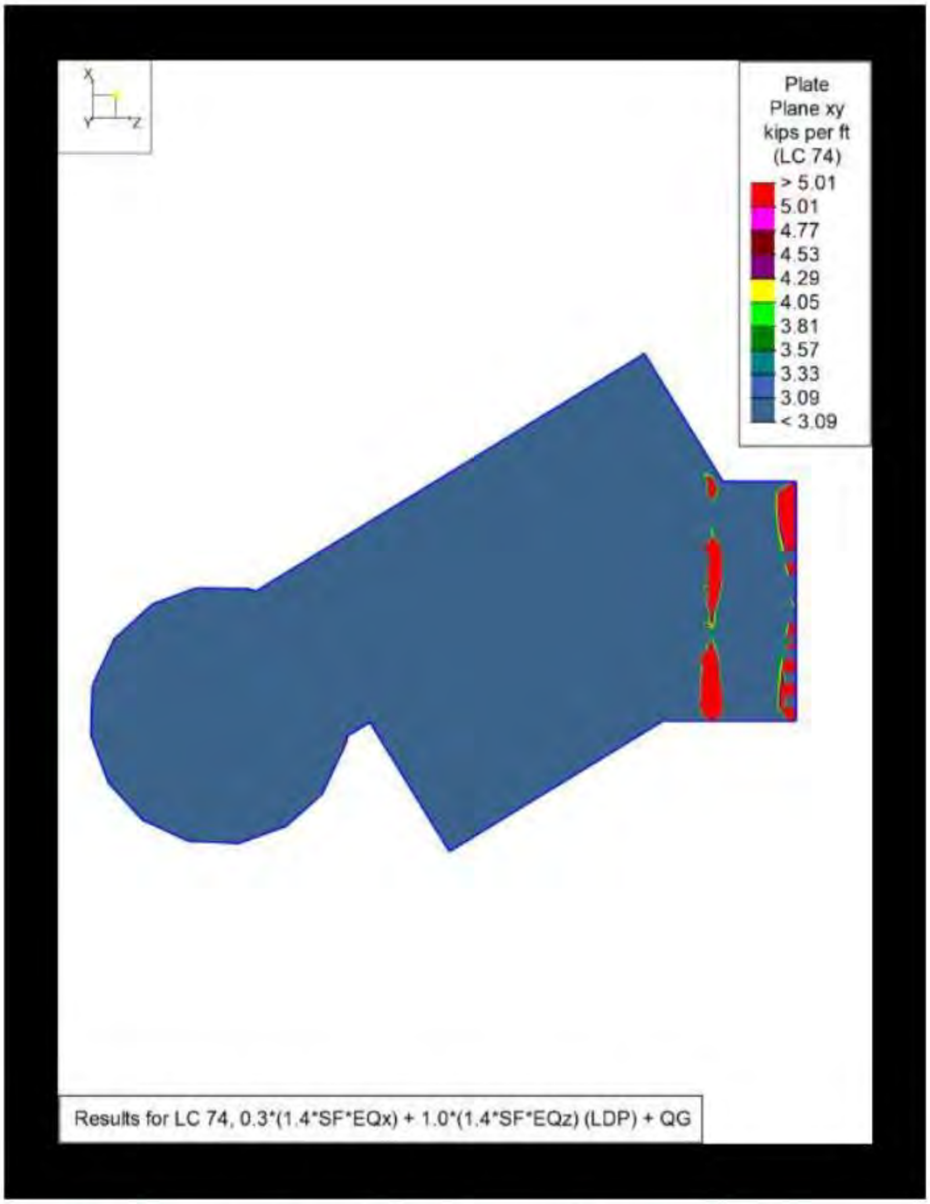


Note: Plates with the average maximum forces are less than the diaphragm capacity. As such, diaphragm is generally adequate.

Diaphragm 5



Note: Outside of the overstressed region, plates with the average maximum forces are less than the diaphragm capacity. Diaphragm in-plane shear upgrades required in the overstressed region.



Note: The regions above with demands greater than approx. 3.09kip/ft are overstressed. Diaphragm in-plane shear upgrades required in the overstressed regions.

Note: It intuitively makes sense that the regions of the diaphragm shown above would have the highest demands and require retrofit as it is the portion of the building that ties together the two nonorthogonal building portions (which are expected to have different seismic responses) as well as being located near reentrant corners.

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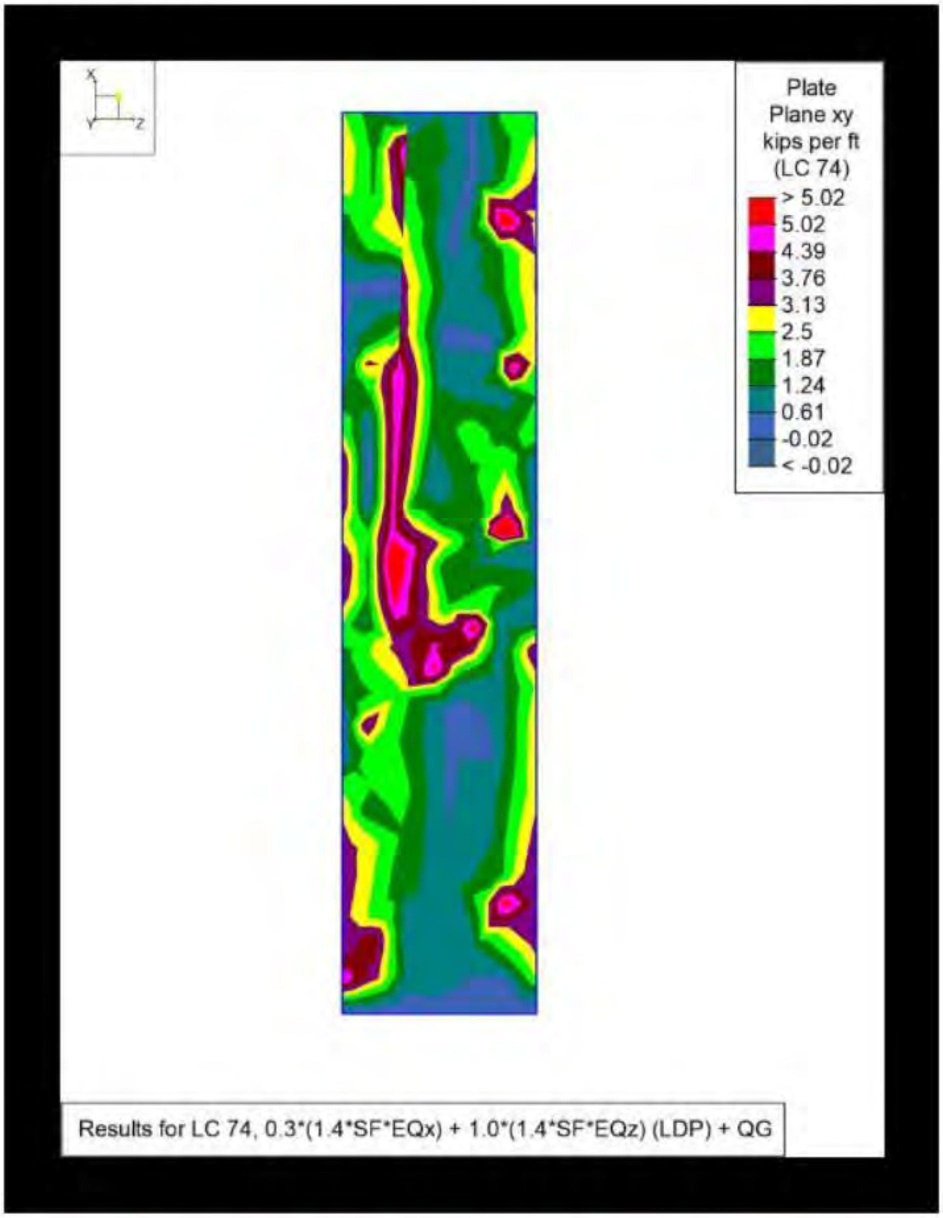
Diaphragm 6



Note: The regions above with demands greater than approx. 2.97kip/ft are overstressed. Diaphragm in-plane shear upgrades required in the overstressed regions.

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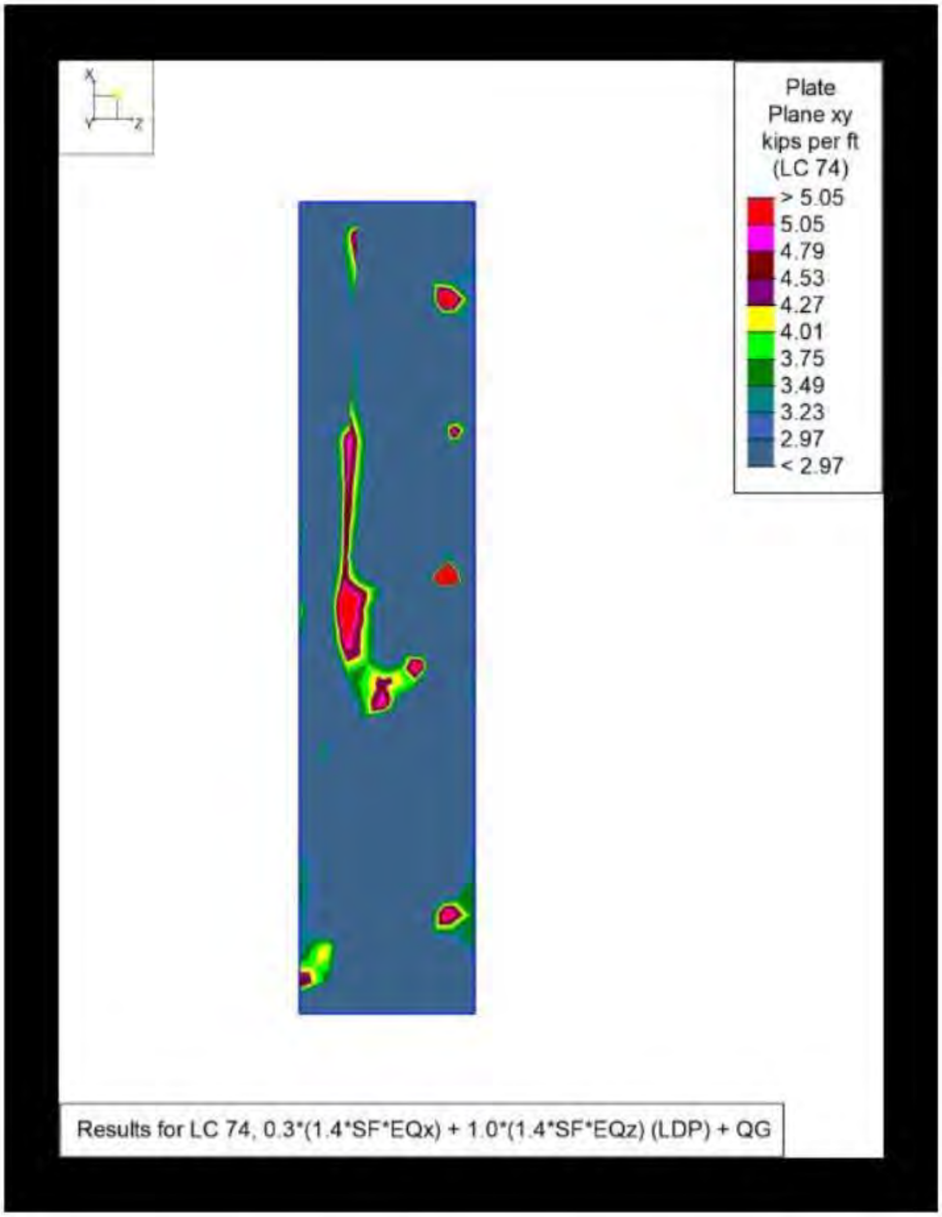

Note: The regions above with demands greater than approx. 2.97kip/ft are overstressed. Diaphragm in-plane shear upgrades required in the overstressed regions.

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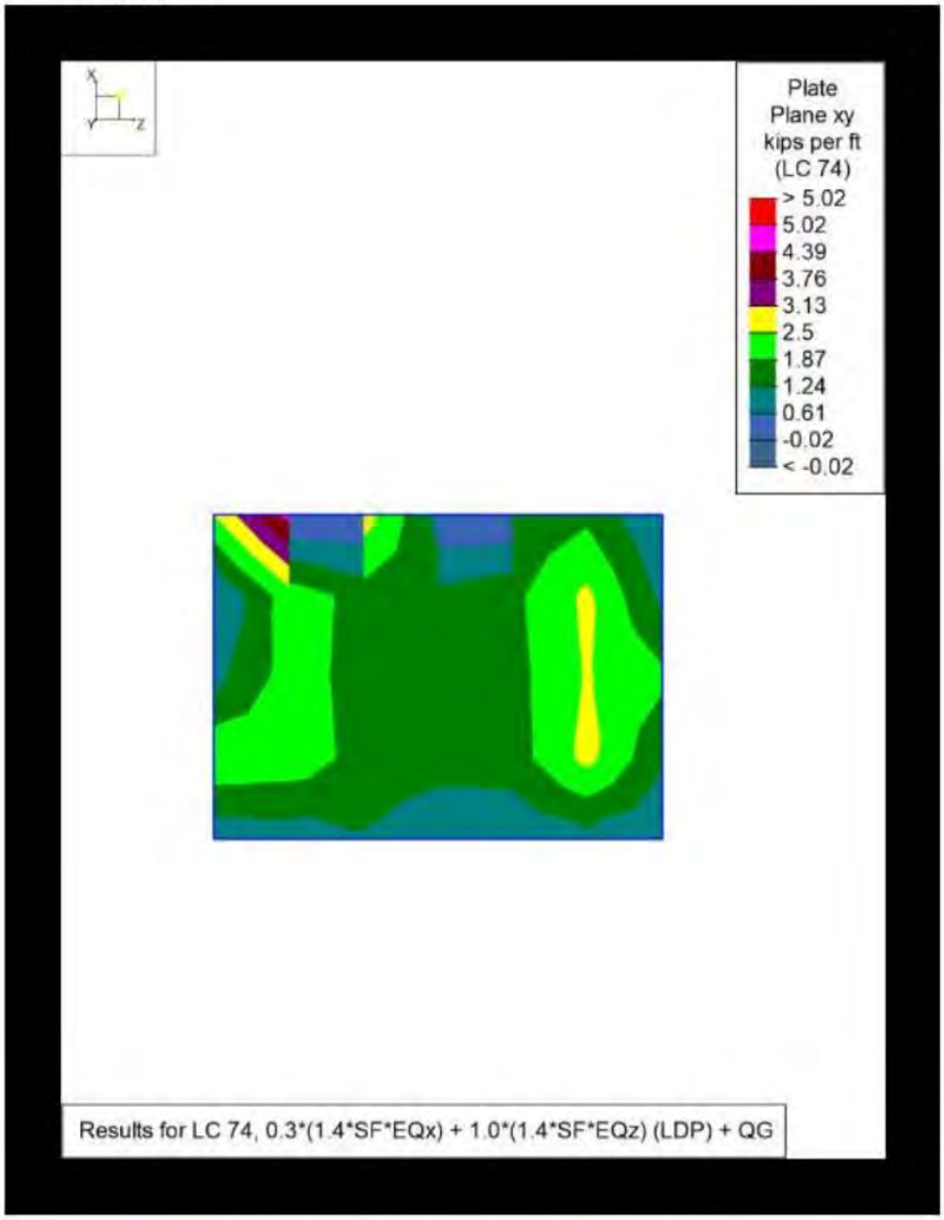
Diaphragm 7



Note: The regions above with demands greater than approx. 2.17kip/ft are overstressed. Diaphragm in-plane shear upgrades required in the overstressed regions. Note that the Diaphragm 7 region is very small and adjacent to Diaphragm 6 where more extensive upgrades are required, so it may be more practical to upgrade both regions simultaneously.

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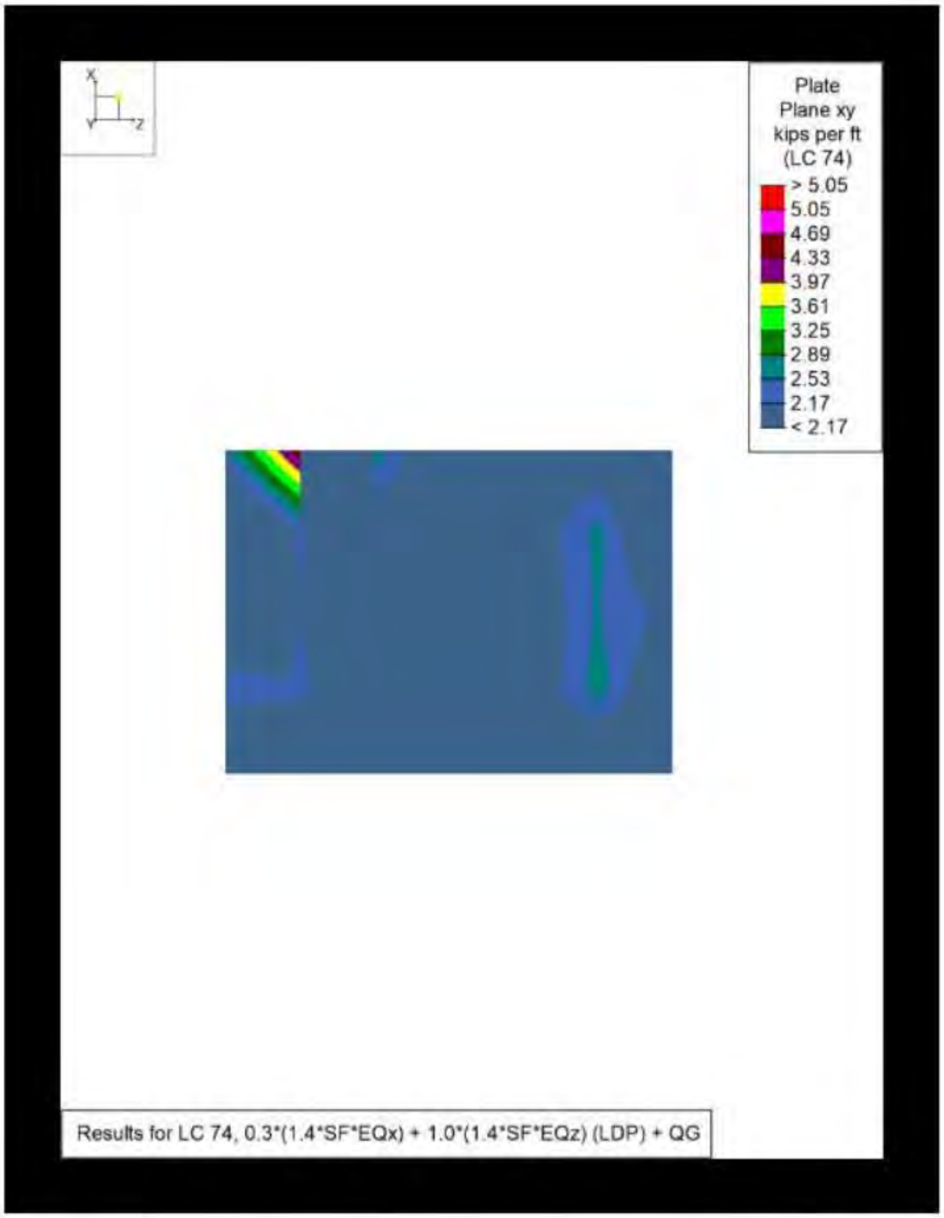

Note: The regions above with demands greater than approx. 2.17kip/ft are overstressed. Diaphragm in-plane shear upgrades required in the overstressed regions. Note that the Diaphragm 7 region is very small and adjacent to Diaphragm 6 where more extensive upgrades are required, so it may be more practical to upgrade both regions simultaneously.

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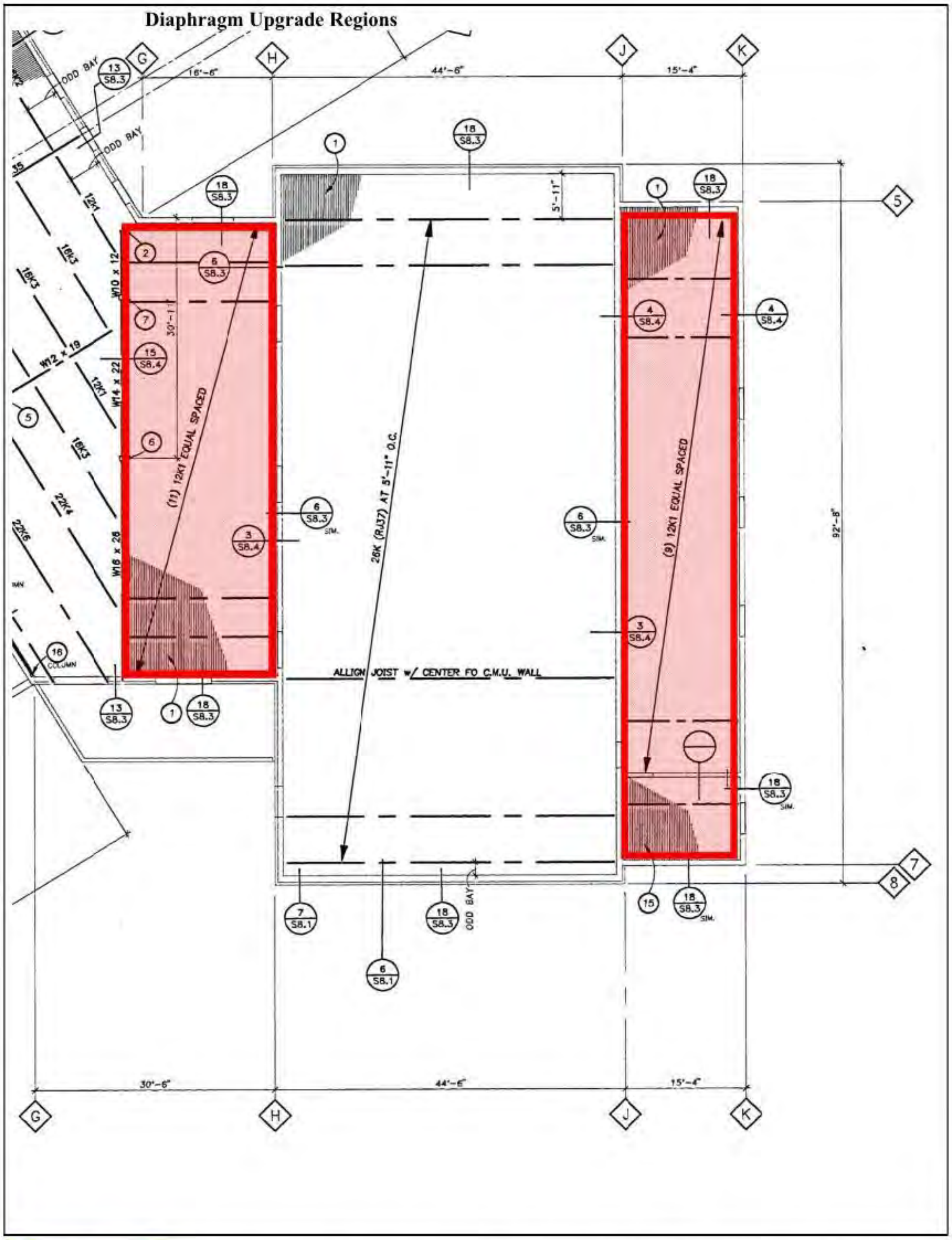

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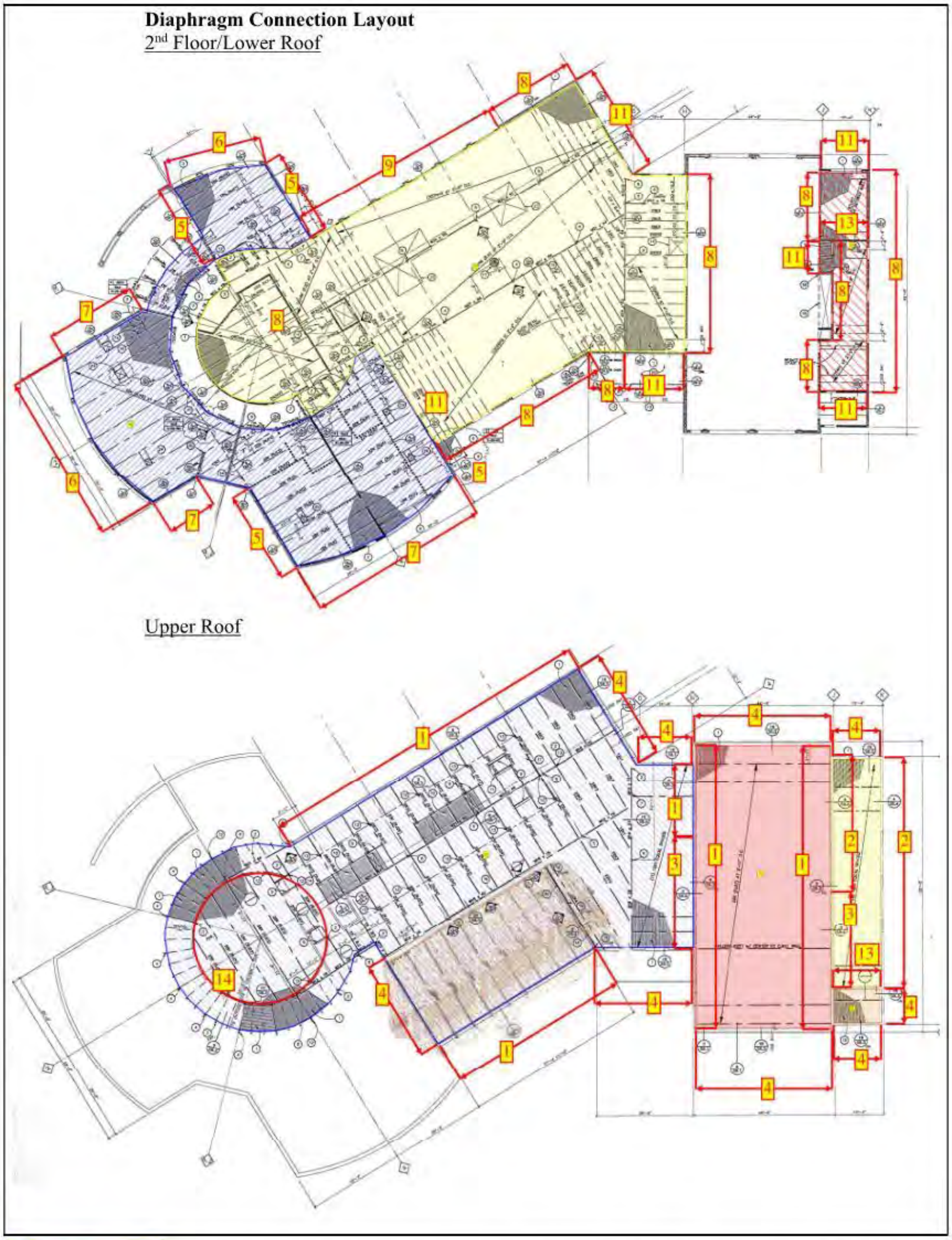

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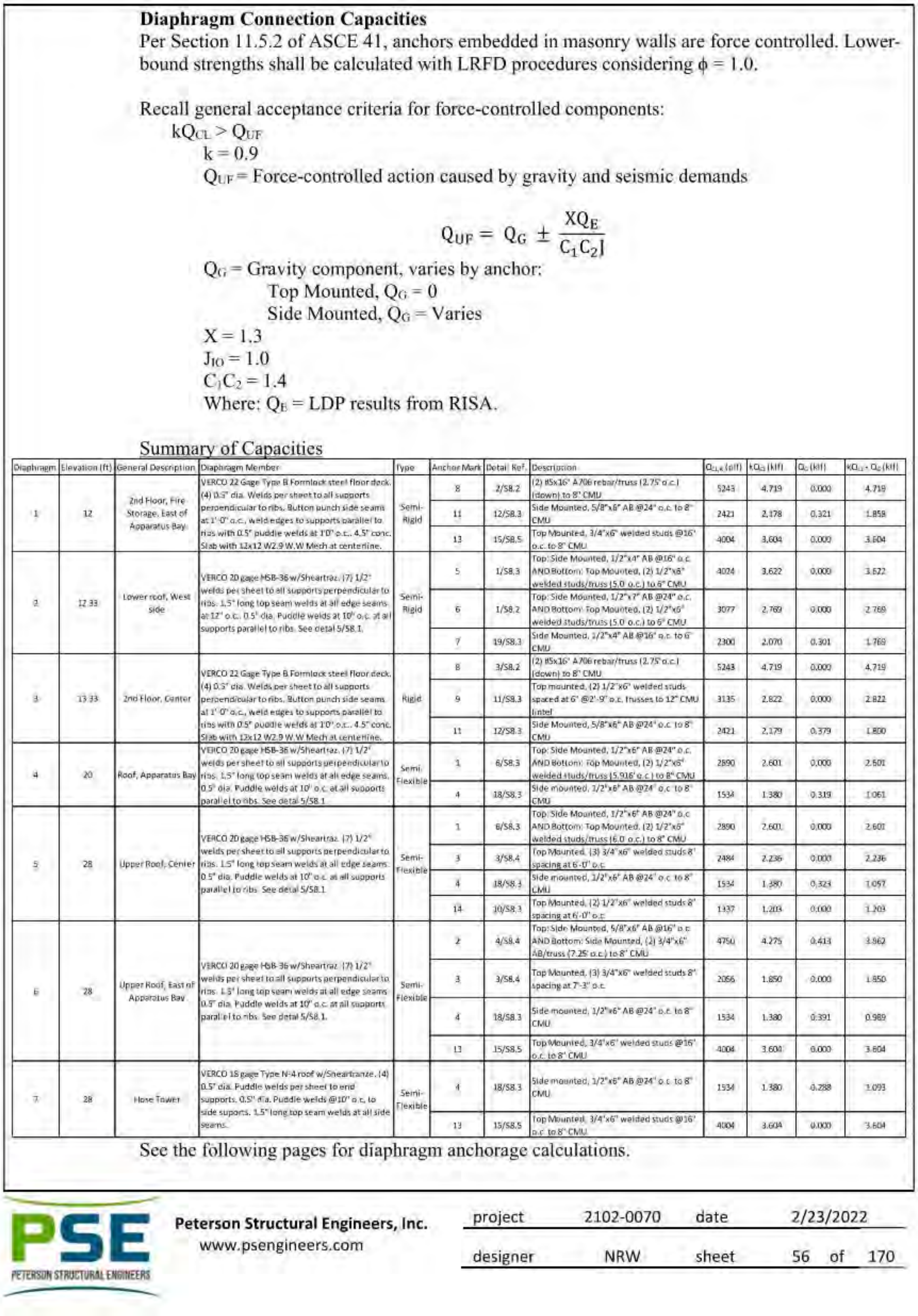

Diaphragm Connection Capacities

Per Section 11.5.2 of ASCE 41, anchors embedded in masonry walls are force controlled. Lower-bound strengths shall be calculated with LRFD procedures considering $\phi = 1.0$.

Recall general acceptance criteria for force-controlled components:

$kQ_{CL} > Q_{UF}$

$k = 0.9$

Q_{UF} = Force-controlled action caused by gravity and seismic demands

$$Q_{UF} = Q_G \pm \frac{XQ_E}{C_1 C_2 J}$$

Q_G = Gravity component, varies by anchor:

Top Mounted, $Q_G = 0$

Side Mounted, Q_G = Varies

$X = 1.3$

$J_{IO} = 1.0$

$C_1C_2 = 1.4$

Where: Q_E = LDP results from RISA.

Summary of Capacities

Diaphragm	Elevation (ft)	General Description	Diaphragm Member	Type	Anchor Mark	Detail Ref.	Description	$Q_{CL,x}$ (plf)	kQ_{CL} (klf)	Q_G (klf)	$kQ_{CL} - Q_G$ (klf)
1	12	2nd Floor, Fire Storage, East of Apparatus Bay	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c.. 4.5" conc. Slab with 12x12 W2.9 W.W Mech at centerline.	Semi-Rigid	8	2/S8.2	(2) #5x16" A706 rebar/truss (2.75' o.c.) (down) to 8" CMU	5243	4.719	0.000	4.719
					11	12/S8.3	Side Mounted, 5/8"x6" AB @24" o.c. to 8" CMU	2421	2.178	0.321	1.858
					13	15/S8.5	Top Mounted, 3/4"x6" welded studs @16" o.c. to 8" CMU	4004	3.604	0.000	3.604
2	12.33	Lower roof, West side	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams at 12" o.c.. 0.5" dia. Puddle welds at 10" o.c. at all supports parallel to ribs. See detal 5/S8.1.	Semi-Rigid	5	1/S8.3	Top: Side Mounted, 1/2"x4" AB @16" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (5.0 o.c.) to 6" CMU	4024	3.622	0.000	3.622
					6	1/S8.2	Top: Side Mounted, 1/2"x7" AB @24" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (5.0' o.c.) to 6" CMU	3077	2.769	0.000	2.769
					7	19/S8.3	Side Mounted, 1/2"x4" AB @16" o.c. to 6" CMU	2300	2.070	0.301	1.769
3	13.33	2nd Floor, Center	VERCO 22 Gage Type B Formlock steel floor deck. (4) 0.5" dia. Welds per sheet to all supports perpendicular to ribs. Button punch side seams at 1'-0" o.c., weld edges to supports parallel to ribs with 0.5" puddle welds at 1'0" o.c.. 4.5" conc. Slab with 12x12 W2.9 W.W Mech at centerline.	Rigid	8	3/S8.2	(2) #5x16" A706 rebar/truss (2.75' o.c.) (down) to 8" CMU	5243	4.719	0.000	4.719
					9	11/S8.3	Top mounted, (2) 1/2"x6" welded studs spaced at 6" @2'-9" o.c. trusses to 12" CMU lintel	3135	2.822	0.000	2.822
					11	12/S8.3	Side Mounted, 5/8"x6" AB @24" o.c. to 8" CMU	2421	2.179	0.379	1.800
4	20	Roof, Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10' o.c. at all supports parallel to ribs. See detal 5/S8.1	Semi-Flexible	1	6/S8.3	Top: Side Mounted, 1/2"x6" AB @24" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (5.916' o.c.) to 8" CMU	2890	2.601	0.000	2.601
					4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1534	1.380	0.319	1.061
5	28	Upper Roof, Center	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10' o.c. at all supports parallel to ribs. See detal 5/S8.1	Semi-Flexible	1	6/S8.3	Top: Side Mounted, 1/2"x6" AB @24" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (6.0 o.c.) to 8" CMU	2890	2.601	0.000	2.601
					3	3/S8.4	Top Mounted, (3) 3/4"x6" welded studs 8" spacing at 6'-0" o.c.	2484	2.236	0.000	2.236
					4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1534	1.380	0.323	1.057
					14	10/S8.3	Top Mounted, (2) 1/2"x6" welded studs 8" spacing at 6'-0" o.c.	1337	1.203	0.000	1.203
6	28	Upper Roof, East of Apparatus Bay	VERCO 20 gage HSB-36 w/Sheartraz. (7) 1/2" welds per sheet to all supports perpendicular to ribs. 1.5" long top seam welds at all edge seams. 0.5" dia. Puddle welds at 10' o.c. at all supports parallel to ribs. See detal 5/S8.1.	Semi-Flexible	2	4/S8.4	Top: Side Mounted, 5/8"x6" AB @16" o.c. AND Bottom: Side Mounted, (2) 3/4"x6" AB/truss (7.25' o.c.) to 8" CMU	4750	4.275	0.413	3.862
					3	3/S8.4	Top Mounted, (3) 3/4"x6" welded studs 8" spacing at 7'-3" o.c.	2056	1.850	0.000	1.850
					4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1534	1.380	0.391	0.989
					13	15/S8.5	Top Mounted, 3/4"x6" welded studs @16" o.c. to 8" CMU	4004	3.604	0.000	3.604
7	28	Hose Tower	VERCO 18 gage Type N-4 roof w/Sheartranze. (4) 0.5" dia. Puddle welds per sheet to end supports. 0.5" dia. Puddle welds @10" o.c. to side suports. 1.5" long top seam welds at all side seams.	Semi-Flexible	4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1534	1.380	0.288	1.093
					13	15/S8.5	Top Mounted, 3/4"x6" welded studs @16" o.c. to 8" CMU	4004	3.604	0.000	3.604

See the following pages for diaphragm anchorage calculations.

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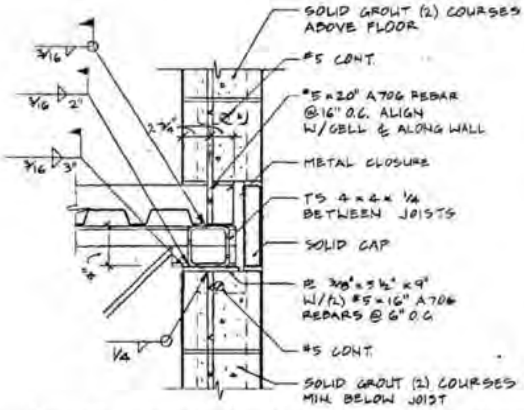
Diaphragm 1:

- Mark 8:
    - Top Mounted
    - #5x20" A706 rebar @16" o.c. (up), (2) #5x16" A706 rebar/truss (down) to 8" CMU

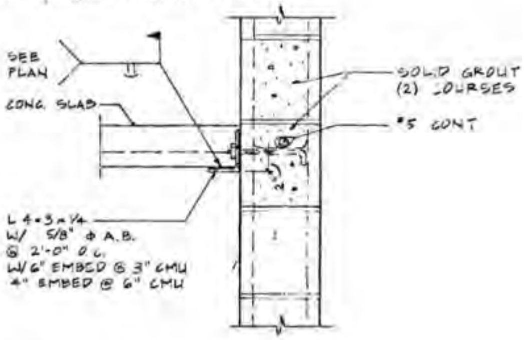


- Capacity determined by % of reinforcing development

$$l_d = \frac{0.13 d_b{}^2 f_y \gamma}{K\sqrt{f'_m}}$$

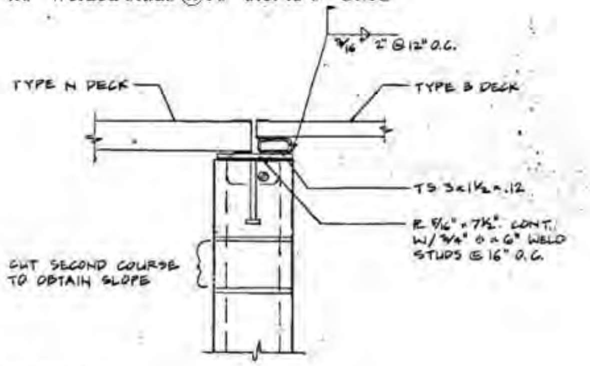
- $d_b = 0.625"$
- $f_y = 60{,}000$psi
- $\gamma = 1.0$
- $K = 2.75"$
- $f'_m = 2{,}000$psi
- Development Length, $l_d = 24.77$in
- Actual Length, $L_b = 16"$
- Bar Spacing, s = 2.75'/2 bars = 1.375'
- Fully developed rebar shear capacity:
    - $B_{vns} = 0.6A_bf_y$
    - $A_b = 0.31\text{in}^2$
    - $f_y = 60{,}000$psi
    - $B_{vns} = 11.16$kip
- Connection Capacity, $V_n = (L_b/l_d)*B_{vn}/s = 5.24$kip/ft

- Mark 11:
  - Side Mounted
  - 5/8"x6" AB @24" o.c. to 8" CMU



  - $f'_m = 2000psi$
  - $A_b = 0.226in^2$
  - $f_y = 36{,}000psi$
  - Spacing, s = 24"
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.841$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 4.882$kip/anchor
  - Connection Capacity, $V_n = \min(B_{vnc}, B_{vns})/s = 2.421$kip/ft

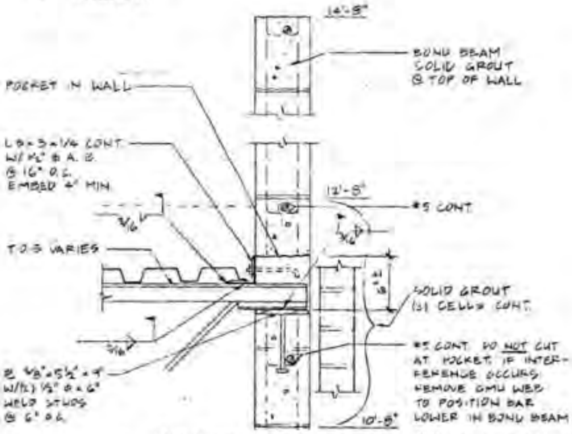
- Mark 13:
  - Top Mounted
  - ¾"x6" welded studs @16" o.c. to 8" CMU



  - $f'_m = 2000psi$
  - $A_b = 0.334in^2$
  - $f_y = 60{,}000psi$
  - Spacing, s = 16"
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 5.338$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 12.024$kip/anchor
  - Connection Capacity, $V_n = \min(B_{vnc}, B_{vns})/s = 4.004$kip/ft

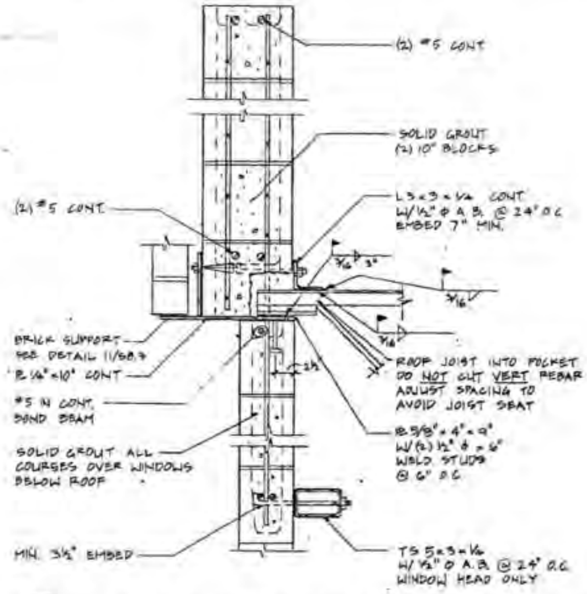
Diaphragm 2:

- Mark 5:



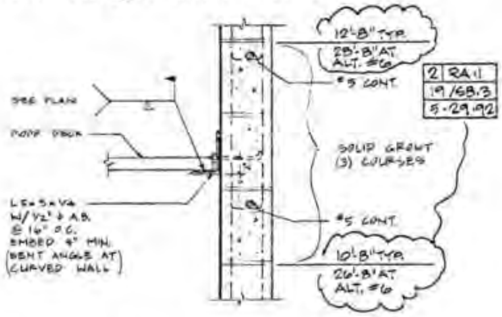
  - ○ Total capacity is the sum of the top and bottom anchorage capacities
  - ○ Top Anchorage:
    - $f'_m = 1500psi$
    - $A_b = 0.142in^2$
    - $f_y = 36,000psi$
    - Spacing, s = 16"
    - Anchor Capacity:
      - By inspection, Masonry Crushing or Steel Shear will control
      - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.011kip/anchor$
      - Steel Shear, $B_{vns} = 0.6A_b f_y = 3.067kip/anchor$
    - Connection Capacity, $V_{n,t} = \min(B_{vnc}, B_{vns})/s = 2.300kip/ft$
  - ○ Bottom Anchorage:
    - $f'_m = 2000psi$
    - $A_b = 0.142in^2$
    - $f_y = 60,000psi$
    - Average Spacing, s = 5'-0"/(2 anchors) = 2.5'
    - Anchor Capacity:
      - By inspection, Masonry Crushing or Steel Shear will control
      - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.310kip/anchor$
      - Steel Shear, $B_{vns} = 0.6A_b f_y = 5.112kip/anchor$
    - Connection Capacity, $V_{n,b} = \min(B_{vnc}, B_{vns})/s = 1.724kip/ft$
  - ○ Combined Capacity, $V_n = V_{n,t} + V_{n,b} = 4.024kip/ft$

- Mark 6:



- Total capacity is the sum of the top and bottom anchorage capacities
- Top Anchorage:
  - $f'_m = 1500$psi
  - $A_b = 0.142$in^2
  - $f_y = 36{,}000$psi
  - Spacing, s = 24"
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.011$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 3.067$kip/anchor
  - Connection Capacity, $V_{n,t} = \min(B_{vnc}, B_{vns})/s = 1.533$kip/ft
- Bottom Anchorage:
  - $f'_m = 2000$psi
  - $A_b = 0.142$in^2
  - $f_y = 60{,}000$psi
  - Average Spacing, s = 5'-7"/(2 anchors) = 2.79'
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.310$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 5.112$kip/anchor
  - Connection Capacity, $V_{n,b} = \min(B_{vnc}, B_{vns})/s = 1.544$kip/ft
- Combined Capacity, $V_n = V_{n,t} + V_{n,b} = 3.077$kip/ft

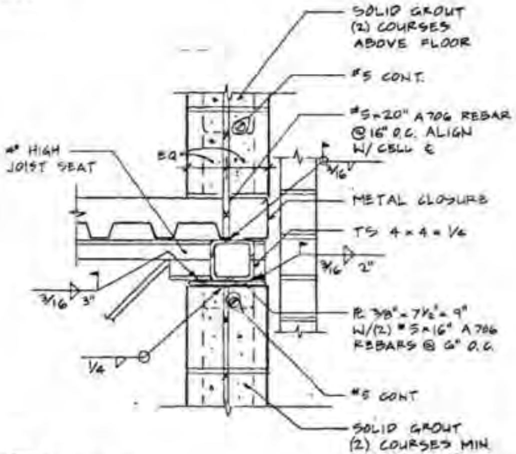
- Mark 7:
  - Side Mounted
  - ½"x4" AB @16" o.c. to 6" CMU



  -
  - $f'_m = 2000$psi
  - $A_b = 0.142$in^2
  - $f_y = 36{,}000$psi
  - Spacing, s = 16"
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.310$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 3.067$kip/anchor
  - Connection Capacity, $V_n = \min(B_{vnc}, B_{vns})/s = 2.300$kip/ft

Diaphragm 3:

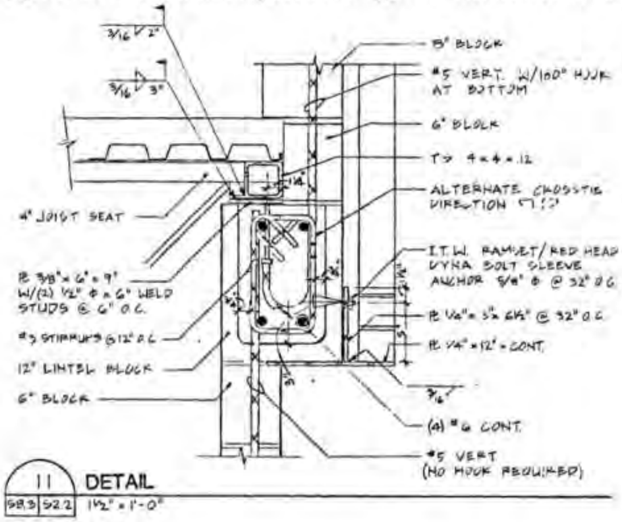
- Mark 8:
  - Top Mounted
  - #5x20" A706 rebar @16" o.c. (up), (2) #5x16" A706 rebar/truss (down) to 8" CMU



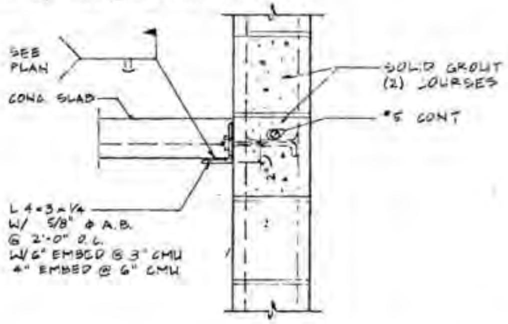
3 DETAIL
S82 S22 1½" = 1'-0"

  -
  - Note: Connection is structurally similar to Diaphragm 1 Connection Mark 8.
  - ∴ Connection Capacity, $V_n = (L_b/l_d)*B_{vn}/s = 5.24$kip/ft

- Mark 9:
  - Top Mounted
  - (2) 1/2"x6" welded studs spaced at 6" @2'-9" o.c. trusses to 12" CMU lintel



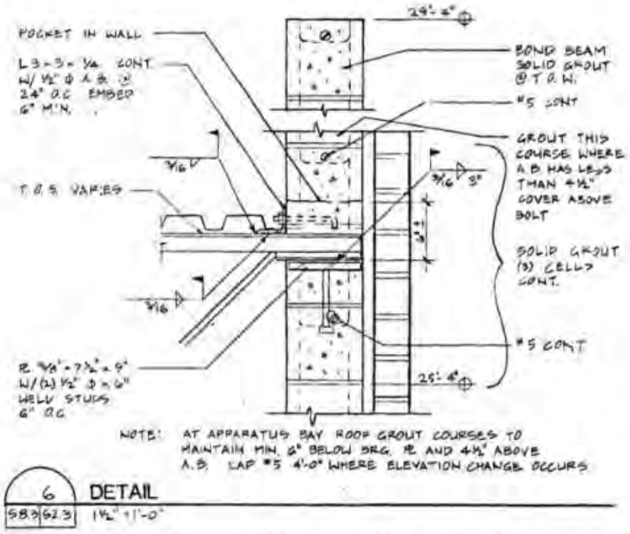
  -
  - $f'_m = 2000$psi
  - $A_b = 0.142\text{in}^2$
  - $f_y = 60{,}000$psi
  - Average Spacing, s = 2'-9"/(2 anchors) = 1.375'
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.310$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 5.112$kip/anchor
  - Connection Capacity, $V_{n,b} = \min(B_{vnc}, B_{vns})/s = 3.135$kip/ft
- Mark 11:
  - Side Mounted
  - 5/8"x6" AB @24" o.c. to 8" CMU



  -
  - Note: Anchorage is structural similar to Diaphragm 1 Mark 1.
  - ∴ Connection Capacity, $V_n = 2.421$kip/ft

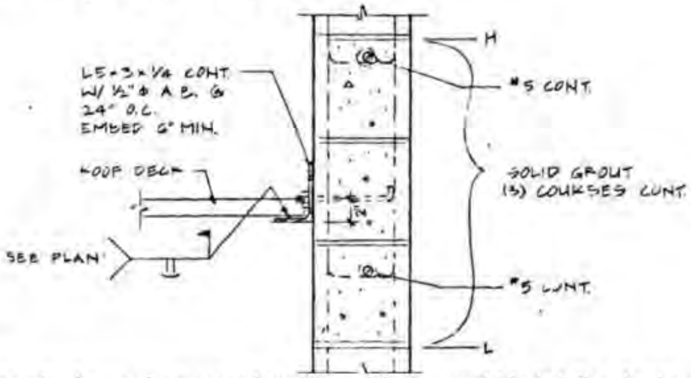
Diaphragm 4:

- Mark 1:



  - Total capacity is the sum of the top and bottom anchorage capacities
  - Top Anchorage:
    - $f'_m = 1500$psi
    - $A_b = 0.142$in^2
    - $f_y = 36{,}000$psi
    - Spacing, s = 24”
    - Anchor Capacity:
      - By inspection, Masonry Crushing or Steel Shear will control
      - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.011$kip/anchor
      - Steel Shear, $B_{vns} = 0.6A_b f_y = 3.067$kip/anchor
    - Connection Capacity, $V_{n,t} = \min(B_{vnc}, B_{vns})/s = 1.534$kip/ft
  - Bottom Anchorage:
    - $f'_m = 1500$psi
    - $A_b = 0.142$in^2
    - $f_y = 60{,}000$psi
    - Average Spacing, s = 5’-11”/(2 anchors) = 2.958’
    - Anchor Capacity:
      - By inspection, Masonry Crushing or Steel Shear will control
      - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.011$kip/anchor
      - Steel Shear, $B_{vns} = 0.6A_b f_y = 5.112$kip/anchor
    - Connection Capacity, $V_{n,b} = \min(B_{vnc}, B_{vns})/s = 1.356$kip/ft
  - Combined Capacity, $V_n = V_{n,t} + V_{n,b} = 2.890$kip/ft

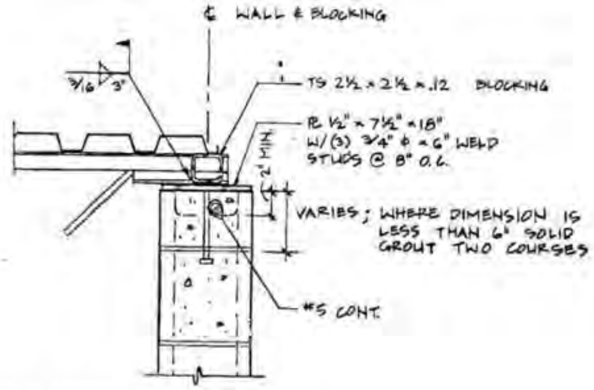
- Mark 4:
  - Side Mounted
  - ½"x6" AB @24" o.c. to 8" CMU



  -
  - Note: Anchorage is structural similar to Diaphragm 4 Mark 1 Top Anchorage.
  - ∴ Connection Capacity, V_n = 1.534kip/ft

Diaphragm 5:

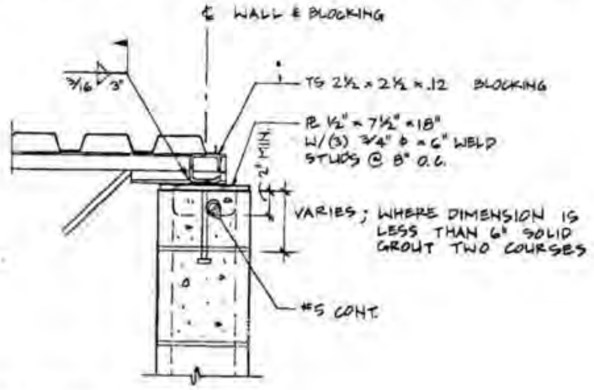
- Mark 1:
  - Note: Anchorage is structural similar to Diaphragm 4 Mark 1 Anchorage.
  - ∴ Connection Capacity, V_n = 2.890kip/ft
- Mark 3:
  - Top Mounted
  - (3) ¾"x6" welded studs, 8" spacing, 6' truss spacing (24" effective spacing)



  -
  - $f'_m = 1500$psi
  - $A_b = 0.334$in^2
  - $f_y = 60{,}000$psi
  - Spacing, s = 24"
  - Anchor Capacity:
    - By inspection, Masonry Crushing or Steel Shear will control
    - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.968$kip/anchor
    - Steel Shear, $B_{vns} = 0.6A_b f_y = 12.024$kip/anchor
  - Connection Capacity, $V_n = \min(B_{vnc}, B_{vns})/s = 2.484$kip/ft

- Mark 4:
  - Side Mounted
  - ½"x6" AB @24" o.c. to 8" CMU
  - Note: Anchorage is structural similar to Diaphragm 4 Mark 4 Anchorage.
  - ∴ Connection Capacity, V_n = 1.534kip/ft

- Mark 14:
    - Top Mounted
    - (2) 1/2"x6" welded studs, 8" spacing, 6' truss spacing (36" effective spacing)



-
    -
    - $f'_m = 1500psi$
    - $A_b = 0.334in^2$
    - $f_y = 60{,}000psi$
    - Spacing, s = 36"
    - Anchor Capacity;
        - By inspection, Masonry Crushing or Steel Shear will control
        - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.011kip/anchor$
        - Steel Shear, $B_{vns} = 0.6A_b f_y = 5.112kip/anchor$
    - Connection Capacity, $V_n = \min(B_{vnc}, B_{vns})/s = 1.337kip/ft$

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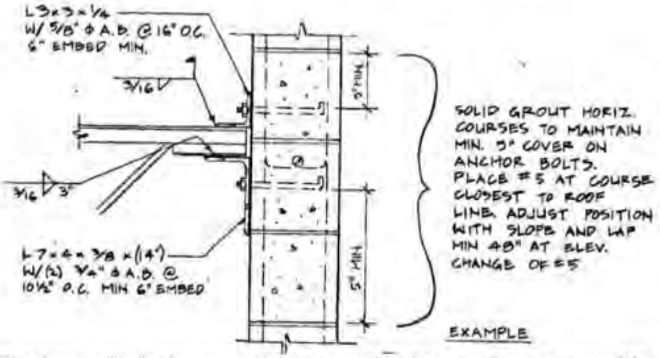
Diaphragm 6:

- Mark 2:



  - Total capacity is the sum of the top and bottom anchorage capacities
  - Top Anchorage:
    - 5/8"x6" AB @16" o.c.
    - $f'_m = 1500psi$
    - $A_b = 0.226in^2$
    - $f_y = 36,000psi$
    - Spacing, s = 16"
    - Anchor Capacity:
      - By inspection, Masonry Crushing or Steel Shear will control
      - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.505kip/anchor$
      - Steel Shear, $B_{vns} = 0.6A_b f_y = 4.882kip/anchor$
    - Connection Capacity, $V_{n,t} = \min(B_{vnc}, B_{vns})/s = 3.379kip/ft$
  - Bottom Anchorage:
    - (2) 3/4"x6" AB @16" o.c.
    - $f'_m = 1500psi$
    - $A_b = 0.334in^2$
    - $f_y = 36,000psi$
    - Spacing, s = 7.25'/(2 anchors) = 3.625'
    - Anchor Capacity:
      - By inspection, Masonry Crushing or Steel Shear will control
      - Masonry Crushing, $B_{vnc} = 1050(f'_m A_b)^{1/4} = 4.968kip/anchor$
      - Steel Shear, $B_{vns} = 0.6A_b f_y = 7.214kip/anchor$
    - Connection Capacity, $V_{n,b} = \min(B_{vnc}, B_{vns})/s = 1.370kip/ft$
  - Combined Capacity, $V_n = V_{n,t} + V_{n,b} = 4.750kip/ft$

- Mark 4:
  - Side Mounted
  - ½"x6" AB @24" o.c. to 8" CMU
  - Note: Anchorage is structural similar to Diaphragm 4 Mark 4 Anchorage.
  - ∴ Connection Capacity, $V_n = 1.534kip/ft$

- Mark 13:
  - Top Mounted
  - ¾"x6" welded studs @16" o.c. to 8" CMU
  - Note: Anchorage is structurally similar to Diaphragm 1 Mark 13 Anchorage.
  - Connection Capacity, $V_n = 4.004kip/ft$

Diaphragm 7:

- Mark 4:
    - Side Mounted
    - ½"x6" AB @24" o.c. to 8" CMU
    - Note: Anchorage is structural similar to Diaphragm 4 Mark 4 Anchorage.
    - ∴ Connection Capacity, V_n = 1.534kip/ft

- Mark 13:
    - Top Mounted
    - ¾"x6" welded studs @16" o.c. to 8" CMU
    - Note: Anchorage is structurally similar to Diaphragm 1 Mark 13 Anchorage.
    - Connection Capacity, V_n = 4.004kip/ft

Diaphragm Connection Demands

See the previous Summary of Diaphragm In-Plane Demands for diaphragm demand distribution.
See below for summary of results and interpretations of where upgrades are required.

Diaphragm	General Description	Anchor Mark	Detail Ref.	Description	$\kappa Q_{CE} - Q_G$ (klf)	$Q_{E,UD}$ (klf)	$X*Q_{E,UD}/(C_1C_2J)$ (klf)	ASCE 41 DCR	Upgrade Length	Notes
1	2nd Floor, Fire Storage, East of Apparatus Bay	8	2/S8.2	(2) #5x16" A706 rebar/truss (2.75' o.c.) (down) to 8" CMU	4.719	0.619	6.164	130.6%	32.44	UPGRADES REQUIRED: Exterior wall region, took average of overstressed regions (2)
		11	12/S8.3	Side Mounted, 5/8"x6" AB @24" o.c. to 8" CMU	1.858	1.944	1.805	97.1%	0.00	Ignored region by stairs (connections north of it will likely drag load away). Ignored corner peak forces
		13	15/S8.5	Top Mounted, 3/4"x6" welded studs @16" o.c. to 8" CMU	3.604	[illegible]	3.343	92.8%	0.00	Averaged (3) plates in highest stress region
2	Lower roof, West side	5	1/S8.6	Top: Side Mounted, 1/2"x4" AB @16" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (5.0' o.c.) to 6" CMU	3.622	[illegible]	3.456	95.5%	0.00	Peak corner force at beam support/reentrant corner ignored
		6	1/S8.2	Top: Side Mounted, 1/2"x7" AB @24" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (5.0' o.c.) to 6" CMU	2.769	2.512	2.351	84.9%	0.00	Peak plate considered (conservative)
		7	20/S8.3	Side Mounted, 1/2"x4" AB @16" o.c. to 6" CMU	1.769	1.703	1.665	94.1%	0.00	Peak (3) plates ignored at corners and locations of support.
3	2nd Floor, Center	8	3/S8.1	(2) #5x16" A706 rebar/truss (2.75' o.c.) (down) to 8" CMU	4.719	4.336	4.491	95.2%	0.00	Averaged (10) plates in highest stress region
		9	11/S8.3	Top mounted, (2) 1/2"x6" welded studs spaced at 6" @2'-9" o.c. trusses to 12" CMU lintel	2.822	[illegible]	2.792	99.0%	0.00	Peak plate considered (conservative)
		11	12/S8.3	Side Mounted, 5/8"x6" AB @24" o.c. to 8" CMU	1.800	[illegible]	2.754	153.0%	83.24	UPGRADES REQUIRED: ALL REGIONS
4	Roof, Apparatus Bay	1	6/S8.3	Top: Side Mounted, 1/2"x6" AB @24" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (5.916' o.c.) to 8" CMU	2.601	[illegible]	2.327	89.5%	0.00	Averaged (10) plates in highest stress region
		4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1.061	1.070	0.994	93.6%	0.00	Averaged corner plate with (3) adjacent
5	Upper Roof, Center	1	6/S8.3	Top: Side Mounted, 1/2"x6" AB @24" o.c. AND Bottom: Top Mounted, (2) 1/2"x6" welded studs/truss (6.0' o.c.) to 8" CMU	2.601	3.029	3.370	129.5%	16.00	UPGRADES REQUIRED: Approx 16' requires upgrades [illegible]
		3	3/S8.4	Top Mounted, (3) 3/4"x6" welded studs 8" spacing at 6'-0" o.c.	2.236	[illegible]	3.216	143.8%	20.05	UPGRADES REQUIRED: North half of connection length requires upgrades
		4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1.057	[illegible]	2.575	243.6%	40.66	UPGRADES REQUIRED: Almost the entire connection length requires upgrades
		14	10/S8.3	Top Mounted, (2) 1/2"x6" welded studs 8" spacing at 6'-0" o.c.	1.203	0.514	0.858	71.3%	0.00	Averaged (15) plates in highest stress region
6	Upper Roof, East of Apparatus Bay	2	4/S8.4	Top: Side Mounted, 5/8"x6" AB @16" o.c. AND Bottom: Side Mounted, (2) 3/4"x6" AB/truss (7.25' o.c.) to 8" CMU	3.462	[illegible]	3.376	97.5%	23.67	Southern portion of connection
		3	3/S8.4	Top Mounted, (3) 3/4"x6" welded studs 8" spacing at 7'-3" o.c.	1.850	[illegible]	3.492	188.7%	40.33	UPGRADES REQUIRED: ENTIRE CONNECTION LENGTH (averaged stresses along length)
		4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	0.989	[illegible]	2.370	239.6%	15.67	UPGRADES REQUIRED: ENTIRE CONNECTION LENGTH (averaged stresses along length)
		13	15/S8.5	Top Mounted, 3/4"x6" welded studs @16" o.c. to 8" CMU	3.604	3.770	2.572	71.4%	0.00	Averaged entire connection length, some peak forces at corners
7	Hose Tower	4	18/S8.3	Side mounted, 1/2"x6" AB @24" o.c. to 8" CMU	1.093	[illegible]	1.339	126.8%	38.33	UPGRADES REQUIRED: ENTIRE CONNECTION LENGTH [illegible]
		13	15/S8.5	Top Mounted, 3/4"x6" welded studs @16" o.c. to 8" CMU	3.604	[illegible]	3.136	87.0%	0.00	Conservatively considers peak demand

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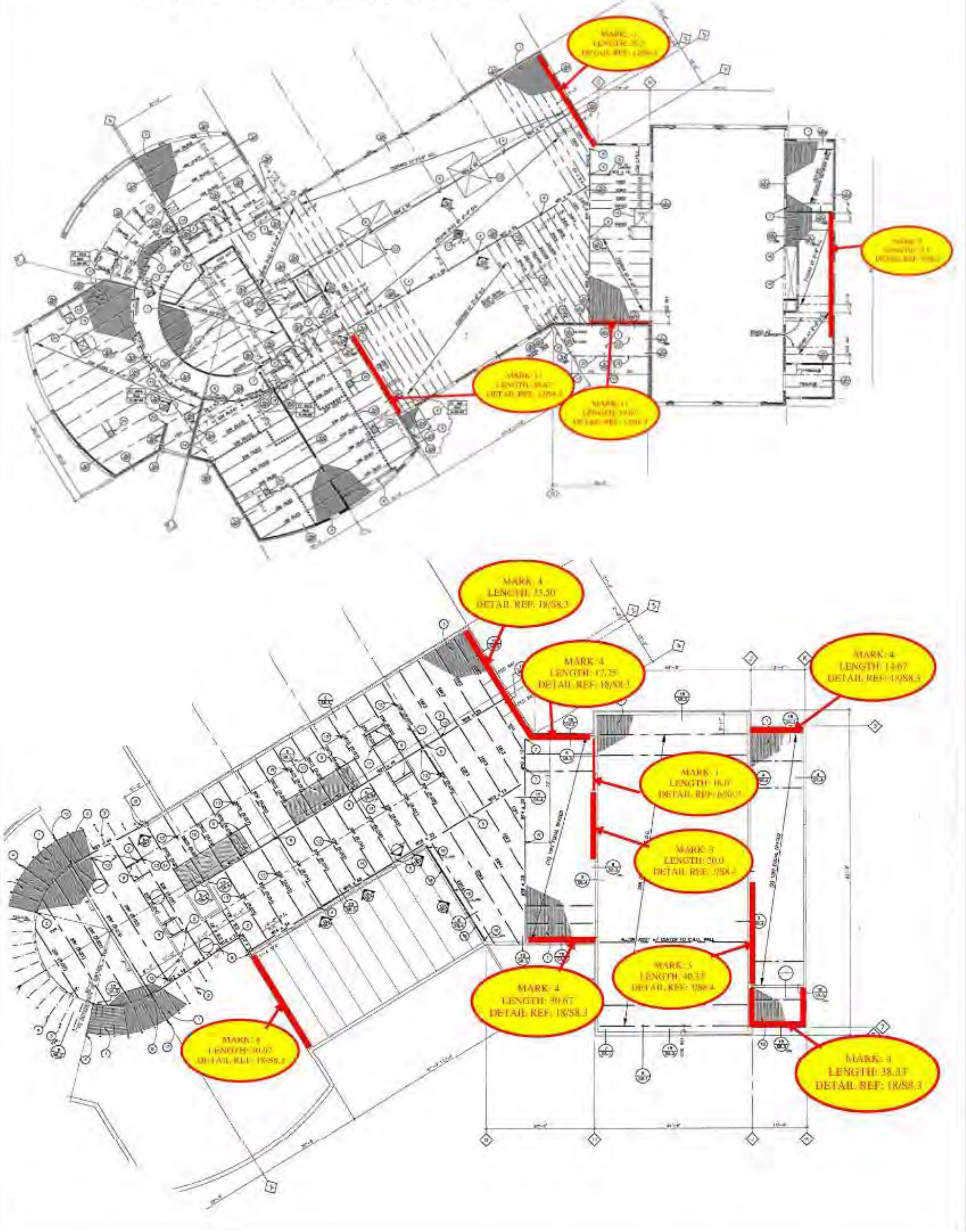
Diaphragm Connection Upgrade Regions



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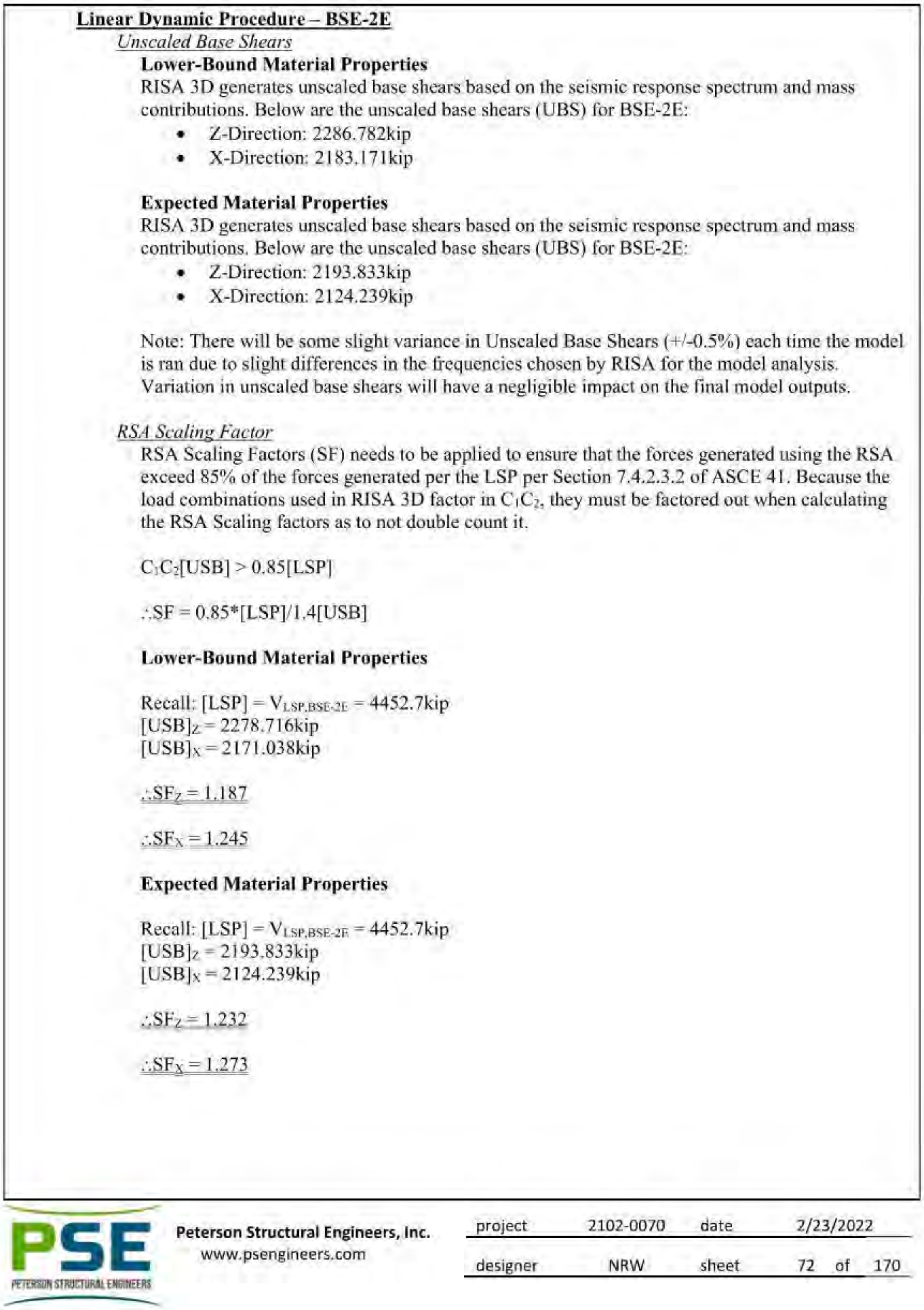

Linear Dynamic Procedure – BSE-2E

Unscaled Base Shears

Lower-Bound Material Properties

RISA 3D generates unscaled base shears based on the seismic response spectrum and mass contributions. Below are the unscaled base shears (UBS) for BSE-2E:

- Z-Direction: 2286.782kip
- X-Direction: 2183.171kip

Expected Material Properties

RISA 3D generates unscaled base shears based on the seismic response spectrum and mass contributions. Below are the unscaled base shears (UBS) for BSE-2E:

- Z-Direction: 2193.833kip
- X-Direction: 2124.239kip

Note: There will be some slight variance in Unscaled Base Shears (+/-0.5%) each time the model is ran due to slight differences in the frequencies chosen by RISA for the model analysis. Variation in unscaled base shears will have a negligible impact on the final model outputs.

RSA Scaling Factor

RSA Scaling Factors (SF) needs to be applied to ensure that the forces generated using the RSA exceed 85% of the forces generated per the LSP per Section 7.4.2.3.2 of ASCE 41. Because the load combinations used in RISA 3D factor in C_1C_2, they must be factored out when calculating the RSA Scaling factors as to not double count it.

$C_1C_2[USB] > 0.85[LSP]$

$\therefore SF = 0.85*[LSP]/1.4[USB]$

Lower-Bound Material Properties

Recall: $[LSP] = V_{LSP,BSE\text{-}2E} = 4452.7\text{kip}$
$[USB]_Z = 2278.716\text{kip}$
$[USB]_X = 2171.038\text{kip}$

$\underline{\therefore SF_Z = 1.187}$

$\underline{\therefore SF_X = 1.245}$

Expected Material Properties

Recall: $[LSP] = V_{LSP,BSE\text{-}2E} = 4452.7\text{kip}$
$[USB]_Z = 2193.833\text{kip}$
$[USB]_X = 2124.239\text{kip}$

$\underline{\therefore SF_Z = 1.232}$

$\underline{\therefore SF_X = 1.273}$

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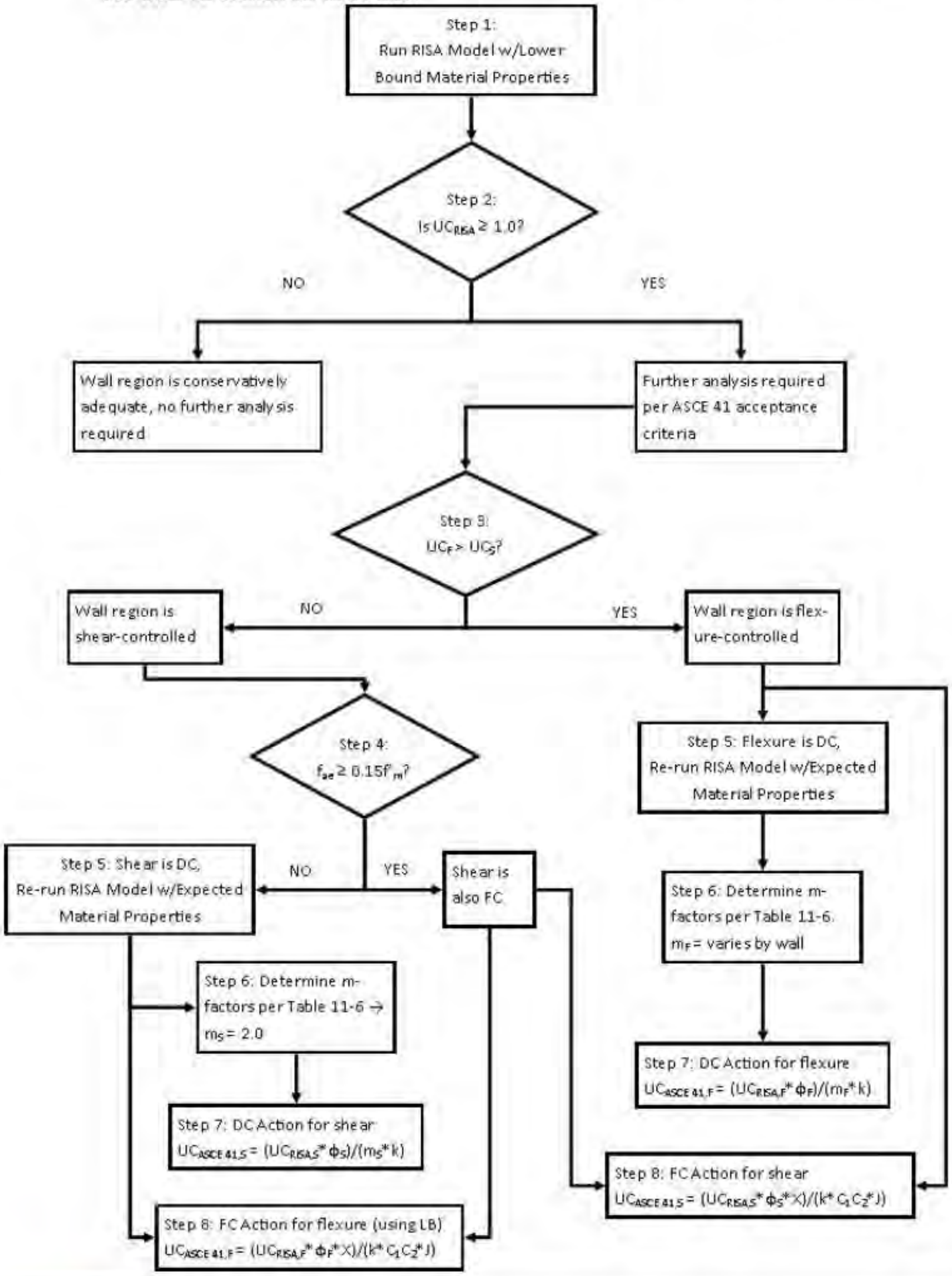
Wall Panel Evaluation for In-Plane Loads

General Approach

The general approach for evaluating the masonry shearwalls is similar for both seismic events. See BSE-1E section for more info.



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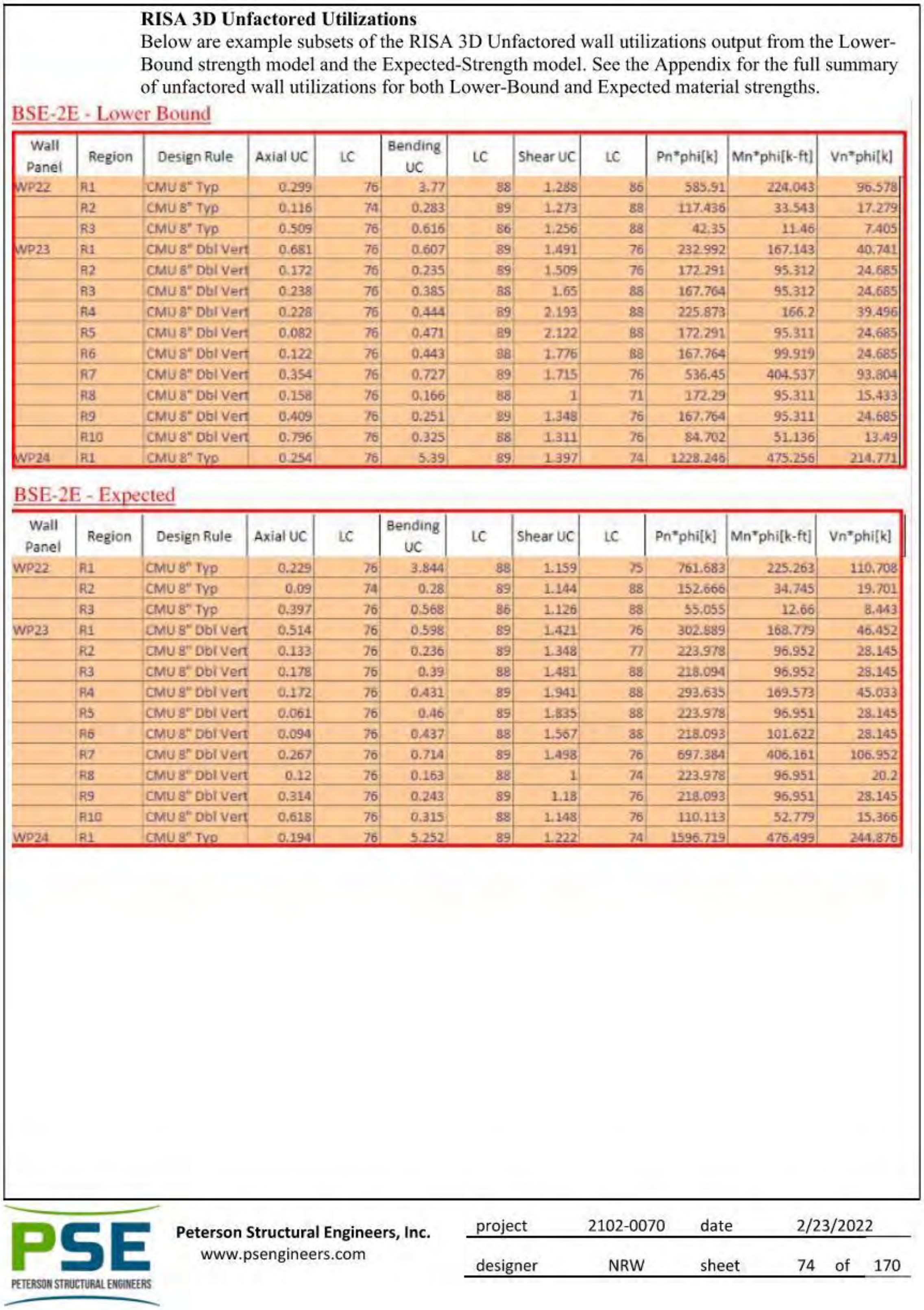

RISA 3D Unfactored Utilizations

Below are example subsets of the RISA 3D Unfactored wall utilizations output from the Lower-Bound strength model and the Expected-Strength model. See the Appendix for the full summary of unfactored wall utilizations for both Lower-Bound and Expected material strengths.

BSE-2E - Lower Bound

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP22	R1	CMU 8" Typ	0.299	76	3.77	88	1.288	86	585.91	224.043	96.578
	R2	CMU 8" Typ	0.116	74	0.283	89	1.273	88	117.436	33.543	17.279
	R3	CMU 8" Typ	0.509	76	0.616	86	1.256	88	42.35	11.46	7.405
WP23	R1	CMU 8" Dbl Vert	0.681	76	0.607	89	1.491	76	232.992	167.143	40.741
	R2	CMU 8" Dbl Vert	0.172	76	0.235	89	1.509	76	172.291	95.312	24.685
	R3	CMU 8" Dbl Vert	0.238	76	0.385	88	1.65	88	167.764	95.312	24.685
	R4	CMU 8" Dbl Vert	0.228	76	0.444	89	2.193	88	225.873	166.2	39.496
	R5	CMU 8" Dbl Vert	0.082	76	0.471	89	2.122	88	172.291	95.311	24.685
	R6	CMU 8" Dbl Vert	0.122	76	0.443	88	1.776	88	167.764	99.919	24.685
	R7	CMU 8" Dbl Vert	0.354	76	0.727	89	1.715	76	536.45	404.537	93.804
	R8	CMU 8" Dbl Vert	0.158	76	0.166	88	1	71	172.29	95.311	15.433
	R9	CMU 8" Dbl Vert	0.409	76	0.251	89	1.348	76	167.764	95.311	24.685
	R10	CMU 8" Dbl Vert	0.796	76	0.325	88	1.311	76	84.702	51.136	13.49
WP24	R1	CMU 8" Typ	0.254	76	5.39	89	1.397	74	1228.246	475.256	214.771

BSE-2E - Expected

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP22	R1	CMU 8" Typ	0.229	76	3.844	88	1.159	75	761.683	225.263	110.708
	R2	CMU 8" Typ	0.09	74	0.28	89	1.144	88	152.666	34.745	19.701
	R3	CMU 8" Typ	0.397	76	0.568	86	1.126	88	55.055	12.66	8.443
WP23	R1	CMU 8" Dbl Vert	0.514	76	0.598	89	1.421	76	302.889	168.779	46.452
	R2	CMU 8" Dbl Vert	0.133	76	0.236	89	1.348	77	223.978	96.952	28.145
	R3	CMU 8" Dbl Vert	0.178	76	0.39	88	1.481	88	218.094	96.952	28.145
	R4	CMU 8" Dbl Vert	0.172	76	0.431	89	1.941	88	293.635	169.573	45.033
	R5	CMU 8" Dbl Vert	0.061	76	0.46	89	1.835	88	223.978	96.951	28.145
	R6	CMU 8" Dbl Vert	0.094	76	0.437	88	1.567	88	218.093	101.622	28.145
	R7	CMU 8" Dbl Vert	0.267	76	0.714	89	1.498	76	697.384	406.161	106.952
	R8	CMU 8" Dbl Vert	0.12	76	0.163	88	1	74	223.978	96.951	20.2
	R9	CMU 8" Dbl Vert	0.314	76	0.243	89	1.18	76	218.093	96.951	28.145
	R10	CMU 8" Dbl Vert	0.618	76	0.315	88	1.148	76	110.113	52.779	15.366
WP24	R1	CMU 8" Typ	0.194	76	5.252	89	1.222	74	1596.719	476.499	244.876

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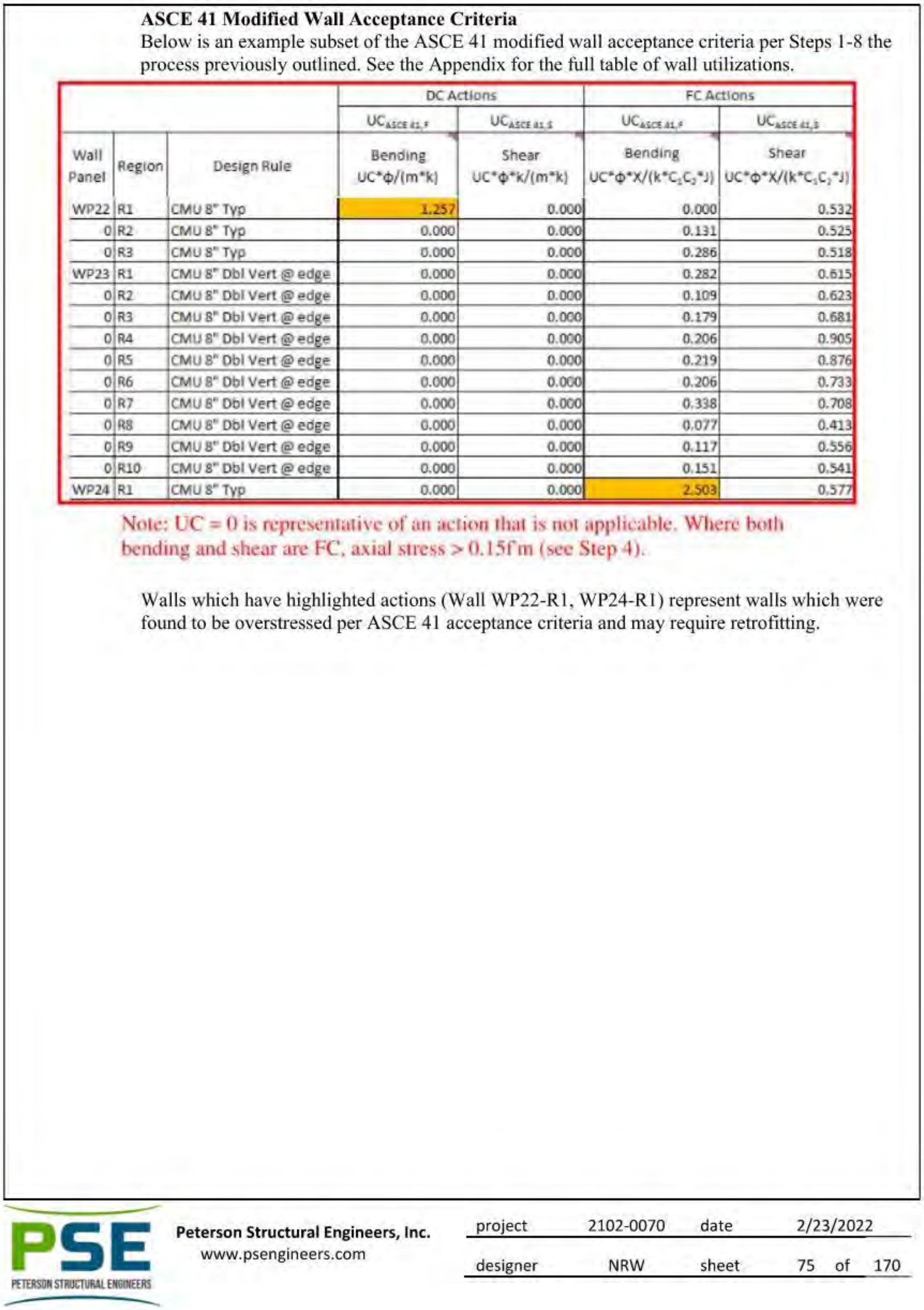

ASCE 41 Modified Wall Acceptance Criteria

Below is an example subset of the ASCE 41 modified wall acceptance criteria per Steps 1-8 the process previously outlined. See the Appendix for the full table of wall utilizations.

			DC Actions		FC Actions	
			$UC_{ASCE\ 41,F}$	$UC_{ASCE\ 41,S}$	$UC_{ASCE\ 41,F}$	$UC_{ASCE\ 41,S}$
Wall Panel	Region	Design Rule	Bending UC*Φ/(m*k)	Shear UC*Φ*k/(m*k)	Bending UC*Φ*X/(k*C_1C_2*J)	Shear UC*Φ*X/(k*C_1C_2*J)
WP22	R1	CMU 8" Typ	1.257	0.000	0.000	0.532
0	R2	CMU 8" Typ	0.000	0.000	0.131	0.525
0	R3	CMU 8" Typ	0.000	0.000	0.286	0.518
WP23	R1	CMU 8" Dbl Vert @ edge	0.000	0.000	0.282	0.615
0	R2	CMU 8" Dbl Vert @ edge	0.000	0.000	0.109	0.623
0	R3	CMU 8" Dbl Vert @ edge	0.000	0.000	0.179	0.681
0	R4	CMU 8" Dbl Vert @ edge	0.000	0.000	0.206	0.905
0	R5	CMU 8" Dbl Vert @ edge	0.000	0.000	0.219	0.876
0	R6	CMU 8" Dbl Vert @ edge	0.000	0.000	0.206	0.733
0	R7	CMU 8" Dbl Vert @ edge	0.000	0.000	0.338	0.708
0	R8	CMU 8" Dbl Vert @ edge	0.000	0.000	0.077	0.413
0	R9	CMU 8" Dbl Vert @ edge	0.000	0.000	0.117	0.556
0	R10	CMU 8" Dbl Vert @ edge	0.000	0.000	0.151	0.541
WP24	R1	CMU 8" Typ	0.000	0.000	2.503	0.577

Note: UC = 0 is representative of an action that is not applicable. Where both bending and shear are FC, axial stress > 0.15f'm (see Step 4).

Walls which have highlighted actions (Wall WP22-R1, WP24-R1) represent walls which were found to be overstressed per ASCE 41 acceptance criteria and may require retrofitting.

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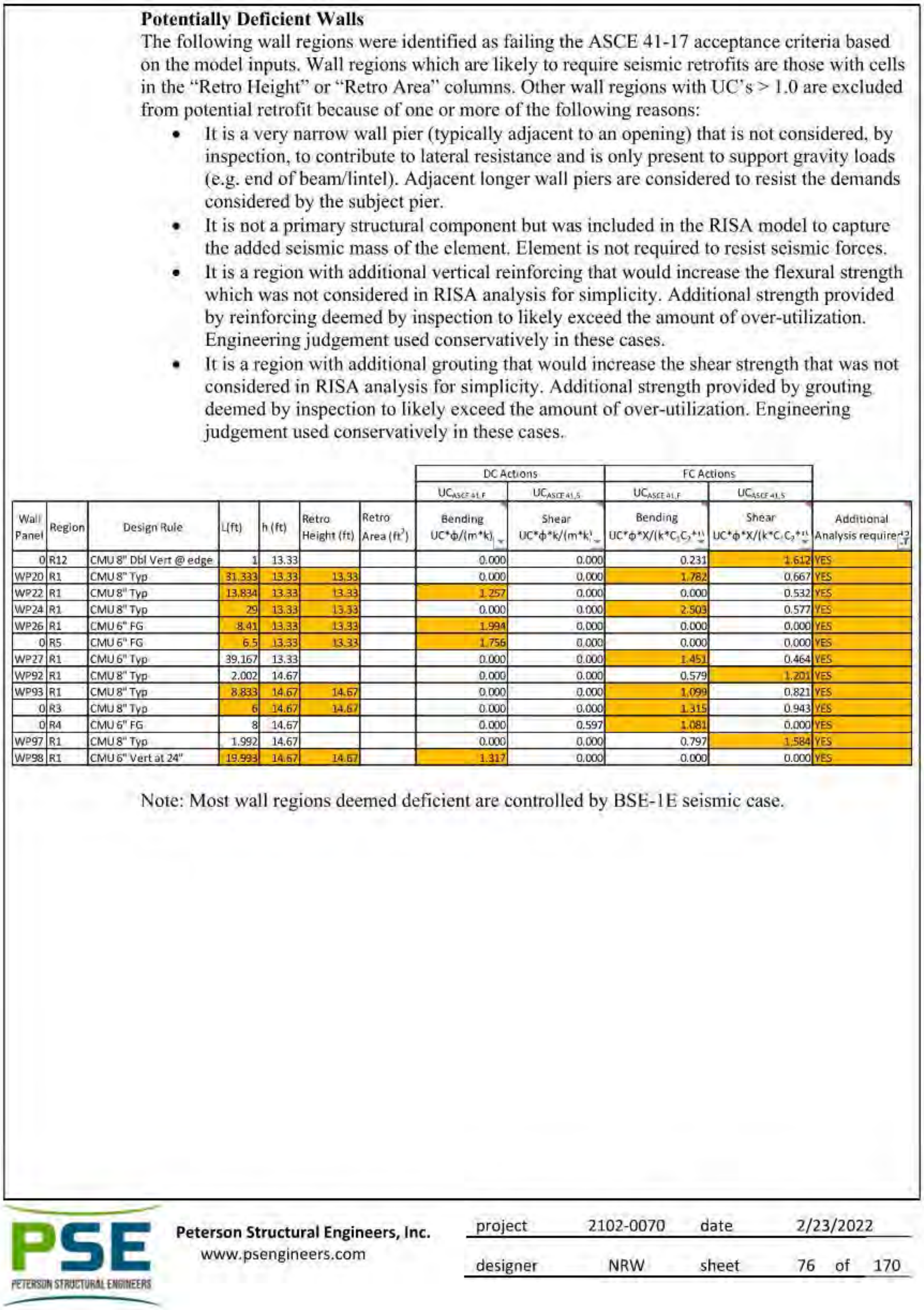

Potentially Deficient Walls

The following wall regions were identified as failing the ASCE 41-17 acceptance criteria based on the model inputs. Wall regions which are likely to require seismic retrofits are those with cells in the "Retro Height" or "Retro Area" columns. Other wall regions with UC's > 1.0 are excluded from potential retrofit because of one or more of the following reasons:

- It is a very narrow wall pier (typically adjacent to an opening) that is not considered, by inspection, to contribute to lateral resistance and is only present to support gravity loads (e.g. end of beam/lintel). Adjacent longer wall piers are considered to resist the demands considered by the subject pier.
- It is not a primary structural component but was included in the RISA model to capture the added seismic mass of the element. Element is not required to resist seismic forces.
- It is a region with additional vertical reinforcing that would increase the flexural strength which was not considered in RISA analysis for simplicity. Additional strength provided by reinforcing deemed by inspection to likely exceed the amount of over-utilization. Engineering judgement used conservatively in these cases.
- It is a region with additional grouting that would increase the shear strength that was not considered in RISA analysis for simplicity. Additional strength provided by grouting deemed by inspection to likely exceed the amount of over-utilization. Engineering judgement used conservatively in these cases.

							DC Actions		FC Actions		
							$UC_{ASCE 41,F}$	$UC_{ASCE 41,S}$	$UC_{ASCE 41,F}$	$UC_{ASCE 41,S}$	
Wall Panel	Region	Design Rule	L(ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending UC*ϕ/(m*k)	Shear UC*ϕ*k/(m*k	Bending UC*ϕ*X/(k*C_1C_2*	Shear UC*ϕ*X/(k*C_1C_2*	Additional Analysis require
0	R12	CMU 8" Dbl Vert @ edge	1	13.33			0.000	0.000	0.231	1.612	YES
WP20	R1	CMU 8" Typ	31.333	13.33	13.33		0.000	0.000	1.782	0.667	YES
WP22	R1	CMU 8" Typ	13.834	13.33	13.33		1.257	0.000	0.000	0.532	YES
WP24	R1	CMU 8" Typ	29	13.33	13.33		0.000	0.000	2.503	0.577	YES
WP26	R1	CMU 6" FG	8.41	13.33	13.33		1.994	0.000	0.000	0.000	YES
0	R5	CMU 6" FG	6.5	13.33	13.33		1.756	0.000	0.000	0.000	YES
WP27	R1	CMU 6" Typ	39.167	13.33			0.000	0.000	1.451	0.464	YES
WP92	R1	CMU 8" Typ	2.002	14.67			0.000	0.000	0.579	1.201	YES
WP93	R1	CMU 8" Typ	8.833	14.67	14.67		0.000	0.000	1.099	0.821	YES
0	R3	CMU 8" Typ	6	14.67	14.67		0.000	0.000	1.315	0.943	YES
0	R4	CMU 6" FG	8	14.67			0.000	0.597	1.081	0.000	YES
WP97	R1	CMU 8" Typ	1.992	14.67			0.000	0.000	0.797	1.584	YES
WP98	R1	CMU 6" Vert at 24"	19.993	14.67	14.67		1.317	0.000	0.000	0.000	YES

Note: Most wall regions deemed deficient are controlled by BSE-1E seismic case.

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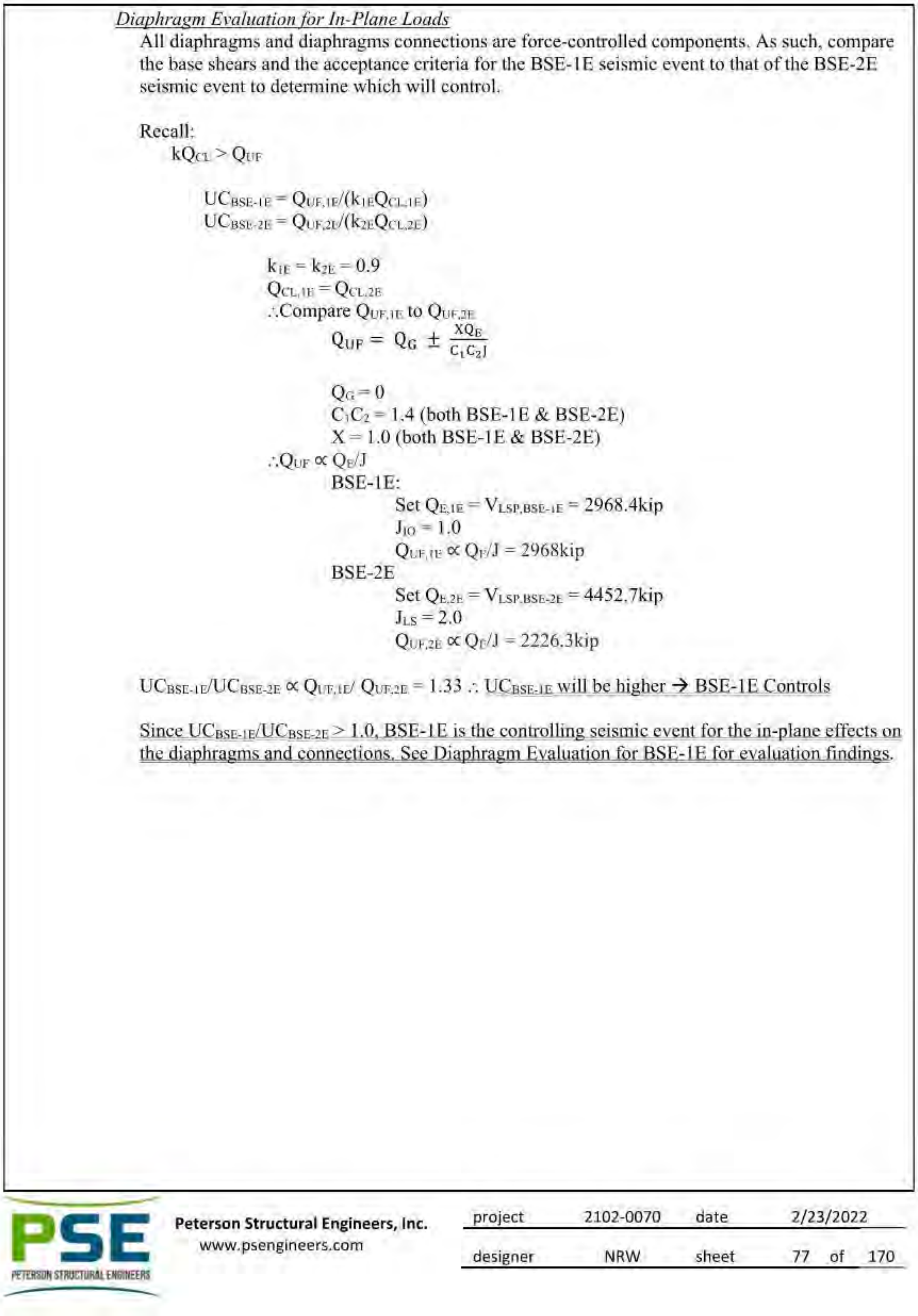

Diaphragm Evaluation for In-Plane Loads

All diaphragms and diaphragms connections are force-controlled components. As such, compare the base shears and the acceptance criteria for the BSE-1E seismic event to that of the BSE-2E seismic event to determine which will control.

Recall:

$kQ_{CL} > Q_{UF}$

$UC_{BSE\text{-}1E} = Q_{UF,1E}/(k_{1E}Q_{CL,1E})$
$UC_{BSE\text{-}2E} = Q_{UF,2E}/(k_{2E}Q_{CL,2E})$

$k_{1E} = k_{2E} = 0.9$
$Q_{CL,1E} = Q_{CL,2E}$
$\therefore$Compare $Q_{UF,1E}$ to $Q_{UF,2E}$

$$Q_{UF} = Q_G \pm \frac{XQ_E}{C_1C_2J}$$

$Q_G = 0$
$C_1C_2 = 1.4$ (both BSE-1E & BSE-2E)
$X = 1.0$ (both BSE-1E & BSE-2E)
$\therefore Q_{UF} \propto Q_E/J$

BSE-1E:
Set $Q_{E,1E} = V_{LSP,BSE\text{-}1E} = 2968.4$kip
$J_{IO} = 1.0$
$Q_{UF,1E} \propto Q_E/J = 2968$kip

BSE-2E
Set $Q_{E,2E} = V_{LSP,BSE\text{-}2E} = 4452.7$kip
$J_{LS} = 2.0$
$Q_{UF,2E} \propto Q_E/J = 2226.3$kip

$UC_{BSE\text{-}1E}/UC_{BSE\text{-}2E} \propto Q_{UF,1E}/\ Q_{UF,2E} = 1.33 \therefore$ $UC_{BSE\text{-}1E}$ will be higher → BSE-1E Controls

Since $UC_{BSE\text{-}1E}/UC_{BSE\text{-}2E} > 1.0$, BSE-1E is the controlling seismic event for the in-plane effects on the diaphragms and connections. See Diaphragm Evaluation for BSE-1E for evaluation findings.

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Out-of-Plane Design Checks

Diaphragm Connections

Evaluate the diaphragm-to-wall connections for resisting out-of-plane loads per ASCE 41 Section 7.2.11.1.

Demands:

$$F_p = 0.4 S_{XS} k_a k_h \chi W_p \qquad (7\text{-}9)$$

$$F_{p,min} = 0.2 k_a \chi W_p \qquad (7\text{-}10)$$

$$k_a = 1.0 + \frac{L_f}{100} \qquad (7\text{-}11)$$

$$k_h = \frac{1}{3}\left(1 + \frac{2z_a}{h_n}\right) \qquad (7\text{-}12)$$

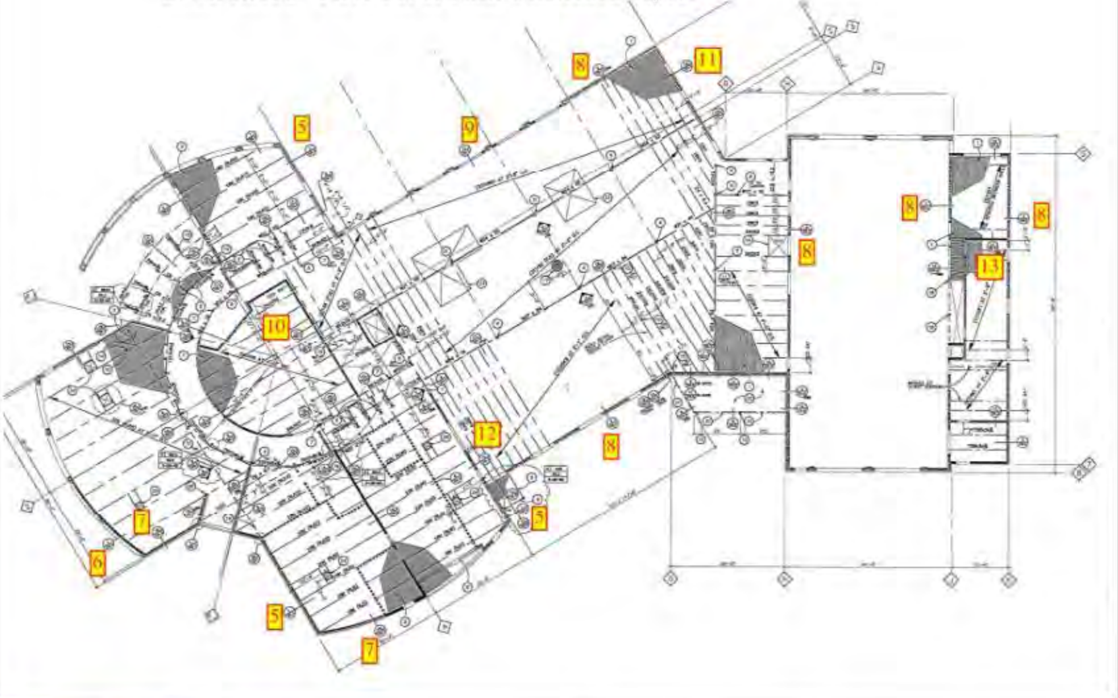
Note:

- k_a = 1.0 for rigid diaphragms
- k_h = 1.0 in all cases (not all building diaphragms are flexible)
- X:
    - Immediate Occupancy: X = 2.0 (corresponds to BSE-1E)
    - Life Safety: X = 1.3 (corresponds to BSE -2E)
- S_{XS}:
    - BSE-1E: $S_{XS} = 0.531$
    - BSE-2E: $S_{XS} = 0.797$

Note: $0.4S_{XS} > 0.2$ for all cases $\therefore F_p$ will always control over $F_{p,min}$

Upper Roof Out-of-Plane Connection Layout

Lower Roof/2nd Floor Out-of-Plane Connection Layout



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Roof Connection Demands:

BSE-1E (IO)

Mark	Level	Parallel or Perp. To framing	Anchor Mount Position	Connection Description	Detail Ref	Wall Type	Veneer?	Wall Weight (ksf)	Connection Spacing (ft)	Trib Height (ft)	Trib Weight, W_p (kip)	Diaphragm Type	Diaphragm Length, L_f (ft)	k_a	k_h	X	Demand, F_p (kip)
1	Upper Roof	Perp.	Top	Typical: (2) 1/2"x6" welded studs @6" o.c.	6/S8.3	CMU 8" Typ	YES	0.094	6.00	10.01	5.643	Flexible	76.128	1.761	1	2.0	4.222
2	Upper Roof	Perp.	Side	Storage: (2) 3/4"x6" AB @10.5" o.c.	4/S8.4	CMU 8" Typ	NO	0.055	7.25	10.67	4.255	Flexible	15.67	1.157	1	2.0	2.091
3	Upper Roof	Perp.	Top	Apparatus Bay: (3) 3/4"x6" welded studs @8" o.c.	3/S8.4	CMU 12" Typ	YES	0.119	5.92	13.67	9.625	Flexible	43.167	1.432	1	2.0	5.854
4	Upper Roof	Parallel	Side	Typical: 1/2"x6" AB @24" o.c.	18/S8.3	CMU 12" Typ	YES	0.119	2.00	13.67	3.253	Flexible	43.167	1.432	1	2.0	1.979
5	Lower Roof	Perp.	Top	Typical: (2) 1/2"x6" welded studs @6" o.c.	1/S8.3	CMU 6" Typ	YES	0.081	5.42	8.84	3.876	Flexible	29.16	1.292	1	2.0	2.127
6	Lower Roof	Perp.	Top	West Area: (2) 1/2"x6" welded studs @6" o.c.	1/S8.2	CMU 6" Typ	YES	0.081	5.58	8.84	3.996	Flexible	42.3	1.423	1	2.0	2.415
7	Lower Roof	Parallel	Side	Typical: 1/2"x4" AB @16" o.c.	19/S8.3	CMU 6" Typ	YES	0.081	1.33	8.84	0.952	Flexible	56.4	1.564	1	2.0	0.632

BSE-2E (LS)

Mark	Level	Parallel or Perp. To framing	Anchor Mount Position	Connection Description	Detail Ref	Wall Type	Veneer?	Wall Weight (ksf)	Connection Spacing (ft)	Trib Height (ft)	Trib Weight, W_p (kip)	Diaphragm Type	Diaphragm Length, L_f (ft)	k_a	k_h	X	Demand, F_p (kip)
1	Upper Roof	Perp.	Top	Typical: (2) 1/2"x6" welded studs @6" o.c.	6/S8.3	CMU 8" Typ	YES	0.094	6.00	10.01	5.643	Flexible	76.128	1.761	1	1.3	4.119
2	Upper Roof	Perp.	Side	Storage: (2) 3/4"x6" AB @10.5" o.c.	4/S8.4	CMU 8" Typ	NO	0.055	7.25	10.67	4.255	Flexible	15.67	1.157	1	1.3	2.040
3	Upper Roof	Perp.	Top	Apparatus Bay: (3) 3/4"x6" welded studs @8" o.c.	3/S8.4	CMU 12" Typ	YES	0.119	5.92	13.67	9.625	Flexible	43.167	1.432	1	1.3	5.711
4	Upper Roof	Parallel	Side	Typical: 1/2"x6" AB @24" o.c.	18/S8.3	CMU 12" Typ	YES	0.119	2.00	13.67	3.253	Flexible	43.167	1.432	1	1.3	1.930
5	Lower Roof	Perp.	Top	Typical: (2) 1/2"x6" welded studs @6" o.c.	1/S8.3	CMU 6" Typ	YES	0.081	5.42	8.84	3.876	Flexible	29.16	1.292	1	1.3	2.075
6	Lower Roof	Perp.	Top	West Area: (2) 1/2"x6" welded studs @6" o.c.	1/S8.2	CMU 6" Typ	YES	0.081	5.58	8.84	3.996	Flexible	42.3	1.423	1	1.3	2.356
7	Lower Roof	Parallel	Side	Typical: 1/2"x4" AB @16" o.c.	19/S8.3	CMU 6" Typ	YES	0.081	1.33	8.84	0.952	Flexible	56.4	1.564	1	1.3	0.617

2^{nd} Floor Connection Demands

BSE-1E (IO)

Mark	Level	Parallel or Perp. To framing	Anchor mount position	Connection Description	Detail Ref	Wall Type	Veneer?	Wall Weight (ksf)	Connection Spacing (ft)	Trib Height (ft)	Trib Weight, W_p (kip)	Diaphragm Type	Diaphragm Length, L_f (ft)	k_a	k_h	X	Demand, F_p (kip)
8	2nd	Perp.	Top	Typical: #5x20" A706 rebar @16" o.c. (up), (2) #5x16" A706 rebar/truss (down)	2&3/S8.2	CMU 8" Typ	YES	0.094	2.75	14.00	3.619	Rigid	N/A	1.0	1.0	2.0	1.537
9	2nd	Perp.	Top	Into Lintel: (2) 1/2"x6" welded studs @6" o.c.	11/S8.3	CMU 8" Typ	YES	0.094	2.75	14.00	3.619	Rigid	N/A	1.0	1.0	2.0	1.537
10	2nd	Perp.	Top	Center Circle: (2) #5x16" A706 rebar @8" o.c.	13/S8.2	CMU 6" Typ	NO	0.042	4.00	14.00	2.352	Rigid	N/A	1.0	1.0	2.0	0.999
11	2nd	Parallel	Side	Typical: 5/8"x6" AB @2'-0" o.c.	12/S8.3	CMU 8" Typ	YES	0.094	2.00	14.00	2.632	Rigid	N/A	1.0	1.0	2.0	1.118
12	2nd	Parallel	Side	Typical: 5/8"x4" AB @2'-0" o.c.	12/S8.3	CMU 6" Typ	YES	0.081	2.00	14.00	2.268	Rigid	N/A	1.0	1.0	2.0	0.963
13	2nd	Parallel	Top	Storage: 3/4"x6" welded studs @16" o.c.	15/S8.5	CMU 8" Typ	NO	0.055	1.33	6.00	0.439	Rigid	N/A	1.0	1.0	2.0	0.186

BSE-2E (LS)

Mark	Level	Parallel or Perp. To framing	Anchor mount position	Connection Description	Detail Ref	Wall Type	Veneer?	Wall Weight (ksf)	Connection Spacing (ft)	Trib Height (ft)	Trib Weight, W_p (kip)	Diaphragm Type	Diaphragm Length, L_f (ft)	k_a	k_h	X	Demand, F_p (kip)
8	2nd	Perp.	Top	Typical: #5x20" A706 rebar @16" o.c. (up), (2) #5x16" A706 rebar/truss (down)	2&3/S8.2	CMU 8" Typ	YES	0.094	2.75	14.00	3.619	Rigid	N/A	1.0	1.0	1.3	1.500
9	2nd	Perp.	Top	Into Lintel: (2) 1/2"x6" welded studs @6" o.c.	11/S8.3	CMU 8" Typ	YES	0.094	2.75	14.00	3.619	Rigid	N/A	1.0	1.0	1.3	1.500
10	2nd	Perp.	Top	Center Circle: (2) #5x16" A706 rebar @8" o.c.	13/S8.2	CMU 6" Typ	NO	0.042	4.00	14.00	2.352	Rigid	N/A	1.0	1.0	1.3	0.975
11	2nd	Parallel	Side	Typical: 5/8"x6" AB @2'-0" o.c.	12/S8.3	CMU 8" Typ	YES	0.094	2.00	14.00	2.632	Rigid	N/A	1.0	1.0	1.3	1.091
12	2nd	Parallel	Side	Typical: 5/8"x4" AB @2'-0" o.c.	12/S8.3	CMU 6" Typ	YES	0.081	2.00	14.00	2.268	Rigid	N/A	1.0	1.0	1.3	0.940
13	2nd	Parallel	Top	Storage: 3/4"x6" welded studs @16" o.c.	15/S8.5	CMU 8" Typ	NO	0.055	1.33	6.00	0.439	Rigid	N/A	1.0	1.0	1.3	0.182

Example Calculation: Mark 8

$F_p = 0.4*S_{XS}*k_a*k_h*X*W_p$ [ASCE 41-17, Eqn 7-9]

BSE-1E:

$S_{XS} = 0.531$

$k_a = 1.0$ (rigid diaphragm)

$k_h = 1.0$ (not all diaphragms are rigid, conservative)

$X_{IO} = 2.0$

$W_p = D_w$*trib height*spacing

$D_w = 55psf + 39psf = 0.094ks$ (8" CMU + Brick Veneer)

Trib height = $(h_2/2)+(h_1/2) = (14.67'/2) + (13.33'/2) = 14.0'$

Spacing = 2.75' (truss pacing)

$W_p = 3.619kip$

$\underline{F_{p,BSE-1E} = 1.537kip}$

Connection Checks

Evaluation Criteria

By inspection, BSE-1E seismic event controls.

Per ASCE 41 Section 11.5.2, anchors are to be evaluated per the following:

- Force-Controlled action
- Lower Bound Material Strengths
- LRFD, ϕ = 1.00

Note: For simplicity, conservatively compare the lower bound strengths to the seismic demands generated above. Demands are not reduced to force-controlled action per Section 7.5.1.2 of ASCE 41. Evaluation is conservative.

Controlling Anchors

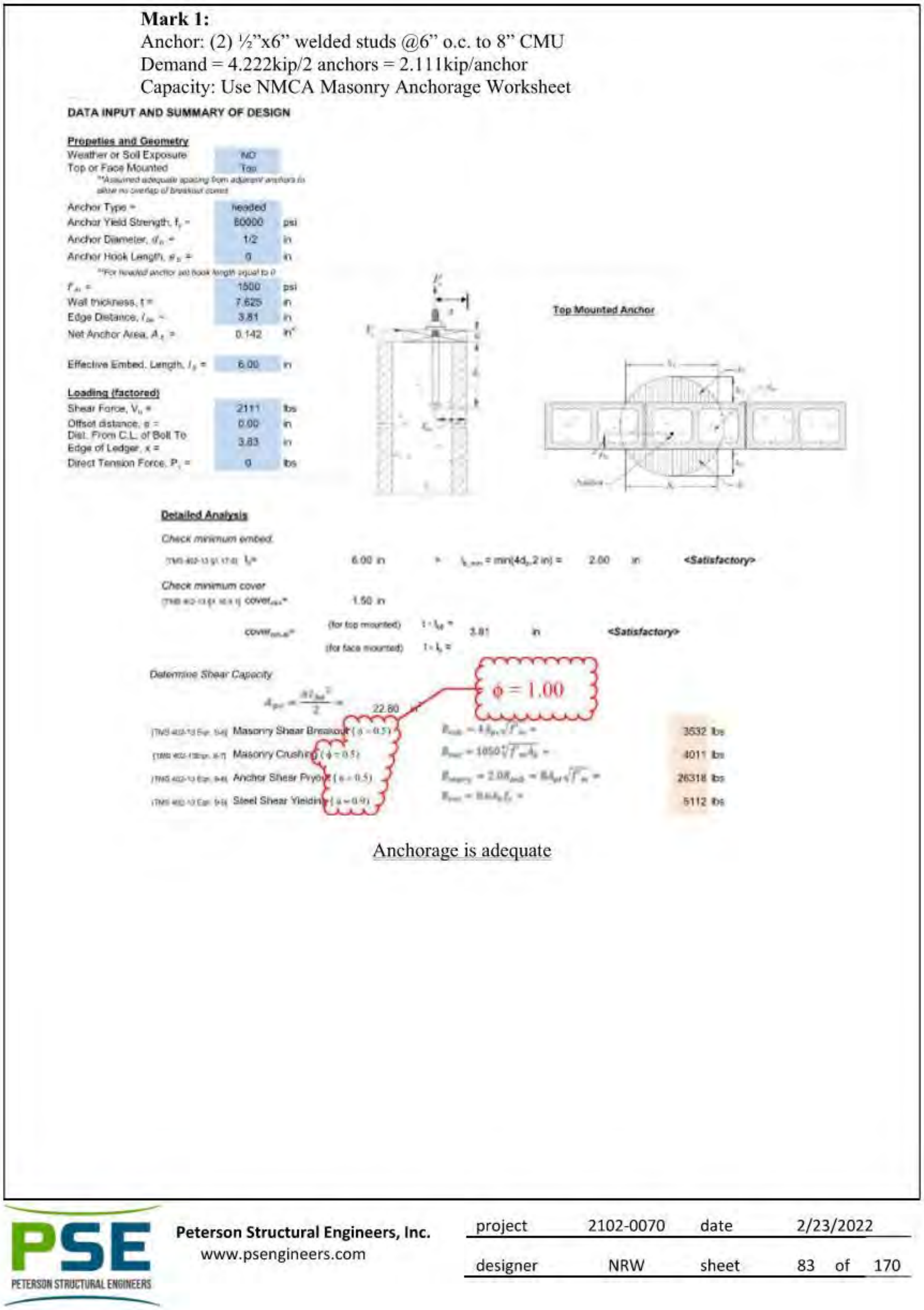
By inspection, the controlling connections are the following:

Top Mounted Anchors:

- Mark 1: (2) ½"x6" welded studs @6" o.c. to 8" CMU
- Mark 3: (3) ¾"x6" welded studs @8" o.c. to 8" CMU or 12" CMU (8" controls)
- Mark 6: (2) ½" x6" welded studs @6" o.c. to 6" CMU

Side Mounted Anchors:

- Mark 2: (2) ¾"x6" AB @10.5" o.c. to 8" CMU
- Mark 7: ½"x4" AB @16" o.c. to 6" CMU
- Mark 11: 5/8"x6" AB @24" o.c. to 8" CMU
- Mark 12: 5/8"x4" AB @24" o.c. to 6" CMU



Mark 1:

Anchor: (2) ½"x6" welded studs @6" o.c. to 8" CMU

Demand = 4.222kip/2 anchors = 2.111kip/anchor

Capacity: Use NMCA Masonry Anchorage Worksheet

DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Top	

***Assumed adequate spacing from adjacent anchors to allow no overlap of breakout cones*

Anchor Type =	headed	
Anchor Yield Strength, f_y =	60000	psi
Anchor Diameter, d_b =	1/2	in
Anchor Hook Length, e_b =	0	in

***For headed anchor set hook length equal to 0*

f'_m =	1500	psi
Wall thickness, t =	7.625	in
Edge Distance, l_{be} =	3.81	in
Net Anchor Area, A_b =	0.142	in^2
Effective Embed. Length, l_b =	6.00	in

Loading (factored)

Shear Force, V_u =	2111	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	3.83	in
Direct Tension Force, P_t =	0	lbs

Detailed Analysis

Check minimum embed.

[TMS 402-13 §1.17.6] l_b= 6.00 in > $l_{b,min}$ = min(4d_b,2 in) = 2.00 in **<Satisfactory>**

Check minimum cover

[TMS 402-13 §6.3.1] $cover_{min}$= 1.50 in

$cover_{min,all}$= (for top mounted) $t - l_{be}$ = 3.81 in **<Satisfactory>**
(for face mounted) $t - l_b$ =

Determine Shear Capacity

$A_{pv} = \frac{\pi l_{be}^2}{2} =$ 22.80 in^2

ϕ = 1.00

[TMS 402-13 Eq. 9-6]	Masonry Shear Breakout (ϕ = 0.5)	$B_{vnb} = 4A_{pv}\sqrt{f'_m} =$	3532 lbs
[TMS 402-13 Eq. 9-7]	Masonry Crushing (ϕ = 0.5)	$B_{vnc} = 1050\sqrt[4]{f'_m A_b} =$	4011 lbs
[TMS 402-13 Eq. 9-8]	Anchor Shear Pryout (ϕ = 0.5)	$B_{vnpry} = 2.0B_{anb} = 8A_{pt}\sqrt{f'_m} =$	26318 lbs
[TMS 402-13 Eq. 9-9]	Steel Shear Yielding (ϕ = 0.9)	$B_{vns} = 0.6A_b f_y =$	5112 lbs

Anchorage is adequate

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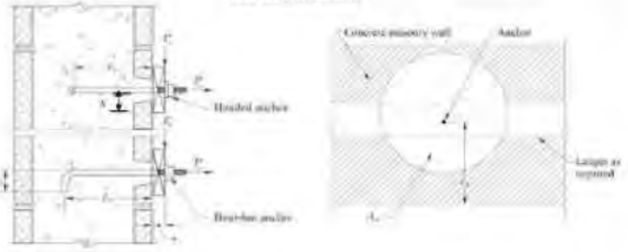
Mark 2:
Anchor: (2) ¾”x6” AB @10.5” o.c. to 8” CMU
Demand = 2.091kip/2 anchors = 1.451kip/anchor
Capacity: Use NMCA Masonry Anchorage Worksheet

Face Mounted Anchor



DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Face	

***Assumed adequate distance from top/bottom of wall and spacing from adjacent anchors to develop breakout cone*

Anchor Type =	bent-bar	
Anchor Yield Strength, f_y =	36000	psi
Anchor Diameter, d_b =	3/4	in
Anchor Hook Length, e_b =	0	in
f'_m =	1500	psi
Wall thickness, t =	7.625	in
Edge Distance, l_{be} =	3.61	in
Net Anchor Area, A_b =	0.334	in^2
Effective Embed. Length, l_b =	6.00	in

Loading (factored)

Shear Force, V_u =	0	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	2.50	in
Direct Tension Force, P_u =	1451	lbs

Detailed Analysis

Check minimum embed.

[TMS 402-13 §1.17.6] l_b= 6.00 in > $l_{b,min}$ = min(4d$_b$,2 in) = 3.00 in *<Satisfactory>*

Check minimum cover

[TMS 402-13 §1.16.4.1] cover$_{min}$= 1.50 in

cover$_{actual}$= (for top mounted) $t - l_{be}$ = 1.63 in *<Satisfactory>*
(for face mounted) $t - l_b$ =

Total Tension Force Considering Ecc., b_{af}

$$b_{af} = P_u + \frac{V_u e}{(\frac{5}{6})d} =$$ 1451 lbs ****assuming that moment arm is (5/6) of 'd'*

Determine Tensile Capacity

h_1=	0.00	in	s_1=	0.00	in	A_1=	0.00	in^2
h_2=	0.00	in	s_2=	0.00	in	A_2=	0.00	in^2

$A_{pt} = \pi l_b^2 =$ 113.10 in^2

[TMS 402-13 Eqn. 9-1]	Masonry Tensile Breakout (ϕ = 0.5)	$B_{anb} = 4A_{pt}\sqrt{f'_m}$ =	17521	lbs
[TMS 402-13 Eqn. 9-2]	Steel Tensile Yield (ϕ = 0.9)	$B_{ans} = A_b f_y$ =	12024	lbs
[TMS 402-13 Eqn. 9-4]	Anchor Pullout (ϕ = 0.65)	$B_{anp} = 1.5f'_m e_b d_b + 300\pi(l_b + e_b + d_b)d_b$ =	4771	lbs
	Design Axial Strength	ϕB_{an} =	3101	lbs > b_{af} *<Satisfactory>*
	Governing Failure Mode	***Pullout***		

$\phi = 1.00$

4771lb

Anchorage is adequate

Mark 3:
Anchor: (3) ¾"x6" welded studs @8" o.c. to 8" CMU
Demand = 4.222kip/3 anchors = 1.951kip/anchor
Capacity: Use NMCA Masonry Anchorage Worksheet

DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Top	

***Assumed adequate spacing from adjacent anchors to allow no overlap of breakout cones*

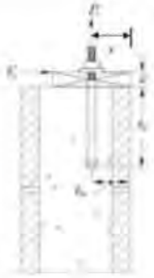
Anchor Type =	headed	
Anchor Yield Strength, f_y =	60000	psi
Anchor Diameter, d_b =	3/4	in
Anchor Hook Length, e_b =	0	in

***For headed anchor set hook length equal to 0*

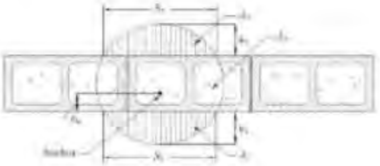
f'_m =	1500	psi
Wall thickness, t =	7.625	in
Edge Distance, l_{be} =	3.81	in
Net Anchor Area, A_b =	0.334	in^2
Effective Embed. Length, l_b =	6.00	in

Loading (factored)

Shear Force, V_u =	1951	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	3.63	in
Direct Tension Force, P_u =	0	lbs



Top Mounted Anchor



Detailed Analysis

Check minimum embed

[TMS 402-13 §6.1.4.7.4] l_b= 6.00 in > $l_{b,min}$ = min(4d_b,2 in) = 3.00 in **<Satisfactory>**

Check minimum cover

[TMS 402-13 §6.1.4.4.1] $cover_{min}$= 1.50 in

$cover_{actual}$= (for top mounted) $t - l_{be}$ = 3.81 in **<Satisfactory>**
(for face mounted) $t - l_b$ =

Determine Shear Capacity

$$A_{pv} = \frac{\pi l_{be}^2}{2} = 22.80 \text{ in}^2$$

$\phi = 1.00$

[TMS 402-13 Eqn. 9-6] Masonry Shear Breakout ($\phi = 0.5$)	$B_{vnb} = 4A_{pv}\sqrt{f'_m}$ =	3532	lbs
[TMS 402-13 Eqn. 9-7] Masonry Crushing ($\phi = 0.5$)	$B_{vnc} = 1050\sqrt[4]{f'_m A_b}$ =	4988	lbs
[TMS 402-13 Eqn. 9-8] Anchor Shear Pryout ($\phi = 0.5$)	$B_{vnpry} = 2.0B_{anb} = 8A_{pt}\sqrt{f'_m}$ =	26318	lbs
[TMS 402-13 Eqn. 9-9] Steel Shear Yielding ($\phi = 0.9$)	$B_{vns} = 0.6A_b f_y$ =	12024	lbs

<u>Anchorage is adequate</u>

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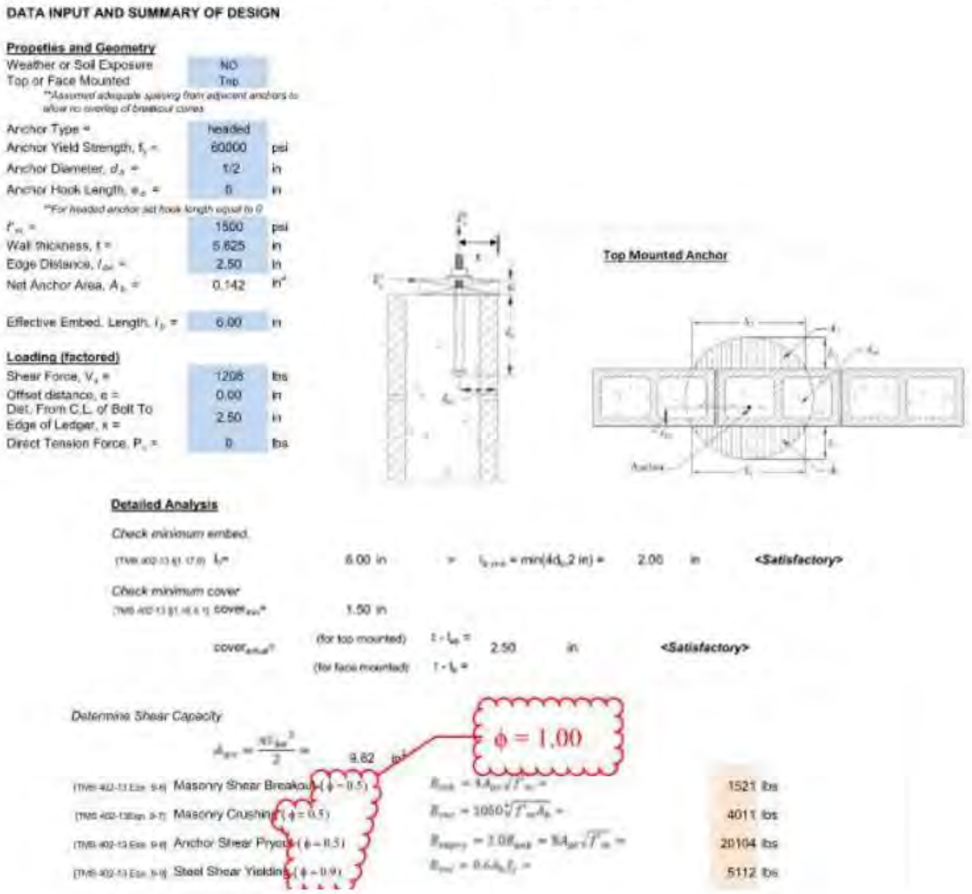
Mark 6:

Anchor: (2) ½”x6” welded studs @6” o.c. to 6” CMU
Demand = 2.415kip/2 anchors = 1.208kip/anchor
Capacity: Use NMCA Masonry Anchorage Worksheet



DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Top	

**Assumed adequate spacing from adjacent anchors to allow no overlap of breakout cones

Anchor Type =	headed	
Anchor Yield Strength, f_y =	60000	psi
Anchor Diameter, d_b =	1/2	in
Anchor Hook Length, e_b =	0	in

**For headed anchor set hook length equal to 0

f'_m =	1500	psi
Wall thickness, t =	5.625	in
Edge Distance, l_{be} =	2.50	in
Net Anchor Area, A_b =	0.142	in²
Effective Embed. Length, l_b =	6.00	in

Loading (factored)

Shear Force, V_u =	1208	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	2.50	in
Direct Tension Force, P_u =	0	lbs

Detailed Analysis

Check minimum embed.

(TMS 402-13 §1.17.6) l_b= 6.00 in ≥ $l_{b,min}$ = min(4d_b,2 in) = 2.00 in *<Satisfactory>*

Check minimum cover

(TMS 402-13 §1.16.4.1) $cover_{min}$= 1.50 in

$cover_{actual}$? (for top mounted) $t - l_{be}$ = 2.50 in *<Satisfactory>*
(for face mounted) $t - l_b$ =

Determine Shear Capacity

$A_{pv} = \frac{\pi l_{be}^2}{2} =$ 9.82 in²

$\phi = 1.00$

(TMS 402-13 Eqn. 9-6)	Masonry Shear Breakout ($\phi = 0.5$)	$B_{vnb} = 4A_{pv}\sqrt{f'_m} =$	1521 lbs
(TMS 402-13 Eqn. 9-7)	Masonry Crushing ($\phi = 0.5$)	$B_{vnc} = 1050\sqrt[4]{f'_m A_b} =$	4011 lbs
(TMS 402-13 Eqn. 9-8)	Anchor Shear Pryout ($\phi = 0.5$)	$B_{vnpry} = 2.0B_{anb} = 8A_{pt}\sqrt{f'_m} =$	20104 lbs
(TMS 402-13 Eqn. 9-9)	Steel Shear Yielding ($\phi = 0.9$)	$B_{vns} = 0.6A_b f_y =$	5112 lbs

Anchorage is adequate

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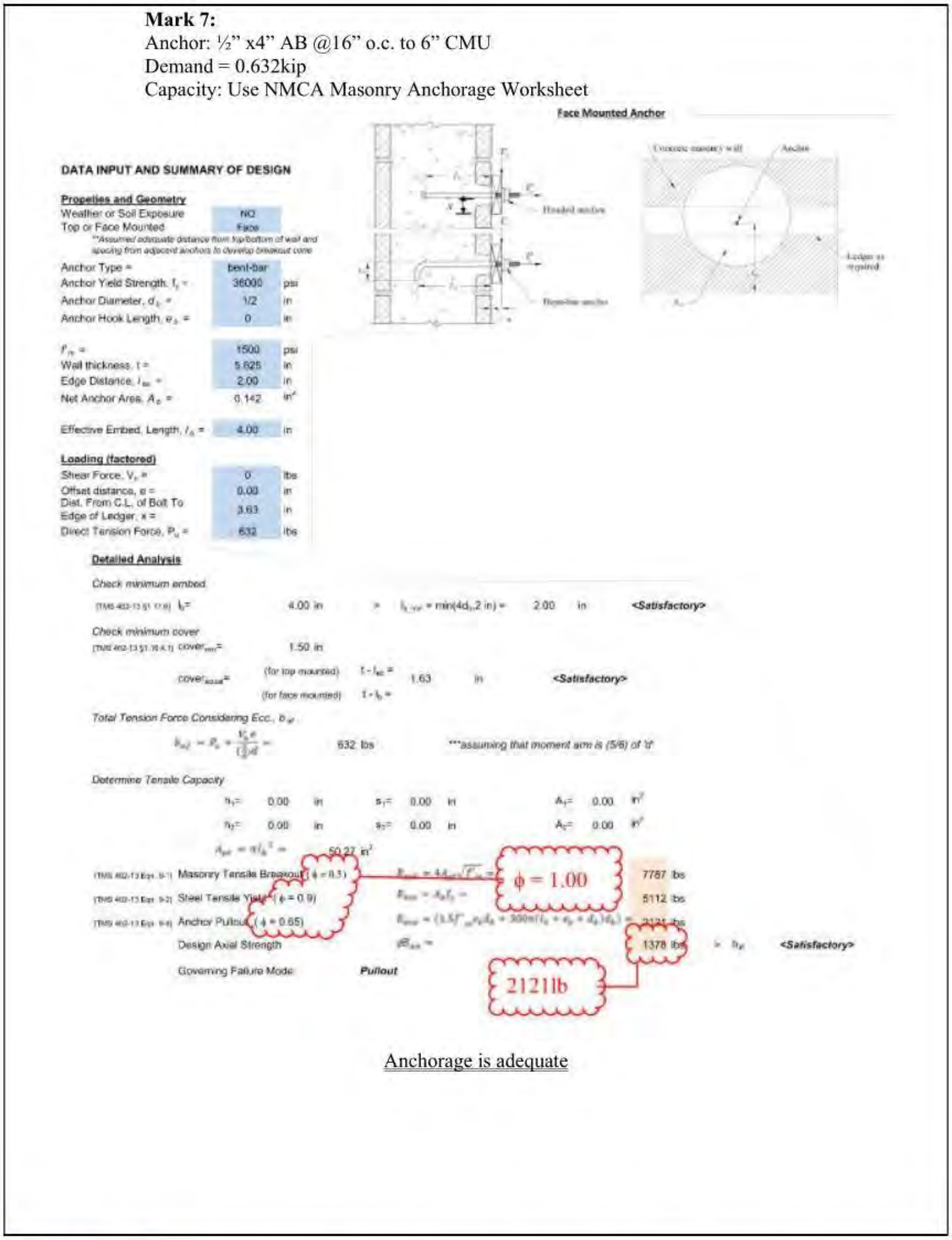


Mark 7:
Anchor: ½” x4” AB @16” o.c. to 6” CMU
Demand = 0.632kip
Capacity: Use NMCA Masonry Anchorage Worksheet

DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Face	

***Assumed adequate distance from top/bottom of wall and spacing from adjacent anchors to develop breakout cone*

Anchor Type =	bent-bar	
Anchor Yield Strength, f_y =	36000	psi
Anchor Diameter, d_b =	1/2	in
Anchor Hook Length, e_b =	0	in
f'_m =	1500	psi
Wall thickness, t =	5.625	in
Edge Distance, l_{be} =	2.00	in
Net Anchor Area, A_b =	0.142	in²
Effective Embed. Length, l_b =	4.00	in

Loading (factored)

Shear Force, V_u =	0	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	3.63	in
Direct Tension Force, P_u =	632	lbs

Detailed Analysis

Check minimum embed

(TMS 402-13 §1.17.6) l_b= 4.00 in ≥ $l_{b,min}$ = min(4d_b,2 in) = 2.00 in <Satisfactory>

Check minimum cover

(TMS 402-13 §1.16.4.1) $cover_{min}$= 1.50 in

$cover_{actual}$= (for top mounted) $t - l_{be}$ = 1.63 in <Satisfactory>
(for face mounted) $t - l_b$ =

Total Tension Force Considering Ecc., b_{af}

$b_{af} = P_u + \frac{V_u e}{(\frac{5}{6})d} =$ 632 lbs ****assuming that moment arm is (5/6) of 'd'*

Determine Tensile Capacity

h_1=	0.00	in	s_1=	0.00	in	A_1=	0.00	in²
h_2=	0.00	in	s_2=	0.00	in	A_2=	0.00	in²

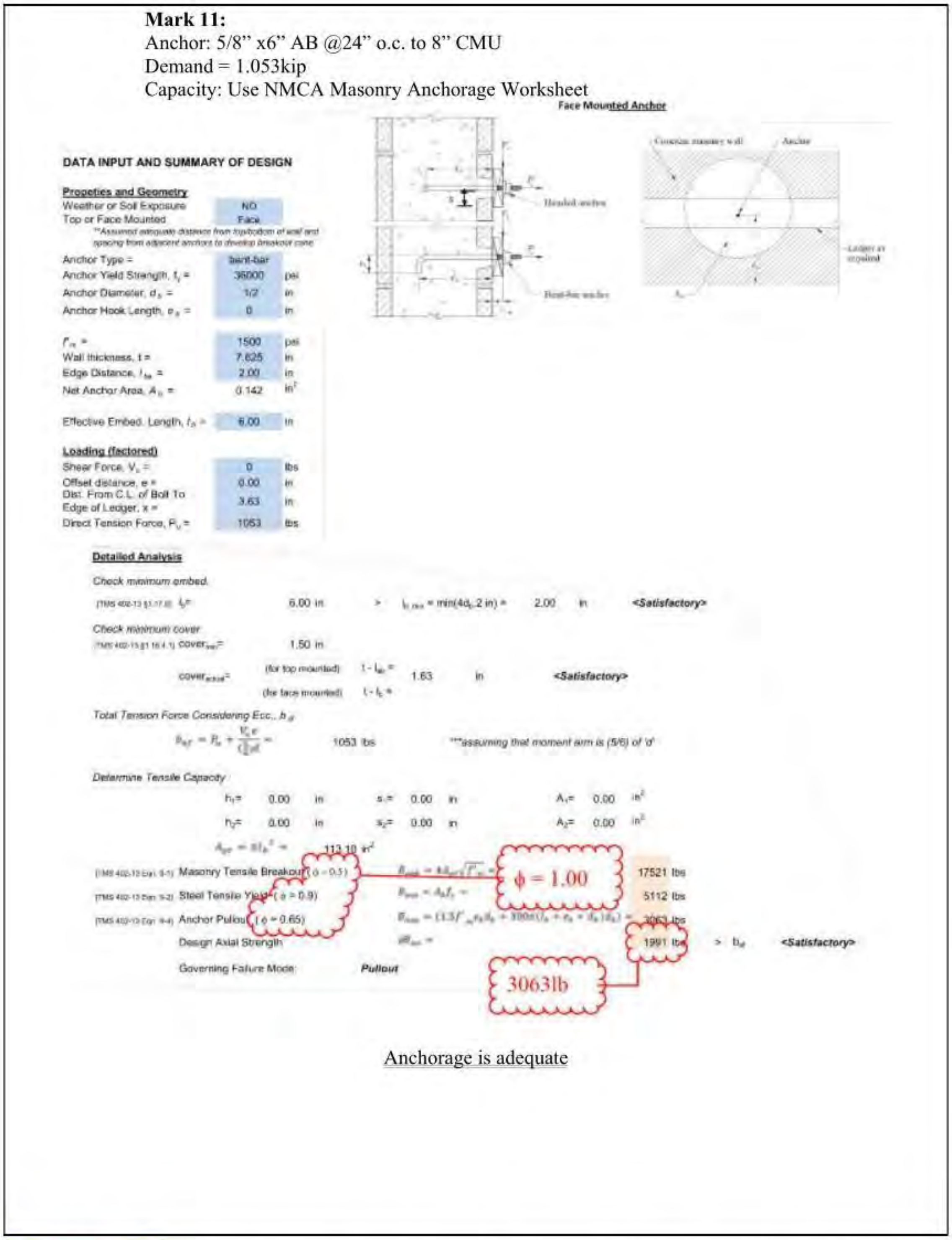
$A_{pt} = \pi l_b^2 =$ 50.27 in²

(TMS 402-13 Eqn. 9-1) Masonry Tensile Breakout (ϕ = 0.5) $B_{anb} = 4A_{pt}\sqrt{f'_m} =$ 7787 lbs
(TMS 402-13 Eqn. 9-2) Steel Tensile Yield (ϕ = 0.9) $B_{ans} = A_b f_y =$ 5112 lbs
(TMS 402-13 Eqn. 9-4) Anchor Pullout (ϕ = 0.65) $B_{anp} = (1.5 f'_m e_b d_b + 300\pi(l_b + e_b + d_b)d_b) =$ 2121 lbs
Design Axial Strength ϕB_{an} = 1378 lbs ≥ b_{af} <Satisfactory>
Governing Failure Mode **Pullout**

ϕ = 1.00

2121lb

Anchorage is adequate



Mark 11:
Anchor: 5/8" x6" AB @24" o.c. to 8" CMU
Demand = 1.053kip
Capacity: Use NMCA Masonry Anchorage Worksheet

DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Face	

**Assumed adequate distance from top/bottom of wall and spacing from adjacent anchors to develop breakout cone

Anchor Type =	bent-bar	
Anchor Yield Strength, f_y =	36000	psi
Anchor Diameter, d_b =	1/2	in
Anchor Hook Length, e_b =	0	in
f'_m =	1500	psi
Wall thickness, t =	7.625	in
Edge Distance, l_{be} =	2.00	in
Net Anchor Area, A_b =	0.142	in^2
Effective Embed. Length, l_b =	6.00	in

Loading (factored)

Shear Force, V_u =	0	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	3.63	in
Direct Tension Force, P_u =	1053	lbs

Detailed Analysis

Check minimum embed.

(TMS 402-13 §1.17.8) l_b= 6.00 in > $l_{b,min}$ = min(4d_b,2 in) = 2.00 in *<Satisfactory>*

Check minimum cover

(TMS 402-13 §1.16.4.1) $cover_{req}$= 1.50 in

$cover_{actual}$= (for top mounted) $t - l_{be}$ = 1.63 in *<Satisfactory>*
(for face mounted) $t - l_b$ =

Total Tension Force Considering Ecc., b_{af}

$b_{af} = P_u + \frac{V_u e}{(\frac{5}{6})d} =$ 1053 lbs ***assuming that moment arm is (5/6) of 'd'

Determine Tensile Capacity

h_1= 0.00 in s_1= 0.00 in A_1= 0.00 in^2
h_2= 0.00 in s_2= 0.00 in A_2= 0.00 in^2

$A_{pt} = \pi l_b^2 =$ 113.10 in^2

(TMS 402-13 Eqn. 9-1) Masonry Tensile Breakout (ϕ = 0.5) $B_{anb} = 4A_{pt}\sqrt{f'_m} =$ 17521 lbs
(TMS 402-13 Eqn. 9-2) Steel Tensile Yield (ϕ = 0.9) $B_{ans} = A_b f_y =$ 5112 lbs
(TMS 402-13 Eqn. 9-4) Anchor Pullout (ϕ = 0.65) $B_{anp} = (1.5 f'_m e_b d_b + 300\pi(l_b + e_b + d_b)d_b) =$ 3063 lbs
Design Axial Strength ϕB_{an} = 1991 lbs > b_{af} *<Satisfactory>*
Governing Failure Mode: ***Pullout***

$\phi = 1.00$

3063lb

Anchorage is adequate

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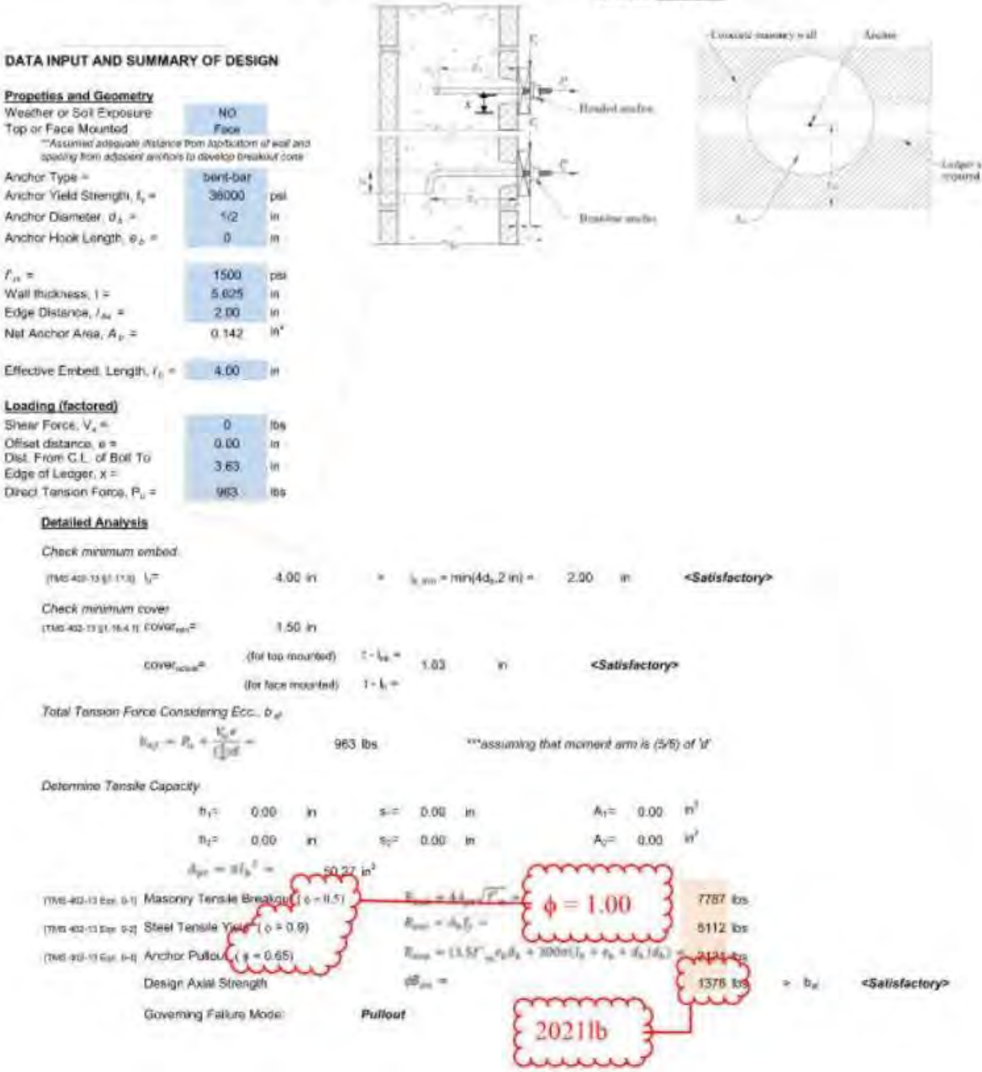
Mark 12:
Anchor: 5/8” 46” AB @24” o.c. to 6” CMU
Demand = 0.963kip
Capacity: Use NMCA Masonry Anchorage Worksheet



DATA INPUT AND SUMMARY OF DESIGN

Propeties and Geometry

Weather or Soil Exposure	NO	
Top or Face Mounted	Face	

**Assumed adequate distance from top/bottom of wall and spacing from adjacent anchors to develop breakout cone

Anchor Type =	bent-bar	
Anchor Yield Strength, f_y =	36000	psi
Anchor Diameter, d_b =	1/2	in
Anchor Hook Length, e_b =	0	in
f'_m =	1500	psi
Wall thickness, t =	5.625	in
Edge Distance, l_{be} =	2.00	in
Net Anchor Area, A_b =	0.142	in²
Effective Embed. Length, l_b =	4.00	in

Loading (factored)

Shear Force, V_u =	0	lbs
Offset distance, e =	0.00	in
Dist. From C.L. of Bolt To Edge of Ledger, x =	3.63	in
Direct Tension Force, P_u =	963	lbs

Detailed Analysis

Check minimum embed

(TMS 402-13 §1.17.6) l_b= 4.00 in > $l_{b,min}$ = min(4d_b,2 in) = 2.00 in *<Satisfactory>*

Check minimum cover

(TMS 402-13 §1.16.4.1) cover$_{min}$= 1.50 in

cover$_{actual}$= (for top mounted) t - l_{be} = (for face mounted) t - l_b = 1.63 in *<Satisfactory>*

Total Tension Force Considering Ecc., b_{af}

$b_{af} = P_u + \frac{V_u e}{(\frac{5}{6})d} =$ 963 lbs ***assuming that moment arm is (5/6) of 'd'*

Determine Tensile Capacity

h_1= 0.00 in s_1= 0.00 in A_1= 0.00 in²

h_2= 0.00 in s_2= 0.00 in A_2= 0.00 in²

$A_{pt} = \pi l_b^2 =$ 50.27 in²

(TMS 402-13 Eqn. 9-1) Masonry Tensile Breakout (ϕ = 0.5) $B_{anb} = 4A_{pt}\sqrt{f'_m} =$ 7787 lbs

(TMS 402-13 Eqn. 9-2) Steel Tensile Yield (ϕ = 0.9) $B_{ans} = A_b f_y =$ 5112 lbs

(TMS 402-13 Eqn. 9-4) Anchor Pullout (ϕ = 0.65) $B_{anp} = 1.5 f'_m e_b d_b + 300\pi(l_b + e_b + d_b)d_b =$ 2121 lbs

Design Axial Strength ϕB_{an} = 1376 lbs > b_{af} *<Satisfactory>*

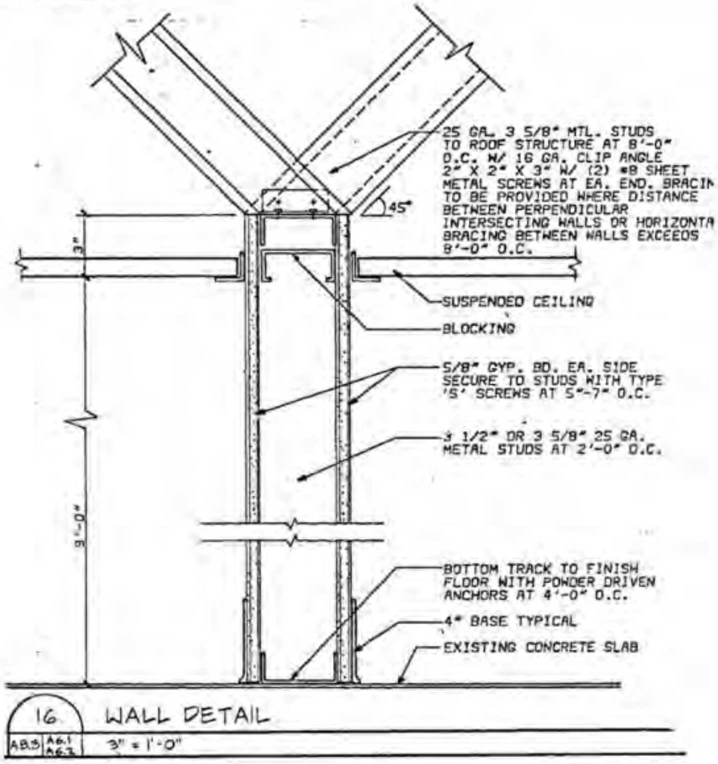
Governing Failure Mode: ***Pullout***

ϕ = 1.00

2021lb

<ins>Anchorage is adequate</ins>
<ins>Diahpragm to CMU anchorage is adequate for out-of-plane loads</ins>

Interior Partition Walls



Height, H = 9'-3" from bottom connection to top bracing
Bracing Spacing, S = 9'-0"
Top Track Section: 350T125-33 (conservatively assumed)
Brace Section: 350S125-18
Per ASCE 41 Section 13.6.2.3.2, nonstructural partitions are to be analyzed per Section 13.4.3.

Demands:

13.4.3.1 Horizontal Seismic Forces. Horizontal seismic forces on nonstructural components shall be determined in accordance with Eq. (13-1).

$$F_p = \frac{0.4 a_p S_{XS} W_p \left(1 + 2\frac{z}{h}\right)}{\left(\frac{R_p}{I_p}\right)} \qquad (13\text{-}1)$$

$$F_p(\text{maximum}) = 1.6 S_{XS} I_p W_p \qquad (13\text{-}2)$$

$$F_p(\text{minimum}) = 0.3 S_{XS} I_p W_p \qquad (13\text{-}3)$$

Where:

- a_p = 1.0 (ASCE 7 Table 13.5-1)
- S_{XS} = 0.797 (BSE-2E contols)
    - Wall unit weight = 10psf (conservative for 3.5" stud wall w/5/8" gym).
    - $W_{p,Wall}$ = 10psf
    - $W_{p,Track} = W_{p,Wall}*(H/2)$ = 46.25plf
    - $W_{p,Brace} = W_{p,Wall}*(H/2)*(S)$ = 370lb
- x = 9'-3" (top of wall)
- h = 12'-4" (average height of lowest roof region)
- R_p = 2.5 (ASCE 7 Table 13.5-1)
- I_p = 1.0 (per ASCE 41 Section 13.6.2.3.2, Position Retention)

$F_p = 0.319W_p$ ← Controls
$F_{p,Min} = 0.244W_p$

$F_{p,Wall}$ = 3.19psf (1.0E)
$F_{p,Track}$ = 14.75plf (1.0E)
$F_{p,Brace}$ = 118.0lb (1.0E)

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Top Track Member

Top Track Section: 350T125-33
Evaluate as a simply supported beam spanning between brace points.
Span = 8’-0”
Demand: $F_{p,Track}$ = 14.75plf (1.0E)

Input Mode

Mode
○ Wall Stud
● Beam/Joist

Load Modifiers
Strength: 0.7
Deflection: 0.7

Uniform Load
☑ Use 1-Setting for Uniform Load
14.75 lb/ft

Bracing
Bracing Settings: Manual
1 - Setting Bracing: 60 in
☐ Use 2% rule for Bridging Connectors

Spans: 1

		Span	Uniform Load	Axial Load	Flexural Bracing	Axial K_yL_y	Axial K_tL_t
Left Cant	☐	0.00 ft	0.00 lb/ft	0.00 lb	60 in	60 in	60 in
Span		8.00 ft	14.75 lb/ft	0.00 lb	96 in	60 in	60 in
Right Cant	☐	0.00 ft	0.00 lb/ft	0.00 lb	60 in	60 in	60 in

Member Summary

Section: *350S125-33 Single C Stud*
Fy: *33.0 ksi*
Maxo: *287.7 Ft-Lb*
Ma(Brc): *112.6 Ft-Lb @Span*
Ma(Dist): *294.0 Ft-Lb @Span*
Allowable Axial: *N/A*
Va: *1023.6 lb*
Ix: *0.382 in^4*

Mpos/Ma(brc): *73.3% Stressed @ Span*
Mmax/Maxo: *28.7% Stressed @ Span*
Deflection: *L/1138 @ Span*
Distortional (Bending Only): *28.1% Stressed @ Span*
Bending and Shear (Unstiffened): *4.0% Stressed @R2*
Bending and Shear (Stiffened): *N/A*
Bending and Axial: *N/A*
Web Stiffeners Required?: *No*

Note: Calculations are in ASD.

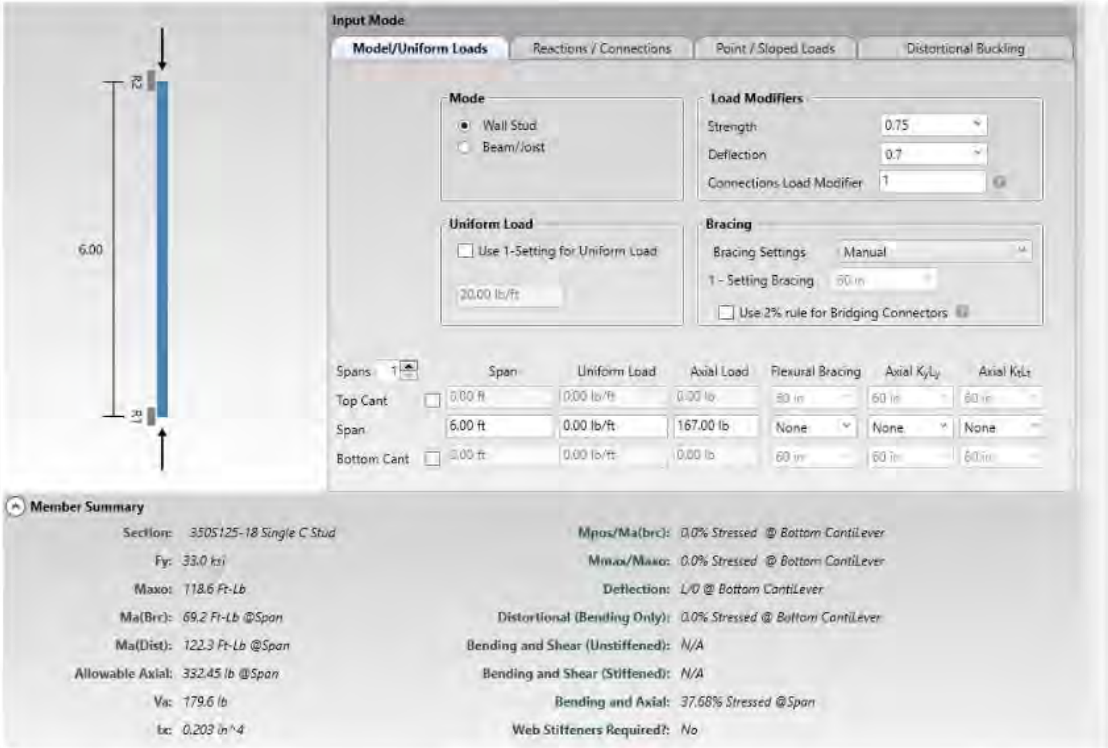
Per Simpson CFS Designer (see see above), the Track is adequate for shear and bending.

Drift Ratio (0.7E) = 0.084in/(9.25’*12) = 0.00076 < Max allowable = 0.02 ✓

Member deflection is acceptable

<u>Top Track Bracing</u>

Brace Section: 350S125-18
Height = 6'-0" max assumed (conservative)
Axial Load = $F_{p,Brace}/\sin(45)$ = 166.9lb (1.0E)



Mode
● Wall Stud
○ Beam/Joist

Load Modifiers
Strength: 0.75
Deflection: 0.7
Connections Load Modifier: 1

Uniform Load
☐ Use 1-Setting for Uniform Load
20.00 lb/ft

Bracing
Bracing Settings: Manual
1 - Setting Bracing: 60 in
☐ Use 2% rule for Bridging Connectors

Spans: 1

		Span	Uniform Load	Axial Load	Flexural Bracing	Axial K_yL_y	Axial K_tL_t
Top Cant	☐	0.00 ft	0.00 lb/ft	0.00 lb	80 in	60 in	60 in
Span		6.00 ft	0.00 lb/ft	167.00 lb	None	None	None
Bottom Cant	☐	0.00 ft	0.00 lb/ft	0.00 lb	60 in	60 in	60 in

Member Summary

Section:	*350S125-18 Single C Stud*	**Mpos/Ma(brc):**	*0.0% Stressed @ Bottom CantiLever*
Fy:	*33.0 ksi*	**Mmax/Maxo:**	*0.0% Stressed @ Bottom CantiLever*
Maxo:	*118.6 Ft-Lb*	**Deflection:**	*L/0 @ Bottom CantiLever*
Ma(Brc):	*69.2 Ft-Lb @Span*	**Distortional (Bending Only):**	*0.0% Stressed @ Bottom CantiLever*
Ma(Dist):	*122.3 Ft-Lb @Span*	**Bending and Shear (Unstiffened):**	*N/A*
Allowable Axial:	*332.45 lb @Span*	**Bending and Shear (Stiffened):**	*N/A*
Va:	*179.6 lb*	**Bending and Axial:**	*37.68% Stressed @Span*
Ixe:	*0.203 in^4*	**Web Stiffeners Required?:**	*No*

Note: Calculations are in ASD

<u>Per Simpson CFS Designer (see see above), the Brace is adequate</u>

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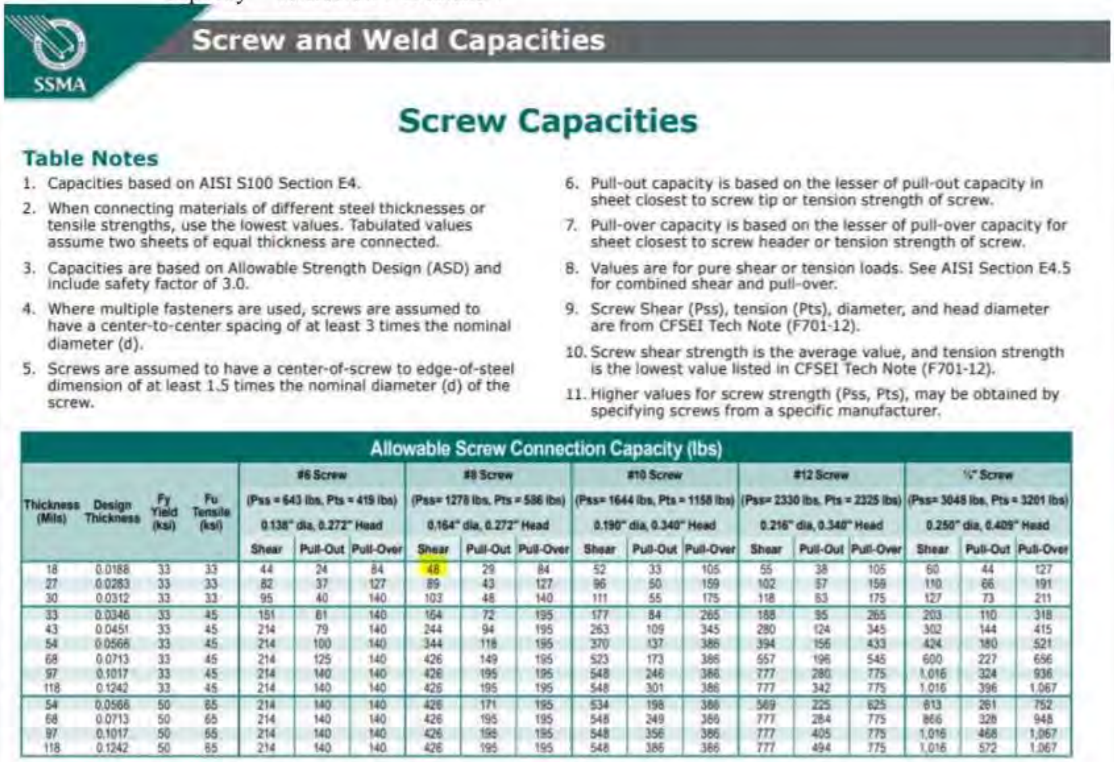
Brace Connection

Connection = (2) #8 screws

Demand:

- Shear = $F_{p,Brace}$/2screws = 59lb (1.0E), 41.3lb (0.7E, ASD)
- Tension = 0lb

Capacity = 48lb/screw > Demand ✓



SSMA

Screw and Weld Capacities

Screw Capacities

Table Notes

1. Capacities based on AISI S100 Section E4.
2. When connecting materials of different steel thicknesses or tensile strengths, use the lowest values. Tabulated values assume two sheets of equal thickness are connected.
3. Capacities are based on Allowable Strength Design (ASD) and include safety factor of 3.0.
4. Where multiple fasteners are used, screws are assumed to have a center-to-center spacing of at least 3 times the nominal diameter (d).
5. Screws are assumed to have a center-of-screw to edge-of-steel dimension of at least 1.5 times the nominal diameter (d) of the screw.
6. Pull-out capacity is based on the lesser of pull-out capacity in sheet closest to screw tip or tension strength of screw.
7. Pull-over capacity is based on the lesser of pull-over capacity for sheet closest to screw header or tension strength of screw.
8. Values are for pure shear or tension loads. See AISI Section E4.5 for combined shear and pull-over.
9. Screw Shear (Pss), tension (Pts), diameter, and head diameter are from CFSEI Tech Note (F701-12).
10. Screw shear strength is the average value, and tension strength is the lowest value listed in CFSEI Tech Note (F701-12).
11. Higher values for screw strength (Pss, Pts), may be obtained by specifying screws from a specific manufacturer.

Allowable Screw Connection Capacity (lbs)

Thickness (Mils)	Design Thickness	Fy Yield (ksi)	Fu Tensile (ksi)	#6 Screw (Pss = 643 lbs, Pts = 419 lbs) 0.138" dia, 0.272" Head			#8 Screw (Pss= 1278 lbs, Pts = 586 lbs) 0.164" dia, 0.272" Head			#10 Screw (Pss= 1644 lbs, Pts = 1158 lbs) 0.190" dia, 0.340" Head			#12 Screw (Pss= 2330 lbs, Pts = 2325 lbs) 0.216" dia, 0.340" Head			½" Screw (Pss= 3048 lbs, Pts = 3201 lbs) 0.250" dia, 0.409" Head		
				Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over
18	0.0188	33	33	44	24	84	48	29	84	52	33	105	55	38	105	60	44	127
27	0.0283	33	33	82	37	127	89	43	127	96	50	159	102	57	159	110	66	191
30	0.0312	33	33	95	40	140	103	48	140	111	55	175	118	63	175	127	73	211
33	0.0346	33	45	151	81	140	164	72	195	177	84	265	188	95	265	203	110	318
43	0.0451	33	45	214	79	140	244	94	195	263	109	345	280	124	345	302	144	415
54	0.0566	33	45	214	100	140	344	118	195	370	137	386	394	156	433	424	180	521
68	0.0713	33	45	214	125	140	426	149	195	523	173	386	557	196	545	600	227	656
97	0.1017	33	45	214	140	140	426	195	195	548	246	386	777	280	775	1,016	324	936
118	0.1242	33	45	214	140	140	426	195	195	548	301	386	777	342	775	1,016	396	1,067
54	0.0566	50	65	214	140	140	426	171	195	534	198	386	569	225	625	813	261	752
68	0.0713	50	65	214	140	140	426	195	195	548	249	386	777	284	775	866	328	948
97	0.1017	50	65	214	140	140	426	195	195	548	356	386	777	405	775	1,016	468	1,067
118	0.1242	50	65	214	140	140	426	195	195	548	386	386	777	494	775	1,016	572	1,067

Bracing and Connections are adequate

Interior partition wall top connections are adequate for out of plane bracing

Exterior Walls

General Criteria

Evaluate per ASCE 41-17 Section 7.2.11 and Section 11.3.5. Evaluate typical and special wall cases for conformance.

Actions caused by out-of-plane forces are considered Force-Controlled.

Acceptance Criteria:

$kQ_{CL} > Q_{UF}$
k = knowledge factor
k = 0.90 U.N.O. (per ASCE 41 section 6.2.4.2)
Q_{CL} = default material properties. U.N.O. $\phi = 1.00$

Q_{UF} = Force-controlled action caused by gravity and seismic demands

$$Q_{UF} = Q_G \pm F_p$$
$$Q_G = 1.1(Q_D + Q_L + Q_S)$$

BSE-1E: Immediate Occupancy

$$Q_{UF} = Q_G \pm F_P$$

$F_p = 0.4S_{XS}X_1{*}W_p$
$F_{p,min} = 0.1X_1{*}W_p$
Where:
$X_1 = 1.7$ (IO)
$S_{XS} = 0.531$
W_p = Wall weight
$\therefore F_p = 0.361W_p$

BSE-2E: Life Safety

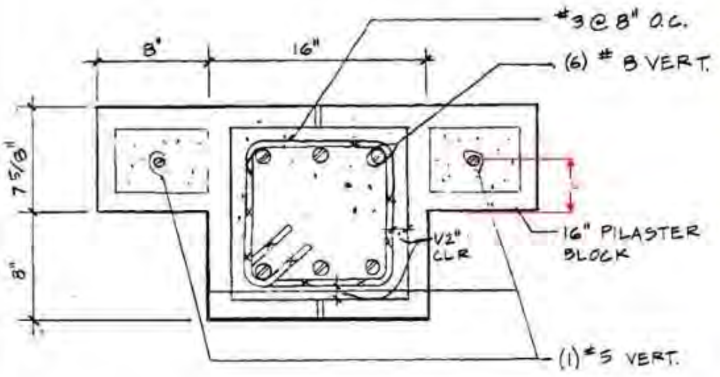
$$Q_{UF} = Q_G \pm F_P$$

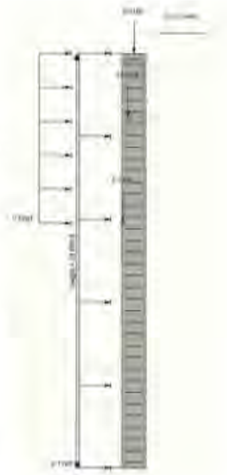
$F_p = 0.4S_{XS}X_1{*}W_p$
$F_{p,min} = 0.1X_1{*}W_p$
Where:
$X_1 = 1.1$ (LS)
$S_{XS} = 0.797$
W_p = Wall weight
$\therefore F_p = 0.351W_p$

<u>∴BSE-1E: IO Controls Out-of-plane wall analysis</u>

Wall 1

Wall Type: Apparatus Bay Pilaster (special wall case)
Height between floors, $h_1 = 20'\text{-}0''$
Parapet height, $h_p = 3'\text{-}8''$
Height of Adjacent Opening, $h_o = 14'\text{-}0''$ (both sides)
$f'_m = 2{,}000\text{psi}$
Evaluation conservatively only considers 16" pilaster

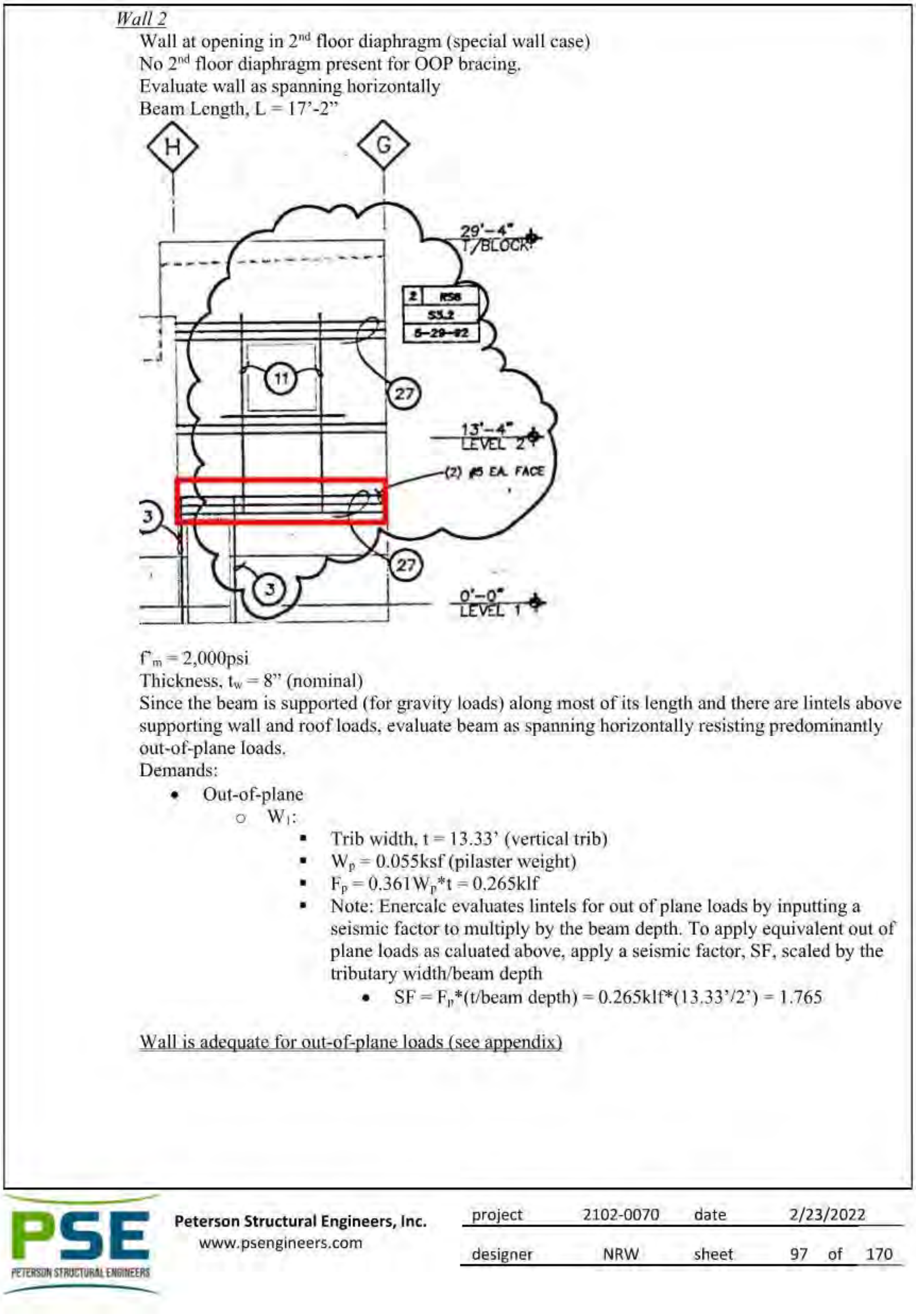




Demands:

- Gravity, P
  - ○ P_1
    - ▪ Tributary Width, t = 2(12.5'/2) + 2.67' = 15.167'
    - ▪ Dead:
      - D_R = 0.045klf*t = 0.683kip (per RISA)
      - D_{Wall} = 0.094ksf*9.67'*12.5 = 11.36kip (supported lintel)
    - ▪ L_R = 0.06klf*t = 0.910kip (per RISA)
    - ▪ S = 0.087klf*t = 1.32kip (per RISA)
    - ▪ Eccentricity, e = 7.625"/2 = 3.8125" (assumes reaction at centerline of lintel)
  - ○ $P_2 = D_{Veneer}$ = (9.67'*t)*0.039ksf = 5.72kip (7.625" Eccentricity)
  - ○ $P_3 = D_{Self}$ = 0.175ksf*2.67'*20.37' = 9.518kip (0" eccentricity)
- Out-of-plane
  - ○ W_1:
    - ▪ Trib width, t = 2.67'
    - ▪ W_p = 0.175ksf (pilaster weight)
    - ▪ $F_p = 0.361W_p$*t = 0.169klf
  - ○ W_2:
    - ▪ Trib width, t = 15.167'
    - ▪ W_p = 0.094ksf (wall weight above)
    - ▪ $F_p = 0.361W_p$*t = 0.515klf
  - ○ Note: Out-of-plane forces to be applied in the direction such that moments are additive to the eccentric gravity loads

<u>Wall is adequate for out-of-plane loads (see appendix)</u>



Wall 2

Wall at opening in 2^{nd} floor diaphragm (special wall case)
No 2^{nd} floor diaphragm present for OOP bracing.
Evaluate wall as spanning horizontally
Beam Length, L = 17'-2"

f'_m = 2,000psi
Thickness, t_w = 8" (nominal)
Since the beam is supported (for gravity loads) along most of its length and there are lintels above supporting wall and roof loads, evaluate beam as spanning horizontally resisting predominantly out-of-plane loads.
Demands:

- Out-of-plane
  - W_1:
    - Trib width, t = 13.33' (vertical trib)
    - W_p = 0.055ksf (pilaster weight)
    - $F_p = 0.361W_p$*t = 0.265klf
    - Note: Enercalc evaluates lintels for out of plane loads by inputting a seismic factor to multiply by the beam depth. To apply equivalent out of plane loads as caluated above, apply a seismic factor, SF, scaled by the tributary width/beam depth
      - SF = F_p*(t/beam depth) = 0.265klf*(13.33'/2') = 1.765

<u>Wall is adequate for out-of-plane loads (see appendix)</u>

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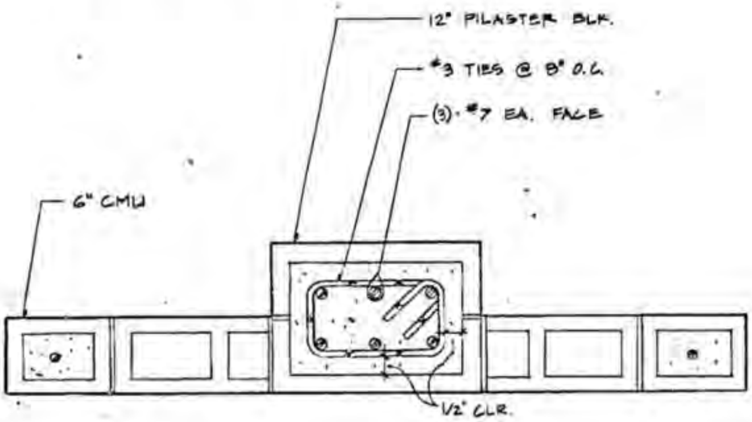
Wall 3

Wall Type: 1st Floor Main Building Region Pilaster (special wall case)
Height between floors, h_1 = 13'-4"
Conservatively only consider the center 12" pilaster
f'_m = 2,000psi
Column spacing = 12'-0" o.c.



Demands:

- Gravity, P
  - Roof Loads:
    - D_R = 0.166klf*12' = 1.992kip (per RISA)
    - L_R = 0.221klf*12' = 2.652kip (per RISA)
    - S = 0.32klf*12' = 3.84kip (per RISA)
    - Eccentricity, e = 2"
  - 2nd Floor Loads:
    - D_{2nd} = 0.817klf*12' = 9.804kip (per RISA)
    - L_{2nd} = 0.575klf*12 = 6.9kip (per RISA)
    - Eccentricity, e = -1.4375"
  - Wall Weight Above, D_W = 0.055ksf*(21'tall)*12' = 13.86kip
    - Eccentricity, e = 2"
  - D_{Veneer} = (9.67'*t)*0.039ksf = 5.72kip (5.8125" Eccentricity)
  - D_{Self} = 0.175ksf*2.67'*20.37' = 9.518kip (col. weight only, 0" eccentricity)
- Out-of-plane
  - W_1:
    - Trib width, t = 2(7.33'/2)+4.667' = 12.0'
    - W_p = 0.097ksf (approx. avg wall weight tributary + veneer)
    - F_p = 0.361W_p*t = 420klf
  - Note: Out-of-plane forces to be applied in the direction such that moments are additive to the eccentric gravity loads

<u>Wall is adequate for out-of-plane loads (see appendix)</u>

Wall 4

Wall type: 1st Floor 6" Typical reinforcing
Height between floors, h_1 = 12'-4"
Parapet Height, h_p = 2'-8"
f'_m = 2,000psi
Vert. Reinforcing: #5 @32" o.c.
Horiz. Reinforcing: #5 @48" o.c.
Demands:

- Gravity, P
  - Roof Loads:
    - D_R = 0.303klf (per RISA)
    - L_R = 0.303klf (per RISA)
    - S = 0.439klf (per RISA)
    - Eccentricity, e = 2.8125"
  - D_{Veneer} = 15'*0.039ksf = 0.585klf (-5.625" Eccentricity)
    - Note: Even though the brick veneer has an opposite eccentric as the roof loads, conservatively apply them with the same eccentricity for simplicity.
  - D_{Self} = 0.042ksf*15' = 0.630klf (0" eccentricity)
    - Note: Self weight built into Enercalc calculator
- Out-of-plane
  - W_1:
    - W_p = 0.081ksf (approx. wall weight + veneer)
    - F_p = 0.361W_p = 0.0292ksf (build into Enercalc)
  - Note: Out-of-plane forces to be applied in the direction such that moments are additive to the eccentric gravity loads

Wall is adequate for out-of-plane loads (see appendix)

Wall 5

Wall type: 1st Floor 12" Typical reinforcing
Height between floors, h_1 = 20'-0"
Parapet Height, h_p = 3'-8"
f'_m = 2,000psi
Vert. Reinforcing: (2) #5 @32" o.c.
Horiz. Reinforcing: #5 @48" o.c.
Demands:

- Gravity, P
  - Roof Loads:
    - D_R = 0.334klf (per RISA)
    - L_R = 0.445klf (per RISA)
    - S = 0.645klf (per RISA)
    - Eccentricity, e = 5.625"
      - Note: The actual eccentricity = 0", however, Enercalc can only account for one eccentricity. As such, conservatively use 5.625" eccentricity to match the brick veneer.
  - D_{Veneer} = 23.67'*0.039ksf = 0.923klf (5.625" Eccentricity)
  - D_{Self}: Self weight built into Enercalc calculator
- Out-of-plane
  - W_1:
    - W_p = 0.119ksf (approx. wall weight + veneer)
    - F_p = 0.361W_p = 0.043ksf (built into Enercalc)
  - Note: Out-of-plane forces to be applied in the direction such that moments are additive to the eccentric gravity loads

Wall is adequate for out-of-plane loads (see appendix)

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Wall 6

Wall type: 2^{nd} Floor 8" Typical reinforcing
Height between floors, h_1 = 14'-8"
Parapet Height, h_p = 1'-8"
f'_m = 1,500psi
Vert. Reinforcing: #5 @32" o.c.
Horiz. Reinforcing: #5 @48" o.c.
Demands:

- Gravity, P
    - Roof Loads:
        - D_R = 0.229klf
        - L_R = 0.305klf
        - S = 0.442klf
        - Eccentricity, e = 3.8125"
            - Note: The actual eccentricity = 0", however, Enercalc can only account for one eccentricity. As such, conservatively use 3.8125" eccentricity to match the brick veneer.
    - D_{Veneer} = 16.33'*0.039ksf = 0.637klf (3.8125" Eccentricity)
    - D_{Self} = Self weight built into Enercalc calculator
- Out-of-plane
    - W_1:
        - W_p = 0.094ksf (approx. wall weight + veneer)
        - F_p = 0.361W_p = 0.034ksf (build into Enercalc)
    - Note: Out-of-plane forces to be applied in the direction such that moments are additive to the eccentric gravity loads

Wall is adequate for out-of-plane loads (see appendix)

Appendix F1: RISA 3D Data

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Gravity Demands

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 2 : Dead Lower Roof)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M8	Y	-0.43	-0.43	0	%100
2	M11	Y	-0.43	-0.43	0	%100
3	M9	Y	-0.433	-0.433	0	%100
4	M12	Y	-0.433	-0.433	0	%100
5	M10	Y	-0.447	-0.447	0	%100
6	M13	Y	-0.09	-0.09	0	%100
7	M14	Y	-0.09	-0.09	0	%100
8	M16	Y	-0.7	-0.7	0	%100
9	M17	Y	-0.103	-0.103	0	%100
10	M18	Y	-0.1	-0.1	0	%100
11	M23	Y	-0.05	-0.05	0	%100
12	M55	Y	-0.1	-0.1	0	%100
13	M68	Y	-0.1	-0.1	0	%100
14	M78	Y	-0.096	-0.096	0	%100
15	M77	Y	-0.096	-0.096	0	%100
16	M76	Y	-0.096	-0.096	0	%100
17	M80	Y	-0.096	-0.096	0	%100
18	M78	Y	-0.251	-0.251	0	%100
19	M77	Y	-0.251	-0.251	0	%100
20	M76	Y	-0.251	-0.251	0	%100
21	M80	Y	-0.251	-0.251	0	%100
22	M118	Y	-0.39	-0.39	0	%100
23	M119	Y	-0.367	-0.367	0	%100
24	M118	Y	-0.358	-0.358	0	%100
25	M119	Y	-0.358	-0.358	0	%100
26	M118	Y	-0.104	-0.104	0	%100
27	M119	Y	-0.104	-0.104	0	%100
28	M120	Y	-0.05	-0.05	0	%100
29	M120	Y	-0.355	-0.355	0	%100
30	M121	Y	-0.388	-0.388	0	%100
31	M121	Y	-0.355	-0.355	0	%100
32	M122	Y	-0.25	-0.25	0	%100
33	M122	Y	-0.462	-0.462	0	%100
34	M123	Y	-0.462	-0.462	0	%100
35	M124	Y	-0.462	-0.462	0	%100
36	M123	Y	-0.05	-0.05	0	%100
37	M124	Y	-0.05	-0.05	0	%100

Member Distributed Loads (BLC 3 : Dead 2nd Floor)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M33	Y	-0.5	-0.5	0	%100
2	M33	Y	0.5	0.5	0	%100
3	M56	Y	-0.142	-0.142	0	%100
4	M17	Y	-0.178	-0.178	0	%100
5	M18	Y	-0.178	-0.178	0	%100
6	M19	Y	-0.355	-0.355	0	%100
7	M20	Y	-0.178	-0.178	0	%100
8	M21	Y	-0.87	-0.87	0	%100
9	M25	Y	-0.124	-0.124	0	%100
10	M204	Y	-0.44	-0.44	0	%100
11	M205	Y	-0.44	-0.44	0	%100
12	M27	Y	-0.44	-0.44	0	%100
13	M206	Y	-0.44	-0.44	0	%100
14	M26	Y	-0.44	-0.44	0	%100

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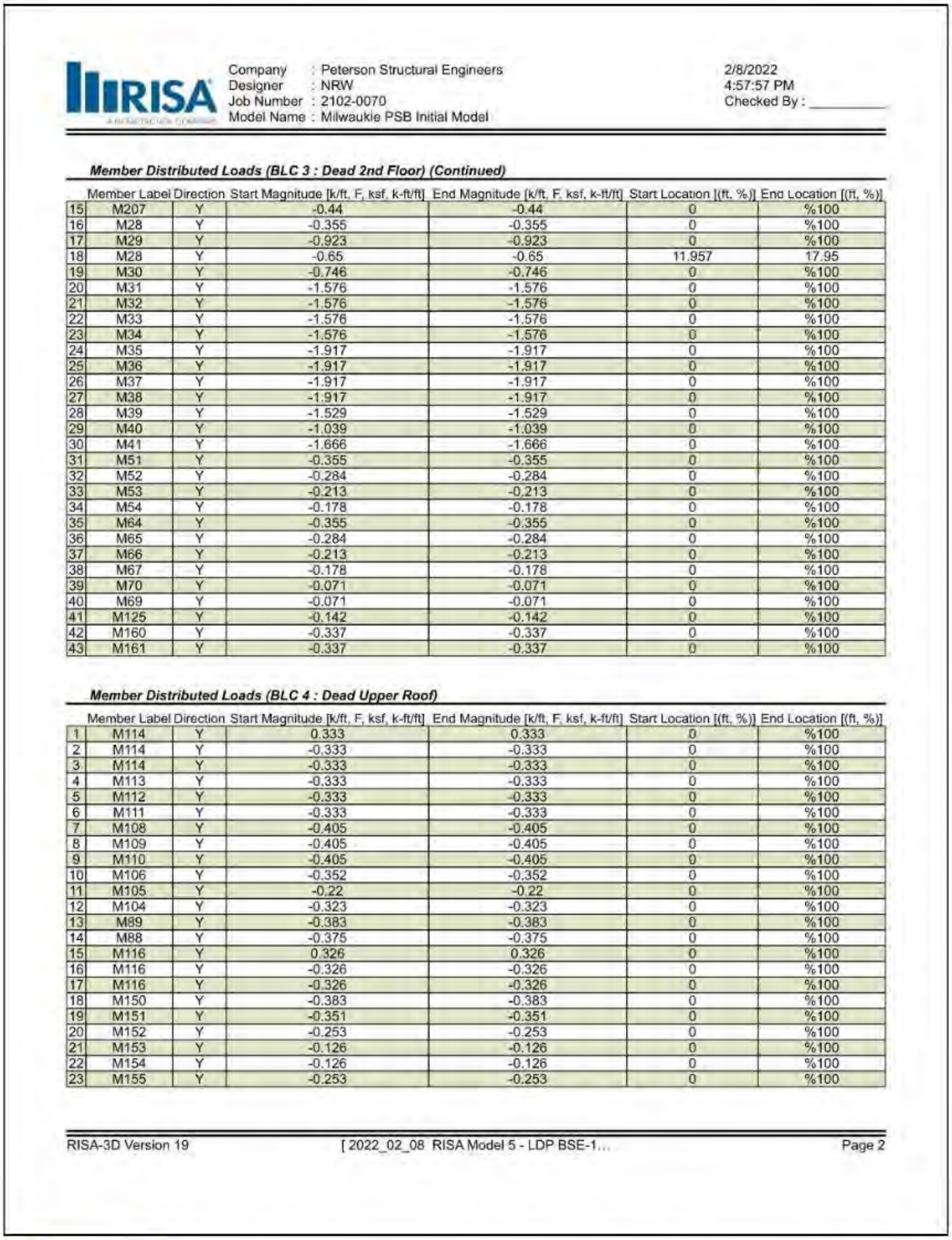

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 3 : Dead 2nd Floor) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
15	M207	Y	-0.44	-0.44	0	%100
16	M28	Y	-0.355	-0.355	0	%100
17	M29	Y	-0.923	-0.923	0	%100
18	M28	Y	-0.65	-0.65	11.957	17.95
19	M30	Y	-0.746	-0.746	0	%100
20	M31	Y	-1.576	-1.576	0	%100
21	M32	Y	-1.576	-1.576	0	%100
22	M33	Y	-1.576	-1.576	0	%100
23	M34	Y	-1.576	-1.576	0	%100
24	M35	Y	-1.917	-1.917	0	%100
25	M36	Y	-1.917	-1.917	0	%100
26	M37	Y	-1.917	-1.917	0	%100
27	M38	Y	-1.917	-1.917	0	%100
28	M39	Y	-1.529	-1.529	0	%100
29	M40	Y	-1.039	-1.039	0	%100
30	M41	Y	-1.666	-1.666	0	%100
31	M51	Y	-0.355	-0.355	0	%100
32	M52	Y	-0.284	-0.284	0	%100
33	M53	Y	-0.213	-0.213	0	%100
34	M54	Y	-0.178	-0.178	0	%100
35	M64	Y	-0.355	-0.355	0	%100
36	M65	Y	-0.284	-0.284	0	%100
37	M66	Y	-0.213	-0.213	0	%100
38	M67	Y	-0.178	-0.178	0	%100
39	M70	Y	-0.071	-0.071	0	%100
40	M69	Y	-0.071	-0.071	0	%100
41	M125	Y	-0.142	-0.142	0	%100
42	M160	Y	-0.337	-0.337	0	%100
43	M161	Y	-0.337	-0.337	0	%100

Member Distributed Loads (BLC 4 : Dead Upper Roof)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M114	Y	0.333	0.333	0	%100
2	M114	Y	-0.333	-0.333	0	%100
3	M114	Y	-0.333	-0.333	0	%100
4	M113	Y	-0.333	-0.333	0	%100
5	M112	Y	-0.333	-0.333	0	%100
6	M111	Y	-0.333	-0.333	0	%100
7	M108	Y	-0.405	-0.405	0	%100
8	M109	Y	-0.405	-0.405	0	%100
9	M110	Y	-0.405	-0.405	0	%100
10	M106	Y	-0.352	-0.352	0	%100
11	M105	Y	-0.22	-0.22	0	%100
12	M104	Y	-0.323	-0.323	0	%100
13	M89	Y	-0.383	-0.383	0	%100
14	M88	Y	-0.375	-0.375	0	%100
15	M116	Y	0.326	0.326	0	%100
16	M116	Y	-0.326	-0.326	0	%100
17	M116	Y	-0.326	-0.326	0	%100
18	M150	Y	-0.383	-0.383	0	%100
19	M151	Y	-0.351	-0.351	0	%100
20	M152	Y	-0.253	-0.253	0	%100
21	M153	Y	-0.126	-0.126	0	%100
22	M154	Y	-0.126	-0.126	0	%100
23	M155	Y	-0.253	-0.253	0	%100

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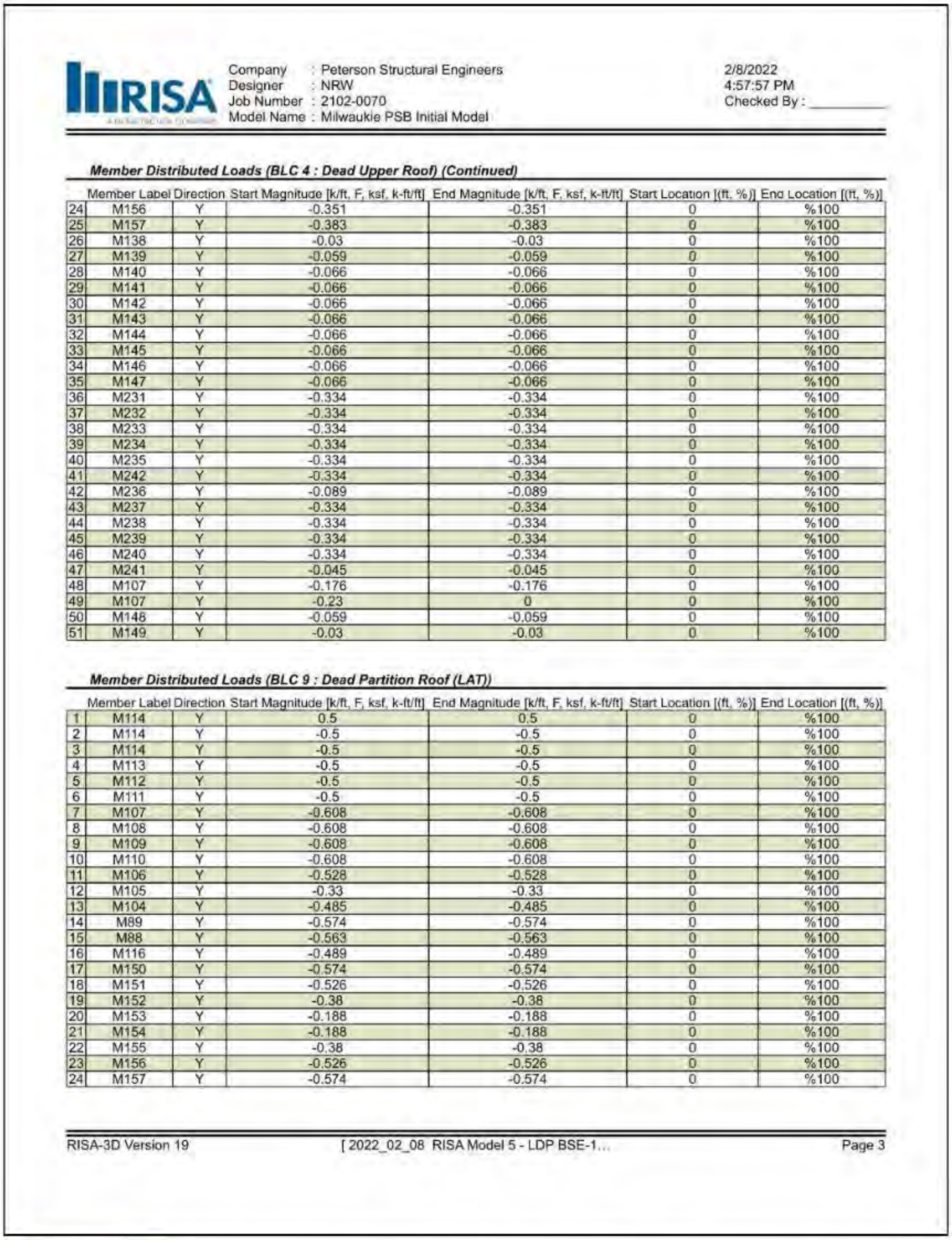

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 4 : Dead Upper Roof) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
24	M156	Y	-0.351	-0.351	0	%100
25	M157	Y	-0.383	-0.383	0	%100
26	M138	Y	-0.03	-0.03	0	%100
27	M139	Y	-0.059	-0.059	0	%100
28	M140	Y	-0.066	-0.066	0	%100
29	M141	Y	-0.066	-0.066	0	%100
30	M142	Y	-0.066	-0.066	0	%100
31	M143	Y	-0.066	-0.066	0	%100
32	M144	Y	-0.066	-0.066	0	%100
33	M145	Y	-0.066	-0.066	0	%100
34	M146	Y	-0.066	-0.066	0	%100
35	M147	Y	-0.066	-0.066	0	%100
36	M231	Y	-0.334	-0.334	0	%100
37	M232	Y	-0.334	-0.334	0	%100
38	M233	Y	-0.334	-0.334	0	%100
39	M234	Y	-0.334	-0.334	0	%100
40	M235	Y	-0.334	-0.334	0	%100
41	M242	Y	-0.334	-0.334	0	%100
42	M236	Y	-0.089	-0.089	0	%100
43	M237	Y	-0.334	-0.334	0	%100
44	M238	Y	-0.334	-0.334	0	%100
45	M239	Y	-0.334	-0.334	0	%100
46	M240	Y	-0.334	-0.334	0	%100
47	M241	Y	-0.045	-0.045	0	%100
48	M107	Y	-0.176	-0.176	0	%100
49	M107	Y	-0.23	0	0	%100
50	M148	Y	-0.059	-0.059	0	%100
51	M149	Y	-0.03	-0.03	0	%100

Member Distributed Loads (BLC 9 : Dead Partition Roof (LAT))

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M114	Y	0.5	0.5	0	%100
2	M114	Y	-0.5	-0.5	0	%100
3	M114	Y	-0.5	-0.5	0	%100
4	M113	Y	-0.5	-0.5	0	%100
5	M112	Y	-0.5	-0.5	0	%100
6	M111	Y	-0.5	-0.5	0	%100
7	M107	Y	-0.608	-0.608	0	%100
8	M108	Y	-0.608	-0.608	0	%100
9	M109	Y	-0.608	-0.608	0	%100
10	M110	Y	-0.608	-0.608	0	%100
11	M106	Y	-0.528	-0.528	0	%100
12	M105	Y	-0.33	-0.33	0	%100
13	M104	Y	-0.485	-0.485	0	%100
14	M89	Y	-0.574	-0.574	0	%100
15	M88	Y	-0.563	-0.563	0	%100
16	M116	Y	-0.489	-0.489	0	%100
17	M150	Y	-0.574	-0.574	0	%100
18	M151	Y	-0.526	-0.526	0	%100
19	M152	Y	-0.38	-0.38	0	%100
20	M153	Y	-0.188	-0.188	0	%100
21	M154	Y	-0.188	-0.188	0	%100
22	M155	Y	-0.38	-0.38	0	%100
23	M156	Y	-0.526	-0.526	0	%100
24	M157	Y	-0.574	-0.574	0	%100

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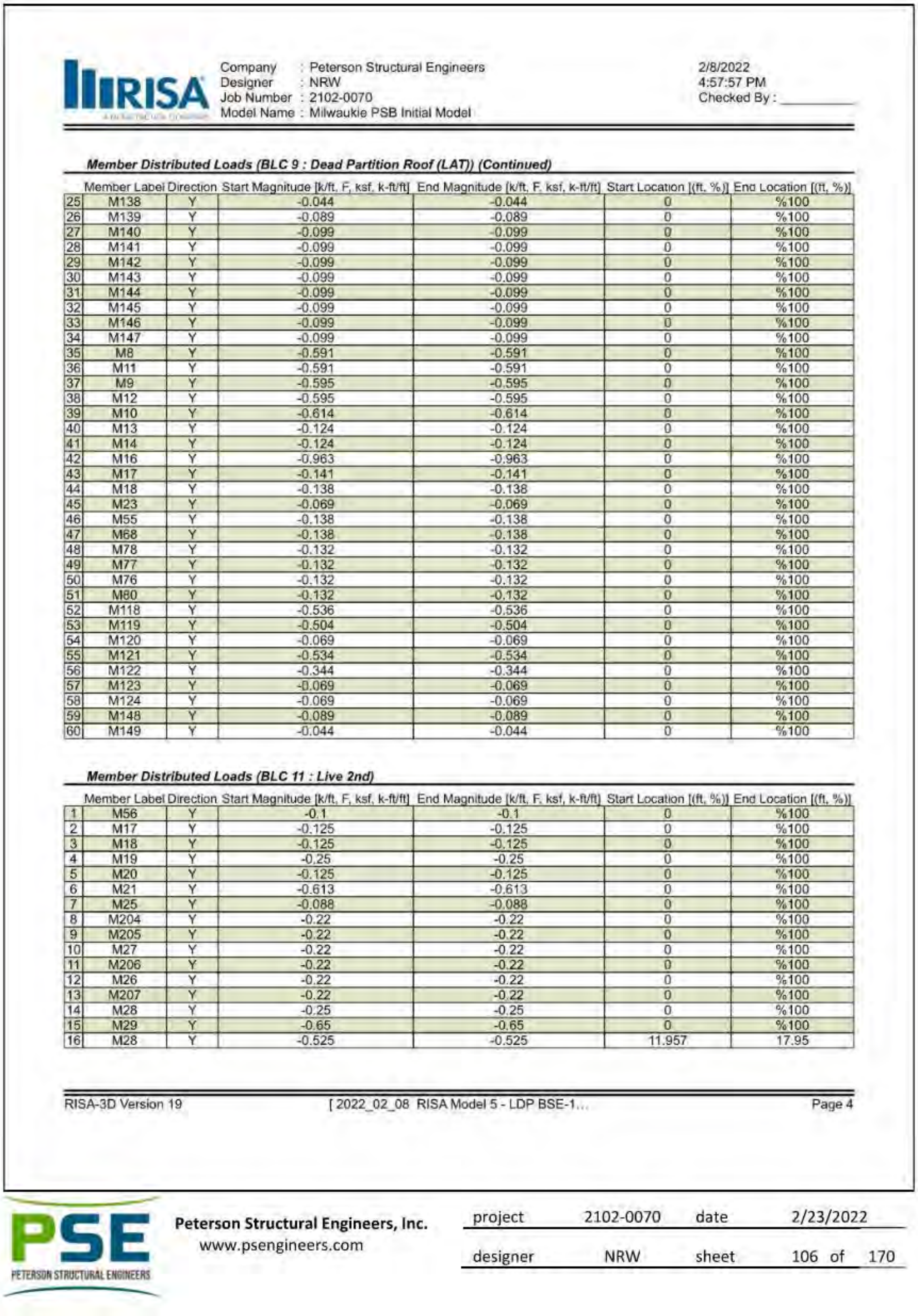

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 9 : Dead Partition Roof (LAT)) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
25	M138	Y	-0.044	-0.044	0	%100
26	M139	Y	-0.089	-0.089	0	%100
27	M140	Y	-0.099	-0.099	0	%100
28	M141	Y	-0.099	-0.099	0	%100
29	M142	Y	-0.099	-0.099	0	%100
30	M143	Y	-0.099	-0.099	0	%100
31	M144	Y	-0.099	-0.099	0	%100
32	M145	Y	-0.099	-0.099	0	%100
33	M146	Y	-0.099	-0.099	0	%100
34	M147	Y	-0.099	-0.099	0	%100
35	M8	Y	-0.591	-0.591	0	%100
36	M11	Y	-0.591	-0.591	0	%100
37	M9	Y	-0.595	-0.595	0	%100
38	M12	Y	-0.595	-0.595	0	%100
39	M10	Y	-0.614	-0.614	0	%100
40	M13	Y	-0.124	-0.124	0	%100
41	M14	Y	-0.124	-0.124	0	%100
42	M16	Y	-0.963	-0.963	0	%100
43	M17	Y	-0.141	-0.141	0	%100
44	M18	Y	-0.138	-0.138	0	%100
45	M23	Y	-0.069	-0.069	0	%100
46	M55	Y	-0.138	-0.138	0	%100
47	M68	Y	-0.138	-0.138	0	%100
48	M78	Y	-0.132	-0.132	0	%100
49	M77	Y	-0.132	-0.132	0	%100
50	M76	Y	-0.132	-0.132	0	%100
51	M80	Y	-0.132	-0.132	0	%100
52	M118	Y	-0.536	-0.536	0	%100
53	M119	Y	-0.504	-0.504	0	%100
54	M120	Y	-0.069	-0.069	0	%100
55	M121	Y	-0.534	-0.534	0	%100
56	M122	Y	-0.344	-0.344	0	%100
57	M123	Y	-0.069	-0.069	0	%100
58	M124	Y	-0.069	-0.069	0	%100
59	M148	Y	-0.089	-0.089	0	%100
60	M149	Y	-0.044	-0.044	0	%100

Member Distributed Loads (BLC 11 : Live 2nd)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M56	Y	-0.1	-0.1	0	%100
2	M17	Y	-0.125	-0.125	0	%100
3	M18	Y	-0.125	-0.125	0	%100
4	M19	Y	-0.25	-0.25	0	%100
5	M20	Y	-0.125	-0.125	0	%100
6	M21	Y	-0.613	-0.613	0	%100
7	M25	Y	-0.088	-0.088	0	%100
8	M204	Y	-0.22	-0.22	0	%100
9	M205	Y	-0.22	-0.22	0	%100
10	M27	Y	-0.22	-0.22	0	%100
11	M206	Y	-0.22	-0.22	0	%100
12	M26	Y	-0.22	-0.22	0	%100
13	M207	Y	-0.22	-0.22	0	%100
14	M28	Y	-0.25	-0.25	0	%100
15	M29	Y	-0.65	-0.65	0	%100
16	M28	Y	-0.525	-0.525	11.957	17.95

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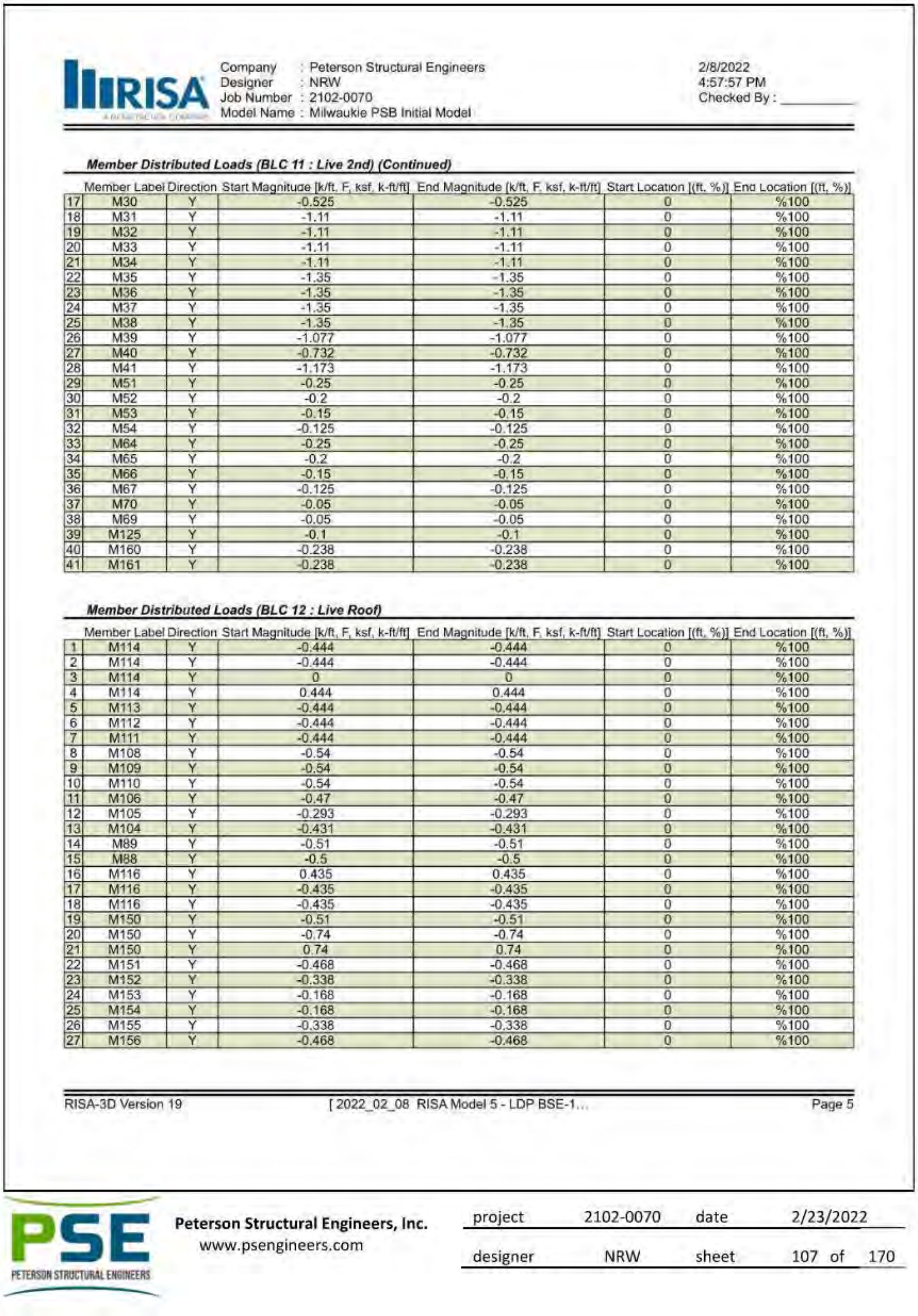

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 11 : Live 2nd) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
17	M30	Y	-0.525	-0.525	0	%100
18	M31	Y	-1.11	-1.11	0	%100
19	M32	Y	-1.11	-1.11	0	%100
20	M33	Y	-1.11	-1.11	0	%100
21	M34	Y	-1.11	-1.11	0	%100
22	M35	Y	-1.35	-1.35	0	%100
23	M36	Y	-1.35	-1.35	0	%100
24	M37	Y	-1.35	-1.35	0	%100
25	M38	Y	-1.35	-1.35	0	%100
26	M39	Y	-1.077	-1.077	0	%100
27	M40	Y	-0.732	-0.732	0	%100
28	M41	Y	-1.173	-1.173	0	%100
29	M51	Y	-0.25	-0.25	0	%100
30	M52	Y	-0.2	-0.2	0	%100
31	M53	Y	-0.15	-0.15	0	%100
32	M54	Y	-0.125	-0.125	0	%100
33	M64	Y	-0.25	-0.25	0	%100
34	M65	Y	-0.2	-0.2	0	%100
35	M66	Y	-0.15	-0.15	0	%100
36	M67	Y	-0.125	-0.125	0	%100
37	M70	Y	-0.05	-0.05	0	%100
38	M69	Y	-0.05	-0.05	0	%100
39	M125	Y	-0.1	-0.1	0	%100
40	M160	Y	-0.238	-0.238	0	%100
41	M161	Y	-0.238	-0.238	0	%100

Member Distributed Loads (BLC 12 : Live Roof)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M114	Y	-0.444	-0.444	0	%100
2	M114	Y	-0.444	-0.444	0	%100
3	M114	Y	0	0	0	%100
4	M114	Y	0.444	0.444	0	%100
5	M113	Y	-0.444	-0.444	0	%100
6	M112	Y	-0.444	-0.444	0	%100
7	M111	Y	-0.444	-0.444	0	%100
8	M108	Y	-0.54	-0.54	0	%100
9	M109	Y	-0.54	-0.54	0	%100
10	M110	Y	-0.54	-0.54	0	%100
11	M106	Y	-0.47	-0.47	0	%100
12	M105	Y	-0.293	-0.293	0	%100
13	M104	Y	-0.431	-0.431	0	%100
14	M89	Y	-0.51	-0.51	0	%100
15	M88	Y	-0.5	-0.5	0	%100
16	M116	Y	0.435	0.435	0	%100
17	M116	Y	-0.435	-0.435	0	%100
18	M116	Y	-0.435	-0.435	0	%100
19	M150	Y	-0.51	-0.51	0	%100
20	M150	Y	-0.74	-0.74	0	%100
21	M150	Y	0.74	0.74	0	%100
22	M151	Y	-0.468	-0.468	0	%100
23	M152	Y	-0.338	-0.338	0	%100
24	M153	Y	-0.168	-0.168	0	%100
25	M154	Y	-0.168	-0.168	0	%100
26	M155	Y	-0.338	-0.338	0	%100
27	M156	Y	-0.468	-0.468	0	%100

