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NORTH Clackamas Schools

CBRE | HEERY

mahlum

ROWE MIDDLE SCHOOL

3606 SE LAKE ROAD | MILWAUKIE, OR 97222

APPLICANT'S REPRESENTATIVE

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OWNER | APPLICANT:

NORTH CLACKAMAS SCHOOL DISTRICT
12451 SE FULLER ROAD
MILWAUKIE, OR 97222
CONTACT: DAVID HOBBS

APPLICATION TYPE

TYPE III - MAJOR MODIFICATION
OF A COMMUNITY SERVICE USE

SUBMITTAL DATE

DECEMBER 22, 2017

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Attachments

GENERAL INFORMATION

Applicant:	**North Clackamas School District** 12451 SE Fuller Road Milwaukie, OR 97222 Contact: David Hobbs Capital Projects Manager
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SITE INFORMATION

Parcel Number:	1S1E36DC05700
Address:	3606 SE Lake Road
Size:	14.23 acres
Zoning Designation:	R-10
Existing Use:	Rowe Middle School
Street Functional Classifications:	SE Lake Road is classified as a Minor Arterial. SE Shell Lane is classified as a local road.
Surrounding Zoning:	The properties to the east and west are zoned R-10. The properties to the north are zoned R-7. The properties to the south are in Clackamas County and are zoned R-10.

INTRODUCTION

APPLICANT'S REQUEST

The North Clackamas School District is proposing several improvements to Rowe Middle School and seeks approval of an application for a Type III Major Modification of a Community Service Use. This narrative has been prepared to describe the proposed development and to document compliance with the relevant sections of Milwaukie's Development Code.

SITE DESCRIPTION/SURROUNDING LAND USE

Rowe Middle School is located at 3606 SE Lake Road within the City of Milwaukie. The site consists of one tax lot, 1s1Ee36dc 05700. The District also owns two parcels located to the east of the site (tax lots 2s1e01ab 00100 and 1s1e36dc 05900) but no work has been proposed on these properties as part of the improvement package. The site is approximately 14.23 acres and is zoned R-10. The existing site includes a north playfield and a south playfield with steep slopes separating the building from the south playfield. The north playfield consists of two tennis courts and two ball fields. Parking is provided along all sides of the building. Standard asphalt is used on the north side and south side, with pervious concrete parking to the east and west. A bus loop is provided on the northwest side of the building, with a separate parent drop-off area to the northeast of the building.

PROPOSAL

The North Clackamas School District is proposing several bond related improvements to the Rowe Middle School Campus.

A new addition is proposed on the southwest side of the existing building which will house two new classrooms and four relocated classrooms. A new generator, transformer, and dumpster will be located along the existing west wall of the gymnasium. A loading ramp will be constructed to allow access to the kitchen. A retaining wall will be provided along the southwestern corner of the proposed building addition to allow a new sidewalk to be installed.

A new building expansion is proposed on the east end of the building which will close off the interior courtyard. Adjacent sidewalk, curb and asphalt will be removed and replaced. On the north side of the building, a new entrance and minor building expansion will be constructed adjacent to the bus loop. Adjacent concrete surfacing will be removed and reinstalled.

On the northern end of the site, a covered play area will be constructed in place of the existing softball field. Asphalt surfacing will be constructed under and adjacent to the play area, connecting to existing sidewalk. Two additional high school tennis courts will be constructed to the west of the existing tennis courts. The existing ball field will be redeveloped into a High School Junior Varsity Baseball field with new dugouts and bleachers.

The proposed upgrades will also include the following renovations:

- Renovation of the building's existing commons and kitchen.

- Renovation and expansion of the building's existing media center.
- Addition of classrooms to the building's east and west wings.
- Expansion of building area and reconfiguration of the administrative offices.
- Replacement of single-pane windows with new energy efficient windows.
- Covering of existing rock-wall façade along the existing building's eastern and northern frontages with metal panel material.
- Replacement of classroom door lock hardware within the building.
- Re-roofing of the existing buildings.
- Adjustment and potential replacement of some existing utilities.

NEIGHBORHOOD MEETING

The Applicant met with the Lake Road Neighborhood Association at their regularly scheduled neighborhood meeting on December 13, 2017. Attendance was light, but the Applicant presented plans for the building renovations and answered questions.

APPLICABLE CRITERIA

The following sections of the City of Milwaukie's Zoning and Development Ordinance have been extracted as they have been deemed to be applicable to the proposal. Following each **bold** applicable criteria or design standard, the Applicant has provided a series of draft findings. The intent of providing code and detailed responses and findings is to document, with absolute certainty, that the proposed development has satisfied the approval criteria for Type III Major Modification of a Community Service Use application.

CHAPTER 19.300 BASE ZONES

19.301 LOW DENSITY RESIDENTIAL ZONES

The low density residential zones are Residential Zone R-10, Residential Zone R-7, and Residential Zone R-5. These zones implement the Low Density and Moderate Density residential land use designations in the Milwaukie Comprehensive Plan.

19.301.1 Purpose

The low density residential zones are intended to create, maintain, and promote neighborhoods with larger lot sizes where the land use is primarily single-family dwellings. They allow for some non household living uses but maintain the overall character of a single-family neighborhood.

19.301.2 Allowed Uses in Low Density Residential Zones

Uses allowed, either outright or conditionally, in the low density residential zones are listed in Table 19.301.2 below. Similar uses not listed in the table may be allowed through a Director's Determination pursuant to Section 19.903. Notes and/or cross references to other applicable code sections are listed in the "Standards/Additional Provisions" column.

See Section 19.201 Definitions for specific descriptions of the uses listed in the table.

Table 19.301.2 Low Density Residential Uses Allowed		
Use	**R-10**	**Standards/Additional Provisions**
Accessory and Other Uses		
Community service use	**CSU**	**Section 19.904 Community Service Uses**

CSU = Permitted with Community Service Use approval subject to provisions of Section 19.904. Type III review required to establish a new CSU or for major modification of an existing CSU. Type I review required for a minor modification of an existing CSU.

Applicant's Facts and Findings: School facilities are permitted within the City's R-10 zoning district when approved through a Community Service Use Application. Rowe Middle School was previously approved through a CSU application. The proposed

improvements are allowed as a major modification of an existing CSU, a Type III application within the City.

19.301.4 Development Standards

In the low density residential zones, the development standards in Table 19.301.4 apply. Notes and/or cross references to other applicable code sections are listed in the "Standards/Additional Provisions" column. Additional standards are provided in Subsection 19.301.5.

See Sections 19.201 Definitions and 19.202 Measurements for specific descriptions of standards and measurements listed in the table.

Table 19.301.4 Low Density Residential Development Standards		
Standard	**R-10**	**Standards/Additional Provisions**
A. Lot Standards		
1. Minimum lot size (sq ft) **a. Single-family detached** **b. Duplex**	 **10,000** **14,000**	**Subsection 19.501.1 Lot Size Exceptions**
2. Minimum lot width (ft)	**70**	
3. Minimum lot depth (ft)	**100**	
4. Minimum street frontage requirements (ft) **a. Standard lot** **b. Flag lot** **c. Double flag lot**	 **35** **25** **35**	
B. Development Standards		
1. Minimum yard requirements for primary structures (ft) **a. Front yard** **b. Side yard** **c. Street side yard** **d. Rear yard**	 **20** **10** **20** **20**	**Subsection 19.301.5.A Side Yards** **Subsection 19.501.2 Yard Exceptions** **Subsection 19.504.8 Flag Lot Design and Development Standards**
2. Maximum building height for primary structures	**2.5 stories or 35 ft, whichever is less**	**Subsection 19.501.3 Building Height and Side Yard Height Plane Exceptions**
3. Side yard height plane limit **a. Height above ground at minimum required side yard depth (ft)** **b. Slope of plane (degrees)**	 **20** **45**	**Subsection 19.501.3 Building Height and Side Yard Height Plane Exceptions**
4. Maximum lot coverage (percent of total lot area)	**30**	**Section 19.201 "Lot coverage" definition** **Subsection 19.301.5.B Lot Coverage**

5. Minimum vegetation (percent of total lot area)	**35**	**Subsection 19.301.5.C Front Yard Minimum Vegetation Subsection 19.504.7 Minimum Vegetation**
C. Other Standards		
1. Density requirements (dwelling units per acre) **a. Minimum** **b. Maximum**	 **3.5** **4.4**	**Subsection 19.301.5.D Residential Densities Subsection 19.501.4 Density Exceptions**

Applicant's Facts and Findings:

The Applicant has not proposed any residential development therefore the standards of the underlying zone associated with residential developments do not apply to this proposal.

The standards which do apply are listed in *Table 19.302.4 Low Density Residential Development Standards:*

The existing school is located approximately 435 feet from the front lot line. A new covered play structure will be located approximately 318 feet from the front lot line. All structures greatly exceed the minimum 20 foot required front yard setback. The existing building is approximately 60 feet from the western property side yard boundary. The proposed western addition will be located approximately 29 feet from the side yard. The existing building is located approximately 96 feet from the eastern property side yard boundary. The new covered play structure is located approximately 29 feet from the eastern property side yard boundary. The existing building is 196.35 feet from the rear property line. The proposed renovations will not impact the rear yard setback.

The applicant is not proposing any new structures that will exceed the maximum height. The main portions of the existing school building have a maximum height below 20 feet. The tallest portion of the school is the gymnasium which is located approximately 60 feet from the western side yard. With a side yard setback of 20 feet, and a projection angle of 45 degrees, the building is in conformance with the side yard setback plane standard.

The existing building and associated facilities cover approximately 88,492 square feet of the 14.23-acre site, or approximately 14.3 percent. The proposed renovations to the building and facilities will increase the lot coverage to approximately 104,654 square feet or 16.9%, below the maximum allowed lot coverage of 30 percent.

The existing site has approximately 408,494 square feet of vegetative area, or 65.9 percent. The site as proposed will have approximately 397,243 square feet of vegetative area, or 64.1 percent. The vegetative area on site exceeds the minimum requirement of 35 percent.

As shown above, the Applicant meets all the underlying standards of the base zone.

CHAPTER 19.500 SUPPLEMENTARY DEVELOPMENT REGULATIONS

19.501 GENERAL EXCEPTIONS

The exceptions listed in Subsections 19.501.1–4 below are "by right" exceptions. "By right" exceptions require no special review or approval by the City to implement.

19.501.3 Building Height and Side Yard Height Plane Exceptions

- **A. Projections such as chimneys, spires, domes, elevator shaft housings, flagpoles, and other similar objects not used for human occupancy are not subject to the building height and side yard height plane limitations of the Zoning Ordinance, except as provided in an L-F Zone.**
- **B. The following encroachments into a side yard height plane are allowed:**
  1. **Roof overhangs or eaves, provided that they do not extend more than 30 in horizontally beyond the side yard height plane.**
  2. **The gable end of a roof, provided that the encroachment is not more than 8 ft high above the side yard height plane or more than 40 ft wide.**
  3. **Dormers, with the following limitations:**
     - **a. The highest point of any dormer is at or below the height of the primary roof ridge.**
     - **b. The encroachment is not more than 6 ft high above the side yard height plane or more than 8 ft wide.**
     - **c. The combined width of all dormers does not exceed 50% of the length of the roof on which they are located.**

Applicant's Facts and Findings: No exceptions to the building height and side yard planes are proposed. The requirements of this section do not apply.

CHAPTER 19.600 OFF-STREET PARKING AND LOADING

19.601 PURPOSE

Chapter 19.600 regulates off-street parking and loading areas on private property outside the public right-of-way. The purpose of Chapter 19.600 is to: provide adequate, but not excessive, space for off-street parking; avoid parking-related congestion on the streets; avoid unnecessary conflicts between vehicles, bicycles, and pedestrians; encourage bicycling, transit, and carpooling; minimize parking impacts to adjacent properties; improve the appearance of parking areas; and minimize environmental impacts of parking areas.

Regulations governing the provision of on-street parking within the right-of-way are contained in Chapter 19.700. The management of on-street parking is governed by Chapter 10.20. Chapter

19.600 does not enforce compliance with the Americans with Disabilities Act (ADA). ADA compliance on private property is reviewed and enforced by the Building Official.

19.602 APPLICABILITY

19.602.1 General Applicability

The regulations of Chapter 19.600 apply to all off-street parking areas and off-street loading areas, whether required by the City as part of development or a change in use, per Subsection 19.602.3, or voluntarily installed for the convenience of users, per Subsection 19.602.4. Activity that is not described by Subsections 19.602.3 or 4 is exempt from compliance with the provisions of Chapter 19.600. Changes to nonconforming off-street parking and loading are addressed through Chapter 19.600 and not through the provisions of Chapter 19.800.

19.602.2 Maintenance Applicability

Property owners shall comply with the regulations of Chapter 19.600 by ensuring conformance with the standards of Chapter 19.600 related to ongoing maintenance, operations, and use of off-street parking and loading areas. Changes to existing off-street parking or loading areas that bring the area out of conformance with Chapter 19.600, or further out of conformance if already nonconforming, are prohibited.

19.602.3 Applicability for Development and Change in Use Activity

The provisions of Chapter 19.600 apply to development and changes of use as described in Subsection 19.602.3.

- **A. Development of a vacant site shall have off-street parking and off-street loading areas that conform to the requirements of Chapter 19.600. Development of a site that results in an increase of 100% or more of the existing floor area and/or structure footprint on a site shall also conform to the requirements of Chapter 19.600. The floor area and/or footprint of structures demolished prior to development or redevelopment on the site shall not be considered when calculating the increase in floor area and/or structural footprints.**
- **B. Existing off-street parking and loading areas shall be brought closer into conformance with the standards of Chapter 19.600, per Subsection 19.602.5, when the following types of development or change in use occur:**
  1. **Development that results in an increase of less than 100% of the existing floor area and/or structure footprint.**
  2. **Changes of use, as defined in Section 19.201.**

Applicant's Facts and Findings: The proposed development will not be located on a vacant site. The development will not result in an increase of 100% or more of the existing floor area and/or structure footprint. Off-street parking and loading areas are in conformance with the provisions of Chapter 19.600, as addressed within this land use narrative. No changes of use are proposed.

The requirements of this section have been met.

19.602.4 Applicability not Associated With Development or Change in Use

A. Any parking or loading area developed to serve an existing use(s) that is not associated with development activity or a change in use described in Subsection 19.602.3 shall conform to the requirements of Sections 19.604 and 19.606-19.611. The total number of spaces in the existing parking area and new parking area shall not exceed the maximum allowed quantity of parking as established in Section 19.605.

B. Any parking or loading area that is not developed to serve an existing use and is not associated with development activity or a change in use as described in Subsection 19.602.3 shall conform to the requirements of Sections 19.604 and 19.606-19.611. The requirements of Section 19.605 do not apply to parking areas described under Subsection 19.602.4.B.

Applicant's Facts and Findings: The Applicant has addressed the requirements of Sections 19.604, 19.605, and 19.606-19.611 as they apply to this project.

19.602.5 Improvements to Existing Off-Street Parking and Loading Areas

A. Purpose

The purpose of Subsection 19.602.5 is to improve nonconforming off-street parking and loading areas as redevelopment occurs. These improvements should occur in conjunction with a development or change in use.