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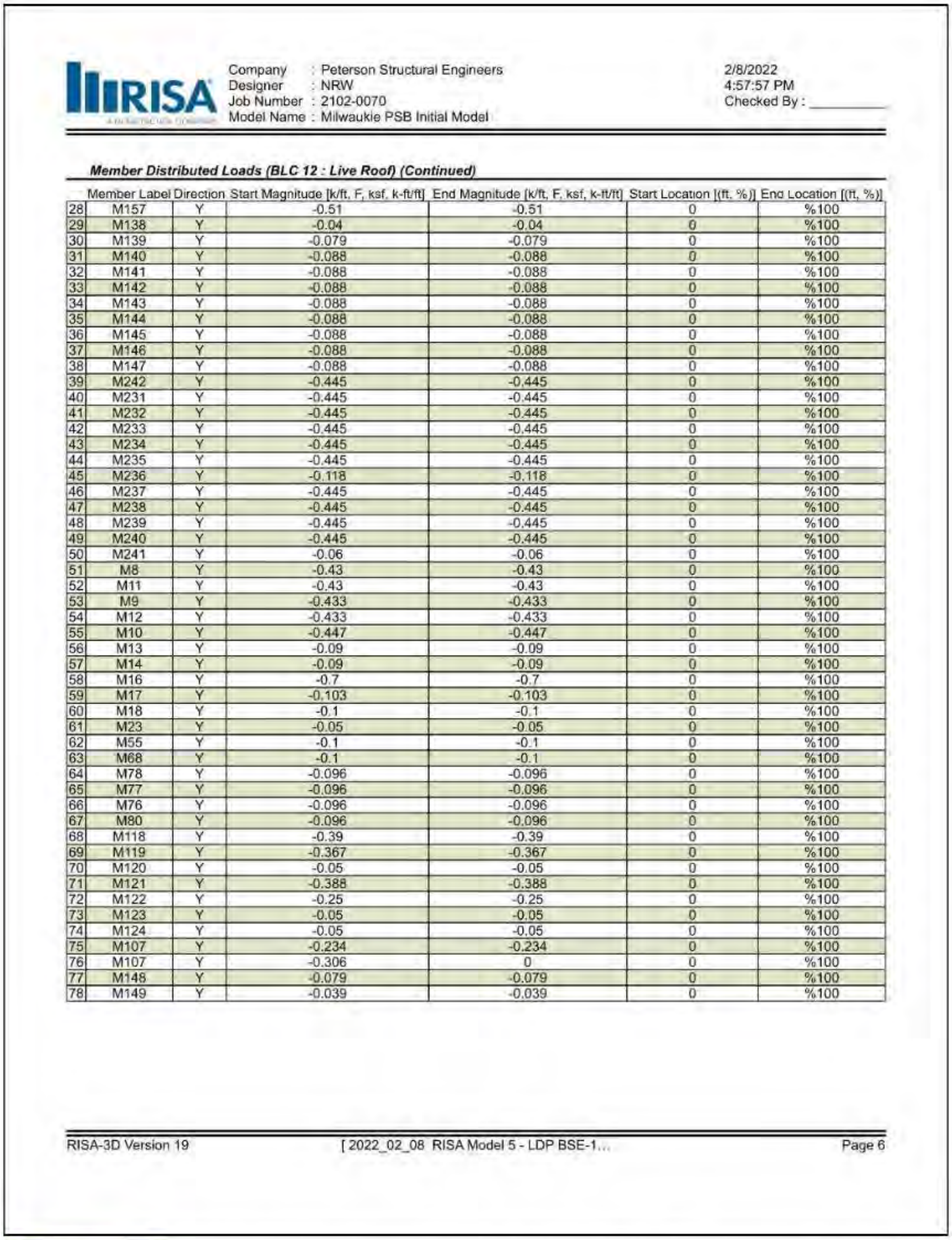

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 12 : Live Roof) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
28	M157	Y	-0.51	-0.51	0	%100
29	M138	Y	-0.04	-0.04	0	%100
30	M139	Y	-0.079	-0.079	0	%100
31	M140	Y	-0.088	-0.088	0	%100
32	M141	Y	-0.088	-0.088	0	%100
33	M142	Y	-0.088	-0.088	0	%100
34	M143	Y	-0.088	-0.088	0	%100
35	M144	Y	-0.088	-0.088	0	%100
36	M145	Y	-0.088	-0.088	0	%100
37	M146	Y	-0.088	-0.088	0	%100
38	M147	Y	-0.088	-0.088	0	%100
39	M242	Y	-0.445	-0.445	0	%100
40	M231	Y	-0.445	-0.445	0	%100
41	M232	Y	-0.445	-0.445	0	%100
42	M233	Y	-0.445	-0.445	0	%100
43	M234	Y	-0.445	-0.445	0	%100
44	M235	Y	-0.445	-0.445	0	%100
45	M236	Y	-0.118	-0.118	0	%100
46	M237	Y	-0.445	-0.445	0	%100
47	M238	Y	-0.445	-0.445	0	%100
48	M239	Y	-0.445	-0.445	0	%100
49	M240	Y	-0.445	-0.445	0	%100
50	M241	Y	-0.06	-0.06	0	%100
51	M8	Y	-0.43	-0.43	0	%100
52	M11	Y	-0.43	-0.43	0	%100
53	M9	Y	-0.433	-0.433	0	%100
54	M12	Y	-0.433	-0.433	0	%100
55	M10	Y	-0.447	-0.447	0	%100
56	M13	Y	-0.09	-0.09	0	%100
57	M14	Y	-0.09	-0.09	0	%100
58	M16	Y	-0.7	-0.7	0	%100
59	M17	Y	-0.103	-0.103	0	%100
60	M18	Y	-0.1	-0.1	0	%100
61	M23	Y	-0.05	-0.05	0	%100
62	M55	Y	-0.1	-0.1	0	%100
63	M68	Y	-0.1	-0.1	0	%100
64	M78	Y	-0.096	-0.096	0	%100
65	M77	Y	-0.096	-0.096	0	%100
66	M76	Y	-0.096	-0.096	0	%100
67	M80	Y	-0.096	-0.096	0	%100
68	M118	Y	-0.39	-0.39	0	%100
69	M119	Y	-0.367	-0.367	0	%100
70	M120	Y	-0.05	-0.05	0	%100
71	M121	Y	-0.388	-0.388	0	%100
72	M122	Y	-0.25	-0.25	0	%100
73	M123	Y	-0.05	-0.05	0	%100
74	M124	Y	-0.05	-0.05	0	%100
75	M107	Y	-0.234	-0.234	0	%100
76	M107	Y	-0.306	0	0	%100
77	M148	Y	-0.079	-0.079	0	%100
78	M149	Y	-0.039	-0.039	0	%100

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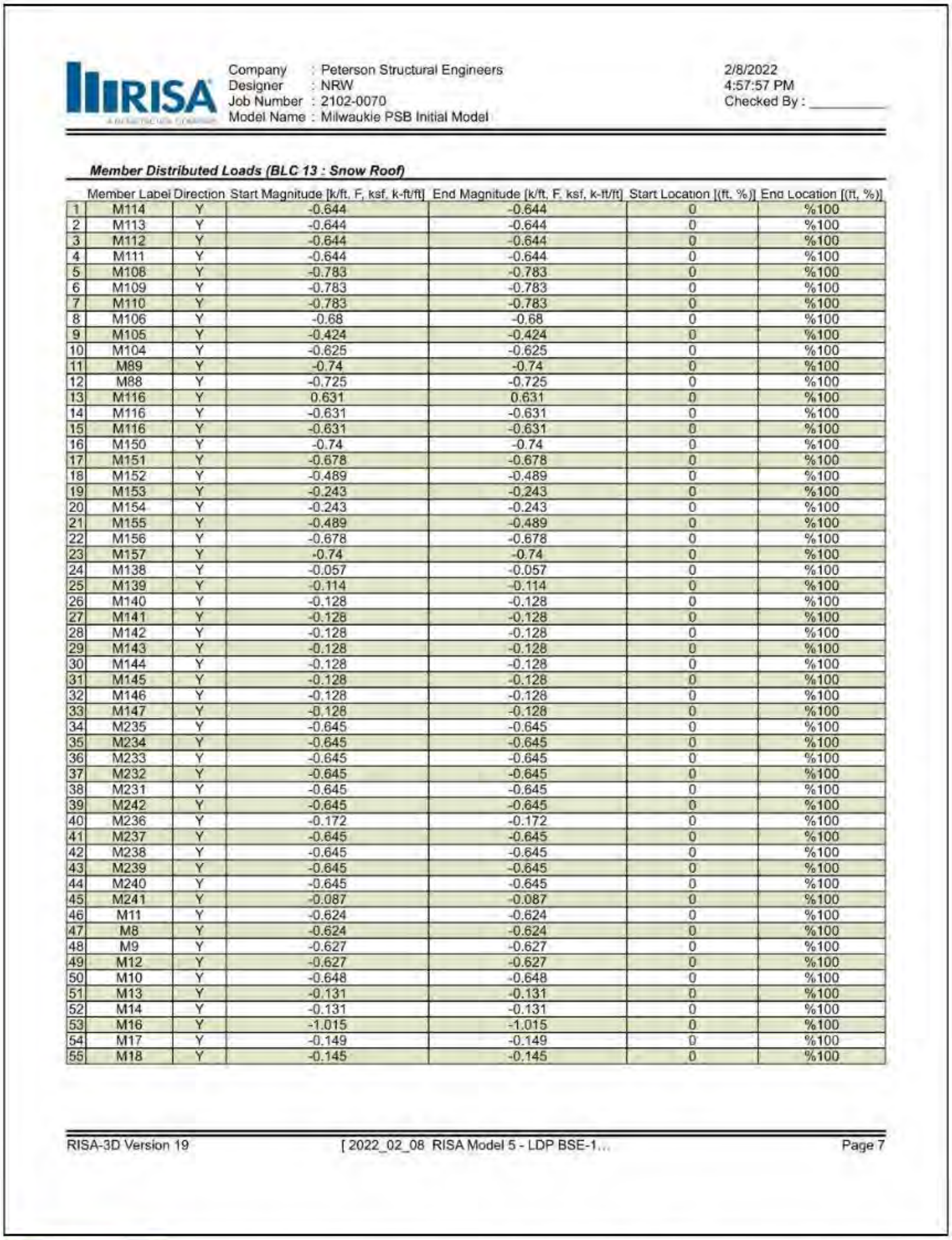

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Member Distributed Loads (BLC 13 : Snow Roof)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
1	M114	Y	-0.644	-0.644	0	%100
2	M113	Y	-0.644	-0.644	0	%100
3	M112	Y	-0.644	-0.644	0	%100
4	M111	Y	-0.644	-0.644	0	%100
5	M108	Y	-0.783	-0.783	0	%100
6	M109	Y	-0.783	-0.783	0	%100
7	M110	Y	-0.783	-0.783	0	%100
8	M106	Y	-0.68	-0.68	0	%100
9	M105	Y	-0.424	-0.424	0	%100
10	M104	Y	-0.625	-0.625	0	%100
11	M89	Y	-0.74	-0.74	0	%100
12	M88	Y	-0.725	-0.725	0	%100
13	M116	Y	0.631	0.631	0	%100
14	M116	Y	-0.631	-0.631	0	%100
15	M116	Y	-0.631	-0.631	0	%100
16	M150	Y	-0.74	-0.74	0	%100
17	M151	Y	-0.678	-0.678	0	%100
18	M152	Y	-0.489	-0.489	0	%100
19	M153	Y	-0.243	-0.243	0	%100
20	M154	Y	-0.243	-0.243	0	%100
21	M155	Y	-0.489	-0.489	0	%100
22	M156	Y	-0.678	-0.678	0	%100
23	M157	Y	-0.74	-0.74	0	%100
24	M138	Y	-0.057	-0.057	0	%100
25	M139	Y	-0.114	-0.114	0	%100
26	M140	Y	-0.128	-0.128	0	%100
27	M141	Y	-0.128	-0.128	0	%100
28	M142	Y	-0.128	-0.128	0	%100
29	M143	Y	-0.128	-0.128	0	%100
30	M144	Y	-0.128	-0.128	0	%100
31	M145	Y	-0.128	-0.128	0	%100
32	M146	Y	-0.128	-0.128	0	%100
33	M147	Y	-0.128	-0.128	0	%100
34	M235	Y	-0.645	-0.645	0	%100
35	M234	Y	-0.645	-0.645	0	%100
36	M233	Y	-0.645	-0.645	0	%100
37	M232	Y	-0.645	-0.645	0	%100
38	M231	Y	-0.645	-0.645	0	%100
39	M242	Y	-0.645	-0.645	0	%100
40	M236	Y	-0.172	-0.172	0	%100
41	M237	Y	-0.645	-0.645	0	%100
42	M238	Y	-0.645	-0.645	0	%100
43	M239	Y	-0.645	-0.645	0	%100
44	M240	Y	-0.645	-0.645	0	%100
45	M241	Y	-0.087	-0.087	0	%100
46	M11	Y	-0.624	-0.624	0	%100
47	M8	Y	-0.624	-0.624	0	%100
48	M9	Y	-0.627	-0.627	0	%100
49	M12	Y	-0.627	-0.627	0	%100
50	M10	Y	-0.648	-0.648	0	%100
51	M13	Y	-0.131	-0.131	0	%100
52	M14	Y	-0.131	-0.131	0	%100
53	M16	Y	-1.015	-1.015	0	%100
54	M17	Y	-0.149	-0.149	0	%100
55	M18	Y	-0.145	-0.145	0	%100

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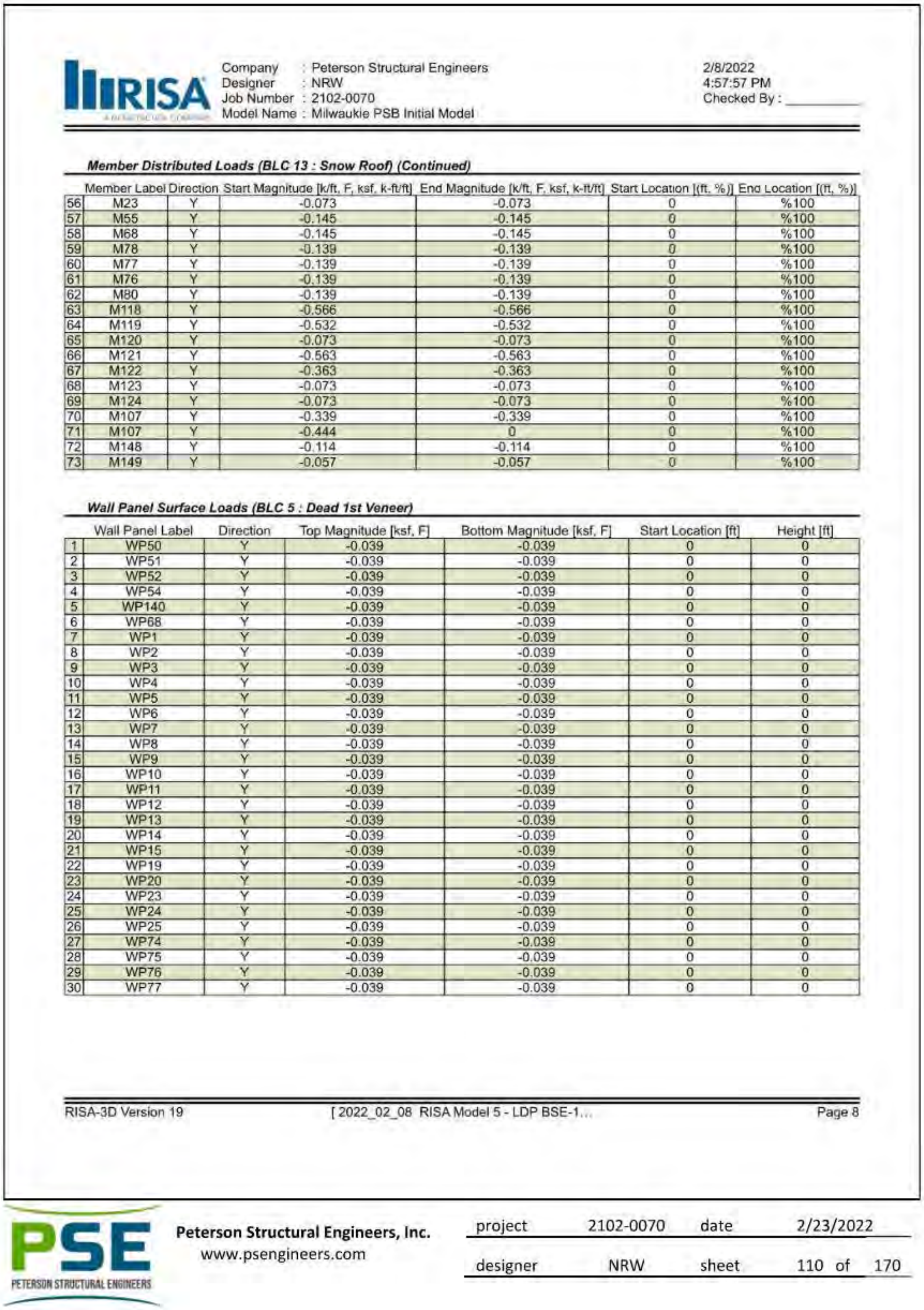
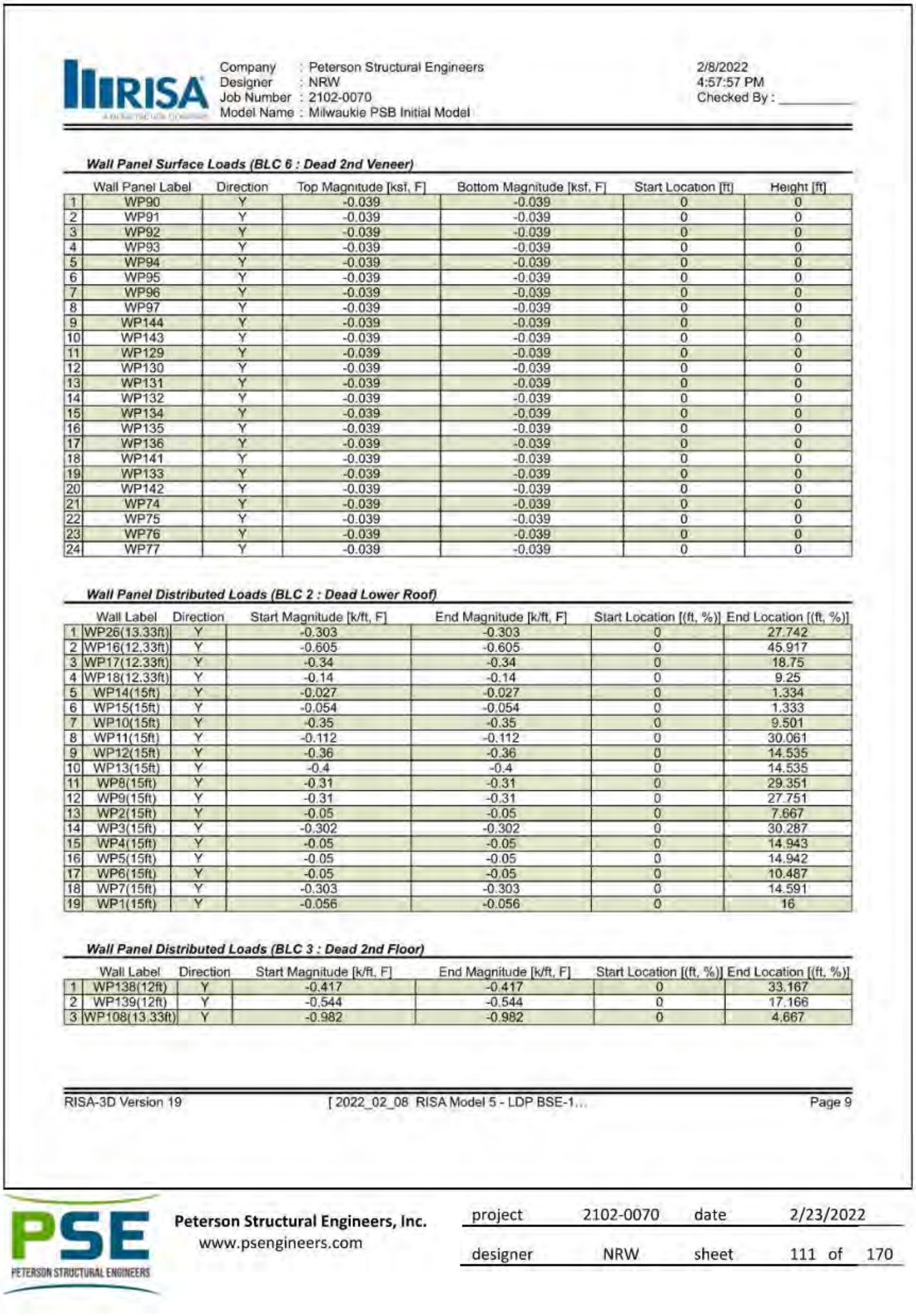


Member Distributed Loads (BLC 13 : Snow Roof) (Continued)

	Member Label	Direction	Start Magnitude [k/ft, F, ksf, k-ft/ft]	End Magnitude [k/ft, F, ksf, k-ft/ft]	Start Location [(ft, %)]	End Location [(ft, %)]
56	M23	Y	-0.073	-0.073	0	%100
57	M55	Y	-0.145	-0.145	0	%100
58	M68	Y	-0.145	-0.145	0	%100
59	M78	Y	-0.139	-0.139	0	%100
60	M77	Y	-0.139	-0.139	0	%100
61	M76	Y	-0.139	-0.139	0	%100
62	M80	Y	-0.139	-0.139	0	%100
63	M118	Y	-0.566	-0.566	0	%100
64	M119	Y	-0.532	-0.532	0	%100
65	M120	Y	-0.073	-0.073	0	%100
66	M121	Y	-0.563	-0.563	0	%100
67	M122	Y	-0.363	-0.363	0	%100
68	M123	Y	-0.073	-0.073	0	%100
69	M124	Y	-0.073	-0.073	0	%100
70	M107	Y	-0.339	-0.339	0	%100
71	M107	Y	-0.444	0	0	%100
72	M148	Y	-0.114	-0.114	0	%100
73	M149	Y	-0.057	-0.057	0	%100

Wall Panel Surface Loads (BLC 5 : Dead 1st Veneer)

	Wall Panel Label	Direction	Top Magnitude [ksf, F]	Bottom Magnitude [ksf, F]	Start Location [ft]	Height [ft]
1	WP50	Y	-0.039	-0.039	0	0
2	WP51	Y	-0.039	-0.039	0	0
3	WP52	Y	-0.039	-0.039	0	0
4	WP54	Y	-0.039	-0.039	0	0
5	WP140	Y	-0.039	-0.039	0	0
6	WP68	Y	-0.039	-0.039	0	0
7	WP1	Y	-0.039	-0.039	0	0
8	WP2	Y	-0.039	-0.039	0	0
9	WP3	Y	-0.039	-0.039	0	0
10	WP4	Y	-0.039	-0.039	0	0
11	WP5	Y	-0.039	-0.039	0	0
12	WP6	Y	-0.039	-0.039	0	0
13	WP7	Y	-0.039	-0.039	0	0
14	WP8	Y	-0.039	-0.039	0	0
15	WP9	Y	-0.039	-0.039	0	0
16	WP10	Y	-0.039	-0.039	0	0
17	WP11	Y	-0.039	-0.039	0	0
18	WP12	Y	-0.039	-0.039	0	0
19	WP13	Y	-0.039	-0.039	0	0
20	WP14	Y	-0.039	-0.039	0	0
21	WP15	Y	-0.039	-0.039	0	0
22	WP19	Y	-0.039	-0.039	0	0
23	WP20	Y	-0.039	-0.039	0	0
24	WP23	Y	-0.039	-0.039	0	0
25	WP24	Y	-0.039	-0.039	0	0
26	WP25	Y	-0.039	-0.039	0	0
27	WP74	Y	-0.039	-0.039	0	0
28	WP75	Y	-0.039	-0.039	0	0
29	WP76	Y	-0.039	-0.039	0	0
30	WP77	Y	-0.039	-0.039	0	0



Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Wall Panel Surface Loads (BLC 6 : Dead 2nd Veneer)

	Wall Panel Label	Direction	Top Magnitude [ksf, F]	Bottom Magnitude [ksf, F]	Start Location [ft]	Height [ft]
1	WP90	Y	-0.039	-0.039	0	0
2	WP91	Y	-0.039	-0.039	0	0
3	WP92	Y	-0.039	-0.039	0	0
4	WP93	Y	-0.039	-0.039	0	0
5	WP94	Y	-0.039	-0.039	0	0
6	WP95	Y	-0.039	-0.039	0	0
7	WP96	Y	-0.039	-0.039	0	0
8	WP97	Y	-0.039	-0.039	0	0
9	WP144	Y	-0.039	-0.039	0	0
10	WP143	Y	-0.039	-0.039	0	0
11	WP129	Y	-0.039	-0.039	0	0
12	WP130	Y	-0.039	-0.039	0	0
13	WP131	Y	-0.039	-0.039	0	0
14	WP132	Y	-0.039	-0.039	0	0
15	WP134	Y	-0.039	-0.039	0	0
16	WP135	Y	-0.039	-0.039	0	0
17	WP136	Y	-0.039	-0.039	0	0
18	WP141	Y	-0.039	-0.039	0	0
19	WP133	Y	-0.039	-0.039	0	0
20	WP142	Y	-0.039	-0.039	0	0
21	WP74	Y	-0.039	-0.039	0	0
22	WP75	Y	-0.039	-0.039	0	0
23	WP76	Y	-0.039	-0.039	0	0
24	WP77	Y	-0.039	-0.039	0	0

Wall Panel Distributed Loads (BLC 2 : Dead Lower Roof)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP26(13.33ft)	Y	-0.303	-0.303	0	27.742
2	WP16(12.33ft)	Y	-0.605	-0.605	0	45.917
3	WP17(12.33ft)	Y	-0.34	-0.34	0	18.75
4	WP18(12.33ft)	Y	-0.14	-0.14	0	9.25
5	WP14(15ft)	Y	-0.027	-0.027	0	1.334
6	WP15(15ft)	Y	-0.054	-0.054	0	1.333
7	WP10(15ft)	Y	-0.35	-0.35	0	9.501
8	WP11(15ft)	Y	-0.112	-0.112	0	30.061
9	WP12(15ft)	Y	-0.36	-0.36	0	14.535
10	WP13(15ft)	Y	-0.4	-0.4	0	14.535
11	WP8(15ft)	Y	-0.31	-0.31	0	29.351
12	WP9(15ft)	Y	-0.31	-0.31	0	27.751
13	WP2(15ft)	Y	-0.05	-0.05	0	7.667
14	WP3(15ft)	Y	-0.302	-0.302	0	30.287
15	WP4(15ft)	Y	-0.05	-0.05	0	14.943
16	WP5(15ft)	Y	-0.05	-0.05	0	14.942
17	WP6(15ft)	Y	-0.05	-0.05	0	10.487
18	WP7(15ft)	Y	-0.303	-0.303	0	14.591
19	WP1(15ft)	Y	-0.056	-0.056	0	16

Wall Panel Distributed Loads (BLC 3 : Dead 2nd Floor)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP138(12ft)	Y	-0.417	-0.417	0	33.167
2	WP139(12ft)	Y	-0.544	-0.544	0	17.166
3	WP108(13.33ft)	Y	-0.982	-0.982	0	4.667

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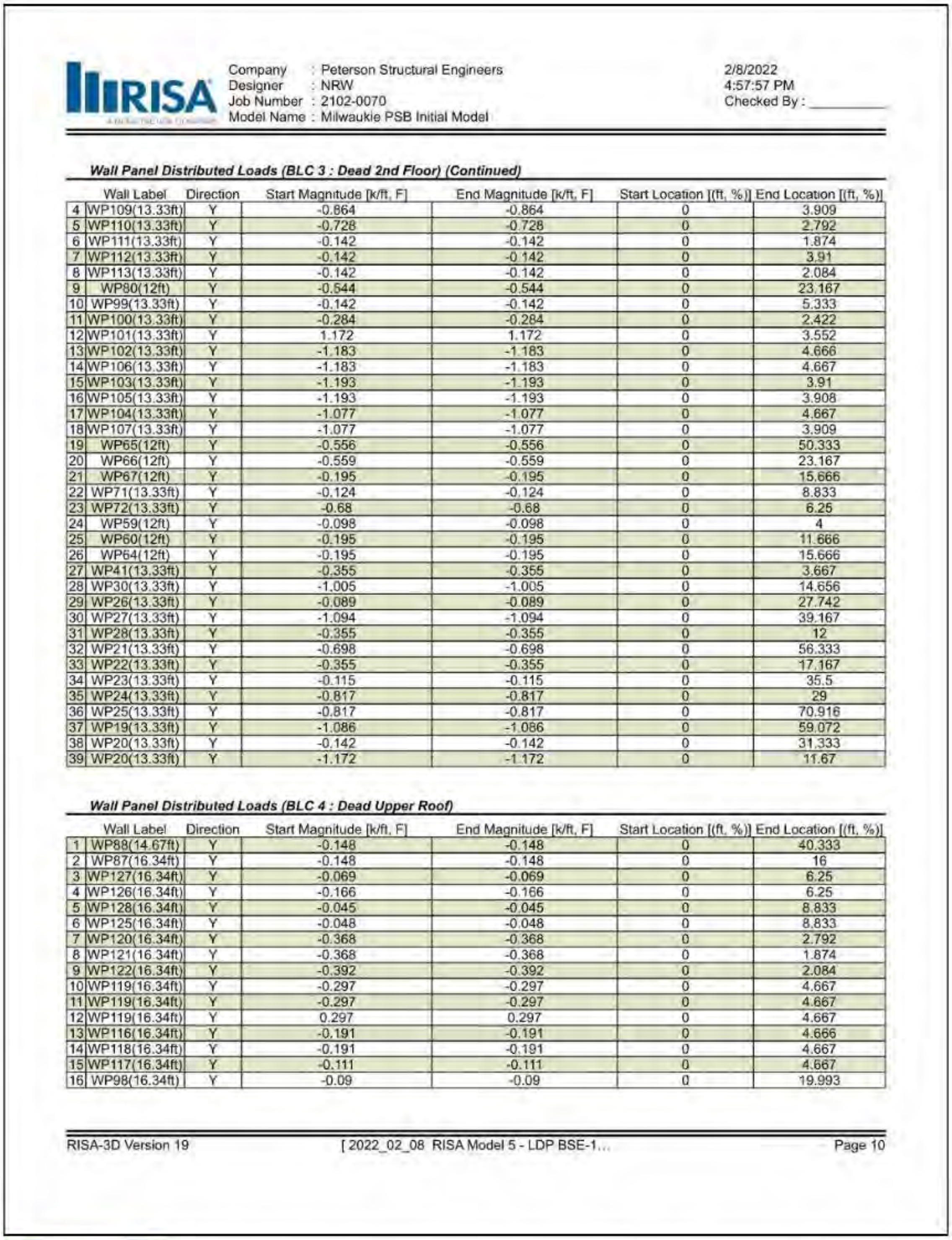

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Wall Panel Distributed Loads (BLC 3 : Dead 2nd Floor) (Continued)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
4	WP109(13.33ft)	Y	-0.864	-0.864	0	3.909
5	WP110(13.33ft)	Y	-0.728	-0.728	0	2.792
6	WP111(13.33ft)	Y	-0.142	-0.142	0	1.874
7	WP112(13.33ft)	Y	-0.142	-0.142	0	3.91
8	WP113(13.33ft)	Y	-0.142	-0.142	0	2.084
9	WP80(12ft)	Y	-0.544	-0.544	0	23.167
10	WP99(13.33ft)	Y	-0.142	-0.142	0	5.333
11	WP100(13.33ft)	Y	-0.284	-0.284	0	2.422
12	WP101(13.33ft)	Y	1.172	1.172	0	3.552
13	WP102(13.33ft)	Y	-1.183	-1.183	0	4.666
14	WP106(13.33ft)	Y	-1.183	-1.183	0	4.667
15	WP103(13.33ft)	Y	-1.193	-1.193	0	3.91
16	WP105(13.33ft)	Y	-1.193	-1.193	0	3.908
17	WP104(13.33ft)	Y	-1.077	-1.077	0	4.667
18	WP107(13.33ft)	Y	-1.077	-1.077	0	3.909
19	WP65(12ft)	Y	-0.556	-0.556	0	50.333
20	WP66(12ft)	Y	-0.559	-0.559	0	23.167
21	WP67(12ft)	Y	-0.195	-0.195	0	15.666
22	WP71(13.33ft)	Y	-0.124	-0.124	0	8.833
23	WP72(13.33ft)	Y	-0.68	-0.68	0	6.25
24	WP59(12ft)	Y	-0.098	-0.098	0	4
25	WP60(12ft)	Y	-0.195	-0.195	0	11.666
26	WP64(12ft)	Y	-0.195	-0.195	0	15.666
27	WP41(13.33ft)	Y	-0.355	-0.355	0	3.667
28	WP30(13.33ft)	Y	-1.005	-1.005	0	14.656
29	WP26(13.33ft)	Y	-0.089	-0.089	0	27.742
30	WP27(13.33ft)	Y	-1.094	-1.094	0	39.167
31	WP28(13.33ft)	Y	-0.355	-0.355	0	12
32	WP21(13.33ft)	Y	-0.698	-0.698	0	56.333
33	WP22(13.33ft)	Y	-0.355	-0.355	0	17.167
34	WP23(13.33ft)	Y	-0.115	-0.115	0	35.5
35	WP24(13.33ft)	Y	-0.817	-0.817	0	29
36	WP25(13.33ft)	Y	-0.817	-0.817	0	70.916
37	WP19(13.33ft)	Y	-1.086	-1.086	0	59.072
38	WP20(13.33ft)	Y	-0.142	-0.142	0	31.333
39	WP20(13.33ft)	Y	-1.172	-1.172	0	11.67

Wall Panel Distributed Loads (BLC 4 : Dead Upper Roof)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP88(14.67ft)	Y	-0.148	-0.148	0	40.333
2	WP87(16.34ft)	Y	-0.148	-0.148	0	16
3	WP127(16.34ft)	Y	-0.069	-0.069	0	6.25
4	WP126(16.34ft)	Y	-0.166	-0.166	0	6.25
5	WP128(16.34ft)	Y	-0.045	-0.045	0	8.833
6	WP125(16.34ft)	Y	-0.048	-0.048	0	8.833
7	WP120(16.34ft)	Y	-0.368	-0.368	0	2.792
8	WP121(16.34ft)	Y	-0.368	-0.368	0	1.874
9	WP122(16.34ft)	Y	-0.392	-0.392	0	2.084
10	WP119(16.34ft)	Y	-0.297	-0.297	0	4.667
11	WP119(16.34ft)	Y	-0.297	-0.297	0	4.667
12	WP119(16.34ft)	Y	0.297	0.297	0	4.667
13	WP116(16.34ft)	Y	-0.191	-0.191	0	4.666
14	WP118(16.34ft)	Y	-0.191	-0.191	0	4.667
15	WP117(16.34ft)	Y	-0.111	-0.111	0	4.667
16	WP98(16.34ft)	Y	-0.09	-0.09	0	19.993

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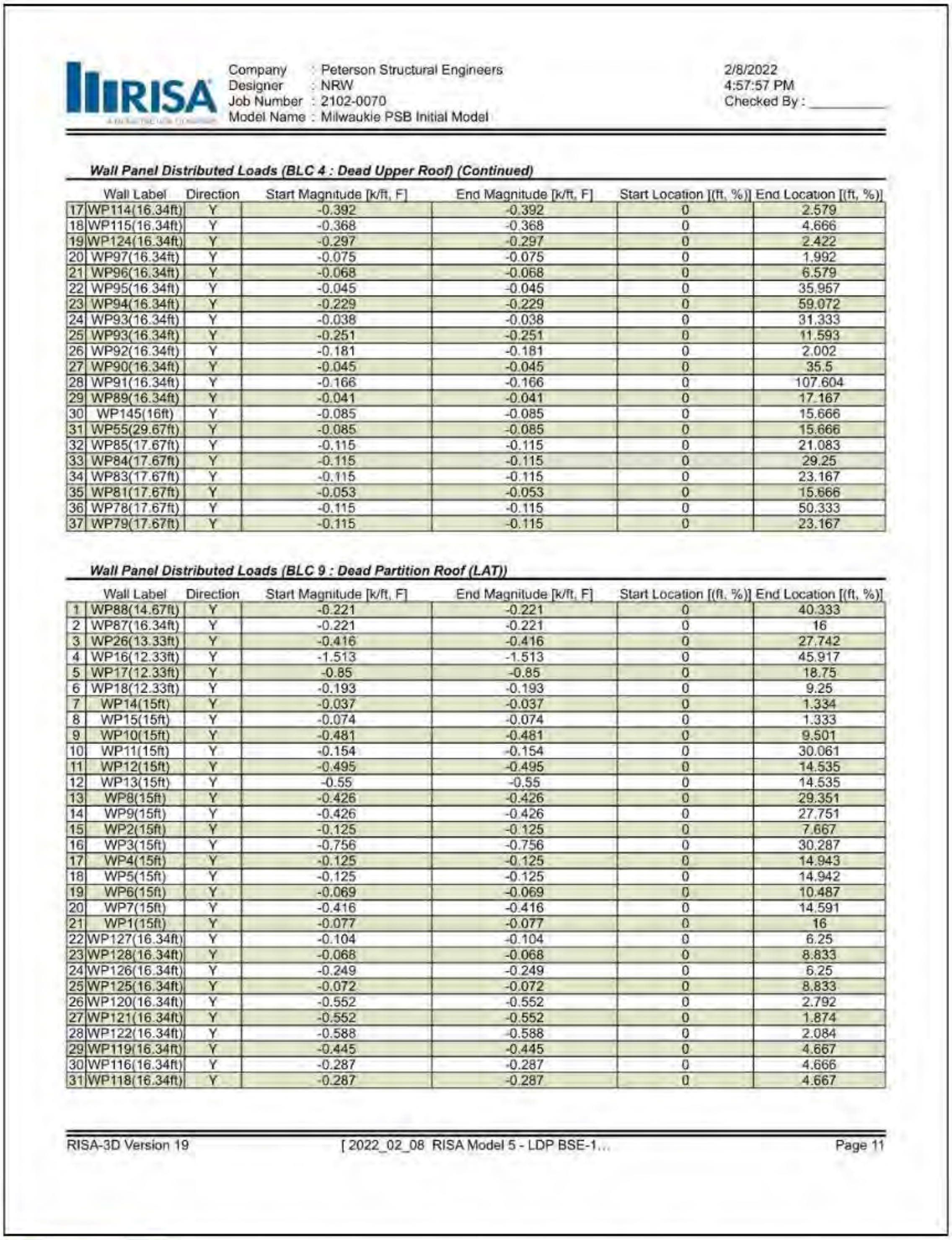

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Wall Panel Distributed Loads (BLC 4 : Dead Upper Roof) (Continued)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
17	WP114(16.34ft)	Y	-0.392	-0.392	0	2.579
18	WP115(16.34ft)	Y	-0.368	-0.368	0	4.666
19	WP124(16.34ft)	Y	-0.297	-0.297	0	2.422
20	WP97(16.34ft)	Y	-0.075	-0.075	0	1.992
21	WP96(16.34ft)	Y	-0.068	-0.068	0	6.579
22	WP95(16.34ft)	Y	-0.045	-0.045	0	35.957
23	WP94(16.34ft)	Y	-0.229	-0.229	0	59.072
24	WP93(16.34ft)	Y	-0.038	-0.038	0	31.333
25	WP93(16.34ft)	Y	-0.251	-0.251	0	11.593
26	WP92(16.34ft)	Y	-0.181	-0.181	0	2.002
27	WP90(16.34ft)	Y	-0.045	-0.045	0	35.5
28	WP91(16.34ft)	Y	-0.166	-0.166	0	107.604
29	WP89(16.34ft)	Y	-0.041	-0.041	0	17.167
30	WP145(16ft)	Y	-0.085	-0.085	0	15.666
31	WP55(29.67ft)	Y	-0.085	-0.085	0	15.666
32	WP85(17.67ft)	Y	-0.115	-0.115	0	21.083
33	WP84(17.67ft)	Y	-0.115	-0.115	0	29.25
34	WP83(17.67ft)	Y	-0.115	-0.115	0	23.167
35	WP81(17.67ft)	Y	-0.053	-0.053	0	15.666
36	WP78(17.67ft)	Y	-0.115	-0.115	0	50.333
37	WP79(17.67ft)	Y	-0.115	-0.115	0	23.167

Wall Panel Distributed Loads (BLC 9 : Dead Partition Roof (LAT))

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP88(14.67ft)	Y	-0.221	-0.221	0	40.333
2	WP87(16.34ft)	Y	-0.221	-0.221	0	16
3	WP26(13.33ft)	Y	-0.416	-0.416	0	27.742
4	WP16(12.33ft)	Y	-1.513	-1.513	0	45.917
5	WP17(12.33ft)	Y	-0.85	-0.85	0	18.75
6	WP18(12.33ft)	Y	-0.193	-0.193	0	9.25
7	WP14(15ft)	Y	-0.037	-0.037	0	1.334
8	WP15(15ft)	Y	-0.074	-0.074	0	1.333
9	WP10(15ft)	Y	-0.481	-0.481	0	9.501
10	WP11(15ft)	Y	-0.154	-0.154	0	30.061
11	WP12(15ft)	Y	-0.495	-0.495	0	14.535
12	WP13(15ft)	Y	-0.55	-0.55	0	14.535
13	WP8(15ft)	Y	-0.426	-0.426	0	29.351
14	WP9(15ft)	Y	-0.426	-0.426	0	27.751
15	WP2(15ft)	Y	-0.125	-0.125	0	7.667
16	WP3(15ft)	Y	-0.756	-0.756	0	30.287
17	WP4(15ft)	Y	-0.125	-0.125	0	14.943
18	WP5(15ft)	Y	-0.125	-0.125	0	14.942
19	WP6(15ft)	Y	-0.069	-0.069	0	10.487
20	WP7(15ft)	Y	-0.416	-0.416	0	14.591
21	WP1(15ft)	Y	-0.077	-0.077	0	16
22	WP127(16.34ft)	Y	-0.104	-0.104	0	6.25
23	WP128(16.34ft)	Y	-0.068	-0.068	0	8.833
24	WP126(16.34ft)	Y	-0.249	-0.249	0	6.25
25	WP125(16.34ft)	Y	-0.072	-0.072	0	8.833
26	WP120(16.34ft)	Y	-0.552	-0.552	0	2.792
27	WP121(16.34ft)	Y	-0.552	-0.552	0	1.874
28	WP122(16.34ft)	Y	-0.588	-0.588	0	2.084
29	WP119(16.34ft)	Y	-0.445	-0.445	0	4.667
30	WP116(16.34ft)	Y	-0.287	-0.287	0	4.666
31	WP118(16.34ft)	Y	-0.287	-0.287	0	4.667

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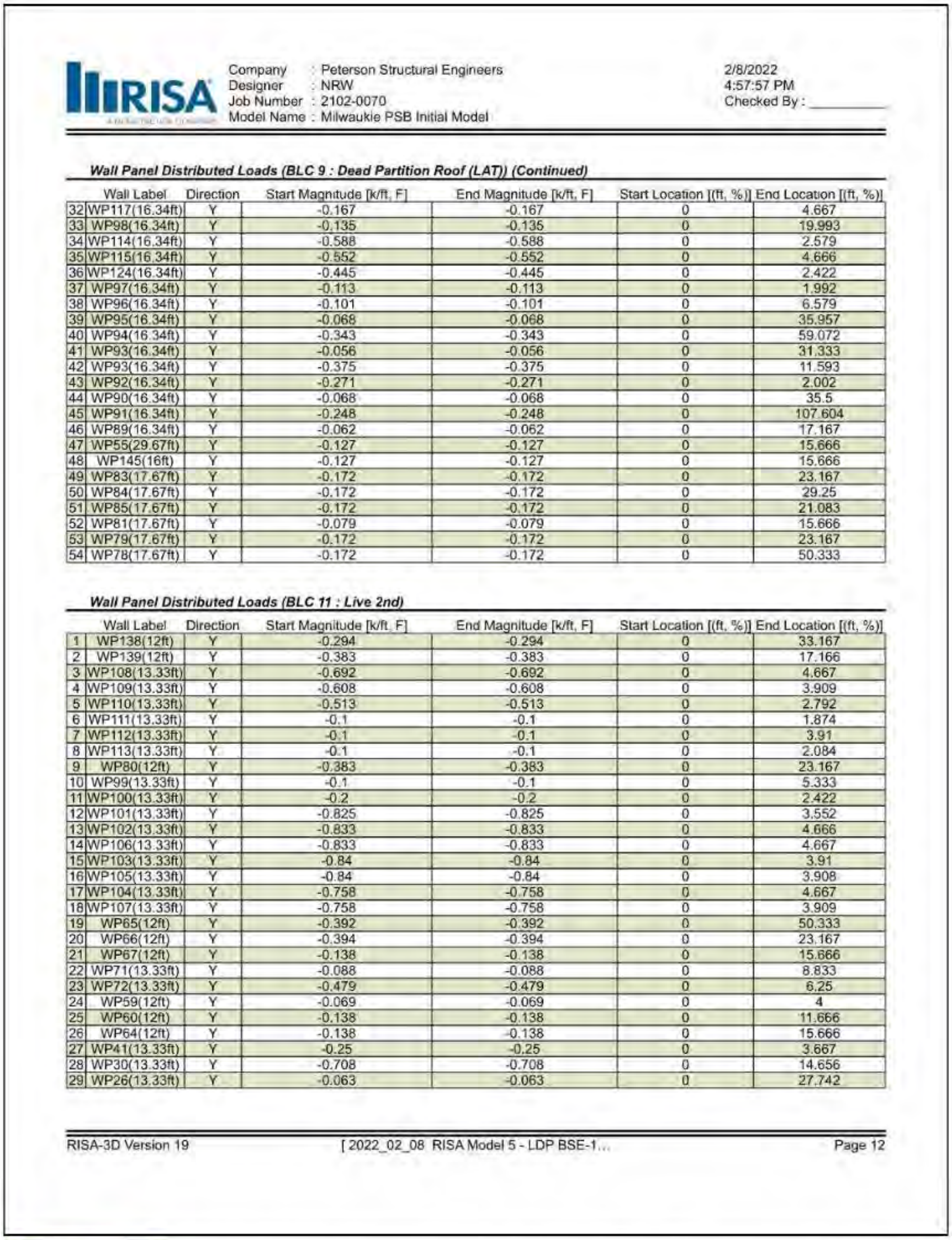
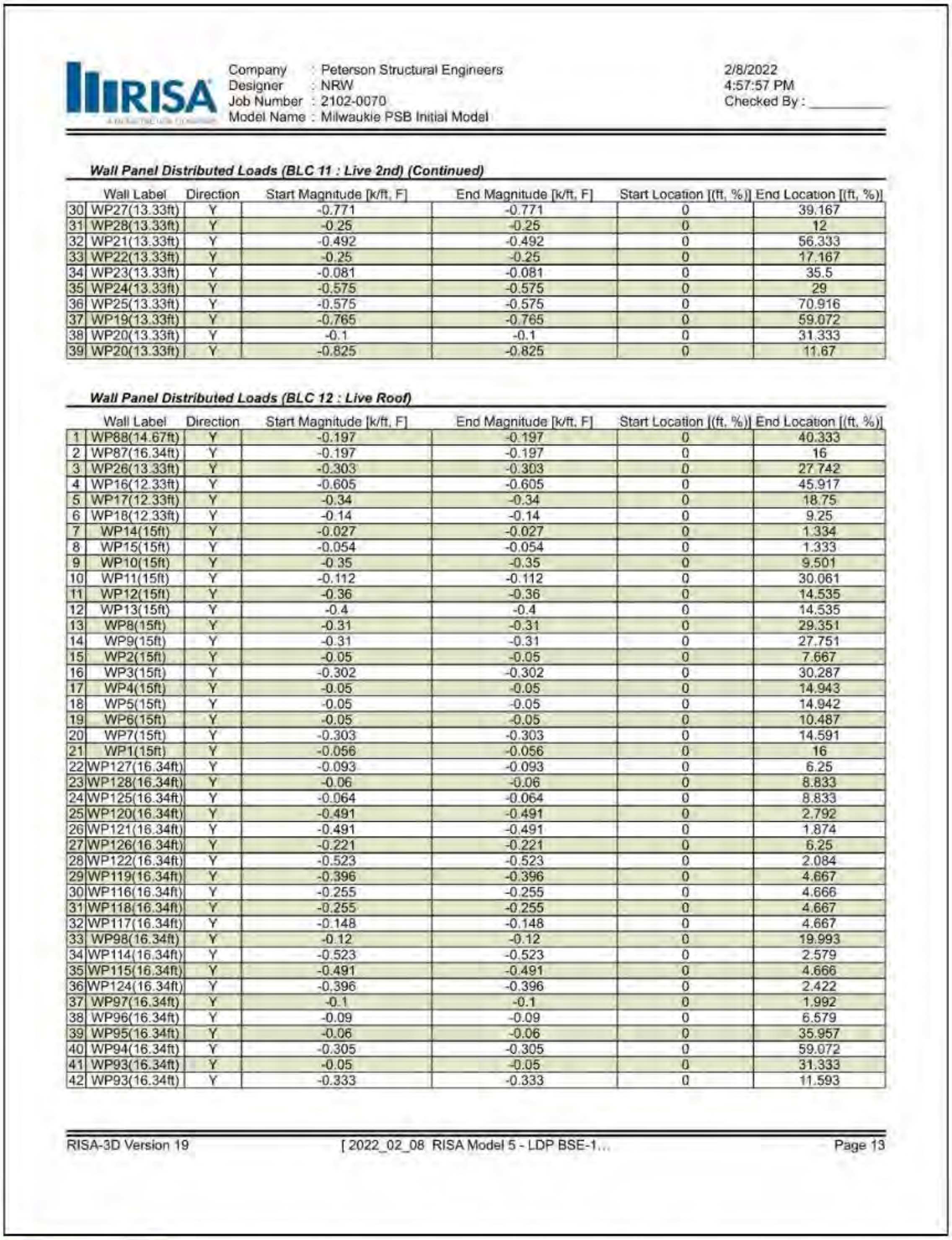


Wall Panel Distributed Loads (BLC 9 : Dead Partition Roof (LAT)) (Continued)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
32	WP117(16.34ft)	Y	-0.167	-0.167	0	4.667
33	WP98(16.34ft)	Y	-0.135	-0.135	0	19.993
34	WP114(16.34ft)	Y	-0.588	-0.588	0	2.579
35	WP115(16.34ft)	Y	-0.552	-0.552	0	4.666
36	WP124(16.34ft)	Y	-0.445	-0.445	0	2.422
37	WP97(16.34ft)	Y	-0.113	-0.113	0	1.992
38	WP96(16.34ft)	Y	-0.101	-0.101	0	6.579
39	WP95(16.34ft)	Y	-0.068	-0.068	0	35.957
40	WP94(16.34ft)	Y	-0.343	-0.343	0	59.072
41	WP93(16.34ft)	Y	-0.056	-0.056	0	31.333
42	WP93(16.34ft)	Y	-0.375	-0.375	0	11.593
43	WP92(16.34ft)	Y	-0.271	-0.271	0	2.002
44	WP90(16.34ft)	Y	-0.068	-0.068	0	35.5
45	WP91(16.34ft)	Y	-0.248	-0.248	0	107.604
46	WP89(16.34ft)	Y	-0.062	-0.062	0	17.167
47	WP55(29.67ft)	Y	-0.127	-0.127	0	15.666
48	WP145(16ft)	Y	-0.127	-0.127	0	15.666
49	WP83(17.67ft)	Y	-0.172	-0.172	0	23.167
50	WP84(17.67ft)	Y	-0.172	-0.172	0	29.25
51	WP85(17.67ft)	Y	-0.172	-0.172	0	21.083
52	WP81(17.67ft)	Y	-0.079	-0.079	0	15.666
53	WP79(17.67ft)	Y	-0.172	-0.172	0	23.167
54	WP78(17.67ft)	Y	-0.172	-0.172	0	50.333

Wall Panel Distributed Loads (BLC 11 : Live 2nd)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP138(12ft)	Y	-0.294	-0.294	0	33.167
2	WP139(12ft)	Y	-0.383	-0.383	0	17.166
3	WP108(13.33ft)	Y	-0.692	-0.692	0	4.667
4	WP109(13.33ft)	Y	-0.608	-0.608	0	3.909
5	WP110(13.33ft)	Y	-0.513	-0.513	0	2.792
6	WP111(13.33ft)	Y	-0.1	-0.1	0	1.874
7	WP112(13.33ft)	Y	-0.1	-0.1	0	3.91
8	WP113(13.33ft)	Y	-0.1	-0.1	0	2.084
9	WP80(12ft)	Y	-0.383	-0.383	0	23.167
10	WP99(13.33ft)	Y	-0.1	-0.1	0	5.333
11	WP100(13.33ft)	Y	-0.2	-0.2	0	2.422
12	WP101(13.33ft)	Y	-0.825	-0.825	0	3.552
13	WP102(13.33ft)	Y	-0.833	-0.833	0	4.666
14	WP106(13.33ft)	Y	-0.833	-0.833	0	4.667
15	WP103(13.33ft)	Y	-0.84	-0.84	0	3.91
16	WP105(13.33ft)	Y	-0.84	-0.84	0	3.908
17	WP104(13.33ft)	Y	-0.758	-0.758	0	4.667
18	WP107(13.33ft)	Y	-0.758	-0.758	0	3.909
19	WP65(12ft)	Y	-0.392	-0.392	0	50.333
20	WP66(12ft)	Y	-0.394	-0.394	0	23.167
21	WP67(12ft)	Y	-0.138	-0.138	0	15.666
22	WP71(13.33ft)	Y	-0.088	-0.088	0	8.833
23	WP72(13.33ft)	Y	-0.479	-0.479	0	6.25
24	WP59(12ft)	Y	-0.069	-0.069	0	4
25	WP60(12ft)	Y	-0.138	-0.138	0	11.666
26	WP64(12ft)	Y	-0.138	-0.138	0	15.666
27	WP41(13.33ft)	Y	-0.25	-0.25	0	3.667
28	WP30(13.33ft)	Y	-0.708	-0.708	0	14.656
29	WP26(13.33ft)	Y	-0.063	-0.063	0	27.742



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Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Wall Panel Distributed Loads (BLC 11 : Live 2nd) (Continued)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
30	WP27(13.33ft)	Y	-0.771	-0.771	0	39.167
31	WP28(13.33ft)	Y	-0.25	-0.25	0	12
32	WP21(13.33ft)	Y	-0.492	-0.492	0	56.333
33	WP22(13.33ft)	Y	-0.25	-0.25	0	17.167
34	WP23(13.33ft)	Y	-0.081	-0.081	0	35.5
35	WP24(13.33ft)	Y	-0.575	-0.575	0	29
36	WP25(13.33ft)	Y	-0.575	-0.575	0	70.916
37	WP19(13.33ft)	Y	-0.765	-0.765	0	59.072
38	WP20(13.33ft)	Y	-0.1	-0.1	0	31.333
39	WP20(13.33ft)	Y	-0.825	-0.825	0	11.67

Wall Panel Distributed Loads (BLC 12 : Live Roof)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP88(14.67ft)	Y	-0.197	-0.197	0	40.333
2	WP87(16.34ft)	Y	-0.197	-0.197	0	16
3	WP26(13.33ft)	Y	-0.303	-0.303	0	27.742
4	WP16(12.33ft)	Y	-0.605	-0.605	0	45.917
5	WP17(12.33ft)	Y	-0.34	-0.34	0	18.75
6	WP18(12.33ft)	Y	-0.14	-0.14	0	9.25
7	WP14(15ft)	Y	-0.027	-0.027	0	1.334
8	WP15(15ft)	Y	-0.054	-0.054	0	1.333
9	WP10(15ft)	Y	-0.35	-0.35	0	9.501
10	WP11(15ft)	Y	-0.112	-0.112	0	30.061
11	WP12(15ft)	Y	-0.36	-0.36	0	14.535
12	WP13(15ft)	Y	-0.4	-0.4	0	14.535
13	WP8(15ft)	Y	-0.31	-0.31	0	29.351
14	WP9(15ft)	Y	-0.31	-0.31	0	27.751
15	WP2(15ft)	Y	-0.05	-0.05	0	7.667
16	WP3(15ft)	Y	-0.302	-0.302	0	30.287
17	WP4(15ft)	Y	-0.05	-0.05	0	14.943
18	WP5(15ft)	Y	-0.05	-0.05	0	14.942
19	WP6(15ft)	Y	-0.05	-0.05	0	10.487
20	WP7(15ft)	Y	-0.303	-0.303	0	14.591
21	WP1(15ft)	Y	-0.056	-0.056	0	16
22	WP127(16.34ft)	Y	-0.093	-0.093	0	6.25
23	WP128(16.34ft)	Y	-0.06	-0.06	0	8.833
24	WP125(16.34ft)	Y	-0.064	-0.064	0	8.833
25	WP120(16.34ft)	Y	-0.491	-0.491	0	2.792
26	WP121(16.34ft)	Y	-0.491	-0.491	0	1.874
27	WP126(16.34ft)	Y	-0.221	-0.221	0	6.25
28	WP122(16.34ft)	Y	-0.523	-0.523	0	2.084
29	WP119(16.34ft)	Y	-0.396	-0.396	0	4.667
30	WP116(16.34ft)	Y	-0.255	-0.255	0	4.666
31	WP118(16.34ft)	Y	-0.255	-0.255	0	4.667
32	WP117(16.34ft)	Y	-0.148	-0.148	0	4.667
33	WP98(16.34ft)	Y	-0.12	-0.12	0	19.993
34	WP114(16.34ft)	Y	-0.523	-0.523	0	2.579
35	WP115(16.34ft)	Y	-0.491	-0.491	0	4.666
36	WP124(16.34ft)	Y	-0.396	-0.396	0	2.422
37	WP97(16.34ft)	Y	-0.1	-0.1	0	1.992
38	WP96(16.34ft)	Y	-0.09	-0.09	0	6.579
39	WP95(16.34ft)	Y	-0.06	-0.06	0	35.957
40	WP94(16.34ft)	Y	-0.305	-0.305	0	59.072
41	WP93(16.34ft)	Y	-0.05	-0.05	0	31.333
42	WP93(16.34ft)	Y	-0.333	-0.333	0	11.593

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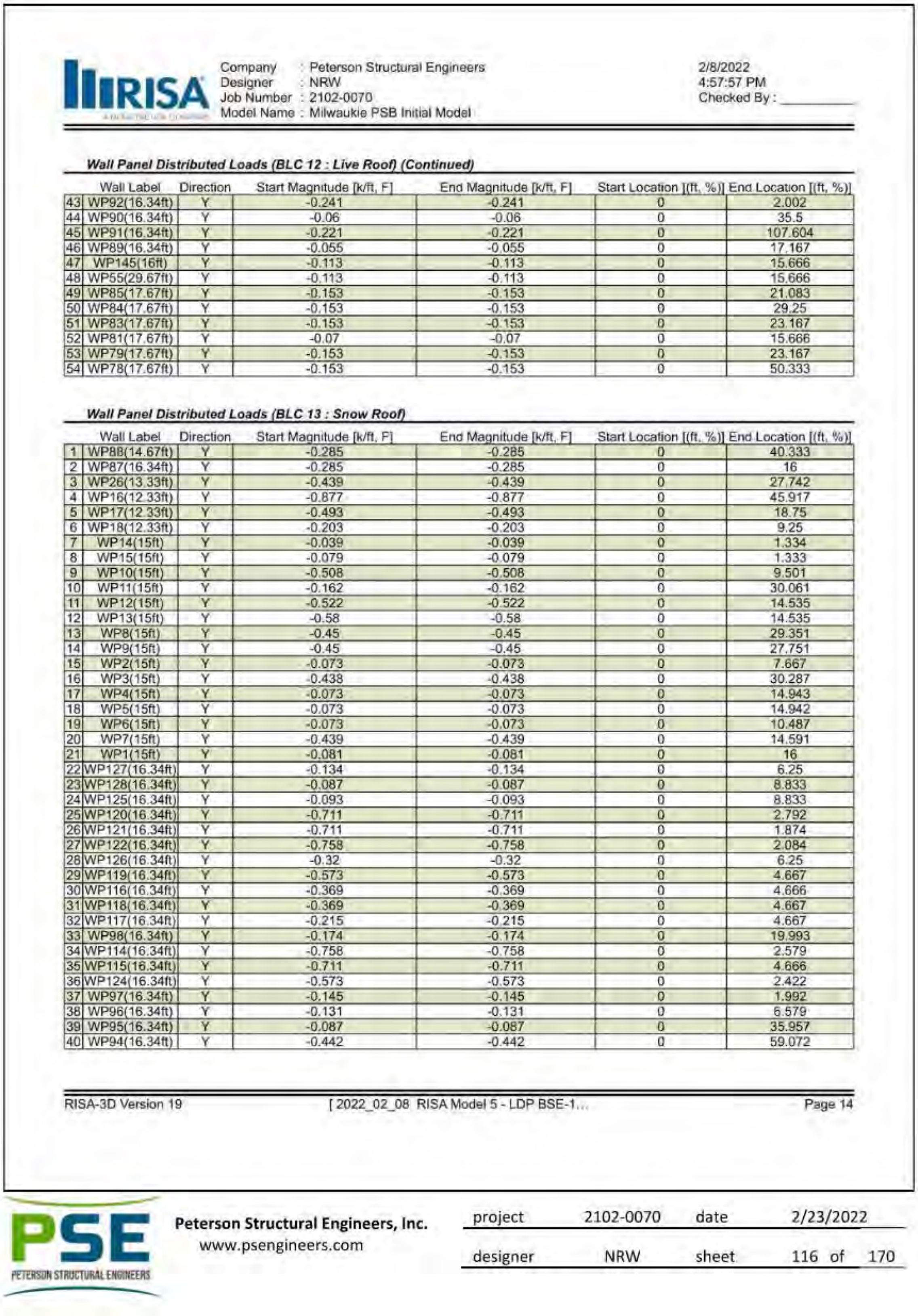

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

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Wall Panel Distributed Loads (BLC 12 : Live Roof) (Continued)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
43	WP92(16.34ft)	Y	-0.241	-0.241	0	2.002
44	WP90(16.34ft)	Y	-0.06	-0.06	0	35.5
45	WP91(16.34ft)	Y	-0.221	-0.221	0	107.604
46	WP89(16.34ft)	Y	-0.055	-0.055	0	17.167
47	WP145(16ft)	Y	-0.113	-0.113	0	15.666
48	WP55(29.67ft)	Y	-0.113	-0.113	0	15.666
49	WP85(17.67ft)	Y	-0.153	-0.153	0	21.083
50	WP84(17.67ft)	Y	-0.153	-0.153	0	29.25
51	WP83(17.67ft)	Y	-0.153	-0.153	0	23.167
52	WP81(17.67ft)	Y	-0.07	-0.07	0	15.666
53	WP79(17.67ft)	Y	-0.153	-0.153	0	23.167
54	WP78(17.67ft)	Y	-0.153	-0.153	0	50.333

Wall Panel Distributed Loads (BLC 13 : Snow Roof)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
1	WP88(14.67ft)	Y	-0.285	-0.285	0	40.333
2	WP87(16.34ft)	Y	-0.285	-0.285	0	16
3	WP26(13.33ft)	Y	-0.439	-0.439	0	27.742
4	WP16(12.33ft)	Y	-0.877	-0.877	0	45.917
5	WP17(12.33ft)	Y	-0.493	-0.493	0	18.75
6	WP18(12.33ft)	Y	-0.203	-0.203	0	9.25
7	WP14(15ft)	Y	-0.039	-0.039	0	1.334
8	WP15(15ft)	Y	-0.079	-0.079	0	1.333
9	WP10(15ft)	Y	-0.508	-0.508	0	9.501
10	WP11(15ft)	Y	-0.162	-0.162	0	30.061
11	WP12(15ft)	Y	-0.522	-0.522	0	14.535
12	WP13(15ft)	Y	-0.58	-0.58	0	14.535
13	WP8(15ft)	Y	-0.45	-0.45	0	29.351
14	WP9(15ft)	Y	-0.45	-0.45	0	27.751
15	WP2(15ft)	Y	-0.073	-0.073	0	7.667
16	WP3(15ft)	Y	-0.438	-0.438	0	30.287
17	WP4(15ft)	Y	-0.073	-0.073	0	14.943
18	WP5(15ft)	Y	-0.073	-0.073	0	14.942
19	WP6(15ft)	Y	-0.073	-0.073	0	10.487
20	WP7(15ft)	Y	-0.439	-0.439	0	14.591
21	WP1(15ft)	Y	-0.081	-0.081	0	16
22	WP127(16.34ft)	Y	-0.134	-0.134	0	6.25
23	WP128(16.34ft)	Y	-0.087	-0.087	0	8.833
24	WP125(16.34ft)	Y	-0.093	-0.093	0	8.833
25	WP120(16.34ft)	Y	-0.711	-0.711	0	2.792
26	WP121(16.34ft)	Y	-0.711	-0.711	0	1.874
27	WP122(16.34ft)	Y	-0.758	-0.758	0	2.084
28	WP126(16.34ft)	Y	-0.32	-0.32	0	6.25
29	WP119(16.34ft)	Y	-0.573	-0.573	0	4.667
30	WP116(16.34ft)	Y	-0.369	-0.369	0	4.666
31	WP118(16.34ft)	Y	-0.369	-0.369	0	4.667
32	WP117(16.34ft)	Y	-0.215	-0.215	0	4.667
33	WP98(16.34ft)	Y	-0.174	-0.174	0	19.993
34	WP114(16.34ft)	Y	-0.758	-0.758	0	2.579
35	WP115(16.34ft)	Y	-0.711	-0.711	0	4.666
36	WP124(16.34ft)	Y	-0.573	-0.573	0	2.422
37	WP97(16.34ft)	Y	-0.145	-0.145	0	1.992
38	WP96(16.34ft)	Y	-0.131	-0.131	0	6.579
39	WP95(16.34ft)	Y	-0.087	-0.087	0	35.957
40	WP94(16.34ft)	Y	-0.442	-0.442	0	59.072

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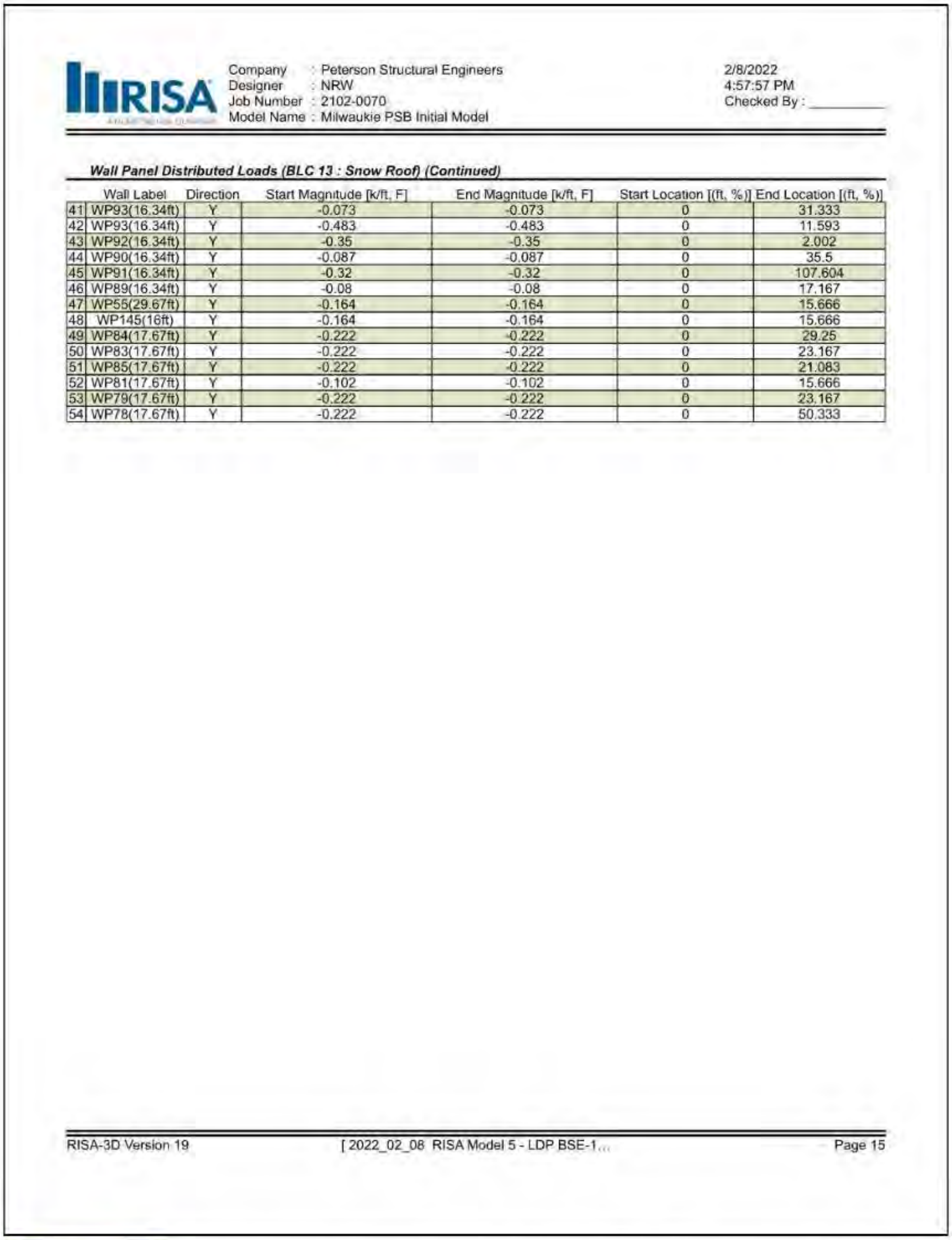

Company : Peterson Structural Engineers
Designer : NRW
Job Number : 2102-0070
Model Name : Milwaukie PSB Initial Model

2/8/2022
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Wall Panel Distributed Loads (BLC 13 : Snow Roof) (Continued)

	Wall Label	Direction	Start Magnitude [k/ft, F]	End Magnitude [k/ft, F]	Start Location [(ft, %)]	End Location [(ft, %)]
41	WP93(16.34ft)	Y	-0.073	-0.073	0	31.333
42	WP93(16.34ft)	Y	-0.483	-0.483	0	11.593
43	WP92(16.34ft)	Y	-0.35	-0.35	0	2.002
44	WP90(16.34ft)	Y	-0.087	-0.087	0	35.5
45	WP91(16.34ft)	Y	-0.32	-0.32	0	107.604
46	WP89(16.34ft)	Y	-0.08	-0.08	0	17.167
47	WP55(29.67ft)	Y	-0.164	-0.164	0	15.666
48	WP145(16ft)	Y	-0.164	-0.164	0	15.666
49	WP84(17.67ft)	Y	-0.222	-0.222	0	29.25
50	WP83(17.67ft)	Y	-0.222	-0.222	0	23.167
51	WP85(17.67ft)	Y	-0.222	-0.222	0	21.083
52	WP81(17.67ft)	Y	-0.102	-0.102	0	15.666
53	WP79(17.67ft)	Y	-0.222	-0.222	0	23.167
54	WP78(17.67ft)	Y	-0.222	-0.222	0	50.333

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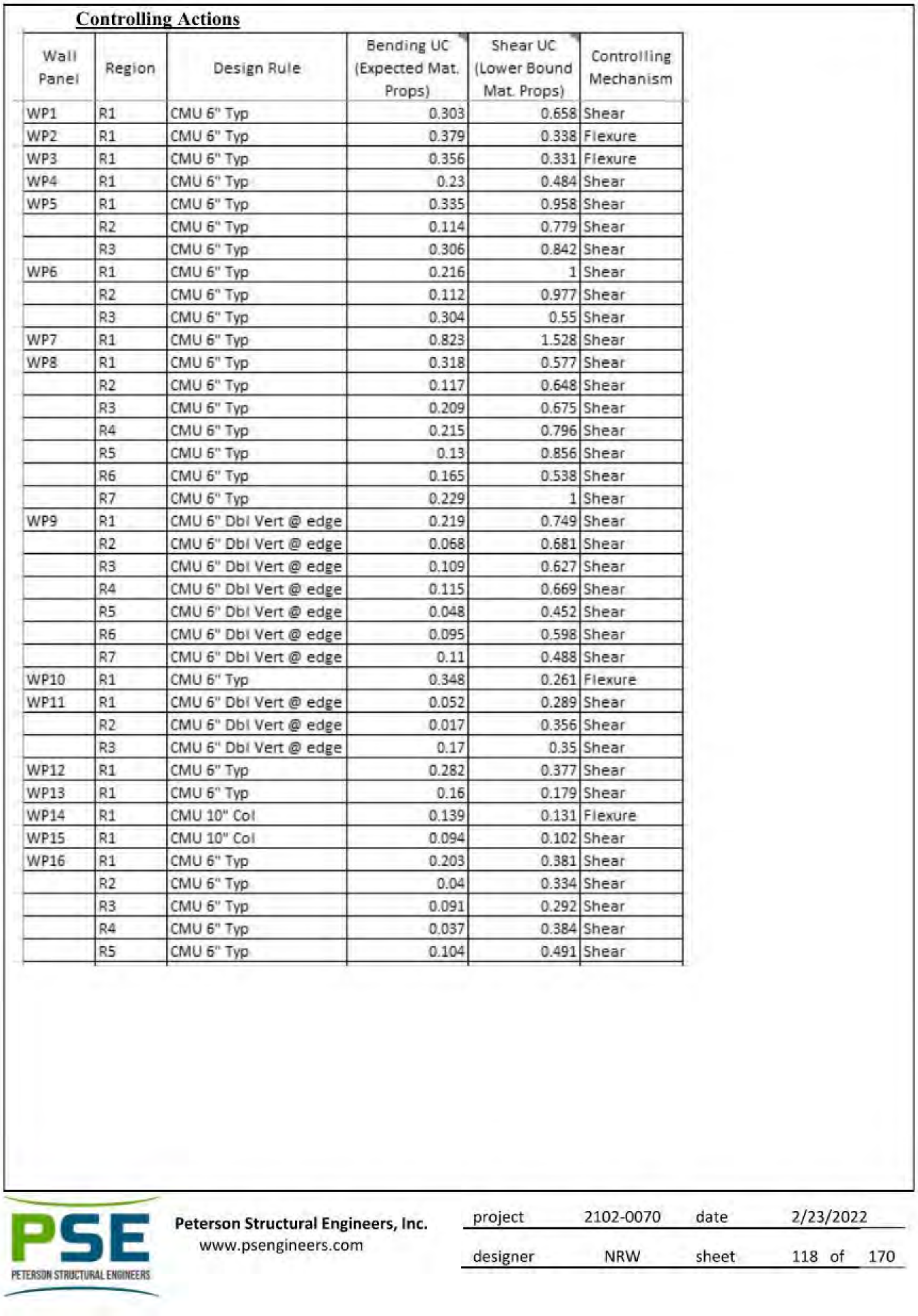

Controlling Actions

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP1	R1	CMU 6" Typ	0.303	0.658	Shear
WP2	R1	CMU 6" Typ	0.379	0.338	Flexure
WP3	R1	CMU 6" Typ	0.356	0.331	Flexure
WP4	R1	CMU 6" Typ	0.23	0.484	Shear
WP5	R1	CMU 6" Typ	0.335	0.958	Shear
	R2	CMU 6" Typ	0.114	0.779	Shear
	R3	CMU 6" Typ	0.306	0.842	Shear
WP6	R1	CMU 6" Typ	0.216	1	Shear
	R2	CMU 6" Typ	0.112	0.977	Shear
	R3	CMU 6" Typ	0.304	0.55	Shear
WP7	R1	CMU 6" Typ	0.823	1.528	Shear
WP8	R1	CMU 6" Typ	0.318	0.577	Shear
	R2	CMU 6" Typ	0.117	0.648	Shear
	R3	CMU 6" Typ	0.209	0.675	Shear
	R4	CMU 6" Typ	0.215	0.796	Shear
	R5	CMU 6" Typ	0.13	0.856	Shear
	R6	CMU 6" Typ	0.165	0.538	Shear
	R7	CMU 6" Typ	0.229	1	Shear
WP9	R1	CMU 6" Dbl Vert @ edge	0.219	0.749	Shear
	R2	CMU 6" Dbl Vert @ edge	0.068	0.681	Shear
	R3	CMU 6" Dbl Vert @ edge	0.109	0.627	Shear
	R4	CMU 6" Dbl Vert @ edge	0.115	0.669	Shear
	R5	CMU 6" Dbl Vert @ edge	0.048	0.452	Shear
	R6	CMU 6" Dbl Vert @ edge	0.095	0.598	Shear
	R7	CMU 6" Dbl Vert @ edge	0.11	0.488	Shear
WP10	R1	CMU 6" Typ	0.348	0.261	Flexure
WP11	R1	CMU 6" Dbl Vert @ edge	0.052	0.289	Shear
	R2	CMU 6" Dbl Vert @ edge	0.017	0.356	Shear
	R3	CMU 6" Dbl Vert @ edge	0.17	0.35	Shear
WP12	R1	CMU 6" Typ	0.282	0.377	Shear
WP13	R1	CMU 6" Typ	0.16	0.179	Shear
WP14	R1	CMU 10" Col	0.139	0.131	Flexure
WP15	R1	CMU 10" Col	0.094	0.102	Shear
WP16	R1	CMU 6" Typ	0.203	0.381	Shear
	R2	CMU 6" Typ	0.04	0.334	Shear
	R3	CMU 6" Typ	0.091	0.292	Shear
	R4	CMU 6" Typ	0.037	0.384	Shear
	R5	CMU 6" Typ	0.104	0.491	Shear

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Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP17	R1	CMU 6" Typ	0.612	0.648	Shear
WP18	R1	CMU 6" Typ	0.227	0.557	Shear
WP19	R1	CMU 8" Dbl Vert @ edge	0.289	0.872	Shear
	R2	CMU 8" Dbl Vert @ edge	0.168	1.028	Shear
	R3	CMU 8" Dbl Vert @ edge	0.24	1	Shear
	R4	CMU 8" Dbl Vert @ edge	0.307	1.145	Shear
	R5	CMU 8" Dbl Vert @ edge	0.277	1.08	Shear
	R6	CMU 8" Dbl Vert @ edge	0.318	1	Shear
	R7	CMU 8" Dbl Vert @ edge	0.364	1.371	Shear
	R8	CMU 8" Dbl Vert @ edge	0.324	1.137	Shear
	R9	CMU 8" Dbl Vert @ edge	0.351	1	Shear
	R10	CMU 8" Dbl Vert @ edge	0.97	1.361	Shear
	R11	CMU 8" Dbl Vert @ edge	0.221	1.069	Shear
	R12	CMU 8" Dbl Vert @ edge	0.302	1.969	Shear
WP20	R1	CMU 8" Typ	0.326	0.62	Shear
WP21	R1	CMU 8" Dbl Vert @ edge	0.253	1	Shear
	R2	CMU 8" Dbl Vert @ edge	0.12	0.884	Shear
	R3	CMU 8" Dbl Vert @ edge	0.307	0.694	Shear
	R4	CMU 8" Dbl Vert @ edge	0.134	0.918	Shear
	R5	CMU 8" Dbl Vert @ edge	0.485	1.002	Shear
	R6	CMU 8" Dbl Vert @ edge	0.163	0.825	Shear
	R7	CMU 8" Dbl Vert @ edge	0.49	1	Shear
	R8	CMU 8" Dbl Vert @ edge	0.171	1	Shear
	R9	CMU 8" Dbl Vert @ edge	0.679	1	Shear
	R10	CMU 8" Dbl Vert @ edge	0.125	1.07	Shear
	R11	CMU 8" Dbl Vert @ edge	0.137	1	Shear
WP22	R1	CMU 8" Typ	2.913	1	Flexure
	R2	CMU 8" Typ	0.198	1	Shear
	R3	CMU 8" Typ	0.232	1	Shear
WP23	R1	CMU 8" Dbl Vert @ edge	0.231	0.848	Shear
	R2	CMU 8" Dbl Vert @ edge	0.137	1	Shear
	R3	CMU 8" Dbl Vert @ edge	0.192	1	Shear
	R4	CMU 8" Dbl Vert @ edge	0.222	1.3	Shear
	R5	CMU 8" Dbl Vert @ edge	0.303	1.301	Shear
	R6	CMU 8" Dbl Vert @ edge	0.277	1.061	Shear
	R7	CMU 8" Dbl Vert @ edge	0.609	1	Shear
	R8	CMU 8" Dbl Vert @ edge	0.08	0.523	Shear
	R9	CMU 8" Dbl Vert @ edge	0.147	0.925	Shear

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
	R10	CMU 8" Dbl Vert @ edge	0.189	1	Shear
WP24	R1	CMU 8" Typ	0.668	1.086	Shear
WP25	R1	CMU 6" FG	0.434	0.457	Shear
	R2	CMU 6" FG	0.463	0.495	Shear
	R3	CMU 6" FG	0.476	0.393	Flexure
	R4	CMU 6" FG	0.479	0.892	Shear
	R5	CMU 6" FG	0.512	0.614	Shear
	R6	CMU 6" FG	0.604	0.507	Flexure
	R7	CMU 6" FG	0.447	0.954	Shear
	R8	CMU 6" FG	0.517	0.563	Shear
	R9	CMU 6" FG	0.615	0.536	Flexure
	R10	CMU 6" FG	0.468	1	Shear
	R11	CMU 6" FG	0.553	0.585	Shear
	R12	CMU 6" FG	0.677	0.571	Flexure
	R13	CMU 6" FG	0.562	1	Shear
	R14	CMU 6" FG	0.601	0.663	Shear
	R15	CMU 6" FG	0.744	0.611	Flexure
	R16	CMU 6" FG	0.684	1	Shear
	R17	CMU 6" FG	0.654	0.781	Shear
	R18	CMU 6" FG	0.652	0.764	Shear
	R19	CMU 6" FG	0.229	1	Shear
WP26	R1	CMU 6" FG	1.374	1	Flexure
	R2	CMU 6" FG	0.281	0.828	Shear
	R3	CMU 6" FG	0.33	1	Shear
	R4	CMU 6" FG	0.374	1	Shear
	R5	CMU 6" FG	2.934	1	Flexure
	R6	CMU 6" FG	0.441	0.974	Shear
	R7	CMU 6" FG	0.591	1.175	Shear
WP27	R1	CMU 6" Typ	0.412	0.939	Shear
WP28	R1	CMU 6" Typ	0.238	0.784	Shear
WP29	R1	CMU 6" Typ	0.141	1	Shear
WP30	R1	CMU 6" Typ	0.477	1	Shear
WP41	R1	CMU 6" Typ	0.604	1	Shear
WP50	R1	CMU 12" Typ	1.084	1	Flexure
WP51	R1	CMU 8" Typ	0.558	0.774	Shear
	R2	CMU 8" Typ	0.193	0.324	Shear
	R3	CMU 8" Typ	0.195	0.23	Shear
	R4	CMU 8" Typ	0.144	0.223	Shear

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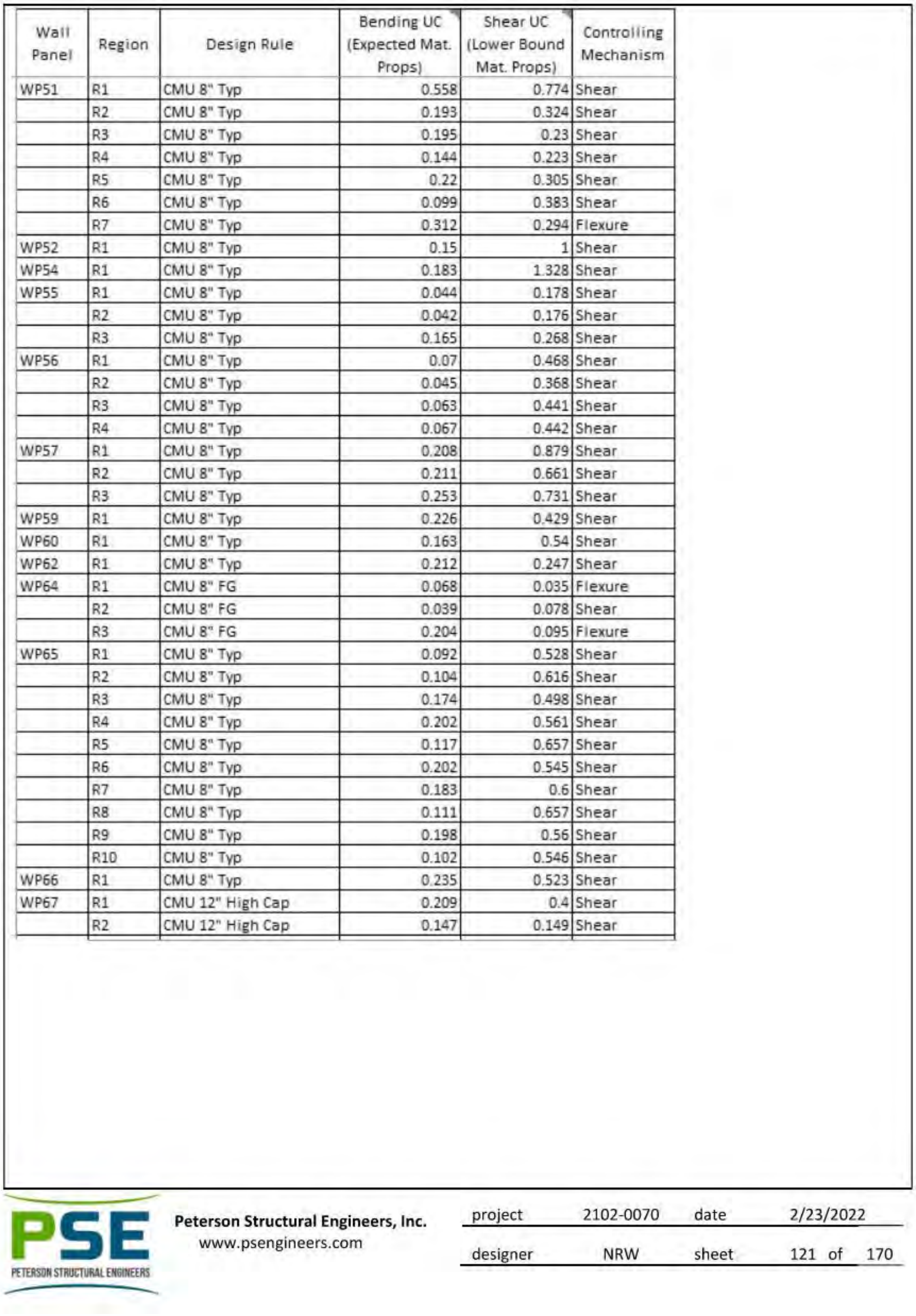

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP51	R1	CMU 8" Typ	0.558	0.774	Shear
	R2	CMU 8" Typ	0.193	0.324	Shear
	R3	CMU 8" Typ	0.195	0.23	Shear
	R4	CMU 8" Typ	0.144	0.223	Shear
	R5	CMU 8" Typ	0.22	0.305	Shear
	R6	CMU 8" Typ	0.099	0.383	Shear
	R7	CMU 8" Typ	0.312	0.294	Flexure
WP52	R1	CMU 8" Typ	0.15	1	Shear
WP54	R1	CMU 8" Typ	0.183	1.328	Shear
WP55	R1	CMU 8" Typ	0.044	0.178	Shear
	R2	CMU 8" Typ	0.042	0.176	Shear
	R3	CMU 8" Typ	0.165	0.268	Shear
WP56	R1	CMU 8" Typ	0.07	0.468	Shear
	R2	CMU 8" Typ	0.045	0.368	Shear
	R3	CMU 8" Typ	0.063	0.441	Shear
	R4	CMU 8" Typ	0.067	0.442	Shear
WP57	R1	CMU 8" Typ	0.208	0.879	Shear
	R2	CMU 8" Typ	0.211	0.661	Shear
	R3	CMU 8" Typ	0.253	0.731	Shear
WP59	R1	CMU 8" Typ	0.226	0.429	Shear
WP60	R1	CMU 8" Typ	0.163	0.54	Shear
WP62	R1	CMU 8" Typ	0.212	0.247	Shear
WP64	R1	CMU 8" FG	0.068	0.035	Flexure
	R2	CMU 8" FG	0.039	0.078	Shear
	R3	CMU 8" FG	0.204	0.095	Flexure
WP65	R1	CMU 8" Typ	0.092	0.528	Shear
	R2	CMU 8" Typ	0.104	0.616	Shear
	R3	CMU 8" Typ	0.174	0.498	Shear
	R4	CMU 8" Typ	0.202	0.561	Shear
	R5	CMU 8" Typ	0.117	0.657	Shear
	R6	CMU 8" Typ	0.202	0.545	Shear
	R7	CMU 8" Typ	0.183	0.6	Shear
	R8	CMU 8" Typ	0.111	0.657	Shear
	R9	CMU 8" Typ	0.198	0.56	Shear
	R10	CMU 8" Typ	0.102	0.546	Shear
WP66	R1	CMU 8" Typ	0.235	0.523	Shear
WP67	R1	CMU 12" High Cap	0.209	0.4	Shear
	R2	CMU 12" High Cap	0.147	0.149	Shear

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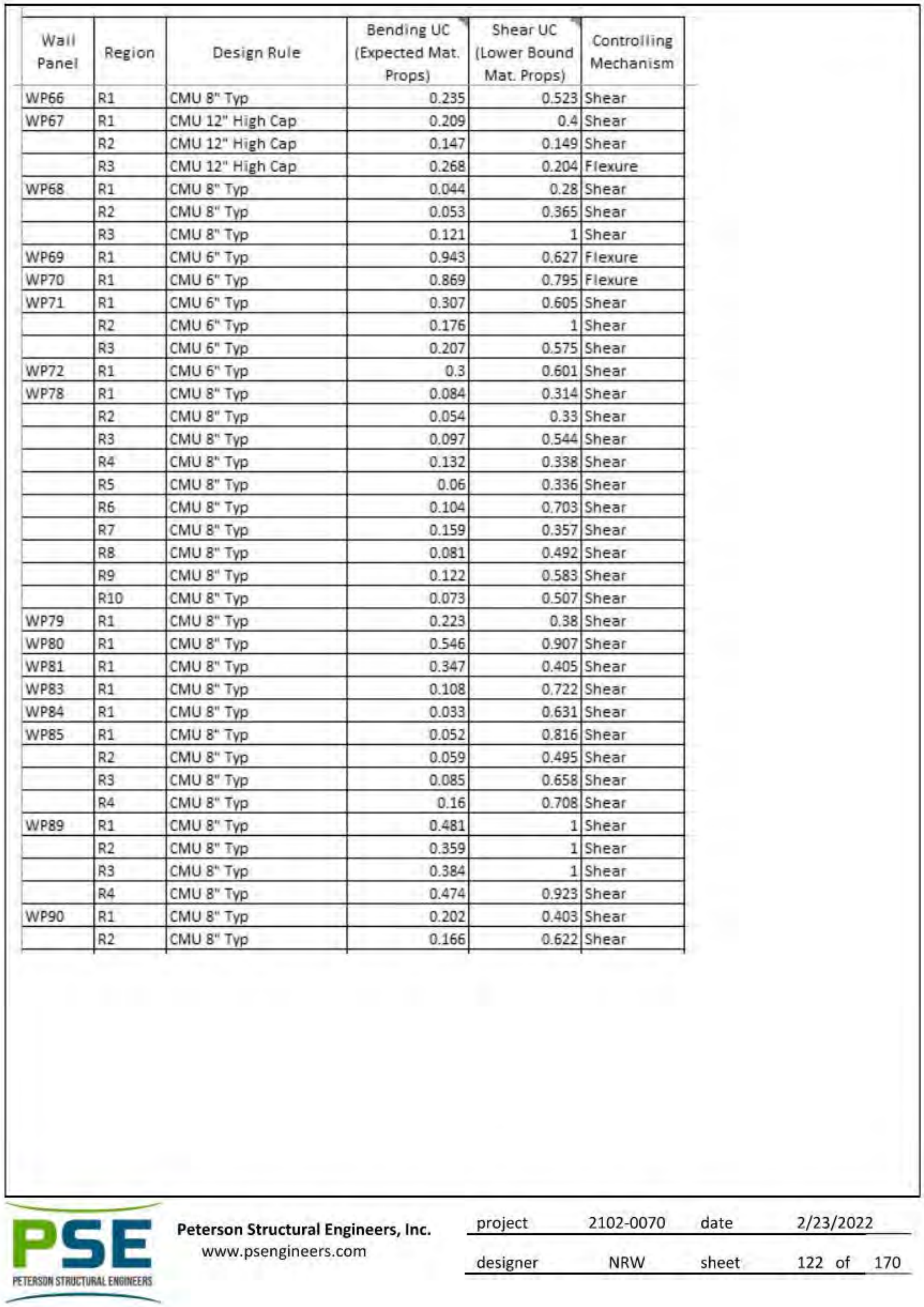

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP66	R1	CMU 8" Typ	0.235	0.523	Shear
WP67	R1	CMU 12" High Cap	0.209	0.4	Shear
	R2	CMU 12" High Cap	0.147	0.149	Shear
	R3	CMU 12" High Cap	0.268	0.204	Flexure
WP68	R1	CMU 8" Typ	0.044	0.28	Shear
	R2	CMU 8" Typ	0.053	0.365	Shear
	R3	CMU 8" Typ	0.121	1	Shear
WP69	R1	CMU 6" Typ	0.943	0.627	Flexure
WP70	R1	CMU 6" Typ	0.869	0.795	Flexure
WP71	R1	CMU 6" Typ	0.307	0.605	Shear
	R2	CMU 6" Typ	0.176	1	Shear
	R3	CMU 6" Typ	0.207	0.575	Shear
WP72	R1	CMU 6" Typ	0.3	0.601	Shear
WP78	R1	CMU 8" Typ	0.084	0.314	Shear
	R2	CMU 8" Typ	0.054	0.33	Shear
	R3	CMU 8" Typ	0.097	0.544	Shear
	R4	CMU 8" Typ	0.132	0.338	Shear
	R5	CMU 8" Typ	0.06	0.336	Shear
	R6	CMU 8" Typ	0.104	0.703	Shear
	R7	CMU 8" Typ	0.159	0.357	Shear
	R8	CMU 8" Typ	0.081	0.492	Shear
	R9	CMU 8" Typ	0.122	0.583	Shear
	R10	CMU 8" Typ	0.073	0.507	Shear
WP79	R1	CMU 8" Typ	0.223	0.38	Shear
WP80	R1	CMU 8" Typ	0.546	0.907	Shear
WP81	R1	CMU 8" Typ	0.347	0.405	Shear
WP83	R1	CMU 8" Typ	0.108	0.722	Shear
WP84	R1	CMU 8" Typ	0.033	0.631	Shear
WP85	R1	CMU 8" Typ	0.052	0.816	Shear
	R2	CMU 8" Typ	0.059	0.495	Shear
	R3	CMU 8" Typ	0.085	0.658	Shear
	R4	CMU 8" Typ	0.16	0.708	Shear
WP89	R1	CMU 8" Typ	0.481	1	Shear
	R2	CMU 8" Typ	0.359	1	Shear
	R3	CMU 8" Typ	0.384	1	Shear
	R4	CMU 8" Typ	0.474	0.923	Shear
WP90	R1	CMU 8" Typ	0.202	0.403	Shear
	R2	CMU 8" Typ	0.166	0.622	Shear

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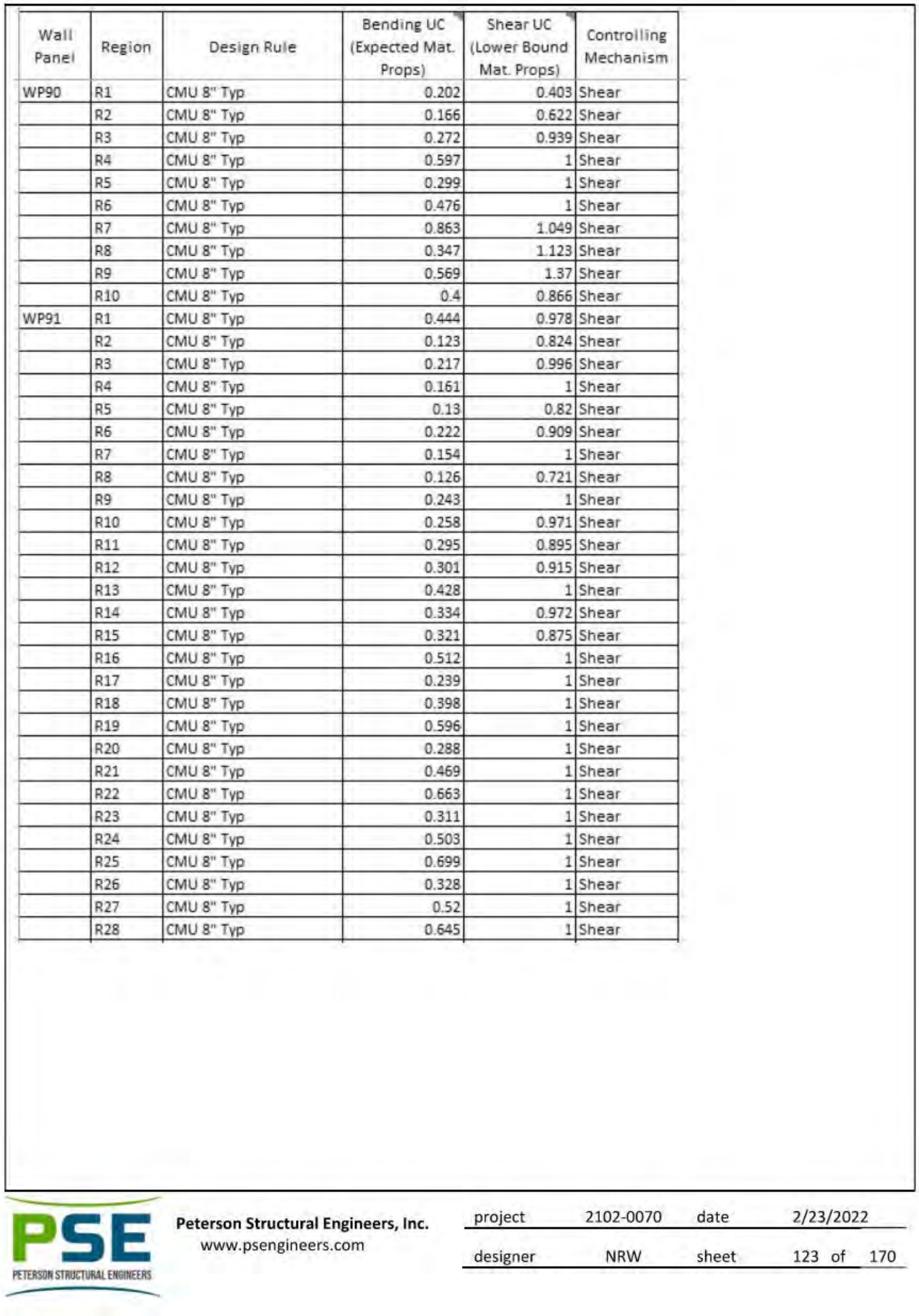

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP90	R1	CMU 8" Typ	0.202	0.403	Shear
	R2	CMU 8" Typ	0.166	0.622	Shear
	R3	CMU 8" Typ	0.272	0.939	Shear
	R4	CMU 8" Typ	0.597	1	Shear
	R5	CMU 8" Typ	0.299	1	Shear
	R6	CMU 8" Typ	0.476	1	Shear
	R7	CMU 8" Typ	0.863	1.049	Shear
	R8	CMU 8" Typ	0.347	1.123	Shear
	R9	CMU 8" Typ	0.569	1.37	Shear
	R10	CMU 8" Typ	0.4	0.866	Shear
WP91	R1	CMU 8" Typ	0.444	0.978	Shear
	R2	CMU 8" Typ	0.123	0.824	Shear
	R3	CMU 8" Typ	0.217	0.996	Shear
	R4	CMU 8" Typ	0.161	1	Shear
	R5	CMU 8" Typ	0.13	0.82	Shear
	R6	CMU 8" Typ	0.222	0.909	Shear
	R7	CMU 8" Typ	0.154	1	Shear
	R8	CMU 8" Typ	0.126	0.721	Shear
	R9	CMU 8" Typ	0.243	1	Shear
	R10	CMU 8" Typ	0.258	0.971	Shear
	R11	CMU 8" Typ	0.295	0.895	Shear
	R12	CMU 8" Typ	0.301	0.915	Shear
	R13	CMU 8" Typ	0.428	1	Shear
	R14	CMU 8" Typ	0.334	0.972	Shear
	R15	CMU 8" Typ	0.321	0.875	Shear
	R16	CMU 8" Typ	0.512	1	Shear
	R17	CMU 8" Typ	0.239	1	Shear
	R18	CMU 8" Typ	0.398	1	Shear
	R19	CMU 8" Typ	0.596	1	Shear
	R20	CMU 8" Typ	0.288	1	Shear
	R21	CMU 8" Typ	0.469	1	Shear
	R22	CMU 8" Typ	0.663	1	Shear
	R23	CMU 8" Typ	0.311	1	Shear
	R24	CMU 8" Typ	0.503	1	Shear
	R25	CMU 8" Typ	0.699	1	Shear
	R26	CMU 8" Typ	0.328	1	Shear
	R27	CMU 8" Typ	0.52	1	Shear
	R28	CMU 8" Typ	0.645	1	Shear

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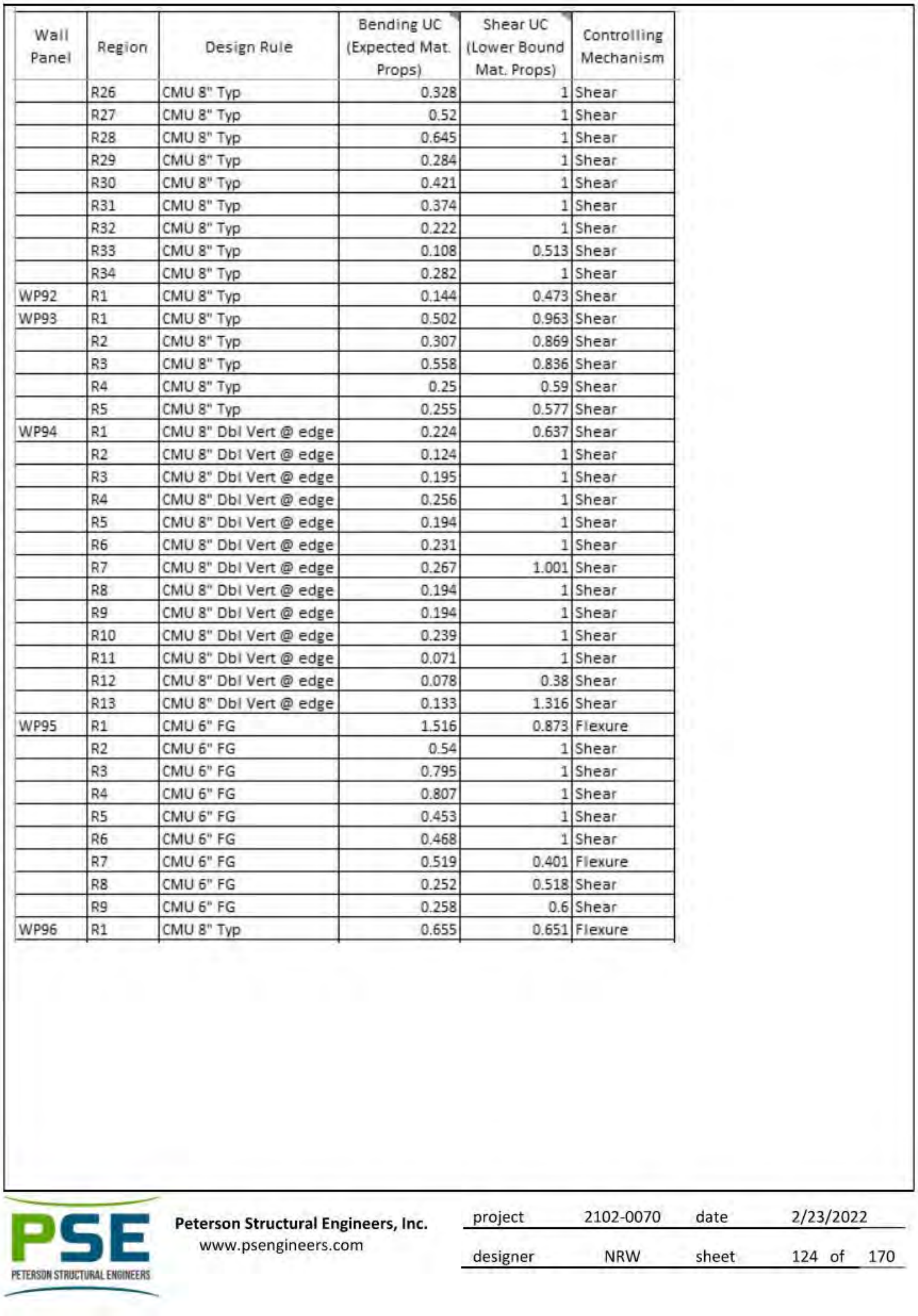

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
	R26	CMU 8" Typ	0.328	1	Shear
	R27	CMU 8" Typ	0.52	1	Shear
	R28	CMU 8" Typ	0.645	1	Shear
	R29	CMU 8" Typ	0.284	1	Shear
	R30	CMU 8" Typ	0.421	1	Shear
	R31	CMU 8" Typ	0.374	1	Shear
	R32	CMU 8" Typ	0.222	1	Shear
	R33	CMU 8" Typ	0.108	0.513	Shear
	R34	CMU 8" Typ	0.282	1	Shear
WP92	R1	CMU 8" Typ	0.144	0.473	Shear
WP93	R1	CMU 8" Typ	0.502	0.963	Shear
	R2	CMU 8" Typ	0.307	0.869	Shear
	R3	CMU 8" Typ	0.558	0.836	Shear
	R4	CMU 8" Typ	0.25	0.59	Shear
	R5	CMU 8" Typ	0.255	0.577	Shear
WP94	R1	CMU 8" Dbl Vert @ edge	0.224	0.637	Shear
	R2	CMU 8" Dbl Vert @ edge	0.124	1	Shear
	R3	CMU 8" Dbl Vert @ edge	0.195	1	Shear
	R4	CMU 8" Dbl Vert @ edge	0.256	1	Shear
	R5	CMU 8" Dbl Vert @ edge	0.194	1	Shear
	R6	CMU 8" Dbl Vert @ edge	0.231	1	Shear
	R7	CMU 8" Dbl Vert @ edge	0.267	1.001	Shear
	R8	CMU 8" Dbl Vert @ edge	0.194	1	Shear
	R9	CMU 8" Dbl Vert @ edge	0.194	1	Shear
	R10	CMU 8" Dbl Vert @ edge	0.239	1	Shear
	R11	CMU 8" Dbl Vert @ edge	0.071	1	Shear
	R12	CMU 8" Dbl Vert @ edge	0.078	0.38	Shear
	R13	CMU 8" Dbl Vert @ edge	0.133	1.316	Shear
WP95	R1	CMU 6" FG	1.516	0.873	Flexure
	R2	CMU 6" FG	0.54	1	Shear
	R3	CMU 6" FG	0.795	1	Shear
	R4	CMU 6" FG	0.807	1	Shear
	R5	CMU 6" FG	0.453	1	Shear
	R6	CMU 6" FG	0.468	1	Shear
	R7	CMU 6" FG	0.519	0.401	Flexure
	R8	CMU 6" FG	0.252	0.518	Shear
	R9	CMU 6" FG	0.258	0.6	Shear
WP96	R1	CMU 8" Typ	0.655	0.651	Flexure

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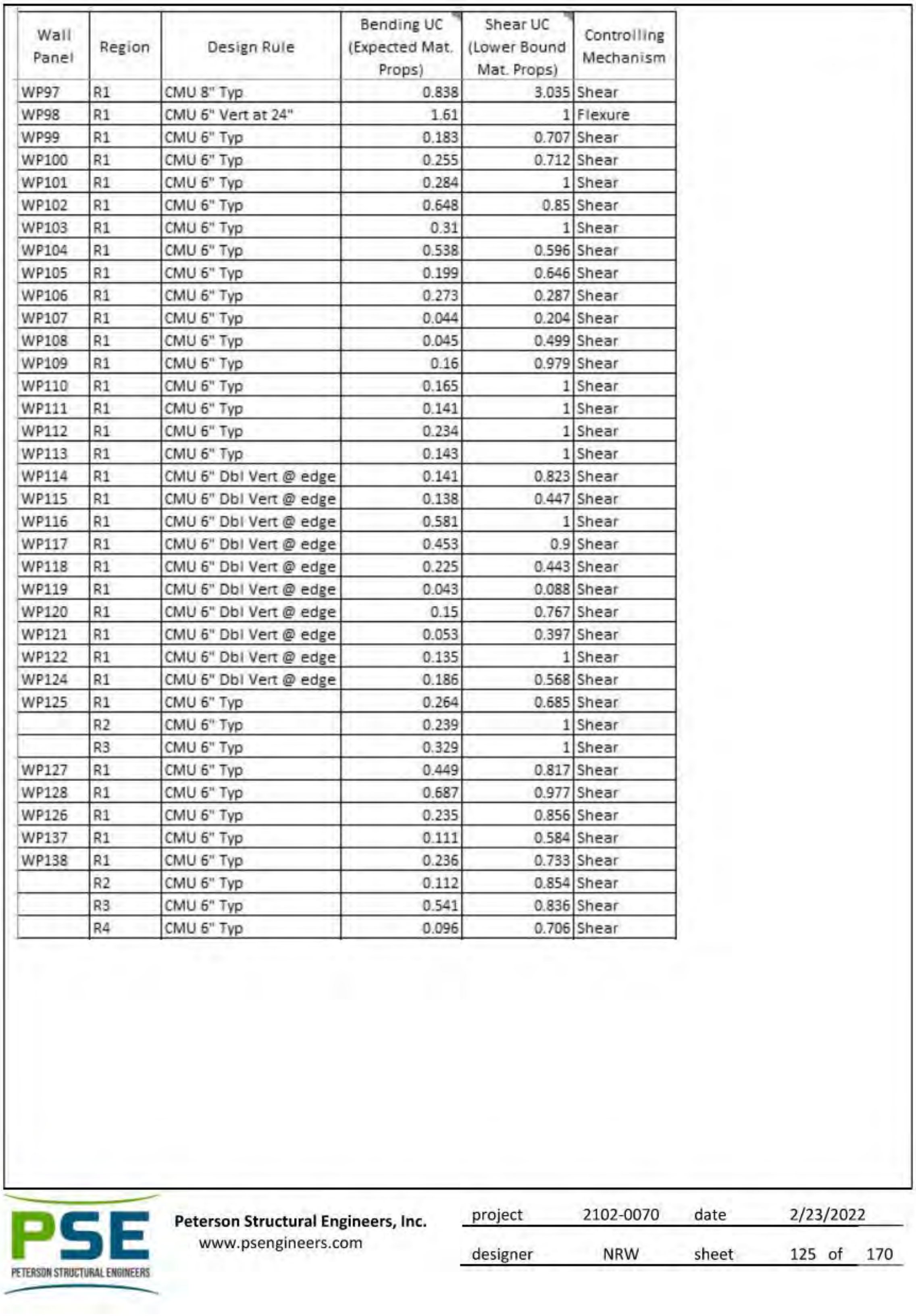

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP97	R1	CMU 8" Typ	0.838	3.035	Shear
WP98	R1	CMU 6" Vert at 24"	1.61	1	Flexure
WP99	R1	CMU 6" Typ	0.183	0.707	Shear
WP100	R1	CMU 6" Typ	0.255	0.712	Shear
WP101	R1	CMU 6" Typ	0.284	1	Shear
WP102	R1	CMU 6" Typ	0.648	0.85	Shear
WP103	R1	CMU 6" Typ	0.31	1	Shear
WP104	R1	CMU 6" Typ	0.538	0.596	Shear
WP105	R1	CMU 6" Typ	0.199	0.646	Shear
WP106	R1	CMU 6" Typ	0.273	0.287	Shear
WP107	R1	CMU 6" Typ	0.044	0.204	Shear
WP108	R1	CMU 6" Typ	0.045	0.499	Shear
WP109	R1	CMU 6" Typ	0.16	0.979	Shear
WP110	R1	CMU 6" Typ	0.165	1	Shear
WP111	R1	CMU 6" Typ	0.141	1	Shear
WP112	R1	CMU 6" Typ	0.234	1	Shear
WP113	R1	CMU 6" Typ	0.143	1	Shear
WP114	R1	CMU 6" Dbl Vert @ edge	0.141	0.823	Shear
WP115	R1	CMU 6" Dbl Vert @ edge	0.138	0.447	Shear
WP116	R1	CMU 6" Dbl Vert @ edge	0.581	1	Shear
WP117	R1	CMU 6" Dbl Vert @ edge	0.453	0.9	Shear
WP118	R1	CMU 6" Dbl Vert @ edge	0.225	0.443	Shear
WP119	R1	CMU 6" Dbl Vert @ edge	0.043	0.088	Shear
WP120	R1	CMU 6" Dbl Vert @ edge	0.15	0.767	Shear
WP121	R1	CMU 6" Dbl Vert @ edge	0.053	0.397	Shear
WP122	R1	CMU 6" Dbl Vert @ edge	0.135	1	Shear
WP124	R1	CMU 6" Dbl Vert @ edge	0.186	0.568	Shear
WP125	R1	CMU 6" Typ	0.264	0.685	Shear
	R2	CMU 6" Typ	0.239	1	Shear
	R3	CMU 6" Typ	0.329	1	Shear
WP127	R1	CMU 6" Typ	0.449	0.817	Shear
WP128	R1	CMU 6" Typ	0.687	0.977	Shear
WP126	R1	CMU 6" Typ	0.235	0.856	Shear
WP137	R1	CMU 6" Typ	0.111	0.584	Shear
WP138	R1	CMU 6" Typ	0.236	0.733	Shear
	R2	CMU 6" Typ	0.112	0.854	Shear
	R3	CMU 6" Typ	0.541	0.836	Shear
	R4	CMU 6" Typ	0.096	0.706	Shear

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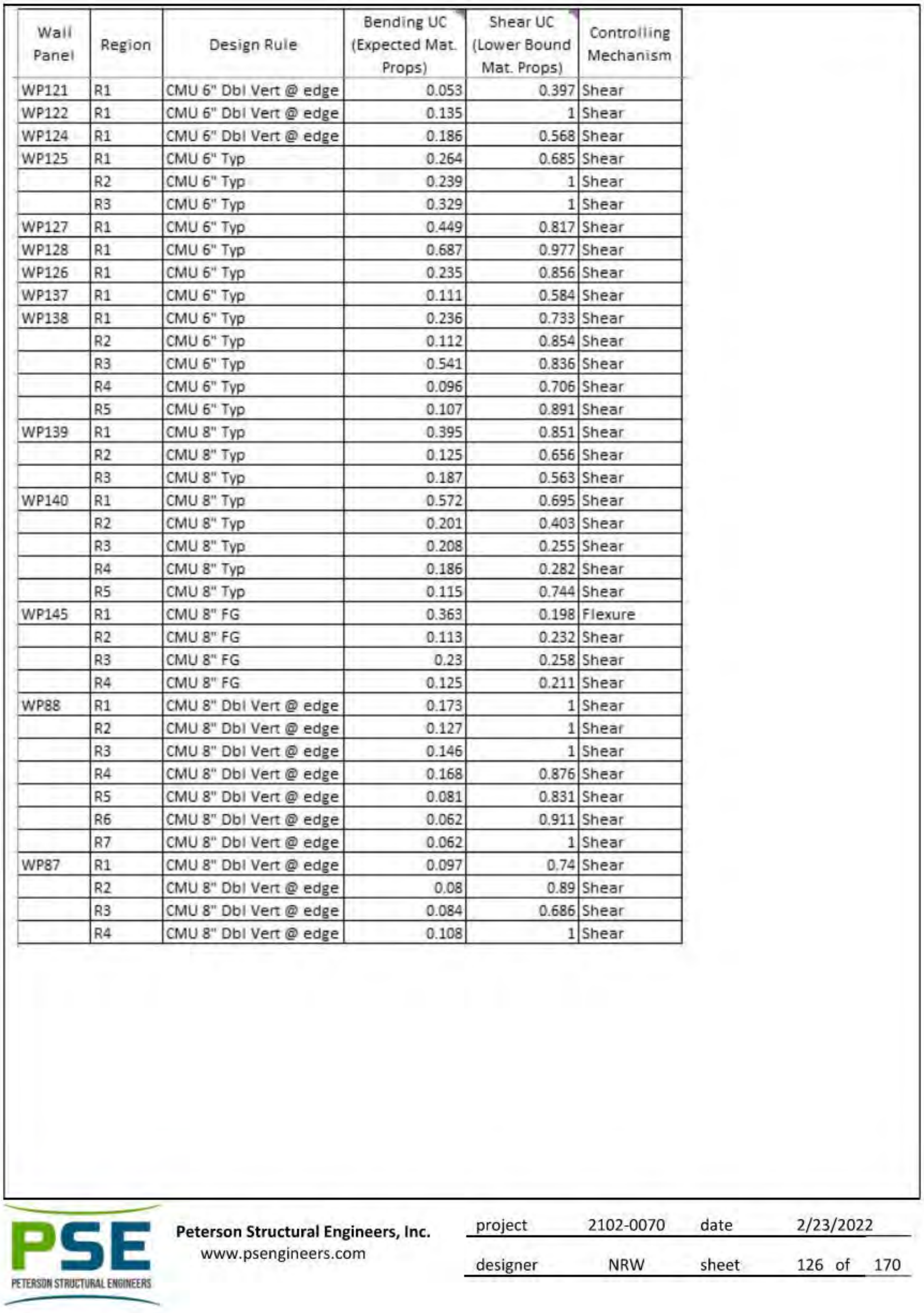

Wall Panel	Region	Design Rule	Bending UC (Expected Mat. Props)	Shear UC (Lower Bound Mat. Props)	Controlling Mechanism
WP121	R1	CMU 6" Dbl Vert @ edge	0.053	0.397	Shear
WP122	R1	CMU 6" Dbl Vert @ edge	0.135	1	Shear
WP124	R1	CMU 6" Dbl Vert @ edge	0.186	0.568	Shear
WP125	R1	CMU 6" Typ	0.264	0.685	Shear
	R2	CMU 6" Typ	0.239	1	Shear
	R3	CMU 6" Typ	0.329	1	Shear
WP127	R1	CMU 6" Typ	0.449	0.817	Shear
WP128	R1	CMU 6" Typ	0.687	0.977	Shear
WP126	R1	CMU 6" Typ	0.235	0.856	Shear
WP137	R1	CMU 6" Typ	0.111	0.584	Shear
WP138	R1	CMU 6" Typ	0.236	0.733	Shear
	R2	CMU 6" Typ	0.112	0.854	Shear
	R3	CMU 6" Typ	0.541	0.836	Shear
	R4	CMU 6" Typ	0.096	0.706	Shear
	R5	CMU 6" Typ	0.107	0.891	Shear
WP139	R1	CMU 8" Typ	0.395	0.851	Shear
	R2	CMU 8" Typ	0.125	0.656	Shear
	R3	CMU 8" Typ	0.187	0.563	Shear
WP140	R1	CMU 8" Typ	0.572	0.695	Shear
	R2	CMU 8" Typ	0.201	0.403	Shear
	R3	CMU 8" Typ	0.208	0.255	Shear
	R4	CMU 8" Typ	0.186	0.282	Shear
	R5	CMU 8" Typ	0.115	0.744	Shear
WP145	R1	CMU 8" FG	0.363	0.198	Flexure
	R2	CMU 8" FG	0.113	0.232	Shear
	R3	CMU 8" FG	0.23	0.258	Shear
	R4	CMU 8" FG	0.125	0.211	Shear
WP88	R1	CMU 8" Dbl Vert @ edge	0.173	1	Shear
	R2	CMU 8" Dbl Vert @ edge	0.127	1	Shear
	R3	CMU 8" Dbl Vert @ edge	0.146	1	Shear
	R4	CMU 8" Dbl Vert @ edge	0.168	0.876	Shear
	R5	CMU 8" Dbl Vert @ edge	0.081	0.831	Shear
	R6	CMU 8" Dbl Vert @ edge	0.062	0.911	Shear
	R7	CMU 8" Dbl Vert @ edge	0.062	1	Shear
WP87	R1	CMU 8" Dbl Vert @ edge	0.097	0.74	Shear
	R2	CMU 8" Dbl Vert @ edge	0.08	0.89	Shear
	R3	CMU 8" Dbl Vert @ edge	0.084	0.686	Shear
	R4	CMU 8" Dbl Vert @ edge	0.108	1	Shear

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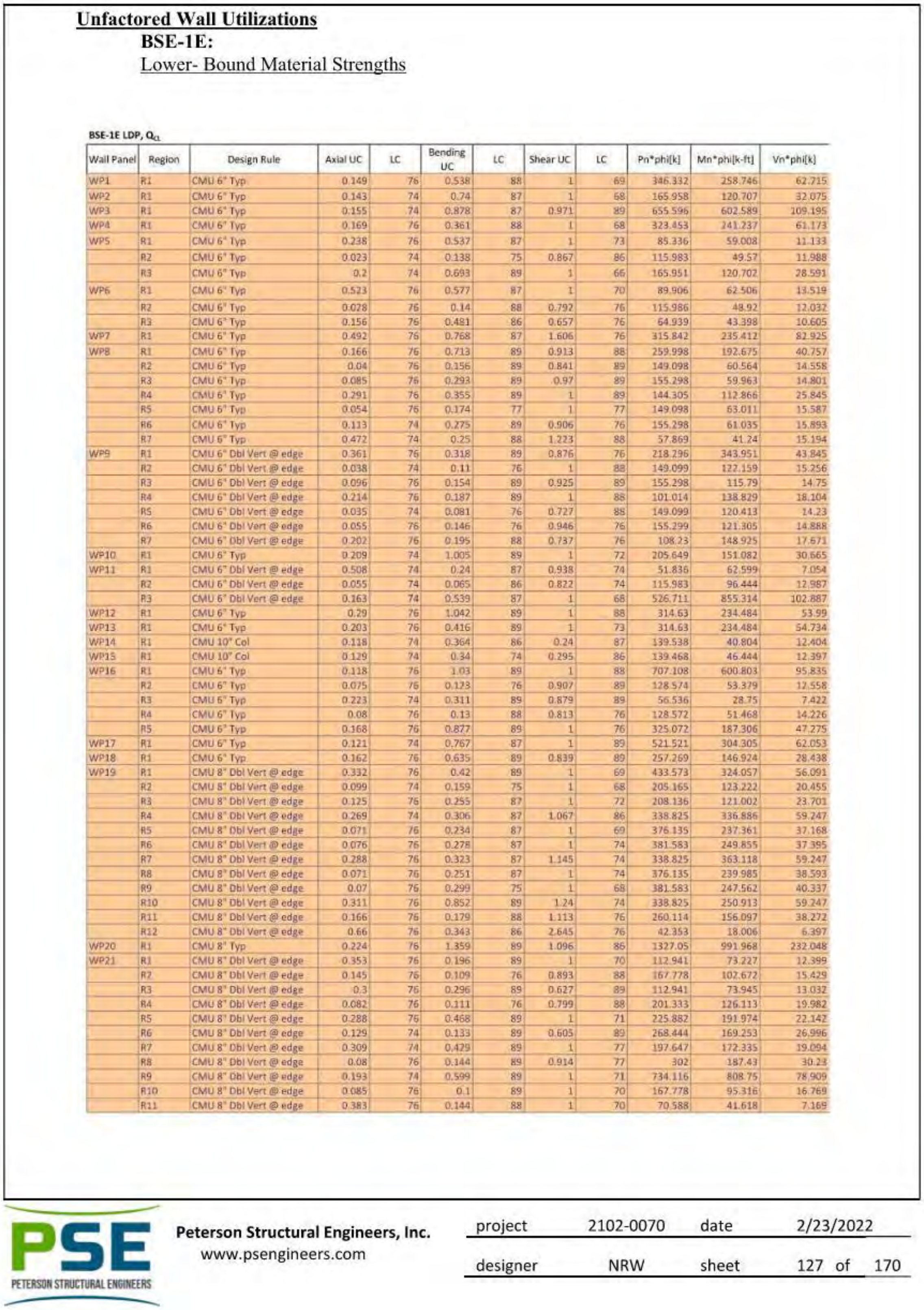

Unfactored Wall Utilizations

BSE-1E:

Lower- Bound Material Strengths

BSE-1E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP1	R1	CMU 6" Typ	0.149	76	0.538	88	1	69	346.332	258.746	62.715
WP2	R1	CMU 6" Typ	0.143	74	0.74	87	1	68	165.958	120.707	32.075
WP3	R1	CMU 6" Typ	0.155	74	0.878	87	0.971	89	655.596	602.589	109.195
WP4	R1	CMU 6" Typ	0.169	76	0.361	88	1	68	323.453	241.237	61.173
WP5	R1	CMU 6" Typ	0.238	76	0.537	87	1	73	85.336	59.008	11.133
	R2	CMU 6" Typ	0.023	74	0.138	75	0.867	86	115.983	49.57	11.988
	R3	CMU 6" Typ	0.2	74	0.693	89	1	66	165.951	120.702	28.591
WP6	R1	CMU 6" Typ	0.523	76	0.577	87	1	70	89.906	62.506	13.519
	R2	CMU 6" Typ	0.028	76	0.14	88	0.792	76	115.986	48.92	12.032
	R3	CMU 6" Typ	0.156	76	0.481	86	0.657	76	64.939	43.398	10.605
WP7	R1	CMU 6" Typ	0.492	76	0.768	87	1.606	76	315.842	235.412	82.925
WP8	R1	CMU 6" Typ	0.166	76	0.713	89	0.913	88	259.998	192.675	40.757
	R2	CMU 6" Typ	0.04	76	0.156	89	0.841	89	149.098	60.564	14.558
	R3	CMU 6" Typ	0.085	76	0.293	89	0.97	89	155.298	59.963	14.801
	R4	CMU 6" Typ	0.291	76	0.355	89	1	89	144.305	112.866	25.845
	R5	CMU 6" Typ	0.054	76	0.174	77	1	77	149.098	63.011	15.587
	R6	CMU 6" Typ	0.113	74	0.275	89	0.906	76	155.298	61.035	15.893
	R7	CMU 6" Typ	0.472	74	0.25	88	1.223	88	57.869	41.24	15.194
WP9	R1	CMU 6" Dbl Vert @ edge	0.361	76	0.318	89	0.876	76	218.296	343.951	43.845
	R2	CMU 6" Dbl Vert @ edge	0.038	74	0.11	76	1	88	149.099	122.159	15.256
	R3	CMU 6" Dbl Vert @ edge	0.096	76	0.154	89	0.925	89	155.298	115.79	14.75
	R4	CMU 6" Dbl Vert @ edge	0.214	76	0.187	89	1	88	101.014	138.829	18.104
	R5	CMU 6" Dbl Vert @ edge	0.035	74	0.081	76	0.727	88	149.099	120.413	14.23
	R6	CMU 6" Dbl Vert @ edge	0.055	76	0.146	76	0.946	76	155.299	121.305	14.888
	R7	CMU 6" Dbl Vert @ edge	0.202	76	0.195	88	0.737	76	108.23	148.925	17.671
WP10	R1	CMU 6" Typ	0.209	74	1.005	89	1	72	205.649	151.082	30.665
WP11	R1	CMU 6" Dbl Vert @ edge	0.508	74	0.24	87	0.938	74	51.836	62.599	7.054
	R2	CMU 6" Dbl Vert @ edge	0.055	74	0.065	86	0.822	74	115.983	96.444	12.987
	R3	CMU 6" Dbl Vert @ edge	0.163	74	0.539	87	1	68	526.711	855.314	102.887
WP12	R1	CMU 6" Typ	0.29	76	1.042	89	1	88	314.63	234.484	53.99
WP13	R1	CMU 6" Typ	0.203	76	0.416	89	1	73	314.63	234.484	54.734
WP14	R1	CMU 10" Col	0.118	74	0.364	86	0.24	87	139.538	40.804	12.404
WP15	R1	CMU 10" Col	0.129	74	0.34	74	0.295	86	139.468	46.444	12.397
WP16	R1	CMU 6" Typ	0.118	76	1.03	89	1	88	707.108	600.803	95.835
	R2	CMU 6" Typ	0.075	76	0.123	76	0.907	89	128.574	53.379	12.558
	R3	CMU 6" Typ	0.223	74	0.311	89	0.879	89	56.536	28.75	7.422
	R4	CMU 6" Typ	0.08	76	0.13	88	0.813	76	128.572	51.468	14.226
	R5	CMU 6" Typ	0.168	76	0.877	89	1	76	325.072	187.306	47.275
WP17	R1	CMU 6" Typ	0.121	74	0.767	87	1	89	521.521	304.305	62.053
WP18	R1	CMU 6" Typ	0.162	76	0.635	89	0.839	89	257.269	146.924	28.438
WP19	R1	CMU 8" Dbl Vert @ edge	0.332	76	0.42	89	1	69	433.573	324.057	56.091
	R2	CMU 8" Dbl Vert @ edge	0.099	74	0.159	75	1	68	205.165	123.222	20.455
	R3	CMU 8" Dbl Vert @ edge	0.125	76	0.255	87	1	72	208.136	121.002	23.701
	R4	CMU 8" Dbl Vert @ edge	0.269	74	0.306	87	1.067	86	338.825	336.886	59.247
	R5	CMU 8" Dbl Vert @ edge	0.071	76	0.234	87	1	69	376.135	237.361	37.168
	R6	CMU 8" Dbl Vert @ edge	0.076	76	0.278	87	1	74	381.583	249.855	37.395
	R7	CMU 8" Dbl Vert @ edge	0.288	76	0.323	87	1.145	74	338.825	363.118	59.247
	R8	CMU 8" Dbl Vert @ edge	0.071	76	0.251	87	1	74	376.135	239.985	38.593
	R9	CMU 8" Dbl Vert @ edge	0.07	76	0.299	75	1	68	381.583	247.562	40.337
	R10	CMU 8" Dbl Vert @ edge	0.311	76	0.852	89	1.24	74	338.825	250.913	59.247
	R11	CMU 8" Dbl Vert @ edge	0.166	76	0.179	88	1.113	76	260.114	156.097	38.272
	R12	CMU 8" Dbl Vert @ edge	0.66	76	0.343	86	2.645	76	42.353	18.006	6.397
WP20	R1	CMU 8" Typ	0.224	76	1.359	89	1.096	86	1327.05	991.968	232.048
WP21	R1	CMU 8" Dbl Vert @ edge	0.353	76	0.196	89	1	70	112.941	73.227	12.399
	R2	CMU 8" Dbl Vert @ edge	0.145	76	0.109	76	0.893	88	167.778	102.672	15.429
	R3	CMU 8" Dbl Vert @ edge	0.3	76	0.296	89	0.627	89	112.941	73.945	13.032
	R4	CMU 8" Dbl Vert @ edge	0.082	76	0.111	76	0.799	88	201.333	126.113	19.982
	R5	CMU 8" Dbl Vert @ edge	0.288	76	0.468	89	1	71	225.882	191.974	22.142
	R6	CMU 8" Dbl Vert @ edge	0.129	74	0.133	89	0.605	89	268.444	169.253	26.996
	R7	CMU 8" Dbl Vert @ edge	0.309	74	0.429	89	1	77	197.647	172.335	19.094
	R8	CMU 8" Dbl Vert @ edge	0.08	76	0.144	89	0.914	77	302	187.43	30.23
	R9	CMU 8" Dbl Vert @ edge	0.193	74	0.599	89	1	71	734.116	808.75	78.909
	R10	CMU 8" Dbl Vert @ edge	0.085	76	0.1	89	1	70	167.778	95.316	16.769
	R11	CMU 8" Dbl Vert @ edge	0.383	76	0.144	88	1	70	70.588	41.618	7.169

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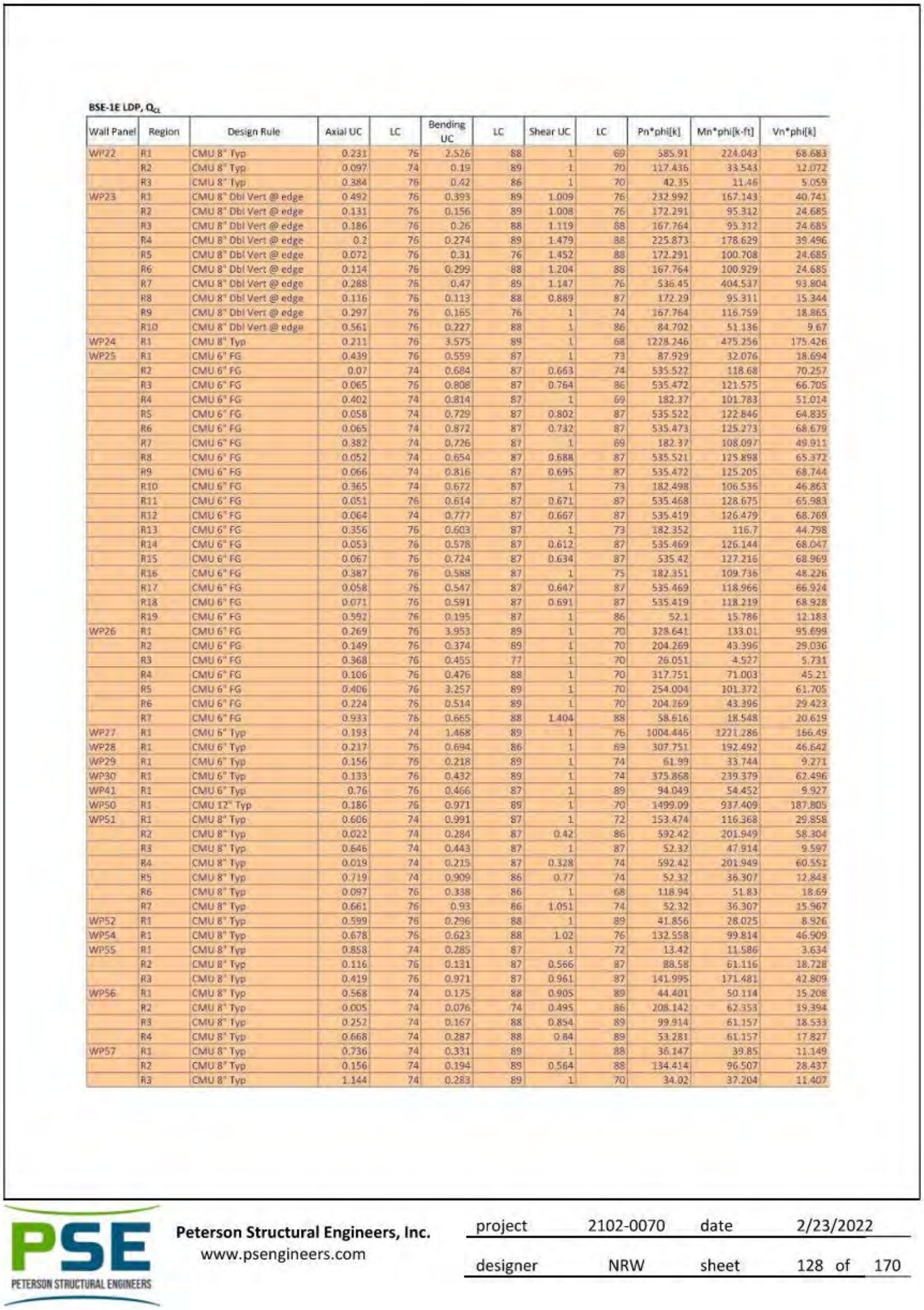

BSE-1E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP22	R1	CMU 8" Typ	0.231	76	2.526	88	1	69	585.91	224.043	68.683
	R2	CMU 8" Typ	0.097	74	0.19	89	1	70	117.436	33.543	12.072
	R3	CMU 8" Typ	0.384	76	0.42	86	1	70	42.35	11.46	5.059
WP23	R1	CMU 8" Dbl Vert @ edge	0.492	76	0.393	89	1.009	76	232.992	167.143	40.741
	R2	CMU 8" Dbl Vert @ edge	0.131	76	0.156	89	1.008	76	172.291	95.312	24.685
	R3	CMU 8" Dbl Vert @ edge	0.186	76	0.26	88	1.119	88	167.764	95.312	24.685
	R4	CMU 8" Dbl Vert @ edge	0.2	76	0.274	89	1.479	88	225.873	178.629	39.496
	R5	CMU 8" Dbl Vert @ edge	0.072	76	0.31	76	1.452	88	172.291	100.708	24.685
	R6	CMU 8" Dbl Vert @ edge	0.114	76	0.299	88	1.204	88	167.764	100.929	24.685
	R7	CMU 8" Dbl Vert @ edge	0.288	76	0.47	89	1.147	76	536.45	404.537	93.804
	R8	CMU 8" Dbl Vert @ edge	0.116	76	0.113	88	0.889	87	172.29	95.311	15.344
	R9	CMU 8" Dbl Vert @ edge	0.297	76	0.165	76	1	74	167.764	116.759	18.865
	R10	CMU 8" Dbl Vert @ edge	0.561	76	0.227	88	1	86	84.702	51.136	9.67
WP24	R1	CMU 8" Typ	0.211	76	3.575	89	1	68	1228.246	475.256	175.426
WP25	R1	CMU 6" FG	0.439	76	0.559	87	1	73	87.929	32.076	18.694
	R2	CMU 6" FG	0.07	74	0.684	87	0.663	74	535.522	118.68	70.257
	R3	CMU 6" FG	0.065	76	0.808	87	0.764	86	535.472	121.575	66.705
	R4	CMU 6" FG	0.402	74	0.814	87	1	69	182.37	101.783	51.014
	R5	CMU 6" FG	0.058	74	0.729	87	0.802	87	535.522	122.846	64.835
	R6	CMU 6" FG	0.065	74	0.872	87	0.732	87	535.473	125.273	68.679
	R7	CMU 6" FG	0.382	74	0.726	87	1	69	182.37	108.097	49.911
	R8	CMU 6" FG	0.052	74	0.654	87	0.688	87	535.521	125.898	65.372
	R9	CMU 6" FG	0.066	74	0.816	87	0.695	87	535.472	125.205	68.744
	R10	CMU 6" FG	0.365	74	0.672	87	1	73	182.498	106.536	46.863
	R11	CMU 6" FG	0.051	76	0.614	87	0.671	87	535.468	128.675	65.983
	R12	CMU 6" FG	0.064	74	0.777	87	0.667	87	535.419	126.479	68.769
	R13	CMU 6" FG	0.356	76	0.603	87	1	73	182.352	116.7	44.798
	R14	CMU 6" FG	0.053	76	0.578	87	0.612	87	535.469	126.144	68.047
	R15	CMU 6" FG	0.067	76	0.724	87	0.634	87	535.42	127.216	68.969
	R16	CMU 6" FG	0.387	76	0.588	87	1	75	182.351	109.736	48.226
	R17	CMU 6" FG	0.058	76	0.547	87	0.647	87	535.469	118.966	66.924
	R18	CMU 6" FG	0.071	76	0.591	87	0.691	87	535.419	118.219	68.928
	R19	CMU 6" FG	0.592	76	0.195	87	1	86	52.1	15.786	12.183
WP26	R1	CMU 6" FG	0.269	76	3.953	89	1	70	328.641	133.01	95.699
	R2	CMU 6" FG	0.149	76	0.374	89	1	70	204.269	43.396	29.036
	R3	CMU 6" FG	0.368	76	0.455	77	1	70	26.051	4.527	5.731
	R4	CMU 6" FG	0.106	76	0.476	88	1	70	317.751	71.003	45.21
	R5	CMU 6" FG	0.406	76	3.257	89	1	70	254.004	101.372	61.705
	R6	CMU 6" FG	0.224	76	0.514	89	1	70	204.269	43.396	29.423
	R7	CMU 6" FG	0.933	76	0.665	88	1.404	88	58.616	18.548	20.619
WP27	R1	CMU 6" Typ	0.193	74	1.468	89	1	76	1004.446	1221.286	166.49
WP28	R1	CMU 6" Typ	0.217	76	0.694	86	1	69	307.751	192.492	46.642
WP29	R1	CMU 6" Typ	0.156	76	0.218	89	1	74	61.99	33.744	9.271
WP30	R1	CMU 6" Typ	0.133	76	0.432	89	1	74	375.868	239.379	62.496
WP41	R1	CMU 6" Typ	0.76	76	0.466	87	1	89	94.049	54.452	9.927
WP50	R1	CMU 12" Typ	0.186	76	0.971	89	1	70	1499.09	937.409	187.805
WP51	R1	CMU 8" Typ	0.606	74	0.991	87	1	72	153.474	116.368	29.858
	R2	CMU 8" Typ	0.022	74	0.284	87	0.42	86	592.42	201.949	58.304
	R3	CMU 8" Typ	0.646	74	0.443	87	1	87	52.32	47.914	9.597
	R4	CMU 8" Typ	0.019	74	0.215	87	0.328	74	592.42	201.949	60.551
	R5	CMU 8" Typ	0.719	74	0.909	86	0.77	74	52.32	36.307	12.843
	R6	CMU 8" Typ	0.097	76	0.338	86	1	68	118.94	51.83	18.69
	R7	CMU 8" Typ	0.661	76	0.93	86	1.051	74	52.32	36.307	15.967
WP52	R1	CMU 8" Typ	0.599	76	0.296	88	1	89	41.856	28.025	8.926
WP54	R1	CMU 8" Typ	0.678	76	0.623	88	1.02	76	132.558	99.814	46.909
WP55	R1	CMU 8" Typ	0.858	74	0.285	87	1	72	13.42	11.586	3.634
	R2	CMU 8" Typ	0.116	76	0.131	87	0.566	87	88.58	61.116	18.728
	R3	CMU 8" Typ	0.419	76	0.971	87	0.961	87	141.995	171.481	42.809
WP56	R1	CMU 8" Typ	0.568	74	0.175	88	0.905	89	44.401	50.114	15.208
	R2	CMU 8" Typ	0.005	74	0.076	74	0.495	86	208.142	62.353	19.394
	R3	CMU 8" Typ	0.252	74	0.167	88	0.854	89	99.914	61.157	18.533
	R4	CMU 8" Typ	0.668	74	0.287	88	0.84	89	53.281	61.157	17.827
WP57	R1	CMU 8" Typ	0.736	74	0.331	89	1	88	36.147	39.85	11.149
	R2	CMU 8" Typ	0.156	74	0.194	89	0.564	88	134.414	96.507	28.437
	R3	CMU 8" Typ	1.144	74	0.283	89	1	70	34.02	37.204	11.407

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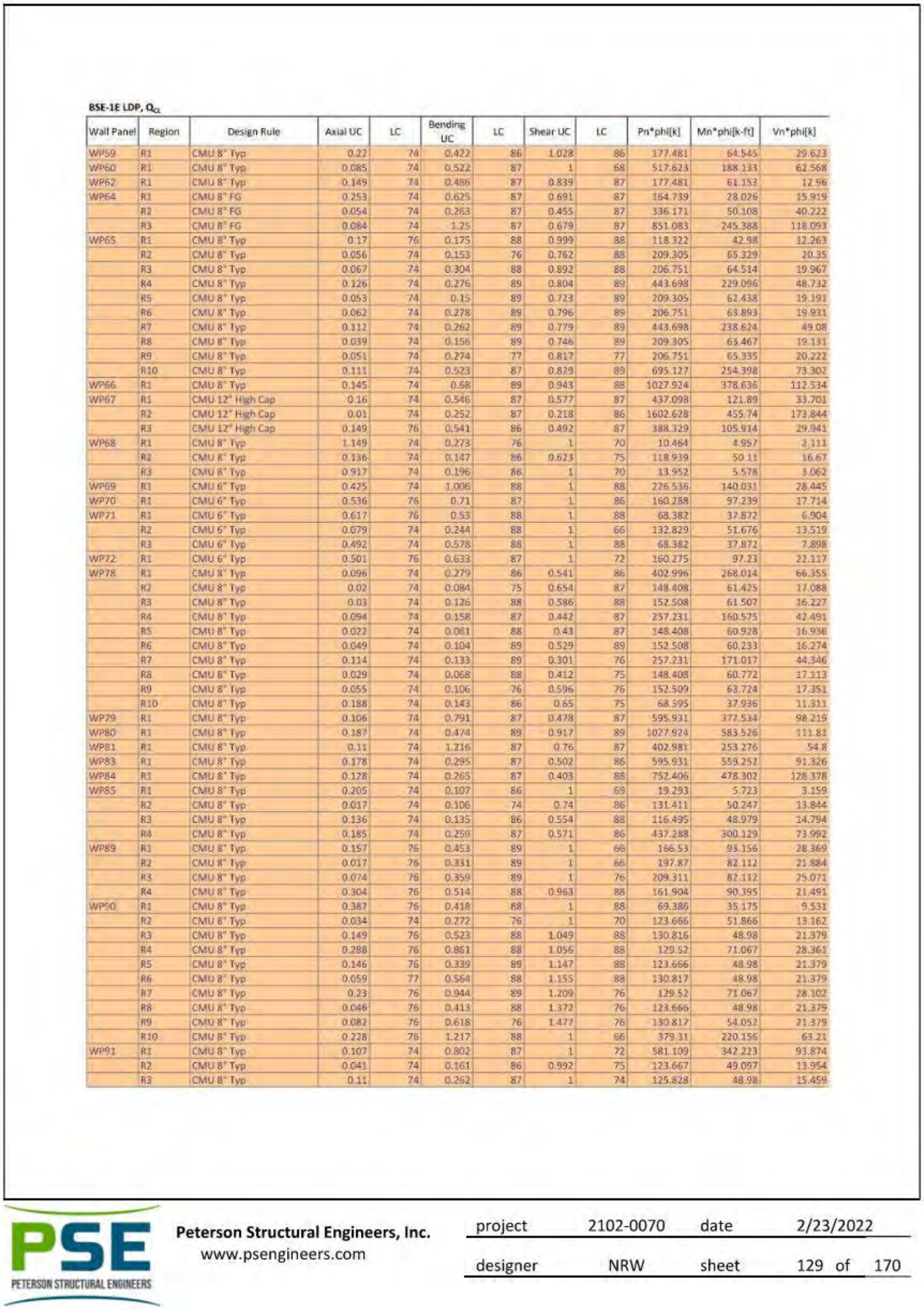

BSE-1E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP59	R1	CMU 8" Typ	0.22	74	0.422	86	1.028	86	177.481	64.545	29.623
WP60	R1	CMU 8" Typ	0.085	74	0.522	87	1	68	517.623	188.133	62.568
WP62	R1	CMU 8" Typ	0.149	74	0.486	87	0.839	87	177.481	61.153	12.96
WP64	R1	CMU 8" FG	0.253	74	0.625	87	0.691	87	164.739	28.026	15.919
	R2	CMU 8" FG	0.054	74	0.263	87	0.455	87	336.171	50.108	40.222
	R3	CMU 8" FG	0.084	74	1.25	87	0.679	87	851.083	245.388	118.093
WP65	R1	CMU 8" Typ	0.17	76	0.175	88	0.999	88	118.322	42.98	12.263
	R2	CMU 8" Typ	0.056	74	0.153	76	0.762	88	209.305	65.329	20.35
	R3	CMU 8" Typ	0.067	74	0.304	88	0.892	88	206.751	64.514	19.967
	R4	CMU 8" Typ	0.126	74	0.276	89	0.804	89	443.698	229.096	48.732
	R5	CMU 8" Typ	0.053	74	0.15	89	0.723	89	209.305	62.438	19.191
	R6	CMU 8" Typ	0.062	74	0.278	89	0.796	89	206.751	63.893	19.931
	R7	CMU 8" Typ	0.112	74	0.262	89	0.779	89	443.698	238.624	49.08
	R8	CMU 8" Typ	0.039	74	0.156	89	0.746	89	209.305	63.467	19.131
	R9	CMU 8" Typ	0.051	74	0.274	77	0.817	77	206.751	65.335	20.222
	R10	CMU 8" Typ	0.111	74	0.523	87	0.829	89	695.127	254.398	73.302
WP66	R1	CMU 8" Typ	0.145	74	0.68	89	0.943	88	1027.924	378.636	112.534
WP67	R1	CMU 12" High Cap	0.16	74	0.546	87	0.577	87	437.098	121.89	33.701
	R2	CMU 12" High Cap	0.01	74	0.252	87	0.218	86	1602.628	455.74	173.844
	R3	CMU 12" High Cap	0.149	76	0.541	86	0.492	87	388.329	105.914	29.941
WP68	R1	CMU 8" Typ	1.149	74	0.273	76	1	70	10.464	4.957	2.111
	R2	CMU 8" Typ	0.136	74	0.147	86	0.623	75	118.939	50.11	16.67
	R3	CMU 8" Typ	0.917	74	0.196	86	1	70	13.952	5.578	3.062
WP69	R1	CMU 6" Typ	0.425	74	1.006	88	1	88	226.536	140.031	28.445
WP70	R1	CMU 6" Typ	0.536	76	0.71	87	1	86	160.288	97.239	17.714
WP71	R1	CMU 6" Typ	0.617	76	0.53	88	1	88	68.382	37.872	6.904
	R2	CMU 6" Typ	0.079	74	0.244	88	1	66	132.829	51.676	13.519
	R3	CMU 6" Typ	0.492	74	0.578	88	1	88	68.382	37.872	7.898
WP72	R1	CMU 6" Typ	0.501	76	0.633	87	1	72	160.275	97.23	22.117
WP78	R1	CMU 8" Typ	0.096	74	0.279	86	0.541	86	402.996	268.014	66.355
	R2	CMU 8" Typ	0.02	74	0.084	75	0.654	87	148.408	61.425	17.088
	R3	CMU 8" Typ	0.03	74	0.126	88	0.586	88	152.508	61.507	16.227
	R4	CMU 8" Typ	0.094	74	0.158	87	0.442	87	257.231	160.575	42.491
	R5	CMU 8" Typ	0.022	74	0.061	88	0.43	87	148.408	60.928	16.936
	R6	CMU 8" Typ	0.049	74	0.104	89	0.529	89	152.508	60.233	16.274
	R7	CMU 8" Typ	0.114	74	0.133	89	0.301	76	257.231	171.017	44.346
	R8	CMU 8" Typ	0.029	74	0.068	88	0.412	75	148.408	60.772	17.113
	R9	CMU 8" Typ	0.055	74	0.106	76	0.596	76	152.509	63.724	17.351
	R10	CMU 8" Typ	0.188	74	0.143	86	0.65	75	68.595	37.936	11.311
WP79	R1	CMU 8" Typ	0.106	74	0.791	87	0.478	87	595.931	377.534	98.219
WP80	R1	CMU 8" Typ	0.187	74	0.474	89	0.917	89	1027.924	583.526	111.81
WP81	R1	CMU 8" Typ	0.11	74	1.216	87	0.76	87	402.981	253.276	54.8
WP83	R1	CMU 8" Typ	0.178	74	0.295	87	0.502	86	595.931	559.252	91.326
WP84	R1	CMU 8" Typ	0.128	74	0.265	87	0.403	88	752.406	478.302	128.378
WP85	R1	CMU 8" Typ	0.205	74	0.107	86	1	69	19.293	5.723	3.159
	R2	CMU 8" Typ	0.017	74	0.106	74	0.74	86	131.411	50.247	13.844
	R3	CMU 8" Typ	0.136	74	0.135	86	0.554	88	116.495	48.979	14.794
	R4	CMU 8" Typ	0.185	74	0.259	87	0.571	86	437.288	300.129	73.992
WP89	R1	CMU 8" Typ	0.157	76	0.453	89	1	66	166.53	93.156	28.369
	R2	CMU 8" Typ	0.017	76	0.331	89	1	66	197.87	82.112	21.884
	R3	CMU 8" Typ	0.074	76	0.359	89	1	76	209.311	82.112	25.071
	R4	CMU 8" Typ	0.304	76	0.514	88	0.963	88	161.904	90.395	21.491
WP90	R1	CMU 8" Typ	0.387	76	0.418	88	1	88	69.386	35.175	9.531
	R2	CMU 8" Typ	0.034	74	0.272	76	1	70	123.666	51.866	13.162
	R3	CMU 8" Typ	0.149	76	0.523	88	1.049	88	130.816	48.98	21.379
	R4	CMU 8" Typ	0.288	76	0.861	88	1.056	88	129.52	71.067	28.361
	R5	CMU 8" Typ	0.146	76	0.339	89	1.147	88	123.666	48.98	21.379
	R6	CMU 8" Typ	0.059	77	0.564	88	1.155	88	130.817	48.98	21.379
	R7	CMU 8" Typ	0.23	76	0.944	89	1.209	76	129.52	71.067	28.102
	R8	CMU 8" Typ	0.046	76	0.413	88	1.372	76	123.666	48.98	21.379
	R9	CMU 8" Typ	0.082	76	0.618	76	1.477	76	130.817	54.052	21.379
	R10	CMU 8" Typ	0.228	76	1.217	88	1	66	379.31	220.156	63.21
WP91	R1	CMU 8" Typ	0.107	74	0.802	87	1	72	581.109	342.223	93.874
	R2	CMU 8" Typ	0.041	74	0.161	86	0.992	75	123.667	49.097	13.954
	R3	CMU 8" Typ	0.11	74	0.262	87	1	74	125.828	48.98	15.459

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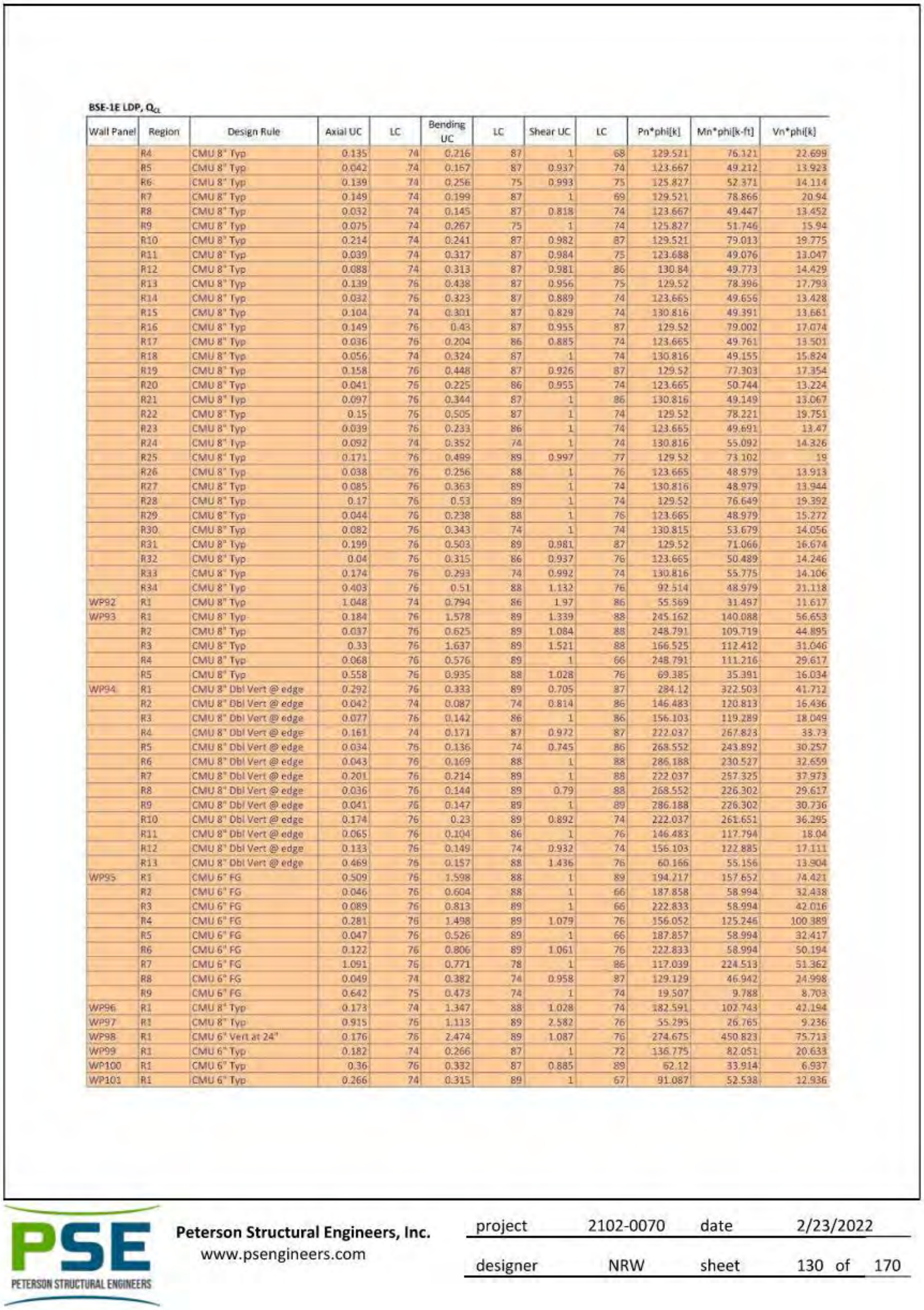

BSE-1E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
	R4	CMU 8" Typ	0.135	74	0.216	87	1	68	129.521	76.121	22.699
	R5	CMU 8" Typ	0.042	74	0.167	87	0.937	74	123.667	49.212	13.923
	R6	CMU 8" Typ	0.139	74	0.256	75	0.993	75	125.827	52.371	14.114
	R7	CMU 8" Typ	0.149	74	0.199	87	1	69	129.521	78.866	20.94
	R8	CMU 8" Typ	0.032	74	0.145	87	0.818	74	123.667	49.447	13.452
	R9	CMU 8" Typ	0.075	74	0.267	75	1	74	125.827	51.746	15.94
	R10	CMU 8" Typ	0.214	74	0.241	87	0.982	87	129.521	79.013	19.775
	R11	CMU 8" Typ	0.039	74	0.317	87	0.984	75	123.688	49.076	13.047
	R12	CMU 8" Typ	0.088	74	0.313	87	0.981	86	130.84	49.773	14.429
	R13	CMU 8" Typ	0.139	76	0.438	87	0.956	75	129.52	78.396	17.793
	R14	CMU 8" Typ	0.032	76	0.323	87	0.889	74	123.665	49.656	13.428
	R15	CMU 8" Typ	0.104	74	0.301	87	0.829	74	130.816	49.391	13.661
	R16	CMU 8" Typ	0.149	76	0.43	87	0.955	87	129.52	79.002	17.074
	R17	CMU 8" Typ	0.036	76	0.204	86	0.885	74	123.665	49.761	13.501
	R18	CMU 8" Typ	0.056	74	0.324	87	1	74	130.816	49.155	15.824
	R19	CMU 8" Typ	0.158	76	0.448	87	0.926	87	129.52	77.303	17.354
	R20	CMU 8" Typ	0.041	76	0.225	86	0.955	74	123.665	50.744	13.224
	R21	CMU 8" Typ	0.097	76	0.344	87	1	86	130.816	49.149	13.067
	R22	CMU 8" Typ	0.15	76	0.505	87	1	74	129.52	78.221	19.751
	R23	CMU 8" Typ	0.039	76	0.233	86	1	74	123.665	49.691	13.47
	R24	CMU 8" Typ	0.092	74	0.352	74	1	74	130.816	55.092	14.326
	R25	CMU 8" Typ	0.171	76	0.499	89	0.997	77	129.52	73.102	19
	R26	CMU 8" Typ	0.038	76	0.256	88	1	76	123.665	48.979	13.913
	R27	CMU 8" Typ	0.085	76	0.363	89	1	74	130.816	48.979	13.944
	R28	CMU 8" Typ	0.17	76	0.53	89	1	74	129.52	76.649	19.392
	R29	CMU 8" Typ	0.044	76	0.238	88	1	76	123.665	48.979	15.272
	R30	CMU 8" Typ	0.082	76	0.343	74	1	74	130.815	53.679	14.056
	R31	CMU 8" Typ	0.199	76	0.503	89	0.981	87	129.52	71.066	16.674
	R32	CMU 8" Typ	0.04	76	0.315	86	0.937	76	123.665	50.489	14.246
	R33	CMU 8" Typ	0.174	76	0.293	74	0.992	74	130.816	55.775	14.106
	R34	CMU 8" Typ	0.403	76	0.51	88	1.132	76	92.514	48.979	21.118
WP92	R1	CMU 8" Typ	1.048	74	0.794	86	1.97	86	55.569	31.497	11.617
WP93	R1	CMU 8" Typ	0.184	76	1.578	89	1.339	88	245.162	140.088	56.653
	R2	CMU 8" Typ	0.037	76	0.625	89	1.084	88	248.791	109.719	44.895
	R3	CMU 8" Typ	0.33	76	1.637	89	1.521	88	166.525	112.412	31.046
	R4	CMU 8" Typ	0.068	76	0.576	89	1	66	248.791	111.216	29.617
	R5	CMU 8" Typ	0.558	76	0.935	88	1.028	76	69.385	35.391	16.034
WP94	R1	CMU 8" Dbl Vert @ edge	0.292	76	0.333	89	0.705	87	284.12	322.503	41.712
	R2	CMU 8" Dbl Vert @ edge	0.042	74	0.087	74	0.814	86	146.483	120.813	16.436
	R3	CMU 8" Dbl Vert @ edge	0.077	76	0.142	86	1	86	156.103	119.289	18.049
	R4	CMU 8" Dbl Vert @ edge	0.161	74	0.171	87	0.972	87	222.037	267.823	33.73
	R5	CMU 8" Dbl Vert @ edge	0.034	76	0.136	74	0.745	86	268.552	243.892	30.257
	R6	CMU 8" Dbl Vert @ edge	0.043	76	0.169	88	1	88	286.188	230.527	32.659
	R7	CMU 8" Dbl Vert @ edge	0.201	76	0.214	89	1	88	222.037	257.325	37.973
	R8	CMU 8" Dbl Vert @ edge	0.036	76	0.144	89	0.79	88	268.552	226.302	29.617
	R9	CMU 8" Dbl Vert @ edge	0.041	76	0.147	89	1	89	286.188	226.302	30.736
	R10	CMU 8" Dbl Vert @ edge	0.174	76	0.23	89	0.892	74	222.037	261.651	36.295
	R11	CMU 8" Dbl Vert @ edge	0.065	76	0.104	86	1	76	146.483	117.794	18.04
	R12	CMU 8" Dbl Vert @ edge	0.133	76	0.149	74	0.932	74	156.103	122.885	17.111
	R13	CMU 8" Dbl Vert @ edge	0.469	76	0.157	88	1.436	76	60.166	55.156	13.904
WP95	R1	CMU 6" FG	0.509	76	1.598	88	1	89	194.217	157.652	74.421
	R2	CMU 6" FG	0.046	76	0.604	88	1	66	187.858	58.994	32.438
	R3	CMU 6" FG	0.089	76	0.813	89	1	66	222.833	58.994	42.016
	R4	CMU 6" FG	0.281	76	1.498	89	1.079	76	156.052	125.246	100.389
	R5	CMU 6" FG	0.047	76	0.526	89	1	66	187.857	58.994	32.417
	R6	CMU 6" FG	0.122	76	0.806	89	1.061	76	222.833	58.994	50.194
	R7	CMU 6" FG	1.091	76	0.771	78	1	86	117.039	224.513	51.362
	R8	CMU 6" FG	0.049	74	0.382	74	0.958	87	129.129	46.942	24.998
	R9	CMU 6" FG	0.642	75	0.473	74	1	74	19.507	9.788	8.703
WP96	R1	CMU 8" Typ	0.173	74	1.347	88	1.028	74	182.591	102.743	42.194
WP97	R1	CMU 8" Typ	0.915	76	1.113	89	2.582	76	55.295	26.765	9.236
WP98	R1	CMU 6" Vert at 24"	0.176	76	2.474	89	1.087	76	274.675	450.823	75.713
WP99	R1	CMU 6" Typ	0.182	74	0.266	87	1	72	136.775	82.051	20.633
WP100	R1	CMU 6" Typ	0.36	76	0.332	87	0.885	89	62.12	33.914	6.937
WP101	R1	CMU 6" Typ	0.266	74	0.315	89	1	67	91.087	52.538	12.936

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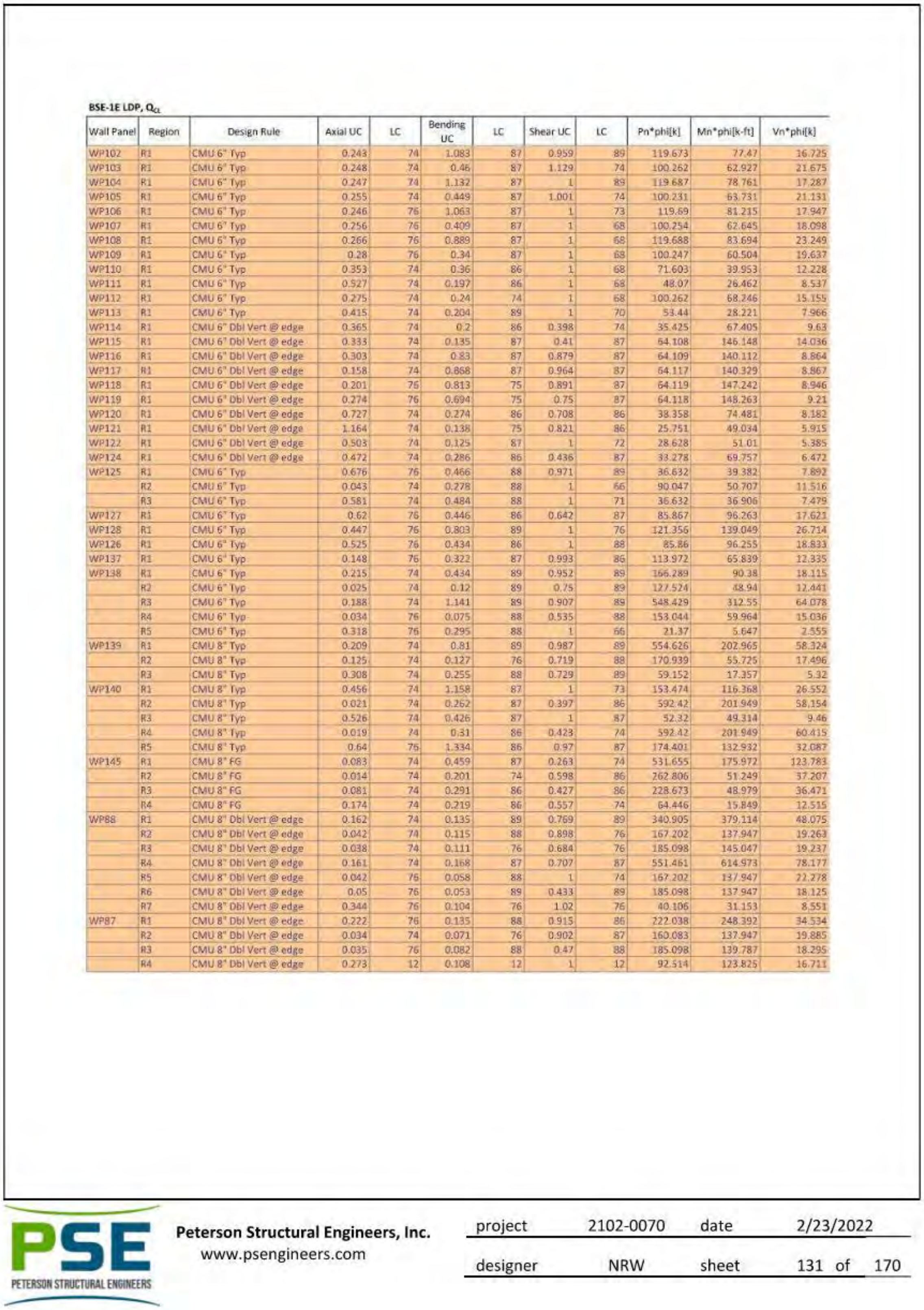

BSE-1E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP102	R1	CMU 6" Typ	0.243	74	1.083	87	0.959	89	119.673	77.47	16.725
WP103	R1	CMU 6" Typ	0.248	74	0.46	87	1.129	74	100.262	62.927	21.675
WP104	R1	CMU 6" Typ	0.247	74	1.132	87	1	89	119.687	78.761	17.287
WP105	R1	CMU 6" Typ	0.255	74	0.449	87	1.001	74	100.231	63.731	21.131
WP106	R1	CMU 6" Typ	0.246	76	1.063	87	1	73	119.69	81.215	17.947
WP107	R1	CMU 6" Typ	0.256	76	0.409	87	1	68	100.254	62.645	18.098
WP108	R1	CMU 6" Typ	0.266	76	0.889	87	1	68	119.688	83.694	23.249
WP109	R1	CMU 6" Typ	0.28	76	0.34	87	1	68	100.247	60.504	19.637
WP110	R1	CMU 6" Typ	0.353	74	0.36	86	1	68	71.603	39.953	12.228
WP111	R1	CMU 6" Typ	0.527	74	0.197	86	1	68	48.07	26.462	8.537
WP112	R1	CMU 6" Typ	0.275	74	0.24	74	1	68	100.262	68.246	15.155
WP113	R1	CMU 6" Typ	0.415	74	0.204	89	1	70	53.44	28.221	7.966
WP114	R1	CMU 6" Dbl Vert @ edge	0.365	74	0.2	86	0.398	74	35.425	67.405	9.63
WP115	R1	CMU 6" Dbl Vert @ edge	0.333	74	0.135	87	0.41	87	64.108	146.148	14.036
WP116	R1	CMU 6" Dbl Vert @ edge	0.303	74	0.83	87	0.879	87	64.109	140.112	8.864
WP117	R1	CMU 6" Dbl Vert @ edge	0.158	74	0.868	87	0.964	87	64.117	140.329	8.867
WP118	R1	CMU 6" Dbl Vert @ edge	0.201	76	0.813	75	0.891	87	64.119	147.242	8.946
WP119	R1	CMU 6" Dbl Vert @ edge	0.274	76	0.694	75	0.75	87	64.118	148.263	9.21
WP120	R1	CMU 6" Dbl Vert @ edge	0.727	74	0.274	86	0.708	86	38.358	74.481	8.182
WP121	R1	CMU 6" Dbl Vert @ edge	1.164	74	0.138	75	0.821	86	25.751	49.034	5.915
WP122	R1	CMU 6" Dbl Vert @ edge	0.503	74	0.125	87	1	72	28.628	51.01	5.385
WP124	R1	CMU 6" Dbl Vert @ edge	0.472	74	0.286	86	0.436	87	33.278	69.757	6.472
WP125	R1	CMU 6" Typ	0.676	76	0.466	88	0.971	89	36.632	39.382	7.892
	R2	CMU 6" Typ	0.043	74	0.278	88	1	66	90.047	50.707	11.516
	R3	CMU 6" Typ	0.581	74	0.484	88	1	71	36.632	36.906	7.479
WP127	R1	CMU 6" Typ	0.62	76	0.446	86	0.642	87	85.867	96.263	17.621
WP128	R1	CMU 6" Typ	0.447	76	0.803	89	1	76	121.356	139.049	26.714
WP126	R1	CMU 6" Typ	0.525	76	0.434	86	1	88	85.86	96.255	18.833
WP137	R1	CMU 6" Typ	0.148	76	0.322	87	0.993	86	113.972	65.839	12.335
WP138	R1	CMU 6" Typ	0.215	74	0.434	89	0.952	89	166.289	90.38	18.115
	R2	CMU 6" Typ	0.025	74	0.12	89	0.75	89	127.524	48.94	12.441
	R3	CMU 6" Typ	0.188	74	1.141	89	0.907	89	548.429	312.55	64.078
	R4	CMU 6" Typ	0.034	76	0.075	88	0.535	88	153.044	59.964	15.036
	R5	CMU 6" Typ	0.318	76	0.295	88	1	66	21.37	5.647	2.555
WP139	R1	CMU 8" Typ	0.209	74	0.81	89	0.987	89	554.626	202.965	58.324
	R2	CMU 8" Typ	0.125	74	0.127	76	0.719	88	170.939	55.725	17.496
	R3	CMU 8" Typ	0.308	74	0.255	88	0.729	89	59.152	17.357	5.32
WP140	R1	CMU 8" Typ	0.456	74	1.158	87	1	73	153.474	116.368	26.552
	R2	CMU 8" Typ	0.021	74	0.262	87	0.397	86	592.42	201.949	58.154
	R3	CMU 8" Typ	0.526	74	0.426	87	1	87	52.32	49.314	9.46
	R4	CMU 8" Typ	0.019	74	0.31	86	0.423	74	592.42	201.949	60.415
	R5	CMU 8" Typ	0.64	76	1.334	86	0.97	87	174.401	132.932	32.087
WP145	R1	CMU 8" FG	0.083	74	0.459	87	0.263	74	531.655	175.972	123.783
	R2	CMU 8" FG	0.014	74	0.201	74	0.598	86	262.806	51.249	37.207
	R3	CMU 8" FG	0.081	74	0.291	86	0.427	86	228.673	48.979	36.471
	R4	CMU 8" FG	0.174	74	0.219	86	0.557	74	64.446	15.849	12.515
WP88	R1	CMU 8" Dbl Vert @ edge	0.162	74	0.135	89	0.769	89	340.905	379.114	48.075
	R2	CMU 8" Dbl Vert @ edge	0.042	74	0.115	88	0.898	76	167.202	137.947	19.263
	R3	CMU 8" Dbl Vert @ edge	0.038	74	0.111	76	0.684	76	185.098	145.047	19.237
	R4	CMU 8" Dbl Vert @ edge	0.161	74	0.168	87	0.707	87	551.461	614.973	78.177
	R5	CMU 8" Dbl Vert @ edge	0.042	76	0.058	88	1	74	167.202	137.947	22.278
	R6	CMU 8" Dbl Vert @ edge	0.05	76	0.053	89	0.433	89	185.098	137.947	18.125
	R7	CMU 8" Dbl Vert @ edge	0.344	76	0.104	76	1.02	76	40.106	31.153	8.551
WP87	R1	CMU 8" Dbl Vert @ edge	0.222	76	0.135	88	0.915	86	222.038	248.392	34.534
	R2	CMU 8" Dbl Vert @ edge	0.034	74	0.071	76	0.902	87	160.083	137.947	19.885
	R3	CMU 8" Dbl Vert @ edge	0.035	76	0.082	88	0.47	88	185.098	139.787	18.295
	R4	CMU 8" Dbl Vert @ edge	0.273	12	0.108	12	1	12	92.514	123.825	16.711

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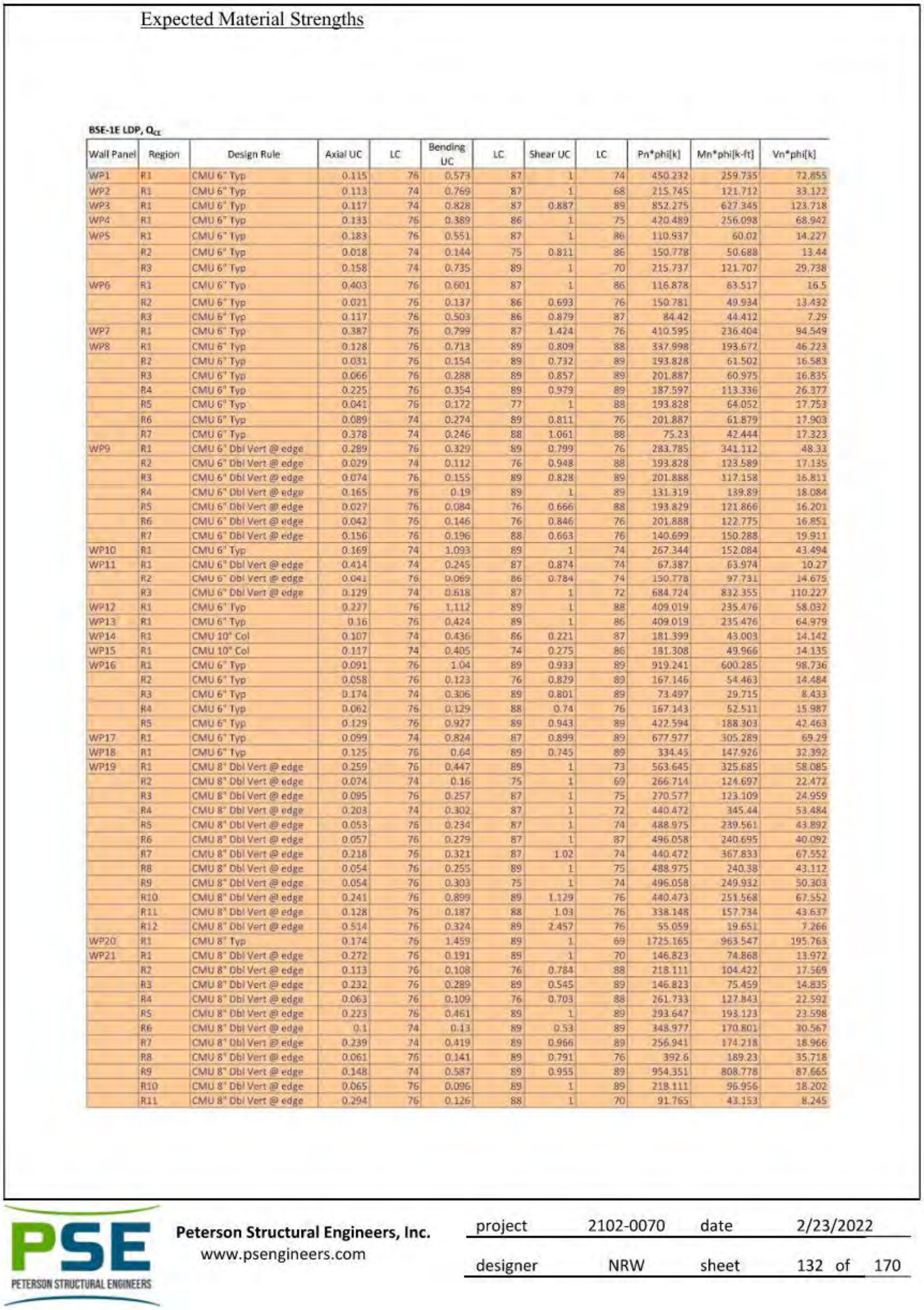

Expected Material Strengths

BSE-1E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP1	R1	CMU 6" Typ	0.115	76	0.573	87	1	74	450.232	259.735	72.855
WP2	R1	CMU 6" Typ	0.113	74	0.769	87	1	68	215.745	121.712	33.122
WP3	R1	CMU 6" Typ	0.117	74	0.828	87	0.887	89	852.275	627.345	123.718
WP4	R1	CMU 6" Typ	0.133	76	0.389	86	1	75	420.489	256.098	68.942
WP5	R1	CMU 6" Typ	0.183	76	0.551	87	1	86	110.937	60.02	14.227
	R2	CMU 6" Typ	0.018	74	0.144	75	0.811	86	150.778	50.688	13.44
	R3	CMU 6" Typ	0.158	74	0.735	89	1	70	215.737	121.707	29.738
WP6	R1	CMU 6" Typ	0.403	76	0.601	87	1	86	116.878	63.517	16.5
	R2	CMU 6" Typ	0.021	76	0.137	86	0.693	76	150.781	49.934	13.432
	R3	CMU 6" Typ	0.117	76	0.503	86	0.879	87	84.42	44.412	7.29
WP7	R1	CMU 6" Typ	0.387	76	0.799	87	1.424	76	410.595	236.404	94.549
WP8	R1	CMU 6" Typ	0.128	76	0.713	89	0.809	88	337.998	193.672	46.223
	R2	CMU 6" Typ	0.031	76	0.154	89	0.732	89	193.828	61.502	16.583
	R3	CMU 6" Typ	0.066	76	0.288	89	0.857	89	201.887	60.975	16.835
	R4	CMU 6" Typ	0.225	76	0.354	89	0.979	89	187.597	113.336	26.377
	R5	CMU 6" Typ	0.041	76	0.172	77	1	88	193.828	64.052	17.753
	R6	CMU 6" Typ	0.089	74	0.274	89	0.811	76	201.887	61.879	17.903
	R7	CMU 6" Typ	0.378	74	0.246	88	1.061	88	75.23	42.444	17.323
WP9	R1	CMU 6" Dbl Vert @ edge	0.289	76	0.329	89	0.799	76	283.785	341.112	48.33
	R2	CMU 6" Dbl Vert @ edge	0.029	74	0.112	76	0.948	88	193.828	123.589	17.135
	R3	CMU 6" Dbl Vert @ edge	0.074	76	0.155	89	0.828	89	201.888	117.158	16.811
	R4	CMU 6" Dbl Vert @ edge	0.165	76	0.19	89	1	89	131.319	139.89	18.084
	R5	CMU 6" Dbl Vert @ edge	0.027	76	0.084	76	0.666	88	193.829	121.866	16.201
	R6	CMU 6" Dbl Vert @ edge	0.042	76	0.146	76	0.846	76	201.888	122.775	16.851
	R7	CMU 6" Dbl Vert @ edge	0.156	76	0.196	88	0.663	76	140.699	150.288	19.911
WP10	R1	CMU 6" Typ	0.169	74	1.093	89	1	74	267.344	152.084	43.494
WP11	R1	CMU 6" Dbl Vert @ edge	0.414	74	0.245	87	0.874	74	67.387	63.974	10.27
	R2	CMU 6" Dbl Vert @ edge	0.041	76	0.069	86	0.784	74	150.778	97.731	14.675
	R3	CMU 6" Dbl Vert @ edge	0.129	74	0.618	87	1	72	684.724	832.355	110.227
WP12	R1	CMU 6" Typ	0.227	76	1.112	89	1	88	409.019	235.476	58.032
WP13	R1	CMU 6" Typ	0.16	76	0.424	89	1	86	409.019	235.476	64.979
WP14	R1	CMU 10" Col	0.107	74	0.436	86	0.221	87	181.399	43.003	14.142
WP15	R1	CMU 10" Col	0.117	74	0.405	74	0.275	86	181.308	49.966	14.135
WP16	R1	CMU 6" Typ	0.091	76	1.04	89	0.933	89	919.241	600.285	98.736
	R2	CMU 6" Typ	0.058	76	0.123	76	0.829	89	167.146	54.463	14.484
	R3	CMU 6" Typ	0.174	74	0.306	89	0.801	89	73.497	29.715	8.433
	R4	CMU 6" Typ	0.062	76	0.129	88	0.74	76	167.143	52.511	15.987
	R5	CMU 6" Typ	0.129	76	0.927	89	0.943	89	422.594	188.303	42.463
WP17	R1	CMU 6" Typ	0.099	74	0.824	87	0.899	89	677.977	305.289	69.29
WP18	R1	CMU 6" Typ	0.125	76	0.64	89	0.745	89	334.45	147.926	32.392
WP19	R1	CMU 8" Dbl Vert @ edge	0.259	76	0.447	89	1	73	563.645	325.685	58.085
	R2	CMU 8" Dbl Vert @ edge	0.074	74	0.16	75	1	69	266.714	124.697	22.472
	R3	CMU 8" Dbl Vert @ edge	0.095	76	0.257	87	1	75	270.577	123.109	24.959
	R4	CMU 8" Dbl Vert @ edge	0.203	74	0.302	87	1	72	440.472	345.44	53.484
	R5	CMU 8" Dbl Vert @ edge	0.053	76	0.234	87	1	74	488.975	239.561	43.892
	R6	CMU 8" Dbl Vert @ edge	0.057	76	0.279	87	1	87	496.058	240.695	40.092
	R7	CMU 8" Dbl Vert @ edge	0.218	76	0.321	87	1.02	74	440.472	367.833	67.552
	R8	CMU 8" Dbl Vert @ edge	0.054	76	0.255	89	1	75	488.975	240.38	43.112
	R9	CMU 8" Dbl Vert @ edge	0.054	76	0.303	75	1	74	496.058	249.932	50.303
	R10	CMU 8" Dbl Vert @ edge	0.241	76	0.899	89	1.129	76	440.473	251.568	67.552
	R11	CMU 8" Dbl Vert @ edge	0.128	76	0.187	88	1.03	76	338.148	157.734	43.637
	R12	CMU 8" Dbl Vert @ edge	0.514	76	0.324	89	2.457	76	55.059	19.651	7.266
WP20	R1	CMU 8" Typ	0.174	76	1.459	89	1	69	1725.165	963.547	195.763
WP21	R1	CMU 8" Dbl Vert @ edge	0.272	76	0.191	89	1	70	146.823	74.868	13.972
	R2	CMU 8" Dbl Vert @ edge	0.113	76	0.108	76	0.784	88	218.111	104.422	17.569
	R3	CMU 8" Dbl Vert @ edge	0.232	76	0.289	89	0.545	89	146.823	75.459	14.835
	R4	CMU 8" Dbl Vert @ edge	0.063	76	0.109	76	0.703	88	261.733	127.843	22.592
	R5	CMU 8" Dbl Vert @ edge	0.223	76	0.461	89	1	89	293.647	193.123	23.598
	R6	CMU 8" Dbl Vert @ edge	0.1	74	0.13	89	0.53	89	348.977	170.801	30.567
	R7	CMU 8" Dbl Vert @ edge	0.239	74	0.419	89	0.966	89	256.941	174.218	18.966
	R8	CMU 8" Dbl Vert @ edge	0.061	76	0.141	89	0.791	76	392.6	189.23	35.718
	R9	CMU 8" Dbl Vert @ edge	0.148	74	0.587	89	0.955	89	954.351	808.778	87.665
	R10	CMU 8" Dbl Vert @ edge	0.065	76	0.096	89	1	89	218.111	96.956	18.202
	R11	CMU 8" Dbl Vert @ edge	0.294	76	0.126	88	1	70	91.765	43.153	8.245

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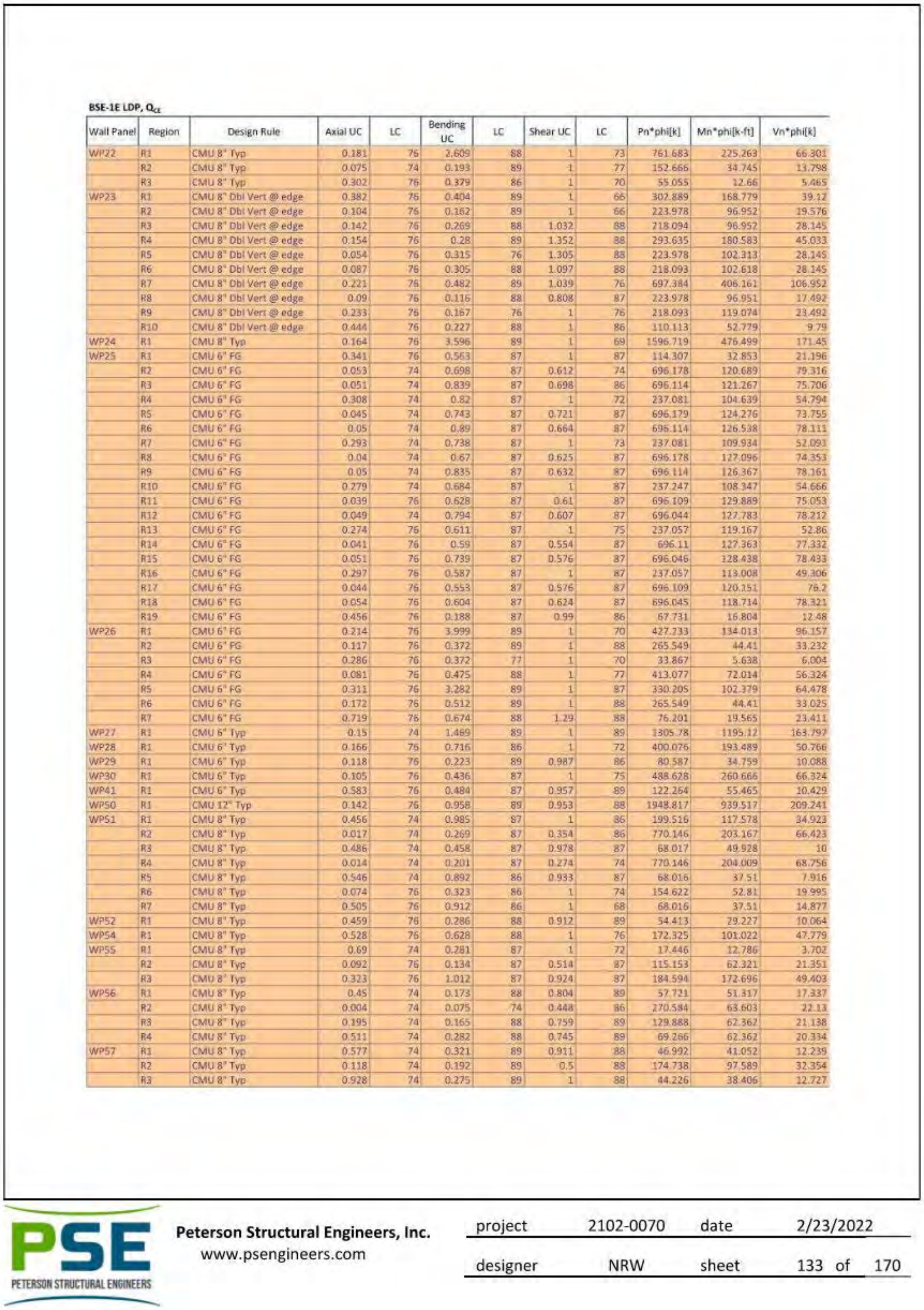

BSE-1E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP22	R1	CMU 8" Typ	0.181	76	2.609	88	1	73	761.683	225.263	66.301
	R2	CMU 8" Typ	0.075	74	0.193	89	1	77	152.666	34.745	13.798
	R3	CMU 8" Typ	0.302	76	0.379	86	1	70	55.055	12.66	5.465
WP23	R1	CMU 8" Dbl Vert @ edge	0.382	76	0.404	89	1	66	302.889	168.779	39.12
	R2	CMU 8" Dbl Vert @ edge	0.104	76	0.162	89	1	66	223.978	96.952	19.576
	R3	CMU 8" Dbl Vert @ edge	0.142	76	0.269	88	1.032	88	218.094	96.952	28.145
	R4	CMU 8" Dbl Vert @ edge	0.154	76	0.28	89	1.352	88	293.635	180.583	45.033
	R5	CMU 8" Dbl Vert @ edge	0.054	76	0.315	76	1.305	88	223.978	102.313	28.145
	R6	CMU 8" Dbl Vert @ edge	0.087	76	0.305	88	1.097	88	218.093	102.618	28.145
	R7	CMU 8" Dbl Vert @ edge	0.221	76	0.482	89	1.039	76	697.384	406.161	106.952
	R8	CMU 8" Dbl Vert @ edge	0.09	76	0.116	88	0.808	87	223.978	96.951	17.492
	R9	CMU 8" Dbl Vert @ edge	0.233	76	0.167	76	1	76	218.093	119.074	23.492
	R10	CMU 8" Dbl Vert @ edge	0.444	76	0.227	88	1	86	110.113	52.779	9.79
WP24	R1	CMU 8" Typ	0.164	76	3.596	89	1	69	1596.719	476.499	171.45
WP25	R1	CMU 6" FG	0.341	76	0.563	87	1	87	114.307	32.853	21.196
	R2	CMU 6" FG	0.053	74	0.698	87	0.612	74	696.178	120.689	79.316
	R3	CMU 6" FG	0.051	74	0.839	87	0.698	86	696.114	121.267	75.706
	R4	CMU 6" FG	0.308	74	0.82	87	1	72	237.081	104.639	54.794
	R5	CMU 6" FG	0.045	74	0.743	87	0.721	87	696.179	124.276	73.755
	R6	CMU 6" FG	0.05	74	0.89	87	0.664	87	696.114	126.538	78.111
	R7	CMU 6" FG	0.293	74	0.738	87	1	73	237.081	109.934	52.093
	R8	CMU 6" FG	0.04	74	0.67	87	0.625	87	696.178	127.096	74.353
	R9	CMU 6" FG	0.05	74	0.835	87	0.632	87	696.114	126.367	78.161
	R10	CMU 6" FG	0.279	74	0.684	87	1	87	237.247	108.347	54.666
	R11	CMU 6" FG	0.039	76	0.628	87	0.61	87	696.109	129.889	75.053
	R12	CMU 6" FG	0.049	74	0.794	87	0.607	87	696.044	127.783	78.212
	R13	CMU 6" FG	0.274	76	0.611	87	1	75	237.057	119.167	52.86
	R14	CMU 6" FG	0.041	76	0.59	87	0.554	87	696.11	127.363	77.332
	R15	CMU 6" FG	0.051	76	0.739	87	0.576	87	696.046	128.438	78.433
	R16	CMU 6" FG	0.297	76	0.587	87	1	87	237.057	113.008	49.306
	R17	CMU 6" FG	0.044	76	0.553	87	0.576	87	696.109	120.151	76.2
	R18	CMU 6" FG	0.054	76	0.604	87	0.624	87	696.045	118.714	78.321
	R19	CMU 6" FG	0.456	76	0.188	87	0.99	86	67.731	16.804	12.48
WP26	R1	CMU 6" FG	0.214	76	3.999	89	1	70	427.233	134.013	96.157
	R2	CMU 6" FG	0.117	76	0.372	89	1	88	265.549	44.41	33.232
	R3	CMU 6" FG	0.286	76	0.372	77	1	70	33.867	5.638	6.004
	R4	CMU 6" FG	0.081	76	0.475	88	1	77	413.077	72.014	56.324
	R5	CMU 6" FG	0.311	76	3.282	89	1	87	330.205	102.379	64.478
	R6	CMU 6" FG	0.172	76	0.512	89	1	88	265.549	44.41	33.025
	R7	CMU 6" FG	0.719	76	0.674	88	1.29	88	76.201	19.565	23.411
WP27	R1	CMU 6" Typ	0.15	74	1.469	89	1	89	1305.78	1195.12	163.797
WP28	R1	CMU 6" Typ	0.166	76	0.716	86	1	72	400.076	193.489	50.766
WP29	R1	CMU 6" Typ	0.118	76	0.223	89	0.987	86	80.587	34.759	10.088
WP30	R1	CMU 6" Typ	0.105	76	0.436	87	1	75	488.628	260.666	66.324
WP41	R1	CMU 6" Typ	0.583	76	0.484	87	0.957	89	122.264	55.465	10.429
WP50	R1	CMU 12" Typ	0.142	76	0.958	89	0.953	88	1948.817	939.517	209.241
WP51	R1	CMU 8" Typ	0.456	74	0.985	87	1	86	199.516	117.578	34.923
	R2	CMU 8" Typ	0.017	74	0.269	87	0.354	86	770.146	203.167	66.423
	R3	CMU 8" Typ	0.486	74	0.458	87	0.978	87	68.017	49.928	10
	R4	CMU 8" Typ	0.014	74	0.201	87	0.274	74	770.146	204.009	68.756
	R5	CMU 8" Typ	0.546	74	0.892	86	0.933	87	68.016	37.51	7.916
	R6	CMU 8" Typ	0.074	76	0.323	86	1	74	154.622	52.81	19.995
	R7	CMU 8" Typ	0.505	76	0.912	86	1	68	68.016	37.51	14.877
WP52	R1	CMU 8" Typ	0.459	76	0.286	88	0.912	89	54.413	29.227	10.064
WP54	R1	CMU 8" Typ	0.528	76	0.628	88	1	76	172.325	101.022	47.779
WP55	R1	CMU 8" Typ	0.69	74	0.281	87	1	72	17.446	12.786	3.702
	R2	CMU 8" Typ	0.092	76	0.134	87	0.514	87	115.153	62.321	21.351
	R3	CMU 8" Typ	0.323	76	1.012	87	0.924	87	184.594	172.696	49.403
WP56	R1	CMU 8" Typ	0.45	74	0.173	88	0.804	89	57.721	51.317	17.337
	R2	CMU 8" Typ	0.004	74	0.075	74	0.448	86	270.584	63.603	22.13
	R3	CMU 8" Typ	0.195	74	0.165	88	0.759	89	129.888	62.362	21.138
	R4	CMU 8" Typ	0.511	74	0.282	88	0.745	89	69.266	62.362	20.334
WP57	R1	CMU 8" Typ	0.577	74	0.321	89	0.911	88	46.992	41.052	12.239
	R2	CMU 8" Typ	0.118	74	0.192	89	0.5	88	174.738	97.589	32.354
	R3	CMU 8" Typ	0.928	74	0.275	89	1	88	44.226	38.406	12.727

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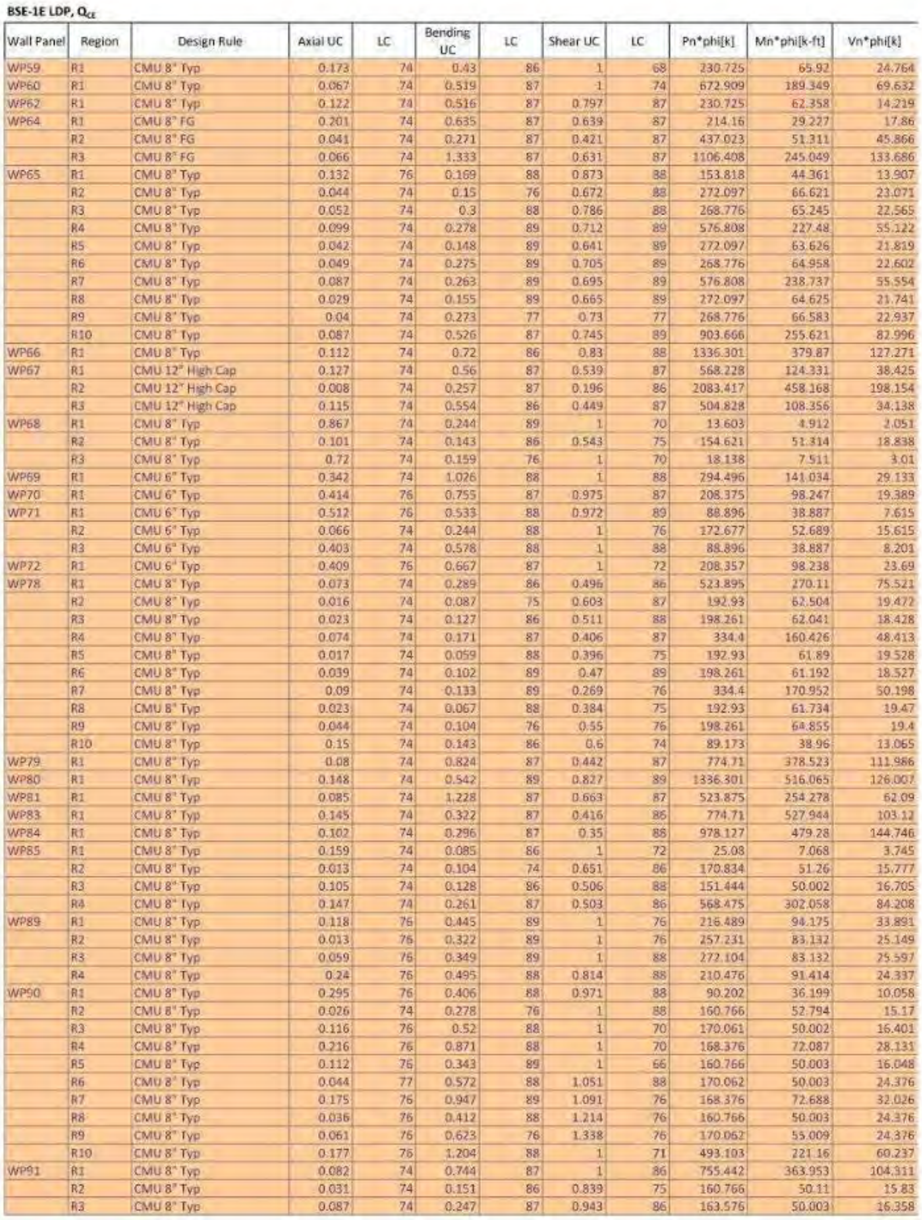

BSE-1E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP59	R1	CMU 8" Typ	0.173	74	0.43	86	1	68	230.725	65.92	24.764
WP60	R1	CMU 8" Typ	0.067	74	0.519	87	1	74	672.909	189.349	69.632
WP62	R1	CMU 8" Typ	0.122	74	0.516	87	0.797	87	230.725	62.358	14.219
WP64	R1	CMU 8" FG	0.201	74	0.635	87	0.639	87	214.16	29.227	17.86
	R2	CMU 8" FG	0.041	74	0.271	87	0.421	87	437.023	51.311	45.866
	R3	CMU 8" FG	0.066	74	1.333	87	0.631	87	1106.408	245.049	133.686
WP65	R1	CMU 8" Typ	0.132	76	0.169	88	0.873	88	153.818	44.361	13.907
	R2	CMU 8" Typ	0.044	74	0.15	76	0.672	88	272.097	66.621	23.071
	R3	CMU 8" Typ	0.052	74	0.3	88	0.786	88	268.776	65.245	22.565
	R4	CMU 8" Typ	0.099	74	0.278	89	0.712	89	576.808	227.48	55.122
	R5	CMU 8" Typ	0.042	74	0.148	89	0.641	89	272.097	63.626	21.819
	R6	CMU 8" Typ	0.049	74	0.275	89	0.705	89	268.776	64.958	22.602
	R7	CMU 8" Typ	0.087	74	0.263	89	0.695	89	576.808	238.737	55.554
	R8	CMU 8" Typ	0.029	74	0.155	89	0.665	89	272.097	64.625	21.741
	R9	CMU 8" Typ	0.04	74	0.273	77	0.73	77	268.776	66.583	22.937
	R10	CMU 8" Typ	0.087	74	0.526	87	0.745	89	903.666	255.621	82.996
WP66	R1	CMU 8" Typ	0.112	74	0.72	86	0.83	88	1336.301	379.87	127.271
WP67	R1	CMU 12" High Cap	0.127	74	0.56	87	0.539	87	568.228	124.331	38.425
	R2	CMU 12" High Cap	0.008	74	0.257	87	0.196	86	2083.417	458.168	198.154
	R3	CMU 12" High Cap	0.115	74	0.554	86	0.449	87	504.828	108.356	34.138
WP68	R1	CMU 8" Typ	0.867	74	0.244	89	1	70	13.603	4.912	2.051
	R2	CMU 8" Typ	0.101	74	0.143	86	0.543	75	154.621	51.314	18.838
	R3	CMU 8" Typ	0.72	74	0.159	76	1	70	18.138	7.511	3.01
WP69	R1	CMU 6" Typ	0.342	74	1.026	88	1	88	294.496	141.034	29.133
WP70	R1	CMU 6" Typ	0.414	76	0.755	87	0.975	87	208.375	98.247	19.389
WP71	R1	CMU 6" Typ	0.512	76	0.533	88	0.972	89	88.896	38.887	7.615
	R2	CMU 6" Typ	0.066	74	0.244	88	1	76	172.677	52.689	15.615
	R3	CMU 6" Typ	0.403	74	0.578	88	1	88	88.896	38.887	8.201
WP72	R1	CMU 6" Typ	0.409	76	0.667	87	1	72	208.357	98.238	23.69
WP78	R1	CMU 8" Typ	0.073	74	0.289	86	0.496	86	523.895	270.11	75.521
	R2	CMU 8" Typ	0.016	74	0.087	75	0.603	87	192.93	62.504	19.472
	R3	CMU 8" Typ	0.023	74	0.127	86	0.511	88	198.261	62.041	18.428
	R4	CMU 8" Typ	0.074	74	0.171	87	0.406	87	334.4	160.426	48.413
	R5	CMU 8" Typ	0.017	74	0.059	88	0.396	75	192.93	61.89	19.528
	R6	CMU 8" Typ	0.039	74	0.102	89	0.47	89	198.261	61.192	18.527
	R7	CMU 8" Typ	0.09	74	0.133	89	0.269	76	334.4	170.952	50.198
	R8	CMU 8" Typ	0.023	74	0.067	88	0.384	75	192.93	61.734	19.47
	R9	CMU 8" Typ	0.044	74	0.104	76	0.55	76	198.261	64.855	19.4
	R10	CMU 8" Typ	0.15	74	0.143	86	0.6	74	89.173	38.96	13.065
WP79	R1	CMU 8" Typ	0.08	74	0.824	87	0.442	87	774.71	378.523	111.986
WP80	R1	CMU 8" Typ	0.148	74	0.542	89	0.827	89	1336.301	516.065	126.007
WP81	R1	CMU 8" Typ	0.085	74	1.228	87	0.663	87	523.875	254.278	62.09
WP83	R1	CMU 8" Typ	0.145	74	0.322	87	0.416	86	774.71	527.944	103.12
WP84	R1	CMU 8" Typ	0.102	74	0.296	87	0.35	88	978.127	479.28	144.746
WP85	R1	CMU 8" Typ	0.159	74	0.085	86	1	72	25.08	7.068	3.745
	R2	CMU 8" Typ	0.013	74	0.104	74	0.651	86	170.834	51.26	15.777
	R3	CMU 8" Typ	0.105	74	0.128	86	0.506	88	151.444	50.002	16.705
	R4	CMU 8" Typ	0.147	74	0.261	87	0.503	86	568.475	302.058	84.208
WP89	R1	CMU 8" Typ	0.118	76	0.445	89	1	76	216.489	94.175	33.891
	R2	CMU 8" Typ	0.013	76	0.322	89	1	76	257.231	83.132	25.149
	R3	CMU 8" Typ	0.059	76	0.349	89	1	88	272.104	83.132	25.597
	R4	CMU 8" Typ	0.24	76	0.495	88	0.814	88	210.476	91.414	24.337
WP90	R1	CMU 8" Typ	0.295	76	0.406	88	0.971	88	90.202	36.199	10.058
	R2	CMU 8" Typ	0.026	74	0.278	76	1	88	160.766	52.794	15.17
	R3	CMU 8" Typ	0.116	76	0.52	88	1	70	170.061	50.002	16.401
	R4	CMU 8" Typ	0.216	76	0.871	88	1	70	168.376	72.087	28.131
	R5	CMU 8" Typ	0.112	76	0.343	89	1	66	160.766	50.003	16.048
	R6	CMU 8" Typ	0.044	77	0.572	88	1.051	88	170.062	50.003	24.376
	R7	CMU 8" Typ	0.175	76	0.947	89	1.091	76	168.376	72.688	32.026
	R8	CMU 8" Typ	0.036	76	0.412	88	1.214	76	160.766	50.003	24.376
	R9	CMU 8" Typ	0.061	76	0.623	76	1.338	76	170.062	55.009	24.376
	R10	CMU 8" Typ	0.177	76	1.204	88	1	71	493.103	221.16	60.237
WP91	R1	CMU 8" Typ	0.082	74	0.744	87	1	86	755.442	363.953	104.311
	R2	CMU 8" Typ	0.031	74	0.151	86	0.839	75	160.766	50.11	15.83
	R3	CMU 8" Typ	0.087	74	0.247	87	0.943	86	163.576	50.003	16.358

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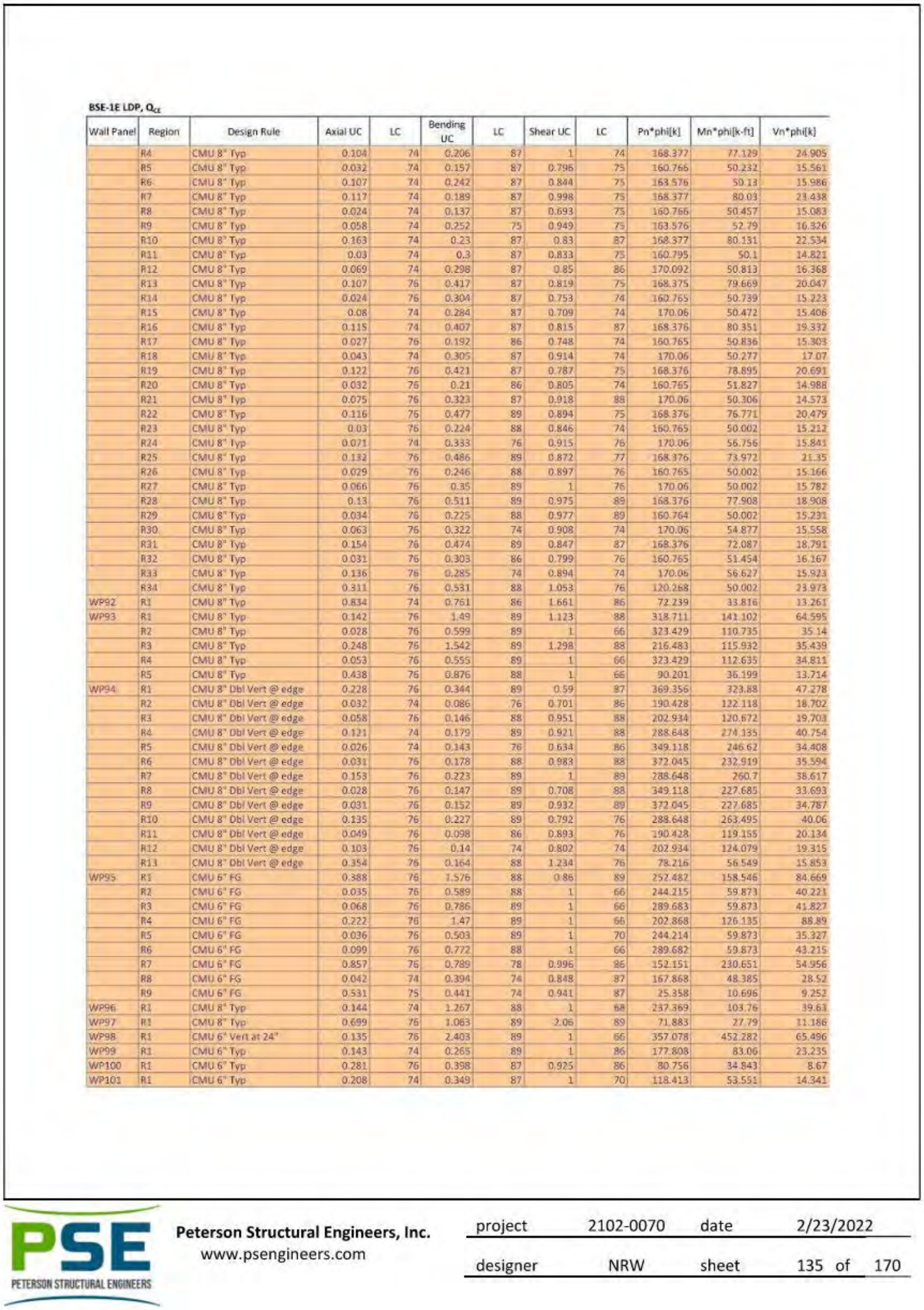

BSE-1E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
	R4	CMU 8" Typ	0.104	74	0.206	87	1	74	168.377	77.129	24.905
	R5	CMU 8" Typ	0.032	74	0.157	87	0.796	75	160.766	50.232	15.561
	R6	CMU 8" Typ	0.107	74	0.242	87	0.844	75	163.576	50.13	15.986
	R7	CMU 8" Typ	0.117	74	0.189	87	0.998	75	168.377	80.03	23.438
	R8	CMU 8" Typ	0.024	74	0.137	87	0.693	75	160.766	50.457	15.083
	R9	CMU 8" Typ	0.058	74	0.252	75	0.949	75	163.576	52.79	16.326
	R10	CMU 8" Typ	0.163	74	0.23	87	0.83	87	168.377	80.131	22.534
	R11	CMU 8" Typ	0.03	74	0.3	87	0.833	75	160.795	50.1	14.821
	R12	CMU 8" Typ	0.069	74	0.298	87	0.85	86	170.092	50.813	16.368
	R13	CMU 8" Typ	0.107	76	0.417	87	0.819	75	168.375	79.669	20.047
	R14	CMU 8" Typ	0.024	76	0.304	87	0.753	74	160.765	50.739	15.223
	R15	CMU 8" Typ	0.08	74	0.284	87	0.709	74	170.06	50.472	15.406
	R16	CMU 8" Typ	0.115	74	0.407	87	0.815	87	168.376	80.351	19.332
	R17	CMU 8" Typ	0.027	76	0.192	86	0.748	74	160.765	50.836	15.303
	R18	CMU 8" Typ	0.043	74	0.305	87	0.914	74	170.06	50.277	17.07
	R19	CMU 8" Typ	0.122	76	0.421	87	0.787	75	168.376	78.895	20.691
	R20	CMU 8" Typ	0.032	76	0.21	86	0.805	74	160.765	51.827	14.988
	R21	CMU 8" Typ	0.075	76	0.323	87	0.918	88	170.06	50.306	14.573
	R22	CMU 8" Typ	0.116	76	0.477	89	0.894	75	168.376	76.771	20.479
	R23	CMU 8" Typ	0.03	76	0.224	88	0.846	74	160.765	50.002	15.212
	R24	CMU 8" Typ	0.071	74	0.333	76	0.915	76	170.06	56.756	15.841
	R25	CMU 8" Typ	0.132	76	0.486	89	0.872	77	168.376	73.972	21.35
	R26	CMU 8" Typ	0.029	76	0.246	88	0.897	76	160.765	50.002	15.166
	R27	CMU 8" Typ	0.066	76	0.35	89	1	76	170.06	50.002	15.782
	R28	CMU 8" Typ	0.13	76	0.511	89	0.975	89	168.376	77.908	18.908
	R29	CMU 8" Typ	0.034	76	0.225	88	0.977	89	160.764	50.002	15.231
	R30	CMU 8" Typ	0.063	76	0.322	74	0.908	74	170.06	54.877	15.558
	R31	CMU 8" Typ	0.154	76	0.474	89	0.847	87	168.376	72.087	18.791
	R32	CMU 8" Typ	0.031	76	0.303	86	0.799	76	160.765	51.454	16.167
	R33	CMU 8" Typ	0.136	76	0.285	74	0.894	74	170.06	56.627	15.923
	R34	CMU 8" Typ	0.311	76	0.531	88	1.053	76	120.268	50.002	23.973
WP92	R1	CMU 8" Typ	0.834	74	0.761	86	1.661	86	72.239	33.816	13.261
WP93	R1	CMU 8" Typ	0.142	76	1.49	89	1.123	88	318.711	141.102	64.595
	R2	CMU 8" Typ	0.028	76	0.599	89	1	66	323.429	110.735	35.14
	R3	CMU 8" Typ	0.248	76	1.542	89	1.298	88	216.483	115.932	35.439
	R4	CMU 8" Typ	0.053	76	0.555	89	1	66	323.429	112.635	34.811
	R5	CMU 8" Typ	0.438	76	0.876	88	1	66	90.201	36.199	13.714
WP94	R1	CMU 8" Dbl Vert @ edge	0.228	76	0.344	89	0.59	87	369.356	323.88	47.278
	R2	CMU 8" Dbl Vert @ edge	0.032	74	0.086	76	0.701	86	190.428	122.118	18.702
	R3	CMU 8" Dbl Vert @ edge	0.058	76	0.146	88	0.951	88	202.934	120.672	19.703
	R4	CMU 8" Dbl Vert @ edge	0.121	74	0.179	89	0.921	88	288.648	274.135	40.754
	R5	CMU 8" Dbl Vert @ edge	0.026	74	0.143	76	0.634	86	349.118	246.62	34.408
	R6	CMU 8" Dbl Vert @ edge	0.031	76	0.178	88	0.983	88	372.045	232.919	35.594
	R7	CMU 8" Dbl Vert @ edge	0.153	76	0.223	89	1	89	288.648	260.7	38.617
	R8	CMU 8" Dbl Vert @ edge	0.028	76	0.147	89	0.708	88	349.118	227.685	33.693
	R9	CMU 8" Dbl Vert @ edge	0.031	76	0.152	89	0.932	89	372.045	227.685	34.787
	R10	CMU 8" Dbl Vert @ edge	0.135	76	0.227	89	0.792	76	288.648	263.495	40.06
	R11	CMU 8" Dbl Vert @ edge	0.049	76	0.098	86	0.893	76	190.428	119.155	20.134
	R12	CMU 8" Dbl Vert @ edge	0.103	76	0.14	74	0.802	74	202.934	124.079	19.315
	R13	CMU 8" Dbl Vert @ edge	0.354	76	0.164	88	1.234	76	78.216	56.549	15.853
WP95	R1	CMU 6" FG	0.388	76	1.576	88	0.86	89	252.482	158.546	84.669
	R2	CMU 6" FG	0.035	76	0.589	88	1	66	244.215	59.873	40.221
	R3	CMU 6" FG	0.068	76	0.786	89	1	66	289.683	59.873	41.827
	R4	CMU 6" FG	0.222	76	1.47	89	1	66	202.868	126.135	88.89
	R5	CMU 6" FG	0.036	76	0.503	89	1	70	244.214	59.873	35.327
	R6	CMU 6" FG	0.099	76	0.772	88	1	66	289.682	59.873	43.215
	R7	CMU 6" FG	0.857	76	0.789	78	0.996	86	152.151	230.651	54.956
	R8	CMU 6" FG	0.042	74	0.394	74	0.848	87	167.868	48.385	28.52
	R9	CMU 6" FG	0.531	75	0.441	74	0.941	87	25.358	10.696	9.252
WP96	R1	CMU 8" Typ	0.144	74	1.267	88	1	68	237.369	103.76	39.63
WP97	R1	CMU 8" Typ	0.699	76	1.063	89	2.06	89	71.883	27.79	11.186
WP98	R1	CMU 6" Vert at 24"	0.135	76	2.403	89	1	66	357.078	452.282	65.496
WP99	R1	CMU 6" Typ	0.143	74	0.265	89	1	86	177.808	83.06	23.235
WP100	R1	CMU 6" Typ	0.281	76	0.398	87	0.925	86	80.756	34.843	8.67
WP101	R1	CMU 6" Typ	0.208	74	0.349	87	1	70	118.413	53.551	14.341

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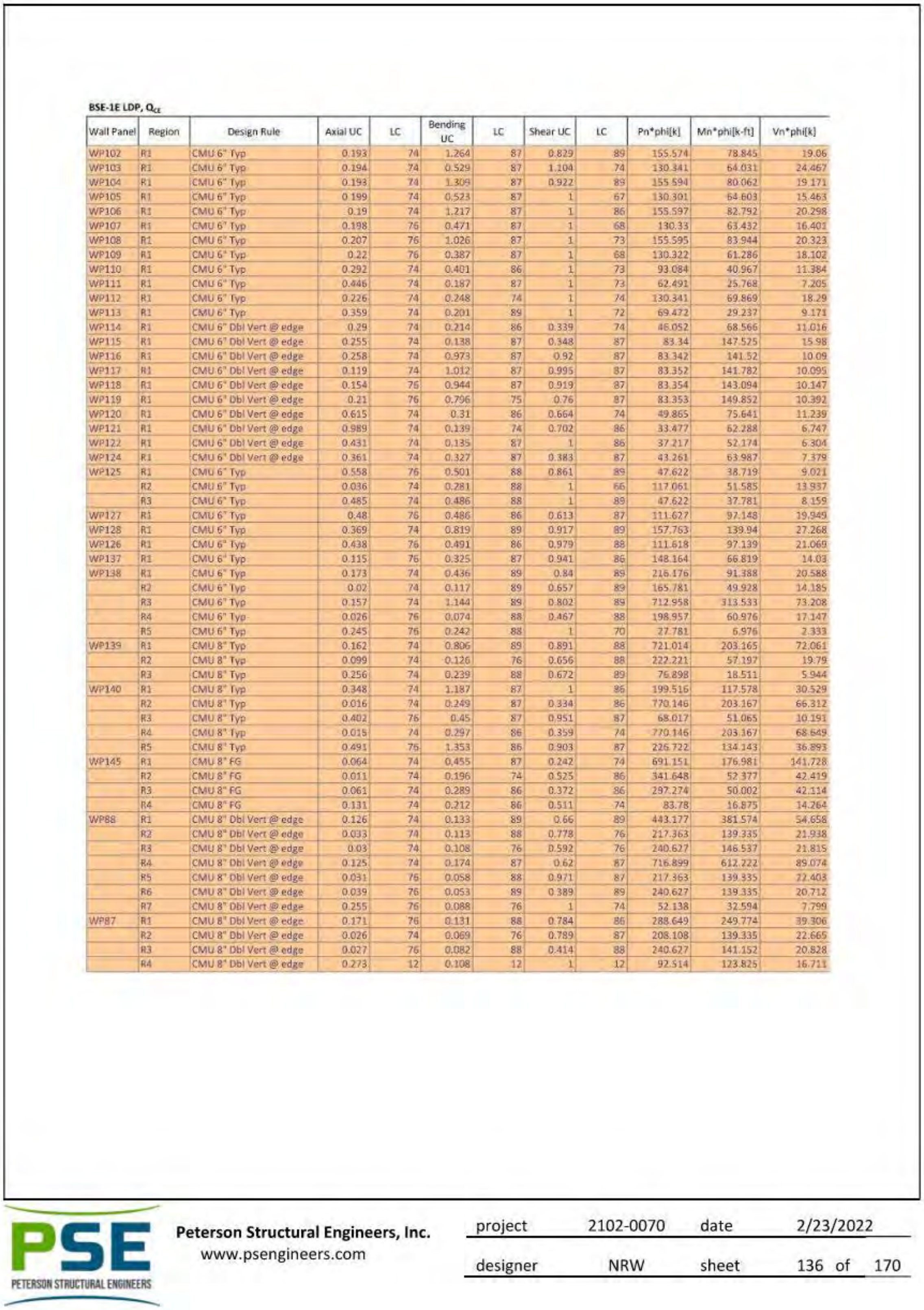

BSE-1E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP102	R1	CMU 6" Typ	0.193	74	1.264	87	0.829	89	155.574	78.845	19.06
WP103	R1	CMU 6" Typ	0.194	74	0.529	87	1.104	74	130.341	64.031	24.467
WP104	R1	CMU 6" Typ	0.193	74	1.309	87	0.922	89	155.594	80.062	19.171
WP105	R1	CMU 6" Typ	0.199	74	0.523	87	1	67	130.301	64.603	15.463
WP106	R1	CMU 6" Typ	0.19	74	1.217	87	1	86	155.597	82.792	20.298
WP107	R1	CMU 6" Typ	0.198	76	0.471	87	1	68	130.33	63.432	16.401
WP108	R1	CMU 6" Typ	0.207	76	1.026	87	1	73	155.595	83.944	20.323
WP109	R1	CMU 6" Typ	0.22	76	0.387	87	1	68	130.322	61.286	18.102
WP110	R1	CMU 6" Typ	0.292	74	0.401	86	1	73	93.084	40.967	11.384
WP111	R1	CMU 6" Typ	0.446	74	0.187	87	1	73	62.491	25.768	7.205
WP112	R1	CMU 6" Typ	0.226	74	0.248	74	1	74	130.341	69.869	18.29
WP113	R1	CMU 6" Typ	0.359	74	0.201	89	1	72	69.472	29.237	9.171
WP114	R1	CMU 6" Dbl Vert @ edge	0.29	74	0.214	86	0.339	74	46.052	68.566	11.016
WP115	R1	CMU 6" Dbl Vert @ edge	0.255	74	0.138	87	0.348	87	83.34	147.525	15.98
WP116	R1	CMU 6" Dbl Vert @ edge	0.258	74	0.973	87	0.92	87	83.342	141.52	10.09
WP117	R1	CMU 6" Dbl Vert @ edge	0.119	74	1.012	87	0.995	87	83.352	141.782	10.095
WP118	R1	CMU 6" Dbl Vert @ edge	0.154	76	0.944	87	0.919	87	83.354	143.094	10.147
WP119	R1	CMU 6" Dbl Vert @ edge	0.21	76	0.796	75	0.76	87	83.353	149.852	10.392
WP120	R1	CMU 6" Dbl Vert @ edge	0.615	74	0.31	86	0.664	74	49.865	75.641	11.239
WP121	R1	CMU 6" Dbl Vert @ edge	0.989	74	0.139	74	0.702	86	33.477	62.288	6.747
WP122	R1	CMU 6" Dbl Vert @ edge	0.431	74	0.135	87	1	86	37.217	52.174	6.304
WP124	R1	CMU 6" Dbl Vert @ edge	0.361	74	0.327	87	0.383	87	43.261	63.987	7.379
WP125	R1	CMU 6" Typ	0.558	76	0.501	88	0.861	89	47.622	38.719	9.021
	R2	CMU 6" Typ	0.036	74	0.281	88	1	66	117.061	51.585	13.937
	R3	CMU 6" Typ	0.485	74	0.486	88	1	89	47.622	37.781	8.159
WP127	R1	CMU 6" Typ	0.48	76	0.486	86	0.613	87	111.627	97.148	19.949
WP128	R1	CMU 6" Typ	0.369	74	0.819	89	0.917	89	157.763	139.94	27.268
WP126	R1	CMU 6" Typ	0.438	76	0.491	86	0.979	88	111.618	97.139	21.069
WP137	R1	CMU 6" Typ	0.115	76	0.325	87	0.941	86	148.164	66.819	14.03
WP138	R1	CMU 6" Typ	0.173	74	0.436	89	0.84	89	216.176	91.388	20.588
	R2	CMU 6" Typ	0.02	74	0.117	89	0.657	89	165.781	49.928	14.185
	R3	CMU 6" Typ	0.157	74	1.144	89	0.802	89	712.958	313.533	73.208
	R4	CMU 6" Typ	0.026	76	0.074	88	0.467	88	198.957	60.976	17.147
	R5	CMU 6" Typ	0.245	76	0.242	88	1	70	27.781	6.976	2.333
WP139	R1	CMU 8" Typ	0.162	74	0.806	89	0.891	88	721.014	203.165	72.061
	R2	CMU 8" Typ	0.099	74	0.126	76	0.656	88	222.221	57.197	19.79
	R3	CMU 8" Typ	0.256	74	0.239	88	0.672	89	76.898	18.511	5.944
WP140	R1	CMU 8" Typ	0.348	74	1.187	87	1	86	199.516	117.578	30.529
	R2	CMU 8" Typ	0.016	74	0.249	87	0.334	86	770.146	203.167	66.312
	R3	CMU 8" Typ	0.402	76	0.45	87	0.951	87	68.017	51.065	10.191
	R4	CMU 8" Typ	0.015	74	0.297	86	0.359	74	770.146	203.167	68.649
	R5	CMU 8" Typ	0.491	76	1.353	86	0.903	87	226.722	134.143	36.893
WP145	R1	CMU 8" FG	0.064	74	0.455	87	0.242	74	691.151	176.981	141.728
	R2	CMU 8" FG	0.011	74	0.196	74	0.525	86	341.648	52.377	42.419
	R3	CMU 8" FG	0.061	74	0.289	86	0.372	86	297.274	50.002	42.114
	R4	CMU 8" FG	0.131	74	0.212	86	0.511	74	83.78	16.875	14.264
WP88	R1	CMU 8" Dbl Vert @ edge	0.126	74	0.133	89	0.66	89	443.177	381.574	54.658
	R2	CMU 8" Dbl Vert @ edge	0.033	74	0.113	88	0.778	76	217.363	139.335	21.938
	R3	CMU 8" Dbl Vert @ edge	0.03	74	0.108	76	0.592	76	240.627	146.537	21.815
	R4	CMU 8" Dbl Vert @ edge	0.125	74	0.174	87	0.62	87	716.899	612.222	89.074
	R5	CMU 8" Dbl Vert @ edge	0.031	76	0.058	88	0.971	87	217.363	139.335	22.403
	R6	CMU 8" Dbl Vert @ edge	0.039	76	0.053	89	0.389	89	240.627	139.335	20.712
	R7	CMU 8" Dbl Vert @ edge	0.255	76	0.088	76	1	74	52.138	32.594	7.799
WP87	R1	CMU 8" Dbl Vert @ edge	0.171	76	0.131	88	0.784	86	288.649	249.774	39.306
	R2	CMU 8" Dbl Vert @ edge	0.026	74	0.069	76	0.789	87	208.108	139.335	22.665
	R3	CMU 8" Dbl Vert @ edge	0.027	76	0.082	88	0.414	88	240.627	141.152	20.828
	R4	CMU 8" Dbl Vert @ edge	0.273	12	0.108	12	1	12	92.514	123.825	16.711

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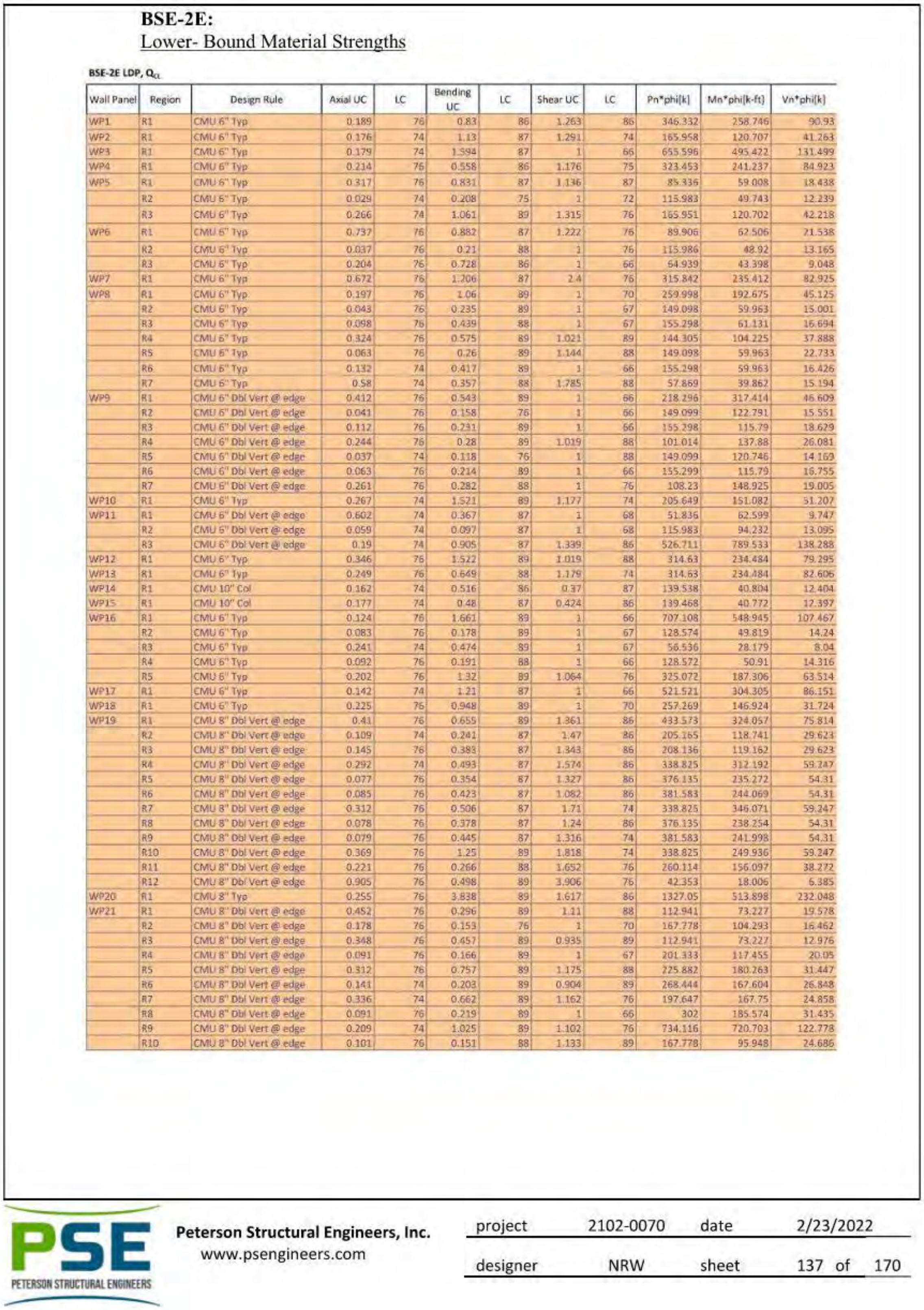

BSE-2E:

Lower- Bound Material Strengths

BSE-2E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP1	R1	CMU 6" Typ	0.189	76	0.83	86	1.263	86	346.332	258.746	90.93
WP2	R1	CMU 6" Typ	0.176	74	1.13	87	1.291	74	165.958	120.707	41.263
WP3	R1	CMU 6" Typ	0.179	74	1.594	87	1	66	655.596	495.422	131.499
WP4	R1	CMU 6" Typ	0.214	76	0.558	86	1.176	75	323.453	241.237	84.923
WP5	R1	CMU 6" Typ	0.317	76	0.831	87	1.136	87	85.336	59.008	18.438
	R2	CMU 6" Typ	0.029	74	0.208	75	1	72	115.983	49.743	12.239
	R3	CMU 6" Typ	0.266	74	1.061	89	1.315	76	165.951	120.702	42.218
WP6	R1	CMU 6" Typ	0.737	76	0.882	87	1.222	76	89.906	62.506	21.538
	R2	CMU 6" Typ	0.037	76	0.21	88	1	76	115.986	48.92	13.165
	R3	CMU 6" Typ	0.204	76	0.728	86	1	66	64.939	43.398	9.048
WP7	R1	CMU 6" Typ	0.672	76	1.206	87	2.4	76	315.842	235.412	82.925
WP8	R1	CMU 6" Typ	0.197	76	1.06	89	1	70	259.998	192.675	45.125
	R2	CMU 6" Typ	0.043	76	0.235	89	1	67	149.098	59.963	15.001
	R3	CMU 6" Typ	0.098	76	0.439	88	1	67	155.298	61.131	16.694
	R4	CMU 6" Typ	0.324	76	0.575	89	1.021	89	144.305	104.225	37.888
	R5	CMU 6" Typ	0.063	76	0.26	89	1.144	88	149.098	59.963	22.733
	R6	CMU 6" Typ	0.132	74	0.417	89	1	66	155.298	59.963	16.426
	R7	CMU 6" Typ	0.58	74	0.357	88	1.785	88	57.869	39.862	15.194
WP9	R1	CMU 6" Dbl Vert @ edge	0.412	76	0.543	89	1	66	218.296	317.414	46.609
	R2	CMU 6" Dbl Vert @ edge	0.041	76	0.158	76	1	66	149.099	122.791	15.551
	R3	CMU 6" Dbl Vert @ edge	0.112	76	0.231	89	1	66	155.298	115.79	18.629
	R4	CMU 6" Dbl Vert @ edge	0.244	76	0.28	89	1.019	88	101.014	137.88	26.081
	R5	CMU 6" Dbl Vert @ edge	0.037	74	0.118	76	1	88	149.099	120.746	14.169
	R6	CMU 6" Dbl Vert @ edge	0.063	76	0.214	89	1	66	155.299	115.79	16.755
	R7	CMU 6" Dbl Vert @ edge	0.261	76	0.282	88	1	76	108.23	148.925	19.005
WP10	R1	CMU 6" Typ	0.267	74	1.521	89	1.177	74	205.649	151.082	51.207
WP11	R1	CMU 6" Dbl Vert @ edge	0.602	74	0.367	87	1	68	51.836	62.599	9.747
	R2	CMU 6" Dbl Vert @ edge	0.059	74	0.097	87	1	68	115.983	94.232	13.095
	R3	CMU 6" Dbl Vert @ edge	0.19	74	0.905	87	1.339	86	526.711	789.533	138.288
WP12	R1	CMU 6" Typ	0.346	76	1.522	89	1.019	88	314.63	234.484	79.295
WP13	R1	CMU 6" Typ	0.249	76	0.649	88	1.179	74	314.63	234.484	82.606
WP14	R1	CMU 10" Col	0.162	74	0.516	86	0.37	87	139.538	40.804	12.404
WP15	R1	CMU 10" Col	0.177	74	0.48	87	0.424	86	139.468	40.772	12.397
WP16	R1	CMU 6" Typ	0.124	76	1.661	89	1	66	707.108	548.945	107.467
	R2	CMU 6" Typ	0.083	76	0.178	89	1	67	128.574	49.819	14.24
	R3	CMU 6" Typ	0.241	74	0.474	89	1	67	56.536	28.179	8.04
	R4	CMU 6" Typ	0.092	76	0.191	88	1	66	128.572	50.91	14.316
	R5	CMU 6" Typ	0.202	76	1.32	89	1.064	76	325.072	187.306	63.514
WP17	R1	CMU 6" Typ	0.142	74	1.21	87	1	66	521.521	304.305	86.151
WP18	R1	CMU 6" Typ	0.225	76	0.948	89	1	70	257.269	146.924	31.724
WP19	R1	CMU 8" Dbl Vert @ edge	0.41	76	0.655	89	1.361	86	433.573	324.057	75.814
	R2	CMU 8" Dbl Vert @ edge	0.109	74	0.241	87	1.47	86	205.165	118.741	29.623
	R3	CMU 8" Dbl Vert @ edge	0.145	76	0.383	87	1.343	86	208.136	119.162	29.623
	R4	CMU 8" Dbl Vert @ edge	0.292	74	0.493	87	1.574	86	338.825	312.192	59.247
	R5	CMU 8" Dbl Vert @ edge	0.077	76	0.354	87	1.327	86	376.135	235.272	54.31
	R6	CMU 8" Dbl Vert @ edge	0.085	76	0.423	87	1.082	86	381.583	244.069	54.31
	R7	CMU 8" Dbl Vert @ edge	0.312	76	0.506	87	1.71	74	338.825	346.071	59.247
	R8	CMU 8" Dbl Vert @ edge	0.078	76	0.378	87	1.24	86	376.135	238.254	54.31
	R9	CMU 8" Dbl Vert @ edge	0.079	76	0.445	87	1.316	74	381.583	241.998	54.31
	R10	CMU 8" Dbl Vert @ edge	0.369	76	1.25	89	1.818	74	338.825	249.936	59.247
	R11	CMU 8" Dbl Vert @ edge	0.221	76	0.266	88	1.652	76	260.114	156.097	38.272
	R12	CMU 8" Dbl Vert @ edge	0.905	76	0.498	89	3.906	76	42.353	18.006	6.385
WP20	R1	CMU 8" Typ	0.255	76	3.838	89	1.617	86	1327.05	513.898	232.048
WP21	R1	CMU 8" Dbl Vert @ edge	0.452	76	0.296	89	1.11	88	112.941	73.227	19.578
	R2	CMU 8" Dbl Vert @ edge	0.178	76	0.153	76	1	70	167.778	104.293	16.462
	R3	CMU 8" Dbl Vert @ edge	0.348	76	0.457	89	0.935	89	112.941	73.227	12.976
	R4	CMU 8" Dbl Vert @ edge	0.091	76	0.166	89	1	67	201.333	117.455	20.05
	R5	CMU 8" Dbl Vert @ edge	0.312	76	0.757	89	1.175	88	225.882	180.263	31.447
	R6	CMU 8" Dbl Vert @ edge	0.141	74	0.203	89	0.904	89	268.444	167.604	26.848
	R7	CMU 8" Dbl Vert @ edge	0.336	74	0.662	89	1.162	76	197.647	167.75	24.858
	R8	CMU 8" Dbl Vert @ edge	0.091	76	0.219	89	1	66	302	185.574	31.435
	R9	CMU 8" Dbl Vert @ edge	0.209	74	1.025	89	1.102	76	734.116	720.703	122.778
	R10	CMU 8" Dbl Vert @ edge	0.101	76	0.151	88	1.133	89	167.778	95.948	24.686

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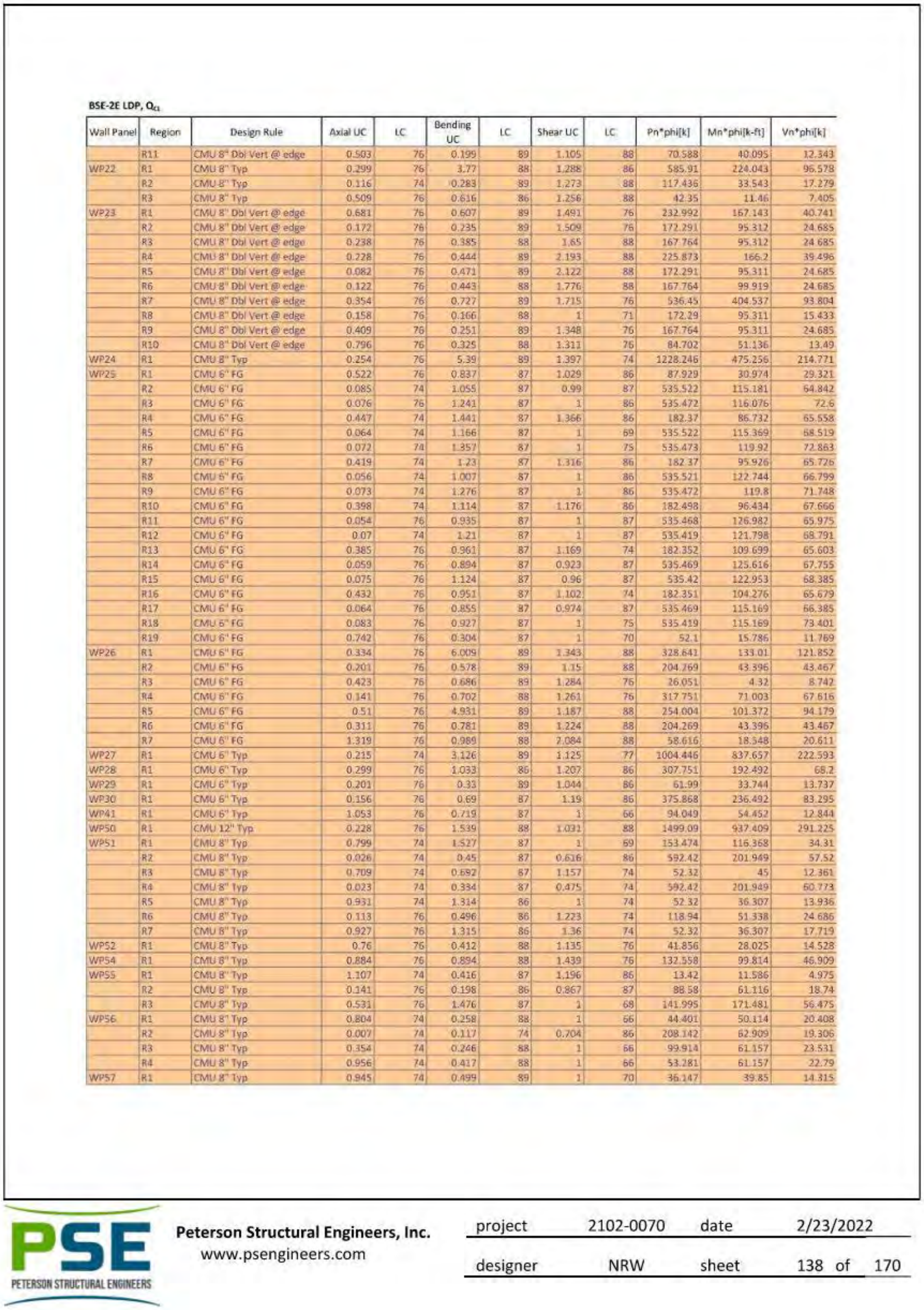

BSE-2E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
	R11	CMU 8" Dbl Vert @ edge	0.503	76	0.199	89	1.105	88	70.588	40.095	12.343
WP22	R1	CMU 8" Typ	0.299	76	3.77	88	1.288	86	585.91	224.043	96.578
	R2	CMU 8" Typ	0.116	74	0.283	89	1.273	88	117.436	33.543	17.279
	R3	CMU 8" Typ	0.509	76	0.616	86	1.256	88	42.35	11.46	7.405
WP23	R1	CMU 8" Dbl Vert @ edge	0.681	76	0.607	89	1.491	76	232.992	167.143	40.741
	R2	CMU 8" Dbl Vert @ edge	0.172	76	0.235	89	1.509	76	172.291	95.312	24.685
	R3	CMU 8" Dbl Vert @ edge	0.238	76	0.385	88	1.65	88	167.764	95.312	24.685
	R4	CMU 8" Dbl Vert @ edge	0.228	76	0.444	89	2.193	88	225.873	166.2	39.496
	R5	CMU 8" Dbl Vert @ edge	0.082	76	0.471	89	2.122	88	172.291	95.311	24.685
	R6	CMU 8" Dbl Vert @ edge	0.122	76	0.443	88	1.776	88	167.764	99.919	24.685
	R7	CMU 8" Dbl Vert @ edge	0.354	76	0.727	89	1.715	76	536.45	404.537	93.804
	R8	CMU 8" Dbl Vert @ edge	0.158	76	0.166	88	1	71	172.29	95.311	15.433
	R9	CMU 8" Dbl Vert @ edge	0.409	76	0.251	89	1.348	76	167.764	95.311	24.685
	R10	CMU 8" Dbl Vert @ edge	0.796	76	0.325	88	1.311	76	84.702	51.136	13.49
WP24	R1	CMU 8" Typ	0.254	76	5.39	89	1.397	74	1228.246	475.256	214.771
WP25	R1	CMU 6" FG	0.522	76	0.837	87	1.029	86	87.929	30.974	29.321
	R2	CMU 6" FG	0.085	74	1.055	87	0.99	87	535.522	115.181	64.842
	R3	CMU 6" FG	0.076	76	1.241	87	1	86	535.472	116.076	72.6
	R4	CMU 6" FG	0.447	74	1.441	87	1.366	86	182.37	86.732	65.558
	R5	CMU 6" FG	0.064	74	1.166	87	1	69	535.522	115.369	68.519
	R6	CMU 6" FG	0.072	74	1.357	87	1	75	535.473	119.92	72.863
	R7	CMU 6" FG	0.419	74	1.23	87	1.316	86	182.37	95.926	65.726
	R8	CMU 6" FG	0.056	74	1.007	87	1	86	535.521	122.744	66.799
	R9	CMU 6" FG	0.073	74	1.276	87	1	86	535.472	119.8	71.748
	R10	CMU 6" FG	0.398	74	1.114	87	1.176	86	182.498	96.434	67.666
	R11	CMU 6" FG	0.054	76	0.935	87	1	87	535.468	126.982	65.975
	R12	CMU 6" FG	0.07	74	1.21	87	1	87	535.419	121.798	68.791
	R13	CMU 6" FG	0.385	76	0.961	87	1.169	74	182.352	109.699	65.603
	R14	CMU 6" FG	0.059	76	0.894	87	0.923	87	535.469	125.616	67.755
	R15	CMU 6" FG	0.075	76	1.124	87	0.96	87	535.42	122.953	68.385
	R16	CMU 6" FG	0.432	76	0.951	87	1.102	74	182.351	104.276	65.679
	R17	CMU 6" FG	0.064	76	0.855	87	0.974	87	535.469	115.169	66.385
	R18	CMU 6" FG	0.083	76	0.927	87	1	75	535.419	115.169	73.401
	R19	CMU 6" FG	0.742	76	0.304	87	1	70	52.1	15.786	11.769
WP26	R1	CMU 6" FG	0.334	76	6.009	89	1.343	88	328.641	133.01	121.852
	R2	CMU 6" FG	0.201	76	0.578	89	1.15	88	204.769	43.396	43.467
	R3	CMU 6" FG	0.423	76	0.686	89	1.284	76	26.051	4.32	8.742
	R4	CMU 6" FG	0.141	76	0.702	88	1.261	76	317.751	71.003	67.616
	R5	CMU 6" FG	0.51	76	4.931	89	1.187	88	254.004	101.372	94.179
	R6	CMU 6" FG	0.311	76	0.781	89	1.224	88	204.269	43.396	43.467
	R7	CMU 6" FG	1.319	76	0.989	88	2.084	88	58.616	18.548	20.611
WP27	R1	CMU 6" Typ	0.215	74	3.126	89	1.125	77	1004.446	837.657	222.593
WP28	R1	CMU 6" Typ	0.299	76	1.033	86	1.207	86	307.751	192.492	68.2
WP29	R1	CMU 6" Typ	0.201	76	0.33	89	1.044	86	61.99	33.744	13.737
WP30	R1	CMU 6" Typ	0.156	76	0.69	87	1.19	86	375.868	236.492	83.295
WP41	R1	CMU 6" Typ	1.053	76	0.719	87	1	66	94.049	54.452	12.844
WP50	R1	CMU 12" Typ	0.228	76	1.539	88	1.031	88	1499.09	937.409	291.225
WP51	R1	CMU 8" Typ	0.799	74	1.527	87	1	69	153.474	116.368	34.31
	R2	CMU 8" Typ	0.026	74	0.45	87	0.616	86	592.42	201.949	57.52
	R3	CMU 8" Typ	0.709	74	0.692	87	1.157	74	52.32	45	12.361
	R4	CMU 8" Typ	0.023	74	0.334	87	0.475	74	592.42	201.949	60.773
	R5	CMU 8" Typ	0.931	74	1.314	86	1	74	52.32	36.307	13.936
	R6	CMU 8" Typ	0.113	76	0.496	86	1.223	74	118.94	51.338	24.686
	R7	CMU 8" Typ	0.927	76	1.315	86	1.36	74	52.32	36.307	17.719
WP52	R1	CMU 8" Typ	0.76	76	0.412	88	1.135	76	41.856	28.025	14.528
WP54	R1	CMU 8" Typ	0.884	76	0.894	88	1.439	76	132.558	99.814	46.909
WP55	R1	CMU 8" Typ	1.107	74	0.416	87	1.196	86	13.42	11.586	4.975
	R2	CMU 8" Typ	0.141	76	0.198	86	0.867	87	88.58	61.116	18.74
	R3	CMU 8" Typ	0.531	76	1.476	87	1	68	141.995	171.481	56.475
WP56	R1	CMU 8" Typ	0.804	74	0.258	88	1	66	44.401	50.114	20.408
	R2	CMU 8" Typ	0.007	74	0.117	74	0.704	86	208.142	62.909	19.306
	R3	CMU 8" Typ	0.354	74	0.246	88	1	66	99.914	61.157	23.531
	R4	CMU 8" Typ	0.956	74	0.417	88	1	66	53.281	61.157	22.79
WP57	R1	CMU 8" Typ	0.945	74	0.499	89	1	70	36.147	39.85	14.315

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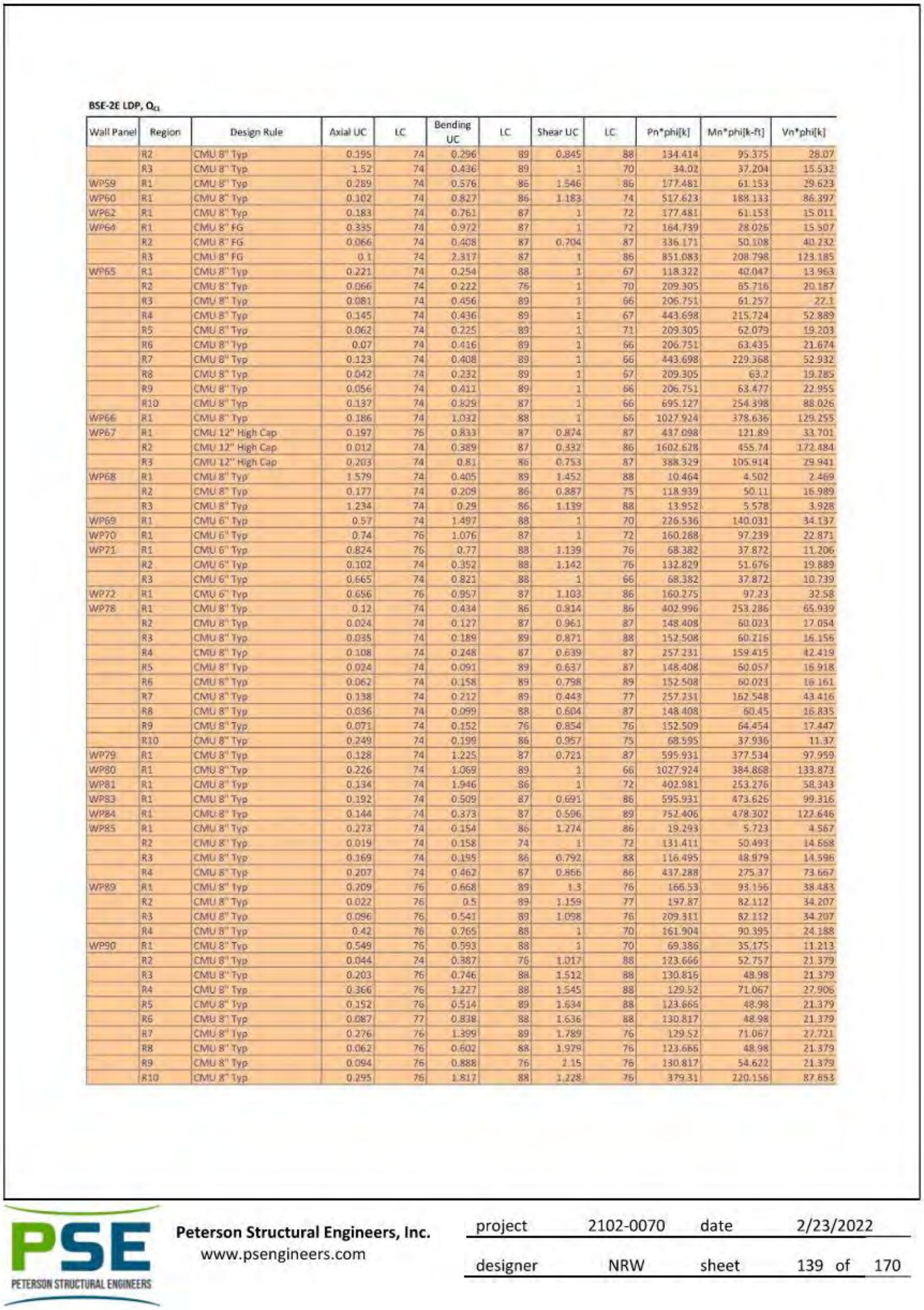

BSE-2E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
	R2	CMU 8" Typ	0.195	74	0.296	89	0.845	88	134.414	95.375	28.07
	R3	CMU 8" Typ	1.52	74	0.436	89	1	70	34.02	37.204	15.532
WP59	R1	CMU 8" Typ	0.289	74	0.576	86	1.546	86	177.481	61.153	29.623
WP60	R1	CMU 8" Typ	0.102	74	0.827	86	1.183	74	517.623	188.133	86.397
WP62	R1	CMU 8" Typ	0.183	74	0.761	87	1	72	177.481	61.153	15.011
WP64	R1	CMU 8" FG	0.335	74	0.972	87	1	72	164.739	28.026	15.507
	R2	CMU 8" FG	0.066	74	0.408	87	0.704	87	336.171	50.108	40.232
	R3	CMU 8" FG	0.1	74	2.317	87	1	86	851.083	208.798	123.185
WP65	R1	CMU 8" Typ	0.221	74	0.254	88	1	67	118.322	40.047	13.963
	R2	CMU 8" Typ	0.066	74	0.222	76	1	70	209.305	65.716	20.187
	R3	CMU 8" Typ	0.081	74	0.456	89	1	66	206.751	61.257	22.1
	R4	CMU 8" Typ	0.145	74	0.436	89	1	67	443.698	215.724	52.889
	R5	CMU 8" Typ	0.062	74	0.225	89	1	71	209.305	62.079	19.203
	R6	CMU 8" Typ	0.07	74	0.416	89	1	66	206.751	63.435	21.674
	R7	CMU 8" Typ	0.123	74	0.408	89	1	66	443.698	229.368	52.932
	R8	CMU 8" Typ	0.042	74	0.232	89	1	67	209.305	63.2	19.285
	R9	CMU 8" Typ	0.056	74	0.411	89	1	66	206.751	63.477	22.955
	R10	CMU 8" Typ	0.137	74	0.829	87	1	66	695.127	254.398	88.026
WP66	R1	CMU 8" Typ	0.186	74	1.032	88	1	66	1027.924	378.636	129.255
WP67	R1	CMU 12" High Cap	0.197	76	0.833	87	0.874	87	437.098	121.89	33.701
	R2	CMU 12" High Cap	0.012	74	0.389	87	0.332	86	1602.628	455.74	172.484
	R3	CMU 12" High Cap	0.203	74	0.81	86	0.753	87	388.329	105.914	29.941
WP68	R1	CMU 8" Typ	1.579	74	0.405	89	1.452	88	10.464	4.502	2.469
	R2	CMU 8" Typ	0.177	74	0.209	86	0.887	75	118.939	50.11	16.989
	R3	CMU 8" Typ	1.234	74	0.29	86	1.139	88	13.952	5.578	3.928
WP69	R1	CMU 6" Typ	0.57	74	1.497	88	1	70	226.536	140.031	34.137
WP70	R1	CMU 6" Typ	0.74	76	1.076	87	1	72	160.288	97.239	22.871
WP71	R1	CMU 6" Typ	0.824	76	0.77	88	1.139	76	68.382	37.872	11.206
	R2	CMU 6" Typ	0.102	74	0.352	88	1.142	76	132.829	51.676	19.889
	R3	CMU 6" Typ	0.665	74	0.821	88	1	66	68.382	37.872	10.739
WP72	R1	CMU 6" Typ	0.656	76	0.957	87	1.103	86	160.275	97.23	32.58
WP78	R1	CMU 8" Typ	0.12	74	0.434	86	0.814	86	402.996	253.286	65.939
	R2	CMU 8" Typ	0.024	74	0.127	87	0.961	87	148.408	60.023	17.054
	R3	CMU 8" Typ	0.035	74	0.189	89	0.871	88	152.508	60.216	16.156
	R4	CMU 8" Typ	0.108	74	0.248	87	0.639	87	257.231	159.415	42.419
	R5	CMU 8" Typ	0.024	74	0.091	89	0.637	87	148.408	60.057	16.918
	R6	CMU 8" Typ	0.062	74	0.158	89	0.798	89	152.508	60.023	16.161
	R7	CMU 8" Typ	0.138	74	0.212	89	0.443	77	257.231	162.548	43.416
	R8	CMU 8" Typ	0.036	74	0.099	88	0.604	87	148.408	60.45	16.835
	R9	CMU 8" Typ	0.071	74	0.152	76	0.854	76	152.509	64.454	17.447
	R10	CMU 8" Typ	0.249	74	0.199	86	0.957	75	68.595	37.936	11.37
WP79	R1	CMU 8" Typ	0.128	74	1.225	87	0.721	87	595.931	377.534	97.959
WP80	R1	CMU 8" Typ	0.226	74	1.069	89	1	66	1027.924	384.868	133.873
WP81	R1	CMU 8" Typ	0.134	74	1.946	86	1	72	402.981	253.276	58.343
WP83	R1	CMU 8" Typ	0.192	74	0.509	87	0.691	86	595.931	473.626	99.316
WP84	R1	CMU 8" Typ	0.144	74	0.373	87	0.596	89	752.406	478.302	122.646
WP85	R1	CMU 8" Typ	0.273	74	0.154	86	1.274	86	19.293	5.723	4.567
	R2	CMU 8" Typ	0.019	74	0.158	74	1	72	131.411	50.493	14.668
	R3	CMU 8" Typ	0.169	74	0.195	86	0.792	88	116.495	48.979	14.596
	R4	CMU 8" Typ	0.207	74	0.462	87	0.866	86	437.288	275.37	73.667
WP89	R1	CMU 8" Typ	0.209	76	0.668	89	1.3	76	166.53	93.156	38.483
	R2	CMU 8" Typ	0.022	76	0.5	89	1.159	77	197.87	82.112	34.207
	R3	CMU 8" Typ	0.096	76	0.541	89	1.098	76	209.311	82.112	34.207
	R4	CMU 8" Typ	0.42	76	0.765	88	1	70	161.904	90.395	24.188
WP90	R1	CMU 8" Typ	0.549	76	0.593	88	1	70	69.386	35.175	11.213
	R2	CMU 8" Typ	0.044	74	0.387	76	1.017	88	123.666	52.757	21.379
	R3	CMU 8" Typ	0.203	76	0.746	88	1.512	88	130.816	48.98	21.379
	R4	CMU 8" Typ	0.366	76	1.227	88	1.545	88	129.52	71.067	27.906
	R5	CMU 8" Typ	0.152	76	0.514	89	1.634	88	123.666	48.98	21.379
	R6	CMU 8" Typ	0.087	77	0.838	88	1.636	88	130.817	48.98	21.379
	R7	CMU 8" Typ	0.276	76	1.399	89	1.789	76	129.52	71.067	27.721
	R8	CMU 8" Typ	0.062	76	0.602	88	1.979	76	123.666	48.98	21.379
	R9	CMU 8" Typ	0.094	76	0.888	76	2.15	76	130.817	54.622	21.379
	R10	CMU 8" Typ	0.295	76	1.817	88	1.228	76	379.31	220.156	87.653

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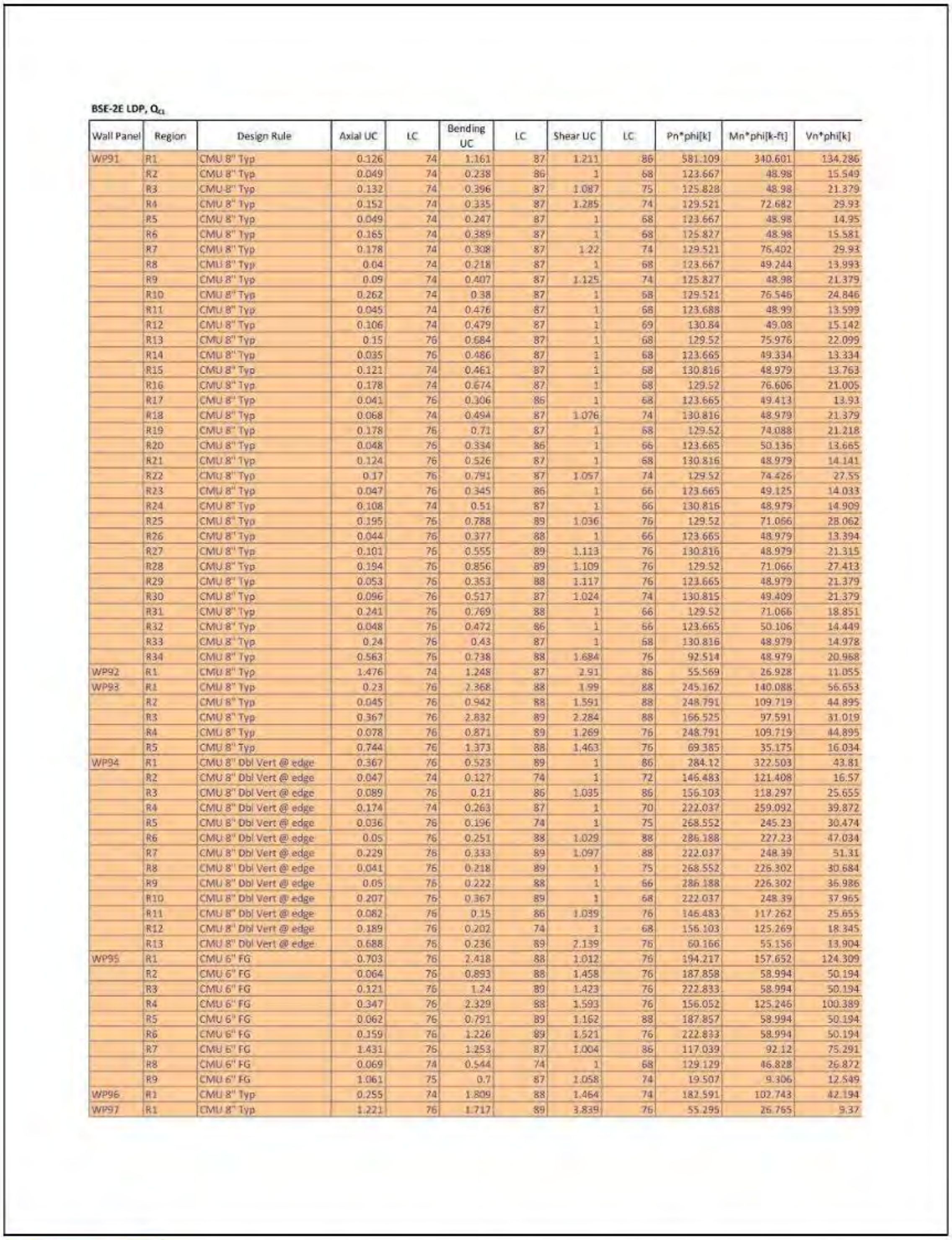

BSE-2E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP91	R1	CMU 8" Typ	0.126	74	1.161	87	1.211	86	581.109	340.601	134.286
	R2	CMU 8" Typ	0.049	74	0.238	86	1	68	123.667	48.98	15.549
	R3	CMU 8" Typ	0.132	74	0.396	87	1.087	75	125.828	48.98	21.379
	R4	CMU 8" Typ	0.152	74	0.335	87	1.285	74	129.521	72.682	29.93
	R5	CMU 8" Typ	0.049	74	0.247	87	1	68	123.667	48.98	14.95
	R6	CMU 8" Typ	0.165	74	0.389	87	1	68	125.827	48.98	15.581
	R7	CMU 8" Typ	0.178	74	0.308	87	1.22	74	129.521	76.402	29.93
	R8	CMU 8" Typ	0.04	74	0.218	87	1	68	123.667	49.244	13.993
	R9	CMU 8" Typ	0.09	74	0.407	87	1.125	74	125.827	48.98	21.379
	R10	CMU 8" Typ	0.262	74	0.38	87	1	68	129.521	76.546	24.846
	R11	CMU 8" Typ	0.045	74	0.476	87	1	68	123.688	48.99	13.599
	R12	CMU 8" Typ	0.106	74	0.479	87	1	69	130.84	49.08	15.142
	R13	CMU 8" Typ	0.15	76	0.684	87	1	68	129.52	75.976	22.099
	R14	CMU 8" Typ	0.035	76	0.486	87	1	68	123.665	49.334	13.334
	R15	CMU 8" Typ	0.121	74	0.461	87	1	68	130.816	48.979	13.763
	R16	CMU 8" Typ	0.178	74	0.674	87	1	68	129.52	76.606	21.005
	R17	CMU 8" Typ	0.041	76	0.306	86	1	68	123.665	49.413	13.93
	R18	CMU 8" Typ	0.068	74	0.494	87	1.076	74	130.816	48.979	21.379
	R19	CMU 8" Typ	0.178	76	0.71	87	1	68	129.52	74.088	21.218
	R20	CMU 8" Typ	0.048	76	0.334	86	1	66	123.665	50.136	13.665
	R21	CMU 8" Typ	0.124	76	0.526	87	1	68	130.816	48.979	14.141
	R22	CMU 8" Typ	0.17	76	0.791	87	1.057	74	129.52	74.426	27.55
	R23	CMU 8" Typ	0.047	76	0.345	86	1	66	123.665	49.125	14.033
	R24	CMU 8" Typ	0.108	74	0.51	87	1	66	130.816	48.979	14.909
	R25	CMU 8" Typ	0.195	76	0.788	89	1.036	76	129.52	71.066	28.062
	R26	CMU 8" Typ	0.044	76	0.377	88	1	66	123.665	48.979	13.394
	R27	CMU 8" Typ	0.101	76	0.555	89	1.113	76	130.816	48.979	21.315
	R28	CMU 8" Typ	0.194	76	0.856	89	1.109	76	129.52	71.066	27.413
	R29	CMU 8" Typ	0.053	76	0.353	88	1.117	76	123.665	48.979	21.379
	R30	CMU 8" Typ	0.096	76	0.517	87	1.024	74	130.815	49.409	21.379
	R31	CMU 8" Typ	0.241	76	0.769	88	1	66	129.52	71.066	18.851
	R32	CMU 8" Typ	0.048	76	0.472	86	1	66	123.665	50.106	14.449
	R33	CMU 8" Typ	0.24	76	0.43	87	1	68	130.816	48.979	14.978
	R34	CMU 8" Typ	0.563	76	0.738	88	1.684	76	92.514	48.979	20.968
WP92	R1	CMU 8" Typ	1.476	74	1.248	87	2.91	86	55.569	26.928	11.055
WP93	R1	CMU 8" Typ	0.23	76	2.368	88	1.99	88	245.162	140.088	56.653
	R2	CMU 8" Typ	0.045	76	0.942	88	1.591	88	248.791	109.719	44.895
	R3	CMU 8" Typ	0.367	76	2.832	89	2.284	88	166.525	97.591	31.019
	R4	CMU 8" Typ	0.078	76	0.871	89	1.269	76	248.791	109.719	44.895
	R5	CMU 8" Typ	0.744	76	1.373	88	1.463	76	69.385	35.175	16.034
WP94	R1	CMU 8" Dbl Vert @ edge	0.367	76	0.523	89	1	86	284.12	322.503	43.81
	R2	CMU 8" Dbl Vert @ edge	0.047	74	0.127	74	1	72	146.483	121.408	16.57
	R3	CMU 8" Dbl Vert @ edge	0.089	76	0.21	86	1.035	86	156.103	118.297	25.655
	R4	CMU 8" Dbl Vert @ edge	0.174	74	0.263	87	1	70	222.037	259.092	39.872
	R5	CMU 8" Dbl Vert @ edge	0.036	76	0.196	74	1	75	268.552	245.23	30.474
	R6	CMU 8" Dbl Vert @ edge	0.05	76	0.251	88	1.029	88	286.188	227.23	47.034
	R7	CMU 8" Dbl Vert @ edge	0.229	76	0.333	89	1.097	88	222.037	248.39	51.31
	R8	CMU 8" Dbl Vert @ edge	0.041	76	0.218	89	1	75	268.552	226.302	30.684
	R9	CMU 8" Dbl Vert @ edge	0.05	76	0.222	88	1	66	286.188	226.302	36.986
	R10	CMU 8" Dbl Vert @ edge	0.207	76	0.367	89	1	68	222.037	248.39	37.965
	R11	CMU 8" Dbl Vert @ edge	0.082	76	0.15	86	1.039	76	146.483	117.262	25.655
	R12	CMU 8" Dbl Vert @ edge	0.189	76	0.202	74	1	68	156.103	125.269	18.345
	R13	CMU 8" Dbl Vert @ edge	0.688	76	0.236	89	2.139	76	60.166	55.156	13.904
WP95	R1	CMU 6" FG	0.703	76	2.418	88	1.012	76	194.217	157.652	124.309
	R2	CMU 6" FG	0.064	76	0.893	88	1.458	76	187.858	58.994	50.194
	R3	CMU 6" FG	0.121	76	1.24	89	1.423	76	222.833	58.994	50.194
	R4	CMU 6" FG	0.347	76	2.329	88	1.593	76	156.052	125.246	100.389
	R5	CMU 6" FG	0.062	76	0.791	89	1.162	88	187.857	58.994	50.194
	R6	CMU 6" FG	0.159	76	1.226	89	1.521	76	222.833	58.994	50.194
	R7	CMU 6" FG	1.431	76	1.253	87	1.004	86	117.039	92.12	75.291
	R8	CMU 6" FG	0.069	74	0.544	74	1	68	129.129	46.828	26.872
	R9	CMU 6" FG	1.061	75	0.7	87	1.058	74	19.507	9.306	12.549
WP96	R1	CMU 8" Typ	0.255	74	1.809	88	1.464	74	182.591	102.743	42.194
WP97	R1	CMU 8" Typ	1.221	76	1.717	89	3.839	76	55.295	26.765	9.37

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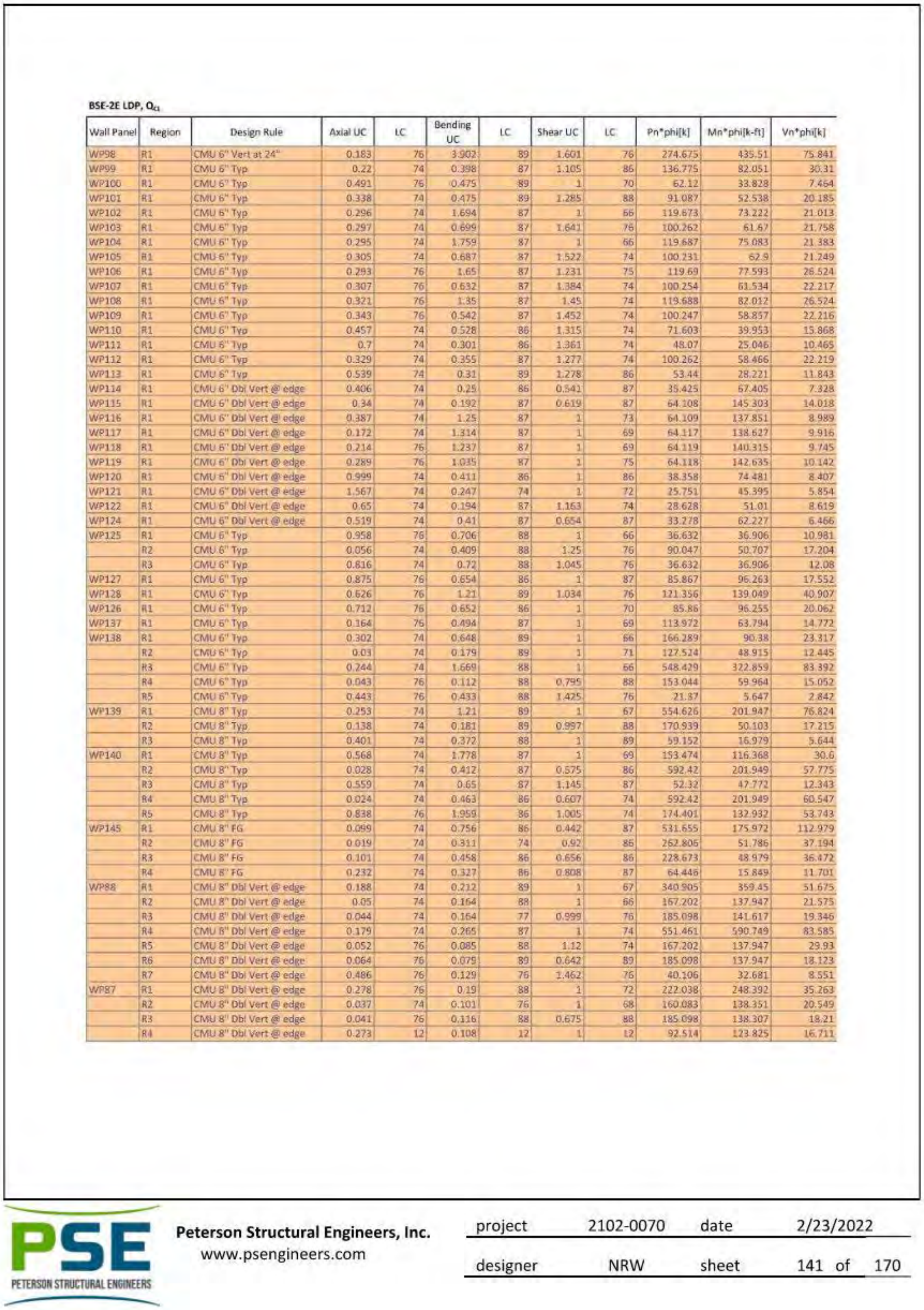

BSE-2E LDP, Q_{CL}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP98	R1	CMU 6" Vert at 24"	0.183	76	3.902	89	1.601	76	274.675	435.51	75.841
WP99	R1	CMU 6" Typ	0.22	74	0.398	87	1.105	86	136.775	82.051	30.31
WP100	R1	CMU 6" Typ	0.491	76	0.475	89	1	70	62.12	33.828	7.464
WP101	R1	CMU 6" Typ	0.338	74	0.475	89	1.285	88	91.087	52.538	20.185
WP102	R1	CMU 6" Typ	0.296	74	1.694	87	1	66	119.673	73.222	21.013
WP103	R1	CMU 6" Typ	0.297	74	0.699	87	1.641	76	100.262	61.67	21.758
WP104	R1	CMU 6" Typ	0.295	74	1.759	87	1	66	119.687	75.083	21.383
WP105	R1	CMU 6" Typ	0.305	74	0.687	87	1.522	74	100.231	62.9	21.249
WP106	R1	CMU 6" Typ	0.293	76	1.65	87	1.231	75	119.69	77.593	26.524
WP107	R1	CMU 6" Typ	0.307	76	0.632	87	1.384	74	100.254	61.534	22.217
WP108	R1	CMU 6" Typ	0.321	76	1.35	87	1.45	74	119.688	82.012	26.524
WP109	R1	CMU 6" Typ	0.343	76	0.542	87	1.452	74	100.247	58.857	22.216
WP110	R1	CMU 6" Typ	0.457	74	0.528	86	1.315	74	71.603	39.953	15.868
WP111	R1	CMU 6" Typ	0.7	74	0.301	86	1.361	74	48.07	25.046	10.465
WP112	R1	CMU 6" Typ	0.329	74	0.355	87	1.277	74	100.262	58.466	22.219
WP113	R1	CMU 6" Typ	0.539	74	0.31	89	1.278	86	53.44	28.221	11.843
WP114	R1	CMU 6" Dbl Vert @ edge	0.406	74	0.25	86	0.541	87	35.425	67.405	7.328
WP115	R1	CMU 6" Dbl Vert @ edge	0.34	74	0.192	87	0.619	87	64.108	145.303	14.018
WP116	R1	CMU 6" Dbl Vert @ edge	0.387	74	1.25	87	1	73	64.109	137.851	8.989
WP117	R1	CMU 6" Dbl Vert @ edge	0.172	74	1.314	87	1	69	64.117	138.627	9.916
WP118	R1	CMU 6" Dbl Vert @ edge	0.214	76	1.237	87	1	69	64.119	140.315	9.745
WP119	R1	CMU 6" Dbl Vert @ edge	0.289	76	1.035	87	1	75	64.118	142.635	10.142
WP120	R1	CMU 6" Dbl Vert @ edge	0.999	74	0.411	86	1	86	38.358	74.481	8.407
WP121	R1	CMU 6" Dbl Vert @ edge	1.567	74	0.247	74	1	72	25.751	45.395	5.854
WP122	R1	CMU 6" Dbl Vert @ edge	0.65	74	0.194	87	1.163	74	28.628	51.01	8.619
WP124	R1	CMU 6" Dbl Vert @ edge	0.519	74	0.41	87	0.654	87	33.278	62.227	6.466
WP125	R1	CMU 6" Typ	0.958	76	0.706	88	1	66	36.632	36.906	10.981
	R2	CMU 6" Typ	0.056	74	0.409	88	1.25	76	90.047	50.707	17.204
	R3	CMU 6" Typ	0.816	74	0.72	88	1.045	76	36.632	36.906	12.08
WP127	R1	CMU 6" Typ	0.875	76	0.654	86	1	87	85.867	96.263	17.552
WP128	R1	CMU 6" Typ	0.626	76	1.21	89	1.034	76	121.356	139.049	40.907
WP126	R1	CMU 6" Typ	0.712	76	0.652	86	1	70	85.86	96.255	20.062
WP137	R1	CMU 6" Typ	0.164	76	0.494	87	1	69	113.972	63.794	14.772
WP138	R1	CMU 6" Typ	0.302	74	0.648	89	1	66	166.289	90.38	23.317
	R2	CMU 6" Typ	0.03	74	0.179	89	1	71	127.524	48.915	12.445
	R3	CMU 6" Typ	0.244	74	1.669	88	1	66	548.429	322.859	83.392
	R4	CMU 6" Typ	0.043	76	0.112	88	0.795	88	153.044	59.964	15.052
	R5	CMU 6" Typ	0.443	76	0.433	88	1.425	76	21.37	5.647	2.842
WP139	R1	CMU 8" Typ	0.253	74	1.21	89	1	67	554.626	201.947	76.824
	R2	CMU 8" Typ	0.138	74	0.181	89	0.997	88	170.939	50.103	17.215
	R3	CMU 8" Typ	0.401	74	0.372	88	1	89	59.152	16.979	5.644
WP140	R1	CMU 8" Typ	0.568	74	1.778	87	1	69	153.474	116.368	30.6
	R2	CMU 8" Typ	0.028	74	0.412	87	0.575	86	592.42	201.949	57.775
	R3	CMU 8" Typ	0.559	74	0.65	87	1.145	87	52.32	47.772	12.343
	R4	CMU 8" Typ	0.024	74	0.463	86	0.607	74	592.42	201.949	60.547
	R5	CMU 8" Typ	0.838	76	1.959	86	1.005	74	174.401	132.932	53.743
WP145	R1	CMU 8" FG	0.099	74	0.756	86	0.442	87	531.655	175.972	112.979
	R2	CMU 8" FG	0.019	74	0.311	74	0.92	86	262.806	51.786	37.194
	R3	CMU 8" FG	0.101	74	0.458	86	0.656	86	228.673	48.979	36.472
	R4	CMU 8" FG	0.232	74	0.327	86	0.808	87	64.446	15.849	11.701
WP88	R1	CMU 8" Dbl Vert @ edge	0.188	74	0.212	89	1	67	340.905	359.45	51.675
	R2	CMU 8" Dbl Vert @ edge	0.05	74	0.164	88	1	66	167.202	137.947	21.575
	R3	CMU 8" Dbl Vert @ edge	0.044	74	0.164	77	0.999	76	185.098	141.617	19.346
	R4	CMU 8" Dbl Vert @ edge	0.179	74	0.265	87	1	74	551.461	590.749	83.585
	R5	CMU 8" Dbl Vert @ edge	0.052	76	0.085	88	1.12	74	167.202	137.947	29.93
	R6	CMU 8" Dbl Vert @ edge	0.064	76	0.079	89	0.642	89	185.098	137.947	18.123
	R7	CMU 8" Dbl Vert @ edge	0.486	76	0.129	76	1.462	76	40.106	32.681	8.551
WP87	R1	CMU 8" Dbl Vert @ edge	0.278	76	0.19	88	1	72	222.038	248.392	35.263
	R2	CMU 8" Dbl Vert @ edge	0.037	74	0.101	76	1	68	160.083	138.351	20.549
	R3	CMU 8" Dbl Vert @ edge	0.041	76	0.116	88	0.675	88	185.098	138.307	18.21
	R4	CMU 8" Dbl Vert @ edge	0.273	12	0.108	12	1	12	92.514	123.825	16.711

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Expected Material Strengths

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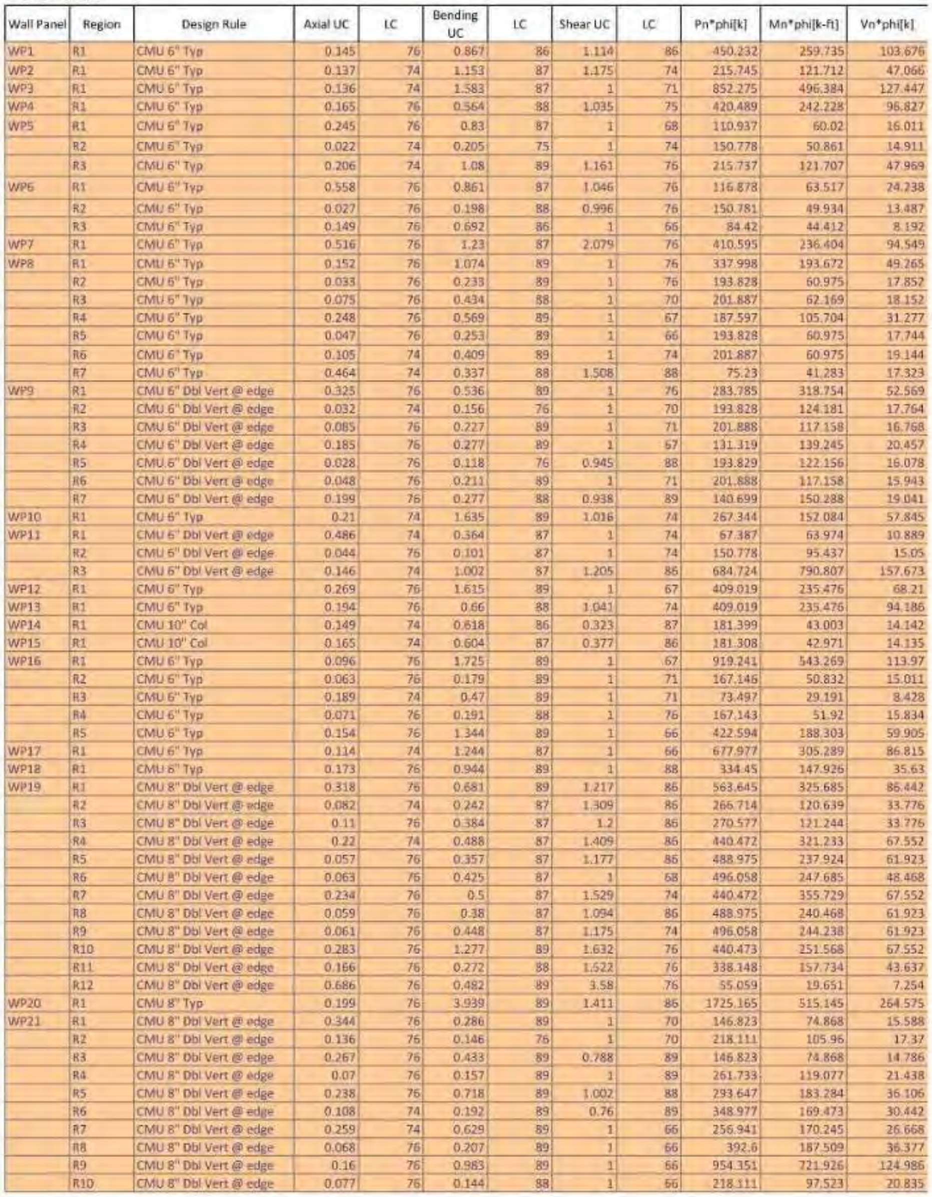

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP1	R1	CMU 6" Typ	0.145	76	0.867	86	1.114	86	450.232	259.735	103.676
WP2	R1	CMU 6" Typ	0.137	74	1.153	87	1.175	74	215.745	121.712	47.066
WP3	R1	CMU 6" Typ	0.136	74	1.583	87	1	71	852.275	496.384	127.447
WP4	R1	CMU 6" Typ	0.165	76	0.564	88	1.035	75	420.489	242.228	96.827
WP5	R1	CMU 6" Typ	0.245	76	0.83	87	1	68	110.937	60.02	16.011
	R2	CMU 6" Typ	0.022	74	0.205	75	1	74	150.778	50.861	14.911
	R3	CMU 6" Typ	0.206	74	1.08	89	1.161	76	215.737	121.707	47.969
WP6	R1	CMU 6" Typ	0.558	76	0.861	87	1.046	76	116.878	63.517	24.238
	R2	CMU 6" Typ	0.027	76	0.198	88	0.996	76	150.781	49.934	13.487
	R3	CMU 6" Typ	0.149	76	0.692	86	1	66	84.42	44.412	8.192
WP7	R1	CMU 6" Typ	0.516	76	1.23	87	2.079	76	410.595	236.404	94.549
WP8	R1	CMU 6" Typ	0.152	76	1.074	89	1	76	337.998	193.672	49.265
	R2	CMU 6" Typ	0.033	76	0.233	89	1	76	193.828	60.975	17.852
	R3	CMU 6" Typ	0.075	76	0.434	88	1	70	201.887	62.169	18.152
	R4	CMU 6" Typ	0.248	76	0.569	89	1	67	187.597	105.704	31.277
	R5	CMU 6" Typ	0.047	76	0.253	89	1	66	193.828	60.975	17.744
	R6	CMU 6" Typ	0.105	74	0.409	89	1	74	201.887	60.975	19.144
	R7	CMU 6" Typ	0.464	74	0.337	88	1.508	88	75.23	41.283	17.323
WP9	R1	CMU 6" Dbl Vert @ edge	0.325	76	0.536	89	1	76	283.785	318.754	52.569
	R2	CMU 6" Dbl Vert @ edge	0.032	74	0.156	76	1	70	193.828	124.181	17.764
	R3	CMU 6" Dbl Vert @ edge	0.085	76	0.227	89	1	71	201.888	117.158	16.768
	R4	CMU 6" Dbl Vert @ edge	0.185	76	0.277	89	1	67	131.319	139.245	20.457
	R5	CMU 6" Dbl Vert @ edge	0.028	76	0.118	76	0.945	88	193.829	122.156	16.078
	R6	CMU 6" Dbl Vert @ edge	0.048	76	0.211	89	1	71	201.888	117.158	15.943
	R7	CMU 6" Dbl Vert @ edge	0.199	76	0.277	88	0.938	89	140.699	150.288	19.041
WP10	R1	CMU 6" Typ	0.21	74	1.635	89	1.016	74	267.344	152.084	57.845
WP11	R1	CMU 6" Dbl Vert @ edge	0.486	74	0.364	87	1	74	67.387	63.974	10.889
	R2	CMU 6" Dbl Vert @ edge	0.044	76	0.101	87	1	74	150.778	95.437	15.05
	R3	CMU 6" Dbl Vert @ edge	0.146	74	1.002	87	1.205	86	684.724	790.807	157.673
WP12	R1	CMU 6" Typ	0.269	76	1.615	89	1	67	409.019	235.476	68.21
WP13	R1	CMU 6" Typ	0.194	76	0.66	88	1.041	74	409.019	235.476	94.186
WP14	R1	CMU 10" Col	0.149	74	0.618	86	0.323	87	181.399	43.003	14.142
WP15	R1	CMU 10" Col	0.165	74	0.604	87	0.377	86	181.308	42.971	14.135
WP16	R1	CMU 6" Typ	0.096	76	1.725	89	1	67	919.241	543.269	113.97
	R2	CMU 6" Typ	0.063	76	0.179	89	1	71	167.146	50.832	15.011
	R3	CMU 6" Typ	0.189	74	0.47	89	1	71	73.497	29.191	8.428
	R4	CMU 6" Typ	0.071	76	0.191	88	1	76	167.143	51.92	15.834
	R5	CMU 6" Typ	0.154	76	1.344	89	1	66	422.594	188.303	59.905
WP17	R1	CMU 6" Typ	0.114	74	1.244	87	1	66	677.977	305.289	86.815
WP18	R1	CMU 6" Typ	0.173	76	0.944	89	1	88	334.45	147.926	35.63
WP19	R1	CMU 8" Dbl Vert @ edge	0.318	76	0.681	89	1.217	86	563.645	325.685	86.442
	R2	CMU 8" Dbl Vert @ edge	0.082	74	0.242	87	1.309	86	266.714	120.639	33.776
	R3	CMU 8" Dbl Vert @ edge	0.11	76	0.384	87	1.2	86	270.577	121.244	33.776
	R4	CMU 8" Dbl Vert @ edge	0.22	74	0.488	87	1.409	86	440.472	321.233	67.552
	R5	CMU 8" Dbl Vert @ edge	0.057	76	0.357	87	1.177	86	488.975	237.924	61.923
	R6	CMU 8" Dbl Vert @ edge	0.063	76	0.425	87	1	68	496.058	247.685	48.468
	R7	CMU 8" Dbl Vert @ edge	0.234	76	0.5	87	1.529	74	440.472	355.729	67.552
	R8	CMU 8" Dbl Vert @ edge	0.059	76	0.38	87	1.094	86	488.975	240.468	61.923
	R9	CMU 8" Dbl Vert @ edge	0.061	76	0.448	87	1.175	74	496.058	244.238	61.923
	R10	CMU 8" Dbl Vert @ edge	0.283	76	1.277	89	1.632	76	440.473	251.568	67.552
	R11	CMU 8" Dbl Vert @ edge	0.166	76	0.272	88	1.522	76	338.148	157.734	43.637
	R12	CMU 8" Dbl Vert @ edge	0.686	76	0.482	89	3.58	76	55.059	19.651	7.254
WP20	R1	CMU 8" Typ	0.199	76	3.939	89	1.411	86	1725.165	515.145	264.575
WP21	R1	CMU 8" Dbl Vert @ edge	0.344	76	0.286	89	1	70	146.823	74.868	15.588
	R2	CMU 8" Dbl Vert @ edge	0.136	76	0.146	76	1	70	218.111	105.96	17.37
	R3	CMU 8" Dbl Vert @ edge	0.267	76	0.433	89	0.788	89	146.823	74.868	14.786
	R4	CMU 8" Dbl Vert @ edge	0.07	76	0.157	89	1	89	261.733	119.077	21.438
	R5	CMU 8" Dbl Vert @ edge	0.238	76	0.718	89	1.002	88	293.647	183.284	36.106
	R6	CMU 8" Dbl Vert @ edge	0.108	74	0.192	89	0.76	89	348.977	169.473	30.442
	R7	CMU 8" Dbl Vert @ edge	0.259	74	0.629	89	1	66	256.941	170.245	26.668
	R8	CMU 8" Dbl Vert @ edge	0.068	76	0.207	89	1	66	392.6	187.509	36.377
	R9	CMU 8" Dbl Vert @ edge	0.16	76	0.983	89	1	66	954.351	721.926	124.986
	R10	CMU 8" Dbl Vert @ edge	0.077	76	0.144	88	1	66	218.111	97.523	20.835

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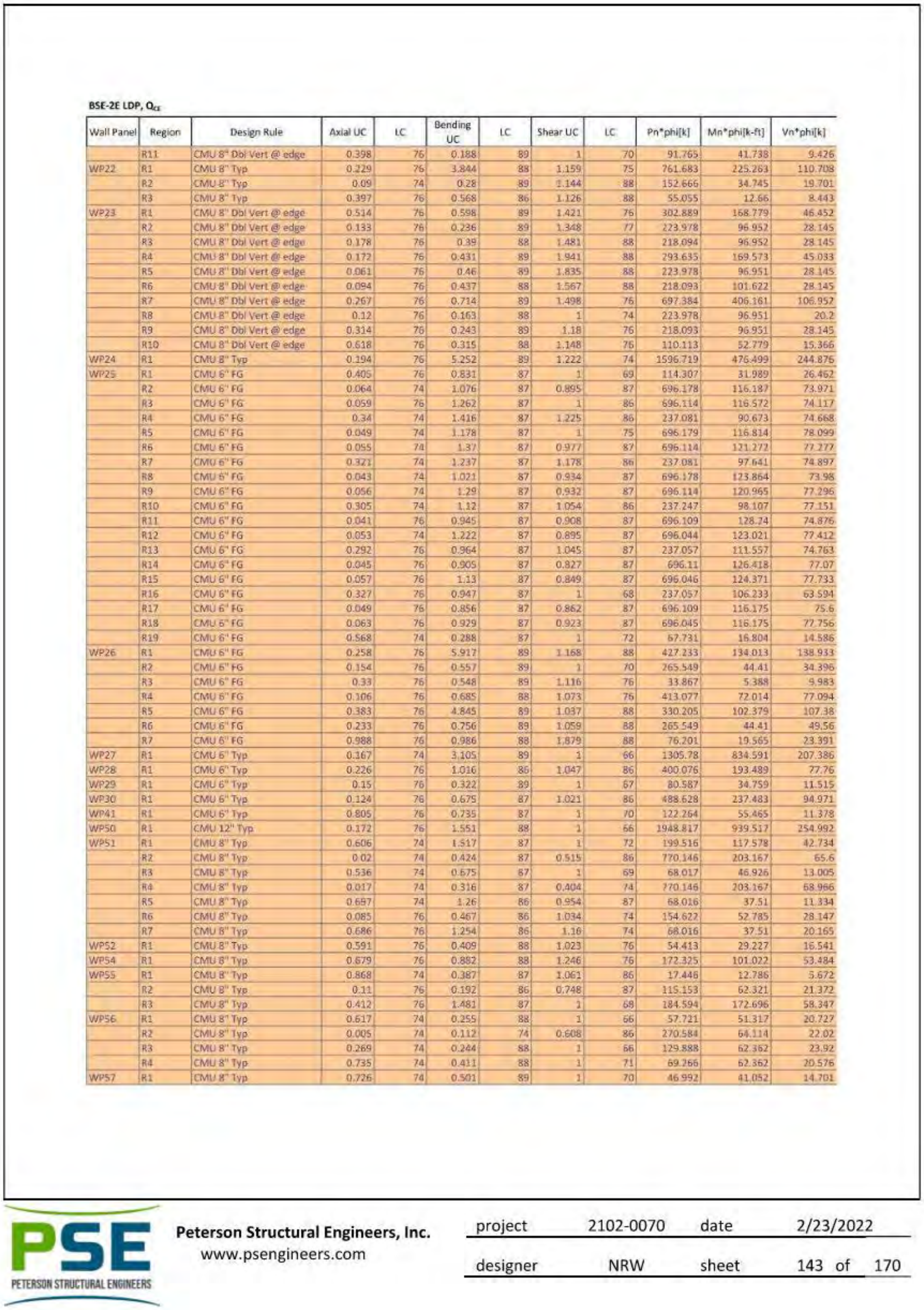

BSE-2E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
	R11	CMU 8" Dbl Vert @ edge	0.398	76	0.188	89	1	70	91.765	41.738	9.426
WP22	R1	CMU 8" Typ	0.229	76	3.844	88	1.159	75	761.683	225.263	110.708
	R2	CMU 8" Typ	0.09	74	0.28	89	1.144	88	152.666	34.745	19.701
	R3	CMU 8" Typ	0.397	76	0.568	86	1.126	88	55.055	12.66	8.443
WP23	R1	CMU 8" Dbl Vert @ edge	0.514	76	0.598	89	1.421	76	302.889	168.779	46.452
	R2	CMU 8" Dbl Vert @ edge	0.133	76	0.236	89	1.348	77	223.978	96.952	28.145
	R3	CMU 8" Dbl Vert @ edge	0.178	76	0.39	88	1.481	88	218.094	96.952	28.145
	R4	CMU 8" Dbl Vert @ edge	0.172	76	0.431	89	1.941	88	293.635	169.573	45.033
	R5	CMU 8" Dbl Vert @ edge	0.061	76	0.46	89	1.835	88	223.978	96.951	28.145
	R6	CMU 8" Dbl Vert @ edge	0.094	76	0.437	88	1.567	88	218.093	101.622	28.145
	R7	CMU 8" Dbl Vert @ edge	0.267	76	0.714	89	1.498	76	697.384	406.161	106.957
	R8	CMU 8" Dbl Vert @ edge	0.12	76	0.163	88	1	74	223.978	96.951	20.2
	R9	CMU 8" Dbl Vert @ edge	0.314	76	0.243	89	1.18	76	218.093	96.951	28.145
	R10	CMU 8" Dbl Vert @ edge	0.618	76	0.315	88	1.148	76	110.113	52.779	15.366
WP24	R1	CMU 8" Typ	0.194	76	5.252	89	1.222	74	1596.719	476.499	244.876
WP25	R1	CMU 6" FG	0.405	76	0.831	87	1	69	114.307	31.989	26.462
	R2	CMU 6" FG	0.064	74	1.076	87	0.895	87	696.178	116.187	73.971
	R3	CMU 6" FG	0.059	76	1.262	87	1	86	696.114	116.572	74.117
	R4	CMU 6" FG	0.34	74	1.416	87	1.225	86	237.081	90.673	74.668
	R5	CMU 6" FG	0.049	74	1.178	87	1	75	696.179	116.814	78.099
	R6	CMU 6" FG	0.055	74	1.37	87	0.977	87	696.114	121.272	77.277
	R7	CMU 6" FG	0.321	74	1.237	87	1.178	86	237.081	97.641	74.897
	R8	CMU 6" FG	0.043	74	1.021	87	0.934	87	696.178	123.864	73.98
	R9	CMU 6" FG	0.056	74	1.29	87	0.932	87	696.114	120.965	77.296
	R10	CMU 6" FG	0.305	74	1.12	87	1.054	86	237.247	98.107	77.151
	R11	CMU 6" FG	0.041	76	0.945	87	0.908	87	696.109	128.24	74.876
	R12	CMU 6" FG	0.053	74	1.222	87	0.895	87	696.044	123.021	77.412
	R13	CMU 6" FG	0.292	76	0.964	87	1.045	87	237.057	111.557	74.763
	R14	CMU 6" FG	0.045	76	0.905	87	0.827	87	696.11	126.418	77.07
	R15	CMU 6" FG	0.057	76	1.13	87	0.849	87	696.046	124.371	77.733
	R16	CMU 6" FG	0.327	76	0.947	87	1	68	237.057	106.233	63.594
	R17	CMU 6" FG	0.049	76	0.856	87	0.862	87	696.109	116.175	75.6
	R18	CMU 6" FG	0.063	76	0.929	87	0.923	87	696.045	116.175	77.756
	R19	CMU 6" FG	0.568	74	0.288	87	1	72	67.731	16.804	14.586
WP26	R1	CMU 6" FG	0.258	76	5.917	89	1.168	88	427.233	134.013	138.933
	R2	CMU 6" FG	0.154	76	0.557	89	1	70	265.549	44.41	34.396
	R3	CMU 6" FG	0.33	76	0.548	89	1.116	76	33.867	5.388	9.983
	R4	CMU 6" FG	0.106	76	0.685	88	1.073	76	413.077	72.014	77.094
	R5	CMU 6" FG	0.383	76	4.845	89	1.037	88	330.205	102.379	107.38
	R6	CMU 6" FG	0.233	76	0.756	89	1.059	88	265.549	44.41	49.56
	R7	CMU 6" FG	0.988	76	0.986	88	1.879	88	76.201	19.565	23.391
WP27	R1	CMU 6" Typ	0.167	74	3.105	89	1	66	1305.78	834.591	207.386
WP28	R1	CMU 6" Typ	0.226	76	1.016	86	1.047	86	400.076	193.489	77.76
WP29	R1	CMU 6" Typ	0.15	76	0.322	89	1	67	80.587	34.759	11.515
WP30	R1	CMU 6" Typ	0.124	76	0.675	87	1.021	86	488.628	237.483	94.971
WP41	R1	CMU 6" Typ	0.805	76	0.735	87	1	70	122.264	55.465	11.378
WP50	R1	CMU 12" Typ	0.172	76	1.551	88	1	66	1948.817	939.517	254.992
WP51	R1	CMU 8" Typ	0.606	74	1.517	87	1	72	199.516	117.578	42.734
	R2	CMU 8" Typ	0.02	74	0.424	87	0.515	86	770.146	203.167	65.6
	R3	CMU 8" Typ	0.536	74	0.675	87	1	69	68.017	46.926	13.005
	R4	CMU 8" Typ	0.017	74	0.316	87	0.404	74	770.146	203.167	68.966
	R5	CMU 8" Typ	0.697	74	1.26	86	0.954	87	68.016	37.51	11.334
	R6	CMU 8" Typ	0.085	76	0.467	86	1.034	74	154.622	52.785	28.147
	R7	CMU 8" Typ	0.686	76	1.254	86	1.16	74	68.016	37.51	20.165
WP52	R1	CMU 8" Typ	0.591	76	0.409	88	1.023	76	54.413	29.227	16.541
WP54	R1	CMU 8" Typ	0.679	76	0.882	88	1.246	76	172.325	101.022	53.484
WP55	R1	CMU 8" Typ	0.868	74	0.387	87	1.061	86	17.446	12.786	5.672
	R2	CMU 8" Typ	0.11	76	0.192	86	0.748	87	115.153	62.321	21.372
	R3	CMU 8" Typ	0.412	76	1.481	87	1	68	184.594	172.696	58.347
WP56	R1	CMU 8" Typ	0.617	74	0.255	88	1	66	57.721	51.317	20.727
	R2	CMU 8" Typ	0.005	74	0.112	74	0.608	86	270.584	64.114	22.02
	R3	CMU 8" Typ	0.269	74	0.244	88	1	66	129.888	62.362	23.92
	R4	CMU 8" Typ	0.735	74	0.411	88	1	71	69.266	62.362	20.576
WP57	R1	CMU 8" Typ	0.726	74	0.501	89	1	70	46.992	41.052	14.701

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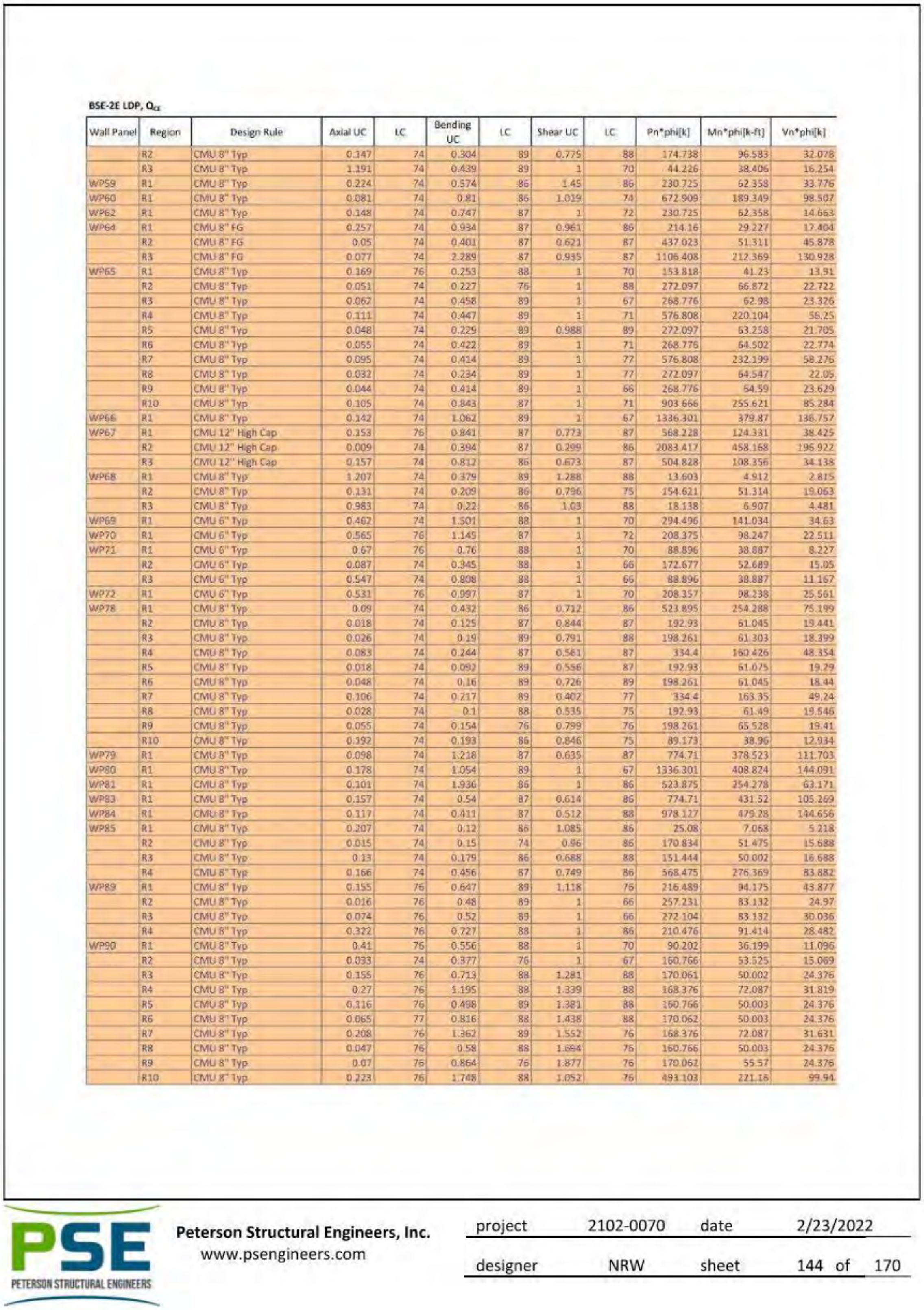

BSE-2E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
	R2	CMU 8" Typ	0.147	74	0.304	89	0.775	88	174.738	96.583	32.078
	R3	CMU 8" Typ	1.191	74	0.439	89	1	70	44.226	38.406	16.254
WP59	R1	CMU 8" Typ	0.224	74	0.574	86	1.45	86	230.725	62.358	33.776
WP60	R1	CMU 8" Typ	0.081	74	0.81	86	1.019	74	672.909	189.349	98.507
WP62	R1	CMU 8" Typ	0.148	74	0.747	87	1	72	230.725	62.358	14.663
WP64	R1	CMU 8" FG	0.257	74	0.934	87	0.961	86	214.16	29.227	17.404
	R2	CMU 8" FG	0.05	74	0.401	87	0.621	87	437.023	51.311	45.878
	R3	CMU 8" FG	0.077	74	2.289	87	0.935	87	1106.408	212.369	130.928
WP65	R1	CMU 8" Typ	0.169	76	0.253	88	1	70	153.818	41.23	13.91
	R2	CMU 8" Typ	0.051	74	0.227	76	1	88	272.097	66.872	22.722
	R3	CMU 8" Typ	0.062	74	0.458	89	1	67	268.776	62.98	23.326
	R4	CMU 8" Typ	0.111	74	0.447	89	1	71	576.808	220.104	56.25
	R5	CMU 8" Typ	0.048	74	0.229	89	0.988	89	272.097	63.258	21.705
	R6	CMU 8" Typ	0.055	74	0.422	89	1	71	268.776	64.502	22.774
	R7	CMU 8" Typ	0.095	74	0.414	89	1	77	576.808	232.199	58.276
	R8	CMU 8" Typ	0.032	74	0.234	89	1	77	272.097	64.547	22.05
	R9	CMU 8" Typ	0.044	74	0.414	89	1	66	268.776	64.59	23.629
	R10	CMU 8" Typ	0.105	74	0.843	87	1	71	903.666	255.621	85.284
WP66	R1	CMU 8" Typ	0.142	74	1.062	89	1	67	1336.301	379.87	136.757
WP67	R1	CMU 12" High Cap	0.153	76	0.841	87	0.773	87	568.228	124.331	38.425
	R2	CMU 12" High Cap	0.009	74	0.394	87	0.299	86	2083.417	458.168	196.922
	R3	CMU 12" High Cap	0.157	74	0.812	86	0.673	87	504.828	108.356	34.138
WP68	R1	CMU 8" Typ	1.207	74	0.379	89	1.288	88	13.603	4.912	2.815
	R2	CMU 8" Typ	0.131	74	0.209	86	0.796	75	154.621	51.314	19.063
	R3	CMU 8" Typ	0.983	74	0.22	86	1.03	88	18.138	6.907	4.481
WP69	R1	CMU 6" Typ	0.462	74	1.501	88	1	70	294.496	141.034	34.63
WP70	R1	CMU 6" Typ	0.565	76	1.145	87	1	72	208.375	98.247	22.511
WP71	R1	CMU 6" Typ	0.67	76	0.76	88	1	70	88.896	38.887	8.227
	R2	CMU 6" Typ	0.087	74	0.345	88	1	66	172.677	52.689	15.05
	R3	CMU 6" Typ	0.547	74	0.808	88	1	66	88.896	38.887	11.167
WP72	R1	CMU 6" Typ	0.531	76	0.997	87	1	70	208.357	98.238	25.561
WP78	R1	CMU 8" Typ	0.09	74	0.432	86	0.712	86	523.895	254.288	75.199
	R2	CMU 8" Typ	0.018	74	0.125	87	0.844	87	192.93	61.045	19.441
	R3	CMU 8" Typ	0.026	74	0.19	89	0.791	88	198.261	61.303	18.399
	R4	CMU 8" Typ	0.083	74	0.244	87	0.561	87	334.4	160.426	48.354
	R5	CMU 8" Typ	0.018	74	0.092	89	0.556	87	192.93	61.075	19.29
	R6	CMU 8" Typ	0.048	74	0.16	89	0.726	89	198.261	61.045	18.44
	R7	CMU 8" Typ	0.106	74	0.217	89	0.402	77	334.4	163.35	49.24
	R8	CMU 8" Typ	0.028	74	0.1	88	0.535	75	192.93	61.49	19.546
	R9	CMU 8" Typ	0.055	74	0.154	76	0.799	76	198.261	65.528	19.41
	R10	CMU 8" Typ	0.192	74	0.193	86	0.846	75	89.173	38.96	12.934
WP79	R1	CMU 8" Typ	0.098	74	1.218	87	0.635	87	774.71	378.523	111.703
WP80	R1	CMU 8" Typ	0.178	74	1.054	89	1	67	1336.301	408.824	144.091
WP81	R1	CMU 8" Typ	0.101	74	1.936	86	1	86	523.875	254.278	63.171
WP83	R1	CMU 8" Typ	0.157	74	0.54	87	0.614	86	774.71	431.52	105.269
WP84	R1	CMU 8" Typ	0.117	74	0.411	87	0.512	88	978.127	479.28	144.656
WP85	R1	CMU 8" Typ	0.207	74	0.12	86	1.085	86	25.08	7.068	5.218
	R2	CMU 8' Typ	0.015	74	0.15	74	0.96	86	170.834	51.475	15.688
	R3	CMU 8" Typ	0.13	74	0.179	86	0.688	88	151.444	50.002	16.688
	R4	CMU 8" Typ	0.166	74	0.456	67	0.749	86	568.475	276.369	83.882
WP89	R1	CMU 8" Typ	0.155	76	0.647	89	1.118	76	216.489	94.175	43.877
	R2	CMU 8" Typ	0.016	76	0.48	89	1	66	257.231	83.132	24.97
	R3	CMU 8" Typ	0.074	76	0.52	89	1	66	272.104	83.132	30.036
	R4	CMU 8" Typ	0.322	76	0.727	88	1	86	210.476	91.414	28.482
WP90	R1	CMU 8" Typ	0.41	76	0.556	88	1	70	90.202	36.199	11.096
	R2	CMU 8" Typ	0.033	74	0.377	76	1	67	160.766	53.525	15.069
	R3	CMU 8" Typ	0.155	76	0.713	88	1.281	88	170.061	50.002	24.376
	R4	CMU 8" Typ	0.27	76	1.195	88	1.339	88	168.376	72.087	31.819
	R5	CMU 8" Typ	0.116	76	0.498	89	1.381	88	160.766	50.003	24.376
	R6	CMU 8" Typ	0.065	77	0.816	88	1.438	88	170.062	50.003	24.376
	R7	CMU 8" Typ	0.208	76	1.362	89	1.552	76	168.376	72.087	31.631
	R8	CMU 8" Typ	0.047	76	0.58	88	1.694	76	160.766	50.003	24.376
	R9	CMU 8" Typ	0.07	76	0.864	76	1.877	76	170.062	55.57	24.376
	R10	CMU 8" Typ	0.223	76	1.748	88	1.052	76	493.103	221.16	99.94

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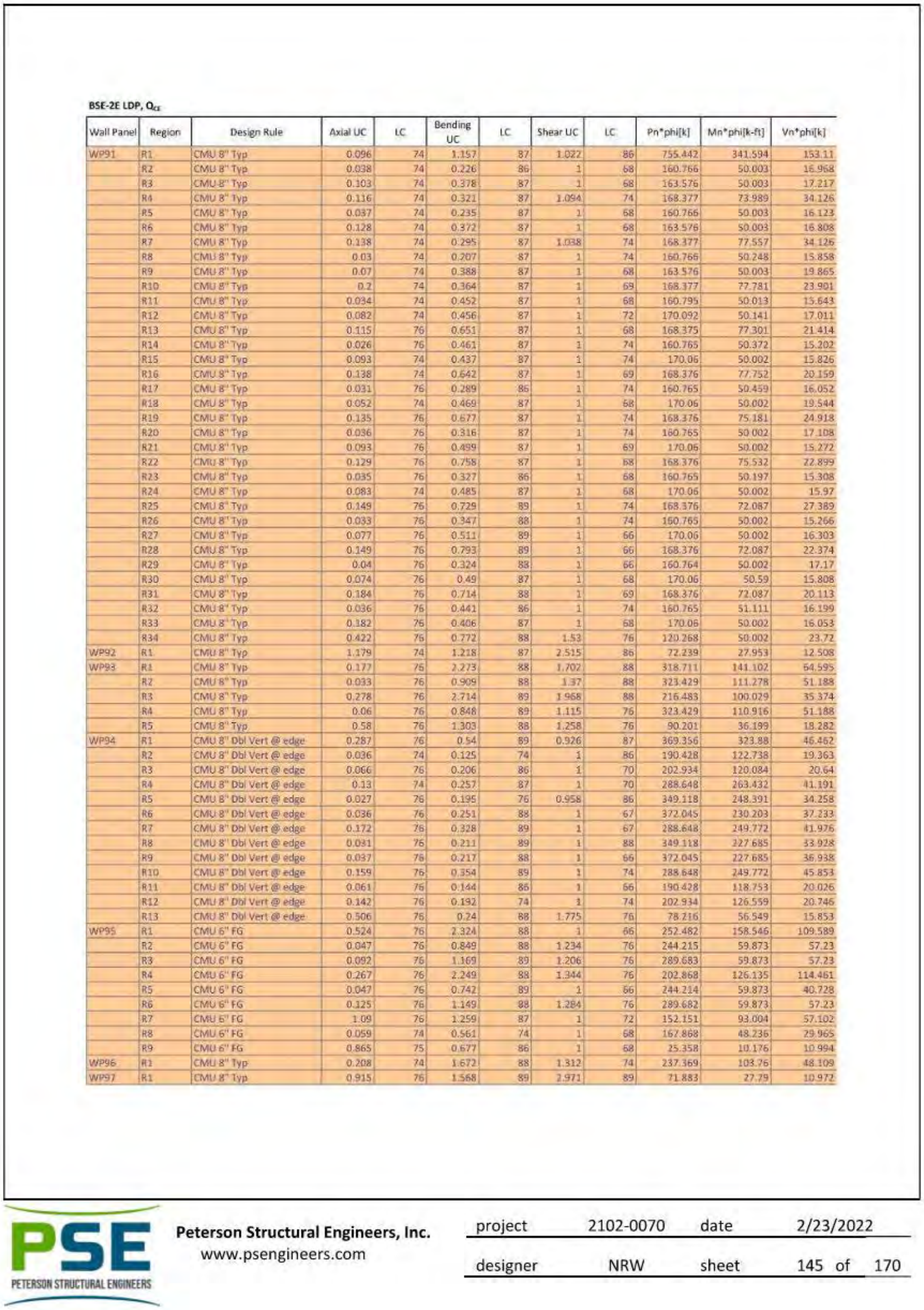

BSE-2E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP91	R1	CMU 8" Typ	0.096	74	1.157	87	1.022	86	755.442	341.594	153.11
	R2	CMU 8" Typ	0.038	74	0.226	86	1	68	160.766	50.003	16.968
	R3	CMU 8" Typ	0.103	74	0.378	87	1	68	163.576	50.003	17.217
	R4	CMU 8" Typ	0.116	74	0.321	87	1.094	74	168.377	73.989	34.126
	R5	CMU 8" Typ	0.037	74	0.235	87	1	68	160.766	50.003	16.123
	R6	CMU 8" Typ	0.128	74	0.372	87	1	68	163.576	50.003	16.808
	R7	CMU 8" Typ	0.138	74	0.295	87	1.038	74	168.377	77.557	34.126
	R8	CMU 8" Typ	0.03	74	0.207	87	1	74	160.766	50.248	15.858
	R9	CMU 8" Typ	0.07	74	0.388	87	1	68	163.576	50.003	19.865
	R10	CMU 8" Typ	0.2	74	0.364	87	1	69	168.377	77.781	23.901
	R11	CMU 8" Typ	0.034	74	0.452	87	1	68	160.795	50.013	15.643
	R12	CMU 8" Typ	0.082	74	0.456	87	1	72	170.092	50.141	17.011
	R13	CMU 8" Typ	0.115	76	0.651	87	1	68	168.375	77.301	21.414
	R14	CMU 8" Typ	0.026	76	0.461	87	1	74	160.765	50.372	15.202
	R15	CMU 8" Typ	0.093	74	0.437	87	1	74	170.06	50.002	15.826
	R16	CMU 8" Typ	0.138	74	0.642	87	1	69	168.376	77.752	20.159
	R17	CMU 8" Typ	0.031	76	0.289	86	1	74	160.765	50.459	16.052
	R18	CMU 8" Typ	0.052	74	0.469	87	1	68	170.06	50.002	19.544
	R19	CMU 8" Typ	0.135	76	0.677	87	1	74	168.376	75.181	24.918
	R20	CMU 8" Typ	0.036	76	0.316	87	1	74	160.765	50.002	17.108
	R21	CMU 8" Typ	0.093	76	0.499	87	1	69	170.06	50.002	15.272
	R22	CMU 8" Typ	0.129	76	0.758	87	1	68	168.376	75.532	22.899
	R23	CMU 8" Typ	0.035	76	0.327	86	1	68	160.765	50.197	15.308
	R24	CMU 8" Typ	0.083	74	0.485	87	1	68	170.06	50.002	15.97
	R25	CMU 8" Typ	0.149	76	0.729	89	1	74	168.376	72.087	27.389
	R26	CMU 8" Typ	0.033	76	0.347	88	1	74	160.765	50.002	15.266
	R27	CMU 8" Typ	0.077	76	0.511	89	1	66	170.06	50.002	16.303
	R28	CMU 8" Typ	0.149	76	0.793	89	1	66	168.376	72.087	22.374
	R29	CMU 8" Typ	0.04	76	0.324	88	1	66	160.764	50.002	17.17
	R30	CMU 8" Typ	0.074	76	0.49	87	1	68	170.06	50.59	15.808
	R31	CMU 8" Typ	0.184	76	0.714	88	1	69	168.376	72.087	20.113
	R32	CMU 8" Typ	0.036	76	0.441	86	1	74	160.765	51.111	16.199
	R33	CMU 8" Typ	0.182	76	0.406	87	1	68	170.06	50.002	16.053
	R34	CMU 8" Typ	0.422	76	0.772	88	1.53	76	120.268	50.002	23.72
WP92	R1	CMU 8" Typ	1.179	74	1.218	87	2.515	86	72.239	27.953	12.508
WP93	R1	CMU 8" Typ	0.177	76	2.273	88	1.702	88	318.711	141.102	64.595
	R2	CMU 8" Typ	0.033	76	0.909	88	1.37	88	323.429	111.278	51.188
	R3	CMU 8" Typ	0.278	76	2.714	89	1.968	88	216.483	100.029	35.374
	R4	CMU 8" Typ	0.06	76	0.848	89	1.115	76	323.429	110.916	51.188
	R5	CMU 8" Typ	0.58	76	1.303	88	1.258	76	90.201	36.199	18.282
WP94	R1	CMU 8" Dbl Vert @ edge	0.287	76	0.54	89	0.926	87	369.356	323.88	46.462
	R2	CMU 8" Dbl Vert @ edge	0.036	74	0.125	74	1	86	190.428	122.738	19.363
	R3	CMU 8" Dbl Vert @ edge	0.066	76	0.206	86	1	70	202.934	120.084	20.64
	R4	CMU 8" Dbl Vert @ edge	0.13	74	0.257	87	1	70	288.648	263.432	41.191
	R5	CMU 8" Dbl Vert @ edge	0.027	76	0.195	76	0.958	86	349.118	248.391	34.258
	R6	CMU 8" Dbl Vert @ edge	0.036	76	0.251	88	1	67	372.045	230.203	37.233
	R7	CMU 8" Dbl Vert @ edge	0.172	76	0.328	89	1	67	288.648	249.772	41.976
	R8	CMU 8" Dbl Vert @ edge	0.031	76	0.211	89	1	88	349.118	227.685	33.928
	R9	CMU 8" Dbl Vert @ edge	0.037	76	0.217	88	1	66	372.045	227.685	36.938
	R10	CMU 8" Dbl Vert @ edge	0.159	76	0.354	89	1	74	288.648	249.772	45.853
	R11	CMU 8" Dbl Vert @ edge	0.061	76	0.144	86	1	66	190.428	118.753	20.026
	R12	CMU 8" Dbl Vert @ edge	0.142	76	0.192	74	1	74	202.934	126.559	20.746
	R13	CMU 8" Dbl Vert @ edge	0.506	76	0.24	88	1.775	76	78.216	56.549	15.853
WP95	R1	CMU 6" FG	0.524	76	2.324	88	1	66	252.482	158.546	109.589
	R2	CMU 6" FG	0.047	76	0.849	88	1.234	76	244.215	59.873	57.23
	R3	CMU 6" FG	0.092	76	1.169	89	1.206	76	289.683	59.873	57.23
	R4	CMU 6" FG	0.267	76	2.249	88	1.344	76	202.868	126.135	114.461
	R5	CMU 6" FG	0.047	76	0.742	89	1	66	244.214	59.873	40.728
	R6	CMU 6" FG	0.125	76	1.149	88	1.284	76	289.682	59.873	57.23
	R7	CMU 6" FG	1.09	76	1.259	87	1	72	152.151	93.004	57.102
	R8	CMU 6" FG	0.059	74	0.561	74	1	68	167.868	48.236	29.965
	R9	CMU 6" FG	0.865	75	0.677	86	1	68	25.358	10.176	10.994
WP96	R1	CMU 8" Typ	0.208	74	1.672	88	1.312	74	237.369	103.76	48.109
WP97	R1	CMU 8" Typ	0.915	76	1.568	89	2.971	89	71.883	27.79	10.972

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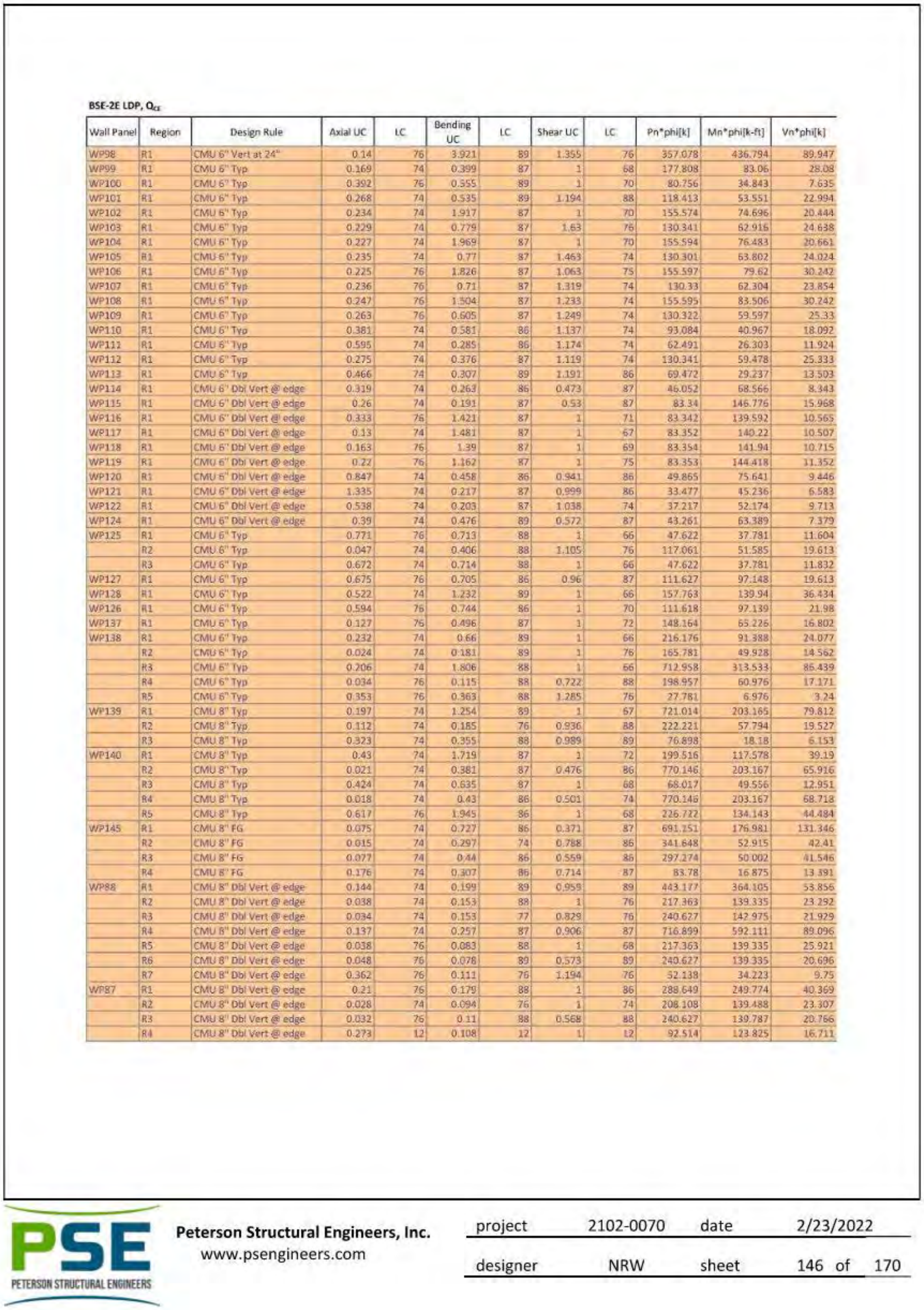

BSE-2E LDP, Q_{CE}

Wall Panel	Region	Design Rule	Axial UC	LC	Bending UC	LC	Shear UC	LC	Pn*phi[k]	Mn*phi[k-ft]	Vn*phi[k]
WP98	R1	CMU 6" Vert at 24"	0.14	76	3.921	89	1.355	76	357.078	436.794	89.947
WP99	R1	CMU 6" Typ	0.169	74	0.399	87	1	68	177.808	83.06	28.08
WP100	R1	CMU 6" Typ	0.392	76	0.555	89	1	70	80.756	34.843	7.635
WP101	R1	CMU 6" Typ	0.268	74	0.535	89	1.194	88	118.413	53.551	22.994
WP102	R1	CMU 6" Typ	0.234	74	1.917	87	1	70	155.574	74.696	20.444
WP103	R1	CMU 6" Typ	0.229	74	0.779	87	1.63	76	130.341	62.916	24.638
WP104	R1	CMU 6" Typ	0.227	74	1.969	87	1	70	155.594	76.483	20.661
WP105	R1	CMU 6" Typ	0.235	74	0.77	87	1.463	74	130.301	63.802	24.024
WP106	R1	CMU 6" Typ	0.225	76	1.826	87	1.063	75	155.597	79.62	30.242
WP107	R1	CMU 6" Typ	0.236	76	0.71	87	1.319	74	130.33	62.304	23.854
WP108	R1	CMU 6" Typ	0.247	76	1.504	87	1.233	74	155.595	83.506	30.242
WP109	R1	CMU 6" Typ	0.263	76	0.605	87	1.249	74	130.322	59.597	25.33
WP110	R1	CMU 6" Typ	0.381	74	0.581	86	1.137	74	93.084	40.967	18.092
WP111	R1	CMU 6" Typ	0.595	74	0.285	86	1.174	74	62.491	26.303	11.924
WP112	R1	CMU 6" Typ	0.275	74	0.376	87	1.119	74	130.341	59.478	25.333
WP113	R1	CMU 6" Typ	0.466	74	0.307	89	1.191	86	69.472	29.237	13.503
WP114	R1	CMU 6" Dbl Vert @ edge	0.319	74	0.263	86	0.473	87	46.052	68.566	8.343
WP115	R1	CMU 6" Dbl Vert @ edge	0.26	74	0.191	87	0.53	87	83.34	146.776	15.968
WP116	R1	CMU 6" Dbl Vert @ edge	0.333	76	1.421	87	1	71	83.342	139.592	10.565
WP117	R1	CMU 6" Dbl Vert @ edge	0.13	74	1.481	87	1	67	83.352	140.22	10.507
WP118	R1	CMU 6" Dbl Vert @ edge	0.163	76	1.39	87	1	69	83.354	141.94	10.715
WP119	R1	CMU 6" Dbl Vert @ edge	0.22	76	1.162	87	1	75	83.353	144.418	11.352
WP120	R1	CMU 6" Dbl Vert @ edge	0.847	74	0.458	86	0.941	86	49.865	75.641	9.446
WP121	R1	CMU 6" Dbl Vert @ edge	1.335	74	0.217	87	0.999	86	33.477	45.236	6.583
WP122	R1	CMU 6" Dbl Vert @ edge	0.538	74	0.203	87	1.038	74	37.217	52.174	9.713
WP124	R1	CMU 6" Dbl Vert @ edge	0.39	74	0.476	89	0.572	87	43.261	63.389	7.379
WP125	R1	CMU 6" Typ	0.771	76	0.713	88	1	66	47.622	37.781	11.604
	R2	CMU 6" Typ	0.047	74	0.406	88	1.105	76	117.061	51.585	19.613
	R3	CMU 6" Typ	0.672	74	0.714	88	1	66	47.622	37.781	11.832
WP127	R1	CMU 6" Typ	0.675	76	0.705	86	0.96	87	111.627	97.148	19.613
WP128	R1	CMU 6" Typ	0.522	74	1.232	89	1	66	157.763	139.94	36.434
WP126	R1	CMU 6" Typ	0.594	76	0.744	86	1	70	111.618	97.139	21.98
WP137	R1	CMU 6" Typ	0.127	76	0.496	87	1	72	148.164	65.226	16.802
WP138	R1	CMU 6" Typ	0.232	74	0.66	89	1	66	216.176	91.388	24.077
	R2	CMU 6" Typ	0.024	74	0.181	89	1	76	165.781	49.928	14.562
	R3	CMU 6" Typ	0.206	74	1.806	88	1	66	712.958	313.533	86.439
	R4	CMU 6" Typ	0.034	76	0.115	88	0.722	88	198.957	60.976	17.171
	R5	CMU 6" Typ	0.353	76	0.363	88	1.285	76	27.781	6.976	3.24
WP139	R1	CMU 8" Typ	0.197	74	1.254	89	1	67	721.014	203.165	79.812
	R2	CMU 8" Typ	0.112	74	0.185	76	0.936	88	222.221	57.794	19.527
	R3	CMU 8" Typ	0.323	74	0.355	88	0.989	89	76.898	18.18	6.153
WP140	R1	CMU 8" Typ	0.43	74	1.719	87	1	72	199.516	117.578	39.19
	R2	CMU 8" Typ	0.021	74	0.381	87	0.476	86	770.146	203.167	65.916
	R3	CMU 8" Typ	0.424	74	0.635	87	1	68	68.017	49.556	12.951
	R4	CMU 8" Typ	0.018	74	0.43	86	0.501	74	770.146	203.167	68.718
	R5	CMU 8" Typ	0.617	76	1.945	86	1	68	226.722	134.143	44.484
WP145	R1	CMU 8" FG	0.075	74	0.727	86	0.371	87	691.151	176.981	131.346
	R2	CMU 8" FG	0.015	74	0.297	74	0.788	86	341.648	52.915	42.41
	R3	CMU 8" FG	0.077	74	0.44	86	0.559	86	297.274	50.002	41.546
	R4	CMU 8" FG	0.176	74	0.307	86	0.714	87	83.78	16.875	13.391
WP88	R1	CMU 8" Dbl Vert @ edge	0.144	74	0.199	89	0.959	89	443.177	364.105	53.856
	R2	CMU 8" Dbl Vert @ edge	0.038	74	0.153	88	1	76	217.363	139.335	23.292
	R3	CMU 8" Dbl Vert @ edge	0.034	74	0.153	77	0.829	76	240.627	142.975	21.929
	R4	CMU 8" Dbl Vert @ edge	0.137	74	0.257	87	0.906	87	716.899	592.111	89.096
	R5	CMU 8" Dbl Vert @ edge	0.038	76	0.083	88	1	68	217.363	139.335	25.921
	R6	CMU 8" Dbl Vert @ edge	0.048	76	0.078	89	0.573	89	240.627	139.335	20.696
	R7	CMU 8" Dbl Vert @ edge	0.362	76	0.111	76	1.194	76	52.138	34.223	9.75
WP87	R1	CMU 8" Dbl Vert @ edge	0.21	76	0.179	88	1	86	288.649	249.774	40.369
	R2	CMU 8" Dbl Vert @ edge	0.028	74	0.094	76	1	74	208.108	139.488	23.307
	R3	CMU 8" Dbl Vert @ edge	0.032	76	0.11	88	0.568	88	240.627	139.787	20.766
	R4	CMU 8" Dbl Vert @ edge	0.273	12	0.108	12	1	12	92.514	123.825	16.711

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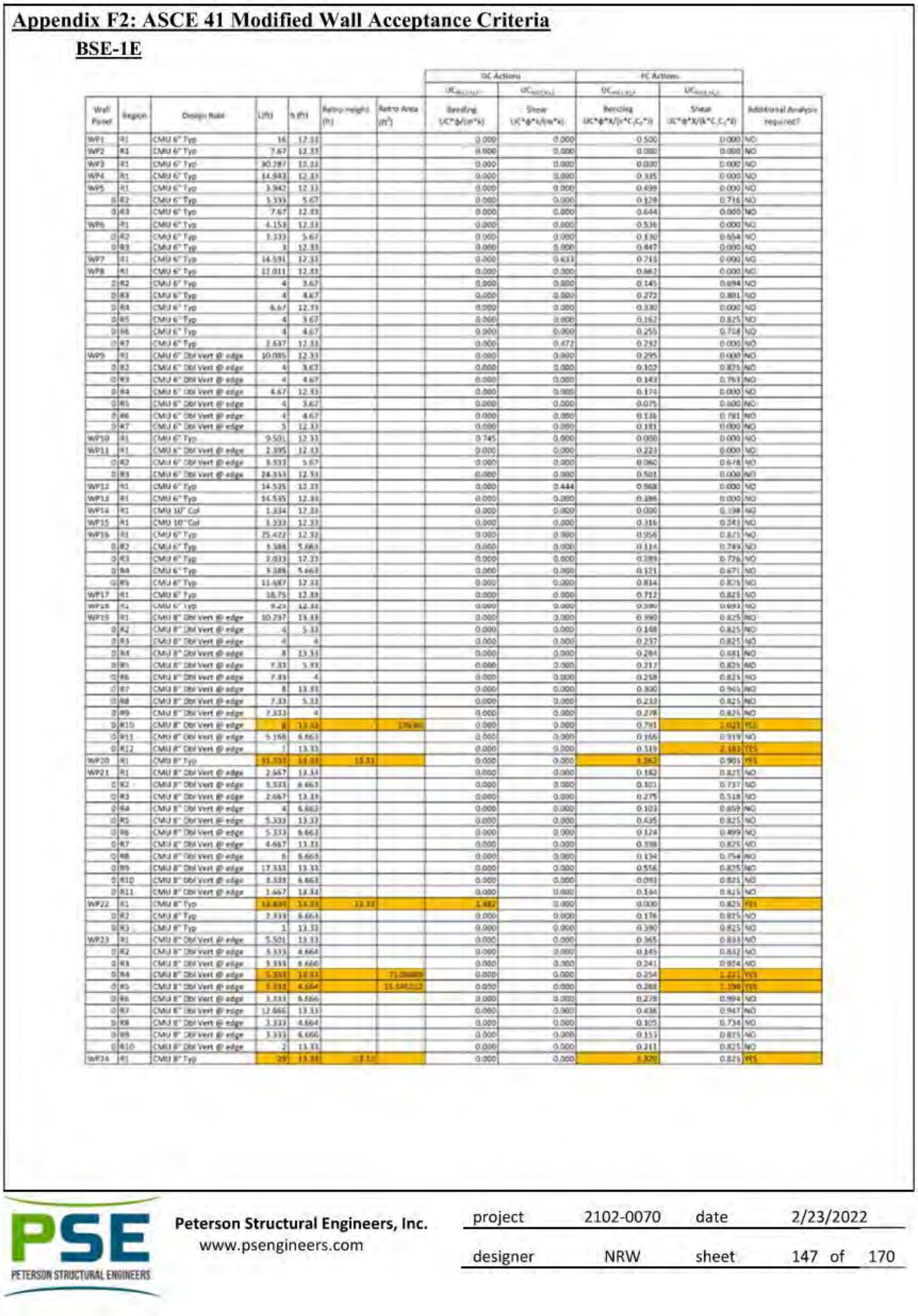

Appendix F2: ASCE 41 Modified Wall Acceptance Criteria

BSE-1E

							DC Actions		FC Actions		
							UC[illegible]	UC[illegible]	UC[illegible]	UC[illegible]	
Wall Panel	Region	Design Rule	L(ft)	h (ft)	Retro height (ft)	Retro Area (ft²)	Bending $UC*\phi/(m*k)$	Shear $UC*\phi*k/(m*k)$	Bending $UC*\phi*X/(k*C_1C_2*J)$	Shear $UC*\phi*X/(k*C_1C_2*J)$	Additional Analysis required?
WP1	R1	CMU 6" Typ	16	12.33			0.000	0.000	0.500	0.000	NO
WP2	R1	CMU 6" Typ	7.67	12.33			0.000	0.000	0.000	0.000	NO
WP3	R1	CMU 6" Typ	30.787	12.33			0.000	0.000	0.000	0.000	NO
WP4	R1	CMU 6" Typ	14.943	12.33			0.000	0.000	0.335	0.000	NO
WP5	R1	CMU 6" Typ	3.942	12.33			0.000	0.000	0.499	0.000	NO
0	R2	CMU 6" Typ	3.333	5.67			0.000	0.000	0.129	0.716	NO
0	R3	CMU 6" Typ	7.67	12.33			0.000	0.000	0.644	0.000	NO
WP6	R1	CMU 6" Typ	4.153	12.33			0.000	0.000	0.536	0.000	NO
0	R2	CMU 6" Typ	3.333	5.67			0.000	0.000	0.130	0.654	NO
0	R3	CMU 6" Typ	3	12.33			0.000	0.000	0.447	0.000	NO
WP7	R1	CMU 6" Typ	14.591	12.33			0.000	0.633	0.715	0.000	NO
WP8	R1	CMU 6" Typ	17.011	12.33			0.000	0.000	0.662	0.000	NO
0	R2	CMU 6" Typ	4	3.67			0.000	0.000	0.145	0.694	NO
0	R3	CMU 6" Typ	4	4.67			0.000	0.000	0.272	0.801	NO
0	R4	CMU 6" Typ	4.67	12.33			0.000	0.000	0.330	0.000	NO
0	R5	CMU 6" Typ	4	3.67			0.000	0.000	0.162	0.825	NO
0	R6	CMU 6" Typ	4	4.67			0.000	0.000	0.255	0.758	NO
0	R7	CMU 6" Typ	2.637	12.33			0.000	0.472	0.292	0.000	NO
WP9	R1	CMU 6" Dbl Vert @ edge	10.085	12.33			0.000	0.000	0.295	0.000	NO
0	R2	CMU 6" Dbl Vert @ edge	4	3.67			0.000	0.000	0.102	0.875	NO
0	R3	CMU 6" Dbl Vert @ edge	4	4.67			0.000	0.000	0.143	0.763	NO
0	R4	CMU 6" Dbl Vert @ edge	4.67	12.33			0.000	0.000	0.174	0.000	NO
0	R5	CMU 6" Dbl Vert @ edge	4	3.67			0.000	0.000	0.075	0.600	NO
0	R6	CMU 6" Dbl Vert @ edge	4	4.67			0.000	0.000	0.136	0.781	NO
0	R7	CMU 6" Dbl Vert @ edge	5	12.33			0.000	0.000	0.181	0.000	NO
WP10	R1	CMU 6" Typ	9.501	12.33			0.745	0.000	0.000	0.000	NO
WP11	R1	CMU 6" Dbl Vert @ edge	2.395	12.33			0.000	0.000	0.223	0.000	NO
0	R2	CMU 6" Dbl Vert @ edge	3.333	5.67			0.000	0.000	0.060	0.678	NO
0	R3	CMU 6" Dbl Vert @ edge	24.333	12.33			0.000	0.000	0.501	0.000	NO
WP12	R1	CMU 6" Typ	14.535	12.33			0.000	0.444	0.968	0.000	NO
WP13	R1	CMU 6" Typ	14.535	12.33			0.000	0.000	0.386	0.000	NO
WP14	R1	CMU 10" Col	1.334	12.33			0.000	0.000	0.000	0.198	NO
WP15	R1	CMU 10" Col	1.333	12.33			0.000	0.000	0.316	0.243	NO
WP16	R1	CMU 6" Typ	25.422	12.32			0.000	0.000	0.956	0.825	NO
0	R2	CMU 6" Typ	3.388	5.663			0.000	0.000	0.114	0.749	NO
0	R3	CMU 6" Typ	2.033	12.33			0.000	0.000	0.289	0.776	NO
0	R4	CMU 6" Typ	3.388	5.663			0.000	0.000	0.121	0.671	NO
0	R5	CMU 6" Typ	11.687	12.33			0.000	0.000	0.814	0.825	NO
WP17	R1	CMU 6" Typ	18.75	12.33			0.000	0.000	0.712	0.825	NO
WP18	R1	CMU 6" Typ	9.25	12.33			0.000	0.000	0.590	0.693	NO
WP19	R1	CMU 8" Dbl Vert @ edge	10.297	13.33			0.000	0.000	0.390	0.825	NO
0	R2	CMU 8" Dbl Vert @ edge	4	5.33			0.000	0.000	0.148	0.825	NO
0	R3	CMU 8" Dbl Vert @ edge	4	4			0.000	0.000	0.237	0.825	NO
0	R4	CMU 8" Dbl Vert @ edge	8	13.33			0.000	0.000	0.284	0.881	NO
0	R5	CMU 8" Dbl Vert @ edge	7.33	5.33			0.000	0.000	0.317	0.825	NO
0	R6	CMU 8" Dbl Vert @ edge	7.33	4			0.000	0.000	0.258	0.825	NO
0	R7	CMU 8" Dbl Vert @ edge	8	13.33			0.000	0.000	0.300	0.965	NO
0	R8	CMU 8" Dbl Vert @ edge	7.33	5.33			0.000	0.000	0.233	0.825	NO
0	R9	CMU 8" Dbl Vert @ edge	7.333	4			0.000	0.000	0.278	0.825	NO
0	R10	CMU 8" Dbl Vert @ edge	8	13.33		176.00	0.000	0.000	0.791	1.023	YES
0	R11	CMU 8" Dbl Vert @ edge	5.168	6.663			0.000	0.000	0.166	0.919	NO
0	R12	CMU 8" Dbl Vert @ edge	1	13.33			0.000	0.000	0.319	2.183	YES
WP20	R1	CMU 8" Typ	31.333	13.33	13.33		0.000	0.000	1.362	0.905	YES
WP21	R1	CMU 8" Dbl Vert @ edge	2.667	13.33			0.000	0.000	0.182	0.825	NO
0	R2	CMU 8" Dbl Vert @ edge	3.333	6.663			0.000	0.000	0.101	0.737	NO
0	R3	CMU 8" Dbl Vert @ edge	2.667	13.33			0.000	0.000	0.275	0.518	NO
0	R4	CMU 8" Dbl Vert @ edge	4	6.663			0.000	0.000	0.103	0.859	NO
0	R5	CMU 8" Dbl Vert @ edge	5.333	13.33			0.000	0.000	0.435	0.825	NO
0	R6	CMU 8" Dbl Vert @ edge	5.333	6.663			0.000	0.000	0.124	0.499	NO
0	R7	CMU 8" Dbl Vert @ edge	4.667	13.33			0.000	0.000	0.398	0.825	NO
0	R8	CMU 8" Dbl Vert @ edge	8	6.663			0.000	0.000	0.134	0.754	NO
0	R9	CMU 8" Dbl Vert @ edge	17.333	13.33			0.000	0.000	0.556	0.825	NO
0	R10	CMU 8" Dbl Vert @ edge	3.333	6.663			0.000	0.000	0.093	0.825	NO
0	R11	CMU 8" Dbl Vert @ edge	1.667	13.34			0.000	0.000	0.144	0.825	NO
WP22	R1	CMU 8" Typ	18.000	13.33	13.33		1.482	0.000	0.000	0.825	YES
0	R2	CMU 8" Typ	7.333	6.663			0.000	0.000	0.176	0.825	NO
0	R3	CMU 8" Typ	1	13.33			0.000	0.000	0.390	0.825	NO
WP23	R1	CMU 8" Dbl Vert @ edge	5.501	13.33			0.000	0.000	0.365	0.833	NO
0	R2	CMU 8" Dbl Vert @ edge	3.333	4.664			0.000	0.000	0.145	0.832	NO
0	R3	CMU 8" Dbl Vert @ edge	3.333	6.666			0.000	0.000	0.241	0.974	NO
0	R4	CMU 8" Dbl Vert @ edge	5.333	13.33		71.08889	0.000	0.000	0.254	1.221	YES
0	R5	CMU 8" Dbl Vert @ edge	3.333	4.664		15.548312	0.000	0.000	0.288	1.398	YES
0	R6	CMU 8" Dbl Vert @ edge	3.333	6.666			0.000	0.000	0.278	0.994	NO
0	R7	CMU 8" Dbl Vert @ edge	12.666	13.33			0.000	0.000	0.438	0.947	NO
0	R8	CMU 8" Dbl Vert @ edge	3.333	4.664			0.000	0.000	0.105	0.734	NO
0	R9	CMU 8" Dbl Vert @ edge	3.333	6.666			0.000	0.000	0.151	0.825	NO
0	R10	CMU 8" Dbl Vert @ edge	2	13.33			0.000	0.000	0.211	0.825	NO
WP24	R1	CMU 8" Typ	28	13.33	13.33		0.000	0.000	1.320	0.825	YES

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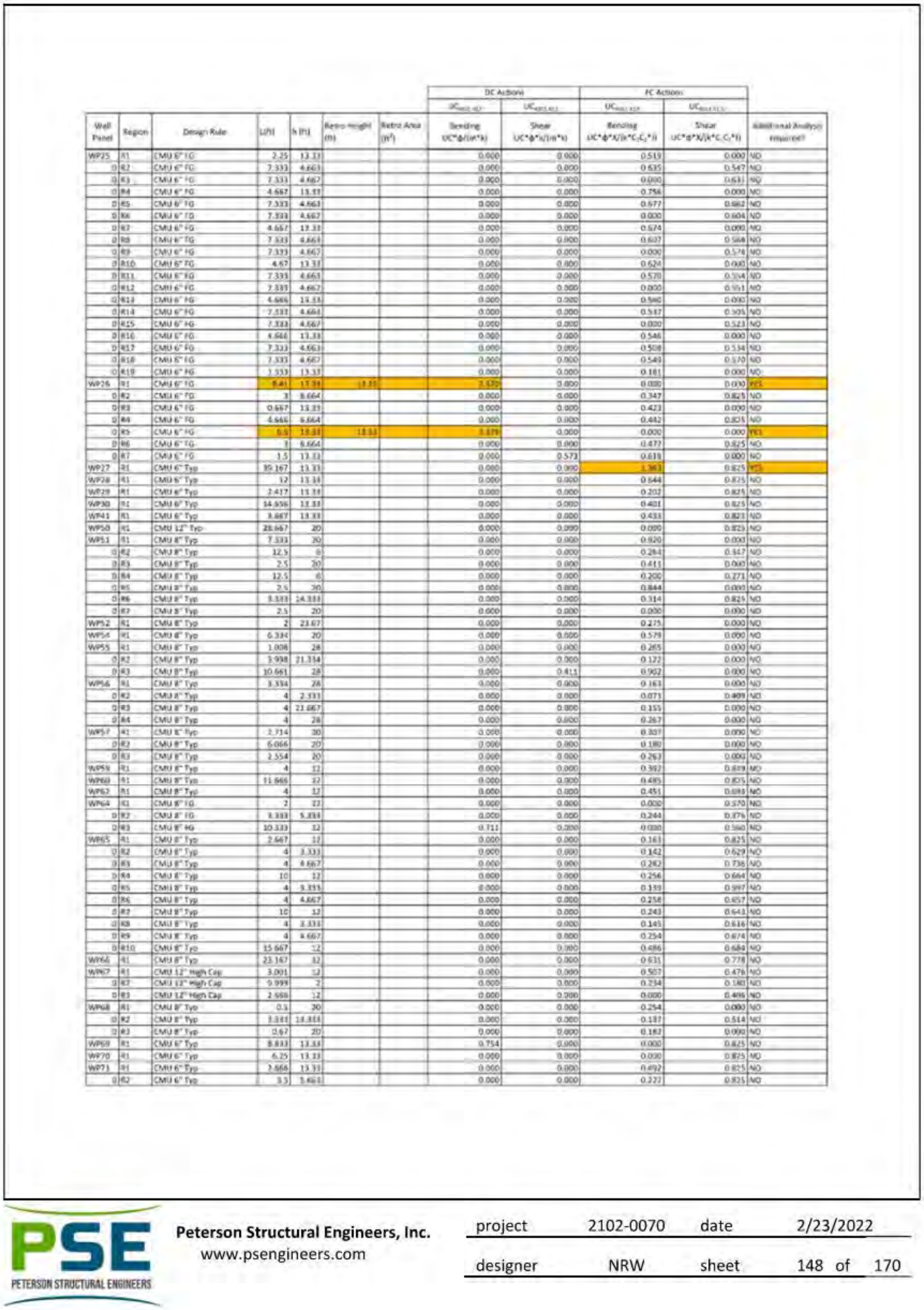

							DC Actions		FC Actions		
							UC [illegible]	UC [illegible]	UC [illegible]	UC [illegible]	
Wall Panel	Region	Design Rule	L(ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending UC*ϕ/(m*k)	Shear UC*ϕ*κ/(m*k)	Bending UC*ϕ*X/(k*C₁C₂*J)	Shear UC*ϕ*X/(k*C₁C₂*J)	Additional Analysis required?
WP25	R1	CMU 6" FG	2.25	13.33			0.000	0.000	0.513	0.000	NO
0	R2	CMU 6" FG	7.333	4.663			0.000	0.000	0.635	0.547	NO
0	R3	CMU 6" FG	7.333	4.667			0.000	0.000	0.000	0.631	NO
0	R4	CMU 6" FG	4.667	13.33			0.000	0.000	0.756	0.000	NO
0	R5	CMU 6" FG	7.333	4.663			0.000	0.000	0.677	0.862	NO
0	R6	CMU 6" FG	7.333	4.667			0.000	0.000	0.000	0.604	NO
0	R7	CMU 6" FG	4.667	13.33			0.000	0.000	0.674	0.000	NO
0	R8	CMU 6" FG	7.333	4.663			0.000	0.000	0.607	0.568	NO
0	R9	CMU 6" FG	7.333	4.667			0.000	0.000	0.000	0.574	NO
0	R10	CMU 6" FG	4.67	13.33			0.000	0.000	0.624	0.000	NO
0	R11	CMU 6" FG	7.333	4.663			0.000	0.000	0.570	0.554	NO
0	R12	CMU 6" FG	7.333	4.667			0.000	0.000	0.000	0.551	NO
0	R13	CMU 6" FG	4.666	13.33			0.000	0.000	0.540	0.000	NO
0	R14	CMU 6" FG	7.333	4.664			0.000	0.000	0.537	0.505	NO
0	R15	CMU 6" FG	7.333	4.667			0.000	0.000	0.000	0.523	NO
0	R16	CMU 6" FG	4.666	13.33			0.000	0.000	0.546	0.000	NO
0	R17	CMU 6" FG	7.333	4.663			0.000	0.000	0.508	0.534	NO
0	R18	CMU 6" FG	7.333	4.667			0.000	0.000	0.549	0.570	NO
0	R19	CMU 6" FG	3.333	13.33			0.000	0.000	0.181	0.000	NO
WP26	R1	CMU 6" FG	8.41	13.33	13.33		2.120	0.000	0.000	0.000	YES
0	R2	CMU 6" FG	3	8.664			0.000	0.000	0.347	0.825	NO
0	R3	CMU 6" FG	0.667	13.33			0.000	0.000	0.423	0.000	NO
0	R4	CMU 6" FG	4.666	6.664			0.000	0.000	0.442	0.825	NO
0	R5	CMU 6" FG	6.5	13.33	13.33		3.379	0.000	0.000	0.000	YES
0	R6	CMU 6" FG	3	6.664			0.000	0.000	0.477	0.825	NO
0	R7	CMU 6" FG	1.5	13.33			0.000	0.573	0.618	0.000	NO
WP27	R1	CMU 6" Typ	39.167	13.33			0.000	0.000	1.383	0.825	YES
WP28	R1	CMU 6" Typ	12	13.33			0.000	0.000	0.644	0.825	NO
WP29	R1	CMU 6" Typ	2.417	13.33			0.000	0.000	0.202	0.825	NO
WP30	R1	CMU 6" Typ	14.656	13.33			0.000	0.000	0.401	0.825	NO
WP41	R1	CMU 6" Typ	3.667	13.33			0.000	0.000	0.433	0.825	NO
WP50	R1	CMU 12" Typ	28.667	20			0.000	0.000	0.000	0.825	NO
WP51	R1	CMU 8" Typ	7.333	20			0.000	0.000	0.920	0.000	NO
0	R2	CMU 8" Typ	12.5	8			0.000	0.000	0.284	0.547	NO
0	R3	CMU 8" Typ	2.5	20			0.000	0.000	0.411	0.000	NO
0	R4	CMU 8" Typ	12.5	8			0.000	0.000	0.200	0.271	NO
0	R5	CMU 8" Typ	2.5	20			0.000	0.000	0.844	0.000	NO
0	R6	CMU 8" Typ	3.333	14.333			0.000	0.000	0.314	0.825	NO
0	R7	CMU 8" Typ	2.5	20			0.000	0.000	0.000	0.000	NO
WP52	R1	CMU 8" Typ	2	23.67			0.000	0.000	0.275	0.000	NO
WP54	R1	CMU 8" Typ	6.334	20			0.000	0.000	0.579	0.000	NO
WP55	R1	CMU 8" Typ	1.008	28			0.000	0.000	0.265	0.000	NO
0	R2	CMU 8" Typ	3.998	21.334			0.000	0.000	0.122	0.000	NO
0	R3	CMU 8" Typ	10.661	28			0.000	0.411	0.962	0.000	NO
WP56	R1	CMU 8" Typ	3.334	28			0.000	0.000	0.163	0.000	NO
0	R2	CMU 8" Typ	4	2.333			0.000	0.000	0.071	0.409	NO
0	R3	CMU 8" Typ	4	21.667			0.000	0.000	0.155	0.000	NO
0	R4	CMU 8" Typ	4	28			0.000	0.000	0.267	0.000	NO
WP57	R1	CMU 8" Typ	2.714	30			0.000	0.000	0.307	0.000	NO
0	R2	CMU 8" Typ	6.066	20			0.000	0.000	0.180	0.000	NO
0	R3	CMU 8" Typ	2.554	20			0.000	0.000	0.263	0.000	NO
WP59	R1	CMU 8" Typ	4	12			0.000	0.000	0.392	0.819	NO
WP60	R1	CMU 8" Typ	11.666	12			0.000	0.000	0.485	0.825	NO
WP62	R1	CMU 8" Typ	4	12			0.000	0.000	0.451	0.698	NO
WP64	R1	CMU 8" FG	2	12			0.000	0.000	0.000	0.570	NO
0	R2	CMU 8" FG	3.333	5.334			0.000	0.000	0.244	0.376	NO
0	R3	CMU 8" FG	10.333	12			0.711	0.000	0.000	0.560	NO
WP65	R1	CMU 8" Typ	2.667	12			0.000	0.000	0.161	0.825	NO
0	R2	CMU 8" Typ	4	3.333			0.000	0.000	0.142	0.629	NO
0	R3	CMU 8" Typ	4	4.667			0.000	0.000	0.282	0.736	NO
0	R4	CMU 8" Typ	10	12			0.000	0.000	0.256	0.664	NO
0	R5	CMU 8" Typ	4	3.333			0.000	0.000	0.139	0.597	NO
0	R6	CMU 8" Typ	4	4.667			0.000	0.000	0.258	0.657	NO
0	R7	CMU 8" Typ	10	12			0.000	0.000	0.243	0.643	NO
0	R8	CMU 8" Typ	4	3.333			0.000	0.000	0.145	0.616	NO
0	R9	CMU 8" Typ	4	4.667			0.000	0.000	0.254	0.674	NO
0	R10	CMU 8" Typ	15.667	12			0.000	0.000	0.486	0.684	NO
WP66	R1	CMU 8" Typ	23.167	12			0.000	0.000	0.631	0.778	NO
WP67	R1	CMU 12" High Cap	3.001	12			0.000	0.000	0.507	0.476	NO
0	R2	CMU 12" High Cap	9.999	2			0.000	0.000	0.234	0.180	NO
0	R3	CMU 12" High Cap	2.666	12			0.000	0.000	0.000	0.496	NO
WP68	R1	CMU 8" Typ	0.5	20			0.000	0.000	0.254	0.000	NO
0	R2	CMU 8" Typ	3.333	14.333			0.000	0.000	0.137	0.514	NO
0	R3	CMU 8" Typ	0.67	20			0.000	0.000	0.182	0.000	NO
WP69	R1	CMU 6" Typ	8.833	13.33			0.754	0.000	0.000	0.825	NO
WP70	R1	CMU 6" Typ	6.25	13.33			0.000	0.000	0.000	0.825	NO
WP71	R1	CMU 6" Typ	2.666	13.33			0.000	0.000	0.492	0.825	NO
0	R2	CMU 6" Typ	3.5	5.663			0.000	0.000	0.227	0.825	NO

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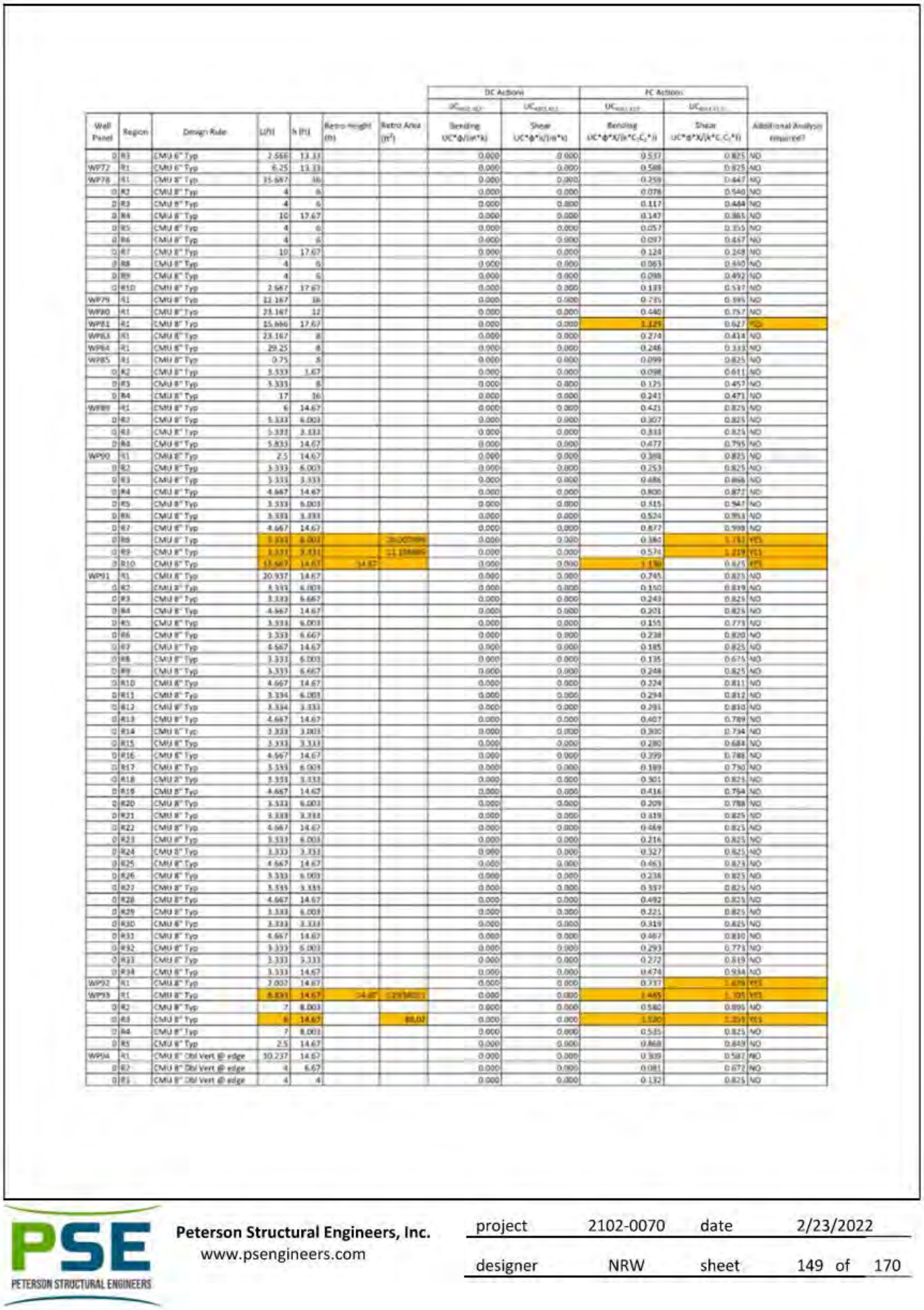

							DC Actions		FC Actions		
							UC	UC	UC	UC	
Wall Panel	Region	Design Rule	L(ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending UC*ϕ/(m*k)	Shear UC*ϕ*κ/(m*k)	Bending UC*ϕ*X/(k*C₁C₂*J)	Shear UC*ϕ*X/(k*C₁C₂*J)	Additional Analysis Required?
0	R3	CMU 6" Typ	2.666	13.33			0.000	0.000	0.537	0.825	NO
WP72	R1	CMU 6" Typ	6.25	13.33			0.000	0.000	0.588	0.825	NO
WP78	R1	CMU 8" Typ	15.667	16			0.000	0.000	0.259	0.447	NO
0	R2	CMU 8" Typ	4	6			0.000	0.000	0.078	0.540	NO
0	R3	CMU 8" Typ	4	6			0.000	0.000	0.117	0.484	NO
0	R4	CMU 8" Typ	10	17.67			0.000	0.000	0.147	0.365	NO
0	R5	CMU 8" Typ	4	6			0.000	0.000	0.057	0.355	NO
0	R6	CMU 8" Typ	4	6			0.000	0.000	0.097	0.467	NO
0	R7	CMU 8" Typ	10	17.67			0.000	0.000	0.124	0.248	NO
0	R8	CMU 8" Typ	4	6			0.000	0.000	0.063	0.490	NO
0	R9	CMU 8" Typ	4	6			0.000	0.000	0.098	0.492	NO
0	R10	CMU 8" Typ	2.667	17.67			0.000	0.000	0.133	0.537	NO
WP79	R1	CMU 8" Typ	12.167	16			0.000	0.000	0.735	0.395	NO
WP80	R1	CMU 8" Typ	23.167	12			0.000	0.000	0.440	0.757	NO
WP81	R1	CMU 8" Typ	15.666	17.67			0.000	0.000	1.129	0.627	YES
WP83	R1	CMU 8" Typ	23.167	8			0.000	0.000	0.274	0.414	NO
WP84	R1	CMU 8" Typ	29.25	8			0.000	0.000	0.246	0.333	NO
WP85	R1	CMU 8" Typ	0.75	8			0.000	0.000	0.099	0.825	NO
0	R2	CMU 8" Typ	3.333	1.67			0.000	0.000	0.098	0.611	NO
0	R3	CMU 8" Typ	3.333	8			0.000	0.000	0.125	0.457	NO
0	R4	CMU 8" Typ	17	16			0.000	0.000	0.241	0.471	NO
WP89	R1	CMU 8" Typ	6	14.67			0.000	0.000	0.421	0.825	NO
0	R2	CMU 8" Typ	5.333	6.003			0.000	0.000	0.307	0.825	NO
0	R3	CMU 8" Typ	5.333	3.333			0.000	0.000	0.333	0.825	NO
0	R4	CMU 8" Typ	5.833	14.67			0.000	0.000	0.477	0.795	NO
WP90	R1	CMU 8" Typ	2.5	14.67			0.000	0.000	0.398	0.825	NO
0	R2	CMU 8" Typ	3.333	6.003			0.000	0.000	0.253	0.825	NO
0	R3	CMU 8" Typ	3.333	3.333			0.000	0.000	0.686	0.866	NO
0	R4	CMU 8" Typ	4.667	14.67			0.000	0.000	0.800	0.872	NO
0	R5	CMU 8" Typ	3.333	6.003			0.000	0.000	0.315	0.947	NO
0	R6	CMU 8" Typ	3.333	3.333			0.000	0.000	0.524	0.953	NO
0	R7	CMU 8" Typ	4.667	14.67			0.000	0.000	0.877	0.998	NO
0	R8	CMU 8" Typ	3.333	6.003		20.007999	0.000	0.000	0.380	1.742	YES
0	R9	CMU 8" Typ	3.333	3.333		11.108889	0.000	0.000	0.574	1.219	YES
0	R10	CMU 8" Typ	15.667	14.67	14.67		0.000	0.000	1.136	0.825	YES
WP91	R1	CMU 8" Typ	20.937	14.67			0.000	0.000	0.745	0.825	NO
0	R2	CMU 8" Typ	3.333	6.003			0.000	0.000	0.150	0.819	NO
0	R3	CMU 8" Typ	3.333	6.667			0.000	0.000	0.243	0.825	NO
0	R4	CMU 8" Typ	4.667	14.67			0.000	0.000	0.201	0.825	NO
0	R5	CMU 8" Typ	3.333	6.003			0.000	0.000	0.155	0.773	NO
0	R6	CMU 8" Typ	3.333	6.667			0.000	0.000	0.238	0.820	NO
0	R7	CMU 8" Typ	4.667	14.67			0.000	0.000	0.185	0.825	NO
0	R8	CMU 8" Typ	3.333	6.003			0.000	0.000	0.135	0.675	NO
0	R9	CMU 8" Typ	3.333	6.667			0.000	0.000	0.248	0.825	NO
0	R10	CMU 8" Typ	4.667	14.67			0.000	0.000	0.224	0.811	NO
0	R11	CMU 8" Typ	3.334	6.003			0.000	0.000	0.294	0.812	NO
0	R12	CMU 8" Typ	3.334	3.333			0.000	0.000	0.291	0.830	NO
0	R13	CMU 8" Typ	4.667	14.67			0.000	0.000	0.407	0.789	NO
0	R14	CMU 8" Typ	3.333	3.003			0.000	0.000	0.300	0.734	NO
0	R15	CMU 8" Typ	3.333	3.333			0.000	0.000	0.280	0.684	NO
0	R16	CMU 8" Typ	4.667	14.67			0.000	0.000	0.399	0.788	NO
0	R17	CMU 8" Typ	3.333	6.003			0.000	0.000	0.189	0.730	NO
0	R18	CMU 8" Typ	3.333	3.333			0.000	0.000	0.301	0.825	NO
0	R19	CMU 8" Typ	4.667	14.67			0.000	0.000	0.416	0.764	NO
0	R20	CMU 8" Typ	3.333	6.003			0.000	0.000	0.209	0.788	NO
0	R21	CMU 8" Typ	3.333	3.333			0.000	0.000	0.319	0.825	NO
0	R22	CMU 8" Typ	4.667	14.67			0.000	0.000	0.469	0.825	NO
0	R23	CMU 8" Typ	3.333	6.003			0.000	0.000	0.216	0.825	NO
0	R24	CMU 8" Typ	3.333	3.333			0.000	0.000	0.327	0.825	NO
0	R25	CMU 8" Typ	4.667	14.67			0.000	0.000	0.463	0.823	NO
0	R26	CMU 8" Typ	3.333	6.003			0.000	0.000	0.238	0.825	NO
0	R27	CMU 8" Typ	3.333	3.333			0.000	0.000	0.357	0.825	NO
0	R28	CMU 8" Typ	4.667	14.67			0.000	0.000	0.492	0.825	NO
0	R29	CMU 8" Typ	3.333	6.003			0.000	0.000	0.221	0.825	NO
0	R30	CMU 8" Typ	3.333	3.333			0.000	0.000	0.319	0.825	NO
0	R31	CMU 8" Typ	4.667	14.67			0.000	0.000	0.467	0.810	NO
0	R32	CMU 8" Typ	3.333	6.003			0.000	0.000	0.293	0.773	NO
0	R33	CMU 8" Typ	3.333	3.333			0.000	0.000	0.272	0.819	NO
0	R34	CMU 8" Typ	3.333	14.67			0.000	0.000	0.474	0.934	NO
WP92	R1	CMU 8" Typ	7.003	14.67			0.000	0.000	0.737	1.679	YES
WP93	R1	CMU 8" Typ	8.833	14.67	14.67	129.58001	0.000	0.000	1.465	1.105	YES
0	R2	CMU 8" Typ	7	8.003			0.000	0.000	0.580	0.895	NO
0	R3	CMU 8" Typ	6	14.67		88.02	0.000	0.000	1.020	1.255	YES
0	R4	CMU 8" Typ	7	8.003			0.000	0.000	0.535	0.825	NO
0	R5	CMU 8" Typ	2.5	14.67			0.000	0.000	0.868	0.849	NO
WP94	R1	CMU 8" Dbl Vert @ edge	10.237	14.67			0.000	0.000	0.309	0.587	NO
0	R2	CMU 8" Dbl Vert @ edge	4	6.67			0.000	0.000	0.081	0.672	NO
0	R3	CMU 8" Dbl Vert @ edge	4	4			0.000	0.000	0.132	0.825	NO

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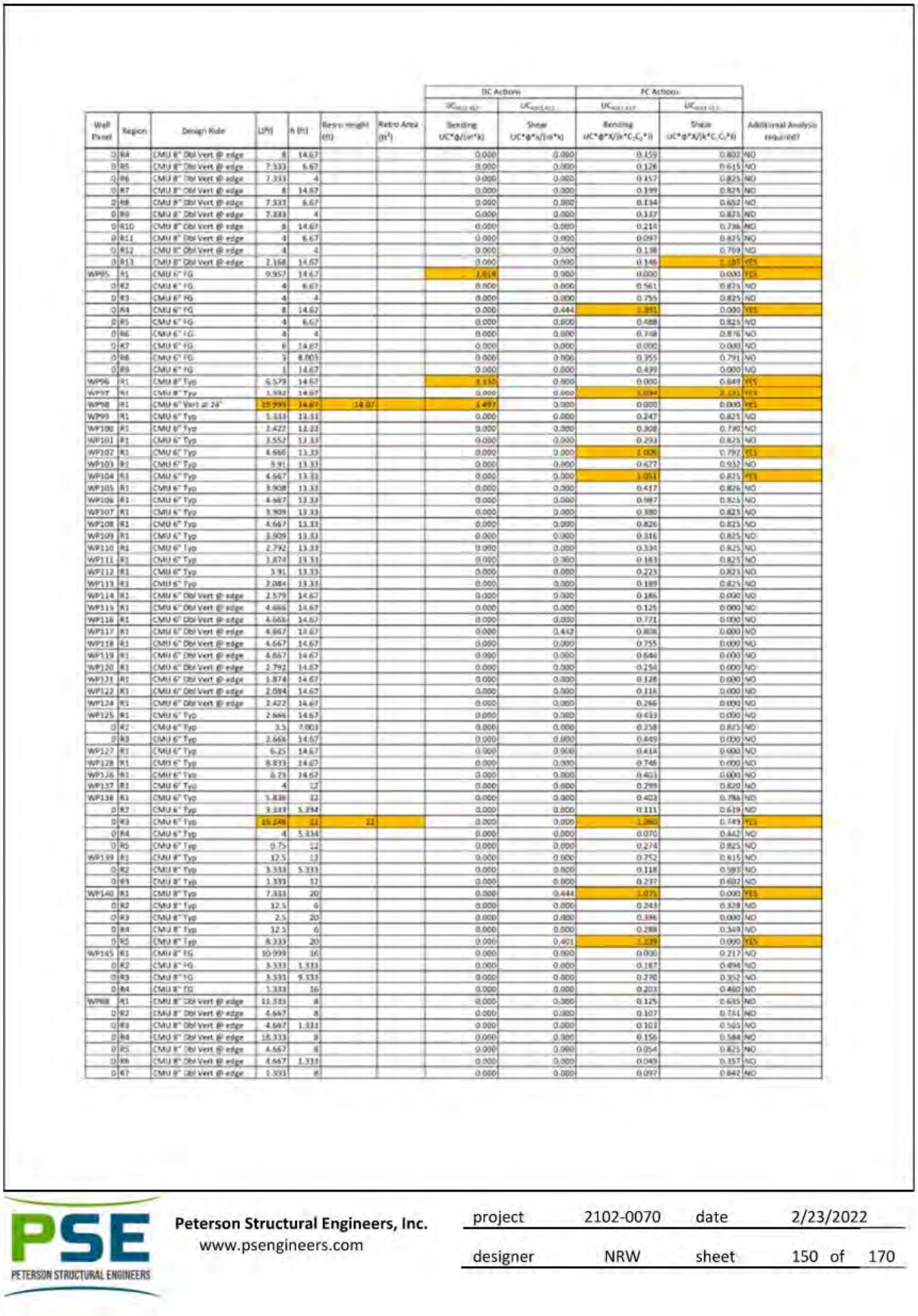

							DC Actions		FC Actions		
							UC [illegible]	UC [illegible]	UC [illegible]	UC [illegible]	
Wall Panel	Region	Design Rule	L(ft)	h (ft)	Retro Height (ft)	Retro Area (ft^2)	Bending UC*ϕ/(m*k)	Shear UC*ϕ*s/(m*k)	Bending UC*ϕ*X/(k*C_1C_2*J)	Shear UC*ϕ*X/(k*C_1C_2*J)	Additional Analysis required?
0	R4	CMU 8" Dbl Vert @ edge	8	14.67			0.000	0.000	0.159	0.802	NO
0	R5	CMU 8" Dbl Vert @ edge	7.333	6.67			0.000	0.000	0.126	0.615	NO
0	R6	CMU 8" Dbl Vert @ edge	7.333	4			0.000	0.000	0.157	0.825	NO
0	R7	CMU 8" Dbl Vert @ edge	8	14.67			0.000	0.000	0.199	0.825	NO
0	R8	CMU 8" Dbl Vert @ edge	7.333	6.67			0.000	0.000	0.134	0.652	NO
0	R9	CMU 8" Dbl Vert @ edge	7.333	4			0.000	0.000	0.137	0.825	NO
0	R10	CMU 8" Dbl Vert @ edge	8	14.67			0.000	0.000	0.214	0.736	NO
0	R11	CMU 8" Dbl Vert @ edge	4	6.67			0.000	0.000	0.097	0.825	NO
0	R12	CMU 8" Dbl Vert @ edge	4	4			0.000	0.000	0.138	0.769	NO
0	R13	CMU 8" Dbl Vert @ edge	2.168	14.67			0.000	0.000	0.146	1.185	YES
WP95	R1	CMU 6" FG	9.957	14.67			1.614	0.000	0.000	0.000	YES
0	R2	CMU 6" FG	4	6.67			0.000	0.000	0.561	0.825	NO
0	R3	CMU 6" FG	4	4			0.000	0.000	0.755	0.825	NO
0	R4	CMU 6" FG	8	14.62			0.000	0.444	1.391	0.000	YES
0	R5	CMU 6" FG	4	6.67			0.000	0.000	0.488	0.825	NO
0	R6	CMU 6" FG	4	4			0.000	0.000	0.748	0.876	NO
0	R7	CMU 6" FG	6	14.67			0.000	0.000	0.000	0.000	NO
0	R8	CMU 6" FG	3	8.003			0.000	0.000	0.355	0.791	NO
0	R9	CMU 6" FG	1	14.67			0.000	0.000	0.439	0.000	NO
WP96	R1	CMU 8" Typ	6.579	14.67			1.130	0.000	0.000	0.849	YES
WP97	R1	CMU 8" Typ	1.992	14.67			0.000	0.000	1.094	2.131	YES
WP98	R1	CMU 6" Vert at 24"	19.999	14.67	14.67		1.497	0.000	0.000	0.000	YES
WP99	R1	CMU 6" Typ	5.333	13.33			0.000	0.000	0.247	0.825	NO
WP100	R1	CMU 6" Typ	2.422	12.22			0.000	0.000	0.308	0.730	NO
WP101	R1	CMU 6" Typ	3.552	13.33			0.000	0.000	0.293	0.825	NO
WP102	R1	CMU 6" Typ	4.666	13.33			0.000	0.000	1.006	0.792	YES
WP103	R1	CMU 6" Typ	3.91	13.33			0.000	0.000	0.477	0.932	NO
WP104	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	1.051	0.825	YES
WP105	R1	CMU 6" Typ	3.908	13.33			0.000	0.000	0.417	0.826	NO
WP106	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	0.987	0.825	NO
WP107	R1	CMU 6" Typ	3.909	13.33			0.000	0.000	0.380	0.825	NO
WP108	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	0.826	0.825	NO
WP109	R1	CMU 6" Typ	3.909	13.33			0.000	0.000	0.316	0.825	NO
WP110	R1	CMU 6" Typ	2.792	13.33			0.000	0.000	0.334	0.825	NO
WP111	R1	CMU 6" Typ	1.874	13.33			0.000	0.000	0.183	0.825	NO
WP112	R1	CMU 6" Typ	3.91	13.33			0.000	0.000	0.223	0.825	NO
WP113	R1	CMU 6" Typ	2.084	13.33			0.000	0.000	0.189	0.825	NO
WP114	R1	CMU 6" Dbl Vert @ edge	2.579	14.67			0.000	0.000	0.186	0.000	NO
WP115	R1	CMU 6" Dbl Vert @ edge	4.666	14.67			0.000	0.000	0.125	0.000	NO
WP116	R1	CMU 6" Dbl Vert @ edge	4.666	14.67			0.000	0.000	0.771	0.000	NO
WP117	R1	CMU 6" Dbl Vert @ edge	4.667	14.67			0.000	0.442	0.808	0.000	NO
WP118	R1	CMU 6" Dbl Vert @ edge	4.667	14.67			0.000	0.000	0.755	0.000	NO
WP119	R1	CMU 6" Dbl Vert @ edge	4.667	14.67			0.000	0.000	0.644	0.000	NO
WP120	R1	CMU 6" Dbl Vert @ edge	2.792	14.67			0.000	0.000	0.256	0.000	NO
WP121	R1	CMU 6" Dbl Vert @ edge	1.874	14.67			0.000	0.000	0.128	0.000	NO
WP122	R1	CMU 6" Dbl Vert @ edge	2.084	14.67			0.000	0.000	0.116	0.000	NO
WP124	R1	CMU 6" Dbl Vert @ edge	2.422	14.67			0.000	0.000	0.266	0.000	NO
WP125	R1	CMU 6" Typ	2.666	14.67			0.000	0.000	0.433	0.000	NO
0	R2	CMU 6" Typ	3.5	7.003			0.000	0.000	0.258	0.825	NO
0	R3	CMU 6" Typ	2.666	14.67			0.000	0.000	0.849	0.000	NO
WP127	R1	CMU 6" Typ	6.25	14.67			0.000	0.000	0.414	0.000	NO
WP128	R1	CMU 6" Typ	8.833	14.67			0.000	0.000	0.746	0.000	NO
WP126	R1	CMU 6" Typ	8.75	14.67			0.000	0.000	0.403	0.000	NO
WP137	R1	CMU 6" Typ	4	12			0.000	0.000	0.299	0.820	NO
WP138	R1	CMU 6" Typ	5.838	12			0.000	0.000	0.403	0.786	NO
0	R7	CMU 6" Typ	3.333	5.334			0.000	0.000	0.111	0.619	NO
0	R3	CMU 6" Typ	19.248	12	12		0.000	0.000	1.080	0.749	YES
0	R4	CMU 6" Typ	4	5.334			0.000	0.000	0.070	0.442	NO
0	R5	CMU 6" Typ	0.75	12			0.000	0.000	0.274	0.825	NO
WP139	R1	CMU 8" Typ	12.5	12			0.000	0.000	0.752	0.815	NO
0	R2	CMU 8" Typ	3.333	5.333			0.000	0.000	0.118	0.593	NO
0	R3	CMU 8" Typ	1.333	12			0.000	0.000	0.237	0.602	NO
WP140	R1	CMU 8" Typ	7.333	20			0.000	0.444	1.075	0.000	YES
0	R2	CMU 8" Typ	12.5	6			0.000	0.000	0.243	0.328	NO
0	R3	CMU 8" Typ	2.5	20			0.000	0.000	0.396	0.000	NO
0	R4	CMU 8" Typ	12.5	6			0.000	0.000	0.288	0.349	NO
0	R5	CMU 8" Typ	8.333	20			0.000	0.401	1.239	0.000	YES
WP145	R1	CMU 8" FG	10.999	16			0.000	0.000	0.000	0.217	NO
0	R2	CMU 8" FG	3.333	1.333			0.000	0.000	0.187	0.494	NO
0	R3	CMU 8" FG	3.333	9.333			0.000	0.000	0.270	0.352	NO
0	R4	CMU 8" FG	1.333	16			0.000	0.000	0.203	0.460	NO
WP88	R1	CMU 8" Dbl Vert @ edge	11.333	8			0.000	0.000	0.125	0.635	NO
0	R2	CMU 8" Dbl Vert @ edge	4.667	8			0.000	0.000	0.107	0.741	NO
0	R3	CMU 8" Dbl Vert @ edge	4.667	1.333			0.000	0.000	0.103	0.565	NO
0	R4	CMU 8" Dbl Vert @ edge	18.333	8			0.000	0.000	0.156	0.584	NO
0	R5	CMU 8" Dbl Vert @ edge	4.667	8			0.000	0.000	0.054	0.825	NO
0	R6	CMU 8" Dbl Vert @ edge	4.667	1.333			0.000	0.000	0.049	0.357	NO
0	R7	CMU 8" Dbl Vert @ edge	1.333	8			0.000	0.000	0.097	0.842	NO

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							UC Actions		PC Actions		
							UC[illegible]	UC[illegible]	UC[illegible]	UC[illegible]	
Wall Panel	Region	Design Rule	L (ft)	h (ft)	Retro Height (ft)	Retro Area (ft^2)	Bending UC*ϕ/(m*k)	Shear UC*ϕ*k/(m*k)	Bending UC*ϕ*X/(k*C₁C₂*J)	Shear UC*ϕ*X/(k*C₁C₂*J)	Additional Analysis required?
WP87	R1	CMU 8" Dbl Vert @ edge	8	8			0.000	0.000	0.125	0.753	NO
0	R2	CMU 8" Dbl Vert @ edge	4.667	8			0.000	0.000	0.066	0.745	NO
0	R3	CMU 8" Dbl Vert @ edge	4.667	1.333			0.000	0.000	0.076	0.398	NO
0	R4	CMU 8" Dbl Vert @ edge	3.333	8			0.000	0.000	0.100	0.571	NO

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BSE-2E

							DC Actions		FC Actions		
							UC	UC	UC	UC	
Wall Panel	Region	Design Run	L (ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending UC*φ/(m*k)	Shear UC*φ*λ/(m*k)	Bending UC*φ*λ/(k*C₁C₂*J)	Shear UC*φ*λ/(k*C₁C₂*J)	Additional Analysis required?
WP1	R1	CMU 6" Typ	16	12.33			0.000	0.495	0.385	0.000	NO
WP2	R1	CMU 6" Typ	7.67	12.33			0.475	0.000	0.000	0.000	NO
WP3	R1	CMU 6" Typ	30.287	12.33			0.457	0.000	0.000	0.000	NO
WP4	R1	CMU 6" Typ	14.943	12.33			0.000	0.460	0.259	0.000	NO
WP5	R1	CMU 6" Typ	3.942	12.33			0.000	0.000	0.386	0.000	NO
0	R2	CMU 6" Typ	3.333	5.67			0.000	0.000	0.097	0.413	NO
0	R3	CMU 6" Typ	7.67	12.33			0.000	0.516	0.493	0.000	NO
WP6	R1	CMU 6" Typ	4.153	12.33			0.000	0.465	0.410	0.000	NO
0	R2	CMU 6" Typ	3.333	5.67			0.000	0.000	0.098	0.413	NO
0	R3	CMU 6" Typ	3	12.33			0.000	0.000	0.338	0.000	NO
WP7	R1	CMU 6" Typ	14.991	12.33			0.000	0.924	0.560	0.000	NO
WP8	R1	CMU 6" Typ	12.011	12.33			0.000	0.444	0.492	0.000	NO
0	R2	CMU 6" Typ	4	3.67			0.000	0.000	0.109	0.413	NO
0	R3	CMU 6" Typ	4	4.67			0.000	0.000	0.204	0.413	NO
0	R4	CMU 6" Typ	6.67	12.33			0.000	0.000	0.267	0.000	NO
0	R5	CMU 6" Typ	4	3.67			0.000	0.000	0.121	0.472	NO
0	R6	CMU 6" Typ	4	4.67			0.000	0.000	0.194	0.413	NO
0	R7	CMU 6" Typ	2.637	12.33			0.000	0.670	0.166	0.000	NO
WP9	R1	CMU 6" Dbl Vert @ edge	10.085	12.33			0.000	0.000	0.252	0.000	NO
0	R2	CMU 6" Dbl Vert @ edge	4	3.67			0.000	0.000	0.073	0.413	NO
0	R3	CMU 6" Dbl Vert @ edge	4	4.67			0.000	0.000	0.107	0.413	NO
0	R4	CMU 6" Dbl Vert @ edge	4.67	12.33			0.000	0.000	0.130	0.000	NO
0	R5	CMU 6" Dbl Vert @ edge	4	3.67			0.000	0.000	0.055	0.413	NO
0	R6	CMU 6" Dbl Vert @ edge	4	4.67			0.000	0.000	0.099	0.413	NO
0	R7	CMU 6" Dbl Vert @ edge	5	12.33			0.000	0.000	0.131	0.000	NO
WP10	R1	CMU 6" Typ	9.501	12.33			0.433	0.000	0.000	0.000	NO
WP11	R1	CMU 6" Dbl Vert @ edge	2.395	12.33			0.000	0.000	0.170	0.000	NO
0	R2	CMU 6" Dbl Vert @ edge	3.333	5.67			0.000	0.000	0.045	0.413	NO
0	R3	CMU 6" Dbl Vert @ edge	24.333	12.33			0.000	0.436	0.420	0.000	NO
WP12	R1	CMU 6" Typ	14.535	12.33			0.000	0.444	0.707	0.000	NO
WP13	R1	CMU 6" Typ	14.535	12.33			0.000	0.463	0.301	0.000	NO
WP14	R1	CMU 10" Col	1.384	12.33			0.000	0.000	0.000	0.158	NO
WP15	R1	CMU 10" Col	1.333	12.33			0.000	0.000	0.223	0.175	NO
WP16	R1	CMU 6" Typ	25.422	12.33			0.000	0.000	0.771	0.413	NO
0	R2	CMU 6" Typ	1.388	5.663			0.000	0.000	0.083	0.413	NO
0	R3	CMU 6" Typ	2.033	12.33			0.000	0.000	0.220	0.413	NO
0	R4	CMU 6" Typ	1.388	5.663			0.000	0.000	0.089	0.413	NO
0	R5	CMU 6" Typ	11.687	12.33			0.000	0.000	0.613	0.449	NO
WP17	R1	CMU 6" Typ	18.75	12.33			0.000	0.000	0.562	0.413	NO
WP18	R1	CMU 6" Typ	9.25	12.33			0.000	0.000	0.440	0.413	NO
WP19	R1	CMU 8" Dbl Vert @ edge	10.237	13.33			0.000	0.000	0.304	0.562	NO
0	R2	CMU 8" Dbl Vert @ edge	4	5.33			0.000	0.000	0.112	0.607	NO
0	R3	CMU 8" Dbl Vert @ edge	4	4			0.000	0.000	0.178	0.554	NO
0	R4	CMU 8" Dbl Vert @ edge	8	13.33			0.000	0.000	0.229	0.650	NO
0	R5	CMU 8" Dbl Vert @ edge	7.33	5.33			0.000	0.000	0.164	0.548	NO
0	R6	CMU 8" Dbl Vert @ edge	7.33	4			0.000	0.000	0.196	0.447	NO
0	R7	CMU 8" Dbl Vert @ edge	8	13.33			0.000	0.000	0.235	0.706	NO
0	R8	CMU 8" Dbl Vert @ edge	7.33	5.33			0.000	0.000	0.176	0.512	NO
0	R9	CMU 8" Dbl Vert @ edge	7.333	4			0.000	0.000	0.207	0.541	NO
0	R10	CMU 8" Dbl Vert @ edge	8	13.33			0.000	0.000	0.580	0.750	NO
0	R11	CMU 8" Dbl Vert @ edge	5.168	6.663			0.000	0.000	0.124	0.682	NO
0	R12	CMU 8" Dbl Vert @ edge	1	13.33			0.000	0.000	0.231	1.612	YES
WP20	R1	CMU 8" Typ	31.333	13.33	13.33		0.000	0.000	1.782	0.667	YES
WP21	R1	CMU 8" Dbl Vert @ edge	2.667	13.33			0.000	0.000	0.137	0.458	NO
0	R2	CMU 8" Dbl Vert @ edge	3.333	6.663			0.000	0.000	0.071	0.411	NO
0	R3	CMU 8" Dbl Vert @ edge	2.667	13.33			0.000	0.000	0.212	0.386	NO
0	R4	CMU 8" Dbl Vert @ edge	4	6.663			0.000	0.000	0.077	0.413	NO
0	R5	CMU 8" Dbl Vert @ edge	5.333	13.33			0.000	0.000	0.351	0.485	NO
0	R6	CMU 8" Dbl Vert @ edge	5.333	6.663			0.000	0.000	0.094	0.371	NO
0	R7	CMU 8" Dbl Vert @ edge	4.667	13.33			0.000	0.000	0.307	0.480	NO
0	R8	CMU 8" Dbl Vert @ edge	6	6.663			0.000	0.000	0.102	0.413	NO
0	R9	CMU 8" Dbl Vert @ edge	17.333	13.33			0.000	0.000	0.476	0.495	NO
0	R10	CMU 8" Dbl Vert @ edge	3.333	6.663			0.000	0.000	0.070	0.468	NO
0	R11	CMU 8" Dbl Vert @ edge	1.667	13.33			0.000	0.000	0.092	0.436	NO
WP22	R1	CMU 8" Typ	13.838	13.33	13.33		1.257	0.000	0.000	0.512	YES
0	R2	CMU 8" Typ	2.333	6.663			0.000	0.000	0.131	0.525	NO
0	R3	CMU 8" Typ	1	13.33			0.000	0.000	0.286	0.516	NO
WP23	R1	CMU 8" Dbl Vert @ edge	5.501	13.33			0.000	0.000	0.282	[illegible]	NO
0	R2	CMU 8" Dbl Vert @ edge	3.333	4.664			0.000	0.000	0.109	0.623	NO
0	R3	CMU 8" Dbl Vert @ edge	3.333	6.666			0.000	0.000	0.179	0.681	NO
0	R4	CMU 8" Dbl Vert @ edge	5.333	13.33			0.000	0.000	0.206	0.906	NO
0	R5	CMU 8" Dbl Vert @ edge	3.333	4.664			0.000	0.000	0.219	0.876	NO
0	R6	CMU 8" Dbl Vert @ edge	3.333	6.666			0.000	0.000	0.206	0.733	NO
0	R7	CMU 8" Dbl Vert @ edge	12.666	13.33			0.000	0.000	0.138	0.708	NO
0	R8	CMU 8" Dbl Vert @ edge	3.333	4.664			0.000	0.000	0.077	0.413	NO
0	R9	CMU 8" Dbl Vert @ edge	3.333	6.666			0.000	0.000	0.117	0.556	NO
0	R10	CMU 8" Dbl Vert @ edge	2	13.33			0.000	0.000	0.151	0.541	NO

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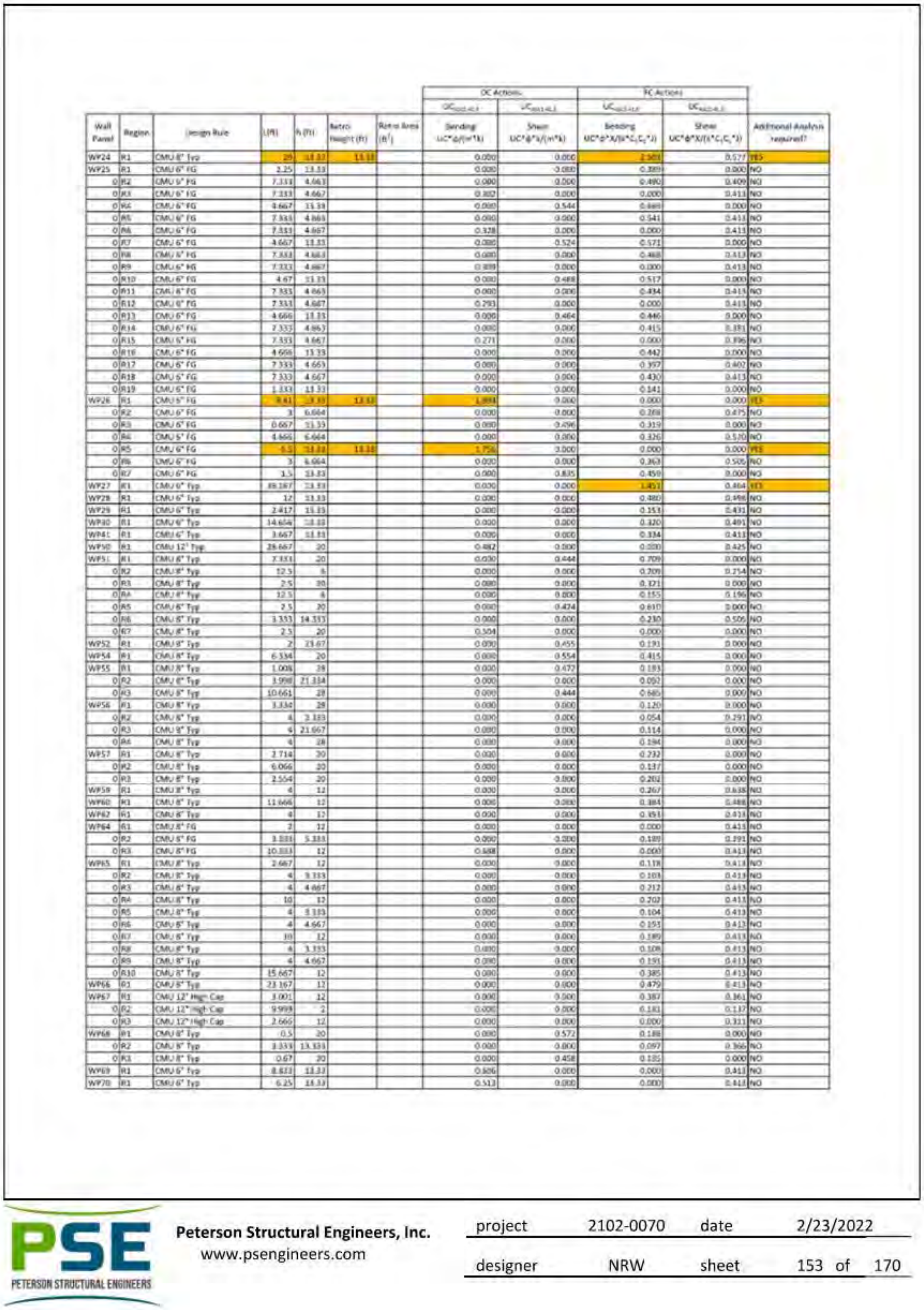

							OC Actions		FC Actions		
							UC[illegible]	UC[illegible]	UC[illegible]	UC[illegible]	
Wall Panel	Region	Design Rule	L (ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending $UC*\Delta/(m*k)$	Shear $UC*\phi*\lambda/(m*k)$	Bending $UC*\phi*X/(k*C_1C_2*J)$	Shear $UC*\phi*X/(k*C_1C_2*J)$	Additional Analysis required?
WP24	R1	CMU 8" Typ	29	13.33	13.33		0.000	0.000	2.503	0.577	YES
WP25	R1	CMU 6" FG	2.25	13.33			0.000	0.000	0.389	0.000	NO
0	R2	CMU 6" FG	7.333	4.663			0.000	0.000	0.490	0.409	NO
0	R3	CMU 6" FG	7.333	4.667			0.302	0.000	0.000	0.413	NO
0	R4	CMU 6" FG	4.667	13.33			0.000	0.544	0.669	0.000	NO
0	R5	CMU 6" FG	7.333	4.663			0.000	0.000	0.541	0.413	NO
0	R6	CMU 6" FG	7.333	4.667			0.328	0.000	0.000	0.413	NO
0	R7	CMU 6" FG	4.667	13.33			0.000	0.524	0.571	0.000	NO
0	R8	CMU 6" FG	7.333	4.663			0.000	0.000	0.468	0.413	NO
0	R9	CMU 6" FG	7.333	4.667			0.309	0.000	0.000	0.413	NO
0	R10	CMU 6" FG	4.67	13.33			0.000	0.488	0.517	0.000	NO
0	R11	CMU 6" FG	7.333	4.663			0.000	0.000	0.434	0.413	NO
0	R12	CMU 6" FG	7.333	4.667			0.293	0.000	0.000	0.413	NO
0	R13	CMU 6" FG	4.666	13.33			0.000	0.464	0.446	0.000	NO
0	R14	CMU 6" FG	7.333	4.663			0.000	0.000	0.415	0.391	NO
0	R15	CMU 6" FG	7.333	4.667			0.271	0.000	0.000	0.396	NO
0	R16	CMU 6" FG	4.666	13.33			0.000	0.000	0.442	0.000	NO
0	R17	CMU 6" FG	7.333	4.663			0.000	0.000	0.397	0.402	NO
0	R18	CMU 6" FG	7.333	4.667			0.000	0.000	0.430	0.413	NO
0	R19	CMU 6" FG	1.333	13.33			0.000	0.000	0.141	0.000	NO
WP26	R1	CMU 6" FG	8.41	13.33	13.33		1.884	0.000	0.000	0.000	YES
0	R2	CMU 6" FG	3	6.664			0.000	0.000	0.268	0.475	NO
0	R3	CMU 6" FG	0.667	13.33			0.000	0.496	0.319	0.000	NO
0	R4	CMU 6" FG	4.666	6.664			0.000	0.000	0.326	0.570	NO
0	R5	CMU 6" FG	6.5	13.33	13.33		1.756	0.000	0.000	0.000	YES
0	R6	CMU 6" FG	3	6.664			0.000	0.000	0.363	0.505	NO
0	R7	CMU 6" FG	1.5	13.33			0.000	0.835	0.459	0.000	NO
WP27	R1	CMU 6" Typ	49.167	13.33			0.000	0.000	1.451	0.464	YES
WP28	R1	CMU 6" Typ	12	13.33			0.000	0.000	0.480	0.496	NO
WP29	R1	CMU 6" Typ	2.417	13.33			0.000	0.000	0.153	0.431	NO
WP30	R1	CMU 6" Typ	14.664	13.33			0.000	0.000	0.320	0.491	NO
WP41	R1	CMU 6" Typ	3.667	13.33			0.000	0.000	0.334	0.413	NO
WP50	R1	CMU 12" Typ	28.667	20			0.482	0.000	0.000	0.425	NO
WP51	R1	CMU 8" Typ	7.333	20			0.000	0.444	0.709	0.000	NO
0	R2	CMU 8" Typ	12.5	6			0.000	0.000	0.709	0.254	NO
0	R3	CMU 8" Typ	2.5	20			0.000	0.000	0.321	0.000	NO
0	R4	CMU 8" Typ	12.5	6			0.000	0.000	0.155	0.196	NO
0	R5	CMU 8" Typ	2.5	20			0.000	0.424	0.610	0.000	NO
0	R6	CMU 8" Typ	3.333	14.333			0.000	0.000	0.230	0.505	NO
0	R7	CMU 8" Typ	2.5	20			0.504	0.000	0.000	0.000	NO
WP52	R1	CMU 8" Typ	2	23.67			0.000	0.455	0.191	0.000	NO
WP54	R1	CMU 8" Typ	6.334	20			0.000	0.554	0.415	0.000	NO
WP55	R1	CMU 8" Typ	1.008	28			0.000	0.472	0.193	0.000	NO
0	R2	CMU 8" Typ	3.998	21.334			0.000	0.000	0.092	0.000	NO
0	R3	CMU 8" Typ	10.661	28			0.000	0.444	0.685	0.000	NO
WP56	R1	CMU 8" Typ	3.334	28			0.000	0.000	0.120	0.000	NO
0	R2	CMU 8" Typ	4	3.333			0.000	0.000	0.054	0.291	NO
0	R3	CMU 8" Typ	4	21.667			0.000	0.000	0.114	0.000	NO
0	R4	CMU 8" Typ	4	28			0.000	0.000	0.194	0.000	NO
WP57	R1	CMU 8" Typ	2.714	20			0.000	0.000	0.232	0.000	NO
0	R2	CMU 8" Typ	6.066	20			0.000	0.000	0.137	0.000	NO
0	R3	CMU 8" Typ	2.554	20			0.000	0.000	0.202	0.000	NO
WP59	R1	CMU 8" Typ	4	12			0.000	0.000	0.267	0.638	NO
WP60	R1	CMU 8" Typ	11.666	12			0.000	0.000	0.384	0.488	NO
WP62	R1	CMU 8" Typ	4	12			0.000	0.000	0.393	0.413	NO
WP64	R1	CMU 8" FG	2	12			0.000	0.000	0.000	0.413	NO
0	R2	CMU 8" FG	3.333	5.333			0.000	0.000	0.189	0.291	NO
0	R3	CMU 8" FG	10.333	12			0.688	0.000	0.000	0.413	NO
WP65	R1	CMU 8" Typ	2.667	12			0.000	0.000	0.118	0.413	NO
0	R2	CMU 8" Typ	4	3.333			0.000	0.000	0.103	0.413	NO
0	R3	CMU 8" Typ	4	4.667			0.000	0.000	0.212	0.413	NO
0	R4	CMU 8" Typ	10	12			0.000	0.000	0.202	0.413	NO
0	R5	CMU 8" Typ	4	3.333			0.000	0.000	0.104	0.413	NO
0	R6	CMU 8" Typ	4	4.667			0.000	0.000	0.193	0.413	NO
0	R7	CMU 8" Typ	10	12			0.000	0.000	0.189	0.413	NO
0	R8	CMU 8" Typ	4	3.333			0.000	0.000	0.108	0.413	NO
0	R9	CMU 8" Typ	4	4.667			0.000	0.000	0.191	0.413	NO
0	R10	CMU 8" Typ	15.667	12			0.000	0.000	0.385	0.413	NO
WP66	R1	CMU 8" Typ	23.167	12			0.000	0.000	0.479	0.413	NO
WP67	R1	CMU 12" High Cap	3.001	12			0.000	0.000	0.387	0.361	NO
0	R2	CMU 12" High Cap	9.999	2			0.000	0.000	0.181	0.137	NO
0	R3	CMU 12" High Cap	2.666	12			0.000	0.000	0.000	0.311	NO
WP68	R1	CMU 8" Typ	0.5	20			0.000	0.572	0.188	0.000	NO
0	R2	CMU 8" Typ	3.333	13.333			0.000	0.000	0.097	0.366	NO
0	R3	CMU 8" Typ	0.67	20			0.000	0.458	0.135	0.000	NO
WP69	R1	CMU 6" Typ	8.833	13.33			0.606	0.000	0.000	0.413	NO
WP70	R1	CMU 6" Typ	6.25	13.33			0.513	0.000	0.000	0.413	NO

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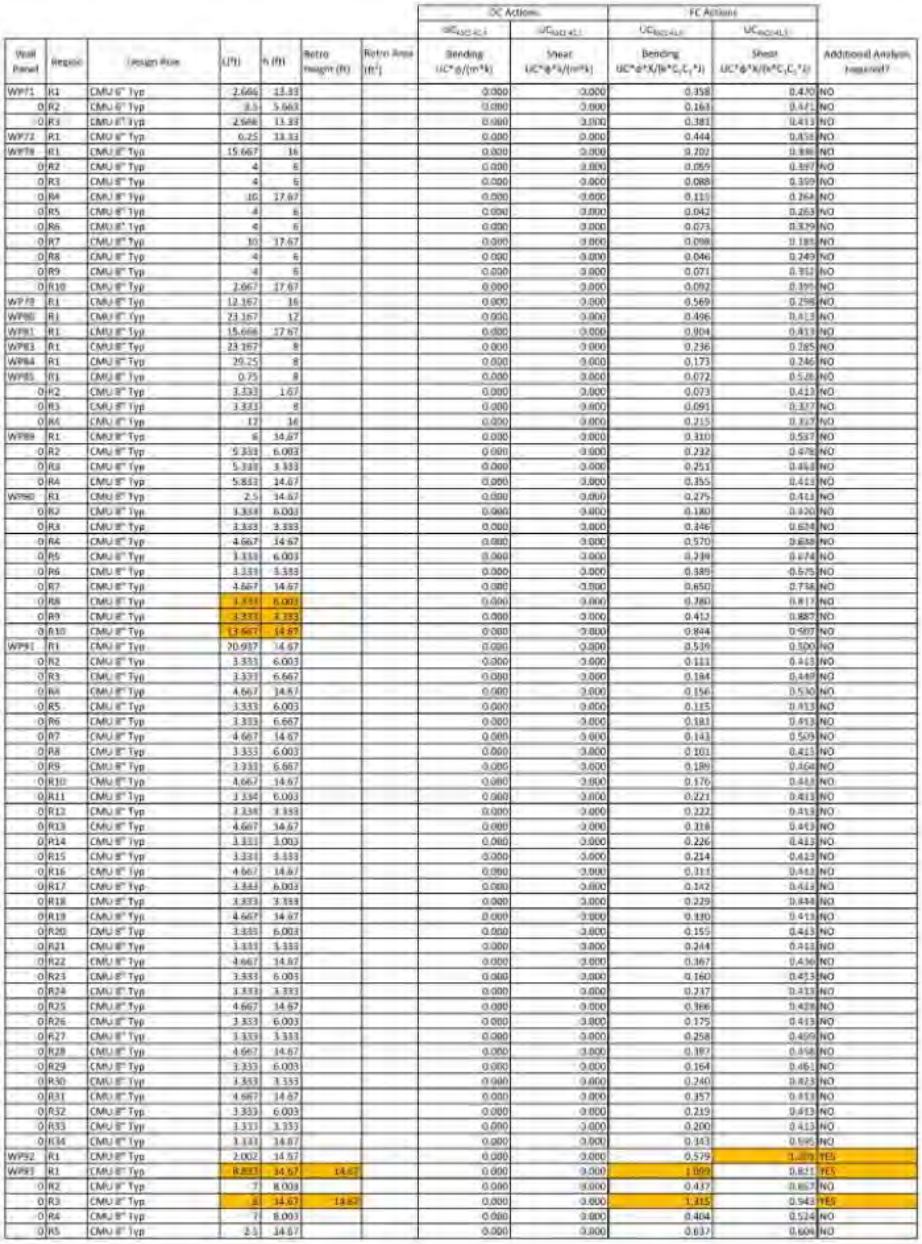

							DC Actions		FC Actions		
							$UC_{ASCE 41-17}$	$UC_{ASCE 41-17}$	$UC_{ASCE 41-17}$	$UC_{ASCE 41-17}$	
Wall Panel	Region	Design Row	L(ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	Bending $UC*\phi/(m*k)$	Shear $UC*\phi*\lambda/(m*k)$	Bending $UC*\phi*X/(k*C_1C_2*J)$	Shear $UC*\phi*X/(k*C_1C_2*J)$	Additional Analysis Required?
WP71	R1	CMU 6" Typ	2.666	13.33			0.000	0.000	0.358	0.470	NO
0	R2	CMU 6" Typ	3.5	5.663			0.000	0.000	0.163	0.471	NO
0	R3	CMU 6" Typ	2.666	13.33			0.000	0.000	0.381	0.413	NO
WP72	R1	CMU 6" Typ	6.25	13.33			0.000	0.000	0.444	0.458	NO
WP78	R1	CMU 8" Typ	15.667	16			0.000	0.000	0.202	0.396	NO
0	R2	CMU 8" Typ	4	6			0.000	0.000	0.059	0.397	NO
0	R3	CMU 8" Typ	4	6			0.000	0.000	0.088	0.399	NO
0	R4	CMU 8" Typ	10	17.67			0.000	0.000	0.115	0.264	NO
0	R5	CMU 8" Typ	4	6			0.000	0.000	0.042	0.263	NO
0	R6	CMU 8" Typ	4	6			0.000	0.000	0.073	0.329	NO
0	R7	CMU 8" Typ	10	17.67			0.000	0.000	0.098	0.183	NO
0	R8	CMU 8" Typ	4	6			0.000	0.000	0.046	0.249	NO
0	R9	CMU 8" Typ	4	6			0.000	0.000	0.071	0.352	NO
0	R10	CMU 8" Typ	2.667	17.67			0.000	0.000	0.092	0.395	NO
WP79	R1	CMU 8" Typ	12.167	16			0.000	0.000	0.569	0.298	NO
WP80	R1	CMU 8" Typ	23.167	12			0.000	0.000	0.496	0.413	NO
WP81	R1	CMU 8" Typ	15.666	17.67			0.000	0.000	0.904	0.413	NO
WP83	R1	CMU 8" Typ	23.167	8			0.000	0.000	0.236	0.285	NO
WP84	R1	CMU 8" Typ	29.25	8			0.000	0.000	0.173	0.246	NO
WP85	R1	CMU 8" Typ	0.75	8			0.000	0.000	0.072	0.528	NO
0	R2	CMU 8" Typ	3.333	1.67			0.000	0.000	0.073	0.413	NO
0	R3	CMU 8" Typ	3.333	8			0.000	0.000	0.091	0.377	NO
0	R4	CMU 8" Typ	17	16			0.000	0.000	0.215	0.357	NO
WP89	R1	CMU 8" Typ	6	34.67			0.000	0.000	0.310	0.537	NO
0	R2	CMU 8" Typ	5.333	6.003			0.000	0.000	0.232	0.478	NO
0	R3	CMU 8" Typ	5.333	3.333			0.000	0.000	0.251	0.468	NO
0	R4	CMU 8" Typ	5.833	14.67			0.000	0.000	0.355	0.413	NO
WP90	R1	CMU 8" Typ	2.5	34.67			0.000	0.000	0.275	0.413	NO
0	R2	CMU 8" Typ	3.334	6.003			0.000	0.000	0.180	0.420	NO
0	R3	CMU 8" Typ	3.333	3.333			0.000	0.000	0.346	0.624	NO
0	R4	CMU 8" Typ	4.667	14.67			0.000	0.000	0.570	0.688	NO
0	R5	CMU 8" Typ	3.333	6.003			0.000	0.000	0.239	0.674	NO
0	R6	CMU 8" Typ	3.333	3.333			0.000	0.000	0.389	0.675	NO
0	R7	CMU 8" Typ	4.667	14.67			0.000	0.000	0.650	0.736	NO
0	R8	CMU 8" Typ	3.333	6.003			0.000	0.000	0.780	0.817	NO
0	R9	CMU 8" Typ	3.333	3.333			0.000	0.000	0.412	0.887	NO
0	R10	CMU 8" Typ	13.667	14.67			0.000	0.000	0.844	0.507	NO
WP91	R1	CMU 8" Typ	20.937	14.67			0.000	0.000	0.539	0.500	NO
0	R2	CMU 8" Typ	3.333	6.003			0.000	0.000	0.111	0.413	NO
0	R3	CMU 8" Typ	3.333	6.667			0.000	0.000	0.184	0.449	NO
0	R4	CMU 8" Typ	4.667	14.67			0.000	0.000	0.156	0.530	NO
0	R5	CMU 8" Typ	3.333	6.003			0.000	0.000	0.115	0.413	NO
0	R6	CMU 8" Typ	3.333	6.667			0.000	0.000	0.181	0.413	NO
0	R7	CMU 8" Typ	4.667	14.67			0.000	0.000	0.143	0.509	NO
0	R8	CMU 8" Typ	3.333	6.003			0.000	0.000	0.101	0.413	NO
0	R9	CMU 8" Typ	3.333	6.667			0.000	0.000	0.189	0.464	NO
0	R10	CMU 8" Typ	4.667	14.67			0.000	0.000	0.176	0.443	NO
0	R11	CMU 8" Typ	3.334	6.003			0.000	0.000	0.221	0.413	NO
0	R12	CMU 8" Typ	3.334	3.333			0.000	0.000	0.222	0.413	NO
0	R13	CMU 8" Typ	4.667	14.67			0.000	0.000	0.318	0.413	NO
0	R14	CMU 8" Typ	3.333	3.003			0.000	0.000	0.226	0.413	NO
0	R15	CMU 8" Typ	3.333	3.333			0.000	0.000	0.214	0.413	NO
0	R16	CMU 8" Typ	4.667	14.67			0.000	0.000	0.311	0.443	NO
0	R17	CMU 8" Typ	3.333	6.003			0.000	0.000	0.142	0.413	NO
0	R18	CMU 8" Typ	3.333	3.333			0.000	0.000	0.229	0.444	NO
0	R19	CMU 8" Typ	4.667	14.67			0.000	0.000	0.330	0.413	NO
0	R20	CMU 8" Typ	3.333	6.003			0.000	0.000	0.155	0.443	NO
0	R21	CMU 8" Typ	3.333	3.333			0.000	0.000	0.244	0.413	NO
0	R22	CMU 8" Typ	4.667	14.67			0.000	0.000	0.367	0.436	NO
0	R23	CMU 8" Typ	3.333	6.003			0.000	0.000	0.160	0.413	NO
0	R24	CMU 8" Typ	3.333	3.333			0.000	0.000	0.237	0.413	NO
0	R25	CMU 8" Typ	4.667	14.67			0.000	0.000	0.366	0.428	NO
0	R26	CMU 8" Typ	3.333	6.003			0.000	0.000	0.175	0.413	NO
0	R27	CMU 8" Typ	3.333	3.333			0.000	0.000	0.258	0.499	NO
0	R28	CMU 8" Typ	4.667	14.67			0.000	0.000	0.397	0.498	NO
0	R29	CMU 8" Typ	3.333	6.003			0.000	0.000	0.164	0.461	NO
0	R30	CMU 8" Typ	3.333	3.333			0.000	0.000	0.240	0.423	NO
0	R31	CMU 8" Typ	4.667	14.67			0.000	0.000	0.357	0.413	NO
0	R32	CMU 8" Typ	3.333	6.003			0.000	0.000	0.219	0.413	NO
0	R33	CMU 8" Typ	3.333	3.333			0.000	0.000	0.200	0.413	NO
0	R34	CMU 8" Typ	3.333	14.67			0.000	0.000	0.343	0.595	NO
WP92	R1	CMU 8" Typ	2.002	14.67			0.000	0.000	0.579	[illegible]	YES
WP93	R1	CMU 8" Typ	8.833	14.67	14.67		0.000	0.000	1.099	0.821	YES
0	R2	CMU 8" Typ	7	8.003			0.000	0.000	0.437	0.867	NO
0	R3	CMU 8" Typ	8	14.67	14.67		0.000	0.000	1.315	0.943	YES
0	R4	CMU 8" Typ	7	8.003			0.000	0.000	0.404	0.524	NO
0	R5	CMU 8" Typ	2.5	14.67			0.000	0.000	0.637	0.604	NO

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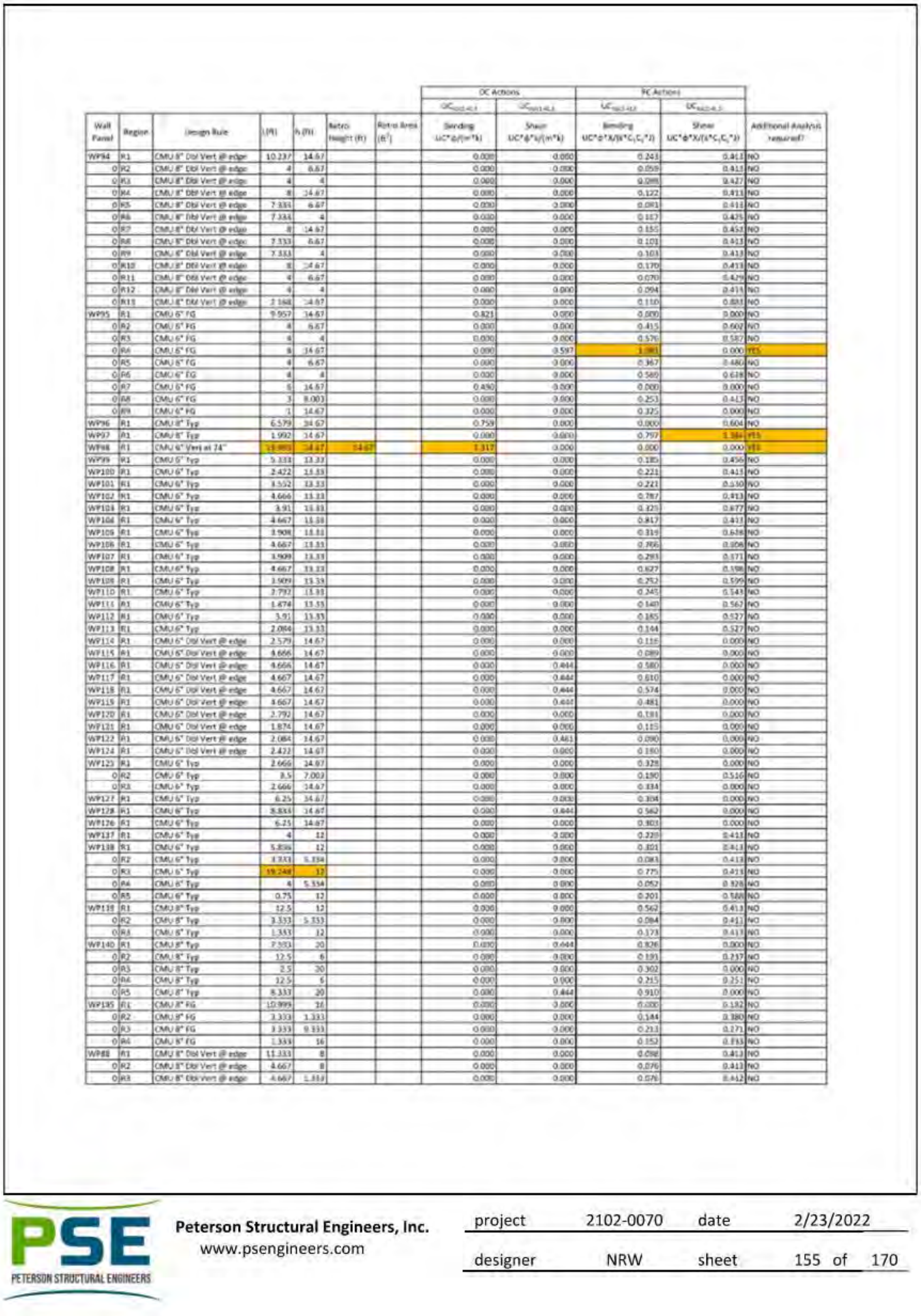

Wall Panel	Region	Design Rule	L (ft)	h (ft)	Retro Height (ft)	Retro Area (ft²)	DC Actions		FC Actions		Additional Analysis required?
							UC [illegible]	UC [illegible]	UC [illegible]	UC [illegible]	
							Bending UC*Q/(m*k)	Shear UC*Φ*λ/(m*k)	Bending UC*Φ*λ/(k*C1*C2*J)	Shear UC*Φ*λ/(k*C1*C2*J)	
WP94	R1	CMU 8" Dbl Vert @ edge	10.237	14.67			0.000	0.000	0.243	0.413	NO
0	R2	CMU 8" Dbl Vert @ edge	4	6.67			0.000	0.000	0.059	0.413	NO
0	R3	CMU 8" Dbl Vert @ edge	4	4			0.000	0.000	0.098	0.427	NO
0	R4	CMU 8" Dbl Vert @ edge	8	14.67			0.000	0.000	0.122	0.413	NO
0	R5	CMU 8" Dbl Vert @ edge	7.333	6.67			0.000	0.000	0.091	0.413	NO
0	R6	CMU 8" Dbl Vert @ edge	7.333	4			0.000	0.000	0.117	0.425	NO
0	R7	CMU 8" Dbl Vert @ edge	8	14.67			0.000	0.000	0.155	0.453	NO
0	R8	CMU 8" Dbl Vert @ edge	7.333	6.67			0.000	0.000	0.101	0.413	NO
0	R9	CMU 8" Dbl Vert @ edge	7.333	4			0.000	0.000	0.103	0.413	NO
0	R10	CMU 8" Dbl Vert @ edge	8	14.67			0.000	0.000	0.170	0.413	NO
0	R11	CMU 8" Dbl Vert @ edge	4	6.67			0.000	0.000	0.070	0.429	NO
0	R12	CMU 8" Dbl Vert @ edge	4	4			0.000	0.000	0.094	0.413	NO
0	R13	CMU 8" Dbl Vert @ edge	2.168	14.67			0.000	0.000	0.110	0.883	NO
WP95	R1	CMU 6" FG	9.957	14.67			0.821	0.000	0.000	0.000	NO
0	R2	CMU 6" FG	8	6.67			0.000	0.000	0.415	0.602	NO
0	R3	CMU 6" FG	4	4			0.000	0.000	0.576	0.587	NO
0	R4	CMU 6" FG	8	14.67			0.000	0.597	1.081	0.000	YES
0	R5	CMU 6" FG	4	6.67			0.000	0.000	0.367	0.480	NO
0	R6	CMU 6" FG	4	4			0.000	0.000	0.589	0.618	NO
0	R7	CMU 6" FG	6	14.67			0.490	0.000	0.000	0.000	NO
0	R8	CMU 6" FG	3	8.003			0.000	0.000	0.253	0.413	NO
0	R9	CMU 6" FG	1	14.67			0.000	0.000	0.325	0.000	NO
WP96	R1	CMU 8" Typ	6.579	14.67			0.759	0.000	0.000	0.604	NO
WP97	R1	CMU 8" Typ	1.992	14.67			0.000	0.000	0.797	1.384	YES
WP98	R1	CMU 6" Vert at 24"	19.985	14.67	14.67		1.317	0.000	0.000	0.000	YES
WP99	R1	CMU 6" Typ	5.333	13.33			0.000	0.000	0.185	0.456	NO
WP100	R1	CMU 6" Typ	2.422	13.33			0.000	0.000	0.221	0.413	NO
WP101	R1	CMU 6" Typ	3.552	13.33			0.000	0.000	0.221	0.530	NO
WP102	R1	CMU 6" Typ	4.666	13.33			0.000	0.000	0.787	0.413	NO
WP103	R1	CMU 6" Typ	3.91	13.33			0.000	0.000	0.325	0.677	NO
WP104	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	0.817	0.413	NO
WP105	R1	CMU 6" Typ	3.908	13.33			0.000	0.000	0.319	0.638	NO
WP106	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	0.766	0.506	NO
WP107	R1	CMU 6" Typ	3.909	13.33			0.000	0.000	0.293	0.371	NO
WP108	R1	CMU 6" Typ	4.667	13.33			0.000	0.000	0.627	0.598	NO
WP109	R1	CMU 6" Typ	3.909	13.33			0.000	0.000	0.252	0.599	NO
WP110	R1	CMU 6" Typ	2.792	13.33			0.000	0.000	0.245	0.543	NO
WP111	R1	CMU 6" Typ	1.874	13.33			0.000	0.000	0.140	0.562	NO
WP112	R1	CMU 6" Typ	3.91	13.33			0.000	0.000	0.185	0.527	NO
WP113	R1	CMU 6" Typ	2.084	13.33			0.000	0.000	0.144	0.527	NO
WP114	R1	CMU 6" Dbl Vert @ edge	2.579	14.67			0.000	0.000	0.116	0.000	NO
WP115	R1	CMU 6" Dbl Vert @ edge	4.666	14.67			0.000	0.000	0.089	0.000	NO
WP116	R1	CMU 6" Dbl Vert @ edge	4.666	14.67			0.000	0.444	0.580	0.000	NO
WP117	R1	CMU 6" Dbl Vert @ edge	4.667	14.67			0.000	0.444	0.610	0.000	NO
WP118	R1	CMU 6" Dbl Vert @ edge	4.667	14.67			0.000	0.444	0.574	0.000	NO
WP119	R1	CMU 6" Dbl Vert @ edge	4.667	14.67			0.000	0.444	0.481	0.000	NO
WP120	R1	CMU 6" Dbl Vert @ edge	2.792	14.67			0.000	0.000	0.181	0.000	NO
WP121	R1	CMU 6" Dbl Vert @ edge	1.874	14.67			0.000	0.000	0.115	0.000	NO
WP122	R1	CMU 6" Dbl Vert @ edge	2.084	14.67			0.000	0.461	0.090	0.000	NO
WP124	R1	CMU 6" Dbl Vert @ edge	2.422	14.67			0.000	0.000	0.180	0.000	NO
WP125	R1	CMU 6" Typ	2.666	14.67			0.000	0.000	0.328	0.000	NO
0	R2	CMU 6" Typ	3.5	7.003			0.000	0.000	0.190	0.516	NO
0	R3	CMU 6" Typ	2.666	14.67			0.000	0.000	0.334	0.000	NO
WP127	R1	CMU 6" Typ	6.25	14.67			0.000	0.000	0.304	0.000	NO
WP128	R1	CMU 6" Typ	8.833	14.67			0.000	0.444	0.562	0.000	NO
WP126	R1	CMU 6" Typ	6.25	14.67			0.000	0.000	0.303	0.000	NO
WP137	R1	CMU 6" Typ	4	12			0.000	0.000	0.229	0.413	NO
WP138	R1	CMU 6" Typ	5.836	12			0.000	0.000	0.301	0.413	NO
0	R2	CMU 6" Typ	3.333	5.334			0.000	0.000	0.083	0.413	NO
0	R3	CMU 6" Typ	19.248	12			0.000	0.000	0.775	0.413	NO
0	R4	CMU 6" Typ	4	5.334			0.000	0.000	0.052	0.328	NO
0	R5	CMU 6" Typ	0.75	12			0.000	0.000	0.201	0.588	NO
WP139	R1	CMU 8" Typ	12.5	12			0.000	0.000	0.562	0.413	NO
0	R2	CMU 8" Typ	3.333	5.333			0.000	0.000	0.084	0.413	NO
0	R3	CMU 8" Typ	1.333	12			0.000	0.000	0.173	0.413	NO
WP140	R1	CMU 8" Typ	7.333	20			0.000	0.444	0.826	0.000	NO
0	R2	CMU 8" Typ	12.5	6			0.000	0.000	0.191	0.237	NO
0	R3	CMU 8" Typ	2.5	20			0.000	0.000	0.302	0.000	NO
0	R4	CMU 8" Typ	12.5	6			0.000	0.000	0.215	0.251	NO
0	R5	CMU 8" Typ	8.333	20			0.000	0.444	0.910	0.000	NO
WP135	R1	CMU 8" FG	10.999	16			0.000	0.000	0.000	0.182	NO
0	R2	CMU 8" FG	3.333	1.333			0.000	0.000	0.144	0.380	NO
0	R3	CMU 8" FG	3.333	9.333			0.000	0.000	0.213	0.271	NO
0	R4	CMU 8" FG	1.333	16			0.000	0.000	0.152	0.833	NO
WP88	R1	CMU 8" Dbl Vert @ edge	11.333	8			0.000	0.000	0.098	0.413	NO
0	R2	CMU 8" Dbl Vert @ edge	4.667	8			0.000	0.000	0.076	0.413	NO
0	R3	CMU 8" Dbl Vert @ edge	4.667	1.333			0.000	0.000	0.076	0.412	NO

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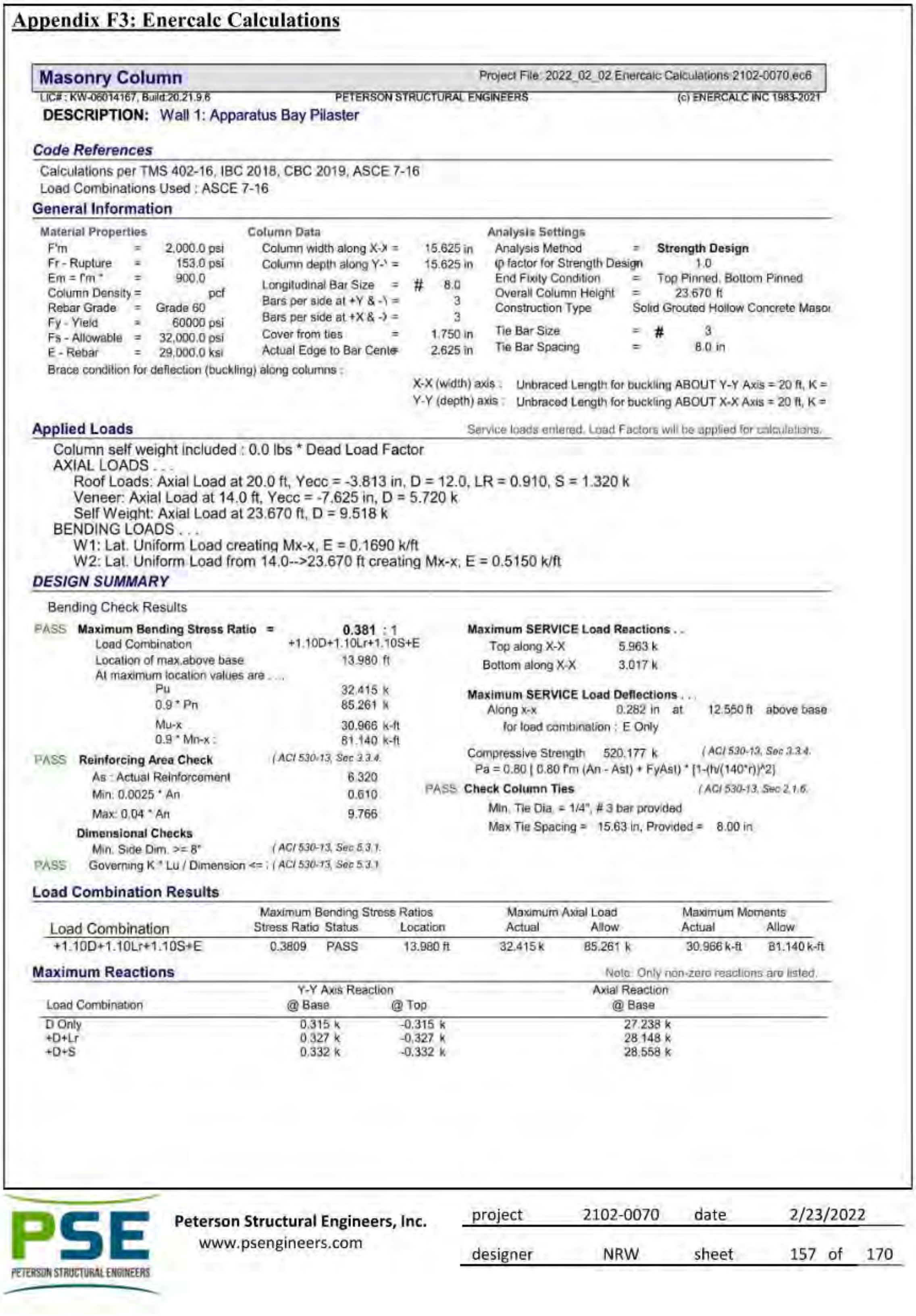
							DC Actions		FC Actions		
							UC[illegible]	UC[illegible]	UC[illegible]	UC[illegible]	
Wall Panel	Region	Design Rule	L (ft)	h (ft)	Retro Height (ft)	Retro Area (ft^2)	Bending UC*φ/(m*k)	Shear UC*φ*k/(m*k)	Bending UC*φ*X/(k*C_1C_2*J)	Shear UC*φ*X/(k*C_1C_2*J)	Additional Analysis required?
0	R4	CMU 8" Dbl Vert @ edge	18.333	8			0.000	0.000	0.123	0.413	NO
0	R5	CMU 8" Dbl Vert @ edge	4.667	8			0.000	0.000	0.039	0.462	NO
0	R6	CMU 8" Dbl Vert @ edge	4.667	1.333			0.000	0.000	0.037	0.265	NO
0	R7	CMU 8" Dbl Vert @ edge	1.333	8			0.000	0.000	0.060	0.601	NO
WP87	R1	CMU 8" Dbl Vert @ edge	8	8			0.000	0.000	0.088	0.414	NO
0	R2	CMU 8" Dbl Vert @ edge	4.667	8			0.000	0.000	0.047	0.413	NO
0	R3	CMU 8" Dbl Vert @ edge	4.667	1.333			0.000	0.000	0.054	0.179	NO
0	R4	CMU 8" Dbl Vert @ edge	3.333	8			0.000	0.000	0.050	0.413	NO



Appendix F3: Enercalc Calculations

Masonry Column Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6
LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 1: Apparatus Bay Pilaster

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties
F'm = 2,000.0 psi
Fr - Rupture = 153.0 psi
Em = f'm * = 900.0
Column Density = pcf
Rebar Grade = Grade 60
Fy - Yield = 60000 psi
Fs - Allowable = 32,000.0 psi
E - Rebar = 29,000.0 ksi

Column Data
Column width along X-X = 15.625 in
Column depth along Y-Y = 15.625 in
Longitudinal Bar Size = # 8.0
Bars per side at +Y & -Y = 3
Bars per side at +X & -X = 3
Cover from ties = 1.750 in
Actual Edge to Bar Cente = 2.625 in

Analysis Settings
Analysis Method = **Strength Design**
φ factor for Strength Design 1.0
End Fixity Condition = Top Pinned, Bottom Pinned
Overall Column Height = 23.670 ft
Construction Type Solid Grouted Hollow Concrete Maso
Tie Bar Size = # 3
Tie Bar Spacing = 8.0 in

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 20 ft, K =
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 20 ft, K =

Applied Loads

Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 0.0 lbs * Dead Load Factor
AXIAL LOADS . . .
Roof Loads: Axial Load at 20.0 ft, Yecc = -3.813 in, D = 12.0, LR = 0.910, S = 1.320 k
Veneer: Axial Load at 14.0 ft, Yecc = -7.625 in, D = 5.720 k
Self Weight: Axial Load at 23.670 ft, D = 9.518 k
BENDING LOADS . . .
W1: Lat. Uniform Load creating Mx-x, E = 0.1690 k/ft
W2: Lat. Uniform Load from 14.0-->23.670 ft creating Mx-x, E = 0.5150 k/ft

DESIGN SUMMARY

Bending Check Results

PASS **Maximum Bending Stress Ratio = 0.381 : 1**
Load Combination +1.10D+1.10Lr+1.10S+E
Location of max.above base 13.980 ft
At maximum location values are . . .
Pu 32.415 k
0.9 * Pn 85.261 k
Mu-x 30.966 k-ft
0.9 * Mn-x : 81.140 k-ft

PASS **Reinforcing Area Check** (*ACI 530-13, Sec 3.3.4.*)
As : Actual Reinforcement 6.320
Min: 0.0025 * An 0.610
Max: 0.04 * An 9.766

Dimensional Checks
Min. Side Dim. >= 8" (*ACI 530-13, Sec 5.3.1.*)
PASS Governing K * Lu / Dimension <= : (*ACI 530-13, Sec 5.3.1*)

Maximum SERVICE Load Reactions . .
Top along X-X 5.963 k
Bottom along X-X 3.017 k

Maximum SERVICE Load Deflections . . .
Along x-x 0.282 in at 12.550 ft above base
for load combination : E Only

Compressive Strength 520.177 k (*ACI 530-13, Sec 3.3.4.*)
Pa = 0.80 [0.80 f'm (An - Ast) + FyAst) * [1-(h/(140*r))^2]

PASS **Check Column Ties** (*ACI 530-13, Sec 2.1.6.*)
Min. Tie Dia. = 1/4", # 3 bar provided
Max Tie Spacing = 15.63 in, Provided = 8.00 in

Load Combination Results

Load Combination	Maximum Bending Stress Ratios Stress Ratio	Status	Location	Maximum Axial Load Actual	Allow	Maximum Moments Actual	Allow
+1.10D+1.10Lr+1.10S+E	0.3809	PASS	13.980 ft	32.415 k	85.261 k	30.966 k-ft	81.140 k-ft

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base
D Only	0.315 k	-0.315 k	27.238 k
+D+Lr	0.327 k	-0.327 k	28.148 k
+D+S	0.332 k	-0.332 k	28.558 k

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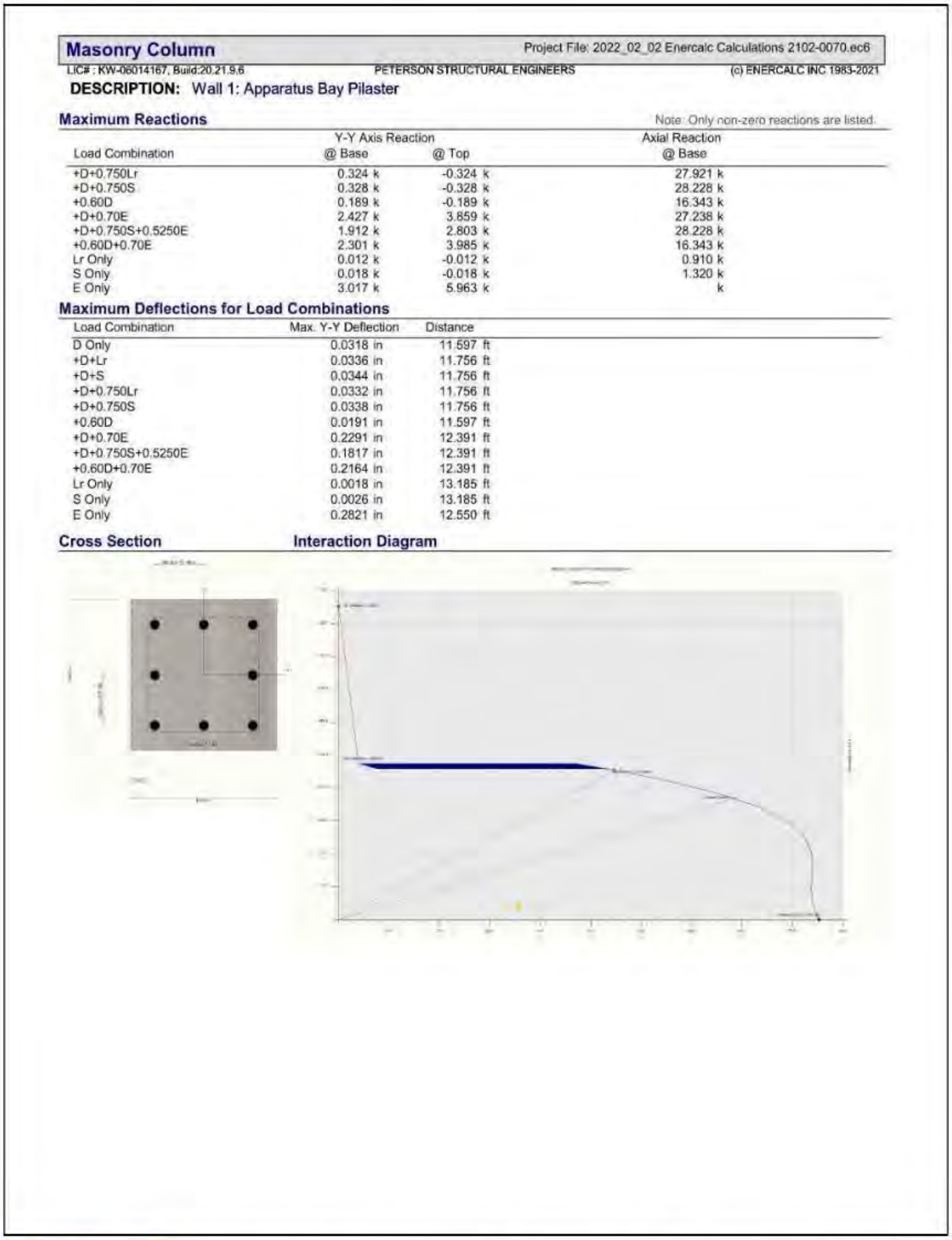

Masonry Column Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 1: Apparatus Bay Pilaster

Maximum Reactions

Note: Only non-zero reactions are listed.