B. Limitations on Required Improvements

The cost of materials for any required improvements shall not exceed 10% of the development permit value of the associated development, redevelopment, and/or tenant improvements associated with a change in use. The cost of capital equipment such as manufacturing or operational equipment is exempt from the building permit value for purposes of this regulation. This exemption does not include building infrastructure such as electrical, plumbing, heating, venting, or air conditioning equipment.

C. Areas of Required Improvement

The Planning Director will evaluate the applicant's parking plan and use the prioritized list below when determining what improvements will be required.

1. **Paving and striping of parking areas, per Subsection 19.606.3.A.**
2. **Minimum required vehicle parking spaces, per Section 19.605.**
3. **Minimum required bicycle parking spaces, per Section 19.609.**
4. **Landscaping of existing buffers, islands, and medians, per Subsection 19.606.2.D.**
5. **New perimeter landscape buffers, islands, and medians, as applicable, per Subsection 19.606.2.E.**

6. **Other applicable standards within Chapter 19.600, as determined by the Planning Director.**

Applicant's Facts and Findings: The proposed development will have minimal impact on the existing parking lot. The applicant is proposing to repave and stripe portions of the parking lot which will be impacted by the proposed development. Bicycle parking has been relocated, and exceeds the minimum requirement of section 19.609. Existing landscaping within the buffers, islands and medians will be maintained.

The requirements of this section have been met.

19.603 REVIEW PROCESS AND SUBMITTAL REQUIREMENTS

19.603.1 Review Process

The Planning Director shall apply the provisions of Chapter 19.600 in reviewing all land use and development permit applications, except when an application is subject to a quasi-judicial land use review or appeal, in which case the body reviewing the application or appeal has the authority to implement and interpret the provisions of Chapter 19.600.

19.603.2 Submittal Requirements

Except for single-family dwellings, a development or change in use subject to Chapter 19.600 as per Section 19.602 shall submit a parking plan, drawn to scale. The parking plan shall show that all applicable standards are met, and shall include but not be limited to the items listed below, unless waived by the Planning Director.

- **A. Delineation of individual spaces and wheel stops.**
- **B. Drive aisles necessary to serve spaces.**
- **C. Accessways, including driveways and driveway approaches, to streets, alleys, and properties to be served.**
- **D. Pedestrian pathways and circulation.**
- **E. Bicycle parking areas and rack specifications.**
- **F. Fencing.**
- **G. Abutting land uses.**
- **H. Grading, drainage, surfacing, and subgrading details.**
- **I. Location and design of lighting fixtures and levels of illumination.**
- **J. Delineation of existing and proposed structures.**
- **K. Parking and loading area signage.**
- **L. Landscaping, including the following information.**
    1. **The location and area of existing and proposed trees, vegetation, and plant materials, including details about the number, size, and species of such items.**
    2. **Notation of the trees, plants, and vegetation to be removed, and protection measures for existing trees and plants to be preserved.**

Applicant's Facts and Findings: The Applicant has provided detailed site and landscape plans which contain the information required within this section.

19.604 GENERAL PARKING STANDARDS

19.604.1 Parking Provided with Development Activity

All required off-street parking areas shall be provided at the time the structure is built; at the time a structure or site is enlarged; or when there is change in use or an increase in density or intensity. All required off-street parking areas shall be provided in conformance with the standards of Chapter 19.600 prior to issuance of a certificate of occupancy, or final development permit approval, or as otherwise specified in any applicable land use decision.

Applicant's Facts and Findings: All required off-street parking areas will be provided at the time the structure is renovated. All required off-street parking areas are in conformance with the standards of Chapter 19.600.

19.604.2 Parking Area Location

Accessory parking shall be located in one or more of the following areas:

- **A. On the same site as the primary use for which the parking is accessory.**
- **B. On a site owned by the same entity as the site containing the primary use that meets the standards of Subsection 19.605.4.B.2. Accessory parking that is located in this manner shall not be considered a parking facility for purposes of the base zones in Chapter 19.300.**
- **C. Where shared parking is approved in conformance with Subsection 19.605.4.**

Applicant's Facts and Findings: The parking is located on the same site of the primary use for which the parking is accessory. This standard has been met.

19.604.3 Use of Parking Areas

All required off-street parking areas shall continually be available for the parking of operable vehicles of intended users of the site. Required parking shall not be rented, leased, sold, or otherwise used for parking that is unrelated to the primary or accessory use of the site, except where a shared parking agreement per Subsection 19.605.4 has been recorded. Subsection 19.604.3 does not prohibit charging fees for parking when the parking serves the primary or accessory uses on site.

Applicant's Facts and Findings: The District intends to make all proposed parking areas continually available for the parking of operable vehicles related to the operation of the site as a middle school. The District does not intend to rent, lease, or sell parking stalls. This standard has been met.

19.604.4 Storage Prohibited

No required off-street parking area shall be used for storage of equipment or materials, except as specifically authorized by Subsection 19.607.2 Commercial Vehicle, Pleasure Craft, and Recreational Vehicle Parking.

Applicant's Facts and Findings: The District does not intend to utilize any portion of the proposed parking areas on site for storage of equipment or materials following the completion of construction activities. Parking areas may be utilized for temporary staging or storage during various phases of construction. This standard has been met.

19.605 VEHICLE PARKING QUANTITY REQUIREMENTS

The purpose of Section 19.605 is to ensure that development provides adequate, but not excessive, vehicle parking based on their estimated parking demand. Subsection 19.605.1 establishes parking ratios for common land uses, and Subsection 19.605.3 allows certain exemptions and reductions to these ratios based on location or on-site amenities. Modifications to the established parking ratios and determinations of parking requirements for unique land uses are allowed with discretionary review per Subsection 19.605.2.

Nonresidential development in the Downtown Mixed Use (DMU) and Open Space (OS) Zones is exempt from the requirements of Section 19.605.

19.605.1 Minimum and Maximum Requirements

- **A. Development shall provide at least the minimum and not more than the maximum number of parking spaces as listed in Table 19.605.1. Modifications to the standards in Table 19.605.1 may be made as per Section 19.605. Where multiple ratios are listed, the Planning Director shall determine which ratio to apply to the proposed development or use.**
- **B. When a specific use has not been proposed or identified at the time of permit review, the Planning Director may elect to assign a use category from Table 19.605.1 to determine the minimum required and maximum allowed parking. Future tenants or property owners are responsible for compliance with Chapter 19.600 per the applicability provisions of Section 19.602.**
- **C. If a proposed use is not listed in Table 19.605.1, the Planning Director has the discretion to apply the quantity requirements of a similar use listed in the table upon finding that the listed use and unlisted use have similar parking demands. If a similar use is not listed, the quantity requirements will be determined per Subsection 19.605.2.**
- **D. Where the calculation of minimum parking spaces does not result in a whole number, the result shall be rounded down to the next whole number. Where the calculation of maximum parking spaces does not result in a whole number, the result shall be rounded to the nearest whole number.**
- **E. Parking spaces for disabled persons, and other improvements related to parking, loading, and maneuvering for disabled persons, shall conform to the Americans with**

Disabilities Act and shall be subject to review and approval by the Building Official. Spaces reserved for disabled persons are included in the minimum required and maximum allowed number of off-street parking spaces.

F. Uses that have legally established parking areas that exceed the maximum number of spaces allowed by Section 19.605 prior to June 17, 2010, the effective date of Ordinance #2015, shall be considered nonconforming with respect to the quantity requirements. Such uses shall not be considered parking facilities as defined in Section 19.201.

Applicant's Facts and Findings: Table 19.605.1 states that elementary and junior high schools must provide a minimum of 1 parking space per classroom, and a maximum of 2 parking spaces per classroom. The District is proposing two new classrooms, bringing the total to 33 classrooms. The proposed development will include the removal a total of 8 parking spaces, bringing the parking space count from 89 stalls to 81. While the total number of parking spaces exceeds the maximum allowed parking, the total parking will be brought closer to conformance.

19.606 PARKING AREA DESIGN AND LANDSCAPING

The purpose of Section 19.606 is to ensure that off-street parking areas are safe, environmentally sound, aesthetically pleasing, and that they have efficient circulation. These standards apply to all types of development except for cottage clusters, rowhouses, duplexes, single-family detached dwellings, and residential homes.

19.606.1 Parking Space and Aisle Dimensions

A. The dimensions for required off-street parking spaces and abutting drive aisles, where required, shall be no less than in Table 19.606.1. The minimum dimensions listed in Table 19.606.1 are illustrated in Figure 19.606.1.

Table 19.606.1
Minimum Parking Space And Aisle Dimensions

Angle (A)	Width (B)	Curb Length (C)	1-Way Aisle Width (D)	2-Way Aisle Width (D)	Depth (E)
0° (Parallel)	8.5'	22'	12'	19'	8.5'
30°	9'	17'	12'	19'	16.5'
45°	9'	12'	13'	19'	18.5'
60°	9'	10'	17'	19'	19'
90°	9'	9'	22'	22'	18'

Applicant's Facts and Findings: The proposed development does not include any new parking. The existing parking has been previously approved by the City, consistent with the standards of this section.

B. The dimension of vehicle parking spaces provided for disabled persons shall be according to federal and State requirements.

Applicant's Facts and Findings: Parking for disabled or limited mobility individuals will be provided in accordance with the requirements of the Americans with Disabilities Act (ADA) in accordance with the requirements of the Oregon Structural Specialty Codes (OSSC). The requirements of this section have been met.

C. Parking spaces shall be provided with adequate aisles or turnaround areas so that all vehicles may enter the street in a forward manner.

Applicant's Facts and Findings: All proposed parking areas contain sufficient maneuvering areas to allow vehicles to enter the street in a forward manner. No changes to the existing access or circulation systems adjacent to any parking spaces have been proposed. The requirements of this section have been met.

D. Drive aisles shall be required in parking areas greater than 5 spaces. Drive aisles shall meet the minimum width standards of Subsection 19.606.1. Where a drive aisle or portion thereof does not abut a parking space(s), the minimum allowed width for a one-way drive aisle shall be 8 ft and the minimum allowed width for a two-way drive aisle shall be 16 ft.

Applicant's Facts and Findings: The site contains several existing drive aisles which will not be altered as part of this application. The requirements of this section do not apply.

19.606.2 Landscaping

A. Purpose

The purpose of the off-street parking lot landscaping standards is to provide vertical and horizontal buffering between parking areas and adjacent properties, break up large expanses of paved area, help delineate parking spaces and drive aisles, and provide environmental benefits such as stormwater management, carbon dioxide absorption, and a reduction of the urban heat island effect.

B. General Provisions

1. Parking area landscaping shall be required for the surface parking areas of all uses, except for cottage clusters, rowhouses, duplexes, and single-family detached dwellings. Landscaping shall be based on the standards in Subsections 19.606.2.C-E.

2. Landscaped areas required by Subsection 19.606.2 shall count toward the minimum amount of landscaped area required in other portions of Title 19.

3. Parking areas with 10 or fewer spaces in the Downtown Mixed Use Zone are exempt from the requirements of Subsection 19.606.2.

C. Perimeter Landscaping

The perimeter landscaping of parking areas shall meet the following standards which are illustrated in Figure 19.606.2.C.

1. Dimensions

The minimum width of perimeter landscape areas are shown in Table 19.606.2.C.1. Where a curb provides the border for a perimeter landscape area, the dimension shall be measured from the inside of the curb(s). The Planning Director may reduce the required minimum width of a perimeter landscaping area where existing development or site constraints make it infeasible to provide drive aisles, parking spaces, and the perimeter landscaping buffer width listed in Table 19.606.2.C.1.

Table 19.606.2.C.1 Minimum Perimeter Landscape Strip Dimensions		
Location	**Downtown Zones**	**All Other Zones**
Lot line abutting a right-of-way	**4'**	**8'**
Lot line abutting another property, except for abutting properties that share a parking area	**0'**	**6'**

2. Planting Requirements

Landscaping requirements for perimeter buffer areas shall include 1 tree planted per 40 lineal ft of landscaped buffer area. Where the calculation of the number of trees does not result in a whole number, the result shall be rounded up to the next whole number. Trees shall be planted at evenly spaced intervals along the perimeter buffer to the greatest extent practicable. The remainder of the buffer area shall be grass, ground cover, mulch, shrubs, trees, or other landscape treatment other than concrete and pavement.

3. Additional Planting Requirements Adjacent to Residential Uses

In addition to the planting requirements of Subsection 19.606.2.D.2, all parking areas adjacent to a residential use shall have a continuous visual screen in the landscape perimeter area that abuts the residential use. The area of required screening is illustrated in Figure 19.606.2.C.3. The screen must be opaque throughout the year from 1 to 4 ft above ground to adequately screen vehicle lights. These standards must be met at the time of planting. Examples of acceptable visual screens are a fence or wall, an earth berm with plantings, and other plantings of trees and shrubs.

D. Interior Landscaping

The interior landscaping of parking areas shall meet the following standards which are illustrated in Figure 19.606.2.D.

1. General Requirements

Interior landscaping of parking areas shall be provided for sites where there are more than 10 parking spaces on the entire site. Landscaping that is contiguous to

a perimeter landscaping area and exceeds the minimum width required by Subsection 19.606.2.C.1 will be counted as interior landscaping if it meets all other requirements of Subsection 19.606.2.D.

2. Required Amount of Interior Landscaped Area

At least 25 sq ft of interior landscaped area must be provided for each parking space. Planting areas must be at least 120 sq ft in area and dispersed throughout the parking area.

3. Location and Dimensions of Interior Landscaped Areas

a. Interior landscaped area shall be either a divider median between opposing rows of parking, or a landscape island in the middle or at the end of a parking row.

b. Interior landscaped areas must be a minimum of 6 ft in width. Where a curb provides the border for an interior landscape area, the dimension shall be measured from the inside of the curb(s).

4. Planting Requirements for Interior Landscaped Areas

a. For divider medians, at least 1 shade or canopy tree must be planted for every 40 linear ft. Where the calculation of the number of trees does not result in a whole number, the result shall be rounded up to the next whole number. Trees shall be planted at evenly spaced intervals to the greatest extent practicable.

b. For landscape islands, at least 1 tree shall be planted per island. If 2 interior islands are located contiguously, they may be combined and counted as 2 islands with 2 trees planted.

c. The remainder of any divider median or landscape island shall be grass, ground cover, mulch, shrubs, trees, or other landscape treatment other than concrete and pavement.

5. Additional Landscaping for Large Parking Areas

Parking areas with more than 100 spaces on a site shall not have more than 15 spaces in a row without providing an interior landscaped island. See Figure 19.606.2.D.5.

E. Other Parking Area Landscaping Provisions

1. Preservation of existing trees is encouraged in the off-street parking area and may be credited toward the total number of trees required, based on staff's review.

2. Installation of parking area landscaping shall be required before a certificate of occupancy is issued, unless a performance bond is posted with the City. Then landscaping shall be installed within 6 months thereafter or else the bond will be foreclosed and plant materials installed by the City.

3. Parking area landscaping shall be maintained in good and healthy condition.

4. Required parking landscaping areas may serve as stormwater management facilities for the site. The Engineering Director has the authority to review and approve the design of such areas for conformance with the Public Works

Standards. This allowance does not exempt the off-street parking landscape area from meeting the design or planting standards of Subsection 19.606.2.

5. **Pedestrian walkways are allowed within perimeter and interior landscape buffer if the landscape buffer is at least 2 ft wider than required in Subsections 19.606.2.C.1 and 19.606.2.D.3.b.**

Applicant's Facts and Findings: The proposed development does not include any new parking. The existing parking and parking landscaping was previously approved by the City, consistent with the standards of this section.