Load Combination	Y-Y Axis Reaction @ Base	Y-Y Axis Reaction @ Top	Axial Reaction @ Base
+D+0.750Lr	0.324 k	-0.324 k	27.921 k
+D+0.750S	0.328 k	-0.328 k	28.228 k
+0.60D	0.189 k	-0.189 k	16.343 k
+D+0.70E	2.427 k	3.859 k	27.238 k
+D+0.750S+0.5250E	1.912 k	2.803 k	28.228 k
+0.60D+0.70E	2.301 k	3.985 k	16.343 k
Lr Only	0.012 k	-0.012 k	0.910 k
S Only	0.018 k	-0.018 k	1.320 k
E Only	3.017 k	5.963 k	k

Maximum Deflections for Load Combinations

Load Combination	Max. Y-Y Deflection	Distance
D Only	0.0318 in	11.597 ft
+D+Lr	0.0336 in	11.756 ft
+D+S	0.0344 in	11.756 ft
+D+0.750Lr	0.0332 in	11.756 ft
+D+0.750S	0.0338 in	11.756 ft
+0.60D	0.0191 in	11.597 ft
+D+0.70E	0.2291 in	12.391 ft
+D+0.750S+0.5250E	0.1817 in	12.391 ft
+0.60D+0.70E	0.2164 in	12.391 ft
Lr Only	0.0018 in	13.185 ft
S Only	0.0026 in	13.185 ft
E Only	0.2821 in	12.550 ft

Cross Section **Interaction Diagram**

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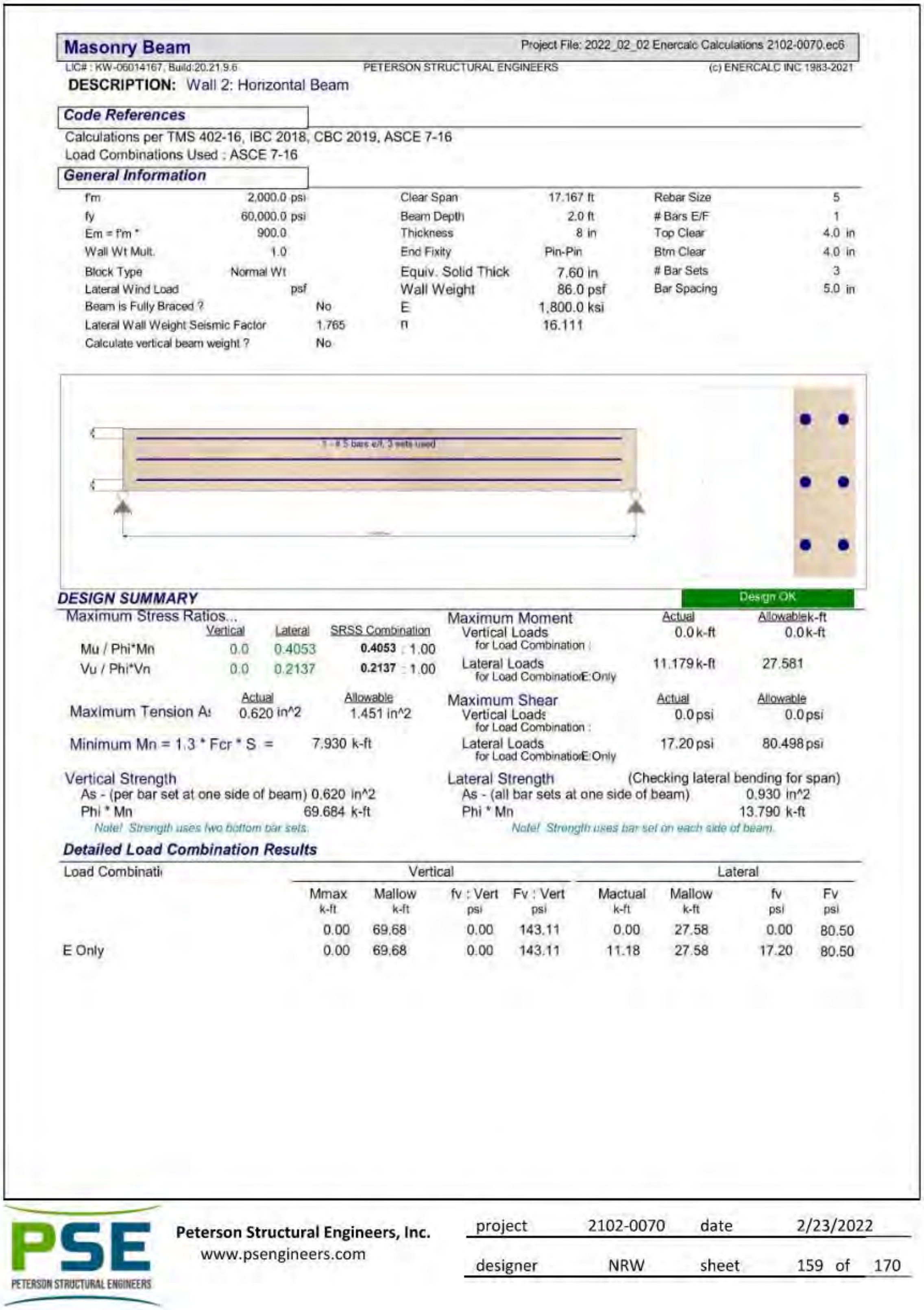

Masonry Beam

Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 2: Horizontal Beam

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

f'm	2,000.0 psi	Clear Span	17.167 ft	Rebar Size	5
fy	60,000.0 psi	Beam Depth	2.0 ft	# Bars E/F	1
Em = f'm *	900.0	Thickness	8 in	Top Clear	4.0 in
Wall Wt Mult.	1.0	End Fixity	Pin-Pin	Btm Clear	4.0 in
Block Type	Normal Wt	Equiv. Solid Thick	7.60 in	# Bar Sets	3
Lateral Wind Load	psf	Wall Weight	86.0 psf	Bar Spacing	5.0 in
Beam is Fully Braced ?	No	E	1,800.0 ksi		
Lateral Wall Weight Seismic Factor	1.765	n	16.111		
Calculate vertical beam weight ?	No				

DESIGN SUMMARY

Design OK

Maximum Stress Ratios...

	Vertical	Lateral	SRSS Combination
Mu / Phi*Mn	0.0	0.4053	**0.4053** : 1.00
Vu / Phi*Vn	0.0	0.2137	**0.2137** : 1.00

	Actual	Allowable
Maximum Tension A:	0.620 in^2	1.451 in^2

Minimum Mn = 1.3 * Fcr * S = 7.930 k-ft

Maximum Moment	Actual	Allowablek-ft
Vertical Loads for Load Combination :	0.0 k-ft	0.0 k-ft
Lateral Loads for Load CombinatioE Only	11.179 k-ft	27.581

Maximum Shear	Actual	Allowable
Vertical Loads for Load Combination :	0.0 psi	0.0 psi
Lateral Loads for Load CombinatioE Only	17.20 psi	80.498 psi

Vertical Strength
As - (per bar set at one side of beam) 0.620 in^2
Phi * Mn 69.684 k-ft
Note! Strength uses two bottom bar sets.

Lateral Strength (Checking lateral bending for span)
As - (all bar sets at one side of beam) 0.930 in^2
Phi * Mn 13.790 k-ft
Note! Strength uses bar set on each side of beam.

Detailed Load Combination Results

Load Combinati	Vertical				Lateral			
	Mmax k-ft	Mallow k-ft	fv : Vert psi	Fv : Vert psi	Mactual k-ft	Mallow k-ft	fv psi	Fv psi
	0.00	69.68	0.00	143.11	0.00	27.58	0.00	80.50
E Only	0.00	69.68	0.00	143.11	11.18	27.58	17.20	80.50

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Masonry Column Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6
LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 3: Main Region Pilaster

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Material Properties
F'm = 2,000.0 psi
Fr - Rupture = 153.0 psi
Em = f'm * = 900.0
Column Density = pcf
Rebar Grade = Grade 60
Fy - Yield = 60000 psi
Fs - Allowable = 32,000.0 psi
E - Rebar = 29,000.0 ksi

Column Data
Column width along X-X = 15.625 in
Column depth along Y-Y = 11.625 in
Longitudinal Bar Size = # 7.0
Bars per side at +Y & -Y = 3
Bars per side at +X & -X = 3
Cover from ties = 1.750 in
Actual Edge to Bar Center= 2.5625 in

Analysis Settings
Analysis Method = **Strength Design**
φ factor for Strength Design 1.0
End Fixity Condition = Top Pinned, Bottom Pinned
Overall Column Height = 13.330 ft
Construction Type Solid Grouted Hollow Concrete Masonr
Tie Bar Size = # 3
Tie Bar Spacing = 8.0 in

Brace condition for deflection (buckling) along columns :
X-X (width) axis : Unbraced Length for buckling ABOUT Y-Y Axis = 13.330 ft, K
Y-Y (depth) axis : Unbraced Length for buckling ABOUT X-X Axis = 13.330 ft, K

Applied Loads Service loads entered. Load Factors will be applied for calculations.

Column self weight included : 0.0 lbs * Dead Load Factor
AXIAL LOADS . . .
Roof Loads: Axial Load at 13.330 ft, Yecc = -2.0 in, D = 1.992, LR = 2.652, S = 3.840 k
2nd Floor Loads: Axial Load at 13.330 ft, Yecc = 1.438 in, D = 9.840, L = 6.90 k
Wall Above: Axial Load at 13.330 ft, Yecc = -2.0 in, D = 13.860 k
Veneer: Axial Load at 13.330 ft, Yecc = -5.813 in, D = 5.720 k
BENDING LOADS . . .
W1: Lat. Uniform Load creating Mx-x, E = 0.420 k/ft

DESIGN SUMMARY

Bending Check Results

PASS **Maximum Bending Stress Ratio =** **0.297 : 1**
Load Combination +1.10D+1.10Lr+1.10S+E
Location of max.above base 7.694 ft
At maximum location values are . . .
Pu 41.694 k
0.9 * Pn 140.334 k
Mu-x 12.481 k-ft
0.9 * Mn-x : 41.983 k-ft

PASS **Reinforcing Area Check** *(ACI 530-13, Sec 3.3.4*
As : Actual Reinforcement 4.800
Min: 0.0025 * An 0.454
Max: 0.04 * An 7.266

Dimensional Checks
Min. Side Dim. >= 8" *(ACI 530-13, Sec 5.3.1*
PASS Governing K * Lu / Dimension <= 3(*(ACI 530-13, Sec 5.3.1*

Maximum SERVICE Load Reactions . .
Top along X-X 2.799 k
Bottom along X-X 2.799 k

Maximum SERVICE Load Deflections . . .
Along x-x 0.082 in at 6.710 ft above base
for load combination : E Only

Compressive Strength 427.513 k *(ACI 530-13, Sec 3.3.4.*
Pa = 0.80 [0.80 f'm (An - Ast) + FyAst) * [1-(h/(140*r))^2]

PASS **Check Column Ties** *(ACI 530-13, Sec 2.1.6*
Min. Tie Dia. = 1/4", # 3 bar provided
Max Tie Spacing = 11.63 in, Provided = 8.00 in

Load Combination Results

Load Combination	Maximum Bending Stress Ratios			Maximum Axial Load		Maximum Moments	
	Stress Ratio	Status	Location	Actual	Allow	Actual	Allow
+1.10D+1.10Lr+1.10S+E	0.2971	PASS	7.694 ft	41.694 k	140.334 k	12.481 k-ft	41.983 k-ft
+1.10D+1.10Lr+1.10S-E	0.1880	PASS	5.636 ft	41.694 k	221.80 k	6.634 k-ft	35.211 k-ft

Maximum Reactions Note: Only non-zero reactions are listed.

Load Combination	Y-Y Axis Reaction @ Base	@ Top	Axial Reaction @ Base
D Only	0.318 k	-0.318 k	31.412 k
+D+L	0.256 k	-0.256 k	38.312 k

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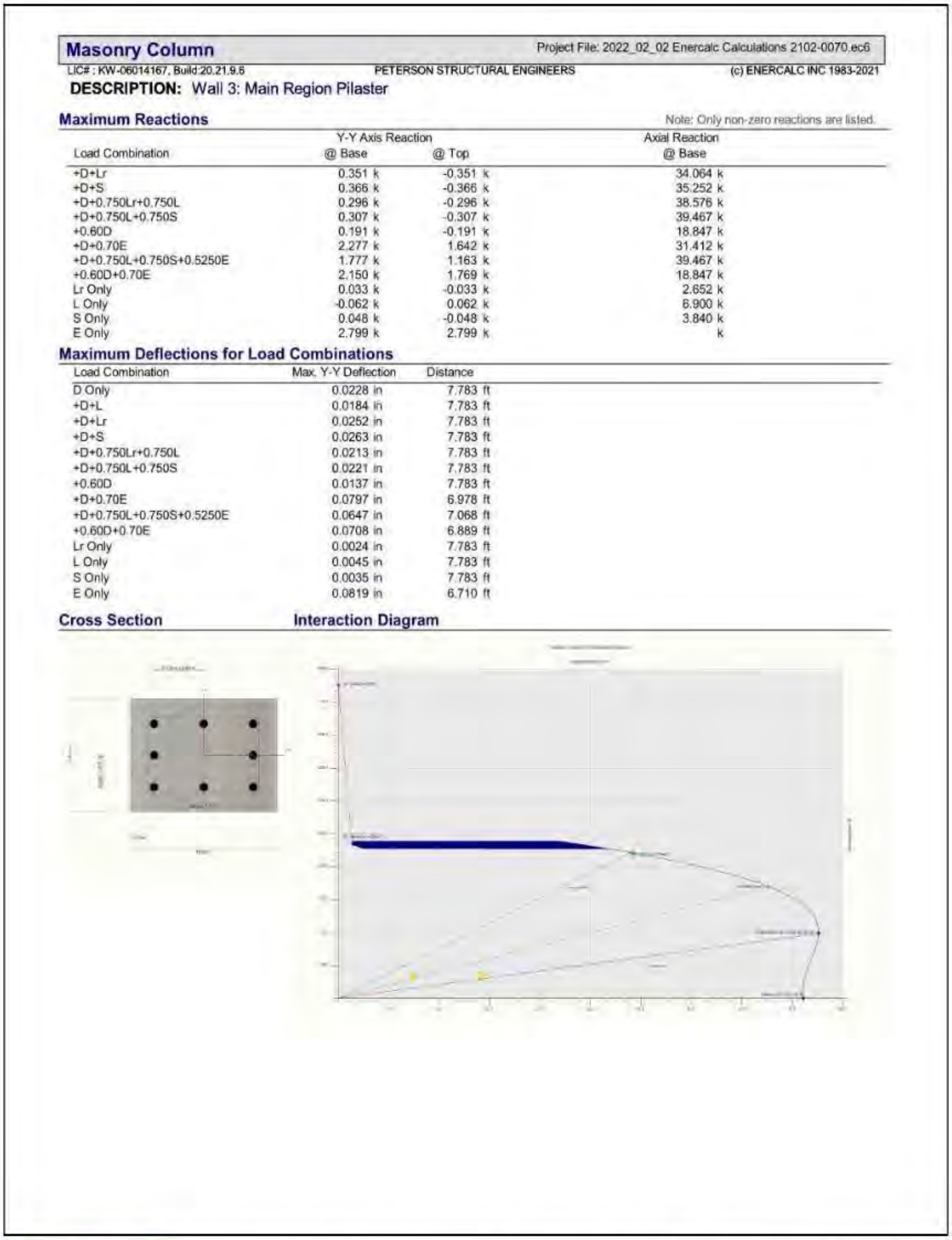

Masonry Column

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LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 3: Main Region Pilaster

Maximum Reactions

Note: Only non-zero reactions are listed.

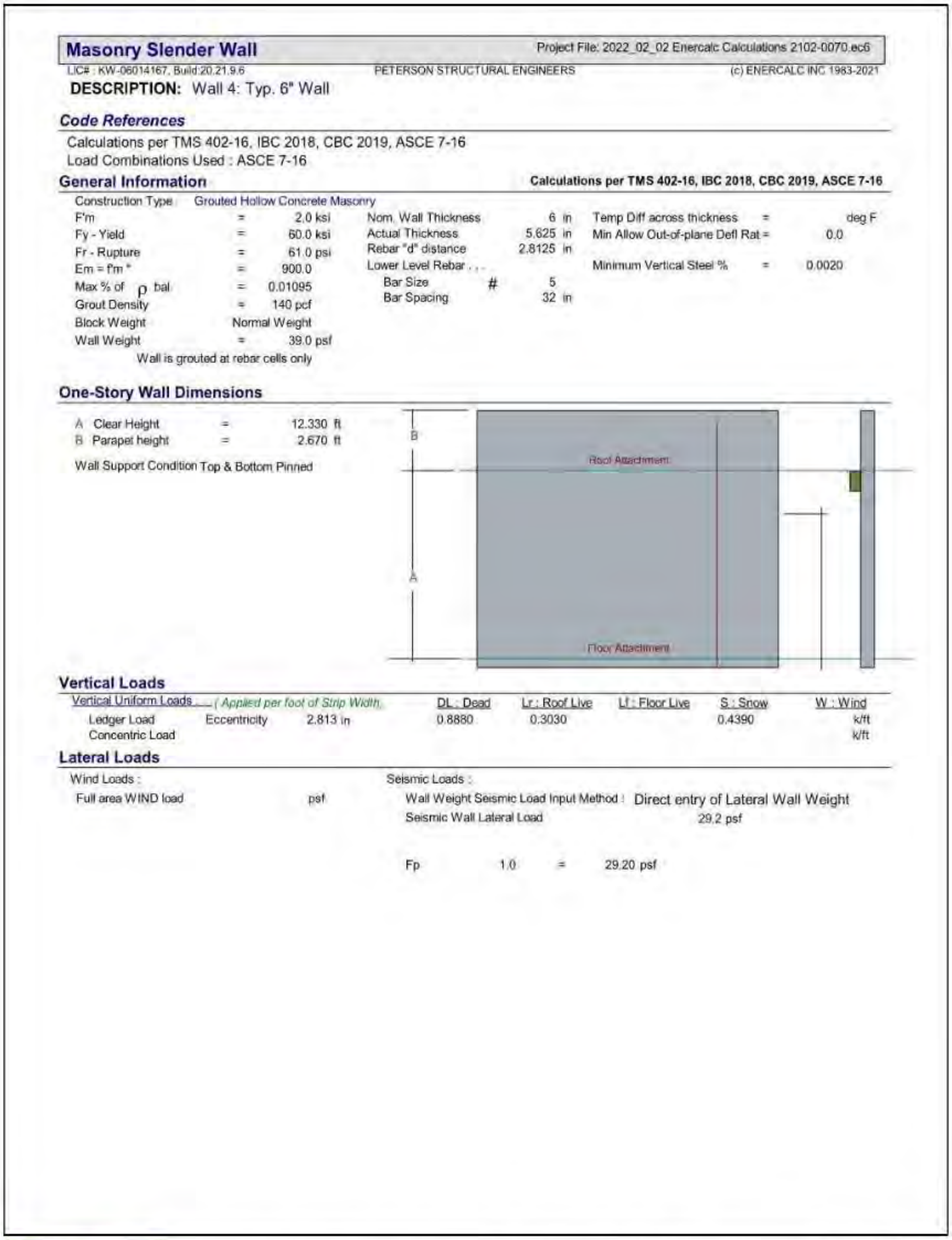
	Y-Y Axis Reaction		Axial Reaction
Load Combination	@ Base	@ Top	@ Base
+D+Lr	0.351 k	-0.351 k	34.064 k
+D+S	0.366 k	-0.366 k	35.252 k
+D+0.750Lr+0.750L	0.296 k	-0.296 k	38.576 k
+D+0.750L+0.750S	0.307 k	-0.307 k	39.467 k
+0.60D	0.191 k	-0.191 k	18.847 k
+D+0.70E	2.277 k	1.642 k	31.412 k
+D+0.750L+0.750S+0.5250E	1.777 k	1.163 k	39.467 k
+0.60D+0.70E	2.150 k	1.769 k	18.847 k
Lr Only	0.033 k	-0.033 k	2.652 k
L Only	-0.062 k	0.062 k	6.900 k
S Only	0.048 k	-0.048 k	3.840 k
E Only	2.799 k	2.799 k	k

Maximum Deflections for Load Combinations

Load Combination	Max. Y-Y Deflection	Distance
D Only	0.0228 in	7.783 ft
+D+L	0.0184 in	7.783 ft
+D+Lr	0.0252 in	7.783 ft
+D+S	0.0263 in	7.783 ft
+D+0.750Lr+0.750L	0.0213 in	7.783 ft
+D+0.750L+0.750S	0.0221 in	7.783 ft
+0.60D	0.0137 in	7.783 ft
+D+0.70E	0.0797 in	6.978 ft
+D+0.750L+0.750S+0.5250E	0.0647 in	7.068 ft
+0.60D+0.70E	0.0708 in	6.889 ft
Lr Only	0.0024 in	7.783 ft
L Only	0.0045 in	7.783 ft
S Only	0.0035 in	7.783 ft
E Only	0.0819 in	6.710 ft

Cross Section

Interaction Diagram



Masonry Slender Wall

Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 4: Typ. 6" Wall

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16

Construction Type Grouted Hollow Concrete Masonry

F'm	=	2.0 ksi	Nom. Wall Thickness	6 in	Temp Diff across thickness	=	deg F
Fy - Yield	=	60.0 ksi	Actual Thickness	5.625 in	Min Allow Out-of-plane Defl Rat	=	0.0
Fr - Rupture	=	61.0 psi	Rebar "d" distance	2.8125 in			
Em = f'm *	=	900.0	Lower Level Rebar . . .		Minimum Vertical Steel %	=	0.0020
Max % of ρ bal	=	0.01095	Bar Size #	5			
Grout Density	=	140 pcf	Bar Spacing	32 in			
Block Weight		Normal Weight					
Wall Weight	=	39.0 psf					

Wall is grouted at rebar cells only

One-Story Wall Dimensions

A Clear Height = 12.330 ft
B Parapet height = 2.670 ft

Wall Support Condition Top & Bottom Pinned

Vertical Loads

Vertical Uniform Loads . . . *(Applied per foot of Strip Width,*

			DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Ledger Load	Eccentricity	2.813 in	0.8880	0.3030		0.4390	k/ft
Concentric Load							k/ft

Lateral Loads

Wind Loads :
Full area WIND load psf

Seismic Loads :
Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight
Seismic Wall Lateral Load 29.2 psf

Fp 1.0 = 29.20 psf

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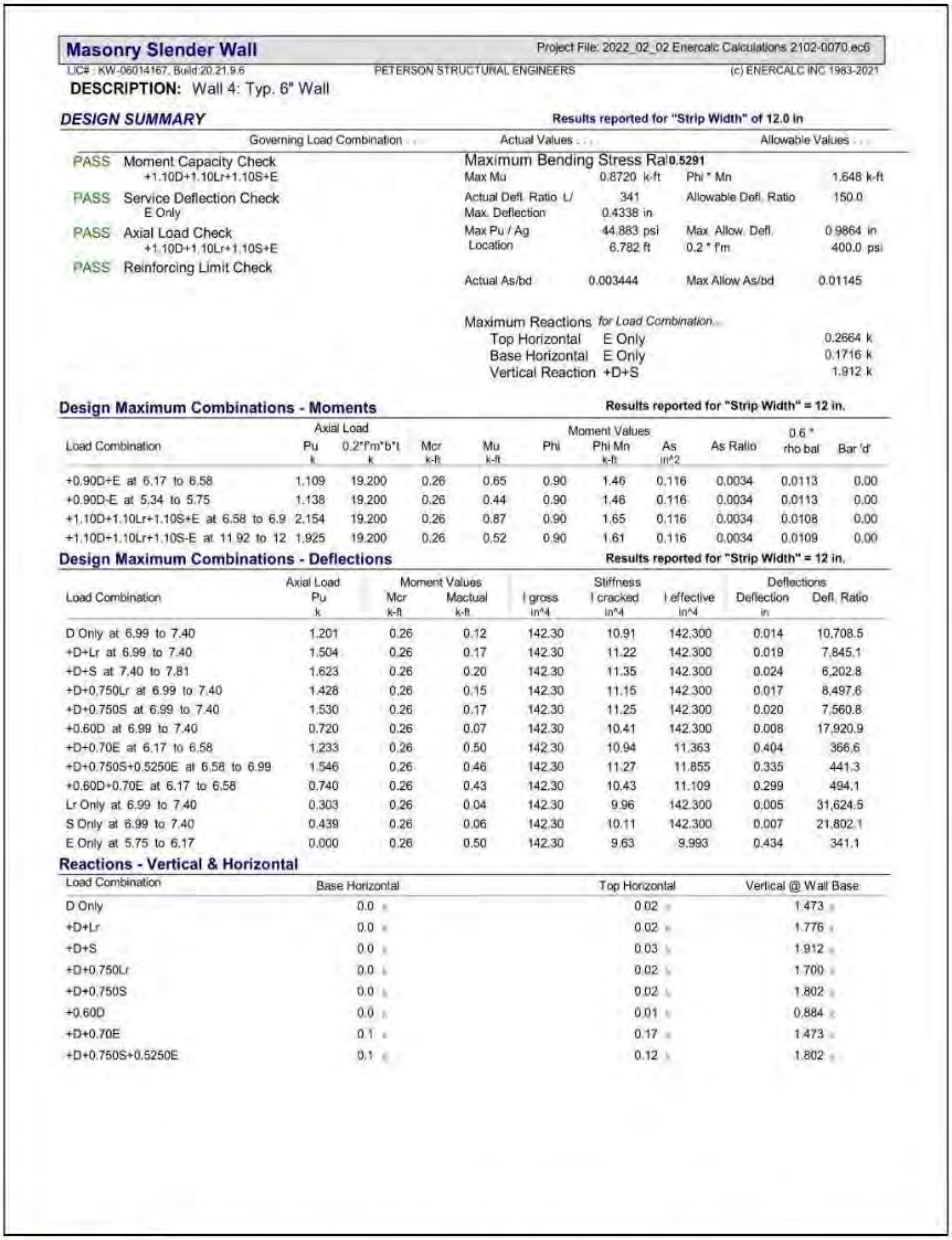

Masonry Slender Wall

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LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 4: Typ. 6" Wall

DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

	Governing Load Combination . . .	Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check +1.10D+1.10Lr+1.10S+E	Maximum Bending Stress Ra	**0.5291**		
		Max Mu	0.8720 k-ft	Phi * Mn	1.648 k-ft
PASS	Service Deflection Check E Only	Actual Defl. Ratio L/	341	Allowable Defl. Ratio	150.0
		Max. Deflection	0.4338 in		
PASS	Axial Load Check +1.10D+1.10Lr+1.10S+E	Max Pu / Ag	44.883 psi	Max. Allow. Defl.	0.9864 in
		Location	6.782 ft	0.2 * f'm	400.0 psi
PASS	Reinforcing Limit Check	Actual As/bd	0.003444	Max Allow As/bd	0.01145

Maximum Reactions *for Load Combination...*

Top Horizontal	E Only	0.2664 k
Base Horizontal	E Only	0.1716 k
Vertical Reaction	+D+S	1.912 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

	Axial Load			Moment Values						
Load Combination	Pu k	0.2*f'm*b*t k	Mcr k-ft	Mu k-ft	Phi	Phi Mn k-ft	As in^2	As Ratio	0.6 * rho bal	Bar 'd'
+0.90D+E at 6.17 to 6.58	1.109	19.200	0.26	0.65	0.90	1.46	0.116	0.0034	0.0113	0.00
+0.90D-E at 5.34 to 5.75	1.138	19.200	0.26	0.44	0.90	1.46	0.116	0.0034	0.0113	0.00
+1.10D+1.10Lr+1.10S+E at 6.58 to 6.9	2.154	19.200	0.26	0.87	0.90	1.65	0.116	0.0034	0.0108	0.00
+1.10D+1.10Lr+1.10S-E at 11.92 to 12	1.925	19.200	0.26	0.52	0.90	1.61	0.116	0.0034	0.0109	0.00

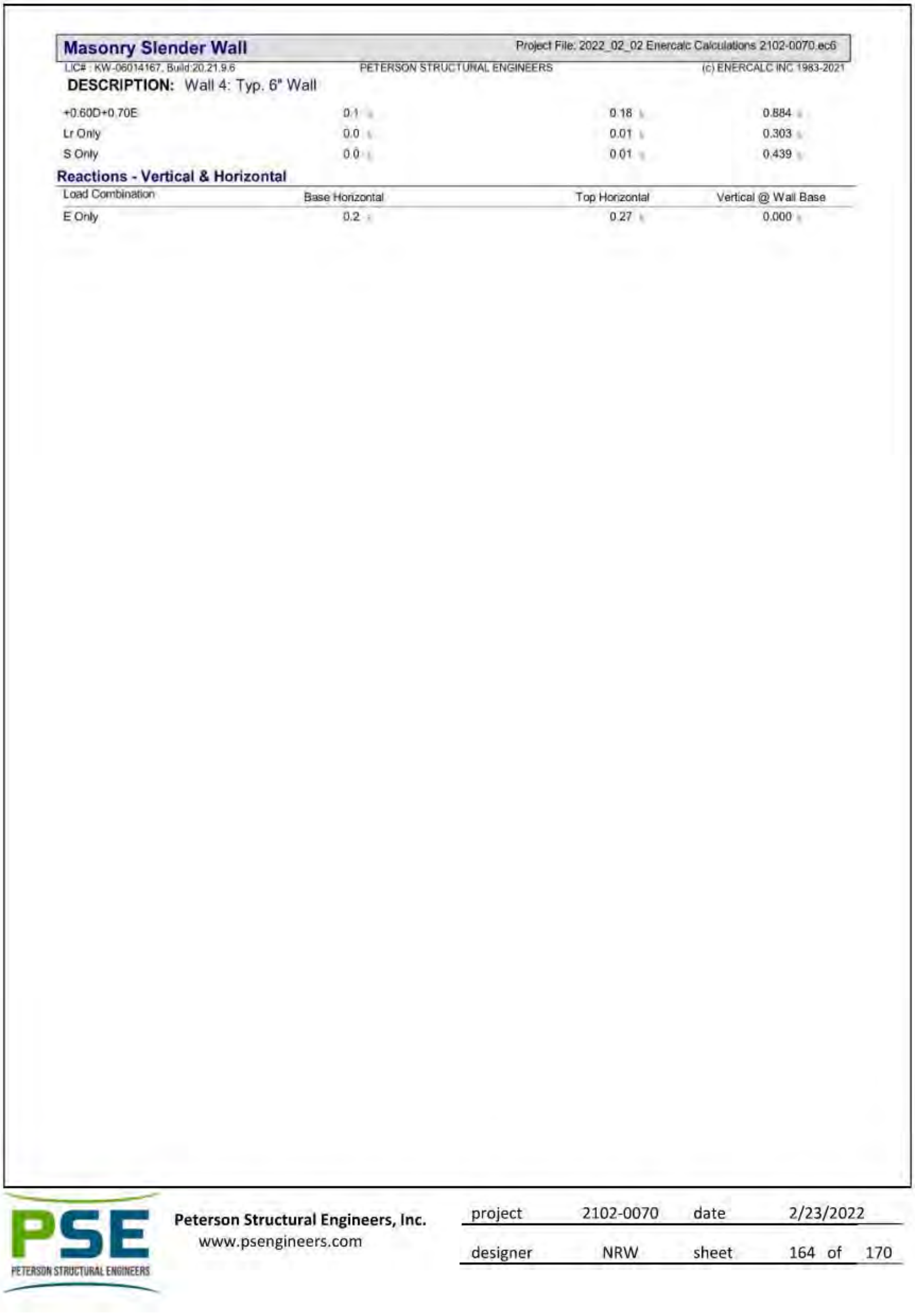
Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

	Axial Load	Moment Values		Stiffness			Deflections	
Load Combination	Pu k	Mcr k-ft	Mactual k-ft	I gross in^4	I cracked in^4	I effective in^4	Deflection in	Defl. Ratio
D Only at 6.99 to 7.40	1.201	0.26	0.12	142.30	10.91	142.300	0.014	10,708.5
+D+Lr at 6.99 to 7.40	1.504	0.26	0.17	142.30	11.22	142.300	0.019	7,845.1
+D+S at 7.40 to 7.81	1.623	0.26	0.20	142.30	11.35	142.300	0.024	6,202.8
+D+0.750Lr at 6.99 to 7.40	1.428	0.26	0.15	142.30	11.15	142.300	0.017	8,497.6
+D+0.750S at 6.99 to 7.40	1.530	0.26	0.17	142.30	11.25	142.300	0.020	7,560.8
+0.60D at 6.99 to 7.40	0.720	0.26	0.07	142.30	10.41	142.300	0.008	17,920.9
+D+0.70E at 6.17 to 6.58	1.233	0.26	0.50	142.30	10.94	11.363	0.404	366.6
+D+0.750S+0.5250E at 6.58 to 6.99	1.546	0.26	0.46	142.30	11.27	11.855	0.335	441.3
+0.60D+0.70E at 6.17 to 6.58	0.740	0.26	0.43	142.30	10.43	11.109	0.299	494.1
Lr Only at 6.99 to 7.40	0.303	0.26	0.04	142.30	9.96	142.300	0.005	31,624.5
S Only at 6.99 to 7.40	0.439	0.26	0.06	142.30	10.11	142.300	0.007	21,802.1
E Only at 5.75 to 6.17	0.000	0.26	0.50	142.30	9.63	9.993	0.434	341.1

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.02 k	1.473 k
+D+Lr	0.0 k	0.02 k	1.776 k
+D+S	0.0 k	0.03 k	1.912 k
+D+0.750Lr	0.0 k	0.02 k	1.700 k
+D+0.750S	0.0 k	0.02 k	1.802 k
+0.60D	0.0 k	0.01 k	0.884 k
+D+0.70E	0.1 k	0.17 k	1.473 k
+D+0.750S+0.5250E	0.1 k	0.12 k	1.802 k



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DESCRIPTION: Wall 4: Typ. 6" Wall

+0.60D+0.70E	0.1	0.18	0.884
Lr Only	0.0	0.01	0.303
S Only	0.0	0.01	0.439

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
E Only	0.2	0.27	0.000

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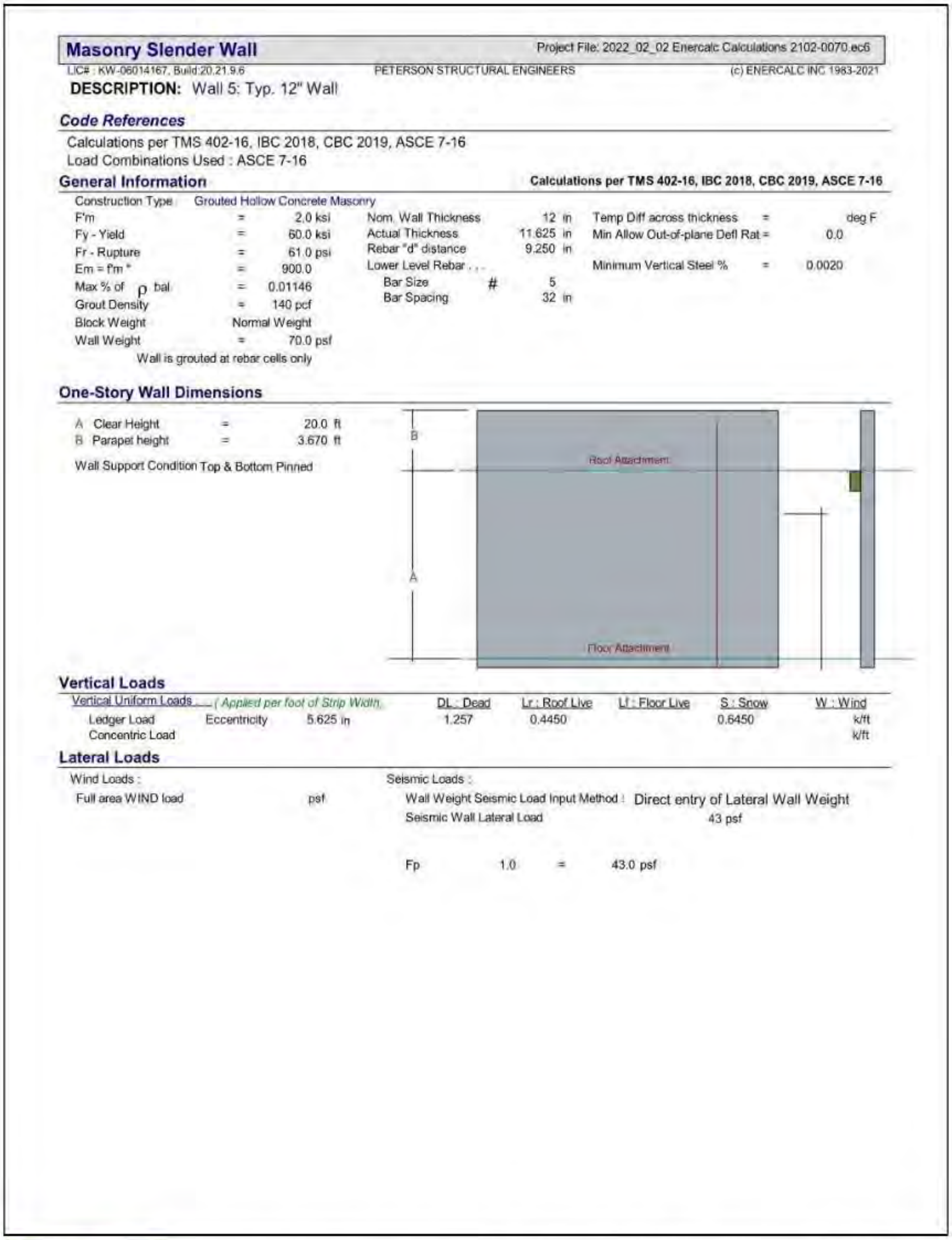

Masonry Slender Wall

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LIC# : KW-06014167, Build:20.21.9.6
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DESCRIPTION: Wall 5: Typ. 12" Wall

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16

Construction Type : Grouted Hollow Concrete Masonry
F'm = 2.0 ksi
Fy - Yield = 60.0 ksi
Fr - Rupture = 61.0 psi
Em = f'm * = 900.0
Max % of ρ bal = 0.01146
Grout Density = 140 pcf
Block Weight Normal Weight
Wall Weight = 70.0 psf
Wall is grouted at rebar cells only

Nom. Wall Thickness 12 in
Actual Thickness 11.625 in
Rebar "d" distance 9.250 in
Lower Level Rebar . . .
Bar Size # 5
Bar Spacing 32 in

Temp Diff across thickness = deg F
Min Allow Out-of-plane Defl Rat = 0.0
Minimum Vertical Steel % = 0.0020

One-Story Wall Dimensions

A Clear Height = 20.0 ft
B Parapet height = 3.670 ft

Wall Support Condition Top & Bottom Pinned

Vertical Loads

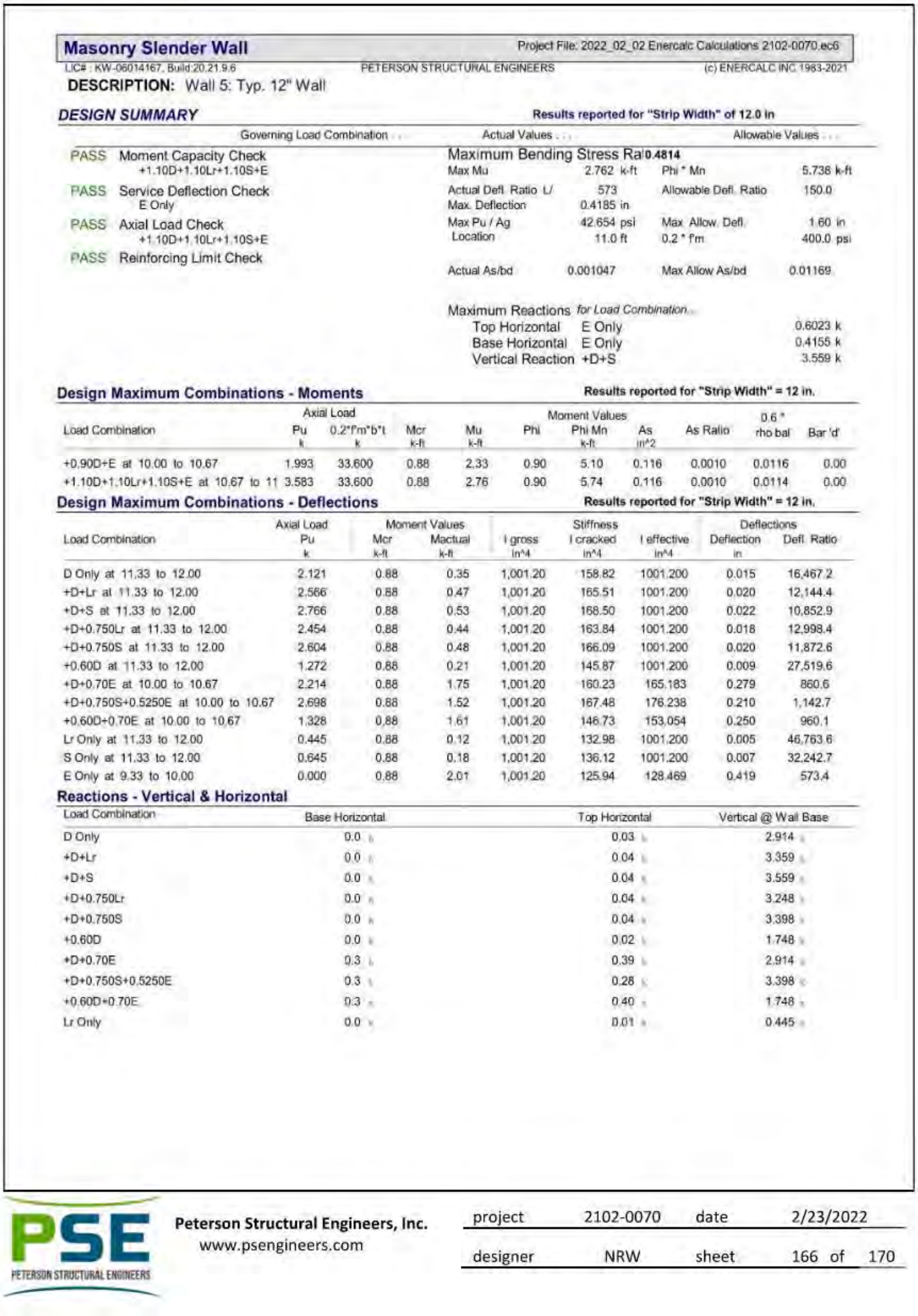
Vertical Uniform Loads . . .	*(Applied per foot of Strip Width)*		DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind	
Ledger Load	Eccentricity	5.625 in	1.257	0.4450		0.6450		k/ft
Concentric Load								k/ft

Lateral Loads

Wind Loads :
Full area WIND load psf

Seismic Loads :
Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight
Seismic Wall Lateral Load 43 psf

Fp 1.0 = 43.0 psf



Masonry Slender Wall

Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 5: Typ. 12" Wall

DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

	Governing Load Combination . . .	Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check +1.10D+1.10Lr+1.10S+E	Maximum Bending Stress Ra	**0.4814**		
		Max Mu	2.762 k-ft	Phi * Mn	5.738 k-ft
PASS	Service Deflection Check E Only	Actual Defl. Ratio L/	573	Allowable Defl. Ratio	150.0
		Max. Deflection	0.4185 in		
PASS	Axial Load Check +1.10D+1.10Lr+1.10S+E	Max Pu / Ag	42.654 psi	Max. Allow. Defl.	1.60 in
		Location	11.0 ft	0.2 * f'm	400.0 psi
PASS	Reinforcing Limit Check				
		Actual As/bd	0.001047	Max Allow As/bd	0.01169

Maximum Reactions *for Load Combination...*

Top Horizontal	E Only	0.6023 k
Base Horizontal	E Only	0.4155 k
Vertical Reaction	+D+S	3.559 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	0.2*f'm*b*t k	Moment Values Mcr k-ft	Mu k-ft	Phi	Phi Mn k-ft	As in^2	As Ratio	0.6 * rho bal	Bar 'd'
+0.90D+E at 10.00 to 10.67	1.993	33.600	0.88	2.33	0.90	5.10	0.116	0.0010	0.0116	0.00
+1.10D+1.10Lr+1.10S+E at 10.67 to 11	3.583	33.600	0.88	2.76	0.90	5.74	0.116	0.0010	0.0114	0.00

Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

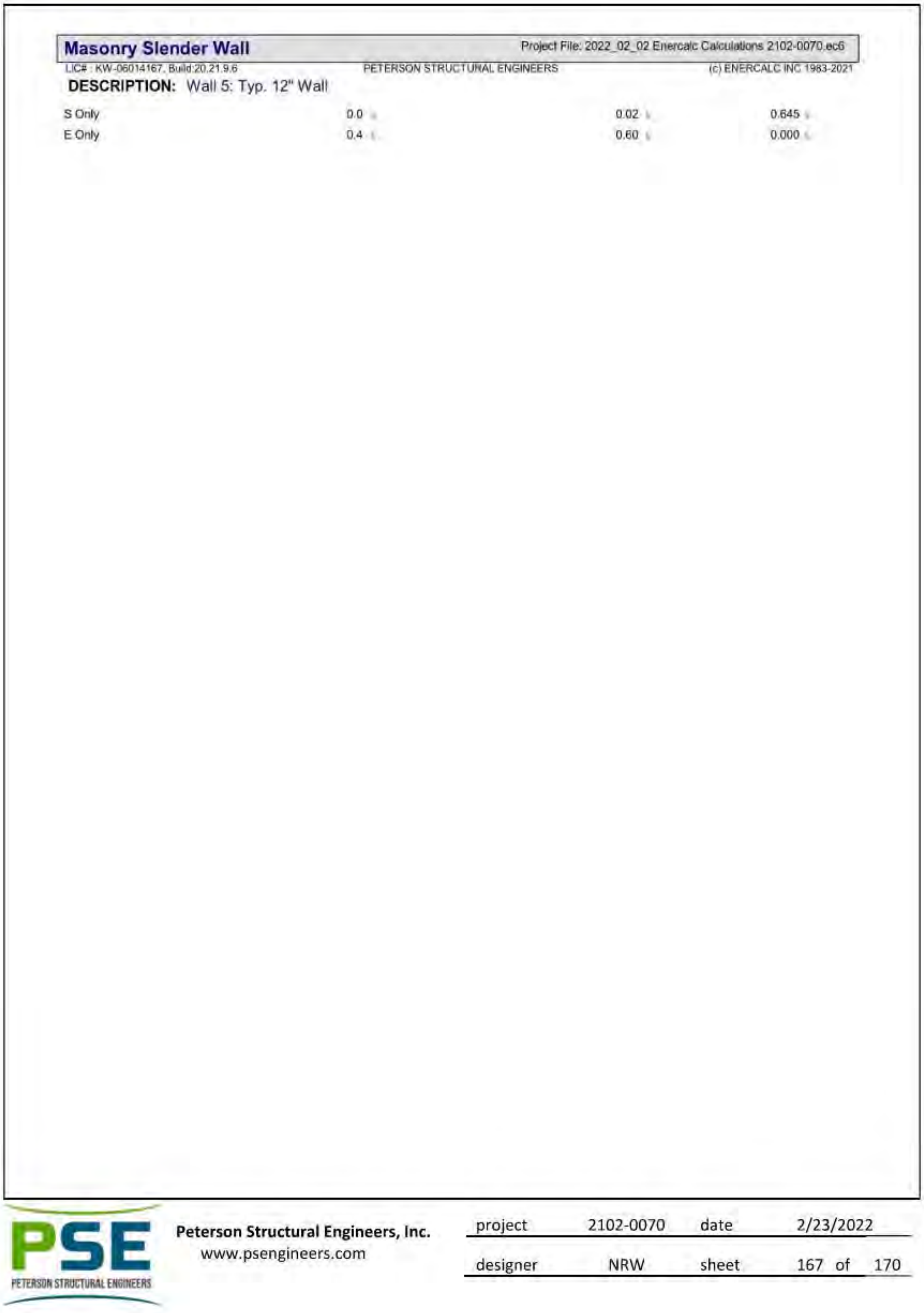
Load Combination	Axial Load Pu k	Moment Values Mcr k-ft	Mactual k-ft	Stiffness I gross in^4	I cracked in^4	I effective in^4	Deflections Deflection in	Defl. Ratio
D Only at 11.33 to 12.00	2.121	0.88	0.35	1,001.20	158.82	1001.200	0.015	16,467.2
+D+Lr at 11.33 to 12.00	2.566	0.88	0.47	1,001.20	165.51	1001.200	0.020	12,144.4
+D+S at 11.33 to 12.00	2.766	0.88	0.53	1,001.20	168.50	1001.200	0.022	10,852.9
+D+0.750Lr at 11.33 to 12.00	2.454	0.88	0.44	1,001.20	163.84	1001.200	0.018	12,998.4
+D+0.750S at 11.33 to 12.00	2.604	0.88	0.48	1,001.20	166.09	1001.200	0.020	11,872.6
+0.60D at 11.33 to 12.00	1.272	0.88	0.21	1,001.20	145.87	1001.200	0.009	27,519.6
+D+0.70E at 10.00 to 10.67	2.214	0.88	1.75	1,001.20	160.23	165.183	0.279	860.6
+D+0.750S+0.5250E at 10.00 to 10.67	2.698	0.88	1.52	1,001.20	167.48	176.238	0.210	1,142.7
+0.60D+0.70E at 10.00 to 10.67	1.328	0.88	1.61	1,001.20	146.73	153.054	0.250	960.1
Lr Only at 11.33 to 12.00	0.445	0.88	0.12	1,001.20	132.98	1001.200	0.005	46,763.6
S Only at 11.33 to 12.00	0.645	0.88	0.18	1,001.20	136.12	1001.200	0.007	32,242.7
E Only at 9.33 to 10.00	0.000	0.88	2.01	1,001.20	125.94	128.469	0.419	573.4

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.03 k	2.914 k
+D+Lr	0.0 k	0.04 k	3.359 k
+D+S	0.0 k	0.04 k	3.559 k
+D+0.750Lr	0.0 k	0.04 k	3.248 k
+D+0.750S	0.0 k	0.04 k	3.398 k
+0.60D	0.0 k	0.02 k	1.748 k
+D+0.70E	0.3 k	0.39 k	2.914 k
+D+0.750S+0.5250E	0.3 k	0.28 k	3.398 k
+0.60D+0.70E	0.3 k	0.40 k	1.748 k
Lr Only	0.0 k	0.01 k	0.445 k

Peterson Structural Engineers, Inc.
www.psengineers.com

project	2102-0070	date	2/23/2022
designer	NRW	sheet	166 of 170



Masonry Slender Wall Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 5: Typ. 12" Wall

S Only	0.0	0.02	0.645
E Only	0.4	0.60	0.000

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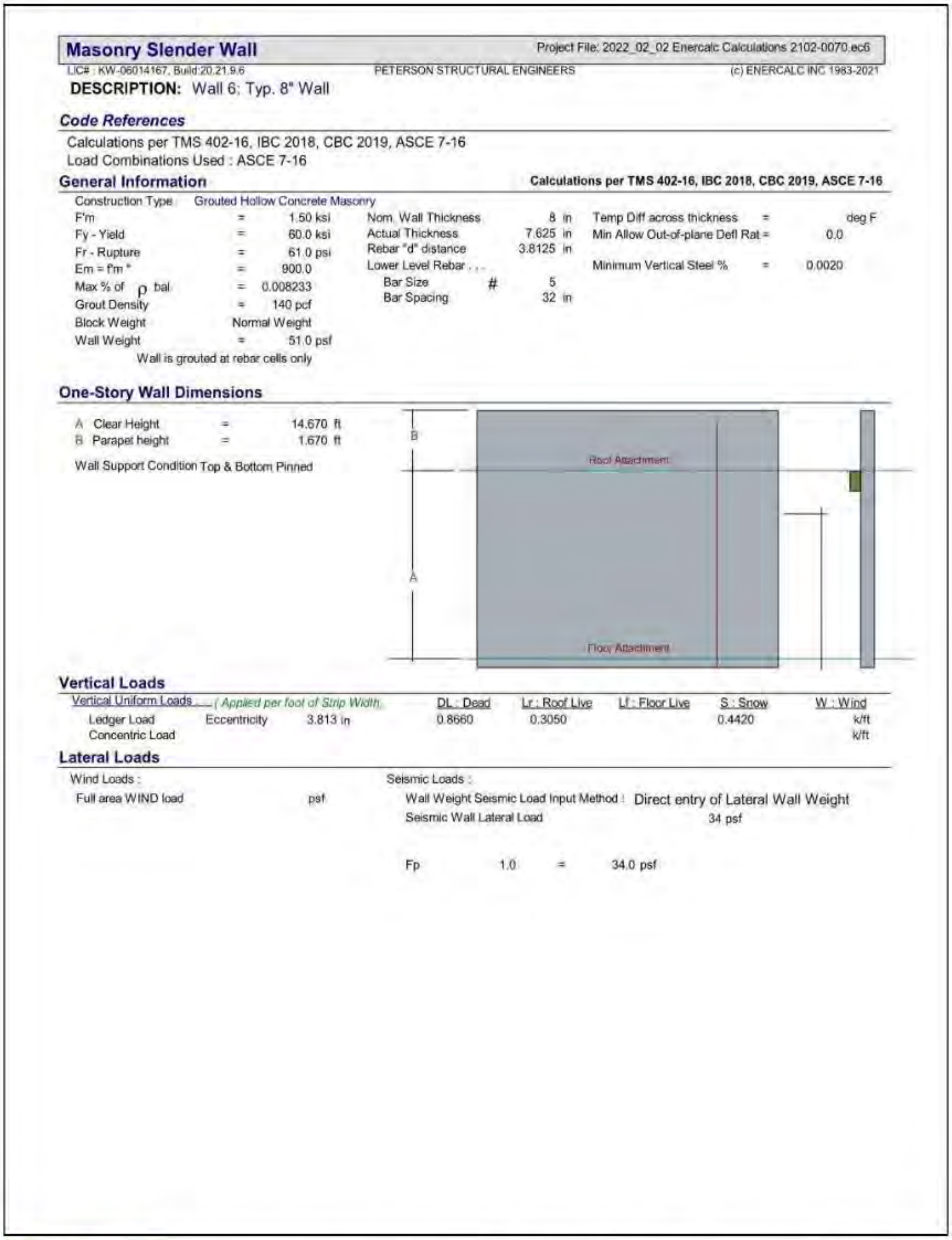
project	2102-0070	date	2/23/2022
designer	NRW	sheet	167 of 170



Masonry Slender Wall

Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 6; Typ. 8" Wall

Code References

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16
Load Combinations Used : ASCE 7-16

General Information

Calculations per TMS 402-16, IBC 2018, CBC 2019, ASCE 7-16

Construction Type : Grouted Hollow Concrete Masonry
F'm = 1.50 ksi
Fy - Yield = 60.0 ksi
Fr - Rupture = 61.0 psi
Em = f'm * = 900.0
Max % of ρ bal = 0.008233
Grout Density = 140 pcf
Block Weight Normal Weight
Wall Weight = 51.0 psf
Wall is grouted at rebar cells only

Nom. Wall Thickness 8 in
Actual Thickness 7.625 in
Rebar "d" distance 3.8125 in
Lower Level Rebar . . .
Bar Size # 5
Bar Spacing 32 in

Temp Diff across thickness = deg F
Min Allow Out-of-plane Defl Rat = 0.0
Minimum Vertical Steel % = 0.0020

One-Story Wall Dimensions

A Clear Height = 14.670 ft
B Parapet height = 1.670 ft
Wall Support Condition Top & Bottom Pinned

Vertical Loads

Vertical Uniform Loads . . . *(Applied per foot of Strip Width,)*

			DL : Dead	Lr : Roof Live	Lf : Floor Live	S : Snow	W : Wind
Ledger Load	Eccentricity	3.813 in	0.8660	0.3050		0.4420	k/ft
Concentric Load							k/ft

Lateral Loads

Wind Loads :
Full area WIND load psf

Seismic Loads :
Wall Weight Seismic Load Input Method : Direct entry of Lateral Wall Weight
Seismic Wall Lateral Load 34 psf

Fp 1.0 = 34.0 psf

Peterson Structural Engineers, Inc.
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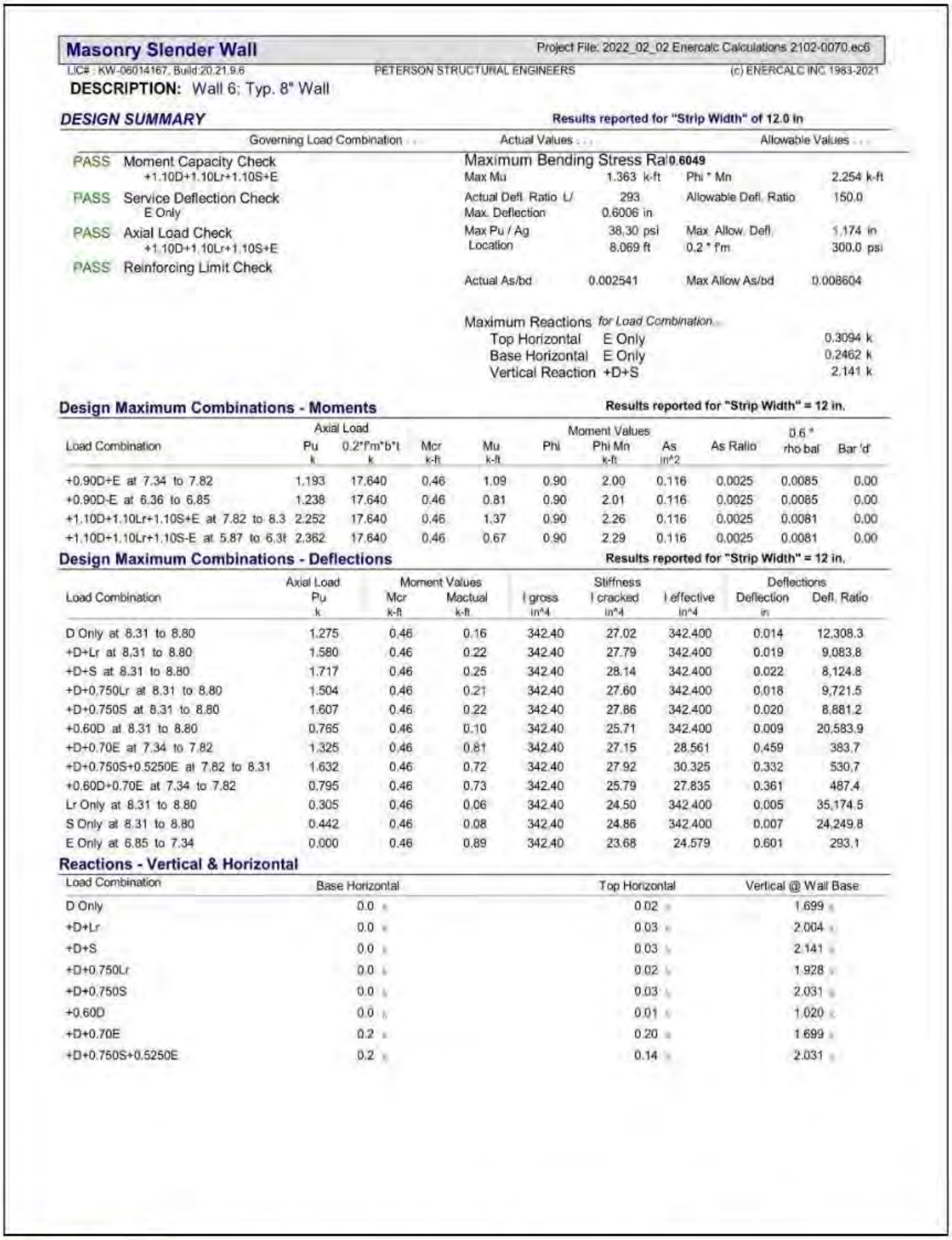
designer	NRW	sheet	168 of 170



Masonry Slender Wall

Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 6; Typ. 8" Wall

DESIGN SUMMARY

Results reported for "Strip Width" of 12.0 in

	Governing Load Combination . . .	Actual Values . . .		Allowable Values . . .	
PASS	Moment Capacity Check +1.10D+1.10Lr+1.10S+E	Maximum Bending Stress Rai	0.6049		
		Max Mu	1.363 k-ft	Phi * Mn	2.254 k-ft
PASS	Service Deflection Check E Only	Actual Defl. Ratio L/	293	Allowable Defl. Ratio	150.0
		Max. Deflection	0.6006 in		
PASS	Axial Load Check +1.10D+1.10Lr+1.10S+E	Max Pu / Ag	38.30 psi	Max. Allow. Defl.	1.174 in
		Location	8.069 ft	0.2 * f'm	300.0 psi
PASS	Reinforcing Limit Check				
		Actual As/bd	0.002541	Max Allow As/bd	0.008604

Maximum Reactions *for Load Combination...*

Top Horizontal	E Only	0.3094 k
Base Horizontal	E Only	0.2462 k
Vertical Reaction	+D+S	2.141 k

Design Maximum Combinations - Moments

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	0.2*f'm*b*t k	Mcr k-ft	Moment Values Mu k-ft	Phi	Phi Mn k-ft	As in^2	As Ratio	0.6 * rho bal	Bar 'd'
+0.90D+E at 7.34 to 7.82	1.193	17.640	0.46	1.09	0.90	2.00	0.116	0.0025	0.0085	0.00
+0.90D-E at 6.36 to 6.85	1.238	17.640	0.46	0.81	0.90	2.01	0.116	0.0025	0.0085	0.00
+1.10D+1.10Lr+1.10S+E at 7.82 to 8.3	2.252	17.640	0.46	1.37	0.90	2.26	0.116	0.0025	0.0081	0.00
+1.10D+1.10Lr+1.10S-E at 5.87 to 6.3t	2.362	17.640	0.46	0.67	0.90	2.29	0.116	0.0025	0.0081	0.00

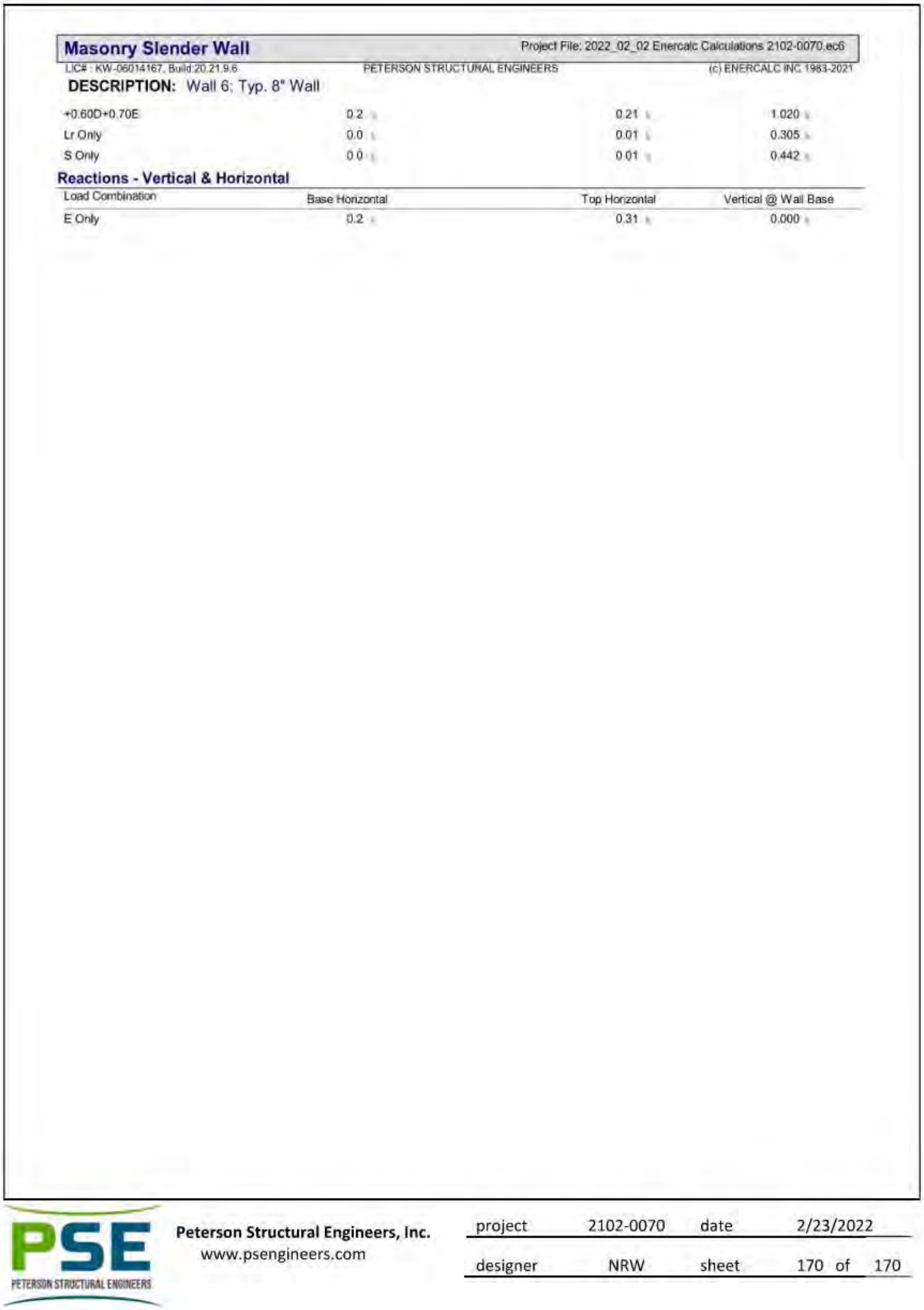
Design Maximum Combinations - Deflections

Results reported for "Strip Width" = 12 in.

Load Combination	Axial Load Pu k	Moment Values Mcr k-ft	Mactual k-ft	Stiffness I gross in^4	I cracked in^4	I effective in^4	Deflections Deflection in	Defl. Ratio
D Only at 8.31 to 8.80	1.275	0.46	0.16	342.40	27.02	342.400	0.014	12,308.3
+D+Lr at 8.31 to 8.80	1.580	0.46	0.22	342.40	27.79	342.400	0.019	9,083.8
+D+S at 8.31 to 8.80	1.717	0.46	0.25	342.40	28.14	342.400	0.022	8,124.8
+D+0.750Lr at 8.31 to 8.80	1.504	0.46	0.21	342.40	27.60	342.400	0.018	9,721.5
+D+0.750S at 8.31 to 8.80	1.607	0.46	0.22	342.40	27.86	342.400	0.020	8,881.2
+0.60D at 8.31 to 8.80	0.765	0.46	0.10	342.40	25.71	342.400	0.009	20,583.9
+D+0.70E at 7.34 to 7.82	1.325	0.46	0.81	342.40	27.15	28.561	0.459	383.7
+D+0.750S+0.5250E at 7.82 to 8.31	1.632	0.46	0.72	342.40	27.92	30.325	0.332	530.7
+0.60D+0.70E at 7.34 to 7.82	0.795	0.46	0.73	342.40	25.79	27.835	0.361	487.4
Lr Only at 8.31 to 8.80	0.305	0.46	0.06	342.40	24.50	342.400	0.005	35,174.5
S Only at 8.31 to 8.80	0.442	0.46	0.08	342.40	24.86	342.400	0.007	24,249.8
E Only at 6.85 to 7.34	0.000	0.46	0.89	342.40	23.68	24.579	0.601	293.1

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
D Only	0.0 k	0.02 k	1.699 k
+D+Lr	0.0 k	0.03 k	2.004 k
+D+S	0.0 k	0.03 k	2.141 k
+D+0.750Lr	0.0 k	0.02 k	1.928 k
+D+0.750S	0.0 k	0.03 k	2.031 k
+0.60D	0.0 k	0.01 k	1.020 k
+D+0.70E	0.2 k	0.20 k	1.699 k
+D+0.750S+0.5250E	0.2 k	0.14 k	2.031 k



Masonry Slender Wall

Project File: 2022_02_02 Enercalc Calculations 2102-0070.ec6

LIC# : KW-06014167, Build:20.21.9.6 PETERSON STRUCTURAL ENGINEERS (c) ENERCALC INC 1983-2021

DESCRIPTION: Wall 6; Typ. 8" Wall

+0.60D+0.70E	0.2 k	0.21 k	1.020 k
Lr Only	0.0 k	0.01 k	0.305 k
S Only	0.0 k	0.01 k	0.442 k

Reactions - Vertical & Horizontal

Load Combination	Base Horizontal	Top Horizontal	Vertical @ Wall Base
E Only	0.2 k	0.31 k	0.000 k

Peterson Structural Engineers, Inc.
www.psengineers.com

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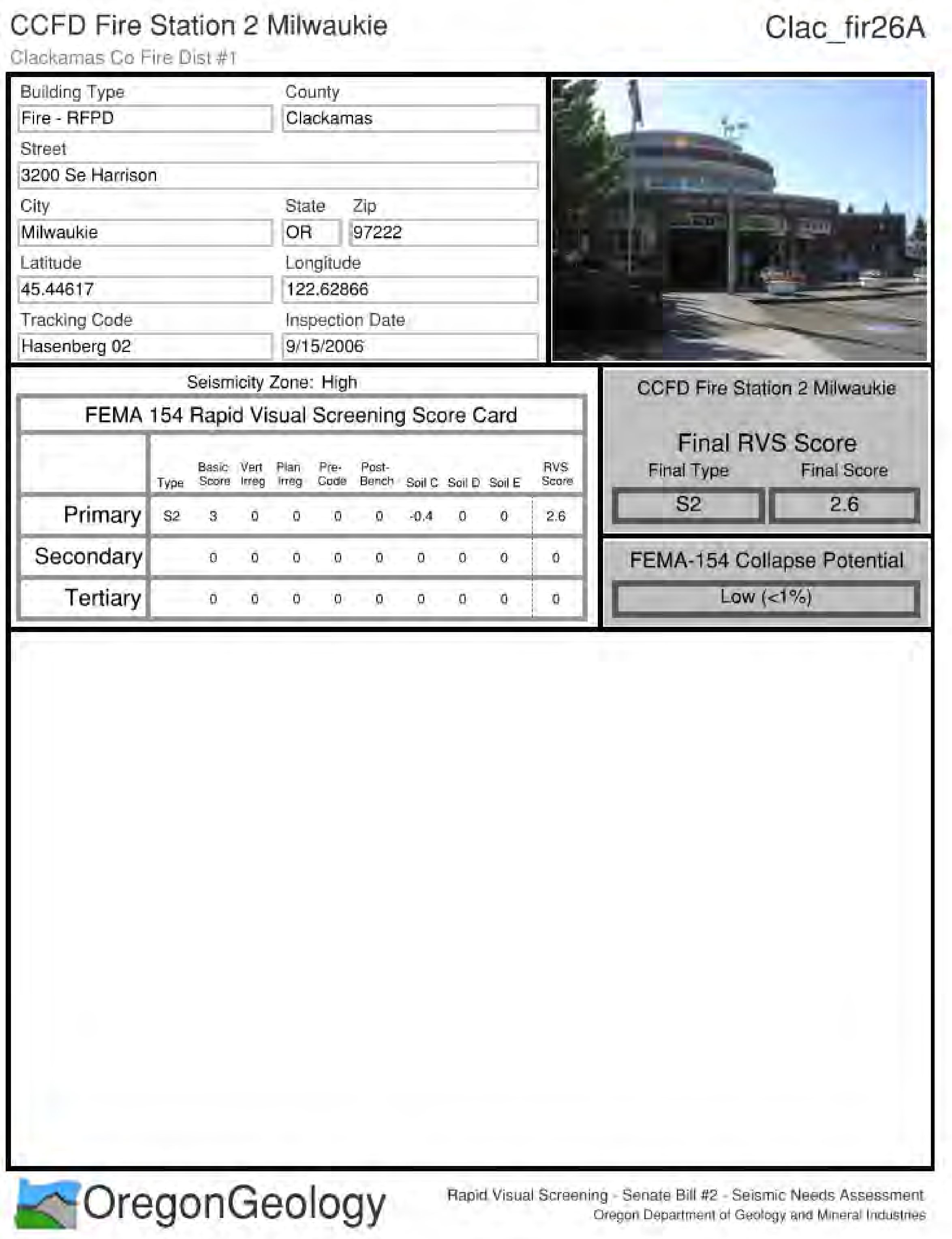
designer	NRW	sheet	170 of 170

10.7 Appendix G: DOGAMI Report

Note that the building type, vertical irregularities, and plan irregularities in the DOGAMI RVS report were incorrect. As such, PSE updated the RVS Score and Collapse potential per FEMA 154 Edition 2 to be included in the SRGP application. See the following pages for the DOGAMI RVS report and PSE's updated RVS values.



CCFD Fire Station 2 Milwaukie
Clackamas Co Fire Dist #1

Clac_fir26A

Building Type
Fire - RFPD

County
Clackamas

Street
3200 Se Harrison

City
Milwaukie

State
OR

Zip
97222

Latitude
45.44617

Longitude
122.62866

Tracking Code
Hasenberg 02

Inspection Date
9/15/2006

Seismicity Zone: High

FEMA 154 Rapid Visual Screening Score Card

	Type	Basic Score	Vert Irreg	Plan Irreg	Pre-Code	Post-Bench	Soil C	Soil D	Soil E	RVS Score
Primary	S2	3	0	0	0	0	-0.4	0	0	2.6
Secondary		0	0	0	0	0	0	0	0	0
Tertiary		0	0	0	0	0	0	0	0	0

CCFD Fire Station 2 Milwaukie

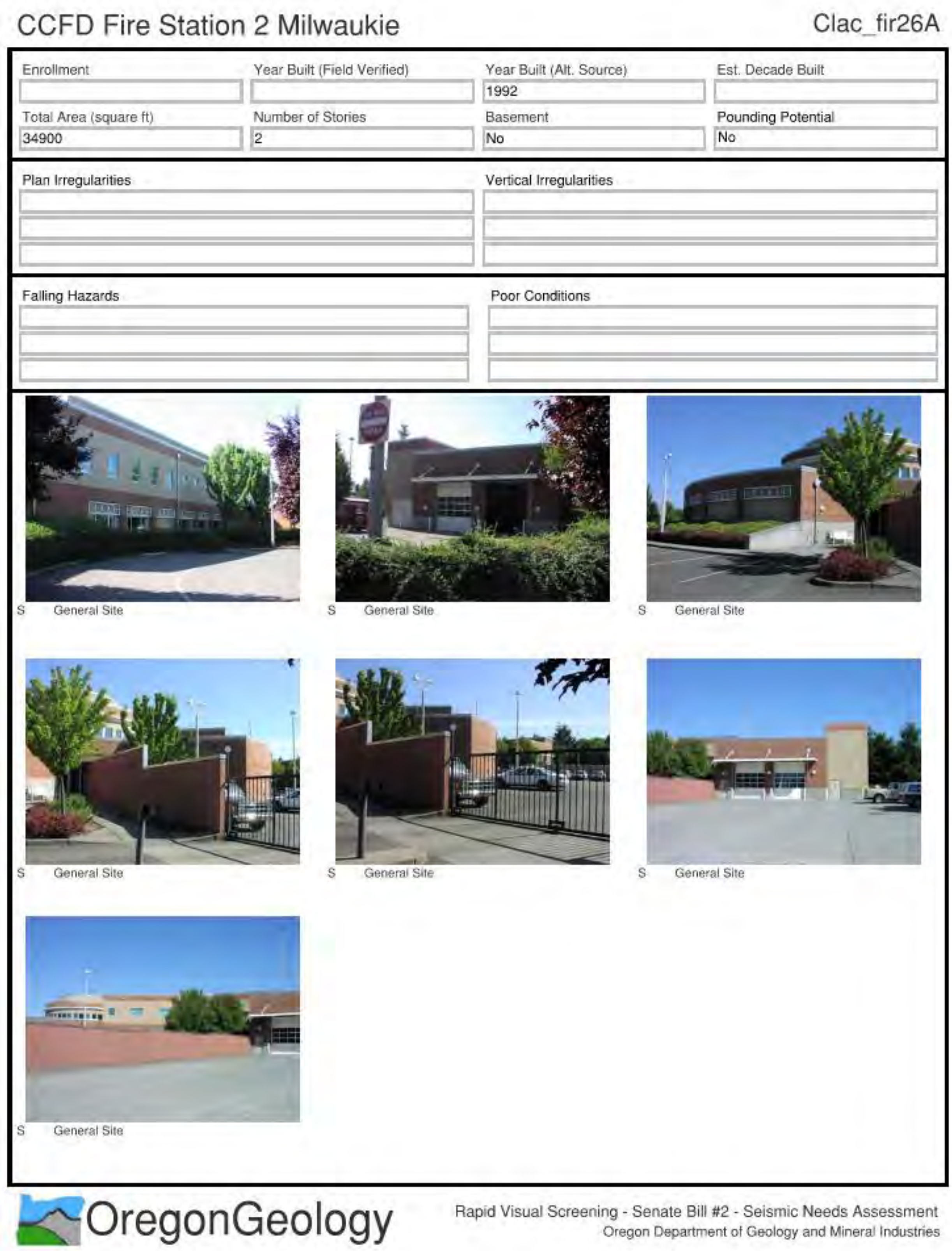
Final RVS Score

Final Type	Final Score
S2	2.6

FEMA-154 Collapse Potential
Low (<1%)

OregonGeology

Rapid Visual Screening - Senate Bill #2 - Seismic Needs Assessment
Oregon Department of Geology and Mineral Industries



CCFD Fire Station 2 Milwaukie

Clac_fir26A

Enrollment	Year Built (Field Verified)	Year Built (Alt. Source)	Est. Decade Built
		1992	
Total Area (square ft)	Number of Stories	Basement	Pounding Potential
34900	2	No	No

Plan Irregularities	Vertical Irregularities

Falling Hazards	Poor Conditions

S General Site

S General Site

S General Site

S General Site

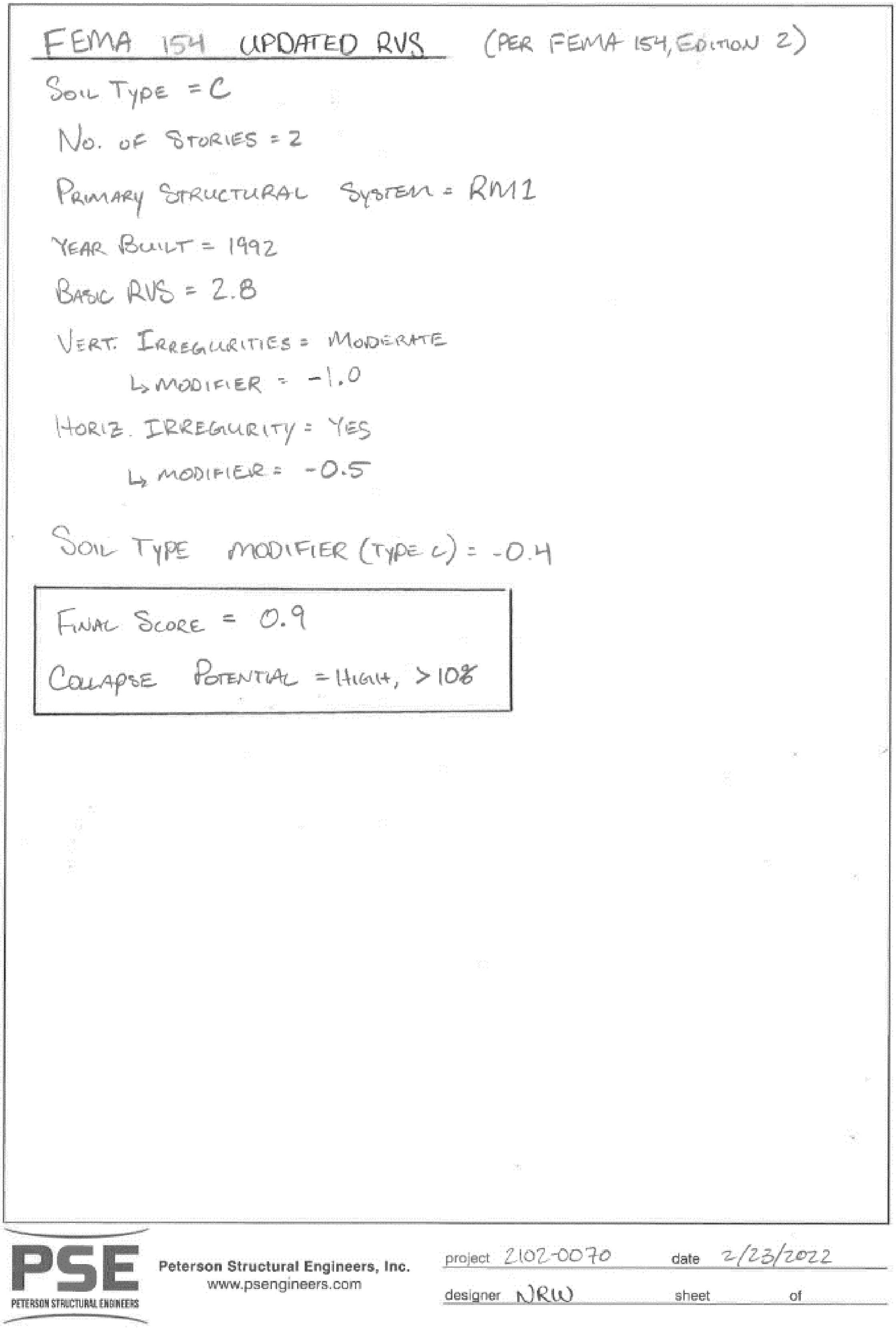
S General Site

S General Site

S General Site

OregonGeology

Rapid Visual Screening - Senate Bill #2 - Seismic Needs Assessment
Oregon Department of Geology and Mineral Industries



FEMA 154 UPDATED RVS (PER FEMA 154, EDITION 2)

SOIL TYPE = C

NO. OF STORIES = 2

PRIMARY STRUCTURAL SYSTEM = RM1

YEAR BUILT = 1992

BASIC RVS = 2.8

VERT. IRREGULARITIES = MODERATE
↳ MODIFIER = -1.0

HORIZ. IRREGULARITY = YES
↳ MODIFIER = -0.5

SOIL TYPE MODIFIER (TYPE C) = -0.4

FINAL SCORE = 0.9

COLLAPSE POTENTIAL = HIGH, >10%

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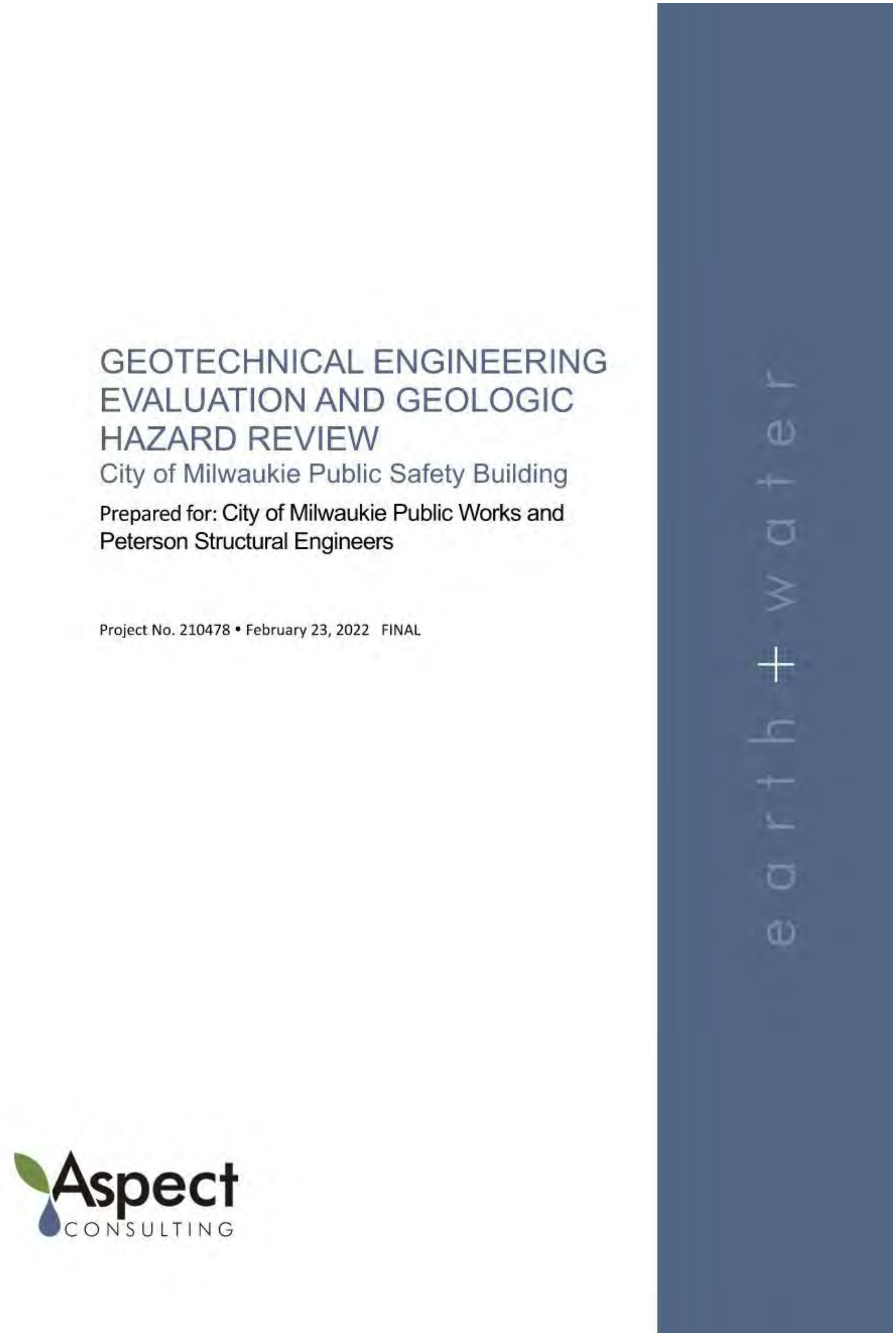
project 2102-0070 date 2/23/2022
designer NRW sheet of

10.8 Appendix H: Geotech Report



GEOTECHNICAL ENGINEERING EVALUATION AND GEOLOGIC HAZARD REVIEW

City of Milwaukie Public Safety Building

Prepared for: City of Milwaukie Public Works and Peterson Structural Engineers

Project No. 210478 • February 23, 2022 FINAL

earth + water

Aspect
CONSULTING

GEOTECHNICAL ENGINEERING EVALUATION AND GEOLOGIC HAZARD REVIEW

City of Milwaukie Public Safety Building

Prepared for: City of Milwaukie Public Works and
Peterson Structural Engineers

Project No. 210478 • February 23, 2022 FINAL

Aspect Consulting, LLC

79209PE
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V:\210478 Milwaukie Public Safety Bldg Seismic Retrofit\Deliverables\Geotech Report\Final\Milwaukie Public Safety Building_Geotech Eng Report_2.23.22_Final.docx

earth + water
Aspect Consulting, LLC 319 SW Washington ST Suite 510 Portland, OR 97204 971.865.5080 www.aspectconsulting.com

Contents

List of Tables *(in text)*

List of Figures

List of Appendices

1 Introduction

This report presents the results of a geotechnical engineering evaluation and geologic hazard review conducted by Aspect Consulting, LLC (Aspect) in support of an existing building seismic evaluation for the City of Milwaukie's (City) public safety building (Project) located at 3200 SE Harrison Street, Milwaukie, Oregon (Site; Figure 1).

Our evaluation was completed in accordance with our agreed-upon scope of work as authorized by the City of Milwaukie Public Works under Contract No. C2022-006.

1.1 Project Understanding

The Project includes an existing building seismic evaluation of the City's public safety building in accordance with American Society of Civil Engineers (ASCE) Standard 41-17, *Seismic Evaluation and Retrofit of Existing Buildings* (ASCE, 2017). A Tier 1 initial screening has been completed by Peterson Structural Engineers and this phase of the seismic evaluation will include a Tier 2 deficiency-based evaluation. As part of a Tier 2 evaluation, the subsurface conditions at the Site and known or suspected geologic Site hazards must be understood as they relate to foundation performance.

Seismic events to be considered include the BSE-1E and BSE-2E events, which correspond to a 20 percent probability of exceedance in 50 years and a 5 percent probability of exceedance in 50 years, respectively.

The public safety building houses the City's Police Department and the Clackamas Fire District No. 1's Station 2 and consists of a two-story structure built in the early 1990s supported on shallow foundations with reinforced concrete masonry unit (CMU) shear walls and steel framing. We assume the building falls under Risk Category IV, essential facility, as defined in ASCE Standard 7-16 (ASCE, 2016).

2 Site Reconnaissance and Conditions

On October 20, 2021, we performed a walking reconnaissance to observe the current surface conditions at and near the Site. The reconnaissance was performed by walking the Site and surrounding area, traversing the neighborhood and noting visible features, such as slope inclination, pavement deteriorations, curb offsets, bowing or warping of rooflines and building walls, vertical cracking of retaining walls, en-echelon cracks, and other potential indicators of surficial damages that could be related to fault surface rupture along the assumed trace of the Portland Hills fault. Select photographs are provided below along with a summary our key observations.

Photographs 1 and 2. East side (left) and south side (right) exterior of existing public safety building.

Photographs 1 and 2 show the east side exterior of the existing Public Safety Building. The concealed trace of the Portland Hills fault is mapped approximately 60 feet east (right side of the pictures). No distinct features were noted in the building's façade indicative of shearing or displacement from lateral or vertical fault offset.

Photographs 3 and 4. SE 34th Ave (left) and modular building (right) on east side of Public Safety Building property line.

Photographs 3 and 4 are of the roadway along SE 34th Avenue and of the modular building in the Public Safety Building's parking lot. The approximate location of the mapped concealed trace of the Portland Hills fault (PHF) is shown on the pictures. Although the pavement is deteriorated on SE 34th Avenue, no distinct features were noted in the pavement, curbs, or structures that could be reasonably attributable to shearing or displacement from lateral or vertical fault offset.

Photographs 5 and 6 show the curbs and sidewalks along SE 32nd Avenue and along SE Monroe Street. The approximate location of the mapped concealed trace of the Portland Hills fault is shown on the pictures. Although the concrete has cracks and minor vertical offsets, no distinct features were noted in the pavement, curbs, or structures that could be reasonably attributable to shearing or displacement from lateral or vertical fault offset.

Photographs 5 and 6. Sidewalk along SE 32nd Ave (left) and sidewalk along SE Monroe St (right)

As a result of our Site reconnaissance, we did not observe any evidence of surface fault rupture or other expression of the Portland Hills fault mapped at/near the Site. Section 4 describes Aspect's subsurface explorations at the Site (Figure 2 shows Site exploration locations.)

2.1 Existing Data Review

We reviewed several available documents, reports, and online information sources during our research of the Site. The data review has been limited to information in the immediate vicinity of the Site, and excludes any specific historical uses. Sources included:

- Published geology maps (Beeson and Tolan., 1989; Gannett and Caldwell,1998; Burns et al., 1997) available through the Oregon Department of Geology and Mineral Industries (DOGAMI) and online geology sources
- DOGAMI Oregon HazVu: Statewide Geohazards Viewer (DOGAMI, 2021; accessed October 13, 2021)
- Clackamas County CMap online GIS portal (Clackamas County, 2017; accessed October 13, 2021)

- Oregon Water Resources Department (OWRD), well log query online portal (OWRD, 2021) for the Site
- Relevant reports in our files

2.2 Geologic Setting

The Site is within the Portland Basin, which is part of the Willamette Valley physiographic province—a narrow north to north-east trending valley approximately 20 to 30 miles wide and 130 miles long. Four basins comprise the province; from north to south, these include: the Portland Basin, Tualatin Basin, Central Willamette Valley, and the Southern Willamette Valley. The northwesterly trending Tualatin Mountains and the Chehalem Mountains separate the Tualatin Basin from the Portland Basin and the Central Willamette Valley, respectively.

Basins within the Willamette Valley and the tributary valleys are filled with over 1,600 feet of unconsolidated alluvial deposits derived from the surrounding uplands and the Columbia River Basin (Gannett and Caldwell, 1998; O'Connor et al., 2001). These deposits rest unconformably on a basement complex comprised principally of the Columbia River Basalt Group. Fine-grained Miocene and Pliocene fluvial-lacustrine deposits occur near the bottom of the basin-fill deposits. Coarse-grained fluvial deposits derived from the Cascade Range and the Missoula Floods generally comprise the upper 300 feet of the basin fill deposits.

The Missoula Floods had significant impacts on the geomorphology and depositional history of the Willamette Valley. Widespread inundation of the valley occurred during these large-volume glacial outburst floods that originated in eastern Montana approximately 12,000 to 15,000 years ago. Up to 250 feet of silt, sand, and gravel were deposited in the Portland Basin, and up to 130 feet of silt, known as the Willamette Silt, were deposited elsewhere in the valley (Woodward et al., 1998).

The Site geology is mapped as Pleistocene channel facies (Qfch) deposits (Beeson and Tolan, 1989). The younger Qfch unit consists of interlayered silts, sands, and gravels deposited on major floodways that are cut into older Pleistocene fine-grained facies (Qff) deposits. The irregular post-flood surfaces of Qfch deposits have been locally filled with bog and pond sediments. The Qff unit consists of course sand and silt deposited by catastrophic floods. The Site near-surface conditions would also have been modified during more recent redevelopments by excavation, filling, and construction that buildings and other structures were founded on.

The bedrock and sediment thickness map (Burns et al., 1997) estimates the unconsolidated sediment thickness underlying the Site by these two units is between 300 and 600 feet.

2.3 Seismic Setting

Several fault zones are located within 50 miles of the Project Site, and the Cascadia Subduction Zone (CSZ) is located approximately 80 miles from the Site off the Oregon Coast. There are several types of seismic sources in the Pacific Northwest, which are discussed in detail below. Volcanic sources beneath the Cascade Range are not considered further in this study; since they rarely exceed about magnitude (M) 5.0 and, thus, are not considered to pose a significant ground-shaking hazard to the Project Site.

Information on the historical record of Oregon earthquakes dates back to approximately 1841. Prior to 1900, approximately 30 earthquakes were documented. Since 1900, several hundred earthquakes have been documented in the state, and especially since the 1980s when the University of Washington established a recording station in northwest Oregon. Catalogues of earthquake events are available from Berg and Baker (1963); Johnson, et al. (1994); and Wong, et al. (2000a). Oregon as a region has a relatively low to medium record of historical seismicity. Clusters of earthquakes are recorded in the Klamath Falls region (M 6.0), northeast Oregon (M 5.0 Umatilla and M 6.5 Milton Freewater), Portland-Vancouver (1962; M 5.2) and the Portland Northern Willamette Valley (local magnitude (ML) 5.6 Mount Angel).

Research completed over the last 12 years by DOGAMI and Oregon State University (Goldfinger et al, 2012) has uncovered evidence of historic earthquakes along the Oregon coast extending back on the order of 10,000 years. The research indicates over 40 events have occurred with as many as 19 of M 9.0 or greater. Based on the current understanding of the potential associated with the CSZ and local faults, the relative regional seismicity would be considered high.

2.3.1 Crustal Earthquakes and Faults

There are at least 55 faults or fault zones in northwest Oregon and southwest Washington (within 125 miles of Portland). However, recorded seismicity generated by crustal sources in the Site vicinity is relatively limited, with only a few recorded earthquakes exceeding ML 5 in the Portland region. Studies (Yelin & Patton, 1991) of small earthquakes in the region indicate most crustal earthquake activity is occurring at depths of 5 to 15 miles. Due to their proximity, the crustal faults are possibly the more significant seismic sources for strong ground motion in the Portland metropolitan area, with the three nearest faults being the Portland Hills fault, the East Bank fault, and the Oatfield fault.

Portland Hills Fault

The nearest fault is the northwest-trending Portland Hills fault, which traces through the east side of the Site (Madlin, 1990; Geomatrix, 1995). The fault is mapped along the northeastern margin of the Tualatin Mountains (Portland Hills) and the southwestern margin of the Portland basin. The crest of the Portland Hills is defined by the northwest-striking Portland Hills anticline. Displacement on the Portland Hills fault is poorly known and controversial. No fault scarps on surficial Quaternary deposits have been described along the fault, but some geomorphic and geophysical evidence suggest Quaternary displacement and the fault is characterized as potentially active (Personius, 2002).

East Bank Fault

The northwest-trending East Bank fault is mapped approximately 3.5 miles northeast of Site. The fault generally runs parallel to the Portland Hills fault and forms the southwestern margin of the Portland basin. No fault scarps on surficial Quaternary deposits have been described along the fault, and the fault is mapped by interpretation as buried by the latest Pleistocene Missoula flood deposits (Personius, 2002).

Oatfield Fault

The northwest-trending Oatfield fault is mapped approximately 1.75 miles southwest of the Site and forms northeast-facing escarpments in volcanic rocks of the Miocene Columbia River Basalt Group in the Tualatin Mountains and northern Willamette Valley. No fault scarps on surficial deposits have been described, but exposures in a light-rail tunnel showing offset of Boring Lava across the fault indicate Quaternary displacement (Personius, 2002).

2.3.2 Cascadia Subduction Zone

Interface Earthquakes

The CSZ megathrust represents the boundary between the subducting Juan de Fuca tectonic plate and the overriding North American tectonic plate. Recurrence intervals for subduction zone earthquakes are based on studies of the geologic record. Based on these studies, recurrence interval estimates have been generated ranging from about 300 to 600 years. Geologic evidence suggests the most recent earthquake occurred in January 1700. The 1700 earthquake probably ruptured much of the approximate 620 mile length of the CSZ, and was estimated at moment magnitudes (Mw) 9.0. The horizontal distance from the edge of the CSZ megathrust, located offshore, is approximately 80 miles from Milwaukie (Wong et al., 2000a). The current U.S. Geological Survey (USGS,2008) risk-based maximum credible earthquake for CSZ megathrust is Mw 9.2.

Intraslab Earthquakes

A number of researchers have noted the complete absence of intraslab seismicity in Western Oregon (Ludwin et al., 1991; Rogers et al., 1996). With the possible exception of the 1873 Richter Magnitude 6.75 Crescent City Earthquake, no moderate to large intraslab earthquakes have occurred in the CSZ from south of Puget Sound to Cape Mendocino. These earthquakes are assumed to have a deep focus of 25 to 45 miles in the subducted Juan de Fuca Plate, and theoretical magnitudes of up to M 7.8. These earthquakes are expected to have epicenters for 30 to 60 miles from the Site.

3 Geologic and Seismic Hazards

Geologic and seismic hazards are defined as those conditions associated with the geologic and seismic environment that could influence existing and/or proposed improvements. In general, the geologic and seismic hazards most commonly associated with the physical and chemical characteristics of near surface soil, rock, and groundwater include the hazards described below.

Those shown in **bold** are the geologic and seismic hazards that could affect the Site and should be considered during the planning process. Maps of the relevant geologic and seismic hazards are included in Figures 3 and 4, respectively.

Geologic Hazards

- Slope stability
- Subsurface voids
- Volcanic hazards
- **Adverse soils**
- **Hydrology and drainage**
- Land subsidence
- **Hydrogeology and groundwater**
- **Hazardous minerals and gases**
- Erosion and sedimentation

Seismic Hazards

- **Liquefaction**
- **Ground shaking**
- Seiches
- Lateral spreading
- Tsunamis
- **Fault ground rupture**
- Earthquake-induced landslides

Specific hazards identified above in **bold** are presented in Table 1 below. The "Level of Concern" is a qualitative assessment based on our engineering geology and geotechnical engineering judgment. Where noted with footnotes, the terminology is taken from a specific source (e.g., HazVu Program).

Table 1. Summary of Geologic and Seismic Hazards Potentially Affecting the Site

Geologic and Seismic Hazard	Examples	Level of Concern
Adverse Soils	Artificial Fill	Low to Moderate, Site was graded and filled as part of past development
	Expansive Soil, Compressible Soil, Organic-Rich Soil, Sensitive Clay	None to Low
Hydrology and Drainage	Flooding[a]	Not in FEMA 100-year flood plain
	Seiches or Standing Water	None to Low
Hydrogeology and Groundwater	Shallow or artesian groundwater	Low
	Seepage	None to Low
	Permeability or percolation	Moderate
Hazardous minerals and gases	Radon[a]	Moderate
	Naturally occurring asbestos (NOA)	None
Seismic Hazards	Cascadia Earthquake Shaking[a]	Very Strong
	Local Source Earthquake Shaking[a]	Very Strong
	Local Fault Rupture[a]	Portland Hills fault traces across Site
	Liquefaction[a]	High

Notes: [a] - HazVu website: http://www.oregongeology.org/hazvu/

3.1 Artificial Fill and Radon Gas

The primary geologic hazard that may require further evaluation during engineering design is related to the artificial fill or radon gas mitigation. However, we do not currently consider these conditions to cause geotechnical issues related to seismic retrofit of the existing building at the Site.

3.2 Seismic Hazards

The primary seismic hazards that could impact the Site are ground shaking from a Cascadia or local fault earthquake (“very strong”), potential for fault ground rupture from the Portland Hills fault zone, and liquefaction.

3.2.1 Cascadia Subduction Zone

The CSZ, a major zone of plate convergence located offshore, is located approximately 80 miles west of the Site and is the primary seismogenic ground shaking source. The CSZ extends from offshore northern California to southern British Columbia and may have generated at least seven great earthquakes (those of magnitude M8 or greater) in the last 3,500 years, suggesting a recurrence interval of approximately 300 to 600 years. Detailed tsunami records from Japan indicated the last significant CSZ earthquake occurred on January 26, 1700. Atwater and others (2005) estimated the earthquake had a magnitude of between M8.7 and 9.2.

3.2.2 *Portland Hills Fault*

The Portland Hills fault trace is mapped along the northeastern side of the Site. Displacement on the Portland Hills fault is poorly known and controversial. No fault scarps on surficial Quaternary deposits have been described along the fault, but some geomorphic and geophysical evidence suggest Quaternary displacement (Personius, 2002). Three available sources, including DOGAMI's Hazvu, the geology map (Beeson and Tolan, 1989), and the USGS faults and folds database (Personius, 2002), show the concealed fault trace in a similar location, along the eastern property boundary, and not passing below the existing Public Safety Building at the Site (Figure 3).

The maximum earthquake that the Portland Hills fault appears to be able to generate is in the range of M_W 6.8–7.2 (Geomatrix, 1995). Based on the Earthquake Scenario Ground Shaking Map for a M 6.8 event (Wong et al., 2000b), the Site could experience a Peak Horizontal Acceleration between 0.7 and 0.9g (where g is the acceleration of gravity) at an IX Modified Mercalli Intensity, which would result in *"violent shaking and considerable damage in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse."*

Unlike California and its Alquist-Priolo earthquake fault zones, due primarily to the ever-evolving understanding of the local and state seismicity and in most cases lack of recent evidence of faulting, Oregon does not specify requirements for developments and faults. The Portland Hills fault sense of movement is also inconclusive, with the current consensus being that it is a northeast-dipping reverse fault with an oblique right-lateral strike-slip component. With an estimated range in slip rates of 0.05–0.4 mm/year (Wong and et al., 2000b) and the mapped distance from the fault trace, direct damage to the structure related to ongoing or earthquake-generated surface fault rupture are unlikely to affect the Public Safety Building during its lifetime.

3.2.3 *Liquefaction*

Subsurface conditions indicate liquefaction may be a potential hazard at the Site. Accordingly, additional analyses are presented in Section 5.2. Liquefaction is a phenomenon in which shaking of a saturated soil causes its material properties to change so that it behaves as a liquid. Soils that liquefy tend to be young, loose, granular soils that are saturated with water. Unsaturated soils will not liquefy, but they may settle during a seismic event. Typical displacements could be on the order of several inches. Thus, if the soil at a site liquefies, the damage resulting from an earthquake can be dramatically increased over what shaking alone might have caused. The liquefaction hazard analysis is based on the age and grain size of the geologic unit, the thickness of the unit, and the relative density and the propagating shear-wave velocity.

4 Subsurface Conditions

Our understanding of the subsurface conditions at the Site were developed through our review of the available geologic mapping, nearby subsurface exploration data, two soil borings advanced at the Site, and our local geologic experience.

4.1 Field Explorations

We explored the subsurface conditions at the Site by advancing two drilled soil borings, designated AB-01 and AB-02 on January 17 and 18, 2022, in the locations shown on Figure 2. Boring AB-01 was advanced to a depth of 46.5 feet bgs and boring AB-02 was advanced to a depth of 51.3 feet bgs. The borings were logged (with representative samples collected) by a member of the Aspect geotechnical engineering staff.

Detailed exploration methods and exploration logs summarizing the subsurface conditions encountered are presented in Appendix A. The terminology used in the soil classifications and other modifiers are defined and presented on the attached Exploration Log Key included in Appendix A.

4.2 Laboratory Testing

Laboratory tests were conducted on selected soil samples to characterize certain engineering (physical) properties of the soils at the Site. Geotechnical laboratory testing included determination of moisture content, fines content, and grain-size distribution. The laboratory tests were conducted in general accordance with appropriate ASTM test methods. Test procedures are discussed in more detail, along with results, in Appendix B.

4.3 Stratigraphy

Based on our explorations completed at the Site, we encountered two primary soil types underlying surface layers of hot mix asphalt (HMA) and crushed rock base course, as described below.

4.3.1 Fill

We encountered fill from just beneath the pavement base course to a depth of 4.5 feet bgs. The fill typically consisted of loose, very moist, brown, sandy silt with gravel (ML)[1], sandy silt (ML) to medium stiff, very moist, brown silt (ML) with low to medium plasticity.

Standard Penetration Test (SPT) blow counts[2] in the fill ranged from 6 to 7 blows per foot (bpf) indicating the fill was typically loose or medium stiff.

Based on our observations, sampling, and testing of the fill, it exhibits moderate shear strength, low permeability, and low to moderate compressibility characteristics.

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[1] Soils are classified per the Unified Soil Classification System (USCS) in general accordance with the ASTM International (ASTM) Method D2488 *Standard Practice of Description and Identification of Soils*.

[2] SPT blow count refers to standard penetration test (SPT) N-values, in accordance with ASTM D1586.

4.3.2 Pleistocene Channel Facies (Qfch)

Underlying the fill, we encountered relatively coarse-grained Pleistocene channel facies (Qfch) to the maximum depth explored by the borings, 51.3 feet bgs. The Qfch consisted of a combination of gravel and sand ranging from:

- Medium dense to dense, moist, brown silty sand (SM)
- Medium dense to dense, moist, dark brown, sand with gravel (SP)
- Dense, moist, brown with orange mottling, gravel with silt and sand (GP-GM)
- Very dense, moist, brown, gravel with sand (GP)

The SPT blow counts in the Qfch ranged from 14 to greater than 100 bpf, with an average value of 53 bpf.

Based on our observations, sampling, and testing of the Qfch, it exhibits high shear strength, moderate to high permeability, and low compressibility characteristics

4.4 Groundwater

Due to drilling using mud rotary methods, we were not able to directly measure the groundwater levels during drilling of AB-01 and AB-02. However, based on our review of the nearby geotechnical explorations, well logs, and resource protection logs, we anticipate groundwater is present approximately 10 feet bgs underlying the Site. Seven soil borings and eleven test pits were advanced approximately 500 to 1,000 feet southeast of the Site and recorded groundwater levels correlating to about 10 feet below the ground surface at the Site (Appendix C).

Groundwater is expected to vary as a function of location, season, and other factors. The depth to static groundwater is not expected to have significant impacts on the proposed redevelopment of the Site.

5 Geotechnical Engineering Conclusions and Recommendations

Based on our explorations, testing, and geotechnical engineering analyses, the following is a summary of the primary geotechnical engineering considerations related to the Tier 2 deficiency-based evaluation:

- The primary geologic hazards relevant to the Site and building are seismic hazards and include strong ground shaking, the potential for liquefaction, and surface fault ground rupture.
- Based on our reconnaissance and data review, the risk of direct damage to the Public Safety Building structure related to ongoing or earthquake-generated surface fault rupture on the Portland Hills fault is low.
- Based on the results of our explorations and characterization of the Site subsurface conditions, the Site soil profile can be classified as a Site Class C and the recommended response spectra for the BSE-2E and BSE-1E seismic hazard levels are included in Appendix D.
- Based on the results of our liquefaction analyses detailed in Appendix E, the relatively dense and coarse-grained Pleistocene channel facies that underly the Site are generally not liquefiable for the BSE-2E and BSE-1E seismic hazard levels.
- The existing building foundations and any future retrofit foundations can rely on relatively standard, shallow footing design criteria.

Details of our geotechnical engineering analyses, conclusions, and recommendations are provided in the subsequent sections.

5.1 Seismic Horizontal Response Spectra

The Tier 2 deficiency-based evaluation will consider ground motions for the BSE-2E and BSE-1E seismic hazard levels in accordance with (ASCE) Standard 41-17, *Seismic Evaluation and Retrofit of Existing Buildings* (ASCE, 2017). A summary of the BSE-2E and BSE-1E seismic hazard level parameters at the Site is included in Table 2.

Table 2. BSE-2E and BSE-1E Seismic Hazard Level Parameters

Hazard Level	Seismic Event Return Period (years)	Peak Ground Acceleration (g)	Earthquake Magnitude
BSE-2E	975	0.31	9.01
BSE-1E	225	0.12	6.10

Notes:
1) Based on the latitude and longitude of the Site: 45.446158°N, -122.6286449°W
2) Values taken from the ATC Hazard Tool (ATC, 2022)

The effects of Site-specific subsurface conditions on the seismic horizontal response spectra at the ground surface are determined based on the "Site Class." The Site Class can be correlated to the average standard penetration resistance (N-value), average shear wave velocity, or average undrained strength (for fine-grained soils) in the upper 100 feet of the soil profile. Based on the average N-value from our explorations, we conclude the Site soil profile can be classified as Site Class C (Very Dense Soil).

We computed the horizontal response spectra for the BSE-2E and BSE-1E seismic hazard levels in accordance with Section 2.4.1.7 of ASCE 41-17 and they are presented graphically in Appendix D. Per Section 3403.3 of the Oregon Structural Specialty Code (OSSC, 2021), the spectral accelerations for the BSE-2E and BSE-1E seismic hazard levels shall be no less than 75 percent of the BSE-2N and BSE-1N accelerations.

5.2 Liquefaction Analyses

Liquefaction occurs when loose, saturated, and relatively cohesionless soil deposits temporarily lose strength from seismic shaking. The primary factors controlling the onset of liquefaction include intensity and duration of strong ground motion, characteristics of subsurface soil, *in situ* stress conditions, and the depth to groundwater.

We conducted liquefaction analyses based on the BSE-2E and BSE-1E seismic hazard levels with the aid of WSliq, a liquefaction analysis software program that was created as part of an extended research project supported by the Washington State Department of Transportation (WSDOT) and authored by Kramer (2008). Liquefaction requires soil saturation, and for the purposes of our analyses we assumed a groundwater level at 10 feet bgs that is consistent with our observations of soil moisture and surrounding data near the Site. Liquefaction analyses were completed based on the specific subsurface data collected and lab testing results of samples from borings AB-01 and AB-02 with the detailed results presented in Appendix E.

In general, the results of our liquefaction analyses indicate the relatively dense and coarse-grained Pleistocene channel facies that underly the Site are not expected to experience widespread liquefaction for the BSE-2E and BSE-1E seismic hazard levels. Minor and discontinuous liquefaction is predicted around a depth of 20 feet bgs based on boring AB-02; however, in our opinion, this does not represent a significant liquefaction hazard at the Site for the seismic hazard levels considered.

5.3 Soil Engineering Properties

We determined the soil engineering properties for the soil types underlying the Site based on the results of the completed subsurface explorations, lab test results, empirical correlations with SPT N values, literature review, and our experience with the local geology. We recommend the soil engineering properties shown on Table 3 for the fill and Pleistocene channel facies underlying the Site.

Table 3. Soil Engineering Properties

Geologic Unit	USCS Classification	SPT N-Value[1] (bpf)	Total Unit Weight (pcf)[2]	Effective Friction Angle (degrees)
Fill	ML	R[3] = 6 to 7 A[3] = 6.5	120	28
Pleistocene Channel Facies	SM, SP, GP-GM, GP	R = 14 to 100+ A = 53	130	36

Notes:
1) N-Values are corrected for field sampling procedures and are presented as blows per foot (bpf).
2) pcf = pounds per cubic feet
3) R = Range of values recorded; A = Average of values recorded.

5.4 Foundation Bearing Capacity

We understand the existing Public Safety Building consists of a two-story structure built in the early 1990s supported on shallow foundations assumed to be a combination of perimeter strip (continuous) footings and isolated spread footings.

For assessing the existing footings for foundation bearing capacity, we recommend assuming a maximum allowable bearing pressure of 1,500 pounds per square feet (psf). This value conservatively assumes some or all of the footings may be supported by the loose, silty fill that underlies the Site to depths of about 4.5 feet bgs.

For retrofit footing design, we recommend the retrofits of existing footings or new footings gain support directly from the dense Pleistocene channel facies or from structural fill (compacted crushed rock) supported by the dense Pleistocene channel facies. For this scenario, we recommend assuming a maximum allowable bearing pressure of 3,500 psf.

The above values include a factor of safety of 3 and can be increased by one-third for short-term (transient) loads like seismic and wind loading.

5.4.1 Foundation Lateral Resistance

To assess the foundation resistance of existing footings to lateral forces, we recommend assuming an allowable passive equivalent fluid density of 220 pounds per cubic foot (pcf), and an allowable base friction coefficient of 0.23. These allowable design values include a factor of safety equal to 1.5 and assume the existing footings are supported by and backfilled with relatively loose and silty fill soil.

For retrofit footings or new footings, we recommend assuming an allowable passive equivalent fluid density of 320 pounds per cubic foot (pcf), and an allowable base friction coefficient of 0.37. These allowable design values include a factor of safety equal to 1.5 and assume retrofits or new footings will be supported by the dense Pleistocene channel facies or structural fill (compacted crushed rock) and well-compacted, granular structural fill.

5.4.2 Minimum Footing Size and Embedment

For determining foundation bearing capacity and lateral resistance values, we have assumed minimum footing widths of 1.5 feet for both existing and new/retrofit footings. We have also assumed that exterior building footings (both existing and new/retrofit) have a minimum embedment of 1.5 feet below the lowest adjacent grade and interior footings (both existing and new/retrofit) have a minimum embedment of 1 foot below interior slabs.

6 Recommendations for Continuing Geotechnical Services

As the seismic retrofit evaluation and design progresses, we recommend the following continuing geotechnical engineering services.

6.1 Additional Design and Consultation Services

We recommend that Aspect:

- Conduct detailed foundation retrofit analyses (if needed).
- Continue to meet with the design team as needed to address geotechnical questions that may arise throughout the remainder of the design process.
- Review the geotechnical elements of the Project plans to see that the geotechnical engineering recommendations are properly interpreted.

6.2 Additional Construction Services

We are available to provide geotechnical engineering and monitoring services during construction. The integrity of the geotechnical elements depends on proper Site preparation and construction procedures. In addition, engineering decisions may have to be made in the field in the event that variations in subsurface conditions become apparent.

During the construction phase of the Project, we recommend that Aspect be retained to perform the following tasks:

- Review applicable submittals.
- Observe and evaluate subgrade and structural fill placement for all footings and slabs-on-grade.
- Attend meetings, as needed.
- Address other geotechnical engineering considerations that may arise during construction.

The purpose of our observations is to verify compliance with design concepts and recommendations, and to allow design changes or evaluation of appropriate construction methods in the event that subsurface conditions differ from those anticipated prior to the start of construction.

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8 Limitations

Work for this project was performed for the City of Milwaukie (Client), and this report was prepared consistent with recognized standards of professionals in the same locality and involving similar conditions, at the time the work was performed. No other warranty, expressed or implied, is made by Aspect Consulting, LLC (Aspect).

Recommendations presented herein are based on our interpretation of site conditions, geotechnical engineering calculations, and judgment in accordance with our mutually agreed-upon scope of work. Our recommendations are unique and specific to the project, site, and Client. Application of this report for any purpose other than the project should be done only after consultation with Aspect.

Variations may exist between the soil and groundwater conditions reported and those actually underlying the site. The nature and extent of such soil variations may change over time and may not be evident before construction begins. If any soil conditions are encountered at the site that are different from those described in this report, Aspect should be notified immediately to review the applicability of our recommendations.

It is the Client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, and agents, are made aware of this report in its entirety. At the time of this report, design plans and construction methods have not been finalized, and the recommendations presented herein are based on preliminary project information. If project developments result in changes from the preliminary project information, Aspect should be contacted to determine if our recommendations contained in this report should be revised and/or expanded upon.

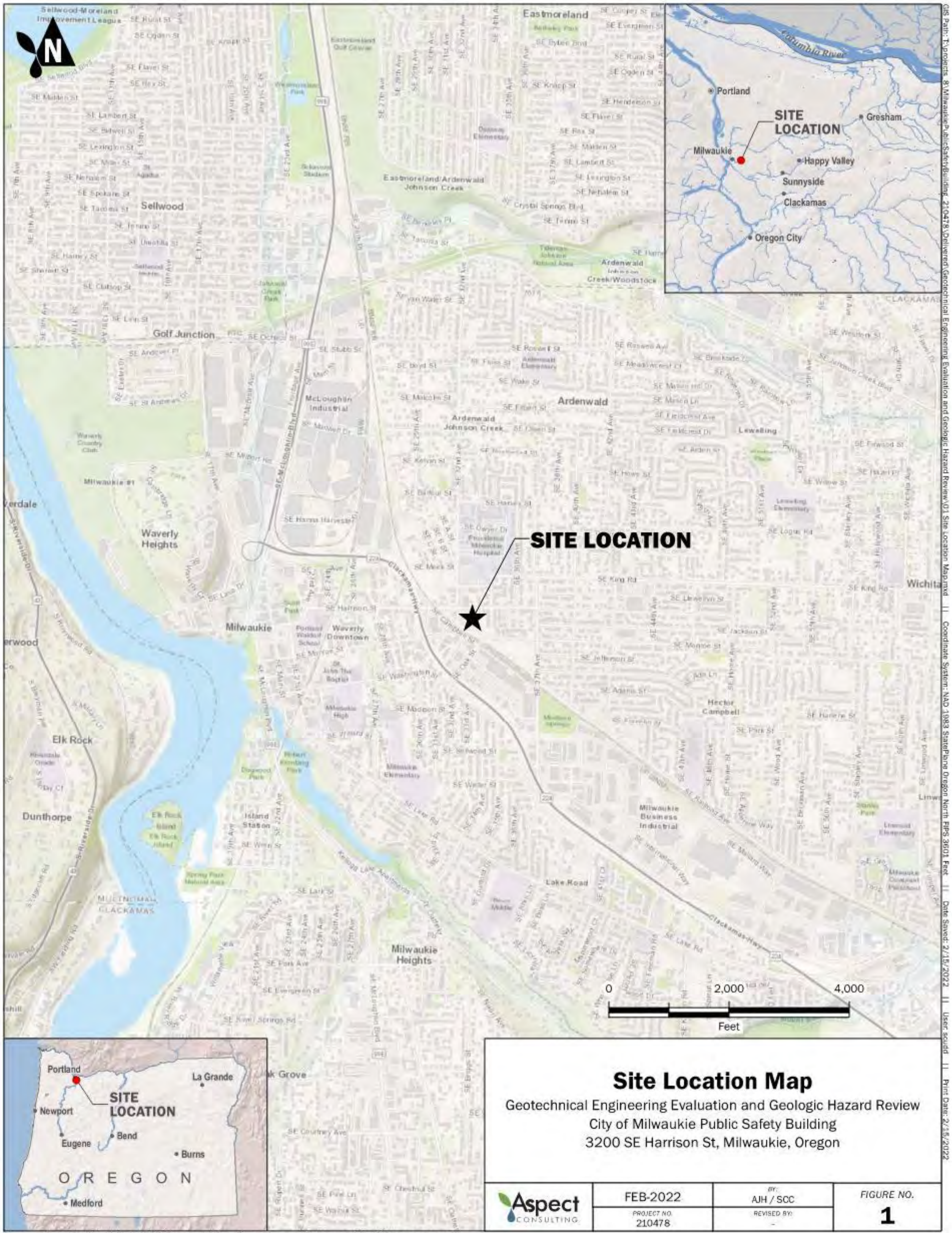
The scope of work does not include services related to construction safety precautions. Site safety is typically the responsibility of the contractor, and our recommendations are not intended to direct the contractor’s site safety methods, techniques, sequences, or procedures. The scope of our work also does not include the assessment of environmental characteristics, particularly those involving potentially hazardous substances in soil or groundwater.

All reports prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect’s original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.

Please refer to Appendix F titled “Report Limitations and Guidelines for Use” for additional information governing the use of this report.

We appreciate the opportunity to perform these services. If you have any questions please call Andrew Holmson, Senior Associate Geotechnical Engineer at (971) 865-5894.

FIGURES



Site Location Map

Geotechnical Engineering Evaluation and Geologic Hazard Review
City of Milwaukie Public Safety Building
3200 SE Harrison St, Milwaukie, Oregon

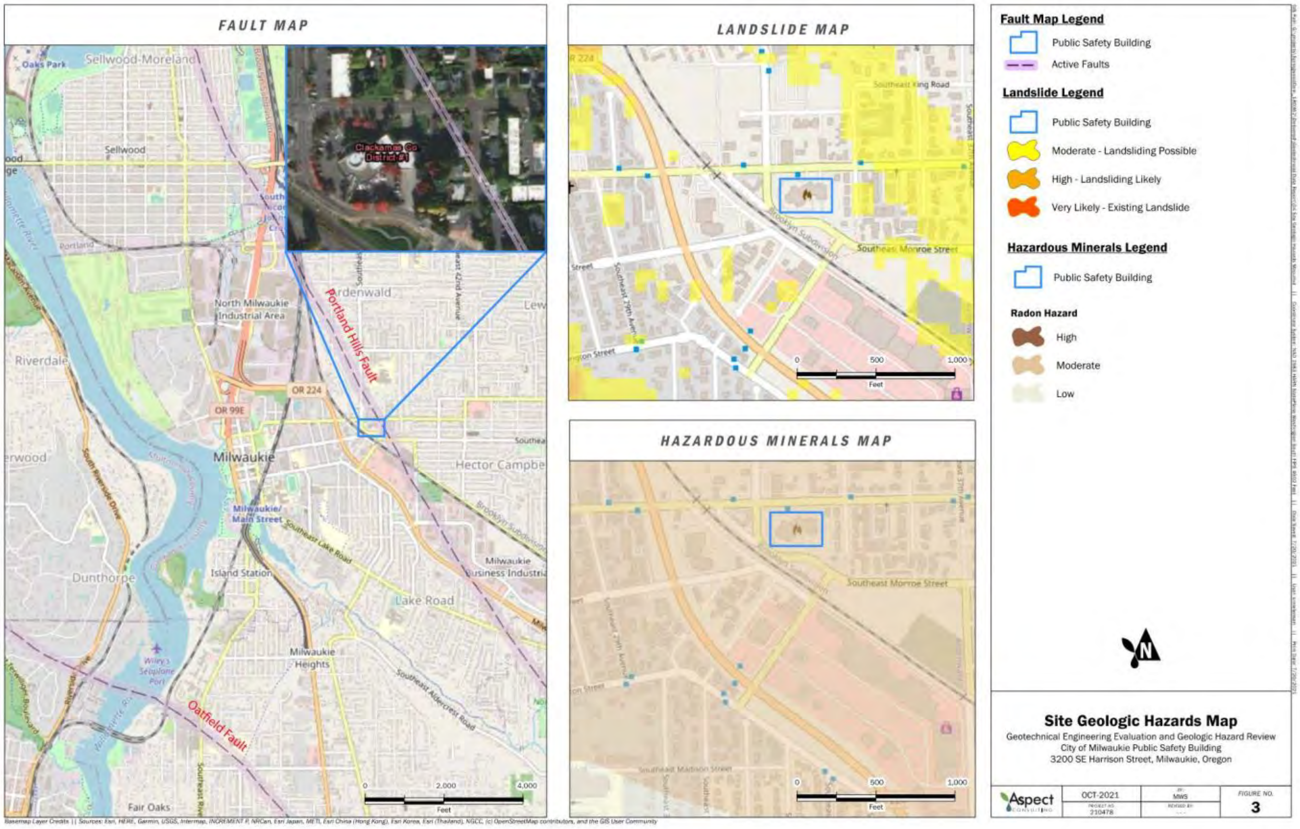
Aspect CONSULTING	FEB-2022	BY: AJH / SCC	FIGURE NO.
	PROJECT NO. 210478	REVISED BY: -	1

Basemap Layer Credits | | Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Site and Exploration Map

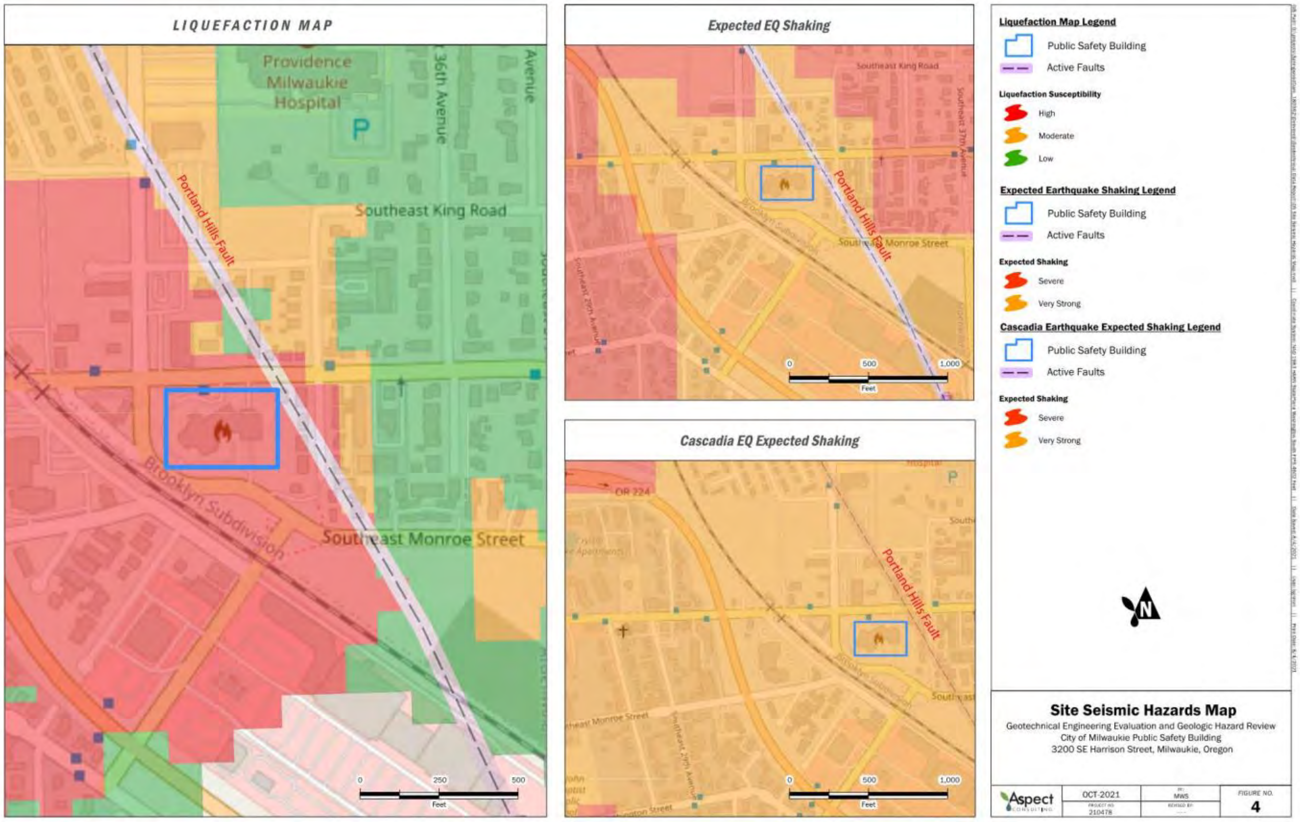
Geotechnical Engineering Evaluation and Geologic Hazard Review
City of Milwaukie Public Safety Building
3200 SE Harrison St, Milwaukie, Oregon

Basemap Layer Credits || Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



Site Geologic Hazards Map
Geotechnical Engineering Evaluation and Geologic Hazard Review
City of Milwaukie Public Safety Building
3200 SE Harrison Street, Milwaukie, Oregon

Aspect CONSULTING | OCT-2021 | BY: MWS | FIGURE NO. 3
PROJECT NO. 210478 | REVISED BY: ---



Site Seismic Hazards Map
Geotechnical Engineering Evaluation and Geologic Hazard Review
City of Milwaukie Public Safety Building
3200 SE Harrison Street, Milwaukie, Oregon

Aspect CONSULTING | OCT-2021 | BY: MWS | FIGURE NO. 4
PROJECT NO. 210478 | REVISED BY: ---

APPENDIX A

Subsurface Explorations

A. Field Exploration Program

On January 17 and 18, 2022, Western States Soil Conservation (WSSC), under subcontract to Aspect, completed two drilled soil borings, designated AB-01 and AB-02 to depths of 46.5 and 51.3 feet bgs, respectively, in the locations shown on Figure 2.

A.1. Geotechnical Borings

The borings were drilled using mud-rotary methods. In boring AB-02, the tricone bit broke off in the boring and the boring was abandoned and moved 1 foot north of its original location before being re-drilled.

Mud-Rotary Drilling Methods

The mud-rotary method consists of advancing a tricone bit with drilling mud (a bentonite slurry). The drill rig rotates the tricone bit and applies downward pressure to advance the boring; the mud is used to cool the bit, to wash the soil cuttings from the boring, and to maintain boring stability. The drilling mud is pumped down the interior of the drill rods and out through the bit at the bottom of the hole. The drilling mud carries soil cuttings up the annular space between the drill rods and the boring wall to the mud tub at the surface. Cuttings carried by the drilling mud are screened out or allowed to settle out in the mud tub, and the drilling mud is recirculated back down the boring.

Soil Logging and Sampling

Soil conditions observed in the borings were logged by a representative of Aspect's geotechnical engineering staff in general accordance with ASTM D2488, *Standard Practice for Description and Identification of Soils* (Visual-Manual Procedure). The stratigraphic contacts shown on the exploration logs represent the approximate boundaries between soil types; actual transitions may be more gradual. The subsurface conditions depicted are only for the specific date and location reported; and therefore, are not necessarily representative of other locations and times.

Soil sampling in the drilled borings was completed at select depth intervals using standard penetration test methods in accordance with ASTM International (ASTM) Method D1586, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils (ASTM, 2018). The SPT method involves driving a 2-inch-outside-diameter split-barrel sampler with a 140-pound hammer free-falling from a distance of 30 inches. When particularly gravelly conditions were encountered, the sampler used was a 3-inch-outside-diameter split-barrel sampler to increase sample recovery.

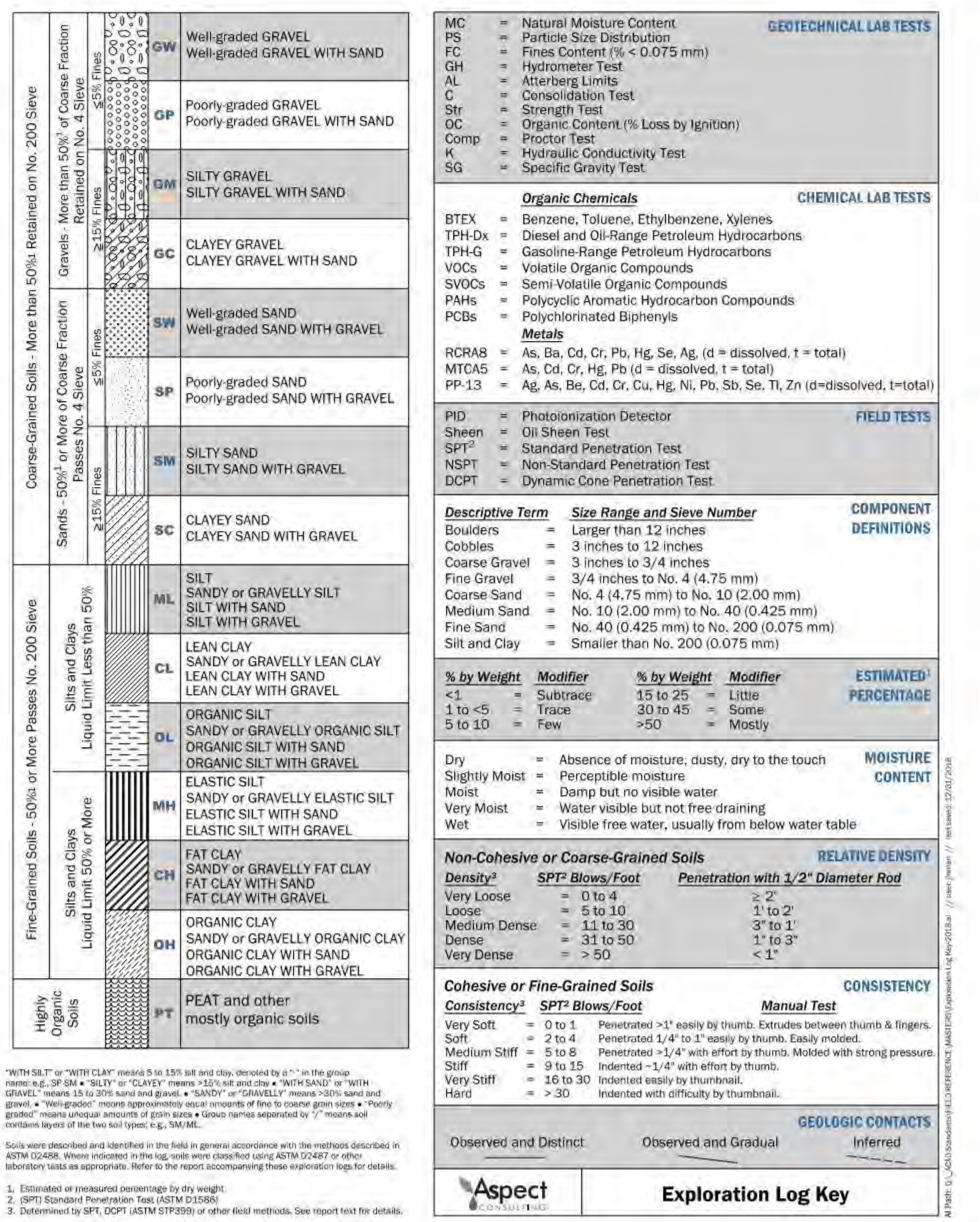
The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler (2-inch-outside-diameter) the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils. If a total of 50 blows are recorded for a single 6-inch interval, the test is terminated, and the blow count is recorded as 50 blows for the total inches of penetration.

When using the 3-inch-diameter sampler, the blow counts were corrected based on industry standards to determine representative N values.

Samples were placed in labeled plastic bags and jars and taken to a laboratory for further classification. Select soil samples collected in Shelby tubes were used for laboratory tests. Tests on these samples are described in Appendix B.

Boring Completion

Upon completion, borings AB-01 and AB-02 were backfilled with hydrated 3/8-inch bentonite chips or bentonite grout in accordance with requirements of the Oregon Water Resources Department and capped with a surface patch of asphalt to match the surrounding conditions. Drill cuttings were placed in 55-gallon drums and hauled away for disposal.



Coarse-Grained Soils - More than 50%1 Retained on No. 200 Sieve	Gravels - More than 50%[1] of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	GW	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	GM	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%[1] or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	SW	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	SM	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%1 or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		ML	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		MH	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			PT	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name: e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC = Natural Moisture Content
PS = Particle Size Distribution
FC = Fines Content (% < 0.075 mm)
GH = Hydrometer Test
AL = Atterberg Limits
C = Consolidation Test
Str = Strength Test
OC = Organic Content (% Loss by Ignition)
Comp = Proctor Test
K = Hydraulic Conductivity Test
SG = Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx = Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G = Gasoline-Range Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
PAHs = Polycyclic Aromatic Hydrocarbon Compounds
PCBs = Polychlorinated Biphenyls

Metals

RCRA8 = As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5 = As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13 = Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID = Photoionization Detector
Sheen = Oil Sheen Test
SPT[2] = Standard Penetration Test
NSPT = Non-Standard Penetration Test
DCPT = Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 mm)
Coarse Sand	=	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	=	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	=	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	=	Smaller than No. 200 (0.075 mm)

ESTIMATED[1] PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry = Absence of moisture, dusty, dry to the touch
Slightly Moist = Perceptible moisture
Moist = Damp but no visible water
Very Moist = Water visible but not free draining
Wet = Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density[3]		*SPT[2] Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency[3]		*SPT[2] Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1' easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct
Observed and Gradual
Inferred

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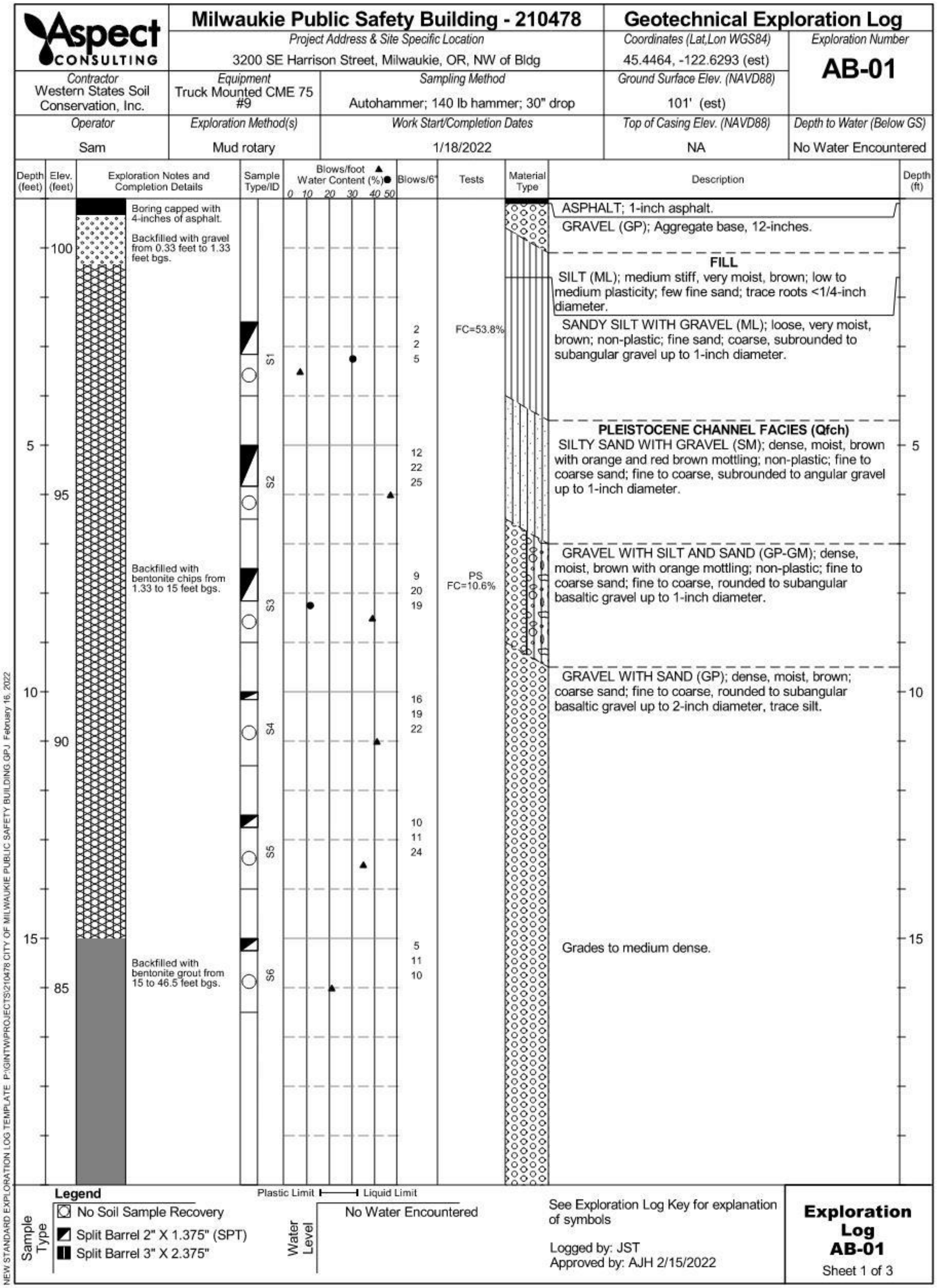
Exploration Log Key

AI Path: Q:_ACAD Standards\FIELD REFERENCE\MASTERS\Exploration Log Key-2018.ai // user: jhuman // last saved: 12/31/2018



Aspect CONSULTING

Milwaukie Public Safety Building - 210478

Geotechnical Exploration Log

Project Address & Site Specific Location	3200 SE Harrison Street, Milwaukie, OR, NW of Bldg
Coordinates (Lat,Lon WGS84)	45.4464, -122.6293 (est)
Exploration Number	AB-01
Contractor	Western States Soil Conservation, Inc.
Equipment	Truck Mounted CME 75 #9
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	101' (est)
Operator	Sam
Exploration Method(s)	Mud rotary
Work Start/Completion Dates	1/18/2022
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	No Water Encountered

Exploration Notes and Completion Details:

- Boring capped with 4-inches of asphalt.
- Backfilled with gravel from 0.33 feet to 1.33 feet bgs.
- Backfilled with bentonite chips from 1.33 to 15 feet bgs.
- Backfilled with bentonite grout from 15 to 46.5 feet bgs.

Sample Type/ID	Blows/6"	Tests
S1	2 2 5	FC=53.8%
S2	12 22 25	
S3	9 20 19	PS FC=10.6%
S4	16 19 22	
S5	10 11 24	
S6	5 11 10	

Description:

ASPHALT; 1-inch asphalt.

GRAVEL (GP); Aggregate base, 12-inches.

FILL

SILT (ML); medium stiff, very moist, brown; low to medium plasticity; few fine sand; trace roots <1/4-inch diameter.

SANDY SILT WITH GRAVEL (ML); loose, very moist, brown; non-plastic; fine sand; coarse, subrounded to subangular gravel up to 1-inch diameter.

PLEISTOCENE CHANNEL FACIES (Qfch)

SILTY SAND WITH GRAVEL (SM); dense, moist, brown with orange and red brown mottling; non-plastic; fine to coarse sand; fine to coarse, subrounded to angular gravel up to 1-inch diameter.

GRAVEL WITH SILT AND SAND (GP-GM); dense, moist, brown with orange mottling; non-plastic; fine to coarse sand; fine to coarse, rounded to subangular basaltic gravel up to 1-inch diameter.

GRAVEL WITH SAND (GP); dense, moist, brown; coarse sand; fine to coarse, rounded to subangular basaltic gravel up to 2-inch diameter, trace silt.

Grades to medium dense.

Legend

Sample Type
- ◩ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)
- ◫ Split Barrel 3" X 2.375"

Plastic Limit ├─┤ Liquid Limit

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JST
Approved by: AJH 2/15/2022

Exploration Log
AB-01
Sheet 1 of 3

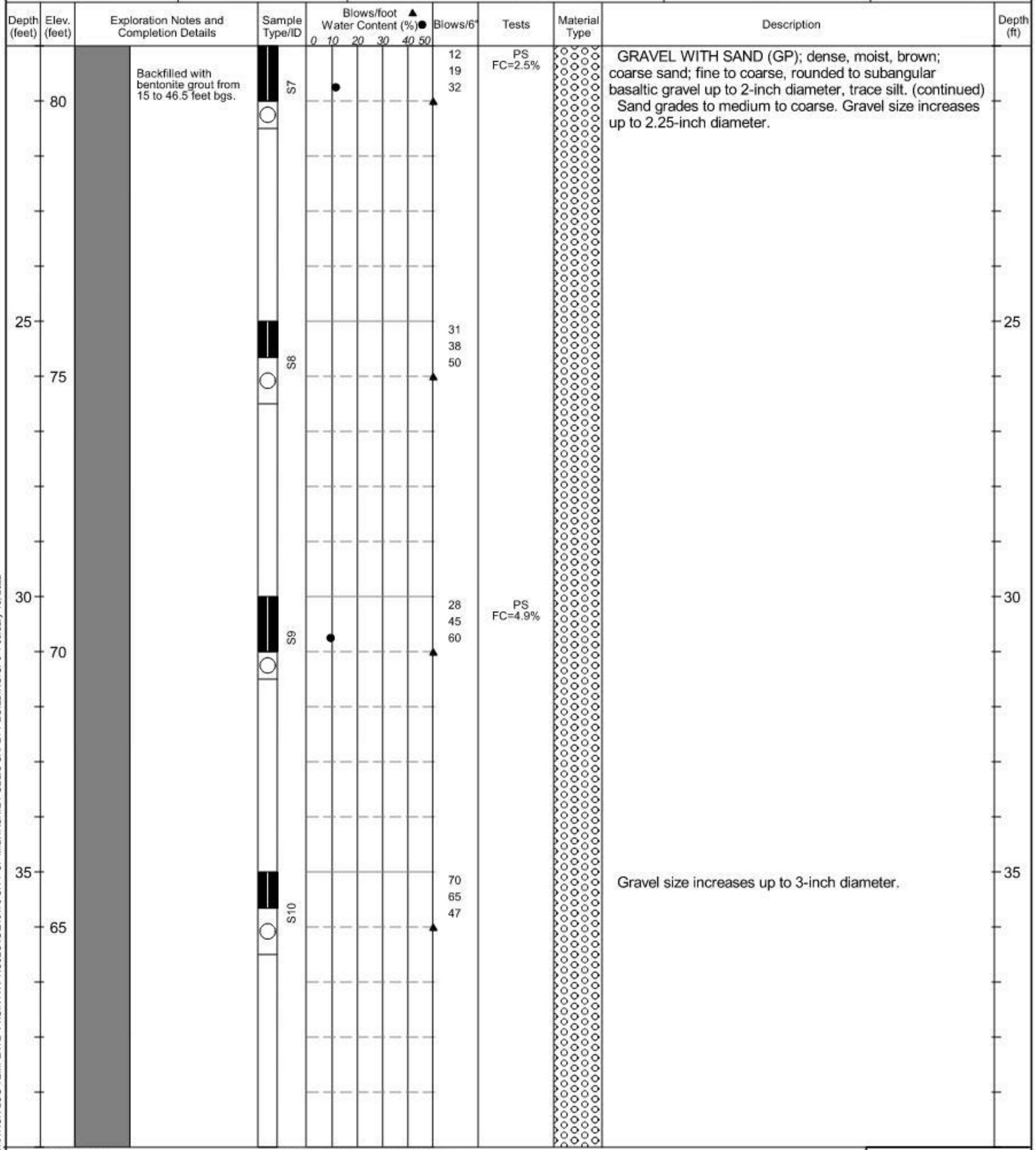
NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\210478 CITY OF MILWAUKIE PUBLIC SAFETY BUILDING.GPJ February 16, 2022

Aspect CONSULTING

Milwaukie Public Safety Building - 210478

Geotechnical Exploration Log

	Project Address & Site Specific Location 3200 SE Harrison Street, Milwaukie, OR, NW of Bldg		*Coordinates (Lat,Lon WGS84)* 45.4464, -122.6293 (est)	*Exploration Number* **AB-01**
Contractor Western States Soil Conservation, Inc.	*Equipment* Truck Mounted CME 75 #9	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 101' (est)	
Operator Sam	*Exploration Method(s)* Mud rotary	*Work Start/Completion Dates* 1/18/2022	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered



Backfilled with bentonite grout from 15 to 46.5 feet bgs.

Sample Type/ID	Blows/6"	Tests
S7	12 19 32	PS FC=2.5%
S8	31 38 50	
S9	28 45 60	PS FC=4.9%
S10	70 65 47	

GRAVEL WITH SAND (GP); dense, moist, brown; coarse sand; fine to coarse, rounded to subangular basaltic gravel up to 2-inch diameter, trace silt. (continued)

Sand grades to medium to coarse. Gravel size increases up to 2.25-inch diameter.

Gravel size increases up to 3-inch diameter.

Legend

Sample Type
- ⊠ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)
- ◼ Split Barrel 3" X 2.375"

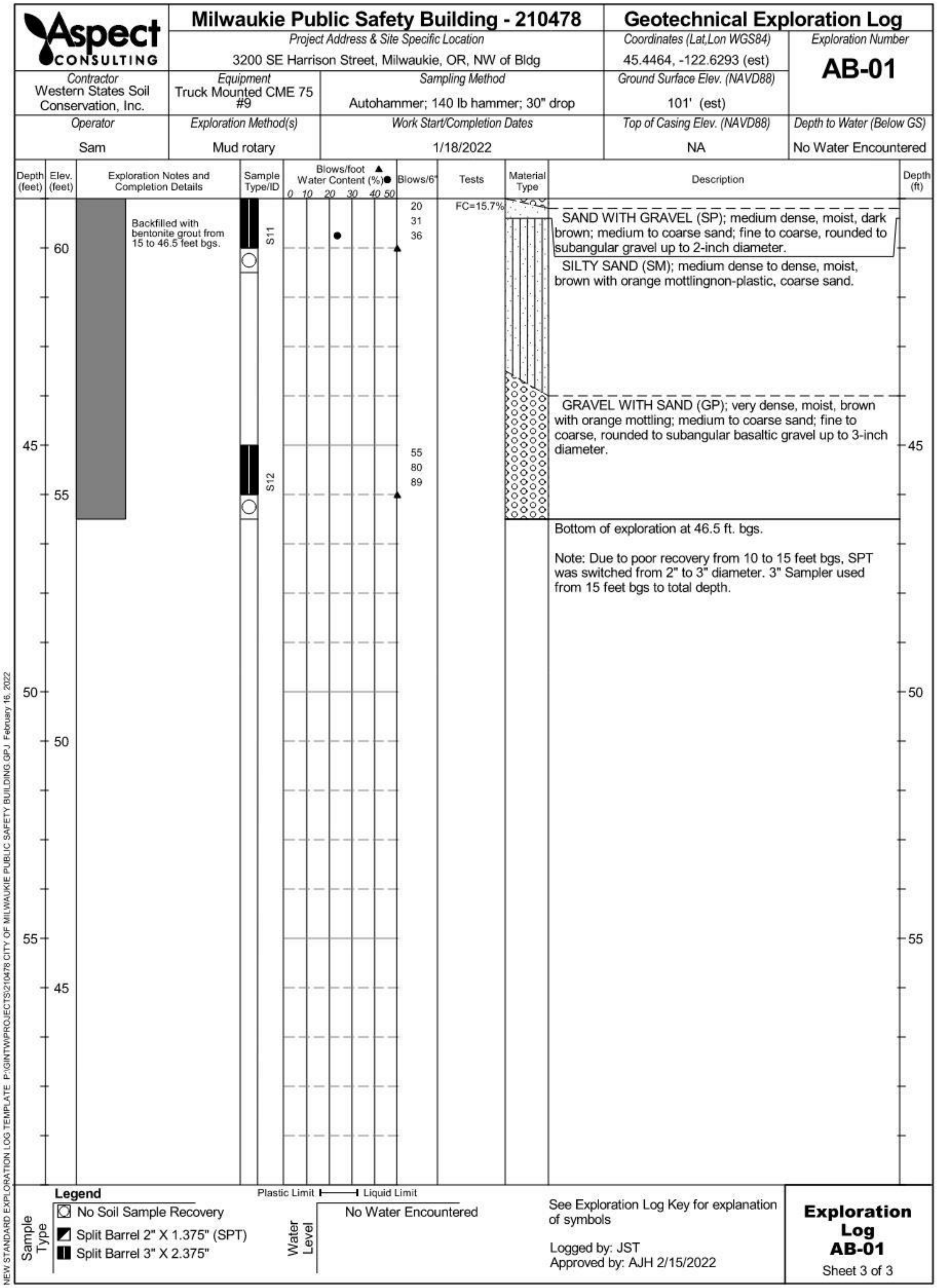
Plastic Limit ├──┤ Liquid Limit

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JST
Approved by: AJH 2/15/2022

Exploration Log
AB-01
Sheet 2 of 3



Milwaukie Public Safety Building - 210478

Geotechnical Exploration Log

Contractor Western States Soil Conservation, Inc.	*Equipment* Truck Mounted CME 75 #9	*Project Address & Site Specific Location* 3200 SE Harrison Street, Milwaukie, OR, NW of Bldg	*Coordinates (Lat,Lon WGS84)* 45.4464, -122.6293 (est)	*Exploration Number* **AB-01**
		Sampling Method Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 101' (est)	
Operator Sam	*Exploration Method(s)* Mud rotary	*Work Start/Completion Dates* 1/18/2022	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/foot ▲ Water Content (%) ● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Backfilled with bentonite grout from 15 to 46.5 feet bgs.	S11		20 31 36	FC=15.7%		SAND WITH GRAVEL (SP); medium dense, moist, dark brown; medium to coarse sand; fine to coarse, rounded to subangular gravel up to 2-inch diameter.	
	60							SILTY SAND (SM); medium dense to dense, moist, brown with orange mottlingnon-plastic, coarse sand.	
								GRAVEL WITH SAND (GP); very dense, moist, brown with orange mottling; medium to coarse sand; fine to coarse, rounded to subangular basaltic gravel up to 3-inch diameter.	
45			S12		55 80 89				45
	55								
								Bottom of exploration at 46.5 ft. bgs. Note: Due to poor recovery from 10 to 15 feet bgs, SPT was switched from 2" to 3" diameter. 3" Sampler used from 15 feet bgs to total depth.	
50									50
	50								
55									55
	45								

Legend

Sample Type
- ○ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)
- ◫ Split Barrel 3" X 2.375"

Plastic Limit ├──┤ Liquid Limit

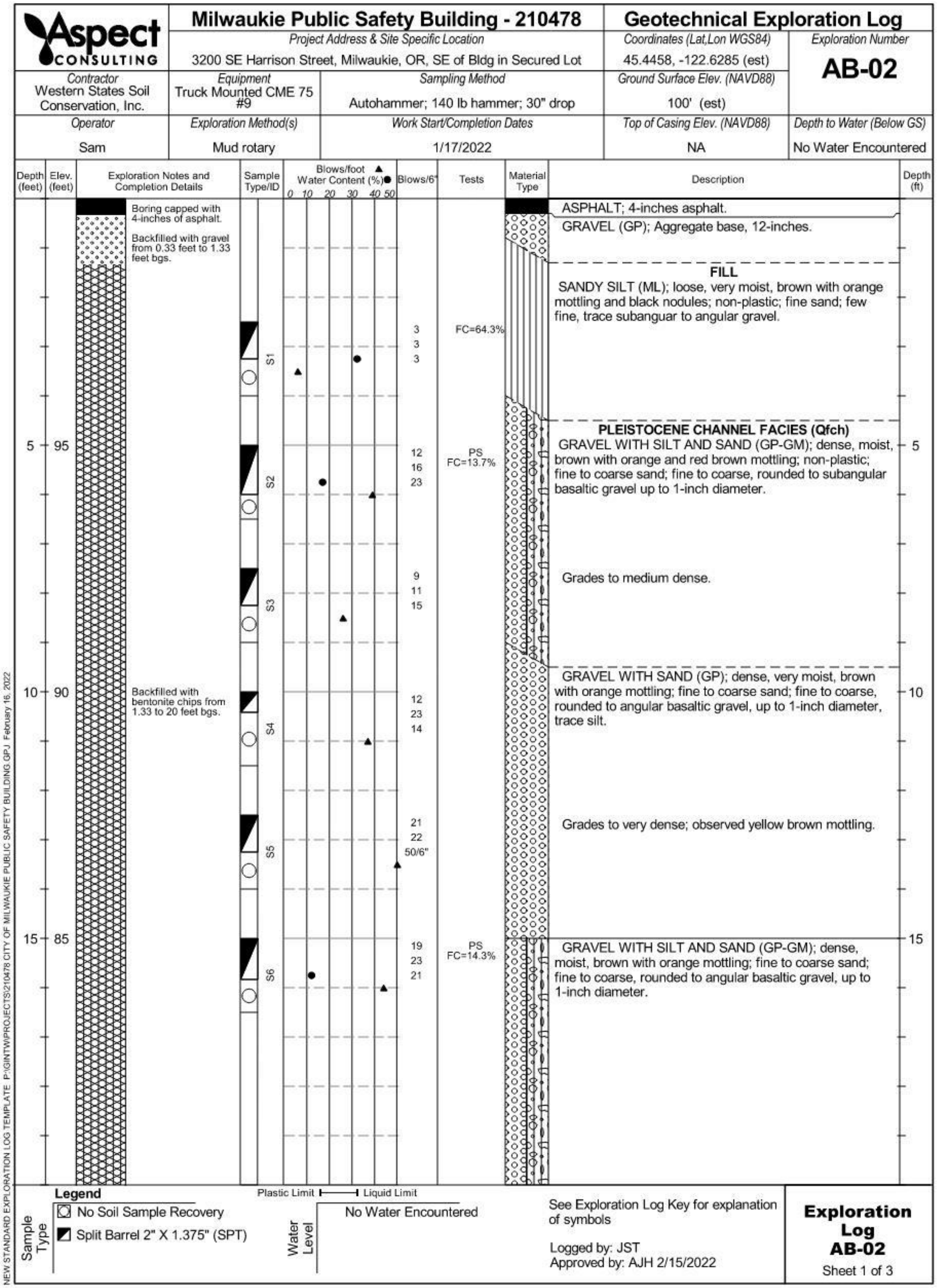
Water Level
No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JST
Approved by: AJH 2/15/2022

Exploration Log
AB-01
Sheet 3 of 3

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\210478 CITY OF MILWAUKIE PUBLIC SAFETY BUILDING.GPJ February 16, 2022



Aspect CONSULTING

Milwaukie Public Safety Building - 210478

Geotechnical Exploration Log

Project Address & Site Specific Location			Coordinates (Lat,Lon WGS84)	Exploration Number
3200 SE Harrison Street, Milwaukie, OR, SE of Bldg in Secured Lot			45.4458, -122.6285 (est)	**AB-02**
Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Western States Soil Conservation, Inc.	Truck Mounted CME 75 #9	Autohammer; 140 lb hammer; 30" drop	100' (est)	
Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Sam	Mud rotary	1/17/2022	NA	No Water Encountered

Depth (feet) | Elev. (feet) | Exploration Notes and Completion Details | Sample Type/ID | Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50 | Blows/6" | Tests | Material Type | Description | Depth (ft)

Exploration Notes and Completion Details:

Boring capped with 4-inches of asphalt.

Backfilled with gravel from 0.33 feet to 1.33 feet bgs.

Backfilled with bentonite chips from 1.33 to 20 feet bgs.

Sample Type/ID	Blows/6"	Tests
S1	3 3 3	FC=64.3%
S2	12 16 23	PS FC=13.7%
S3	9 11 15	
S4	12 23 14	
S5	21 22 50/6"	
S6	19 23 21	PS FC=14.3%

Depth 5, Elev. 95; Depth 10, Elev. 90; Depth 15, Elev. 85

Description:

ASPHALT; 4-inches asphalt.

GRAVEL (GP); Aggregate base, 12-inches.

FILL

SANDY SILT (ML); loose, very moist, brown with orange mottling and black nodules; non-plastic; fine sand; few fine, trace subanguar to angular gravel.

PLEISTOCENE CHANNEL FACIES (Qfch)

GRAVEL WITH SILT AND SAND (GP-GM); dense, moist, brown with orange and red brown mottling; non-plastic; fine to coarse sand; fine to coarse, rounded to subangular basaltic gravel up to 1-inch diameter.

Grades to medium dense.

GRAVEL WITH SAND (GP); dense, very moist, brown with orange mottling; fine to coarse sand; fine to coarse, rounded to angular basaltic gravel, up to 1-inch diameter, trace silt.

Grades to very dense; observed yellow brown mottling.

GRAVEL WITH SILT AND SAND (GP-GM); dense, moist, brown with orange mottling; fine to coarse sand; fine to coarse, rounded to angular basaltic gravel, up to 1-inch diameter.

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├─┤ Liquid Limit

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JST
Approved by: AJH 2/15/2022

Exploration Log AB-02
Sheet 1 of 3

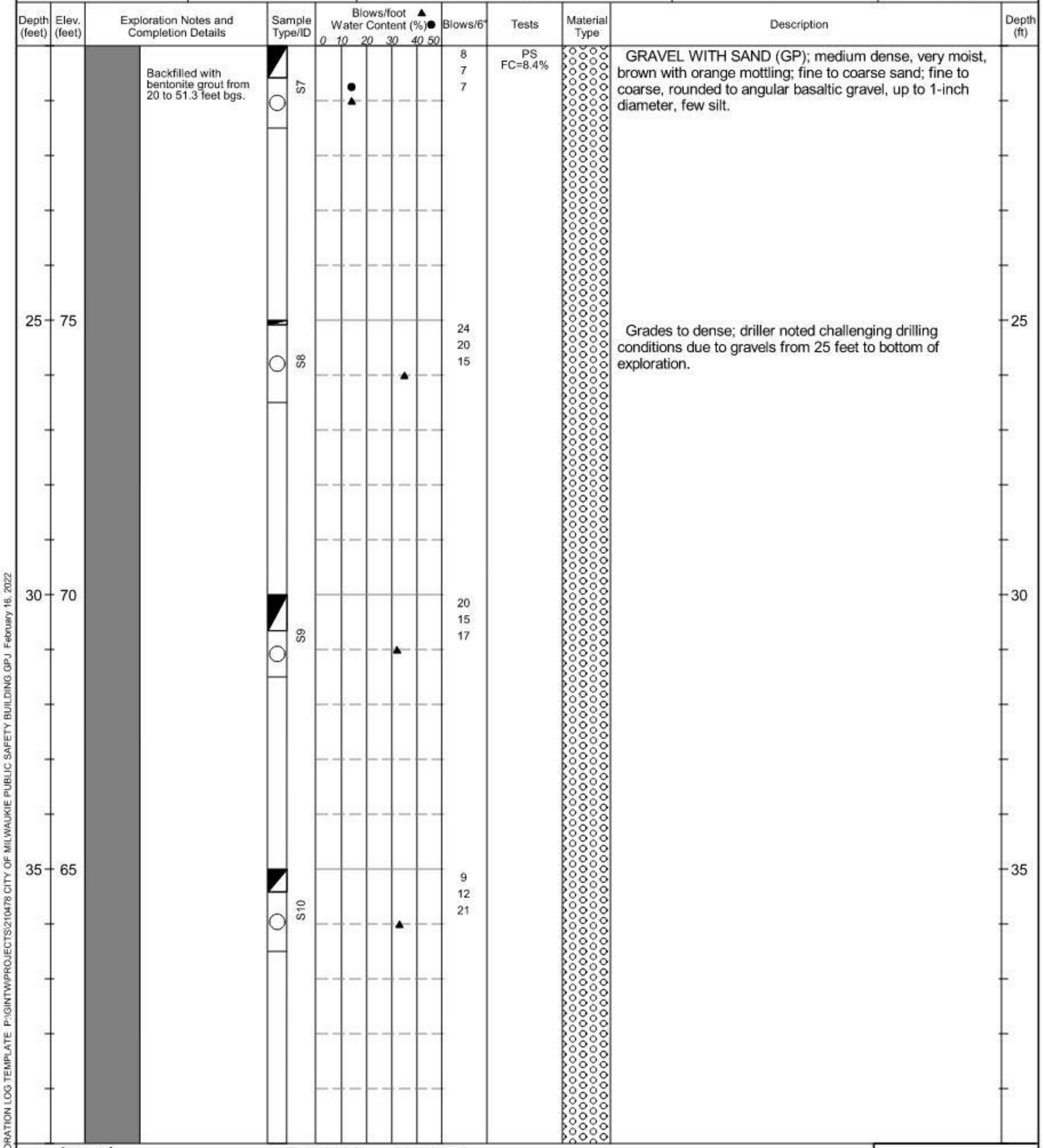
NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\210478 CITY OF MILWAUKIE PUBLIC SAFETY BUILDING.GPJ February 16, 2022

Aspect CONSULTING

Milwaukie Public Safety Building - 210478

Geotechnical Exploration Log

Project Address & Site Specific Location: 3200 SE Harrison Street, Milwaukie, OR, SE of Bldg in Secured Lot
Coordinates (Lat,Lon WGS84): 45.4458, -122.6285 (est)
Exploration Number: **AB-02**
Contractor: Western States Soil Conservation, Inc.
Equipment: Truck Mounted CME 75 #9
Sampling Method: Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88): 100' (est)
Operator: Sam
Exploration Method(s): Mud rotary
Work Start/Completion Dates: 1/17/2022
Top of Casing Elev. (NAVD88): NA
Depth to Water (Below GS): No Water Encountered



Backfilled with bentonite grout from 20 to 51.3 feet bgs.

GRAVEL WITH SAND (GP); medium dense, very moist, brown with orange mottling; fine to coarse sand; fine to coarse, rounded to angular basaltic gravel, up to 1-inch diameter, few silt.

Grades to dense; driller noted challenging drilling conditions due to gravels from 25 feet to bottom of exploration.

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\210478 CITY OF MILWAUKIE PUBLIC SAFETY BUILDING.GPJ February 16, 2022

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├──┤ Liquid Limit

Water Level
No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JST
Approved by: AJH 2/15/2022

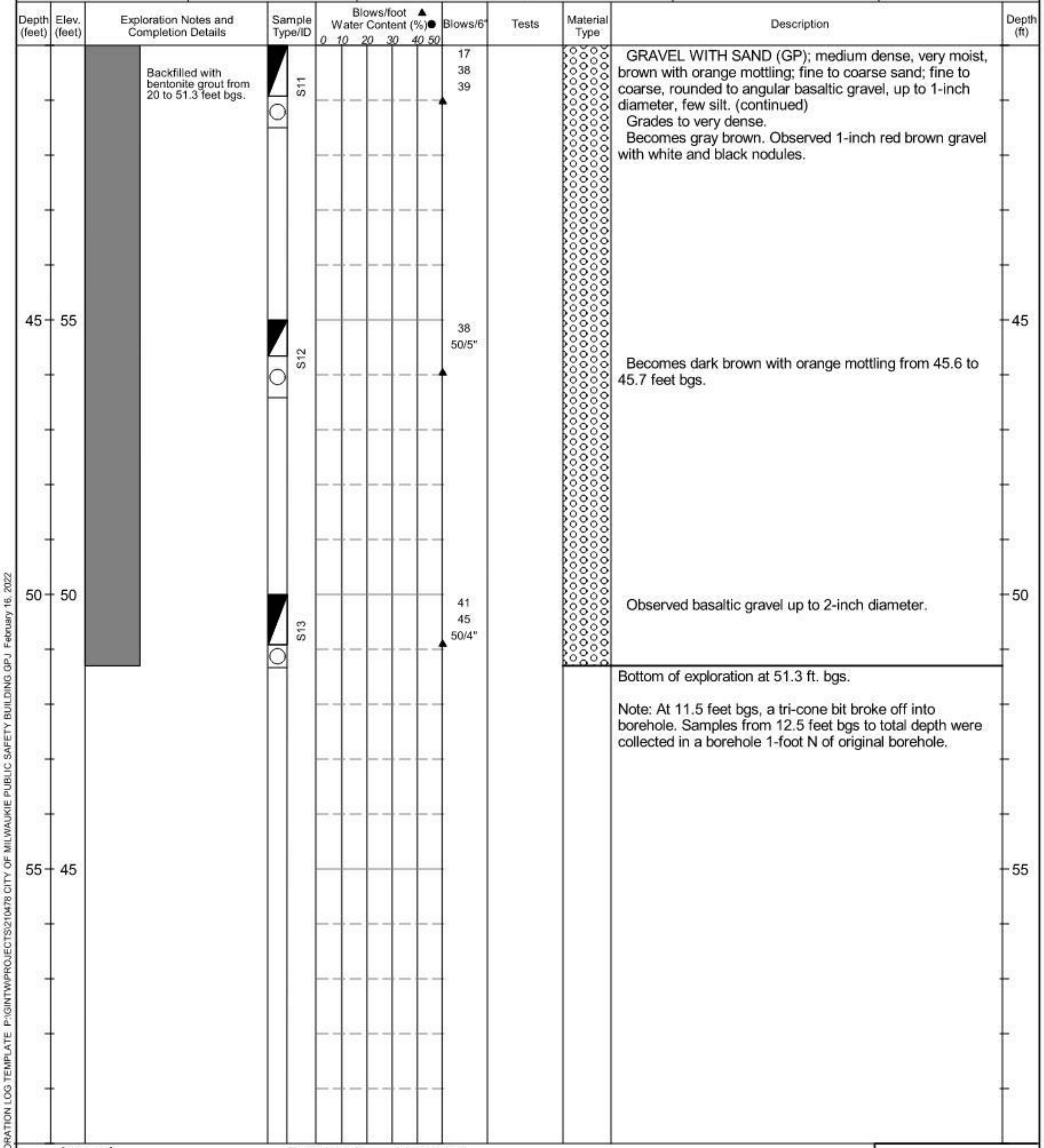
Exploration Log
AB-02
Sheet 2 of 3

Aspect CONSULTING

Milwaukie Public Safety Building - 210478

Geotechnical Exploration Log

Project Address & Site Specific Location 3200 SE Harrison Street, Milwaukie, OR, SE of Bldg in Secured Lot			*Coordinates (Lat,Lon WGS84)* 45.4458, -122.6285 (est)	*Exploration Number* **AB-02**
Contractor Western States Soil Conservation, Inc.	*Equipment* Truck Mounted CME 75 #9	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 100' (est)	
Operator Sam	*Exploration Method(s)* Mud rotary	*Work Start/Completion Dates* 1/17/2022	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered



Depth (feet)	Elev. (feet)	Exploration Notes and Completion Details	Sample Type/ID	Blows/6"	Tests	Description
		Backfilled with bentonite grout from 20 to 51.3 feet bgs.	S11	17 38 39		GRAVEL WITH SAND (GP); medium dense, very moist, brown with orange mottling; fine to coarse sand; fine to coarse, rounded to angular basaltic gravel, up to 1-inch diameter, few silt. (continued) Grades to very dense. Becomes gray brown. Observed 1-inch red brown gravel with white and black nodules.
45	55		S12	38 50/5"		Becomes dark brown with orange mottling from 45.6 to 45.7 feet bgs.
50	50		S13	41 45 50/4"		Observed basaltic gravel up to 2-inch diameter.
						Bottom of exploration at 51.3 ft. bgs. Note: At 11.5 feet bgs, a tri-cone bit broke off into borehole. Samples from 12.5 feet bgs to total depth were collected in a borehole 1-foot N of original borehole.
55	45					

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├─┤ Liquid Limit

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JST
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Exploration Log AB-02
Sheet 3 of 3

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\210478 CITY OF MILWAUKIE PUBLIC SAFETY BUILDING.GPJ February 16, 2022

APPENDIX B

Laboratory Testing Results

B. Geotechnical Laboratory Testing

We identified, designated, and executed several geotechnical laboratory tests in our laboratory and with support from Northwest Testing Inc. (NTI) on selected soil samples collected during the field exploration program. The tests performed and the procedures followed are outlined below.

Water Content Determination

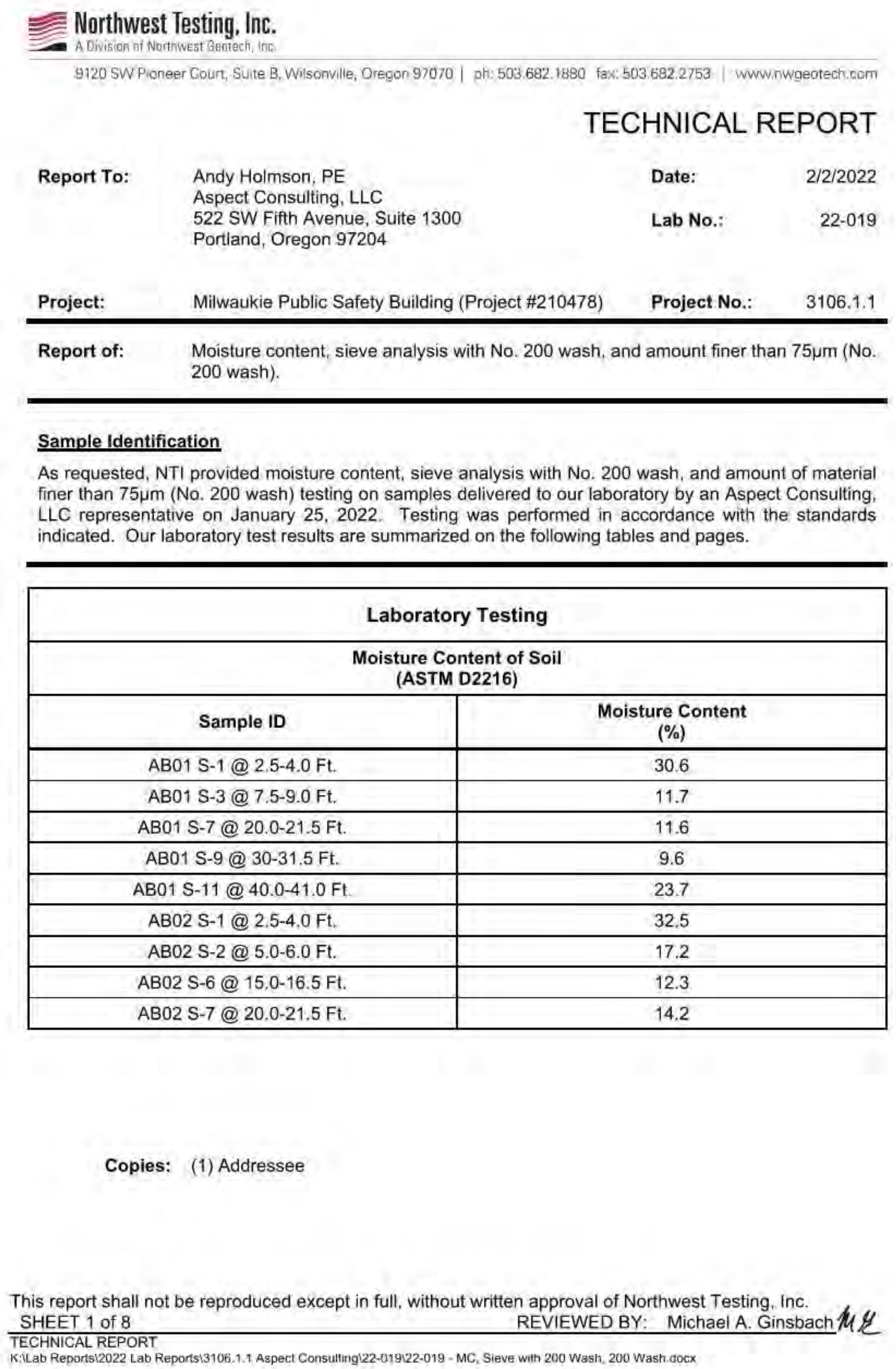
Water contents of selected samples from the soil borings in general accordance with ASTM International (ASTM) D2216. The results of the tests are shown on the exploration logs.

Fines Content Determination

Percent material passing a US No. 200 sieve (fines content) was conducted in accordance with ASTM D1140 on selected soil samples collected from the soil borings. The results of the tests are presented on the exploration logs.

Grain Size Analysis

Grain size analysis was completed in accordance with ASTM D6913 on selected soil samples collected from the soil borings. The results of the tests are presented as curves in Appendix B, plotting percent finer by weight versus grain size.



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A Division of Northwest Geotech, Inc.
9120 SW Pioneer Court, Suite B, Wilsonville, Oregon 97070 | ph: 503.682.1880 fax: 503.682.2753 | www.nwgeotech.com

TECHNICAL REPORT

Report To:
Andy Holmson, PE
Aspect Consulting, LLC
522 SW Fifth Avenue, Suite 1300
Portland, Oregon 97204

Date: 2/2/2022
Lab No.: 22-019

Project: Milwaukie Public Safety Building (Project #210478) **Project No.:** 3106.1.1

Report of: Moisture content, sieve analysis with No. 200 wash, and amount finer than 75μm (No. 200 wash).

Sample Identification

As requested, NTI provided moisture content, sieve analysis with No. 200 wash, and amount of material finer than 75μm (No. 200 wash) testing on samples delivered to our laboratory by an Aspect Consulting, LLC representative on January 25, 2022. Testing was performed in accordance with the standards indicated. Our laboratory test results are summarized on the following tables and pages.

Laboratory Testing

Moisture Content of Soil (ASTM D2216)

Sample ID	Moisture Content (%)
AB01 S-1 @ 2.5-4.0 Ft.	30.6
AB01 S-3 @ 7.5-9.0 Ft.	11.7
AB01 S-7 @ 20.0-21.5 Ft.	11.6
AB01 S-9 @ 30-31.5 Ft.	9.6
AB01 S-11 @ 40.0-41.0 Ft.	23.7
AB02 S-1 @ 2.5-4.0 Ft.	32.5
AB02 S-2 @ 5.0-6.0 Ft.	17.2
AB02 S-6 @ 15.0-16.5 Ft.	12.3
AB02 S-7 @ 20.0-21.5 Ft.	14.2

Copies: (1) Addressee

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SHEET 1 of 8 REVIEWED BY: Michael A. Ginsbach
TECHNICAL REPORT
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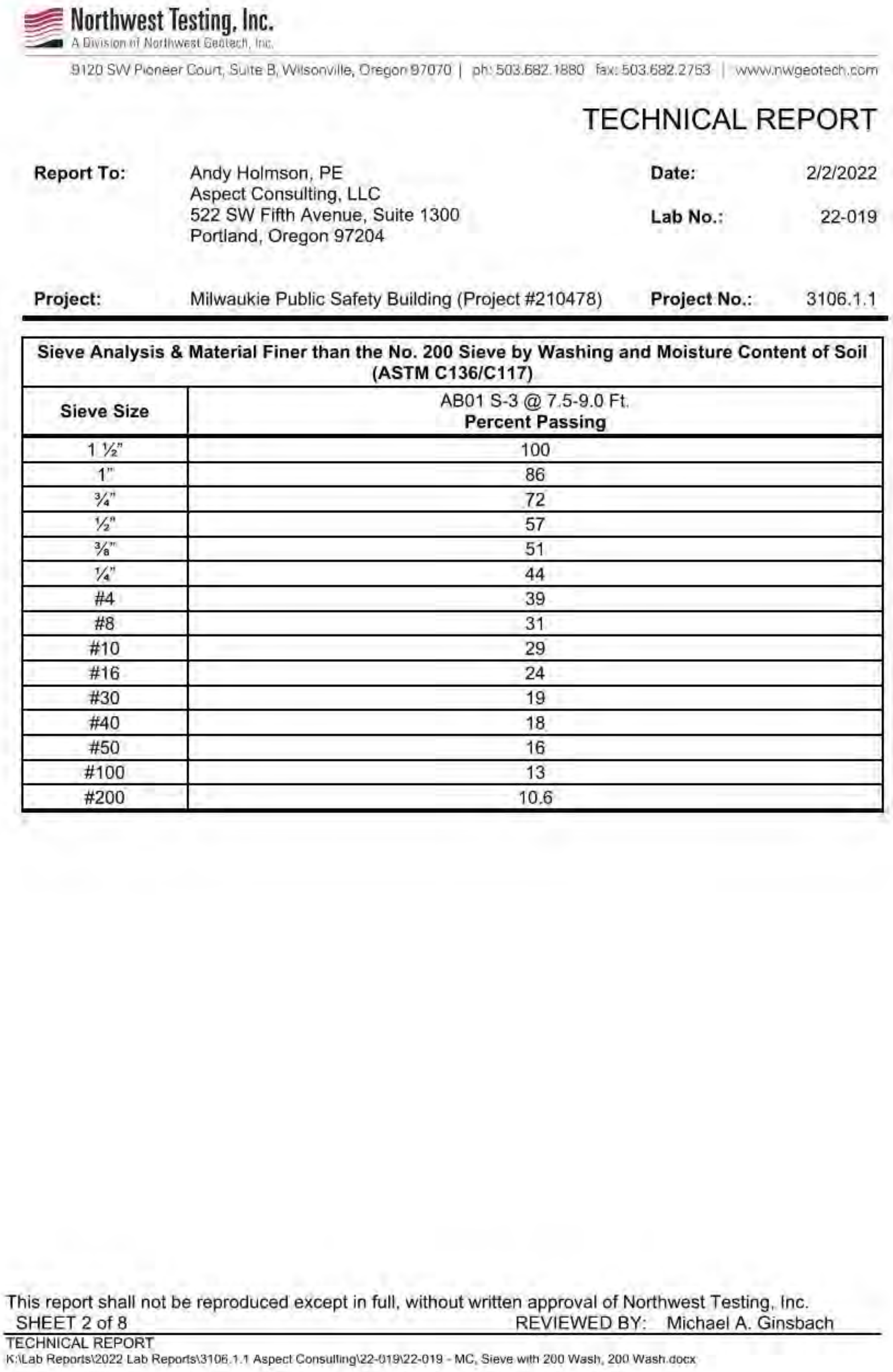

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Portland, Oregon 97204

Date: 2/2/2022

Lab No.: 22-019

Project: Milwaukie Public Safety Building (Project #210478) **Project No.:** 3106.1.1

Sieve Analysis & Material Finer than the No. 200 Sieve by Washing and Moisture Content of Soil (ASTM C136/C117)

Sieve Size	AB01 S-3 @ 7.5-9.0 Ft. **Percent Passing**
1 ½"	100
1"	86
¾"	72
½"	57
⅜"	51
¼"	44
#4	39
#8	31
#10	29
#16	24
#30	19
#40	18
#50	16
#100	13
#200	10.6

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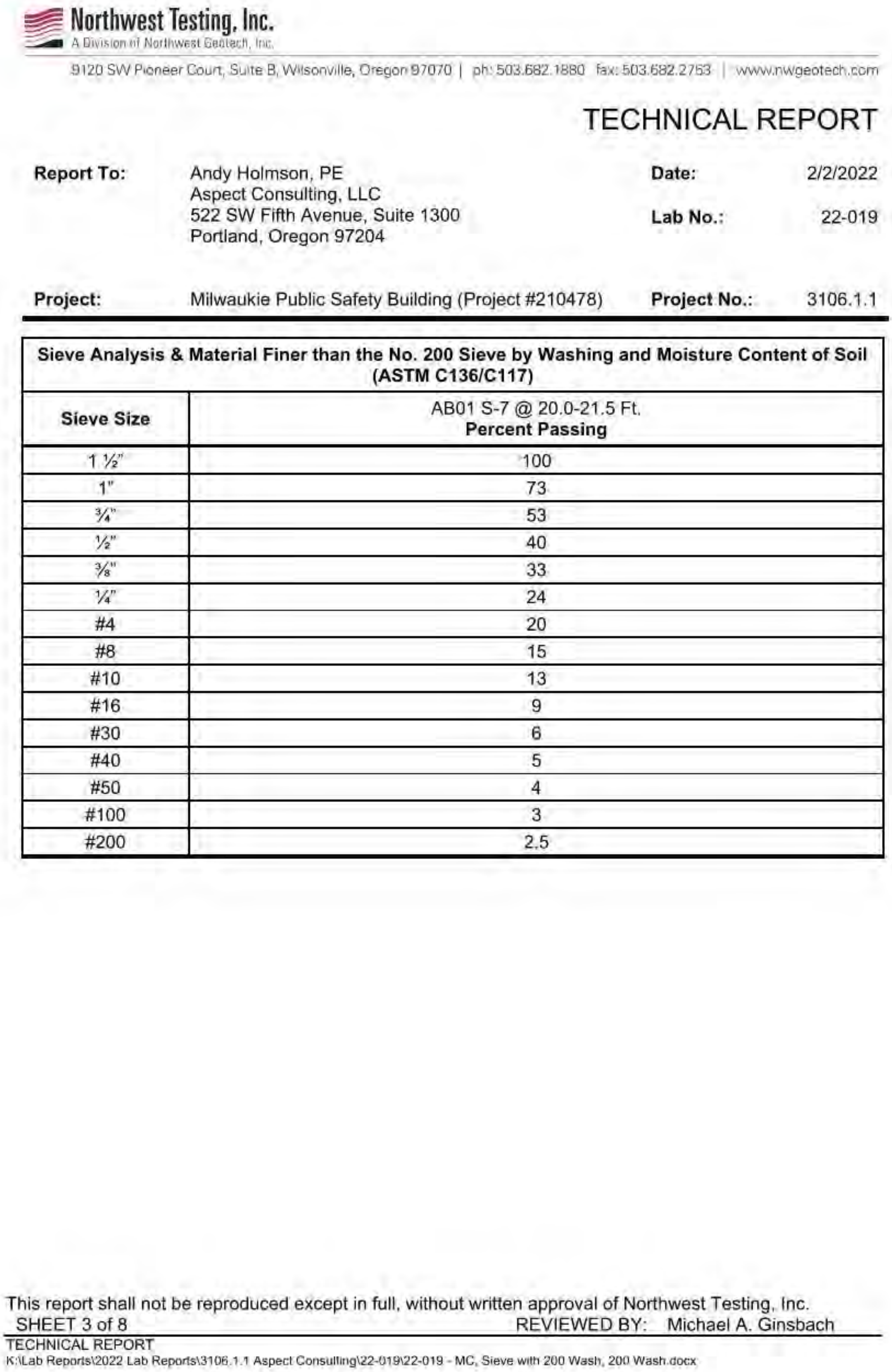

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Sieve Analysis & Material Finer than the No. 200 Sieve by Washing and Moisture Content of Soil (ASTM C136/C117)

Sieve Size	AB01 S-7 @ 20.0-21.5 Ft. **Percent Passing**
1 ½"	100
1"	73
¾"	53
½"	40
⅜"	33
¼"	24
#4	20
#8	15
#10	13
#16	9
#30	6
#40	5
#50	4
#100	3
#200	2.5

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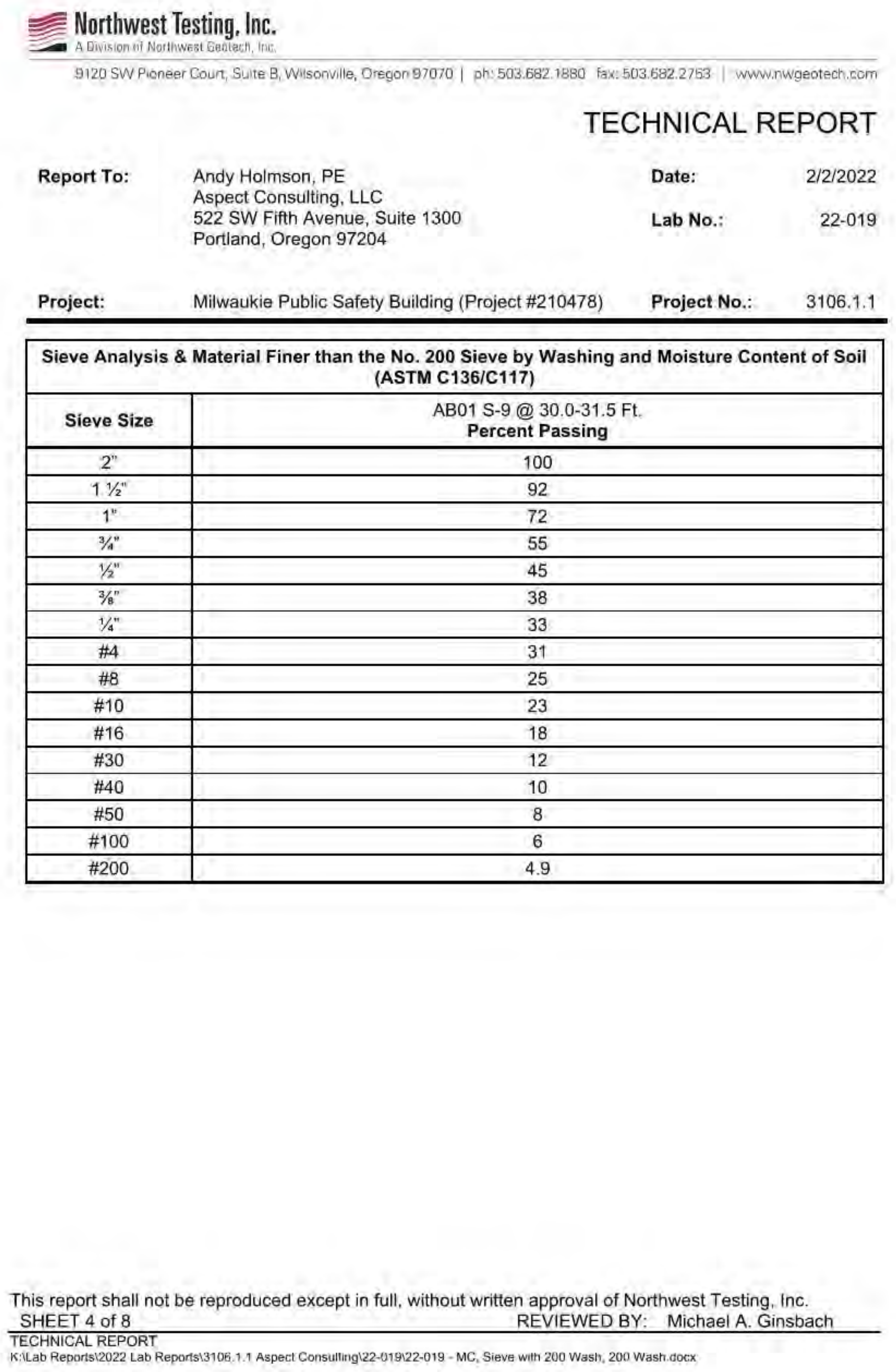

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Sieve Size	AB01 S-9 @ 30.0-31.5 Ft. **Percent Passing**
2"	100
1 ½"	92
1"	72
¾"	55
½"	45
⅜"	38
¼"	33
#4	31
#8	25
#10	23
#16	18
#30	12
#40	10
#50	8
#100	6
#200	4.9

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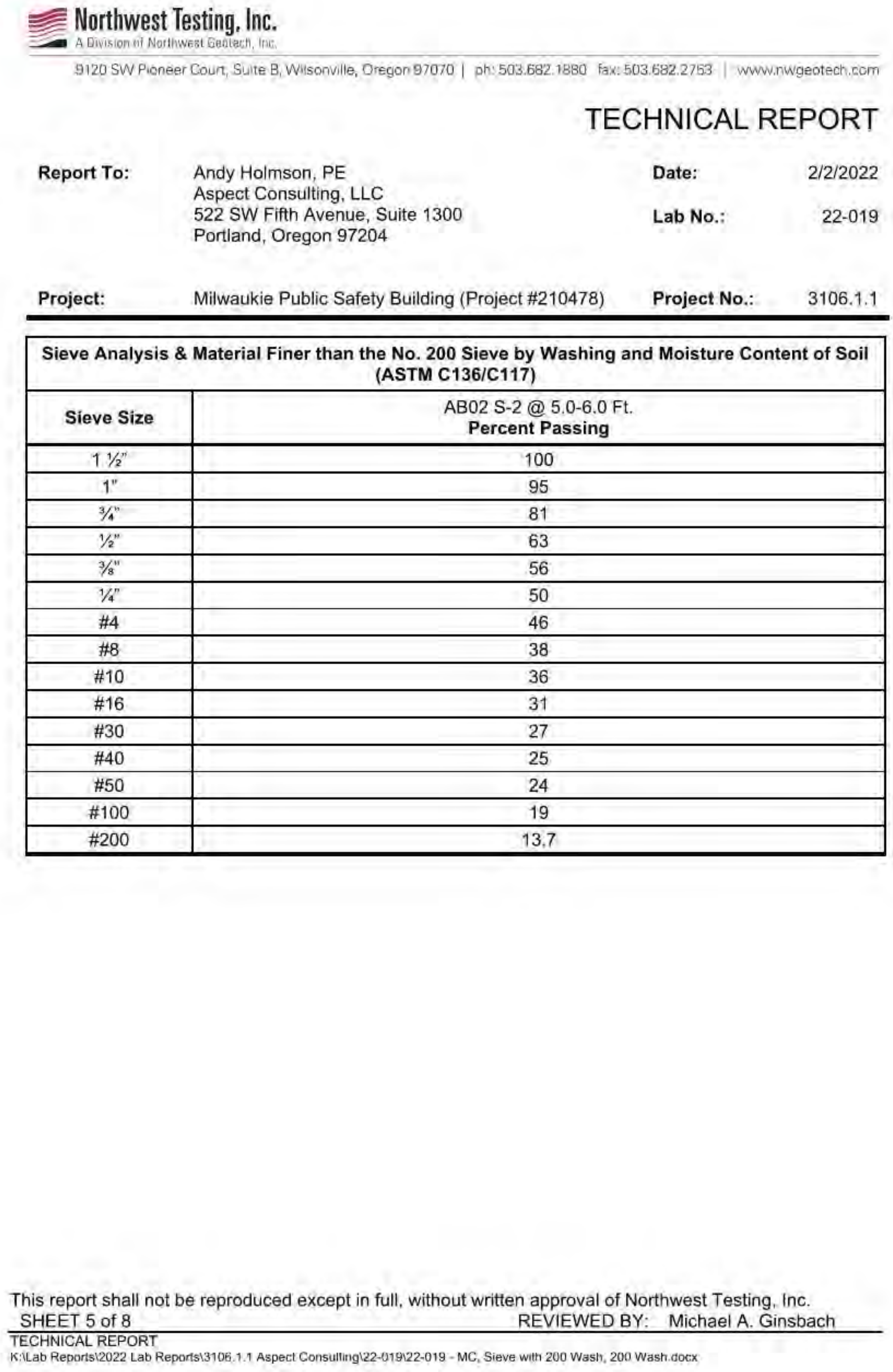

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Lab No.: 22-019

Project: Milwaukie Public Safety Building (Project #210478)

Project No.: 3106.1.1

Sieve Analysis & Material Finer than the No. 200 Sieve by Washing and Moisture Content of Soil (ASTM C136/C117)

Sieve Size	AB02 S-2 @ 5.0-6.0 Ft. **Percent Passing**
1 ½"	100
1"	95
¾"	81
½"	63
⅜"	56
¼"	50
#4	46
#8	38
#10	36
#16	31
#30	27
#40	25
#50	24
#100	19
#200	13.7

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SHEET 5 of 8 REVIEWED BY: Michael A. Ginsbach

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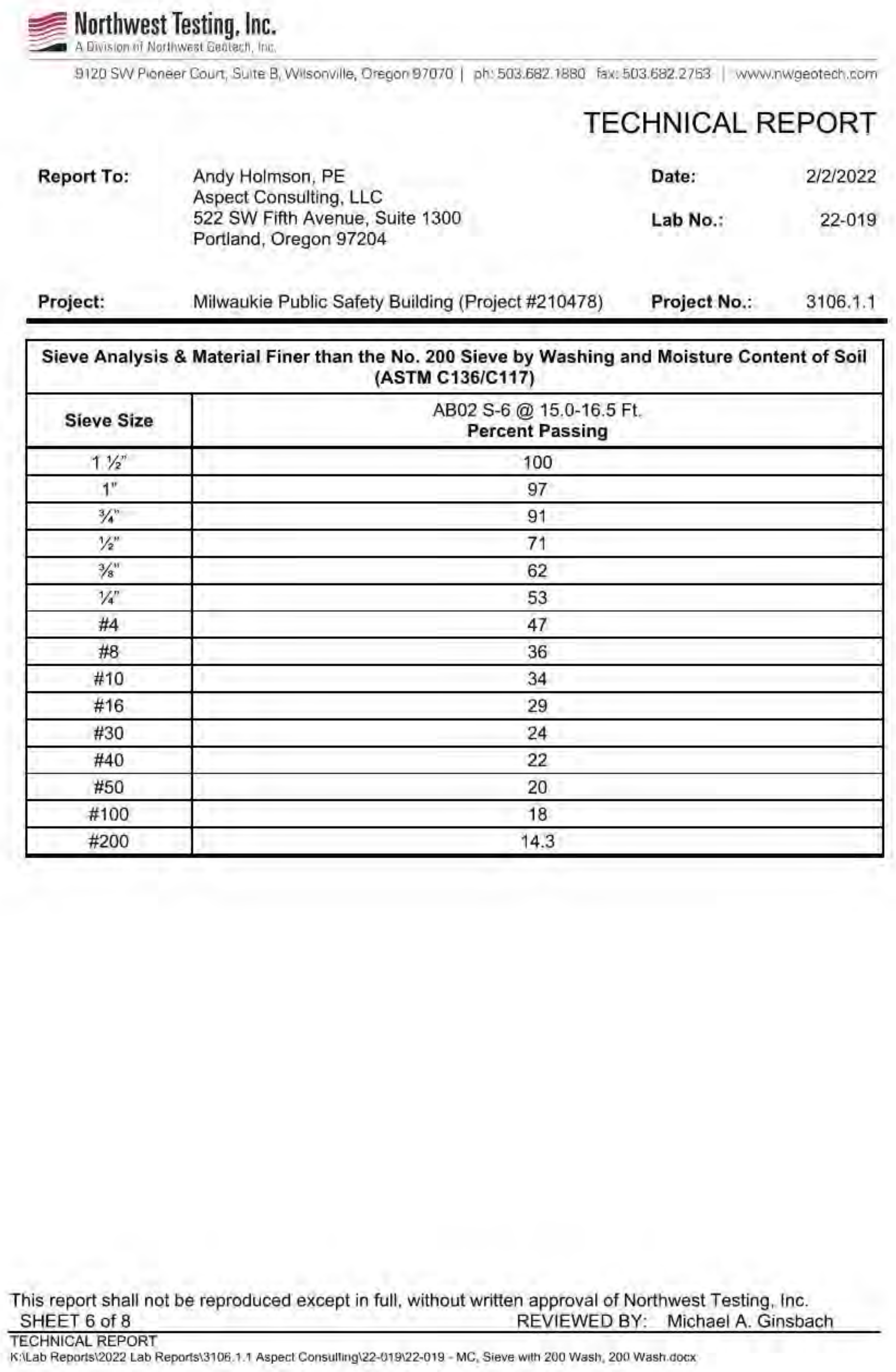

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Lab No.: 22-019

Project: Milwaukie Public Safety Building (Project #210478) **Project No.:** 3106.1.1

Sieve Analysis & Material Finer than the No. 200 Sieve by Washing and Moisture Content of Soil (ASTM C136/C117)

Sieve Size	AB02 S-6 @ 15.0-16.5 Ft. **Percent Passing**
1 ½"	100
1"	97
¾"	91
½"	71
⅜"	62
¼"	53
#4	47
#8	36
#10	34
#16	29
#30	24
#40	22
#50	20
#100	18
#200	14.3

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SHEET 6 of 8 REVIEWED BY: Michael A. Ginsbach

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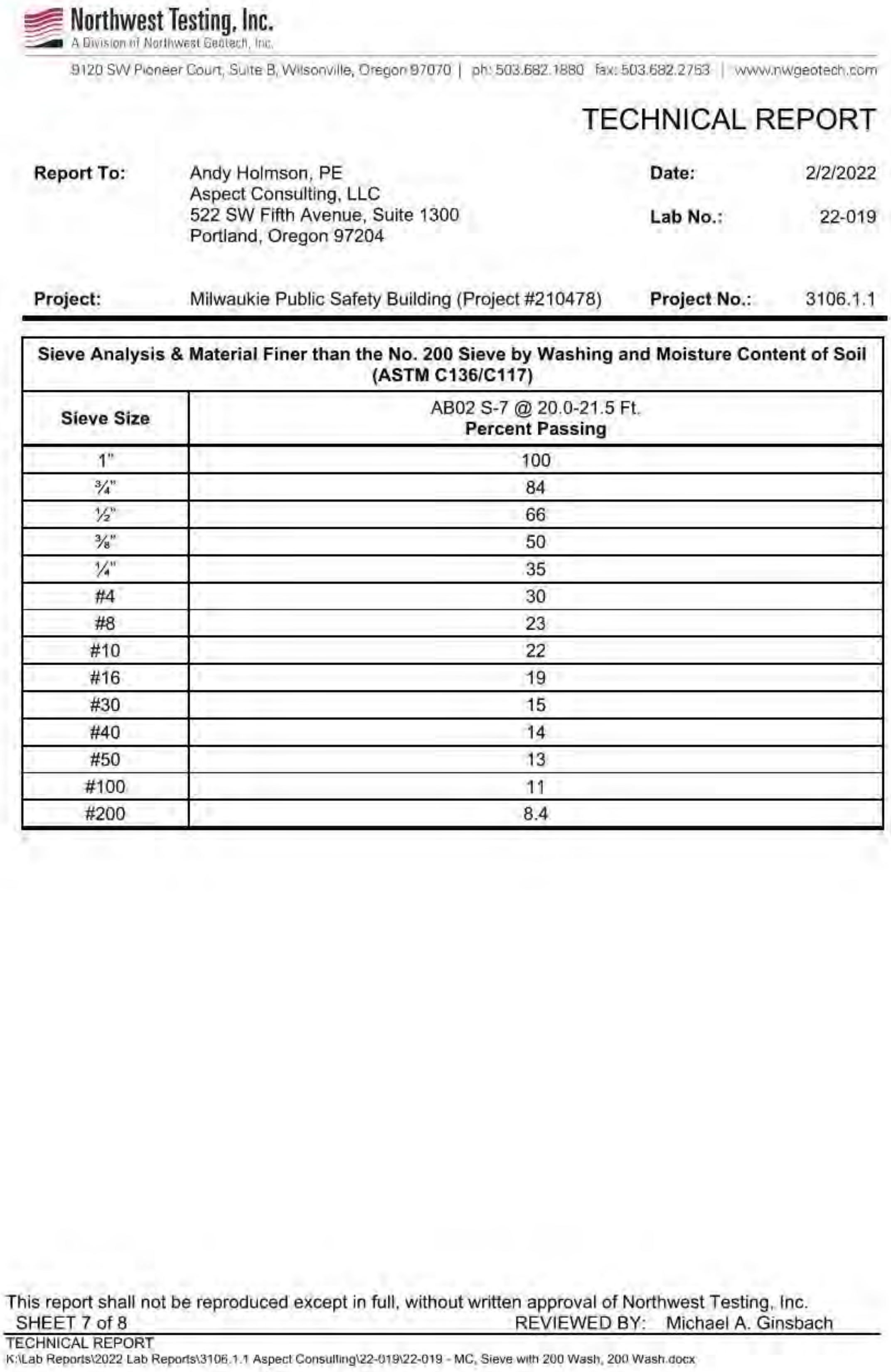

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Sieve Size	AB02 S-7 @ 20.0-21.5 Ft. **Percent Passing**
1"	100
¾"	84
½"	66
⅜"	50
¼"	35
#4	30
#8	23
#10	22
#16	19
#30	15
#40	14
#50	13
#100	11
#200	8.4

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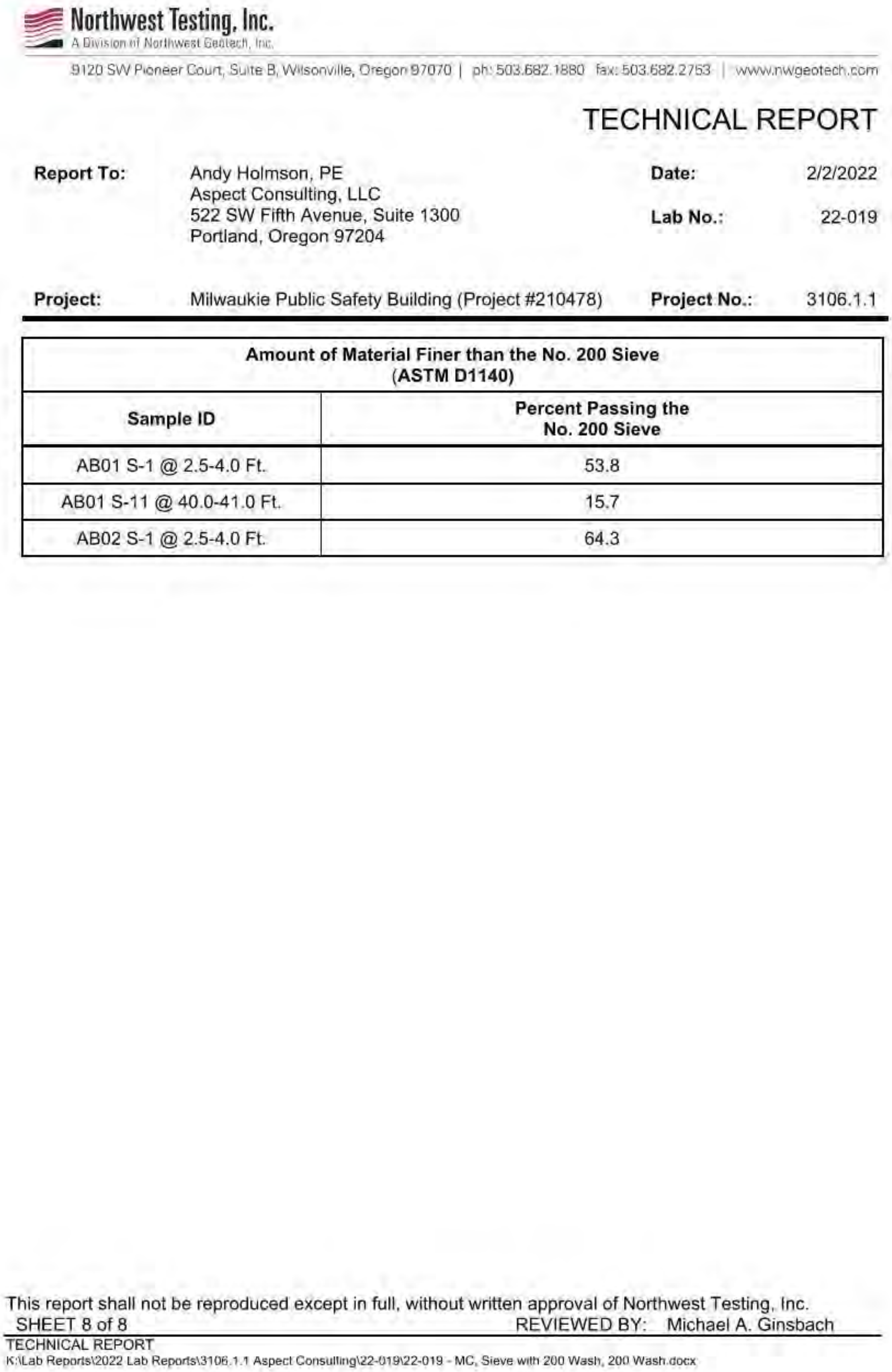

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Portland, Oregon 97204

Date: 2/2/2022

Lab No.: 22-019

Project: Milwaukie Public Safety Building (Project #210478) **Project No.:** 3106.1.1

Amount of Material Finer than the No. 200 Sieve
(ASTM D1140)

Sample ID	Percent Passing the No. 200 Sieve
AB01 S-1 @ 2.5-4.0 Ft.	53.8
AB01 S-11 @ 40.0-41.0 Ft.	15.7
AB02 S-1 @ 2.5-4.0 Ft.	64.3

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SHEET 8 of 8 REVIEWED BY: Michael A. Ginsbach

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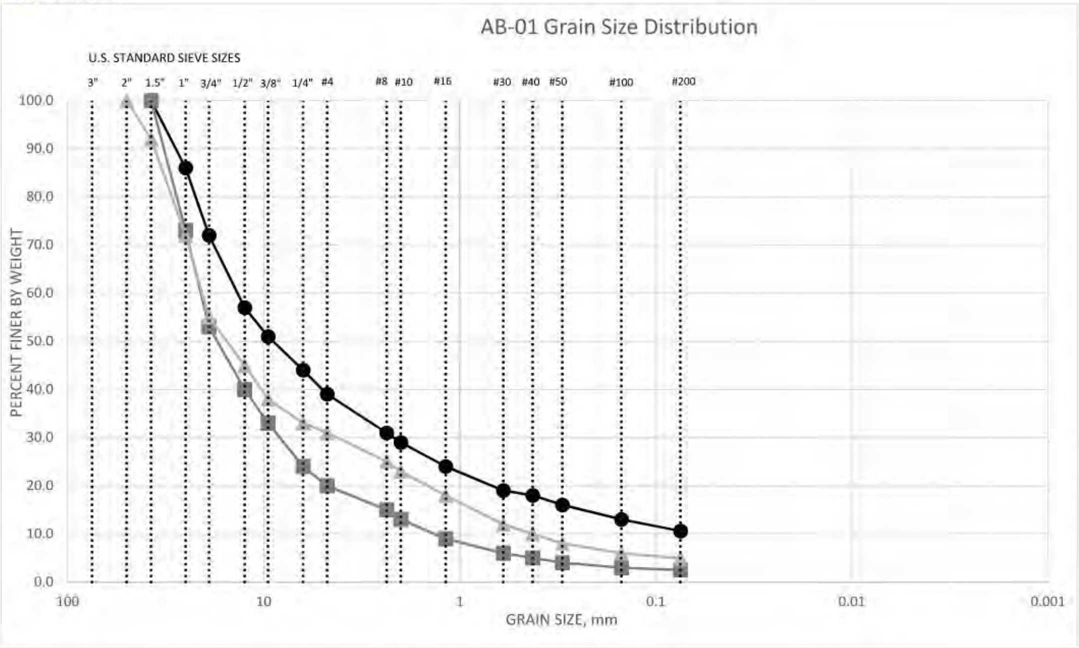
Aspect CONSULTING

Grain Size Distribution



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Silt/Clay Content (%)	Sand Content (%)	Gravel Content (%)	USCS Soil Type
●	AB-01, S3, 7.5-9.0 ft	11.7	10.6	28.4	61.0	GP-GM
■	AB-01, S7, 20.0-21.5 ft	11.6	2.5	17.5	80.0	GP
▲	AB-01, S9, 30.0-31.5 ft	9.6	4.9	26.1	69.0	GP

*The sample(s) tested may not include oversized particles and may only be representative of a portion of the sample/site soil conditions.

Project Name: Milwaukie Public Safety Building Project
Project Number: 210478
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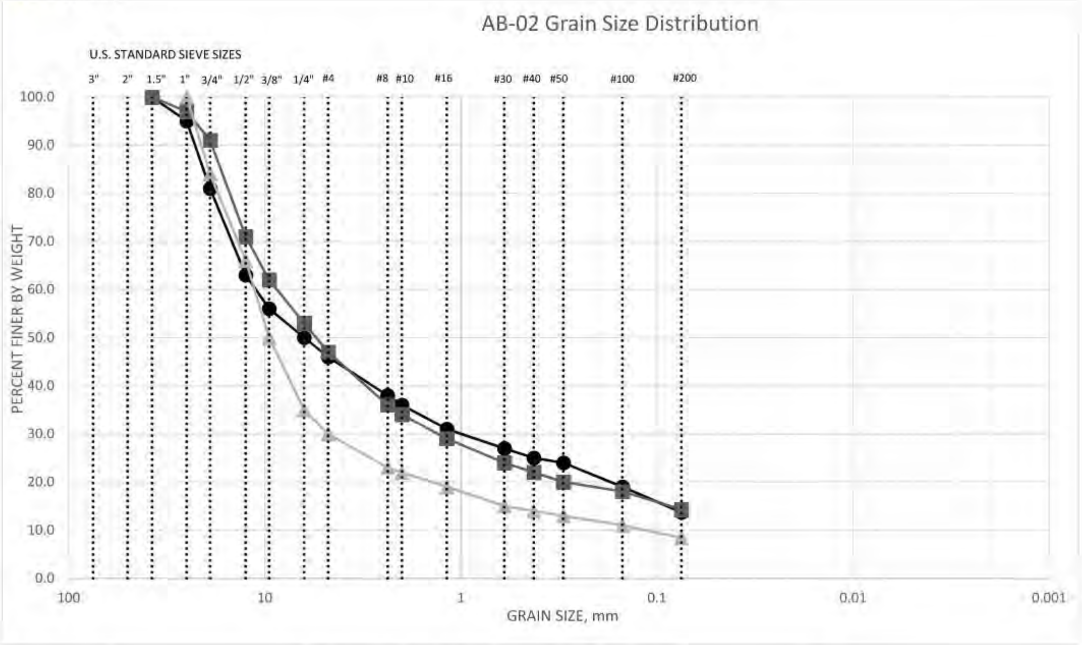
B-1

Grain Size Distribution



Symbol	Exploration, Sample, Depth	Moisture Content (%)	Silt/Clay Content (%)	Sand Content (%)	Gravel Content (%)	USCS Soil Type
●	AB-02, S2, 5.0-6.5 ft	17.2	13.7	32.3	54.0	GP-GM
■	AB-02, S6, 15.0-16.5 ft	12.3	14.3	32.7	53.0	GP-GM
▲	AB-02, S7, 20.0-21.5 ft	14.2	8.4	21.6	70.0	GP

*The sample(s) tested may not include oversized particles and may only be representative of a portion of the sample/site soil conditions.

Project Name: Milwaukie Public Safety Building Project
Project Number: 210478
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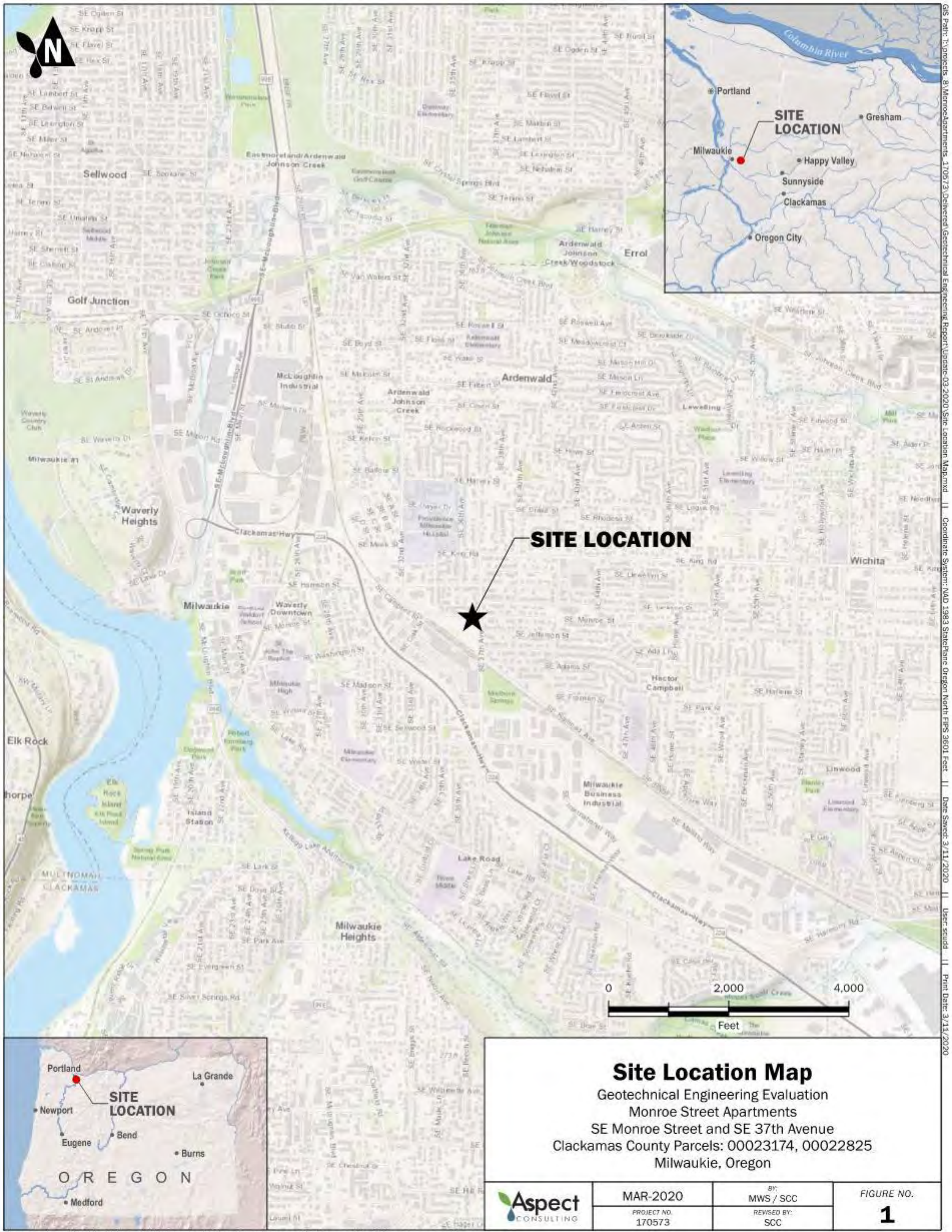
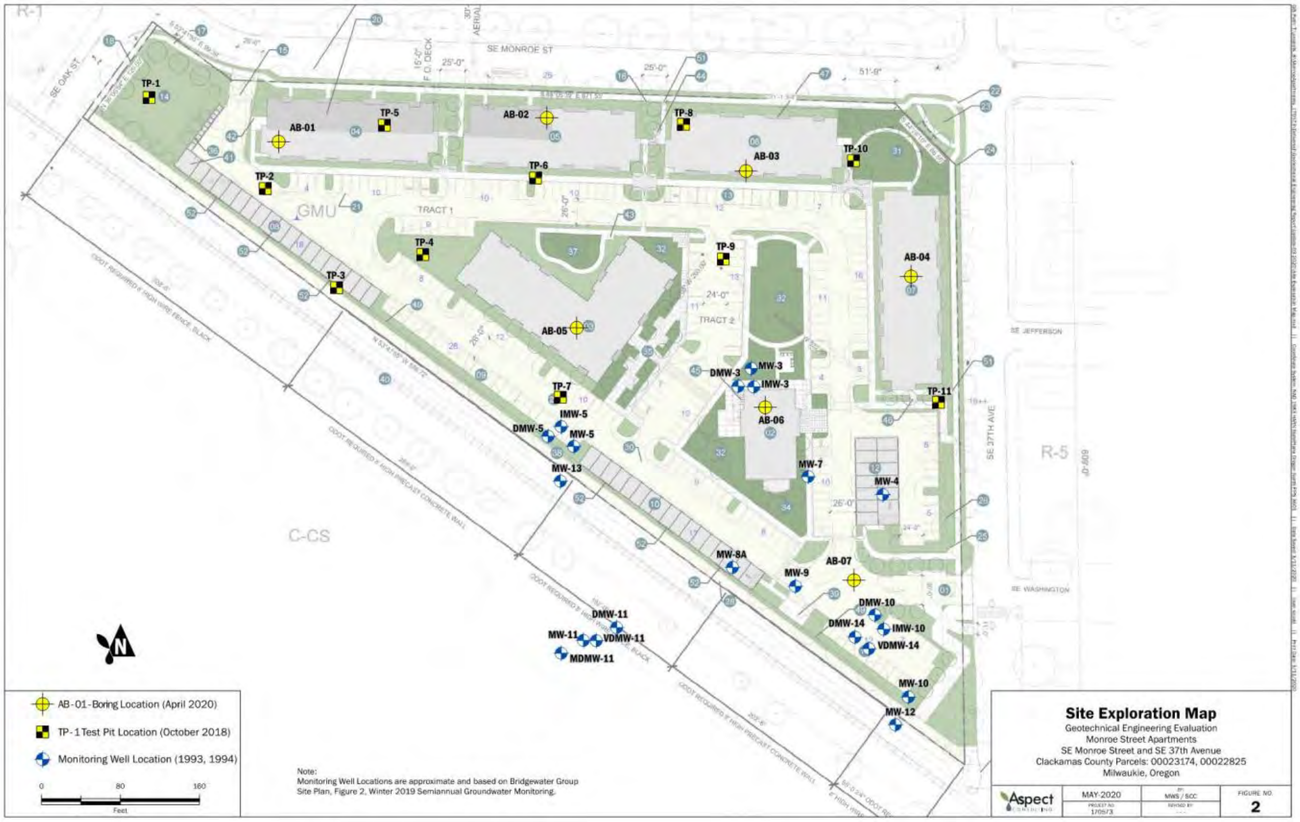
B-2

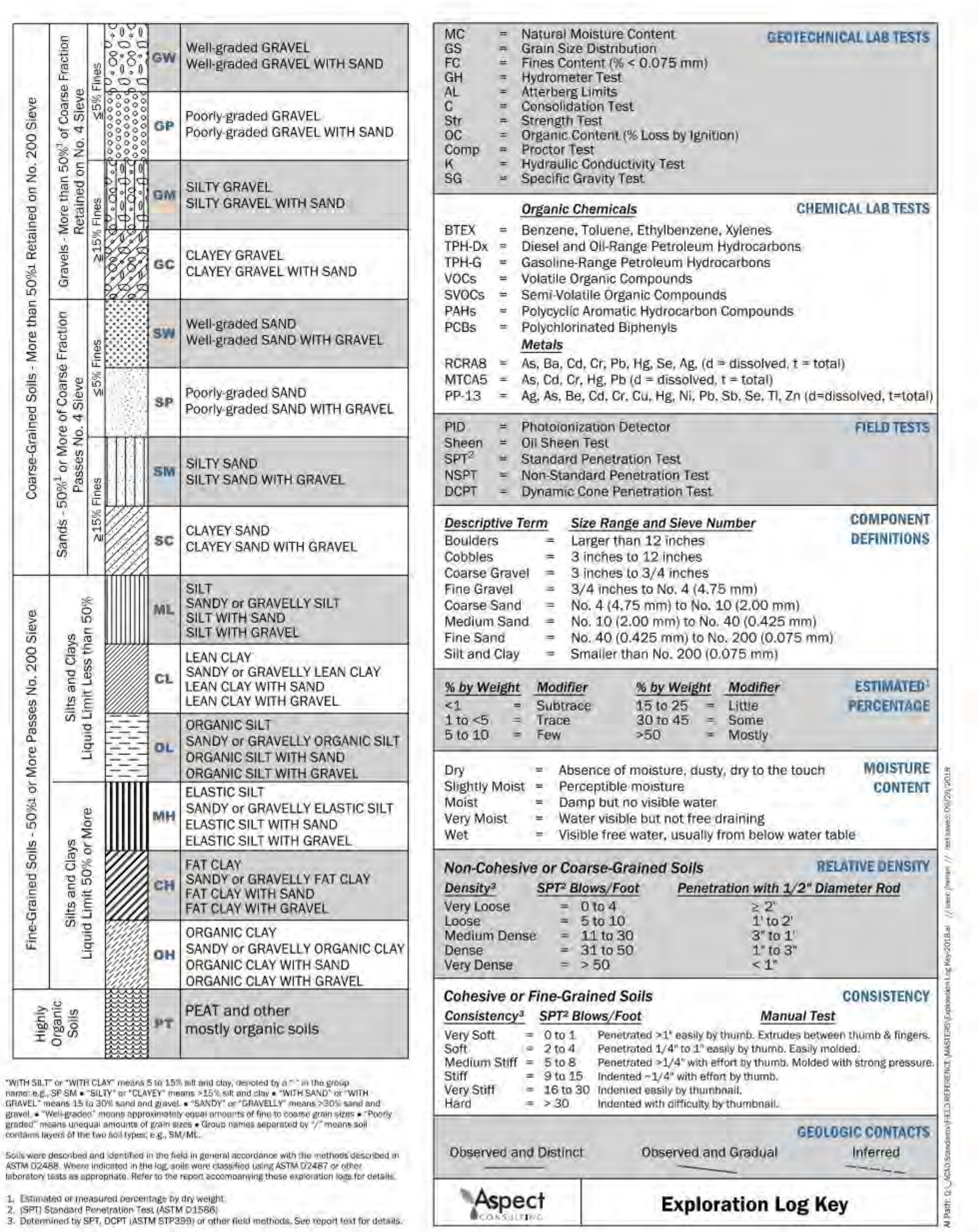
APPENDIX C

Nearby Exploration Logs



Basemap Layer Credits || Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community


R-1
SE OAK ST
SE MONROE ST
GMU
TRACT 1
TRACT 2
C-CS
R-5
SE 27TH AVE
SE JEFFERSON
SE WASHINGTON
TP-1
TP-2
TP-3
TP-4
TP-5
TP-6
TP-7
TP-8
TP-9
TP-10
TP-11
AB-01
AB-02
AB-03
AB-04
AB-05
AB-06
AB-07
MW-3
DMW-3
IMW-3
IMW-5
DMW-5
MW-5
MW-13
MW-7
MW-4
MW-8A
MW-9
DMW-10
DMW-14
IMW-10
VDMW-14
DMW-11
MW-11
VDMW-11
MDMW-11
MW-10
MW-12
N
AB-01-Boring Location (April 2020)
TP-1 Test Pit Location (October 2018)
Monitoring Well Location (1993, 1994)
0
80
160
Feet
Note:
Monitoring Well Locations are approximate and based on Bridgewater Group Site Plan, Figure 2, Winter 2019 Semiannual Groundwater Monitoring.
Site Exploration Map
Geotechnical Engineering Evaluation
Monroe Street Apartments
SE Monroe Street and SE 37th Avenue
Clackamas County Parcels: 00023174, 00022825
Milwaukie, Oregon
Aspect
MAY-2020
PROJECT NO
170573
BY
MWS / SCC
REVISED BY
FIGURE NO
2



Coarse-Grained Soils - More than 50%1 Retained on No. 200 Sieve	Gravels - More than 50%¹ of Coarse Fraction Retained on No. 4 Sieve	≤5% Fines	GW	Well-graded GRAVEL Well-graded GRAVEL WITH SAND
			GP	Poorly-graded GRAVEL Poorly-graded GRAVEL WITH SAND
		≥15% Fines	GM	SILTY GRAVEL SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL CLAYEY GRAVEL WITH SAND
	Sands - 50%¹ or More of Coarse Fraction Passes No. 4 Sieve	≤5% Fines	SW	Well-graded SAND Well-graded SAND WITH GRAVEL
			SP	Poorly-graded SAND Poorly-graded SAND WITH GRAVEL
		≥15% Fines	SM	SILTY SAND SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND CLAYEY SAND WITH GRAVEL
Fine-Grained Soils - 50%1 or More Passes No. 200 Sieve	Silts and Clays Liquid Limit Less than 50%		ML	SILT SANDY or GRAVELLY SILT SILT WITH SAND SILT WITH GRAVEL
			CL	LEAN CLAY SANDY or GRAVELLY LEAN CLAY LEAN CLAY WITH SAND LEAN CLAY WITH GRAVEL
			OL	ORGANIC SILT SANDY or GRAVELLY ORGANIC SILT ORGANIC SILT WITH SAND ORGANIC SILT WITH GRAVEL
	Silts and Clays Liquid Limit 50% or More		MH	ELASTIC SILT SANDY or GRAVELLY ELASTIC SILT ELASTIC SILT WITH SAND ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY SANDY or GRAVELLY FAT CLAY FAT CLAY WITH SAND FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY SANDY or GRAVELLY ORGANIC CLAY ORGANIC CLAY WITH SAND ORGANIC CLAY WITH GRAVEL
Highly Organic Soils			PT	PEAT and other mostly organic soils

"WITH SILT" or "WITH CLAY" means 5 to 15% silt and clay, denoted by a "-" in the group name: e.g., SP-SM • "SILTY" or "CLAYEY" means >15% silt and clay • "WITH SAND" or "WITH GRAVEL" means 15 to 30% sand and gravel. • "SANDY" or "GRAVELLY" means >30% sand and gravel. • "Well-graded" means approximately equal amounts of fine to coarse grain sizes • "Poorly graded" means unequal amounts of grain sizes • Group names separated by "/" means soil contains layers of the two soil types; e.g., SM/ML.

Soils were described and identified in the field in general accordance with the methods described in ASTM D2488. Where indicated in the log, soils were classified using ASTM D2487 or other laboratory tests as appropriate. Refer to the report accompanying these exploration logs for details.

1. Estimated or measured percentage by dry weight
2. (SPT) Standard Penetration Test (ASTM D1586)
3. Determined by SPT, DCPT (ASTM STP399) or other field methods. See report text for details.

GEOTECHNICAL LAB TESTS

MC = Natural Moisture Content
GS = Grain Size Distribution
FC = Fines Content (% < 0.075 mm)
GH = Hydrometer Test
AL = Atterberg Limits
C = Consolidation Test
Str = Strength Test
OC = Organic Content (% Loss by Ignition)
Comp = Proctor Test
K = Hydraulic Conductivity Test
SG = Specific Gravity Test

CHEMICAL LAB TESTS

Organic Chemicals

BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
TPH-Dx = Diesel and Oil-Range Petroleum Hydrocarbons
TPH-G = Gasoline-Range Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
SVOCs = Semi-Volatile Organic Compounds
PAHs = Polycyclic Aromatic Hydrocarbon Compounds
PCBs = Polychlorinated Biphenyls

Metals

RCRA8 = As, Ba, Cd, Cr, Pb, Hg, Se, Ag, (d = dissolved, t = total)
MTCA5 = As, Cd, Cr, Hg, Pb (d = dissolved, t = total)
PP-13 = Ag, As, Be, Cd, Cr, Cu, Hg, Ni, Pb, Sb, Se, Tl, Zn (d=dissolved, t=total)

FIELD TESTS

PID = Photoionization Detector
Sheen = Oil Sheen Test
SPT² = Standard Penetration Test
NSPT = Non-Standard Penetration Test
DCPT = Dynamic Cone Penetration Test

COMPONENT DEFINITIONS

Descriptive Term		*Size Range and Sieve Number*
Boulders	=	Larger than 12 inches
Cobbles	=	3 inches to 12 inches
Coarse Gravel	=	3 inches to 3/4 inches
Fine Gravel	=	3/4 inches to No. 4 (4.75 mm)
Coarse Sand	=	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	=	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	=	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	=	Smaller than No. 200 (0.075 mm)

ESTIMATED¹ PERCENTAGE

% by Weight		*Modifier*	*% by Weight*		*Modifier*
<1	=	Subtrace	15 to 25	=	Little
1 to <5	=	Trace	30 to 45	=	Some
5 to 10	=	Few	>50	=	Mostly

MOISTURE CONTENT

Dry = Absence of moisture, dusty, dry to the touch
Slightly Moist = Perceptible moisture
Moist = Damp but no visible water
Very Moist = Water visible but not free draining
Wet = Visible free water, usually from below water table

RELATIVE DENSITY

Non-Cohesive or Coarse-Grained Soils

Density³		*SPT² Blows/Foot*	*Penetration with 1/2" Diameter Rod*
Very Loose	=	0 to 4	≥ 2'
Loose	=	5 to 10	1' to 2'
Medium Dense	=	11 to 30	3" to 1'
Dense	=	31 to 50	1" to 3"
Very Dense	=	> 50	< 1"

CONSISTENCY

Cohesive or Fine-Grained Soils

Consistency³		*SPT² Blows/Foot*	*Manual Test*
Very Soft	=	0 to 1	Penetrated >1' easily by thumb. Extrudes between thumb & fingers.
Soft	=	2 to 4	Penetrated 1/4" to 1" easily by thumb. Easily molded.
Medium Stiff	=	5 to 8	Penetrated >1/4" with effort by thumb. Molded with strong pressure.
Stiff	=	9 to 15	Indented ~1/4" with effort by thumb.
Very Stiff	=	16 to 30	Indented easily by thumbnail.
Hard	=	> 30	Indented with difficulty by thumbnail.

GEOLOGIC CONTACTS

Observed and Distinct
Observed and Gradual
Inferred

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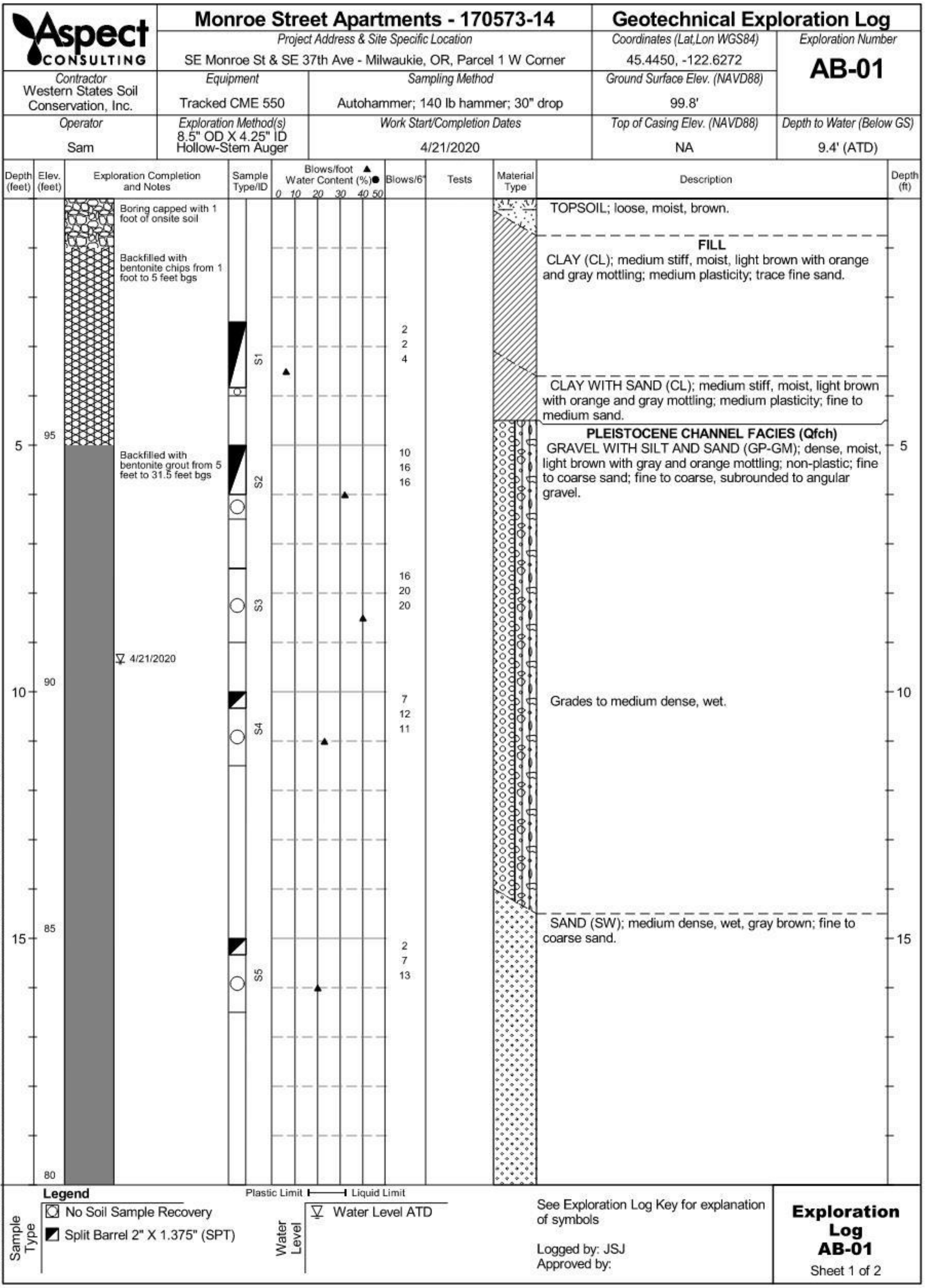
Exploration Log Key

AI Path: Q:_ACAD Standards\FIELD REFERENCE MASTERS\Exploration Log Key-2018.ai // user: jhaman // last saved: 09/28/2018



Aspect CONSULTING

Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 W Corner
Coordinates (Lat,Lon WGS84)	45.4450, -122.6272
Exploration Number	**AB-01**
Contractor	Western States Soil Conservation, Inc.
Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	99.8'
Operator	Sam
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/21/2020
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	9.4' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Boring capped with 1 foot of onsite soil						TOPSOIL; loose, moist, brown.	
		Backfilled with bentonite chips from 1 foot to 5 feet bgs						**FILL** CLAY (CL); medium stiff, moist, light brown with orange and gray mottling; medium plasticity; trace fine sand.	
			S1		2 2 4				
								CLAY WITH SAND (CL); medium stiff, moist, light brown with orange and gray mottling; medium plasticity; fine to medium sand.	
								PLEISTOCENE CHANNEL FACIES (Qfch) GRAVEL WITH SILT AND SAND (GP-GM); dense, moist, light brown with gray and orange mottling; non-plastic; fine to coarse sand; fine to coarse, subrounded to angular gravel.	
5	95	Backfilled with bentonite grout from 5 feet to 31.5 feet bgs	S2		10 16 16				5
			S3		16 20 20				
		∇ 4/21/2020							
10	90		S4		7 12 11			Grades to medium dense, wet.	10
								SAND (SW); medium dense, wet, gray brown; fine to coarse sand.	
15	85		S5		2 7 13				15
	80								

Plastic Limit ├──┤ Liquid Limit

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

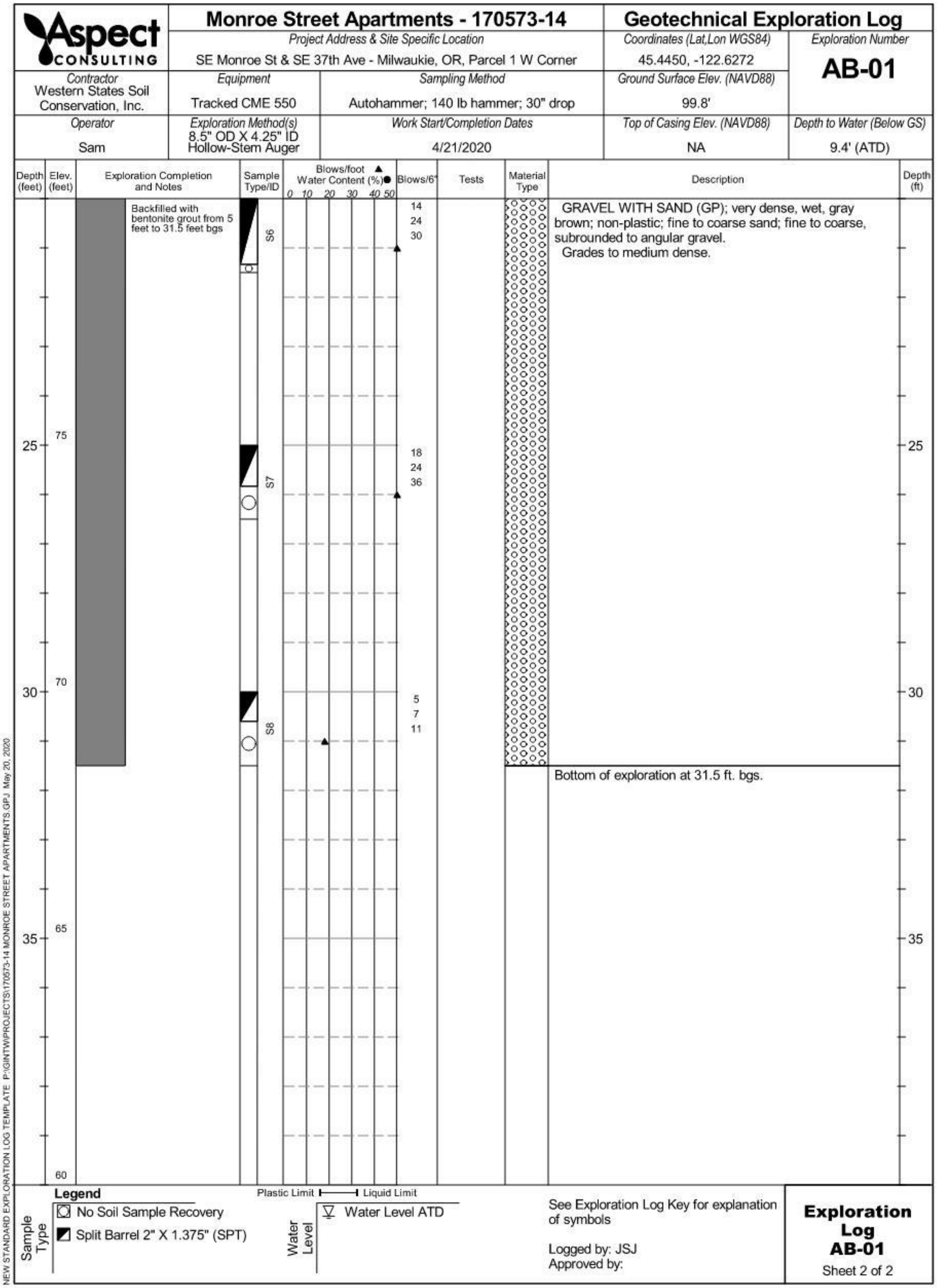
Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log AB-01
Sheet 1 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location		Coordinates (Lat,Lon WGS84)	Exploration Number
SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 W Corner		45.4450, -122.6272	**AB-01**
Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Western States Soil Conservation, Inc.	Tracked CME 550	Autohammer; 140 lb hammer; 30" drop	99.8'	
Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Sam	8.5" OD X 4.25" ID Hollow-Stem Auger	4/21/2020	NA	9.4' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/6"	Tests	Description
		Backfilled with bentonite grout from 5 feet to 31.5 feet bgs	S6	14 24 30		GRAVEL WITH SAND (GP); very dense, wet, gray brown; non-plastic; fine to coarse sand; fine to coarse, subrounded to angular gravel. Grades to medium dense.
25	75		S7	18 24 36		
30	70		S8	5 7 11		
						Bottom of exploration at 31.5 ft. bgs.
35	65					
	60					

Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├─┤ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
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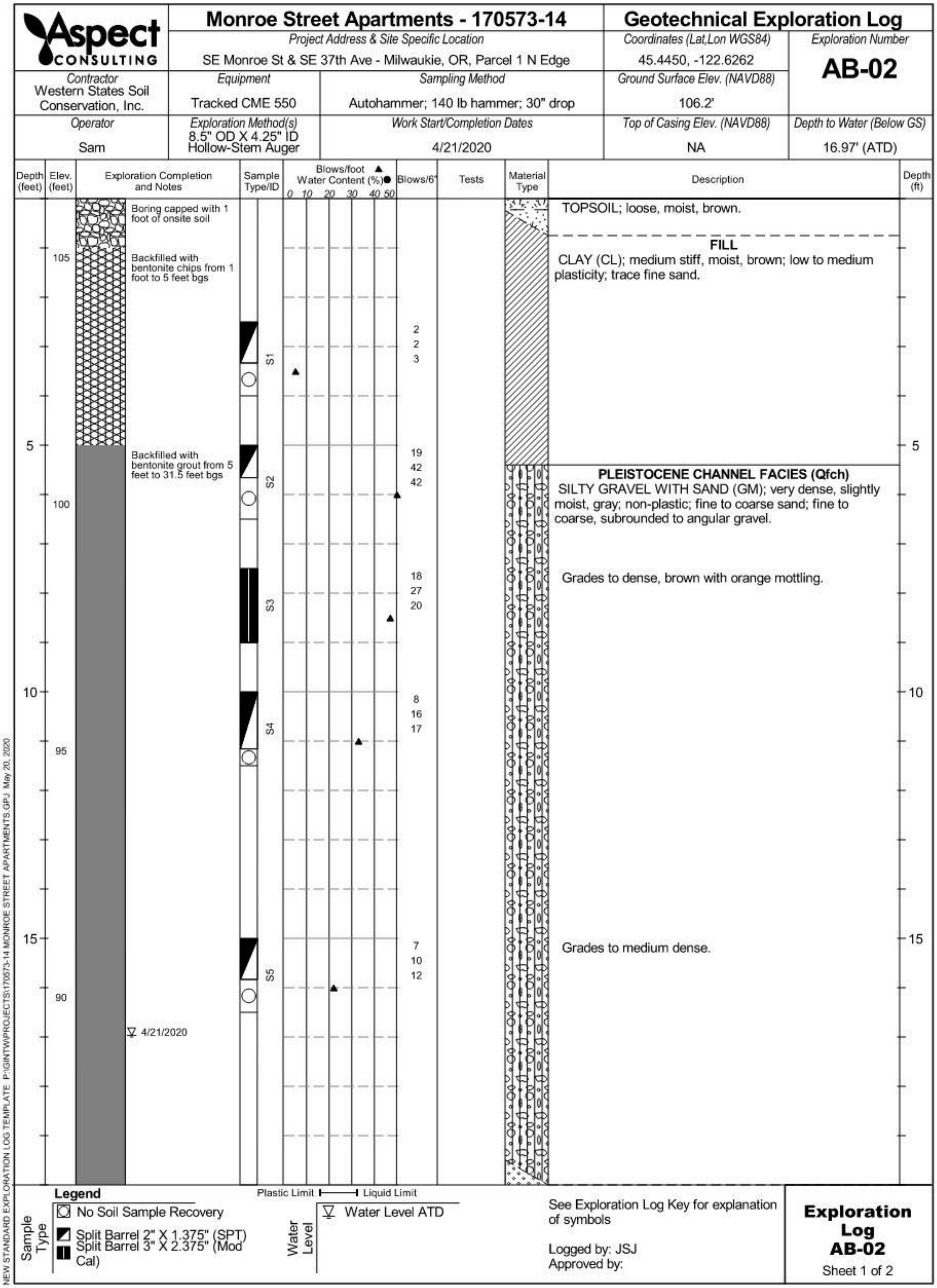
Exploration Log
AB-01
Sheet 2 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



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Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 N Edge
Coordinates (Lat,Lon WGS84)	45.4450, -122.6262
Exploration Number	**AB-02**
Contractor	Western States Soil Conservation, Inc.
Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	106.2'
Operator	Sam
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/21/2020
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	16.97' (ATD)

Exploration Completion and Notes:

- Boring capped with 1 foot of onsite soil
- Backfilled with bentonite chips from 1 foot to 5 feet bgs
- Backfilled with bentonite grout from 5 feet to 31.5 feet bgs
- ⊻ 4/21/2020

Sample Type/ID	Blows/6"
S1	2 2 3
S2	19 42 42
S3	18 27 20
S4	8 16 17
S5	7 10 12

Description:

TOPSOIL; loose, moist, brown.

FILL
CLAY (CL); medium stiff, moist, brown; low to medium plasticity; trace fine sand.

PLEISTOCENE CHANNEL FACIES (Qfch)
SILTY GRAVEL WITH SAND (GM); very dense, slightly moist, gray; non-plastic; fine to coarse sand; fine to coarse, subrounded to angular gravel.

Grades to dense, brown with orange mottling.

Grades to medium dense.

Legend

Sample Type:
- ☒ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)
- ■ Split Barrel 3" X 2.375" (Mod Cal)

Water Level:
- ⊻ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
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Exploration Log AB-02
Sheet 1 of 2

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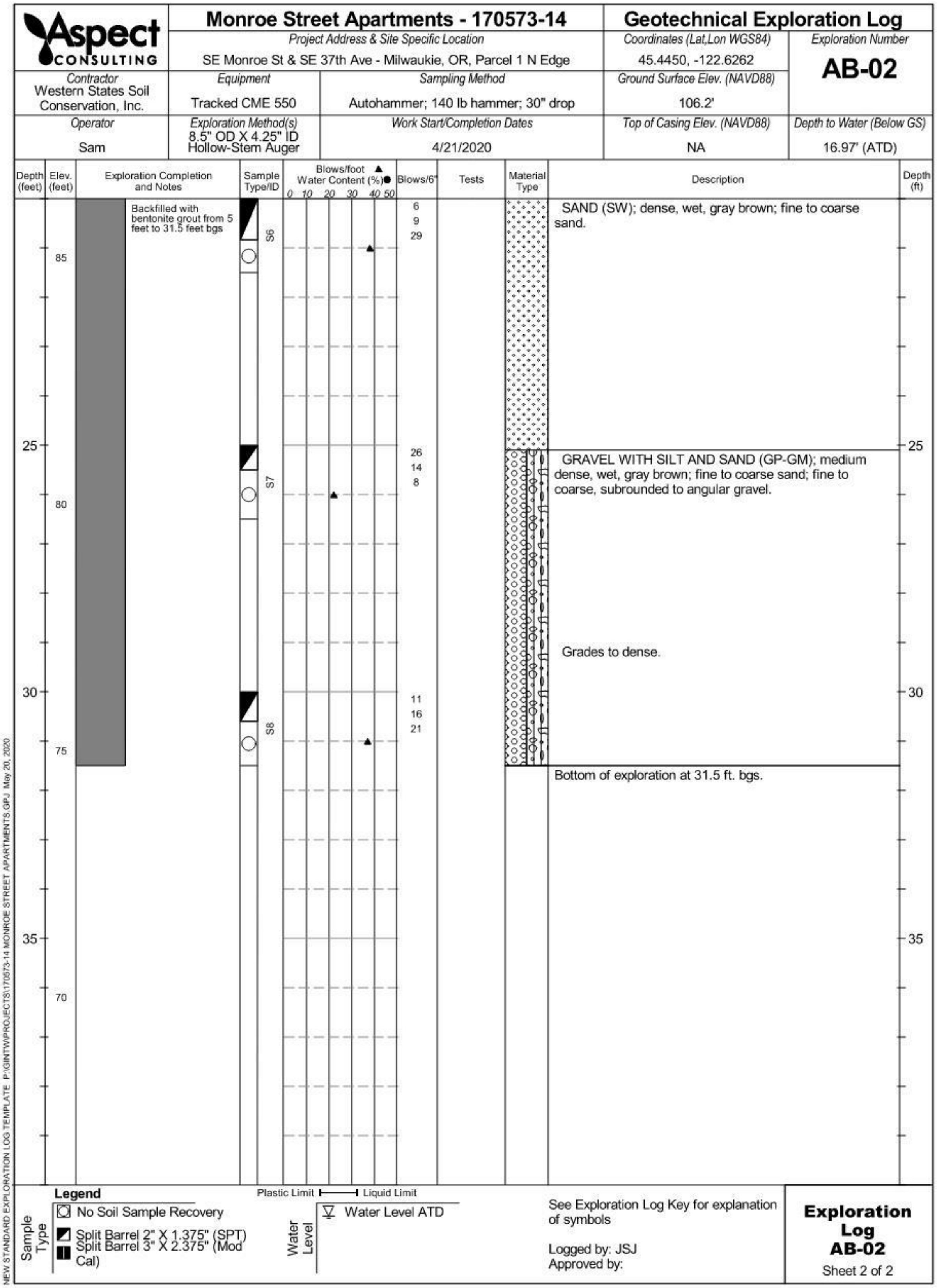

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Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 N Edge		Coordinates (Lat,Lon WGS84)	45.4450, -122.6262
Exploration Number	**AB-02**			
Contractor	Western States Soil Conservation, Inc.			
Equipment	Tracked CME 550			
Sampling Method	Autohammer; 140 lb hammer; 30" drop			
Ground Surface Elev. (NAVD88)	106.2'			
Operator	Sam			
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger			
Work Start/Completion Dates	4/21/2020			
Top of Casing Elev. (NAVD88)	NA			
Depth to Water (Below GS)	16.97' (ATD)			

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/6"	Description
		Backfilled with bentonite grout from 5 feet to 31.5 feet bgs	S6	6 9 29	SAND (SW); dense, wet, gray brown; fine to coarse sand.
	85				
25			S7	26 14 8	GRAVEL WITH SILT AND SAND (GP-GM); medium dense, wet, gray brown; fine to coarse sand; fine to coarse, subrounded to angular gravel.
	80				
					Grades to dense.
30			S8	11 16 21	
	75				Bottom of exploration at 31.5 ft. bgs.
35					
	70				

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)
- ■ Split Barrel 3" X 2.375" (Mod Cal)

Plastic Limit ├─┤ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
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Exploration Log
AB-02
Sheet 2 of 2

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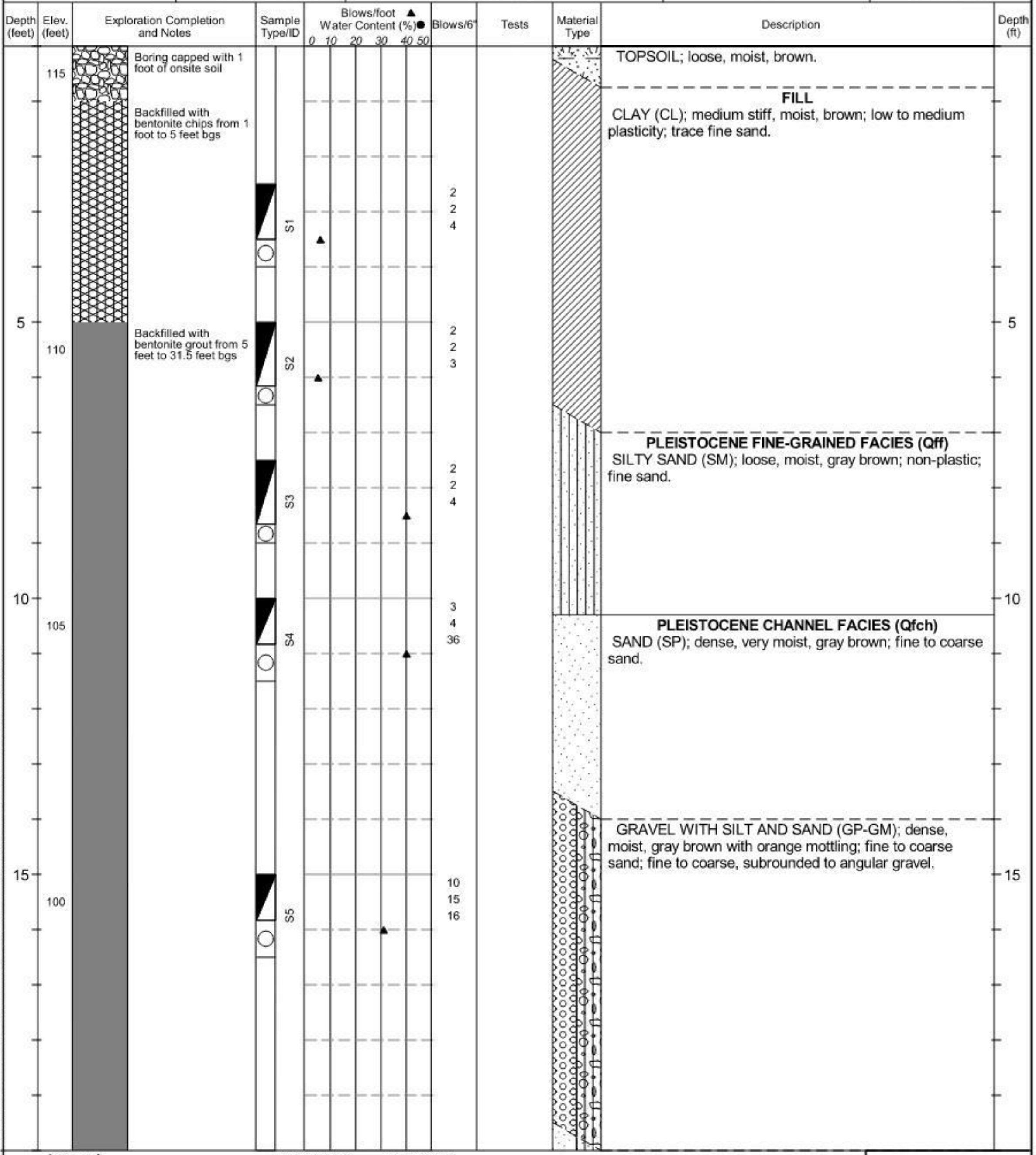
Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 NE Corner
Coordinates (Lat,Lon WGS84)	45.4450, -122.6253
Exploration Number	**AB-03**
Contractor	Western States Soil Conservation, Inc.
Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	115.5'
Operator	Sam
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/22/2020
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	25.8' (ATD)



Boring capped with 1 foot of onsite soil

Backfilled with bentonite chips from 1 foot to 5 feet bgs

Backfilled with bentonite grout from 5 feet to 31.5 feet bgs

Sample Type/ID	Blows/6"
S1	2 2 4
S2	2 2 3
S3	2 2 4
S4	3 4 36
S5	10 15 16

TOPSOIL; loose, moist, brown.

FILL
CLAY (CL); medium stiff, moist, brown; low to medium plasticity; trace fine sand.

PLEISTOCENE FINE-GRAINED FACIES (Qff)
SILTY SAND (SM); loose, moist, gray brown; non-plastic; fine sand.

PLEISTOCENE CHANNEL FACIES (Qfch)
SAND (SP); dense, very moist, gray brown; fine to coarse sand.

GRAVEL WITH SILT AND SAND (GP-GM); dense, moist, gray brown with orange mottling; fine to coarse sand; fine to coarse, subrounded to angular gravel.

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├─┤ Liquid Limit

Water Level
- ⊽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
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Exploration Log AB-03
Sheet 1 of 2

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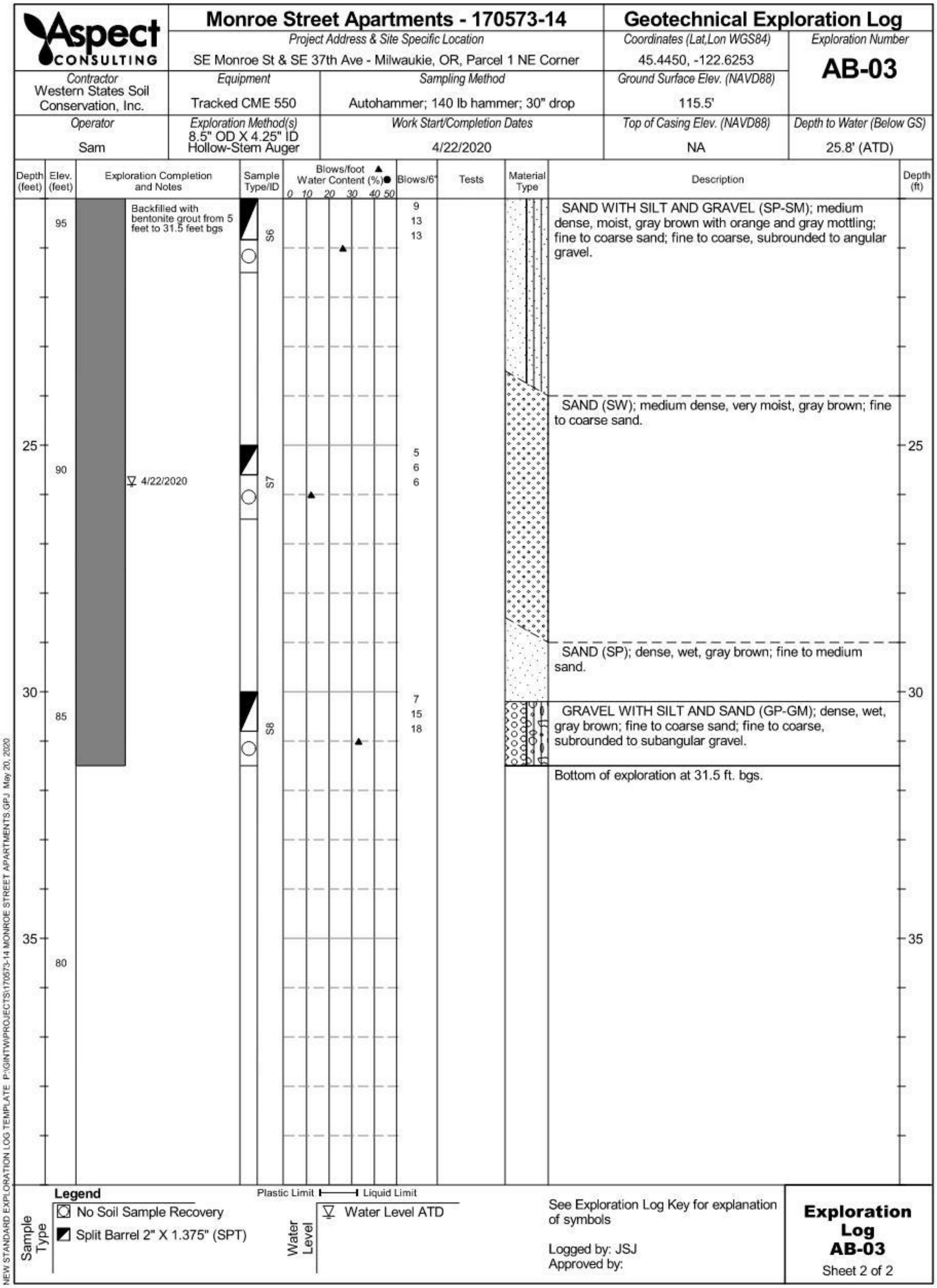

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Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 NE Corner
Coordinates (Lat,Lon WGS84)	45.4450, -122.6253
Exploration Number	**AB-03**
Contractor	Western States Soil Conservation, Inc.
Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	115.5'
Operator	Sam
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/22/2020
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	25.8' (ATD)

Exploration Completion and Notes: Backfilled with bentonite grout from 5 feet to 31.5 feet bgs

▽ 4/22/2020

Sample Type/ID	Blows/6"
S6	9 13 13
S7	5 6 6
S8	7 15 18

Description:

SAND WITH SILT AND GRAVEL (SP-SM); medium dense, moist, gray brown with orange and gray mottling; fine to coarse sand; fine to coarse, subrounded to angular gravel.

SAND (SW); medium dense, very moist, gray brown; fine to coarse sand.

SAND (SP); dense, wet, gray brown; fine to medium sand.

GRAVEL WITH SILT AND SAND (GP-GM); dense, wet, gray brown; fine to coarse sand; fine to coarse, subrounded to subangular gravel.

Bottom of exploration at 31.5 ft. bgs.

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├──┤ Liquid Limit

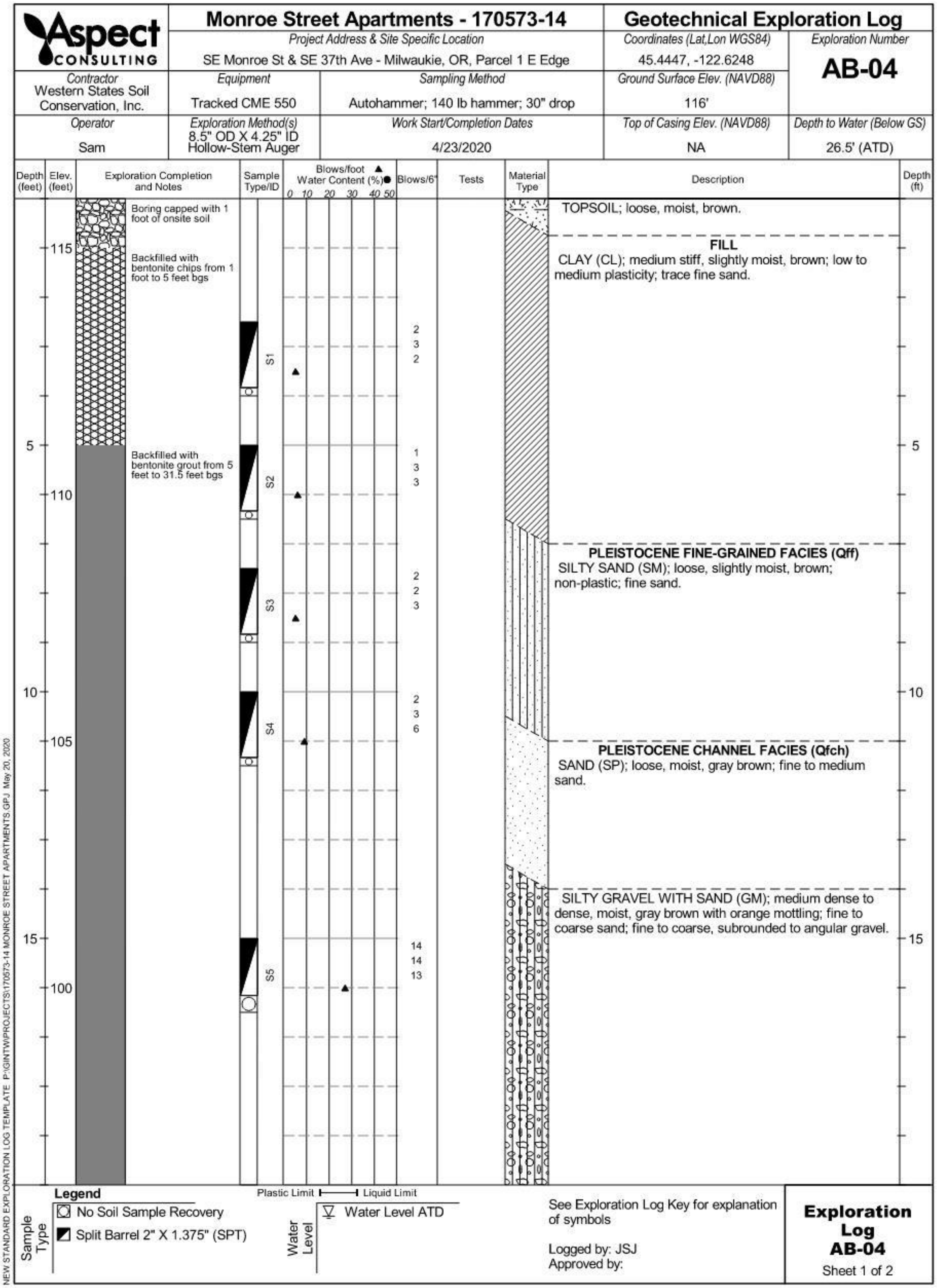
Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log
AB-03
Sheet 2 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 E Edge
Coordinates (Lat,Lon WGS84)	45.4447, -122.6248
Exploration Number	**AB-04**
Contractor	Western States Soil Conservation, Inc.
Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	116'
Operator	Sam
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/23/2020
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	26.5' (ATD)

Depth (feet) | Elev. (feet) | Exploration Completion and Notes | Sample Type/ID | Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50 | Blows/6" | Tests | Material Type | Description | Depth (ft)

Exploration Completion and Notes:

- Boring capped with 1 foot of onsite soil
- Backfilled with bentonite chips from 1 foot to 5 feet bgs
- Backfilled with bentonite grout from 5 feet to 31.5 feet bgs

Sample Type/ID	Blows/6"
S1	2 3 2
S2	1 3 3
S3	2 2 3
S4	2 3 6
S5	14 14 13

Description:

TOPSOIL; loose, moist, brown.

FILL
CLAY (CL); medium stiff, slightly moist, brown; low to medium plasticity; trace fine sand.

PLEISTOCENE FINE-GRAINED FACIES (Qff)
SILTY SAND (SM); loose, slightly moist, brown; non-plastic; fine sand.

PLEISTOCENE CHANNEL FACIES (Qfch)
SAND (SP); loose, moist, gray brown; fine to medium sand.

SILTY GRAVEL WITH SAND (GM); medium dense to dense, moist, gray brown with orange mottling; fine to coarse sand; fine to coarse, subrounded to angular gravel.

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├─┤ Liquid Limit

Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
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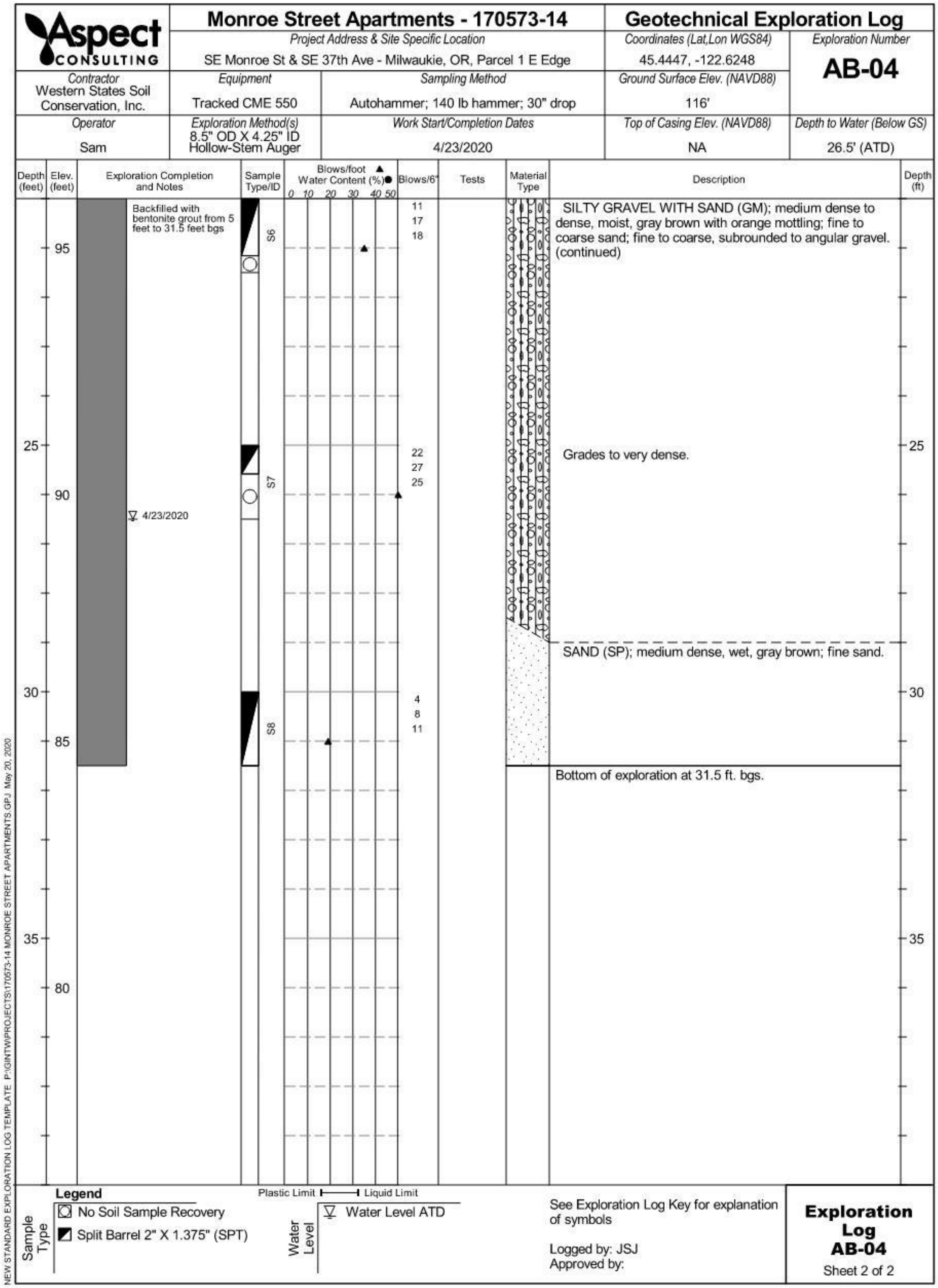
Exploration Log
AB-04
Sheet 1 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



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Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 E Edge
Coordinates (Lat,Lon WGS84)	45.4447, -122.6248
Exploration Number	AB-04
Contractor	Western States Soil Conservation, Inc.
Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop
Ground Surface Elev. (NAVD88)	116'
Operator	Sam
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/23/2020
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	26.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/6"	Tests	Description
		Backfilled with bentonite grout from 5 feet to 31.5 feet bgs	S6	11 17 18		SILTY GRAVEL WITH SAND (GM); medium dense to dense, moist, gray brown with orange mottling; fine to coarse sand; fine to coarse, subrounded to angular gravel. (continued)
	95					
25			S7	22 27 25		Grades to very dense.
	90	⊻ 4/23/2020				
						SAND (SP); medium dense, wet, gray brown; fine sand.
30			S8	4 8 11		
	85					Bottom of exploration at 31.5 ft. bgs.
35						
	80					

Legend

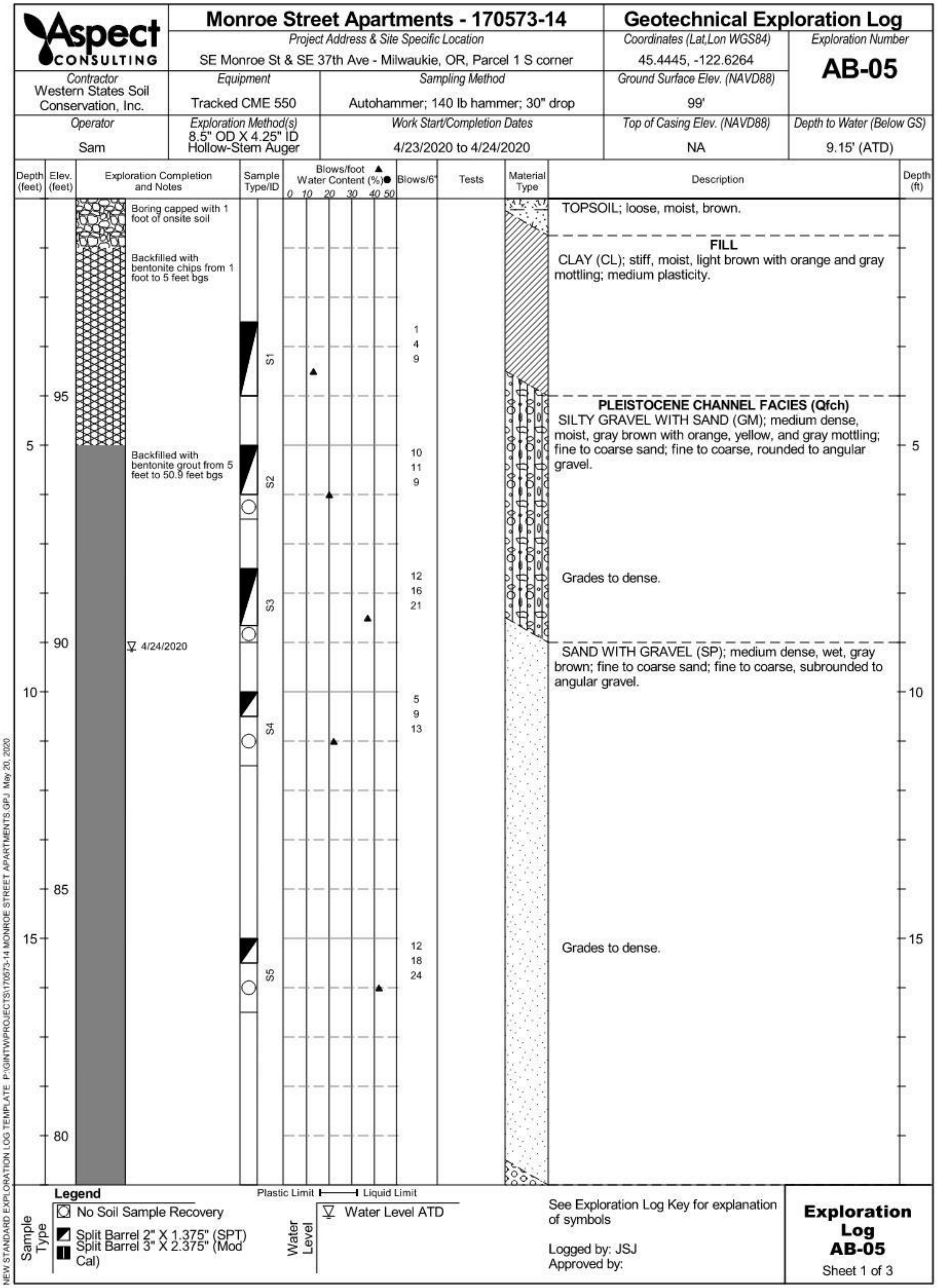
Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Water Level
- ⊻ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log AB-04
Sheet 2 of 2



Aspect CONSULTING

Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location: SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 S corner			Coordinates (Lat,Lon WGS84): 45.4445, -122.6264	Exploration Number: **AB-05**
Contractor: Western States Soil Conservation, Inc.	Equipment: Tracked CME 550	Sampling Method: Autohammer; 140 lb hammer; 30" drop	Ground Surface Elev. (NAVD88): 99'	
Operator: Sam	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 4/23/2020 to 4/24/2020	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 9.15' (ATD)

Exploration Completion and Notes:

- Boring capped with 1 foot of onsite soil
- Backfilled with bentonite chips from 1 foot to 5 feet bgs
- Backfilled with bentonite grout from 5 feet to 50.9 feet bgs
- ⊽ 4/24/2020

Sample Type/ID	Blows/6"
S1	1 4 9
S2	10 11 9
S3	12 16 21
S4	5 9 13
S5	12 18 24

Description:

TOPSOIL; loose, moist, brown.

FILL
CLAY (CL); stiff, moist, light brown with orange and gray mottling; medium plasticity.

PLEISTOCENE CHANNEL FACIES (Qfch)
SILTY GRAVEL WITH SAND (GM); medium dense, moist, gray brown with orange, yellow, and gray mottling; fine to coarse sand; fine to coarse, rounded to angular gravel.

Grades to dense.

SAND WITH GRAVEL (SP); medium dense, wet, gray brown; fine to coarse sand; fine to coarse, subrounded to angular gravel.

Grades to dense.

Legend

Sample Type
- ⊠ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)
- ◨ Split Barrel 3" X 2.375" (Mod Cal)

Plastic Limit ├─┤ Liquid Limit

Water Level
- ⊽ Water Level ATD

See Exploration Log Key for explanation of symbols

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Exploration Log AB-05
Sheet 1 of 3

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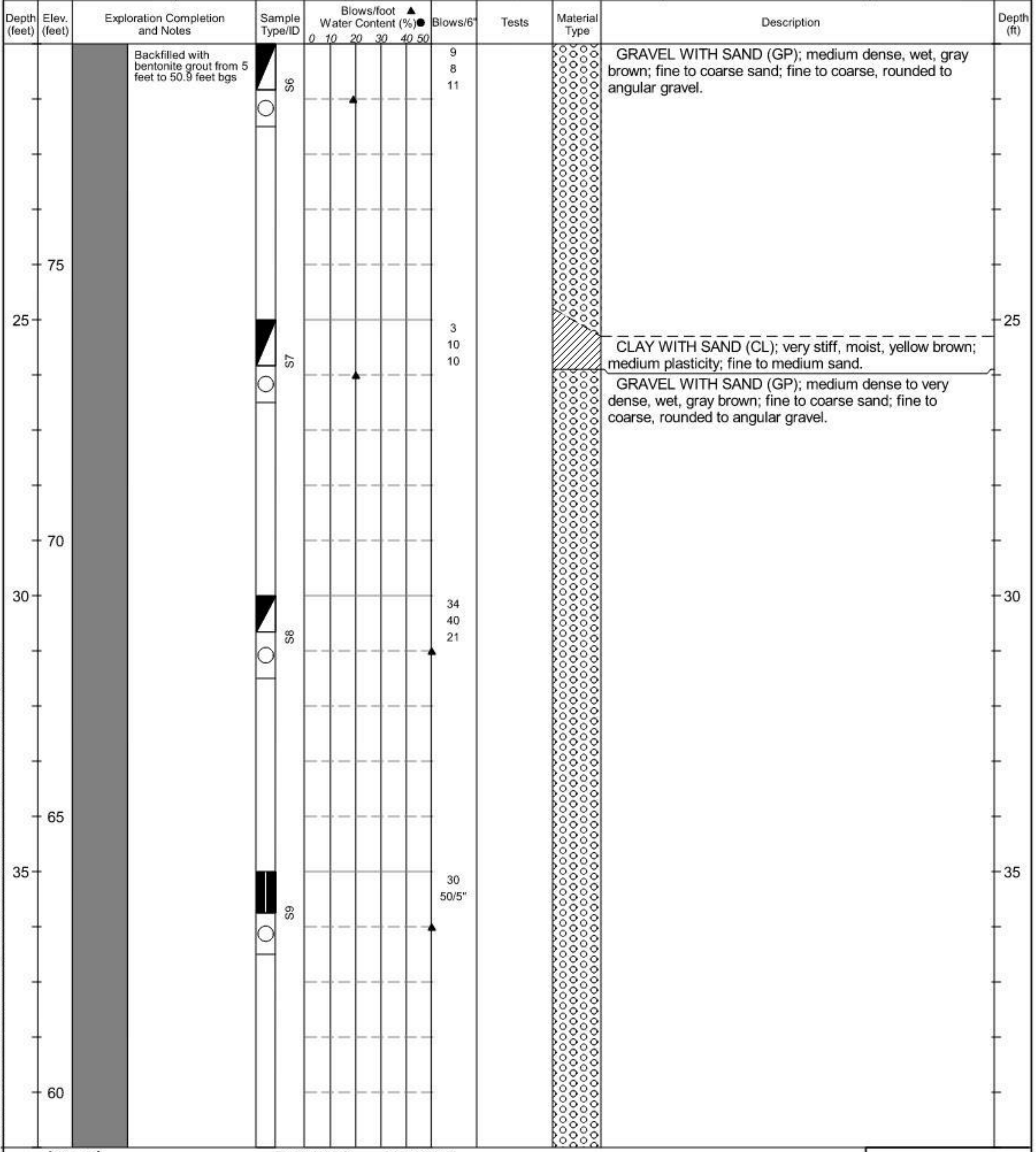
Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 S corner	Coordinates (Lat,Lon WGS84)	45.4445, -122.6264
Exploration Number	AB-05		
Contractor	Western States Soil Conservation, Inc.	Equipment	Tracked CME 550
Sampling Method	Autohammer; 140 lb hammer; 30" drop	Ground Surface Elev. (NAVD88)	99'
Operator	Sam	Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger
Work Start/Completion Dates	4/23/2020 to 4/24/2020	Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	9.15' (ATD)		



GRAVEL WITH SAND (GP); medium dense, wet, gray brown; fine to coarse sand; fine to coarse, rounded to angular gravel.

CLAY WITH SAND (CL); very stiff, moist, yellow brown; medium plasticity; fine to medium sand.

GRAVEL WITH SAND (GP); medium dense to very dense, wet, gray brown; fine to coarse sand; fine to coarse, rounded to angular gravel.

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)
- ■ Split Barrel 3" X 2.375" (Mod Cal)

Plastic Limit ├─┤ Liquid Limit

Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
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Exploration Log AB-05
Sheet 2 of 3

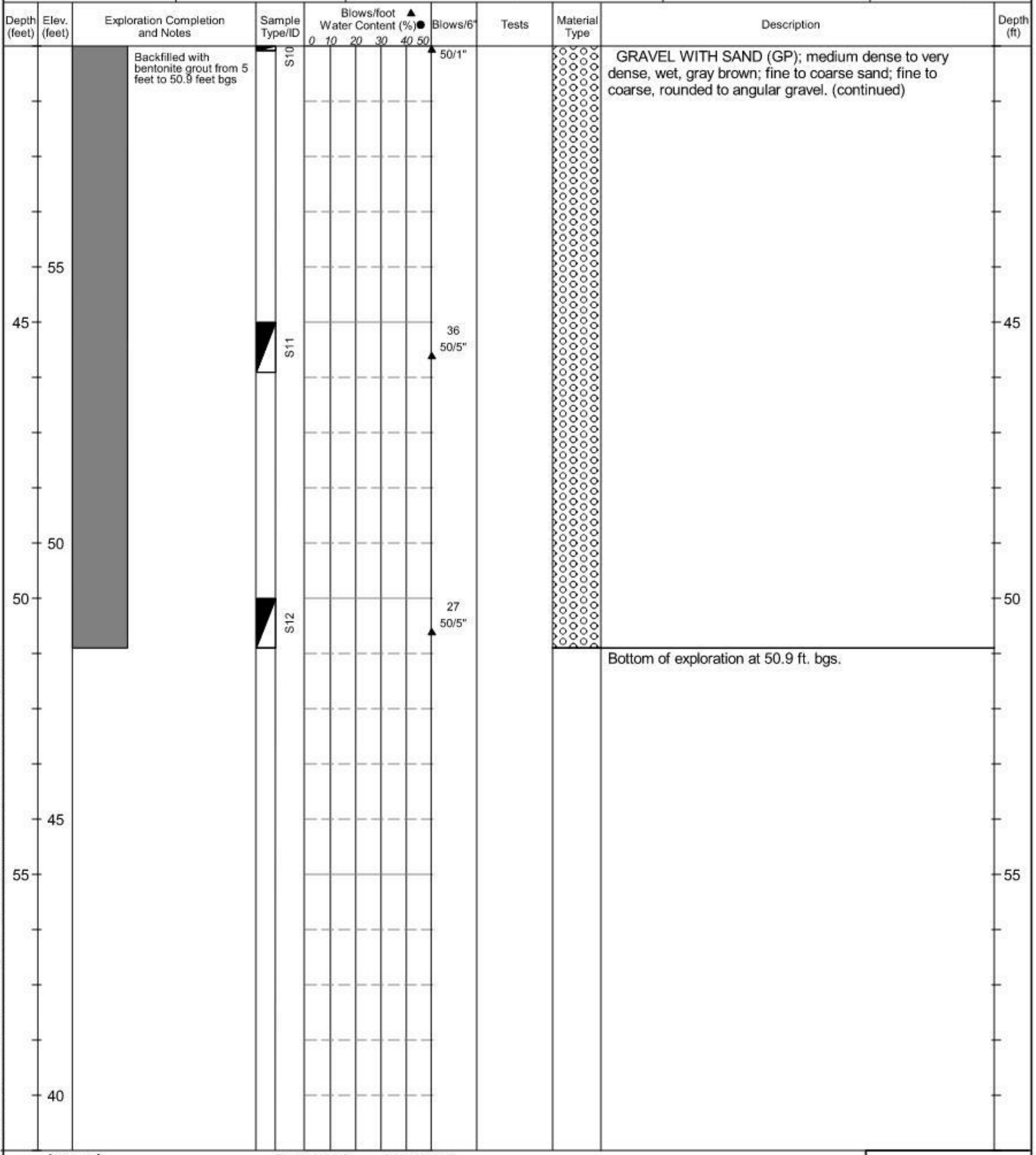
NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020

Aspect CONSULTING

Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location			*Coordinates (Lat,Lon WGS84)*	*Exploration Number*
SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 1 S corner			45.4445, -122.6264	**AB-05**
Contractor Western States Soil Conservation, Inc.	*Equipment* Tracked CME 550	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 99'	
Operator Sam	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 4/23/2020 to 4/24/2020	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* 9.15' (ATD)



Backfilled with bentonite grout from 5 feet to 50.9 feet bgs

GRAVEL WITH SAND (GP); medium dense to very dense, wet, gray brown; fine to coarse sand; fine to coarse, rounded to angular gravel. (continued)

Bottom of exploration at 50.9 ft. bgs.

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)
- ◼ Split Barrel 3" X 2.375" (Mod Cal)

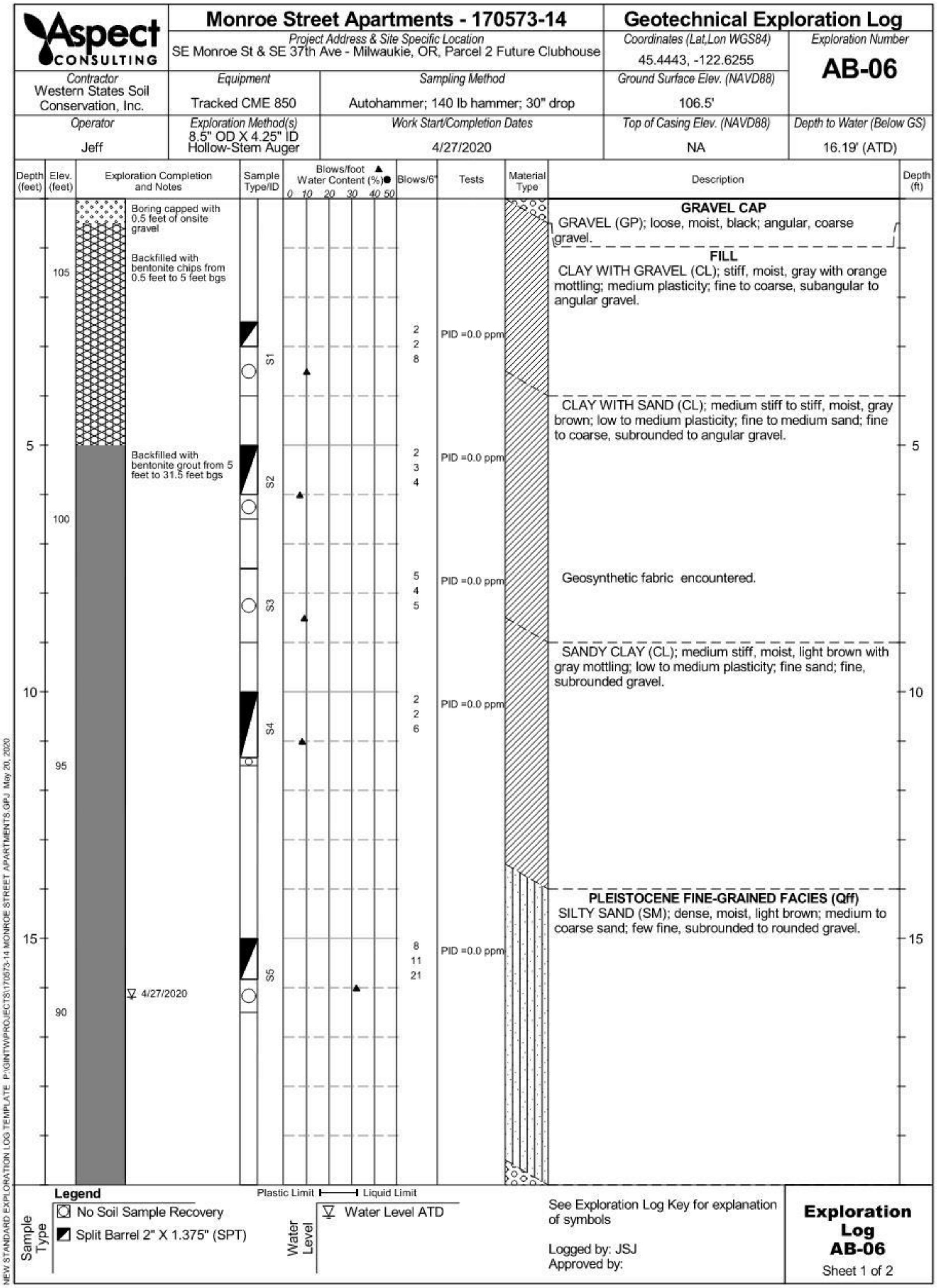
Plastic Limit ├─┤ Liquid Limit

Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log AB-05
Sheet 3 of 3



Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 2 Future Clubhouse		Coordinates (Lat,Lon WGS84)	45.4443, -122.6255
Contractor	Western States Soil Conservation, Inc.		Exploration Number	AB-06
Equipment	Tracked CME 850		Ground Surface Elev. (NAVD88)	106.5'
Sampling Method	Autohammer; 140 lb hammer; 30" drop		Top of Casing Elev. (NAVD88)	NA
Operator	Jeff		Depth to Water (Below GS)	16.19' (ATD)
Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger			
Work Start/Completion Dates	4/27/2020			

Exploration Completion and Notes:

- Boring capped with 0.5 feet of onsite gravel
- Backfilled with bentonite chips from 0.5 feet to 5 feet bgs
- Backfilled with bentonite grout from 5 feet to 31.5 feet bgs
- ⊻ 4/27/2020

Sample Type/ID	Blows/6"	Tests
S1	2 2 8	PID =0.0 ppm
S2	2 3 4	PID =0.0 ppm
S3	5 4 5	PID =0.0 ppm
S4	2 2 6	PID =0.0 ppm
S5	8 11 21	PID =0.0 ppm

Description

GRAVEL CAP

GRAVEL (GP); loose, moist, black; angular, coarse gravel.

FILL

CLAY WITH GRAVEL (CL); stiff, moist, gray with orange mottling; medium plasticity; fine to coarse, subangular to angular gravel.

CLAY WITH SAND (CL); medium stiff to stiff, moist, gray brown; low to medium plasticity; fine to medium sand; fine to coarse, subrounded to angular gravel.

Geosynthetic fabric encountered.

SANDY CLAY (CL); medium stiff, moist, light brown with gray mottling; low to medium plasticity; fine sand; fine, subrounded gravel.

PLEISTOCENE FINE-GRAINED FACIES (Qff)

SILTY SAND (SM); dense, moist, light brown; medium to coarse sand; few fine, subrounded to rounded gravel.

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

Plastic Limit ├─┤ Liquid Limit

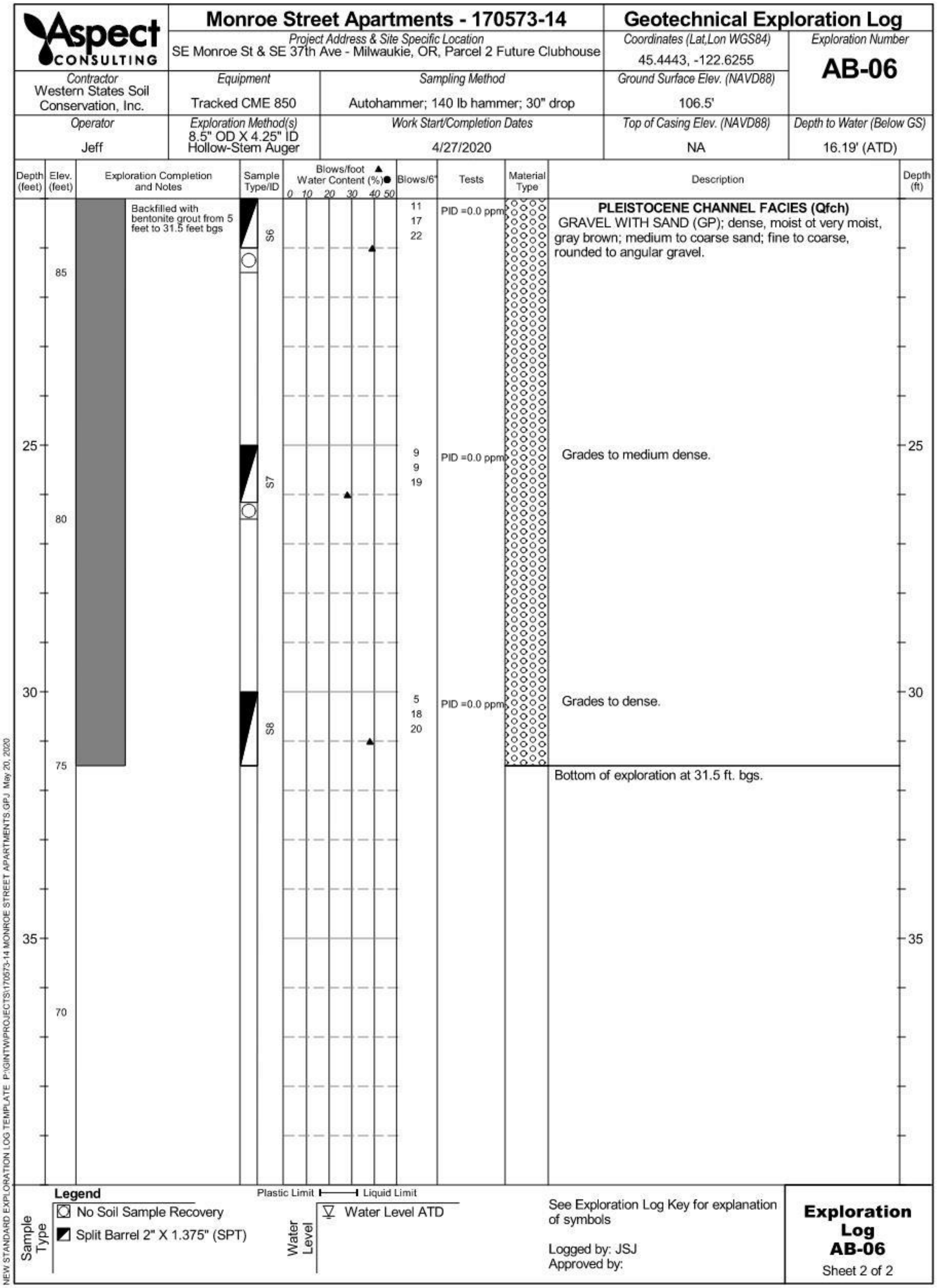
Water Level
- ⊻ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log
AB-06
Sheet 1 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 2 Future Clubhouse		*Coordinates (Lat,Lon WGS84)* 45.4443, -122.6255	*Exploration Number* **AB-06**
Contractor Western States Soil Conservation, Inc.	*Equipment* Tracked CME 850	*Sampling Method* Autohammer; 140 lb hammer; 30" drop	*Ground Surface Elev. (NAVD88)* 106.5'
Operator Jeff	*Exploration Method(s)* 8.5" OD X 4.25" ID Hollow-Stem Auger	*Work Start/Completion Dates* 4/27/2020	*Top of Casing Elev. (NAVD88)* NA
			Depth to Water (Below GS) 16.19' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Backfilled with bentonite grout from 5 feet to 31.5 feet bgs	S6	▲	11 17 22	PID =0.0 ppm		**PLEISTOCENE CHANNEL FACIES (Qfch)** GRAVEL WITH SAND (GP); dense, moist ot very moist, gray brown; medium to coarse sand; fine to coarse, rounded to angular gravel.	
	85								
25			S7	▲	9 9 19	PID =0.0 ppm		Grades to medium dense.	25
	80								
30			S8	▲	5 18 20	PID =0.0 ppm		Grades to dense.	30
	75							Bottom of exploration at 31.5 ft. bgs.	
35									35
	70								

Plastic Limit ⊢—⊣ Liquid Limit

Legend

Sample Type
- ⊠ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

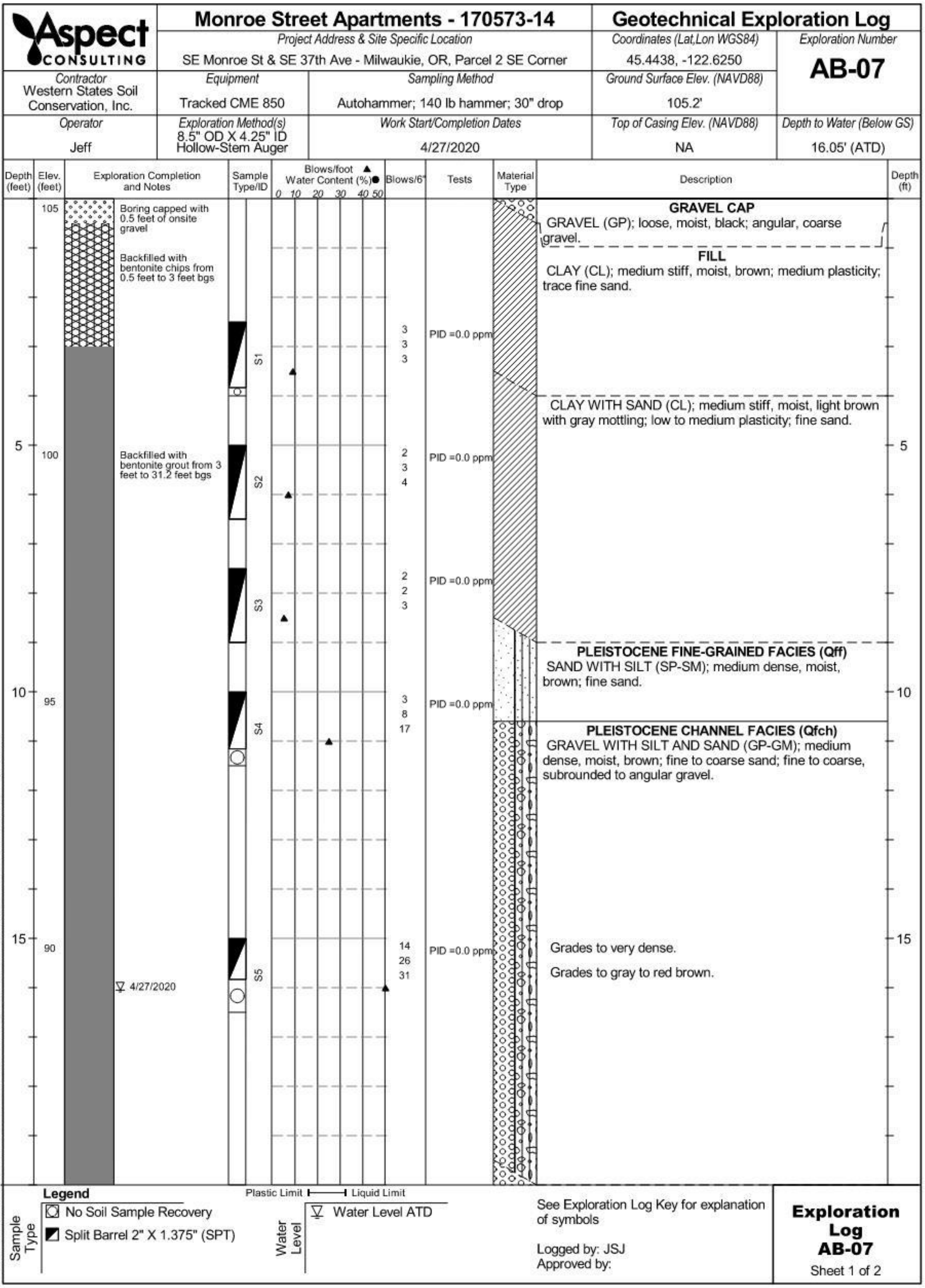
Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log
AB-06
Sheet 2 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Aspect CONSULTING	Project Address & Site Specific Location: SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 2 SE Corner		Coordinates (Lat,Lon WGS84): 45.4438, -122.6250	Exploration Number: **AB-07**
Contractor: Western States Soil Conservation, Inc.	Equipment: Tracked CME 850	Sampling Method: Autohammer; 140 lb hammer; 30" drop	Ground Surface Elev. (NAVD88): 105.2'	
Operator: Jeff	Exploration Method(s): 8.5" OD X 4.25" ID Hollow-Stem Auger	Work Start/Completion Dates: 4/27/2020	Top of Casing Elev. (NAVD88): NA	Depth to Water (Below GS): 16.05' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/6"	Tests	Description	Depth (ft)
	105	Boring capped with 0.5 feet of onsite gravel				**GRAVEL CAP** GRAVEL (GP); loose, moist, black; angular, coarse gravel.	
		Backfilled with bentonite chips from 0.5 feet to 3 feet bgs				**FILL** CLAY (CL); medium stiff, moist, brown; medium plasticity; trace fine sand.	
			S1	3 3 3	PID =0.0 ppm		
						CLAY WITH SAND (CL); medium stiff, moist, light brown with gray mottling; low to medium plasticity; fine sand.	
5	100	Backfilled with bentonite grout from 3 feet to 31.2 feet bgs	S2	2 3 4	PID =0.0 ppm		5
			S3	2 2 3	PID =0.0 ppm		
						PLEISTOCENE FINE-GRAINED FACIES (Qff) SAND WITH SILT (SP-SM); medium dense, moist, brown; fine sand.	
10	95		S4	3 8 17	PID =0.0 ppm		10
						PLEISTOCENE CHANNEL FACIES (Qfch) GRAVEL WITH SILT AND SAND (GP-GM); medium dense, moist, brown; fine to coarse sand; fine to coarse, subrounded to angular gravel.	
15	90		S5	14 26 31	PID =0.0 ppm	Grades to very dense. Grades to gray to red brown.	15
		▽ 4/27/2020					

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◪ Split Barrel 2" X 1.375" (SPT)

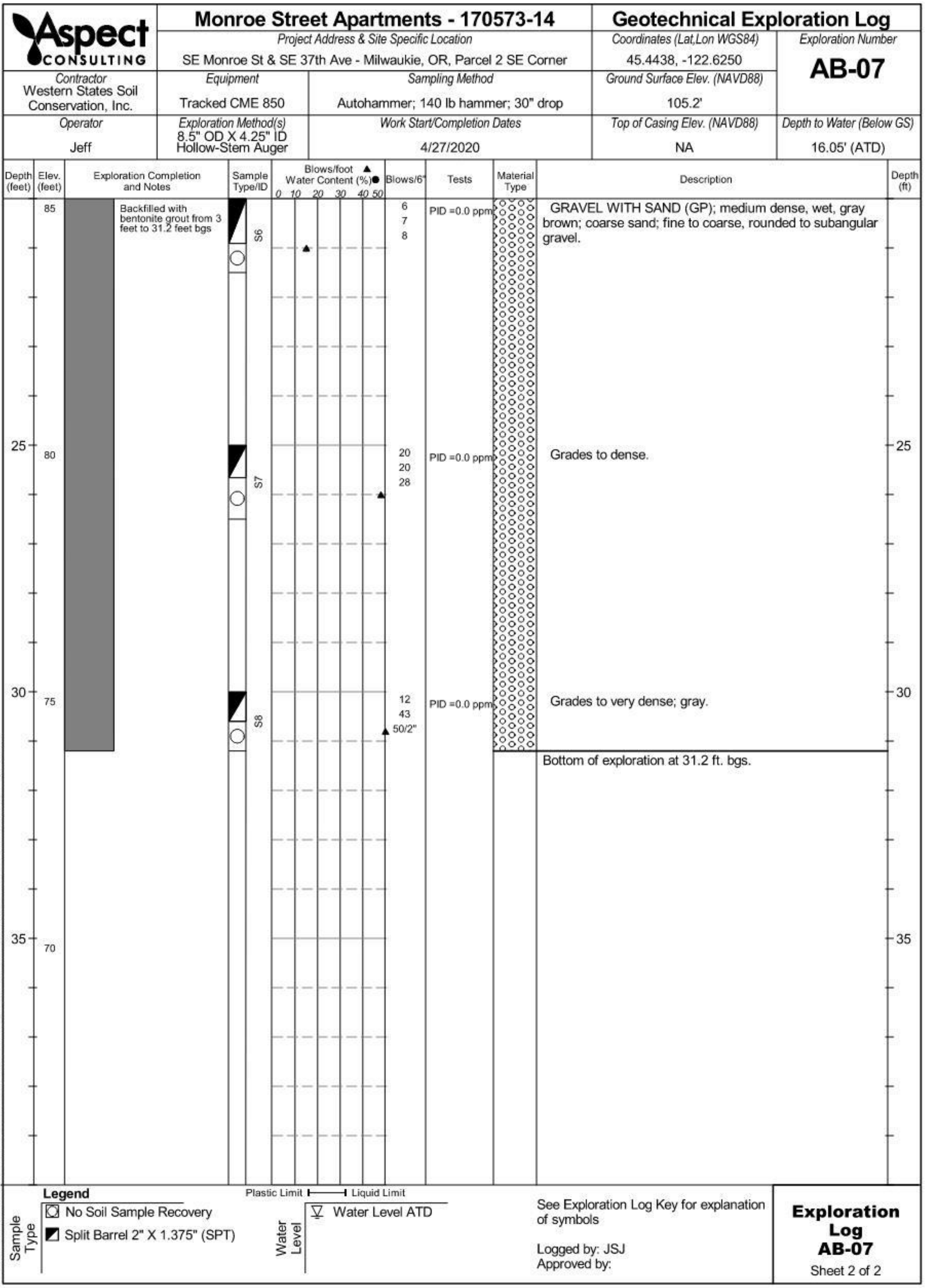
Water Level
- ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log
AB-07
Sheet 1 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-14

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, Parcel 2 SE Corner	Coordinates (Lat,Lon WGS84)	45.4438, -122.6250	Exploration Number: **AB-07**
Contractor	Western States Soil Conservation, Inc.	Equipment	Tracked CME 850	
Sampling Method	Autohammer; 140 lb hammer; 30" drop	Ground Surface Elev. (NAVD88)	105.2'	
Operator	Jeff	Exploration Method(s)	8.5" OD X 4.25" ID Hollow-Stem Auger	
Work Start/Completion Dates	4/27/2020	Top of Casing Elev. (NAVD88)	NA	Depth to Water (Below GS): 16.05' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/6"	Tests	Description	Depth (ft)
	85	Backfilled with bentonite grout from 3 feet to 31.2 feet bgs	S6	6 7 8	PID =0.0 ppm	GRAVEL WITH SAND (GP); medium dense, wet, gray brown; coarse sand; fine to coarse, rounded to subangular gravel.	
25	80		S7	20 20 28	PID =0.0 ppm	Grades to dense.	25
30	75		S8	12 43 50/2"	PID =0.0 ppm	Grades to very dense; gray.	30
						Bottom of exploration at 31.2 ft. bgs.	
35	70						35

Legend

Sample Type
- ☒ No Soil Sample Recovery
- ◩ Split Barrel 2" X 1.375" (SPT)

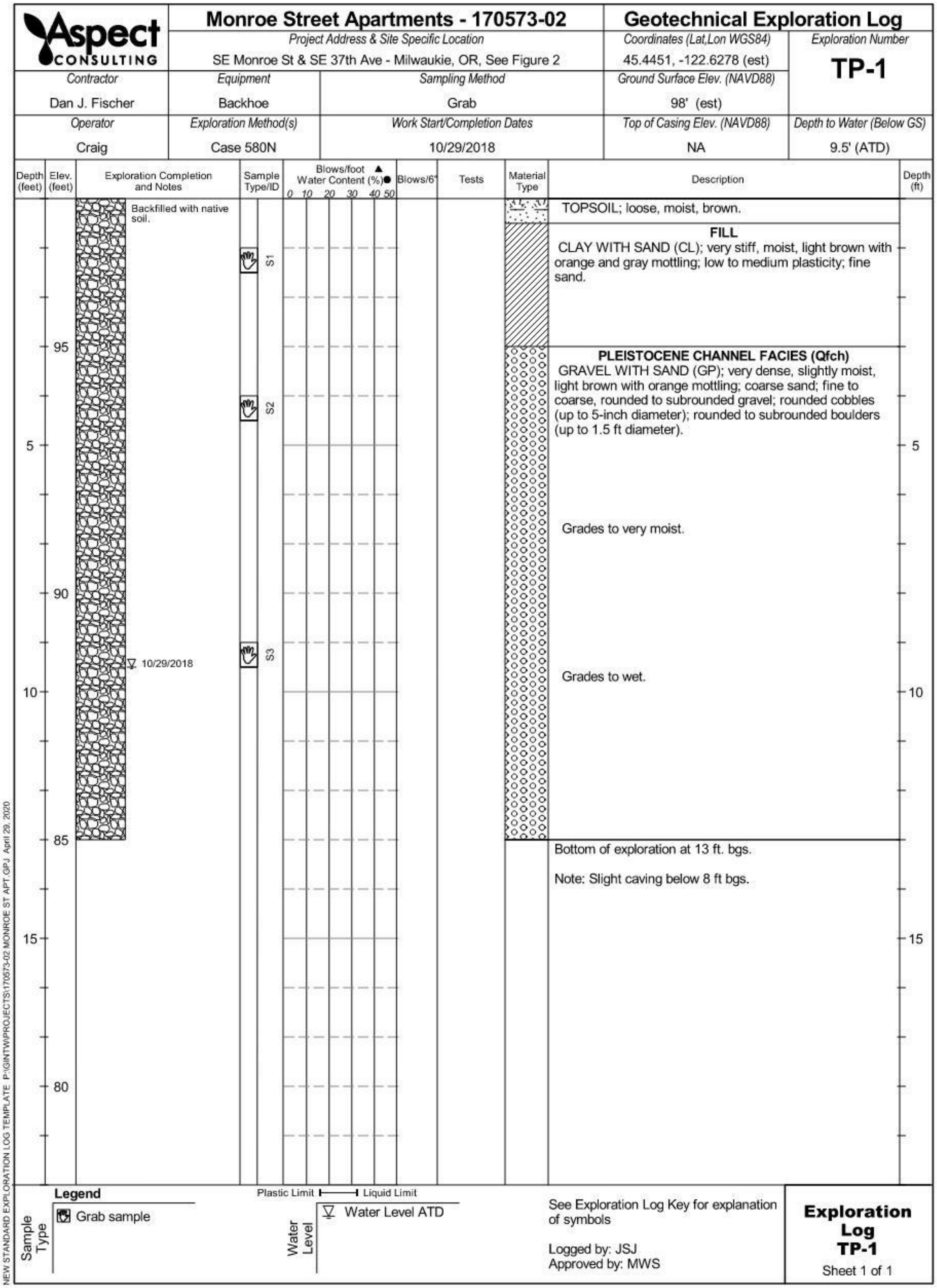
Water Level
- ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by:

Exploration Log AB-07
Sheet 2 of 2

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-14 MONROE STREET APARTMENTS.GPJ May 20, 2020



Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location			*Coordinates (Lat,Lon WGS84)*	*Exploration Number*
SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2			45.4451, -122.6278 (est)	**TP-1**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface Elev. (NAVD88)*	
Dan J. Fischer	Backhoe	Grab	98' (est)	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
Craig	Case 580N	10/29/2018	NA	9.5' (ATD)

Depth (feet) | Elev. (feet) | Exploration Completion and Notes | Sample Type/ID | Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50 | Blows/6" | Tests | Material Type | Description | Depth (ft)

Exploration Completion and Notes: Backfilled with native soil. ∇ 10/29/2018

Samples: S1, S2, S3

TOPSOIL; loose, moist, brown.

FILL

CLAY WITH SAND (CL); very stiff, moist, light brown with orange and gray mottling; low to medium plasticity; fine sand.

PLEISTOCENE CHANNEL FACIES (Qfch)

GRAVEL WITH SAND (GP); very dense, slightly moist, light brown with orange mottling; coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 5-inch diameter); rounded to subrounded boulders (up to 1.5 ft diameter).

Grades to very moist.

Grades to wet.

Bottom of exploration at 13 ft. bgs.

Note: Slight caving below 8 ft bgs.

Legend

Sample Type: 🖐 Grab sample

Plastic Limit ├─┤ Liquid Limit

Water Level: ∇ Water Level ATD

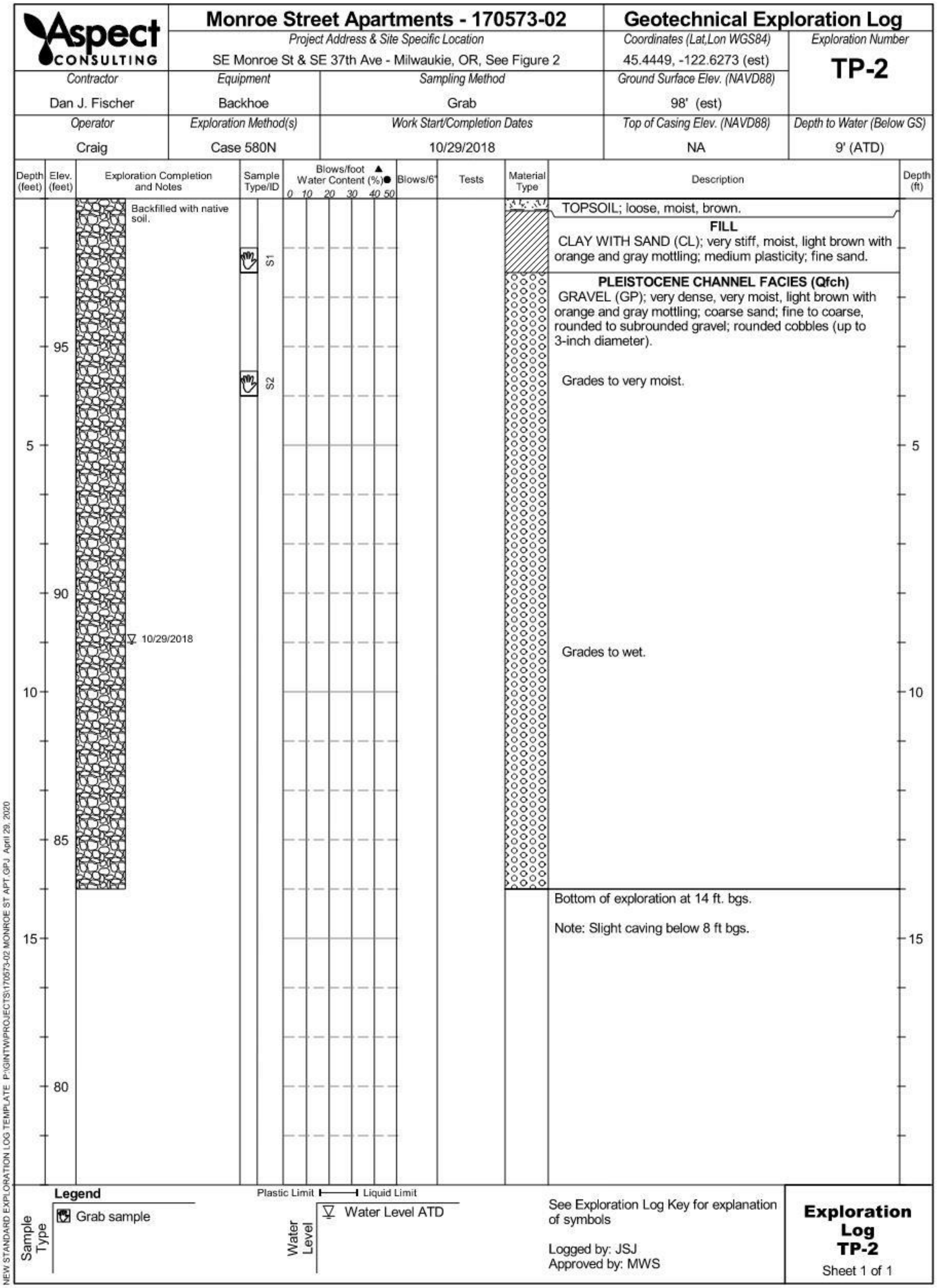
See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log TP-1

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location			Coordinates (Lat,Lon WGS84)	Exploration Number
SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2			45.4449, -122.6273 (est)	**TP-2**
Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)	
Dan J. Fischer	Backhoe	Grab	98' (est)	
Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
Craig	Case 580N	10/29/2018	NA	9' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Description
0	98	Backfilled with native soil.		TOPSOIL; loose, moist, brown.
				FILL CLAY WITH SAND (CL); very stiff, moist, light brown with orange and gray mottling; medium plasticity; fine sand.
1			S1	
				PLEISTOCENE CHANNEL FACIES (Qfch) GRAVEL (GP); very dense, very moist, light brown with orange and gray mottling; coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 3-inch diameter).
3	95			
3.5			S2	Grades to very moist.
5				
8	90			
9		▽ 10/29/2018		Grades to wet.
10				
13	85			
14				Bottom of exploration at 14 ft. bgs. Note: Slight caving below 8 ft bgs.
15				
18	80			

Legend

Sample Type: Grab sample

Plastic Limit ├─┤ Liquid Limit

Water Level: ▽ Water Level ATD

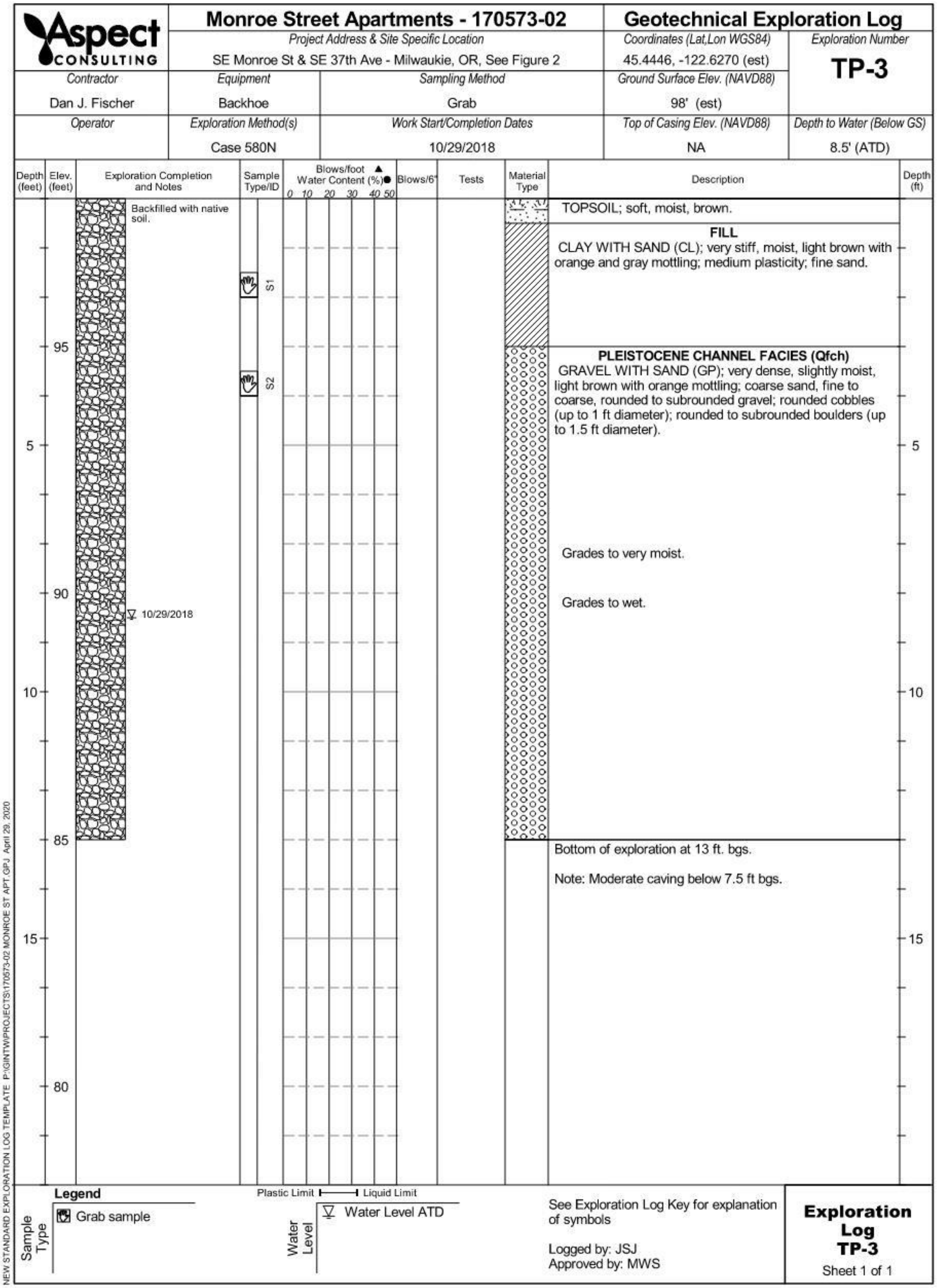
See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log TP-2

Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



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Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location: SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2
Coordinates (Lat,Lon WGS84): 45.4446, -122.6270 (est)
Exploration Number: **TP-3**
Contractor: Dan J. Fischer
Equipment: Backhoe
Sampling Method: Grab
Ground Surface Elev. (NAVD88): 98' (est)
Operator:
Exploration Method(s): Case 580N
Work Start/Completion Dates: 10/29/2018
Top of Casing Elev. (NAVD88): NA
Depth to Water (Below GS): 8.5' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/foot ▲ Water Content (%) ● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Backfilled with native soil.						TOPSOIL; soft, moist, brown.	
			S1					**FILL** CLAY WITH SAND (CL); very stiff, moist, light brown with orange and gray mottling; medium plasticity; fine sand.	
	95		S2					**PLEISTOCENE CHANNEL FACIES (Qfch)** GRAVEL WITH SAND (GP); very dense, slightly moist, light brown with orange mottling; coarse sand, fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter); rounded to subrounded boulders (up to 1.5 ft diameter).	
5									5
								Grades to very moist.	
	90	∇ 10/29/2018						Grades to wet.	
10									10
	85							Bottom of exploration at 13 ft. bgs. Note: Moderate caving below 7.5 ft bgs.	
15									15
	80								

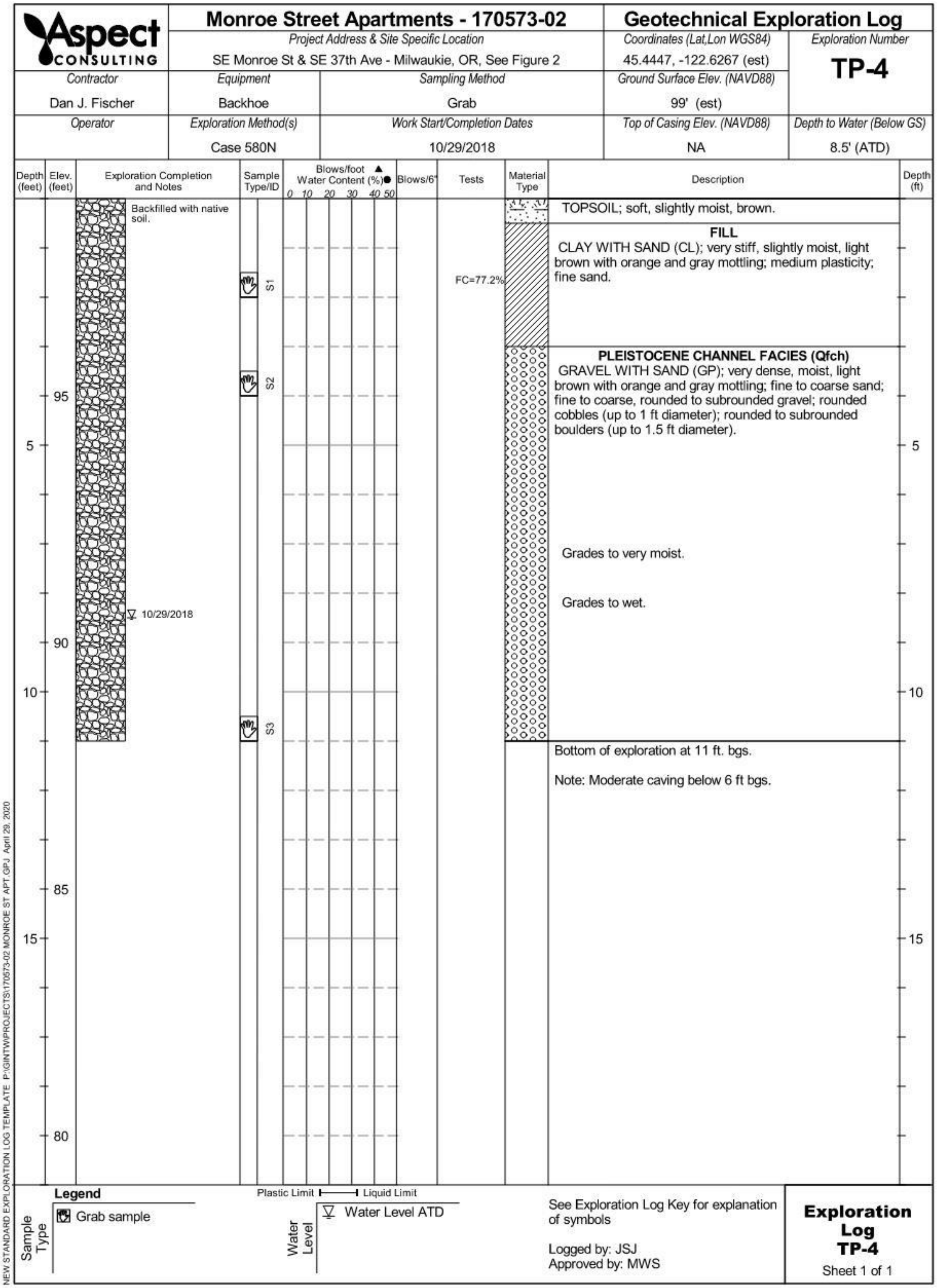
Legend
Sample Type: Grab sample
Plastic Limit ├─┤ Liquid Limit
Water Level: ∇ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log
TP-3
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2	Coordinates (Lat,Lon WGS84)	45.4447, -122.6267 (est)
Contractor	Dan J. Fischer	Exploration Number	TP-4
Equipment	Backhoe	Sampling Method	Grab
Ground Surface Elev. (NAVD88)	99' (est)	Operator	
Exploration Method(s)	Case 580N	Work Start/Completion Dates	10/29/2018
Top of Casing Elev. (NAVD88)	NA	Depth to Water (Below GS)	8.5' (ATD)

Depth (feet) | Elev. (feet) | Exploration Completion and Notes | Sample Type/ID | Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50 | Blows/6" | Tests | Material Type | Description | Depth (ft)

Exploration Completion and Notes: Backfilled with native soil.

▽ 10/29/2018

Samples: S1, S2, S3 (grab)

Tests: FC=77.2%

TOPSOIL; soft, slightly moist, brown.

FILL

CLAY WITH SAND (CL); very stiff, slightly moist, light brown with orange and gray mottling; medium plasticity; fine sand.

PLEISTOCENE CHANNEL FACIES (Qfch)

GRAVEL WITH SAND (GP); very dense, moist, light brown with orange and gray mottling; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter); rounded to subrounded boulders (up to 1.5 ft diameter).

Grades to very moist.

Grades to wet.

Bottom of exploration at 11 ft. bgs.

Note: Moderate caving below 6 ft bgs.

Legend

Sample Type: 🖐 Grab sample

Plastic Limit ├─┤ Liquid Limit

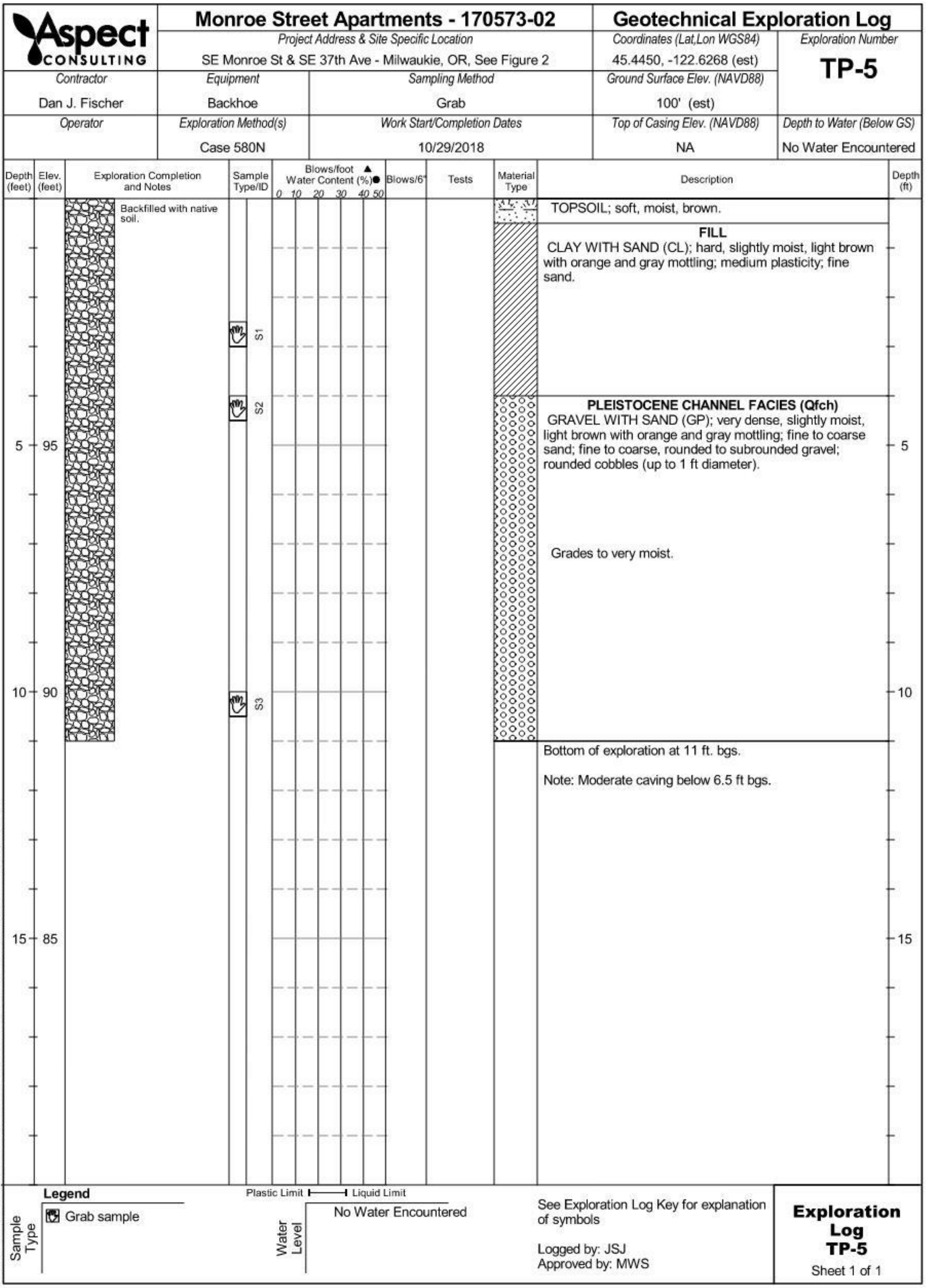
Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log TP-4
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

	Project Address & Site Specific Location SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2		*Coordinates (Lat,Lon WGS84)* 45.4450, -122.6268 (est)	*Exploration Number* **TP-5**
Contractor Dan J. Fischer	*Equipment* Backhoe	*Sampling Method* Grab	*Ground Surface Elev. (NAVD88)* 100' (est)	
Operator	*Exploration Method(s)* Case 580N	*Work Start/Completion Dates* 10/29/2018	*Top of Casing Elev. (NAVD88)* NA	*Depth to Water (Below GS)* No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Backfilled with native soil.						TOPSOIL; soft, moist, brown.	
								FILL CLAY WITH SAND (CL); hard, slightly moist, light brown with orange and gray mottling; medium plasticity; fine sand.	
			S1						
			S2					**PLEISTOCENE CHANNEL FACIES (Qfch)** GRAVEL WITH SAND (GP); very dense, slightly moist, light brown with orange and gray mottling; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter).	
5	95								5
								Grades to very moist.	
10	90		S3						10
								Bottom of exploration at 11 ft. bgs. Note: Moderate caving below 6.5 ft bgs.	
15	85								15

Legend

Sample Type: 🖐 Grab sample

Plastic Limit ├─┤ Liquid Limit

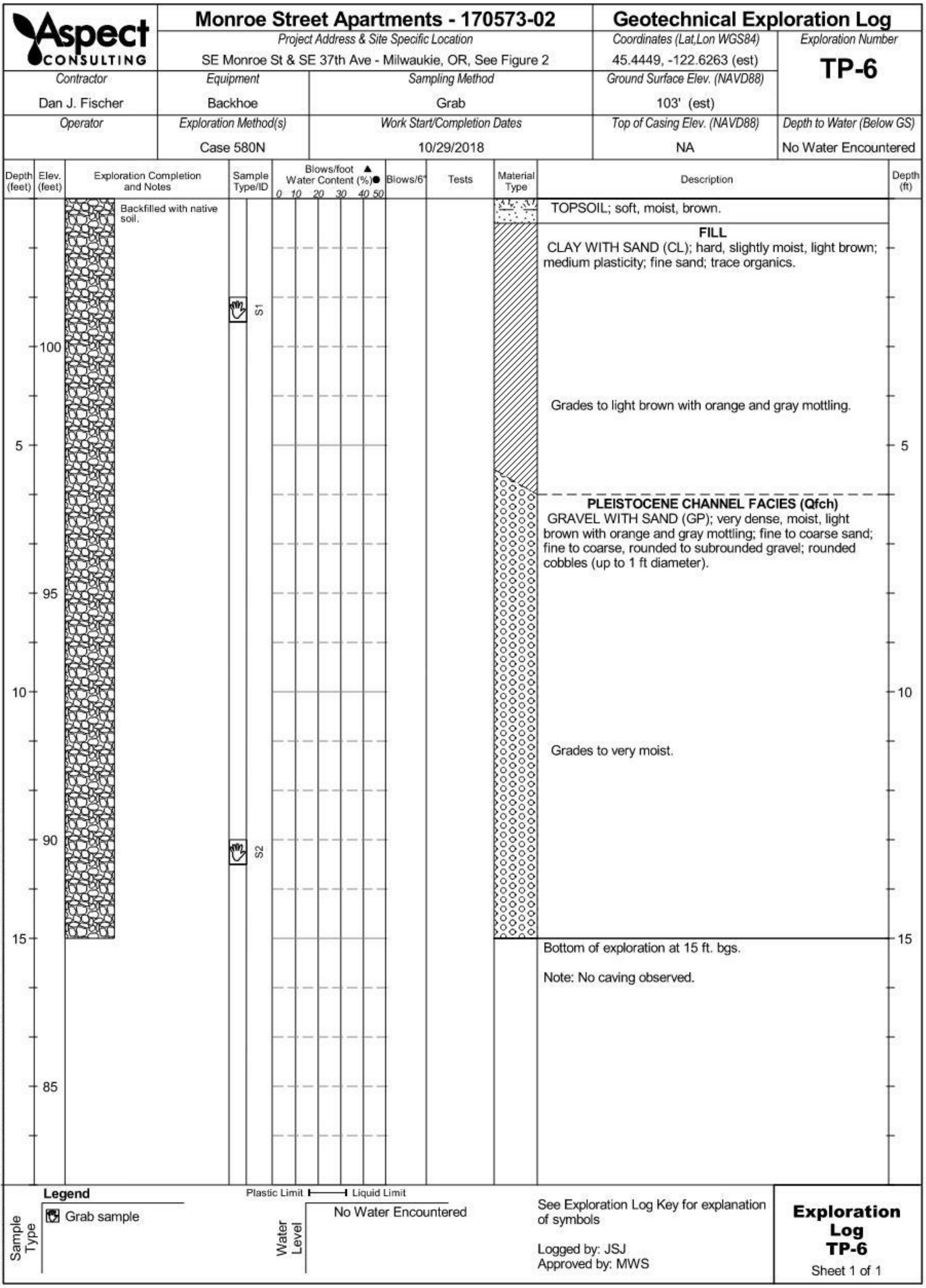
Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log
TP-5
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2	Coordinates (Lat,Lon WGS84)	45.4449, -122.6263 (est)
Exploration Number	**TP-6**	Ground Surface Elev. (NAVD88)	103' (est)
Contractor	Dan J. Fischer	Equipment	Backhoe
Sampling Method	Grab	Operator	
Exploration Method(s)	Case 580N	Work Start/Completion Dates	10/29/2018
Top of Casing Elev. (NAVD88)	NA	Depth to Water (Below GS)	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Description
0	103	Backfilled with native soil.		TOPSOIL; soft, moist, brown.
				FILL CLAY WITH SAND (CL); hard, slightly moist, light brown; medium plasticity; fine sand; trace organics.
			S1	
	100			
				Grades to light brown with orange and gray mottling.
5				
				PLEISTOCENE CHANNEL FACIES (Qfch) GRAVEL WITH SAND (GP); very dense, moist, light brown with orange and gray mottling; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter).
	95			
10				
				Grades to very moist.
	90		S2	
15				Bottom of exploration at 15 ft. bgs. Note: No caving observed.
	85			

Legend

Sample Type: Grab sample

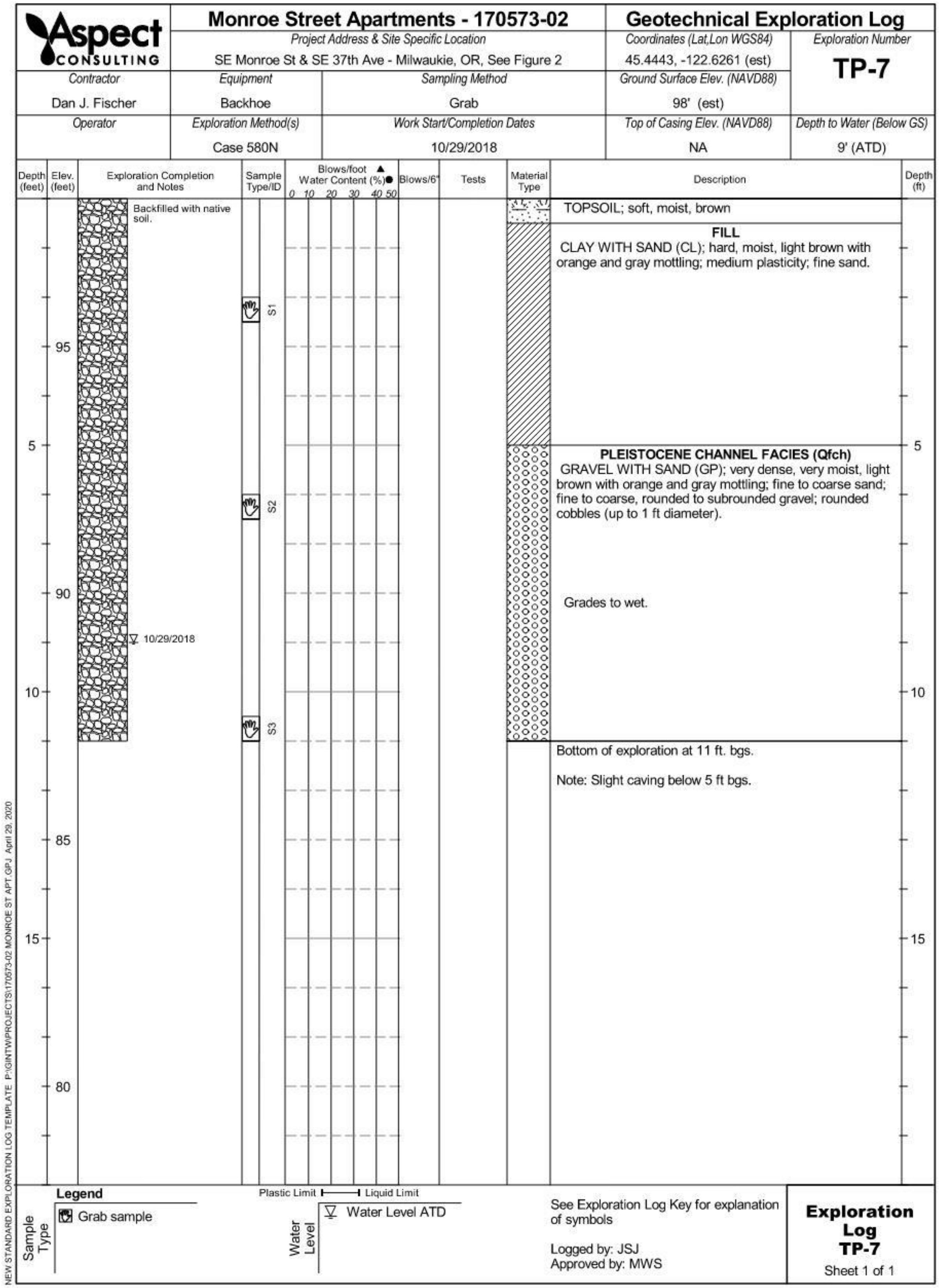
Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log
TP-6
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2
Coordinates (Lat,Lon WGS84)	45.4443, -122.6261 (est)
Exploration Number	**TP-7**
Contractor	Dan J. Fischer
Equipment	Backhoe
Sampling Method	Grab
Ground Surface Elev. (NAVD88)	98' (est)
Operator	
Exploration Method(s)	Case 580N
Work Start/Completion Dates	10/29/2018
Top of Casing Elev. (NAVD88)	NA
Depth to Water (Below GS)	9' (ATD)

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
0		Backfilled with native soil.						TOPSOIL; soft, moist, brown	
								FILL CLAY WITH SAND (CL); hard, moist, light brown with orange and gray mottling; medium plasticity; fine sand.	
			S1						
	95								
5								**PLEISTOCENE CHANNEL FACIES (Qfch)** GRAVEL WITH SAND (GP); very dense, very moist, light brown with orange and gray mottling; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter).	5
			S2						
	90							Grades to wet.	
		▽ 10/29/2018							
10									10
			S3					Bottom of exploration at 11 ft. bgs. Note: Slight caving below 5 ft bgs.	
	85								
15									15
	80								

Legend

Sample Type: Grab sample

Plastic Limit ├─┤ Liquid Limit

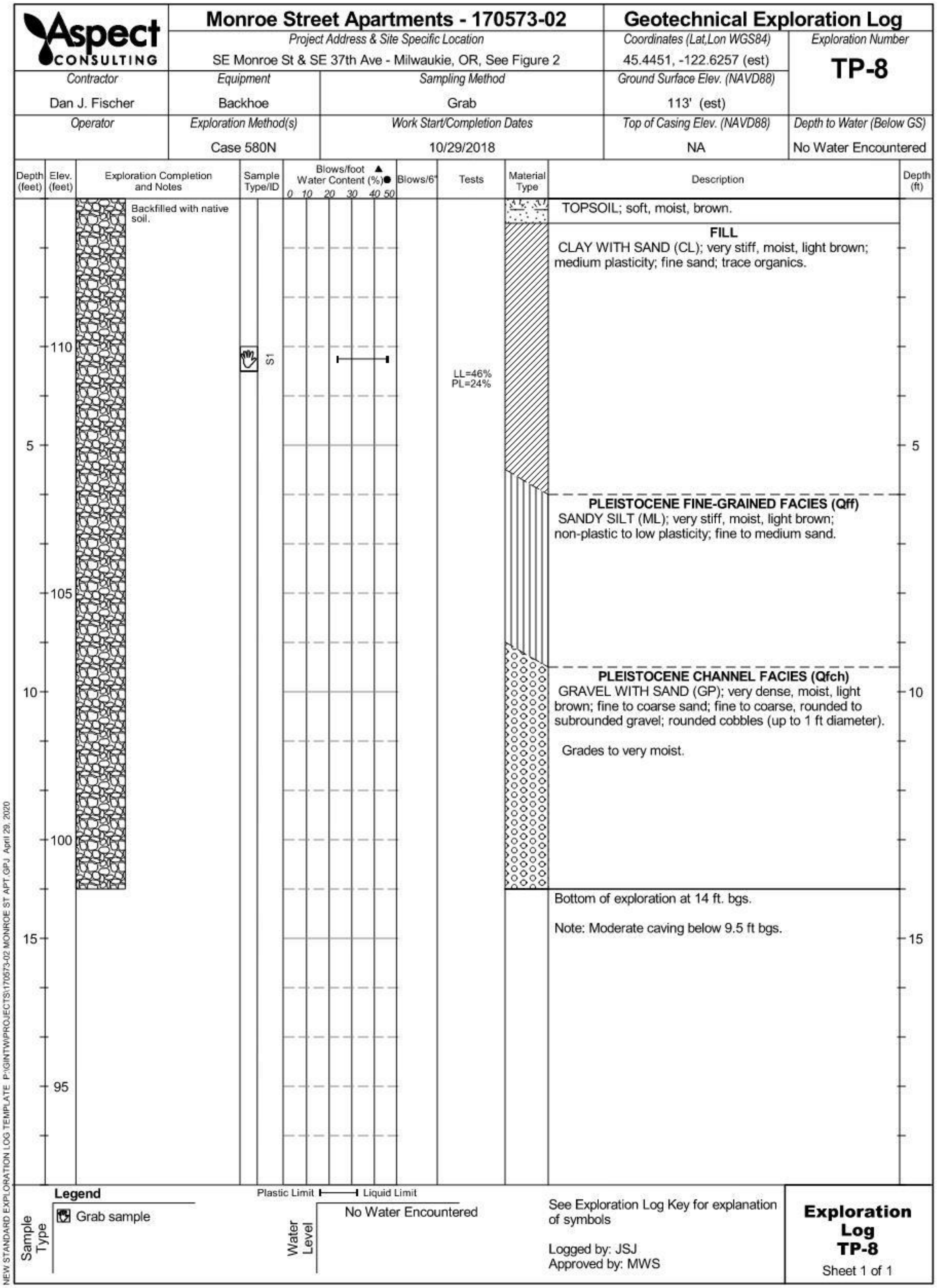
Water Level: ▽ Water Level ATD

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log TP-7
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2	Coordinates (Lat,Lon WGS84)	45.4451, -122.6257 (est)
Exploration Number	TP-8	Ground Surface Elev. (NAVD88)	113' (est)
Contractor	Dan J. Fischer	Equipment	Backhoe
Sampling Method	Grab	Operator	
Exploration Method(s)	Case 580N	Work Start/Completion Dates	10/29/2018
Top of Casing Elev. (NAVD88)	NA	Depth to Water (Below GS)	No Water Encountered

Backfilled with native soil.

LL=46%
PL=24%

TOPSOIL; soft, moist, brown.

FILL

CLAY WITH SAND (CL); very stiff, moist, light brown; medium plasticity; fine sand; trace organics.

PLEISTOCENE FINE-GRAINED FACIES (Qff)

SANDY SILT (ML); very stiff, moist, light brown; non-plastic to low plasticity; fine to medium sand.

PLEISTOCENE CHANNEL FACIES (Qfch)

GRAVEL WITH SAND (GP); very dense, moist, light brown; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter).

Grades to very moist.

Bottom of exploration at 14 ft. bgs.

Note: Moderate caving below 9.5 ft bgs.

Legend

Sample Type: ▨ Grab sample

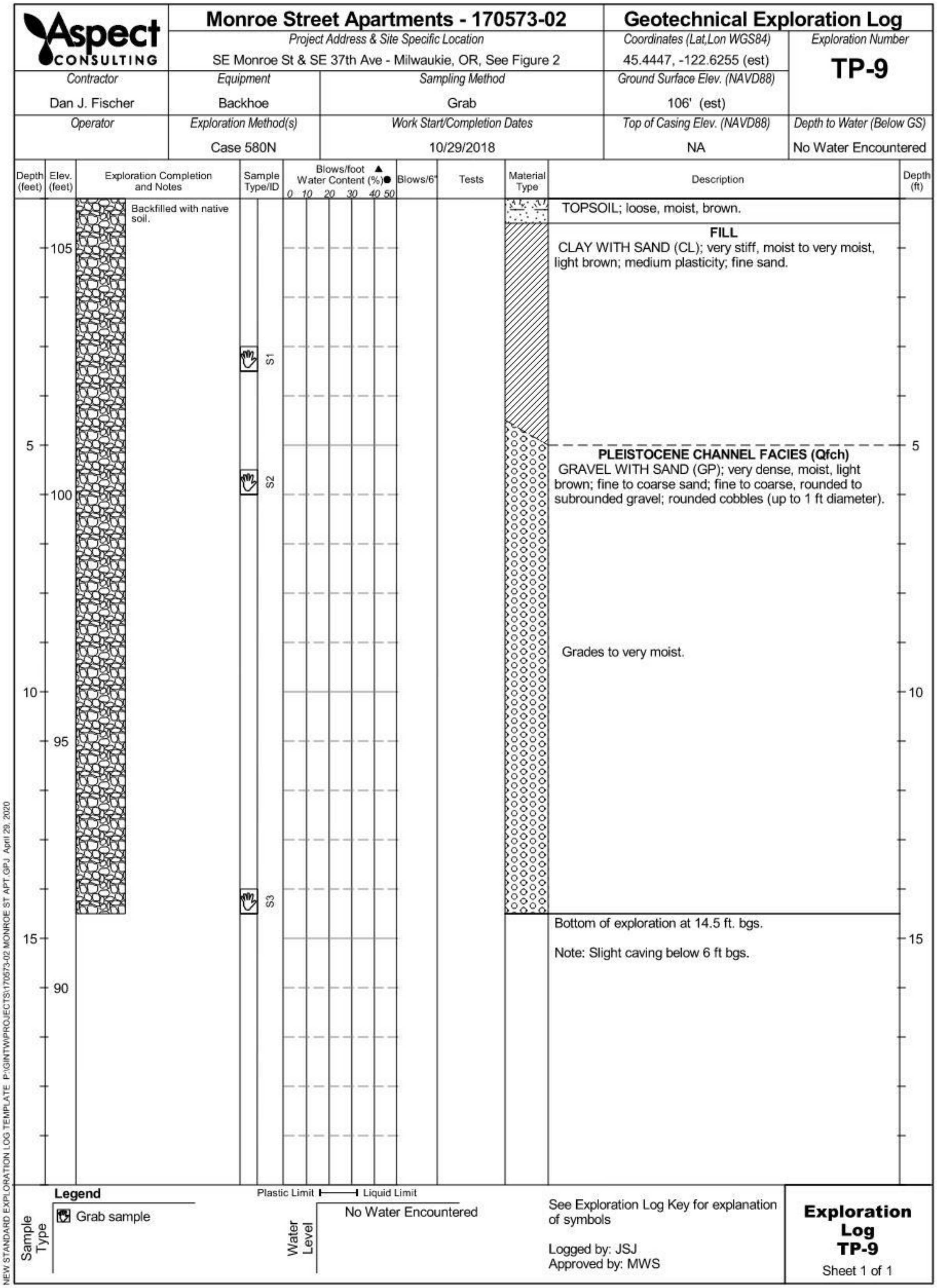
Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log TP-8

Sheet 1 of 1



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location	Coordinates (Lat,Lon WGS84)	Exploration Number
SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2	45.4447, -122.6255 (est)	**TP-9**

Contractor	Equipment	Sampling Method	Ground Surface Elev. (NAVD88)
Dan J. Fischer	Backhoe	Grab	106' (est)

Operator	Exploration Method(s)	Work Start/Completion Dates	Top of Casing Elev. (NAVD88)	Depth to Water (Below GS)
	Case 580N	10/29/2018	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Description
0	106	Backfilled with native soil.		TOPSOIL; loose, moist, brown.
				FILL CLAY WITH SAND (CL); very stiff, moist to very moist, light brown; medium plasticity; fine sand.
			S1	
5				**PLEISTOCENE CHANNEL FACIES (Qfch)** GRAVEL WITH SAND (GP); very dense, moist, light brown; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter).
			S2	
				Grades to very moist.
			S3	
14.5				Bottom of exploration at 14.5 ft. bgs. Note: Slight caving below 6 ft bgs.

Legend

Grab sample

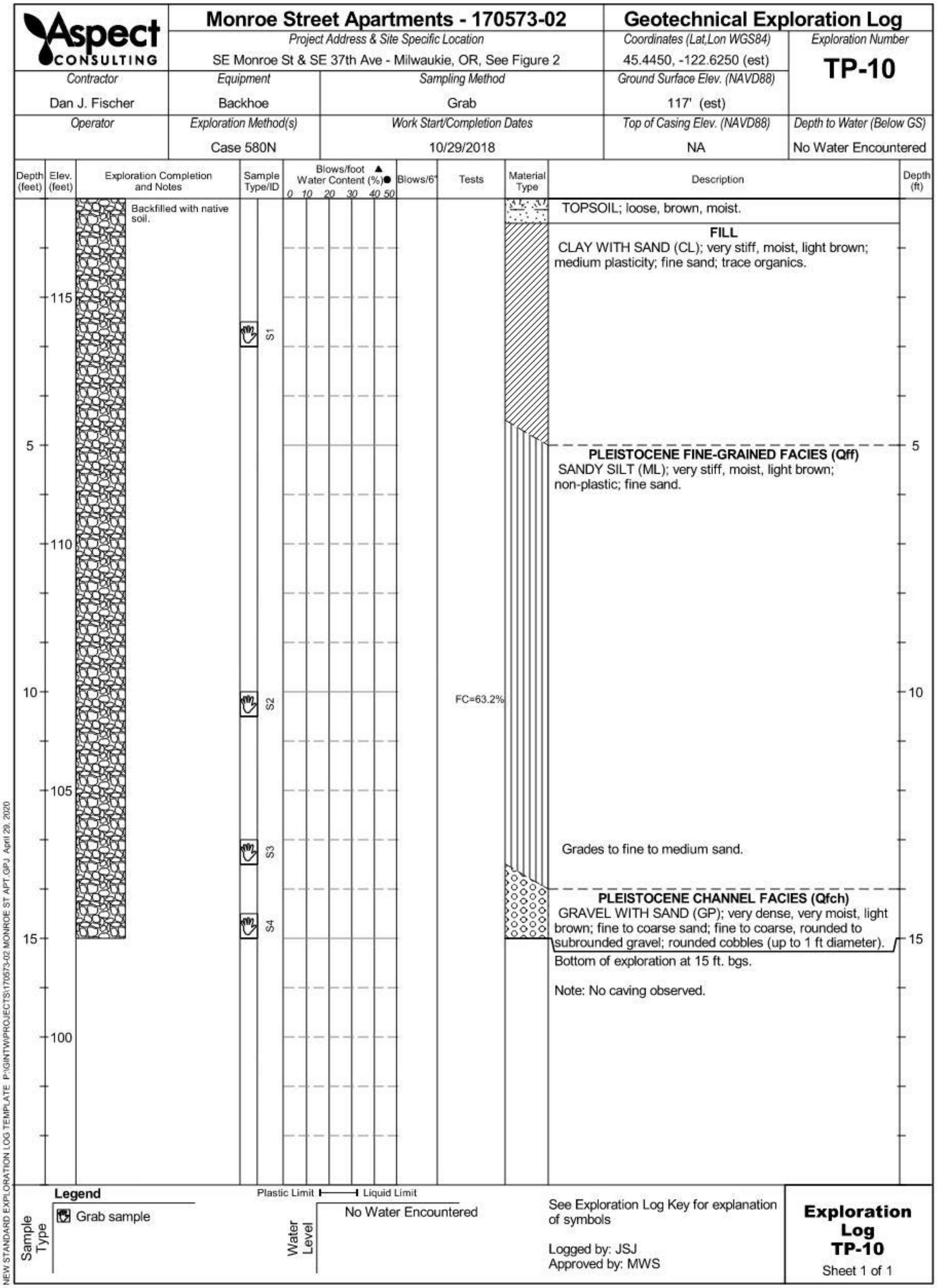
No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log TP-9
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Aspect CONSULTING

Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

	Project Address & Site Specific Location		*Coordinates (Lat,Lon WGS84)*	*Exploration Number*
	SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2		45.4450, -122.6250 (est)	**TP-10**
Contractor	*Equipment*	*Sampling Method*	*Ground Surface Elev. (NAVD88)*	
Dan J. Fischer	Backhoe	Grab	117' (est)	
Operator	*Exploration Method(s)*	*Work Start/Completion Dates*	*Top of Casing Elev. (NAVD88)*	*Depth to Water (Below GS)*
	Case 580N	10/29/2018	NA	No Water Encountered

Depth (feet)	Elev. (feet)	Exploration Completion and Notes	Sample Type/ID	Blows/foot ▲ Water Content (%)● 0 10 20 30 40 50	Blows/6"	Tests	Material Type	Description	Depth (ft)
		Backfilled with native soil.						TOPSOIL; loose, brown, moist.	
								FILL CLAY WITH SAND (CL); very stiff, moist, light brown; medium plasticity; fine sand; trace organics.	
	115								
			S1						
5								**PLEISTOCENE FINE-GRAINED FACIES (Qff)** SANDY SILT (ML); very stiff, moist, light brown; non-plastic; fine sand.	5
	110								
10			S2			FC=63.2%			10
	105								
			S3					Grades to fine to medium sand.	
								PLEISTOCENE CHANNEL FACIES (Qfch) GRAVEL WITH SAND (GP); very dense, very moist, light brown; fine to coarse sand; fine to coarse, rounded to subrounded gravel; rounded cobbles (up to 1 ft diameter).	
			S4						
15								Bottom of exploration at 15 ft. bgs. Note: No caving observed.	15
	100								

Legend

Sample Type: Grab sample

Plastic Limit ├─┤ Liquid Limit

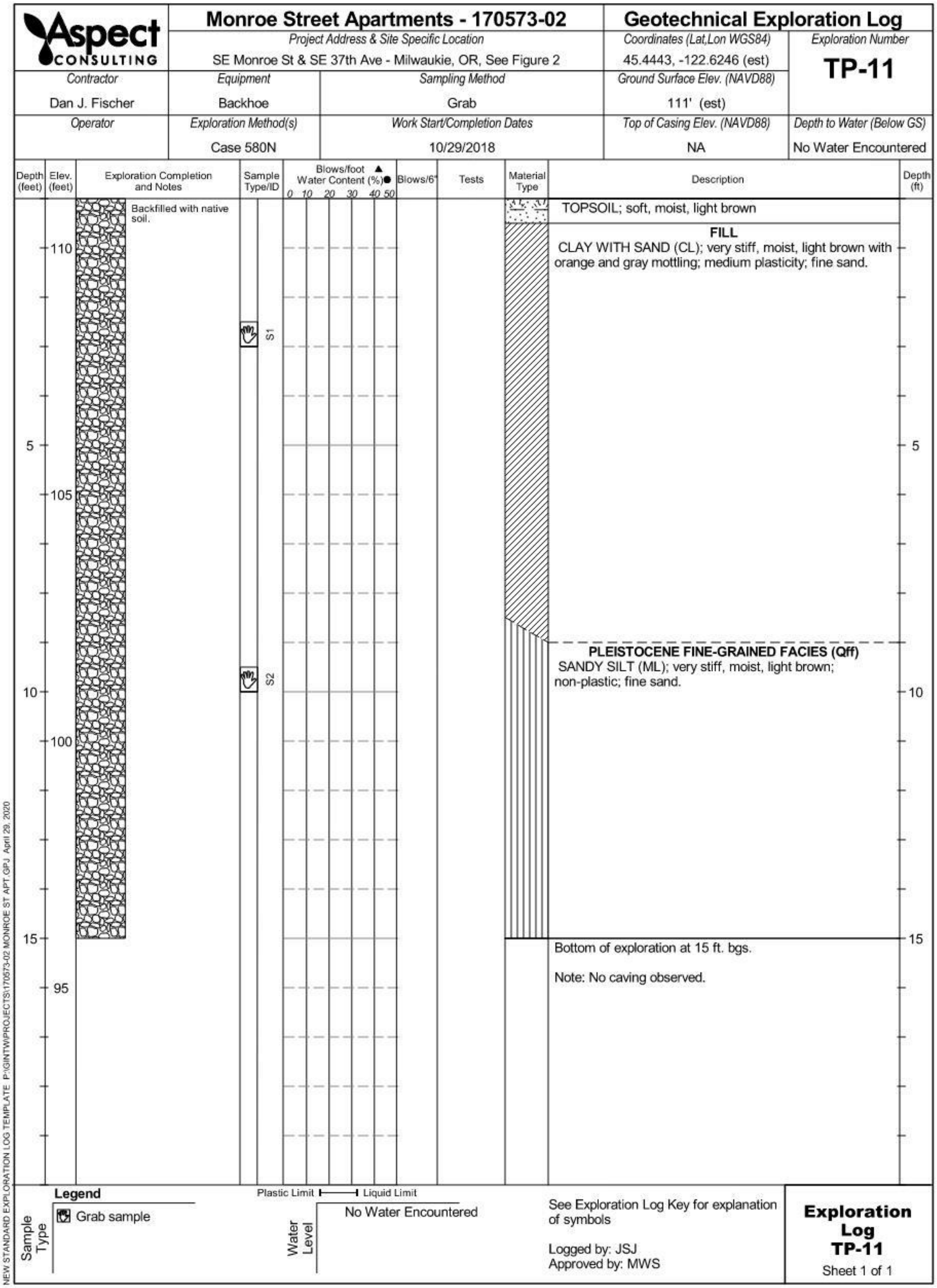
Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

Logged by: JSJ
Approved by: MWS

Exploration Log
TP-10
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020



Monroe Street Apartments - 170573-02

Geotechnical Exploration Log

Project Address & Site Specific Location	SE Monroe St & SE 37th Ave - Milwaukie, OR, See Figure 2	Coordinates (Lat,Lon WGS84)	45.4443, -122.6246 (est)
Exploration Number	TP-11	Ground Surface Elev. (NAVD88)	111' (est)
Contractor	Dan J. Fischer	Equipment	Backhoe
Sampling Method	Grab	Operator	
Exploration Method(s)	Case 580N	Work Start/Completion Dates	10/29/2018
Top of Casing Elev. (NAVD88)	NA	Depth to Water (Below GS)	No Water Encountered

Exploration Completion and Notes: Backfilled with native soil.

TOPSOIL; soft, moist, light brown

FILL
CLAY WITH SAND (CL); very stiff, moist, light brown with orange and gray mottling; medium plasticity; fine sand.

PLEISTOCENE FINE-GRAINED FACIES (Qff)
SANDY SILT (ML); very stiff, moist, light brown; non-plastic; fine sand.

Bottom of exploration at 15 ft. bgs.

Note: No caving observed.

Legend
Sample Type: Grab sample

Water Level: No Water Encountered

See Exploration Log Key for explanation of symbols

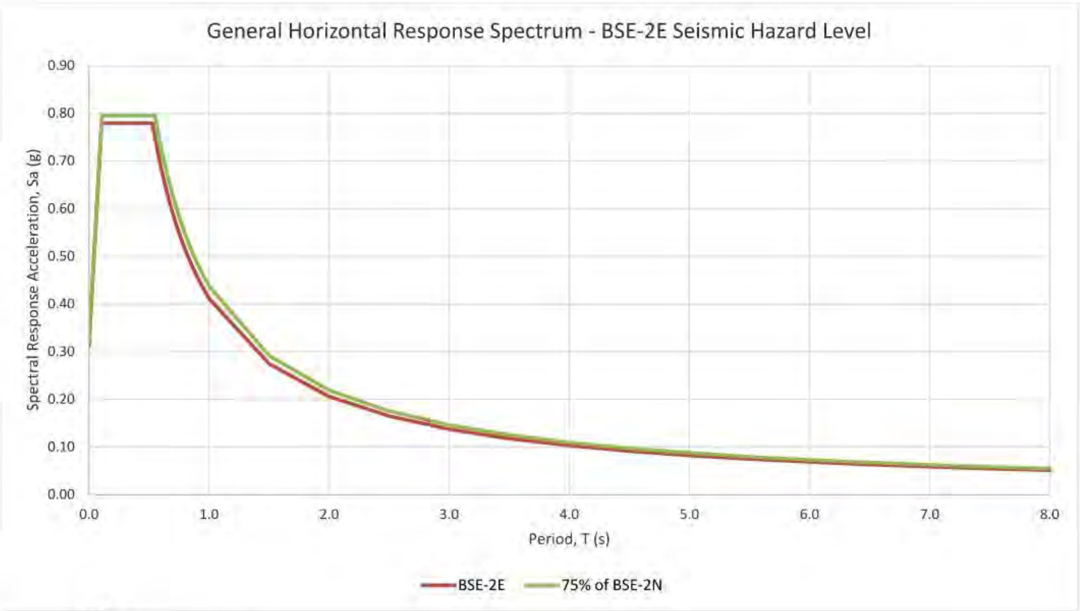
Logged by: JSJ
Approved by: MWS

Exploration Log TP-11
Sheet 1 of 1

NEW STANDARD EXPLORATION LOG TEMPLATE P:\GINTW\PROJECTS\170573-02 MONROE ST APT.GPJ April 29, 2020

APPENDIX D

BSE-2E and BSE-1E Response Spectra



Notes:
1. Seismic Site Class C
2. Response Spectrum per Section 2.4.1.7 of ASCE 41-17
3. Per Section 3403.3 of the OSSC, spectral accelerations shall be no less than 75% of the BSE-2N accelerations

Figure D-1
Reponse Spectrum - BSE-2E Seismic Hazard Level
Milwaukie Public Safety Building Seismic Retrofit
Milwaukie, Oregon

Aspect Consulting
2/15/2022
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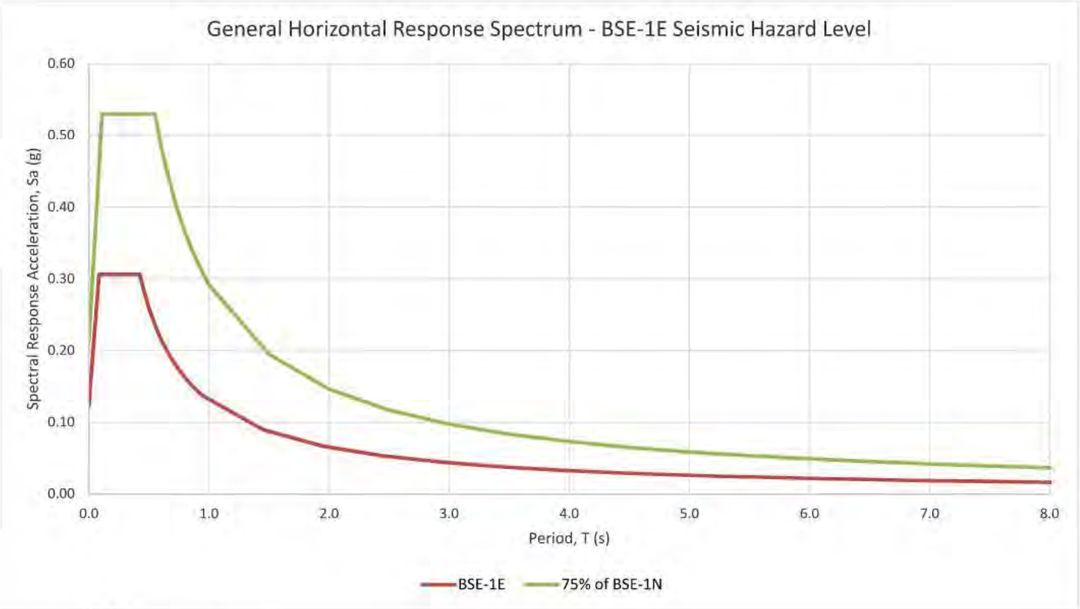

Notes:
1. Seismic Site Class C
2. Response Spectrum per Section 2.4.1.7 of ASCE 41-17
3. Per Section 3403.3 of the OSSC, spectral accelerations shall be no less than 75% of the BSE-1N accelerations

Figure D-2

Reponse Spectrum - BSE-1E Seismic Hazard Level

Milwaukie Public Safety Building Seismic Retrofit
Milwuakie, Oregon

Aspect Consulting
2/15/2022
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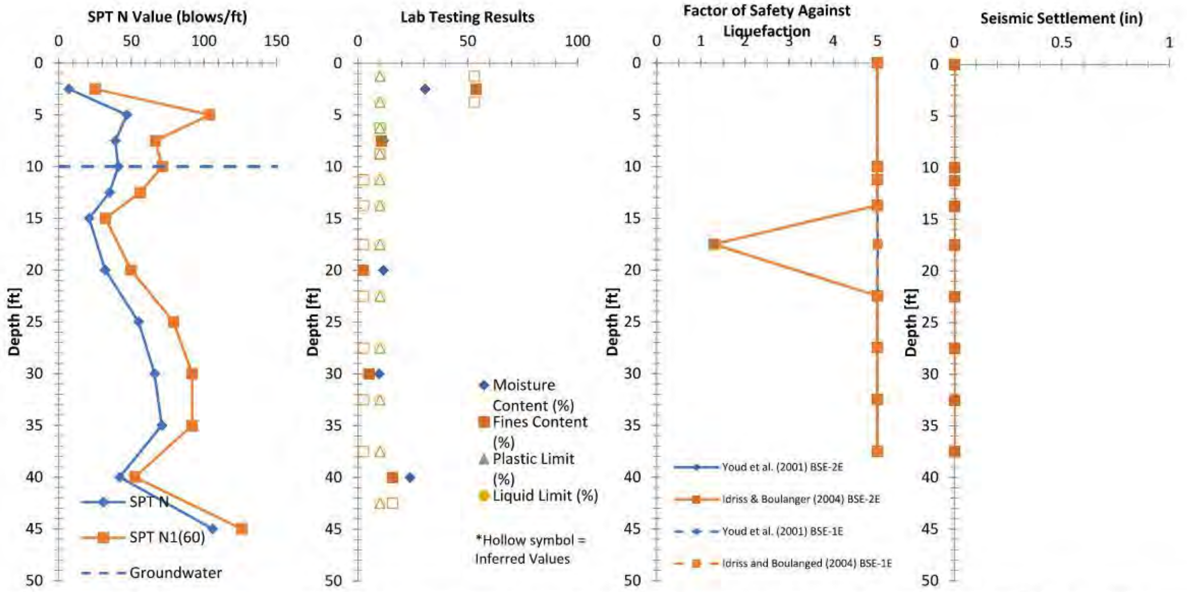
APPENDIX E

Liquefaction Analyses



Location	Reference Exploration	Earthquake Scenario	Magnitude	Effective Peak Ground Acceleration (g)
3200 SE Harrison St., Milwaukie, OR	AB-01	BSE-1E	6.10	0.1228
		BSE-2E	9.01	0.3124

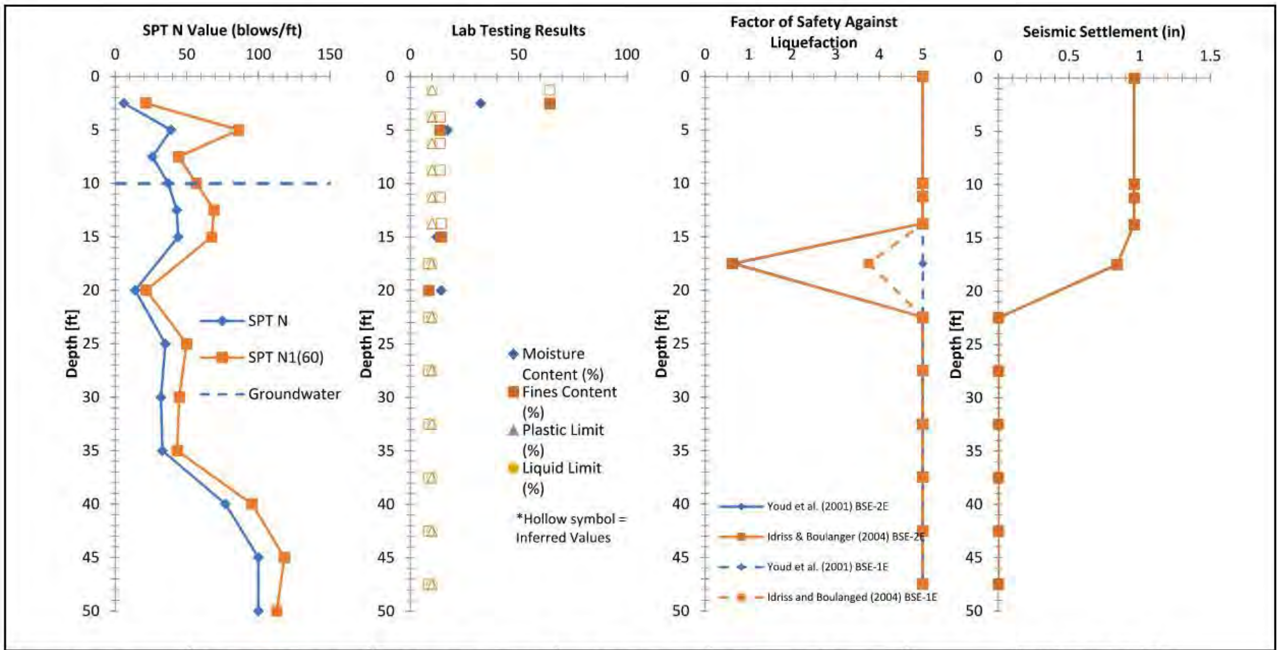
Notes:

Liquefaction Analysis
Milwaukie Public Safety Building
Milwaukie, OR

Project No.:	Analysis By:	Updated:
210478	AJH	2/15/2022

Aspect CONSULTING

Figure
E-1



Location	Reference Exploration	Earthquake Scenario	Magnitude	Effective Peak Ground Acceleration (g)
3200 SE Harrison St., Milwaukie, OR	AB-02	BSE-1E	6.10	0.1228
		BSE-2E	9.01	0.3124

Liquefaction Analysis
Milwaukie Public Safety Building
Milwaukie, OR

Project No.:	Analysis By:	Updated:
210478	AJH	2/15/2022

Aspect CONSULTING

Figure
E-2

Notes:
1. Discontinous zone of potentially liquefiable soil (BSE-2E) consisting of medium dense gravel with sand (GP) near 20 feet bgs.

APPENDIX F

Report Limitations and Guidelines for Use

REPORT LIMITATIONS AND GUIDELINES FOR USE

Geoscience is Not Exact

The geoscience practices (geotechnical engineering, geology, and environmental science) are far less exact than other engineering and natural science disciplines. It is important to recognize this limitation in evaluating the content of the report. If you are unclear how these "Report Limitations and Guidelines for Use" apply to your project or property, you should contact Aspect Consulting, LLC (Aspect).

This Report and Project-Specific Factors

Aspect's services are designed to meet the specific needs of our clients. Aspect has performed the services in general accordance with our agreement (the Agreement) with the Client (defined under the Limitations section of this project's work product). This report has been prepared for the exclusive use of the Client. This report should not be applied for any purpose or project except the purpose described in the Agreement.

Aspect considered many unique, project-specific factors when establishing the Scope of Work for this project and report. You should not rely on this report if it was:

- Not prepared for you;
- Not prepared for the specific purpose identified in the Agreement;
- Not prepared for the specific subject property assessed; or
- Completed before important changes occurred concerning the subject property, project, or governmental regulatory actions.

If changes are made to the project or subject property after the date of this report, Aspect should be retained to assess the impact of the changes with respect to the conclusions contained in the report.

Reliance Conditions for Third Parties

This report was prepared for the exclusive use of the Client. No other party may rely on the product of our services unless we agree in advance to such reliance in writing. This is to provide our firm with reasonable protection against liability claims by third parties with whom there would otherwise be no contractual limitations. Within the limitations of scope, schedule, and budget, our services have been executed in accordance with our Agreement with the Client and recognized geoscience practices in the same locality and involving similar conditions at the time this report was prepared

Property Conditions Change Over Time

This report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by events such as a change in property use or occupancy, or by natural events, such as floods, earthquakes, slope instability, or groundwater fluctuations. If any of the described events may have occurred following the issuance of the report, you should contact Aspect so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

Geotechnical, Geologic, and Environmental Reports Are Not Interchangeable

The equipment, techniques, and personnel used to perform a geotechnical or geologic study differ significantly from those used to perform an environmental study and vice versa. For that reason, a geotechnical engineering or geologic report does not usually address any environmental findings, conclusions, or recommendations (e.g., about the likelihood of encountering underground storage tanks or regulated contaminants). Similarly, environmental reports are not used to address geotechnical or geologic concerns regarding the subject property.

We appreciate the opportunity to perform these services. If you have any questions please contact the Aspect Project Manager for this project.

10.9 Appendix I: M.E.P. Evaluation Report

R&W
ENGINEERING, INC.

Mechanical Final Report – Milwaukie PSB Seismic Evaluation

Review by: Dwayne Johnson and Ed Carlisle, P.E.

Fire suppression piping is to be anchored and braced in accordance with NFP-13. The fire suppression piping in this building is properly anchored and braced per NFPA-13

Fire suppression piping is to have flexible couplings in accordance with NFPA-13.
The fire suppression piping in this building has flexible couplings at the sprinkler riser. This building has no seismic joint so there is no seismic expansion joint associated with the fire suppression system.

Penetrations through panelized ceilings for fire suppression devices are to provide clearances in accordance with NFPA-13. The sprinkler head penetrations through both hard lid ceilings and t-bar ceilings in this building have standard semi-recessed escutcheons which provide proper clearances.

Fluid and gas piping is to have flexible couplings at building seismic joints in accordance with NFPA-13.
The gas piping in this building does not have any flexible couplings as the largest main pipe is 1-1/2" threaded piping. This building has no seismic joint so there is no seismic expansion joint associated with the gas piping.

Fluid and gas piping is to be anchored and braced to the structure to limit spills or leaks.
The 1-1/2" threaded gas supply piping routes up inside of the exterior wall from the gas meter to the 2nd floor. The 1-1/2" threaded gas supply piping at the 2nd floor is hung from the truss joists with hanger rods less than 12" below the truss joists.

One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are to be restrained.
The fire suppression supply piping from 1st floor to 2nd floor is routed up in a wall so C-Clamps were not visible. The gas supply piping is not over 2.5 in. so it does not have C-clamps associated with it.

10.10 Appendix J: Elevator Specialist Evaluation Report

ECS
Elevator Consulting Services

ELEVATOR SEISMIC EVALUATION

MILWAUKIE PUBLIC SAFETY BUILDING
3200 SE Harrison St.
Milwaukie, OR 97222

ONE (1) HYDRAULIC PASSENGER ELEVATOR

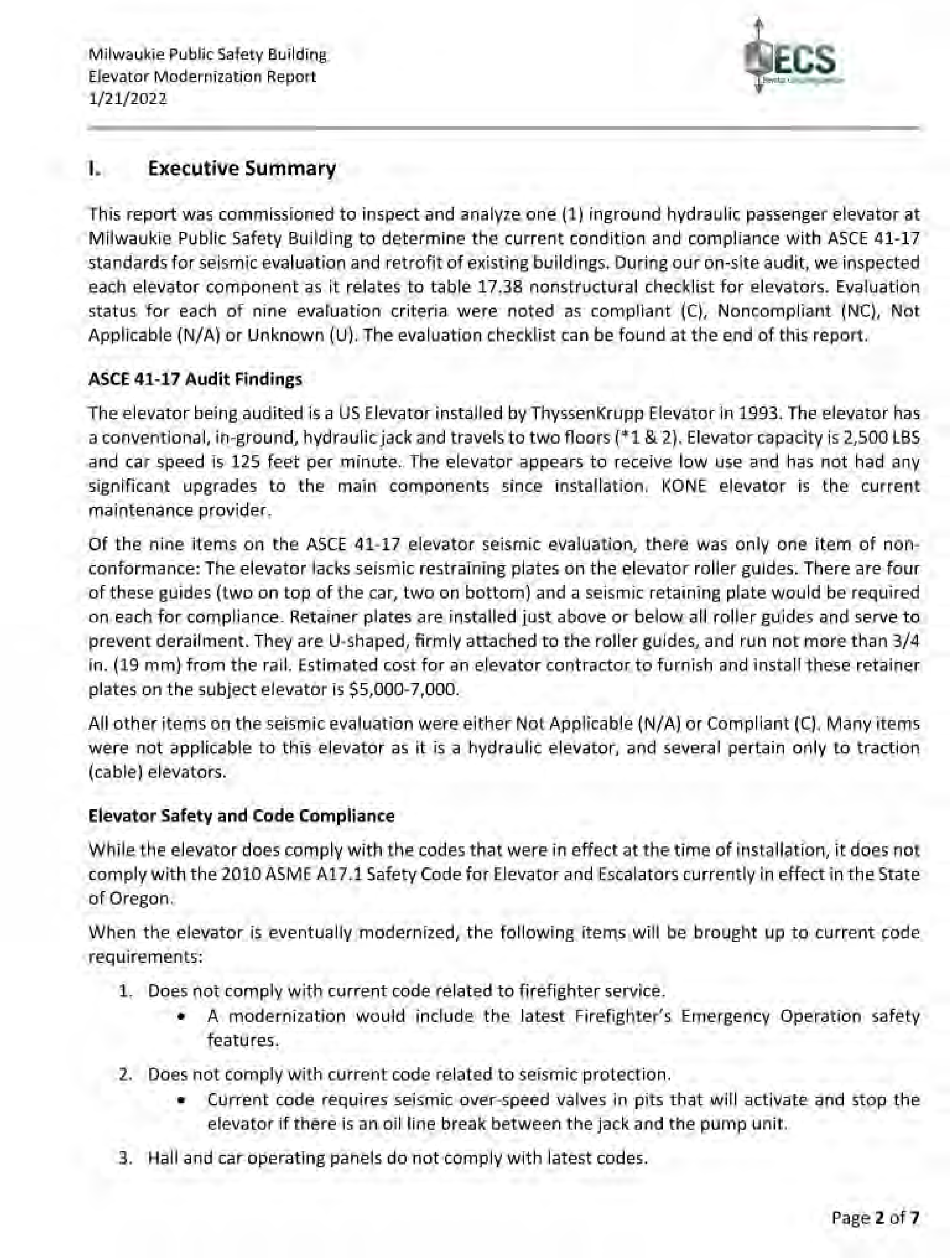
1/21/2022

Prepared For

Bill Sandbo
Principle
Peterson Structural Engineers
708 Broadway, Ste 110
Tacoma, WA 98402
Bill.Sandbo@psengineers.com

Prepared By

Bill Greenland
Consultant
Elevator Consulting Services, Inc.
1117 31ST Ave. South
Seattle, WA 98144
(425) 957-4641
billg@elevatoradvice.com



I. Executive Summary

This report was commissioned to inspect and analyze one (1) inground hydraulic passenger elevator at Milwaukie Public Safety Building to determine the current condition and compliance with ASCE 41-17 standards for seismic evaluation and retrofit of existing buildings. During our on-site audit, we inspected each elevator component as it relates to table 17.38 nonstructural checklist for elevators. Evaluation status for each of nine evaluation criteria were noted as compliant (C), Noncompliant (NC), Not Applicable (N/A) or Unknown (U). The evaluation checklist can be found at the end of this report.

ASCE 41-17 Audit Findings

The elevator being audited is a US Elevator installed by ThyssenKrupp Elevator in 1993. The elevator has a conventional, in-ground, hydraulic jack and travels to two floors (*1 & 2). Elevator capacity is 2,500 LBS and car speed is 125 feet per minute. The elevator appears to receive low use and has not had any significant upgrades to the main components since installation. KONE elevator is the current maintenance provider.

Of the nine items on the ASCE 41-17 elevator seismic evaluation, there was only one item of non-conformance: The elevator lacks seismic restraining plates on the elevator roller guides. There are four of these guides (two on top of the car, two on bottom) and a seismic retaining plate would be required on each for compliance. Retainer plates are installed just above or below all roller guides and serve to prevent derailment. They are U-shaped, firmly attached to the roller guides, and run not more than 3/4 in. (19 mm) from the rail. Estimated cost for an elevator contractor to furnish and install these retainer plates on the subject elevator is $5,000-7,000.

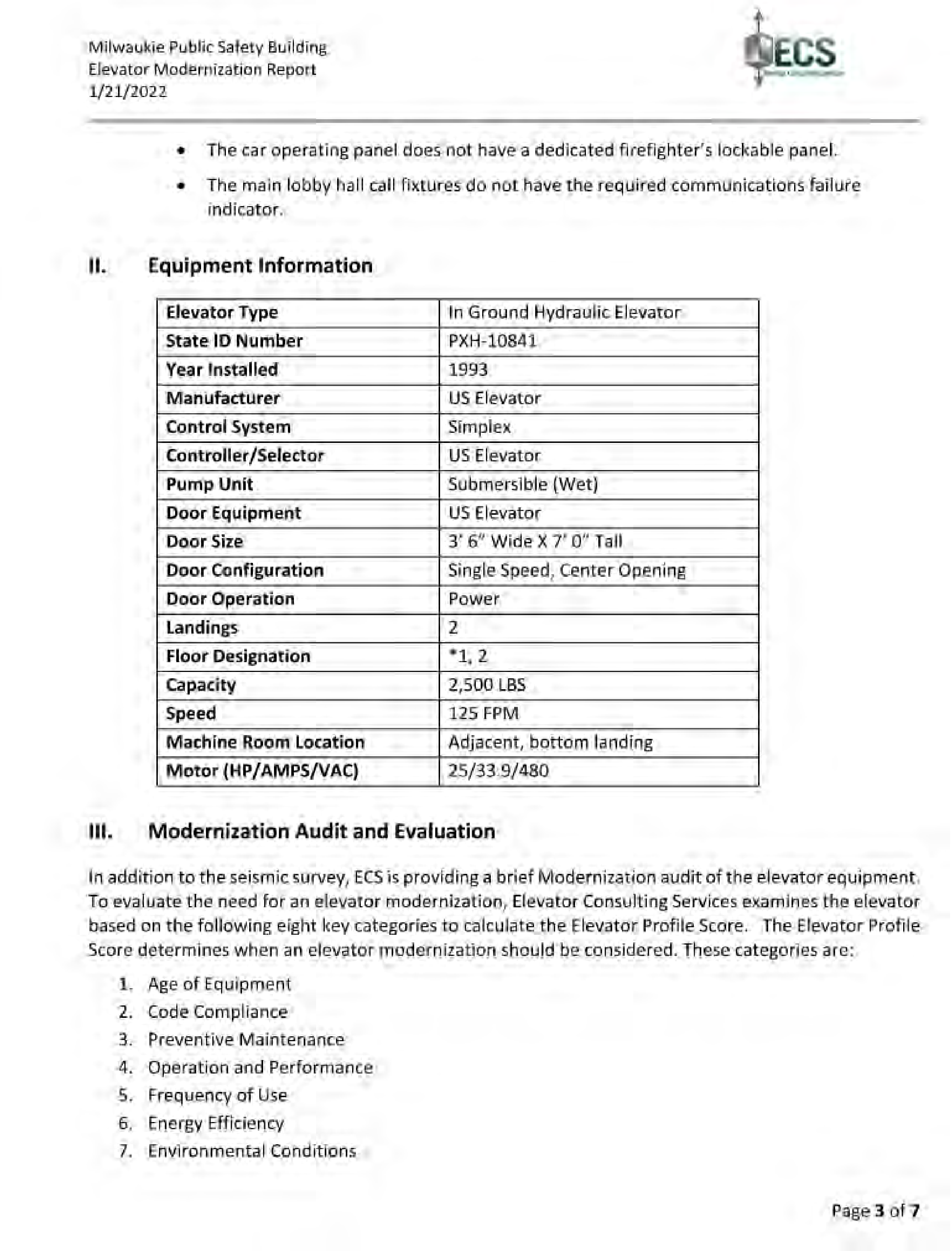
All other items on the seismic evaluation were either Not Applicable (N/A) or Compliant (C). Many items were not applicable to this elevator as it is a hydraulic elevator, and several pertain only to traction (cable) elevators.

Elevator Safety and Code Compliance

While the elevator does comply with the codes that were in effect at the time of installation, it does not comply with the 2010 ASME A17.1 Safety Code for Elevator and Escalators currently in effect in the State of Oregon.

When the elevator is eventually modernized, the following items will be brought up to current code requirements:

1. Does not comply with current code related to firefighter service.
    - A modernization would include the latest Firefighter's Emergency Operation safety features.
2. Does not comply with current code related to seismic protection.
    - Current code requires seismic over-speed valves in pits that will activate and stop the elevator if there is an oil line break between the jack and the pump unit.
3. Hall and car operating panels do not comply with latest codes.



- The car operating panel does not have a dedicated firefighter's lockable panel.
- The main lobby hall call fixtures do not have the required communications failure indicator.

II. Equipment Information

Elevator Type	In Ground Hydraulic Elevator
State ID Number	PXH-10841
Year Installed	1993
Manufacturer	US Elevator
Control System	Simplex
Controller/Selector	US Elevator
Pump Unit	Submersible (Wet)
Door Equipment	US Elevator
Door Size	3' 6" Wide X 7' 0" Tall
Door Configuration	Single Speed, Center Opening
Door Operation	Power
Landings	2
Floor Designation	*1, 2
Capacity	2,500 LBS
Speed	125 FPM
Machine Room Location	Adjacent, bottom landing
Motor (HP/AMPS/VAC)	25/33.9/480

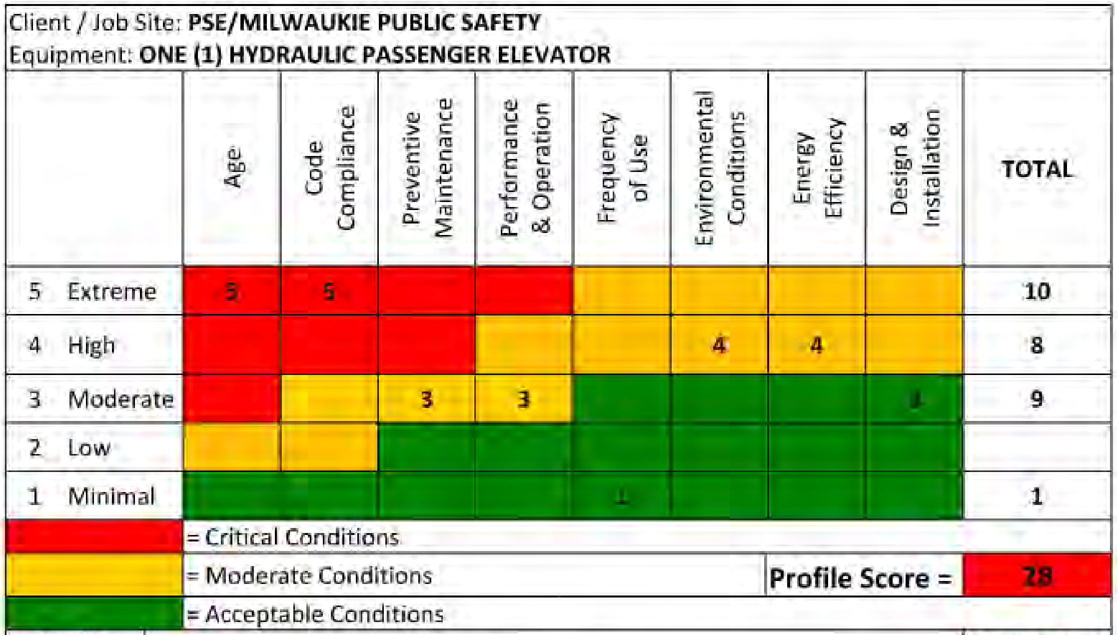
III. Modernization Audit and Evaluation

In addition to the seismic survey, ECS is providing a brief Modernization audit of the elevator equipment. To evaluate the need for an elevator modernization, Elevator Consulting Services examines the elevator based on the following eight key categories to calculate the Elevator Profile Score. The Elevator Profile Score determines when an elevator modernization should be considered. These categories are:

1. Age of Equipment
2. Code Compliance
3. Preventive Maintenance
4. Operation and Performance
5. Frequency of Use
6. Energy Efficiency
7. Environmental Conditions

8. Design and Installation

Elevator Consulting Services Elevator Equipment Profile



Client / Job Site: **PSE/MILWAUKIE PUBLIC SAFETY**
Equipment: **ONE (1) HYDRAULIC PASSENGER ELEVATOR**

	Age	Code Compliance	Preventive Maintenance	Performance & Operation	Frequency of Use	Environmental Conditions	Energy Efficiency	Design & Installation	TOTAL
5 Extreme	5	5							10
4 High						4	4		8
3 Moderate			3	3				3	9
2 Low									
1 Minimal					1				1

🟥 = Critical Conditions

🟨 = Moderate Conditions **Profile Score = 28**

🟩 = Acceptable Conditions

Profile Score	Description	Time Frame to Replace
Greater than 30	Equipment condition is extreme. Major components expected to fail. Proper maintenance is difficult, and parts are, or will become, obsolete. Multiple safety and code concerns. Modernize immediately.	Immediately
25 – 30	Equipment is nearing end of expected life. Potential failure of major components. Proper maintenance is becoming difficult, and parts are becoming obsolete. Potential safety and code issues. Begin planning for modernization.	2 to 5 years
17 – 24	Equipment shows normal wear based on current age. Update and improve maintenance program. Include modernization in long term planning.	6 to 9 years
Less than 17	Equipment shows normal wear based on current age. Maintain existing maintenance program. Modernization should not be needed for 10+ years.	10 + years

Although a modernization of the elevator system is a large investment, the advantages are many, including:

1. Building and Personal Safety Code Requirements
    - Fire safety
    - Seismic safety
    - Passenger protection
2. Operation and Performance
    - More efficient building traffic
    - Reduced maintenance to keep obsolete equipment functioning, and more maintenance on the proper areas
    - Savings on electrical power
    - Longer life of retained equipment
3. Appearance and Quality of Life
    - New cab interior (optional) and fixtures
    - New elevator lobby fixtures
4. Increased Value of the Building
5. Reduced Owner Liability
6. Reduced Environmental Risks

Cost Estimates

The cost estimate to modernize the elevator is $120,000. This estimate does not include ancillary work by other trades that would be required in support of the elevator modernization. The cost estimate for the required ancillary work is an additional $20,000-25,000.

Estimated Schedule

New elevator equipment is custom manufactured for each job, which means a significant lead time before actual construction begins. The following table highlights some of the major tasks that must be accomplished as part of an elevator modernization project:

Develop specifications and bid documents	4-6 weeks
Bid process and review	6 weeks
Contract negotiations to NTP	4-6 weeks
Provide and review drawings and submittals	10 weeks
Order and deliver equipment	16-24 weeks
Elevator Construction	3-4 weeks
Final inspection and punch list completion	2-4 weeks
Total Modernization Construction Schedule	45-70 weeks

IV. Equipment Photos

Fig. 1 – Machine room

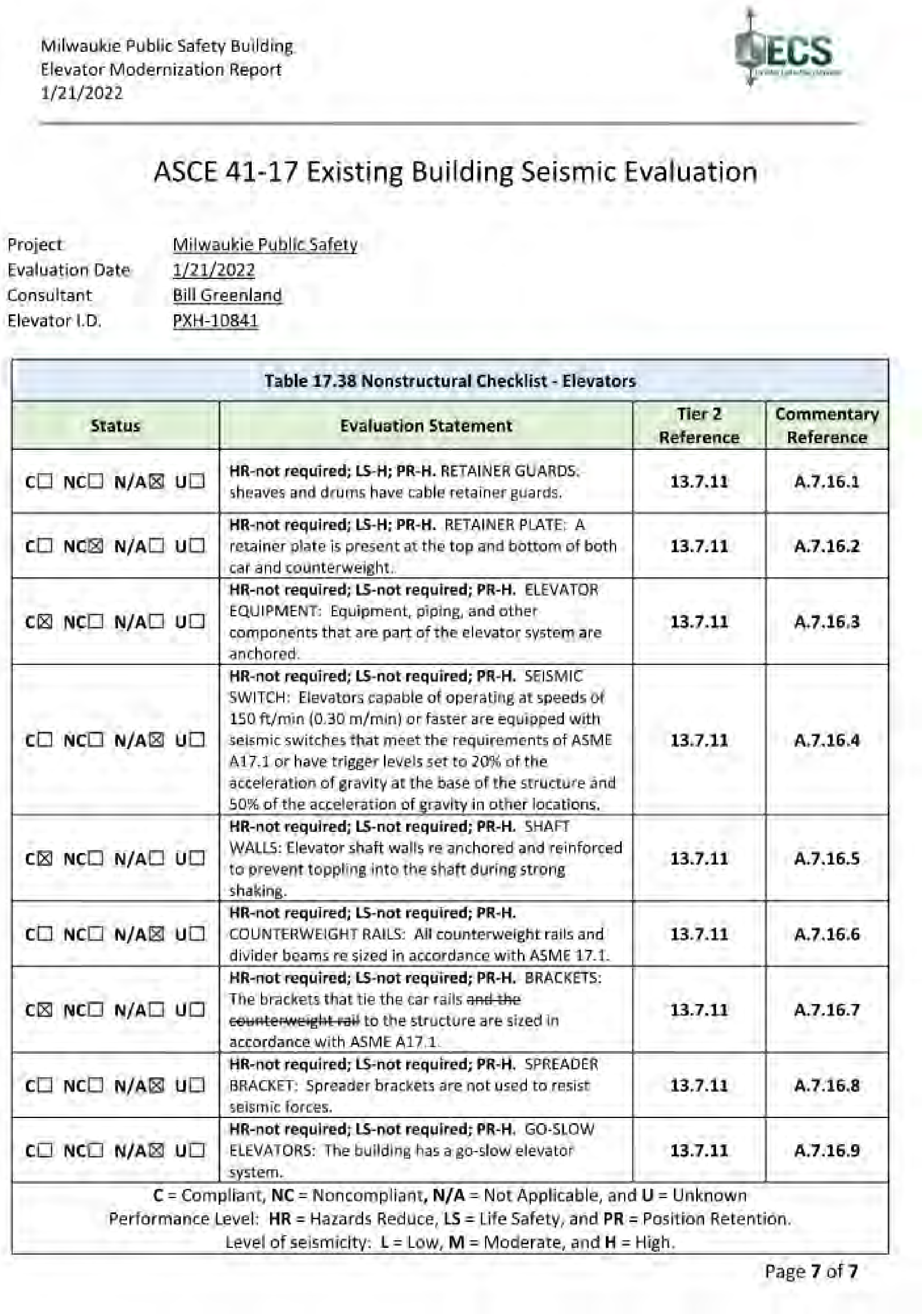
Fig. 2 – Oil line support brackets

Fig. 3 – Roller guides (w/ out seismic retainer plates)

Fig. 4 – Pit oil line (lacks seismic overspeed valve)

Fig. 5 – Guide rail fishplate

Fig. 6 – Guide rail & bracket



Milwaukie Public Safety Building
Elevator Modernization Report
1/21/2022

ASCE 41-17 Existing Building Seismic Evaluation

Project Milwaukie Public Safety
Evaluation Date 1/21/2022
Consultant Bill Greenland
Elevator I.D. PXH-10841

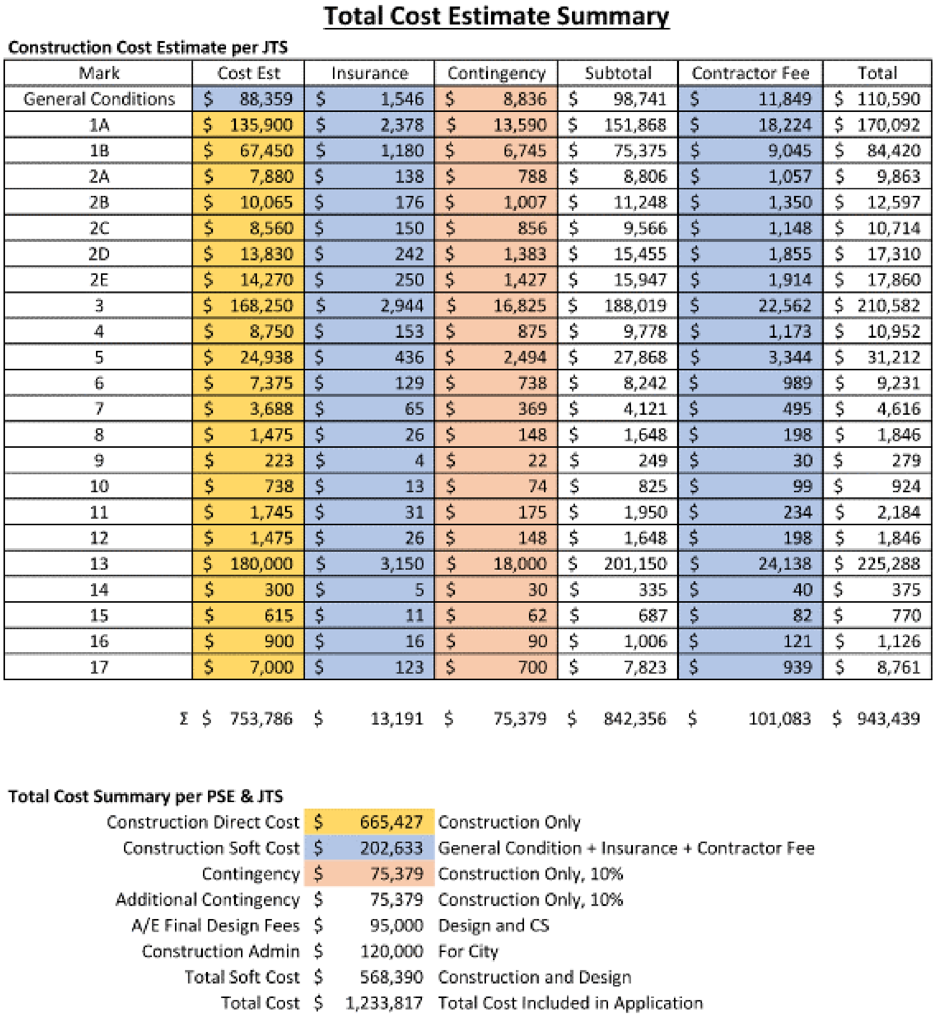
Table 17.38 Nonstructural Checklist - Elevators

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C☐ NC☐ N/A☒ U☐	**HR-not required; LS-H; PR-H.** RETAINER GUARDS: sheaves and drums have cable retainer guards.	**13.7.11**	**A.7.16.1**
C☐ NC☒ N/A☐ U☐	**HR-not required; LS-H; PR-H.** RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	**13.7.11**	**A.7.16.2**
C☒ NC☐ N/A☐ U☐	**HR-not required; LS-not required; PR-H.** ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	**13.7.11**	**A.7.16.3**
C☐ NC☐ N/A☒ U☐	**HR-not required; LS-not required; PR-H.** SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.	**13.7.11**	**A.7.16.4**
C☒ NC☐ N/A☐ U☐	**HR-not required; LS-not required; PR-H.** SHAFT WALLS: Elevator shaft walls re anchored and reinforced to prevent toppling into the shaft during strong shaking.	**13.7.11**	**A.7.16.5**
C☐ NC☐ N/A☒ U☐	**HR-not required; LS-not required; PR-H.** COUNTERWEIGHT RAILS: All counterweight rails and divider beams re sized in accordance with ASME 17.1.	**13.7.11**	**A.7.16.6**
C☒ NC☐ N/A☐ U☐	**HR-not required; LS-not required; PR-H.** BRACKETS: The brackets that tie the car rails ~~and the counterweight rail~~ to the structure are sized in accordance with ASME A17.1.	**13.7.11**	**A.7.16.7**
C☐ NC☐ N/A☒ U☐	**HR-not required; LS-not required; PR-H.** SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.	**13.7.11**	**A.7.16.8**
C☐ NC☐ N/A☒ U☐	**HR-not required; LS-not required; PR-H.** GO-SLOW ELEVATORS: The building has a go-slow elevator system.	**13.7.11**	**A.7.16.9**

C = Compliant, **NC** = Noncompliant, **N/A** = Not Applicable, and **U** = Unknown
Performance Level: **HR** = Hazards Reduce, **LS** = Life Safety, and **PR** = Position Retention.
Level of seismicity: **L** = Low, **M** = Moderate, and **H** = High.

Page **7** of **7**

10.11 Appendix K: Itemized Retrofit Cost Estimate



Total Cost Estimate Summary

Construction Cost Estimate per JTS

Mark	Cost Est	Insurance	Contingency	Subtotal	Contractor Fee	Total
General Conditions	$ 88,359	$ 1,546	$ 8,836	$ 98,741	$ 11,849	$ 110,590
1A	$ 135,900	$ 2,378	$ 13,590	$ 151,868	$ 18,224	$ 170,092
1B	$ 67,450	$ 1,180	$ 6,745	$ 75,375	$ 9,045	$ 84,420
2A	$ 7,880	$ 138	$ 788	$ 8,806	$ 1,057	$ 9,863
2B	$ 10,065	$ 176	$ 1,007	$ 11,248	$ 1,350	$ 12,597
2C	$ 8,560	$ 150	$ 856	$ 9,566	$ 1,148	$ 10,714
2D	$ 13,830	$ 242	$ 1,383	$ 15,455	$ 1,855	$ 17,310
2E	$ 14,270	$ 250	$ 1,427	$ 15,947	$ 1,914	$ 17,860
3	$ 168,250	$ 2,944	$ 16,825	$ 188,019	$ 22,562	$ 210,582
4	$ 8,750	$ 153	$ 875	$ 9,778	$ 1,173	$ 10,952
5	$ 24,938	$ 436	$ 2,494	$ 27,868	$ 3,344	$ 31,212
6	$ 7,375	$ 129	$ 738	$ 8,242	$ 989	$ 9,231
7	$ 3,688	$ 65	$ 369	$ 4,121	$ 495	$ 4,616
8	$ 1,475	$ 26	$ 148	$ 1,648	$ 198	$ 1,846
9	$ 223	$ 4	$ 22	$ 249	$ 30	$ 279
10	$ 738	$ 13	$ 74	$ 825	$ 99	$ 924
11	$ 1,745	$ 31	$ 175	$ 1,950	$ 234	$ 2,184
12	$ 1,475	$ 26	$ 148	$ 1,648	$ 198	$ 1,846
13	$ 180,000	$ 3,150	$ 18,000	$ 201,150	$ 24,138	$ 225,288
14	$ 300	$ 5	$ 30	$ 335	$ 40	$ 375
15	$ 615	$ 11	$ 62	$ 687	$ 82	$ 770
16	$ 900	$ 16	$ 90	$ 1,006	$ 121	$ 1,126
17	$ 7,000	$ 123	$ 700	$ 7,823	$ 939	$ 8,761
Σ	$ 753,786	$ 13,191	$ 75,379	$ 842,356	$ 101,083	$ 943,439

Total Cost Summary per PSE & JTS

Construction Direct Cost	$ 665,427	Construction Only
Construction Soft Cost	$ 202,633	General Condition + Insurance + Contractor Fee
Contingency	$ 75,379	Construction Only, 10%
Additional Contingency	$ 75,379	Construction Only, 10%
A/E Final Design Fees	$ 95,000	Design and CS
Construction Admin	$ 120,000	For City
Total Soft Cost	$ 568,390	Construction and Design
Total Cost	$ 1,233,817	Total Cost Included in Application

The following pages show the construction cost estimate as prepared by JTS.