19.606.3 Additional Design Standards

A. Paving and Striping

Paving and striping are required for all required maneuvering and standing areas. Off-street parking areas shall have a durable and dust-free hard surface, shall be maintained for all-weather use, and shall be striped to show delineation of parking spaces and directional markings for driveways and accessways. Permeable paving surfaces may be used to reduce surface water runoff and protect water quality.

Applicant's Facts and Findings: The proposed development will have minimal impact on the existing parking lot. The applicant is proposing to repave and stripe portions of the parking lot which will be impacted by the proposed development.

The requirements of this section have been met.

B. Wheel Stops

Parking bumpers or wheel stops, of a minimum 4-in height, shall be provided at parking spaces to prevent vehicles from encroaching on the street right-of-way, adjacent landscaped areas, or pedestrian walkways. Curbing may substitute for wheel stops if vehicles will not encroach into the minimum required width for landscape or pedestrian areas.

Applicant's Facts and Findings: Wheel stops are provided at parking spaces to prevent vehicles from encroaching on street right-of-way, adjacent landscaped areas, and pedestrian walkways.

C. Site Access and Drive Aisles

1. **Accessways to parking areas shall be the minimum number necessary to provide access while not inhibiting the safe circulation and carrying capacity of the street. Driveway approaches shall comply with the access spacing standards of Chapter 12.16.**
2. **Drive aisles shall meet the dimensional requirements in Subsection 19.606.1.**

3. **Parking drive aisles shall align with the approved driveway access and shall not be wider than the approved driveway access within 10 ft of the right-of-way boundary.**
4. **Along collector and arterial streets, no parking space shall be located such that its maneuvering area is in an ingress or egress aisle within 20 ft of the back of the sidewalk, or from the right-of-way boundary where no sidewalk exists.**
5. **Driveways and on-site circulation shall be designed so that vehicles enter the right-of-way in a forward motion.**

Applicant's Facts and Findings: The applicant is not proposing any changes to the accessways or drive aisles on site. The existing accessways and drive aisles meet the requirements of this section.

D. Pedestrian Access and Circulation

Subsection 19.504.9 establishes standards that are applicable to an entire property for on-site walkways and circulation. The purpose of Subsection 19.606.3.D is to provide safe and convenient pedestrian access routes specifically through off-street parking areas. Walkways required by Subsection 19.606.3.D are considered part of the on-site walkway and circulation system required by Subsection 19.504.9.

1. **Pedestrian access shall be provided for off-street parking areas so that no parking space is further than 100 ft away, measured along vehicle drive aisles, from a building entrance, or a walkway that meets the standards of Subsection 19.606.3.D.2.**
2. **Walkways through off-street parking areas must be continuous, must lead to a building entrance, and meet the design standards of Subsection 19.504.9.E.**

Applicant's Facts and Findings: As shown on the preliminary site plans, walkways either currently exist or have been provided within 100 feet of all parking spaces and all walkways create a continuous path leading to a building entrance from the parking areas.

E. Internal Circulation

1. **General Circulation**

   The Planning Director has the authority to review the pedestrian, bicycle, and vehicular circulation of the site and impose conditions to ensure safe and efficient on-site circulation. Such conditions may include, but are not limited to, on-site signage, pavement markings, addition or modification of curbs, and modifying drive aisle dimensions.

Applicant's Facts and Findings: The Applicant acknowledges that the planning director may review the proposed circulation systems on site and may impose conditions of approval to ensure that safe and efficient circulation is provided.

F. Lighting

Lighting is required for parking areas with more than 10 spaces. The Planning Director may require lighting for parking areas of less than 10 spaces if the parking area would not be safe due to the lack of lighting. Lighting shall be designed to enhance safe access for vehicles and pedestrians on the site, and shall meet the following standards:

1. **Lighting luminaires shall have a cutoff angle of 90 degrees or greater to ensure that lighting is directed toward the parking surface.**
2. **Parking area lighting shall not cause a light trespass of more than 0.5 footcandles measured vertically at the boundaries of the site.**
3. **Pedestrian walkways and bicycle parking areas in off-street parking areas shall have a minimum illumination level of 0.5 footcandles, measured horizontally at the ground level.**
4. **Where practicable, lights shall be placed so they do not shine directly into any WQR and/or HCA location. The type, size, and intensity of lighting shall be selected so that impacts to habitat functions are minimized.**

Applicant's Facts and Findings: The applicant is not proposing any changes to the existing lighting within the parking lot.

The requirements of this section were previously met under the original application.

19.608 LOADING

19.608.2. Number of Loading Spaces

The Planning Director shall determine whether to require off-street loading for commercial, industrial, public, and semipublic uses. The ratios listed below should be the minimum required unless the Planning Director finds that a different number of loading spaces are needed upon reviewing the loading needs of a proposed use.

A. Nonresidential and Mixed-Use Buildings

Buildings where any floor area is in nonresidential uses should meet the following standards:

1. **Less than 20,000 sq ft of total floor area: no loading spaces required.**
2. **20,000 to 50,000 sq ft of total floor area: 1 loading space.**
3. **More than 50,000 sq ft of total floor area: 2 loading spaces.**

Applicant's Facts and Findings: The existing building has a total area of 101,107 square feet. The proposed additions total of 13,116 square feet. The proposed building exceeds 50,000 square feet in total floor area, therefore two loading zones are required. As shown on the Site Plan (Sheet C-201), two loading spaces are located along the western boundary of the building.

The requirements of this section have been met.

19.609 BICYCLE PARKING

19.609.1 Applicability

Bicycle parking shall be provided for all new commercial, industrial, community service use, and multifamily residential development. Temporary and seasonal uses (e.g., fireworks and Christmas tree stands) and storage units are exempt from Section 19.609. Bicycle parking shall be provided in the Downtown Mixed Use Zone and at transit centers.

19.609.2 Quantity of Spaces

- **A. The quantity of required bicycle parking spaces shall be as described in this subsection. In no case shall less than 2 spaces be provided.**
  - **1. Unless otherwise specified, the number of bicycle parking spaces shall be at least 10% of the minimum required vehicle parking for the use.**
  - **2. The number of bicycle parking spaces at transit centers shall be provided at the ratio of at least 1 space per 100 daily boardings.**
  - **3. Multifamily residential development with 4 or more units shall provide 1 space per unit.**
- **B. Covered or enclosed bicycle parking. A minimum of 50% of the bicycle spaces shall be covered and/or enclosed (in lockers or a secure room) in any of the following situations:**
  - **1. When 10% or more of vehicle parking is covered.**
  - **2. If more than 10 bicycle parking spaces are required.**
  - **3. Multifamily residential development with 4 or more units.**

Applicant's Facts and Findings: A minimum of 33 vehicle parking spaces are required, therefore a minimum of 3 bicycle parking spaces are required. A total of 12 bicycle parking spaces have been provided. The proposed development will not feature covered or enclosed bicycle parking, as criteria 1-3 listed above are not applicable.

19.609.3 Space Standards and Racks

- **A. The dimension of each bicycle parking space shall be a minimum of 2 x 6 ft. A 5-ft-wide access aisle must be provided. If spaces are covered, 7 ft of overhead clearance must be provided. Bicycle racks must be securely anchored and designed to allow the frame and 1 wheel to be locked to a rack using a high security, U-shaped, shackle lock.**
- **B. Lighting shall conform to the standards of Subsection 19.606.3.F.**

Applicant's Facts and Findings: As shown on the First Floor Plan, all bicycle parking dimensional standards have been met.

19.609.4 Location

A. Bicycle parking facilities shall meet the following requirements:

1. **Located within 50 ft of the main building entrance.**
2. **Closer to the entrance than the nearest non-ADA designated vehicle parking space.**
3. **Designed to provide direct access to a public right-of-way.**
4. **Dispersed for multiple entrances.**
5. **In a location that is visible to building occupants or from the main parking lot.**
6. **Designed not to impede pedestrians along sidewalks or public rights-of-way.**
7. **Separated from vehicle parking areas by curbing or other similar physical barriers.**

Applicant's Facts and Findings: As shown on the attached architectural plan, all bicycle parking will be located within 50 feet of the main building entrance, closer to the entrance than the nearest non-ADA designated vehicle parking space, designed to provide direct access to the public right-of-way, in a location that is visible from the main parking lot, is designed not to impede pedestrians along sidewalks or public rights-of-way and will be separated from vehicle parking areas by curbing.

The requirements of this section have been met.

19.610 CARPOOL AND VANPOOL PARKING

19.610.1 Applicability

New industrial, institutional, and commercial development with 20 or more required parking spaces shall provide carpool/vanpool parking.

Applicant's Facts and Findings: The applicant is not proposing new development, therefore no changes to the amount of carpool/vanpool parking is proposed.

CHAPTER 19.700 PUBLIC FACILITY IMPROVEMENTS

19.701.2 For Public Facilities

A. Ensure that public facility improvements are safe, convenient, and adequate.

B. Ensure that public facility improvements are designed and constructed to City standards in a timely manner.

C. Ensure that the expenditure of public monies for public facility improvements is minimized when improvements are needed for private development.

D. Ensure that public facility improvements meet the City of Milwaukie Comprehensive Plan goals and policies.

E.

19.702 APPLICABILITY

19.702.1 General

Chapter 19.700 applies to the following types of development in all zones:

A. Partitions.

B. Subdivisions.

C. Replats.

D. New construction.

E. Modification or expansion of an existing structure or a change or intensification in use that results in any one of the following. See Subsections 19.702.2-3 for specific applicability provisions for single-family residential development and development in downtown zones.

1. A new dwelling unit.

2. Any increase in gross floor area.

3. Any projected increase in vehicle trips, as determined by the Engineering Director.

Applicant's Facts and Findings: The proposed renovations will modify and expand an existing structure, with an increase in gross floor area, therefore the requirements of this section are applicable.

19.703 REVIEW PROCESS

19.703.1 Preapplication Conference

For all proposed development that requires a land use application and is subject to Chapter 19.700 per Section 19.702, the applicant shall schedule a preapplication conference with the City prior to submittal of the land use application. The Engineering Director may waive this requirement for proposals that are not complex.

Applicant's Facts and Findings: A preapplication conference was held with the City on August 31, 2017 to discuss the proposed development.

19.703.2 Application Submittal

For all proposed development that is subject to Chapter 19.700 per Section 19.702, one of the following types of applications is required.

A. Development Permit Application

If the proposed development does not require a land use application, compliance with Chapter 19.700 will be reviewed as part of the development permit application submittal.

B. Transportation Facilities Review (TFR) Land Use Application

If the proposed development triggers a transportation impact study (TIS) per Section 19.704, a TFR land use application shall be required. Compliance with Chapter 19.700 will be reviewed as part of the TFR application submittal and will be subject to a Type II review process as set forth in Section 19.1005. The TFR application shall be consolidated with, and processed concurrently with, any other required land use applications.

If the proposed development does not trigger a TIS per Section 19.704, but does require the submittal of other land use applications, compliance with Chapter 19.700 will be reviewed during the review of the other land use applications.

Applicant's Facts and Findings: The Applicant has not been required to provide a Transportation Impact Statement however other land use applications have been proposed. The City will therefore review the proposed improvements to the public facility improvements as part of this application package.

19.703.3 Approval Criteria

For all proposed development that is subject to Chapter 19.700 per Section 19.702, the required development permit and/or land use application shall demonstrate compliance with the following approval criteria at the time of submittal.

A. Procedures, Requirements, and Standards

Development and related public facility improvements shall comply with procedures, requirements, and standards of Chapter 19.700 and the Public Works Standards.

Applicant's Facts and Findings: All proposed improvements to the City's public facilities included within this application have been designed to meet the requirements of section 19.700 and the City's public works standards. All improvements will be installed in accordance with the City's procedures and requirements. The requirements of this section for preliminary design are met and the installation standards can be met through the imposition of a condition of approval.

B. Transportation Facility Improvements

Development shall provide transportation improvements and mitigation at the time of development in rough proportion to the potential impacts of the development per Section 19.705 Rough Proportionality, except as allowed by Chapter 13.32 Fee in Lieu of Construction.

Development in downtown zones that is exempt per Subsection 19.702.3.B shall only be required to provide transportation improvements that are identified by a Transportation Impact Study as necessary to mitigate the development's transportation impacts. Such development is not required to provide on-site frontage improvements.

Applicant's Facts and Findings: The proposed development has not triggered the need for a transportation impact statement because the proposed use of the campus will not change as a result of the proposed development. As such, no transportation improvements beyond the frontage improvements proposed along the site's frontages have been proposed.

C. Safety and Functionality Standards

The City will not issue any development permits unless the proposed development complies with the City's basic safety and functionality standards, the purpose of which is to ensure that development does not occur in areas where the surrounding public facilities are inadequate. Upon submittal of a development permit application, an applicant shall demonstrate that the development property has or will have all of the following:

1. Adequate street drainage, as determined by the Engineering Director.

2. **Safe access and clear vision at intersections, as determined by the Engineering Director.**
3. **Adequate public utilities, as determined by the Engineering Director.**
4. **Access onto a public street with the minimum paved widths as stated in Subsection 19.703.3.C.5 below.**
5. **Adequate frontage improvements as follows:**
   a. **For local streets, a minimum paved width of 16 ft along the site's frontage.**
   b. **For nonlocal streets, a minimum paved width of 20 ft along the site's frontage.**
   c. **For all streets, a minimum horizontal right-of-way clearance of 20 ft along the site's frontage.**
6. **Compliance with Level of Service D for all intersections impacted by the development, except those on Oregon Highway 99E that shall be subject to the following:**
   a. **Level of Service F for the first hour of the morning or evening 2-hour peak period.**
   b. **Level of Service E for the second hour of the morning or evening 2-hour peak period.**

Applicant's Facts and Findings: The District's proposed improvements are consistent with the City's requirements for safety and functionality. The site has been designed with consideration for safe access and clear vision at intersections. As described in the responses to 19.703.4, below, all minimum requirements for the site's surrounding street network have been satisfied through the proposed improvement plans. All required utilities improvements will be installed as required by the City's Engineering Director.

19.703.4 Determinations

There are four key determinations related to transportation facility improvements that occur during the processing of a development permit or land use application. These determinations are described below in the order in which they occur in the review process. They are also shown in Figure 19.703.4. In making these determinations, the Engineering Director will take the goals and policies of the TSP into consideration and use the criteria and guidelines in this chapter.

A. Impact Evaluation

For development that is subject to Chapter 19.700 per Subsection 19.702.1, the Engineering Director will determine whether the proposed development has impacts to the transportation system pursuant to Section 19.704. Pursuant to Subsection 19.704.1, the Engineering Director will also determine whether a transportation impact study (TIS) is required. If a TIS is required, a transportation facilities review land use application shall be submitted pursuant to Subsection 19.703.2.B.

For development that is subject to Chapter 19.700 per Subsection 19.702.2, the City has determined that there are impacts to the transportation system if the proposed single-family residential expansion/conversion is greater than 200 sq ft.

Applicant's Facts and Findings: The proposed improvements to the site will not create any change of use, therefore impacts associated with the improvements will be similar to the existing conditions within the area. The director indicated that because of the low potential for any unusual impacts associated with this development, no Traffic Impact Statement would be required in support of the proposed improvements.