CSI	Item Description	Alternate Name	Takeoff Qty	Unit	Labor U.P.	Labor Total	Matl U.P.	Matl Total	Subs U.P.	Subs Total	Other U.P.	Other Total	Equip U.P.	Equip Total	Total
	General Condition	General Conditior													
1000	Project Superintendent														
1000	Project Superintendent	General Conditic	8.0	week	3,400.00	27,200					150.00	1,200	120.00	960	29,360
1000	Project Superintendent Total					27,200						1,200		960	29,360
1001	Project Managers														
1001	Project Manager	General Conditic	8.0	week	950.00	7,600					150.00	1,200	100.00	800	9,600
1001	Project Managers Total					7,600						1,200		800	9,600
1019	Tolls & Parking Fees														
1019	Jobsite Parking	General Conditic		NIC											
1019	Tolls & Parking Fees Total														
1120	Jobsite Security														
1120	Jobsite Security	General Conditic		NIC											
1120	Jobsite Security Total														
1200	Office Space														
1200	Job Office Rental	General Conditic		NIC											
1200	Office Space Total														
1210	Office Furniture & Expenses														
1210	Electronics - Computer, Communications, etc	General Conditic	2.0	mnth							250.00	500			500
1210	Office Furniture & Expenses Total											500			500
1220	Office Supplies														
1220	Drinking Water - Office	General Conditic	2.0	mnth							61.28	123			123
1220	Office Supplies Total											123			123
1230	Telephone														
1230	Cell Phone Service	General Conditic	2.0	mnth							250.00	500			500
1230	Telephone Total											500			500
1235	Internet Services														
1235	Internet Connection Fee	General Conditic	1.0	each							500.00	500			500
1235	Internet Service	General Conditic	2.0	mnth							150.00	300			300
1235	Internet Services Total											800			800
1240	Plan Reproduction														
1240	Reprographics & Mailings	General Conditic	1.0	lsum							1,000.00	1,000			1,000
1240	Plan Reproduction Total											1,000			1,000
1505	Mobilization														
1505	Jobsite Mobilization/Demob	General Conditic	1.0	lsum	1,200.00	1,200					2,500.00	2,500			3,700
1505	Mobilization Total					1,200						2,500			3,700
1511	Temporary Lighting														
1511	Temporary Lighting	General Conditic		NIC											
1511	Temporary Lighting Total														
1512	Temporary Electricity														
1512	Temp Power Connection	General Conditic		inc											
1512	Temporary Electricity Total														
1516	Temporary Sanitation														
1516	Sanikan	General Conditic	2.0	mnth							675.00	1,350			1,350
1516	Temporary Sanitation Total											1,350			1,350
1521	Tool & Drysheds														
1521	Storage Container	General Conditic	2.0	mnth							500.00	1,000			1,000
1521	Tool & Drysheds Total											1,000			1,000
1522	Temporary Railings/Safety														
1522	Site Safety & Supply	General Conditic	8.0	week	375.00	3,000					100.00	800			3,800
1522	Temporary Railings/Safety Total					3,000						800			3,800
1523	Temporary Weather Protection														
1523	Temporary Weather Protection	General Conditic	2.0	mnth	2,250.00	4,500					500.00	1,000			5,500
1523	Temporary Weather Protection Total					4,500						1,000			5,500
1524	Temporary Protection - Finishes														
1524	Interior Protection	General Conditic	8,500.0	sqft	0.32	2,700					0.20	1,700			4,400
1524	Temporary Protection - Finishes Total					2,700						1,700			4,400

CSI	Item Description	Alternate Name	Takeoff Qty	Unit	Labor U.P.	Labor Total	Matl U.P.	Matl Total	Subs U.P.	Subs Total	Other U.P.	Other Total	Equip U.P.	Equip Total	Total
1560	Construction Cleaning														
1560	Construction Cleaning	General Conditic	8.0	week	375.00	3,000					40.00	320			3,320
1560	Construction Cleaning Total					3,000						320			3,320
1600	Small Tools - Rental														
1600	Small Tools - Rental	General Conditic	2.0	mnth									2,500.00	5,000	5,000
1600	Small Tools - Rental Total													5,000	5,000
1601	Small Tools - Purchase														
1601	Small Tools - Purchase	General Conditic	2.0	mnth							500.00	1,000			1,000
1601	Small Tools - Purchase Total											1,000			1,000
1700	Punchlist														
1700	Punchlist	General Conditic	8,500.0	sqft	0.32	2,715					0.10	850			3,565
1700	Punchlist Total					2,715						850			3,565
1710	Final Cleaning														
1710	Final Cleaning	General Conditic	8,500.0	sqft					0.68	5,801					5,801
1710	Final Cleaning Total									5,801					5,801
1803	Building Permits														
1803	Building Permit	General Conditic		NIC											
1803	Building Permits Total														
1809	Traffic Permits														
1809	Street Use Permits	General Conditic		NIC											
1809	Traffic Permits Total														
1930	Safety														
1930	Safety Officer	General Conditic	8.0	week	255.00	2,040									2,040
1930	Safety Total					2,040									2,040
2090	Dump Fees														
2090	Dump Fees	General Conditic	8.0	each							750.00	6,000			6,000
2090	Dump Fees Total											6,000			6,000
	General Condition Total	General Conditior				53,955				5,801		21,843		6,760	88,359
	Mark 1A	Mark 1A													
2050	Demolition														
2050	Demolition - Select Wall Finishes	Mark 1A	1,000.0	sqft					10.00	10,000					10,000
2050	Demolition Total									10,000					10,000
3340	Shotcrete														
3340	FRP/FRCM Type 1	Mark 1A	1,000.0	sqft					100.00	100,000					100,000
3340	Scaffolding	Mark 1A	1.0	Allow					7,500.00	7,500					7,500
3340	Shotcrete Total									107,500					107,500
9250	Drywall														
9250	Gypsum Board - Patch	Mark 1A	1,000.0	sqft					8.40	8,400					8,400
9250	Drywall Total									8,400					8,400
9900	Painting														
9900	Painting - Repair Allowance	Mark 1A	1.0	allow					10,000.00	10,000					10,000
9900	Painting Total									10,000					10,000
	Mark 1A Total	Mark 1A								135,900					135,900
	Mark 1B	Mark 1B													
2050	Demolition														
2050	Demolition - Select Wall Finishes	Mark 1B	500.0	sqft					10.00	5,000					5,000
2050	Demolition Total									5,000					5,000
3340	Shotcrete														
3340	FRP/FRCM Type 2	Mark 1B	500.0	sqft					100.00	50,000					50,000
3340	Scaffolding	Mark 1B	1.0	Allow					2,500.00	2,500					2,500
3340	Shotcrete Total									52,500					52,500
9250	Drywall														
9250	Gypsum Board - Patch	Mark 1B	500.0	sqft					8.40	4,200					4,200
9250	Drywall Total									4,200					4,200
9900	Painting														

CSI	Item Description	Alternate Name	Takeoff Qty	Unit	Labor U.P.	Labor Total	Matl U.P.	Matl Total	Subs U.P.	Subs Total	Other U.P.	Other Total	Equip U.P.	Equip Total	Total
9900	Painting - Repair Allowance	Mark 1B	1.0	allow					5,750.00	5,750					5,750
9900	Painting Total									5,750					5,750
	Mark 1B Total	Mark 1B								67,450					67,450
	Mark 2A	Mark 2A													
5100	Steel Materials														
5100	Mark 2A - Steel Plate & Angle Materials	Mark 2A	33.0	lnft					40.00	1,320					1,320
5100	Mark 2A - Welding	Mark 2A	27.0	each					85.00	2,295					2,295
5100	Mark 2A - Bolting	Mark 2A	27.0	each					145.00	3,915					3,915
5100	Mark 2A - Inspections	Mark 2A	1.0	lsum					350.00	350					350
5100	Steel Materials Total									7,880					7,880
	Mark 2A Total	Mark 2A								7,880					7,880
	Mark 2B	Mark 2B													
5100	Steel Materials														
5100	Mark 2B - Bolting	Mark 2B	67.0	each					145.00	9,715					9,715
5100	Mark 2B - Inspections	Mark 2B	1.0	lsum					350.00	350					350
5100	Steel Materials Total									10,065					10,065
	Mark 2B Total	Mark 2B								10,065					10,065
	Mark 2C	Mark 2C													
5100	Steel Materials														
5100	Mark 2C - Channel	Mark 2C	16.0	lnft					255.00	4,080					4,080
5100	Mark 2C - Welding	Mark 2C	14.0	each					150.00	2,100					2,100
5100	Mark 2C - Bolting	Mark 2C	14.0	each					145.00	2,030					2,030
5100	Mark 2C - Inspections	Mark 2C	1.0	lsum					350.00	350					350
5100	Steel Materials Total									8,560					8,560
	Mark 2C Total	Mark 2C								8,560					8,560
	Mark 2D	Mark 2D													
5100	Steel Materials														
5100	Mark 2D - Steel Plate & Angle Materials	Mark 2D	61.0	lnft					40.00	2,440					2,440
5100	Mark 2D - Welding	Mark 2D	48.0	each					85.00	4,080					4,080
5100	Mark 2D - Bolting	Mark 2D	48.0	each					145.00	6,960					6,960
5100	Mark 2D - Inspections	Mark 2D	1.0	lsum					350.00	350					350
5100	Steel Materials Total									13,830					13,830
	Mark 2D Total	Mark 2D								13,830					13,830
	Mark 2E	Mark 2E													
5100	Steel Materials														
5100	Mark 2E - Bolting	Mark 2E	96.0	each					145.00	13,920					13,920
5100	Mark 2E - Inspections	Mark 2E	1.0	lsum					350.00	350					350
5100	Steel Materials Total									14,270					14,270
	Mark 2E Total	Mark 2E								14,270					14,270
	Mark 3	Mark 3													
2050	Demolition														
2050	Roofing Demolition	Mark 3	2,500.0	sqft					12.50	31,250					31,250
2050	Demolition Total									31,250					31,250
5100	Steel Materials														
5100	Welding Exsposed Metal Decking (roof) - 3" we	Mark 3	700.0	each					35.00	24,500					24,500
5100	Steel Materials Total									24,500					24,500
7500	Membrane Roofing														
7500	Membrane Roofing	Mark 3	2,500.0	sqft					45.00	112,500					112,500
7500	Membrane Roofing Total									112,500					112,500
	Mark 3 Total	Mark 3								168,250					168,250
	Mark 4	Mark 4													
2050	Demolition														
2050	Demolition - Select ACT Trimming	Mark 4	2,500.0	lnft					3.50	8,750					8,750
2050	Demolition Total									8,750					8,750
	Mark 4 Total	Mark 4								8,750					8,750

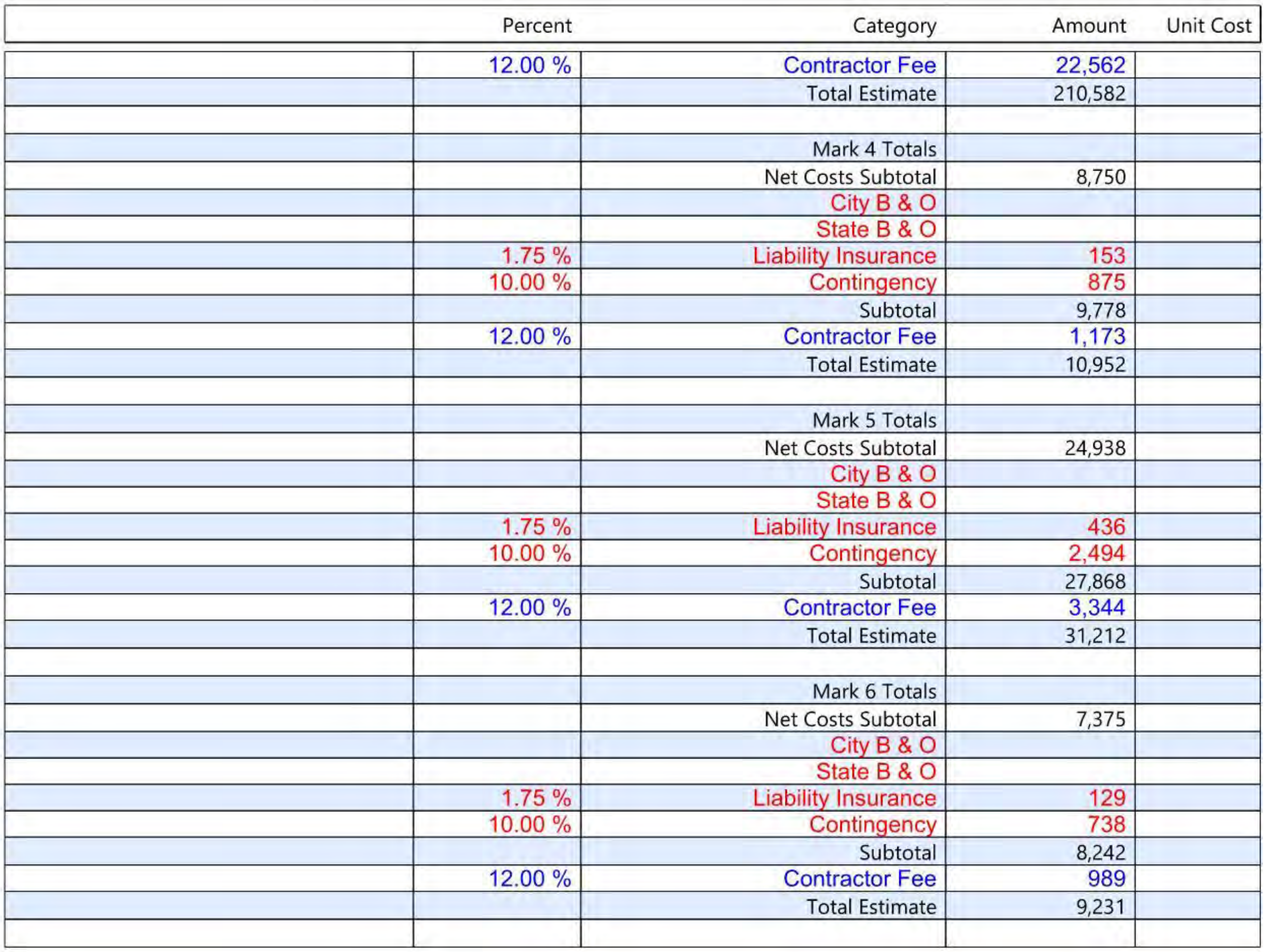
CSI	Item Description	Alternate Name	Takeoff Qty	Unit	Labor U.P.	Labor Total	Matl U.P.	Matl Total	Subs U.P.	Subs Total	Other U.P.	Other Total	Equip U.P.	Equip Total	Total
	Mark 5	Mark 5													
9500	Acoustical Treatment														
9500	Acoustical Ceilings Provide Support 1/SR3	Mark 5	2,500.0	lnft					9.97	24,938					24,938
9500	Acoustical Treatment Total									24,938					24,938
	Mark 5 Total	Mark 5								24,938					24,938
	Mark 6	Mark 6													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 6	Mark 6	50.0	each	112.50	5,625	35.00	1,750							7,375
13080	Sound Vibration & Seismic Control Total					5,625		1,750							7,375
	Mark 6 Total	Mark 6				5,625		1,750							7,375
	Mark 7	Mark 7													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 7 2/SR3	Mark 7	25.0	each	112.50	2,813	35.00	875							3,688
13080	Sound Vibration & Seismic Control Total					2,813		875							3,688
	Mark 7 Total	Mark 7				2,813		875							3,688
	Mark 8	Mark 8													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 8	Mark 8	10.0	each	112.50	1,125	35.00	350							1,475
13080	Sound Vibration & Seismic Control Total					1,125		350							1,475
	Mark 8 Total	Mark 8				1,125		350							1,475
	Mark 9	Mark 9													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 9 - Trampoline	Mark 9	1.0	each	112.50	113	110.00	110							223
13080	Sound Vibration & Seismic Control Total					113		110							223
	Mark 9 Total	Mark 9				113		110							223
	Mark 10	Mark 10													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 10 2/SR3	Mark 10	5.0	each	112.50	563	35.00	175							738
13080	Sound Vibration & Seismic Control Total					563		175							738
	Mark 10 Total	Mark 10				563		175							738
	Mark 11	Mark 11													
5120	Steel Erection														
5120	Unistrut Attachment - Condition 11 3/SR3	Mark 11	20.0	each	11.25	225	75.00	1,500	1.00	20					1,745
5120	Steel Erection Total					225		1,500		20					1,745
	Mark 11 Total	Mark 11				225		1,500		20					1,745
	Mark 12	Mark 12													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 12 2/SR3	Mark 12	10.0	each	112.50	1,125	35.00	350							1,475
13080	Sound Vibration & Seismic Control Total					1,125		350							1,475
	Mark 12 Total	Mark 12				1,125		350							1,475
	Mark 13	Mark 13													
8110	Hollow Metal Doors														
8110	Non-Structural Retrofit - Check 13 Replace Sec	Mark 13	2.0	each					20,000.00	40,000					40,000
8110	Non-Structural Retrofit - Check 13 Replace high	Mark 13	4.0	each					35,000.00	140,000					140,000
8110	Hollow Metal Doors Total									180,000					180,000
	Mark 13 Total	Mark 13								180,000					180,000
	Mark 14	Mark 14													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 14 4/SR3	Mark 14	5.0	each	30.00	150	30.00	150							300
13080	Sound Vibration & Seismic Control Total					150		150							300
	Mark 14 Total	Mark 14				150		150							300
	Mark 15	Mark 15													

CSI	Item Description	Alternate Name	Takeoff Qty	Unit	Labor U.P.	Labor Total	Matl U.P.	Matl Total	Subs U.P.	Subs Total	Other U.P.	Other Total	Equip U.P.	Equip Total	Total
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 15 Generator S	Mark 15	1.0	each	450.00	450	165.00	165							615
13080	Sound Vibration & Seismic Control Total					450		165							615
	Mark 15 Total	Mark 15				450		165							615
	Mark 16	Mark 16													
16100	Electrical														
16100	Non-Structural Retrofit - Check 16 Electrical Eq	Mark 16	5.0	each	150.00	750	30.00	150							900
16100	Electrical Total					750		150							900
	Mark 16 Total	Mark 16				750		150							900
	Mark 17	Mark 17													
13080	Sound Vibration & Seismic Control														
13080	Non-Structural Retrofit - Check 17 - EV Retaine	Mark 17	1.0	lsum					7,000.00	7,000					7,000
13080	Sound Vibration & Seismic Control Total									7,000					7,000
	Mark 17 Total	Mark 17								7,000					7,000

	Percent	Category	Amount	Unit Cost
		General Condition Totals		
		Net Costs Subtotal	88,359	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	1,546	
	10.00 %	Contingency	8,836	
		Subtotal	98,741	
	12.00 %	Contractor Fee	11,849	
		Total Estimate	110,590	
		Mark 1A Totals		
		Net Costs Subtotal	135,900	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	2,378	
	10.00 %	Contingency	13,590	
		Subtotal	151,868	
	12.00 %	Contractor Fee	18,224	
		Total Estimate	170,092	
		Mark 1B Totals		

	Percent	Category	Amount	Unit Cost
		Net Costs Subtotal	67,450	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	1,180	
	10.00 %	Contingency	6,745	
		Subtotal	75,375	
	12.00 %	Contractor Fee	9,045	
		Total Estimate	84,420	
		Mark 2A Totals		
		Net Costs Subtotal	7,880	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	138	
	10.00 %	Contingency	788	
		Subtotal	8,806	
	12.00 %	Contractor Fee	1,057	
		Total Estimate	9,863	
		Mark 2B Totals		
		Net Costs Subtotal	10,065	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	176	
	10.00 %	Contingency	1,007	
		Subtotal	11,248	
	12.00 %	Contractor Fee	1,350	
		Total Estimate	12,597	
		Mark 2C Totals		
		Net Costs Subtotal	8,560	
		City B & O		
		State B & O		

	Percent	Category	Amount	Unit Cost
	1.75 %	Liability Insurance	150	
	10.00 %	Contingency	856	
		Subtotal	9,566	
	12.00 %	Contractor Fee	1,148	
		Total Estimate	10,714	
		Mark 2D Totals		
		Net Costs Subtotal	13,830	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	242	
	10.00 %	Contingency	1,383	
		Subtotal	15,455	
	12.00 %	Contractor Fee	1,855	
		Total Estimate	17,310	
		Mark 2E Totals		
		Net Costs Subtotal	14,270	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	250	
	10.00 %	Contingency	1,427	
		Subtotal	15,947	
	12.00 %	Contractor Fee	1,914	
		Total Estimate	17,860	
		Mark 3 Totals		
		Net Costs Subtotal	168,250	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	2,944	
	10.00 %	Contingency	16,825	
		Subtotal	188,019	



	Percent	Category	Amount	Unit Cost
	12.00 %	Contractor Fee	22,562	
		Total Estimate	210,582	
		Mark 4 Totals		
		Net Costs Subtotal	8,750	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	153	
	10.00 %	Contingency	875	
		Subtotal	9,778	
	12.00 %	Contractor Fee	1,173	
		Total Estimate	10,952	
		Mark 5 Totals		
		Net Costs Subtotal	24,938	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	436	
	10.00 %	Contingency	2,494	
		Subtotal	27,868	
	12.00 %	Contractor Fee	3,344	
		Total Estimate	31,212	
		Mark 6 Totals		
		Net Costs Subtotal	7,375	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	129	
	10.00 %	Contingency	738	
		Subtotal	8,242	
	12.00 %	Contractor Fee	989	
		Total Estimate	9,231	

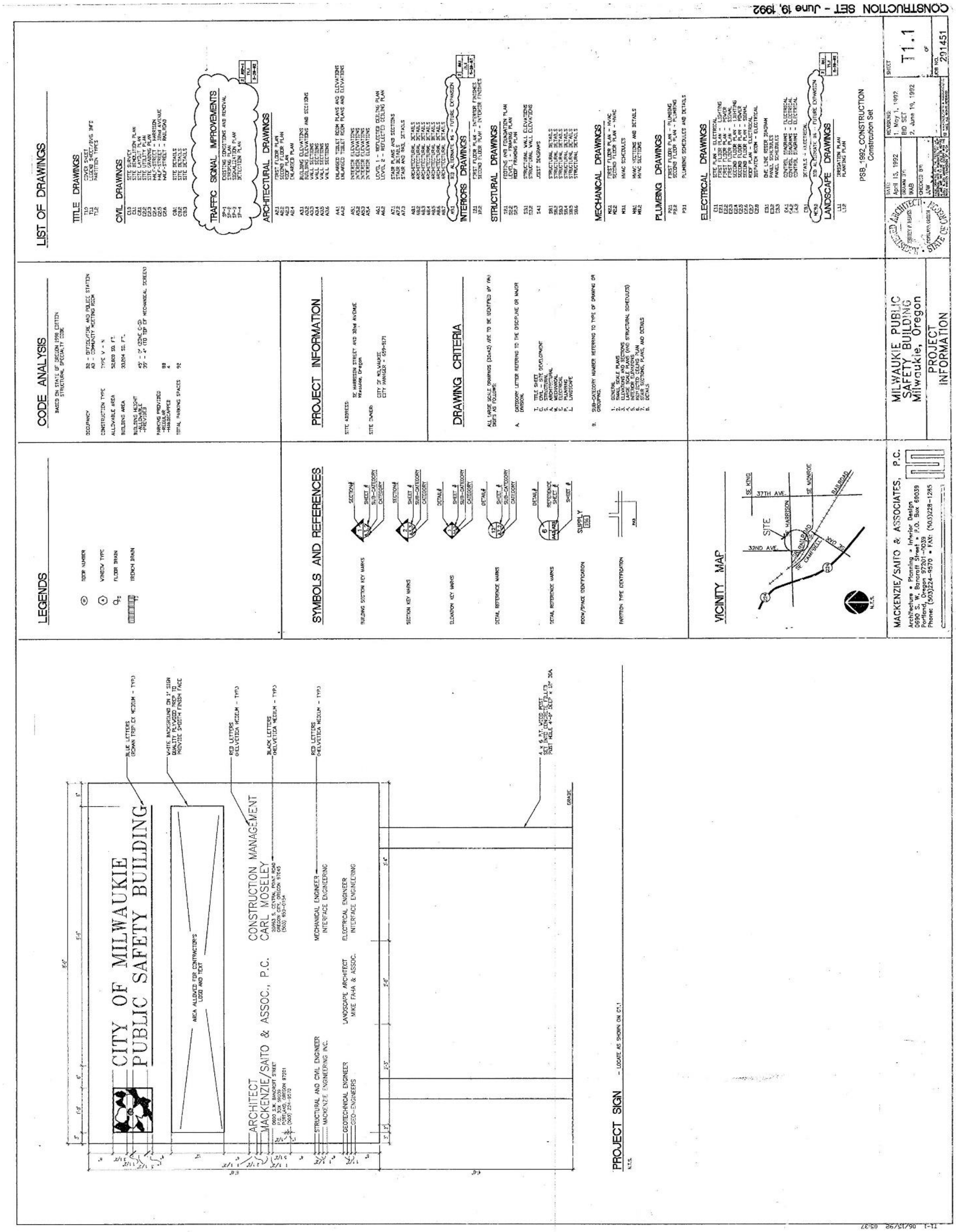
	Percent	Category	Amount	Unit Cost
		Mark 7 Totals		
		Net Costs Subtotal	3,688	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	65	
	10.00 %	Contingency	369	
		Subtotal	4,121	
	12.00 %	Contractor Fee	494	
		Total Estimate	4,615	
		Mark 8 Totals		
		Net Costs Subtotal	1,475	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	26	
	10.00 %	Contingency	148	
		Subtotal	1,648	
	12.00 %	Contractor Fee	198	
		Total Estimate	1,846	
		Mark 9 Totals		
		Net Costs Subtotal	223	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	4	
	10.00 %	Contingency	22	
		Subtotal	249	
	12.00 %	Contractor Fee	30	
		Total Estimate	278	
		Mark 10 Totals		
		Net Costs Subtotal	738	
		City B & O		

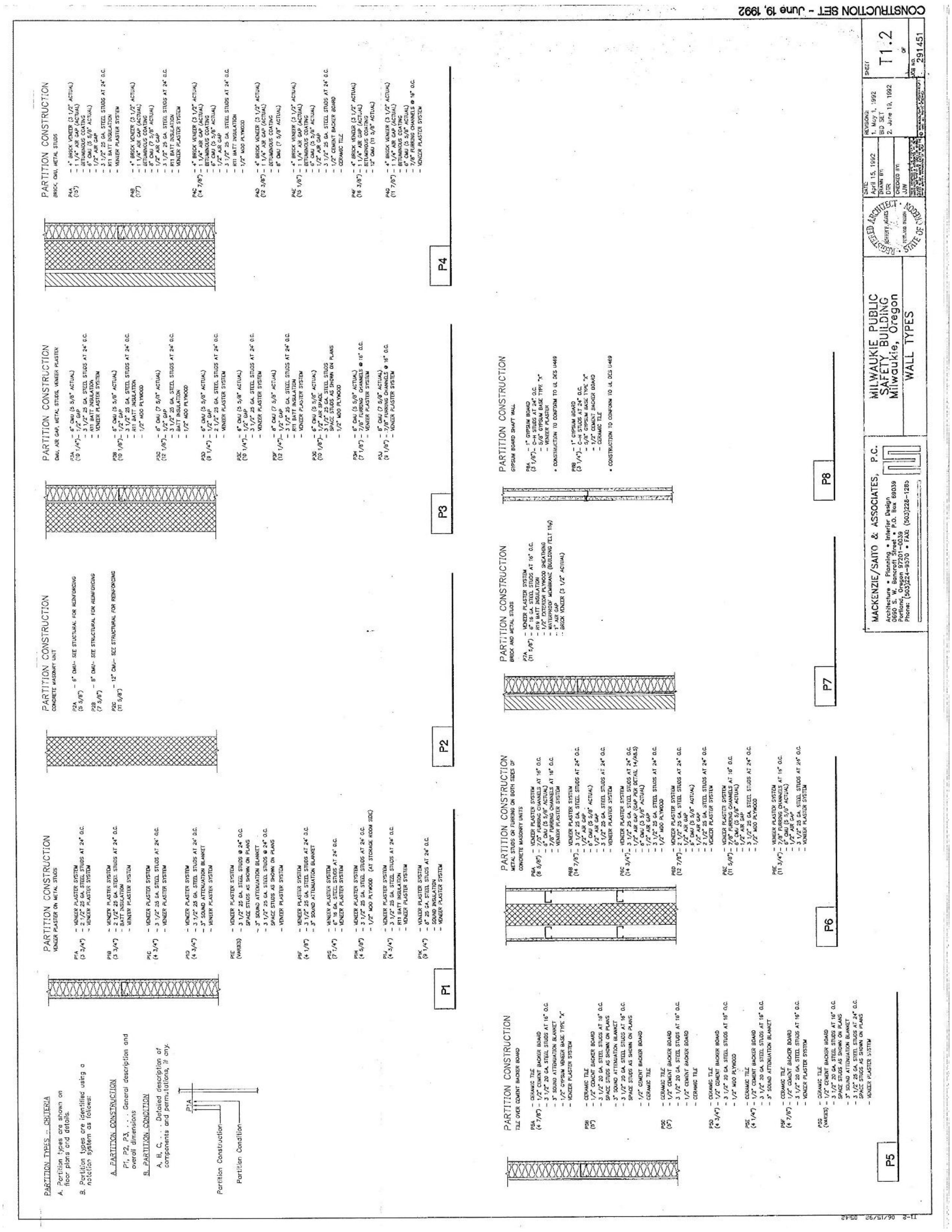
	Percent	Category	Amount	Unit Cost
		State B & O		
	1.75 %	Liability Insurance	13	
	10.00 %	Contingency	74	
		Subtotal	824	
	12.00 %	Contractor Fee	99	
		Total Estimate	923	
		Mark 11 Totals		
		Net Costs Subtotal	1,745	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	31	
	10.00 %	Contingency	175	
		Subtotal	1,950	
	12.00 %	Contractor Fee	234	
		Total Estimate	2,184	
		Mark 12 Totals		
		Net Costs Subtotal	1,475	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	26	
	10.00 %	Contingency	148	
		Subtotal	1,648	
	12.00 %	Contractor Fee	198	
		Total Estimate	1,846	
		Mark 13 Totals		
		Net Costs Subtotal	180,000	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	3,150	
	10.00 %	Contingency	18,000	

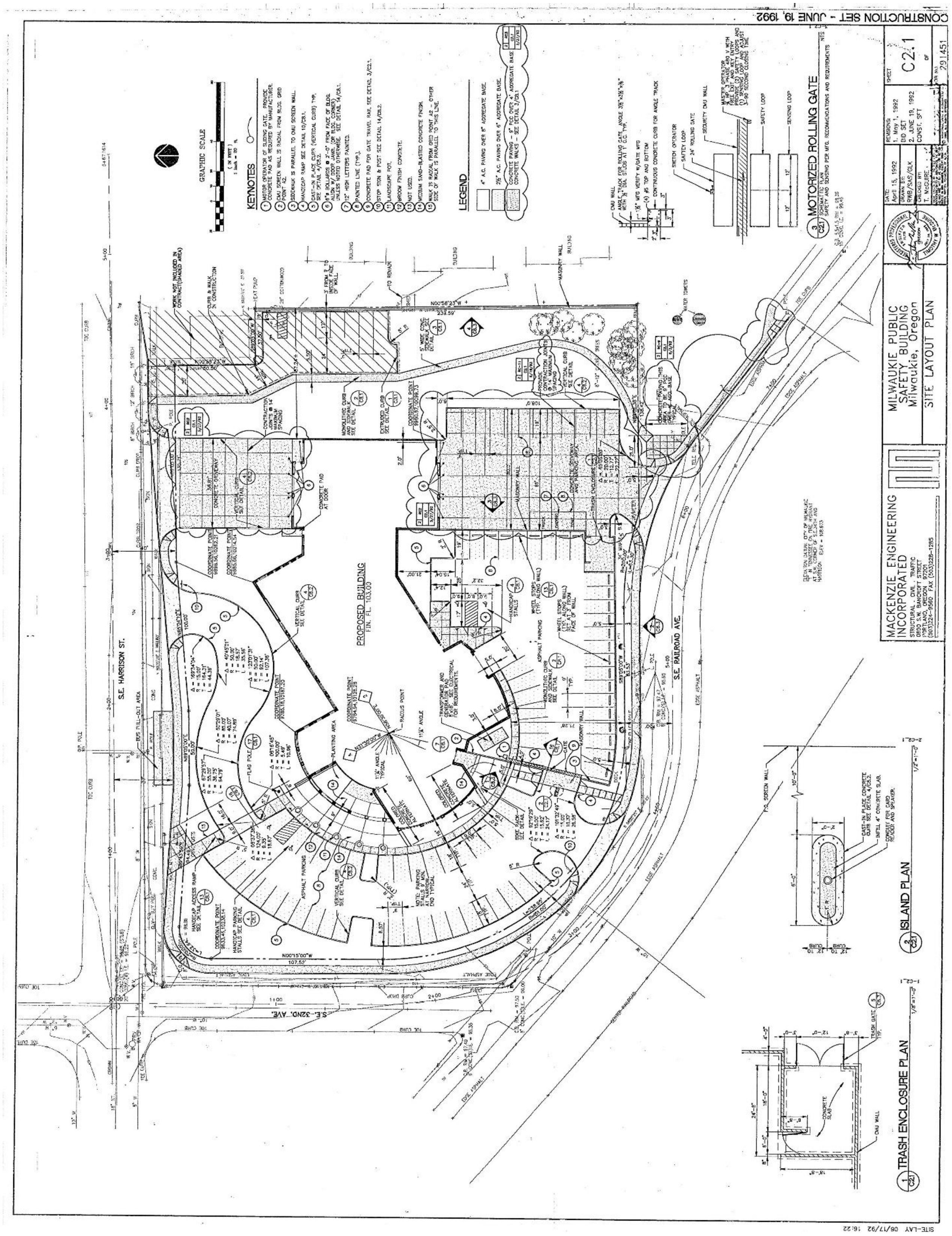
	Percent	Category	Amount	Unit Cost
		Subtotal	201,150	
	12.00 %	Contractor Fee	24,138	
		Total Estimate	225,288	
		Mark 14 Totals		
		Net Costs Subtotal	300	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	5	
	10.00 %	Contingency	30	
		Subtotal	335	
	12.00 %	Contractor Fee	40	
		Total Estimate	375	
		Mark 15 Totals		
		Net Costs Subtotal	615	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	11	
	10.00 %	Contingency	62	
		Subtotal	687	
	12.00 %	Contractor Fee	82	
		Total Estimate	770	
		Mark 16 Totals		
		Net Costs Subtotal	900	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	16	
	10.00 %	Contingency	90	
		Subtotal	1,006	
	12.00 %	Contractor Fee	121	
		Total Estimate	1,126	

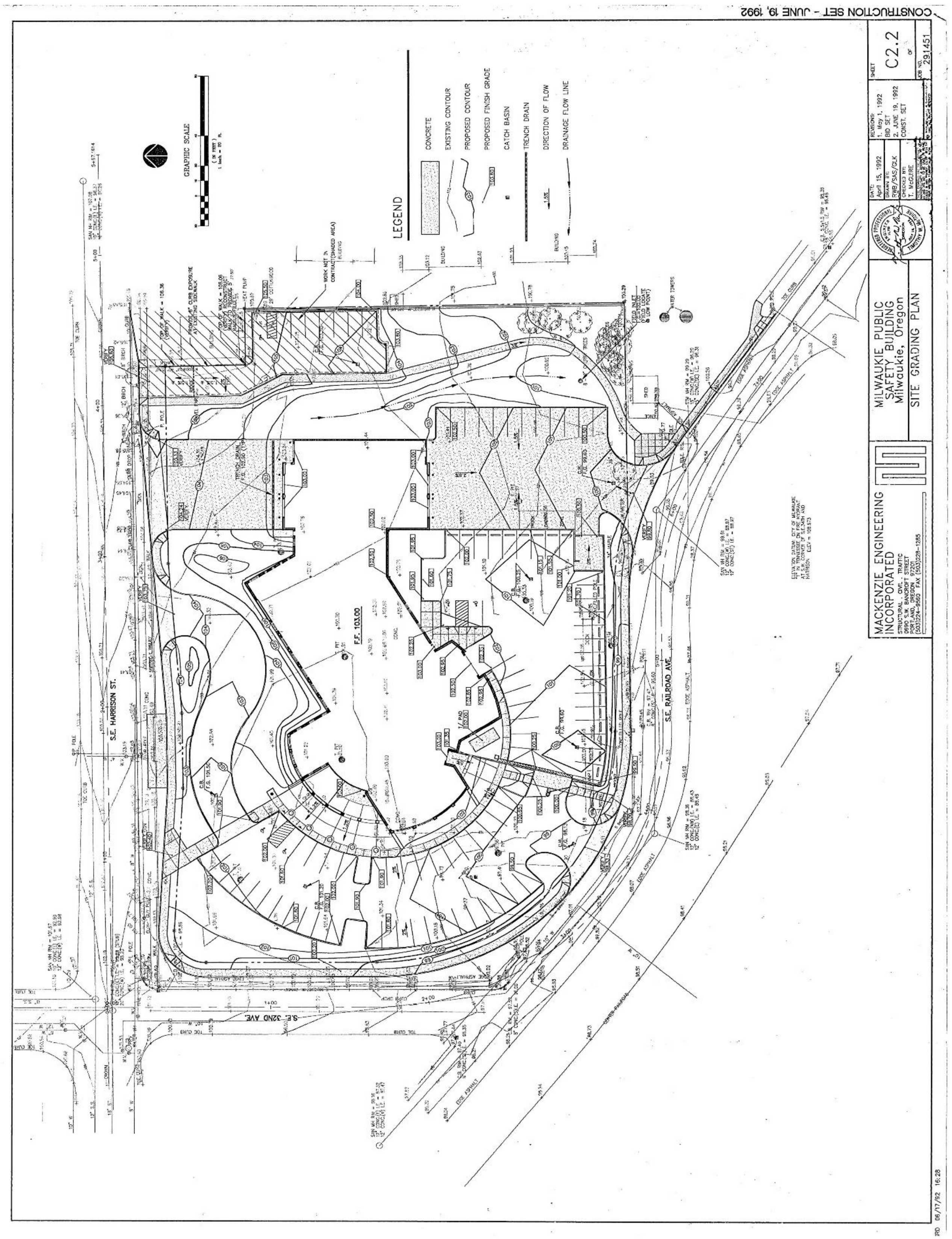
	Percent	Category	Amount	Unit Cost
		Mark 17 Totals		
		Net Costs Subtotal	7,000	
		City B & O		
		State B & O		
	1.75 %	Liability Insurance	123	
	10.00 %	Contingency	700	
		Subtotal	7,823	
	12.00 %	Contractor Fee	939	
		Total Estimate	8,761	
		Estimate Grand Total	943,436	

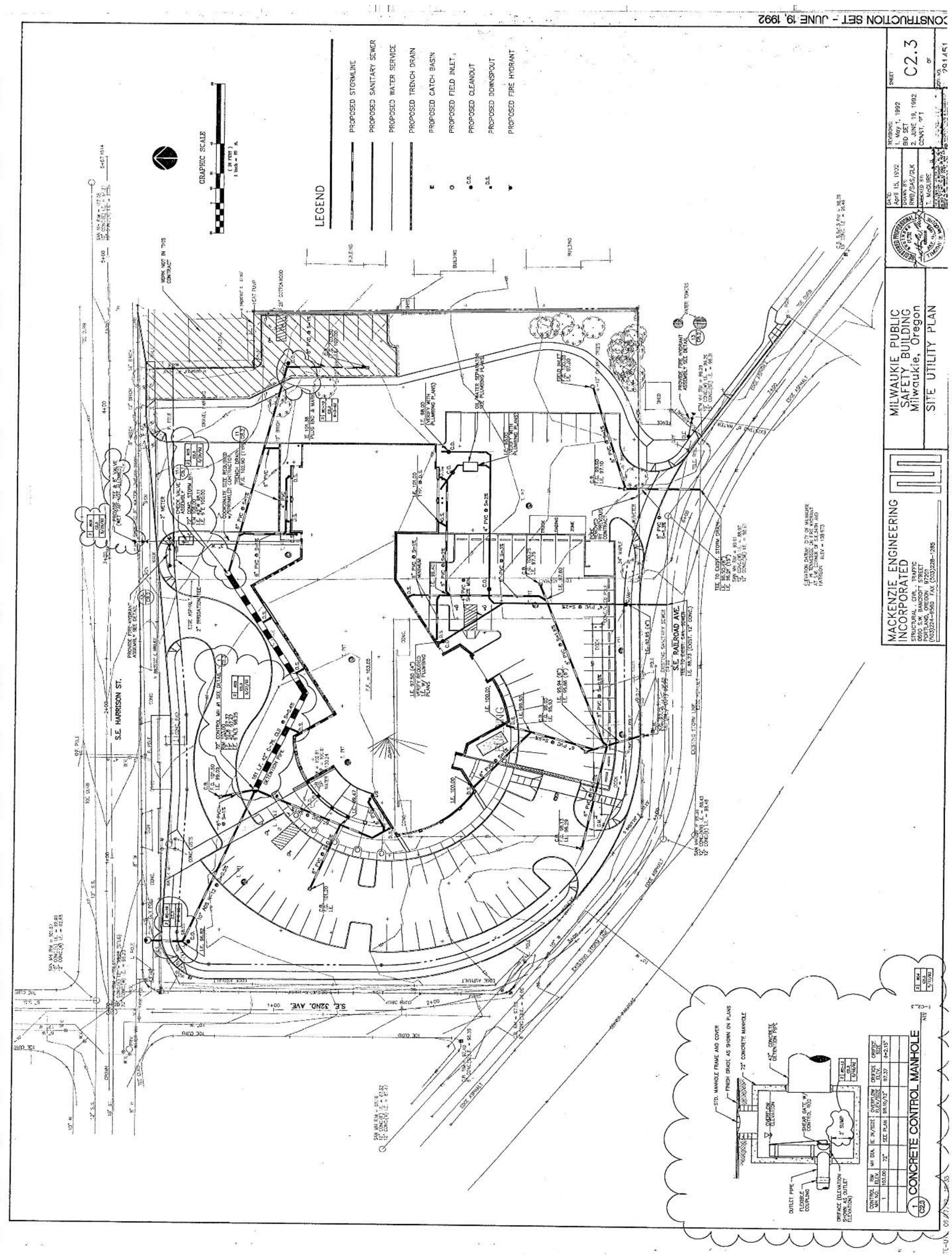
10.12 Appendix L: Select Historical Building Drawings

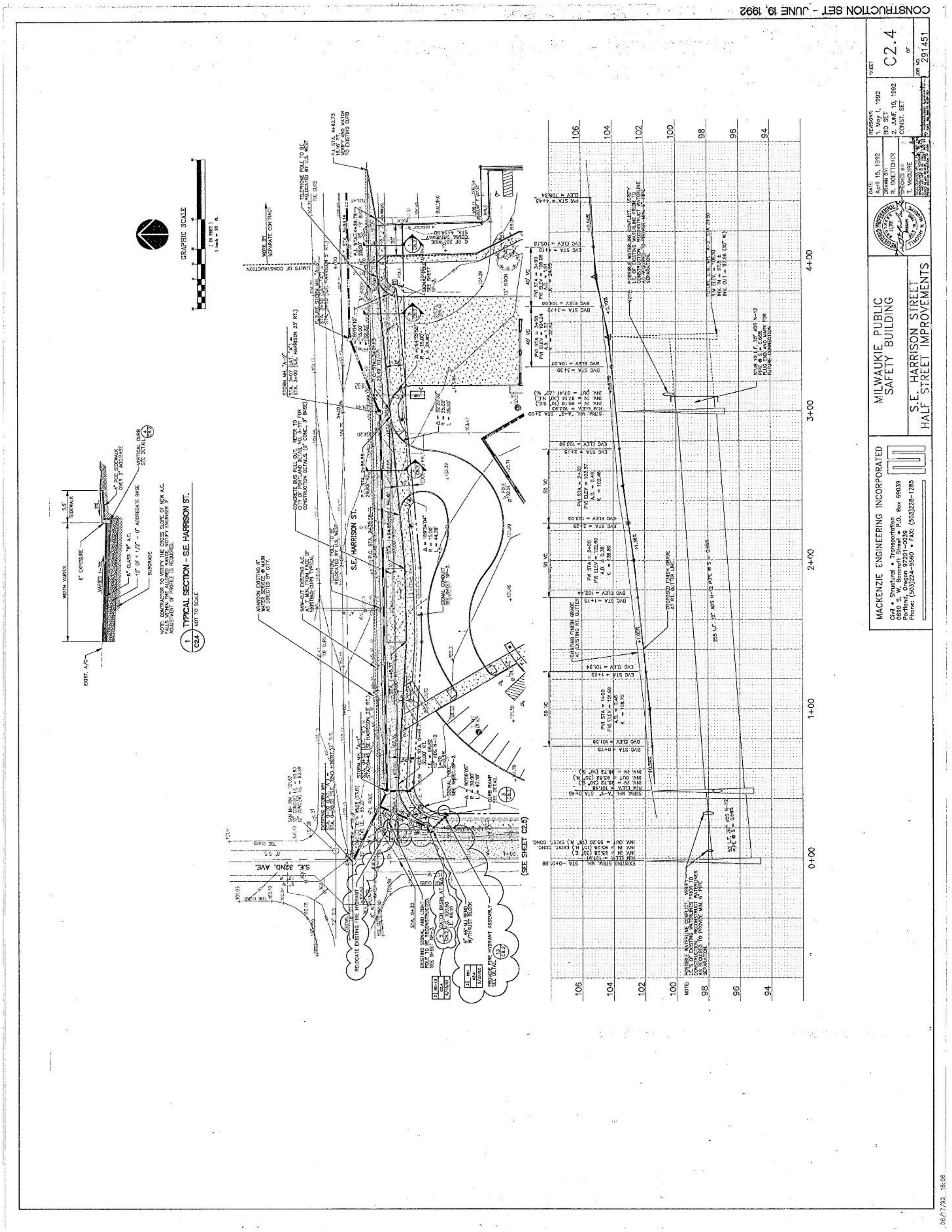


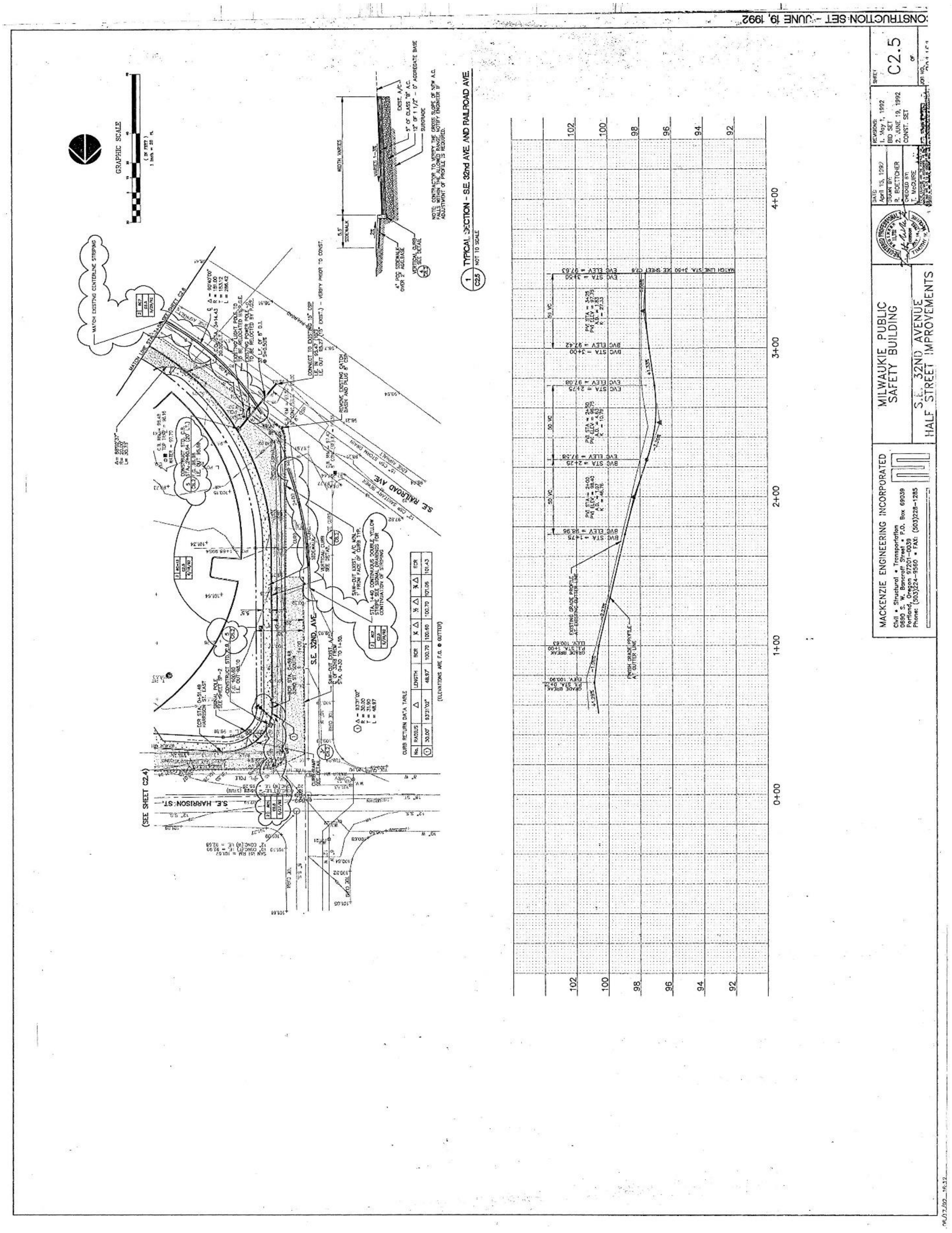

CONSTRUCTION SET - June 19, 1992
PARTITION TYPES -- CRITERIA
PARTITION CONSTRUCTION
P1
P2
P3
P4
P5
P6
P7
P8
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9370 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
WALL TYPES
DATE: April 15, 1992
REVISIONS: 1. May 1, 1992 BID SET
2. June 19, 1992
SHEET
T1.2
JOB NO. 291451

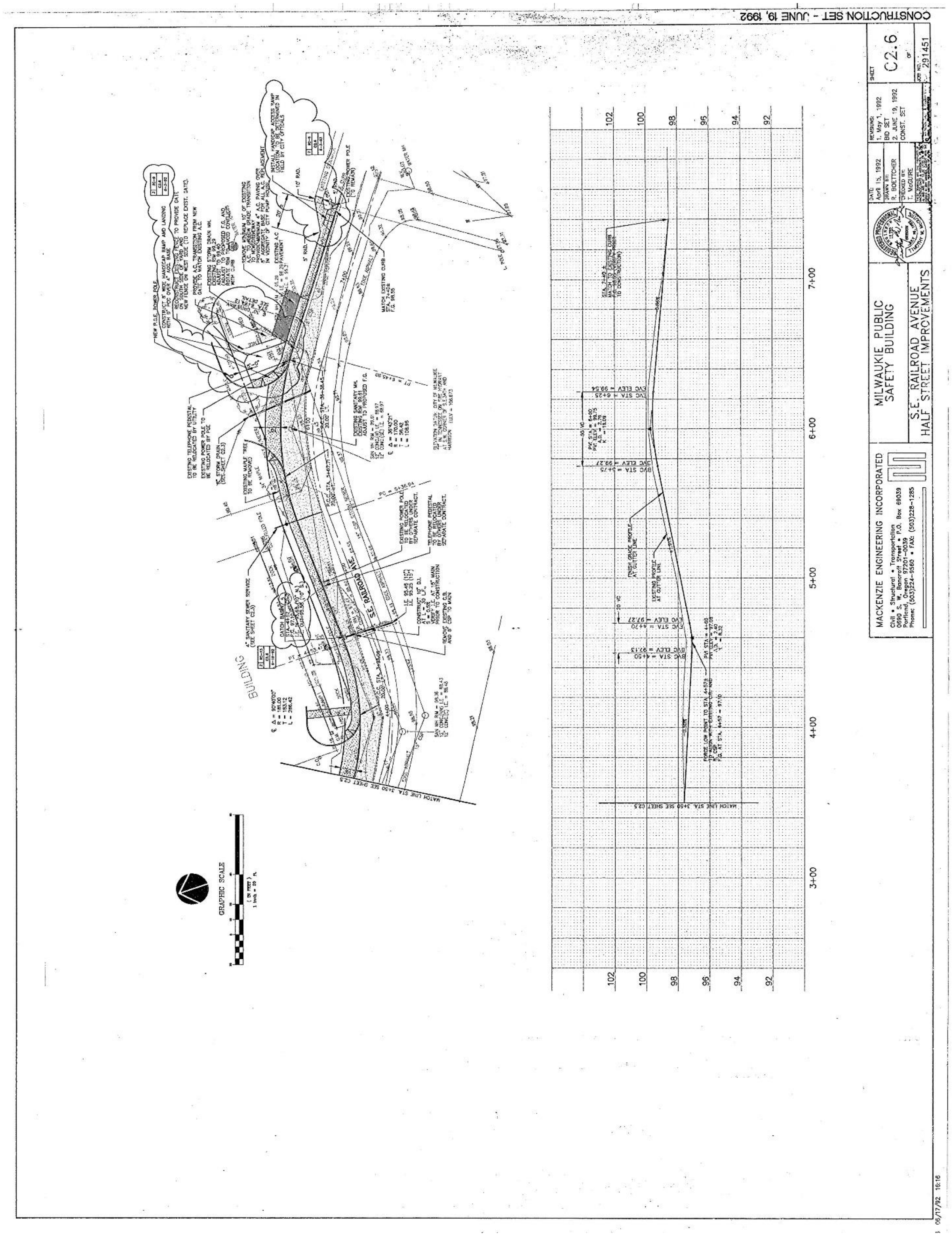

CONSTRUCTION SET - JUNE 19, 1992
GRAPHIC SCALE
KEYNOTES
LEGEND
PROPOSED BUILDING
FIN. FL. 103.00
S.E. HARRISON ST.
S.E. RAILROAD AVE.
S.E. 32ND. AVE.
3 MOTORIZED ROLLING GATE
2 ISLAND PLAN
1 TRASH ENCLOSURE PLAN
MACKENZIE ENGINEERING INCORPORATED
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
SITE LAYOUT PLAN
C2.1
291451
SITE-LAY 06/17/92 16:22

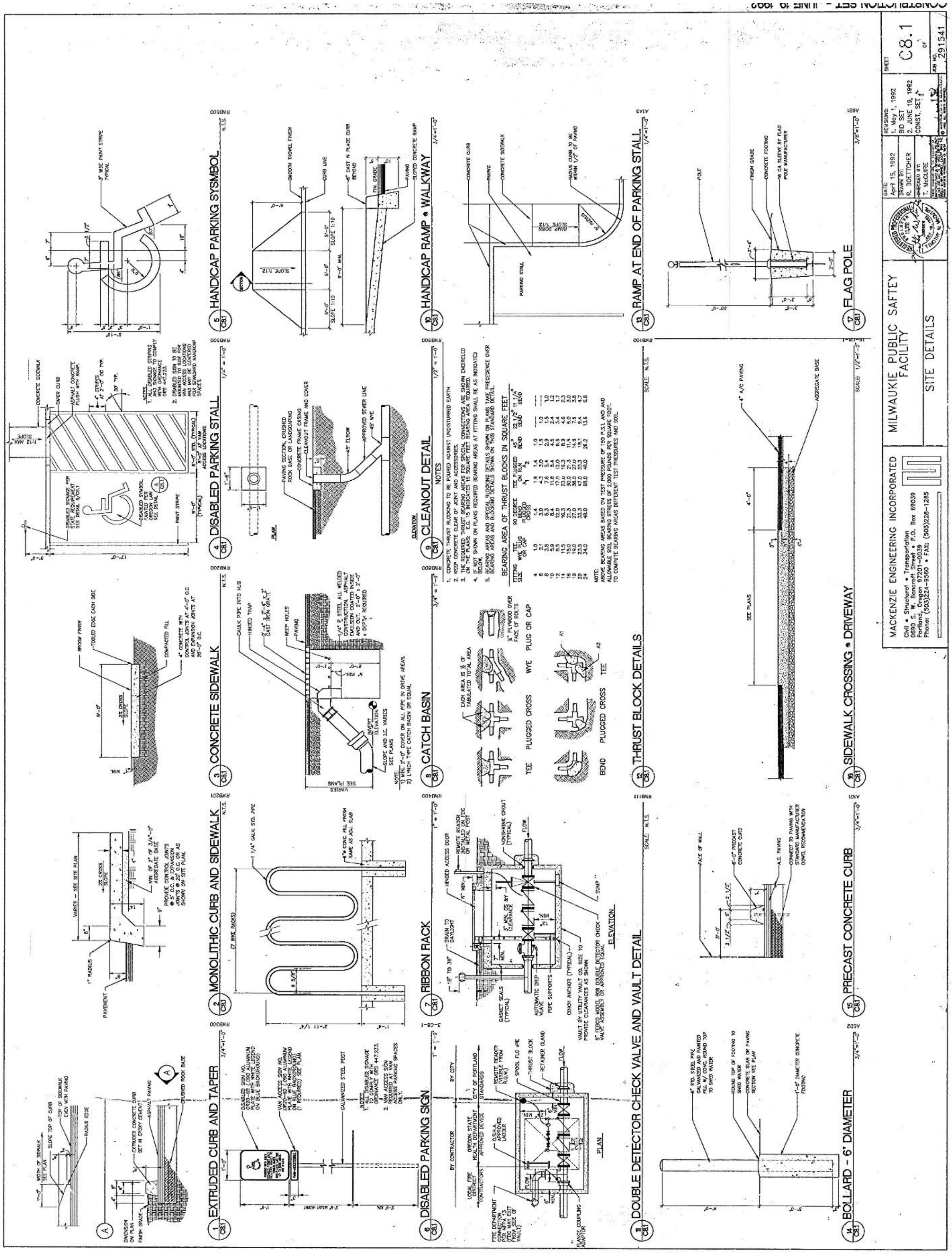

CONSTRUCTION SET - JUNE 19, 1992
LEGEND
CONCRETE
EXISTING CONTOUR
PROPOSED CONTOUR
PROPOSED FINISH GRADE
CATCH BASIN
TRENCH DRAIN
DIRECTION OF FLOW
DRAINAGE FLOW LINE
GRAPHIC SCALE
1 inch = 20 ft.
S.E. HARRISON ST.
S.E. RAILROAD AVE.
S.E. 32ND AVE.
F.F. 103.00
MACKENZIE ENGINEERING INCORPORATED
STRUCTURAL · CIVIL · TRAFFIC
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
SITE GRADING PLAN
DATE: April 15, 1992
DRAWN BY: RWB/SAS/CLK
CHECKED BY: T. McGUIRE
REVISIONS: 1. May 1, 1992 BID SET 2. JUNE 19, 1992 CONST. SET
SHEET C2.2
JOB NO. 291451
06/17/92 16:28

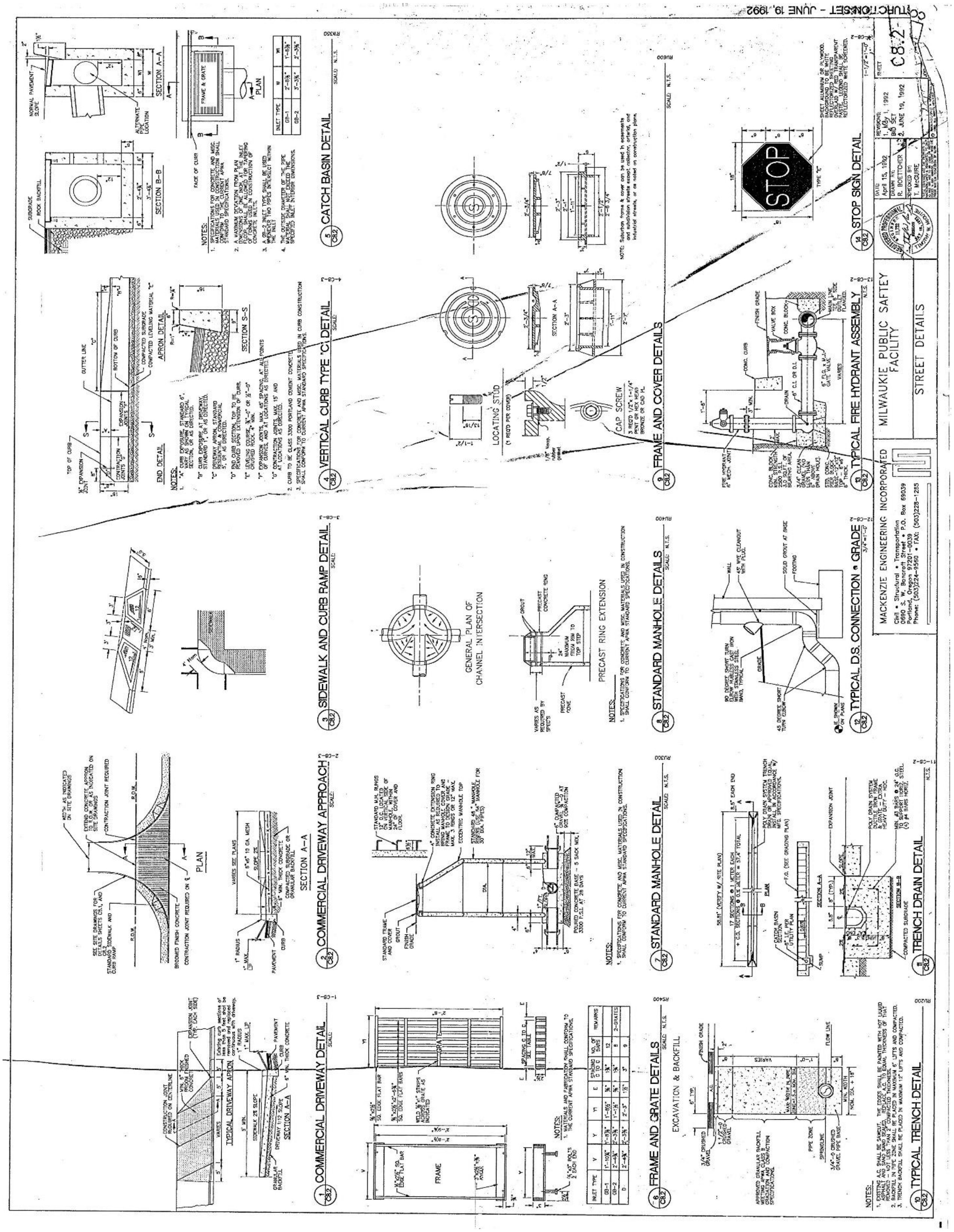

CONSTRUCTION SET - JUNE 19, 1992
LEGEND
PROPOSED STORMLINE
PROPOSED SANITARY SEWER
PROPOSED WATER SERVICE
PROPOSED TRENCH DRAIN
PROPOSED CATCH BASIN
PROPOSED FIELD INLET
PROPOSED CLEANOUT
PROPOSED DOWNSPOUT
PROPOSED FIRE HYDRANT
GRAPHIC SCALE
S.E. HARRISON ST.
S.E. 32ND. AVE.
S.E. RAILROAD AVE.
MACKENZIE ENGINEERING INCORPORATED
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
SITE UTILITY PLAN
C2.3
CONCRETE CONTROL MANHOLE

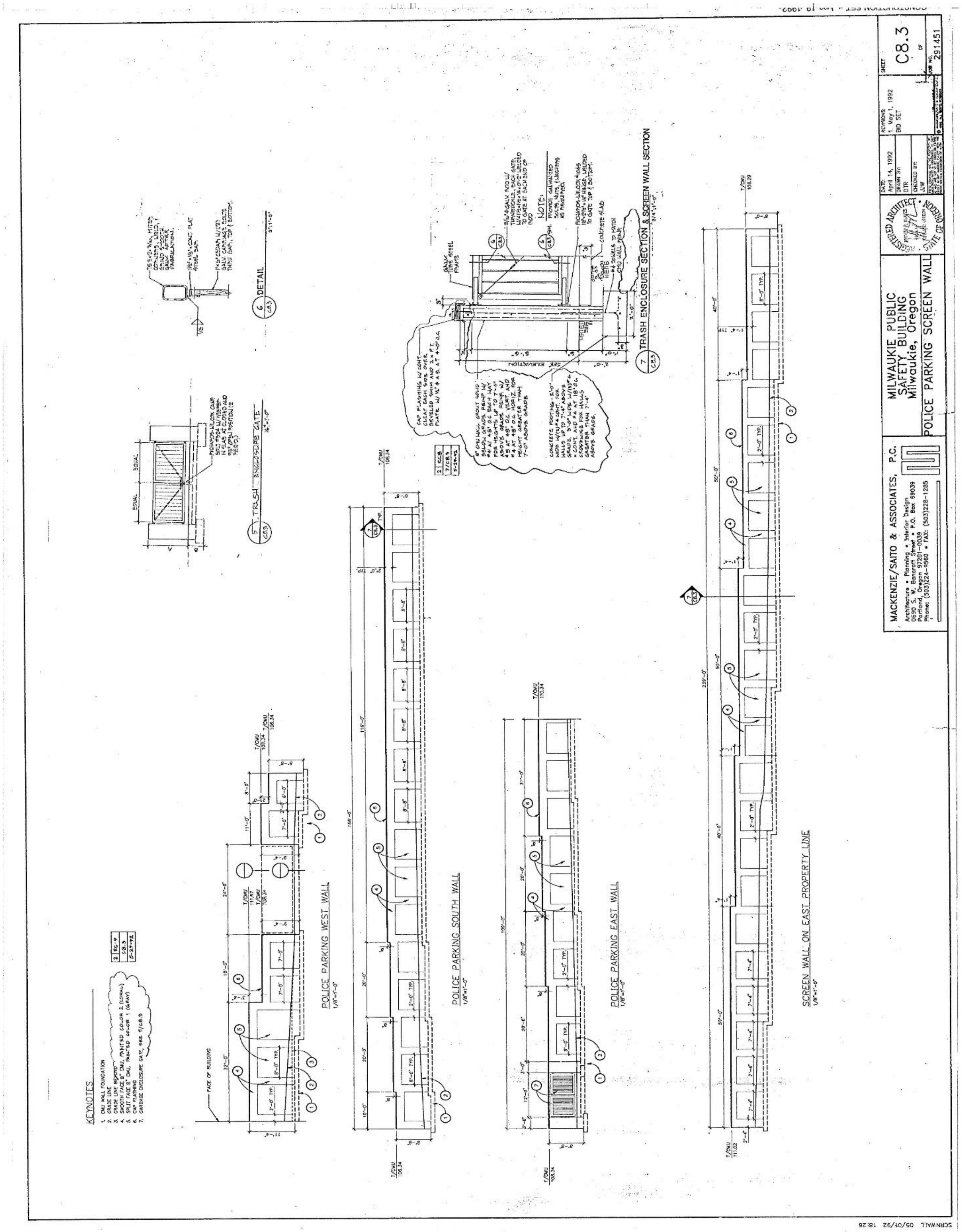

CONSTRUCTION SET - JUNE 19, 1992
MILWAUKIE PUBLIC SAFETY BUILDING
S.E. HARRISON STREET HALF STREET IMPROVEMENTS
MACKENZIE ENGINEERING INCORPORATED
Civil • Structural • Transportation
Portland, Oregon
C2.4
291451
S.E. HARRISON ST.
S.E. 32ND. AVE.
(SEE SHEET C2.5)
GRAPHIC SCALE
1 TYPICAL SECTION - S.E. HARRISON ST.
NOT TO SCALE
0+00
1+00
2+00
3+00
4+00
106
104
102
100
98
96
94
06/17/92

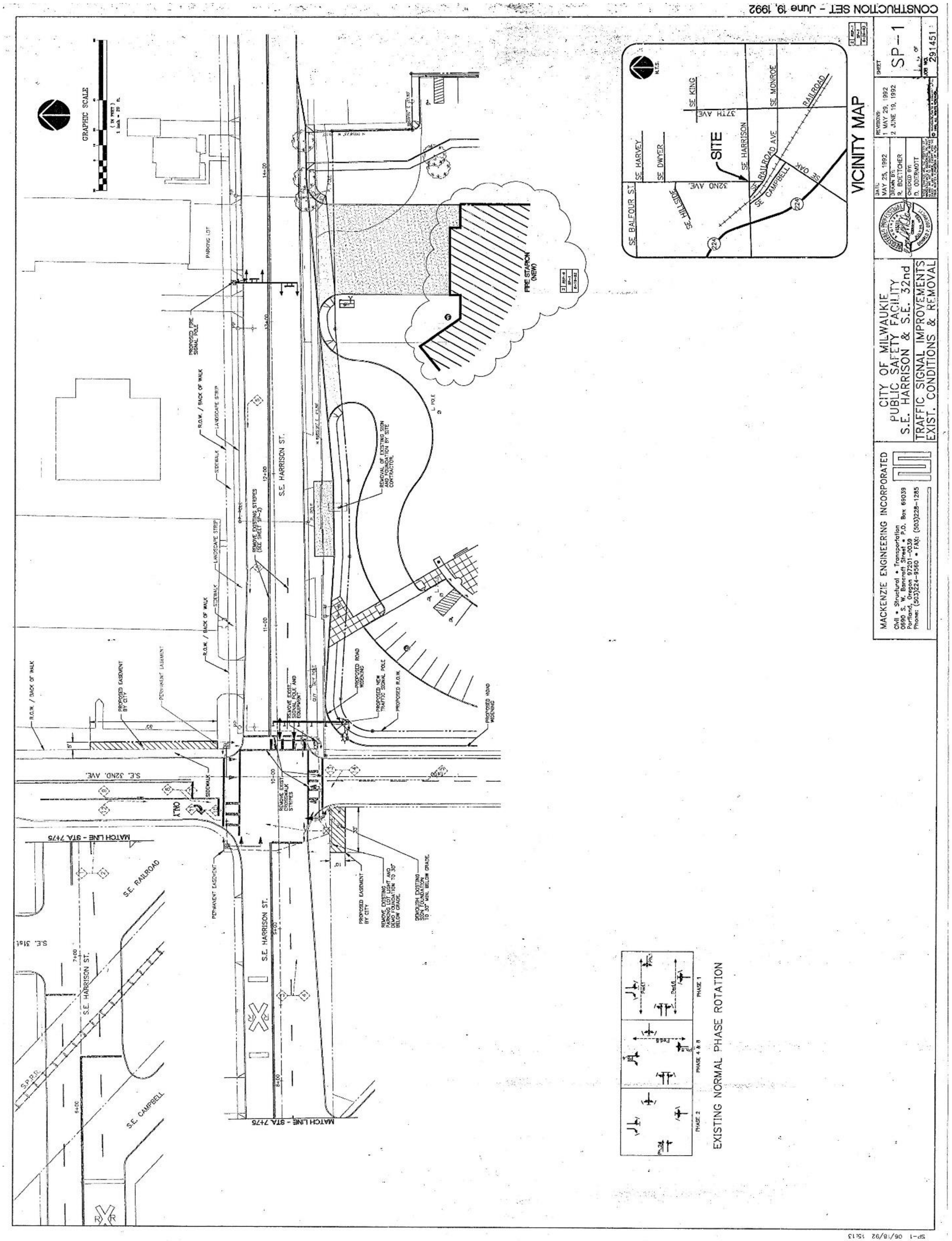

CONSTRUCTION SET - JUNE 19, 1992
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
TYPICAL SECTION - S.E. 32nd AVE. AND RAILROAD AVE.
NOT TO SCALE
S.E. 32ND AVE
S.E. RAILROAD AVE
S.E. HARRISON ST.
(SEE SHEET C2.4)
CURB RETURN DATA TABLE
(ELEVATIONS ARE F.G. @ GUTTER)
0+00
1+00
2+00
3+00
4+00
102
100
98
96
94
92
MILWAUKIE PUBLIC SAFETY BUILDING
S.E. 32ND AVENUE
HALF STREET IMPROVEMENTS
MACKENZIE ENGINEERING INCORPORATED
Civil • Structural • Transportation
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
DATE: April 15, 1992
DRAWN BY: R. BOETTCHER
CHECKED BY: T. McGUIRE
REVISIONS: 1. May 1, 1992 BID SET 2. JUNE 19, 1992 CONST. SET
SHEET
C2.5

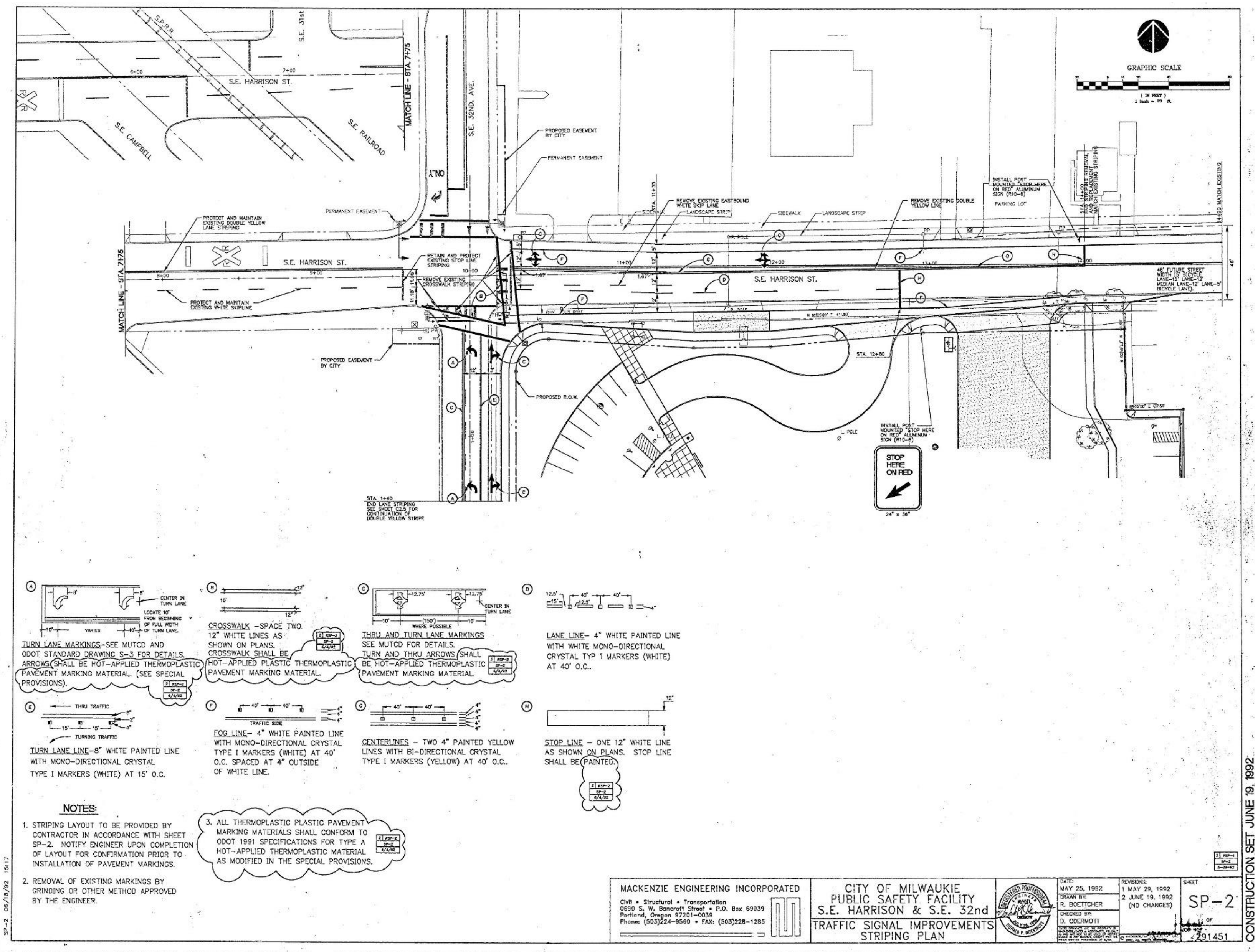

CONSTRUCTION SET – JUNE 19, 1992
SHEET
C2.6
OF
JOB NO. 291451
REVISIONS:
1. May 1, 1992
BID SET
2. JUNE 19, 1992
CONST. SET
DATE: April 15, 1992
DRAWN BY: R. BOETTCHER
CHECKED BY: T. McGUIRE
TIMOTHY W. McGUIRE
MILWAUKIE PUBLIC SAFETY BUILDING
S.E. RAILROAD AVENUE HALF STREET IMPROVEMENTS
MACKENZIE ENGINEERING INCORPORATED
Civil • Structural • Transportation
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201–0039
Phone: (503)224–9560 • FAX: (503)228–1285
S.E. RAILROAD AVE.
BUILDING
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
MATCH LINE STA. 3+50 SEE SHEET C2.5
EXISTING PROFILE AT GUTTER LINE
FINISH GRADE PROFILE AT GUTTER LINE
BVC STA = 4+50
BVC ELEV = 97.13
EVC STA = 4+70
EVC ELEV = 97.27
BVC STA = 5+75
BVC ELEV = 99.27
EVC STA = 6+25
EVC ELEV = 99.54
3+00
4+00
5+00
6+00
7+00
102
100
98
96
94
92
05/17/92 16:16

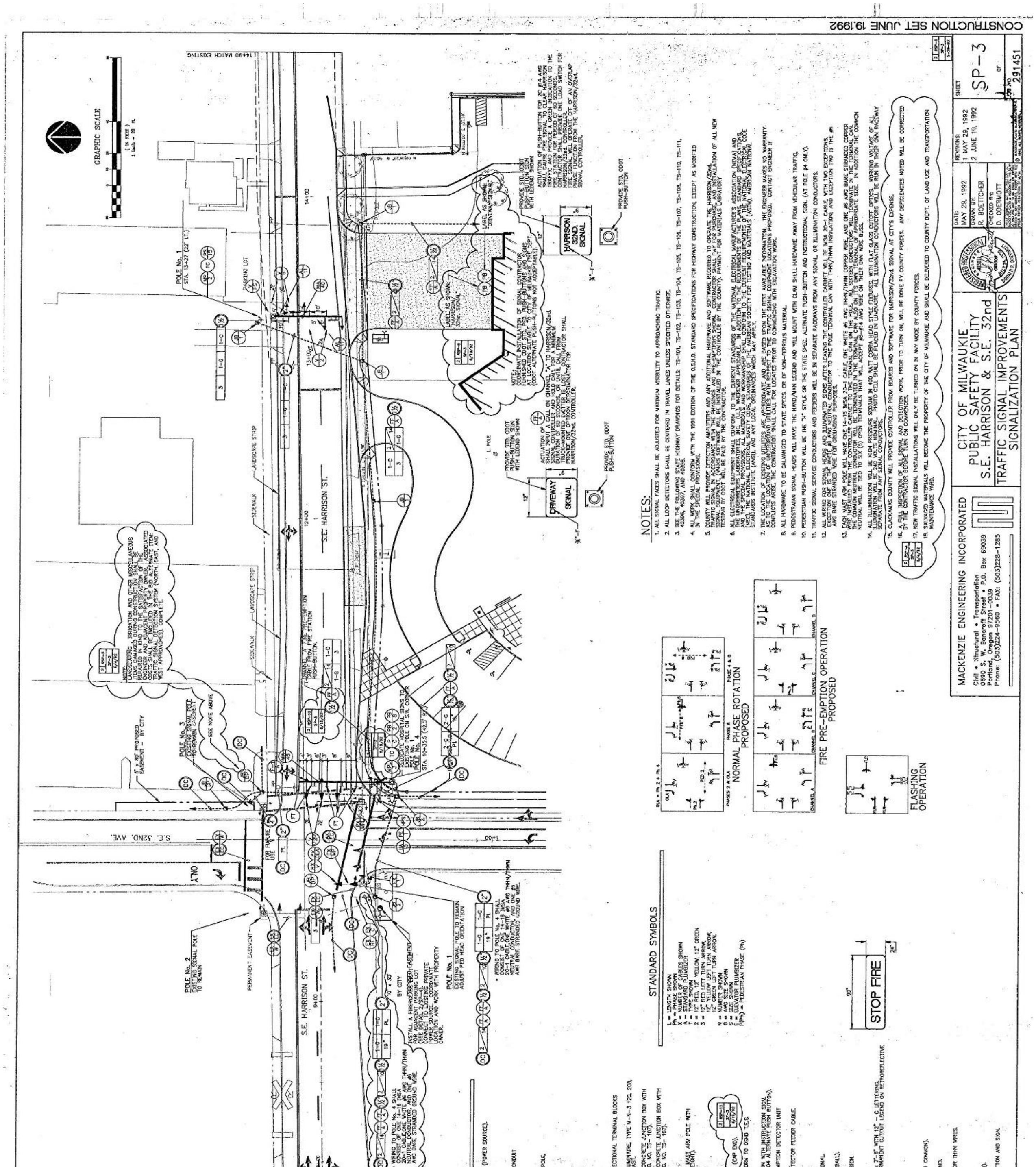

CONSTRUCTION SET - JUNE 19 1992
1 C8.1 EXTRUDED CURB AND TAPER
2 C8.1 MONOLITHIC CURB AND SIDEWALK
3 C8.1 CONCRETE SIDEWALK
4 C8.1 DISABLED PARKING STALL
5 C8.1 HANDICAP PARKING SYSMBOL
6 C8.1 DISABLED PARKING SIGN
7 C8.1 RIBBON RACK
8 C8.1 CATCH BASIN
9 C8.1 CLEANOUT DETAIL
10 C8.1 HANDICAP RAMP @ WALKWAY
11 C8.1 DOUBLE DETECTOR CHECK VALVE AND VAULT DETAIL
12 C8.1 THRUST BLOCK DETAILS
13 C8.1 RAMP AT END OF PARKING STALL
14 C8.1 BOLLARD - 6" DIAMETER
15 C8.1 PRECAST CONCRETE CURB
16 C8.1 SIDEWALK CROSSING @ DRIVEWAY
17 C8.1 FLAG POLE
BEARING AREA OF THRUST BLOCKS IN SQUARE FEET
MACKENZIE ENGINEERING INCORPORATED
MILWAUKIE PUBLIC SAFTEY FACILITY
SITE DETAILS
April 15, 1992
C8.1
291541

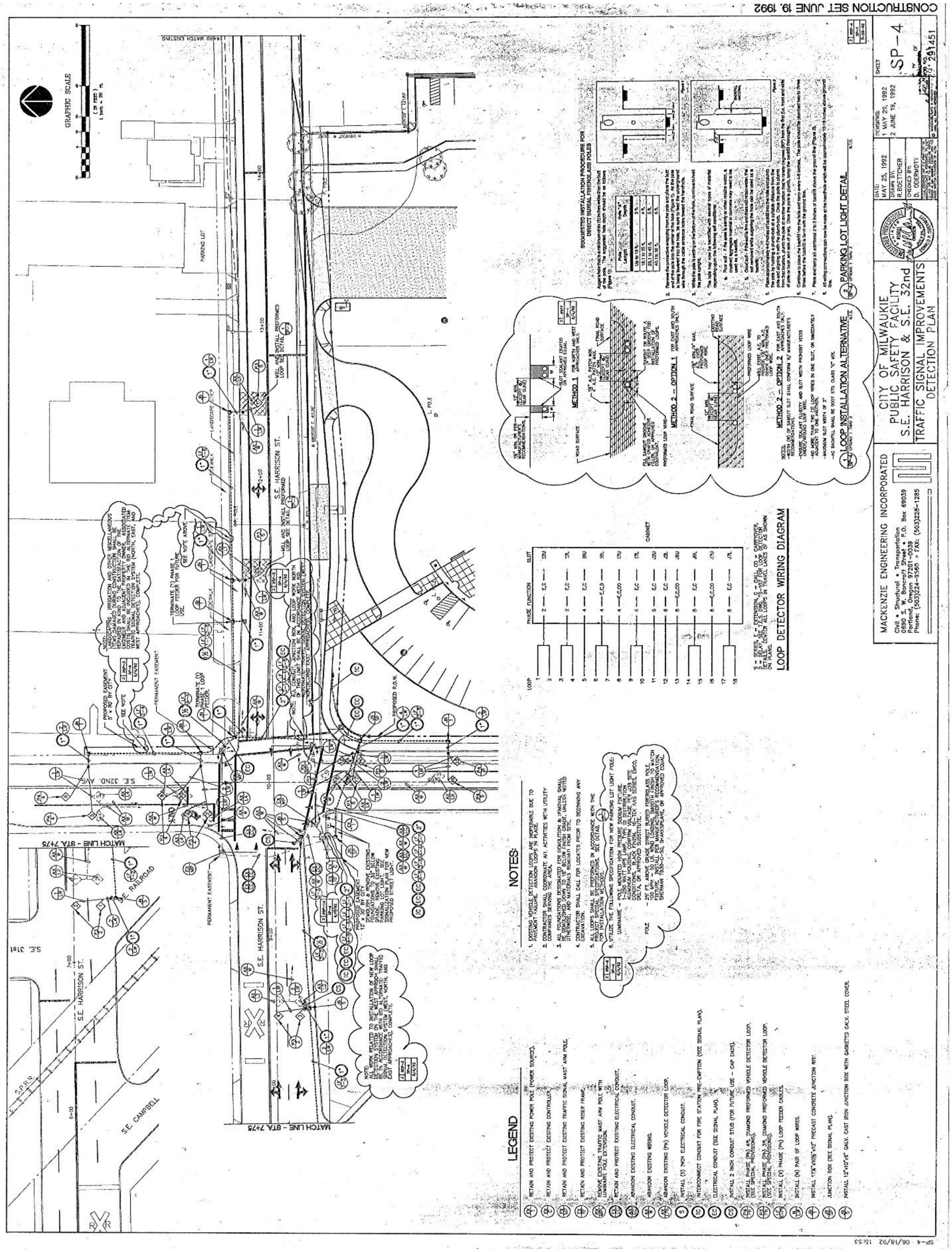

CONSTRUCTION SET - JUNE 19, 1992
1 COMMERCIAL DRIVEWAY DETAIL
2 COMMERCIAL DRIVEWAY APPROACH
3 SIDEWALK AND CURB RAMP DETAIL
4 VERTICAL CURB TYPE 'C' DETAIL
5 CATCH BASIN DETAIL
6 FRAME AND GRATE DETAILS
7 STANDARD MANHOLE DETAIL
8 STANDARD MANHOLE DETAILS
9 FRAME AND COVER DETAILS
10 TYPICAL TRENCH DETAIL
11 TRENCH DRAIN DETAIL
12 TYPICAL DS. CONNECTION @ GRADE
13 TYPICAL FIRE HYDRANT ASSEMBLY
14 STOP SIGN DETAIL
STOP
MACKENZIE ENGINEERING INCORPORATED
Civil • Structural • Transportation
0690 S.W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFTEY FACILITY
STREET DETAILS
DATE April 15, 1992
CHECKED BY T. McGUIRE
REVISIONS
1. May 1, 1992 BID SET
2. JUNE 19, 1992
SHEET C8.2

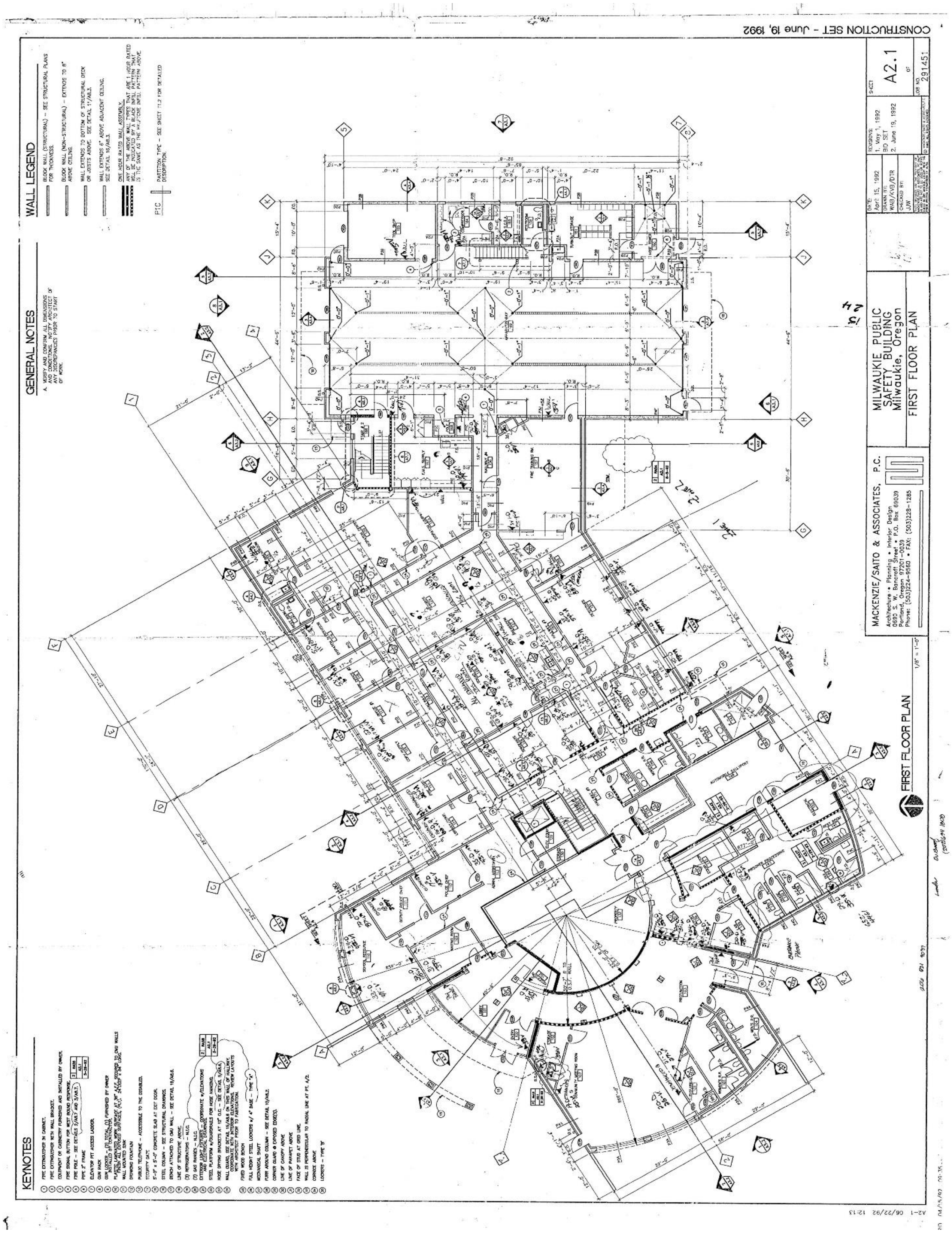

KEYNOTES
1. CMU WALL FOUNDATION
2. GRADE LINE
3. GRADE LINE BEYOND
4. SMOOTH FACE 8" CMU, PAINTED COLOR 2 (CORAL)
5. SPLIT FACE 8" CMU, PAINTED COLOR 1 (GRAY)
6. CAP FLASHING
7. GARBAGE ENCLOSURE GATE, SEE 5/C8.3
POLICE PARKING WEST WALL 1/8"=1'-0"
POLICE PARKING SOUTH WALL 1/8"=1'-0"
POLICE PARKING EAST WALL 1/8"=1'-0"
SCREEN WALL ON EAST PROPERTY LINE 1/8"=1'-0"
5 C8.3 TRASH ENCLOSURE GATE
6 C8.3 DETAIL
7 C8.3 TRASH ENCLOSURE SECTION & SCREEN WALL SECTION
FACE OF BUILDING
SEE ELEVATION
NOTE:
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
POLICE PARKING SCREEN WALL
DATE: April 14, 1992
DRAWN BY: DTR
CHECKED BY: JLW
REVISIONS: 1. May 1, 1992 BID SET
SHEET C8.3
JOB NO. 291451
SCRNWALL 05/01/92 18:28

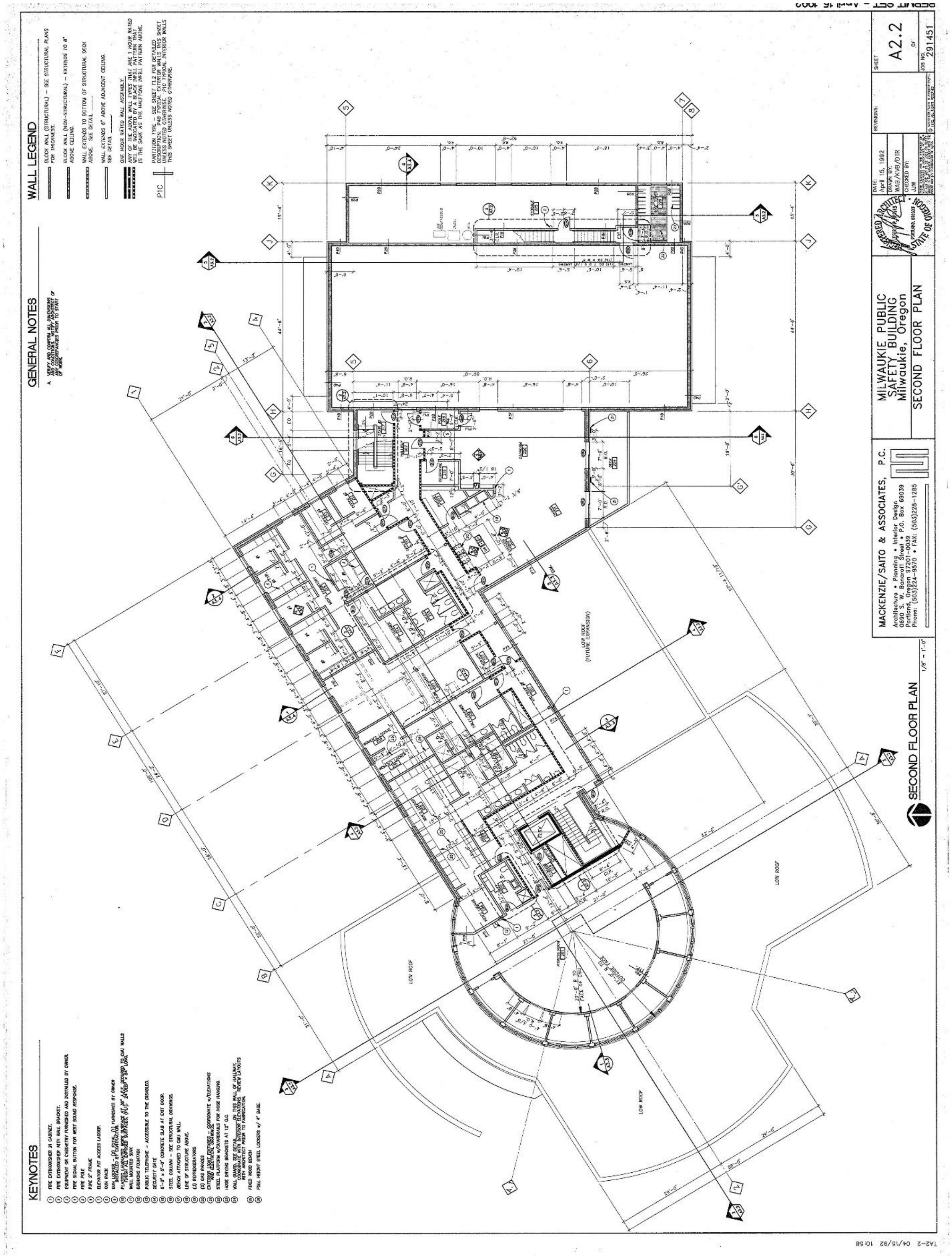

CONSTRUCTION SET – June 19, 1992
VICINITY MAP
SITE
SE HARVEY
SE DWYER
SE BALFOUR ST.
SE HILLSIDE
32ND AVE.
37TH AVE
SE KING
SE HARRISON
SE MONROE
RAILROAD AVE
RAILROAD
SE CAMPBELL
SE OAK
224
GRAPHIC SCALE
FIRE STATION (NEW)
S.E. HARRISON ST.
S.E. 32ND. AVE.
S.E. RAILROAD
S.E. CAMPBELL
S.E. 31st
S.P.P.R.
MATCH LINE - STA 7+75
PROPOSED FIRE SIGNAL POLE
R.O.W. / BACK OF WALK
LANDSCAPE STRIP
SIDEWALK
PARKING LOT
PROPOSED EASEMENT BY CITY
PERMANENT EASEMENT
PROPOSED ROAD WIDENING
PROPOSED NEW TRAFFIC SIGNAL POLE
PROPOSED R.O.W.
REMOVAL OF EXISTING SIGN AND FOUNDATION BY SITE CONTRACTOR
REMOVE EXISTING STRIPES (SEE SHEET SP-2)
REMOVE EXIST. CROSSWALK STRIPES
DEMOLISH EXISTING SIGN FOUNDATION TO 30" MIN. BELOW GRADE
REMOVE EXISTING PARKING LOT LIGHT AND REMOVE FOUNDATION TO 30" BELOW GRADE
ONLY
EXISTING NORMAL PHASE ROTATION
PHASE 1
PHASE 2
PHASE 4 & 8
MACKENZIE ENGINEERING INCORPORATED
Civil • Structural • Transportation
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
CITY OF MILWAUKIE
PUBLIC SAFETY FACILITY
S.E. HARRISON & S.E. 32nd
TRAFFIC SIGNAL IMPROVEMENTS
EXIST. CONDITIONS & REMOVAL
DATE: MAY 25, 1992
DRAWN BY: R. BOETTCHER
CHECKED BY: D. ODERMOTT
REVISIONS:
1 MAY 29, 1992
2 JUNE 19, 1992
SHEET
SP-1
JOB NO. 291451
SP-1 06/18/92 15:13

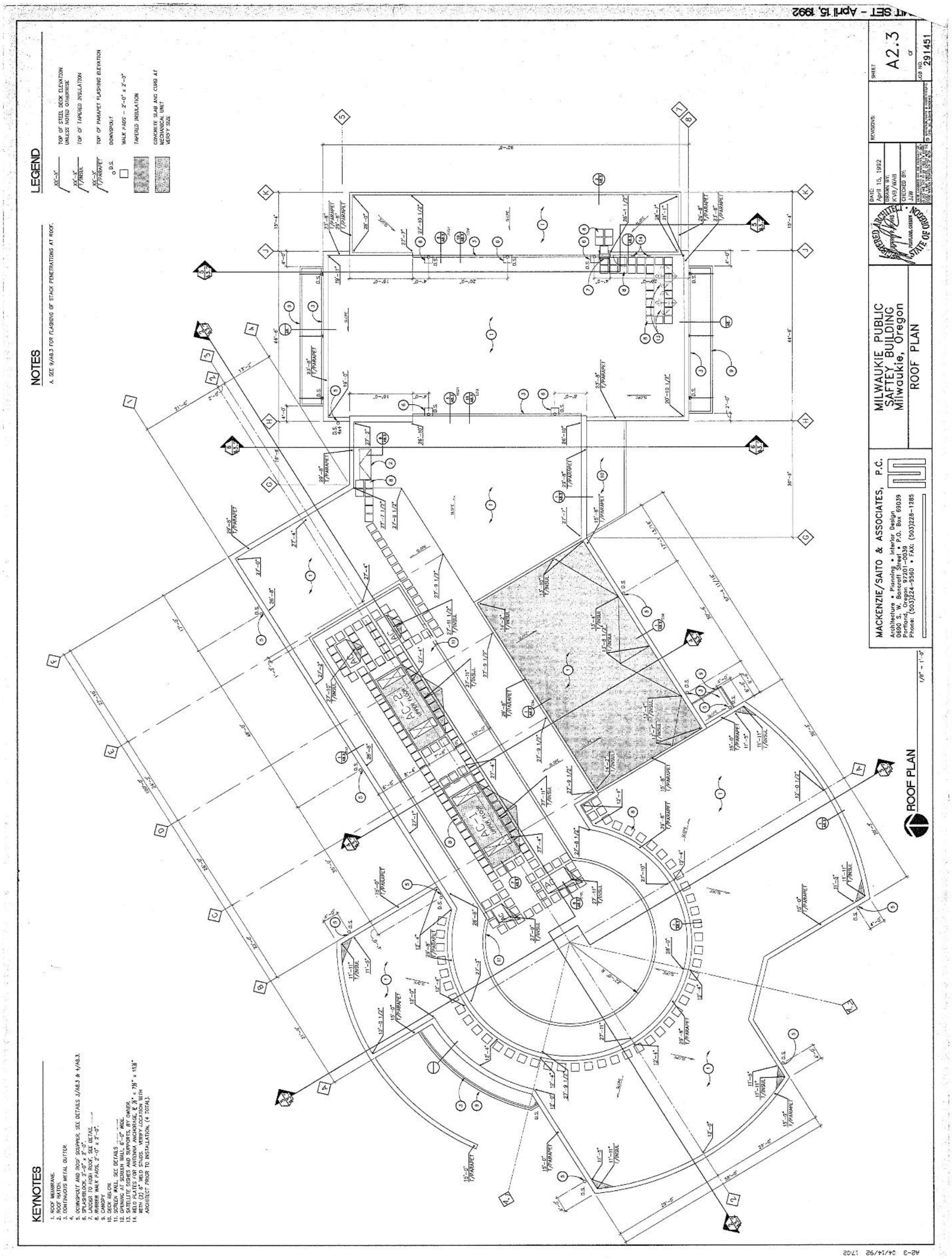

CONSTRUCTION SET JUNE 19, 1992
GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.
S.E. HARRISON ST.
S.E. 31st
S.P.R.R.
S.E. CAMPBELL
S.E. RAILROAD
S.E. 32ND. AVE.
MATCH LINE - STA. 7+75
ONLY
PROPOSED EASEMENT BY CITY
PERMANENT EASEMENT
PROTECT AND MAINTAIN EXISTING DOUBLE YELLOW LANE STRIPING
PROTECT AND MAINTAIN EXISTING WHITE SKIPLINE
RETAIN AND PROTECT EXISTING STOP LINE STRIPING
REMOVE EXISTING CROSSWALK STRIPING
PROPOSED R.O.W.
STA. 1+40 END LANE STRIPING SEE SHEET C2.5 FOR CONTINUATION OF DOUBLE YELLOW STRIPE
STA. 11+35
REMOVE EXISTING EASTBOUND WHITE SKIP LANE
SIDEWALK
LANDSCAPE STRIP
REMOVE EXISTING DOUBLE YELLOW LINE
INSTALL POST MOUNTED "STOP HERE ON RED" ALUMINUM SIGN (R10-6)
PARKING LOT
STA. 14+00 END STRIPING REMOVAL AND REPLACEMENT MATCH EXISTING STRIPING
14+90 MATCH EXISTING
48' FUTURE STREET WIDTH (5' BICYCLE LANE-12' LANE-12' MEDIAN LANE-12' LANE-5' BICYCLE LANE).
48'
STA. 12+80
L. POLE
STOP HERE ON RED
24" x 36"
8+00
9+00
10+00
11+00
12+00
13+00
14+00
1+00
A
B
C
D
E
F
G
H
TURN LANE MARKINGS-SEE MUTCD AND ODOT STANDARD DRAWING S-3 FOR DETAILS. ARROWS SHALL BE HOT-APPLIED THERMOPLASTIC PAVEMENT MARKING MATERIAL. (SEE SPECIAL PROVISIONS).
CENTER IN TURN LANE
LOCATE 10' FROM BEGINNING OF FULL WIDTH OF TURN LANE.
VARIES
CROSSWALK -SPACE TWO 12" WHITE LINES AS SHOWN ON PLANS. CROSSWALK SHALL BE HOT-APPLIED PLASTIC THERMOPLASTIC PAVEMENT MARKING MATERIAL.
THRU AND TURN LANE MARKINGS SEE MUTCD FOR DETAILS. TURN AND THRU ARROWS SHALL BE HOT-APPLIED THERMOPLASTIC PAVEMENT MARKING MATERIAL.
(150') WHERE POSSIBLE
LANE LINE- 4" WHITE PAINTED LINE WITH WHITE MONO-DIRECTIONAL CRYSTAL TYP I MARKERS (WHITE) AT 40' O.C..
THRU TRAFFIC
TURNING TRAFFIC
TURN LANE LINE-8" WHITE PAINTED LINE WITH MONO-DIRECTIONAL CRYSTAL TYPE I MARKERS (WHITE) AT 15' O.C.
TRAFFIC SIDE
FOG LINE- 4" WHITE PAINTED LINE WITH MONO-DIRECTIONAL CRYSTAL TYPE I MARKERS (WHITE) AT 40' O.C. SPACED AT 4" OUTSIDE OF WHITE LINE.
CENTERLINES - TWO 4" PAINTED YELLOW LINES WITH BI-DIRECTIONAL CRYSTAL TYPE I MARKERS (YELLOW) AT 40' O.C..
STOP LINE - ONE 12" WHITE LINE AS SHOWN ON PLANS. STOP LINE SHALL BE PAINTED.
2 RSP-2 SP-2 6/4/92
NOTES:
1. STRIPING LAYOUT TO BE PROVIDED BY CONTRACTOR IN ACCORDANCE WITH SHEET SP-2. NOTIFY ENGINEER UPON COMPLETION OF LAYOUT FOR CONFIRMATION PRIOR TO INSTALLATION OF PAVEMENT MARKINGS.
2. REMOVAL OF EXISTING MARKINGS BY GRINDING OR OTHER METHOD APPROVED BY THE ENGINEER.
3. ALL THERMOPLASTIC PLASTIC PAVEMENT MARKING MATERIALS SHALL CONFORM TO ODOT 1991 SPECIFICATIONS FOR TYPE A HOT-APPLIED THERMOPLASTIC MATERIAL AS MODIFIED IN THE SPECIAL PROVISIONS.
SP-2 06/18/92 15:17
MACKENZIE ENGINEERING INCORPORATED
Civil • Structural • Transportation
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
CITY OF MILWAUKIE
PUBLIC SAFETY FACILITY
S.E. HARRISON & S.E. 32nd
TRAFFIC SIGNAL IMPROVEMENTS
STRIPING PLAN
DONALD P. ODERMOTT
DATE: MAY 25, 1992
DRAWN BY: R. BOETTCHER
CHECKED BY: D. ODERMOTT
REVISIONS: 1 MAY 29, 1992 2 JUNE 19, 1992 (NO CHANGES)
SHEET SP-2
291451


CONSTRUCTION SET JUNE 19,1992
GRAPHIC SCALE
S.E. HARRISON ST.
S.E. 32ND. AVE.
NOTES:
LEGEND
STANDARD SYMBOLS
NORMAL PHASE ROTATION PROPOSED
FIRE PRE-EMPTION OPERATION PROPOSED
FLASHING OPERATION
STOP FIRE
DRIVEWAY SIGNAL
HARRISON 32ND. SIGNAL
MATCH LINE - STA. 7+75
MACKENZIE ENGINEERING INCORPORATED
CITY OF MILWAUKIE PUBLIC SAFETY FACILITY S.E. HARRISON & S.E. 32nd
TRAFFIC SIGNAL IMPROVEMENTS SIGNALIZATION PLAN
MAY 29, 1992
1 MAY 29, 1992
2 JUNE 19, 1992
R. BOETTCHER
SP-3
291451


CONSTRUCTION SET JUNE 19, 1992
GRAPHIC SCALE
S.E. HARRISON ST.
S.E. 32ND. AVE.
S.E. CAMPBELL
S.E. RAILROAD
PARKING LOT
MATCH LINE - STA. 7+75
NOTES:
LEGEND
LOOP DETECTOR WIRING DIAGRAM
LOOP INSTALLATION ALTERNATIVE
PARKING LOT LIGHT DETAIL
MACKENZIE ENGINEERING INCORPORATED
CITY OF MILWAUKIE
PUBLIC SAFETY FACILITY
S.E. HARRISON & S.E. 32nd
TRAFFIC SIGNAL IMPROVEMENTS
DETECTION PLAN
SP-4


CONSTRUCTION SET - June 19, 1992
WALL LEGEND
GENERAL NOTES
KEYNOTES
FIRST FLOOR PLAN
MILWAUKIE PUBLIC SAFETY BUILDING Milwaukie, Oregon
FIRST FLOOR PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
A2.1
291451
1/8" = 1'-0"


WALL LEGEND
GENERAL NOTES
KEYNOTES
LOW ROOF (FUTURE EXPANSION)
LOW ROOF
SECOND FLOOR PLAN
1/8" = 1'-0"
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
SECOND FLOOR PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S.W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9370 • FAX: (503)228-1285
DATE: April 15, 1992
SHEET A2.2
JOB NO. 291451
PERMIT SET - April 15 1992
TA2-2 04/15/92 10:58


PERMIT SET - April 15, 1992
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ROOF PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
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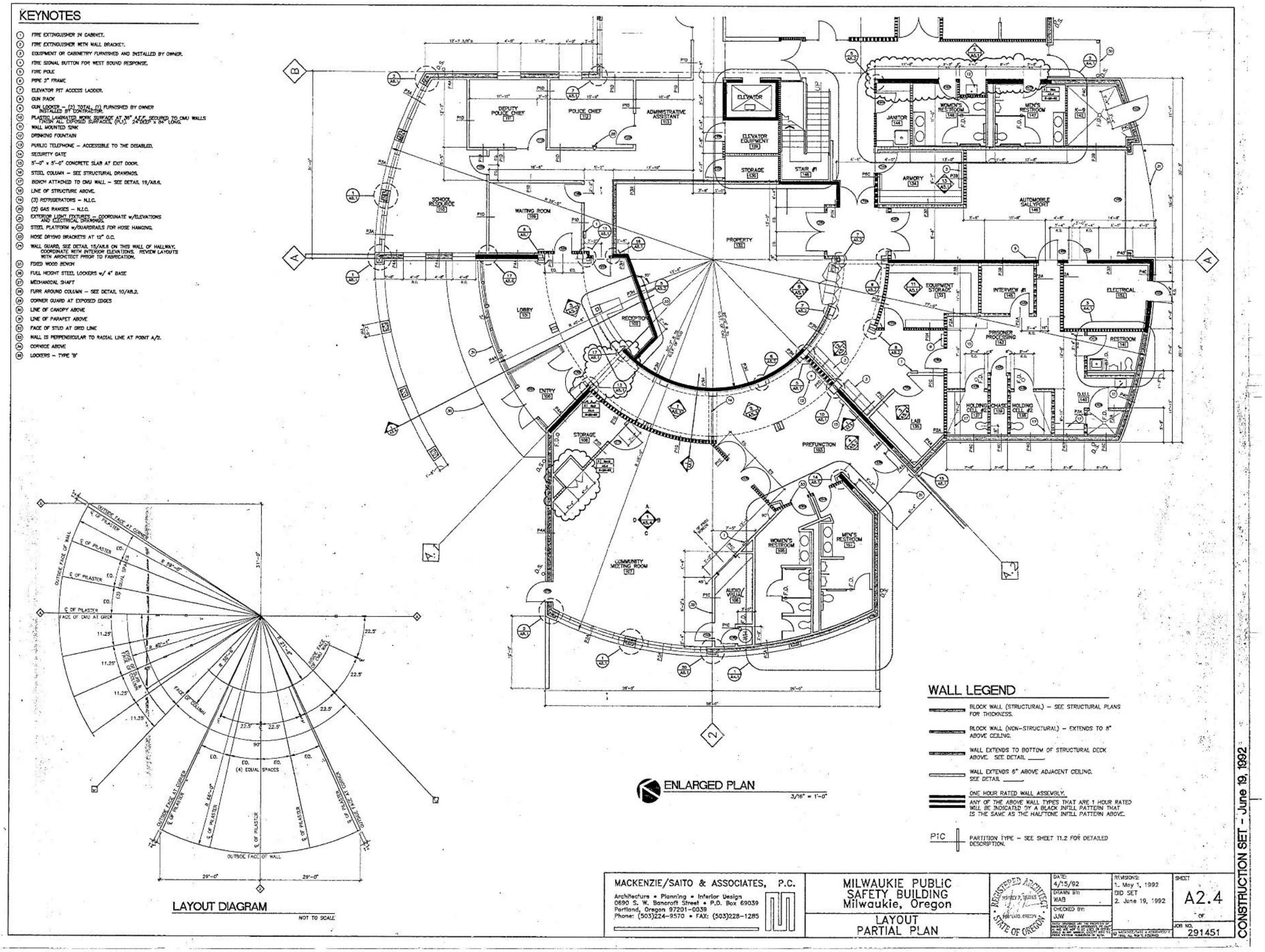
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
DATE: April 15, 1992
SHEET A2.3
JOB NO. 291451
ROOF PLAN
1/8" = 1'-0"
NOTES
LEGEND
KEYNOTES
AC-1
AC-2
A2-3 04/14/92 17:02



KEYNOTES

① FIRE EXTINGUISHER IN CABINET.
② FIRE EXTINGUISHER WITH WALL BRACKET.
③ EQUIPMENT OR CABINETRY FURNISHED AND INSTALLED BY OWNER.
④ FIRE SIGNAL BUTTON FOR WEST BOUND RESPONSE.
⑤ FIRE POLE
⑥ PIPE 2" FRAME
⑦ ELEVATOR PIT ACCESS LADDER.
⑧ GUN RACK
⑨ GUN LOCKER – (2) TOTAL, (1) FURNISHED BY OWNER INSTALLED BY CONTRACTOR.
⑩ PLASTIC LAMINATED WORK SURFACE AT 36" A.F.F. SECURED TO CMU WALLS FINISH ALL EXPOSED SURFACES, (PL1). 24"DEEP x 84" LONG.
⑪ WALL MOUNTED SINK
⑫ DRINKING FOUNTAIN
⑬ PUBLIC TELEPHONE – ACCESSIBLE TO THE DISABLED.
⑭ SECURITY GATE
⑮ 5'-0" x 5'-0" CONCRETE SLAB AT EXIT DOOR.
⑯ STEEL COLUMN – SEE STRUCTURAL DRAWINGS.
⑰ BENCH ATTACHED TO CMU WALL – SEE DETAIL 19/A8.6.
⑱ LINE OF STRUCTURE ABOVE.
⑲ (3) REFRIGERATORS – N.I.C.
⑳ (2) GAS RANGES – N.I.C.
㉑ EXTERIOR LIGHT FIXTURES – COORDINATE w/ELEVATIONS AND ELECTRICAL DRAWINGS.
㉒ STEEL PLATFORM w/GUARDRAILS FOR HOSE HANGING.
㉓ HOSE DRYING BRACKETS AT 12" O.C.
㉔ WALL GUARD, SEE DETAIL 15/A8.6 ON THIS WALL OF HALLWAY. COORDINATE WITH INTERIOR ELEVATIONS. REVIEW LAYOUTS WITH ARCHITECT PRIOR TO FABRICATION.
㉕ FIXED WOOD BENCH
㉖ FULL HEIGHT STEEL LOCKERS w/ 4" BASE
㉗ MECHANICAL SHAFT
㉘ FURR AROUND COLUMN – SEE DETAIL 10/A8.2.
㉙ CORNER GUARD AT EXPOSED EDGES
㉚ LINE OF CANOPY ABOVE
㉛ LINE OF PARAPET ABOVE
㉜ FACE OF STUD AT GRID LINE
㉝ WALL IS PERPENDICULAR TO RADIAL LINE AT POINT A/2.
㉞ CORNICE ABOVE
㉟ LOCKERS – TYPE 'B'

WALL LEGEND

▬	BLOCK WALL (STRUCTURAL) – SEE STRUCTURAL PLANS FOR THICKNESS.
▬	BLOCK WALL (NON-STRUCTURAL) – EXTENDS TO 8" ABOVE CEILING.
▬	WALL EXTENDS TO BOTTOM OF STRUCTURAL DECK ABOVE. SEE DETAIL _____
▭	WALL EXTENDS 6" ABOVE ADJACENT CEILING. SEE DETAIL _____
☰	ONE HOUR RATED WALL ASSEMBLY. ANY OF THE ABOVE WALL TYPES THAT ARE 1 HOUR RATED WILL BE INDICATED BY A BLACK INFILL PATTERN THAT IS THE SAME AS THE HALFTONE INFILL PATTERN ABOVE.
P1C	PARTITION TYPE – SEE SHEET T1.2 FOR DETAILED DESCRIPTION.

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MILWAUKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

LAYOUT
PARTIAL PLAN

JEFFREY P. REAVES

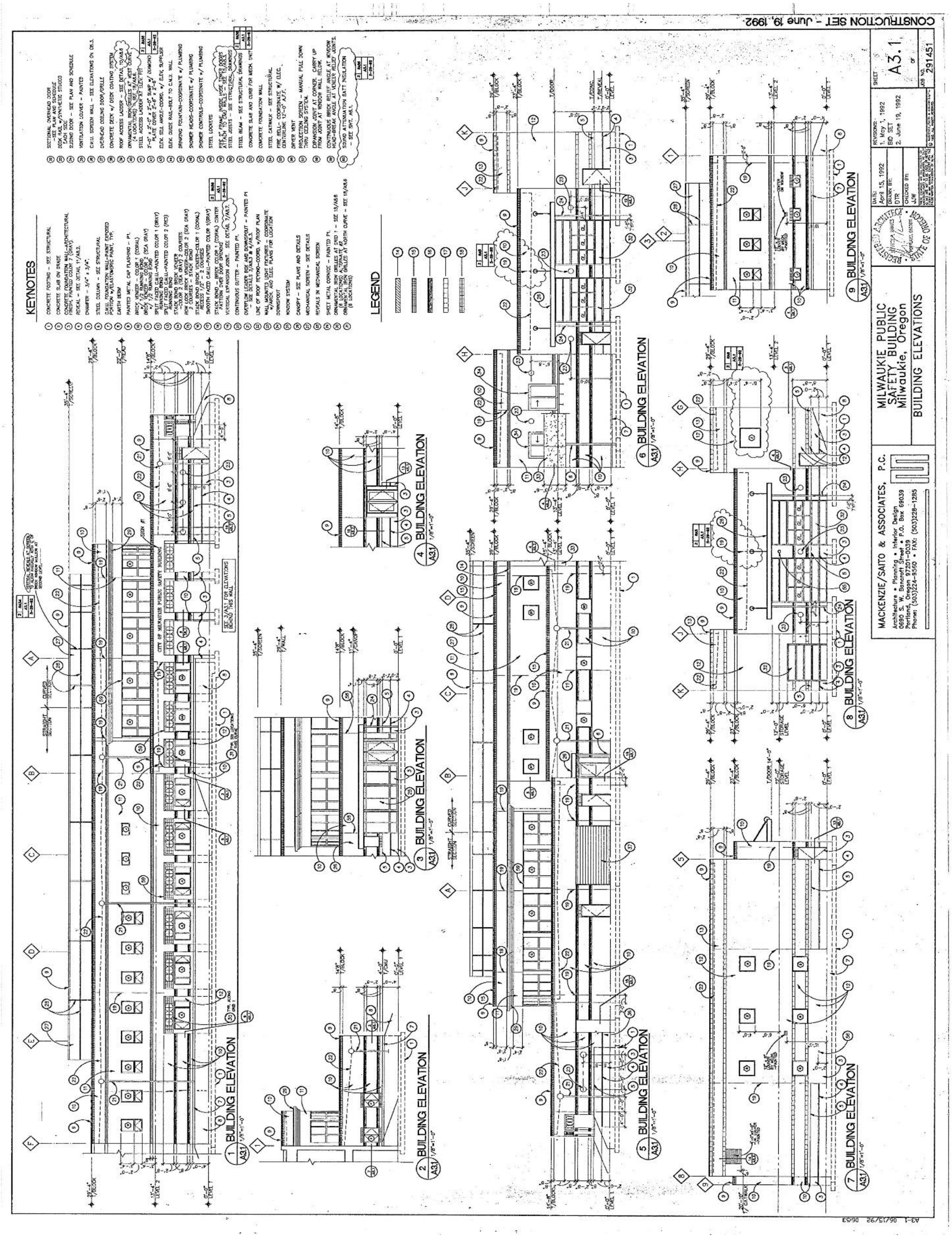
DATE: 4/15/92
DRAWN BY: WAB
CHECKED BY: JJW

REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992

SHEET
A2.4
OF

JOB NO.
291451

CONSTRUCTION SET – June 19, 1992


CONSTRUCTION SET – June 19, 1992
KEYNOTES
LEGEND
1 BUILDING ELEVATION A3.1 1/8"=1'-0"
2 BUILDING ELEVATION A3.1 1/8"=1'-0"
3 BUILDING ELEVATION A3.1 1/8"=1'-0"
4 BUILDING ELEVATION A3.1 1/8"=1'-0"
5 BUILDING ELEVATION A3.1 1/8"=1'-0"
6 BUILDING ELEVATION A3.1 1/8"=1'-0"
7 BUILDING ELEVATION A3.1 1/8"=1'-0"
8 BUILDING ELEVATION A3.1 1/8"=1'-0"
9 BUILDING ELEVATION A3.1 1/8"=1'-0"
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
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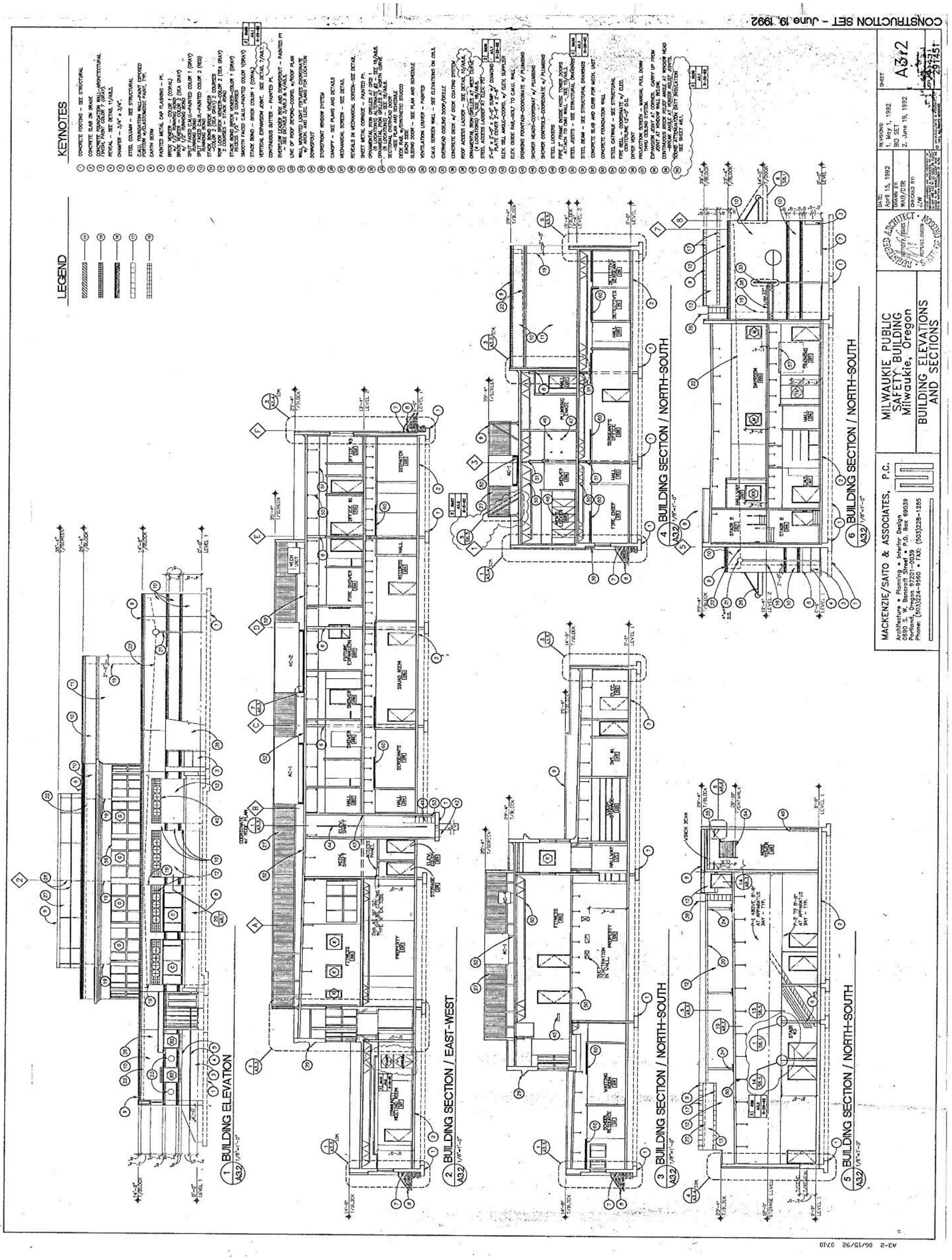
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
BUILDING ELEVATIONS
REGISTERED ARCHITECT
STATE OF OREGON
DATE: April 15, 1992
DRAWN BY: DTR
CHECKED BY: JJW
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992
SHEET A3.1
JOB NO. 291451
A3-1 06/15/92 06:03


CONSTRUCTION SET – June 19, 1992
LEGEND
KEYNOTES
1 BUILDING ELEVATION A32 1/8"=1'-0"
2 BUILDING SECTION / EAST-WEST A32 1/8"=1'-0"
3 BUILDING SECTION / NORTH-SOUTH A32 1/8"=1'-0"
4 BUILDING SECTION / NORTH-SOUTH A32 1/8"=1'-0"
5 BUILDING SECTION / NORTH-SOUTH A32 1/8"=1'-0"
6 BUILDING SECTION / NORTH-SOUTH A32 1/8"=1'-0"
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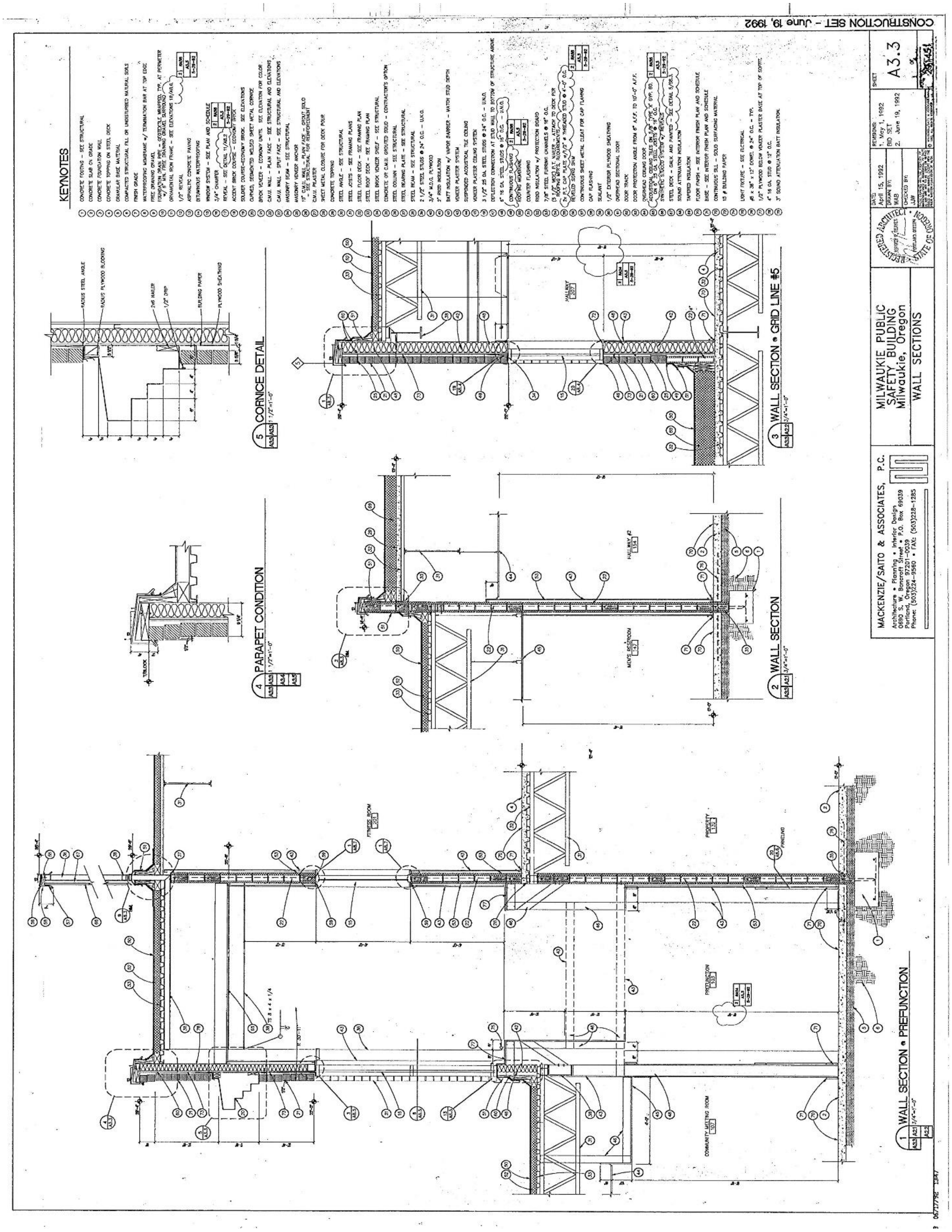
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING Milwaukie, Oregon
BUILDING ELEVATIONS AND SECTIONS
DATE: April 15, 1992
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET A3.2
291451
A3-2 06/15/92 07:10


CONSTRUCTION SET – June 19, 1992
KEYNOTES
5 CORNICE DETAIL 1 1/2"=1'-0"
3 WALL SECTION @ GRID LINE #5 3/4"=1'-0"
4 PARAPET CONDITION 1 1/2"=1'-0"
2 WALL SECTION 3/4"=1'-0"
1 WALL SECTION @ PREFUNCTION 3/4"=1'-0"
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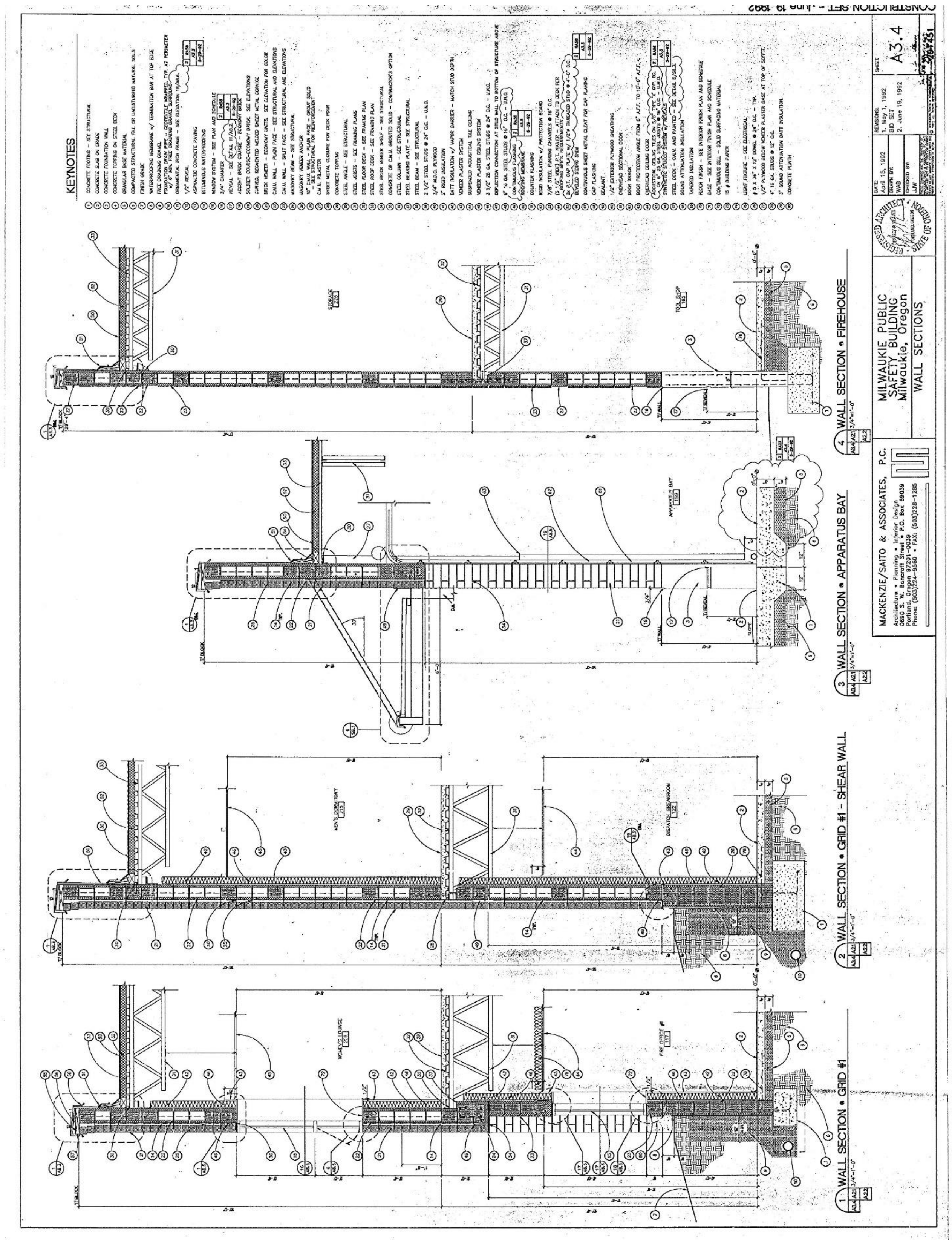
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
WALL SECTIONS
DATE: April 15, 1992
REVISIONS: 1. May 1, 1992 BID SET
2. June 19, 1992
SHEET A3.3


CONSTRUCTION SET - June 19, 1992
KEYNOTES
① CONCRETE FOOTING – SEE STRUCTURAL
② CONCRETE SLAB ON GRADE
③ CONCRETE FOUNDATION WALL
④ CONCRETE TOPPING ON STEEL DECK
⑤ GRANULAR BASE MATERIAL
⑥ COMPACTED STRUCTURAL FILL OR UNDISTURBED NATURAL SOILS
⑦ FINISH GRADE
⑧ WATERPROOFING MEMBRANE w/ TERMINATION BAR AT TOP EDGE
⑨ FREE DRAINING GRAVEL
⑩ FOUNDATION DRAIN PIPE – GEOTEXTILE WRAPPED, TYP. AT PERIMETER w/ 6" MIN. FREE DRAINING GRAVEL SURROUND
⑪ ORNAMENTAL IRON FRAME – SEE ELEVATION 18/A8.6.
⑫ 1/2" REVEAL
⑬ ASPHALTIC CONCRETE PAVING
⑭ BITUMINOUS WATERPROOFING
⑮ WINDOW SYSTEM – SEE PLAN AND SCHEDULE
⑯ 3/4" CHAMFER
⑰ REVEAL – SEE DETAIL 11/A8.2
⑱ ACCENT BRICK COURSE – ECONOMY BRICK
⑲ SOLDIER COURSE-ECONOMY BRICK. SEE ELEVATIONS
⑳ CURVED, SEGMENTED WELDED SHEET METAL CORNICE
㉑ BRICK VENEER – ECONOMY UNITS. SEE ELEVATION FOR COLOR
㉒ C.M.U. WALL – PLAIN FACE – SEE STRUCTURAL AND ELEVATIONS
㉓ C.M.U. WALL – SPLIT FACE – SEE STRUCTURAL AND ELEVATIONS
㉔ MASONRY BEAM – SEE STRUCTURAL
㉕ MASONRY VENEER ANCHOR
㉖ 10" C.M.U. WALL – PLAIN FACE – GROUT SOLID – SEE STRUCTURAL FOR REINFORCEMENT
㉗ C.M.U. PILASTER
㉘ SHEET METAL CLOSURE FOR DECK POUR
㉙ CONCRETE TOPPING
㉚ STEEL ANGLE – SEE STRUCTURAL
㉛ STEEL JOISTS – SEE FRAMING PLANS
㉜ STEEL FLOOR DECK – SEE FRAMING PLAN
㉝ STEEL ROOF DECK – SEE FRAMING PLAN
㉞ STEEL BRICK VENEER SHELF – SEE STRUCTURAL
㉟ CONCRETE OR C.M.U. GROUTED SOLID – CONTRACTOR'S OPTION
㊱ STEEL COLUMN – SEE STRUCTURAL
㊲ STEEL BEARING PLATE – SEE STRUCTURAL
㊳ STEEL BEAM – SEE STRUCTURAL
㊴ 2 1/2" STEEL STUDS @ 24" O.C. – U.N.O.
㊵ 3/4" M.D.O. PLYWOOD
㊶ 2" RIGID INSULATION
㊷ BATT INSULATION w/ VAPOR BARRIER – MATCH STUD DEPTH
㊸ VENEER PLASTER SYSTEM
㊹ SUSPENDED ACOUSTICAL TILE CEILING
㊺ VENEER PLASTER CEILING SYSTEM
㊻ 3 1/2" 25 GA. STEEL STUDS @ 24" O.C. – U.N.O.
㊼ DEFLECTION CONNECTION AT STUD WALL TO BOTTOM OF STRUCTURE ABOVE
㊽ 6" 16 GA. STEEL STUDS @ 16" O.C. – U.N.O.
㊾ CONTINUOUS FLASHING
㊿ ROOFING MEMBRANE
(51) COUNTER FLASHING
(52) RIGID INSULATION w/ PROTECTION BOARD
(53) 7/8" STEEL FURRING CHANNELS @ 16" O.C.
(54) (5 1/2" WIDE) P.T. NAILER – ATTACH TO DECK PER ROOFING MFR'S. REQUIREMENTS
(55) 2x P.T. CAP PLATE w/ 1/2"ø THREADED STUD @ 4'-0" O.C.
(56) BEVELED SIDING SHIM
(57) CONTINUOUS SHEET METAL CLEAT FOR CAP FLAHING
(58) CAP FLASHING
(59) SEALANT
(60) 1/2" EXTERIOR PLYWOOD SHEATHING
(61) OVERHEAD SECTIONAL DOOR
(62) DOOR TRACK
(63) DOOR PROTECTION ANGLE FROM 6" A.F.F. TO 10'-0" A.F.F.
(64) OVERHEAD COILING DOOR
(65) ACOUSTICAL CEILING TILES ON 5/8" TYPE 'X' GYP. BD. ON 6" 25 GA. STEEL JOISTS @ 16" O.C. – U.N.O.
(66) SYNTHETIC STUCCO SYSTEM w/ REVEALS
(67) STEEL DECK – GALV. AND PAINTED – SEE DETAIL 6/S8.3.
(68) SOUND ATTENUATION INSULATION
(69) TAPERED INSULATION
(70) FLOOR FINISH – SEE INTERIOR FINISH PLAN AND SCHEDULE
(71) BASE – SEE INTERIOR FINISH PLAN AND SCHEDULE
(72) CONTINUOUS SILL – SOLID SURFACING MATERIAL
(73) 15 # BUILDING PAPER
(74)
(75) LIGHT FIXTURE – SEE ELECTRICAL
(76) # 5 X 36" X 12" DOWEL @ 24" O.C. – TYP.
(77) 1/2" PLYWOOD BELOW VENEER PLASTER BASE AT TOP OF SOFFIT.
(78) 4" 16 GA. STUDS @ 12" O.C.
(79) 3" SOUND ATTENUATION BATT INSULATION.
(80) CONCRETE PLINTH
2 RA58 A3.3 5-29-92
T/BLOCK
T/WALL
T/REVEAL
SLOPE
WOMEN'S LOUNGE 209
FIRE OFFICE #1 117
MEN'S DORMITORY 215
DISPATCH BREAKROOM 122
APPARATUS BAY 159
STORAGE 225
TOOL SHOP 160
1 WALL SECTION • GRID #1 A3.4 A2.1 A2.2 3/4"=1'-0"
2 WALL SECTION • GRID #1 - SHEAR WALL A3.4 A2.1 A2.2 3/4"=1'-0"
3 WALL SECTION • APPARATUS BAY A3.4 A2.1 A2.2 3/4"=1'-0"
4 WALL SECTION • FIREHOUSE A3.4 A2.1 A2.2 3/4"=1'-0"
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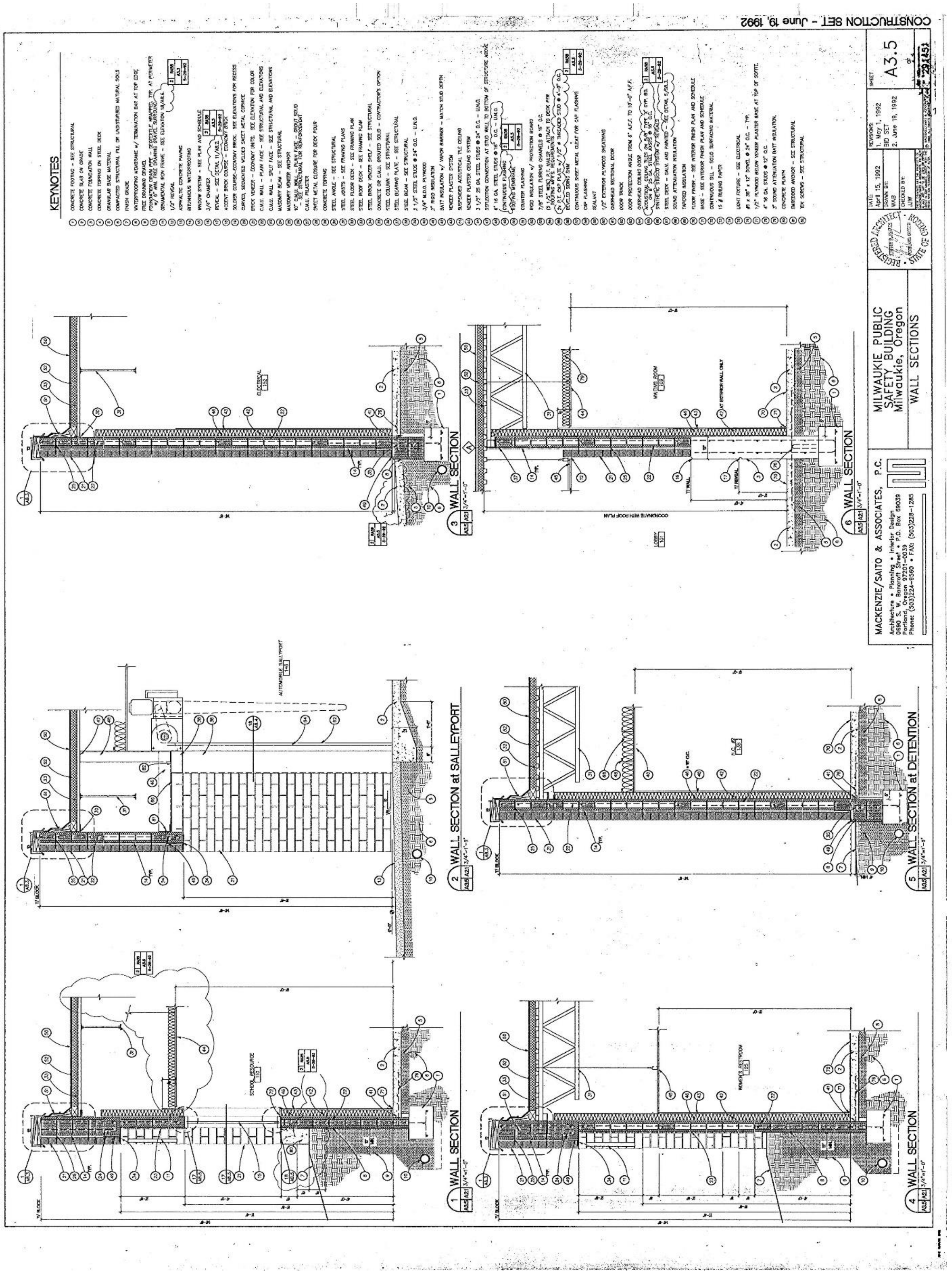
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
WALL SECTIONS
REGISTERED ARCHITECT
PORTLAND, OREGON
STATE OF OREGON
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET A3.4
920451


CONSTRUCTION SET – June 19, 1992
KEYNOTES
1 WALL SECTION 3/4"=1'-0"
2 WALL SECTION at SALLEYPORT 3/4"=1'-0"
3 WALL SECTION 3/4"=1'-0"
4 WALL SECTION 3/4"=1'-0"
5 WALL SECTION at DETENTION 3/4"=1'-0"
6 WALL SECTION 3/4"=1'-0"
AUTOMOBILE SALLYPORT
WAITING ROOM
LOBBY
MACKENZIE/SAITO & ASSOCIATES, P.C.
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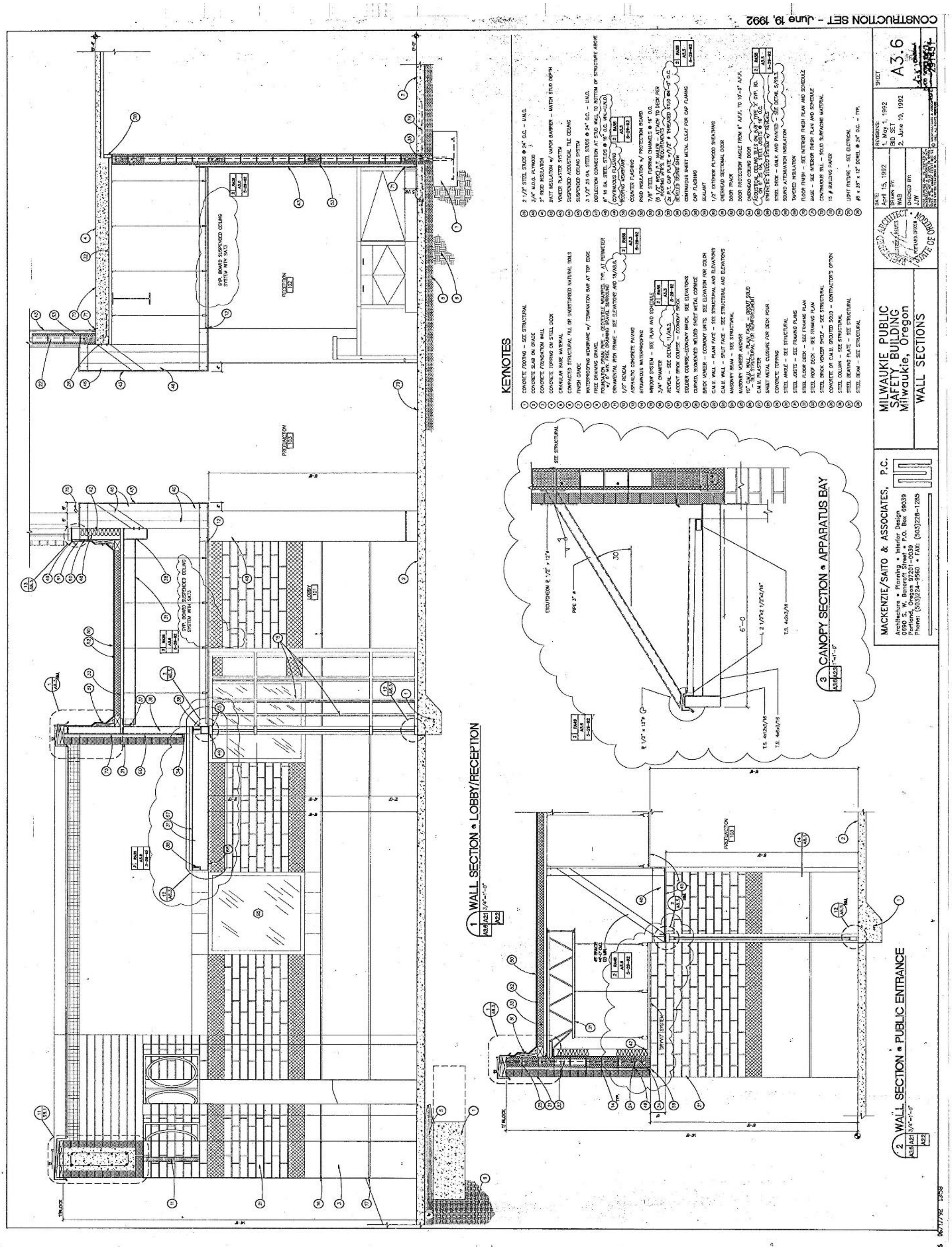
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
WALL SECTIONS
REGISTERED ARCHITECT • STATE OF OREGON
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992
SHEET A3.5
29145


CONSTRUCTION SET – June 19, 1992
1 WALL SECTION @ LOBBY/RECEPTION
2 WALL SECTION @ PUBLIC ENTRANCE
3 CANOPY SECTION @ APPARATUS BAY
RECEPTION 102
PREFUNCTION 103
LOBBY 101
SEE STRUCTURAL
KEYNOTES
CONCRETE FOOTING – SEE STRUCTURAL
CONCRETE SLAB ON GRADE
CONCRETE FOUNDATION WALL
CONCRETE TOPPING ON STEEL DECK
GRANULAR BASE MATERIAL
COMPACTED STRUCTURAL FILL OR UNDISTURBED NATURAL SOILS
FINISH GRADE
WATERPROOFING MEMBRANE w/ TERMINATION BAR AT TOP EDGE
FREE DRAINING GRAVEL
FOUNDATION DRAIN PIPE – GEOTEXTILE WRAPPED, TYP. AT PERIMETER w/ 6" MIN. FREE DRAINING GRAVEL SURROUND
ORNAMENTAL IRON FRAME – SEE ELEVATIONS AND 18/A8.6
1/2" REVEAL
ASPHALTIC CONCRETE PAVING
BITUMINOUS WATERPROOFING
WINDOW SYSTEM – SEE PLAN AND SCHEDULE
3/4" CHAMFER
REVEAL – SEE DETAIL 11/A8.2
ACCENT BRICK COURSE – ECONOMY BRICK
SOLDIER COURSE–ECONOMY BRICK, SEE ELEVATIONS
CURVED, SEGMENTED WELDED SHEET METAL CORNICE
BRICK VENEER – ECONOMY UNITS. SEE ELEVATION FOR COLOR
C.M.U. WALL – PLAIN FACE – SEE STRUCTURAL AND ELEVATIONS
C.M.U. WALL – SPLIT FACE – SEE STRUCTURAL AND ELEVATIONS
MASONRY BEAM – SEE STRUCTURAL
MASONRY VENEER ANCHOR
10" C.M.U. WALL – PLAIN FACE – GROUT SOLID – SEE STRUCTURAL FOR REINFORCEMENT
C.M.U. PILASTER
SHEET METAL CLOSURE FOR DECK POUR
CONCRETE TOPPING
STEEL ANGLE – SEE STRUCTURAL
STEEL JOISTS – SEE FRAMING PLANS
STEEL FLOOR DECK – SEE FRAMING PLAN
STEEL ROOF DECK – SEE FRAMING PLAN
STEEL BRICK VENEER SHELF – SEE STRUCTURAL
CONCRETE OR C.M.U. GROUTED SOLID – CONTRACTOR'S OPTION
STEEL COLUMN – SEE STRUCTURAL
STEEL BEARING PLATE – SEE STRUCTURAL
STEEL BEAM – SEE STRUCTURAL
2 1/2" STEEL STUDS @ 24" O.C. – U.N.O.
3/4" M.D.O. PLYWOOD
2" RIGID INSULATION
BATT INSULATION w/ VAPOR BARRIER – MATCH STUD DEPTH
VENEER PLASTER SYSTEM
SUSPENDED ACOUSTICAL TILE CEILING
SUSPENDED CEILING SYSTEM
3 1/2" 25 GA. STEEL STUDS @ 24" O.C. – U.N.O.
DEFLECTION CONNECTION AT STUD WALL TO BOTTOM OF STRUCTURE ABOVE
6" 16 GA. STEEL STUDS @ 16" O.C. MIN.–U.N.O.
CONTINUOUS FLASHING
ROOFING MEMBRANE
COUNTER FLASHING
RIGID INSULATION w/ PROTECTION BOARD
7/8" STEEL FURRING CHANNELS @ 16" O.C.
(5 1/2" WDC) P.T. NAILER – ATTACH TO DECK PER ROOFING MFR'S. REQUIREMENTS
2x P.T. CAP PLATE w/1/2" ø THREADED STUD @4'-0" O.C.
BEVELED SIDING SHIM
CONTINUOUS SHEET METAL CLEAT FOR CAP FLASHING
CAP FLASHING
SEALANT
1/2" EXTERIOR PLYWOOD SHEATHING
OVERHEAD SECTIONAL DOOR
DOOR TRACK
DOOR PROTECTION ANGLE FROM 6" A.F.F. TO 10'-0" A.F.F.
OVERHEAD COILING DOOR
ACOUSTICAL CEILING TILES ON 5/8" TYPE 'X' GYP. BD. ON 6" 25 GA. STEEL JOISTS @ 16" O.C.
SYNTHETIC STUCCO SYSTEM w/ REVEALS – SEE DETAIL 5/A8.3
STEEL DECK – GALV. AND PAINTED
SOUND ATTENUATION INSULATION
TAPERED INSULATION
FLOOR FINISH – SEE INTERIOR FINISH PLAN AND SCHEDULE
BASE – SEE INTERIOR FINISH PLAN AND SCHEDULE
CONTINUOUS SILL – SOLID SURFACING MATERIAL
15 # BUILDING PAPER
LIGHT FIXTURE – SEE ELECTRICAL
#5 x 35" x 12" DOWEL @ 24" O.C. – TYP.
MACKENZIE/SAITO & ASSOCIATES, P.C.
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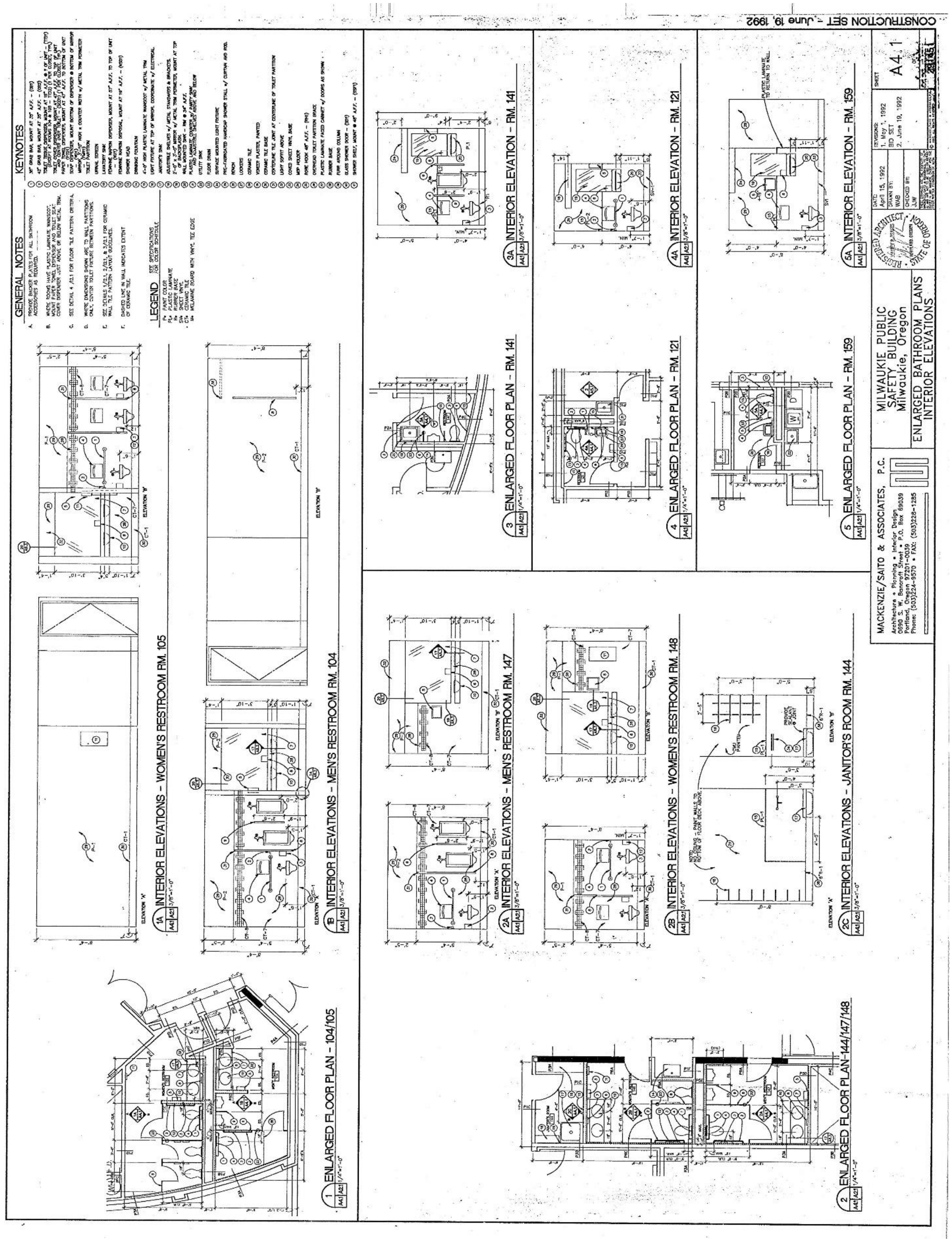
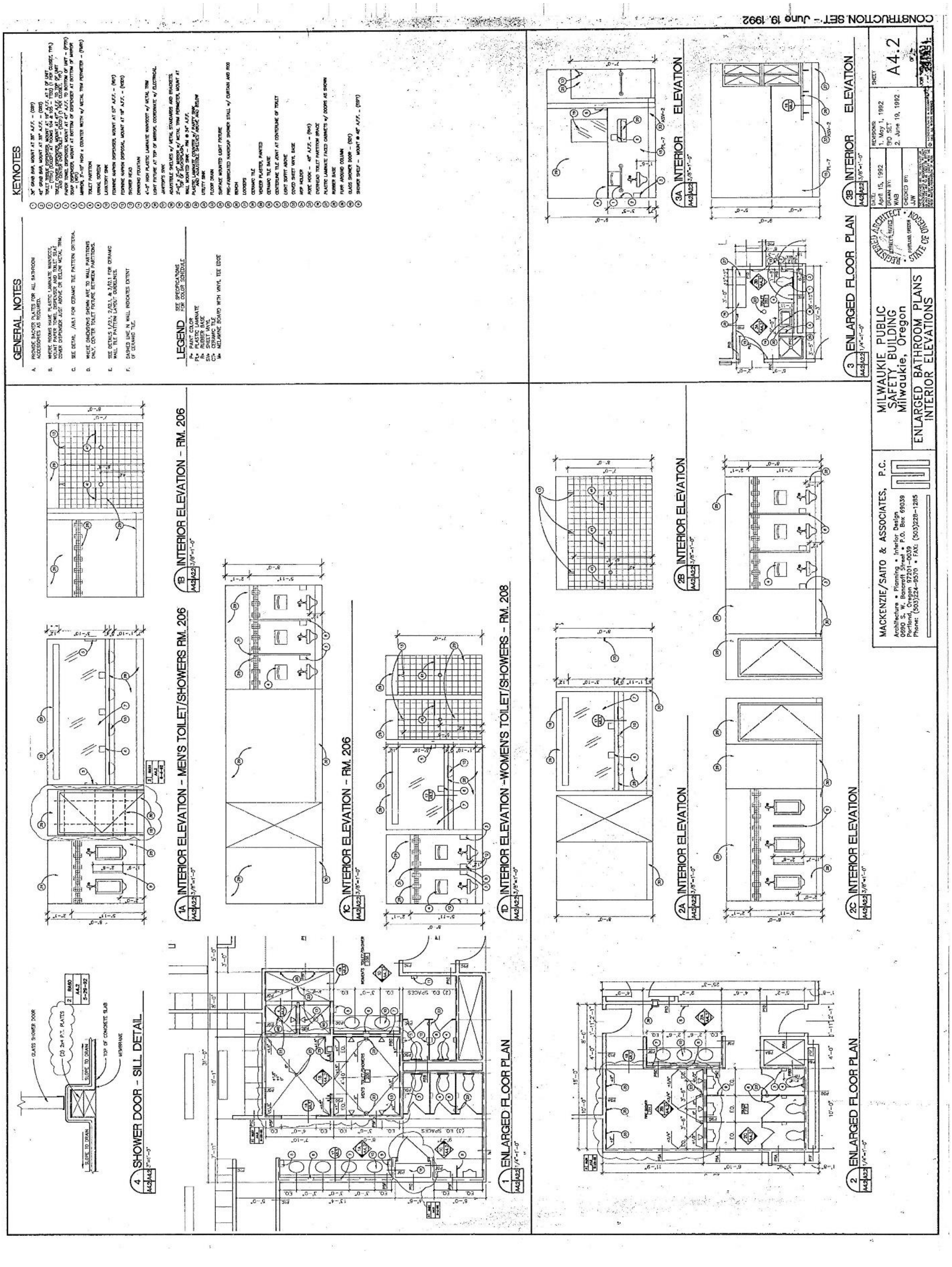
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
WALL SECTIONS
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET A3.6


CONSTRUCTION SET - June 19, 1992
GENERAL NOTES
KEYNOTES
LEGEND
1A INTERIOR ELEVATIONS - WOMEN'S RESTROOM RM. 105
1B INTERIOR ELEVATIONS - MEN'S RESTROOM RM. 104
1 ENLARGED FLOOR PLAN - 104/105
2A INTERIOR ELEVATIONS - MEN'S RESTROOM RM. 147
2B INTERIOR ELEVATIONS - WOMEN'S RESTROOM RM. 148
2C INTERIOR ELEVATIONS - JANITOR'S ROOM RM. 144
2 ENLARGED FLOOR PLAN-144/147/148
3 ENLARGED FLOOR PLAN - RM. 141
3A INTERIOR ELEVATION - RM. 141
4 ENLARGED FLOOR PLAN - RM. 121
4A INTERIOR ELEVATION - RM. 121
5 ENLARGED FLOOR PLAN - RM. 159
5A INTERIOR ELEVATION - RM. 159
MACKENZIE/SAITO & ASSOCIATES, P.C.
MILWAUKIE PUBLIC SAFETY BUILDING Milwaukie, Oregon
ENLARGED BATHROOM PLANS INTERIOR ELEVATIONS
DATE: April 15, 1992
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
A4.1


CONSTRUCTION SET - June 19, 1992
GENERAL NOTES
KEYNOTES
LEGEND
1A INTERIOR ELEVATION - MEN'S TOILET/SHOWERS RM. 206
1B INTERIOR ELEVATION - RM. 206
1C INTERIOR ELEVATION - RM. 206
1D INTERIOR ELEVATION -WOMEN'S TOILET/SHOWERS - RM. 208
4 SHOWER DOOR - SILL DETAIL
1 ENLARGED FLOOR PLAN
2 ENLARGED FLOOR PLAN
2A INTERIOR ELEVATION
2B INTERIOR ELEVATION
2C INTERIOR ELEVATION
3 ENLARGED FLOOR PLAN
3A INTERIOR ELEVATION
3B INTERIOR ELEVATION
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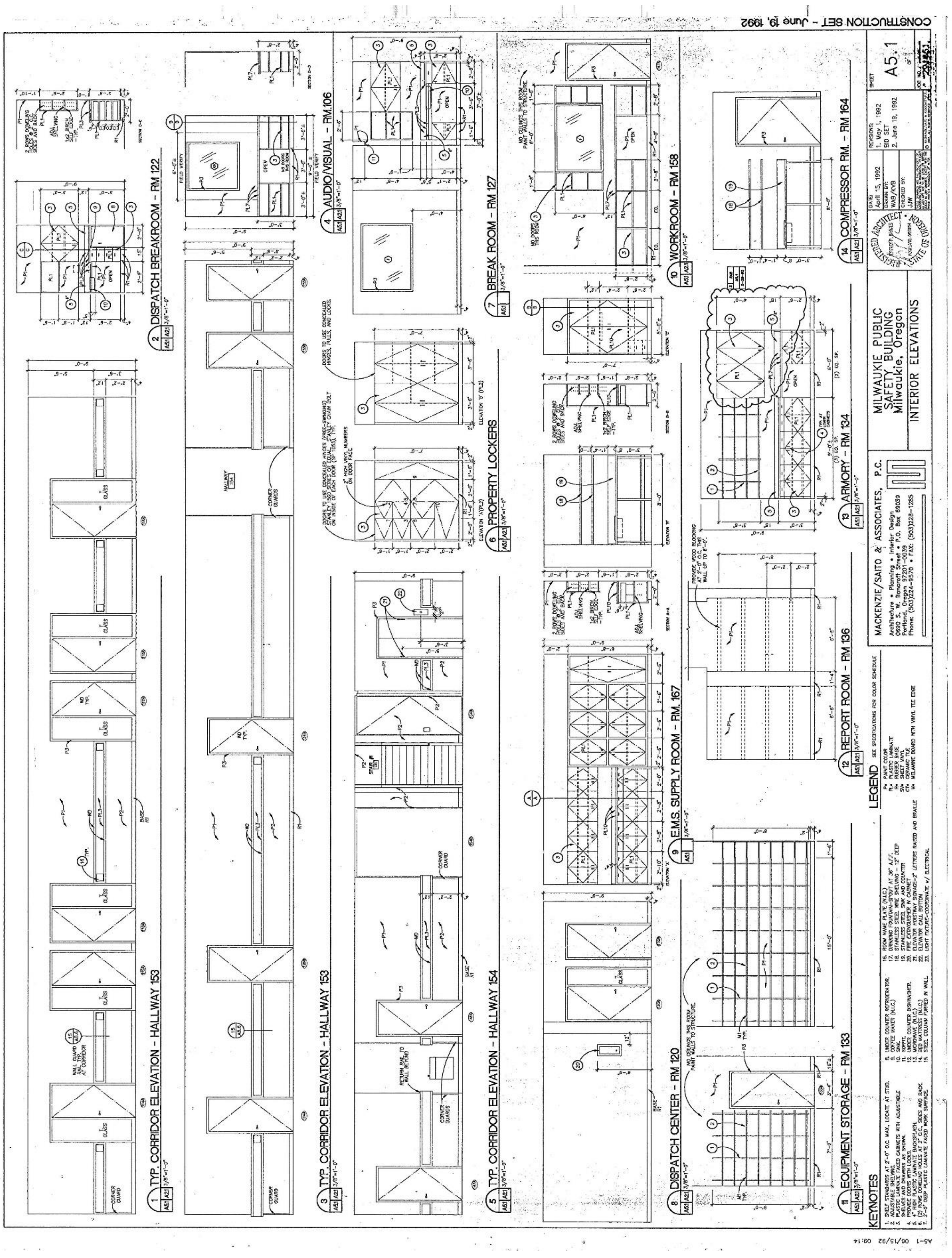
MILWAUKIE PUBLIC SAFETY BUILDING Milwaukie, Oregon
ENLARGED BATHROOM PLANS INTERIOR ELEVATIONS
April 15, 1992
1. May 1, 1992 BID SET
2. June 19, 1992
A4.2


CONSTRUCTION SET - June 19, 1992
1 TYP. CORRIDOR ELEVATION - HALLWAY 153
2 DISPATCH BREAKROOM - RM 122
3 TYP. CORRIDOR ELEVATION - HALLWAY 153
4 AUDIO/VISUAL - RM.106
5 TYP. CORRIDOR ELEVATION - HALLWAY 154
6 PROPERTY LOCKERS
7 BREAK ROOM - RM 127
8 DISPATCH CENTER - RM 120
9 E.M.S. SUPPLY ROOM - RM. 167
10 WORKROOM - RM 158
11 EQUIPMENT STORAGE - RM 133
12 REPORT ROOM - RM 136
13 ARMORY - RM 134
14 COMPRESSOR RM. - RM 164
A51 A21 3/8"=1'-0"
KEYNOTES
1. SHELF STANDARDS AT 2'-0" O.C. MAX., LOCATE AT STUD.
2. ADJUSTABLE SHELVING.
3. PLASTIC LAMINATE FACED CABINETS WITH ADJUSTABLE SHELVES AND DRAWERS AS SHOWN.
4. PROVIDE DOORS WITH LOCKS.
5. 4" HIGH PLASTIC LAMINATE BACKSPLASH.
6. (2) ROWS DOWELING HOLES AT 2" O.C. SIDES AND BACK.
7. 2'-0" DEEP PLASTIC LAMINATE FACED WORK SURFACE.
8. UNDER COUNTER REFRIGERATOR.
9. COFFEE MAKER (N.I.C.)
10. SINK.
11. SOFFIT.
12. UNDER COUNTER DISHWASHER.
13. MICROWAVE (N.I.C.)
14. BED MATTRESS (N.I.C.)
15. STEEL COLUMN FURRED IN WALL.
16. ROOM NAME PLATE (N.I.C.)
17. DRINKING FOUNTAIN-SPOUT AT 36" A.F.F.
18. STAINLESS STEEL WIRE SHELVING - 12" DEEP
19. STAINLESS STEEL SINK AND COUNTER
20. FIRE EXTINGUISHER IN CABINET
21. ELEVATOR HOISTWAY SIGNAGE-2" LETTERS RAISED AND BRAILLE
22. ELEVATOR CALL BUTTON
23. LIGHT FIXTURE-COORDINATE w/ ELECTRICAL
LEGEND SEE SPECIFICATIONS FOR COLOR SCHEDULE
P= PAINT COLOR
PL= PLASTIC LAMINATE
R= RUBBER BASE
SV= SHEET VINYL
CT= CERAMIC TILE
M= MELAMINE BOARD WITH VINYL TEE EDGE
MACKENZIE/SAITO & ASSOCIATES, P.C.
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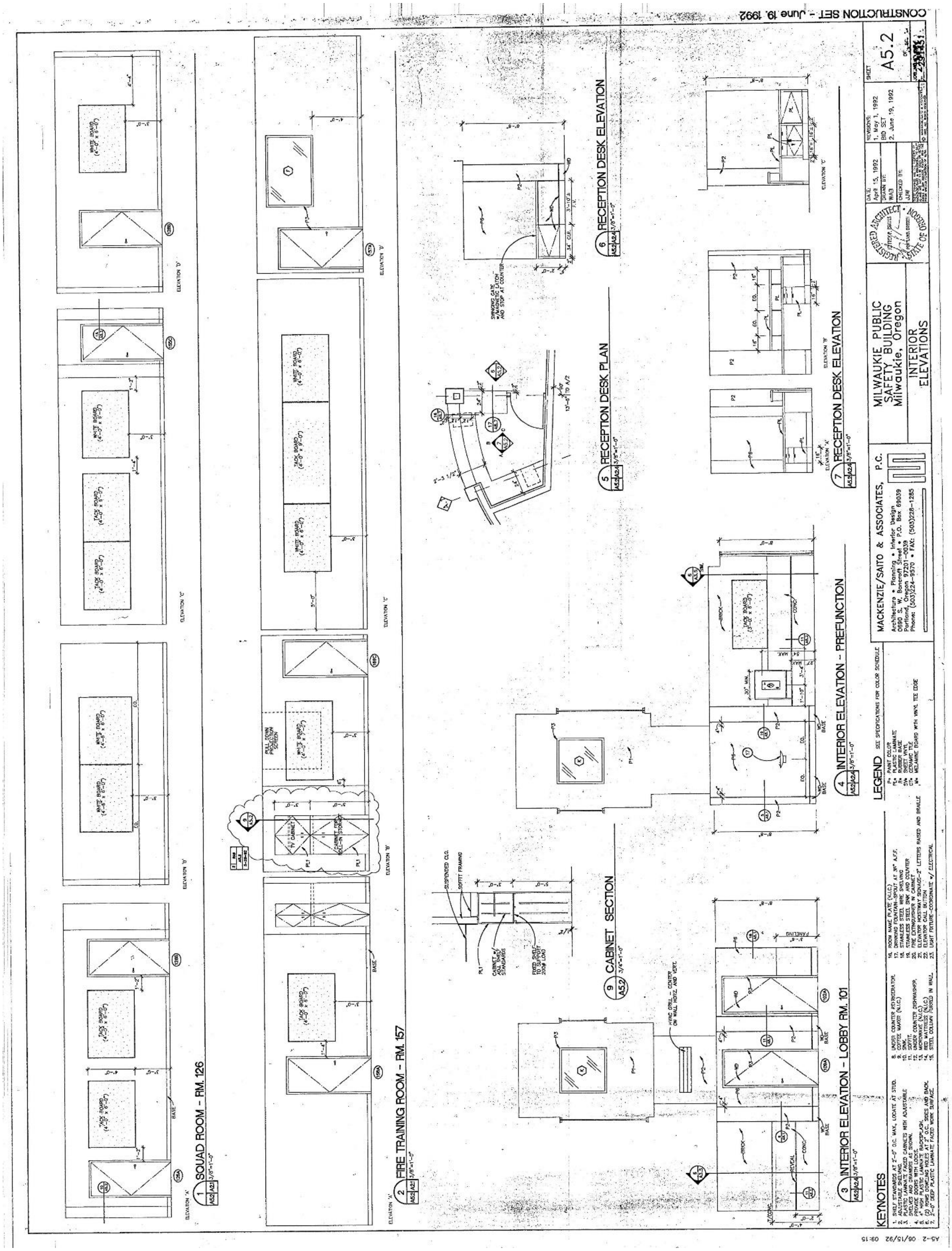
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
INTERIOR ELEVATIONS
DATE: April 15, 1992
DRAWN BY: WAB/KVB
CHECKED BY: JJW
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET A5.1
A5-1 06/15/92 08:14


CONSTRUCTION SET - June 19, 1992
1 SQUAD ROOM - RM. 126 3/8"=1'-0"
2 FIRE TRAINING ROOM - RM. 157 3/8"=1'-0"
3 INTERIOR ELEVATION - LOBBY RM. 101 3/8"=1'-0"
4 INTERIOR ELEVATION - PREFUNCTION 3/8"=1'-0"
5 RECEPTION DESK PLAN 3/8"=1'-0"
6 RECEPTION DESK ELEVATION 3/8"=1'-0"
7 RECEPTION DESK ELEVATION 3/8"=1'-0"
9 CABINET SECTION 3/4"=1'-0"
WHITE BOARD (4'-0" x 6'-0")
TACK BOARD (4'-0" x 6'-0")
ELEVATION 'A'
ELEVATION 'B'
ELEVATION 'C'
ELEVATION 'D'
BASE
KEYNOTES
LEGEND SEE SPECIFICATIONS FOR COLOR SCHEDULE
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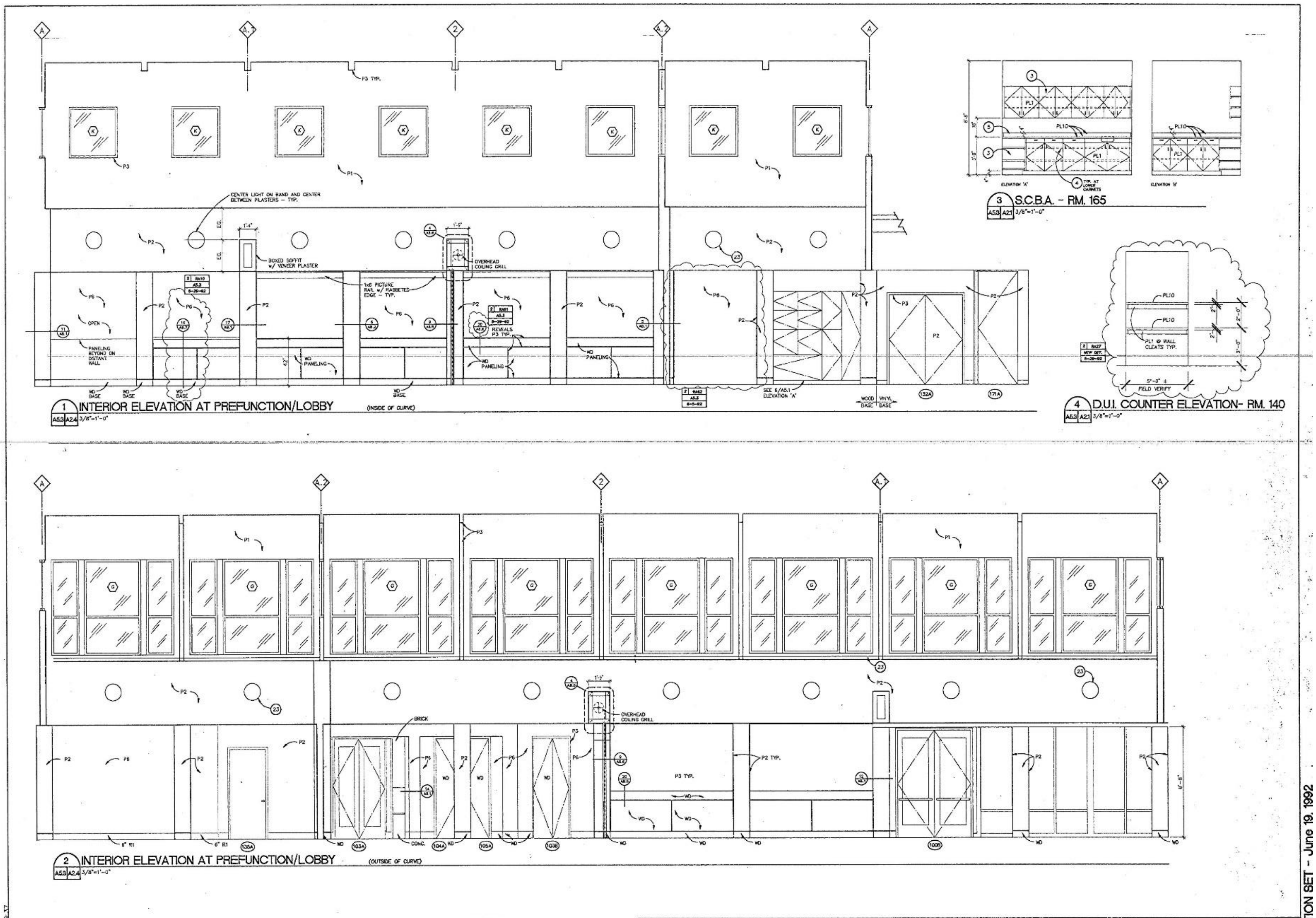
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
INTERIOR ELEVATIONS
DATE: April 15, 1992
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET A5.2
A5-2 06/15/92 09:15



KEYNOTES

1. SHELF STANDARDS AT 2'-0" O.C. MAX., LOCATE AT STUD.
2. ADJUSTABLE SHELVING.
3. PLASTIC LAMINATE FACED CABINETS WITH ADJUSTABLE SHELVES AND DRAWERS AS SHOWN.
4. PROVIDE DOORS WITH LOCKS.
5. 4" HIGH PLASTIC LAMINATE BACKSPLASH.
6. (2) ROWS DOWELING HOLES AT 2" O.C., SIDES AND BACK.
7. 2'-0" DEEP PLASTIC LAMINATE FACED WORK SURFACE.
8. UNDER COUNTER REFRIGERATOR.
9. COFFEE MAKER (N.I.C.)
10. SINK.
11. SOFFIT.
12. UNDER COUNTER DISHWASHER.
13. MICROWAVE (N.I.C.)
14. BED MATTRESS (N.I.C.)
15. STEEL COLUMN FURRED IN WALL.
16. ROOM NAME PLATE (N.I.C.)
17. DRINKING FOUNTAIN-SPOUT AT 36" A.F.F.
18. STAINLESS STEEL WIRE SHELVING
19. STAINLESS STEEL SINK AND COUNTER
20. FIRE EXTINGUISHER IN CABINET
21. ELEVATOR HOISTWAY SIGNAGE-2" LETTERS RAISED AND BRAILLE
22. ELEVATOR CALL BUTTON
23. LIGHT FIXTURE-COORDINATE w/ ELECTRICAL

LEGEND SEE SPECIFICATIONS FOR COLOR SCHEDULE

P= PAINT COLOR
PL= PLASTIC LAMINATE
R= RUBBER BASE
SV= SHEET VINYL
CT= CERAMIC TILE
M= MELAMINE BOARD WITH VINYL TEE EDGE

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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon

INTERIOR ELEVATIONS

REGISTERED ARCHITECT JEFFREY P. GEYER STATE OF OREGON

DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW

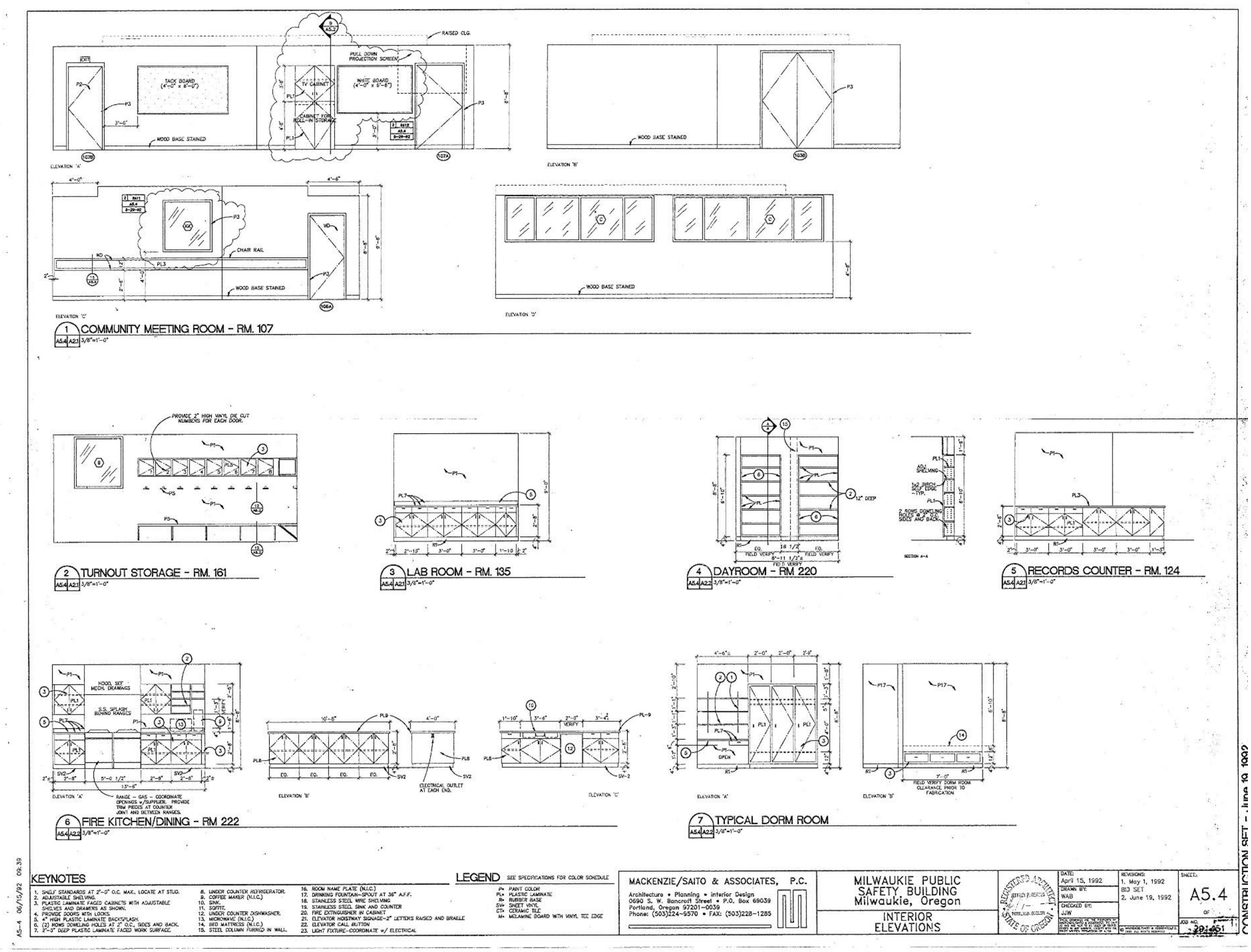
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET A5.3 OF

JOB NO. 291451

CONSTRUCTION SET - June 19, 1992

A5-3 06/12/92 09:37


RAISED CLG.
PULL DOWN PROJECTION SCREEN
TACK BOARD (4'-0" x 8'-0")
WHITE BOARD (4'-0" x 5'-8")
TV CABINET
CABINET FOR ROLL-IN STORAGE
WOOD BASE STAINED
CHAIR RAIL
ELEVATION 'A'
ELEVATION 'B'
ELEVATION 'C'
ELEVATION 'D'
1 COMMUNITY MEETING ROOM - RM. 107 A5.4 A2.1 3/8"=1'-0"
PROVIDE 2" HIGH VINYL DIE CUT NUMBERS FOR EACH DOOR.
2 TURNOUT STORAGE - RM. 161 A5.4 A2.1 3/8"=1'-0"
3 LAB ROOM - RM. 135 A5.4 A2.1 3/8"=1'-0"
12" DEEP
ADJ. SHELVING
1x2 BIRCH SELF EDGE -TYP.
2 ROWS DOWLING HOLES @ 2" O.C. SIDES AND BACK
SECTION A-A
FIELD VERIFY
4 DAYROOM - RM 220 A5.4 A2.2 3/8"=1'-0"
5 RECORDS COUNTER - RM. 124 A5.4 A2.1 3/8"=1'-0"
HOOD, SEE MECH. DRAWINGS
S.S. SPLASH BEHIND RANGES
RANGE - GAS - COORDINATE OPENINGS w/SUPPLIER. PROVIDE TRIM PIECES AT COUNTER JOINT AND BETWEEN RANGES.
ELECTRICAL OUTLET AT EACH END.
6 FIRE KITCHEN/DINING - RM 222 A5.4 A2.2 3/8"=1'-0"
FIELD VERIFY DORM ROOM CLEARANCE PRIOR TO FABRICATION
7 TYPICAL DORM ROOM A5.4 A2.2 3/8"=1'-0"
KEYNOTES
1. SHELF STANDARDS AT 2'-0" O.C. MAX., LOCATE AT STUD.
2. ADJUSTABLE SHELVING.
3. PLASTIC LAMINATE FACED CABINETS WITH ADJUSTABLE SHELVES AND DRAWERS AS SHOWN.
4. PROVIDE DOORS WITH LOCKS.
5. 4" HIGH PLASTIC LAMINATE BACKSPLASH.
6. (2) ROWS DOWELING HOLES AT 2" O.C., SIDES AND BACK.
7. 2'-0" DEEP PLASTIC LAMINATE FACED WORK SURFACE.
8. UNDER COUNTER REFRIGERATOR.
9. COFFEE MAKER (N.I.C.)
10. SINK.
11. SOFFIT.
12. UNDER COUNTER DISHWASHER.
13. MICROWAVE (N.I.C.)
14. BED MATTRESS (N.I.C.)
15. STEEL COLUMN FURRED IN WALL.
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23. LIGHT FIXTURE-COORDINATE w/ ELECTRICAL
LEGEND SEE SPECIFICATIONS FOR COLOR SCHEDULE
P= PAINT COLOR
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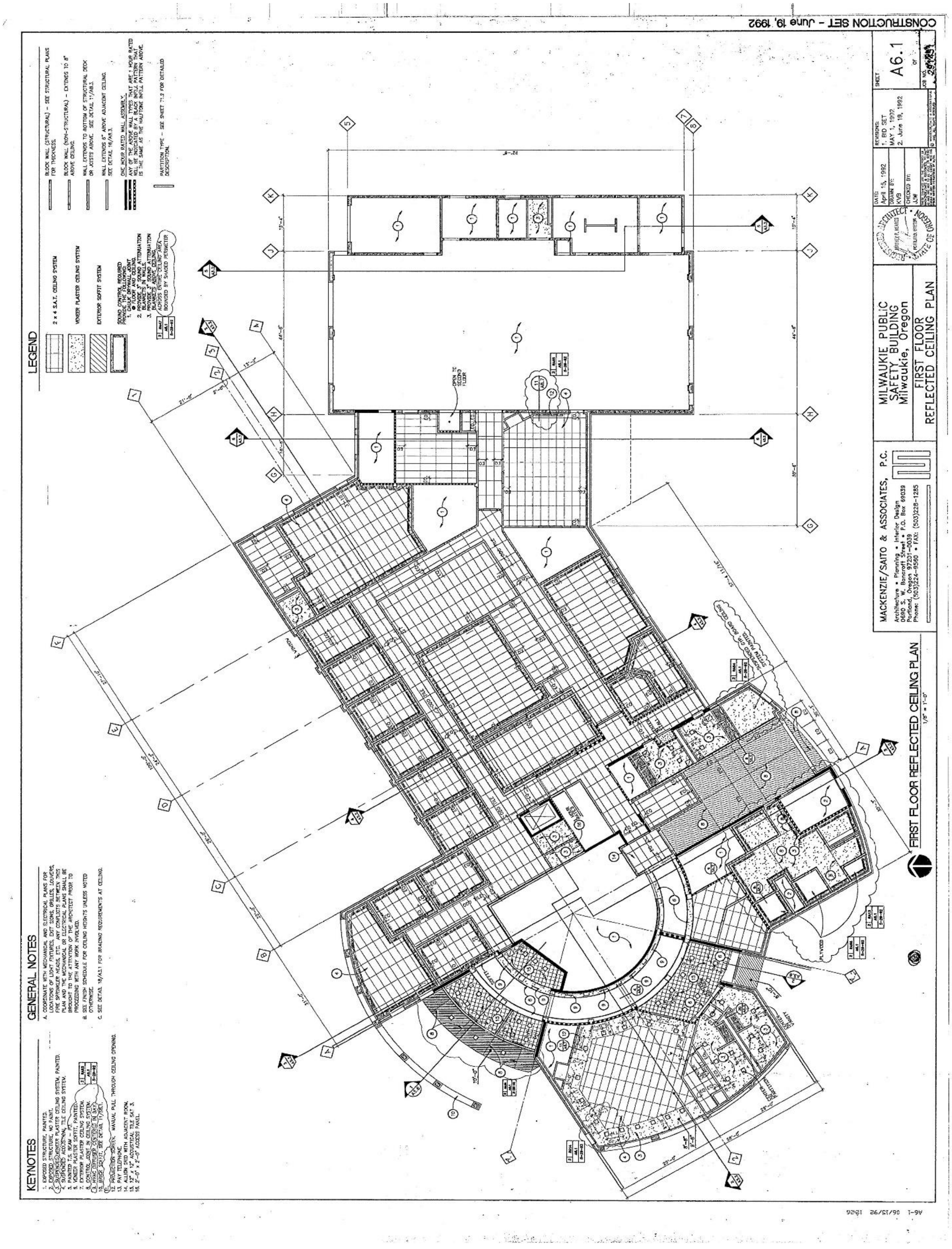
MILWAUKIE PUBLIC SAFETY BUILDING Milwaukie, Oregon
INTERIOR ELEVATIONS
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET: A5.4
JOB NO. 291451
CONSTRUCTION SET - June 19 1992
A5-4 06/15/92 09:39


CONSTRUCTION SET – June 19, 1992
LEGEND
GENERAL NOTES
KEYNOTES
FIRST FLOOR REFLECTED CEILING PLAN
1/8" = 1'-0"
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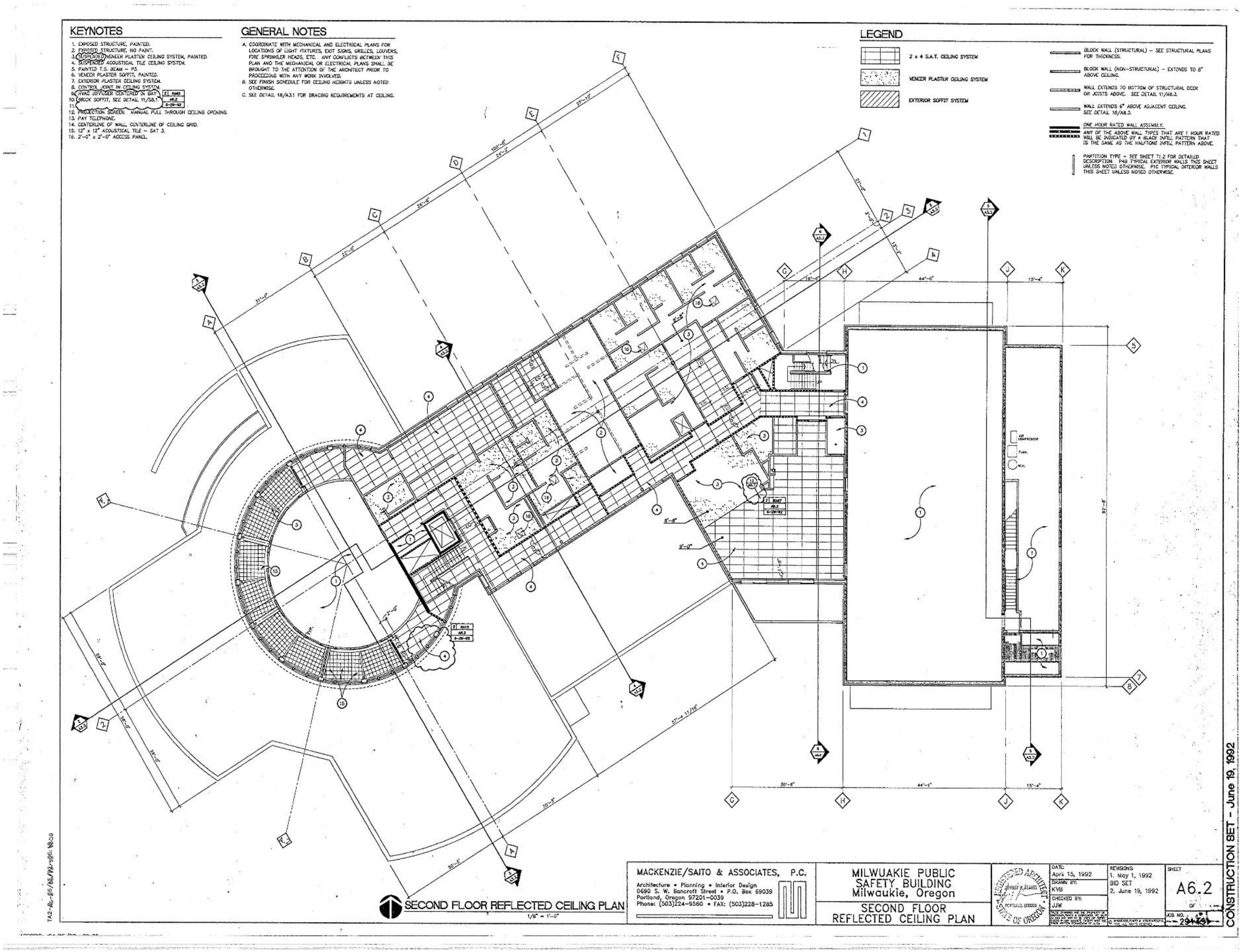
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
FIRST FLOOR REFLECTED CEILING PLAN
DATE: April 15, 1992
DRAWN BY: KVB
CHECKED BY: JJW
REVISIONS:
1. BID SET MAY 1, 1992
2. June 19, 1992
SHEET A6.1
A6-1 06/15/92 10:26



KEYNOTES

1. EXPOSED STRUCTURE, PAINTED.
2. EXPOSED STRUCTURE, NO PAINT.
3. SUSPENDED VENEER PLASTER CEILING SYSTEM, PAINTED.
4. SUSPENDED ACOUSTICAL TILE CEILING SYSTEM.
5. PAINTED T.S. BEAM – P3.
6. VENEER PLASTER SOFFIT, PAINTED.
7. EXTERIOR PLASTER CEILING SYSTEM.
8. CONTROL JOINT IN CEILING SYSTEM.
9. HVAC DIFFUSER CENTERED IN BAY.
10. BRICK SOFFIT, SEE DETAIL 11/S8.1.
11.
12. PROJECTION SCREEN. MANUAL PULL THROUGH CEILING OPENING.
13. PAY TELEPHONE.
14. CENTERLINE OF WALL, CENTERLINE OF CEILING GRID.
15. 12" x 12" ACOUSTICAL TILE – SAT 3.
16. 2'-0" x 2'-0" ACCESS PANEL.

2 RM3
A6.2
5-29-92

GENERAL NOTES

A. COORDINATE WITH MECHANICAL AND ELECTRICAL PLANS FOR LOCATIONS OF LIGHT FIXTURES, EXIT SIGNS, GRILLES, LOUVERS, FIRE SPRINKLER HEADS, ETC. ANY CONFLICTS BETWEEN THIS PLAN AND THE MECHANICAL OR ELECTRICAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO PROCEEDING WITH ANY WORK INVOLVED.
B. SEE FINISH SCHEDULE FOR CEILING HEIGHTS UNLESS NOTED OTHERWISE.
C. SEE DETAIL 18/A3.1 FOR BRACING REQUIREMENTS AT CEILING.

LEGEND

▦	2 x 4 S.A.T. CEILING SYSTEM
░	VENEER PLASTER CEILING SYSTEM
▨	EXTERIOR SOFFIT SYSTEM
═	BLOCK WALL (STRUCTURAL) – SEE STRUCTURAL PLANS FOR THICKNESS.
═	BLOCK WALL (NON-STRUCTURAL) – EXTENDS TO 8" ABOVE CEILING.
═	WALL EXTENDS TO BOTTOM OF STRUCTURAL DECK OR JOISTS ABOVE. SEE DETAIL 11/A8.3.
═	WALL EXTENDS 6" ABOVE ADJACENT CEILING. SEE DETAIL 16/A8.3.
■	ONE HOUR RATED WALL ASSEMBLY. ANY OF THE ABOVE WALL TYPES THAT ARE 1 HOUR RATED WILL BE INDICATED BY A BLACK INFILL PATTERN THAT IS THE SAME AS THE HALFTONE INFILL PATTERN ABOVE.
▯	PARTITION TYPE – SEE SHEET T1.2 FOR DETAILED DESCRIPTION. P4B TYPICAL EXTERIOR WALLS THIS SHEET UNLESS NOTED OTHERWISE. P1C TYPICAL INTERIOR WALLS THIS SHEET UNLESS NOTED OTHERWISE.