B. Street Design

Given the City's existing development pattern, it is expected that most transportation facility improvements will involve existing streets and/or will serve infill development. To ensure that required improvements are safe and relate to existing street and development conditions, the Engineering Director will determine the most appropriate street design cross section using the standards and guidelines contained in Section 19.708. On-site frontage improvements are not required for downtown development that is exempt per Subsection 19.702.3.B.

Applicant's Facts and Findings: The site has frontage along SE Lake Road and SE Shell Lane. Improvements to Lake Road were previously constructed with a Capital Improvement Project, therefore improvements are not necessary as a part of this application. The proposed improvements to the school are relatively minor in nature and do not necessitate improvements to Shell Lane.

The requirements of this section have been met.

C. Proportional Improvements

When transportation facility improvements are required pursuant to this chapter, the Engineering Director will conduct a proportionality analysis pursuant to Section 19.705 to determine the level of improvements that are roughly proportional to the level of potential impacts from the proposed development. Guidelines for conducting a proportionality analysis are contained in Subsection 19.705.2.

Applicant's Facts and Findings: No proportionate share or additional improvements are required in order to mitigate any potential impacts from the project.

D. Fee in Lieu of Construction (FILOC)

If transportation facility improvements are required and determined to be proportional, the City will require construction of the improvements at the time of development. However, the applicant may request to pay a fee in lieu of constructing the required transportation facility improvements. The Engineering Director will approve or deny such requests using the criteria for making FILOC determinations found in Chapter 13.32 Fee in Lieu of Construction.

Applicant's Facts and Findings: The applicant has not proposed to provide any fees in lieu of site construction.

19.704 TRANSPORTATION IMPACT EVALUATION

The Engineering Director will determine whether a proposed development has impacts on the transportation system by using existing transportation data. If the Engineering Director cannot properly evaluate a proposed development's impacts without a more detailed study, a transportation impact study (TIS) will be required to evaluate the adequacy of the transportation system to serve the proposed development and determine proportionate mitigation of impacts. The TIS determination process and requirements are detailed below.

19.704.1 TIS Determination

- **A. Based on information provided by the applicant about the proposed development, the Engineering Director will determine when a TIS is required and will consider the following when making that determination.**
  1. **Changes in land use designation, zoning designation, or development standard.**
  2. **Changes in use or intensity of use.**
  3. **Projected increase in trip generation.**
  4. **Potential impacts to residential areas and local streets.**
  5. **Potential impacts to priority pedestrian and bicycle routes, including, but not limited to, school routes and multimodal street improvements identified in the TSP.**
  6. **Potential impacts to intersection level of service (LOS).**
- **B. It is the responsibility of the applicant to provide enough detailed information for the Engineering Director to make a TIS determination.**
- **C. A TIS determination is not a land use action and may not be appealed.**

Applicant's Facts and Findings: The proposed development will not create a change in use or increase in capacity. As no significant impacts to the surrounding transportation system are anticipated the applicant has not provided a TIS.

19.705 ROUGH PROPORTIONALITY

The purpose of this section is to ensure that required transportation facility improvements are roughly proportional to the potential impacts of the proposed development. The rough proportionality requirements of this section apply to both frontage and off-site, or nonfrontage, improvements. A rough proportionality determination may be appealed pursuant to Subsection 19.703.5.

The Engineering Director will conduct a proportionality analysis for any proposed development that triggers transportation facility improvements per this chapter, with the exception of development subject to Subsection 19.702.2. The Engineering Director may conduct a proportionality analysis for development that triggers transportation facility improvements per Subsection 19.702.2.

When conducting a proportionality analysis for frontage improvements, the Engineering Director will not consider prior use for the portion of the proposed development that involves

new construction. The Engineering Director will, however, consider any benefits that are estimated to accrue to the development property as a result of any required transportation facility improvements.

The following general provisions apply whenever a proportionality analysis is conducted.

19.705.1 Impact Mitigation

Mitigation of impacts, due to increased demand for transportation facilities associated with the proposed development, shall be provided in rough proportion to the transportation impacts of the proposed development. When a TIS is required, potential impacts will be determined in accordance with Section 19.704. When no TIS is required, potential impacts will be determined by the Engineering Director.

Applicant's Facts and Findings: The proposed development will not create a change in use or increase in capacity. As no significant impacts to the surrounding transportation system are anticipated within either the near or long-term horizon, no mitigation has been proposed aside from the frontage improvements and changes to the parking lots adjacent to the site.

19.705.2 Rough Proportionality Guidelines

The following shall be considered when determining proportional improvements:

- **A. Condition and capacity of existing facilities within the impact area in relation to City standards. The impact area is generally defined as the area within a 1/2-mile radius of the proposed development. If a TIS is required pursuant to Section 19.704, the impact area is the TIS study area.**
- **B. Existing vehicle, bicycle, pedestrian, and transit use within the impact area.**
- **C. The effect of increased demand associated with the proposed development on transportation facilities and on other approved, but not yet constructed, development projects within the impact area.**
- **D. The most recent use when a change in use is proposed that does not involve new construction.**
- **E. Applicable TSP goals, policies, and plans.**
- **F. Whether any route affected by increased transportation demand within the impact area is listed in any City program including, but not limited to, school trip safety, neighborhood traffic management, capital improvement, and system development improvement.**
- **G. Accident history within the impact area.**
- **H. Potential increased safety risks to transportation facility users, including pedestrians and cyclists.**
- **I. Potential benefit the development property will receive as a result of the construction of any required transportation facility improvements.**
- **J. Other considerations as may be identified in the review process.**

Applicant's Facts and Findings: The proposed development is a modification of an existing use. The development will not create a change in use or increase in capacity. As no significant impacts to the surrounding transportation system are anticipated within either the near or long-term horizon, no mitigation has been proposed aside from the frontage improvements and changes to the parking lots adjacent to the site.

19.708 TRANSPORTATION FACILITY REQUIREMENTS

This section contains the City's requirements and standards for improvements to public streets, including pedestrian, bicycle, and transit facilities. For ease of reading, the more common term "street" is used more frequently than the more technical terms "public right-of-way" or "right-of-way." As used in this section, however, all three terms have the same meaning.

The City recognizes the importance of balancing the need for improved transportation facilities with the need to ensure that required improvements are fair and proportional. The City also acknowledges the value in providing street design standards that are both objective and flexible. Objective standards allow for consistency of design and provide some measure of certainty for developers and property owners. Flexibility, on the other hand, gives the City the ability to design streets that are safe and that respond to existing street and development conditions in a way that preserves neighborhood character.

The City's street design standards are based on the street classification system described in the TSP. Figure 8-1 of the TSP identifies the functional street classification for every street in the City and Figure 10-1 identifies the type and size of street elements that may be appropriate for any given street based on its classification.

19.708.1 General Street Requirements and Standards

A. Access Management

All development subject to Chapter 19.700 shall comply with access management standards contained in Chapter 12.16.

B. Clear Vision

All development subject to Chapter 19.700 shall comply with clear vision standards contained in Chapter 12.24.

C. Development in Downtown Zones

Street design standards and right-of-way dedication for the downtown zones are subject to the requirements of the Milwaukie Public Works Standards, which implement the streetscape design of the Milwaukie Downtown and Riverfront Plan: Public Area Requirements (PAR). Unless specifically stated otherwise, the standards in Section 19.708 do not apply to development located in the downtown zones or on street sections shown in the PAR per Subsection 19.304.6.

D. Development in Non-Downtown Zones

Development in a non-downtown zone that has frontage on a street section shown in the PAR is subject to the requirements of the Milwaukie Public Works Standards, which implements the street design standards and right-of-way dedication requirements contained in the PAR for that street frontage. The following general provisions apply only to street frontages that are not shown in the PAR and for development that is not in any of the downtown zones listed in Subsection 19.708.1.C above:

1. **Streets shall be designed and improved in accordance with the standards of this chapter and the Public Works Standards. ODOT facilities shall be designed consistent with State and federal standards. County facilities shall be designed consistent with County standards.**
2. **Streets shall be designed according to their functional classification per Figure 8-3b of the TSP.**
3. **Street right-of-way shall be dedicated to the public for street purposes in accordance with Subsection 19.708.2. Right-of-way shall be dedicated at the corners of street intersections to accommodate the required turning radii and transportation facilities in accordance with Section 19.708 and the Public Works Standards. Additional dedication may be required at intersections for improvements identified by the TSP or a required transportation impact study.**
4. **The City shall not approve any development permits for a proposed development unless it has frontage or approved access to a public street.**
5. **Off-site street improvements shall only be required to ensure adequate access to the proposed development and to mitigate for off-site impacts of the proposed development.**
6. **The following provisions apply to all new public streets and extensions to existing public streets.**
    a. **All new streets shall be dedicated and improved in accordance with this chapter.**
    b. **Dedication and construction of a half-street is generally not acceptable. However, a half-street may be approved where it is essential to allow reasonable development of a property and when the review authority finds that it will be possible for the property adjoining the half-street to dedicate and improve the remainder of the street when it develops. The minimum paved roadway width for a half-street shall be the minimum width necessary to accommodate 2 travel lanes pursuant to Subsection 19.708.2.**
7. **Traffic calming may be required for existing or new streets. Traffic calming devices shall be designed in accordance with the Public Works Standards or with the approval of the Engineering Director.**
8. **Railroad Crossings**

Where anticipated development impacts trigger a need to install or improve a railroad crossing, the cost for such improvements may be a condition of development approval.

9. **Street Signs**
   The City shall install all street signs, relative to traffic control and street names, as specified by the Engineering Director. The applicant shall reimburse the City for the cost of all such signs installed by the City.
10. **Streetlights**
    The location of streetlights shall be noted on approved development plans. Streetlights shall be installed in accordance with the Public Works Standards or with the approval of the Engineering Director.

Applicant's Facts and Findings: The Applicant has provided detailed preliminary development plans showing that all proposed improvements have been designed in accordance with the City's public works standards.

E. Street Layout and Connectivity

1. **The length, width, and shape of blocks shall take lot size standards, access and circulation needs, traffic safety, and topographic limitations into consideration.**
2. **The street network shall be generally rectilinear but may vary due to topography or other natural conditions.**
3. **Streets shall be extended to the boundary lines of the developing property where necessary to give access to or allow for future development of adjoining properties.**
   a. **Temporary turnarounds shall be constructed for street stubs in excess of 150 ft in length. Drainage facilities shall be constructed to properly manage stormwater runoff from temporary turnarounds.**
   b. **Street stubs to adjoining properties shall not be considered turnarounds, unless required and designed as turnarounds, since they are intended to continue as through streets when adjoining properties develop.**
   c. **Reserve strips may be required in order to ensure the eventual continuation or completion of a street.**
4. **Permanent turnarounds shall only be provided when no opportunity exists for creating a through street connection. The lack of present ownership or control over abutting property shall not be grounds for construction of a turnaround. For proposed land division sites that are 3 acres or larger, a street ending in a turnaround shall have a maximum length of 200 ft, as measured from the cross street right-of-way to the farthest point of right-of-way containing the turnaround. For proposed land division sites that are less than 3 acres, a street ending in a turnaround shall have a maximum length of 400 ft, measured from the cross street right-of-way to the farthest point of right-of-way containing the**

turnaround. Turnarounds shall be designed in accordance with the requirements of the Public Works Standards. The requirements of this subsection may be adjusted by the Engineering Director to avoid alignments that encourage nonlocal through traffic.

5. **Closed-end street systems may serve no more than 20 dwellings.**

Applicant's Facts and Findings: The Applicant is not proposing to create any new streets as part of this development.

F. Intersection Design and Spacing

1. **Connecting street intersections shall be located to provide for traffic flow, safety, and turning movements, as conditions warrant.**
2. **Street and intersection alignments for local streets shall facilitate local circulation but avoid alignments that encourage nonlocal through traffic.**
3. **Streets should generally be aligned to intersect at right angles (90 degrees). Angles of less than 75 degrees will not be permitted unless the Engineering Director has approved a special intersection design.**
4. **New streets shall intersect at existing street intersections so that centerlines are not offset. Where existing streets adjacent to a proposed development do not align properly, conditions shall be imposed on the development to provide for proper alignment.**
5. **Minimum and maximum block perimeter standards are provided in Table 19.708.1.**
6. **Minimum and maximum intersection spacing standards are provided in Table 19.708.1.**

Applicant's Facts and Findings: No new intersections between existing roadways are proposed as a part of this development.

19.708.2 Street Design Standards

Table 19.708.2 contains the street design elements and dimensional standards for street cross sections by functional classification. Dimensions are shown as ranges to allow for flexibility in developing the most appropriate cross section for a given street or portion of street based on existing conditions and the surrounding development pattern. The additional street design standards in Subsection 19.708.2.A augment the dimensional standards contained in Table 19.708.2. The Engineering Director will rely on Table 19.708.2 and Subsection 19.708.2.A to determine the full-width cross section for a specific street segment based on functional classification. The full-width cross section is the sum total of the widest dimension of all individual street elements. If the Engineering Director determines that a full-width cross section is appropriate and feasible, a full-width cross section will be required. If the Engineering Director determines that a full-width cross section is not appropriate or feasible, the Engineering Director will modify the full-width cross section requirement using the guidelines

provided in Subsection 19.708.2.B. Standards for design speed, horizontal/vertical curves, grades, and curb return radii are specified in the Public Works Standards.

1.

Applicant's Facts and Findings: The proposed development does not necessitate any improvements to Lake Road or Shell Lane.

19.708.3 Sidewalk Requirements and Standards

A. General Provisions

1. Goals, objectives, and policies relating to walking are included in Chapter 5 of the TSP and provide the context for needed pedestrian improvements. Figure 5-1 of the TSP illustrates the Pedestrian Master Plan and Table 5-3 contains the Pedestrian Action Plan.

2. Americans with Disabilities Act (ADA) requirements for public sidewalks shall apply where there is a conflict with City standards.

B. Sidewalk Requirements

1. Requirements

Sidewalks shall be provided on the public street frontage of all development per the requirements of this chapter. Sidewalks shall generally be constructed within the dedicated public right-of-way, but may be located outside of the right-of-way within a public easement with the approval of the Engineering Director.

2. Design Standards

Sidewalks shall be designed and improved in accordance with the requirements of this chapter and the Public Works Standards.

3. Maintenance

Abutting property owners shall be responsible for maintaining sidewalks and landscape strips in accordance with Chapter 12.04.

Applicant's Facts and Findings: The existing sidewalk facilities on site adequately serve the site. Improvements to the sidewalks are being proposed where building renovations will impact the sidewalk, or where new connections are necessary.

The requirements of this section have been met.

19.708.4 Bicycle Facility Requirements and Standards

A. General Provisions

1. Bicycle facilities include bicycle parking and on-street and off-street bike lanes, shared lanes, bike boulevards, and bike paths.

2. Goals, objectives, and policies relating to bicycling are included in Chapter 6 of the TSP and provide the context for needed bicycle improvements. Figure 6-2 of the TSP illustrates the Bicycle Master Plan, and Table 6-3 contains the Bicycle Action Plan.

B. Bicycle Facility Requirements

1. **Requirements**

   Bicycle facilities shall be provided in accordance with this chapter, Chapter 19.600, the TSP, and the Milwaukie Downtown and Riverfront Plan: Public Area Requirements. Requirements include, but are not limited to, parking, signage, pavement markings, intersection treatments, traffic calming, and traffic diversion.

2. **Timing of Construction**
3. **To assure continuity and safety, required bicycle facilities shall generally be constructed at the time of development. If not practical to sign, stripe, or construct bicycle facilities at the time of development due to the absence of adjacent facilities, the development shall provide the paved street width necessary to accommodate the required bicycle facilities.**
4. **Design Standards**

   Bicycle facilities shall be designed and improved in accordance with the requirements of this chapter and the Public Works Standards. Bicycle parking shall be designed and improved in accordance with Chapter 19.600 and the Milwaukie Downtown and Riverfront Plan: Public Area Requirements.

Applicant's Facts and Findings: The existing bicycle facilities adequately serve the site. The applicant is not proposing any changes to the bicycle facilities on site.

19.708.5 Pedestrian/Bicycle Path Requirements and Standards

Applicant's Facts and Findings: No new bicycle pathways have been required or proposed within the proposed development. The requirements of this section do not apply.

19.708.6 Transit Requirements and Standards

A. General Provisions

1. **Transit facilities include bus stops, shelters, and related facilities. Required transit facility improvements may include the dedication of land or the provision of a public easement.**
2. **Goals, objectives, and policies relating to transit are included in Chapter 7 of the TSP. Figure 7-3 of the TSP illustrates the Transit Master Plan, and Table 7-2 contains the Transit Action Plan.**

Applicant's Facts and Findings: No new public transit facilities have been required by the City as part of this project. The requirements of this section do not apply as no new public transit facilities are proposed.

19.709 PUBLIC UTILITY REQUIREMENTS

19.709.1 Review Process

The Engineering Director shall review all proposed development subject to Chapter 19.700 per Section 19.702 in order to: (1) evaluate the adequacy of existing public utilities to serve the proposed development, and (2) determine whether new public utilities or an expansion of

existing public utilities is warranted to ensure compliance with the City's public utility requirements and standards.

A. Permit Review

The Engineering Director shall make every effort to review all development permit applications for compliance with the City's public utility requirements and standards within 10 working days of application submittal. Upon completion of this review, the Engineering Director shall either approve the application, request additional information, or impose conditions on the application to ensure compliance with this chapter.

B. Review Standards

Review standards for public utilities shall be those standards currently in effect, or as modified, and identified in such public documents as Milwaukie's Comprehensive Plan, Wastewater Master Plan, Water Master Plan, Stormwater Master Plan, Transportation System Plan, and Public Works Standards.

Applicant's Facts and Findings: The Applicant has submitted a series of plans showing proposed improvements to the site's public utility system. All proposed improvements have been designed to comply with the City's standards. The Applicant has submitted the attached plans for the City's review, comment, and approval.

19.709.2 Public Utility Improvements

Public utility improvements shall be required for proposed development that would have a detrimental effect on existing public utilities, cause capacity problems for existing public utilities, or fail to meet standards in the Public Works Standards. Development shall be required to complete or otherwise provide for the completion of the required improvements.

A. The Engineering Director shall determine which, if any, utility improvements are required. The Engineering Director's determination requiring utility improvements shall be based upon an analysis that shows the proposed development will result in one or more of the following situations:

1. **Exceeds the design capacity of the utility.**
2. **Exceeds Public Works Standards or other generally accepted standards.**
3. **Creates a potential safety hazard.**
4. **Creates an ongoing maintenance problem.**

B. The Engineering Director may approve one of the following to ensure completion of required utility improvements.

1. **Formation of a reimbursement district in accordance with Chapter 13.30 for off-site public facility improvements fronting other properties.**
2. **Formation of a local improvement district in accordance with Chapter 3.08 for off-site public facility improvements fronting other properties.**

Applicant's Facts and Findings: The proposed improvements to Rowe Middle School will not have a detrimental effect on the existing public utilities, case capacity problems for existing utilities or fail to meet the standards in the Public Works Standards. Improvements to the existing utilities have been shown on the Utility Plan

(Sheet C301-C303). All proposed improvements are based upon analysis that shows the proposed development will be adequately served.

The requirements of this section have been met.

19.709.3 Design Standards

Public utility improvements shall be designed and improved in accordance with the requirements of this chapter, the Public Works Standards, and improvement standards and specifications identified by the City during the development review process. The applicant shall provide engineered utility plans to the Engineering Director for review and approval prior to construction to demonstrate compliance with all City standards and requirements.

Applicant's Facts and Findings: All proposed public utility improvements have been designed in accordance with the requirements of this chapter. The attached plans have been submitted to the City's Engineering Director for review. No construction on site will be scheduled without the required approval and permits.

19.709.4 Oversizing

The Engineering Director may require utility oversizing in anticipation of additional system demand. If oversizing is required, the Engineering Director may authorize a reimbursement district or a system development charge (SDC) credit in accordance with Chapter 13.28.

Applicant's Facts and Findings: The Applicant has proposed improvements to the site's utility network to satisfy the demands associated with the new buildings and facilities on site. The City's Engineering Director has not indicated that any specific oversizing of the system will be required within the site's vicinity.

19.709.5 Monitoring

The Engineering Director shall monitor the progress of all public utility improvements by the applicant to ensure project completion and compliance with all City permitting requirements and standards. Utility improvements are subject to the requirements of Chapter 12.08. Follow-up action, such as facility inspection, bond release, and enforcement, shall be considered a part of the monitoring process.

Applicant's Facts and Findings: The Applicant will work with the City's Engineering Director throughout the construction process to ensure that all proposed improvements are completed to the satisfaction of the Director.

CHAPTER 19.900 LAND USE APPLICATIONS

19.904 COMMUNITY SERVICE USES

19.904.1 Purpose

This section allows development of certain uses which, because of their public convenience, necessity, and unusual character, may be appropriately located in most zoning districts, but which may be permitted only if appropriate for the specific location for which they are

proposed. This section provides standards and procedures for review of applications for such community uses. Community service uses may be sited in any zone, except where expressly prohibited, if they meet the standards of this section. Approval of a CSU does not change the zoning of the property.

19.904.2 Applicability

Any community service use shall be subject to the provisions of this section. Application must be submitted to establish or modify a community service use. Community service uses include certain private and public utilities, institutions, and recreational facilities as listed below:

A. Institutions—Public/Private and Other Public Facilities

1. Schools, public or private, and their accompanying sports facilities, day-care centers, private kindergartens;

Applicant's Facts and Findings: Schools and their accompanying sports facilities are an institutional use within the City of Milwaukie's Zoning Code. The provisions of this section apply to the project because the Applicant has proposed an amendment to the School's existing Community Service Use Permit.

19.904.3 Review Process

Except as provided in Subsections 19.904.5.C for minor modifications and 19.904.11 for wireless communication facilities, community service uses shall be evaluated through a Type III review per Section 19.1006.

Applicant's Facts and Findings: The Applicant acknowledges the required Type III review process.

19.904.4 Approval Criteria

An application for a community service use may be allowed if the following criteria are met:

A. The building setback, height limitation, and off-street parking and similar requirements governing the size and location of development in the underlying zone are met. Where a specific standard is not proposed in the CSU, the standards of the underlying zone are met;

Applicant's Facts and Findings: The Applicant has analyzed the allowable building setbacks, height limitation, and off-street parking and all other applicable development standards. The Applicant's responses to sections 19.300 (Base Zones), 19.500 (Supplementary Development Regulations), 19.600 (Off-Street Parking), and 19.700 (Public Facilities) of the City's code confirm that the District's proposal is in compliance with all applicable underlying development standards and limitations.

B. Specific standards for the proposed uses as found in Subsections 19.904.7-11 are met;

Applicant's Facts and Findings: The standards of 19.904.7 apply to Schools. The Applicant has addressed these standards within this narrative.

C. The hours and levels of operation of the proposed use are reasonably compatible with surrounding uses;

Applicant's Facts and Findings: The use of the site as Rowe Middle School is not proposed to change. The hours and levels of operation are anticipated to be very similar to those in place today, which are reasonably compatible with the surrounding uses.

D. The public benefits of the proposed use are greater than the negative impacts, if any, on the neighborhood; and

Applicant's Facts and Findings: Rowe Middle School has served the residents of the City of Milwaukie and the North Clackamas School District for several years. The public benefits associated with the updating of the school facilities will better serve the public through the provision of a modernized education and associated facilities through the implementation of a public improvement bond. The negative impacts upon the neighborhood involve impacts associated with construction.

E. The location is appropriate for the type of use proposed.

Applicant's Facts and Findings: The Applicant acknowledges the process for review of Type III Applications. The Applicant acknowledges that the City may place conditions of approval upon the application in order to assure compatibility with the uses which are present within the neighborhood. Though it is possible for the City to assign conditions of approval related to suitability, the site is already in use as a school. The District's proposal to update the school and existing sports facilities over the location of the existing facilities warrants very few conditions to ensure suitability as the facility has been in operation for longer than many of the homes within the surrounding neighborhood have been there.

The City's Planning Commission can find that no special conditions of approval require implementation prior to permitting the development of the proposed building and site improvements.

19.904.5 Procedures for Reviewing a Community Service Use

A. The Planning Commission will hold a public hearing on the establishment of, or major modification of, the proposed community service use. If the Commission finds that the approval criteria in Subsection 19.904.4 are met, the Commission shall approve the designation of the site for community service use. If the Commission finds otherwise, the application shall be denied. An approval allows the use on the specific property for which the application was submitted, subject to any conditions the Planning Commission may attach.

B. In permitting a community service use or the modification of an existing one, the City may impose suitable conditions which assure compatibility of the use with other uses in the vicinity. These conditions may include but are not limited to:

1. **Limiting the manner in which the use is conducted by restricting the time an activity may take place and by minimizing such environmental effects as noise and glare;**
2. **Establishing a special yard, setback, lot area, or other lot dimension;**
3. **Limiting the height, size, or location of a building or other structure;**
4. **Designating the size, number, location, and design of vehicle access points;**
5. **Increasing roadway widths, requiring street dedication, and/or requiring improvements within the street right-of-way including full street improvements;**
6. **Designating the size, location, screening, drainage, surfacing, or other improvement of a parking area or truck loading area; and/or**
7. **Limiting or otherwise designating the number, size, location, height, and lighting of signs.**

C. The Planning Director may approve minor modifications to an approved community service per Section 19.1004 Type I Review, provided that such modification:

1. **Does not increase the intensity of any use;**
2. **Meets all requirements of the underlying zone relating to building size and location and off-street parking and the standards of Title 19;**
3. **Does not result in deterioration or loss of any protected natural feature or open space, and does not negatively affect nearby properties;**
4. **Does not alter or contravene any conditions specifically placed on the development by the Planning Commission or City Council; and**
5. **Does not cause any public facility, including transportation, water, sewer and storm drainage, to fail to meet any applicable standards relating to adequacy of the public facility.**

Applicant's Facts and Findings:

The Applicant acknowledges the process for review of Type III Applications. The Applicant acknowledges that the City may place conditions of approval upon the application in order to assure compatibility with the uses which are present within the neighborhood. Though it is possible for the City to assign conditions of approval related to suitability, the site is already in use as an existing school. The District's proposal to update the school and existing sports facilities over the location of the existing facilities warrants very few conditions to ensure suitability as the facility has been in operation for several years.

The City's Planning Commission can find that no special conditions of approval require implementation prior to permitting the development of the proposed building and site improvements.

19.904.6 Application Requirements

An application for approval of a community service use shall include the following:

A. Name, address and telephone number of applicant and/or property owner;

B. Map number and/or subdivision block and lot;
C. Narrative concerning the proposed request;
D. Copy of deed, or other document showing ownership or interest in property. If applicant is not the owner, the written authorization from the owner for the application shall be submitted;
E. Vicinity map;
F. Comprehensive plan and zoning designations;
G. A map showing existing uses, structures, easements, and public utilities and showing proposed development, placement of lot lines, etc.;
H. Detailed plans for the specific project;
I. Any information required by other applicable provisions of local, state or federal law;
J. Proof of payment of the applicable fees;
K. Additional drawings, surveys or other material necessary to understand the proposed use may be required.

Applicant's Facts and Findings: The Applicant has provided each of the required submission materials to allow the City to consider the proposed improvements and the application.

19.904.7 Specific Standards for Schools

Public, private or parochial, elementary, secondary, preschool, nursery schools, kindergartens, and day-care centers are included.

A. Public elementary or secondary schools shall provide the site area/pupil ratio required by state law. Other schools shall provide 1 acre of site area for each 75 pupils of capacity or for each 2½ classrooms, whichever is greater, except as provided in Subsection 19.904.7.B below.
B. Preschools, nursery schools, day-care centers, or kindergartens shall provide a fenced, outdoor play area of at least 75 sq ft for each child of total capacity, or a greater amount if so required by state law. In facilities where groups of children are scheduled at different times for outdoor play, the total play area may be reduced proportionally based on the number of children playing out-of-doors at one time. However, the total play area may not be reduced by more than half. These uses must comply with the State Children's Services Division requirements as well as the City provisions.
C. Walkways, both on and off the site, shall be provided as necessary for safe pedestrian access to schools subject to the requirements and standards of Chapter 19.700.
D. Sight-obscuring fence of 4 to 6 ft in height shall be provided to separate the play area from adjacent residential uses.
E. Public facilities must be adequate to serve the facility.
F. Safe loading and ingress and egress will be provided on and to the site.
G. Off-street parking (including buses) shall be provided as per Chapter 19.600.
H. Minimum setback requirements:

Front yard: 20 ft

Rear yard: 20 ft

Side yard: 20 ft

Setbacks may be increased depending on the type and size of school in order to ensure adequate buffering between uses and safety for students.

I. Bicycle facilities are required which adequately serve the facility.

J. 15% of the total site is to be landscaped.

Applicant's Facts and Findings: The proposed development will include the addition of two classrooms to the middle school. The school will have a total of 33 classrooms, requiring a total of 13.2 acres of site area. The site has a total area of 14. 23 acres, which exceeds the requirement of one acre of site area per 2.5 classrooms.

Walkways and bicycle facilities both on and off site are provided for safe pedestrian access to the school. Public facilities already serve the facility and are adequate to serve the facility with the proposed changes. Safe loading and egress is provided on and to the site. Off-street parking has been provided on site. All setbacks have been met, as shown on the attached site plan.

The site contains adequate landscaping to meet the 15% requirement. The building is landscaped along various facades, the parking areas contain both planter and perimeter landscaping, and the site contains significant areas for sports and recreation. In total, after the proposed site and building improvements, the site will contain 9.12 acres of landscaped area.

This requirement has been met.

19.909 MODIFICATIONS TO EXISTING APPROVALS

19.909.4 Approval Criteria

A. Approval Criteria for Minor Modifications

B. Approval Criteria for Major Modifications

1. The proposed modification complies with all applicable development standards and requirements, except as modified by the original approval.

Applicant's Facts and Findings: The applicant has addressed all applicable development standards within this land use narrative.

2. The proposed modification will continue to meet all applicable approval criteria upon which the original approval was based.

Applicant's Facts and Findings: As demonstrated within this narrative, all proposed modifications will continue to meet all applicable approval criteria upon which the original approval was based upon.

SUMMARY AND CONCLUSION

Based upon the materials submitted herein, the Applicant respectfully requests approval from the City's Planning Department of this application for a Type III Major Modification of a Community Service Use application.