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MILWUAKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

SECOND FLOOR
REFLECTED CEILING PLAN

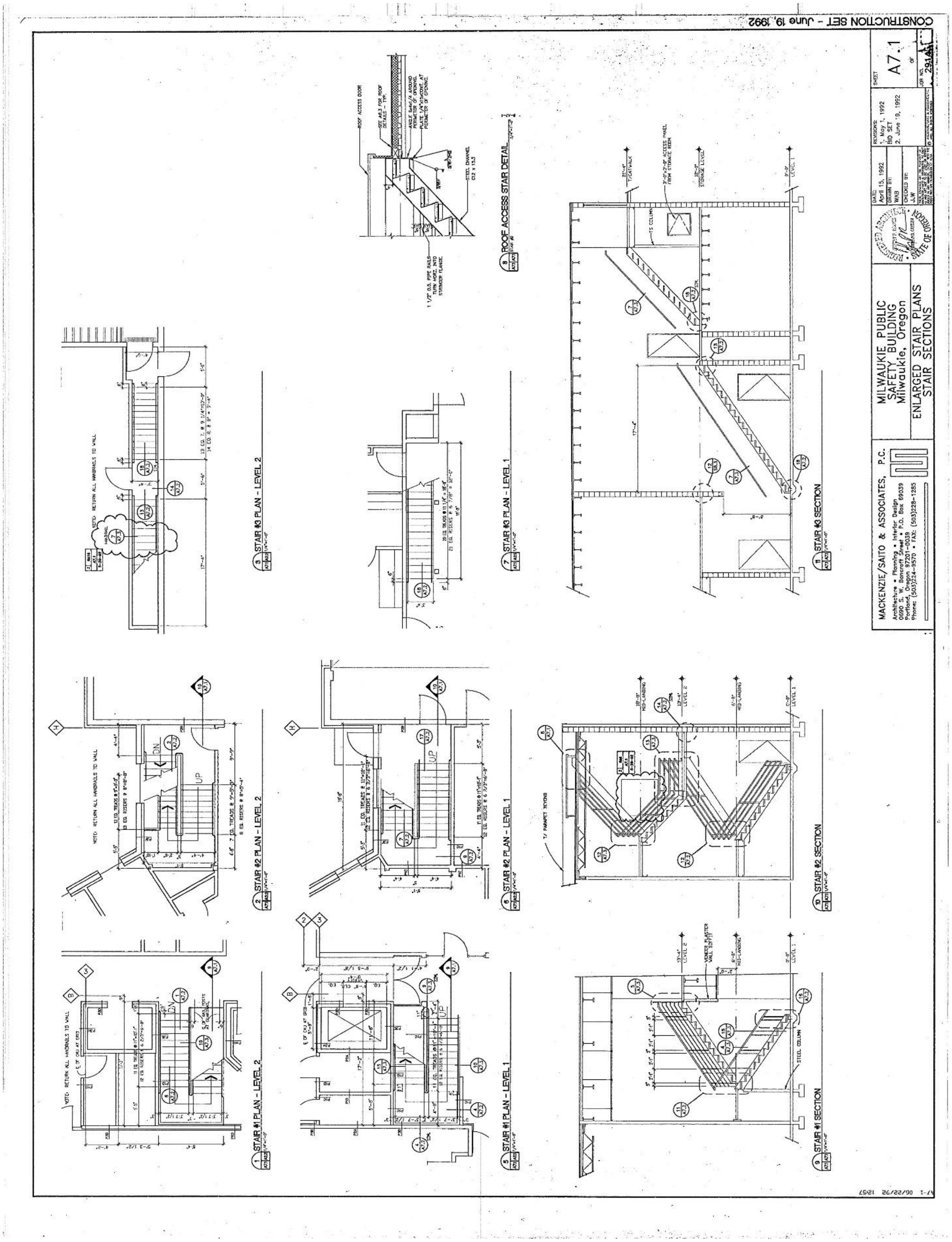
REGISTERED ARCHITECT
JEFFREY P. REAVES
PORTLAND, OREGON
STATE OF OREGON

DATE: April 15, 1992
DRAWN BY: KVB
CHECKED BY: JJW

REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992

SHEET
A6.2
OF

JOB NO. 29+45


CONSTRUCTION SET – June 19, 1992
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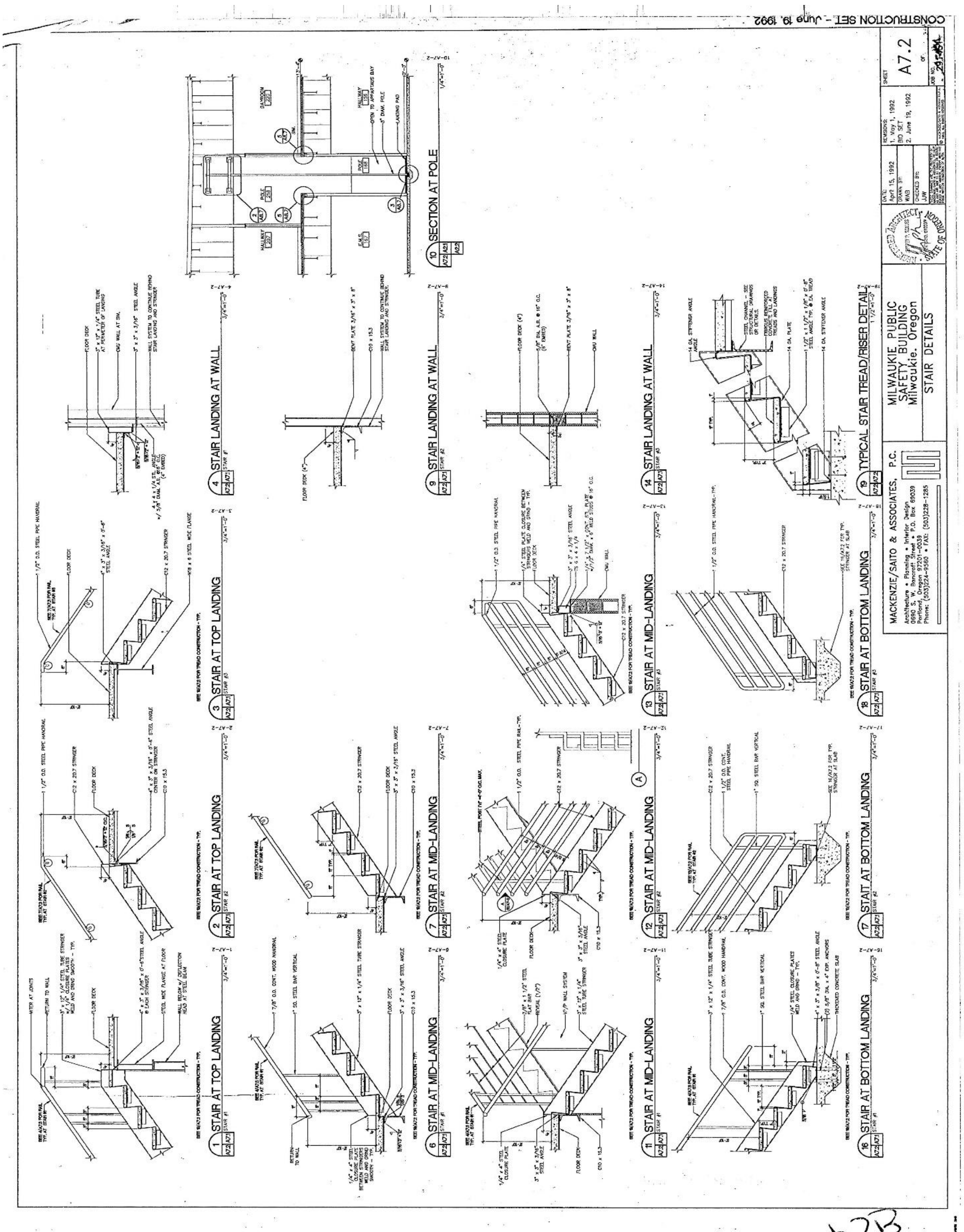
Phone: (503)224-9570 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ENLARGED STAIR PLANS
STAIR SECTIONS
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW
REVISIONS: 1. May 1, 1992 BID SET
2. June 19, 1992
SHEET A7.1
JOB NO. 29149
1 STAIR #1 PLAN - LEVEL 2
2 STAIR #2 PLAN - LEVEL 2
3 STAIR #3 PLAN - LEVEL 2
5 STAIR #1 PLAN - LEVEL 1
6 STAIR #2 PLAN - LEVEL 1
7 STAIR #3 PLAN - LEVEL 1
8 ROOF ACCESS STAIR DETAIL
9 STAIR #1 SECTION
10 STAIR #2 SECTION
11 STAIR #3 SECTION
NOTE: RETURN ALL HANDRAILS TO WALL
UP
DN
ROOF ACCESS DOOR
STEEL CHANNEL C12 x 15.3
1 1/2" O.D. PIPE RAILS
STEEL COLUMN
TS COLUMN
LEVEL 1
LEVEL 2
MID-LANDING
STORAGE LEVEL
T/ CATWALK
T/ PARAPET BEYOND
VENEER PLASTER WALL SOFFIT


CONSTRUCTION SET – June 19, 1992
1 STAIR AT TOP LANDING
2 STAIR AT TOP LANDING
3 STAIR AT TOP LANDING
4 STAIR LANDING AT WALL
6 STAIR AT MID-LANDING
7 STAIR AT MID-LANDING
9 STAIR LANDING AT WALL
10 SECTION AT POLE
11 STAIR AT MID-LANDING
12 STAIR AT MID-LANDING
13 STAIR AT MID-LANDING
14 STAIR LANDING AT WALL
16 STAIR AT BOTTOM LANDING
17 STAIT AT BOTTOM LANDING
18 STAIR AT BOTTOM LANDING
19 TYPICAL STAIR TREAD/RISER DETAIL
MACKENZIE/SAITO & ASSOCIATES, P.C.
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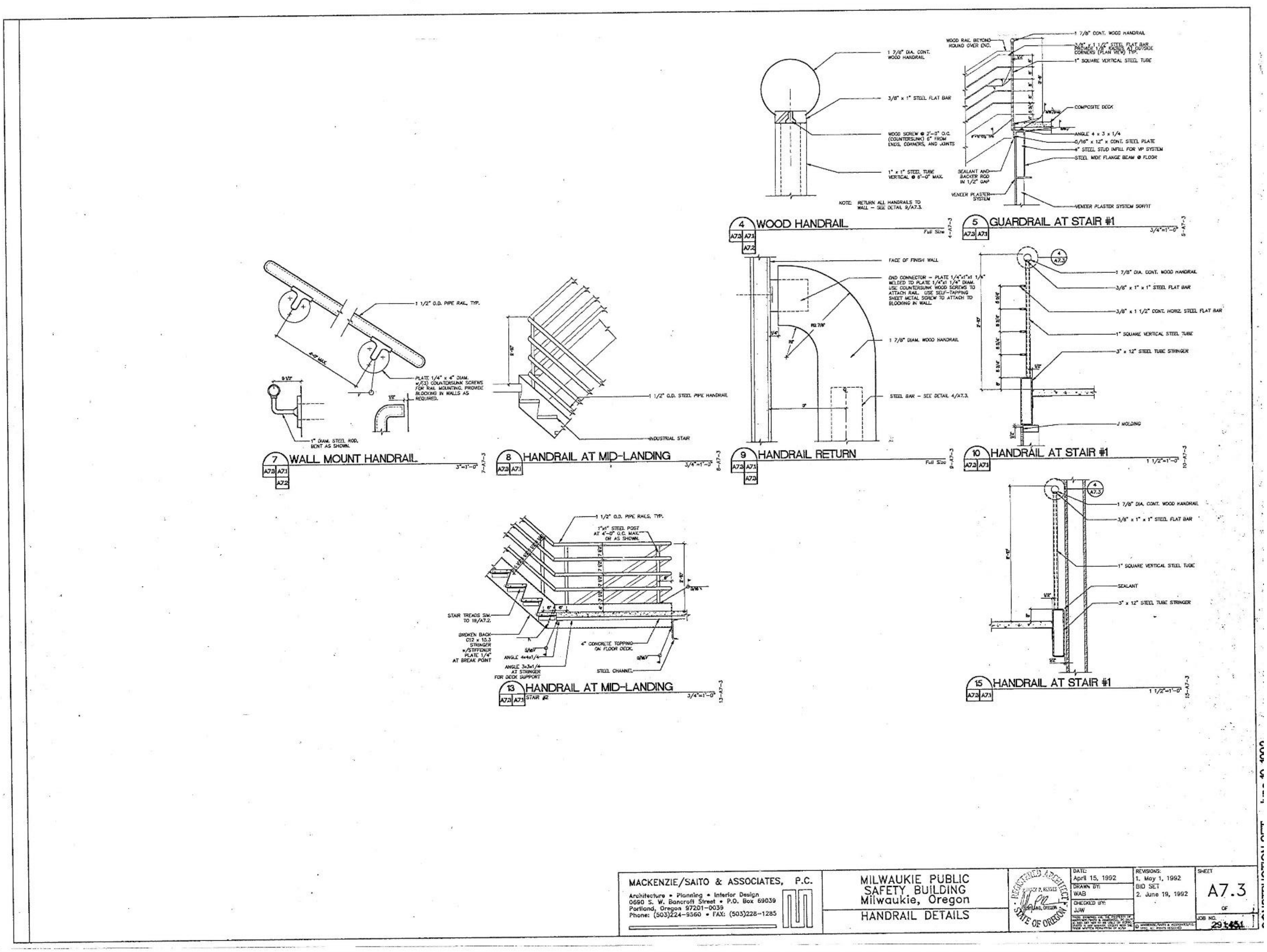
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
STAIR DETAILS
DATE: April 15, 1992
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
A7.2


1 7/8" DIA. CONT. WOOD HANDRAIL
3/8" x 1" STEEL FLAT BAR
WOOD SCREW @ 2'-0" O.C. (COUNTERSUNK) 6" FROM ENDS, CORNERS, AND JOINTS
1" x 1" STEEL TUBE VERTICAL @ 6'-0" MAX.
NOTE: RETURN ALL HANDRAILS TO WALL – SEE DETAIL 9/A7.3.
4 WOOD HANDRAIL
A7.3 A7.1 A7.2
Full Size
4–A7–3
WOOD RAIL BEYOND ROUND OVER END.
1 7/8" CONT. WOOD HANDRAIL
3/8" x 1 1/2" STEEL FLAT BAR PROVIDE 1/8" RADIUS AT OUTSIDE CORNERS (PLAN VIEW) TYP.
1" SQUARE VERTICAL STEEL TUBE
COMPOSITE DECK
ANGLE 4 x 3 x 1/4
5/16" x 12" x CONT. STEEL PLATE
4" STEEL STUD INFILL FOR VP SYSTEM
STEEL WIDE FLANGE BEAM @ FLOOR
SEALANT AND BACKER ROD IN 1/2" GAP
VENEER PLASTER SYSTEM
VENEER PLASTER SYSTEM SOFFIT
5 GUARDRAIL AT STAIR #1
A7.3 A7.1
3/4"=1'-0"
5–A7–3
1 1/2" O.D. PIPE RAIL, TYP.
PLATE 1/4" x 4" DIAM. w/(3) COUNTERSUNK SCREWS FOR RAIL MOUNTING. PROVIDE BLOCKING IN WALLS AS REQUIRED.
1" DIAM. STEEL ROD, BENT AS SHOWN.
9 1/2"
1/2"
4'-0" MAX.
7 WALL MOUNT HANDRAIL
A7.3 A7.1 A7.2
3"=1'-0"
7–A7–3
1 1/2" O.D. STEEL PIPE HANDRAIL
INDUSTRIAL STAIR
8 HANDRAIL AT MID-LANDING
A7.3 A7.1
3/4"=1'-0"
8–A7–3
FACE OF FINISH WALL
END CONNECTOR – PLATE 1/4"x1"x1 1/4" WELDED TO PLATE 1/4"x1 1/4" DIAM. USE COUNTERSUNK WOOD SCREWS TO ATTACH RAIL. USE SELF-TAPPING SHEET METAL SCREW TO ATTACH TO BLOCKING IN WALL.
1 7/8" DIAM. WOOD HANDRAIL
STEEL BAR – SEE DETAIL 4/A7.3.
R2 7/8"
R1"
1/4"
9"
9 HANDRAIL RETURN
A7.3 A7.1 A7.3
Full Size
9–A7–3
4 A7.3
1 7/8" DIA. CONT. WOOD HANDRAIL
3/8" x 1" x 1" STEEL FLAT BAR
3/8" x 1 1/2" CONT. HORIZ. STEEL FLAT BAR
1" SQUARE VERTICAL STEEL TUBE
3" x 12" STEEL TUBE STRINGER
J MOLDING
1/2"
10 HANDRAIL AT STAIR #1
A7.3 A7.1
1 1/2"=1'-0"
10–A7–3
1 1/2" O.D. PIPE RAILS, TYP.
1"x1" STEEL POST AT 4'-0" O.C. MAX. OR AS SHOWN.
STAIR TREADS SIM. TO 18/A7.2.
BROKEN BACK C12 x 15.3 STRINGER w/STIFFENER PLATE 1/4" AT BREAK POINT
ANGLE 4x4x1/4
ANGLE 3x3x1/4 AT STRINGER FOR DECK SUPPORT
4" CONCRETE TOPPING ON FLOOR DECK.
STEEL CHANNEL
3/16"
13 HANDRAIL AT MID-LANDING
A7.3 A7.1 STAIR #2
3/4"=1'-0"
13–A7–3
4 A7.3
1 7/8" DIA. CONT. WOOD HANDRAIL
3/8" x 1" x 1" STEEL FLAT BAR
1" SQUARE VERTICAL STEEL TUBE
SEALANT
3" x 12" STEEL TUBE STRINGER
15 HANDRAIL AT STAIR #1
A7.3 A7.1
1 1/2"=1'-0"
15–A7–3
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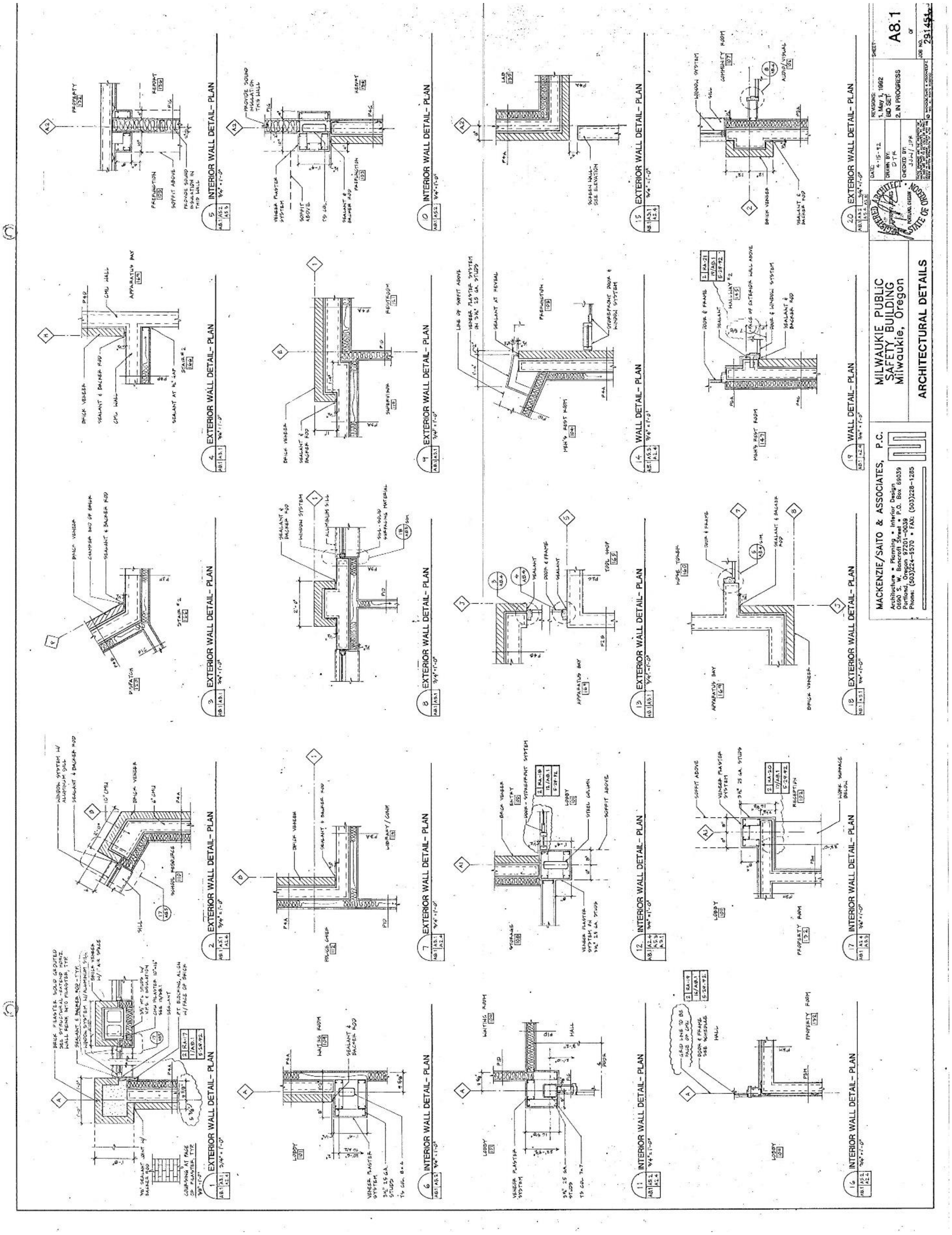
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
HANDRAIL DETAILS
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: JJW
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992
SHEET A7.3
OF
JOB NO. 29 451


1 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
2 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
3 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
4 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
5 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
6 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
7 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
8 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
9 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
10 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
11 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
12 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
13 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
14 WALL DETAIL- PLAN 3/4" = 1'-0"
15 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
16 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
17 INTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
18 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
19 WALL DETAIL- PLAN 3/4" = 1'-0"
20 EXTERIOR WALL DETAIL- PLAN 3/4" = 1'-0"
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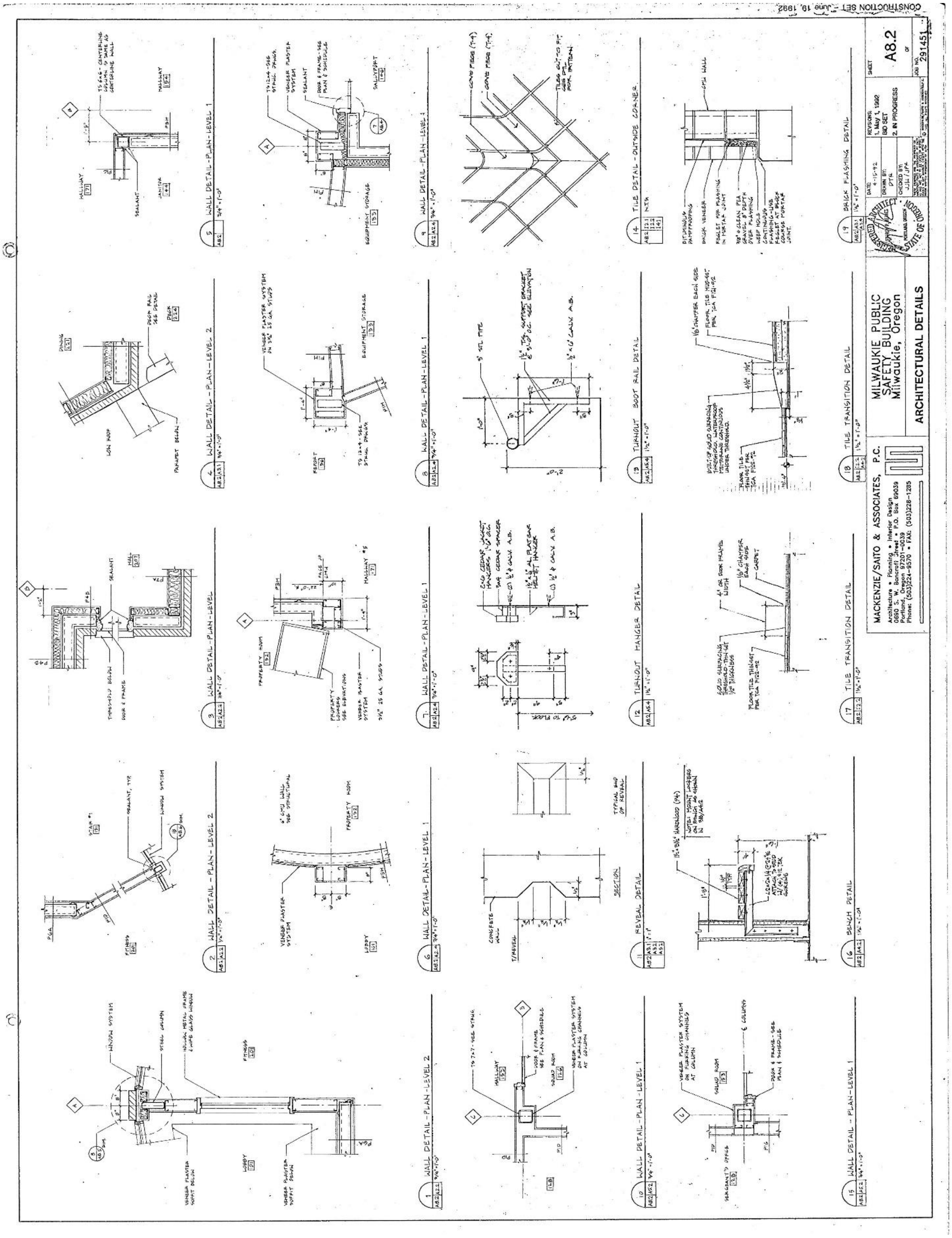
Portland, Oregon 97201-0039
Phone: (503)224-9570 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
DATE 4-15-92
DRAWN BY DTK
CHECKED BY JJM/JPR
REVISIONS: 1. May 1, 1992 BID SET 2. IN PROGRESS
SHEET A8.1
JOB NO. 291451


CONSTRUCTION SET - June 19, 1992
1 WALL DETAIL-PLAN-LEVEL 2
2 WALL DETAIL-PLAN-LEVEL 2
3 WALL DETAIL-PLAN-LEVEL
4 WALL DETAIL-PLAN-LEVEL 2
5 WALL DETAIL-PLAN-LEVEL 1
6 WALL DETAIL-PLAN-LEVEL 1
7 WALL DETAIL-PLAN-LEVEL 1
8 WALL DETAIL-PLAN-LEVEL 1
9 WALL DETAIL-PLAN-LEVEL 1
10 WALL DETAIL-PLAN-LEVEL 1
11 REVEAL DETAIL
12 TURNOUT HANGER DETAIL
13 TURNOUT BOOT RAIL DETAIL
14 TILE DETAIL-OUTSIDE CORNER
15 WALL DETAIL - PLAN-LEVEL 1
16 BENCH DETAIL
17 TILE TRANSITION DETAIL
18 TILE TRANSITION DETAIL
19 BRICK FLASHING DETAIL
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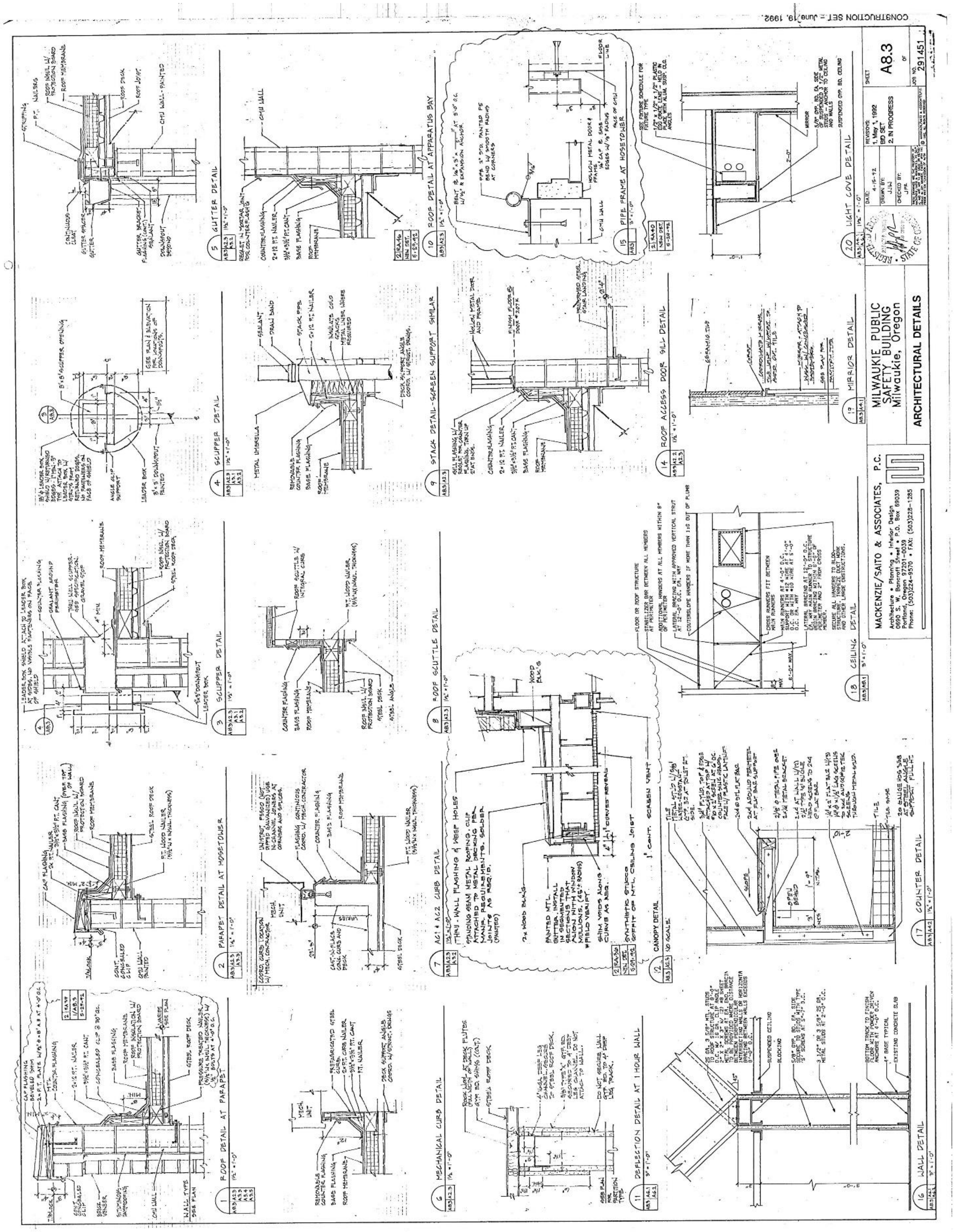
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
DATE: 4-15-92
REVISIONS: 1. May 1, 1992 BID SET
2. IN PROGRESS
SHEET A8.2
JOB NO. 291451


CONSTRUCTION SET - June 19, 1992
1 ROOF DETAIL AT PARAPET 1½" = 1'-0"
2 PARAPET DETAIL AT HOSETOWER 1½" = 1'-0"
3 SCUPPER DETAIL 1½" = 1'-0"
4 SCUPPER DETAIL 1½" = 1'-0"
5 GUTTER DETAIL 1½" = 1'-0"
6 MECHANICAL CURB DETAIL 1½" = 1'-0"
7 AC1 & AC2 CURB DETAIL 1½" = 1'-0"
8 ROOF SCUTTLE DETAIL 1½" = 1'-0"
9 STACK DETAIL-SCREEN SUPPORT SIMILAR 1½" = 1'-0"
10 ROOF DETAIL AT APPARATUS BAY 1½" = 1'-0"
11 DEFLECTION DETAIL AT 1 HOUR WALL 3" = 1'-0"
12 CANOPY DETAIL NO SCALE
14 ROOF ACCESS DOOR SILL DETAIL 1½" = 1'-0"
15 PIPE FRAME AT HOSETOWER
16 WALL DETAIL 3" = 1'-0"
17 COUNTER DETAIL 1½" = 1'-0"
18 CEILING DETAIL 3" = 1'-0"
19 MIRROR DETAIL
20 LIGHT COVE DETAIL 1½" = 1'-0"
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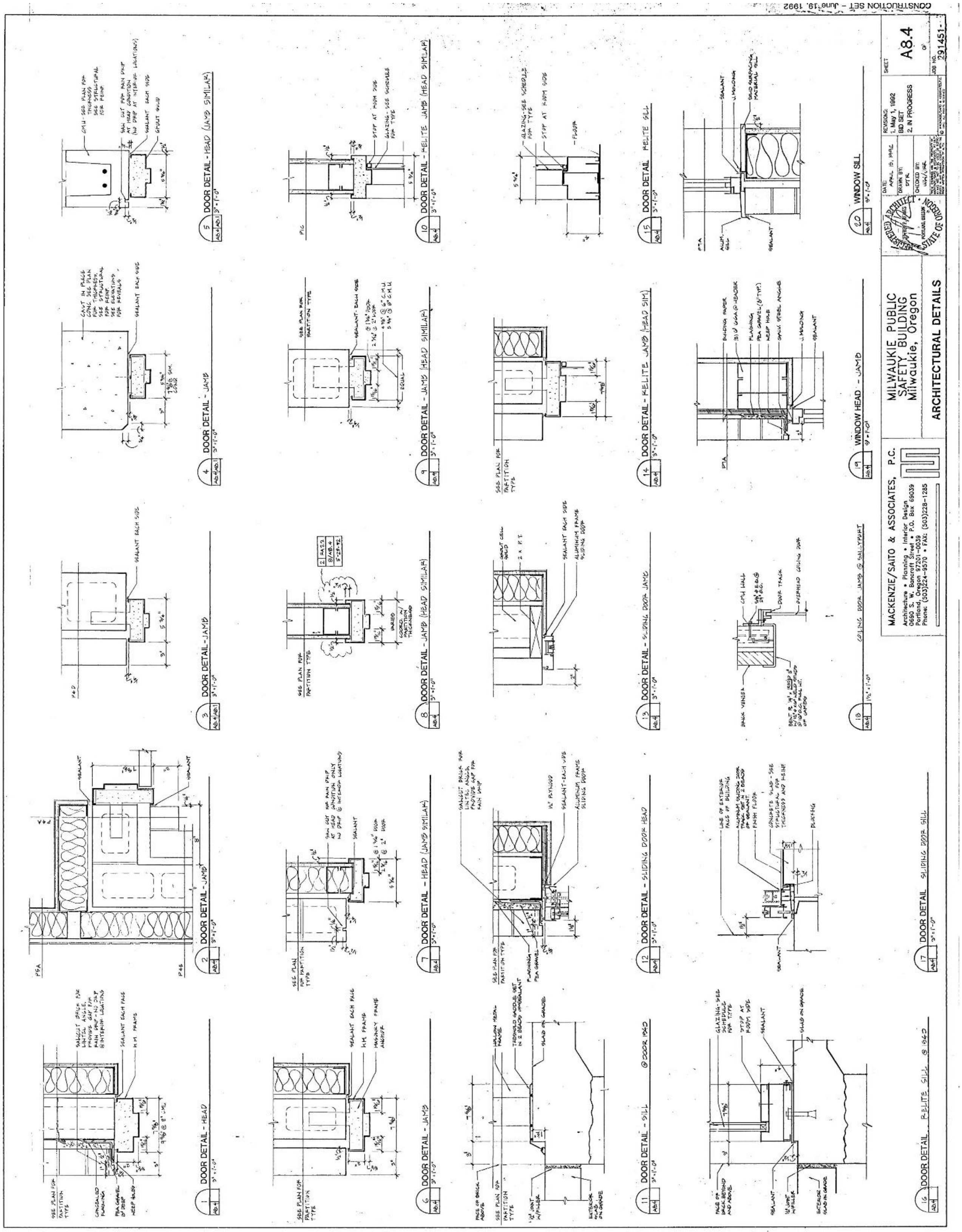
Portland, Oregon 97201-0039
Phone: (503)224-9570 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
DATE: 4-15-92
DRAWN BY: JJW
CHECKED BY: JPR
REVISIONS: 1. May 1, 1992 BID SET 2. IN PROGRESS
SHEET A8.3
JOB NO. 291451


CONSTRUCTION SET – June 19, 1992
1 DOOR DETAIL - HEAD 3"=1'-0"
2 DOOR DETAIL - JAMB 3"=1'-0"
3 DOOR DETAIL - JAMB 3"=1'-0"
4 DOOR DETAIL - JAMB 3"=1'-0"
5 DOOR DETAIL - HEAD (JAMB SIMILAR) 3"=1'-0"
6 DOOR DETAIL - JAMB 3"=1'-0"
7 DOOR DETAIL - HEAD (JAMB SIMILAR) 3"=1'-0"
8 DOOR DETAIL - JAMB (HEAD SIMILAR) 3"=1'-0"
9 DOOR DETAIL - JAMB (HEAD SIMILAR) 3"=1'-0"
10 DOOR DETAIL - KELITE JAMB (HEAD SIMILAR) 3"=1'-0"
11 DOOR DETAIL - SILL 3"=1'-0"
12 DOOR DETAIL - SLIDING DOOR HEAD 3"=1'-0"
13 DOOR DETAIL - SLIDING DOOR JAMB 3"=1'-0"
14 DOOR DETAIL - KELITE JAMB (HEAD SIM) 3"=1'-0"
15 DOOR DETAIL KELITE SILL 3"=1'-0"
16 DOOR DETAIL KELITE SILL
17 DOOR DETAIL SLIDING DOOR SILL 3"=1'-0"
18 COILING DOOR JAMB @ SALLYPORT 1½"=1'-0"
19 WINDOW HEAD - JAMB 9"=1'-0"
20 WINDOW SILL 9"=1'-0"
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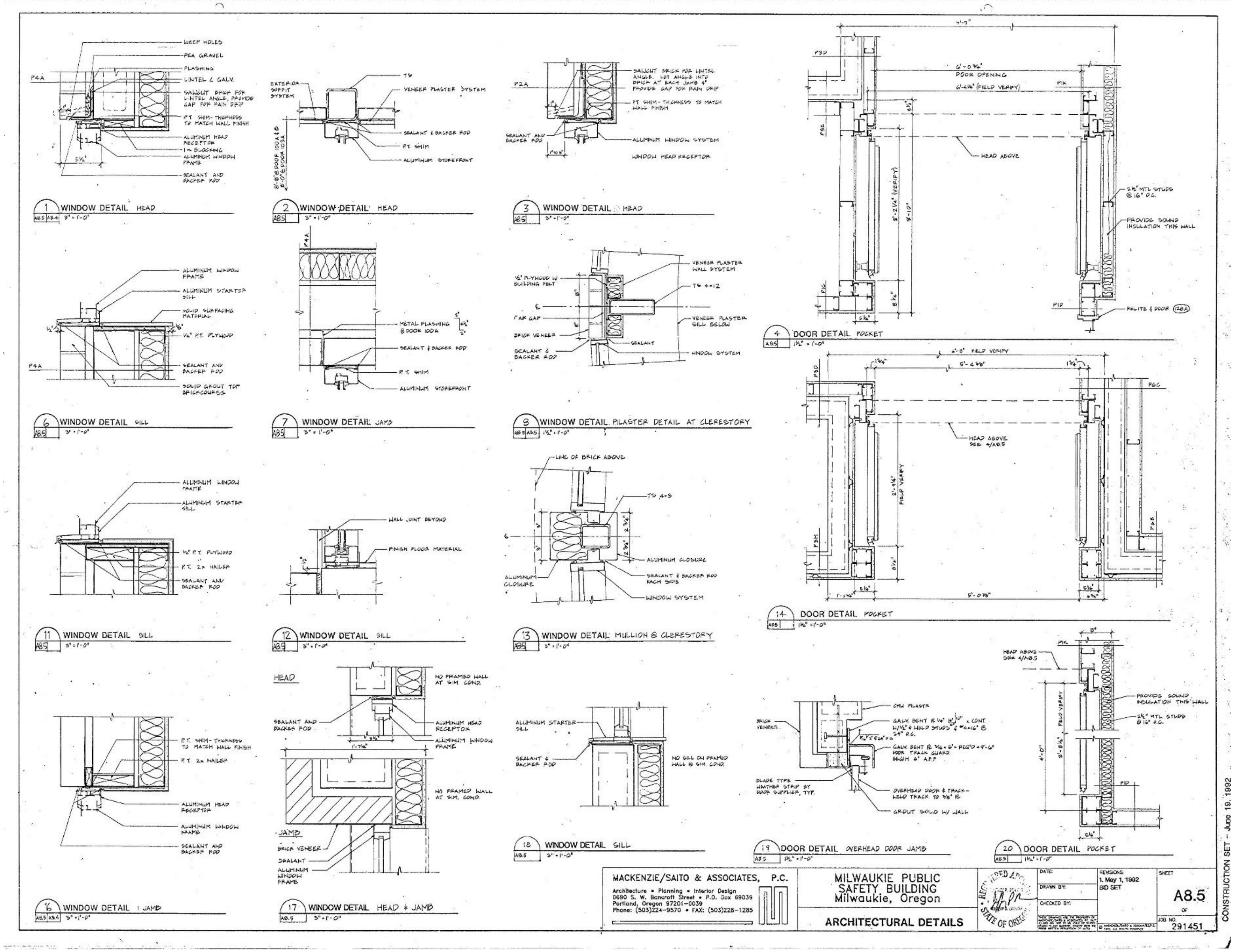
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
DATE: APRIL 19, 1992
DRAWN BY: DTR
CHECKED BY: WW/JAR
REVISIONS: 1. May 1, 1992 BID SET 2. IN PROGRESS
SHEET A8.4
JOB NO. 291451-


CONSTRUCTION SET - June 19, 1992
WEEP HOLES
PEA GRAVEL
FLASHING
LINTEL & GALV.
SAWCUT BRICK FOR LINTEL ANGLE, PROVIDE GAP FOR RAIN DRIP
P.T. SHIM- THICKNESS TO MATCH WALL FINISH
ALUMINUM HEAD RECEPTOR
1x BLOCKING
ALUMINUM WINDOW FRAME
SEALANT AND BACKER ROD
P4A
1 WINDOW DETAIL HEAD
A8.5 A3.4 3" = 1'-0"
EXTERIOR SOFFIT SYSTEM
TS
VENEER PLASTER SYSTEM
SEALANT & BACKER ROD
P.T. SHIM
ALUMINUM STOREFRONT
8'-8" @ DOOR 100A 1 B
8'-0" @ DOOR 103A
2 WINDOW DETAIL HEAD
A8.5 3" = 1'-0"
SAWCUT BRICK FOR LINTEL ANGLE. 1ST ANGLE INTO BRICK AT EACH JAMB 4" PROVIDE GAP FOR RAIN DRIP
P.T. SHIM- THICKNESS TO MATCH WALL FINISH
P2A
SEALANT AND BACKER ROD
ALUMINUM WINDOW SYSTEM
WINDOW HEAD RECEPTOR
3 WINDOW DETAIL HEAD
A8.5 3" = 1'-0"
ALUMINUM WINDOW FRAME
ALUMINUM STARTER SILL
SOLID SURFACING MATERIAL
¾" P.T. PLYWOOD
SEALANT AND BACKER ROD
SOLID GROUT TOP BRICKCOURSE
6 WINDOW DETAIL SILL
A8.5 3" = 1'-0"
METAL FLASHING @ DOOR 100A
SEALANT & BACKER ROD
P.T. SHIM
ALUMINUM STOREFRONT
7 WINDOW DETAIL JAMB
A8.5 3" = 1'-0"
½" PLYWOOD W/ BUILDING FELT
1" AIR GAP
BRICK VENEER
SEALANT & BACKER ROD
VENEER PLASTER WALL SYSTEM
TS 4×12
VENEER PLASTER SILL BELOW
SEALANT
WINDOW SYSTEM
8 WINDOW DETAIL PILASTER DETAIL AT CLERESTORY
A8.5 A8.5 1½" = 1'-0"
ALUMINUM WINDOW FRAME
ALUMINUM STARTER SILL
¾" P.T. PLYWOOD
P.T. 2x NAILER
SEALANT AND BACKER ROD
11 WINDOW DETAIL SILL
A8.5 3" = 1'-0"
WALL JOINT BEYOND
FINISH FLOOR MATERIAL
12 WINDOW DETAIL SILL
A8.5 3" = 1'-0"
LINE OF BRICK ABOVE
TS 4×3
ALUMINUM CLOSURE
SEALANT & BACKER ROD EACH SIDE
WINDOW SYSTEM
13 WINDOW DETAIL MULLION @ CLERESTORY
A8.5 3" = 1'-0"
P.T. SHIM- THICKNESS TO MATCH WALL FINISH
P.T. 2x NAILER
ALUMINUM HEAD RECEPTOR
ALUMINUM WINDOW FRAME
SEALANT AND BACKER ROD
16 WINDOW DETAIL JAMB
A8.5 A3.4 3" = 1'-0"
HEAD
SEALANT AND BACKER ROD
NO FRAMED WALL AT SIM. COND.
ALUMINUM HEAD RECEPTOR
ALUMINUM WINDOW FRAME
JAMB
BRICK VENEER
SEALANT
ALUMINUM WINDOW FRAME
17 WINDOW DETAIL HEAD & JAMB
A8.5 3" = 1'-0"
ALUMINUM STARTER SILL
SEALANT & BACKER ROD
NO SILL ON FRAMED WALL @ SIM. COND.
18 WINDOW DETAIL SILL
A8.5 3" = 1'-0"
7'-7"
6'-0¾" DOOR OPENING
6'-4¼" (FIELD VERIFY)
HEAD ABOVE
3⅝" MTL STUDS @ 16" O.C.
PROVIDE SOUND INSULATION THIS WALL
RELITE & DOOR 128A
8'-2¼" (VERIFY)
8'-10"
4 DOOR DETAIL POCKET
A8.5 1½" = 1'-0"
6'-8" FIELD VERIFY
HEAD ABOVE SEE 4/A8.5
FIELD VERIFY
14 DOOR DETAIL POCKET
A8.5 1½" = 1'-0"
CMU PILASTER
BRICK VENEER
GALV. BENT PL ¼" × CONT. W/ ½" ∅ WELD STUDS @ 24" O.C.
GALV. BENT PL ⅜" × 6" × REQ'D × 4'-6" DOOR TRACK GUARD BEGIN 6" A.F.F.
BLADE TYPE WEATHER STRIP BY DOOR SUPPLIER, TYP.
OVERHEAD DOOR & TRACK - WELD TRACK TO ⅜" PL
GROUT SOLID W/ WALL
19 DOOR DETAIL OVERHEAD DOOR JAMB
A8.5 1½" = 1'-0"
HEAD ABOVE SEE 4/A8.5
PROVIDE SOUND INSULATION THIS WALL
3⅝" MTL STUDS @ 16" O.C.
FIELD VERIFY
4'-0"
20 DOOR DETAIL POCKET
A8.5 1½" = 1'-0"
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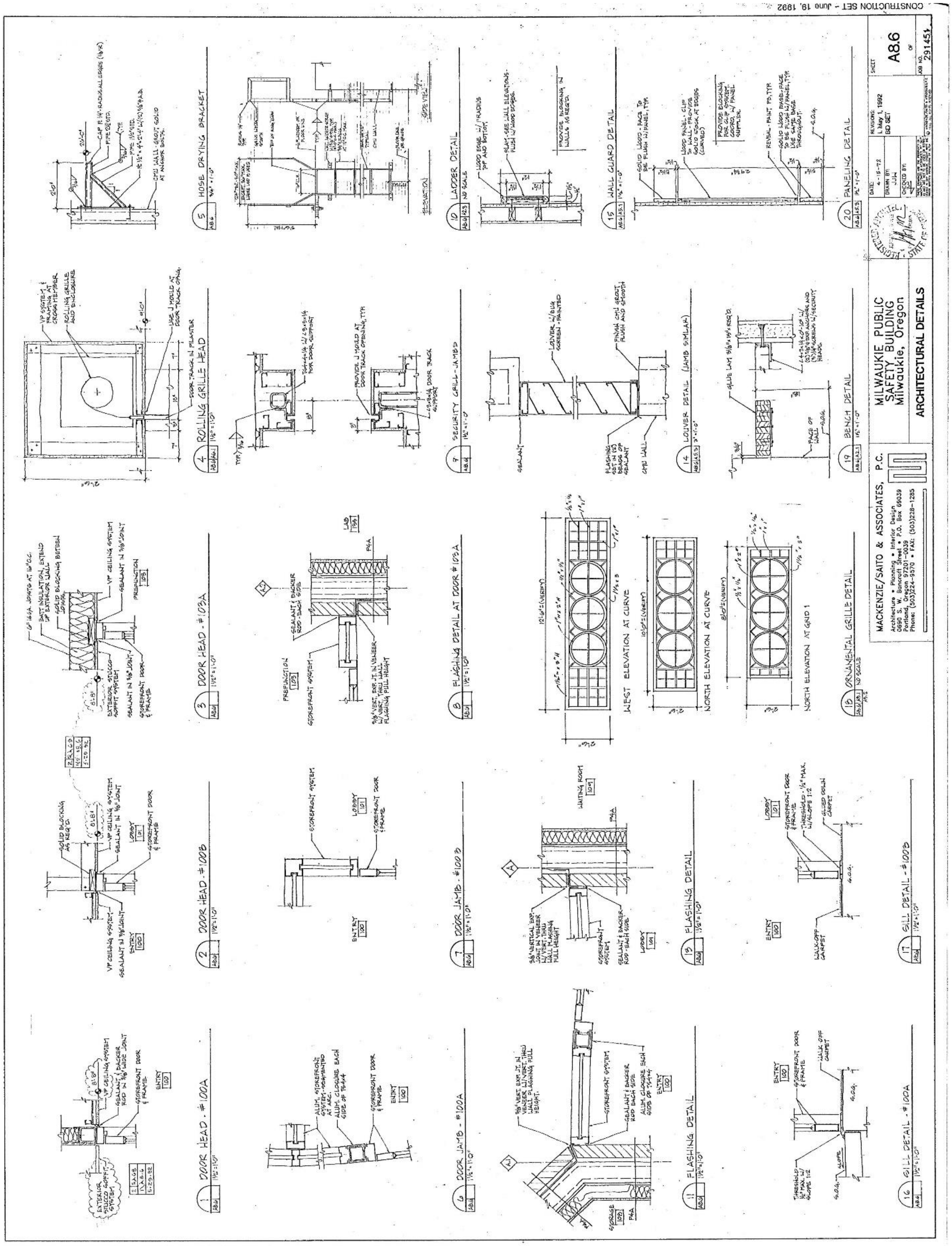
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
STATE OF OREGON
DATE:
DRAWN BY:
CHECKED BY:
REVISIONS:
1. May 1, 1992
BID SET
SHEET
A8.5
OF
JOB NO.
291451


CONSTRUCTION SET - June 19, 1992
1 DOOR HEAD - #100A
2 DOOR HEAD - #100B
3 DOOR HEAD - #103A
4 ROLLING GRILLE HEAD
5 HOSE DRYING BRACKET
6 DOOR JAMB - #100A
7 DOOR JAMB - #100B
8 FLASHING DETAIL AT DOOR #103A
9 SECURITY GRILL-JAMBS
10 LADDER DETAIL
11 FLASHING DETAIL
13 FLASHING DETAIL
14 LOUVER DETAIL (JAMB SIMILAR)
15 WALL GUARD DETAIL
16 SILL DETAIL - #100A
17 SILL DETAIL - #100B
WEST ELEVATION AT CURVE
NORTH ELEVATION AT CURVE
NORTH ELEVATION AT GND 1
18 ORNAMENTAL GRILLE DETAIL
19 BENCH DETAIL
20 PANELING DETAIL
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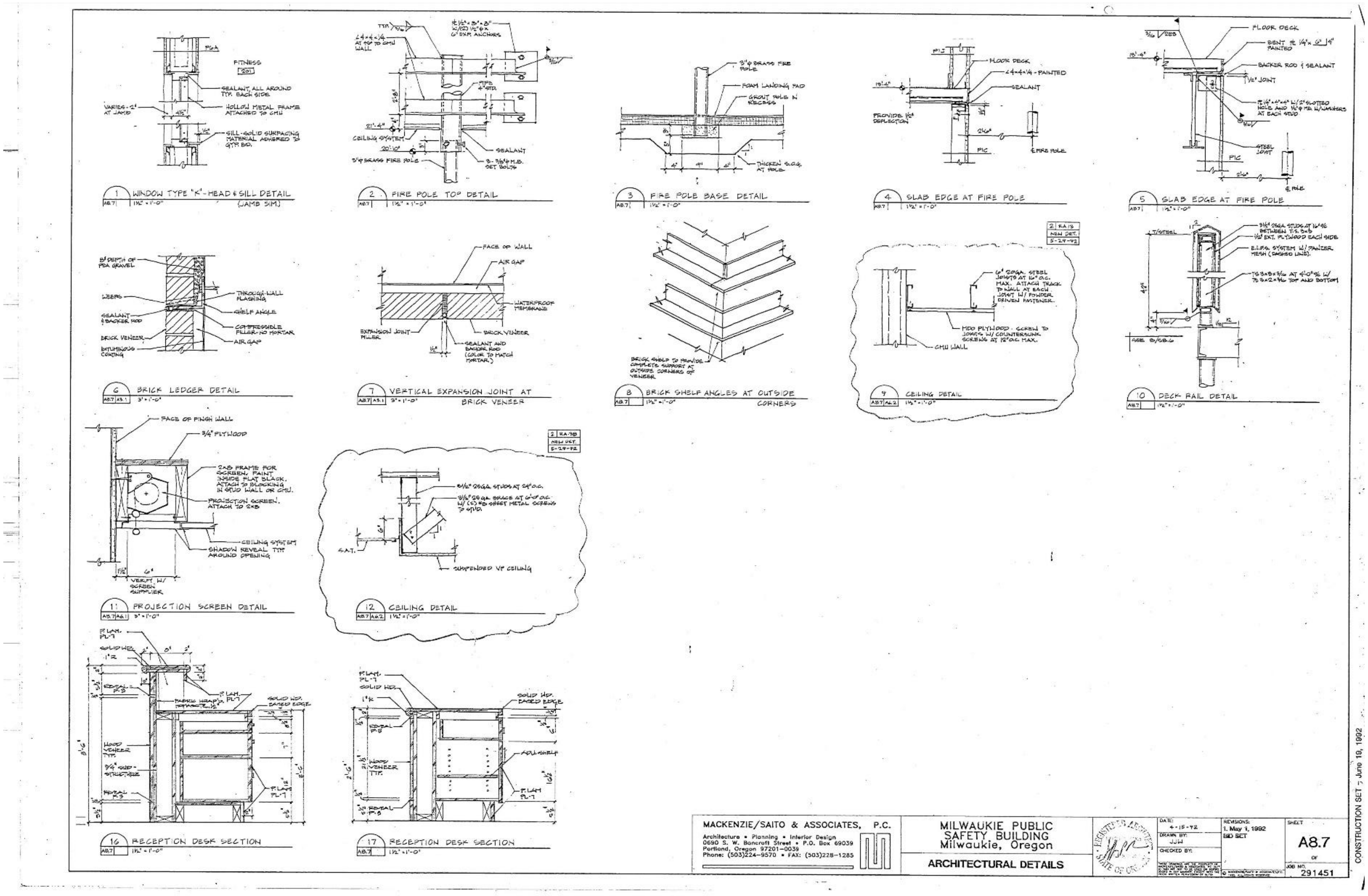
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
DATE: 4-15-92
DRAWN BY: JJW
CHECKED BY:
REVISIONS: L May 1, 1992 BD SET
SHEET A8.6
JOB NO. 291451


FITNESS
201
F6A
SEALANT, ALL AROUND TYP. EACH SIDE
HOLLOW METAL FRAME ATTACHED TO CMU
VARIES - 2" AT JAMB
4½"
SILL - SOLID SURFACING MATERIAL ADHERED TO GYP. BD.
1 WINDOW TYPE "K" - HEAD & SILL DETAIL (JAMB SIM.)
A8.7 1½" = 1'-0"
TYP. 3/16
∠4×4×1/4 AT 45° TO CMU WALL
PL 1/2" × 3" × 8" W/(2) 1/2"φ × 6" EXP. ANCHORS
PIPE 4" STD.
2'-8"
21'-4"
CEILING SYSTEM
20'-10"
3"φ BRASS FIRE POLE
SEALANT
3 - 3/8"φ M.B. SET BOLTS
2 FIRE POLE TOP DETAIL
A8.7 1½" = 1'-0"
3"φ BRASS FIRE POLE
FOAM LANDING PAD
GROUT POLE IN RECESS
THICKEN S.O.G. AT POLE
4" 9" 4"
3 FIRE POLE BASE DETAIL
A8.7 1½" = 1'-0"
P13
FLOOR DECK
∠4×4×1/4 - PAINTED
SEALANT
18'-4"
PROVIDE 1/2" DEFLECTION
2'-6"
P1C
℄ FIRE POLE
4 SLAB EDGE AT FIRE POLE
A8.7 1½" = 1'-0"
3/16 / 2EB
FLOOR DECK
BENT PL 1/4" × 6" | 4" PAINTED
BACKER ROD & SEALANT
1/2" JOINT
PL 1/4" × 4" × 4" W/ 2" SLOTTED HOLE AND 1/2"φ M.B. W/WASHERS AT EACH STUD
3/16
STEEL JOIST
P1C
2'-6"
℄ POLE
5 SLAB EDGE AT FIRE POLE
A8.7 1½" = 1'-0"
8" DEPTH OF PEA GRAVEL
WEEPS
SEALANT & BACKER ROD
BRICK VENEER
BITUMINOUS COATING
THROUGH-WALL FLASHING
SHELF ANGLE
COMPRESSIBLE FILLER - NO MORTAR
AIR GAP
6 BRICK LEDGER DETAIL
A8.7 A3.1 3" = 1'-0"
FACE OF WALL
AIR GAP
WATERPROOF MEMBRANE
BRICK VENEER
EXPANSION JOINT FILLER
SEALANT AND BACKER ROD (COLOR TO MATCH MORTAR)
1/2"
7 VERTICAL EXPANSION JOINT AT BRICK VENEER
A8.7 A3.1 3" = 1'-0"
BRICK SHELF TO PROVIDE COMPLETE SUPPORT AT OUTSIDE CORNERS OF VENEER
8 BRICK SHELF ANGLES AT OUTSIDE CORNERS
A8.7 1½" = 1'-0"
2 RA13
NEW DET.
5-29-92
6" 20GA. STEEL JOISTS AT 16" O.C. MAX. ATTACH TRACK TO WALL AT EACH JOIST W/ POWDER DRIVEN FASTENER.
MDO PLYWOOD. SCREW TO JOISTS W/ COUNTERSUNK SCREWS AT 12" O.C. MAX.
CMU WALL
9 CEILING DETAIL
A8.7 A6.2 1½" = 1'-0"
T/STEEL
3½" 20GA. STUDS AT 16" O.C. BETWEEN T.S. 3×3
1/2" EXT. PLYWOOD EACH SIDE
E.I.F.S. SYSTEM W/ PANZER MESH (DASHED LINE).
TS 3×3×3/16 AT 4'-0" O.C. W/ TS 3×2×3/16 TOP AND BOTTOM
42"
SEE 8/S8.6
10 DECK RAIL DETAIL
A8.7 1½" = 1'-0"
FACE OF FINISH WALL
3/4" PLYWOOD
2×8 FRAME FOR SCREEN. PAINT INSIDE FLAT BLACK. ATTACH TO BLOCKING IN STUD WALL OR CMU.
PROJECTION SCREEN. ATTACH TO 2×8.
CEILING SYSTEM
SHADOW REVEAL TYP. AROUND OPENING
1½" 6"
VERIFY W/ SCREEN SUPPLIER
11 PROJECTION SCREEN DETAIL
A8.7 A6.1 3" = 1'-0"
2 RA-38
NEW DET.
5-29-92
3½" 25GA. STUDS AT 24" O.C.
3½" 25GA. BRACE AT 6'-0" O.C. W/ (2) #8 SHEET METAL SCREWS TO STUD.
S.A.T.
SUSPENDED VP CEILING
12 CEILING DETAIL
A8.7 A6.2 1½" = 1'-0"
P. LAM. PL-7
SOLID WD.
1" R
REVEAL P-3
FABRIC WRAP'D. HOMASOTE, 1/2"
P. LAM. PL-7
SOLID WD. EASED EDGE
WOOD VENEER TYP.
3/4" SUB-STRUCTURE
REVEAL P-3
3'-6"
2'-6"
16 RECEPTION DESK SECTION
A8.7 1½" = 1'-0"
P. LAM. PL-7
SOLID WD.
1" R
REVEAL P-3
WOOD VENEER TYP.
REVEAL P-3
SOLID WD. EASED EDGE
ADJ. SHELF
P. LAM PL-7
2'-6"
17 RECEPTION DESK SECTION
A8.7 1½" = 1'-0"
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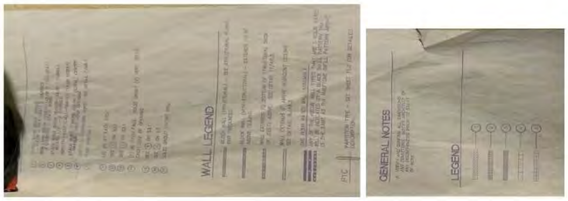
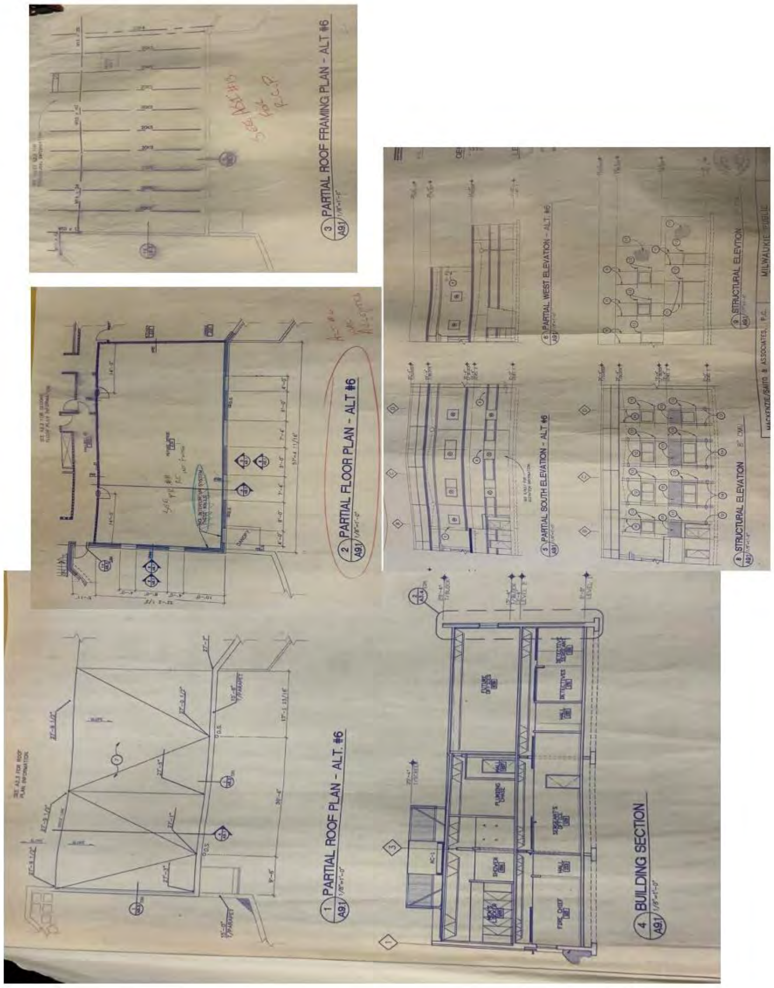
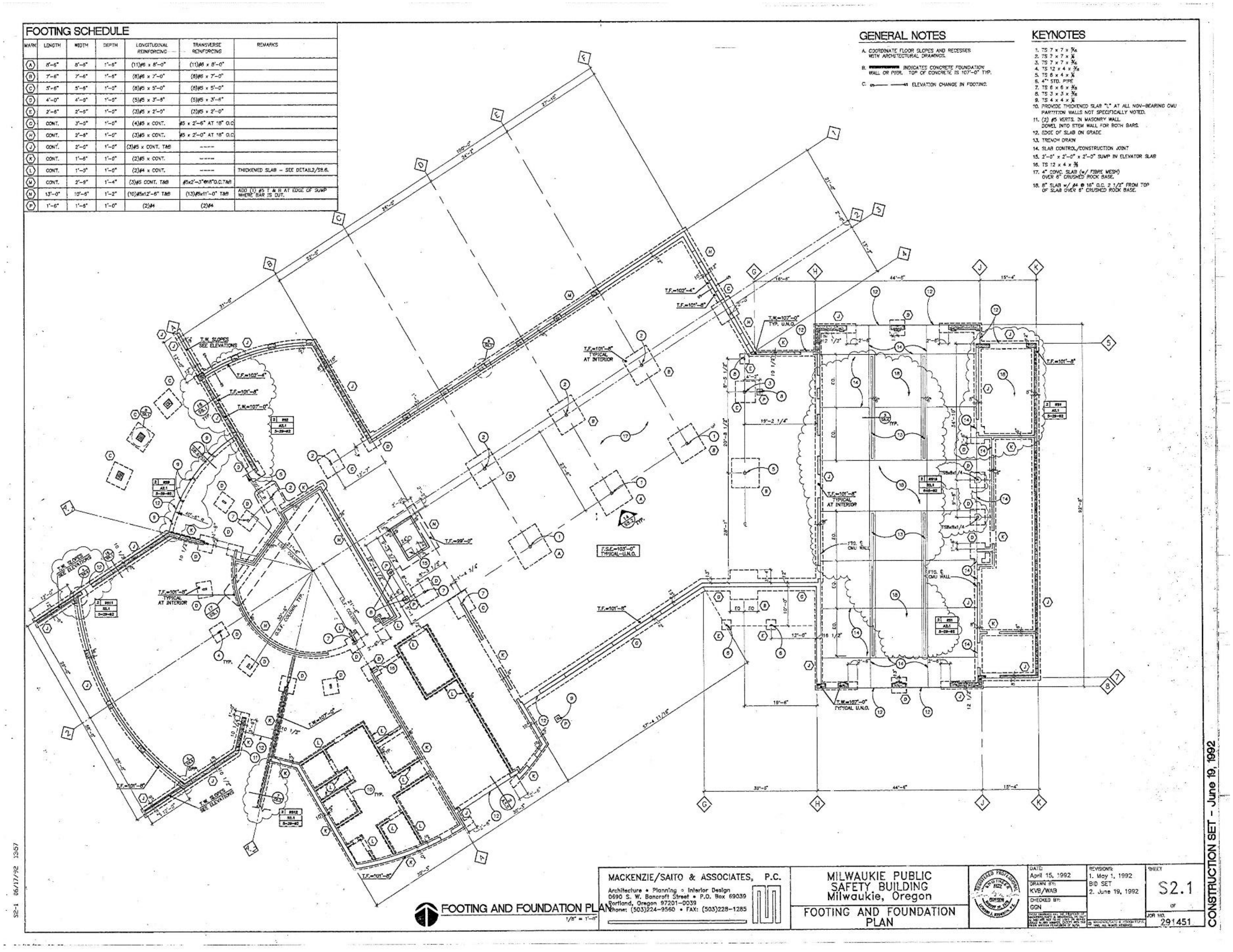
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
ARCHITECTURAL DETAILS
DATE: 4-15-92
DRAWN BY: JJW
CHECKED BY:
REVISIONS: 1. May 1, 1992 BID SET
SHEET A8.7 OF
JOB NO. 291451
CONSTRUCTION SET - June 19, 1992

Photos from Sheet A9.1 Found on Site







FOOTING SCHEDULE

MARK	LENGTH	WIDTH	DEPTH	LONGITUDINAL REINFORCING	TRANSVERSE REINFORCING	REMARKS
A	8'-6"	8'-6"	1'-6"	(11)#6 x 8'-0"	(11)#6 x 8'-0"	
B	7'-6"	7'-6"	1'-6"	(8)#6 x 7'-0"	(8)#6 x 7'-0"	
C	5'-6"	5'-6"	1'-0"	(8)#5 x 5'-0"	(8)#5 x 5'-0"	
D	4'-0"	4'-0"	1'-0"	(5)#5 x 3'-6"	(5)#5 x 3'-6"	
E	2'-6"	2'-6"	1'-0"	(3)#5 x 2'-0"	(3)#5 x 2'-0"	
G	CONT.	3'-0"	1'-0"	(4)#5 x CONT.	#5 x 2'-6" AT 18" O.C	
H	CONT.	2'-6"	1'-0"	(3)#5 x CONT.	#5 x 2'-0" AT 18" O.C	
J	CONT.	2'-0"	1'-0"	(3)#5 x CONT. T&B	----	
K	CONT.	1'-6"	1'-0"	(2)#5 x CONT.	----	
L	CONT.	1'-0"	1'-0"	(2)#4 x CONT.	----	THICKENED SLAB – SEE DETAIL2/S8.6.
M	CONT.	2'-9"	1'-4"	(3)#5 CONT. T&B	#5x2'-3"@18"O.C.T&B	
N	13'-0"	10'-6"	1'-2"	(10)#5x12'-6" T&B	(13)#5x11'-0" T&B	ADD (1) #5 T & B AT EDGE OF SUMP WHERE BAR IS CUT.
P	1'-6"	1'-6"	1'-0"	(2)#4	(2)#4	

GENERAL NOTES

A. COORDINATE FLOOR SLOPES AND RECESSES WITH ARCHITECTURAL DRAWINGS.

B. ▬ INDICATES CONCRETE FOUNDATION WALL OR PIER. TOP OF CONCRETE IS 107'-0" TYP.

C. ELEVATION CHANGE IN FOOTING.

KEYNOTES

1. TS 7 x 7 x 5/16
2. TS 7 x 7 x 1/4
3. TS 7 x 7 x 3/16
4. TS 12 x 4 x 3/16
5. TS 6 x 4 x 1/4
6. 4" STD. PIPE
7. TS 6 x 6 x 3/16
8. TS 3 x 3 x 3/16
9. TS 4 x 4 x 1/4
10. PROVIDE THICKENED SLAB "L" AT ALL NON-BEARING CMU PARTITION WALLS NOT SPECIFICALLY NOTED.
11. (2) #5 VERTS. IN MASONRY WALL. DOWEL INTO STEM WALL FOR BOTH BARS.
12. EDGE OF SLAB ON GRADE
13. TRENCH DRAIN
14. SLAB CONTROL/CONSTRUCTION JOINT
15. 2'-0" x 2'-0" x 2'-0" SUMP IN ELEVATOR SLAB
16. TS 12 x 4 x 3/8
17. 4" CONC. SLAB (w/ FIBRE MESH) OVER 6" CRUSHED ROCK BASE.
18. 8" SLAB w/ #4 @ 16" O.C. 2 1/2" FROM TOP OF SLAB OVER 8" CRUSHED ROCK BASE.

FOOTING AND FOUNDATION PLAN
1/8" = 1'-0"

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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon

FOOTING AND FOUNDATION PLAN

DATE: April 15, 1992
DRAWN BY: KVB/WAB
CHECKED BY: GGN

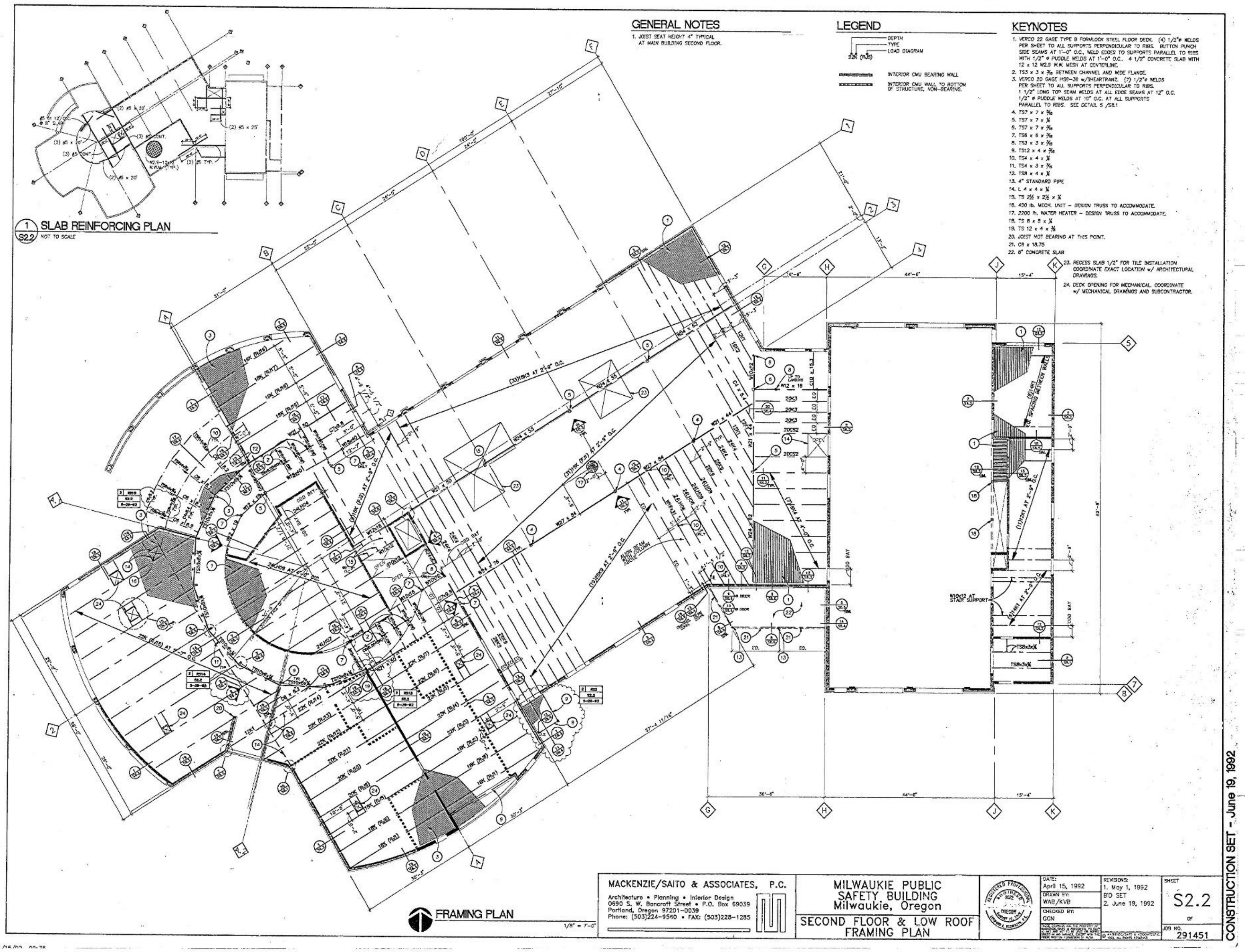
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET S2.1 OF

JOB NO. 291451

CONSTRUCTION SET – June 19, 1992

S2-1 06/17/92 1357



GENERAL NOTES

1. JOIST SEAT HEIGHT 4" TYPICAL AT MAIN BUILDING SECOND FLOOR.

LEGEND

KEYNOTES

1. VERCO 22 GAGE TYPE B FORMLOCK STEEL FLOOR DECK. (4) 1/2"ø WELDS PER SHEET TO ALL SUPPORTS PERPENDICULAR TO RIBS. BUTTON PUNCH SIDE SEAMS AT 1'-0" O.C., WELD EDGES TO SUPPORTS PARALLEL TO RIBS WITH 1/2" ø PUDDLE WELDS AT 1'-0" O.C.. 4 1/2" CONCRETE SLAB WITH 12 x 12 W2.9 W.W. MESH AT CENTERLINE.
2. TS3 x 3 x 3/16 BETWEEN CHANNEL AND WIDE FLANGE.
3. VERCO 20 GAGE HSB-36 w/SHEARTRANZ. (7) 1/2"ø WELDS PER SHEET TO ALL SUPPORTS PERPENDICULAR TO RIBS. 1 1/2" LONG TOP SEAM WELDS AT ALL EDGE SEAMS AT 12" O.C. 1/2" ø PUDDLE WELDS AT 12" O.C. AT ALL SUPPORTS PARALLEL TO RIBS. SEE DETAIL 5 /S8.1
4. TS7 x 7 x 5/16
5. TS7 x 7 x 1/4
6. TS7 x 7 x 3/16
7. TS6 x 6 x 3/16
8. TS3 x 3 x 3/16
9. TS12 x 4 x 3/16
10. TS4 x 4 x 1/4
11. TS4 x 3 x 3/16
12. TS8 x 4 x 1/4
13. 4" STANDARD PIPE
14. L 4 x 4 x 1/4
15. TS 2½ x 2½ x 1/4
16. 400 lb. MECH. UNIT – DESIGN TRUSS TO ACCOMMODATE.
17. 2200 lb. WATER HEATER – DESIGN TRUSS TO ACCOMMODATE.
18. TS 8 x 8 x 1/4
19. TS 12 x 4 x 3/8
20. JOIST NOT BEARING AT THIS POINT.
21. C8 x 18.75
22. 8" CONCRETE SLAB
23. RECESS SLAB 1/2" FOR TILE INSTALLATION COORDINATE EXACT LOCATION w/ ARCHITECTURAL DRAWINGS.
24. DECK OPENING FOR MECHANICAL. COORDINATE w/ MECHANICAL DRAWINGS AND SUBCONTRACTOR.

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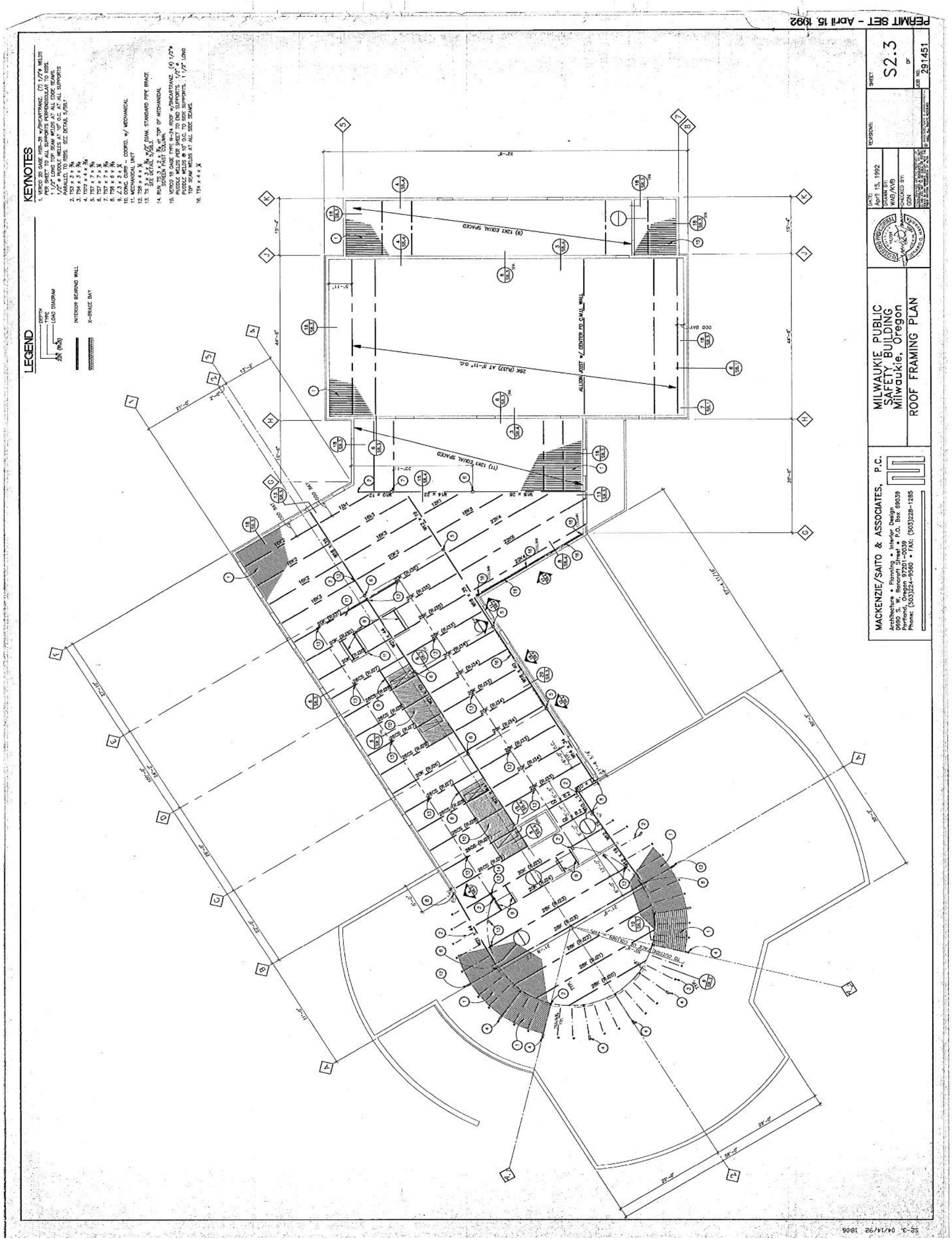
Milwaukie, Oregon

SECOND FLOOR & LOW ROOF FRAMING PLAN

DATE: April 15, 1992
DRAWN BY: WAB/KVB
CHECKED BY: GCN
REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992
SHEET S2.2
OF
JOB NO. 291451


PERMIT SET - April 15, 1992
KEYNOTES
LEGEND
INTERIOR BEARING WALL
X-BRACE BAY
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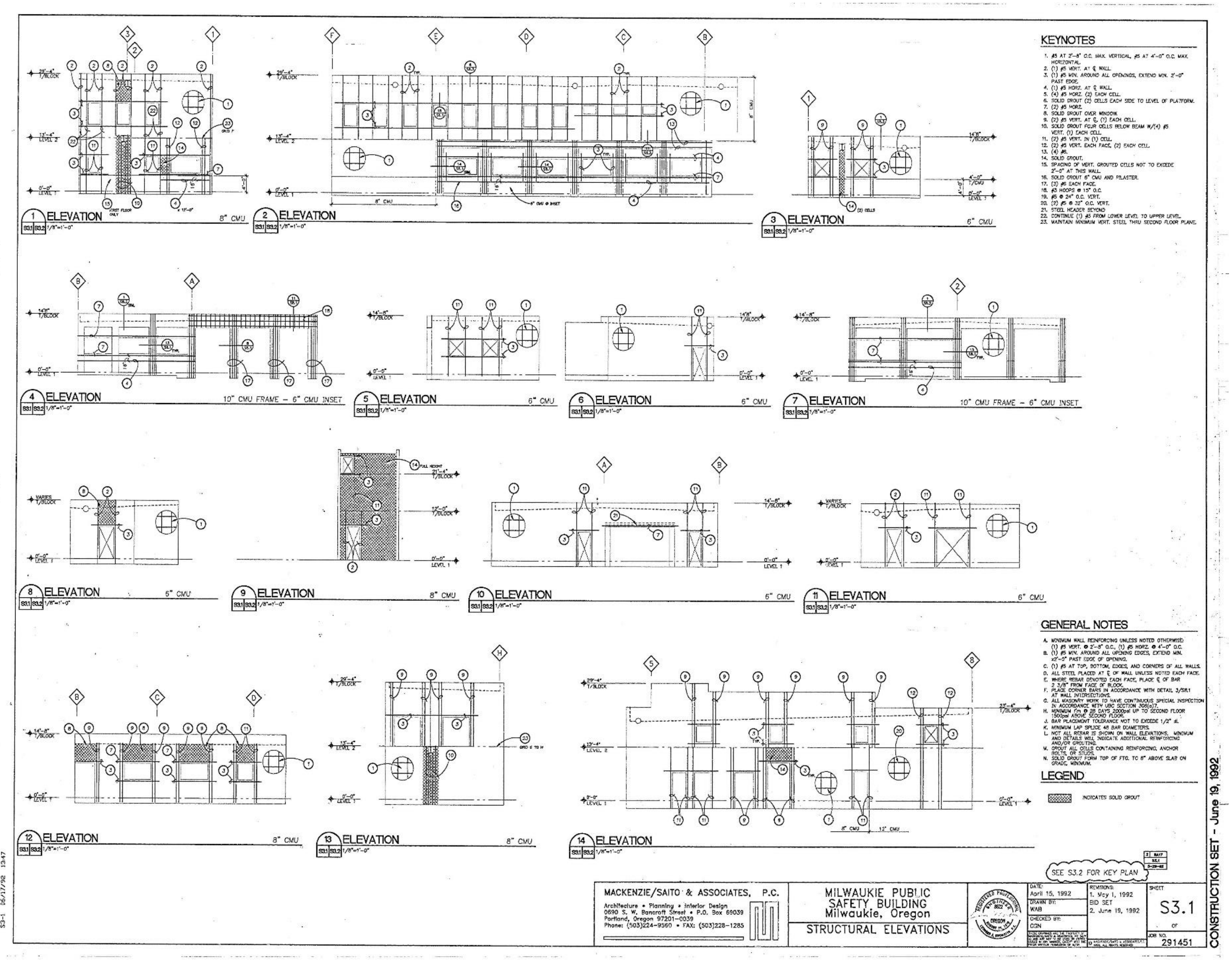
Milwaukie, Oregon
ROOF FRAMING PLAN
April 15, 1992
S2.3
291451



KEYNOTES

1. #5 AT 2'–8" O.C. MAX. VERTICAL, #5 AT 4'–0" O.C. MAX. HORIZONTAL.
2. (1) #5 VERT. AT ℄ WALL.
3. (1) #5 MIN. AROUND ALL OPENINGS, EXTEND MIN. 2'–0" PAST EDGE.
4. (1) #5 HORZ. AT ℄ WALL.
5. (4) #5 HORZ. (2) EACH CELL.
6. SOLID GROUT (2) CELLS EACH SIDE TO LEVEL OF PLATFORM.
7. (2) #5 HORZ.
8. SOLID GROUT OVER WINDOW.
9. (2) #5 VERT. AT ℄, (1) EACH CELL.
10. SOLID GROUT FOUR CELLS BELOW BEAM W/(4) #5 VERT. (1) EACH CELL.
11. (2) #5 VERT. IN (1) CELL.
12. (2) #5 VERT. EACH FACE, (2) EACH CELL.
13. (4) #6.
14. SOLID GROUT.
15. SPACING OF VERT. GROUTED CELLS NOT TO EXCEDE 2'–0" AT THIS WALL.
16. SOLID GROUT 6" CMU AND PILASTER.
17. (3) #6 EACH FACE.
18. #3 HOOPS @ 15" O.C.
19. #5 @ 24" O.C. VERT.
20. (2) #5 @ 32" O.C. VERT.
21. STEEL HEADER BEYOND
22. CONTINUE (1) #5 FROM LOWER LEVEL TO UPPER LEVEL.
23. MAINTAIN MINIMUM VERT. STEEL THRU SECOND FLOOR PLANE.

GENERAL NOTES

A. MINIMUM WALL REINFORCING UNLESS NOTED OTHERWISE: (1) #5 VERT. @ 2'–8" O.C., (1) #5 HORZ. @ 4'–0" O.C.
B. (1) #5 MIN. AROUND ALL OPENING EDGES, EXTEND MIN. x2'–0" PAST EDGE OF OPENING.
C. (1) #5 AT TOP, BOTTOM, EDGES, AND CORNERS OF ALL WALLS.
D. ALL STEEL PLACED AT ℄ OF WALL UNLESS NOTED EACH FACE.
E. WHERE REBAR DENOTED EACH FACE, PLACE ℄ OF BAR 2 3/8" FROM FACE OF BLOCK.
F. PLACE CORNER BARS IN ACCORDANCE WITH DETAIL 3/S8.1 AT WALL INTERSECTIONS.
G. ALL MASONRY WORK TO HAVE CONTINUOUS SPECIAL INSPECTION IN ACCORDANCE WITH UBC SECTION 306(a)7.
H. MINIMUM f'm @ 28 DAYS 2000psi UP TO SECOND FLOOR 1500psi ABOVE SECOND FLOOR.
J. BAR PLACEMENT TOLERANCE NOT TO EXCEDE 1/2" ±.
K. MINIMUM LAP SPLICE 48 BAR DIAMETERS.
L. NOT ALL REBAR IS SHOWN ON WALL ELEVATIONS. MINIMUM AND DETAILS WILL INDICATE ADDITIONAL REINFORCING AND/OR GROUTING.
M. GROUT ALL CELLS CONTAINING REINFORCING, ANCHOR BOLTS, OR STUDS.
N. SOLID GROUT FORM TOP OF FTG. TO 8" ABOVE SLAB ON GRADE, MINIMUM.

LEGEND

▨ INDICATES SOLID GROUT

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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon

STRUCTURAL ELEVATIONS

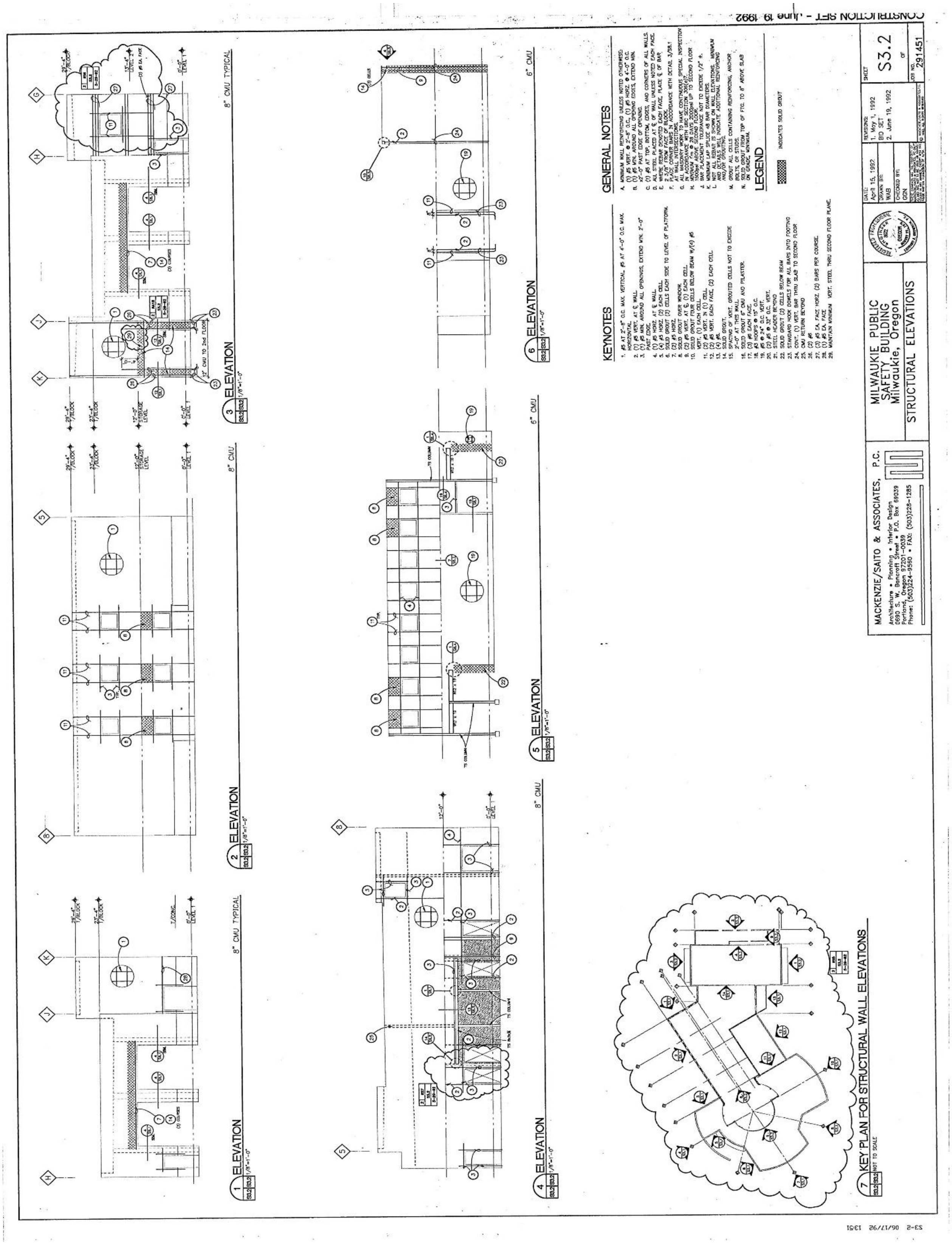
OREGON

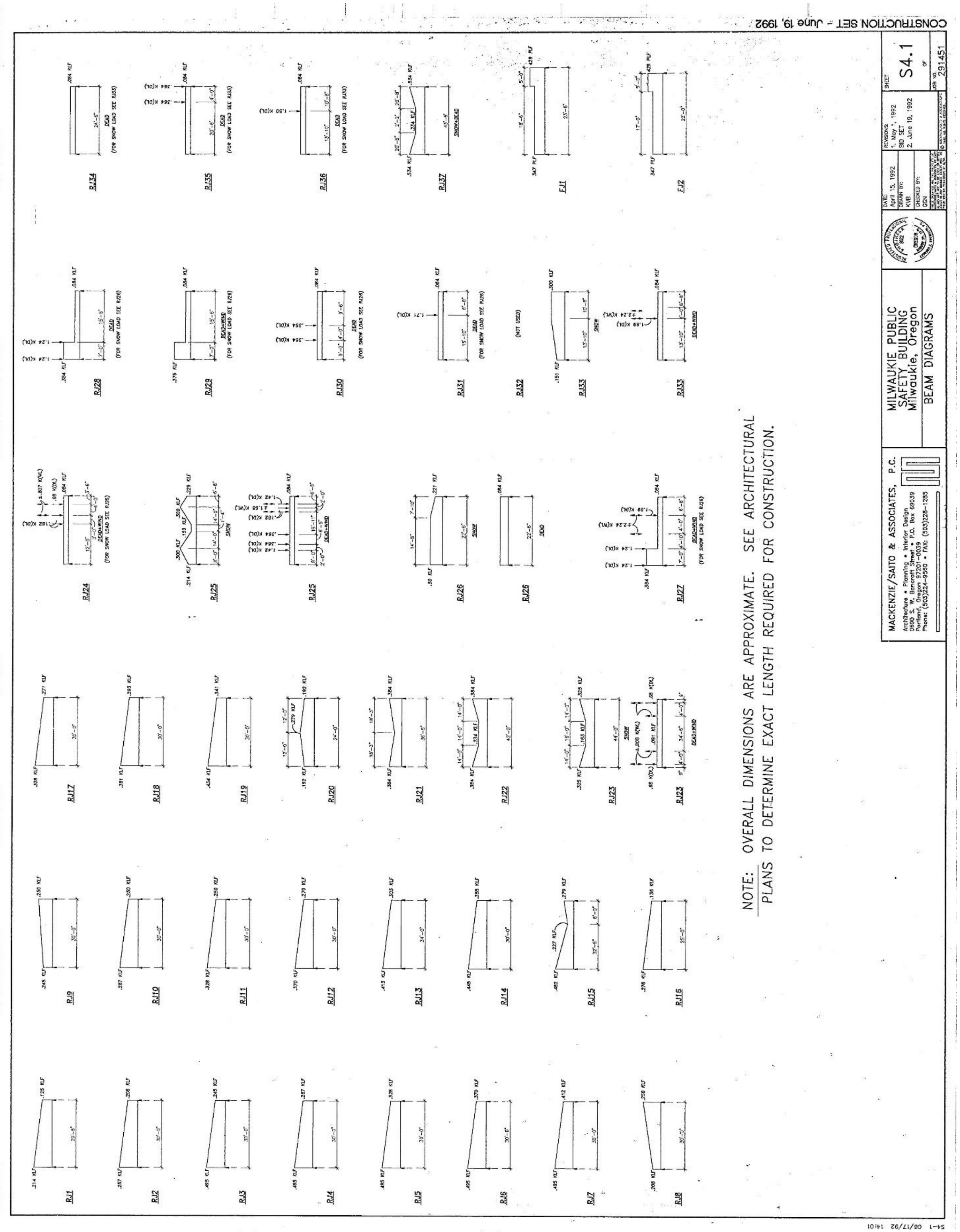
DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: CGN

REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET S3.1 OF

JOB NO. 291451


CONSTRUCTION SET - June 19, 1992
1 ELEVATION
2 ELEVATION
3 ELEVATION
4 ELEVATION
5 ELEVATION
6 ELEVATION
7 KEY PLAN FOR STRUCTURAL WALL ELEVATIONS
8" CMU TYPICAL
8" CMU
6" CMU
KEYNOTES
GENERAL NOTES
LEGEND
MACKENZIE/SAITO & ASSOCIATES, P.C.
MILWAUKIE PUBLIC SAFETY BUILDING Milwaukie, Oregon
STRUCTURAL ELEVATIONS
S3.2
291451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RJ1
RJ2
RJ3
RJ4
RJ5
RJ6
RJ7
RJ8
RJ9
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RJ11
RJ12
RJ13
RJ14
RJ15
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RJ26
RJ27
RJ28
RJ29
RJ30
RJ31
RJ32
RJ33
RJ34
RJ35
RJ36
RJ37
FJ1
FJ2
(NOT USED)
NOTE: OVERALL DIMENSIONS ARE APPROXIMATE. SEE ARCHITECTURAL PLANS TO DETERMINE EXACT LENGTH REQUIRED FOR CONSTRUCTION.
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MILWAUKIE PUBLIC SAFETY BUILDING
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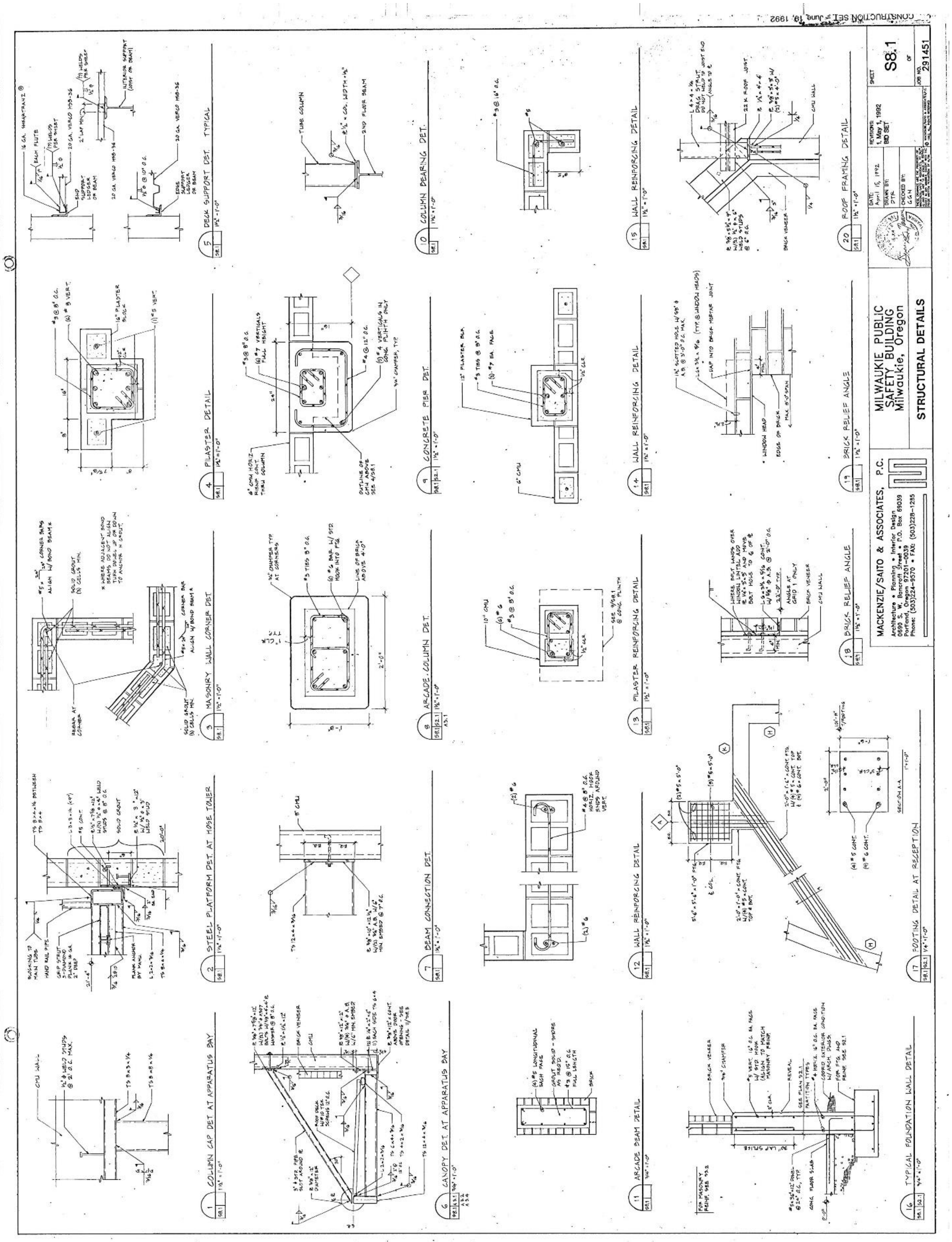
BEAM DIAGRAMS
DATE: April 15, 1992
DRAWN BY: KYB
CHECKED BY: GDN
REVISIONS: 1. May 1, 1992 BID SET
2. June 19, 1992
SHEET S4.1
JOB NO. 291451
S4-1 08/17/92 14:01


CONSTRUCTION SET – June 18, 1992
1 COLUMN CAP DET AT APPARATUS BAY 1½" = 1'-0"
2 STEEL PLATFORM DET. AT HOSE TOWER 1½" = 1'-0"
3 MASONRY WALL CORNER DET. 1½" = 1'-0"
4 PILASTER DETAIL 1½" = 1'-0"
5 DECK SUPPORT DET. TYPICAL 1½" = 1'-0"
6 CANOPY DET. AT APPARATUS BAY ¾" = 1'-0"
7 BEAM CONNECTION DET. 1½" = 1'-0"
8 ARCADE COLUMN DET. 1½" = 1'-0"
9 CONCRETE PIER DET. 1½" = 1'-0"
10 COLUMN BEARING DET. 1½" = 1'-0"
11 ARCADE BEAM DETAIL ¾" = 1'-0"
12 WALL REINFORCING DETAIL 1½" = 1'-0"
13 PILASTER REINFORCING DETAIL 1½" = 1'-0"
14 WALL REINFORCING DETAIL 1½" = 1'-0"
15 WALL REINFORCING DETAIL 1½" = 1'-0"
16 TYPICAL FOUNDATION WALL DETAIL ¾" = 1'-0"
17 FOOTING DETAIL AT RECEPTION ¼" = 1'-0"
18 BRICK RELIEF ANGLE 1½" = 1'-0"
19 BRICK RELIEF ANGLE 1½" = 1'-0"
20 ROOF FRAMING DETAIL 1½" = 1'-0"
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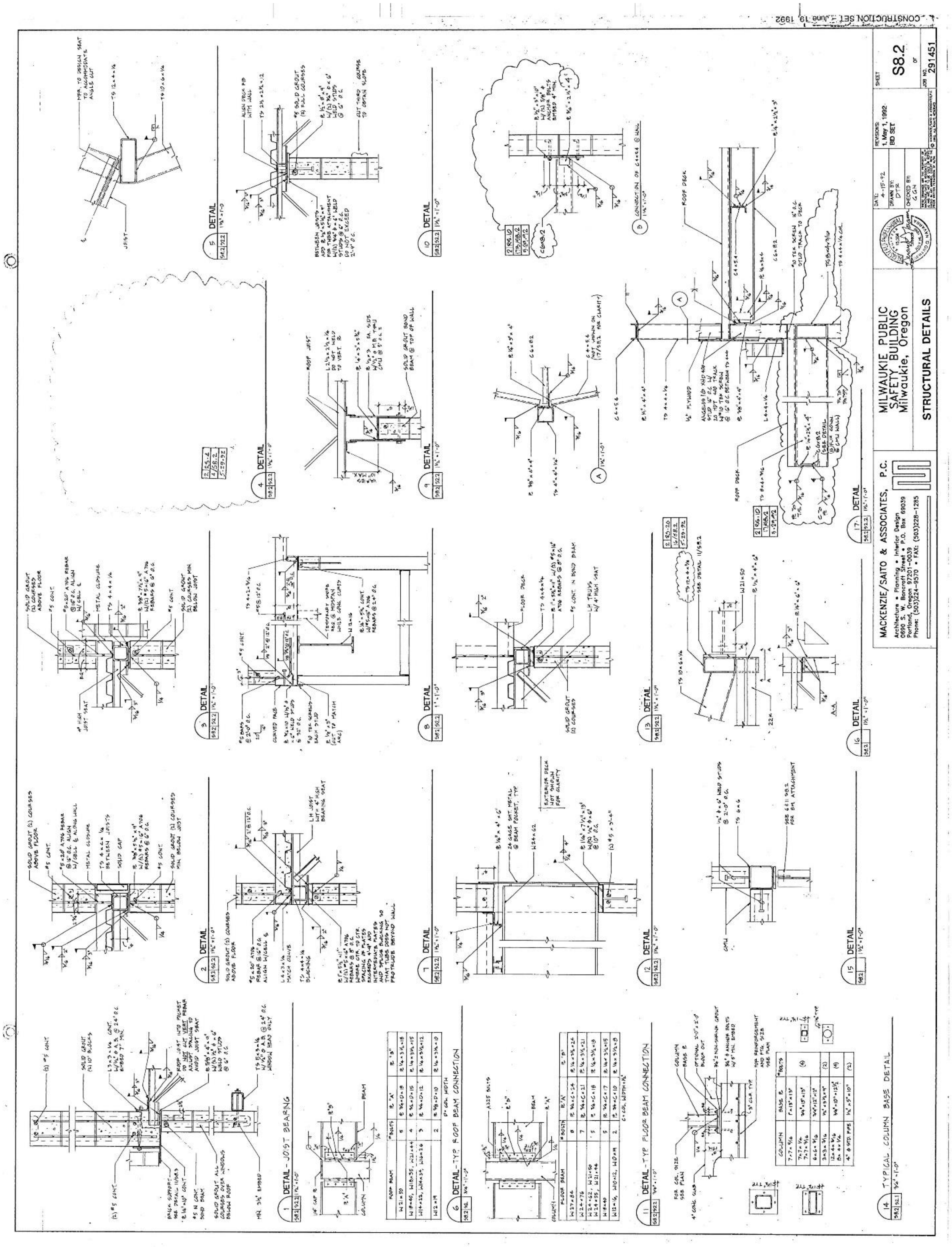
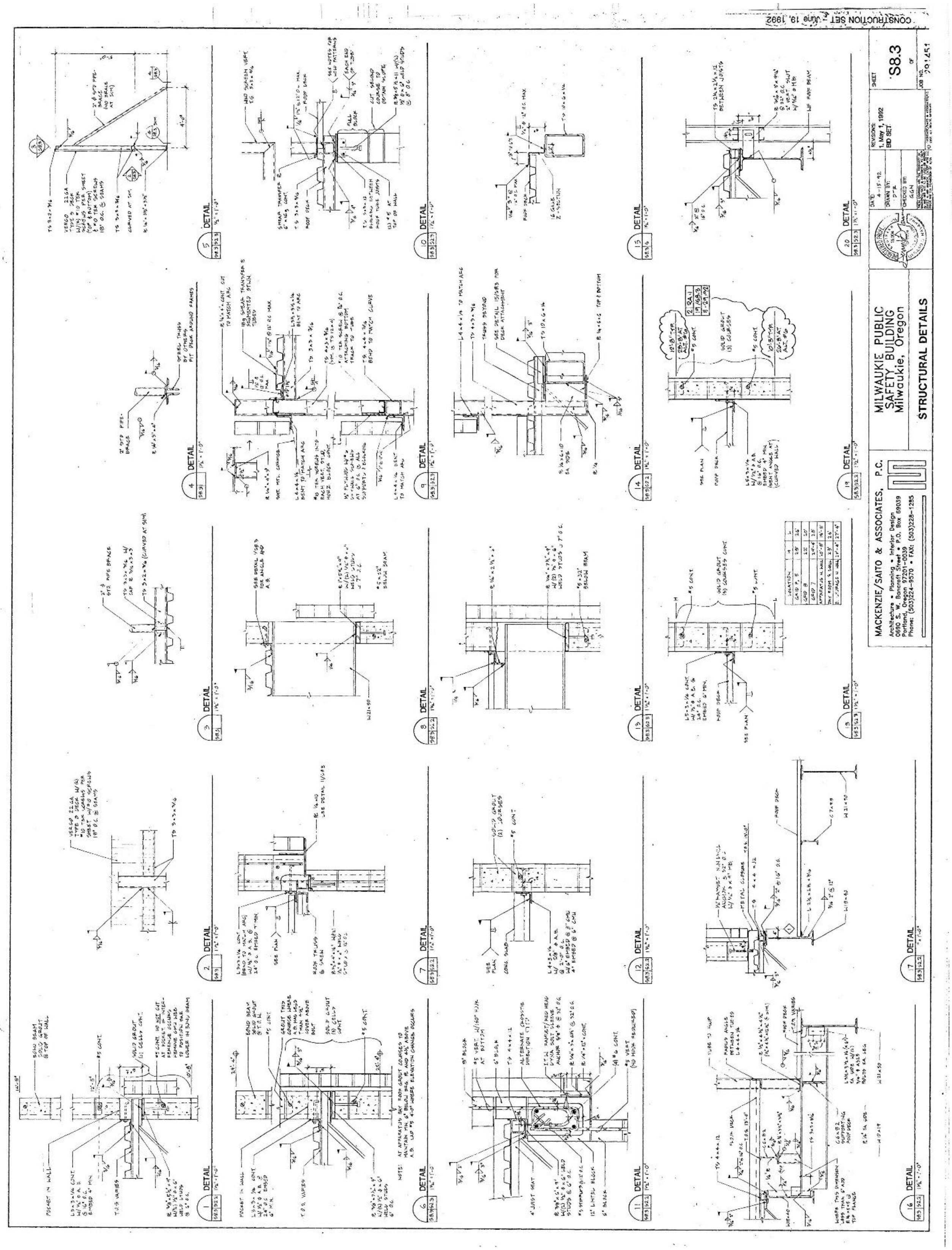
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
STRUCTURAL DETAILS
DATE: April 15, 1992
DRAWN BY: DTR
CHECKED BY: GGH
REVISIONS: 1, May 1, 1992 BID SET
SHEET S8.1 OF
JOB NO. 291451


CONSTRUCTION SET - June 19, 1992
MACKENZIE/SAITO & ASSOCIATES, P.C.
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
STRUCTURAL DETAILS
DATE: 4-15-92
REVISIONS: 1, May 1, 1992 BID SET
SHEET S8.2
JOB NO. 291451


CONSTRUCTION SET - June 19, 1992
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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
STRUCTURAL DETAILS
REVISIONS: 1. May 1, 1992 BID SET
S8.3
DETAIL
1
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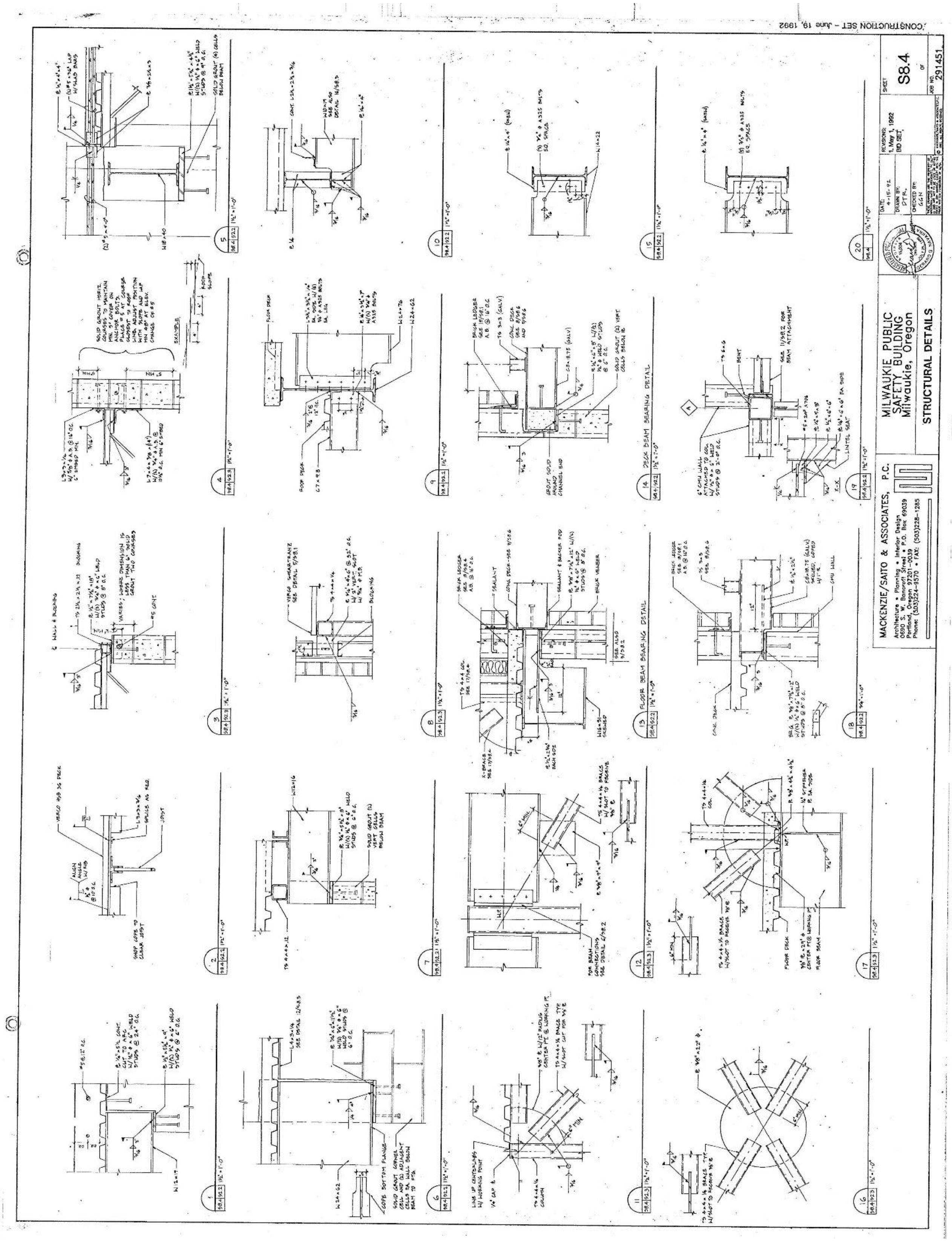
CONSTRUCTION SET – June 19, 1992
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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
STRUCTURAL DETAILS
DATE: 4-15-92
DRAWN BY: DTR
CHECKED BY: GGN
REVISIONS: 1. May 1, 1992 BID SET
SHEET S8.4
JOB NO. 291451
DECK BEAM BEARING DETAIL
FLOOR BEAM BEARING DETAIL
1
2
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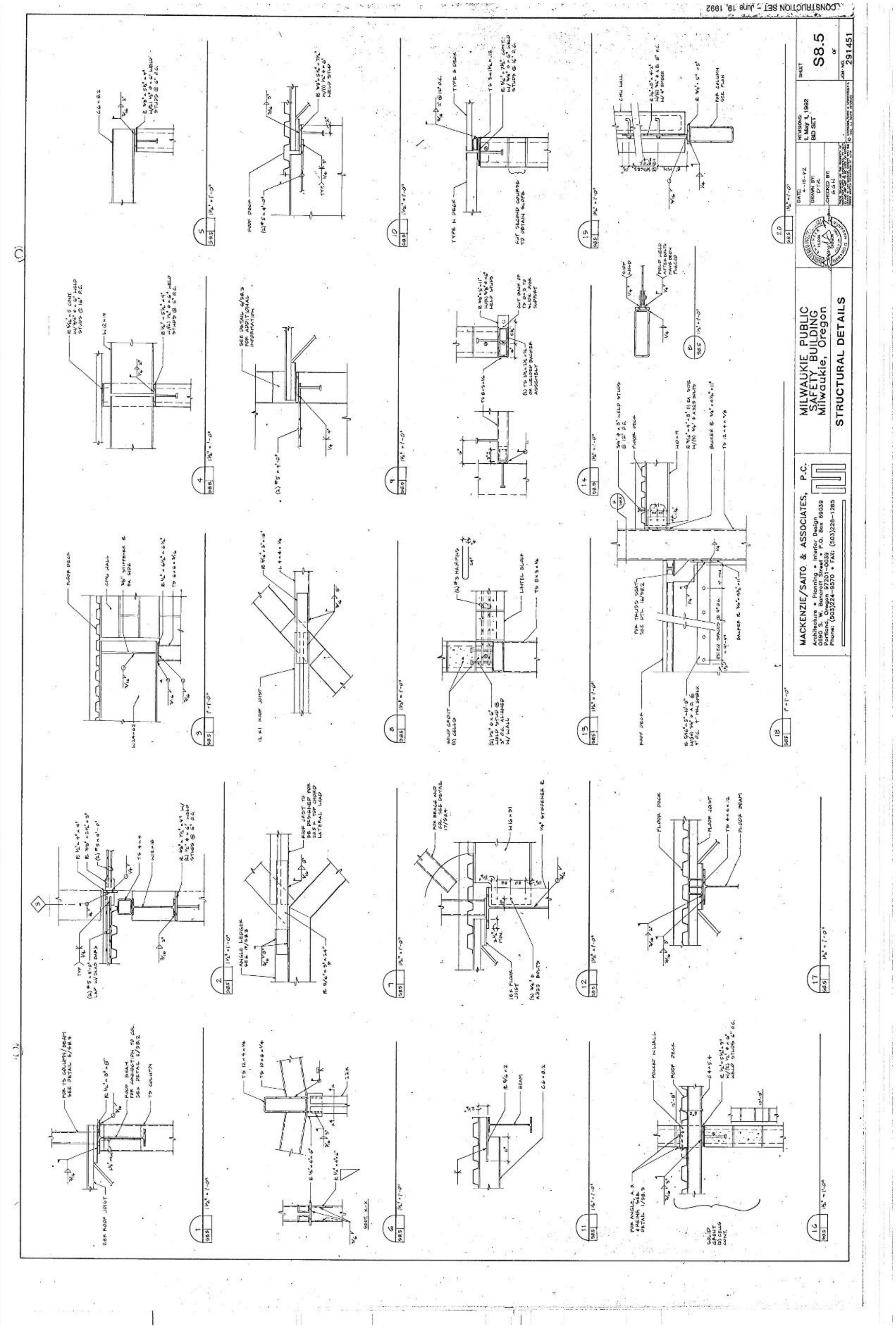
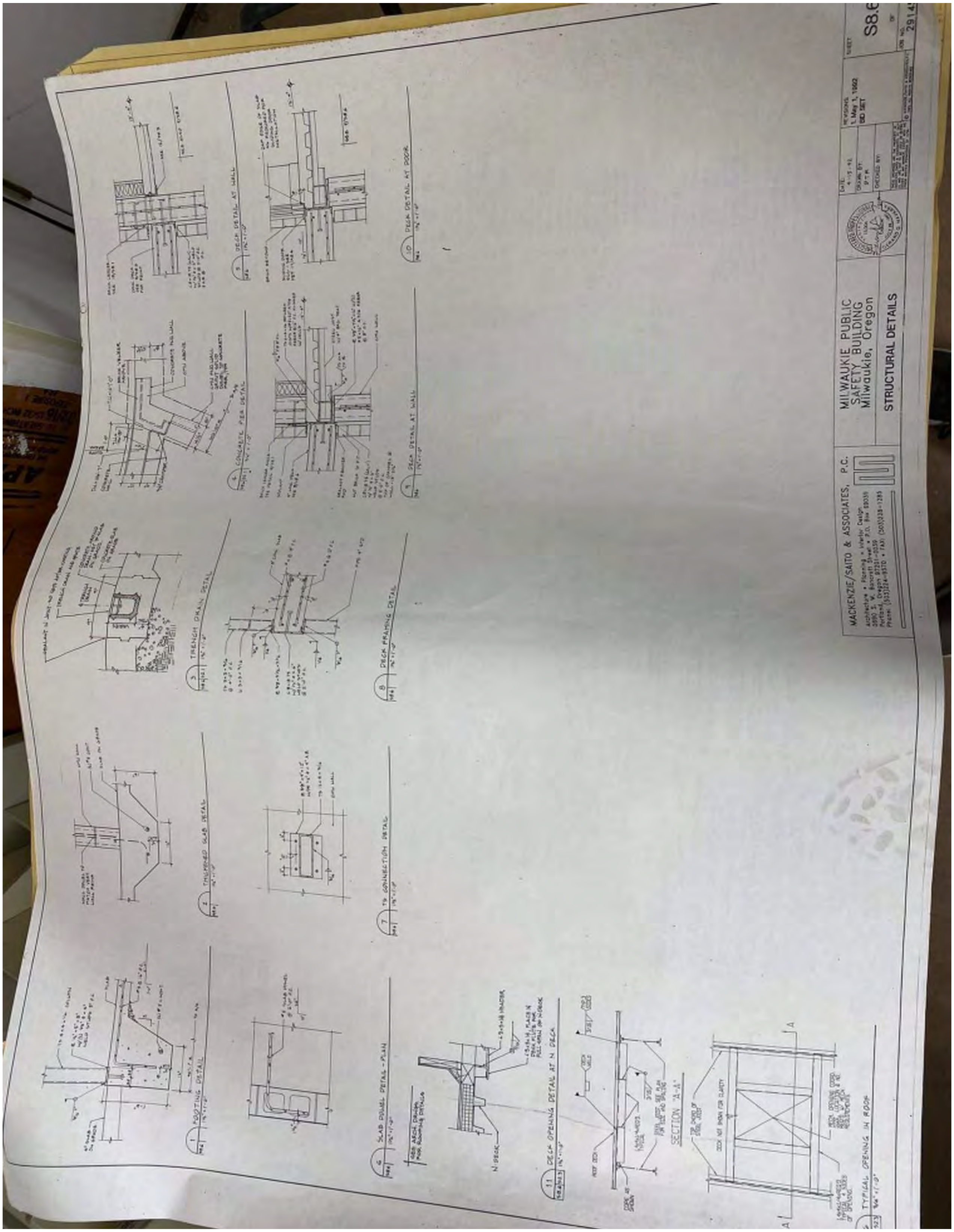

CONSTRUCTION SET - June 18, 1992
MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon
STRUCTURAL DETAILS
MACKENZIE/SAITO & ASSOCIATES, P.C.
S8.5
291451


FOOTING DETAIL
THICKENED SLAB DETAIL
TRENCH DRAIN DETAIL
CONCRETE PIER DETAIL
DECK DETAIL AT WALL
SLAB DOWEL DETAIL - PLAN
TS CONNECTION DETAIL
DECK FRAMING DETAIL
DECK DETAIL AT WALL
DECK DETAIL AT DOOR
DECK OPENING DETAIL AT N DECK
SECTION "A-A"
TYPICAL OPENING IN ROOF
MACKENZIE/SAITO & ASSOCIATES, P.C.
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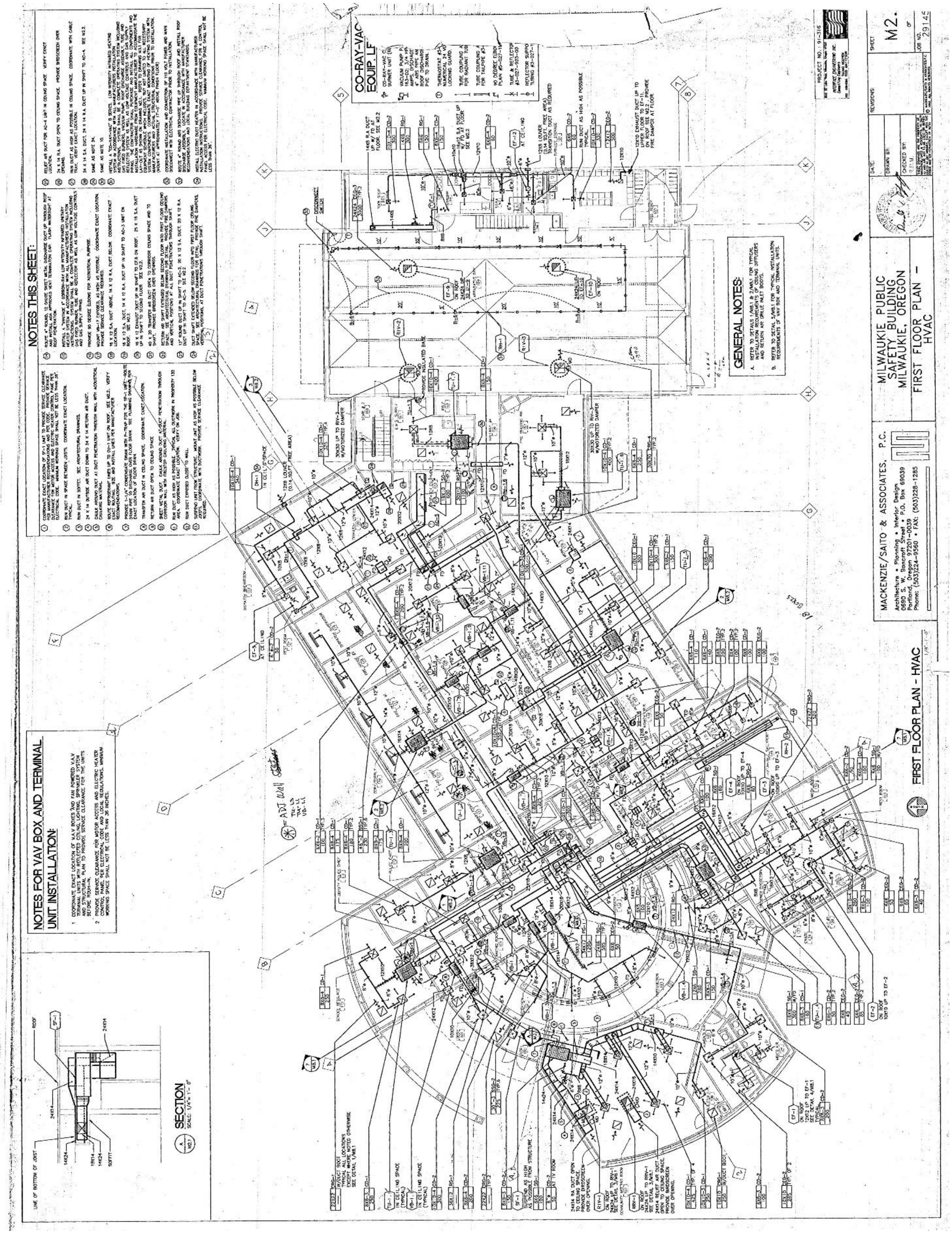
Milwaukie, Oregon
STRUCTURAL DETAILS
BID SET
S8.6


NOTES THIS SHEET:
NOTES FOR VAV BOX AND TERMINAL UNIT INSTALLATION:
GENERAL NOTES:
CO-RAY-VAC EQUIP. LF
SECTION
SCALE: 1/4" = 1'-0"
FIRST FLOOR PLAN - HVAC
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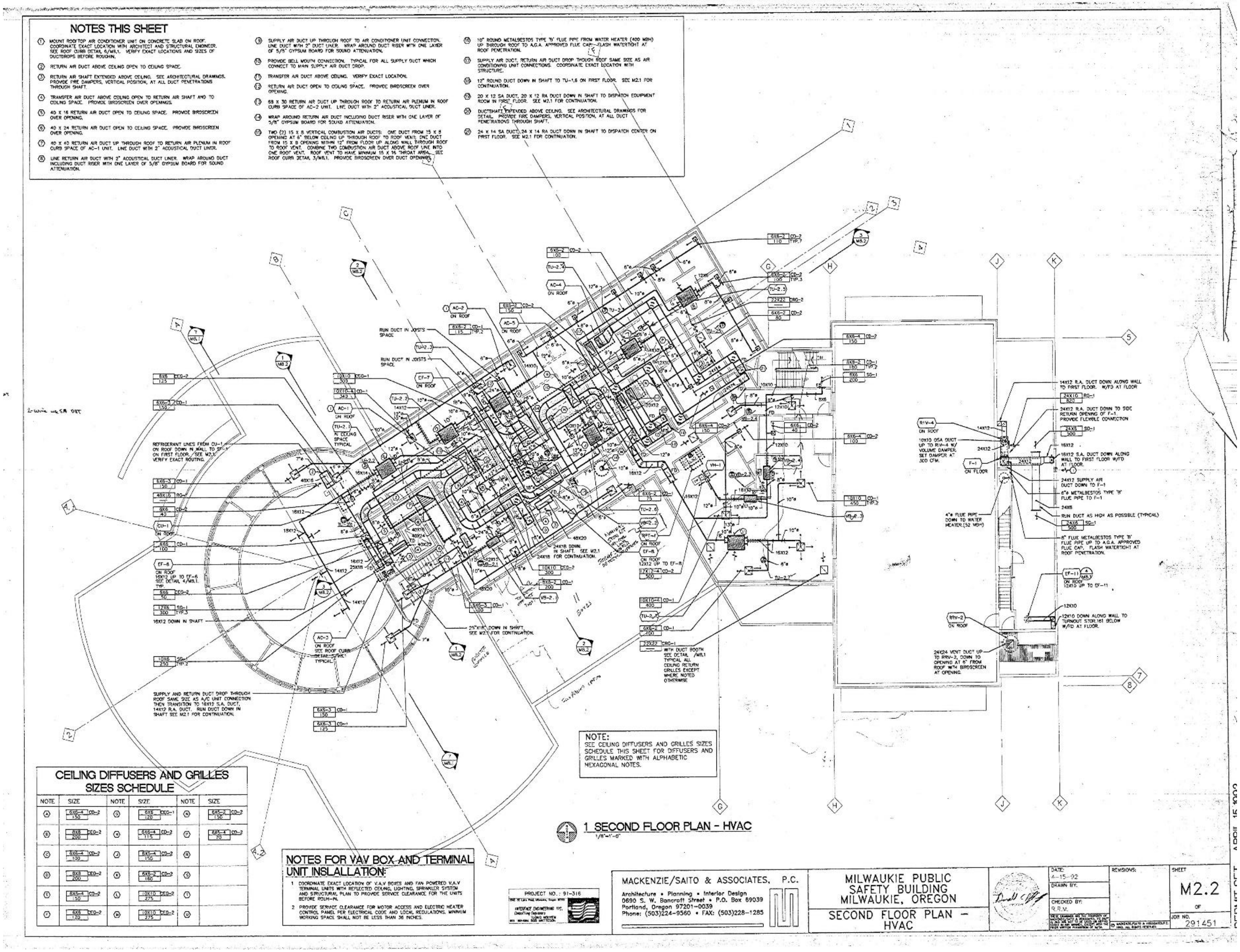
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
FIRST FLOOR PLAN – HVAC
M2.
29145



NOTES THIS SHEET

1. MOUNT ROOFTOP AIR CONDITIONER UNIT ON CONCRETE SLAB ON ROOF. COORDINATE EXACT LOCATION WITH ARCHITECT AND STRUCTURAL ENGINEER. SEE ROOF CURB DETAIL 6/M8.1. VERIFY EXACT LOCATIONS AND SIZES OF DUCTDROPS BEFORE ROUGHIN.
2. RETURN AIR DUCT ABOVE CEILING OPEN TO CEILING SPACE.
3. RETURN AIR SHAFT EXTENDED ABOVE CEILING. SEE ARCHITECTURAL DRAWINGS. PROVIDE FIRE DAMPERS, VERTICAL POSITION, AT ALL DUCT PENETRATIONS THROUGH SHAFT.
4. TRANSFER AIR DUCT ABOVE CEILING OPEN TO RETURN AIR SHAFT AND TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENINGS.
5. 40 X 16 RETURN AIR DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.
6. 40 X 24 RETURN AIR DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.
7. 40 X 40 RETURN AIR DUCT UP THROUGH ROOF TO RETURN AIR PLENUM IN ROOF CURB SPACE OF AC-1 UNIT. LINE DUCT WITH 2" ACOUSTICAL DUCT LINER.
8. LINE RETURN AIR DUCT WITH 2" ACOUSTICAL DUCT LINER. WRAP AROUND DUCT INCLUDING DUCT RISER WITH ONE LAYER OF 5/8" GYPSUM BOARD FOR SOUND ATTENUATION.
9. SUPPLY AIR DUCT UP THROUGH ROOF TO AIR CONDITIONER UNIT CONNECTION. LINE DUCT WITH 2" DUCT LINER. WRAP AROUND DUCT RISER WITH ONE LAYER OF 5/8" GYPSUM BOARD FOR SOUND ATTENUATION.
10. PROVIDE BELL MOUTH CONNECTION. TYPICAL FOR ALL SUPPLY DUCT WHICH CONNECT TO MAIN SUPPLY AIR DUCT DROP.
11. TRANSFER AIR DUCT ABOVE CEILING. VERIFY EXACT LOCATION.
12. RETURN AIR DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.
13. 68 X 30 RETURN AIR DUCT UP THROUGH ROOF TO RETURN AIR PLENUM IN ROOF CURB SPACE OF AC-2 UNIT. LINE DUCT WITH 2" ACOUSTICAL DUCT LINER.
14. WRAP AROUND RETURN AIR DUCT INCLUDING DUCT RISER WITH ONE LAYER OF 5/8" GYPSUM BOARD FOR SOUND ATTENUATION.
15. TWO (2) 15 X 8 VERTICAL COMBUSTION AIR DUCTS: ONE DUCT FROM 15 X 8 OPENING AT 6" BELOW CEILING UP THROUGH ROOF TO ROOF VENT; ONE DUCT FROM 15 X 8 OPENING WITHIN 12" FROM FLOOR UP ALONG WALL THROUGH ROOF TO ROOF VENT. COMBINE TWO COMBUSTION AIR DUCT ABOVE ROOF LINE INTO ONE ROOF VENT. ROOF VENT TO HAVE MINIMUM 15 X 16 THROAT AREA. SEE ROOF CURB DETAIL 3/M8.1. PROVIDE BIRDSCREEN OVER DUCT OPENINGS.
16. 10" ROUND METALBESTOS TYPE 'B' FLUE PIPE FROM WATER HEATER (400 MBH) UP THROUGH ROOF TO A.G.A. APPROVED FLUE CAP. FLASH WATERTIGHT AT ROOF PENETRATION.
17. SUPPLY AIR DUCT, RETURN AIR DUCT DROP THOUGH ROOF SAME SIZE AS AIR CONDITIONING UNIT CONNECTIONS. COORDINATE EXACT LOCATION WITH STRUCTURE.
18. 12" ROUND DUCT DOWN IN SHAFT TO TU-1,6 ON FIRST FLOOR. SEE M2.1 FOR CONTINUATION.
19. 20 X 12 SA DUCT, 20 X 12 RA DUCT DOWN IN SHAFT TO DISPATCH EQUIPMENT ROOM IN FIRST FLOOR. SEE M2.1 FOR CONTINUATION.
20. DUCTSHAFT EXTENDED ABOVE CEILING. SEE ARCHITECTURAL DRAWINGS FOR DETAIL. PROVIDE FIRE DAMPERS, VERTICAL POSITION, AT ALL DUCT PENETRATIONS THROUGH SHAFT.
21. 24 X 14 SA DUCT, 24 X 14 RA DUCT DOWN IN SHAFT TO DISPATCH CENTER ON FIRST FLOOR. SEE M2.1 FOR CONTINUATION.

CEILING DIFFUSERS AND GRILLES SIZES SCHEDULE

NOTE	SIZE	NOTE	SIZE	NOTE	SIZE
A	6X6-4 150 CD-2	G	6X6 120 CEG-1	N	6X6-2 150 CD-2
B	8X8 200 CEG-2	H	6X6-4 115 CD-2	P	6X6-4 70 CD-2
C	6X6-4 100 CD-2	J	6X6-4 150 CD-2	R	
D	8X8 200 CEG-2	K	6X6-2 160 CD-2	S	
E	6X6-4 150 CD-2	L	10X10 275 CEG-2	T	
F	6X6 120 CEG-2	M	10X10 275 CEG-2	U	

NOTES FOR VAV BOX AND TERMINAL UNIT INSLALLATION:

1. COORDINATE EXACT LOCATION OF V.A.V BOXES AND FAN POWERED V.A.V TERMINAL UNITS WITH REFLECTED CEILING, LIGHTING, SPRINKLER SYSTEM AND STRUCTURAL PLAN TO PROVIDE SERVICE CLEARANCE FOR THE UNITS BEFORE ROUGH-IN.
2. PROVIDE SERVICE CLEARANCE FOR MOTOR ACCESS AND ELECTRIC HEATER CONTROL PANEL PER ELECTRICAL CODE AND LOCAL REGULATIONS. MINIMUM WORKING SPACE SHALL NOT BE LESS THAN 36 INCHES.

NOTE:
SEE CEILING DIFFUSERS AND GRILLES SIZES SCHEDULE THIS SHEET FOR DIFFUSERS AND GRILLES MARKED WITH ALPHABETIC HEXAGONAL NOTES.

1 SECOND FLOOR PLAN - HVAC
1/8"=1'-0"

PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers

MACKENZIE/SAITO & ASSOCIATES, P.C.
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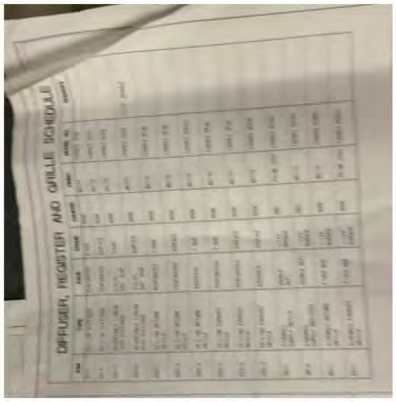
MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

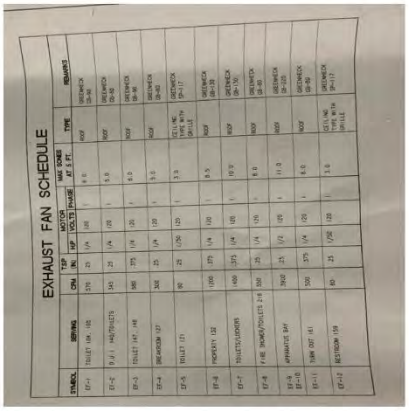
SECOND FLOOR PLAN – HVAC

DATE:	4-15-92
DRAWN BY:	
CHECKED BY:	R.R.M.
REVISIONS:	
SHEET	M2.2 OF
JOB NO.	291451

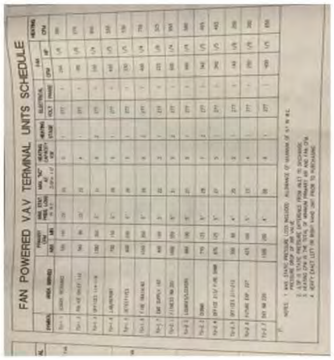
Photos from Sheet M3.1 Found on Site



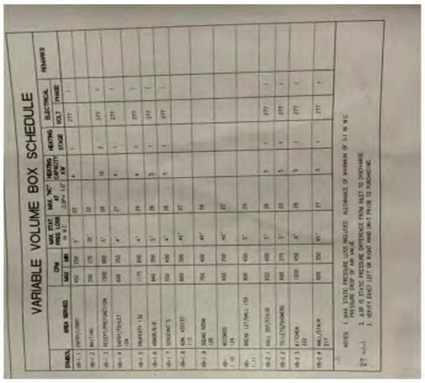
DIFFUSER, REGISTER AND GRILLE SCHEDULE



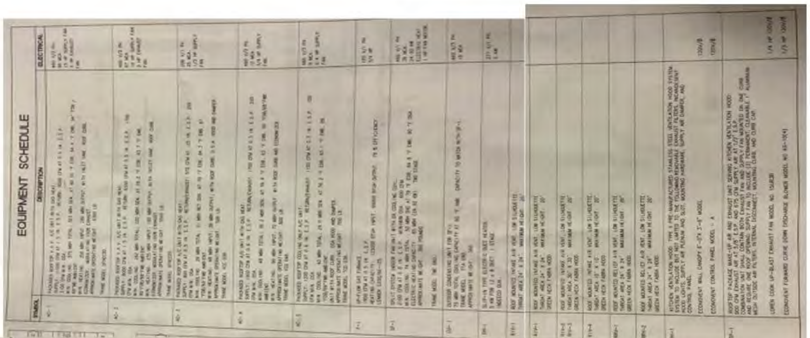
EXHAUST FAN SCHEDULE



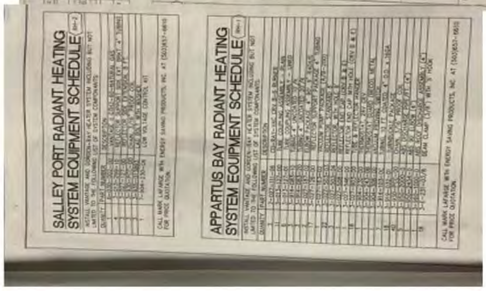
FAN POWERED V.A.V. TERMINAL UNITS SCHEDULE



VARIABLE VOLUME BOX SCHEDULE

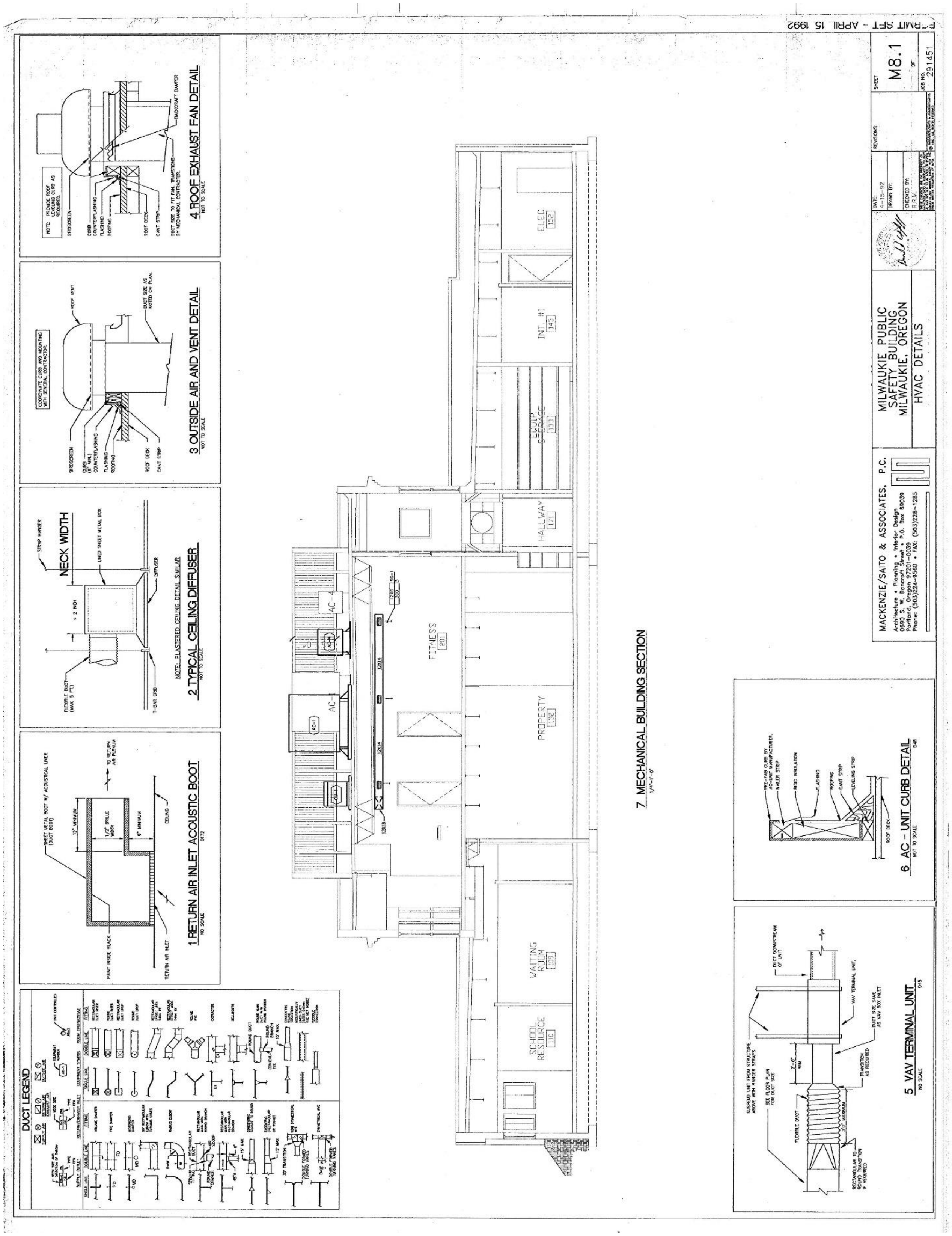


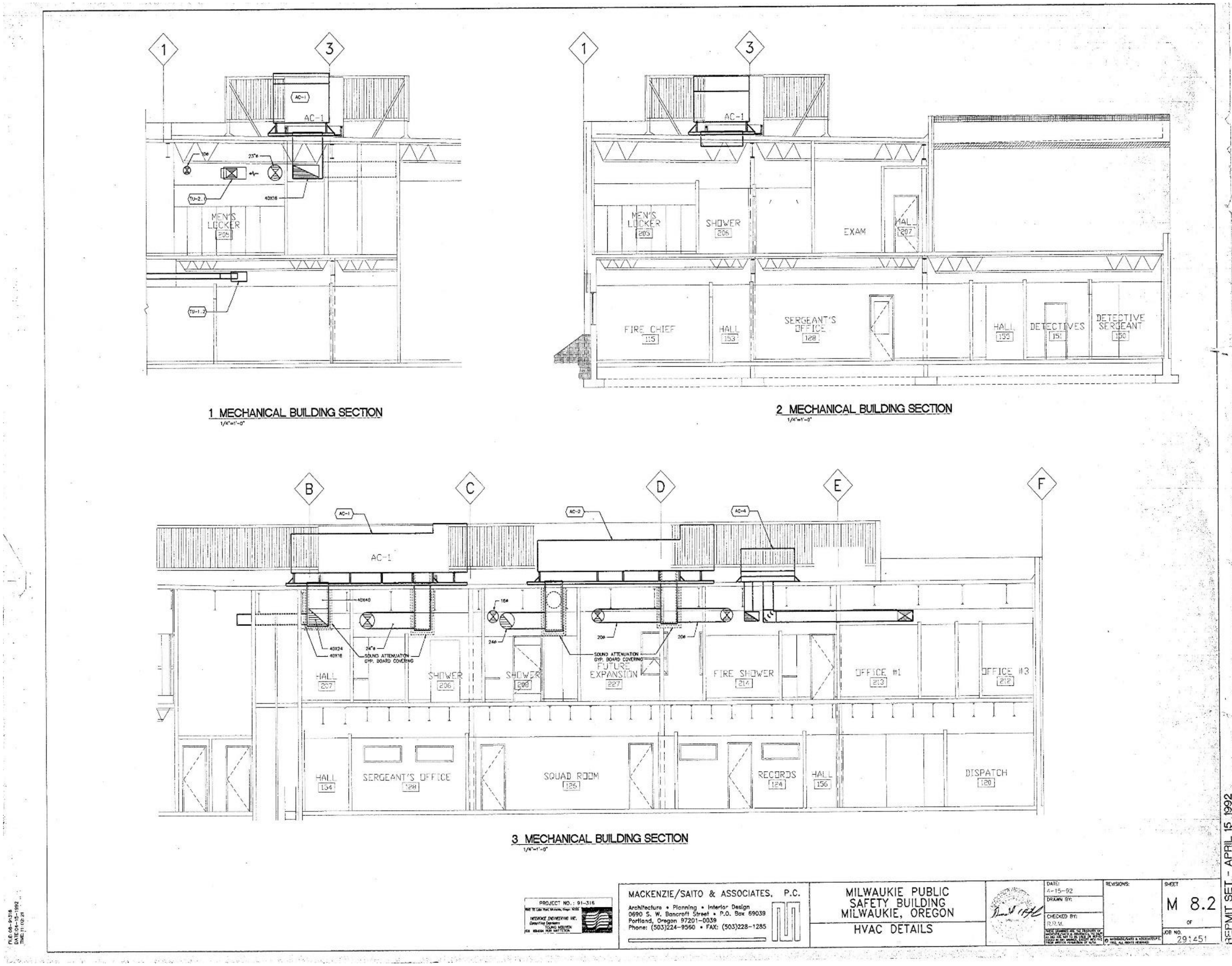
EQUIPMENT SCHEDULE

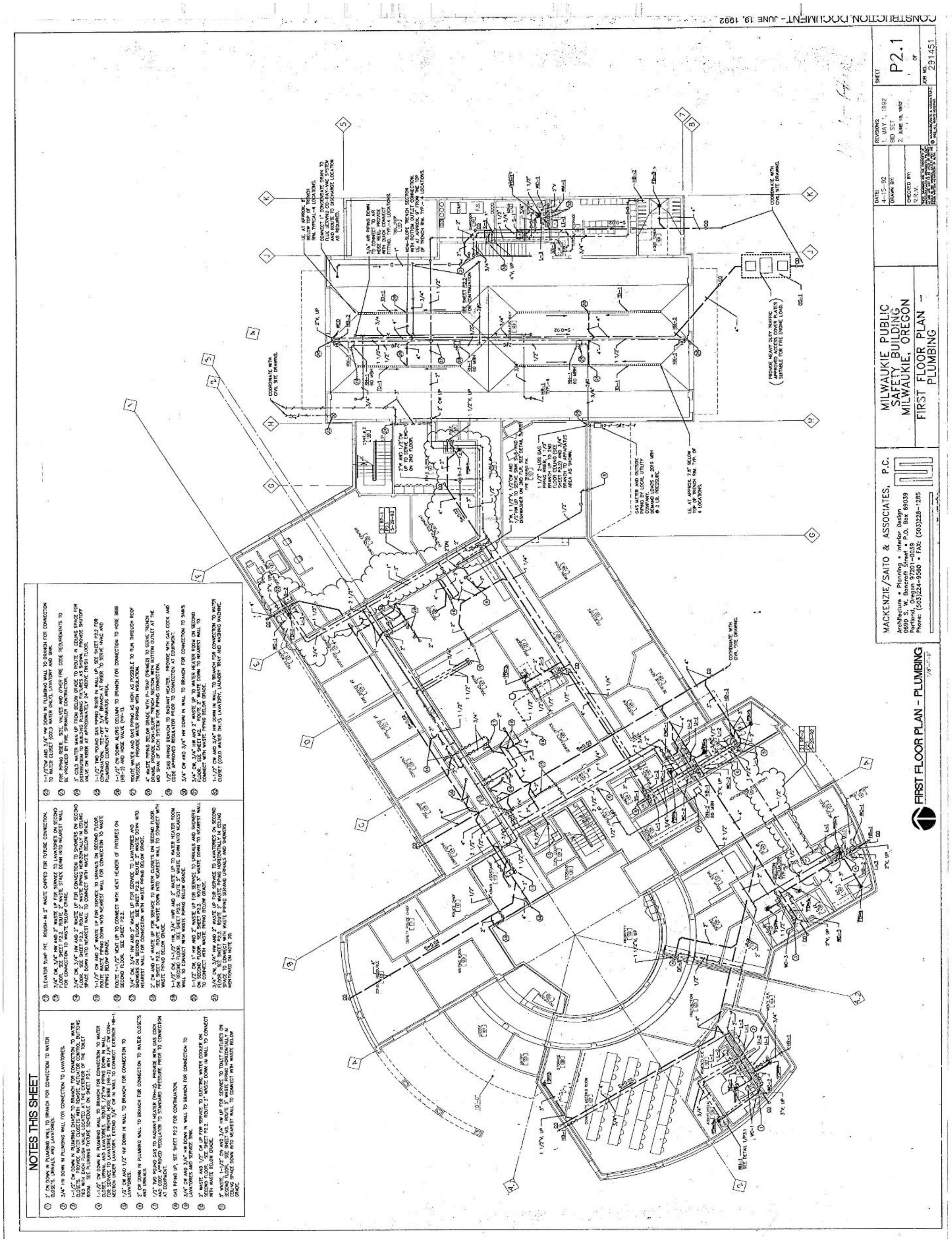


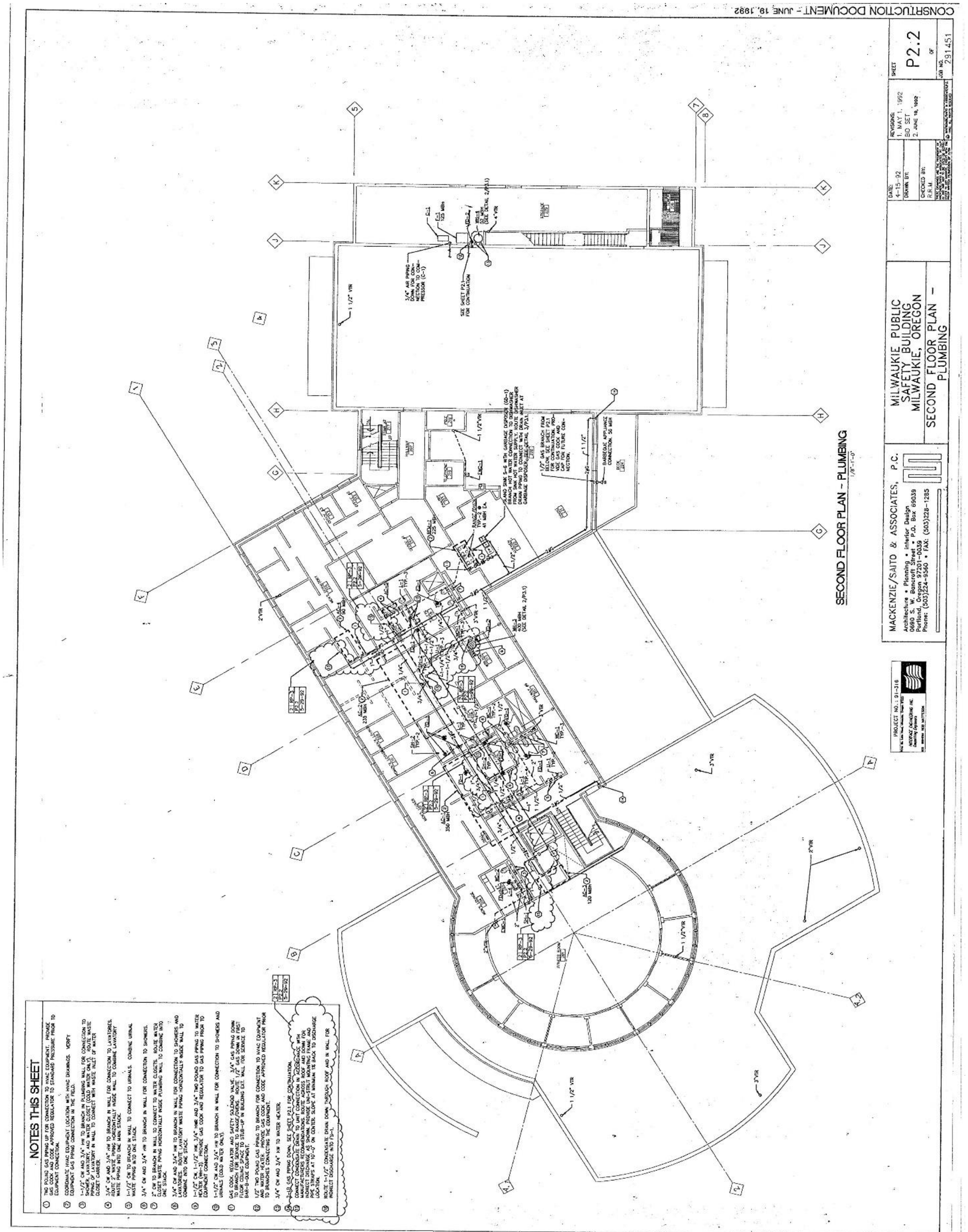
SALLEY PORT RADIANT HEATING SYSTEM EQUIPMENT SCHEDULE

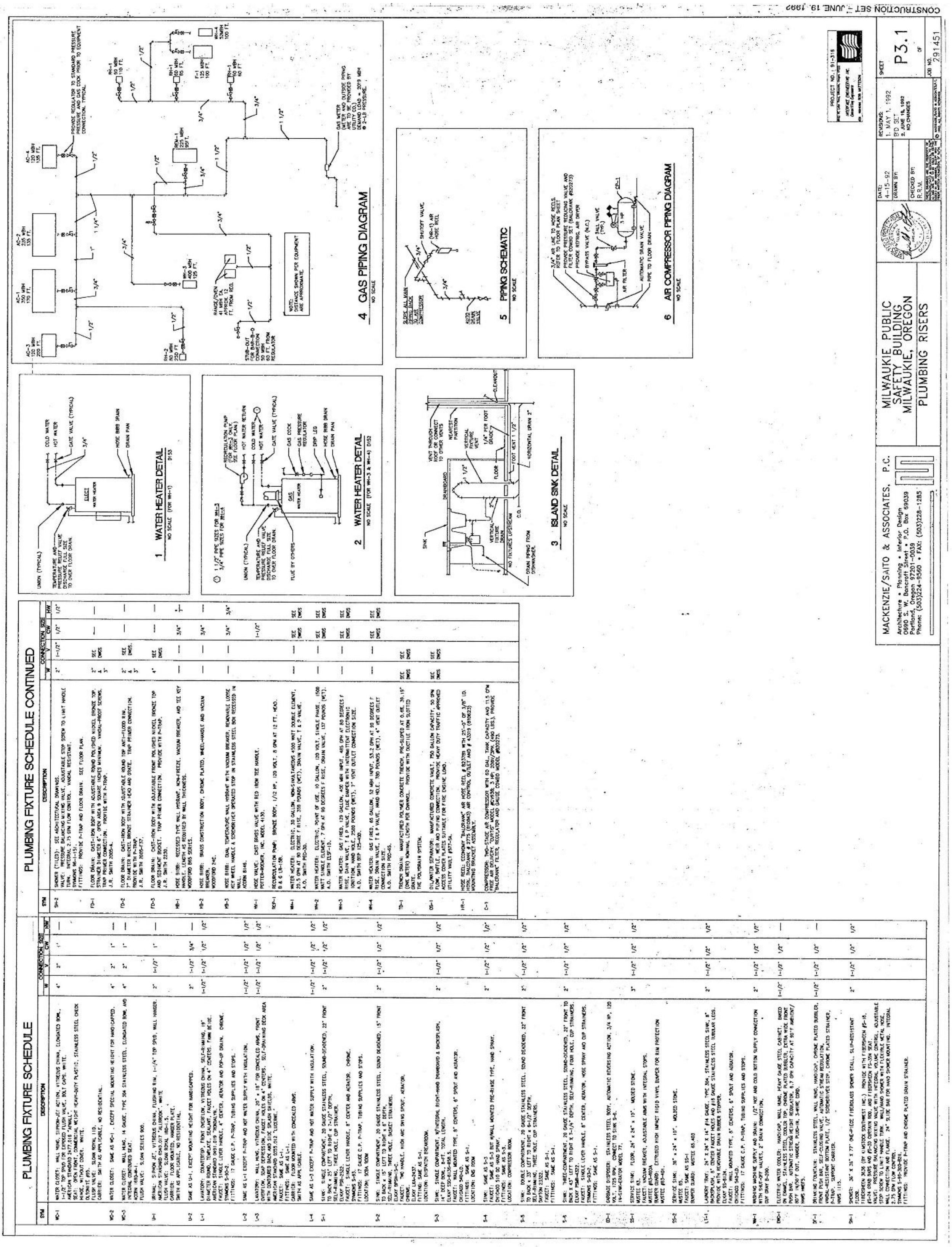
APPARTUS BAY RADIANT HEATING SYSTEM EQUIPMENT SCHEDULE

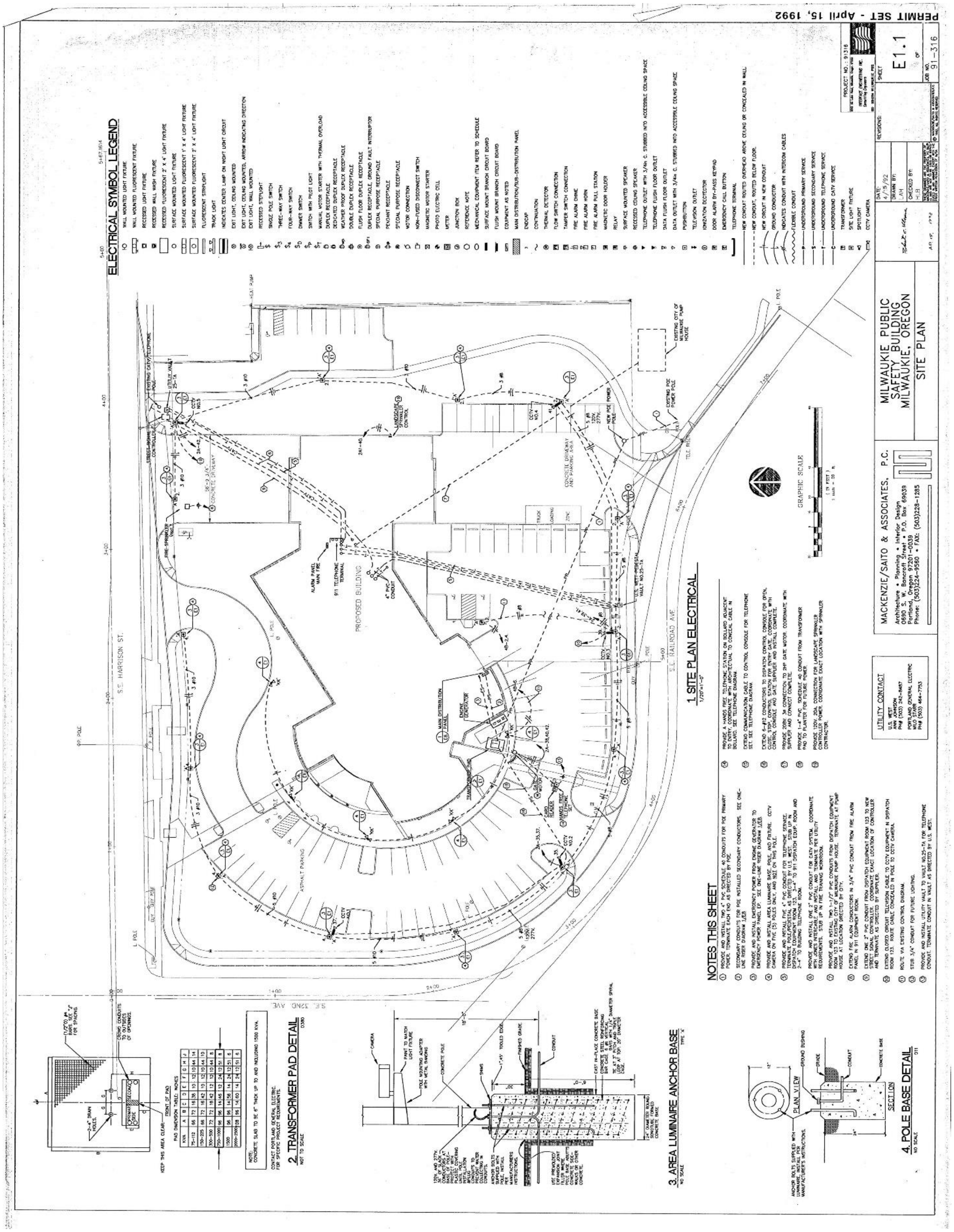

PERMIT SET - APRIL 15 1992
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
HVAC DETAILS
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
DATE: 4-15-92
SHEET M8.1
JOB NO. 291451
1 RETURN AIR INLET ACOUSTIC BOOT
2 TYPICAL CEILING DIFFUSER
NECK WIDTH
3 OUTSIDE AIR AND VENT DETAIL
4 ROOF EXHAUST FAN DETAIL
5 VAV TERMINAL UNIT
6 AC - UNIT CURB DETAIL
7 MECHANICAL BUILDING SECTION
DUCT LEGEND
ELEC 152
INT. #1 145
EQUIP. STORAGE 133
HALLWAY 171
FITNESS 201
PROPERTY 132
WAITING ROOM 109
SCHOOL RESOURCE 110
AC-1
AC-4
NOT TO SCALE

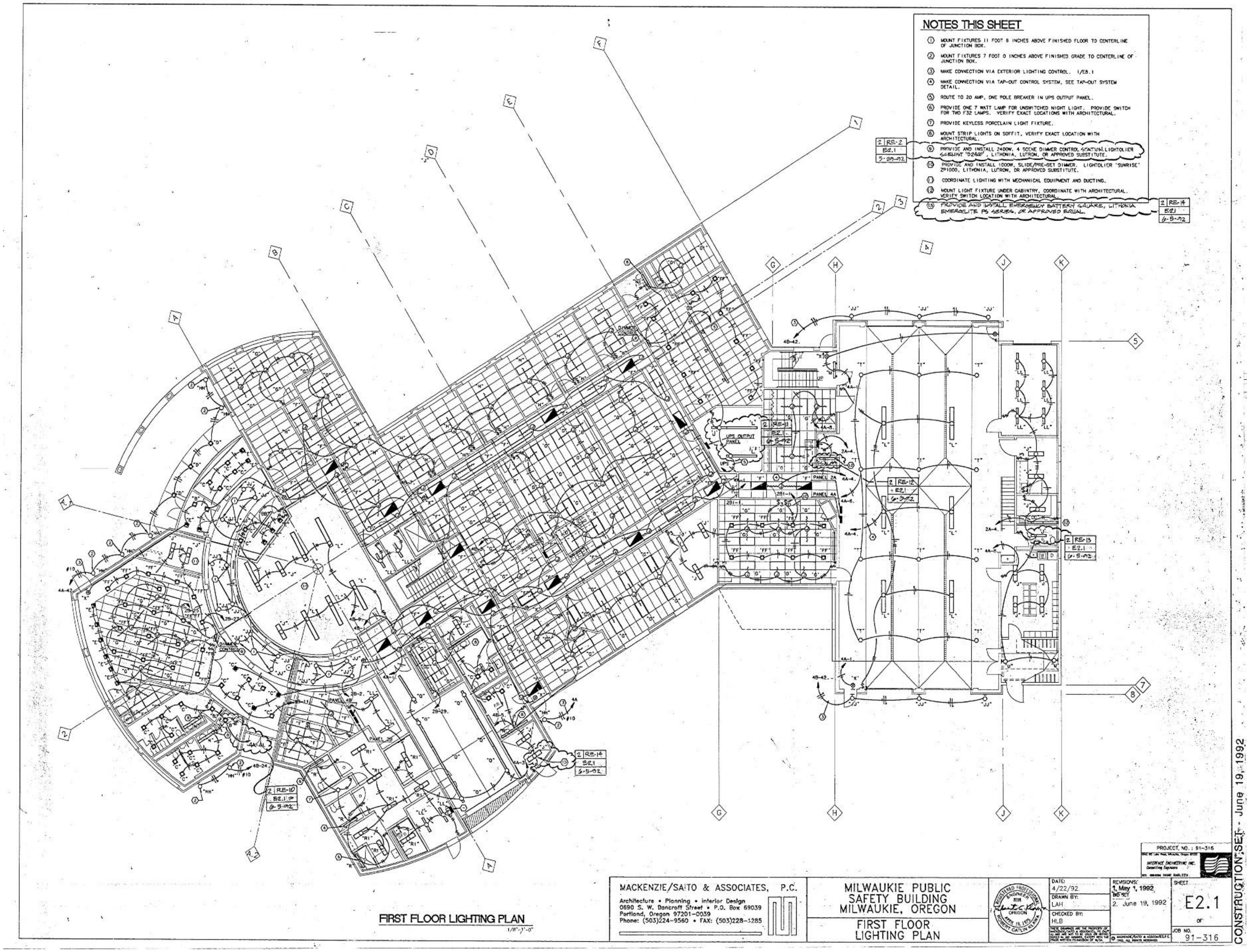

1 MECHANICAL BUILDING SECTION
1/4"=1'-0"
2 MECHANICAL BUILDING SECTION
1/4"=1'-0"
3 MECHANICAL BUILDING SECTION
1/4"=1'-0"
1
3
B
C
D
E
F
AC-1
AC-2
AC-4
TU-2
TU-1.2
23"ø
10ø
40X18
40X40
40X24
24"ø
16ø
24ø
20ø
SOUND ATTENUATION GYP. BOARD COVERING
MEN'S LOCKER 205
SHOWER 206
EXAM
HALL 207
FIRE CHIEF 115
HALL 153
SERGEANT'S OFFICE 128
HALL 155
DETECTIVES 151
DETECTIVE SERGEANT 150
SHOWER 208
FUTURE EXPANSION 227
FIRE SHOWER 214
OFFICE #1 213
OFFICE #3 212
HALL 134
SQUAD ROOM 126
RECORDS 124
HALL 156
DISPATCH 120
PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers
TOUNG NGUYEN
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
HVAC DETAILS
DATE: 4-15-92
DRAWN BY:
CHECKED BY: R.R.M.
REVISIONS:
SHEET
M 8.2
OF
JOB NO. 291451
REPMIT SET - APRIL 15 1992

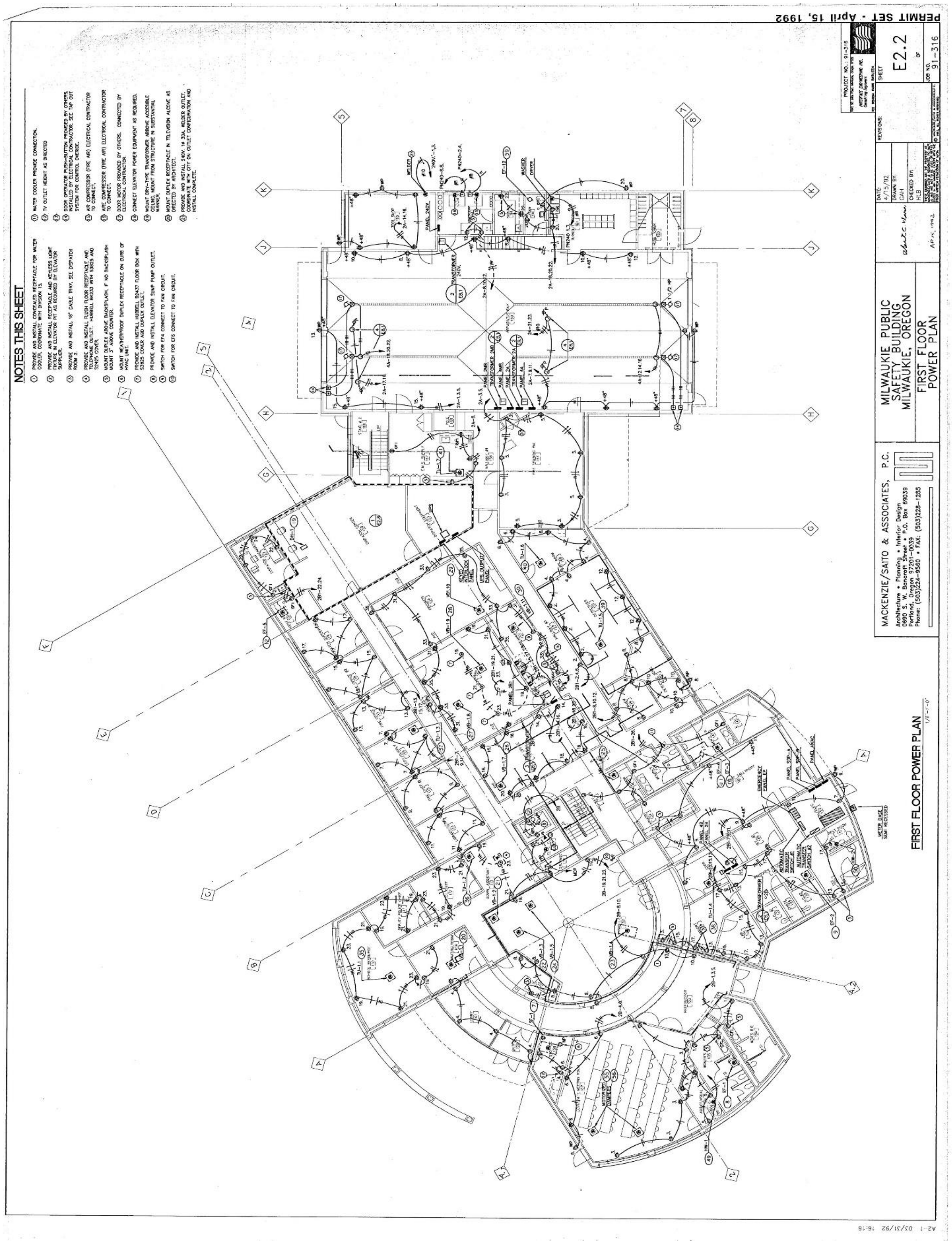

CONSTRUCTION DOCUMENT - JUNE 19, 1992
NOTES THIS SHEET
FIRST FLOOR PLAN - PLUMBING
1/8"=1'-0"
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
FIRST FLOOR PLAN - PLUMBING
DATE: 4-15-92
DRAWN BY:
CHECKED BY: R.R.M.
REVISIONS:
1. MAY 1, 1992 BID SET
2. JUNE 19, 1992
SHEET P2.1
OF
JOB NO. 291451

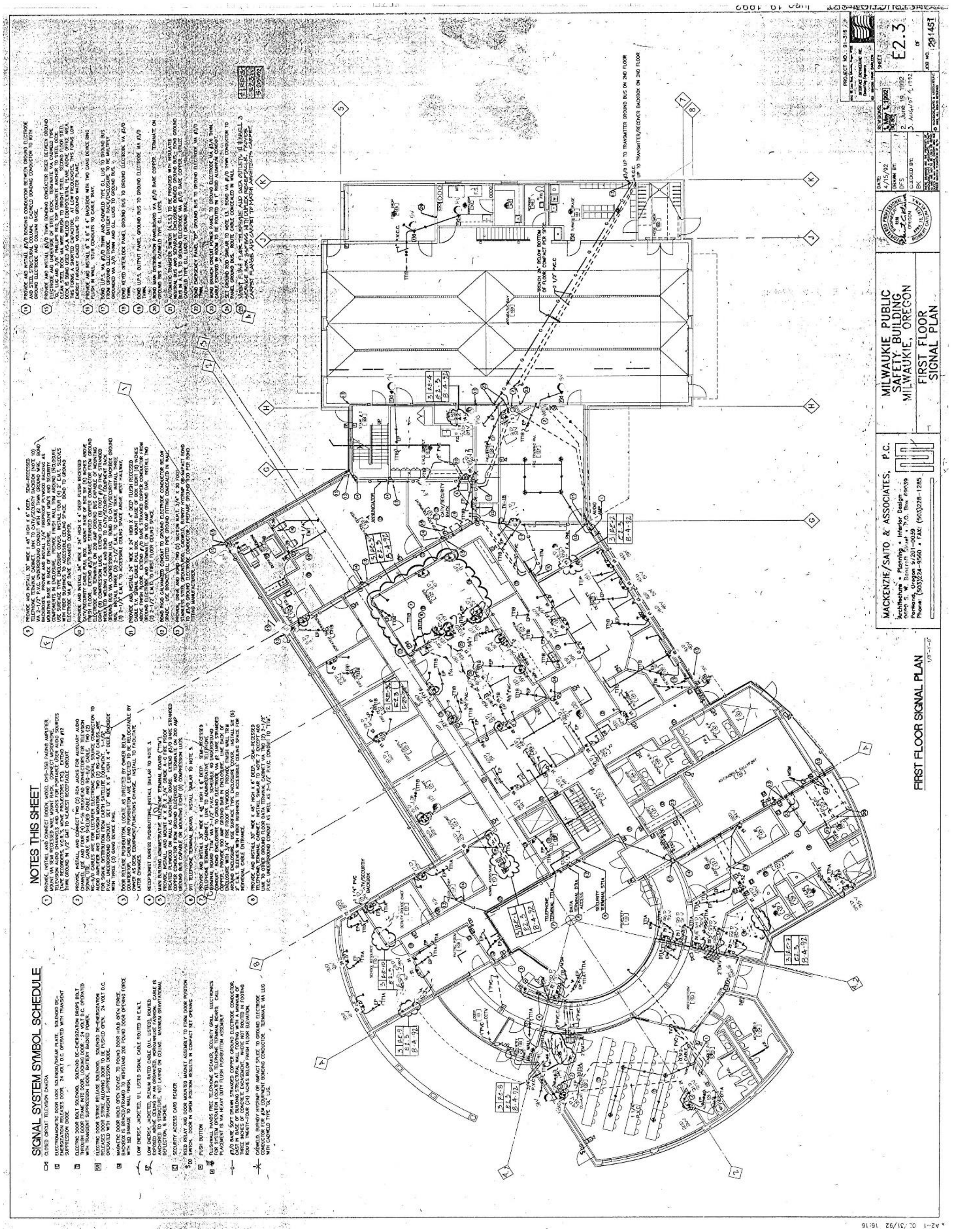

CONSTRUCTION DOCUMENT – JUNE 18, 1992
SHEET
P2.2
OF
JOB NO. 291451
REVISIONS:
1. MAY 1, 1992 BID SET
2. JUNE 18, 1992
DATE: 4-15-92
DRAWN BY:
CHECKED BY: R.R.M.
MILWAUKIE PUBLIC SAFETY BUILDING MILWAUKIE, OREGON
SECOND FLOOR PLAN – PLUMBING
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
SECOND FLOOR PLAN – PLUMBING
1/8"=1'-0"
PROJECT NO.: 91-316
NOTES THIS SHEET

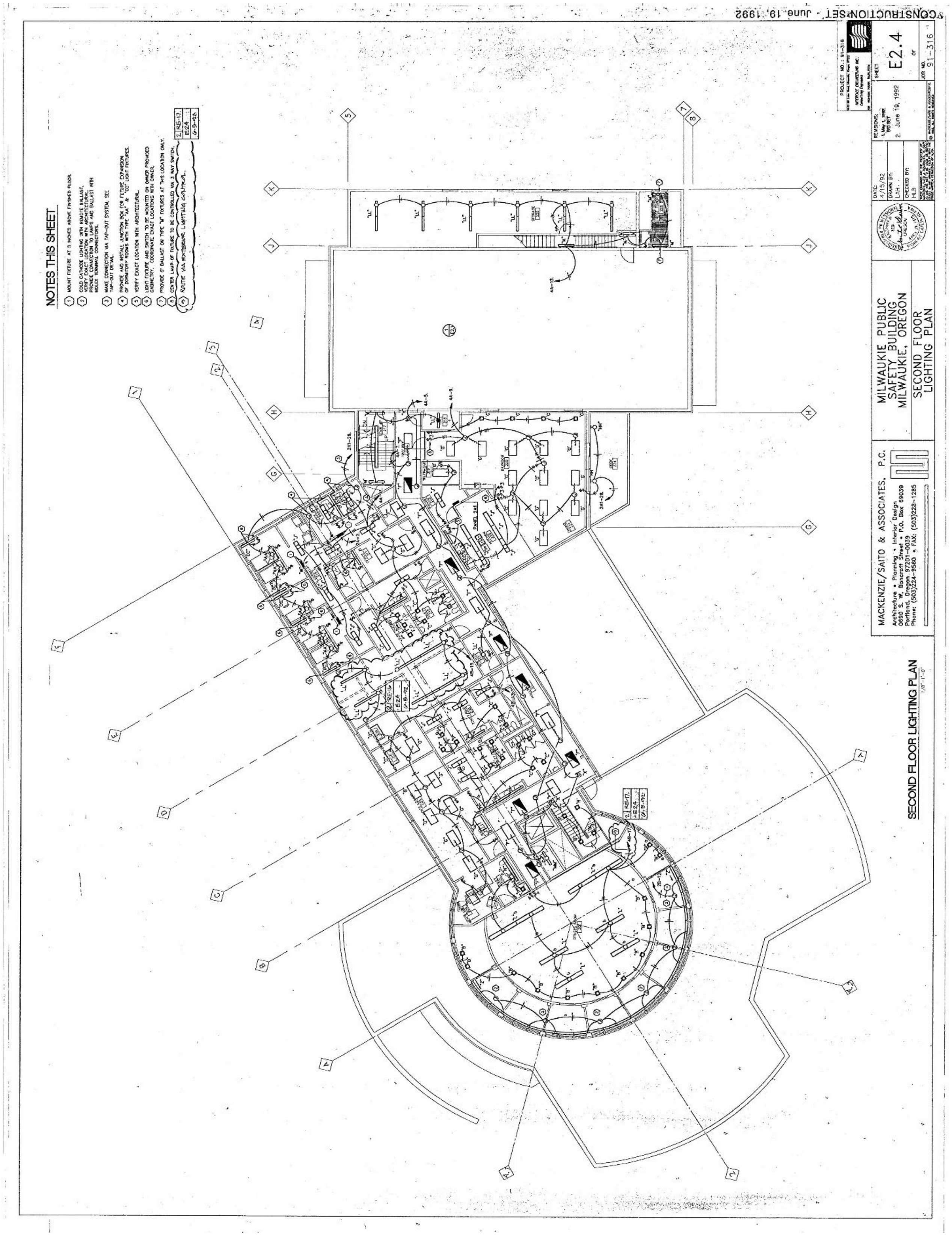

CONSTRUCTION SET - JUNE 19, 1992
PLUMBING FIXTURE SCHEDULE
PLUMBING FIXTURE SCHEDULE CONTINUED
1 WATER HEATER DETAIL
NO SCALE (FOR WH-1)
2 WATER HEATER DETAIL
NO SCALE (FOR WH-3 & WH-4)
3 ISLAND SINK DETAIL
NO SCALE
4 GAS PIPING DIAGRAM
NO SCALE
5 PIPING SCHEMATIC
NO SCALE
6 AIR COMPRESSOR PIPING DIAGRAM
NO SCALE
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
PLUMBING RISERS
DATE: 4-15-92
DRAWN BY:
CHECKED BY: R.R.M.
REVISIONS:
1. MAY 1, 1992 BID SET
2. JUNE 19, 1992 NO CHANGES
SHEET
P3.1
OF
JOB NO. 291451


PERMIT SET - April 15, 1992
ELECTRICAL SYMBOL LEGEND
1. SITE PLAN ELECTRICAL
NOTES THIS SHEET
PROPOSED BUILDING
S.E. HARRISON ST.
S.E. RAILROAD AVE
S.E. 32ND AVE
UTILITY CONTACT
GRAPHIC SCALE
2. TRANSFORMER PAD DETAIL
3. AREA LUMINAIRE ANCHOR BASE
4. POLE BASE DETAIL
MACKENZIE/SAITO & ASSOCIATES, P.C.
MILWAUKIE PUBLIC SAFETY BUILDING MILWAUKIE, OREGON
SITE PLAN
E1.1
91-316


NOTES THIS SHEET
① MOUNT FIXTURES 11 FOOT 8 INCHES ABOVE FINISHED FLOOR TO CENTERLINE OF JUNCTION BOX.
② MOUNT FIXTURES 7 FOOT 0 INCHES ABOVE FINISHED GRADE TO CENTERLINE OF JUNCTION BOX.
③ MAKE CONNECTION VIA EXTERIOR LIGHTING CONTROL. 1/E8.1
④ MAKE CONNECTION VIA TAP-OUT CONTROL SYSTEM, SEE TAP-OUT SYSTEM DETAIL.
⑤ ROUTE TO 20 AMP, ONE POLE BREAKER IN UPS OUTPUT PANEL.
⑥ PROVIDE ONE 7 WATT LAMP FOR UNSWITCHED NIGHT LIGHT. PROVIDE SWITCH FOR TWO F32 LAMPS. VERIFY EXACT LOCATIONS WITH ARCHITECTURAL.
⑦ PROVIDE KEYLESS PORCELAIN LIGHT FIXTURE.
⑧ MOUNT STRIP LIGHTS ON SOFFIT, VERIFY EXACT LOCATION WITH ARCHITECTURAL.
⑨ PROVIDE AND INSTALL 2400W, 4 SCENE DIMMER CONTROL STATION. LIGHTOLIER SCENIST 'S240' , LITHONIA, LUTRON, OR APPROVED SUBSTITUTE.
⑩ PROVIDE AND INSTALL 1000W, SLIDE/PRE-SET DIMMER. LIGHTOLIER 'SUNRISE' ZP1000, LITHONIA, LUTRON, OR APPROVED SUBSTITUTE.
⑪ COORDINATE LIGHTING WITH MECHANICAL EQUIPMENT AND DUCTING.
⑫ MOUNT LIGHT FIXTURE UNDER CABINTRY, COORDINATE WITH ARCHITECTURAL. VERIFY SWITCH LOCATION WITH ARCHITECTURAL.
⑬ PROVIDE AND INSTALL EMERGENCY BATTERY SQUARE, LITHONIA EMERGILITE PS SERIES, OR APPROVED EQUAL.
2 RE-2 E2.1 5-29-92
2 RE-14 E2.1 6-5-92
2 RE-11 E2.1 6-5-92
2 RE-12 E2.1 6-5-92
2 RE-13 E2.1 6-5-92
2 RE-10 E2.1 6-5-92
UPS OUTPUT PANEL
PANEL 2A
PANEL 4A
PANEL 2B
DIMMER CONTROL
G
H
J
K
A
B
C
D
E
F
1
2
3
4
5
7
8
FIRST FLOOR LIGHTING PLAN
1/8" = 1'-0"
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING MILWAUKIE, OREGON
FIRST FLOOR LIGHTING PLAN
REGISTERED PROFESSIONAL ENGINEER OREGON ROBERT CATLIN KLAWA
DATE: 4/22/92
DRAWN BY: LAH
CHECKED BY: HLB
REVISIONS: 1. May 1, 1992 BID SET 2. June 19, 1992
SHEET E2.1 OF
JOB NO. 91-316
PROJECT NO.: 91-316
INTERFACE ENGINEERING INC. Consulting Engineers
CONSTRUCTION SET - June 19, 1992


NOTES THIS SHEET
① PROVIDE AND INSTALL CONCEALED RECEPTACLE FOR WATER COOLER, COORDINATE WITH DIVISION 15.
② PROVIDE AND INSTALL RECEPTACLE AND KEYLESS LIGHT FIXTURE IN ELEVATOR PIT AS REQUIRED BY ELEVATOR SUPPLIER.
③ PROVIDE AND INSTALL 18" CABLE TRAY, SEE DISPATCH ROOM 2.
④ PROVIDE AND INSTALL FLUSH FLOOR RECEPTACLE AND TELEPHONE OUTLET. HUBBELL B4233 WITH S3825 AND S2425 COVER.
⑤ MOUNT DUPLEX ABOVE BACKSPLASH, IF NO BACKSPLASH MOUNT 3" ABOVE COUNTER.
⑥ MOUNT WEATHERPROOF DUPLEX RECEPTACLE ON CURB OF HVAC UNIT.
⑦ PROVIDE AND INSTALL HUBBELL B2437 FLOOR BOX WITH S3825 COVER ABD DUPLEX OUTLET.
⑧ PROVIDE AND INSTALL ELEVATOR SUMP PUMP OUTLET.
⑨ SWITCH FOR EF4 CONNECT TO FAN CIRCUIT.
⑩ SWITCH FOR EF6 CONNECT TO FAN CIRCUIT.
⑪ WATER COOLER PROVIDE CONNECTION.
⑫ TV OUTLET HEIGHT AS DIRECTED
⑬
⑭ DOOR OPERATOR PUSH-BUTTON PROVIDED BY OTHERS, INSTALLED BY ELECTRICAL CONTRACTOR. SEE TAP OUT SYSTEM FOR CONTROL OVERIDE.
⑮ AIR COMPRESSOR (FIRE AIR) ELECTRICAL CONTRACTOR TO CONNECT.
⑯ AIRE COMPRESSOR (FIRE AIR) ELECTRICAL CONTRACTOR TO CONNECT.
⑰ DOOR MOTOR PROVIDED BY OTHERS. CONNECTED BY ELECTRICAL CONTRACTOR.
⑱ CONNECT ELEVATOR POWER EQUIPMENT AS REQUIRED.
⑲ MOUNT DRY-TYPE TRANSFORMER ABBOVE ACCESIBLE CEILING. MOUNT FROM STRUCTURE IN SUBSTANTIAL MANNER.
⑳ MOUNT DUPLEX RECEPTACLE IN TELEVISION ALCOVE AS DIRECTED BY ARCHITECT.
㉑ PROVIDE AND INSTALL 240V. 1Ø 30A. WELDER OUTLET. COORDINATE WITH CITY ON OUTLET CONFIGURATION AND INSTALL COMPLETE.
FIRST FLOOR POWER PLAN
1/8"=1'-0"
METER BASE SEMI RECESSED
EMERGENCY PANEL EP
PANEL SDP-A
PANEL SDP-B
PANEL HVAC
AUTOMATIC TRANSFER SWITCH #1
AUTOMATIC TRANSFER SWITCH #2
TRANSFORMER
KEYED INTERLOCK PANEL
UPS OUTPUT PANEL
UPS
PANEL 2MB
TRANSFORMER 2MB
PANEL 2MB
PANEL 2A
TRANSFORMER 2A
PANEL 4A
TRANSFORMER 240V.
PANEL 240V
WELDER
WASHER
DRYER
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING MILWAUKIE, OREGON
FIRST FLOOR POWER PLAN
APR 15, 1992
DATE: 4/15/92
DRAWN BY: GAH
CHECKED BY: HLB
REVISIONS:
SHEET E2.2
OF
JOB NO. 91-316
PROJECT NO.: 91-316
INTERFACE ENGINEERING INC. Consulting Engineers
PERMIT SET - April 15, 1992
A2-1 03/31/92 16:16


SIGNAL SYSTEM SYMBOL SCHEDULE
NOTES THIS SHEET
FIRST FLOOR SIGNAL PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
FIRST FLOOR SIGNAL PLAN
E2.3
291451


CONSTRUCTION SET - June 19, 1992
NOTES THIS SHEET
① MOUNT FIXTURE AT 8 INCHES ABOVE FINISHED FLOOR.
② COLD CATHODE LIGHTING WITH REMOTE BALLAST. VERIFY EXACT LOCATION WITH ARCHITECTURAL. PROVIDE CONNECTION TO LAMPS AND BALLAST WITH MOLEX TERMINAL CONNECTORS.
③ MAKE CONNECTION VIA TAP-OUT SYSTEM. SEE TAP-OUT DETAIL.
④ PROVIDE AND INSTALL JUNCTION BOX FOR FUTURE EXPANSION OF DORMITORY ROOMS WITH TYPE "AA" & "CC" LIGHT FIXTURES.
⑤ VERIFY EXACT LOCATION WITH ARCHITECTURAL.
⑥ LIGHT FIXTURE AND SWITCH TO BE MOUNTED ON OWNER PROVIDED CABINETRY. COORDINATE EXACT LOCATIONS WITH OWNER.
⑦ PROVIDE 0° BALLAST ON TYPE "M" FIXTURES AT THIS LOCATION ONLY.
⑧ CENTER LAMP OF FIXTURE TO BE CONTROLLED VIA 3 WAY SWITCH.
⑨ ROUTE VIA EXTERIOR LIGHTING CONTROL.
2 RE-17 E24 6-5-92
SECOND FLOOR LIGHTING PLAN
1/8" = 1'-0"
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
SECOND FLOOR LIGHTING PLAN
DATE: 4/15/92
DRAWN BY: LAH
CHECKED BY: HLB
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992
PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers
SHEET
E2.4
JOB NO.
91-316
A
B
C
D
E
F
G
H
J
K
1
2
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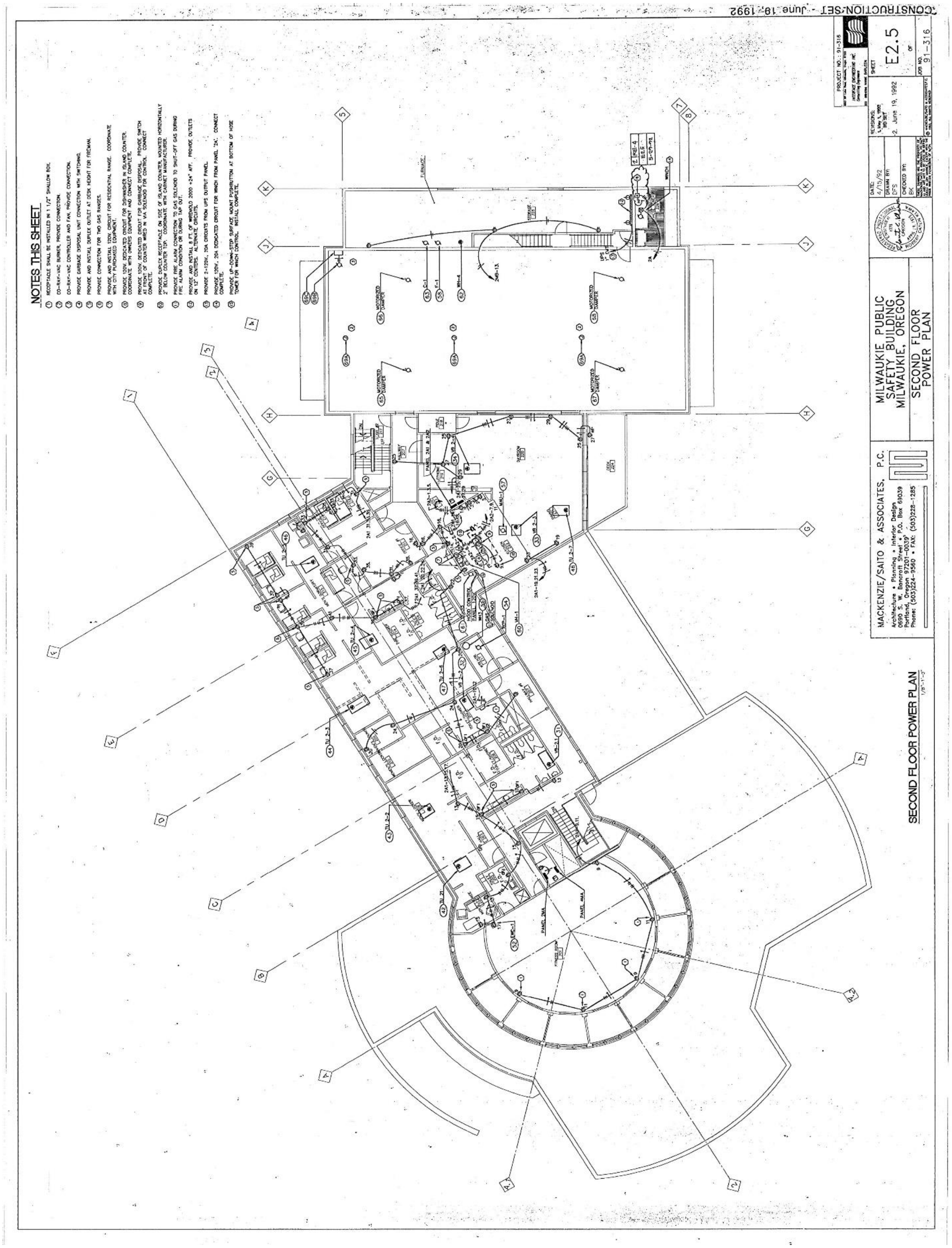
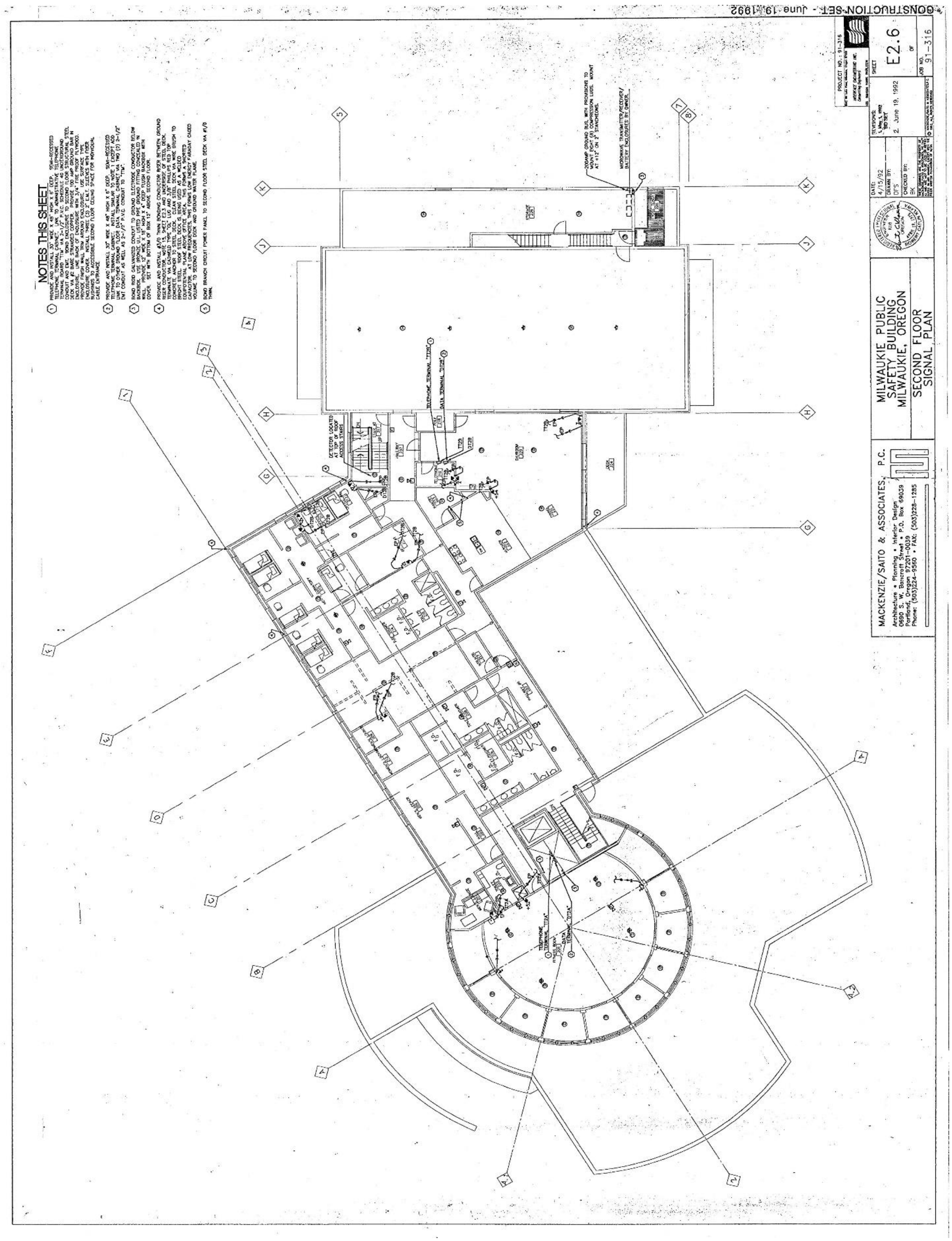
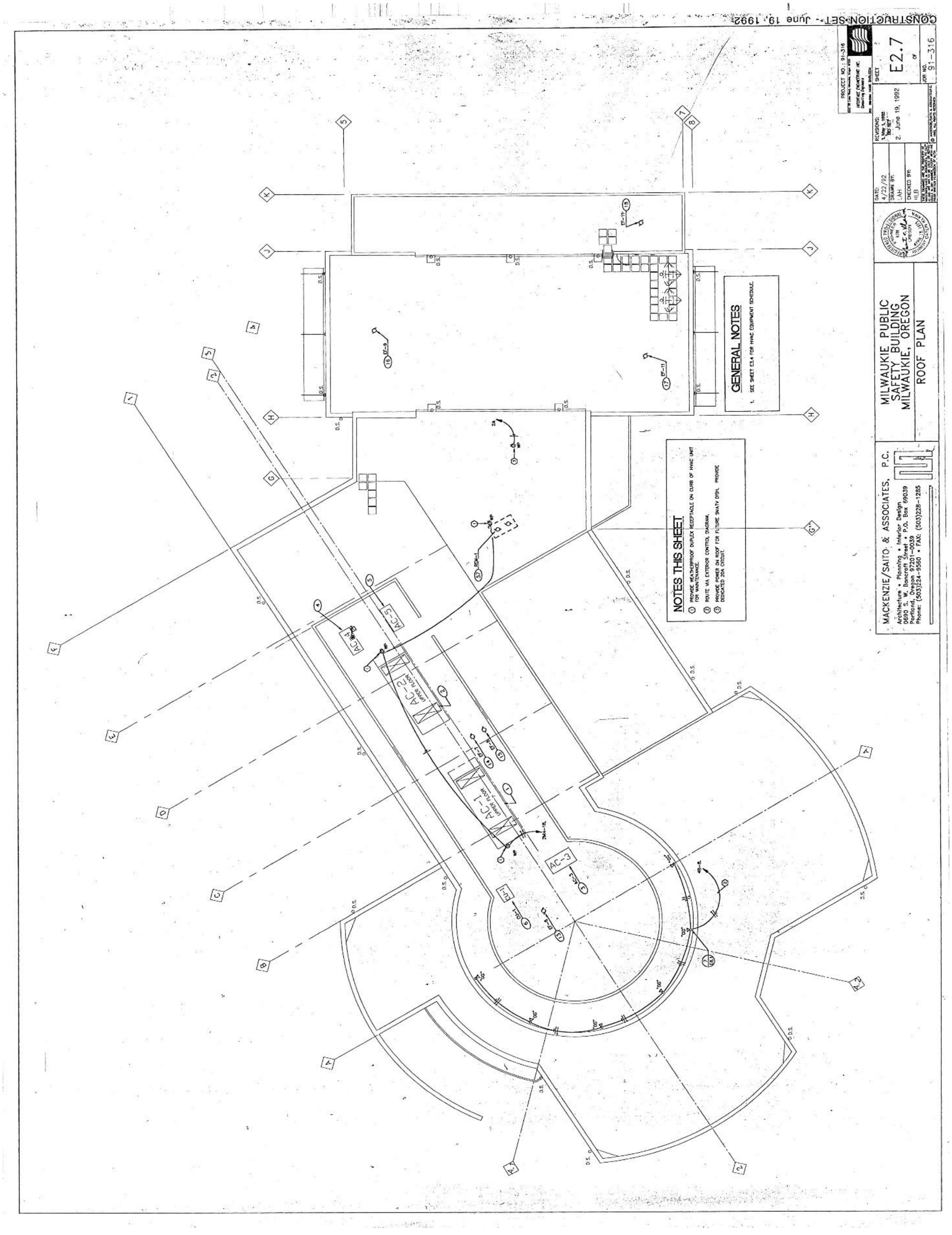
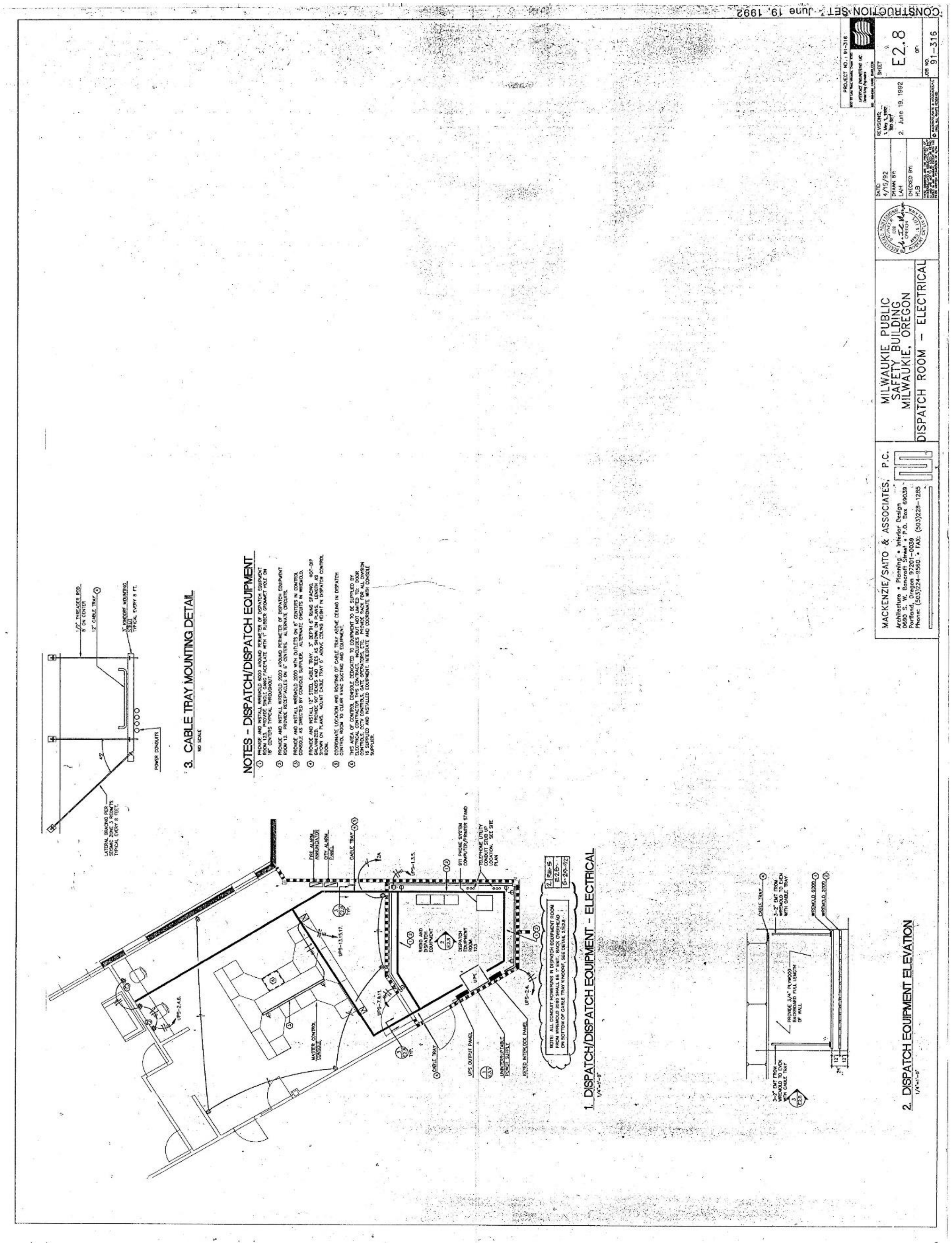
8


CONSTRUCTION SET - June 19, 1992
NOTES THIS SHEET
MILWAUKIE PUBLIC SAFETY BUILDING MILWAUKIE, OREGON
SECOND FLOOR POWER PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
SECOND FLOOR POWER PLAN
1/8"=1'-0"
E2.5
PROJECT NO. 91-316
JOB NO. 91-316


CONSTRUCTION SET - June 19, 1992
NOTES THIS SHEET
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
SECOND FLOOR SIGNAL PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
E2.6
91-316
DETECTOR LOCATED AT TOP OF ROOF ACCESS STAIRS
TELEPHONE TERMINAL "TT2A"
DATA TERMINAL "DT2A"


CONSTRUCTION SET -- June 19, 1992
PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers
SHEET
E2.7
OF
JOB NO.
91-316
REVISIONS:
1. May 1, 1992 "BID SET"
2. June 19, 1992
DATE:
4/22/92
DRAWN BY:
LAH
CHECKED BY:
HLB
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
ROOF PLAN
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
GENERAL NOTES
1. SEE SHEET E3.4 FOR HVAC EQUIPMENT SCHEDULE.
NOTES THIS SHEET
① PROVIDE WEATHERPROOF DUPLEX RECEPTACLE ON CURB OF HVAC UNIT FOR MAINTENANCE.
② ROUTE VIA EXTERIOR CONTROL DIAGRAM.
③ PROVIDE POWER ON ROOF FOR FUTURE SWATV DISH. PROVIDE DEDICATED 20A CIRCUIT.
AC-1
AC-2
AC-3
AC-4
AC-5
EF-9
EF-11
D.S.
K
J
H
G
G''
5
8
7
1
2
3



NOTES - DISPATCH/DISPATCH EQUIPMENT

① PROVIDE AND INSTALL WIREMOLD 6000 AROUND PERIMETER OF DISPATCH EQUIPMENT ROOM 123. PROVIDE SINGLE GANG FACEPLATE WITH 1" RUBBER GROMMET HOLE ON 18" CENTERS TYPICAL THROUGHOUT.

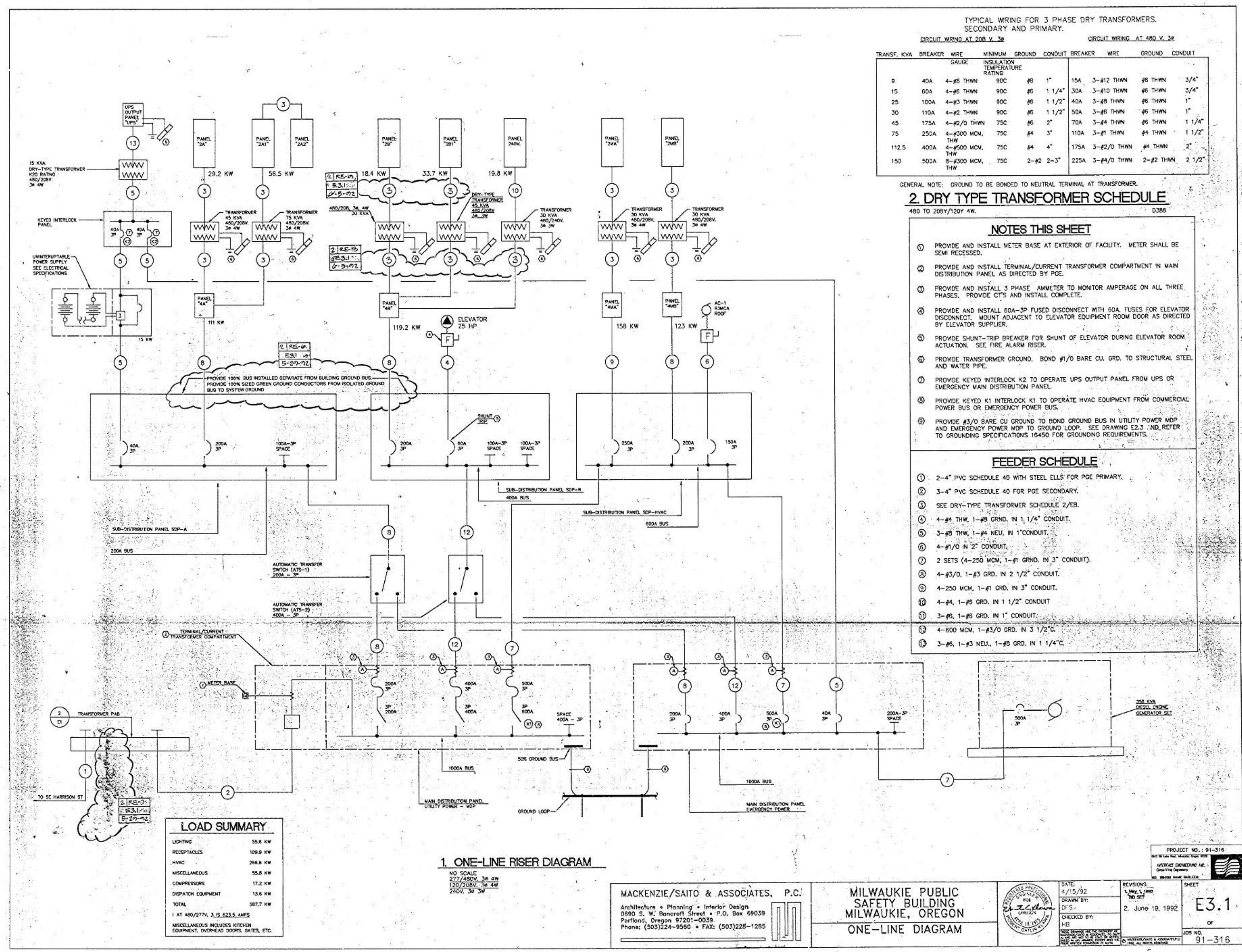
② PROVIDE AND INSTALL WIREMOLD 2000 AROUND PERIMETER OF DISPATCH EQUIPMENT ROOM 12. PROVIDE RECEPTACLES ON 6" CENTERS. ALTERNATE CIRCUITS.

③ PROVIDE AND INSTALL WIREMOLD 2000 WITH OUTLETS ON 6" CENTERS IN CONTROL CONSOLE AS DIRECTED BY CONSOLE SUPPLIER. ALTERNATE CIRCUITS IN WIREMOLD.

④ PROVIDE AND INSTALL 12" STEEL CABLE TRAY. 3" DEPTH 6" RUNG SPACING. HOT-DIP GALVANIZED. PROVIDE 90° BENDS AND TEES AS SHOWN ON PLANS. LENGTH AS SHOWN ON PLANS. MOUNT CABLE TRAY 6" ABOVE CEILING HEIGHT IN DISPATCH CONTROL ROOM.

⑤ COORDINATE LOCATION AND ROUTING OF CABLE TRAY ABOVE CEILING IN DISPATCH CONTROL ROOM TO CLEAR HVAC DUCTING AND EQUIPMENT.

⑥ THIS AREA OF CONTROL CONSOLE DEDICATED TO EQUIPMENT TO BE SUPPLIED BY ELECTRICAL CONTRACTOR THIS CONTRACT. INCLUDES BUT NOT LIMITED TO: DOOR CONTROLS, CCTV CONTROLS, GATE OPERATORS, ETC. PROVIDE RACK FOR ALL DIVISION 15 SUPPLIED AND INSTALLED EQUIPMENT. INTEGRATE AND COORDINATE WITH CONSOLE SUPPLIER.



TYPICAL WIRING FOR 3 PHASE DRY TRANSFORMERS.
SECONDARY AND PRIMARY.

	CIRCUIT WIRING AT 208 V. 3ø					CIRCUIT WIRING AT 480 V. 3ø			
TRANSF. KVA	BREAKER	WIRE GAUGE	MINIMUM INSULATION TEMPERATURE RATING	GROUND	CONDUIT	BREAKER	WIRE	GROUND	CONDUIT
9	40A	4-#8 THWN	90C	#8	1"	15A	3-#12 THWN	#8 THWN	3/4"
15	60A	4-#6 THWN	90C	#6	1 1/4"	30A	3-#10 THWN	#6 THWN	3/4"
25	100A	4-#3 THWN	90C	#6	1 1/2"	40A	3-#8 THWN	#6 THWN	1"
30	110A	4-#2 THWN	90C	#6	1 1/2"	50A	3-#6 THWN	#6 THWN	1"
45	175A	4-#2/0 THWN	75C	#6	2"	70A	3-#4 THWN	#6 THWN	1 1/4"
75	250A	4-#300 MCM, THW	75C	#4	3"	110A	3-#1 THWN	#4 THWN	1 1/2"
112.5	400A	4-#500 MCM, THW	75C	#4	4"	175A	3-#2/0 THWN	#4 THWN	2"
150	500A	8-#300 MCM, THW	75C	2-#2	2-3"	225A	3-#4/0 THWN	2-#2 THWN	2 1/2"

GENERAL NOTE: GROUND TO BE BONDED TO NEUTRAL TERMINAL AT TRANSFORMER.

2. DRY TYPE TRANSFORMER SCHEDULE

480 TO 208Y/120Y 4W. D386

NOTES THIS SHEET

① PROVIDE AND INSTALL METER BASE AT EXTERIOR OF FACILITY. METER SHALL BE SEMI RECESSED.

② PROVIDE AND INSTALL TERMINAL/CURRENT TRANSFORMER COMPARTMENT IN MAIN DISTRIBUTION PANEL AS DIRECTED BY PGE.

③ PROVIDE AND INSTALL 3 PHASE AMMETER TO MONITOR AMPERAGE ON ALL THREE PHASES. PROVIDE CT'S AND INSTALL COMPLETE.

④ PROVIDE AND INSTALL 60A-3P FUSED DISCONNECT WITH 60A. FUSES FOR ELEVATOR DISCONNECT. MOUNT ADJACENT TO ELEVATOR EQUIPMENT ROOM DOOR AS DIRECTED BY ELEVATOR SUPPLIER.

⑤ PROVIDE SHUNT-TRIP BREAKER FOR SHUNT OF ELEVATOR DURING ELEVATOR ROOM ACTUATION. SEE FIRE ALARM RISER.

⑥ PROVIDE TRANSFORMER GROUND. BOND #1/0 BARE CU. GRD. TO STRUCTURAL STEEL AND WATER PIPE.

⑦ PROVIDE KEYED INTERLOCK K2 TO OPERATE UPS OUTPUT PANEL FROM UPS OR EMERGENCY MAIN DISTRIBUTION PANEL.

⑧ PROVIDE KEYED K1 INTERLOCK K1 TO OPERATE HVAC EQUIPMENT FROM COMMERCIAL POWER BUS OR EMERGENCY POWER BUS.

⑨ PROVIDE #3/0 BARE CU GROUND TO BOND GROUND BUS IN UTILITY POWER MDP AND EMERGENCY POWER MDP TO GROUND LOOP. SEE DRAWING E2.3 AND REFER TO GROUNDING SPECIFICATIONS 16450 FOR GROUNDING REQUIREMENTS.

FEEDER SCHEDULE

① 2-4" PVC SCHEDULE 40 WITH STEEL ELLS FOR PGE PRIMARY.
② 3-4" PVC SCHEDULE 40 FOR PGE SECONDARY.
③ SEE DRY-TYPE TRANSFORMER SCHEDULE 2/E8.
④ 4-#4 THW, 1-#8 GRND. IN 1 1/4" CONDUIT.
⑤ 3-#8 THW, 1-#4 NEU. IN 1"CONDUIT.
⑥ 4-#1/0 IN 2" CONDUIT.
⑦ 2 SETS (4-250 MCM, 1-#1 GRND. IN 3" CONDUIT).
⑧ 4-#3/0, 1-#3 GRD. IN 2 1/2" CONDUIT.
⑨ 4-250 MCM, 1-#1 GRD. IN 3" CONDUIT.
⑩ 4-#4, 1-#6 GRD. IN 1 1/2" CONDUIT
⑪ 3-#6, 1-#6 GRD. IN 1" CONDUIT.
⑫ 4-600 MCM, 1-#3/0 GRD. IN 3 1/2"C.
⑬ 3-#6, 1-#3 NEU., 1-#8 GRD. IN 1 1/4"C.

LOAD SUMMARY

LIGHTING	55.6 KW
RECEPTACLES	109.9 KW
HVAC	266.6 KW
MISCELLANEOUS	55.8 KW
COMPRESSORS	17.2 KW
DISPATCH EQUIPMENT	13.6 KW
TOTAL	587.7 KW

I AT 480/277V, 3 IS 623.5 AMPS

MISCELLANEOUS INCLUDES KITCHEN EQUIPMENT, OVERHEAD DOORS, GATES, ETC.

1. ONE-LINE RISER DIAGRAM

NO SCALE
277/480V, 3ø 4W
120/208V, 3ø 4W
240V, 3ø 3W

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Phone: (503)224-9560 • FAX: (503)228-1285

MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON
ONE-LINE DIAGRAM

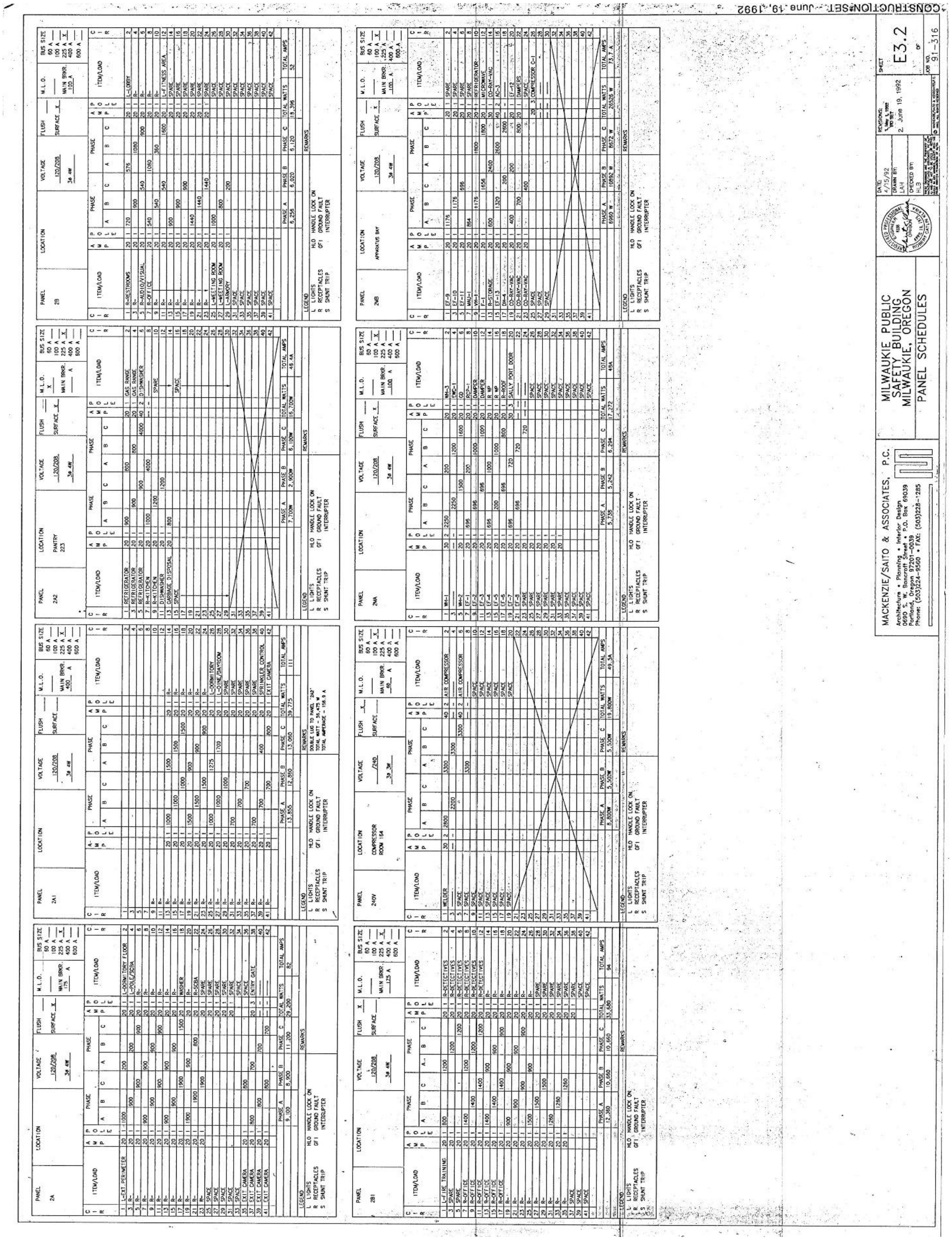
DATE: 4/15/92
DRAWN BY: DFS
CHECKED BY: HB

REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET E3.1 OF
JOB NO. 91-316

PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.

CONSTRUCTION SET – June 19, 1992


CONSTRUCTION SET - June 19, 1992
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
PANEL SCHEDULES
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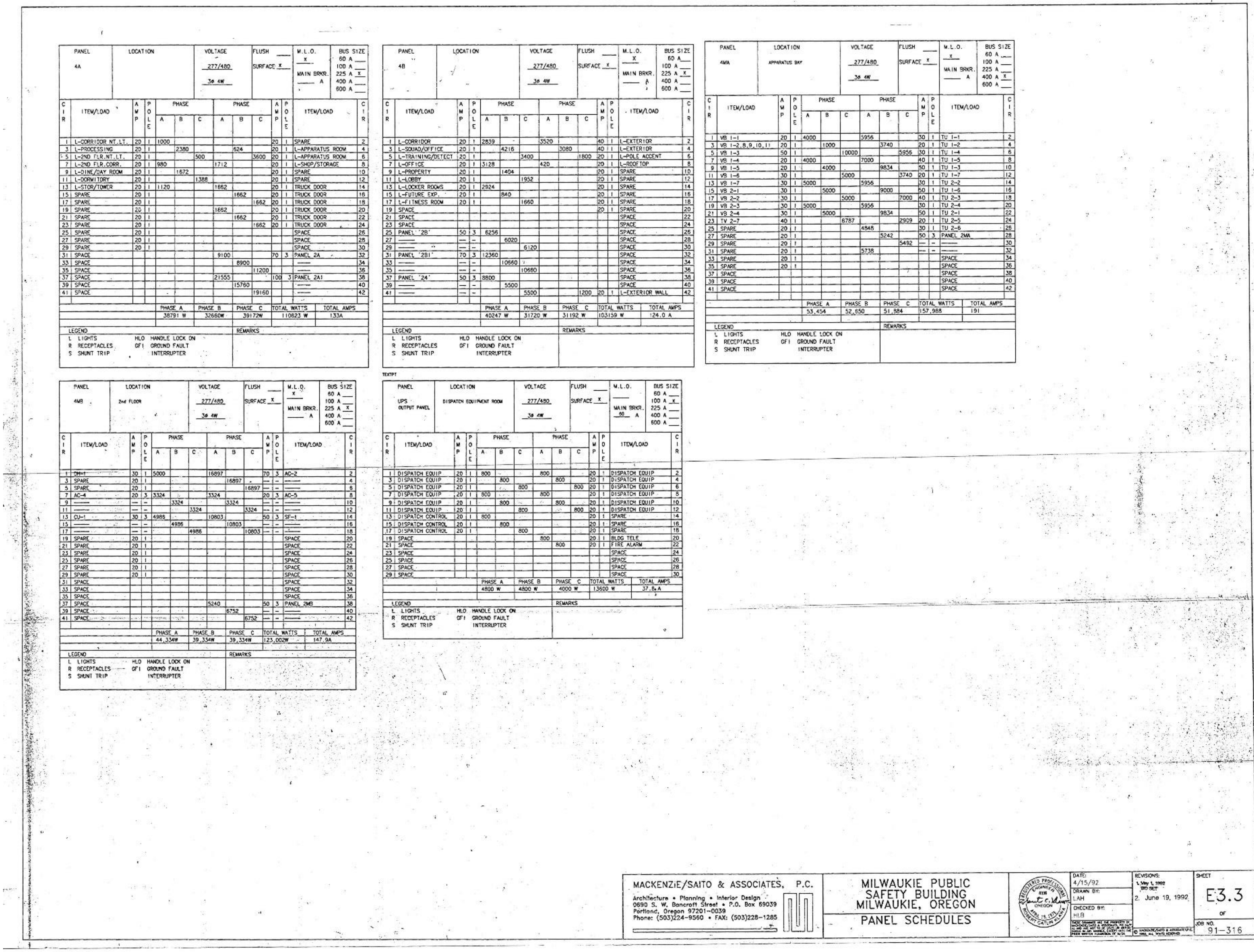
Phone: (503)224-9560 • FAX: (503)228-1285
E3.2
91-316
PANEL 2B
PANEL 242
PANEL 2A1
PANEL 2A
PANEL 2WB
PANEL 2WA
PANEL 240V
PANEL 2B1



PANEL	LOCATION	VOLTAGE	FLUSH / SURFACE	M.L.O.	BUS SIZE
4A		277/480 3ø 4W	FLUSH ___ SURFACE X	M.L.O. X MAIN BRKR. ___ A	60 A ___ 100 A ___ 225 A X 400 A ___ 600 A ___

CIR	ITEM/LOAD	AMP	POLE	PHASE			PHASE			AMP	POLE	ITEM/LOAD	CIR
				A	B	C	A	B	C				
1	L-CORRIDOR NT.LT.	20	1	1000						20	1	SPARE	2
3	L-PROCESSING	20	1		2380			624		20	1	L-APPARATUS ROOM	4
5	L-2ND FLR.NT.LT.	20	1			500			3600	20	1	L-APPARATUS ROOM	6
7	L-2ND FLR.CORR.	20	1	980			1712			20	1	L-SHOP/STORAGE	8
9	L-DINE/DAY ROOM	20	1		1672					20	1	SPARE	10
11	L-DORMITORY	20	1			1388				20	1	SPARE	12
13	L-STOR/TOWER	20	1	1120			1662			20	1	TRUCK DOOR	14
15	SPARE	20	1					1662		20	1	TRUCK DOOR	16
17	SPARE	20	1						1662	20	1	TRUCK DOOR	18
19	SPARE	20	1				1662			20	1	TRUCK DOOR	20
21	SPARE	20	1					1662		20	1	TRUCK DOOR	22
23	SPARE	20	1						1662	20	1	TRUCK DOOR	24
25	SPARE	20	1									SPACE	26
27	SPARE	20	1									SPACE	28
29	SPARE	20	1									SPACE	30
31	SPACE						9100			70	3	PANEL 2A	32
33	SPACE							8900				——	34
35	SPACE								11200			——	36
37	SPACE						21555			100	3	PANEL 2A1	38
39	SPACE							15760				——	40
41	SPACE								19160			——	42

PHASE A	PHASE B	PHASE C	TOTAL WATTS	TOTAL AMPS
38791 W	32660W	39172W	110623 W	133A

LEGEND
L LIGHTS HLO HANDLE LOCK ON
R RECEPTACLES GFI GROUND FAULT INTERRUPTER
S SHUNT TRIP

REMARKS

PANEL	LOCATION	VOLTAGE	FLUSH / SURFACE	M.L.O.	BUS SIZE
4B		277/480 3ø 4W	FLUSH ___ SURFACE X	M.L.O. X MAIN BRKR. ___ A	60 A ___ 100 A ___ 225 A X 400 A ___ 600 A ___

CIR	ITEM/LOAD	AMP	POLE	PHASE			PHASE			AMP	POLE	ITEM/LOAD	CIR
				A	B	C	A	B	C				
1	L-CORRIDOR	20	1	2839			3520			40	1	L-EXTERIOR	2
3	L-SQUAD/OFFICE	20	1		4216			3080		40	1	L-EXTERIOR	4
5	L-TRAINING/DETECT	20	1			3400			1800	20	1	L-POLE ACCENT	6
7	L-OFFICE	20	1	3128			420			20	1	L-ROOFTOP	8
9	L-PROPERTY	20	1		1404					20	1	SPARE	10
11	L-LOBBY	20	1			1952				20	1	SPARE	12
13	L-LOCKER ROOMS	20	1	2924						20	1	SPARE	14
15	L-FUTURE EXP.	20	1		840					20	1	SPARE	16
17	L-FITNESS ROOM	20	1			1660				20	1	SPARE	18
19	SPACE									20	1	SPARE	20
21	SPACE											SPACE	22
23	SPACE											SPACE	24
25	PANEL '2B'	50	3	6256								SPACE	26
27	——	—	–		6020							SPACE	28
29	——	—	–			6120						SPACE	30
31	PANEL '2B1'	70	3	12360								SPACE	32
33	——	—	–		10660							SPACE	34
35	——	—	–			10660						SPACE	36
37	PANEL '24'	50	3	8800								SPACE	38
39	——	—	–		5500							SPACE	40
41	——	—	–			5500			1200	20	1	L-EXTERIOR WALL	42

PHASE A	PHASE B	PHASE C	TOTAL WATTS	TOTAL AMPS
40247 W	31720 W	31192 W	103159 W	124.0 A

LEGEND
L LIGHTS HLO HANDLE LOCK ON
R RECEPTACLES GFI GROUND FAULT INTERRUPTER
S SHUNT TRIP

REMARKS

PANEL	LOCATION	VOLTAGE	FLUSH / SURFACE	M.L.O.	BUS SIZE
4MA	APPARATUS BAY	277/480 3ø 4W	FLUSH ___ SURFACE X	M.L.O. X MAIN BRKR. ___ A	60 A ___ 100 A ___ 225 A ___ 400 A X 600 A ___

CIR	ITEM/LOAD	AMP	POLE	PHASE			PHASE			AMP	POLE	ITEM/LOAD	CIR
				A	B	C	A	B	C				
1	VB 1-1	20	1	4000			5956			30	1	TU 1-1	2
3	VB 1-2,8,9,10,11	20	1		1000			3740		20	1	TU 1-2	4
5	VB 1-3	50	1			10000			5956	30	1	TU 1-4	6
7	VB 1-4	20	1	4000			7000			40	1	TU 1-5	8
9	VB 1-5	20	1		4000			9834		50	1	TU 1-3	10
11	VB 1-6	30	1			5000			3740	20	1	TU 1-7	12
13	VB 1-7	30	1	5000			5956			30	1	TU 2-2	14
15	VB 2-1	30	1		5000			9000		50	1	TU 1-6	16
17	VB 2-2	30	1			5000			7000	40	1	TU 2-3	18
19	VB 2-3	30	1	5000			5956			30	1	TU 2-4	20
21	VB 2-4	30	1		5000			9834		50	1	TU 2-1	22
23	TV 2-7	40	1			6787			2909	20	1	TU 2-5	24
25	SPARE	20	1				4848			30	1	TU 2-6	26
27	SPARE	20	1					5242		50	3	PANEL 2MA	28
29	SPARE	20	1						5492	—	–	——	30
31	SPARE	20	1				5738			—	–	——	32
33	SPARE	20	1									SPACE	34
35	SPARE	20	1									SPACE	36
37	SPACE											SPACE	38
39	SPACE											SPACE	40
41	SPACE											SPACE	42

PHASE A	PHASE B	PHASE C	TOTAL WATTS	TOTAL AMPS
53,454	52,650	51,884	157,988	191

LEGEND
L LIGHTS HLO HANDLE LOCK ON
R RECEPTACLES GFI GROUND FAULT INTERRUPTER
S SHUNT TRIP

REMARKS

PANEL	LOCATION	VOLTAGE	FLUSH / SURFACE	M.L.O.	BUS SIZE
4MB	2nd FLOOR	277/480 3ø 4W	FLUSH ___ SURFACE X	M.L.O. X MAIN BRKR. ___ A	60 A ___ 100 A ___ 225 A X 400 A ___ 600 A ___

CIR	ITEM/LOAD	AMP	POLE	PHASE			PHASE			AMP	POLE	ITEM/LOAD	CIR
				A	B	C	A	B	C				
1	DM-1	30	1	5000			16897			70	3	AC-2	2
3	SPARE	20	1					16897		—	–	——	4
5	SPARE	20	1						16897	—	–	——	6
7	AC-4	20	3	3324			3324			20	3	AC-5	8
9	——	—	–		3324			3324		—	–	——	10
11	——	—	–			3324			3324	—	–	——	12
13	CU-1	30	3	4986			10803			50	3	SF-1	14
15	——	—	–		4986			10803		—	–	——	16
17	——	—	–			4986			10803	—	–	——	18
19	SPARE	20	1									SPACE	20
21	SPARE	20	1									SPACE	22
23	SPARE	20	1									SPACE	24
25	SPARE	20	1									SPACE	26
27	SPARE	20	1									SPACE	28
29	SPARE	20	1									SPACE	30
31	SPACE											SPACE	32
33	SPACE											SPACE	34
35	SPACE											SPACE	36
37	SPACE						5240			50	3	PANEL 2MB	38
39	SPACE							6752		—	–	——	40
41	SPACE								6752	—	–	——	42

PHASE A	PHASE B	PHASE C	TOTAL WATTS	TOTAL AMPS
44,334W	39,334W	39,334W	123,002W	147.9A

LEGEND
L LIGHTS HLO HANDLE LOCK ON
R RECEPTACLES GFI GROUND FAULT INTERRUPTER
S SHUNT TRIP

REMARKS

TEXTPT

PANEL	LOCATION	VOLTAGE	FLUSH / SURFACE	M.L.O.	BUS SIZE
UPS OUTPUT PANEL	DISPATCH EQUIPMENT ROOM	277/480 3ø 4W	FLUSH ___ SURFACE X	M.L.O. ___ MAIN BRKR. 60 A	60 A ___ 100 A X 225 A ___ 400 A ___ 600 A ___

CIR	ITEM/LOAD	AMP	POLE	PHASE			PHASE			AMP	POLE	ITEM/LOAD	CIR
				A	B	C	A	B	C				
1	DISPATCH EQUIP	20	1	800			800			20	1	DISPATCH EQUIP	2
3	DISPATCH EQUIP	20	1		800			800		20	1	DISPATCH EQUIP	4
5	DISPATCH EQUIP	20	1			800			800	20	1	DISPATCH EQUIP	6
7	DISPATCH EQUIP	20	1	800			800			20	1	DISPATCH EQUIP	8
9	DISPATCH EQUIP	20	1		800			800		20	1	DISPATCH EQUIP	10
11	DISPATCH EQUIP	20	1			800			800	20	1	DISPATCH EQUIP	12
13	DISPATCH CONTROL	20	1	800						20	1	SPARE	14
15	DISPATCH CONTROL	20	1		800					20	1	SPARE	16
17	DISPATCH CONTROL	20	1			800				20	1	SPARE	18
19	SPACE						800			20	1	BLDG TELE	20
21	SPACE							800		20	1	FIRE ALARM	22
23	SPACE											SPACE	24
25	SPACE											SPACE	26
27	SPACE											SPACE	28
29	SPACE											SPACE	30

PHASE A	PHASE B	PHASE C	TOTAL WATTS	TOTAL AMPS
4800 W	4800 W	4000 W	13600 W	37.8 A

LEGEND
L LIGHTS HLO HANDLE LOCK ON
R RECEPTACLES GFI GROUND FAULT INTERRUPTER
S SHUNT TRIP

REMARKS

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MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

PANEL SCHEDULES

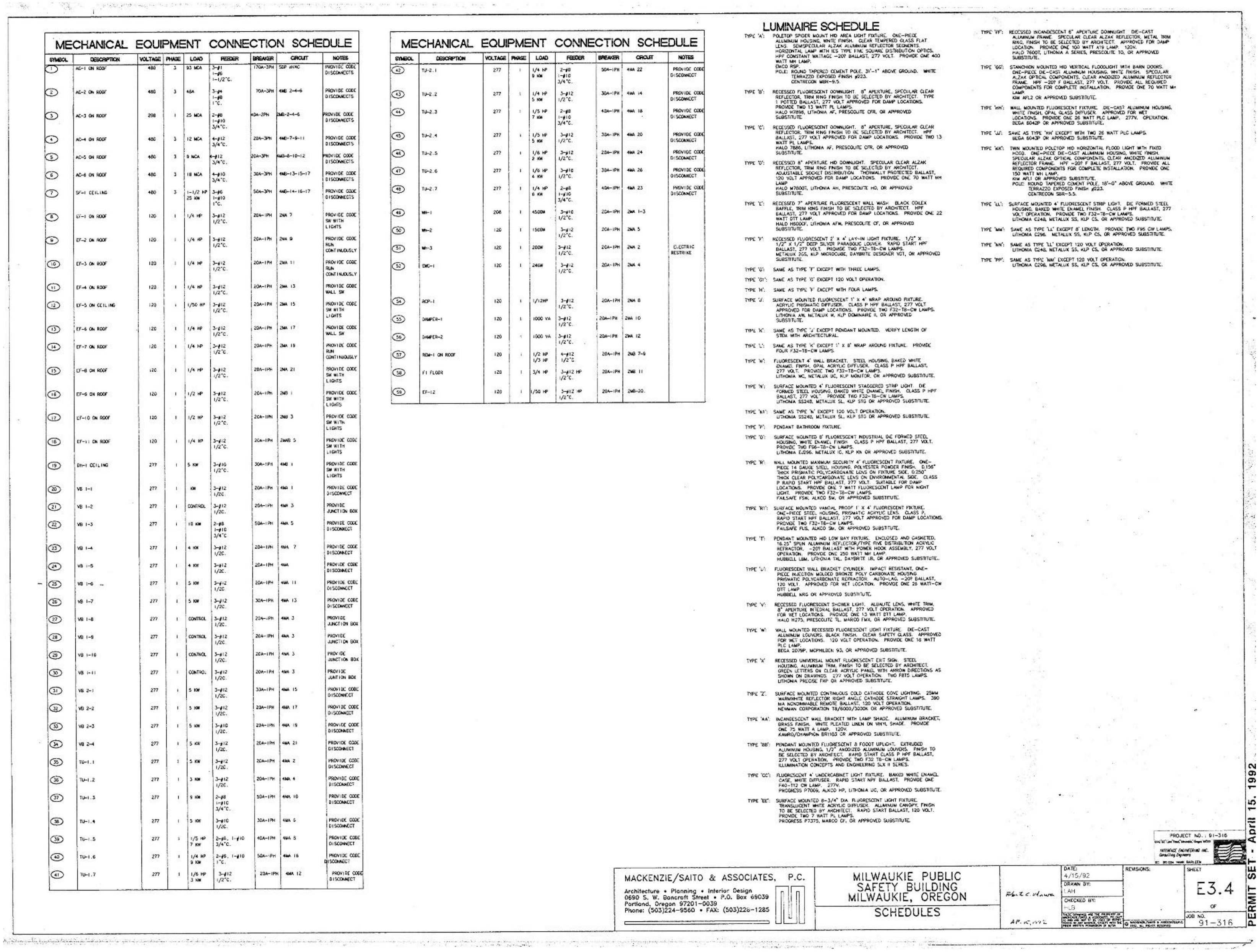
ROBERT CATLIN KLAWA

DATE: 4/15/92
DRAWN BY: LAH
CHECKED BY: HLB

REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET E3.3 OF
JOB NO. 91-316

CONSTRUCTION SET - June 19, 1992



MECHANICAL EQUIPMENT CONNECTION SCHEDULE

SYMBOL	DESCRIPTION	VOLTAGE	PHASE	LOAD	FEEDER	BREAKER	CIRCUIT	NOTES
①	AC-1 ON ROOF	480	3	93 MCA	3-#1 1-#6 1-1/2"C.	170A-3PH	SDP HVAC	PROVIDE CODE DISCONNECTS
②	AC-2 ON ROOF	480	3	48A	3-#4 1-#8 1"C.	70A-3PH	4MB 2-4-6	PROVIDE CODE DISCONNECTS
③	AC-3 ON ROOF	208	1	25 MCA	2-#8 1-#10 3/4"C.	40A-2PH	2MB-2-4-6	PROVIDE CODE DISCONNECTS
④	AC-4 ON ROOF	480	3	12 MCA	4-#12 3/4"C.	20A-3PH	4MB-7-9-11	PROVIDE CODE DISCONNECTS
⑤	AC-5 ON ROOF	480	3	9 MCA	4-#12 3/4"C.	20A-3PH	4MB-8-10-12	PROVIDE CODE DISCONNECTS
⑥	AC-6 ON ROOF	480	3	18 MCA	4-#10 3/4"C.	30A-3PH	4MB-13-15-17	PROVIDE CODE DISCONNECTS
⑦	SF-1 CEILING	480	3	1-1/2 HP 25 KW	3-#6 1-#10 1"C.	50A-3PH	4MB-14-16-17	PROVIDE CODE DISCONNECTS
⑧	EF-1 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 7	PROVIDE CODE SW WITH LIGHTS
⑨	EF-2 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 9	PROVIDE CODE RUN CONTINUOUSLY
⑩	EF-3 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 11	PROVIDE CODE RUN CONTINUOUSLY
⑪	EF-4 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 13	PROVIDE CODE WALL SW
⑫	EF-5 ON CEILING	120	1	1/50 HP	3-#12 1/2"C.	20A-1PH	2MA 15	PROVIDE CODE SW WITH LIGHTS
⑬	EF-6 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 17	PROVIDE CODE WALL SW
⑭	EF-7 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 19	PROVIDE CODE RUN CONTINUOUSLY
⑮	EF-8 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MA 21	PROVIDE CODE SW WITH LIGHTS
⑯	EF-9 ON ROOF	120	1	1/2 HP	3-#12 1/2"C.	20A-1PH	2MB 1	PROVIDE CODE SW WITH LIGHTS
⑰	EF-10 ON ROOF	120	1	1/2 HP	3-#12 1/2"C.	20A-1PH	2MB 3	PROVIDE CODE SW WITH LIGHTS
⑱	EF-11 ON ROOF	120	1	1/4 HP	3-#12 1/2"C.	20A-1PH	2MAB 5	PROVIDE CODE SW WITH LIGHTS
⑲	DH-1 CEILING	277	1	5 KW	3-#10 1/2"C.	30A-1PH	4MB 1	PROVIDE CODE SW WITH LIGHTS
⑳	VB 1-1	277	1	KW	3-#12 1/2C.	20A-1PH	4MA 1	PROVIDE CODE DISCONNECT
㉑	VB 1-2	277	1	CONTROL	3-#12 1/2C.	20A-1PH	4MA 3	PROVIDE JUNCTION BOX
㉒	VB 1-3	277	1	10 KW	2-#8 1-#10 3/4"C	50A-1PH	4MA 5	PROVIDE CODE DISCONNECT
㉓	VB 1-4	277	1	4 KW	3-#12 1/2C.	20A-1PH	4MA 7	PROVIDE CODE DISCONNECT
㉔	VB 1-5	277	1	4 KW	3-#12 1/2C.	20A-1PH	4MA	PROVIDE CODE DISCONNECT
㉕	VB 1-6	277	1	5 KW	3-#12 1/2C.	20A-1PH	4MA 11	PROVIDE CODE DISCONNECT
㉖	VB 1-7	277	1	5 KW	3-#12 1/2C.	30A-1PH	4MA 13	PROVIDE CODE DISCONNECT
㉗	VB 1-8	277	1	CONTROL	3-#12 1/2C.	20A-1PH	4MA 3	PROVIDE JUNCTION BOX
㉘	VB 1-9	277	1	CONTROL	3-#12 1/2C.	20A-1PH	4MA 3	PROVIDE JUNCTION BOX
㉙	VB 1-10	277	1	CONTROL	3-#12 1/2C.	20A-1PH	4MA 3	PROVIDE JUNCTION BOX
㉚	VB 1-11	277	1	CONTROL	3-#12 1/2C.	20A-1PH	4MA 3	PROVIDE JUNTION BOX
㉛	VB 2-1	277	1	5 KW	3-#12 1/2C.	30A-1PH	4MA 15	PROVIDE CODE DISCONNECT
㉜	VB 2-2	277	1	5 KW	3-#12 1/2C.	20A-1PH	4MA 17	PROVIDE CODE DISCONNECT
㉝	VB 2-3	277	1	5 KW	3-#10 1/2C.	20A-1PH	4MA 19	PROVIDE CODE DISCONNECT
㉞	VB 2-4	277	1	5 KW	3-#12 1/2C.	20A-1PH	4MA 21	PROVIDE CODE DISCONNECT
㉟	TU-1.1	277	1	5 KW	3-#12 1/2C.	20A-1PH	4MA 2	PROVIDE CODE DISCONNECT
㊱	TU-1.2	277	1	3 KW	3-#12 1/2C.	20A-1PH	4MA 4	PROVIDE CODE DISCONNECT
㊲	TU-1.3	277	1	9 KW	2-#8 1-#10 3/4"C.	50A-1PH	4MA 10	PROVIDE CODE DISCONNECT
㊳	TU-1.4	277	1	5 KW	3-#10 1/2C.	30A-1PH	4MA 6	PROVIDE CODE DISCONNECT
㊴	TU-1.5	277	1	1/5 HP 7 KW	2-#8, 1-#10 3/4"C.	40A-1PH	4MA 8	PROVIDE CODE DISCONNECT
㊵	TU-1.6	277	1	1/4 HP 9 KW	2-#6, 1-#10 1"C.	50A-1PH	4MA 16	PROVIDE CODE DISCONNECT
㊶	TU-1.7	277	1	1/6 HP 3 KW	3-#12 1/2"C.	20A-1PH	4MA 12	PROVIDE CODE DISCONNECT

MECHANICAL EQUIPMENT CONNECTION SCHEDULE

SYMBOL	DESCRIPTION	VOLTAGE	PHASE	LOAD	FEEDER	BREAKER	CIRCUIT	NOTES
㊷	TU-2.1	277	1	1/4 HP 9 KW	2-#8 1-#10 3/4"C.	50A-1PH	4MA 22	PROVIDE CODE DISCONNECT
㊸	TU-2.2	277	1	1/4 HP 5 KW	3-#12 1/2"C.	30A-1PH	4MA 14	PROVIDE CODE DISCONNECT
㊹	TU-2.3	277	1	1/5 HP 7 KW	2-#8 1-#10 3/4"C.	40A-1PH	4MA 18	PROVIDE CODE DISCONNECT
㊺	TU-2.4	277	1	1/5 HP 5 KW	3-#12 1/2"C.	30A-1PH	4MA 20	PROVIDE CODE DISCONNECT
㊻	TU-2.5	277	1	1/6 HP 2 KW	3-#12 1/2"C.	20A-1PH	4MA 24	PROVIDE CODE DISCONNECT
㊼	TU-2.6	277	1	1/6 HP 4 KW	3-#10 1/2"C.	30A-1PH	4MA 26	PROVIDE CODE DISCONNECT
㊽	TU-2.7	277	1	1/4 HP 6 KW	2-#8 1-#10 3/4"C.	40A-1PH	4MA 23	PROVIDE CODE DISCONNECT
㊾	WH-1	208	1	4500W	3-#10 1/2"C.	20A-1PH	2MA 1-3	
㊿	WH-2	120	1	1500W	3-#12 1/2"C.	20A-1PH	2MA 5	
(51)	WH-3	120	1	200W	3-#12 1/2"C.	20A-1PH	2MA 2	ELECTRIC RESTRIKE
(52)	EWC-1	120	1	246W	3-#12 1/2"C.	20A-1PH	2MA 4	
(54)	RCP-1	120	1	1/12HP	3-#12 1/2"C.	20A-1PH	2MA 8	
(55)	DAMPER-1	120	1	1000 VA	3-#12 1/2"C.	20A-1PH	2MA 10	
(56)	DAMPER-2	120	1	1000 VA	3-#12 1/2"C.	20A-1PH	2MA 12	
(57)	REM-1 ON ROOF	120	1	1/2 HP 1/3 HP	4-#12 1/2"C.	20A-1PH	2MB 7-9	
(58)	FI FLOOR	120	1	3/4 HP	3-#12 HP 1/2"C.	20A-1PH	2MB 11	
(59)	EF-12	120	1	1/50 HP	3-#12 HP 1/2"C.	20A-1PH	2MB-20.	