PLANNING DEPARTMENT
6101 SE Johnson Creek Blvd
Milwaukie OR 97206

PHONE: *503-786-7630*
FAX: *503-774-8236*
E-MAIL: *planning@milwaukieoregon.gov*

Application for Land Use Action

Master File #: _____

Review type*: ☐ I ☐ II ☐ III ☐ IV ☐ V

CHOOSE APPLICATION TYPE(S):

Community Service Use

...

...

...

...

Use separate application forms for:
- Annexation and/or Boundary Change
- Compensation for Reduction in Property Value (Measure 37)
- Daily Display Sign
- Appeal

RESPONSIBLE PARTIES:

APPLICANT (owner or other eligible applicant—see reverse): North Clackamas School District

Mailing address: 12451 SE Fuller Road Milwaukie, OR Zip: 97222

Phone(s): 503-353-6000 E-mail: hobbsd@nclack.k12.or.us

APPLICANT'S REPRESENTATIVE (if different than above): Heery International, Marc Bargenda

Mailing address: 4444 SE Lake Road Milwaukie, OR Zip: 97222

Phone(s): 530-392-5566 E-mail: bargendam@nclack.k12.or.us

SITE INFORMATION:

Address: 3606 SE Lake Road Map & Tax Lot(s): 11e36dc 05700

Comprehensive Plan Designation: P Zoning: R-10 Size of property: 13.34 Acres

PROPOSAL (describe briefly):

Applicant proposes a modification to the Rowe Middle School's Community Service Use Permit.

SIGNATURE:

ATTEST: I am the property owner or I am eligible to initiate this application per Milwaukie Municipal Code (MMC) Subsection 19.1001.6.A. If required, I have attached written authorization to submit this application. To the best of my knowledge, the information provided within this application package is complete and accurate.

Submitted by: Date: 12/20/2017

IMPORTANT INFORMATION ON REVERSE SIDE

RESET

*For multiple applications, this is based on the highest required review type. See MMC Subsection 19.1001.6.B.1.

WHO IS ELIGIBLE TO SUBMIT A LAND USE APPLICATION (excerpted from MMC Subsection 19.1001.6.A):

Type I, II, III, and IV applications may be initiated by the property owner or contract purchaser of the subject property, any person authorized in writing to represent the property owner or contract purchaser, and any agency that has statutory rights of eminent domain for projects they have the authority to construct.

Type V applications may be initiated by any individual.

PREAPPLICATION CONFERENCE:

A preapplication conference may be required or desirable prior to submitting this application. Please discuss with Planning staff.

REVIEW TYPES:

This application will be processed per the assigned review type, as described in the following sections of the Milwaukie Municipal Code:

- Type I: Section 19.1004
- Type II: Section 19.1005
- Type III: Section 19.1006
- Type IV: Section 19.1007
- Type V: Section 19.1008

THIS SECTION FOR OFFICE USE ONLY:

FILE TYPE	FILE NUMBER	FEE AMOUNT*	PERCENT DISCOUNT	DISCOUNT TYPE	DEPOSIT AMOUNT	DATE STAMP
Master file		$			$	
Concurrent application files		$			$	
		$			$	
		$			$	
		$			$	
SUBTOTALS		$			$	
TOTAL AMOUNT RECEIVED: $			**RECEIPT #:**			**RCD BY:**

Associated application file #s (appeals, modifications, previous approvals, etc.):

Neighborhood District Association(s):

Notes:

*After discount (if any)

First American Title

Customer Service Department
121 SW Morrison St., Suite 300
Portland, OR 97204
Phone: 503.219.TRIO (8746)
Fax: 503.790.7872
Email: cs.portland@firstam.com
Date: **12/20/2017**

OWNERSHIP INFORMATION

Owner:	Clackamas Sd #12 North	Parcel #:	00033993
Coowner:		Ref Parcel #:	11E36DC05700
Site:	3606 SE Lake Rd Milwaukie 97222	TRS:	T: 01S R: 01E S: 36 Q: SE
Mail:	12400 SE Freeman Way Milwaukie OR 97222	County:	Clackamas

PROPERTY DESCRIPTION

Map Grid:	657-A4
Census Tract:	021500 Block: 1049
Neighborhood:	LAKE ROAD
School Dist:	12 NORTH CLACKAMAS
Subdiv/Plat:	
Land Use:	AMSC AGRICULTURAL MISC
Zoning:	Milwaukie-R-10 Low Density Residential District
Watershed:	Johnson Creek-Willamette River
Legal:	SEE SPLIT CODE ACCT 05790|Y|179081

ASSESSMENT AND TAXATION

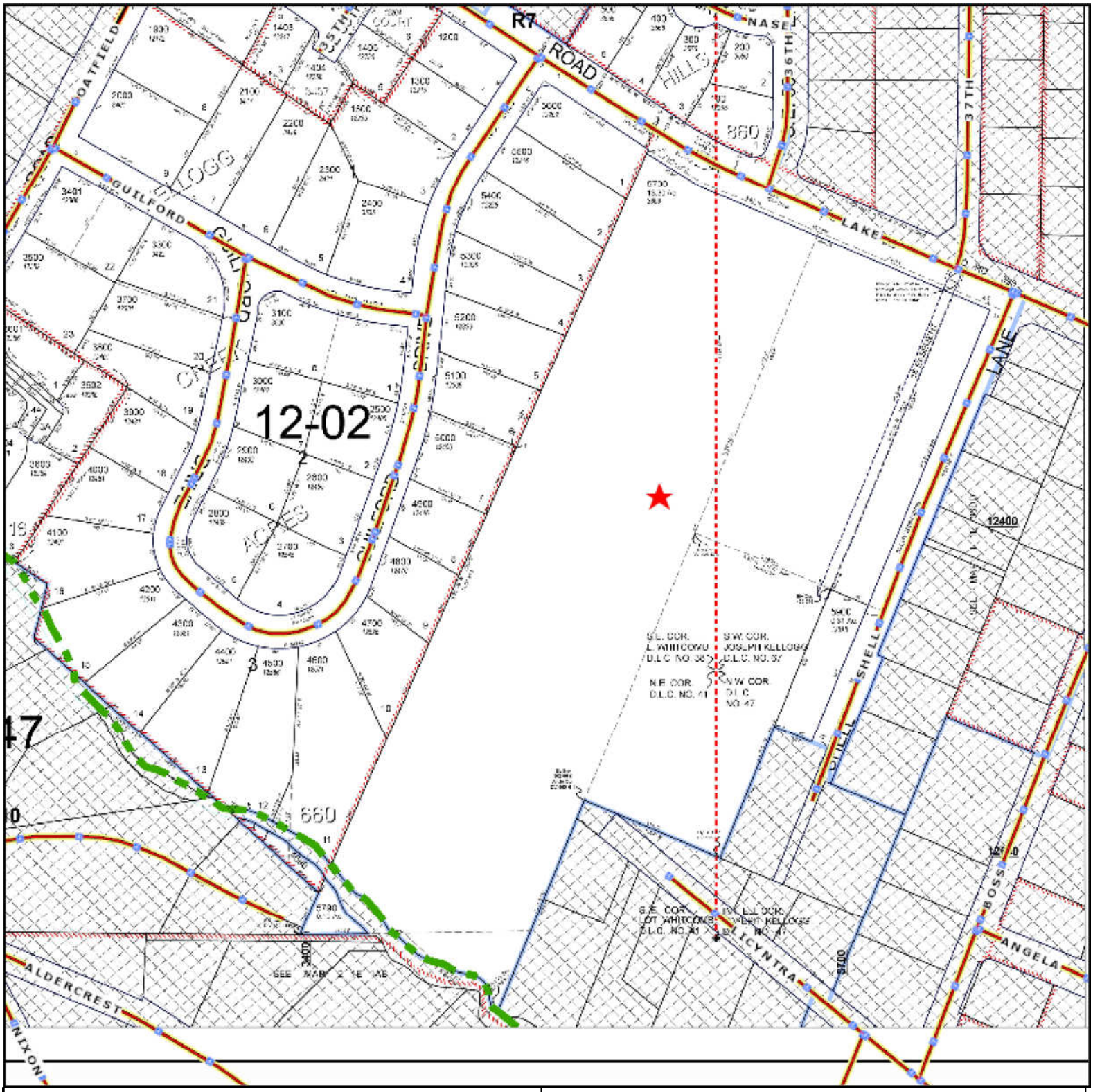
Market Land:	$1,623,053
Market Impr:	$23,252,430
Market Total:	$24,875,483
% Improved:	93
Assessed Total:	$13,386,497 (2017)
Levy Code:	012-002
Tax:	$0.00 (2017)
Millage Rate:	19.7781

PROPERTY CHARACTERISTICS

Bedrooms:		Building Area:		Year Built:	
Baths, Total:	0.00	First Floor:		Eff Year Built:	
Baths, Full:		Second Floor:		Lot Size:	13.67 Acres
Baths, Half:		Basement Fin:		Lot Size:	595,465 SqFt
Total Units:		Basement Unfin:		Lot Width:	
# Stories:	0.00	Basement Total:		Lot Depth:	
# Fireplaces:		Attic Fin:		Roof Material:	
Cooling:	No	Attic Unfin:		Roof Shape:	
Heating:		Attic Total:			
Ext Walls:		Garage:			
Building Style:				Const Type:	0.0

SALES AND LOAN INFORMATION

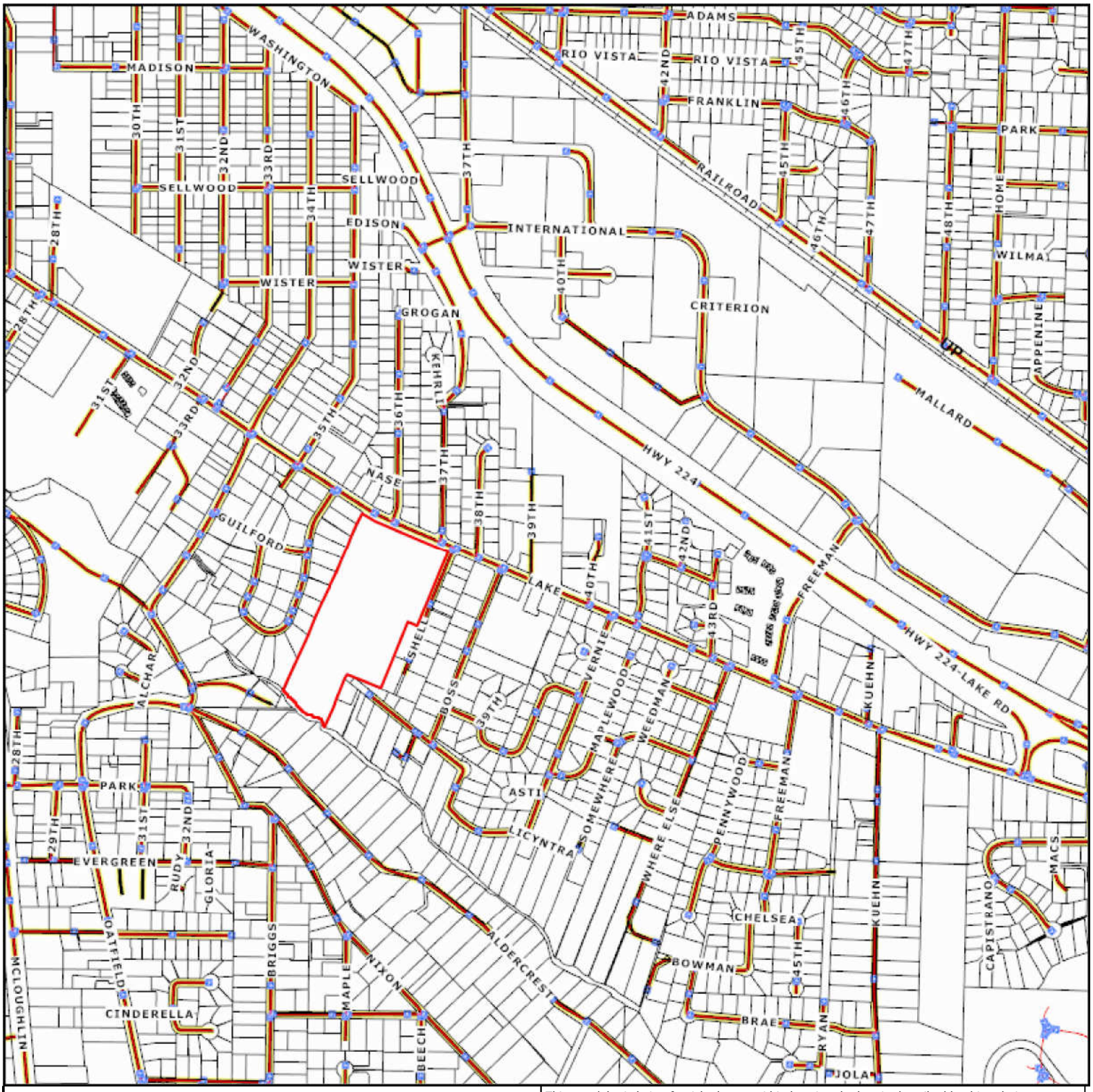
Owner	Date	Doc #	Sale Price	Deed Type	Loan Amt	Loan Type
		565-611				



First American Title

This map/plat is being furnished as an aid in locating the herein described land in relation to adjoining streets, natural boundaries and other land, and is not a survey of the land depicted. Except to the extent a policy of title insurance is expressly modified by endorsement, if any, the company does not insure dimensions, distances, location of easements, acreage or other matters shown thereon.

geoAdvantage



First American Title

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geoAdvantage

FORM No. 633—WARRANTY DEED. STEVENS-NESS LAW PUB. CO. PORTLAND

KA

KNOW ALL MEN BY THESE PRESENTS, That CARTER STANLEY and MARY K. STANLEY, husband and wife, *grantor*s, *in consideration of* Ten and no/100 Dollars, and other good and valuable consideration to them *paid by* SCHOOL DISTRICT #1, CLACKAMAS COUNTY, OREGON, *grantee*, *do* hereby grant, bargain, sell and convey unto the said grantee, its successors, heirs and assigns, all *the following real property, with the tenements, hereditaments and appurtenances, situated in the County of* Clackamas *and State of Oregon, bounded and described as follows, to-wit:*

Part of the Lot Whitcomb D.L.C. and part of the Joseph Kellogg D.L.C. in T.1. and 2,S. R.1.E. of the W.M.
Beginning at a stone in the center of Lake Road, at the most Northerly corner of that tract described in Deed Book 98, page 437; thence along the center of the County Road South 57°00' East 96.00 feet to a stone; thence along the center of the road South 67°00' East 189.3 feet; thence South 22°50' West 512.4 feet to the most Northerly corner of that tract described in Deed Book 425, page 576; thence South 67°00' East 217.73 feet to the most Easterly corner of said tract; thence South 22°50' West 431.38 feet; thence North 67°00' West 218.29 feet to the Easterly line of that tract described in Deed Book 302, page 86; thence South 22°50' West 342.71 feet to the middle of Kellogg Creek; thence downstream following the thread of the stream North 47°02' West 170.51 feet to the south boundary of the Lot Whitcomb D.L.C.; thence tracing said South boundary South 88°30' West 154.91 feet; thence North 23°38' East 1308.2 feet to the place of beginning.

To Have and to Hold the above described and granted premises unto the said grantee, its successors, heirs and assigns forever.

And we the grantors do covenant that we are lawfully seized in fee simple of the above granted premises free from all encumbrances, subject to the rights of the public in and to that portion of said premises lying in roads and highways.

and that we will and our heirs, executors and administrators, shall warrant and forever defend the above granted premises, and every part and parcel thereof, against the lawful claims and demands of all persons whomsoever.