LUMINAIRE SCHEDULE

TYPE 'A': POLETOP SPIDER MOUNT HID AREA LIGHT FIXTURE. ONE-PIECE ALUMINUM HOUSING, WHITE FINISH. CLEAR TEMPERED GLASS FLAT LENS. SEMISPECULAR ALZAK ALUMINUM REFLECTOR SEGMENTS. HORIZONTAL LAMP WITH IES TYPE FIVE SQUARE DISTRIBUTION OPTICS. HPF CONSTANT WATTAGE -20? BALLAST, 277 VOLT. PROVIDE ONE 400 WATT MH LAMP.
EMCO RSP.
POLE: ROUND TAPERED CEMENT POLE, 31'-1" ABOVE GROUND. WHITE TERRAZZO EXPOSED FINISH #223.
CENTRECON MBR-9.5.

TYPE 'B': RECESSED FLUORESCENT DOWNLIGHT. 8" APERTURE, SPECULAR CLEAR REFLECTOR, TRIM RING FINISH TO BE SELECTED BY ARCHITECT. TYPE 1 POTTED BALLAST, 277 VOLT APPROVED FOR DAMP LOCATIONS. PROVIDE TWO 13 WATT PL LAMPS.
HALO H7898, LITHONIA AF, PRESCOLITE CFR, OR APPROVED SUBSTITUTE.

TYPE 'C': RECESSED FLUORESCENT DOWNLIGHT. 8" APERTURE, SPECULAR CLEAR REFLECTOR. TRIM RING FINISH TO BE SELECTED BY ARCHITECT. HPF BALLAST, 277 VOLT APPROVED FOR DAMP LOCATIONS. PROVIDE TWO 13 WATT PL LAMPS.
HALO 7886, LITHONIA AF, PRESCOLITE CFR, OR APPROVED SUBSTITUTE.

TYPE 'D': RECESSED 8" APERTURE HID DOWNLIGHT. SPECULAR CLEAR ALZAK REFLECTOR, TRIM RING FINISH TO BE SELECTED BY ARCHITECT. ADJUSTABLE SOCKET DISTRIBUTION. THERMALLY PROTECTED BALLAST, 120 VOLT APPROVED FOR DAMP LOCATIONS. PROVIDE ONE 70 WATT MH LAMP
HALO M7800T, LITHONIA AH, PRESCOLITE HO, OR APPROVED SUBSTITUTE.

TYPE 'E': RECESSED 7" APERTURE FLUORESCENT WALL WASH. BLACK COILEX BAFFLE, TRIM RING FINISH TO BE SELECTED BY ARCHITECT. HPF BALLAST, 277 VOLT APPROVED FOR DAMP LOCATIONS. PROVIDE ONE 22 WATT DTT LAMP.
HALO H600CF, LITHONIA AFW, PRESCOLITE CF, OR APPROVED SUBSTITUTE.

TYPE 'F': RECESSED FLUORESCENT 2' x 4' LAY-IN LIGHT FIXTURE. 1/2" X 1/2" X 1/2" DEEP SILVER PARABOLIC LOUVER. RAPID START HPF BALLAST, 277 VOLT. PROVIDE TWO F32-T8-CW LAMPS.
METALUX 2GS, KLP MICROCUBE, DAYBRITE DESIGNER VOT, OR APPROVED SUBSTITUTE.

TYPE 'G': SAME AS TYPE 'F' EXCEPT WITH THREE LAMPS.

TYPE 'G1': SAME AS TYPE 'G' EXCEPT 120 VOLT OPERATION.

TYPE 'H': SAME AS TYPE 'F' EXCEPT WITH FOUR LAMPS.

TYPE 'J': SURFACE MOUNTED FLUORESCENT 1' x 4' WRAP AROUND FIXTURE. ACRYLIC PRISMATIC DIFFUSER. CLASS P HPF BALLAST, 277 VOLT APPROVED FOR DAMP LOCATIONS. PROVIDE TWO F32-T8-CW LAMPS.
LITHONIA AW, METALUX W, KLP DOMINAIRE II, OR APPROVED SUBSTITUTE.

TYPE 'K': SAME AS TYPE 'J' EXCEPT PENDANT MOUNTED. VERIFY LENGTH OF STEM WITH ARCHITECTURAL.

TYPE 'L': SAME AS TYPE 'K' EXCEPT 1' x 8' WRAP AROUND FIXTURE. PROVIDE FOUR F32-T8-CW LAMPS.

TYPE 'M': FLUORESCENT 4' WALL BRACKET. STEEL HOUSING, BAKED WHITE ENAMEL FINISH, OPAL ACRYLIC DIFFUSER. CLASS P HPF BALLAST, 277 VOLT. PROVIDE TWO F32-T8-CW LAMPS.
LITHONIA WC, METALUX BC, KLP MONITOR, OR APPROVED SUBSTITUTE.

TYPE 'N': SURFACE MOUNTED 4' FLUORESCENT STAGGERED STRIP LIGHT. DIE FORMED STEEL HOUSING, BAKED WHITE ENAMEL FINISH. CLASS P HPF BALLAST, 277 VOLT. PROVIDE TWO F32-T8-CW LAMPS.
LITHONIA SS248, METALUX SL, KLP STG OR APPROVED SUBSTITUTE.

TYPE 'N1': SAME AS TYPE 'N' EXCEPT 120 VOLT OPERATION.
LITHONIA SS248, METALUX SL, KLP STG OR APPROVED SUBSTITUTE.

TYPE 'P': PENDANT BATHROOM FIXTURE.

TYPE 'Q': SURFACE MOUNTED 8' FLUORESCENT INDUSTRIAL DIE FORMED STEEL HOUSING, WHITE ENAMEL FINISH. CLASS P HPF BALLAST, 277 VOLT. PROVIDE TWO F96-T8-CW LAMPS.
LITHONIA EJ296, METALUX IC, KLP KN OR APPROVED SUBSTITUTE.

TYPE 'R': WALL MOUNTED MAXIMUM SECURITY 4' FLUORESCENT FIXTURE. ONE-PIECE 14 GAUGE STEEL HOUSING, POLYESTER POWDER FINISH. 0.156" THICK PRISMATIC POLYCARBONATE LENS ON FIXTURE SIDE, 0.250" THICK CLEAR POLYCARBONATE LENS ON ENVIRONMENTAL SIDE. CLASS P RAPID START HPF BALLAST, 277 VOLT. SUITABLE FOR DAMP LOCATIONS. PROVIDE ONE 7 WATT FLUORESCENT LAMP FOR NIGHT LIGHT. PROVIDE TWO F32-T8-CW LAMPS.
FAILSAFE FSW, ALKCO SM, OR APPROVED SUBSTITUTE.

TYPE 'R1': SURFACE MOUNTED VANDAL PROOF 1' X 4' FLUORESCENT FIXTURE. ONE-PIECE STEEL HOUSING, PRISMATIC ACRYLIC LENS. CLASS P, RAPID START HPF BALLAST, 277 VOLT APPROVED FOR DAMP LOCATIONS. PROVIDE TWO F32-T8-CW LAMPS.
FAILSAFE FUS, ALKCO SM, OR APPROVED SUBSTITUTE.

TYPE 'T': PENDANT MOUNTED HID LOW BAY FIXTURE. ENCLOSED AND GASKETED. 16.25" SPUN ALUMINUM REFLECTOR/TYPE FIVE DISTRIBUTION ACRYLIC REFRACTOR. -20? BALLAST WITH POWER HOOK ASSEMBLY, 277 VOLT OPERATION. PROVIDE ONE 250 WATT MH LAMP.
HUBBELL LBM, LITHONIA TXL, DAYBRITE LB, OR APPROVED SUBSTITUTE..

TYPE 'U': FLUORESCENT WALL BRACKET CYLINDER. IMPACT RESISTANT, ONE-PIECE INJECTION MOLDED BRONZE POLY CARBONATE HOUSING PRISMATIC POLYCARBONATE REFRACTOR. AUTO-LAG, -20? BALLAST, 120 VOLT. APPROVED FOR WET LOCATION. PROVIDE ONE 26 WATT-CW DTT LAMP.
HUBBELL NRG OR APPROVED SUBSTITUTE.

TYPE 'V': RECESSED FLUORESCENT SHOWER LIGHT. ALBALITE LENS, WHITE TRIM, 8" APERTURE INTEGRAL BALLAST, 277 VOLT OPERATION. APPROVED FOR WET LOCATIONS. PROVIDE ONE 13 WATT DTT LAMP.
HALO H275, PRESCOLITE TL, MARCO FMX, OR APPROVED SUBSTITUTE.

TYPE 'W': WALL MOUNTED RECESSED FLUORESCENT LIGHT FIXTURE. DIE-CAST ALUMINUM LOUVERS, BLACK FINISH. CLEAR SAFETY GLASS. APPROVED FOR WET LOCATIONS. 120 VOLT OPERATION. PROVIDE ONE 16 WATT PLC LAMP.
BEGA 2079P, MCPHILBEN 93, OR APPROVED SUBSTITUTE.

TYPE 'X': RECESSED UNIVERSAL MOUNT FLUORESCENT EXIT SIGN. STEEL HOUSING, ALUMINUM TRIM, FINISH TO BE SELECTED BY ARCHITECT. GREEN LETTERS ON CLEAR ACRYLIC PANEL WITH ARROW DIRECTIONS AS SHOWN ON DRAWINGS. 277 VOLT OPERATION. TWO F8T5 LAMPS.
LITHONIA PRECISE FRP OR APPROVED SUBSTITUTE.

TYPE 'Z': SURFACE MOUNTED CONTINUOUS COLD CATHODE COVE LIGHTING. 25MM WARMWHITE REFLECTOR RIGHT ANGLE CATHODE STRAIGHT LAMPS. 390 MA NONDIMMABLE REMOTE BALLAST, 120 VOLT OPERATION.
NEWMAN CORPORATION T8/6000/3000K OR APPROVED SUBSTITUTE.

TYPE 'AA': INCANDESCENT WALL BRACKET WITH LAMP SHADE. ALUMINUM BRACKET, BRASS FINISH. WHITE PLEATED LINEN ON VINYL SHADE. PROVIDE ONE 75 WATT A LAMP. 120V.
KAMRO/CHAMPION BR1103 OR APPROVED SUBSTITUTE.

TYPE 'BB': PENDANT MOUNTED FLUORESCENT 8 FOOOT UPLIGHT. EXTRUDED ALUMINUM HOUSING, 1/2" ANODIZED ALUMINUM LOUVERS. FINISH TO BE SELECTED BY ARCHITECT. RAPID START CLASS P HPF BALLAST, 277 VOLT OPERATION. PROVIDE TWO F32 T8-CW LAMPS.
ILLUMINATION CONCEPTS AND ENGINEERING SLX II SERIES.

TYPE 'CC': FLUORESCENT 4' UNDERCABINET LIGHT FIXTURE. BAKED WHITE ENAMEL CASE, WHITE DIFFUSER. RAPID START NPF BALLAST. PROVIDE ONE F40-T12 CW LAMP. 277V.
PROGRESS P7009, ALKCO HP, LITHONIA UC, OR APPROVED SUBSTITUTE.

TYPE 'EE': SURFACE MOUNTED 8-3/4" DIA. FLUORESCENT LIGHT FIXTURE. TRANSLUCENT WHITE ACRYLIC DIFFUSER. ALUMINUM CANOPY, FINISH TO BE SELECTED BY ARCHITECT. RAPID START BALLAST, 120 VOLT. PROVIDE TWO 7 WATT PL LAMPS.
PROGRESS P7375, MARCO CF, OR APPROVED SUBSTITUTE.

TYPE 'FF': RECESSED INCANDESCENT 6" APERTURE DOWNLIGHT. DIE-CAST ALUMINUM FRAME. SPECULAR CLEAR ALZAK REFLECTOR, METAL TRIM RING, FINISH TO BE SELECTED BY ARCHITECT. APPROVED FOR DAMP LOCATION. PROVIDE ONE 100 WATT A19 LAMP. 120V.
HALO 7600T, LITHONIA A SERIES, PRESCOLITE TO, OR APPROVED SUBSTITUTE.

TYPE 'GG': STANCHION MOUNTED HID VERTICAL FLOODLIGHT WITH BARN DOORS. ONE-PIECE DIE-CAST ALUMINUM HOUSING, WHITE FINISH. SPECULAR ALZAK OPTICAL COMPONENTS, CLEAR ANODIZED ALUMINUM REFLECTOR FRAME. HPF -20? F BALLAST, 277 VOLT. PROVIDE ALL REQUIRED COMPONENTS FOR COMPLETE INSTALLATION. PROVIDE ONE 70 WATT MH LAMP.
KIM AFL2 OR APPROVED SUBSTITUTE.

TYPE 'HH': WALL MOUNTED FLUORESCENT FIXTURE. DIE-CAST ALUMINUM HOUSING, WHITE FINISH, OPAL GLASS DIFFUSER. APPROVED FOR WET LOCATIONS. PROVIDE ONE 26 WATT PLC LAMP. 277V. OPERATION.
BEGA 6042P OR APPROVED SUBSTITUTE.

TYPE 'JJ': SAME AS TYPE 'HH' EXCEPT WITH TWO 26 WATT PLC LAMPS.
BEGA 6043P OR APPROVED SUBSTITUTE.

TYPE 'KK': TWIN MOUNTED POLETOP HID HORIZONTAL FLOOD LIGHT WITH FIXED HOOD. ONE-PIECE DIE-CAST ALUMINUM HOUSING, WHITE FINISH. SPECULAR ALZAK OPTICAL COMPONENTS, CLEAR ANODIZED ALUMINUM REFLECTOR FRAME. HPF -20? F BALLAST, 277 VOLT. PROVIDE ALL REQUIRED COMPONENTS FOR COMPLETE INSTALLATION. PROVIDE ONE 150 WATT MH LAMP.
KIM AFL1 OR APPROVED SUBSTITUTE.
POLE: ROUND TAPERED CEMENT POLE, 18'-0" ABOVE GROUND. WHITE TERRAZZO EXPOSED FINISH #223.
CENTRECON SBR-5.5.

TYPE 'LL': SURFACE MOUNTED 4' FLUORESCENT STRIP LIGHT. DIE FORMED STEEL HOUSING, BAKED WHITE ENAMEL FINISH. CLASS P HPF BALLAST, 277 VOLT OPERATION. PROVIDE TWO F32-T8-CW LAMPS.
LITHONIA C248, METALUX SS, KLP CS, OR APPROVED SUBSTITUTE.

TYPE 'MM': SAME AS TYPE 'LL' EXCEPT 8' LENGTH. PROVIDE TWO F96 CW LAMPS.
LITHONIA C296, METALUX SS, KLP CS, OR APPROVED SUBSTITUTE.

TYPE 'NN': SAME AS TYPE 'LL' EXCEPT 120 VOLT OPERATION.
LITHONIA C248, METALUX SS, KLP CS, OR APPROVED SUBSTITUTE.

TYPE 'PP': SAME AS TYPE 'MM' EXCEPT 120 VOLT OPERATION.
LITHONIA C296, METALUX SS, KLP CS, OR APPROVED SUBSTITUTE.

PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers

MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285

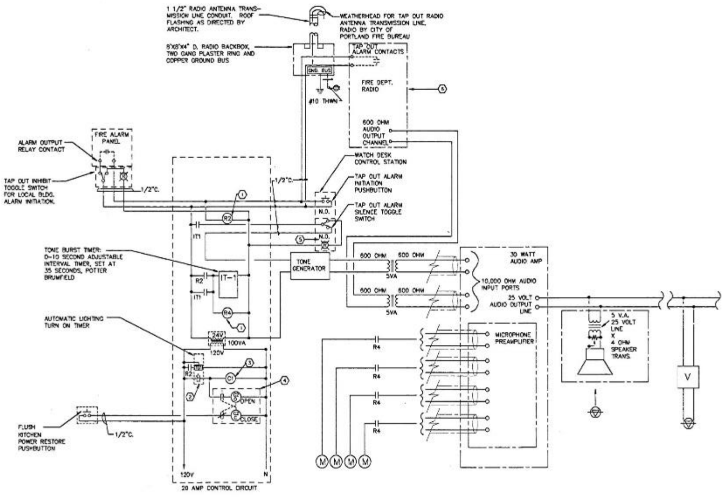
MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

SCHEDULES

AP. 15, 1992

DATE: 4/15/92
DRAWN BY: LAH
CHECKED BY: HLB
REVISIONS:
SHEET E3.4 OF
JOB NO. 91-316

PERMIT SET - April 15, 1992



1. TAP OUT DIAGRAM
NO SCALE D477

NOTES THIS SHEET

① POTTER AND BRUMMFIELD 24 VAC RELAY WITH BASE, KRP11-DG-24 VAC SERIES.
② POTTER AND BRUMMFIELD "DELAY OFF" TIMING RELAY WITH BASE, GCB38-78010MI-10MIN SERIES.
③ ELECTRICALLY HELD CONTACTOR WITH EXPANDABLE CONTACTS, SQUARE "D" 8903 SERIES.
④ MECHANICALLY LATCHED CONTACTOR WITH COIL CLEARING CONTACTORS, SQUARE "D" 8903 SERIES. SHOWN IN OPEN STATE.
⑤ HEAVY DUTY OIL TIGHT PUSHBUTTON OPERATORS AND CONTACT ASSEMBLIES IN FLUSH MOUNTED ENCLOSURES. LABEL EACH PUSHBUTTON AS DIRECTED BY OWNER, AS PER SPECIFICATIONS.
⑥ CONTACT PROVIDED IN CITY RADIO EQUIPMENT.

PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers

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MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

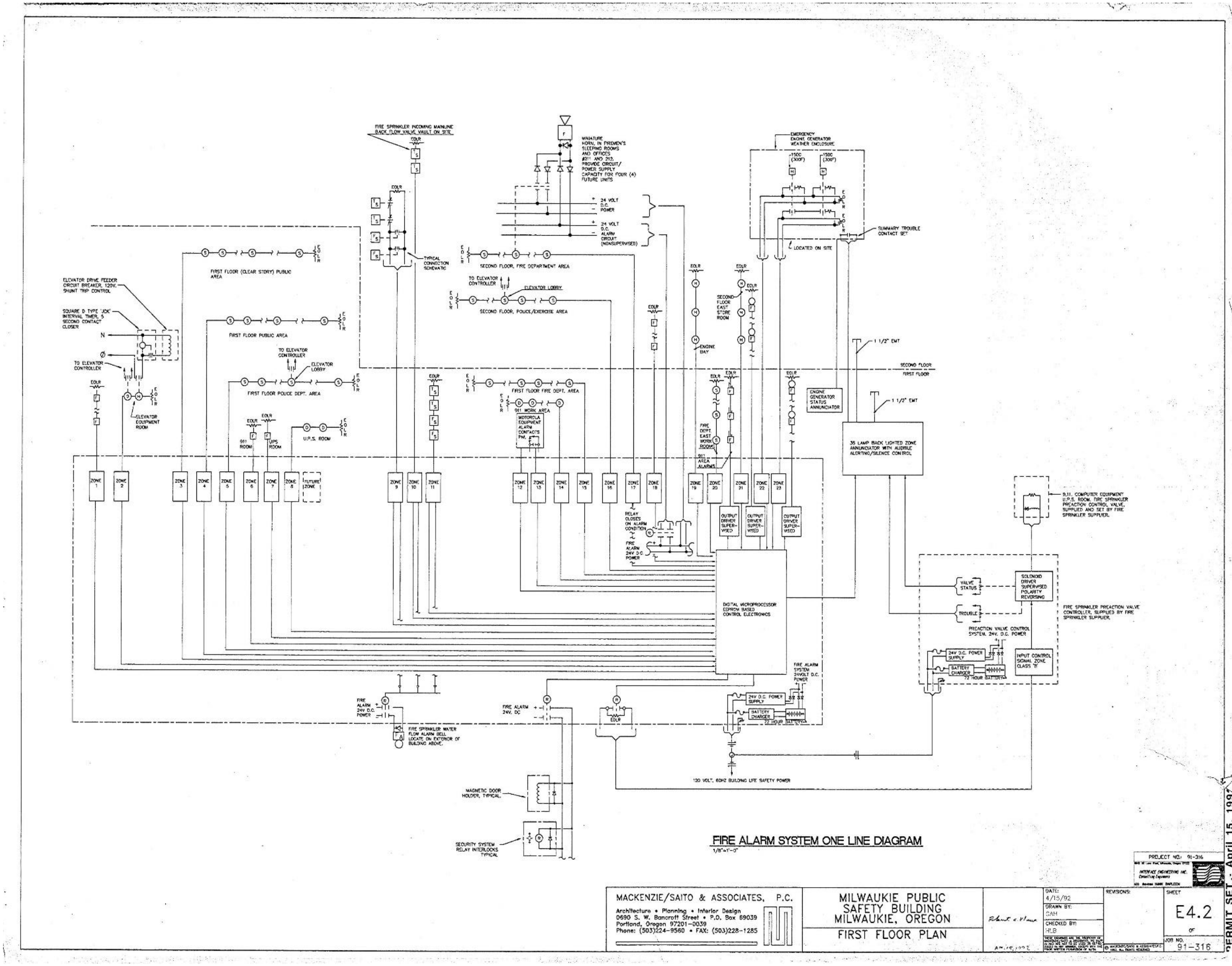
FIRST FLOOR PLAN
ONE LINE DIAGRAM

Apr 15, 1992

DATE: 4/15/92
DRAWN BY: DFS
CHECKED BY: BK
REVISIONS:

SHEET
E4.1
OF
JOB NO. 91-316

PERMIT SET - April 15, 1992


FIRE ALARM SYSTEM ONE LINE DIAGRAM
1/8"=1'-0"
PERMIT SET - April 15, 199
ZONE 1
ZONE 2
ZONE 3
ZONE 4
ZONE 5
ZONE 6
ZONE 7
ZONE 8
FUTURE ZONE
ZONE 9
ZONE 10
ZONE 11
ZONE 12
ZONE 13
ZONE 14
ZONE 15
ZONE 16
ZONE 17
ZONE 18
ZONE 19
ZONE 20
ZONE 21
ZONE 22
ZONE 23
DIGITAL MICROPROCESSOR EEPROM BASED CONTROL ELECTRONICS
35 LAMP BACK LIGHTED ZONE ANNUNCIATOR WITH AUDIBLE ALERTING/SILENCE CONTROL
ENGINE GENERATOR STATUS ANNUNCIATOR
OUTPUT DRIVER SUPERVISED
EMERGENCY ENGINE GENERATOR WEATHER ENCLOSURE
SUMMARY TROUBLE CONTACT SET
LOCATED ON SITE
1 1/2" EMT
SECOND FLOOR
FIRST FLOOR
FIRE SPRINKLER INCOMING MAINLINE BACK FLOW VALVE, VAULT ON SITE
TYPICAL CONNECTION SCHEMATIC
MINIATURE HORN, IN FIREMEN'S SLEEPING ROOMS AND OFFICES #211 AND 212. PROVIDE CIRCUIT/POWER SUPPLY CAPACITY FOR FOUR (4) FUTURE UNITS
24 VOLT D.C. POWER
24 VOLT D.C. ALARM CIRCUIT (NONSUPERVISED)
FIRST FLOOR (CLEAR STORY) PUBLIC AREA
SECOND FLOOR, FIRE DEPARTMENT AREA
SECOND FLOOR, POLICE/EXERCISE AREA
TO ELEVATOR CONTROLLER
ELEVATOR LOBBY
FIRST FLOOR PUBLIC AREA
FIRST FLOOR POLICE DEPT. AREA
FIRST FLOOR FIRE DEPT. AREA
911 WORK AREA
MOTOROLA EQUIPMENT ALARM CONTACTS
911 ROOM
UPS ROOM
U.P.S. ROOM
ELEVATOR DRIVE FEEDER CIRCUIT BREAKER, 120V, SHUNT TRIP CONTROL
SQUARE D TYPE 'JCK' INTERVAL TIMER, 5 SECOND CONTACT CLOSER
ELEVATOR EQUIPMENT ROOM
SECOND FLOOR EAST STORE ROOM
ENGINE BAY
FIRE DEPT EAST WORK ROOM
911 AREA ALARMS
RELAY CLOSES ON ALARM CONDITION
FIRE ALARM 24V D.C. POWER
FIRE ALARM SYSTEM 24VOLT D.C. POWER
24V D.C. POWER SUPPLY
BATTERY CHARGER
72 HOUR BATTERY
120 VOLT, 60HZ BUILDING LIFE SAFETY POWER
FIRE ALARM 24V, DC
FIRE SPRINKLER WATER FLOW ALARM BELL LOCATE ON EXTERIOR OF BUILDING ABOVE.
MAGNETIC DOOR HOLDER, TYPICAL
SECURITY SYSTEM RELAY INTERLOCKS TYPICAL
9.11, COMPUTER EQUIPMENT U.P.S. ROOM, FIRE SPRINKLER PREACTION CONTROL VALVE, SUPPLIED AND SET BY FIRE SPRINKLER SUPPLIER.
SOLENOID DRIVER SUPERVISED POLARITY REVERSING
VALVE STATUS
TROUBLE
FIRE SPRINKLER PREACTION VALVE CONTROLLER, SUPPLIED BY FIRE SPRINKLER SUPPLIER.
PREACTION VALVE CONTROL SYSTEM, 24V. D.C. POWER
INPUT CONTROL SIGNAL ZONE CLASS 'B'
EOLR
PROJECT NO: 91-316
INTERFACE ENGINEERING INC. Consulting Engineers
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
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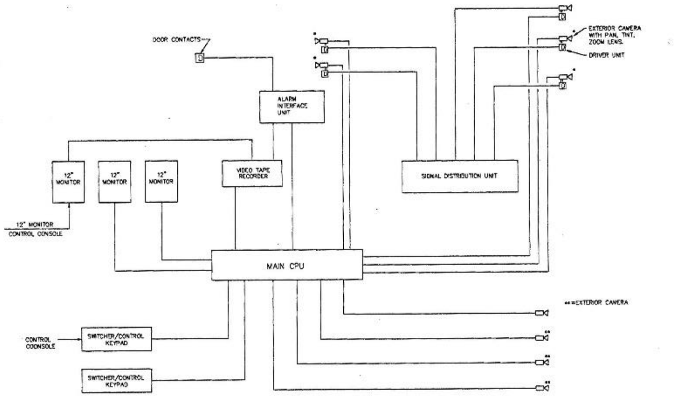
MILWAUKIE PUBLIC SAFETY BUILDING MILWAUKIE, OREGON
FIRST FLOOR PLAN
DATE: 4/15/92
DRAWN BY: SAH
CHECKED BY: HLB
REVISIONS:
SHEET
E4.2
OF
JOB NO. 91-316



SECURITY CCTV CONTROL DIAGRAM

NO SCALE

PROJECT NO.: 91-316

INTERFACE ENGINEERING INC.
Consulting Engineers

HANK BARLEEN

MACKENZIE/SAITO & ASSOCIATES, P.C.
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MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

CONTROL DIAGRAM

AP. 15, 1992

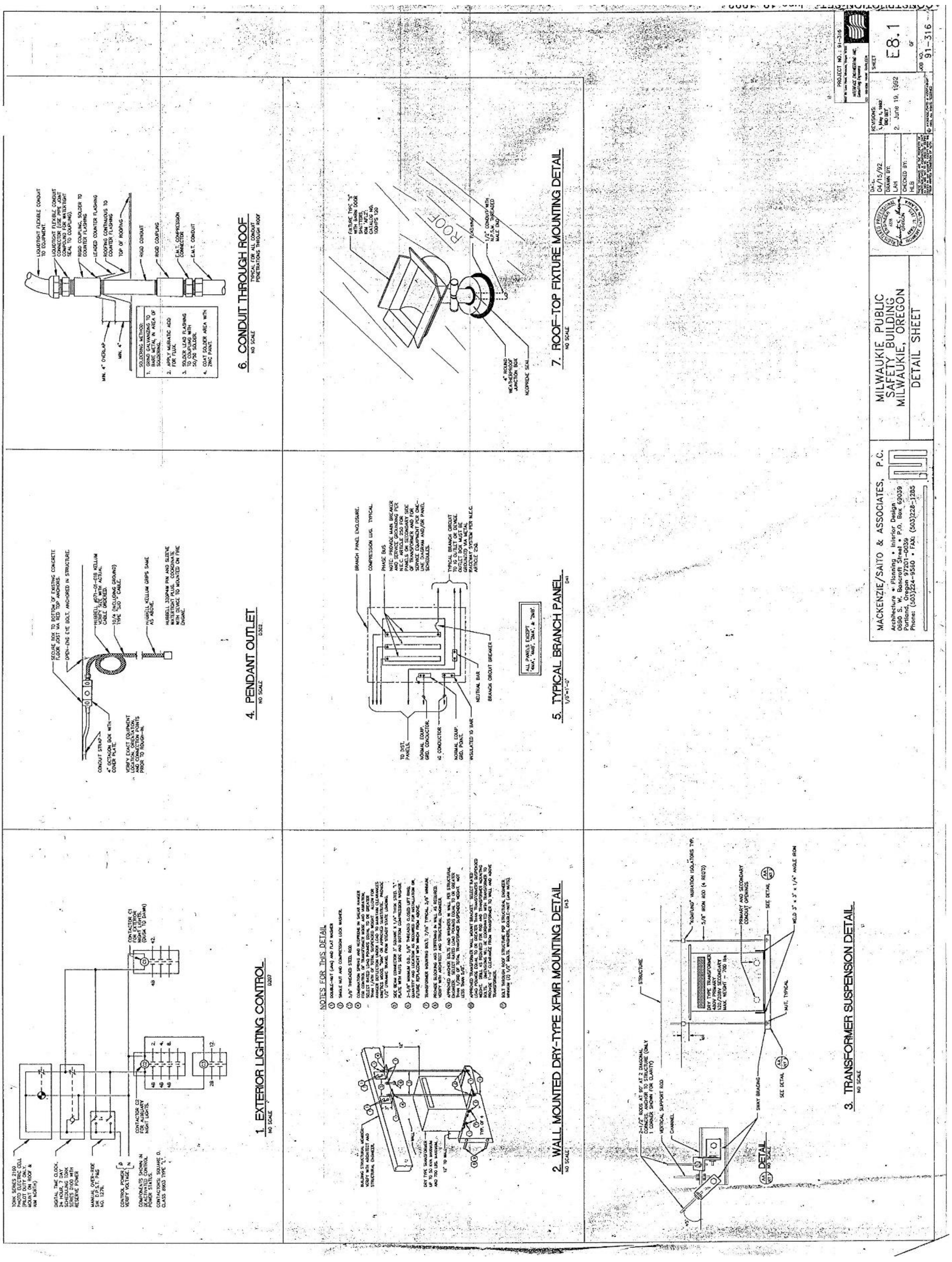
DATE: 4/15/92
DRAWN BY: GAH
CHECKED BY: HLB

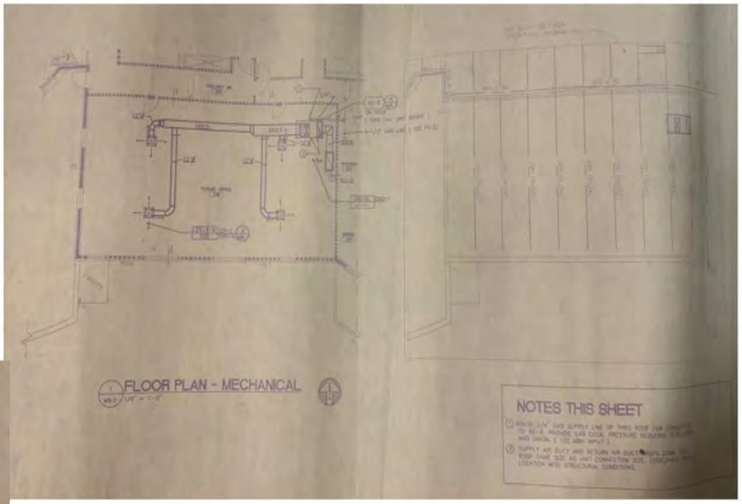
REVISIONS:

SHEET E4.3 OF

JOB NO. 91-316

PERMIT SET - April 15, 1992


1. EXTERIOR LIGHTING CONTROL
NO SCALE
2. WALL MOUNTED DRY-TYPE XFMR MOUNTING DETAIL
NO SCALE
NOTES FOR THIS DETAIL
3. TRANSFORMER SUSPENSION DETAIL
NO SCALE
DETAIL
NO SCALE
4. PENDANT OUTLET
NO SCALE
5. TYPICAL BRANCH PANEL
6. CONDUIT THROUGH ROOF
NO SCALE
TYPICAL FOR ALL CONDUIT PENETRATIONS THROUGH ROOF
7. ROOF-TOP FIXTURE MOUNTING DETAIL
NO SCALE
ROOF
MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201-0039
Phone: (503)224-9560 • FAX: (503)228-1285
MILWAUKIE PUBLIC SAFETY BUILDING
MILWAUKIE, OREGON
DETAIL SHEET
DATE: 04/15/92
REVISIONS:
2. June 19, 1992
PROJECT NO.: 91-316
SHEET
E8.1
JOB NO. 91-316



1 FLOOR PLAN - MECHANICAL

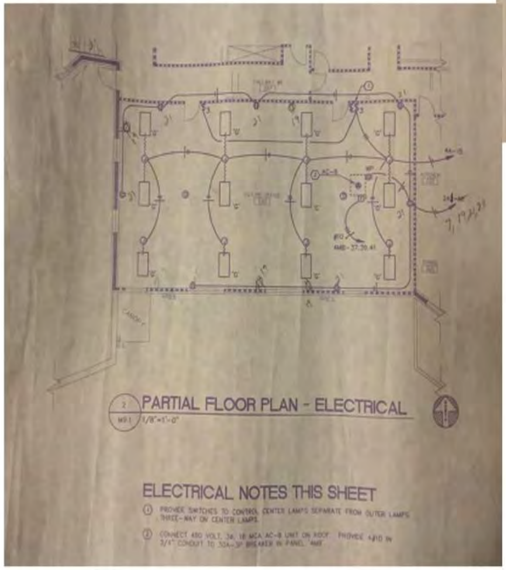
NOTES THIS SHEET

DIFFUSER, REGISTER AND GRILLE SCHEDULE

SYM	TYPE	FACE	FRAME	DAMPER	FINISH	MODEL NO.	REMARKS
CD-1	CEILING DIFFUSER	PERFORATED	T-BAR	NONE	[illegible]	[illegible]	
CRG-1	CEILING RETURN GRILLE	PERFORATED	T-BAR	NONE	[illegible]	[illegible]	

EQUIPMENT SCHEDULE

SYMBOL	DESCRIPTION	ELECTRICAL
AC-8	[illegible]	[illegible]



2 PARTIAL FLOOR PLAN - ELECTRICAL

ELECTRICAL NOTES THIS SHEET

Photos from Sheet ME9.0 Found on Site

10.13 Appendix M: Preliminary Retrofit Details

Structural Retrofits

Check	Checklist	Item	ASCE 41-17 Description	Description of Deficiency	Retrofit Mark	Markup	Detail Ref.	Retrofit Solution Description	Length (ft)	Area (ft²)
1	Collapse Prevent – RM1 and RM2 & Immediate Occupancy – RM1 and RM2	Shear Stress Check	The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in^2. (0.48 MPa).	Per Tier 2 evaluation, some CMU shear walls are overutilized for in-plane shear and/or in-plane flexure. Retrofits required.	1A	🟩	1A/SR2	Remove existing finishes to access interior and/or exterior face(s) of (E) wall. Prepare wall surface per manufacturer instructions. Install FRP or FRCM composite strengthening systems per manufacturer installation instructions. Restore wall finishes in kind. Use Simpson or equivalent composite strengthening systems for retrofit.	N/A	1000*
					1B	🟦	1B/SR2		N/A	500*
2	Collapse Prevent – RM1 and RM2 & Immediate Occupancy – RM1 and RM2	Transfer to Shear Walls	Diaphragms are connected for transfer of seismic forces to the shear walls.	Per Tier 2 evaluation, some diaphragm connections are inadequate to transfer the required seismic forces to the shearwalls. Retrofits required.	2A	▬	2A/SR2	Weld (N) L2.5x1.5x0.25 to (E) 4" TS blocking between trusses. Weld (N) 0.375"x8"x8" plate to (N) Angle. Install (N) 1/2" mechanical anchors to (N) plate at approx. 16" o.c. into grouted CMU cells beyond.	32.5	N/A
					2B	▬	2B/SR2	Install (N) 1/2" mechanical anchors to (E) angle between (E) flute openings at approx. 16" o.c.	85.84	N/A
					2C	▬	2C/SR2	Install (N) C10x15.3 welded/screwed to (E) decking between (E) trusses. Connect (N) channel to (E) CMU grouted blocking with 1/2" mechanical anchors at	13	N/A
					2D	▬	2D/SR2	Weld (N) L3.5x2.5"x0.25 to (E) 2.5" TS blocking between trusses. Weld (N) 0.375"x8"x8" plate to (N) Angle. Install (N) 1/2" mechanical anchors to (N) plate at approx. 16" o.c. into grouted CMU cells beyond.	60.33	N/A
					2E	▬	2E/SR2	Install (N) 1/2" mechanical anchors to (E) angle between (E) flute openings at approx. 16" o.c.	135	N/A
3	Immediate Occupancy – RM1 and RM2	Nonconcrete filled diaphragms	Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	Per Tier 2 evaluation, multiple diaphragm regions in the upper roof are inadequate to resist the in-plane seismic forces. Retrofits required	3	▨	N/A	Remove existing roofing to expose top of metal decking. Provide additional welding at panel sidelaps (approx. 12" o.c.) to improve diaphragm in-plane shear strength. Replace/repair roof following installation of upgrade.	N/A	2500

*Wall regions identified in the markups are representative of the minimum amount of upgrades anticipated. Retrofit wall areas tabulated above are conservative estimates of retrofitted wall regions based on practical considerations.

Nonstructural Retrofits

Check	Checklist	Item	ASCE 41-17 Description	Description of Deficiency	Retrofit Mark	Detail Ref	Retrofit Solution Description	No. of Occurrences
4	Nonstructural - Ceilings	Edge Clearance	The free edges of integrated suspended ceilings with continuous areas greater than 144ft^2 (13.4 m^2) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	PSE did not observe free edges while on site. Retrofit is required.	4	1/SR3	Trim edges at two nonparallel sides and support with approved angle	Approx. 2,500 linear ft
5	Nonstructural - Ceilings	Edge Support	The free edges of integrated suspended ceilings with continuous areas greater than 144 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	PSE did not observe free edges while on site. Retrofit is required.	5	1/SR3	Trim edges at two nonparallel sides and support with approved angle	Approx. 2,500 linear ft
6	Nonstructural – Light Fixtures	Lens Covers	Lens covers on light fixtures are attached with safety devices.	PSE noted some lens covers without safety devices. Retrofit is required.	6	N/A	Add safety devices to lights with lens covers.	Approx. up to 50
7	Nonstructural – Contents and Furnishings	Tall Narrow Contents	Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	PSE observed unanchored tall narrow contents during the site visit. Retrofit is required.	7	2/SR3	Anchor/restrain tall narrow contents to prevent overturning	Approx. 25
8	Nonstructural – Contents and Furnishings	Fall-Prone Contents	Equipment, stored items, or other contents weighting more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	PSE observed unbraced/unrestrained fall-prone contents during the site visit. Retrofit is required.	8	2/SR3	Anchor/restrain contents to prevent overturning	Approx. 10
9	Nonstructural – Contents and Furnishings	Suspended Contents	Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	PSE observed suspended noncompliant elements during the site visit. Retrofit is required.	9	N/A	Provide minimum 4 clips to restrain movement of large hanging trampoline.	1 (Trampoline)
10	Nonstructural – Mechanical and Electrical Equipment	Fall-Prone Equipment	Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft ((1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	PSE observed unbraced fall-prone equipment during the site visit. Retrofit is required.	10	2/SR3	Confirm mechanical and/or electrical equipment is anchored. If not, provide anchorage or lateral restraint.	Approx. 5
11	Nonstructural – Mechanical and Electrical Equipment	In-Line Equipment	Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	PSE observed noncompliant elements during the site visit. Retrofit is required.	11	3/SR3	Provide independent lateral bracing using Unistrut or equivalent system for HVAC equipment in-line with duct of piping system without lateral bracing.	Approx. up to 20
12	Nonstructural – Mechanical and Electrical Equipment	Tall Narrow Equipment	Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the floor slab or adjacent structural walls.	PSE observed unanchored tall narrow contents during the site visit. Retrofit is required.	12	2/SR3	Provide anchorage to slab below for tall unanchored electrical racks.	Approx. 10
13	Nonstructural – Mechanical and Electrical Equipment	Mechanical Doors	Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	Based on PSE's observations, we do not believe the mechanical doors to be able to accommodate the necessary story drift. Retrofit is required.	13	N/A	Replace the existing mechanical doors with drift-compatible doors.	6
14	Nonstructural – Mechanical and Electrical Equipment	Suspended Equipment	Equipment suspended without lateral bracing is free to swing from or move with the structure from which they are suspended without damaging itself or adjoining components.	PSE observed suspended noncompliant elements during the site visit. Retrofit is required.	14	4/SR3	Provide lateral bracing using unistrut or equivalent system for suspended equipment without bracing.	Approx. 5
15	Nonstructural – Mechanical and Electrical Equipment	Vibration Isolators	Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	The observed generator did not have vibration isolators. Retrofit is required.	15	N/A	Confirm if existing generator anchorage has snubbers. Replace generator anchorage with equivalent or better vibration isolated anchors with snubbers if not.	1
16	Nonstructural – Mechanical and Electrical Equipment	Electrical Equipment	Electrical equipment is laterally braced to the structure.	PSE observed noncompliant elements during the site visit. Retrofit is required.	16	N/A	Provide anchorage and/or lateral bracing for currently unanchored/braced equipment. Generally applicable to RTUs and other large MEP equipment that is currently unbraced.	Approx. 5
17	Nonstructural - Elevators	Retainer Plate	A retainer plate is present at the top and bottom of both car and counterweight.	Per Elevator Consulting Services, retainer plates are not present. Retrofit is required.	17	N/A	Install retainer plates per elevator modernization report.	1

NOTICE
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CITY OF MILWAUKIE PSB 60%
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CLIENT INFO:
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MILWAUKIE, OR 97206

2102-0070

SHEET CONTENT
SEISMIC RETROFIT SUMMARY

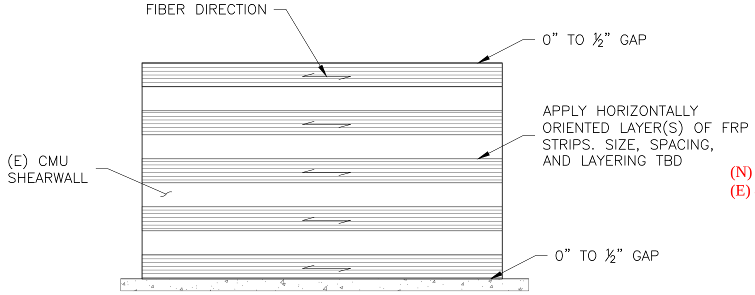
JOB No.
2102-0070

DRAWN NRW
CHECKED WJS

DATE 02/23/22

REVISIONS

SHEET
SR1 OF 16

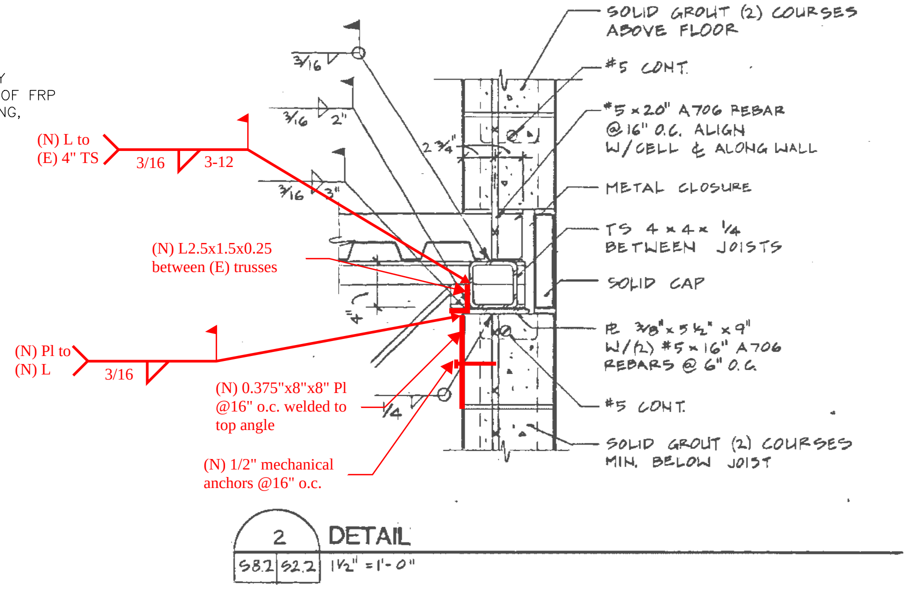


CMU SHEARWALL IN–PLANE SHEAR RETROFIT

1A
–

RETROFIT MARK: 1A

N.T.S.

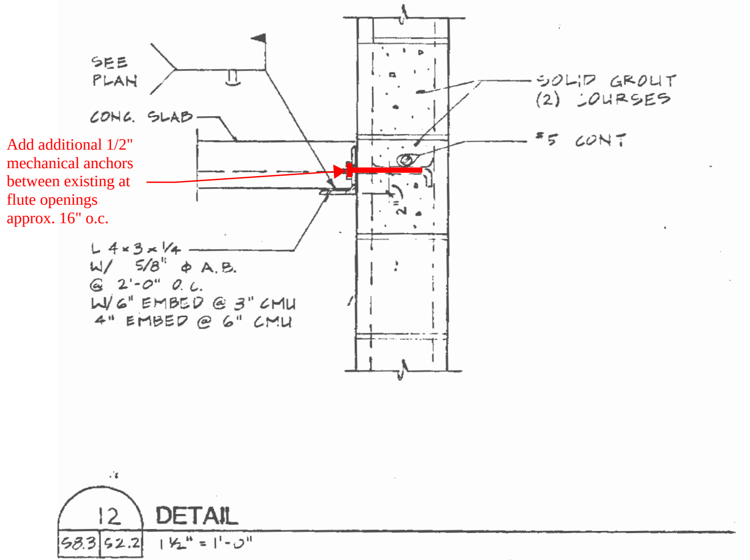


DIAPHRAGM IN–PLANE ANCH. TO CMU WALL RETROFIT (ORIG. 2/S8.2)

2A
–

RETROFIT MARK: 2A

N.T.S.

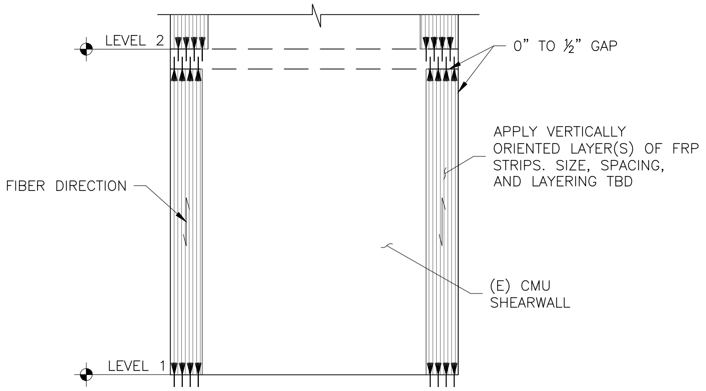


DIAPHRAGM IN–PLANE ANCH. TO CMU WALL RETROFIT (ORIG. 12/S8.3)

2B
–

RETROFIT MARK: 2B

N.T.S.

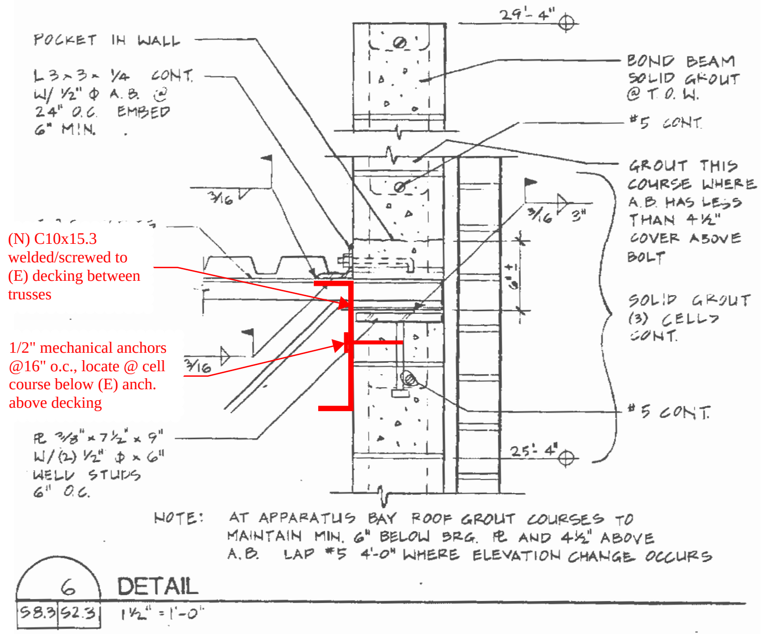


CMU SHEARWALL IN–PLANE FLEXURE RETROFIT

1B
–

RETROFIT MARK: 1B

N.T.S.

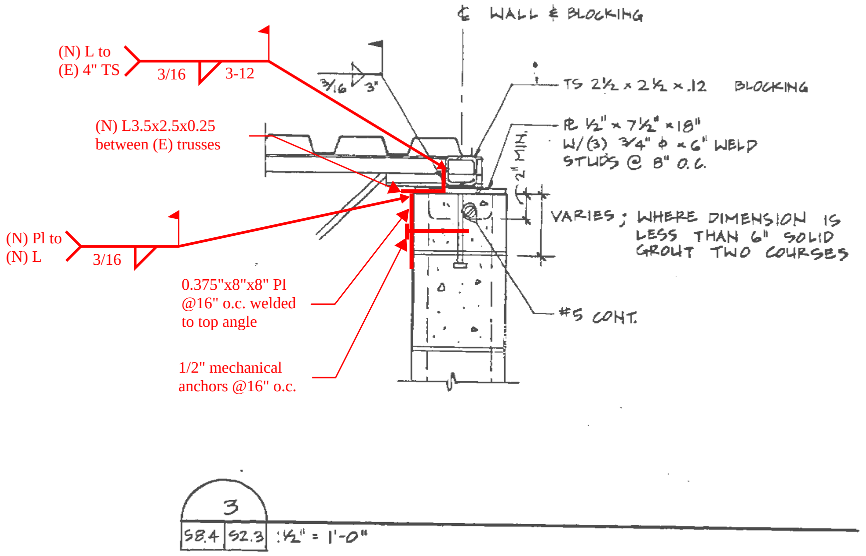


DIAPHRAGM IN–PLANE ANCH. TO CMU WALL RETROFIT (ORIG. 6/S8.3)

2C
–

RETROFIT MARK: 2C

N.T.S.

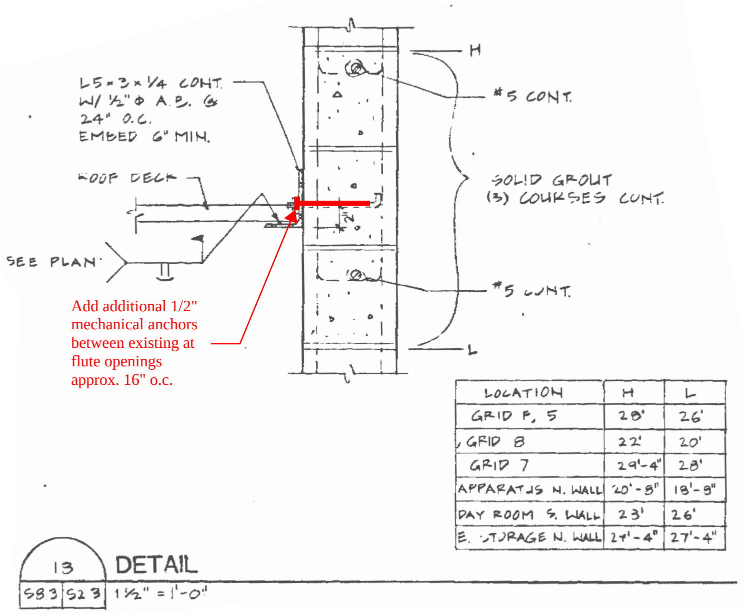


DIAPHRAGM IN–PLANE ANCH. TO CMU WALL RETROFIT (ORIG. 3/S8.4)

2D
–

RETROFIT MARK: 2D

N.T.S.



LOCATION	H	L
GRID F, 5	28'	26'
GRID 8	22'	20'
GRID 7	29'-4"	28'
APPARATUS N. WALL	20'-8"	18'-8"
DAY ROOM S. WALL	23'	26'
E. STORAGE N. WALL	27'-4"	27'-4"

DIAPHRAGM IN–PLANE ANCH. TO CMU WALL RETROFIT (ORIG. 18/S8.3)

2E
–

RETROFIT MARK: 2E

N.T.S.

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CITY OF MILWAUKIE PSB 60%
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SHEET CONTENT 2102–0070
STRUCTURAL SEISMIC RETROFIT DETAILS

JOB No. 2102–0070
DRAWN NRW
CHECKED WJS
DATE 02/23/22
REVISIONS

SHEET SR2 OF 16

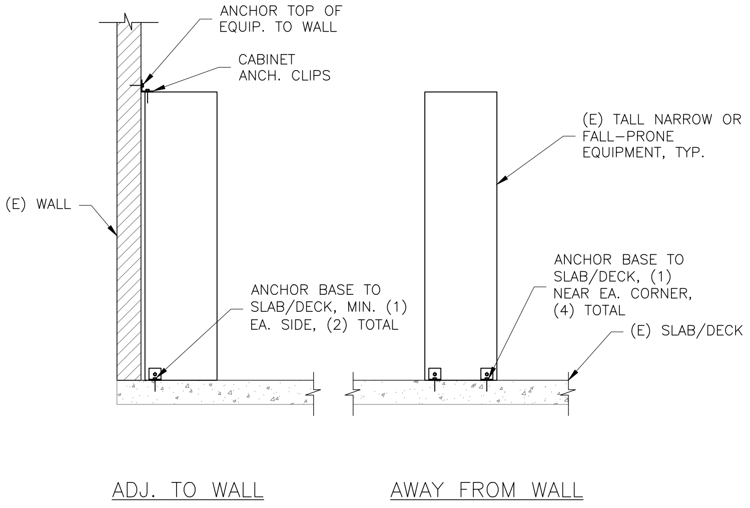
RS504

60% PRELIMINARY DOCUMENTS — NOT FOR CONSTRUCTIONS

INTEGRATED CEILING EDGE CLEARANCE RETROFIT ① –

RETROFIT MARK: 4,6

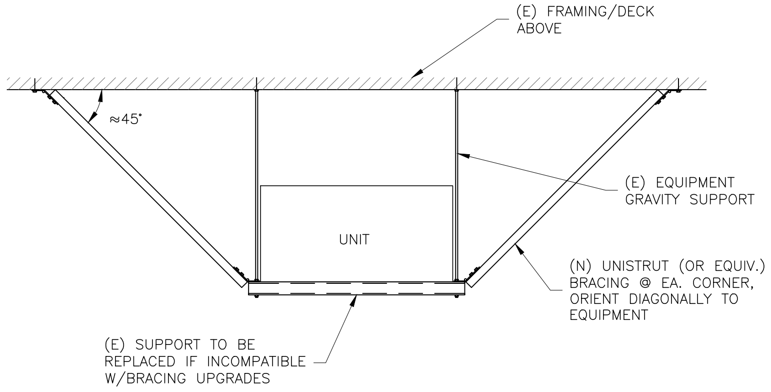
N.T.S.



TALL NARROW/FALL-PRONE EQUIPMENT ANCHORAGE RETROFIT ② –

RETROFIT MARK: 7,8,10,12

N.T.S.



IN-LINE EQUIPMENT BRACING RETROFIT ③ –

RETROFIT MARK: 11

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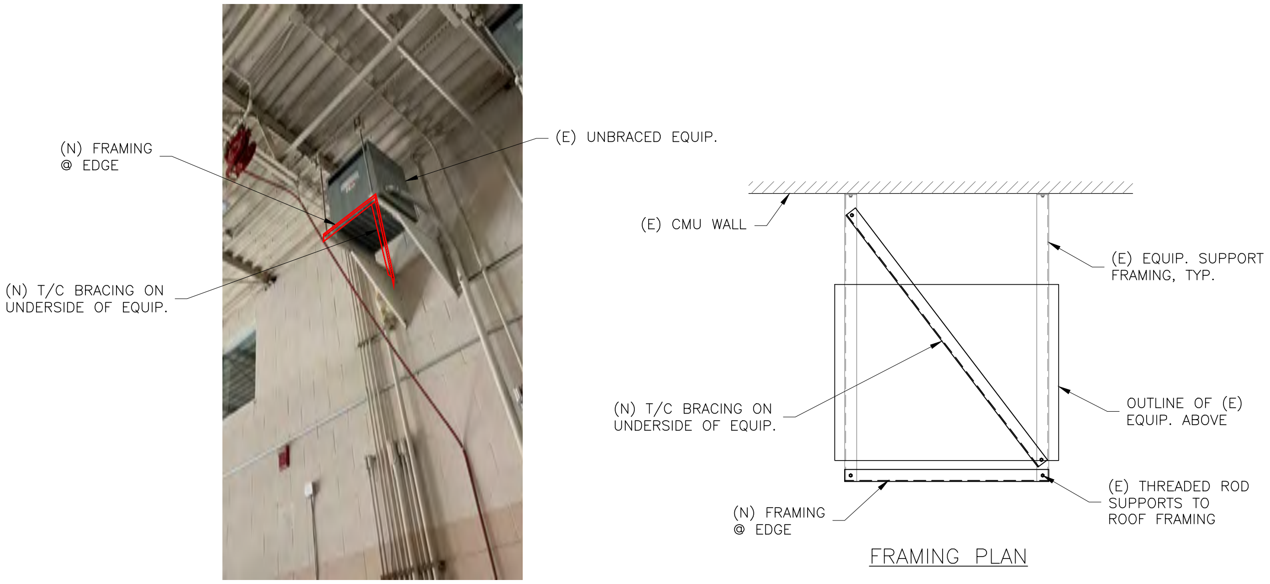

FRAMING PLAN

ISOMETRIC PHOTO

MECHANICAL/ELECTRICAL EQUIPMENT BRACING RETROFIT ④ –

RETROFIT MARK: 14

N.T.S.

NOTICE
0 1
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SHEET CONTENT 2102-0070
NONSTRUCTURAL
SEISMIC RETROFIT
DETAILS

JOB No.
2102-0070

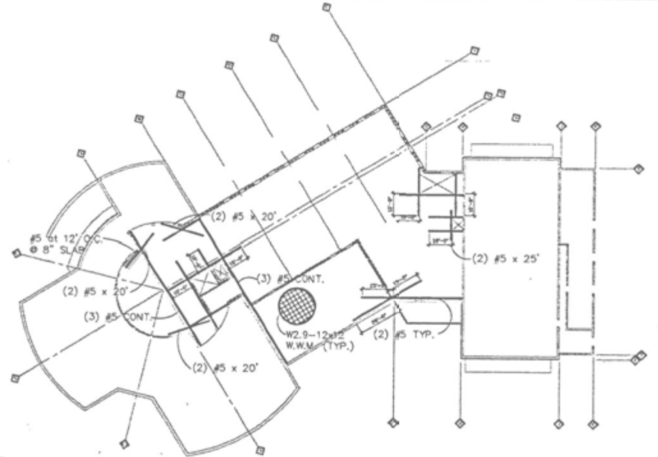
DRAWN NRW
CHECKED WJS

DATE 02/23/22

REVISIONS

SHEET
SR3 OF 16

60% PRELIMINARY DOCUMENTS – NOT FOR CONSTRUCTIONS



1 SLAB REINFORCING PLAN
S2.2 NOT TO SCALE

GENERAL NOTES

1. JOIST SEAT HEIGHT 4" TYPICAL AT MAIN BUILDING SECOND FLOOR.

LEGEND

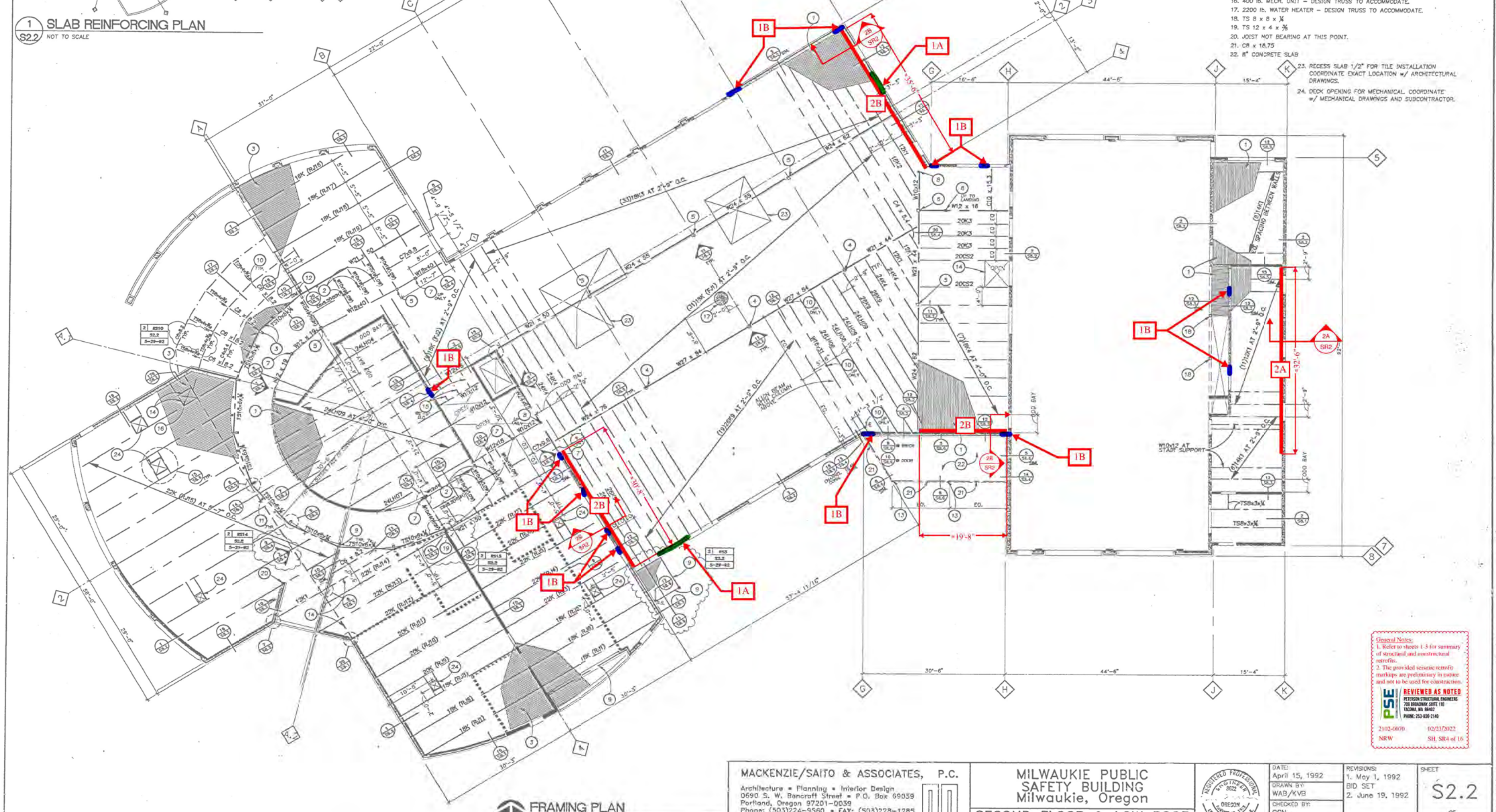
22K (RJ5) — DEPTH, TYPE, LOAD DIAGRAM

▬ INTERIOR CMU BEARING WALL

▬ INTERIOR CMU WALL TO BOTTOM OF STRUCTURE, NON-BEARING.

KEYNOTES

1. VERCO 22 GAGE TYPE B FORMLOCK STEEL FLOOR DECK. (4) 1/2"ø WELDS PER SHEET TO ALL SUPPORTS PERPENDICULAR TO RIBS. BUTTON PUNCH SIDE SEAMS AT 1'-0" O.C., WELD EDGES TO SUPPORTS PARALLEL TO RIBS WITH 1/2" ø PUDDLE WELDS AT 1'-0" O.C.. 4 1/2" CONCRETE SLAB WITH 12 x 12 W2.9 W.W. MESH AT CENTERLINE.
2. TS3 x 3 x 3/16 BETWEEN CHANNEL AND WIDE FLANGE.
3. VERCO 20 GAGE HSB-36 w/SHEARTRANZ. (7) 1/2"ø WELDS PER SHEET TO ALL SUPPORTS PERPENDICULAR TO RIBS. 1 1/2" LONG TOP SEAM WELDS AT ALL EDGE SEAMS AT 12" O.C. 1/2" ø PUDDLE WELDS AT 10" O.C. AT ALL SUPPORTS PARALLEL TO RIBS. SEE DETAIL 5 /S8.1
4. TS7 x 7 x 5/16
5. TS7 x 7 x 1/4
6. TS7 x 7 x 3/16
7. TS6 x 5 x 3/16
8. TS3 x 3 x 3/16
9. TS12 x 4 x 3/16
10. TS4 x 4 x 1/4
11. TS4 x 3 x 3/16
12. TS8 x 4 x 1/4
13. 4" STANDARD PIPE
14. L 4 x 4 x 1/4
15. TS 2½ x 2½ x 1/4
16. 400 lb. MECH. UNIT – DESIGN TRUSS TO ACCOMMODATE.
17. 2200 lb. WATER HEATER – DESIGN TRUSS TO ACCOMMODATE.
18. TS 8 x 8 x 1/4
19. TS 12 x 4 x 3/8
20. JOIST NOT BEARING AT THIS POINT.
21. C8 x 18.75
22. 8" CONCRETE SLAB
23. RECESS SLAB 1/2" FOR TILE INSTALLATION COORDINATE EXACT LOCATION w/ ARCHITECTURAL DRAWINGS.
24. DECK OPENING FOR MECHANICAL. COORDINATE w/ MECHANICAL DRAWINGS AND SUBCONTRACTOR.



FRAMING PLAN

1/8" = 1'-0"

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
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TACOMA, WA 98402
PHONE: 253-830-2140

2102-0070 02/23/2022
NRW SH. SR4 of 16

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Architecture • Planning • Interior Design
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Phone: (503)224-9560 • FAX: (503)228-1285

MILWAUKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

SECOND FLOOR & LOW ROOF
FRAMING PLAN

REGISTERED PROFESSIONAL ENGINEER 8622 OREGON

DATE:	April 15, 1992
DRAWN BY:	WAB/KVB
CHECKED BY:	GGN

REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992

SHEET
S2.2
OF

JOB NO.
291451

CONSTRUCTION SET - June 19, 1992

S2-2 06/17/92 13:33

RS506

LEGEND

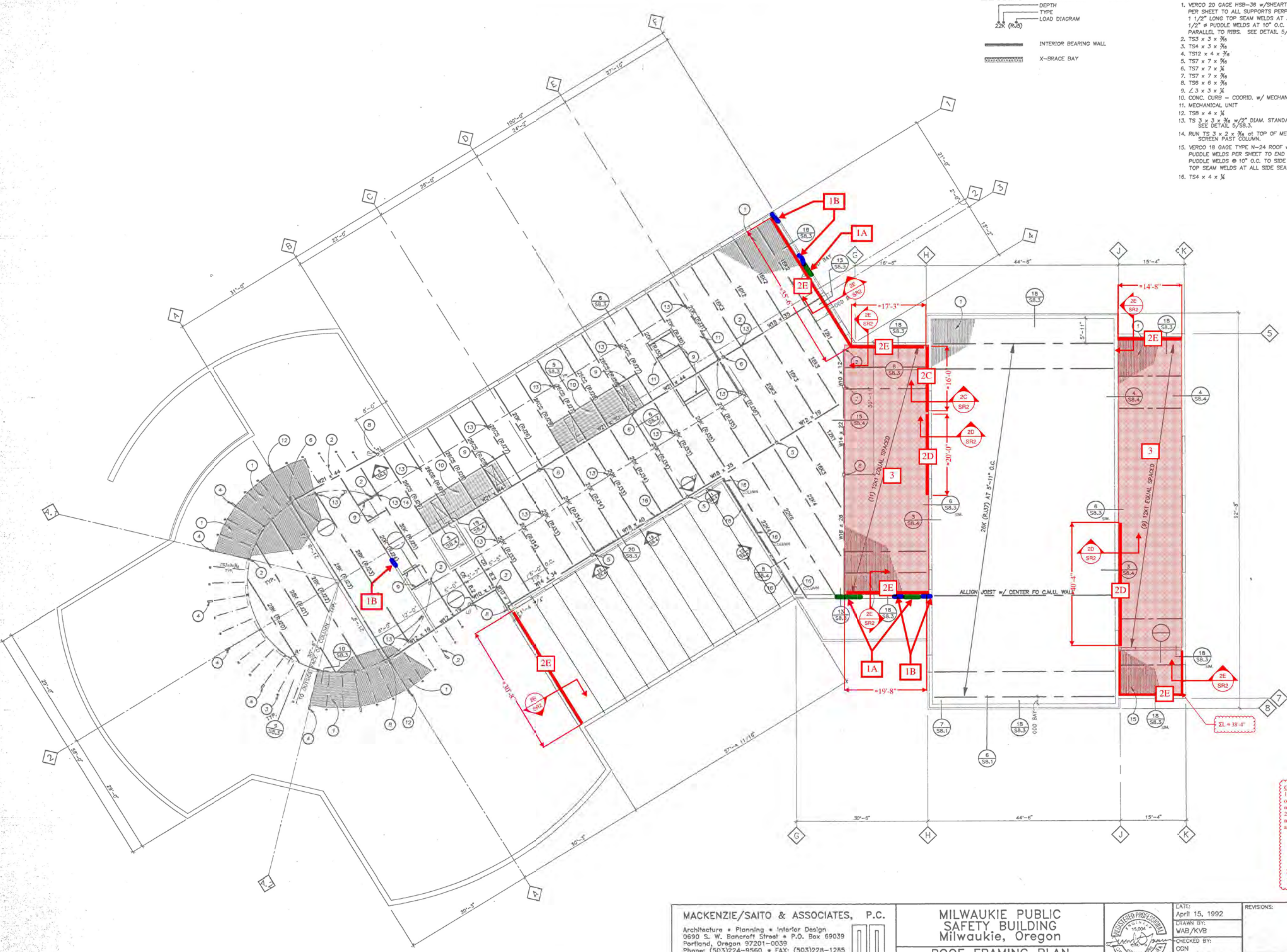
22K (RJ5)
- DEPTH
- TYPE
- LOAD DIAGRAM

▬ INTERIOR BEARING WALL

▨ X-BRACE BAY

KEYNOTES

1. VERCO 20 GAGE HSB-36 w/SHEARTRANZ. (7) 1/2"ø WELDS PER SHEET TO ALL SUPPORTS PERPENDICULAR TO RIBS. 1 1/2" LONG TOP SEAM WELDS AT ALL EDGE SEAMS. 1/2" ø PUDDLE WELDS AT 10" O.C. AT ALL SUPPORTS PARALLEL TO RIBS. SEE DETAIL 5/S8.1
2. TS3 x 3 x 3/16
3. TS4 x 3 x 3/16
4. TS12 x 4 x 3/16
5. TS7 x 7 x 5/16
6. TS7 x 7 x 1/4
7. TS7 x 7 x 3/16
8. TS6 x 6 x 3/16
9. ∠3 x 3 x 1/4
10. CONC. CURB – COORID. w/ MECHANICAL
11. MECHANICAL UNIT
12. TS8 x 4 x 1/4
13. TS 3 x 3 x 3/16 w/2" DIAM. STANDARD PIPE BRACE SEE DETAIL 5/S8.3.
14. RUN TS 3 x 2 x 3/16 at TOP OF MECHANICAL SCREEN PAST COLUMN.
15. VERCO 18 GAGE TYPE N-24 ROOF w/SHEARTRANZ. (4) 1/2"ø PUDDLE WELDS PER SHEET TO END SUPPORTS. 1/2" ø PUDDLE WELDS @ 10" O.C. TO SIDE SUPPORTS. 1 1/2" LONG TOP SEAM WELDS AT ALL SIDE SEAMS.
16. TS4 x 4 x 1/4



General Notes:
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2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

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PHONE: 253-830-2140

2102-0070 02/23/2022
NRW SH. SR5 of 16

S2-3 04/14/92 1806

PERMIT SET - April 15, 1992

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MILWAUKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

ROOF FRAMING PLAN

REGISTERED PROFESSIONAL ENGINEER 15,004
GERARD G. NAVARRA

DATE: April 15, 1992
DRAWN BY: WAB/KVB
CHECKED BY: CGN

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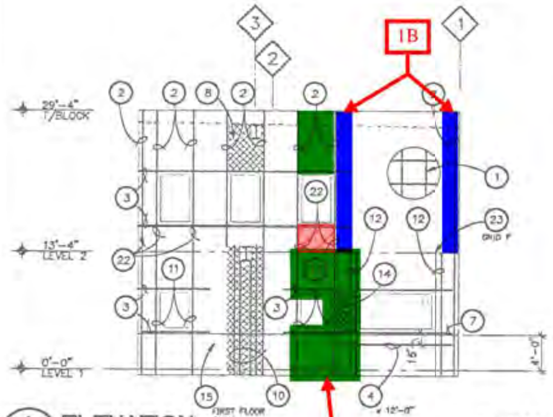
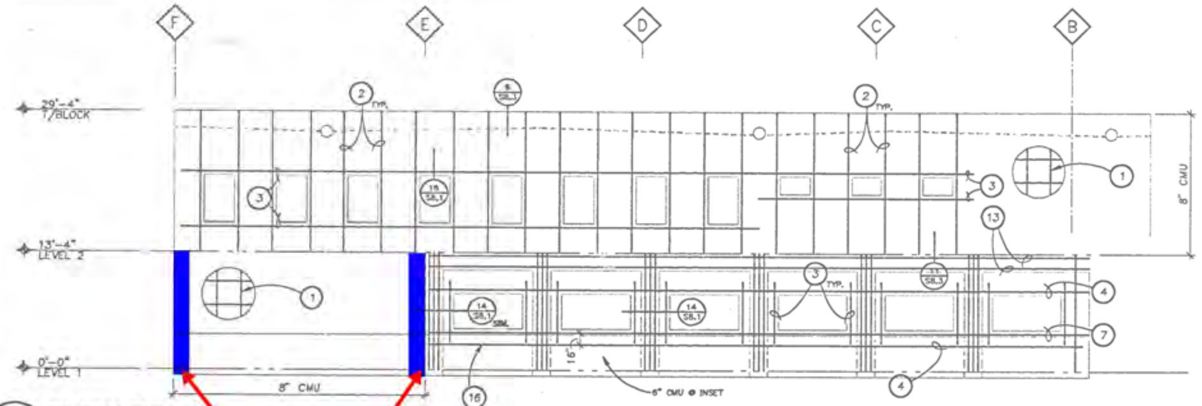
REVISIONS:

SHEET
S2.3
OF

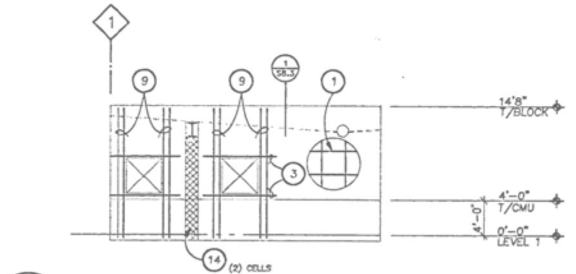
JOB NO. 291451



1 ELEVATION 8" CMU
S3.1 S3.2 1/8"=1'-0"



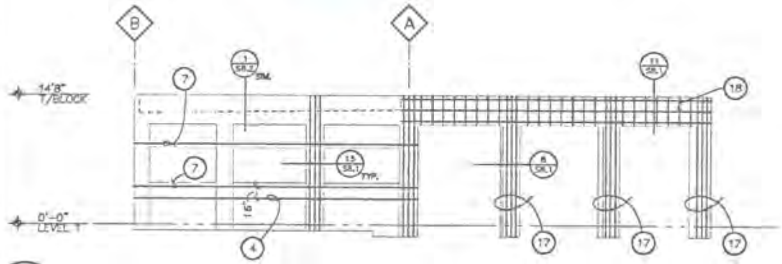
2 ELEVATION
S3.1 S3.2 1/8"=1'-0"



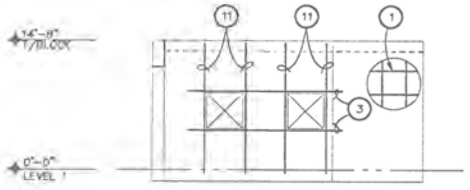
3 ELEVATION 6" CMU
S3.1 S3.2 1/8"=1'-0"

KEYNOTES

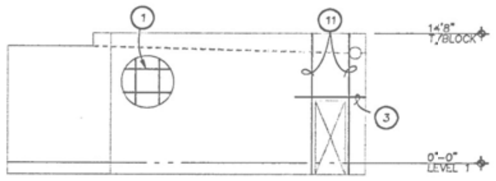
1. #5 AT 2'-8" O.C. MAX. VERTICAL, #5 AT 4'-0" O.C. MAX. HORIZONTAL.
2. (1) #5 VERT. AT ℄ WALL.
3. (1) #5 MIN. AROUND ALL OPENINGS, EXTEND MIN. 2'-0" PAST EDGE.
4. (1) #5 HORZ. AT ℄ WALL.
5. (4) #5 HORZ. (2) EACH CELL.
6. SOLID GROUT (2) CELLS EACH SIDE TO LEVEL OF PLATFORM.
7. (2) #5 HORZ.
8. SOLID GROUT OVER WINDOW.
9. (2) #5 VERT. AT ℄, (1) EACH CELL.
10. SOLID GROUT FOUR CELLS BELOW BEAM W/(4) #5 VERT. (1) EACH CELL.
11. (2) #5 VERT. IN (1) CELL.
12. (2) #5 VERT. EACH FACE, (2) EACH CELL.
13. (4) #6.
14. SOLID GROUT.
15. SPACING OF VERT. GROUTED CELLS NOT TO EXCEDE 2'-0" AT THIS WALL.
16. SOLID GROUT 6" CMU AND PILASTER.
17. (3) #6 EACH FACE.
18. #3 HOOPS @ 15" O.C.
19. #5 @ 24" O.C. VERT.
20. (2) #5 @ 32" O.C. VERT.
21. STEEL HEADER BEYOND
22. CONTINUE (1) #5 FROM LOWER LEVEL TO UPPER LEVEL.
23. MAINTAIN MINIMUM VERT. STEEL THRU SECOND FLOOR PLANE.



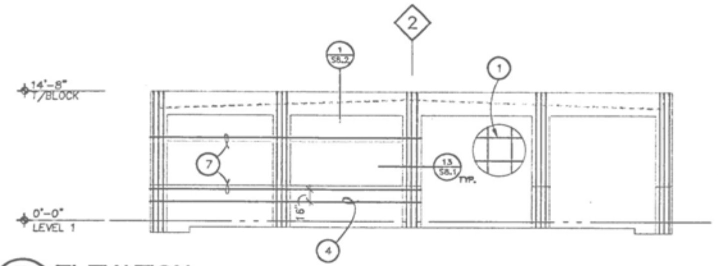
4 ELEVATION 10" CMU FRAME – 6" CMU INSET
S3.1 S3.2 1/8"=1'-0"



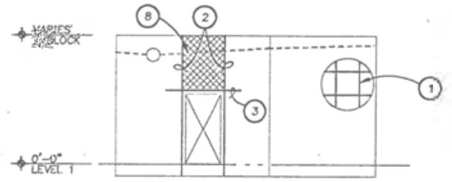
5 ELEVATION 6" CMU
S3.1 S3.2 1/8"=1'-0"



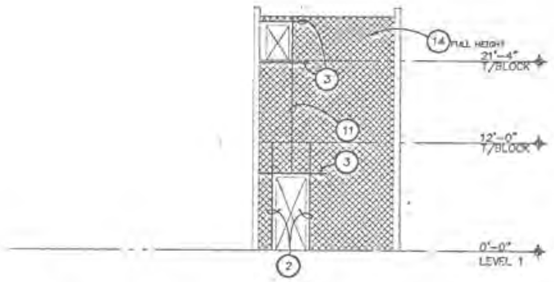
6 ELEVATION 6" CMU
S3.1 S3.2 1/8"=1'-0"



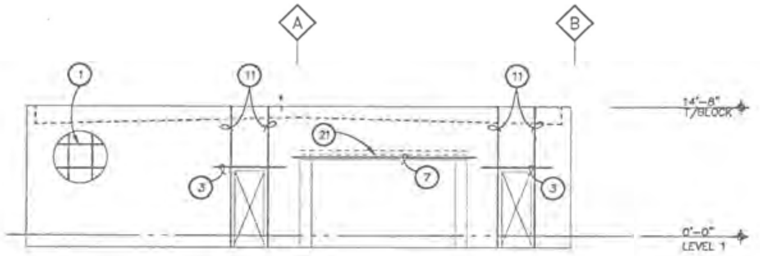
7 ELEVATION 10" CMU FRAME – 6" CMU INSET
S3.1 S3.2 1/8"=1'-0"



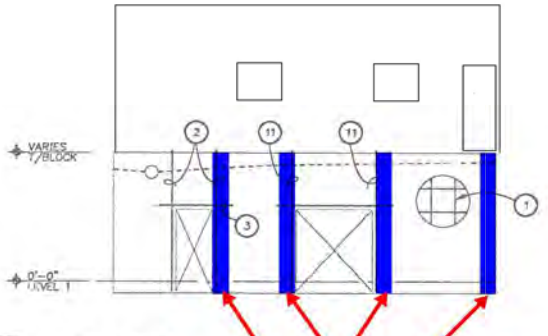
8 ELEVATION 6" CMU
S3.1 S3.2 1/8"=1'-0"



9 ELEVATION 8" CMU
S3.1 S3.2 1/8"=1'-0"



10 ELEVATION 6" CMU
S3.1 S3.2 1/8"=1'-0"



11 ELEVATION 6" CMU
S3.1 S3.2 1/8"=1'-0"

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

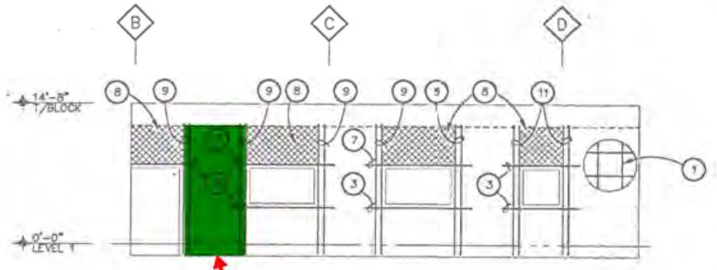
REVIEWED AS NOTED
PETERSON STRUCTURAL ENGINEERS
708 BROADWAY, SUITE 110
TACOMA, WA 98402
PHONE: 253-830-2140
2102-0070 02/23/2022
NRW SH. SR6 of 16

GENERAL NOTES

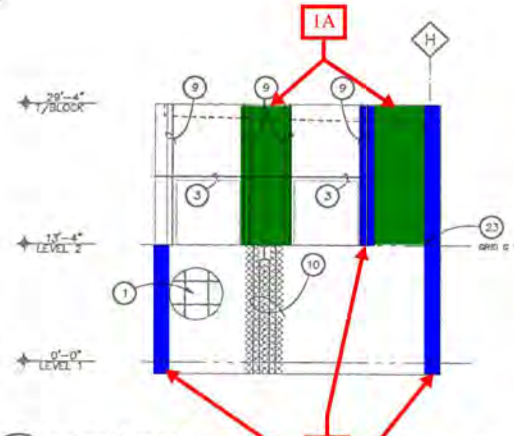
A. MINIMUM WALL REINFORCING UNLESS NOTED OTHERWISE: (1) #5 VERT. @ 2'-8" O.C., (1) #5 HORZ. @ 4'-0" O.C.
B. (1) #5 MIN. AROUND ALL OPENING EDGES, EXTEND MIN. x2'-0" PAST EDGE OF OPENING.
C. (1) #5 AT TOP, BOTTOM, EDGES, AND CORNERS OF ALL WALLS.
D. ALL STEEL PLACED AT ℄ OF WALL UNLESS NOTED EACH FACE.
E. WHERE REBAR DENOTED EACH FACE, PLACE ℄ OF BAR 2 3/8" FROM FACE OF BLOCK.
F. PLACE CORNER BARS IN ACCORDANCE WITH DETAIL 3/S8.1 AT WALL INTERSECTIONS.
G. ALL MASONRY WORK TO HAVE CONTINUOUS SPECIAL INSPECTION IN ACCORDANCE WITH UBC SECTION 306(a)7.
H. MINIMUM f'm @ 28 DAYS 2000psi UP TO SECOND FLOOR 1500psi ABOVE SECOND FLOOR.
J. BAR PLACEMENT TOLERANCE NOT TO EXCEDE 1/2" ±.
K. MINIMUM LAP SPLICE 48 BAR DIAMETERS.
L. NOT ALL REBAR IS SHOWN ON WALL ELEVATIONS. MINIMUM AND DETAILS WILL INDICATE ADDITIONAL REINFORCING AND/OR GROUTING.
M. GROUT ALL CELLS CONTAINING REINFORCING, ANCHOR BOLTS, OR STUDS.
N. SOLID GROUT FORM TOP OF FTG. TO 8" ABOVE SLAB ON GRADE, MINIMUM.

LEGEND

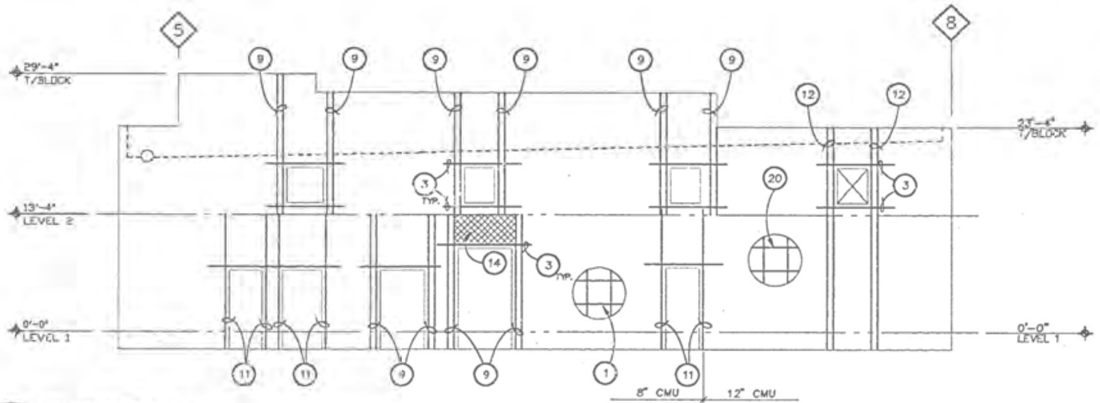
▨ INDICATES SOLID GROUT



12 ELEVATION 8" CMU
S3.1 S3.2 1/8"=1'-0"



13 ELEVATION 8" CMU
S3.1 S3.2 1/8"=1'-0"



14 ELEVATION
S3.1 S3.2 1/8"=1'-0"

SEE S3.2 FOR KEY PLAN

2 RA17
S3.1
5-29-92

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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon

STRUCTURAL ELEVATIONS

8622
OREGON
LEONARD J. KROMBEIN, P.E.

DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: GGN

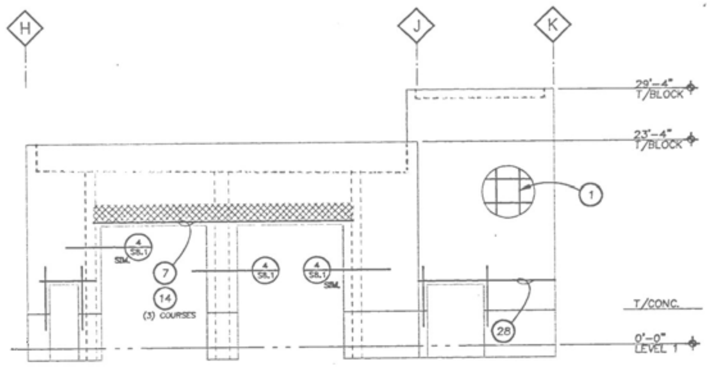
REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992

SHEET S3.1 OF

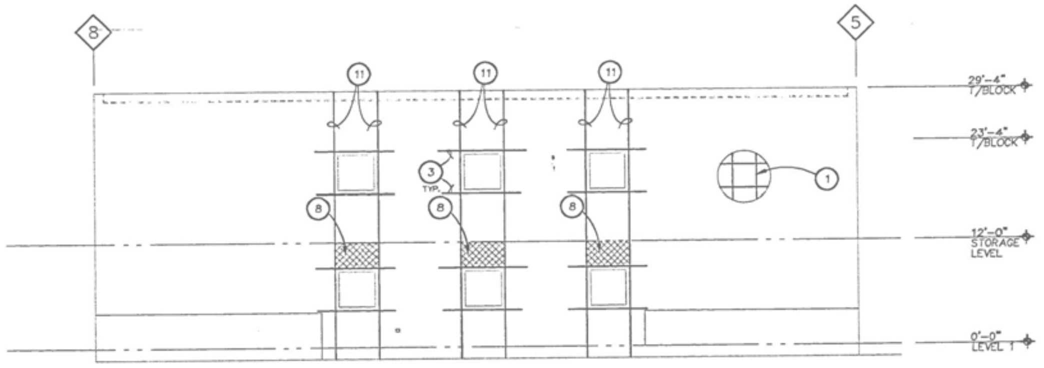
JOB NO. 291451

S3-1 06/17/92 13:47

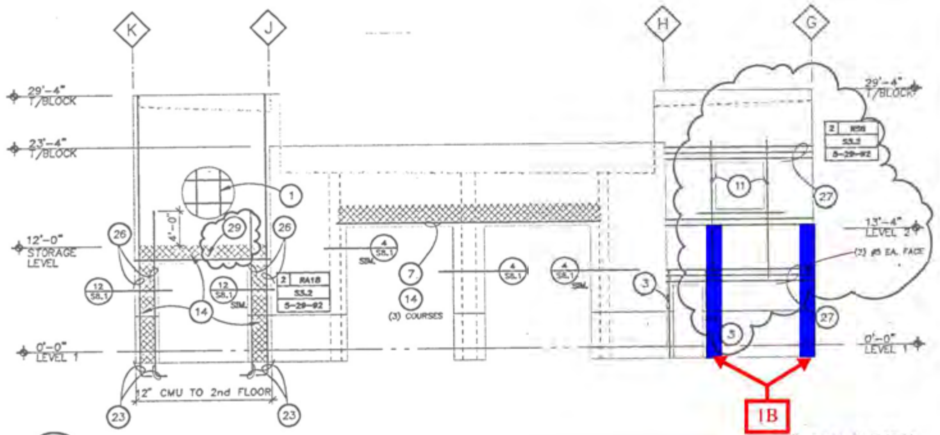
CONSTRUCTION SET - June 19, 1992



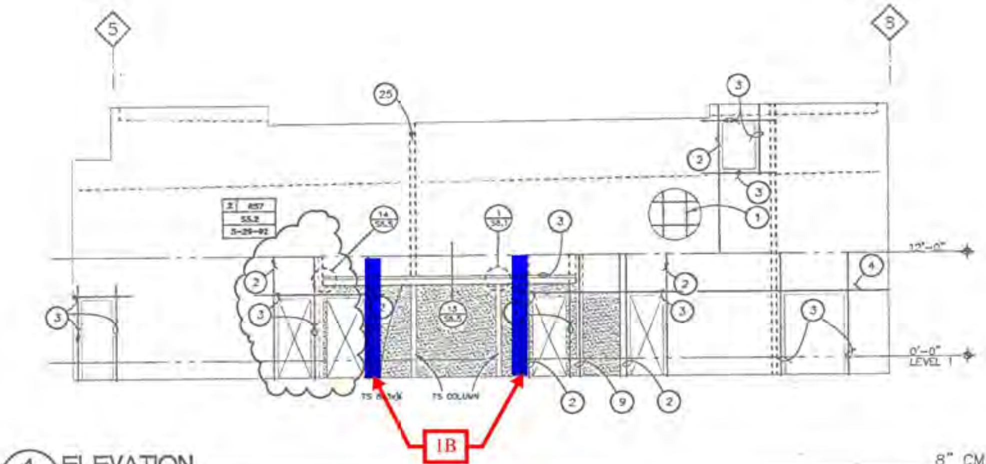
1 ELEVATION 8" CMU TYPICAL
S3.2 S3.2 1/8"=1'-0"



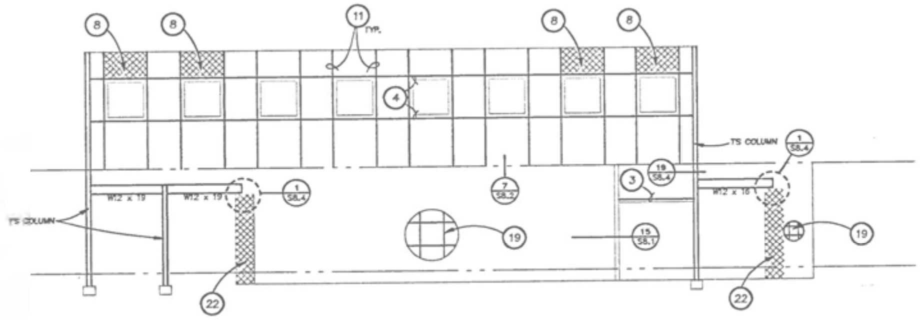
2 ELEVATION 8" CMU
S3.2 S3.2 1/8"=1'-0"



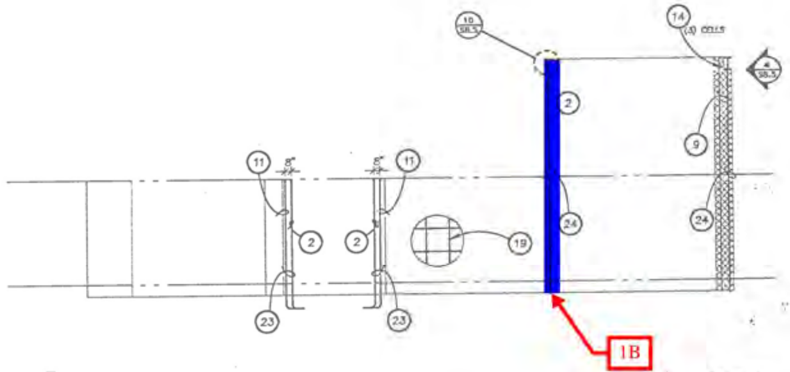
3 ELEVATION 8" CMU TYPICAL
S3.2 S3.2 1/8"=1'-0"



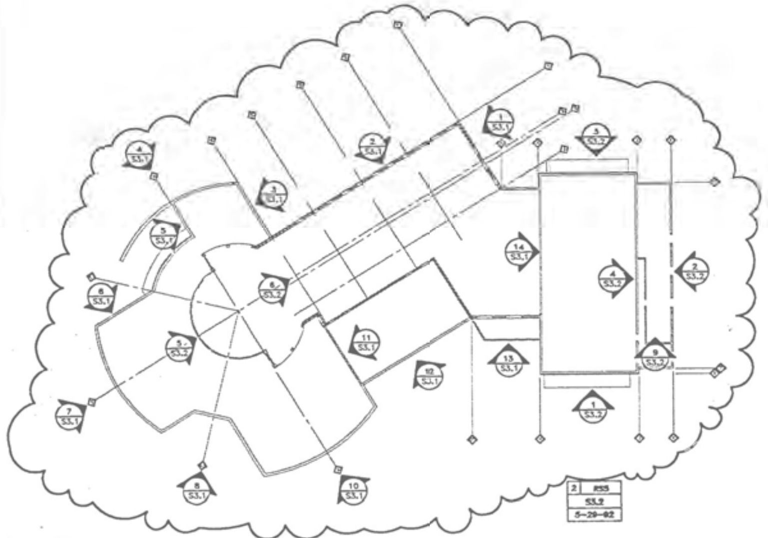
4 ELEVATION 8" CMU
S3.2 S3.2 1/8"=1'-0"



5 ELEVATION 6" CMU
S3.2 S3.2 1/8"=1'-0"



6 ELEVATION 6" CMU
S3.2 S3.2 1/8"=1'-0"



7 KEY PLAN FOR STRUCTURAL WALL ELEVATIONS
S3.2 S3.2 NOT TO SCALE

KEYNOTES

1. #5 AT 2'-8" O.C. MAX. VERTICAL, #5 AT 4'-0" O.C. MAX. HORIZONTAL.
2. (1) #5 VERT. AT ℄ WALL.
3. (1) #5 MIN. AROUND ALL OPENINGS, EXTEND MIN. 2'-0" PAST EDGE.
4. (1) #5 HORZ. AT ℄ WALL.
5. (4) #5 HORZ. (2) EACH CELL.
6. SOLID GROUT (2) CELLS EACH SIDE TO LEVEL OF PLATFORM.
7. (2) #5 HORZ.
8. SOLID GROUT OVER WINDOW.
9. (2) #5 VERT. AT ℄, (1) EACH CELL.
10. SOLID GROUT FOUR CELLS BELOW BEAM W/(4) #5 VERT. (1) EACH CELL.
11. (2) #5 VERT. IN (1) CELL.
12. (2) #5 VERT. EACH FACE, (2) EACH CELL.
13. (4) #6.
14. SOLID GROUT.
15. SPACING OF VERT. GROUTED CELLS NOT TO EXCEDE 2'-0" AT THIS WALL.
16. SOLID GROUT 6" CMU AND PILASTER.
17. (3) #6 EACH FACE.
18. #3 HOOPS @ 15" O.C.
19. #5 @ 24" O.C. VERT.
20. (2) #5 @ 32" O.C. VERT.
21. STEEL HEADER BEYOND
22. SOLID GROUT (2) CELLS BELOW BEAM
23. STANDARD HOOK DOWELS FOR ALL BARS INTO FOOTING
24. CONT. (1) VERT. BAR THRU SLAB TO SECOND FLOOR
25. CMU RETURN BEYOND
26. (2) #6
27. (3) #5 EA. FACE HORZ. (2) BARS PER COURSE.
28. (1) #5 EA. FACE
29. MAINTAIN MINIMUM VERT. STEEL THRU SECOND FLOOR PLANE.

GENERAL NOTES

A. MINIMUM WALL REINFORCING UNLESS NOTED OTHERWISE: (1) #5 VERT. @ 2'-8" O.C., (1) #5 HORZ. @ 4'-0" O.C.
B. (1) #5 MIN. AROUND ALL OPENING EDGES, EXTEND MIN. x2'-0" PAST EDGE OF OPENING.
C. (1) #5 AT TOP, BOTTOM, EDGES, AND CORNERS OF ALL WALLS.
D. ALL STEEL PLACED AT ℄ OF WALL UNLESS NOTED EACH FACE.
E. WHERE REBAR DENOTED EACH FACE, PLACE ℄ OF BAR 2 3/8" FROM FACE OF BLOCK.
F. PLACE CORNER BARS IN ACCORDANCE WITH DETAIL 3/S8.1 AT WALL INTERSECTIONS.
G. ALL MASONRY WORK TO HAVE CONTINUOUS SPECIAL INSPECTION IN ACCORDANCE WITH UBC SECTION 306(a)7.
H. MINIMUM f'm @ 28 DAYS 2000psi UP TO SECOND FLOOR 1500psi ABOVE SECOND FLOOR.
J. BAR PLACEMENT TOLERANCE NOT TO EXCEDE 1/2" ±.
K. MINIMUM LAP SPLICE 48 BAR DIAMETERS.
L. NOT ALL REBAR IS SHOWN ON WALL ELEVATIONS. MINIMUM AND DETAILS WILL INDICATE ADDITIONAL REINFORCING AND/OR GROUTING.
M. GROUT ALL CELLS CONTAINING REINFORCING, ANCHOR BOLTS, OR STUDS.
N. SOLID GROUT FROM TOP OF FTG. TO 8" ABOVE SLAB ON GRADE, MINIMUM.

LEGEND

▩ INDICATES SOLID GROUT

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
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NRW SH. SR7 of 16

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MILWAUKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

STRUCTURAL ELEVATIONS

8622
OREGON

DATE: April 15, 1992
DRAWN BY: WAB
CHECKED BY: GGN

REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET S3.2 OF
JOB NO. 291451

CONSTRUCTION SET - June 19, 1992

S3-2 06/17/92 13:51

KEYNOTES

① FIRE EXTINGUISHER IN CABINET.
② FIRE EXTINGUISHER WITH WALL BRACKET.
③ EQUIPMENT OR CABINETRY FURNISHED AND INSTALLED BY OWNER.
④ FIRE SIGNAL BUTTON FOR WEST BOUND RESPONSE.
⑤ FIRE POLE – SEE DETAILS 2/A8.7 AND 3/A8.7.
⑥ PIPE 2" FRAME
⑦ ELEVATOR PIT ACCESS LADDER.
⑧ GUN RACK
⑨ GUN LOCKER – (2) TOTAL, (1) FURNISHED BY OWNER INSTALLED BY CONTRACTOR.
⑩ PLASTIC LAMINATED WORK SURFACE AT 36" A.F.F. SECURED TO CMU WALLS FINISH ALL EXPOSED SURFACES, (PL1). 24"DEEP x 84" LONG.
⑪ WALL MOUNTED SINK
⑫ DRINKING FOUNTAIN
⑬ PUBLIC TELEPHONE – ACCESSIBLE TO THE DISABLED.
⑭ SECURITY GATE
⑮ 5'-0" x 5'-0" CONCRETE SLAB AT EXIT DOOR.
⑯ STEEL COLUMN – SEE STRUCTURAL DRAWINGS.
⑰ BENCH ATTACHED TO CMU WALL – SEE DETAIL 19/A8.6.
⑱ LINE OF STRUCTURE ABOVE.
⑲ (3) REFRIGERATORS – N.I.C.
⑳ (2) GAS RANGES – N.I.C.
㉑ EXTERIOR LIGHT FIXTURES – COORDINATE w/ELEVATIONS AND ELECTRICAL DRAWINGS.
㉒ STEEL PLATFORM w/GUARDRAILS FOR HOSE HANGING.
㉓ HOSE DRYING BRACKETS AT 12" O.C. – SEE DETAIL 5/A8.6.
㉔ WALL GUARD, SEE DETAIL 15/A8.6 ON THIS WALL OF HALLWAY. COORDINATE WITH INTERIOR ELEVATIONS. REVIEW LAYOUTS WITH ARCHITECT PRIOR TO FABRICATION.
㉕ FIXED WOOD BENCH
㉖ FULL HEIGHT STEEL LOCKERS w/ 4" BASE – TYPE "A"
㉗ MECHANICAL SHAFT
㉘ FURR AROUND COLUMN – SEE DETAIL 10/A8.2.
㉙ CORNER GUARD @ EXPOSED EDGE(S).
㉚ LINE OF CANOPY ABOVE
㉛ LINE OF PARAPET ABOVE
㉜ FACE OF STUD AT GRID LINE.
㉝ WALL IS PERPENDICULAR TO RADIAL LINE AT PT. A/2.
㉞ CORNICE ABOVE
㉟ LOCKERS – TYPE 'B'

2	RA28
A2.1	
5-29-92	

2	RA28
A2.1	
5-29-92	

GENERAL NOTES

A. VERIFY AND CONFIRM ALL DIMENSIONS AND CONDITIONS. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO START OF WORK.

WALL LEGEND

▭	BLOCK WALL (STRUCTURAL) – SEE STRUCTURAL PLANS FOR THICKNESS.
▭	BLOCK WALL (NON-STRUCTURAL) – EXTENDS TO 8" ABOVE CEILING.
▭	WALL EXTENDS TO BOTTOM OF STRUCTURAL DECK OR JOISTS ABOVE. SEE DETAIL 11/A8.3.
▭	WALL EXTENDS 6" ABOVE ADJACENT CEILING. SEE DETAIL 16/A8.3.
■	ONE HOUR RATED WALL ASSEMBLY. ANY OF THE ABOVE WALL TYPES THAT ARE 1 HOUR RATED WILL BE INDICATED BY A BLACK INFILL PATTERN THAT IS THE SAME AS THE HALFTONE INFILL PATTERN ABOVE.
P1C	PARTITION TYPE – SEE SHEET T1.2 FOR DETAILED DESCRIPTION.

FIRST FLOOR PLAN

1/8" = 1'-0"

RS510

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
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15
24

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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon

FIRST FLOOR PLAN

DATE: April 15, 1992
DRAWN BY: WAB/KVB/DTR
CHECKED BY: JJW

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REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992

SHEET A2.1 OF

JOB NO. 291451

CONSTRUCTION SET – June 19, 1992

A2-1 06/22/92 12:13

RD 04/15/92 09:35

KEYNOTES

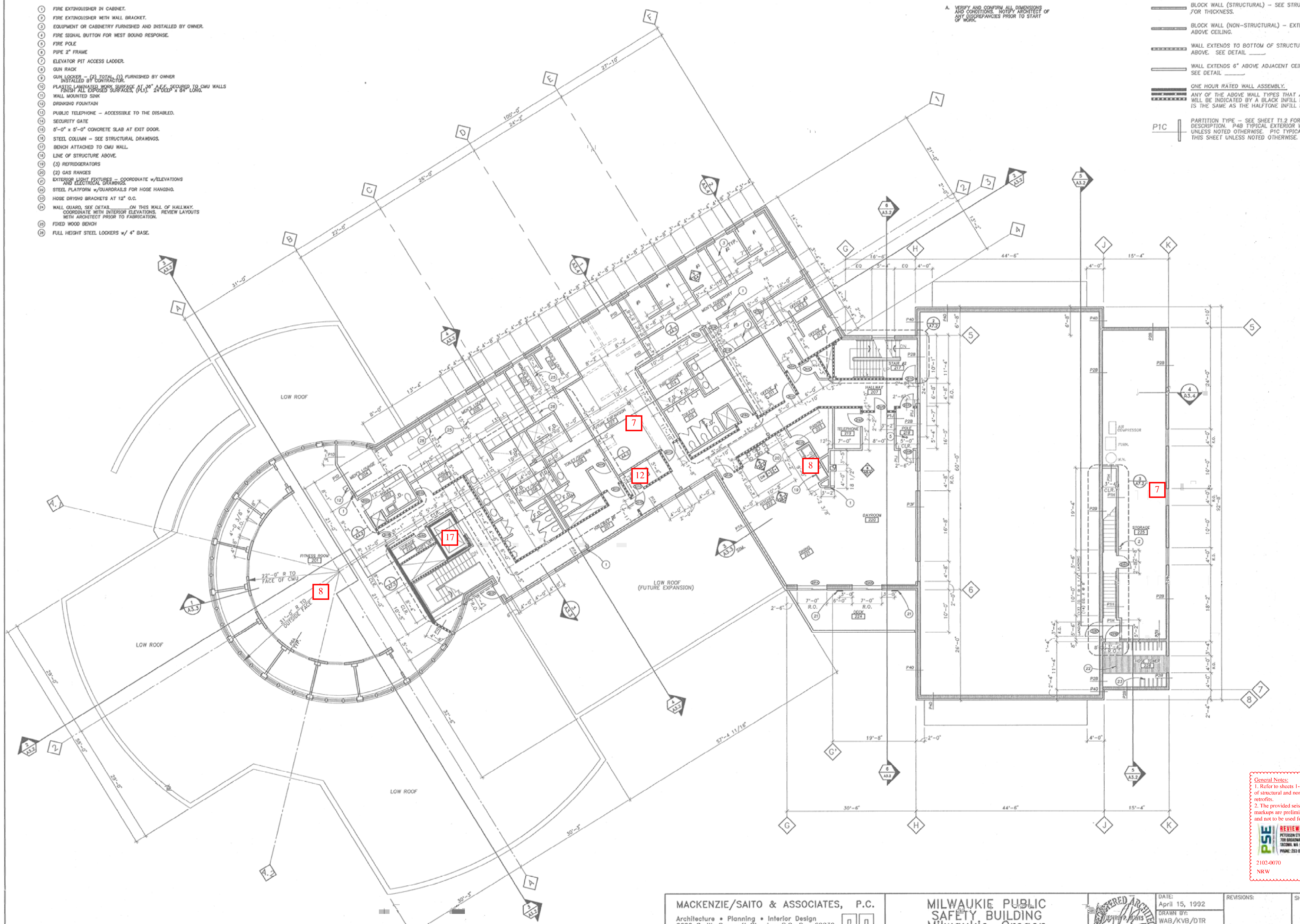
1. FIRE EXTINGUISHER IN CABINET.
2. FIRE EXTINGUISHER WITH WALL BRACKET.
3. EQUIPMENT OR CABINETRY FURNISHED AND INSTALLED BY OWNER.
4. FIRE SIGNAL BUTTON FOR WEST BOUND RESPONSE.
5. FIRE POLE
6. PIPE 2" FRAME
7. ELEVATOR PIT ACCESS LADDER.
8. GUN RACK
9. GUN LOCKER – (2) TOTAL, (1) FURNISHED BY OWNER INSTALLED BY CONTRACTOR.
10. PLASTIC LAMINATED WORK SURFACE AT 36" A.F.F. SECURED TO CMU WALLS FINISH ALL EXPOSED SURFACES, (PL1). 24"DEEP x 84" LONG.
11. WALL MOUNTED SINK
12. DRINKING FOUNTAIN
13. PUBLIC TELEPHONE – ACCESSIBLE TO THE DISABLED.
14. SECURITY GATE
15. 5'-0" x 5'-0" CONCRETE SLAB AT EXIT DOOR.
16. STEEL COLUMN – SEE STRUCTURAL DRAWINGS.
17. BENCH ATTACHED TO CMU WALL.
18. LINE OF STRUCTURE ABOVE.
19. (3) REFRIDGERATORS
20. (2) GAS RANGES
21. EXTERIOR LIGHT FIXTURES – COORDINATE w/ELEVATIONS AND ELECTRICAL DRAWINGS.
22. STEEL PLATFORM w/GUARDRAILS FOR HOSE HANGING.
23. HOSE DRYING BRACKETS AT 12" O.C.
24. WALL GUARD, SEE DETAIL______ON THIS WALL OF HALLWAY. COORDINATE WITH INTERIOR ELEVATIONS. REVIEW LAYOUTS WITH ARCHITECT PRIOR TO FABRICATION.
25. FIXED WOOD BENCH
26. FULL HEIGHT STEEL LOCKERS w/ 4" BASE.

GENERAL NOTES

A. VERIFY AND CONFIRM ALL DIMENSIONS AND CONDITIONS. NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO START OF WORK.

WALL LEGEND

- BLOCK WALL (STRUCTURAL) – SEE STRUCTURAL PLANS FOR THICKNESS.
- BLOCK WALL (NON-STRUCTURAL) – EXTENDS TO 8" ABOVE CEILING.
- WALL EXTENDS TO BOTTOM OF STRUCTURAL DECK ABOVE. SEE DETAIL ____.
- WALL EXTENDS 6" ABOVE ADJACENT CEILING. SEE DETAIL ____.
- ONE HOUR RATED WALL ASSEMBLY. ANY OF THE ABOVE WALL TYPES THAT ARE 1 HOUR RATED WILL BE INDICATED BY A BLACK INFILL PATTERN THAT IS THE SAME AS THE HALFTONE INFILL PATTERN ABOVE.
- P1C — PARTITION TYPE – SEE SHEET T1.2 FOR DETAILED DESCRIPTION. P4B TYPICAL EXTERIOR WALLS THIS SHEET UNLESS NOTED OTHERWISE. P1C TYPICAL INTERIOR WALLS THIS SHEET UNLESS NOTED OTHERWISE.



SECOND FLOOR PLAN

1/8" =

RS511

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
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2102-0070 02/23/2022
NRW SH. SR9 of 16

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MILWAUKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

SECOND FLOOR PLAN

JEFFREY P. REAVES
PORTLAND, OREGON

DATE: April 15, 1992
DRAWN BY: WAB/KVB/DTR
CHECKED BY: JJW

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REVISIONS:

SHEET A2.2 OF

JOB NO. 291451

TA2-2 04/15/92 10:58

PERMIT SET – April 15, 1992

KEYNOTES

1. ROOF MEMBRANE.
2. ROOF HATCH.
3. CONTINUOUS METAL GUTTER.
4.
5. DOWNSPOUT AND ROOF SCUPPER, SEE DETAILS 3/A8.3 & 4/A8.3.
6. SPLASHBLOCK, 2'-0" x 2'-0".
7. LADDER TO HIGH ROOF, SEE DETAIL ____.
8. RUBBER WALK PADS, 2'-0" x 2'-0".
9. CANOPY
10. DECK BELOW.
11. SCREEN WALL, SEE DETAILS ____ ____.
12. OPENING AT SCREEN WALL, 6'-0" WIDE.
13. SATELLITE DISHES AND SUPPORTS, BY OWNER.
14. WELD PLATES FOR ANTENNA ANCHORAGE, ℙ ½" x 7½" x 15½" WITH (2) 6" WELD STUDS. VERIFY LOCATION WITH ARCHITECT PRIOR TO INSTALLATION, (4 TOTAL).

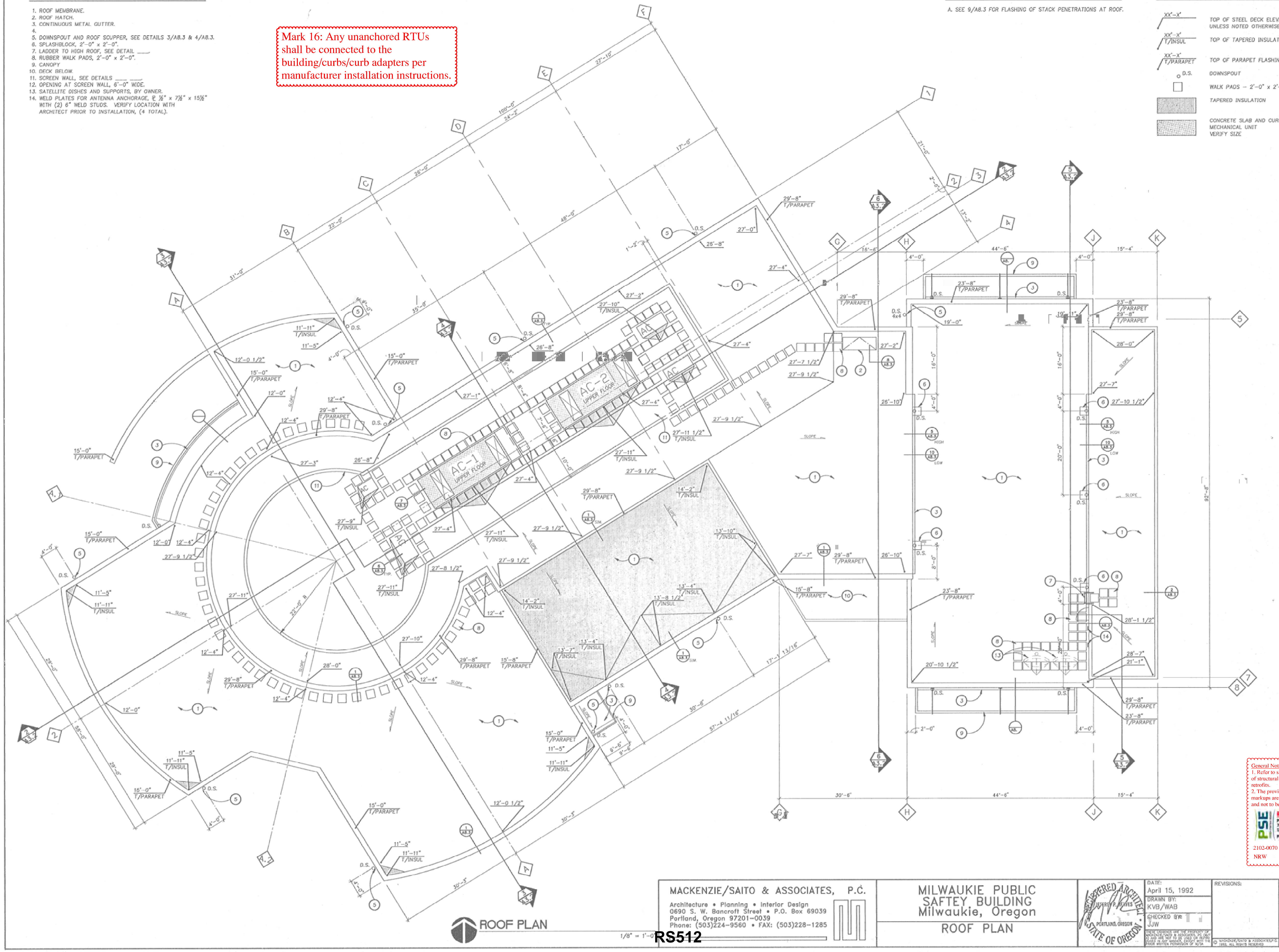
Mark 16: Any unanchored RTUs shall be connected to the building/curbs/curb adapters per manufacturer installation instructions.

NOTES

A. SEE 9/A8.3 FOR FLASHING OF STACK PENETRATIONS AT ROOF.

LEGEND

XX'-X'	TOP OF STEEL DECK ELEVATION UNLESS NOTED OTHERWISE
XX'-X' T/INSUL	TOP OF TAPERED INSULATION
XX'-X' T/PARAPET	TOP OF PARAPET FLASHING ELEVATION
○ D.S.	DOWNSPOUT
☐	WALK PADS – 2'-0" x 2'-0"
▨	TAPERED INSULATION
▨	CONCRETE SLAB AND CURB AT MECHANICAL UNIT VERIFY SIZE



ROOF PLAN

1/8" = 1'-0"

RS512

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
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PHONE: 253-830-2146

2102-0070 02/23/2022
NRW SH. SR10 of 16

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MILWAUKIE PUBLIC
SAFTEY BUILDING
Milwaukie, Oregon

ROOF PLAN

REGISTERED ARCHITECT
JEFFERY P. REEVES
PORTLAND, OREGON
STATE OF OREGON

DATE:
April 15, 1992
DRAWN BY:
KVB/WAB
CHECKED BY:
JJW

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REVISIONS:

SHEET
A2.3
OF

JOB NO.
291451

IT SET - April 15, 1992

A2-3 04/14/92 17:02

KEYNOTES

1. EXPOSED STRUCTURE, PAINTED.
2. EXPOSED STRUCTURE, NO PAINT.
3. SUSPENDED VENEER PLASTER CEILING SYSTEM, PAINTED.
4. SUSPENDED ACOUSTICAL TILE CEILING SYSTEM.
5. PAINTED T.S. BEAM – P3.
6. VENEER PLASTER SOFFIT, PAINTED.
7. EXTERIOR PLASTER CEILING SYSTEM.
8. CONTROL JOINT IN CEILING SYSTEM.
9. HVAC DIFFUSER CENTERED IN BAY.
10. BRICK SOFFIT, SEE DETAIL 11/S8.1.
11.
12. PROJECTION SCREEN. MANUAL PULL THROUGH CEILING OPENING.
13. PAY TELEPHONE.
14. ALLIGN GRID WITH ADJACENT ROOM.
15. 12" x 12" ACOUSTICAL TILE SAT 3.
16. 2'-0" x 2'-0" ACCESS PANEL.

2 RA83
A6.1
5-29-92

GENERAL NOTES

A. COORDINATE WITH MECHANICAL AND ELECTRICAL PLANS FOR LOCATIONS OF LIGHT FIXTURES, EXIT SIGNS, GRILLES, LOUVERS, FIRE SPRINKLER HEADS, ETC. ANY CONFLICTS BETWEEN THIS PLAN AND THE MECHANICAL OR ELECTRICAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO PROCEEDING WITH ANY WORK INVOLVED.

B. SEE FINISH SCHEDULE FOR CEILING HEIGHTS UNLESS NOTED OTHERWISE.

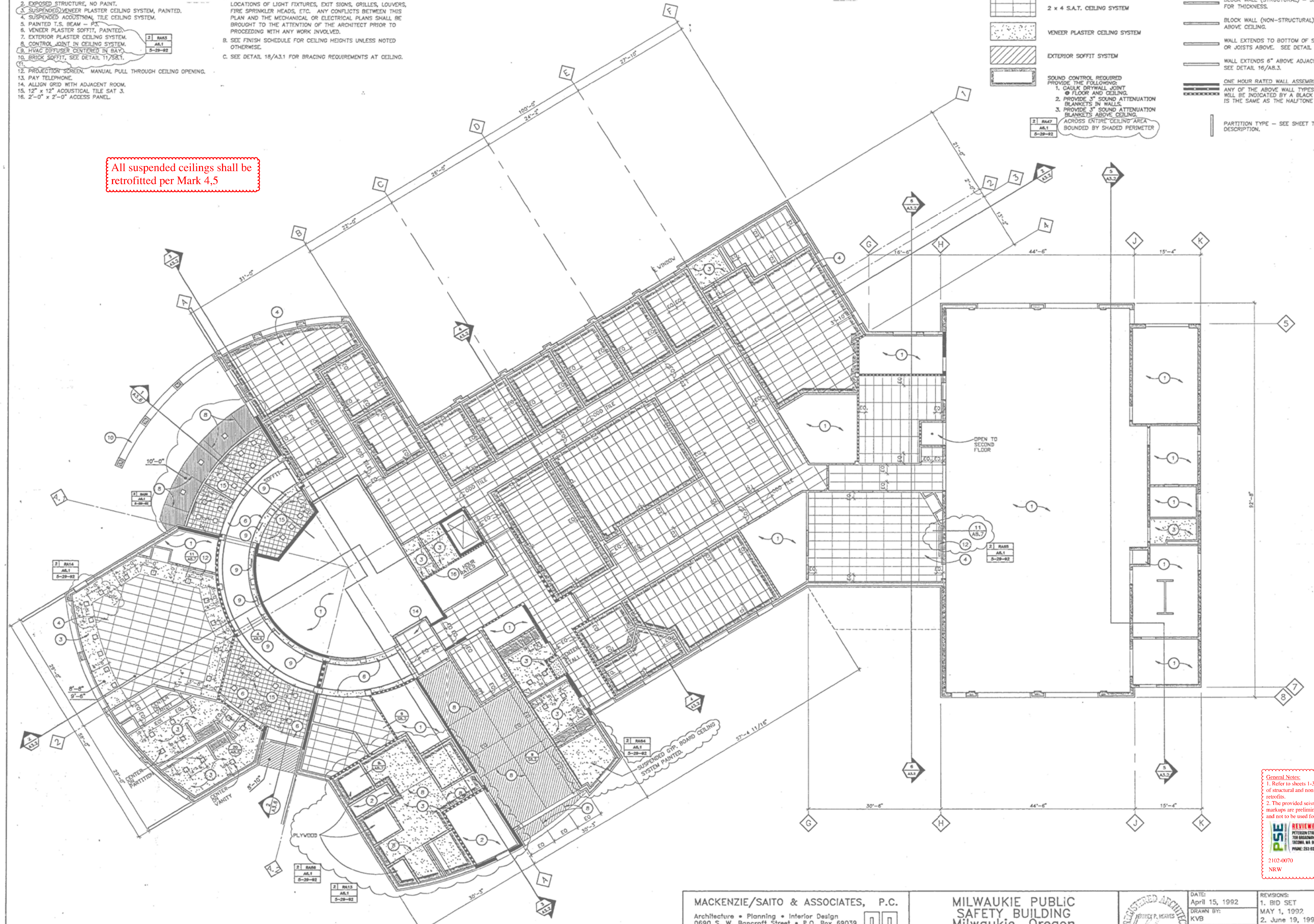
C. SEE DETAIL 18/A3.1 FOR BRACING REQUIREMENTS AT CEILING.

LEGEND

▦	2 x 4 S.A.T. CEILING SYSTEM
⁙	VENEER PLASTER CEILING SYSTEM
▨	EXTERIOR SOFFIT SYSTEM
▭	SOUND CONTROL REQUIRED PROVIDE THE FOLLOWING: 1. CAULK DRYWALL JOINT @ FLOOR AND CEILING. 2. PROVIDE 3" SOUND ATTENUATION BLANKETS IN WALLS. 3. PROVIDE 3" SOUND ATTENUATION BLANKETS ABOVE CEILING. ACROSS ENTIRE CEILING AREA BOUNDED BY SHADED PERIMETER
▭	BLOCK WALL (STRUCTURAL) – SEE STRUCTURAL PLANS FOR THICKNESS.
▭	BLOCK WALL (NON-STRUCTURAL) – EXTENDS TO 8" ABOVE CEILING.
▭	WALL EXTENDS TO BOTTOM OF STRUCTURAL DECK OR JOISTS ABOVE. SEE DETAIL 11/A8.3.
▭	WALL EXTENDS 6" ABOVE ADJACENT CEILING. SEE DETAIL 16/A8.3.
■	ONE HOUR RATED WALL ASSEMBLY. ANY OF THE ABOVE WALL TYPES THAT ARE 1 HOUR RATED WILL BE INDICATED BY A BLACK INFILL PATTERN THAT IS THE SAME AS THE HALFTONE INFILL PATTERN ABOVE.
▯	PARTITION TYPE – SEE SHEET T1.2 FOR DETAILED DESCRIPTION.

2 RA47
A6.1
5-29-92

All suspended ceilings shall be retrofitted per Mark 4,5



FIRST FLOOR REFLECTED CEILING PLAN

1/8" = 1'-0"

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
PETERSON STRUCTURAL ENGINEERS
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PHONE: 253-830-2146

2102-0070 02/23/2022
NRW SH. SR11 of 16

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MILWAUKIE PUBLIC SAFETY BUILDING
Milwaukie, Oregon

FIRST FLOOR REFLECTED CEILING PLAN

REGISTERED ARCHITECT
JEFFREY P. HEAVES
PORTLAND, OREGON
STATE OF OREGON

DATE: April 15, 1992
DRAWN BY: KVB
CHECKED BY: JJW

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REVISIONS:
1. BID SET
MAY 1, 1992
2. June 19, 1992

SHEET
A6.1
OF

JOB NO. 291451

CONSTRUCTION SET - June 19, 1992

A6-1 06/15/92 12:26

KEYNOTES

1. EXPOSED STRUCTURE, PAINTED.
2. EXPOSED STRUCTURE, NO PAINT.
3. SUSPENDED VENEER PLASTER CEILING SYSTEM, PAINTED.
4. SUSPENDED ACOUSTICAL TILE CEILING SYSTEM.
5. PAINTED T.S. BEAM – P3.
6. VENEER PLASTER SOFFIT, PAINTED.
7. EXTERIOR PLASTER CEILING SYSTEM.
8. CONTROL JOINT IN CEILING SYSTEM.
9. HVAC DIFFUSER CENTERED IN BAY
10. BRICK SOFFIT, SEE DETAIL 11/S8.1.
11.
12. PROJECTION SCREEN. MANUAL PULL THROUGH CEILING OPENING.
13. PAY TELEPHONE.
14. CENTERLINE OF WALL, CENTERLINE OF CEILING GRID.
15. 12" x 12" ACOUSTICAL TILE – SAT 3.
16. 2'-0" x 2'-0" ACCESS PANEL.

2 RA63
A6.2
5-29-92

GENERAL NOTES

A. COORDINATE WITH MECHANICAL AND ELECTRICAL PLANS FOR LOCATIONS OF LIGHT FIXTURES, EXIT SIGNS, GRILLES, LOUVERS, FIRE SPRINKLER HEADS, ETC. ANY CONFLICTS BETWEEN THIS PLAN AND THE MECHANICAL OR ELECTRICAL PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT PRIOR TO PROCEEDING WITH ANY WORK INVOLVED.

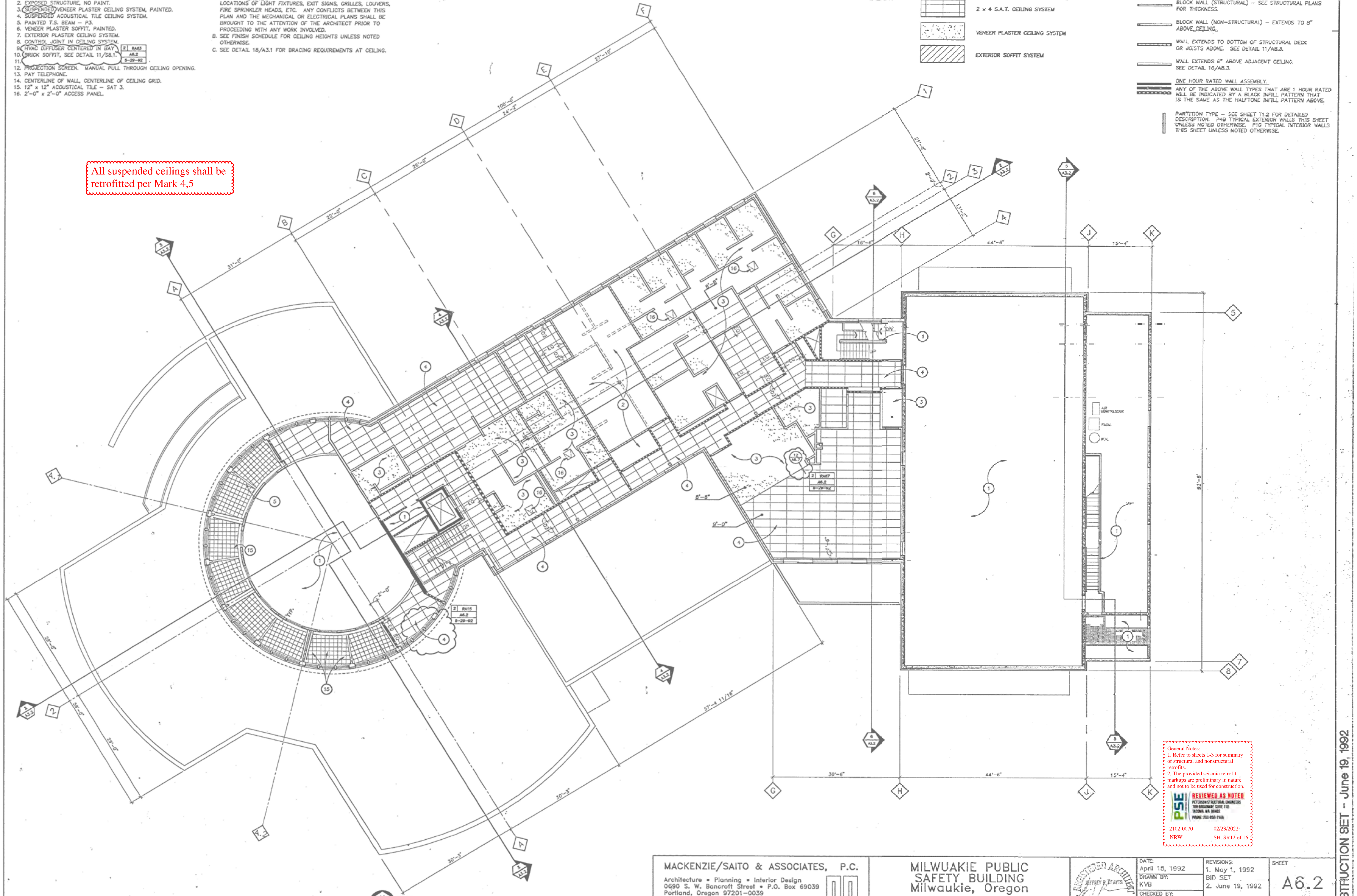
B. SEE FINISH SCHEDULE FOR CEILING HEIGHTS UNLESS NOTED OTHERWISE.

C. SEE DETAIL 18/A3.1 FOR BRACING REQUIREMENTS AT CEILING.

LEGEND

⊞	2 x 4 S.A.T. CEILING SYSTEM
░	VENEER PLASTER CEILING SYSTEM
▨	EXTERIOR SOFFIT SYSTEM

▭	BLOCK WALL (STRUCTURAL) – SEE STRUCTURAL PLANS FOR THICKNESS.
▭	BLOCK WALL (NON-STRUCTURAL) – EXTENDS TO 8" ABOVE CEILING.
▭	WALL EXTENDS TO BOTTOM OF STRUCTURAL DECK OR JOISTS ABOVE. SEE DETAIL 11/A8.3.
▭	WALL EXTENDS 6" ABOVE ADJACENT CEILING. SEE DETAIL 16/A8.3.
▬	ONE HOUR RATED WALL ASSEMBLY. ANY OF THE ABOVE WALL TYPES THAT ARE 1 HOUR RATED WILL BE INDICATED BY A BLACK INFILL PATTERN THAT IS THE SAME AS THE HALFTONE INFILL PATTERN ABOVE.
▯	PARTITION TYPE – SEE SHEET T1.2 FOR DETAILED DESCRIPTION. P4B TYPICAL EXTERIOR WALLS THIS SHEET UNLESS NOTED OTHERWISE. P1C TYPICAL INTERIOR WALLS THIS SHEET UNLESS NOTED OTHERWISE.


All suspended ceilings shall be retrofitted per Mark 4,5

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

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2102-0070 02/23/2022
NRW SH. SR12 of 16

SECOND FLOOR REFLECTED CEILING PLAN

1/8" = 1'-0"

RS514

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MILWUAKIE PUBLIC
SAFETY BUILDING
Milwaukie, Oregon

SECOND FLOOR
REFLECTED CEILING PLAN

JEFFREY P. REAVES
PORTLAND, OREGON

DATE:
April 15, 1992
DRAWN BY:
KVB
CHECKED BY:
JJW

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REVISIONS:
1. May 1, 1992
BID SET
2. June 19, 1992

SHEET
A6.2
OF

JOB NO.
29145

CONSTRUCTION SET – June 19, 1992

NOTES THIS SHEET

① MOUNT FIXTURES 11 FOOT 6 INCHES ABOVE FINISHED FLOOR TO CENTERLINE OF JUNCTION BOX.

② MOUNT FIXTURES 7 FOOT 0 INCHES ABOVE FINISHED GRADE TO CENTERLINE OF JUNCTION BOX.

③ MAKE CONNECTION VIA EXTERIOR LIGHTING CONTROL. 1/E8.1

④ MAKE CONNECTION VIA TAP-OUT CONTROL SYSTEM, SEE TAP-OUT SYSTEM DETAIL.

⑤ ROUTE TO 20 AMP, ONE POLE BREAKER IN UPS OUTPUT PANEL.

⑥ PROVIDE ONE 7 WATT LAMP FOR UNSWITCHED NIGHT LIGHT. PROVIDE SWITCH FOR TWO F32 LAMPS. VERIFY EXACT LOCATIONS WITH ARCHITECTURAL.

⑦ PROVIDE KEYLESS PORCELAIN LIGHT FIXTURE.

⑧ MOUNT STRIP LIGHTS ON SOFFIT, VERIFY EXACT LOCATION WITH ARCHITECTURAL.

⑨ PROVIDE AND INSTALL 2400W. 4 SCENE DIMMER CONTROL STATION. LIGHTOLIER SCENIST 'S2400'. LITHONIA, LUTRON, OR APPROVED SUBSTITUTE.

⑩ PROVIDE AND INSTALL 1000W, SLIDE/PRE-SET DIMMER. LIGHTOLIER 'SUNRISE' ZP1000, LITHONIA, LUTRON, OR APPROVED SUBSTITUTE.

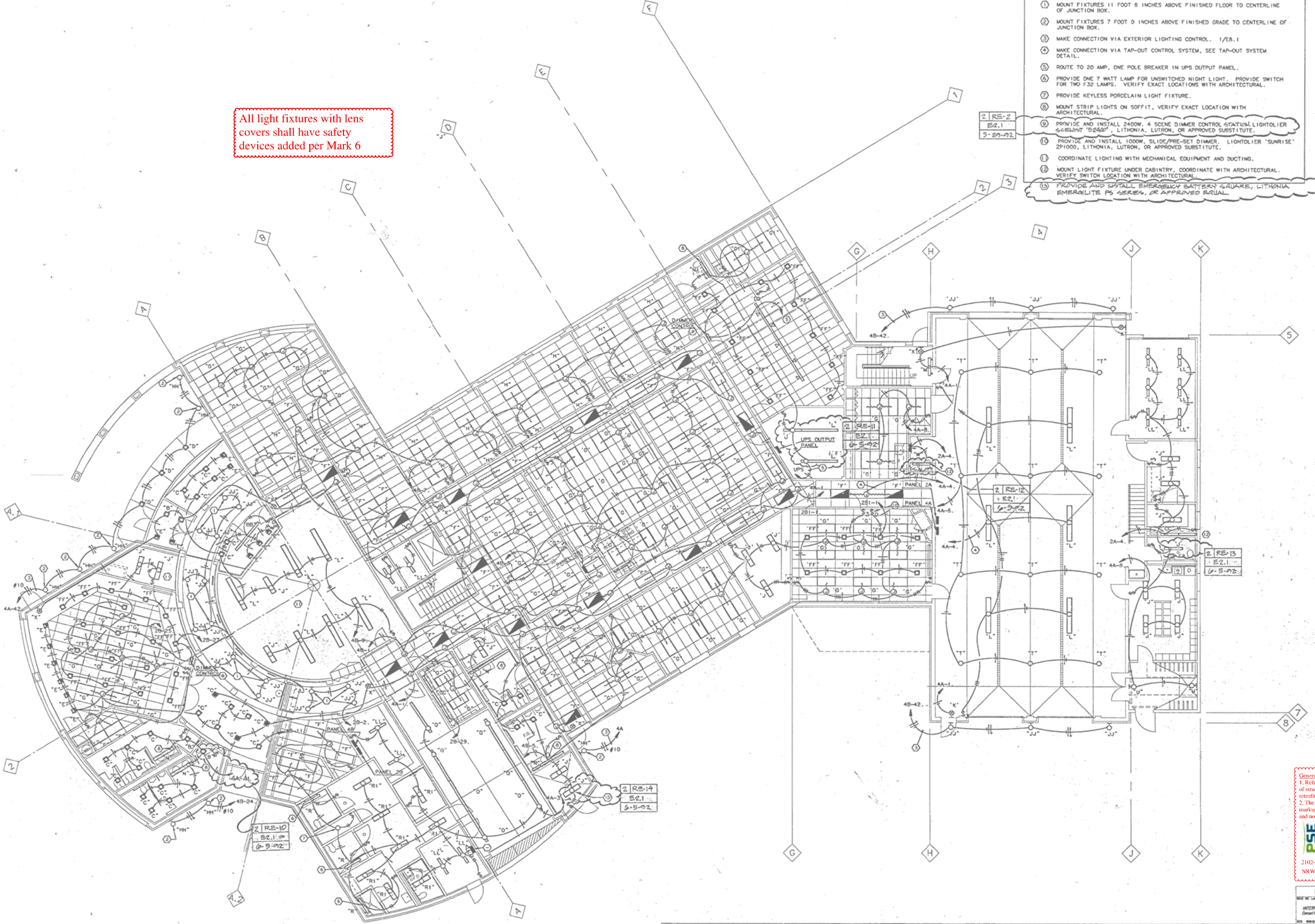
⑪ COORDINATE LIGHTING WITH MECHANICAL EQUIPMENT AND DUCTING.

⑫ MOUNT LIGHT FIXTURE UNDER CABINTRY, COORDINATE WITH ARCHITECTURAL. VERIFY SWITCH LOCATION WITH ARCHITECTURAL.

⑬ PROVIDE AND INSTALL EMERGENCY BATTERY SQUARE, LITHONIA EMERGILITE PS SERIES, OR APPROVED EQUAL.

2 RE-2 E2.1 5-29-92

2 RE-14 E2.1 6-5-92



All light fixtures with lens covers shall have safety devices added per Mark 6

FIRST FLOOR LIGHTING PLAN

1/8"=1'-0"

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
PETERSON STRUCTURAL ENGINEERS
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PHONE: 253-830-2146

2102-0070 02/23/2022
NRW SH. SR13 of 16

PROJECT. NO.: 91-316

INTERFACE ENGINEERING INC.
Consulting Engineers
HANK BARLEEN

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RS515

MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

FIRST FLOOR
LIGHTING PLAN

REGISTERED PROFESSIONAL ENGINEER 8338 OREGON APRIL 18, 1975 ROBERT CATLIN KLAWA

DATE: 4/22/92
DRAWN BY: LAH
CHECKED BY: HLB

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REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

SHEET: E2.1
OF

JOB NO. 91-316

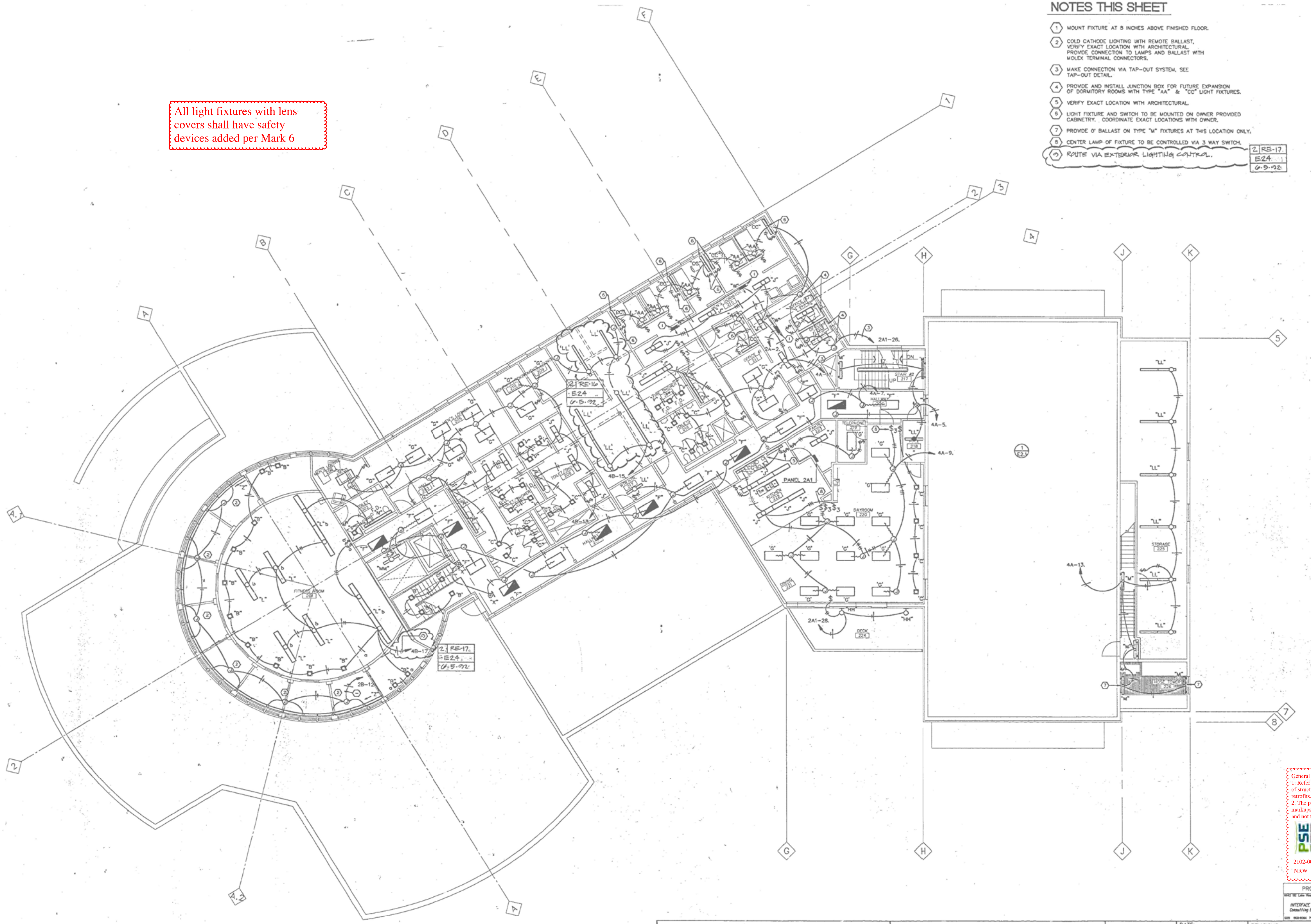
CONSTRUCTION SET - June 19, 1992

NOTES THIS SHEET

1. MOUNT FIXTURE AT 8 INCHES ABOVE FINISHED FLOOR.
2. COLD CATHODE LIGHTING WITH REMOTE BALLAST. VERIFY EXACT LOCATION WITH ARCHITECTURAL. PROVIDE CONNECTION TO LAMPS AND BALLAST WITH MOLEX TERMINAL CONNECTORS.
3. MAKE CONNECTION VIA TAP-OUT SYSTEM, SEE TAP-OUT DETAIL.
4. PROVIDE AND INSTALL JUNCTION BOX FOR FUTURE EXPANSION OF DORMITORY ROOMS WITH TYPE "AA" & "CC" LIGHT FIXTURES.
5. VERIFY EXACT LOCATION WITH ARCHITECTURAL.
6. LIGHT FIXTURE AND SWITCH TO BE MOUNTED ON OWNER PROVIDED CABINETRY. COORDINATE EXACT LOCATIONS WITH OWNER.
7. PROVIDE 0° BALLAST ON TYPE "M" FIXTURES AT THIS LOCATION ONLY.
8. CENTER LAMP OF FIXTURE TO BE CONTROLLED VIA 3 WAY SWITCH.
9. ROUTE VIA EXTERIOR LIGHTING CONTROL.

2 RE-17.
E24
6-5-92

All light fixtures with lens covers shall have safety devices added per Mark 6



General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
PETERSON STRUCTURAL ENGINEERS
708 BROADWAY, SUITE 110
TACOMA, WA 98402
PHONE: 253-830-2144

2102-0070 02/23/2022
NRW SH. SR14 of 16

SECOND FLOOR LIGHTING PLAN
1/8"=1'-0"

MACKENZIE/SAITO & ASSOCIATES, P.C.
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MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

SECOND FLOOR
LIGHTING PLAN

REGISTERED PROFESSIONAL ENGINEER
OREGON
APRIL 18, 1975
ROBERT CATLIN KLAWA

DATE: 4/15/92
DRAWN BY: LAH
CHECKED BY: HLB

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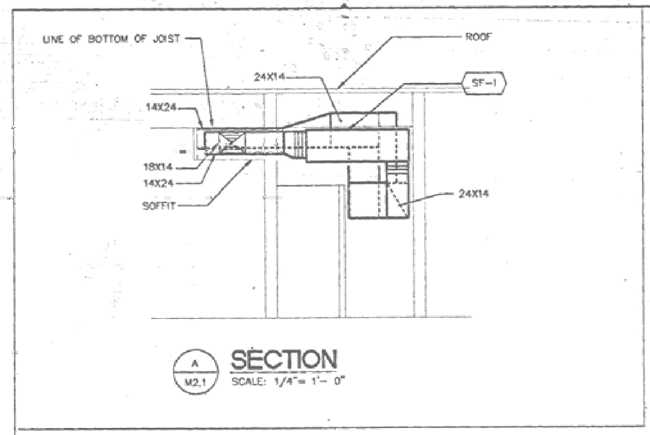
REVISIONS:
1. May 1, 1992 BID SET
2. June 19, 1992

PROJECT NO.: 91-316
8642 SE Lake Road, Milwaukie, Oregon 97222
INTERFACE ENGINEERING INC.
Consulting Engineers
503 659-8364 HANK BARLEEN

SHEET
E2.4
OF

JOB NO.
91-316

CONSTRUCTION SET - June 19, 1992



SECTION

A / M2.1 SCALE: 1/4" = 1'- 0"

NOTES FOR VA OX AND TERMINAL UNIT INSTALLA N:

1 COORDINATE EXACT LOCATION A.V BOXES AND FAN POWERED V.A.V TERMINAL UNITS WITH REFLEC LING, LIGHTING, SPRINKLER SYSTEM AND STRUCTURAL PLAN TO SERVICE CLEARANCE FOR THE UNITS BEFORE ROUH-IN.

2 PROVIDE SERVICE CLEARANC MOTOR ACCESS AND ELECTRIC HEATER CONTROL PANEL PER ELECTR ODE AND LOCAL REGULATIONS. MINIMUM WORKING SPACE SHALL NOT S THAN 36 INCHES.

NOTES THIS SHEET:

① COORDINATE EXACT LOCATION OF SF-1 UNIT DE SERVICE CLEARANCE PER MANUFACTURER RECOMMENDATIONS AND E. PROVIDE SERVICE CLEARANCE FOR MOTOR ACCESS AND ELECTR R CONTROL PANE PER ELECTRICAL CODE. MINIMUM WORKING SPACE OT BE LESS THAN 36".

② RUN DUCT IN SPACE BETWEEN JOISTS. COOR XACT LOCATION. TYPICAL.

③ RUN DUCT IN SOFFET. SEE ARCHITECTURAL .

④ 24 X 14 OUTSIDE AIR DUCT DOWN TO 24 X 1 N AIR DUCT.

⑤ CAULK AROUND DUCT AT DUCT PENETRATION H WALL WITH ACOUSTICAL CAULKING MATERIAL.

⑥ ROUTE REFRIGERANT LINES UP TO CU-1 UNIT F. SEE M2.2. VERIFY EXACT ROUTING. SIZE AND INSTALL LINES PE FACTURER RECOMMENDATIONS.

⑦ PROVIDE 1-1/4" CONDENSATE DRAIN WITH P- OR THE SF-1 UNIT. ROUTE DRAIN PIPE TO DISCHARGE OVER FLOOR DRAI PLUMBING DRAWINGS FOR EXACT LOCATION OF FLOOR DRAIN.

⑧ TRANSFER AIR DUCT IN CEILING SPACE. COO EXACT LOCATION.

⑨ RETURN AIR DUCT OPEN TO CEILING SPACE.

⑩ SHEET METAL DUCT. CAULK AROUND DUCT PENETRATION THROUGH CORRIDOR WALL WITH FIRESTOP CAULKING MA

⑪ RUN DUCT AS HIGH AS POSSIBLE. TYPICAL TWORK IN PROPERTY 132 AREA. COORDINATE EXACT LOCATION. VERI OB.

⑫ RUN DUCT EXPOSED CLOSE TO WALL.

⑬ SUSPEND UNIT FROM STRUCTURE. MOUNT UN HIGH AS POSSIBLE BELOW JOISTS. COORDINATE WITH DUCTWORK. PRO RVICE CLEARANCE REQUIRED.

⑭ ROUTE 4" ROUND, 12 GAUGE SHEET METAL DISCHARGE DUCT UP THROUGH ROOF AND INSTALL AGA APPROVED VENT TERMINATION CAP. FLASH WATERTIGHT AT ROOF PENETRATION.

⑮ INSTALL A "VANTAGE II" GORRON-RAY LOW INTENSITY INFRARED UNITARY HEATER SYSTEM IN ACCORDANCE WITH ALL MANUFACTURERS INSTALLATION INSTRUCTIONS. SYSTEM SHALL BE A COMPLETE OPERATING SYSTEM INCLUDING GAS FIRED BURNER, TUBE AND REFLECTOR AS WELL AS LOW VOLTAGE CONTROLS AND GAS SUPPLY PIPING.

⑯ PROVIDE 90 DEGREE ELBOWS FOR ACOUSTICAL PURPOSE.

⑰ MOUNT VB-17 EXPOSED, AS HIGH AS POSSIBLE. COORDINATE EXACT LOCATION. PROVIDE SERVICE CLEARANCE REQUIRED.

⑱ 16 X 12 S.A. DUCT ABOVE, 14 X 12 R.A. DUCT BELOW. COORDINATE EXACT LOCATION.

⑲ 16 X 12 S.A. DUCT, 14 X 12 R.A. DUCT UP IN SHAFT TO AC-3 UNIT ON ROOF. SEE M2.2.

⑳ 16 X 12 EXHAUST DUCT UP IN SHAFT TO EF.6 ON ROOF. 25 X 18 S.A. DUCT UP IN SHAFT TO SECOND FLOOR. SEE M2.2.

㉑ 40 X 20 TRANSFER AIR DUCT OPEN TO CORRIDOR CEILING SPACE AND TO SHAFT. PROVIDE BIRDSCREEN OVER OPENINGS.

㉒ RETURN AIR SHAFT EXTENDED BELOW SECOND FLOOR INTO FIRST FLOOR CEILING SPACE. SEE ARCHITECTURAL DRAWINGS FOR DETAIL. PROVIDE FIRE DAMPERS AND VERTICAL POSITIONS AT ALL DUCT PENETRATIONS THROUGH SHAFT.

㉓ 12" ROUND DUCT UP IN SHAFT TO AC-2; 20 X 12 S.A. DUCT, 20 X 12 R.A. DUCT UP IN SHAFT TO AC-5. SEE M2.2.

㉔ DUCT SHAFT EXTENDED BELOW SECOND FLOOR INTO FIRST FLOOR CEILING SPACE. SEE ARCHITECTURAL DRAWINGS FOR DETAIL. PROVIDE FIRE DAMPERS. VERTICAL POSITIONS, AT DUCT PENETRATIONS THROUGH SHAFT.

㉕ RELIEF AIR DUCT FOR AC-4 UNIT IN CEILING SPACE. VERIFY EXACT LOCATION.

㉖ 24 X 14 R.A. DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.

㉗ RUN DUCT AS HIGH AS POSSIBLE IN CEILING SPACE. COORDINATE WITH CABLE TRAY. VERIFY EXACT LOCATION.

㉘ 24 X 14 S.A. DUCT, 24 X 14 R.A. DUCT UP IN SHAFT TO AC-4. SEE M2.2.

㉙ SAME AS NOTE 24.

㉚ SAME AS NOTE 10.

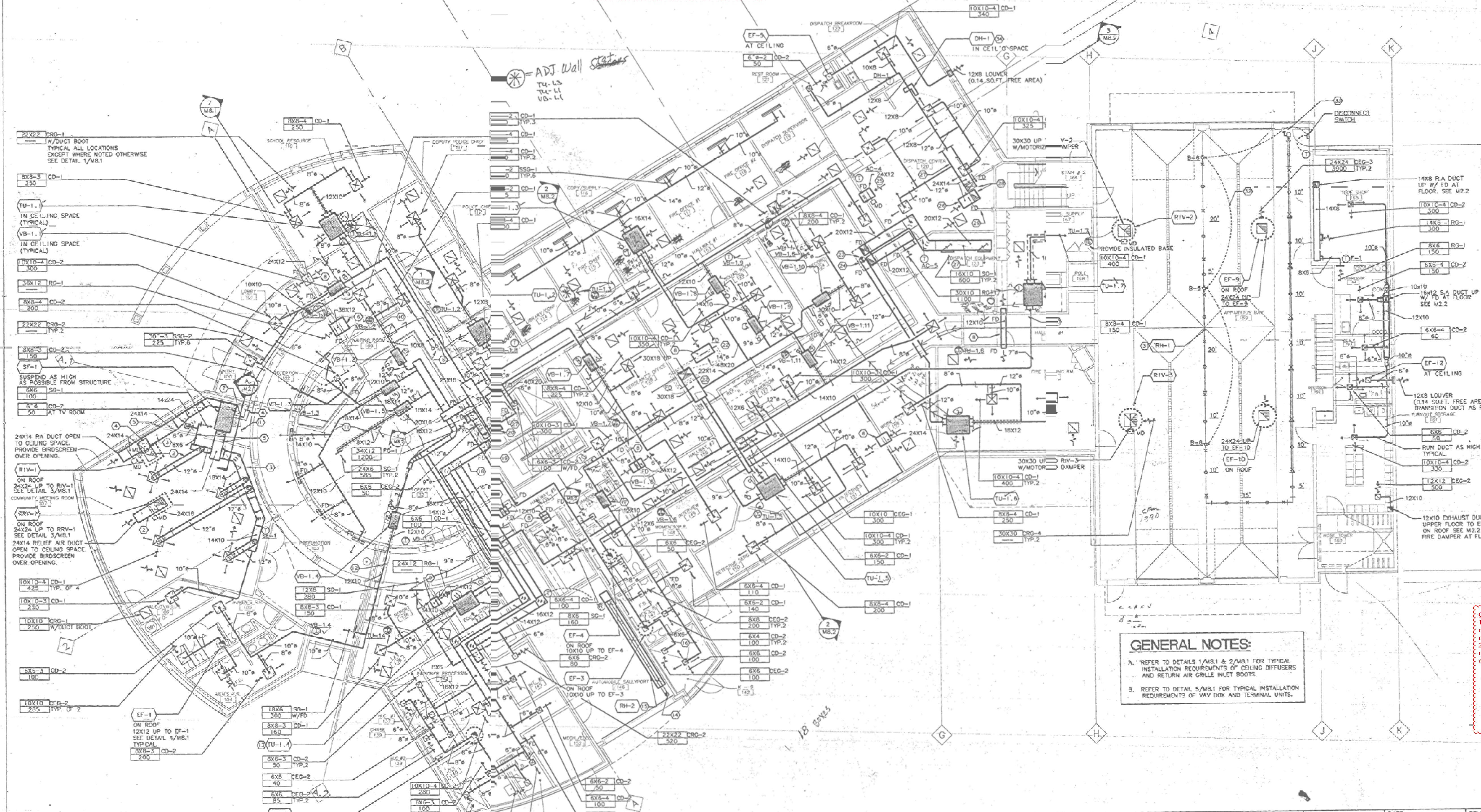
㉛ INSTALL A "CO-RAY-VAC" B SERIES. LOW INTENSITY INFRARED HEATING SYSTEM IN ACCORDANCE WITH ALL MANUFACTURERS INSTALLATION INSTRUCTIONS. SYSTEM SHALL BE A COMPLETE OPERATING SYSTEM INCLUDING GAS FIRED BURNERS, VACUUM PUMP, ROOF DISCHARGE ASSEMBLY, TUBE AND REFLECTOR SYSTEM AS WELL AS LOW VOLTAGE CONTROLS AND GAS SUPPLY PIPING. THE CONTRACTOR SHALL PURCHASE AND INSTALL ALL COMPONENTS AND INSTALLATION HARDWARE FROM EQUIPMENT MANUFACTURER TO ACCOMMODATE THE LAY-OUT AS SHOWN ON DRAWING M2.1. REFER TO DRAWING M3.1 FOR EQUIPMENT SCHEDULE WHICH INCLUDES, BUT NOT LIMITED TO ALL NECESSARY SYSTEM COMPONENTS. COORDINATE EXACT MOUNTING OF HEATING SYSTEM WITH MANUFACTURERS AND ACTUAL STRUCTURAL CONDITIONS PRIOR TO INSTALLATION. (MOUNT AT APPROXIMATELY 17'-0" ABOVE FINISH FLOOR)

㉜ COORDINATE INSTALLATION AND CONNECTION OF 110 VOLT POWER AND MAIN DISCONNECT WITH ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION.

㉝ ROUTE 4" ROUND ABS DISCHARGE PIPE UP THROUGH ROOF AND INSTALL ROOF DISCHARGE ASSEMBLY. LOCATE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS AND LOCAL BUILDING DEPARTMENT STANDARDS.

㉞ INSTALL ELECTRIC DUCT HEATER IN ACCORDANCE WITH MANUFACTURER INSTALLATION INSTRUCTIONS. PROVIDE SERVICE CLEARANCE FOR A CONTROL PANEL ACCESS PER ELECTRICAL CODE. MINIMUM WORKING SPACE SHALL NOT BE LESS THAN 36".

HVAC equipment in-line with duct or piping system without independent lateral bracing shall have lateral bracing added per Mark 11



CO-RAY-VAC EQUIP. LE

- CO-RAY-VAC C BURNER UNIT (6
- VACUUM PUMP P 163-02; 3/4 HP AMPS. DISCHAGE 4" ABS PIPE AN ROOF DISCHARG PVC TO DRAIN.
- Ⓣ THERMOSTAT #3- NUMERICAL 24 VO LOCKING GUARD.
- TUBE COUPLING A FOR RADIANT TUB
- TUBE COUPLING A FOR TAILPIPE #3-
- 90 DEGREE ELBO PLAIN #5-027-15
- TUBE & REFLECTOR #3-027-903-00
- REFLECTOR SUPPO TUBING #3-027-1

GENERAL NOTES:

A. REFER TO DETAILS 1/M8.1 & 2/M8.1 FOR TYPICAL INSTALLATION REQUIREMENTS OF CEILING DIFFUSERS AND RETURN AIR GRILLE INLET BOOTS.

B. REFER TO DETAIL 5/M8.1 FOR TYPICAL INSTALLATION REQUIREMENTS OF VAV BOX AND TERMINAL UNITS.

General Notes:
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REVIEWED AS NOTED
PETERSON STRUCTURAL ENGINEERS
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PHONE: 253-830-2146

2102-0070 02/23/2022
NRW SH. SR15 of 16

PROJECT NO.: 91-316
INTERFACE ENGINEERING INC.
Consulting Engineers
TUONG NGUYEN
503 ROB MATTESON

FIRST FLOOR PLAN - HVAC

1/8"-1'-0"

RS517

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MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

FIRST FLOOR PLAN -
HVAC

DATE:
DRAWN BY:
CHECKED BY: R.R.M.

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REVISIONS:

SHEET M2.
OF
JOB NO. 29145

NOTES THIS SHEET

① MOUNT ROOFTOP AIR CONDITIONER UNIT ON CONCRETE SLAB ON ROOF. COORDINATE EXACT LOCATION WITH ARCHITECT AND STRUCTURAL ENGINEER. SEE ROOF CURB DETAIL 6/M8.1. VERIFY EXACT LOCATIONS AND SIZES OF DUCTDROPS BEFORE ROUGHIN.

② RETURN AIR DUCT ABOVE CEILING OPEN TO CEILING SPACE.

③ RETURN AIR SHAFT EXTENDED ABOVE CEILING. SEE ARCHITECTURAL DRAWINGS. PROVIDE FIRE DAMPERS, VERTICAL POSITION, AT ALL DUCT PENETRATIONS THROUGH SHAFT.

④ TRANSFER AIR DUCT ABOVE CEILING OPEN TO RETURN AIR SHAFT AND TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENINGS.

⑤ 40 X 16 RETURN AIR DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.

⑥ 40 X 24 RETURN AIR DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.

⑦ 40 X 40 RETURN AIR DUCT UP THROUGH ROOF TO RETURN AIR PLENUM IN ROOF CURB SPACE OF AC–1 UNIT. LINE DUCT WITH 2" ACOUSTICAL DUCT LINER.

⑧ LINE RETURN AIR DUCT WITH 2" ACOUSTICAL DUCT LINER. WRAP AROUND DUCT INCLUDING DUCT RISER WITH ONE LAYER OF 5/8" GYPSUM BOARD FOR SOUND ATTENUATION.

⑨ SUPPLY AIR DUCT UP THROUGH ROOF TO AIR CONDITIONER UNIT CONNECTION. LINE DUCT WITH 2" DUCT LINER. WRAP AROUND DUCT RISER WITH ONE LAYER OF 5/8" GYPSUM BOARD FOR SOUND ATTENUATION.

⑩ PROVIDE BELL MOUTH CONNECTION. TYPICAL FOR ALL SUPPLY DUCT WHICH CONNECT TO MAIN SUPPLY AIR DUCT DROP.

⑪ TRANSFER AIR DUCT ABOVE CEILING. VERIFY EXACT LOCATION.

⑫ RETURN AIR DUCT OPEN TO CEILING SPACE. PROVIDE BIRDSCREEN OVER OPENING.

⑬ 68 X 30 RETURN AIR DUCT UP THROUGH ROOF TO RETURN AIR PLENUM IN ROOF CURB SPACE OF AC–2 UNIT. LINE DUCT WITH 2" ACOUSTICAL DUCT LINER.

⑭ WRAP AROUND RETURN AIR DUCT INCLUDING DUCT RISER WITH ONE LAYER OF 5/8" GYPSUM BOARD FOR SOUND ATTENUATION.

⑮ TWO (2) 15 X 8 VERTICAL COMBUSTION AIR DUCTS: ONE DUCT FROM 15 X 8 OPENING AT 6" BELOW CEILING UP THROUGH ROOF TO ROOF VENT; ONE DUCT FROM 15 X 8 OPENING WITHIN 12" FROM FLOOR UP ALONG WALL THROUGH ROOF TO ROOF VENT. COMBINE TWO COMBUSTION AIR DUCT ABOVE ROOF LINE INTO ONE ROOF VENT. ROOF VENT TO HAVE MINIMUM 15 X 16 THROAT AREA. SEE ROOF CURB DETAIL 3/M8.1. PROVIDE BIRDSCREEN OVER DUCT OPENINGS.

⑯ 10" ROUND METALBESTOS TYPE 'B' FLUE PIPE FROM WATER HEATER (400 MBH) UP THROUGH ROOF TO A.G.A. APPROVED FLUE CAP. FLASH WATERTIGHT AT ROOF PENETRATION.

⑰ SUPPLY AIR DUCT, RETURN AIR DUCT DROP THOUGH ROOF SAME SIZE AS AIR CONDITIONING UNIT CONNECTIONS. COORDINATE EXACT LOCATION WITH STRUCTURE.

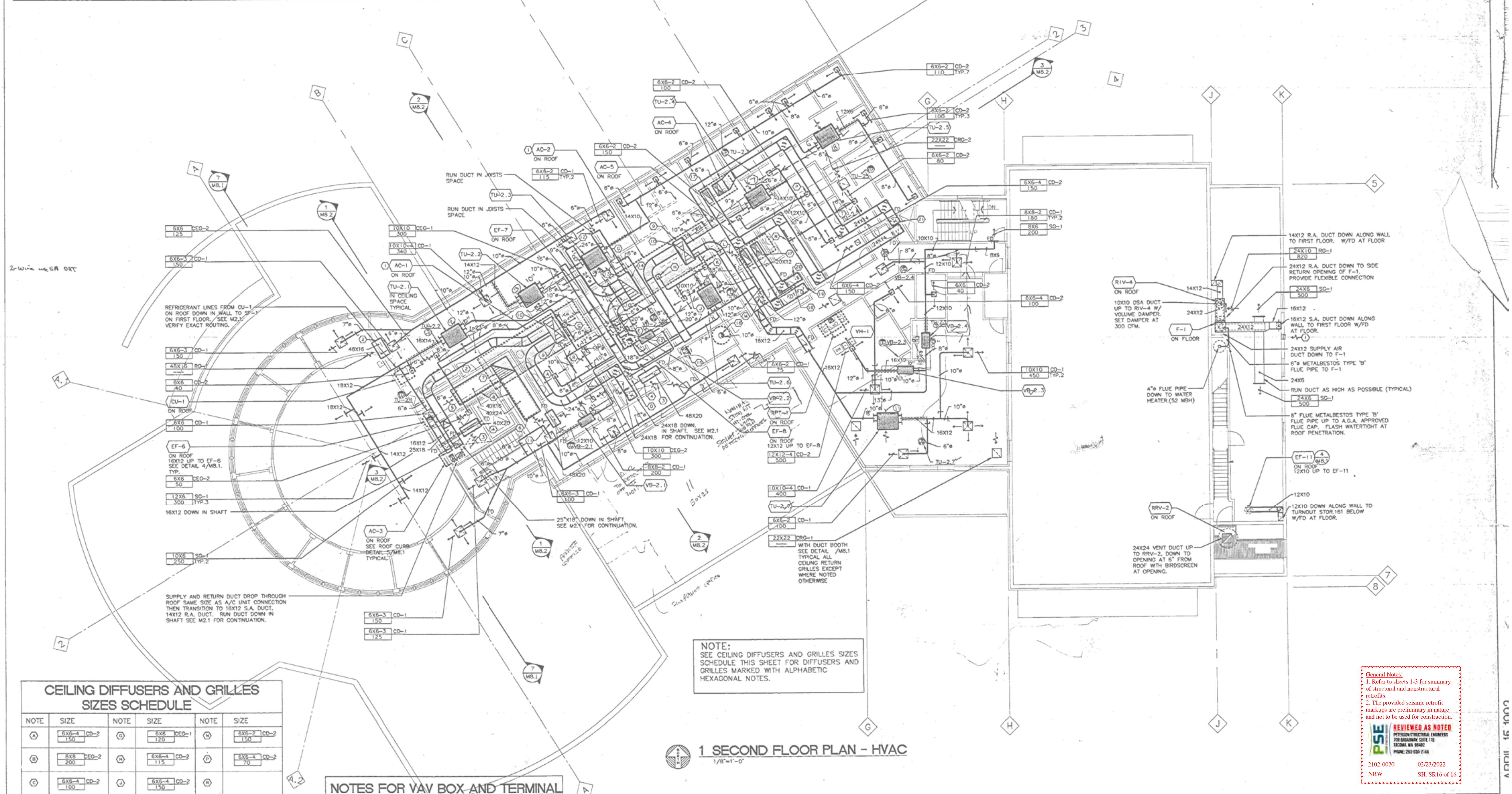
⑱ 12" ROUND DUCT DOWN IN SHAFT TO TU–1.6 ON FIRST FLOOR. SEE M2.1 FOR CONTINUATION.

⑲ 20 X 12 SA DUCT, 20 X 12 RA DUCT DOWN IN SHAFT TO DISPATCH EQUIPMENT ROOM IN FIRST FLOOR. SEE M2.1 FOR CONTINUATION.

⑳ DUCTSHAFT EXTENDED ABOVE CEILING. SEE ARCHITECTURAL DRAWINGS FOR DETAIL. PROVIDE FIRE DAMPERS, VERTICAL POSITION, AT ALL DUCT PENETRATIONS THROUGH SHAFT.

㉑ 24 X 14 SA DUCT, 24 X 14 RA DUCT DOWN IN SHAFT TO DISPATCH CENTER ON FIRST FLOOR. SEE M2.1 FOR CONTINUATION.

HVAC equipment in-line with duct or piping system without independent lateral bracing shall have lateral bracing added per Mark 11



NOTE:
SEE CEILING DIFFUSERS AND GRILLES SIZES SCHEDULE THIS SHEET FOR DIFFUSERS AND GRILLES MARKED WITH ALPHABETIC HEXAGONAL NOTES.

1 SECOND FLOOR PLAN – HVAC

1/8"=1'–0"

CEILING DIFFUSERS AND GRILLES SIZES SCHEDULE

NOTE	SIZE	NOTE	SIZE	NOTE	SIZE
Ⓐ	6X6–4 150 CD–2	Ⓖ	6X6 120 CEG–1	Ⓝ	6X6–2 150 CD–2
Ⓑ	8X8 200 CEG–2	Ⓗ	6X6–4 115 CD–2	Ⓟ	6X6–4 70 CD–2
Ⓒ	6X6–4 100 CD–2	Ⓙ	6X6–4 150 CD–2	Ⓡ	
Ⓓ	8X8 200 CEG–2	Ⓚ	6X6–2 160 CD–2	Ⓢ	
Ⓔ	6X6–4 150 CD–2	Ⓛ	10X10 275 CEG–2	Ⓣ	
Ⓕ	6X6 120 CEG–2	Ⓜ	10X10 275 CEG–2	Ⓤ	

NOTES FOR VAV BOX AND TERMINAL UNIT INSLALLATION:

1 COORDINATE EXACT LOCATION OF V.A.V BOXES AND FAN POWERED V.A.V TERMINAL UNITS WITH REFLECTED CEILING, LIGHTING, SPRINKLER SYSTEM AND STRUCTURAL PLAN TO PROVIDE SERVICE CLEARANCE FOR THE UNITS BEFORE ROUIH–IN.

2 PROVIDE SERVICE CLEARANCE FOR MOTOR ACCESS AND ELECTRIC HEATER CONTROL PANEL PER ELECTRICAL CODE AND LOCAL REGULATIONS. MINIMUM WORKING SPACE SHALL NOT BE LESS THAN 36 INCHES.

General Notes:
1. Refer to sheets 1-3 for summary of structural and nonstructural retrofits.
2. The provided seismic retrofit markups are preliminary in nature and not to be used for construction.

REVIEWED AS NOTED
PETERSON STRUCTURAL ENGINEERS
708 BROADWAY, SUITE 110
TACOMA, WA 98402
PHONE: 253-830-2146

2102-0070 02/23/2022
NRW SH. SR16 of 16

PROJECT NO.: 91–316
9542 SE Lake Road, Milwaukie, Oregon 97222
INTERFACE ENGINEERING INC.
Consulting Engineers
TUONG NGUYEN
503 659-5364 ROB MATTESON

RS518

MACKENZIE/SAITO & ASSOCIATES, P.C.
Architecture • Planning • Interior Design
0690 S. W. Bancroft Street • P.O. Box 69039
Portland, Oregon 97201–0039
Phone: (503)224–9560 • FAX: (503)228–1285

MILWAUKIE PUBLIC
SAFETY BUILDING
MILWAUKIE, OREGON

SECOND FLOOR PLAN –
HVAC

DATE: 4–15–92
DRAWN BY:
CHECKED BY: R.R.M.

THESE DRAWINGS ARE THE PROPERTY OF MACKENZIE/SAITO & ASSOCIATES, P.C. (M/SA) AND ARE NOT TO BE USED OR REPRODUCED IN ANY MANNER, EXCEPT WITH THE PRIOR WRITTEN PERMISSION OF M/SA

REVISIONS:

SHEET M2.2 OF

JOB NO. 291451

Contract No. ___________

ENGINEERING SERVICES AGREEMENT WITH THE CITY OF MILWAUKIE, OREGON FOR PUBLIC SAFETY BUILDING FINAL DESIGN OF SEISMIC RETROFITS (PHASE 1)

THIS AGREEMENT, made and entered into this ____ day of November 2022, by and between the City of Milwaukie, a municipal corporation, hereinafter referred to as the "City," and Peterson Structural Engineers (PSE), whose authorized representative is Bill Sandbo, and having a principal being a registered engineer of the State of Oregon, hereinafter referred to as the "Engineer."

RECITALS

WHEREAS, the City's budget provides for the design of PSB Final Design of Seismic Retrofits; and

WHEREAS, the accomplishment of the work and services described in this Agreement is necessary and essential to the public works improvement program of the City; and

WHEREAS, the City desires to engage the Engineer to render professional engineering services for the project described in this Agreement, and the Engineer is willing and qualified to perform such services.

THEREFORE, in consideration of the promises and covenants contained herein, the parties hereby agree as follows:

1. ENGINEER'S SCOPE OF SERVICES
   The Engineer shall perform professional engineering services relevant to the project as specified in the Scope of Work labeled as Exhibit A and in accordance with the terms and conditions set forth herein, which is attached hereto and by this reference made a part of this Agreement.

2. EFFECTIVE DATE AND DURATION
   This Agreement shall become effective upon the date of execution by the City and shall expire, unless otherwise terminated or extended, on December 31, 2023. All work under this Agreement shall be completed prior to the expiration.

3. COMPENSATION
   City agrees to pay Engineer not to exceed two hundred twenty-nine five hundred eleven dollars ($229,511.00) for performance of those services described in the Scope of Work (Phase 1), which payment shall be based upon the following applicable terms:

   A. Payment by City to Engineer for performance of services under this Agreement includes all expenses incurred by Engineer, with the exception of any expenses identified in this Agreement as separately reimbursable.

   B. As compensation for services as described in Exhibit A, the Engineer shall be paid at an hourly rate based upon the Schedule of Rates in Exhibit B of this Agreement, which shall constitute full and complete payment for said services and all expenditures which may be made and expenses incurred, except as otherwise expressly provided in this Agreement. Hourly rates may be increased by Engineer once each calendar year and must be provided to City no less than 30 days prior to the effective date of the new rates.

   C. Payment will be made in installments based on Engineer's invoice, subject to the approval of the City Manager, or designee, and not more frequently than monthly. Payment shall be made only for work actually completed as of the date of invoice. Payment terms shall be net 30 days from date of invoice.

D. Payment by City shall release City from any further obligation for payment to Engineer, for services performed or expenses incurred as of the date of the invoice. Payment shall not be considered acceptance or approval of any work or waiver of any defects therein.

The Parties hereto do expressly agree that the compensation is based upon the Scope of Work provided in Exhibit A and is not necessarily related to the estimated construction cost of the project. In the event that the actual construction cost differs from the estimated construction cost, the Engineer's compensation will not be adjusted unless the Scope of Work changes and is authorized and accepted by the City.

E. Only when directed in writing by the City and signed by both parties as an amendment to this Agreement, the Engineer shall furnish or acquire for the City the professional and technical services based upon a mutually agreeable rate schedule for minor project additions and/or alterations.

F. The Engineer shall furnish certified cost records for all billings pertaining to other than lump sum fees to substantiate all charges. For such purposes, the books of account of the Engineer shall be subject to audit by the City. The Engineer shall complete work and cost records for all billings in accordance with generally accepted accounting principles.

G. The Engineer shall pay to the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.

H. If Engineer fails, neglects or refuses to make prompt payment of any claim for labor, materials, or services furnished to Engineer, sub-consultant or subcontractor by any person as such claim becomes due, City may pay such claim and charge the amount of the payment against funds due or to become due to the Engineer. The payment of the claim in this manner shall not relieve Engineer or its surety from obligation with respect to any unpaid claims.

I. The Engineer shall pay employees at least time and a half pay for all overtime worked in excess of 40 hours in any one week except for individuals under the contract who are excluded under ORS 653.010 to 653.261 or under 29 USC SS 201-219 from receiving overtime.

J. The Engineer shall promptly, as due, make payment to any person, co-partnership, association or corporation, furnishing medical, surgical and hospital care or other needed care and attention incident to sickness or injury to the employees of Engineer or all sums which Engineer agrees to pay for such services and all moneys and sums which Engineer collected or deducted from the wages of employees pursuant to any law, contract or agreement for the purpose of providing or paying for such service.

K. Engineer shall make payments promptly, as due, to all persons supplying services or materials for work covered under this Agreement. Engineer shall not permit any lien or claim to be filed or prosecuted against the City on any account of any service or materials furnished.

L. The City certifies that sufficient funds are available and authorized for expenditure to finance costs of this contract.

4. OWNERSHIP OF PLANS AND DOCUMENTS: RECORDS

A. The field notes, design notes, and original drawings of the construction plans, as instruments of service, are and shall remain, the property of the Engineer; however, the City shall be furnished, at no additional cost, one set of previously approved reproducible drawings, on 3 mil minimum thickness mylar as well as diskette in “DWG” or “DXF” format, of the original drawings of the work. The City shall have unlimited authority to use the materials received from the Engineer in any way the City deems necessary. Any use, re-use or alteration of any materials other than as contemplated by the applicable Scope of Work shall be at the City's sole risk, unless written permission has been received from Engineer prior to any such use.

B. The City shall make copies, for the use of and without cost to the Engineer, of all of its maps, records, laboratory tests, or other data pertinent to the work to be performed by the Engineer pursuant to this Agreement, and also make available any other maps, records, or other materials available to the City from any other public agency or body.

C. The Engineer shall furnish to the City, copies of all maps, records, field notes, and soil tests which were developed in the course of work for the City and for which compensation has been received by the Engineer at no additional expense to the City except as provided elsewhere in this Agreement.

5. ASSIGNMENT/DELEGATION

Neither party shall assign, sublet or transfer any interest in or duty under this Agreement without the written consent of the other and no assignment shall be of any force or effect whatsoever unless and until the other party has so consented. If City agrees to assignment of tasks to a subcontract, Engineer shall be fully responsible for the negligent acts or omissions of any subcontractors and of all persons employed by them, and neither the approval by City of any subcontractor nor anything contained herein shall be deemed to create any contractual relation between the subcontractor and City.

6. ENGINEER IS INDEPENDENT CONTRACTOR

A. The City's project manager, or designee, shall be responsible for determining whether Engineer's work product is satisfactory and consistent with this agreement, but Engineer is not subject to the direction and control of the City. Engineer shall be an independent contractor for all purposes and shall be entitled to no compensation other than the compensation provided for under Section 3 of this Agreement.

B. Engineer is an independent contractor and not an employee of City. Engineer acknowledges Engineer's status as an independent contractor and acknowledges that Engineer is not an employee of the City for purposes of workers compensation law, public employee benefits law, or any other law. All persons retained by Engineer to provide services under this contract are employees of Engineer and not of City. Engineer acknowledges that it is not entitled to benefits of any kind to which a City employee is entitled and that it shall be solely responsible for workers compensation coverage for its employees and all other payments and taxes required by law. Furthermore, in the event that Engineer is found by a court of law or an administrative agency to be an employee of the City for any purpose, City shall be entitled to offset compensation due, or to demand repayment of any amounts paid to Engineer under the terms of the agreement, to the full extent of any benefits or other remuneration Engineer receives (from City or third party) as a result of said finding and to the full extent of any payments that City is required to make (to Engineer or to a third party) as a result of said finding.

C. The undersigned Engineer hereby represents that no employee of the City or any partnership or corporation in which a City employee has an interest, has or will receive any remuneration of any description from the Engineer, either directly or indirectly, in connection with the letting or performance of this Agreement, except as specifically declared in writing.

D. If this payment is to be charged against Federal funds, Engineer certifies that he/she is not currently employed by the Federal Government and the amount charged does not exceed his/her normal charge for the type of service provided.

E. Engineer and its employees, if any, are not active members of the Oregon Public Employees Retirement System and are not employed for a total of 600 hours or more in the calendar year by any public employer participating in the Retirement System.

F. Engineer certifies that it currently has a Milwaukie or Metro business license or will obtain one prior to delivering services under this Agreement. A business license is required for the duration of this Agreement.

G. Engineer is not an officer, employee, or agent of the City as those terms are used in ORS 30.265.

7. INDEMNITY

A. The City has relied upon the professional ability and training of the Engineer as a material inducement to enter into this Agreement. Engineer represents to the City that the work under this contract will be performed in accordance with the professional standards of skill and care ordinarily exercised by members of the engineering profession under similar conditions and circumstances as well as the requirements of applicable federal, state and local laws, it being understood that acceptance of Engineer's work by the City shall not operate as a waiver or release. Acceptance of documents by City does not relieve Engineer of any responsibility for negligent or wrongful design deficiencies, errors, or omissions.

B. Claims for other than Professional Liability. Engineer shall defend, save and hold harmless the City of Milwaukie, its officers, agents, and employees from all claims, suits, or actions and all expenses incidental to the investigation and defense thereof, of whatsoever nature, including intentional acts to the extent resulting from or arising out of the activities of Engineer or its subcontractors, sub-consultants, agents or employees under this contract. If any aspect of this indemnity shall be found to be illegal or invalid for any reason whatsoever, such illegality or invalidity shall not affect the validity of the remainder of this indemnification.

C. Claims for Professional Liability. Engineer shall defend, save and hold harmless the City of Milwaukie, its officers, agents, and employees from all claims, suits, or actions and all expenses incidental to the investigation and defense thereof, to the extent arising out of the professional negligent acts, errors or omissions of Engineer or its subcontractors, sub-consultants, agents or employees in performance of professional services under this agreement. Any design work by Engineer that results in a design of a facility that is not readily accessible to and usable by individuals with disabilities shall be considered a professionally negligent act, error or omission.

D. As used in subsections B and C of this section, a claim for professional responsibility is a claim made against the City in which the City's alleged liability results directly from the quality of the professional services provided by Engineer, regardless of the type of claim made against the City. A claim for other than professional responsibility is a claim made against the City in which the City's alleged liability results from an act or omission by Engineer unrelated to the quality of professional services provided by Engineer.

8. INSURANCE

The Engineer and its subcontractors shall maintain insurance acceptable to City in full force and effect throughout the term of this contract. Such insurance shall cover risks arising directly or indirectly out of Engineer's activities or work hereunder, including the operations of its subcontractors of any tier. Such insurance shall include provisions that such insurance is primary insurance with respect to the interests of City and that any other insurance maintained by City is excess and not contributory insurance with the insurance required hereunder.

The policy or policies of insurance maintained by the Engineer and its subcontractors shall provide at least the following limits and coverages:

A. Commercial General Liability Insurance
Engineer shall obtain, at Engineer's expense, and keep in effect during the term of this contract, Commercial General Liability Insurance covering Bodily Injury and Property Damage on an “occurrence” form. This coverage shall include Contractual Liability insurance for the indemnity provided under this contract and Product and Completed Operations. Such insurance shall be primary and non-contributory. The following insurance will be carried:

Coverage	Limit
General Aggregate	$3,000,000
Products-Completed Operations Aggregate	3,000,000
Personal & Advertising Injury	2,000,000
Each Occurrence	2,000,000
Damage to Rented Premises (each occurrence)	500,000
Medical Expense (Any one person)	5,000

B. Professional Liability
Engineer shall obtain, at Engineer’s expense, and keep in effect during the term of this contract, Professional Liability Insurance covering any damages caused by an error, omission or any negligent act. Combined single limit per occurrence shall not be less than $2,000,000, or the equivalent. Annual aggregate limit shall not be less than $3,000,000 and filed on a “claims-made” form.

C. Commercial Automobile Insurance
Engineer shall also obtain, at engineer’s expense, and keep in effect during the term of the contract Commercial Automobile Liability coverage on an “occurrence” form including coverage for all owned, hired, and non-owned vehicles. The Combined Single Limit per occurrence shall not be less than $2,000,000.

D. Workers’ Compensation Insurance
The Engineer, its subcontractors, if any, and all employers providing work, labor or materials under this Contract who are subject employers under the Oregon Workers’ Compensation Law shall comply with ORS 656.017, which requires them to provide workers’ compensation coverage that satisfies Oregon law for all their subject workers. Out-of-state employers must provide Oregon workers’ compensation coverage for their workers that complies with ORS 656.126. This shall include Employer’s Liability Insurance with coverage limits of not less than $500,000 each accident.

E. Additional Insured Provision
The Commercial General Liability Insurance Policy and Automobile Policy shall include the City its officers, directors, and employees as additional insureds with respect to this contract. Coverage will be endorsed to provide a per project aggregate.

F. Extended Reporting Coverage
If any of the aforementioned liability insurance is arranged on a “claims made” basis, Extended Reporting coverage will be required at the completion of this contract to a duration of 24 months or the maximum time period the Engineer’s insurer will provide such if less than 24 months. Engineer will be responsible for furnishing certification of Extended Reporting coverage as described or continuous “claims made” liability coverage for 24 months following contract completion. Continuous “claims made” coverage will be acceptable in lieu of Extended Reporting coverage, provided its retroactive date is on or before the effective date of this contract. Coverage will be endorsed to provide a per project aggregate.

G. Notice of Cancellation
There shall be no cancellation, material change, or intent not to renew insurance coverage without 30 days written notice to the City. Any failure to comply with this

provision will not affect the insurance coverage provided to the City. Notice shall be provided to the City at the address listed below in the event of cancellation or non-renewal of the insurance.

H. Insurance Carrier Rating
Coverage provided by the Engineer must be underwritten by an insurance company deemed acceptable by the City. The City reserves the right to reject all or any insurance carrier(s) with an unacceptable financial rating.

I. Certificates of Insurance
As evidence of the insurance coverage required by the contract, the Engineer shall furnish a Certificate of Insurance to the City. No contract shall be effective until the required certificates have been received and approved by the City. A renewal certificate will be sent to the address below ten days prior to coverage expiration.

Certificates of Insurance should read "Insurance certificate pertaining to contract for PSB Final Design of Seismic Retrofits." The City of Milwaukie, its officers, directors and employees shall be added as additional insureds with respects to this contract. "Insured coverage is primary" should read in the description portion of certificate.

J. Primary Coverage Clarification
The parties agree that Engineer's coverage shall be primary to the extent permitted by law. The parties further agree that other insurance maintained by the City is excess and not contributory insurance with the insurance required in this section.

K. Cross-Liability Clause
A cross-liability clause or separation of insureds clause will be included in general liability.

A copy of each insurance policy, certified as a true copy by an authorized representative of the issuing insurance company, or at the discretion of City, in lieu thereof, a certificate in form satisfactory to City certifying to the issuance of such insurance shall be forwarded to:

City of Milwaukie
Attn: Finance
10722 SE Main Street
Milwaukie, Oregon 97222

Business Phone: 503.786.7555
Email: finance@milwaukieoregon.gov

Such policies or certificates must be delivered prior to commencement of the work. The procuring of such required insurance shall not be construed to limit Engineer's liability hereunder. Notwithstanding said insurance, Engineer shall be obligated for the total amount of any damage, injury, or loss to the extent caused by negligence or wrongful acts in the performance of services with this contract.

9. TERMINATION WITHOUT CAUSE
At any time and without cause, City shall have the right, in its sole discretion, to terminate this Agreement by giving notice to Engineer. If City terminates the contract pursuant to this paragraph, it shall pay Engineer for services rendered to the date of termination.

10. TERMINATION WITH CAUSE
A. City may terminate this Agreement effective upon delivery of written notice to Engineer, or at such later date as may be established by City, under any of the following conditions:

1) If City funding from federal, state, local, or other sources is not obtained and continued at levels sufficient to allow for the purchase of the indicated quantity of services. This Agreement may be modified to accommodate a reduction in funds.

2) If Federal or State regulations or guidelines are modified, changed, or interpreted in such a way that the services are no longer allowable or appropriate for purchase under this Agreement.

3) If any license or certificate required by law or regulation to be held by Engineer, its subcontractors, agents, and employees to provide the services required by this Agreement is for any reason denied, revoked, or not renewed.

4) If Engineer becomes insolvent, if voluntary or involuntary petition in bankruptcy is filed by or against Engineer, if a receiver or trustee is appointed for Engineer, or if there is an assignment for the benefit of creditors of Engineer.

Any such termination of this agreement under paragraph (A) shall be without prejudice to any obligations or liabilities of either party already accrued prior to such termination.

B. City, by written notice of default (including breach of contract) to Engineer, may terminate the whole or any part of this Agreement:

1) If Engineer fails to provide services called for by this Agreement within the time specified herein or any extension thereof;

2) If Engineer fails to perform any of the other provisions of this Agreement, or so fails to pursue the work as to endanger performance of this Agreement in accordance with its terms, and after receipt of written notice from City, fails to correct such failures within ten days or such other period as City may authorize; or

3) If the City determines at any time during the term of this Agreement that the Engineer, or a subconsultant to the Engineer, to which the City awarded this Agreement, in whole or in part, on the basis of any equity criteria as described in the solicitation document, including but not limited to Oregon COBID-certification, was never compliant or is no longer compliant.

The rights and remedies of City provided in the above clause related to defaults (including breach of contract) by Engineer shall not be exclusive and are in addition to any other rights and remedies provided by law or under this Agreement.

If City terminates this Agreement under paragraph (B), Engineer shall be entitled to receive as full payment for all services satisfactorily rendered and expenses incurred, an amount which bears the same ratio to the total fees specified in this Agreement as the services satisfactorily rendered by Engineer bear to the total services otherwise required to be performed for such total fee; provided, that there shall be deducted from such amount the amount of damages, if any, sustained by City due to breach of contract by Engineer. Damages for breach of contract shall be those allowed by Oregon law, reasonable and necessary attorney fees, and other costs of litigation at trial and upon appeal.

11. NON-WAIVER

The failure of either party to insist upon or enforce strict performance by the other party of any of the terms of this Agreement or to exercise any rights hereunder, should not be construed as a waiver or relinquishment to any extent of its rights to assert or rely upon such terms or rights on any future occasion.

12. CONTACT INFORMATION

A. All invoices shall be provided in writing and given by personal delivery, mail, or email. Payments may be made by check or electronic transfer. The following addresses shall be used to transmit invoices, payments, and other financial information, and when so addressed, shall be deemed given upon deposit in the United States mail or postage prepaid. In all other instances, invoices and payments shall be deemed given at the time of actual delivery. Changes may be made to the addresses of the departments to whom invoices and payments are to be given by giving written notice pursuant to this paragraph.

City – Accounts Payable	Engineer – Accounts Receivable
10722 SE Main Street Milwaukie, Oregon 97222	9400 SW Barnes Road, Suite 100 Portland, OR 97225-6639
Phone: 503.786.7535	Phone: 503-292-1635
Email: ap@milwaukieoregon.gov	Email: diana.simmons@psengineers.com

B. All notices and project correspondence shall be provided in writing and given by personal delivery, mail, or email. The following addresses shall be used to transmit notices and project-related information, and when so addressed shall be deemed given upon deposit in the United States mail or postage prepaid. In all other instances, notices and correspondence shall be deemed given at the time of actual delivery. Changes may be made in the names and addresses of the person to who notices and correspondence are to be given by giving written notice pursuant to this paragraph.

City – Project Manager	Engineer – Project Manager
Attn: Damien Farwell	Attn: Bill Sandbo
6101 SE Johnson Creek Blvd. Milwaukie, Oregon 97206	708 Broadway, Suite 110 Tacoma, WA 98402
Phone: 503.786.7621	Phone: 253-328-6728
Email: farwelld@milwaukieoregon.gov	Email: Bill.Sandbo@psengineers.com

13. MERGER

This writing is intended both as a final expression of the Agreement between the parties with respect to the included terms and as a complete and exclusive statement of the terms of the Agreement. No modification of this Agreement shall be effective unless and until it is made in writing and signed by both parties.

14. FORCE MAJEURE

Neither City nor Engineer shall be considered in default because of any delays in completion and responsibilities hereunder due to causes beyond the control and without fault or negligence on the part of the parties so disenabled, including but not restricted to, an act of God or of a public enemy, civil unrest, volcano, earthquake, fire, flood, epidemic, pandemic, public health emergency, quarantine restriction, area-wide strike, freight embargo, unusually severe weather or delay of subcontractor or supplies due to such cause; provided that the parties so disenabled shall within ten days from the beginning of such delay, notify the other party in writing of the cause of delay and its probable extent. Such notification shall not be the basis for a claim for additional compensation. Each party shall, however, make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon cessation of the cause, diligently pursue performance of its obligation under the Agreement.

15. NON-DISCRIMINATION

Engineer agrees to comply with all applicable requirements of federal and state civil rights and rehabilitation statues, rules, and regulations. Engineer also shall comply with the Americans with Disabilities Act of 1990, as amended, ORS 659A.142, and all regulations and administrative rules established pursuant to those laws.

16. ERRORS

Engineer shall perform such additional work as may be necessary to correct negligent errors in the work required under this Agreement without undue delays and without additional cost.

17. EXTRA (CHANGES) WORK

Only the Facilities Supervisor may authorize extra (and/or change) work. Failure of Engineer to secure authorization for extra work shall constitute a waiver of all right to adjustment in the contract price or contract time due to such unauthorized extra work and Engineer thereafter shall be entitled to no compensation whatsoever for the performance of such work.

18. GOVERNING LAW

The provisions of this Agreement shall be construed in accordance with the provisions of the laws of the State of Oregon. Any action or suits involving any question arising under this Agreement must be brought in the appropriate court of the State of Oregon.

19. COMPLIANCE WITH APPLICABLE LAW

Engineer shall comply with all applicable federal, state, local laws and ordinances, including but not limited to ORS 279B.020, 279B.220, 279B.225, 279B.230, and 279B.235, which are incorporated herein. If Engineer is a foreign contractor as defined in ORS 279A.120, Engineer shall comply with that section and the City must satisfy itself that the requirements of ORS 279A.120 have been complied with by Engineer before City issues final payment under this agreement. Engineer shall not provide or offer to provide any appreciable pecuniary or material benefit to any officer or employee of City in connection with this Agreement in violation of ORS Chapter 244.

20. CONFLICT BETWEEN TERMS

It is further expressly agreed by and between the parties hereto that should there be any conflict between the terms of this instrument in the proposal of the contract, this instrument shall control and nothing herein shall be considered as an acceptance of the said terms of said proposal conflicting herewith.

21. ACCESS TO RECORDS

City shall have access to such books, documents, papers and records of Engineer as are directly pertinent to this Agreement for the purpose of making audit, examination, excerpts and transcripts.

22. AUDIT

Engineer shall maintain records to help assure conformance with the terms and conditions of this Agreement, and to help assure adequate performance and accurate expenditures within the contract period. Engineer agrees to permit City, the State of Oregon, the federal government, or their duly authorized representatives to audit all records pertaining to this Agreement to help assure the accurate expenditure of funds.

23. SEVERABILITY

In the event any provision or portion of this Agreement is held to be unenforceable or invalid by any court of competent jurisdiction, the validity of the remaining terms and provisions shall not be affected to the extent that it did not materially affect the intent of the parties when they entered into the agreement.

24. COMPLETE AGREEMENT

This Agreement and attached exhibit(s) constitutes the entire Agreement between the parties. No waiver, consent, modification, or change of terms of this Agreement shall bind either party unless in writing and signed by both parties. Such waiver, consent, modification, or change if made, shall be effective only in specific instances and for the specific purpose given. There are no understandings, agreements, or representations, oral or written, not specified herein regarding this Agreement. Engineer, by the signature of its authorized representative, hereby acknowledges that they have read this Agreement, understands it and agrees to be bound by its terms and conditions.

IN WITNESS WHEREOF, City has caused this Agreement to be executed by its duly authorized undersigned officer and Engineer has executed this Agreement on the date hereinabove first written.

CITY OF MILWAUKIE	PETERSON STRUCTURAL ENGINEERS
___________________________	___________________________
Signature	*Signature*
Ann Ober, City Manager	___________________________
Print Name & Title	*Print Name & Title*
___________________________	___________________________
Date	*Date*

Contract No. ___________

EXHIBIT A
SCOPE OF WORK (SERVICES TO BE PROVIDED)

A. PROJECT DESCRIPTION (Phase 1)

Peterson Structural Engineers will provide structural engineering services for final design of seismic retrofits (Phase 1) for the Public Safety Building located in Milwaukie, OR. This scope is based on the scope described in the RFQ document dated August 8, 2022 and includes generation of final deliverables. PSE intends to engage subconsultants to provide services outside of our structural engineering expertise.

PSE previously completed a 60% conceptual retrofit design, documents dated February 24, 2022, in support of the City of Milwaukie's application for the Business Oregon Seismic Rehabilitation Grant Program (SRGP). PSE understands the grant application was successful and the awarded grant will be used to fund the generation of permit, bid and construction documents, construction administration, and construction costs.

Previously completed evaluation report and supporting documents outlined structural and nonstructural retrofits required to meet seismic performance requirements found in ASCE 41-17. These upgrades include retrofits to the building structure as well as MEP, elevator, and architectural upgrades. Architectural support will also be required for repairing finishes and surfaces which are removed to access the underlying structure. Design tasks will also include construction cost estimating to aid the City in evaluating contractor bids. Peterson Structural Engineers will lead the final design effort.

Public Safety Building Final Design of Seismic Retrofits may include but are not limited to the following tasks. This project in general consists of three major phases (0 thru 2).

B. TASKS, DELIVERABLES AND SCHEDULE (Phase 1)

Task 0: Project Management and Team Coordination (Peterson Structural Engineers led)

a) Coordinate project team, schedule, and design tasks.

b) Bi-weekly coordination meetings (assume 1-hr each) with applicable project team members. Record the minutes of all meetings and provide copies to the City and applicable project team members.

c) Provide monthly status report updates to City and applicable project team members.

d) Provide senior-level QA/QC for the project and review all deliverables prior to submittal.

e) Project invoicing.

Task 1: Design Development and Construction Documents (Peterson Structural Engineers led)

a) Analysis and design of structural and nonstructural retrofits to meet performance objective levels as outlined in ASCE 41-17. Analysis and design will build on what was previously completed for the SRGP Grant Application including an exploratory site visit.

b) Development of 90% retrofit design documents and cost estimate to be submitted for City review. PSE assumes one round of comment review and incorporation.

c) Development of 100% retrofit design documents and cost estimate to be submitted for City review. PSE assumes one round of comment review and incorporation.

d) Delivery of final 100% documents appropriate for bid, permit, and construction. Documents will include project drawings/markups, structural calculations, and construction specifications (CSI Format). Documents will include structural, architectural, MEP, and elevator seismic upgrades.

Task 2: Permit and Bid Support (Peterson Structural Engineers led)

a) Review Building Official comments and prepare response letters and updated permit documents (as required) to address comments and questions.

b) Participate in pre-bid meetings with the City.

c) Respond to bidder questions as required.

d) Generate updated bid documents or addenda (as required) to communicate design revisions.

e) Generate a cost estimate for construction to aid the City in evaluating bids.

Proposed Fee and Schedule – Phase I
Please see below for fee summary of scope tasks 0-2 above.

Task Number	Fees to Complete
Task 0 – PM and Team Coordination	$37,164
Task 1 – Design Development and Construction Documents	$174,444
Task 2 – Permit and Bid Support	$17,903
Total	$229,511

Project expenses will be billed at cost plus 10%. Invoices will be submitted at the end of the month for services performed. Should revisions to this scope and fee proposal be affected by pending information or scope changes, we will apprise the city of that situation before proceeding.

Please note that the fee stated above is based solely on an estimate of the time to be expended to complete the scope items defined above. Changes or additions to the defined scope could result in additional fees. PSE will require an amended PO or alternate client official notification before beginning work on design changes or modifications.

Please see below for an estimate of project timeline.

Task Number	Start	Finish
Task 0 – Project Management	Mid-Nov 2022	Dec 2023
Task 1 – Design Development and Construction Documents	Mid-Nov 2022	Spring 2023
Task 2 – Permit and Bid Support	Spring 2023	Spring 2023

The above proposal has been generated assuming that the design services are to be initiated within a six-month period from the proposal date and substantially completed within twelve months of the proposal date. If the schedule of work exceeds the projected time, we reserve the right to revise our fee estimate accordingly.

General Conditions

PSE assumes that City of Milwaukie will issue a contract for review and signature.

Contract No. ___________

EXHIBIT B
SCHEDULE OF RATES

Proposed Fee and Schedule

Final Design of Seismic Retrofits - Phase 1 – Tasks 0-2	TASKS	FEE
PM & Team Coordination	0	$37,164
Design Development and Construction Documents	1	$174,444
Permit and Bid Support	2	$17,903
TOTAL		$229,511

Peterson Structural Engineers Hourly Rates

Rates to remain in effect for duration of contract

Principal-in-Charge	$270
Principal	$259
Senior Associate	$248
Associate	$241
Senior Project Manger	$235
Senior Structural Engineer	$235
Project Manager	$219
Structural Engineer	$216
Associate Project Manger	$205
Senior Project Engineer	$194
Project Engineer	$189
Staff Engineer	$184
Staff Designer	$178
CADD Drafting	$146
Administrative	$135

*Vehicle mileage will be billed at current U.S. General Services Administration allowable rates and periodically adjusted according to federal updates.
*Direct expenses will be billed at cost plus 10%.

Attachment 4

PETERSON STRUCTURAL ENGINEERS

Tacoma Office
708 Broadway
Suite 110
Tacoma, WA 98402
253.830.2140

November 15, 2022

Damien Farwell
City of Milwaukie Public Works
6101 SE Johnson Creek Blvd
Milwaukie, OR 97206
503.786.7614

Project #: 2202-0077

RE: **Public Safety Building (expanded) – Scope and Fee Proposal**

Dear Damien-

Thank you for the opportunity to provide structural engineering services for final design of seismic retrofits for the Public Safety Building located in Milwaukie, OR. This scope is based on the scope described in the RFQ document dated August 8, 2022 and includes generation of final deliverables and construction administration services. PSE intends to engage subconsultants to provide services outside of our structural engineering expertise.

PSE previously completed a 60% conceptual retrofit design, documents dated February 24, 2022, in support of the City of Milwaukie's application for the Business Oregon Seismic Rehabilitation Grant Program (SRGP). PSE understands the grant application was successful and the awarded grant will be used to fund the generation of permit, bid and construction documents, construction administration, and construction costs.

Previously completed evaluation report and supporting documents outlined structural and nonstructural retrofits required to meet seismic performance requirements found in ASCE 41-17. These upgrades include retrofits to the building structure as well as MEP, elevator, and architectural upgrades. Architectural support will also be required for repairing finishes and surfaces which are removed to access the underlying structure. Design tasks will also include construction cost estimating to aid the City in evaluating contractor bids. Peterson Structural Engineers will lead the final design effort.

Project scope will also include construction administration services through the duration of construction. Tasks include facilitating regular coordination meetings, performing site visits at key points of construction, reviewing, and responding to submittals, RFI's, and change orders, and generation of Record Drawings. Project architect MWA will lead the construction administration efforts, but PSE will remain the overall prime.

Proposed Project Scope

PSE proposes the following scope of work:

Task 0. **Project Management and Team Coordination (Peterson Structural Engineers led)**

a) Coordinate project team, schedule, and design tasks.

b) Bi-weekly coordination meetings (assume 1-hr each) with applicable project team members. Record the minutes of all meetings and provide copies to the City and applicable project team members.
c) Provide monthly status report updates to City and applicable project team members.
d) Provide senior-level QA/QC for the project and review all deliverables prior to submittal.
e) Project invoicing

Task 1. **Design Development and Construction Documents (Peterson Structural Engineers led)**

a) Analysis and design of structural and nonstructural retrofits to meet performance objective levels as outlined in ASCE 41-17. Analysis and design will build on what was previously completed for the SRGP Grant Application including an exploratory site visit.
b) Development of 90% retrofit design documents and cost estimate to be submitted for City review. PSE assumes one round of comment review and incorporation.
c) Development of 100% retrofit design documents and cost estimate to be submitted for City review. PSE assumes one round of comment review and incorporation.
d) Delivery of final 100% documents appropriate for bid, permit, and construction. Documents will include project drawings/markups, structural calculations, and construction specifications (CSI Format). Documents will include structural, architectural, MEP, and elevator seismic upgrades.

Task 2. **Permit and Bid Support (Peterson Structural Engineers led)**

a) Review Building Official comments and prepare response letters and updated permit documents (as required) to address comments and questions.
b) Participate in pre-bid meetings with the City.
c) Respond to bidder questions as required
d) Generate updated bid documents or addenda (as required) to communicate design revisions.
e) Generate a cost estimate for construction to aid the City in evaluating bids.

Task 3. **Construction Support (MWA Architects led)**

a) Construction Meetings: MWA to lead coordination meetings throughout the duration of construction. PSE to participate in meetings as well. Included:
    - (1) Pre-construction meeting with the City, contractor, and applicable project team members.
    - Bi-weekly meetings (one every two weeks) with the City, contractor, and applicable project team members.
b) On-Site Presence: Provide a regular on-site presence to oversee construction:
    - MWA to perform regular site visits as necessary (minimum (1) per week, up to (16) hours per week) to oversee construction.
    - PSE and other project team members to perform additional site visits as necessary at pertinent points during construction (e.g., structural observations).
    - Provide written site visit reports to the City, contractor, and project team whenever an on-site observation is performed.

c) Submittal Review: Review and respond to contractor-provided submittals and shop drawings for general conformance with construction documents. This proposal assumes up to (25) total submittals and (10) resubmittals as appropriate, depending on consultant.
d) RFI Responses: Review and respond to contractor provided RFI's as appropriate, depending on trade. This proposal assumes up to (45) RFI's throughout the duration of construction.
e) Change Orders: Review contractor-provided change orders and prepare necessary documentation for the City. Proposal assumes up to (3) change orders.
f) Final Punchlist/Notice of Acceptability of Work: Perform a site visit along with the City project manager and contractor to review completed construction for general conformance with the construction documents. Following the satisfactory completion of all work, provide a written notice of acceptability of work to the City.
g) Record Drawings: Document all changes throughout the duration of construction via redline markups and prepare stamped record drawings. Markups and stamped drawings to be provided to the City at the conclusion of the project.

Items specifically excluded from this proposal include site civil, survey and geotechnical engineering. PSE makes no guarantee that design or construction costs will fall within the estimate generated for the SRGP grant application. The City should also be prepared to review grant requirement and confirm what submittals or information owners are required to generate. Drawings will be Revit based but exported to CAD as needed. No energy modeling or Comcheck will be needed from the City. LEED/Sustainability programs are not included. Contractor pay applications are reviewed and processed by the Onwer.

Proposed Fee and Schedule

Please see below for fee summary of scope tasks 1-3 above.

Task Number	Fees to Complete
Task 0 – PM and Team Coordination	$37,164
Task 1 – Design Development and Construction Documents	$174,444
Task 2 – Permit and Bid Support	$17,903
Task 3 – Construction Support	$203,682
Total	**$433,193**

Project expenses will be billed at cost plus 10%. Invoices will be submitted at the end of the month for services performed. Should revisions to this scope and fee proposal be affected by pending information or scope changes, we will apprise you of that situation before proceeding.

Please note that the fee stated above is based solely on an estimate of the time to be expended to complete the scope items defined above. Changes or additions to the defined scope could result in additional fees. PSE will require an amended PO or alternate client official notification before beginning work on design changes or modifications.

Please see below for an estimate of project timeline.

Task Number	Start	Finish
Task 0 – Project Management	Mid-Nov 2022	Dec 2023
Task 1 – Design Development and Construction Documents	Mid-Nov 2022	Spring 2023
Task 2 – Permit and Bid Support	Spring 2023	Spring 2023
Task 3 – Construction	Spring 2023	Dec 2023

The above proposal has been generated assuming that the design services are to be initiated within a six-month period from the proposal date and substantially completed within twelve months of the proposal date. If the schedule of work exceeds the projected time, we reserve the right to revise our fee estimate accordingly.

General Conditions

PSE assumes that City of Milwaukie will issue a contract for review and signature.

Contract Approval

A fully executed contract will serve as formal notice to proceed. Thank you again for including us and we look forward to working with you on this project. Please call if you have any questions.

Sincerely,

Bill

Bill Sandbo, PE, SE
Principal
Peterson Structural Engineers, Inc.

Sent via email to Damien Farwell on 11/15/2022 <farwelld@milwaukieoregon.gov>

Attachment 5

CITY OF MILWAUKIE

COUNCIL RESOLUTION No.

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF MILWAUKIE, OREGON, AUTHORIZING THE CITY MANAGER TO SIGN AN ENGINEERING SERVICES CONTRACT WITH PETERSON STRUCTURAL ENGINEERS IN THE AMOUNT OF $229,511 TO PROVIDE PROFESSIONAL SERVICES RELATED TO THE FINAL DESIGN OF SEISMIC RETROFITS AT THE PUBLIC SAFETY BUILDING (PSB).

WHEREAS the city's budget provides for the design and construction of seismic retrofits at the PSB, and

WHEREAS public works staff solicited requests for qualifications in September 2022, evaluated submittals, and selected Peterson Structural Engineers to provide professional services for final design, bid assistance, and construction management, and

WHEREAS public works staff has negotiated the final scope and fee for these professional services.

Now, Therefore, be it Resolved by the City Council of the City of Milwaukie, Oregon**,** that the city manager is authorized sign an engineering services contract with Peterson Structural Engineers in the amount of $229,511 to provide professional services for seismic retrofits at the PSB.

Introduced and adopted by the City Council on **December 6, 2022**.

This resolution is effective immediately.

Mark F. Gamba, Mayor

ATTEST:

APPROVED AS TO FORM:

Scott S. Stauffer, City Recorder

Justin D. Gericke, City Attorney