Witness our hand and seal this 29th day of December, 1959.

Carter Stanley (SEAL)
Mary K. Stanley (SEAL)
(SEAL)
(SEAL)

STATE OF OREGON, County of Clackamas } ss.

On this 29th day of December, 19 59, before me, the undersigned, a Notary Public in and for said County and State, personally appeared the within named CARTER STANLEY and MARY K. STANLEY, husband and wife, who are known to me to be the identical individuals described in and who executed the within instrument, and acknowledged to me that they executed the same freely and voluntarily.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my official seal the day and year last above written.

Notary Public for Oregon.
My commission expires January 24, 1963

NOTARY PUBLIC STATE OF OREGON

WARRANTY DEED

CARTER STANLEY, et ux,

TO

SCHOOL DISTRICT #1,

CLACKAMAS COUNTY, OREGON,

AFTER RECORDING RETURN TO

Oregon City Abstract Co.

Docket No. 23657

633

BOOK 565 PAGE 611

STATE OF OREGON, County of Clackamas } ss.

I, Robert Schumacher, County Clerk Ex-Officio Clerk of the County Court of the State of Oregon, for the County of Clackamas, do hereby certify that the within instrument of writing was received for record on the 29 day of DEC 1959 at 1:44 o'clock PM, and recorded in book/reel/volume No. 565 on page 611 or as fee/file/instrument/microfilm/reception No. 23657 Records of said County.

Witness my hand and seal of said Court affixed. ROBERT SCHUMACHER, County Clerk, By Deputy.

Fee $ 3.00

Recording Certificate

September 15, 2017

Andrew Tull
3J Consulting
5075 SW Griffith Dr, Ste. 150
Beaverton OR 97007

Re: Preapplication Report

Dear Andrew:

Enclosed is the Preapplication Report Summary from your meeting with the City on August 31, 2017, concerning your proposal for action on property located at 3606 SE Lake Rd.

A preapplication conference is required prior to submittal of certain types of land use applications in the City of Milwaukie. Where a preapplication conference is required, please be advised of the following:

- Preapplication conferences are valid for a period of 2 years from the date of the conference. If a land use application or development permit has not been submitted within 2 years of the conference date, the Planning Director may require a new preapplication conference.

- If a development proposal is significantly modified after a preapplication conference occurs, the Planning Director may require a new preapplication conference.

If you have any questions concerning the content of this report, please contact the appropriate City staff.

Sincerely,

Alicia Martin
Administrative Specialist II

Enclosure

cc: Bremik Construction
DOWA-IBI Group
Heery International
HHPR
Mahlum Architects
North Clackamas School District

CITY OF MILWAUKIE

PreApp Project ID #: 17-017PA

PRE-APPLICATION CONFERENCE REPORT

This report is provided as a follow-up to a meeting that was held on 8/31/2017 at 10:00am

Applicant Name:	**Andrew Tull**
Company:	**3J Consulting, Inc.**
Applicant 'Role':	Other
Address Line 1:	5075 SW Griffith Drive, Ste 150
Address Line 2:	
City, State Zip:	Beaverton OR 97005
Project Name:	**Rowe Middle School Renovations**
Description:	**Rowe Middle School Renovations**
ProjectAddress:	**3606 SE Lake Rd**
Zone:	Residential R-10
Occupancy Group:	E
ConstructionType:	
Use:	Low Density (LD)
Occupant Load:	
AppsPresent:	Andrew Tull, Sean Murphy, Chris Abbott, Steven Nicholas, David Hobbs, Brian Feeney, John Howorth, Marc Bargenda, Matt Jacoby, Daniel Chin, Garry Kryszak
Staff Attendance:	Brett Kelver, Alex Roller, Samantha Vandagriff, Peter Passarelli

BUILDING ISSUES

ADA:	ADA will need meet all current standards.
Structural:	A permit will be required for any strucutral work to be done on site..
Mechanical:	
Plumbing:	
Plumb Site Utilities:	
Electrical:	Permits are not required for the replacing of fixtures like for like, but will be needed for any relocation or alteration of the circuits. Any fixtures that are being replaced as part of the one of the construction projects will need to be roled into the electrical permit obtained for that project.

Notes: Play ground jungle gyms are not regulated by code, but if it is covered by a structure, the structure would be required to be permitted.
Individual permits will need to be obtained for the different structual projects that are being proposed, but can by applied for concurrently.

Please note all drawings must be individually rolled. If the drawings are small enough to fold they must be individually folded.

FIRE MARSHAL ISSUES

Fire Sprinklers: As required by Oregon Structural Specialty Code (OSSC)

Fire Alarms: As required by Oregon Structural Specialty Code (OSSC)

Fire Hydrants:

Turn Arounds:

Addressing:

Fire Protection:

Fire Access:

Hazardous Mat.:

Fire Marshal Notes: See attached.

PUBLIC WORKS ISSUES

Water: The water System Development Charge (SDC) is based on the size of water meter serving the property. The water SDC will only be assessed with installation of a larger water meter. Water SDC credit will be provided based on the size of any existing water meter serving the property removed from service. The water SDC will be assessed and collected at the time the building permits are issued. The City is interested in obtaining a water and pedestrian access easement along the southeast corner of the property for future construction of a water line that connects the water line on Shell Lane with the water line in Licyntra Lane.

Sewer: Currently, the wastewater System Development Charge (SDC) is comprised of two components. The first component is the City's SDC charge of $1,100 and the second component is the County's SDC for treatment of $6,295 that the City collects and forwards to the County. Both SDC charges are per connection unit. Clackamas county's SDC is calculated with the number of students, and Milwaukie's is calculated with the number of plumbing fixtures. The wastewater SDC will be assessed and collected at the time the building permits are issued.

Storm: Submission of a storm water management plan by a qualified professional engineer is required as part of the proposed development. The plan shall conform to Section 2 - Stormwater Design Standards of the City of Milwaukie Pubic Works Standards.
The storm water management plan shall demonstrate that the post-development runoff does not exceed the pre-development, including any existing storm water management facilities serving the development property. Also, the plan shall demonstrate compliance with water quality standards. The City of Milwaukie has adopted the City of Portland 2016 Stormwater Management Manual for design

of water quality facilities.
All new impervious surfaces, including replacement of impervious surface with new impervious surfaces, are subject to the water quality standards. See City of Milwaukie Public Works Standards for design and construction standards and detailed drawings.

The storm SDC is based on the amount of new impervious surface constructed at the site. One storm SDC unit is the equivalent of 2,706 square feet of impervious surface. The storm SDC is currently $845 per unit. The storm SDC will be assessed and collected at the time the building permits are issued.

Street:

The proposed development fronts the south side of SE Lake Road, an arterial route. The portion of SE Lake Road fronting the proposed development has a right-of-way width of 70 feet and a paved width of approximately 42 feet with curb on both sides and sidewalk improvements on the south side.

The proposed development fronts the west side of SE Shell Lane, a local road. The portion of SE Mullan Street fronting the proposed development has a varying right-of-way width of 50 feet and is improved on the north half of the school's property but unimproved on the east side.

Frontage:

Chapter 19.700 of the Milwaukie Municipal Code, hereafter referred to as "Code", applies to partitions, subdivisions, and new construction.

Transportation Facility Requirements, Code Section 19.708, states that all rights-of-way, streets, sidewalks, necessary public improvements, and other public transportation facilities located in the public right-of-way and abutting the development site shall be adequate at the time of development or shall be made adequate in a timely manner.

Changing the use for the ball field from a recess space to a sport facility for other schools intensifies the use of the site. Additionally, the new building construction satisfies the applicability of frontage improvement requirements per MMC 19.702.1.

SE LAKE ROAD
The necessary improvements to Lake Road were previously constructed with a Capital Improvement Project. The applicant is not responsible for any additional improvements on this frontage.

SE SHELL LANE
A proportionality analysis will be completed to determine the improvements that will be required on the Shell Lane frontage. The limits of these improvements will be between the south end of existing improvements and the south end of the new right-of-way dedication.

Right of Way:

The existing right-of-way on SE Lake Road fronting the proposed development is of adequate width and no right-of-way dedication is required.

The existing right-of-way on SE Shell Lane fronting the proposed development below the required minimum for a local street. Dedication will only be required in front of taxlot 21E01AB00100. Dedication will be 25-feet wide and the length will be the distance required to provide development opportunity for taxlot 21E01AB0020.

Driveways:

Code Section 12.16.040.A states that access to private property shall be permitted with the use of driveway curb cuts and driveways shall meet all applicable guidelines of the Americans with Disabilities Act (ADA). If a new driveway is constructed at the end of Shell lane, then this approach shall be constructed to meet the requirements of Milwaukie's Public Works Standards.

Erosion Control:

Per Code Section 16.28.020(C), an erosion control permit is required prior to placement of fill, site clearing, or land disturbances, including but not limited to grubbing, clearing or removal of ground

vegetation, grading, excavation, or other activities, any of which results in the disturbance or exposure of soils exceeding five hundred square feet.

Code Section 16.28.020(E) states that an erosion control permit is required prior to issuance of building permits or approval of construction plans. Also, Section 16.28.020(B) states that an erosion control plan that meets the requirements of Section 16.28.030 is required prior to any approval of an erosion control permit.

Traffic Impact Study: Transportation impact study will not be required.

PW Notes:

TRANSPORTATION SDC
The Transportation SDC will be based on the increase in trips generated by the new use per the Trip Generation Handbook from the Institute of Transportation Engineers. The SDC for transportation is $1,963 per trip generated. Credits will be given for any demolished structures, which shall be based upon the existing use of the structures.

PARKS & RECREATION SDC
The parks & recreation System Development Charge (SDC) is triggered when application for a building permit on a new dwelling is received. Currently, the parks and recreation SDC for each employee is $60. Credit is applied to the existing building on site, and any demolished structures and is based upon the existing use of the structures. The parks and recreation SDC will be assessed and collected at the time the building permits are issued.

- Engineered plans for public improvements (street/sidewalk) are to be submitted and approved prior to start of construction. Full-engineered design is required along the frontage of the proposed development.

- The applicant shall pay an inspection fee of 5.5% of the cost of public improvements prior to start of construction.

- The applicant shall provide a payment and performance bond for 100% of the cost of the public improvements prior to the start of construction.

- The applicant shall provide a final approved set of Mylar “As Constructed” drawings to the City of Milwaukie prior to the final inspection.

- The applicant shall provide a maintenance bond for 100% of the cost of the public improvements prior to the final inspection.

- Right-of-way dedication on Shell Lane that is 25’ wide with sufficient length to accommodate development of taxlot 21E01AB0020.

- A grading permit will be required if 50 or more cubic yards of material is being moved.

- Analysis will need to be completed by applicant for the prevention of baseballs reaching Lake Road right-of-way

PLANNING ISSUES

Setbacks: As an approved Community Service Use (CSU), the school is subject to the yard requirements established specifically for schools in Milwaukie Municipal Code (MMC) Subsection 19.904.7.

Minimum front, rear, and side yards are 20 ft, and setbacks may be increased depending on the type and size of school in order to ensure adequate buffering between uses and safety for students.

Landscape: For schools, a minimum of 15% of the total site must be landscaped as per MMC Subsection 19.904.7.J. Vegetated areas may be planted in trees, grass, shrubs, or bark dust for planting beds, with no more than 20% of the landscaped area finished in bark dust (as per MMC Subsection 19.504.7). A maximum of 30% of the site may be covered by structures.

Parking: As per the off-street parking standards outlined in MMC Table 19.605.1, elementary and junior high schools require a minimum of 1 off-street parking space per classroom, with a maximum of 2 spaces per classroom allowed. The design standards for off-street parking areas (including landscaping and lighting) are established in MMC Section 19.606. Changes to existing off-street parking shall not push the site out of compliance with relevant standards, or further out of compliance if already nonconforming.

According to the 2007 land use decision for the last major remodel of the school (land use file #CSU-07-03), the school site provided 73 spaces for 36 classrooms, which exceeded the allowed number at the time (when 1.75 spaces per classroom were allowed). Under the current standard and with the proposed replacement of several existing parking spaces with an expansion of the school building and the addition of 2 new classrooms, it is not likely that the new parking count will exceed the maximum allowed. The applicant should confirm that the relevant standards are met as part of the application submittal.

Transportation Review: By increasing the gross floor area of the school, the proposed improvements trigger the applicability of MMC Chapter 19.700 Public Facility Improvements. See the Public Works notes or contact the City's Engineering Department for more information about the requirements of MMC 19.700, including any potential right-of-way dedication or street improvements.

Application Procedures: Those elements of the proposed development that involve more than simply remodeling-type improvements (like replacement of windows, door hardware, or light fixtures; or renovation of the existing commons and kitchen) require Type III review as a major modification of the existing CSU for the school. The current application fee for Type III review is $2,000.

As proposed, it does not appear that any variances will be required, but a final determination will depend on the nature of the final proposal.

Following approval of the CSU major modification, a Type I Development Review application ($200 fee) will be required in conjunction with the development permits for those elements of the project.

For the City's initial review of the CSU application, the applicant should submit 5 complete copies of the submittal materials, including all required forms, checklists, narrative, and plans. (Note: Disregard the call for 12 copies noted in the code and on several checklists.) A determination of the application's completeness will be issued within 30 days. If deemed incomplete, additional information will be requested. If deemed complete, additional copies of the application may be required for referral to other departments, the Lake Road Neighborhood District Association (NDA), and other relevant parties and agencies. City staff will inform the applicant of the total number of copies needed.

Once the application is deemed complete, a public hearing with the Planning Commission will be scheduled. Public notice will be provided to property owners and residents within 300 ft of the subject property at least 20 days prior to the public hearing. A sign giving notice of the application must be posted on the subject property at least 14 days prior to the hearing.

Following a determination that the application is complete (estimate at least 1 month for completeness

review, as noted above), processing time to a final decision for Type III review is approximately 2 months. Issuance of a final decision starts a 15-day appeal period for the applicant and any party who establishes standing.

Prior to submitting the application, the applicant is encouraged (but not required) to present the project at a regular meeting of the Lake Road NDA (6:30 p.m. on the second Wednesday of most months, usually at Rowe Middle School itself, 3606 SE Lake Rd).

Natural Resource Review: The site includes designated natural resource areas (Water Quality Resource and Habitat Conservation Area) adjacent to Kellogg Creek, but the proposed development does not appear to extend near enough to trigger Natural Resource review.

Lot Geography: The subject property is largely rectilinear and has frontage along Lake Road and Shell Lane. The rear portion of the site is adjacent to Kellogg Creek.

Planning Notes: As part of the application's address of the public benefits and negative impacts of the CSU, staff recommends that the applicant talk with neighbors about the proposed new tennis court lighting and the anticipated hours of use of the athletic fields.

ADDITIONAL NOTES AND ISSUES

County Health Notes:

Other Notes:

This is only preliminary preapplication conference information based on the applicant's proposal and does not cover all possible development scenarios. Other requirements may be added after an applicant submits land use applications or building permits. City policies and code requirements are subject to change. If you have any questions, please contact the City staff that attended the conference (listed on Page 1). Contact numbers for these staff are City staff listed at the end of the report.

Sincerely,

City of Milwaukie Development Review Team

BUILDING DEPARTMENT

Sam Vandagriff - Building Official - 503-786-7611

Vacant - Permit Specialist - 503-786-7613

ENGINEERING DEPARTMENT

Chuck Eaton - Engineering Director - 503-786-7605

Jennifer Garbely - Asst. City Engineer - 503-786-7609

Rick Buen - Civil Engineer - 503-786-7610

Alex Roller - Engineering Tech II - 503-786-7695

Jennifer Backhaus- Engineering Tech I - 503-786-7608

COMMUNITY DEVELOPMENT DEPARTMENT

Alma Flores, Comm. Dev. Director - 503-786-7652

Leila Aman - Development Manager - 503-786-7616

Alicia Martin - Admin Specialist - 503-786-7669

PLANNING DEPARTMENT

Dennis Egner - Planning Director - 503-786-7654

David Levitan - Senior Planner - 503-786-7627

Brett Kelver - Associate Planner - 503-786-7657

Vera Kolias - Associate Planner - 503-786-7653

Mary Heberling - Assistant Planner - 503-786-7658

CLACKAMAS FIRE DISTRICT

Mike Boumann - Lieutenant Deputy Fire Marshal - 503-742-2673

Matt Amos - Fire Inspector - 503-742-2660

Clackamas County Fire District #1
Fire Prevention Office

E-mail Memorandum

To: City of Milwaukie Planning Department

From: Matt Amos, Fire Inspector, Clackamas Fire District #1

Date: 9/15/2017

Re: Rowe Middle School 3606 SE Lake Rd. 17-017PA

This review is based upon the current version of the Oregon Fire Code (OFC), as adopted by the Oregon State Fire Marshal's Office. The scope of review is typically limited to fire apparatus access and water supply, although the applicant must comply with all applicable OFC requirements. When buildings are completely protected with an approved automatic fire sprinkler system, the requirements for fire apparatus access and water supply may be modified as approved by the fire code official. The following items should be addressed by the applicant:

COMMENTS:

The Fire District has no comments for this proposal.

2930 S.E. Oak Grove Blvd. • Milwaukie, OR 97267 • 503-742-2660

3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING

PRELIMINARY STORM WATER REPORT

Rowe Middle School Modernization
3606 SE Lake Rd
Milwaukie, OR

December 20, 2017

Prepared For:

North Clackamas School District
Facilities Operations
Attn: David Hobbs
12451 SE Fuller Rd
Milwaukie, OR 97222-1290

Prepared By:
3J Consulting, Inc.
5075 Griffith Drive, Suite 150
Beaverton, Oregon 97005
Project No: 17411
JBC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

I hereby certify that this Stormwater Management Report for Rowe Middle School Modernization has been prepared by me or under my supervision and meets minimum standards of the City of Milwaukie and normal standards of engineering practice. I hereby acknowledge and agree that the jurisdiction does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities designed by me.

EXECUTIVE SUMMARY

The proposed Rowe Middle School Modernization project is located at 3606 SE Lake Rd in Milwaukie, OR. Improvements will be made to the existing building and facilities. Stormwater from the proposed improvements will be treated by installing a PerkFilter Vault or approved equivalent. Detention will be provided for all new and modified impervious area via an underground chamber.

The proposed project will construct improvements to the existing building and facilities. Per the City of Milwaukie's Public Works Standards, dated February 4, 2015 the following standards will be met;

- Storm detention facilities shall be designed to provide storage up to the 25-year storm event, with the safe overflow conveyance of the 100-year storm event. Calculations of site discharge for both the existing and proposed conditions shall be required using the Unit Hydrograph Method. Storms to be evaluated shall include the 2-, 5-, 10-, 25-, and 100-year events. Allowable post development discharge rate for the 2-, 5-, 10-, and 25-year events shall be that of the predevelopment discharge rate. An outfall structure such as a "V-Notch" weir or a single or multiple orifice structure shall be designed to control the release rate for the above events. No flow control orifice smaller than 1.0 inch shall be allowed. If the maximum release rate cannot be met with all the site drainage controlled by a single 1.0-inch orifice, the allowable release rate provided by a 1.0-inch orifice will be considered adequate as approved by the City Engineer.
- All Water Quality Facilities shall meet the design requirements of the current City of Portland, Stormwater Management Manual, as amended and adopted by the City of Milwaukie and the requirements of Subsection 2.0050 (Water Quality Facilities) of the City of Milwaukie Public Works Standards.

The propose of this report is describe the facilities being proposed and to show that the design follows the City of Milwaukie's Public Works and Design Standards, issued February 4, 2015.

PROJECT DESCRIPTION

The proposed Rowe Middle School Modernization project is located at 3606 SE Lake Rd in Milwaukie, OR. Improvements will be made to the existing building and facilities. Runoff from the proposed improvements will be treated by installing an Oldcastle Perkfilter Vault or approved equivalent to the existing stormwater conveyance system on the west side of the existing building. Detention will be accomplished using an underground vault.

The propose of this report is describe the facilities being proposed and to show that the design follows the Standards for the City of Milwaukie's Public Works Standards, issued February 4, 2015.

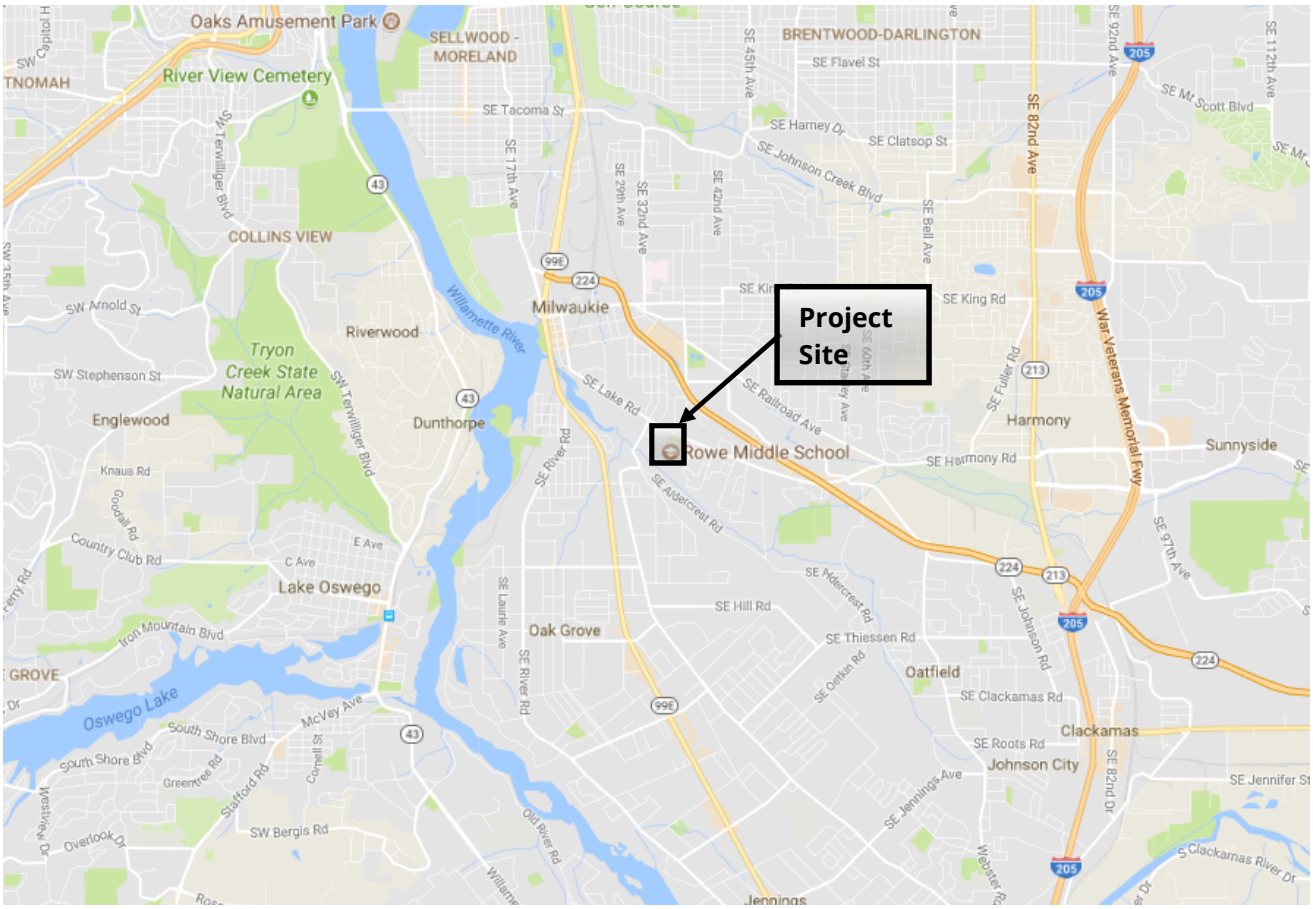


Figure 1 - Vicinity Map

Figure 2 - Site Location

EXISTING CONDITIONS

Site

The existing site is developed and contains Rowe Middle School. The site has an existing stormwater management system in place. The existing site slopes to the southwest and what isn't captured by the existing system sheet flows to Kellogg Creek south of the site. There are 2 separate outfalls for the existing site, one 24" outfall that runs on the west side of the building and one 30" outfall on the west side of the building.

Flood Map

The site is located within Zone X (un-shaded) per flood Insurance Rate Map (FIRM) community panel number 41005C0017D (See Technical Appendix – FIRM Panel 17 of 1175 and Clackamas County, Oregon). FEMA's definition of Zone X (un-shaded) is an area determined to be outside the 0.2% annual chance floodplain.

Site Geology

The soil type as classified by the United States Department of Agriculture Soil Survey is identified in Table 1 (See Technical Appendix – Hydrologic Soil Group for Clackamas County Area, Oregon).

Soil Type	Hydrologic Group
McBee Silty Clay Loam	C
Woodburn Silt Loam	C

Table 1 - Soil Characteristics

A geotechnical report was issued on November 7, 2017 by Intertek PSI. The report states that stormwater infiltration is not recommended for disposal due to fine textured soils near the surface that will likely slow infiltration. Stormwater onsite should be collected and appropriately discharge to an approved location.

Existing Basin Areas

Table 2 shows the breakdown of the existing basin areas (See Technical Appendix: Exhibits: Exhibit 1 – Existing Conditions).

Existing Basin Area	Acres
Impervious Area Draining to 24" Outfall	2.43
Roof Area Draining to 24" Outfall	1.80
Impervious Area Draining to Swale	0.62
Roof Area Draining to Swale	0.22
Pervious Area	5.04
Pervious Area Draining Directly to Kellogg Creek	4.12
Total Area	14.23

Table 2 – Existing Basin Area

Existing Drainage

The existing site has its own stormwater management system. Stormwater is captured via inlets and conveyed to the south where it outfalls to Kellogg Creek The north and west parking lot and main building's roof area is conveyed to the west side of the building. The parking lot east of the building and the southernmost building is conveyed to an existing swale for treatment and discharged to Kellogg Creek to the south.

POST-DEVELOPED CONDITIONS

Proposed Basin Areas

Table 3 shows the breakdown of the post-developed basin areas draining to the 24" outfall and Table 4 shows the breakdown of the post-developed areas draining to the existing swale and pervious area draining directly to Kellogg Creek (See Technical Appendix: Exhibits: Exhibit 2 – Proposed Conditions).

Post-Developed Basin Area	Acres
New & Modified Impervious Area	0.31
New Roof Area	0.36
Undisturbed Impervious Area	2.06
Existing Roof Area	1.80
Pervious Area	4.74
Total Area	9.27

Table 3 – Post Developed Basin Areas Draining to 24" Outfall

Post-Developed Basin Area	Acres
Impervious Area	0.22
Roof Area	0.62
Pervious Area Draining to Kellogg Creek	4.12
Total Area	4.96

Table 4 – Post Developed Basin Areas Draining to Existing Swale

Post-Developed Hydrology

The east side of the site is conveyed to the existing swale and over flows to a 30" outfall in Kellogg Creek The only changes that will made to the system on the east side of the site is a French Drain that will be installed south of the swale. All area captured by this French Drain is pervious and does not require treatment or detention.

The rest of the site is captured and conveyed to a 24" outfall in the Kellogg Creek All improvements made will be conveyed to the system west of the building. The existing system will be fitted with a PerkFilter Vault to treat all new and modified impervious surface. There will also be an underground chamber with a flow control manhole that will be installed to detain and release runoff to predeveloped conditions. The pervious area south of the school sheet flows south to Kellogg Creek.

HYDROLOGIC ANALYSIS DESIGN GUIDELINES

Design Guidelines

The site is located within the jurisdiction of Milwaukie, Oregon. The guidelines used for the design of this project reflect the City of Milwaukie Public Works Standards and water quality facilities follows the City of Portland SWMM. The proposed site will treat stormwater with the use of a PerkFilter Vault or approved equal. The number of cartridges required to treat stormwater was determined using the Rational method.

Hydrograph Method

Naturally occurring rainstorms dissipate over long periods of time. An effective way of estimating storm rainfall is by using the hydrograph method. The Santa Barbra Urban Hydrograph (SBUH) method was used to develop peak flow rates. The computer software XPSTORM was used in modeling the hydrology during the existing and post-developed storm events.

Recurrence Interval (years)	*Depth (inches)
2	2.4
5	3.0
10	3.5
25	4.0
100	4.7

Table 5 – Design Storm Depths

*Rainfall Depths from the City of Milwaukie's Stormwater Master Plan

RUNOFF PARAMETERS

Time of Concentration

The time of concentration was calculated using the TR-55 Method. Since the site is already developed, a time of concentration of 5 minutes was assumed for the existing site. A time of concentration of 5 minutes was also assumed for the post-developed site.

Curve Number

The major factors in determining the curve number (CN) values are hydrologic soils group, cover type, treatment, hydrologic condition, and antecedent runoff condition. The CN represents runoff potential from the ground. Table 2-2a in the TR-55 manual was used to determine the appropriate CN (see technical appendix: Exhibits – Table 2-2a Runoff Curve Numbers). The pervious area for existing and post-developed conditions were given a CN of 74, corresponding to open space in good condition. The CN for all impervious area is 98.

Basin Runoff

The existing and post-developed runoff rates for the site are shown in Table 6 (see Technical Appendix: Hydrographs).

Recurrence Interval (year)	Existing Runoff (cfs)	Proposed Runoff (cfs)	Allowable Release Rate (cfs)
2	2.66	2.80	2.66
5	3.71	3.88	3.71
10	4.65	4.82	4.82
25	5.62	5.81	5.81
100	7.04	7.24	-

Table 6 – Basin Runoff Rates

HYDRAULIC ANALYSIS AND DESIGN CHARACTERISTICS

System Characteristic

Per section 2.0013.C of the City of Milwaukie Public Works and Design Standards, the stormwater conveyance system will be designed to safely convey the 100-year storm event with no out of system flooding.

System Performance

The stormwater conveyance system will be sized in the final design phase of the project to convey all storm events up to and including the 100-year storm event without any out of system flooding.

WATER QUALITY

Water Quality Guidelines

The City of Milwaukie's Public Works Standards state that all water quality facilities shall meet the design requirements of the current City of Portland, Stormwater Management Manual (SWMM). This requires the stormwater quality facility to remove 70% of the total suspended solids (TSS) from 90% of the average annual runoff. The City of Portland SWMM states that "flow rate-based pollution reduction facilities, such as grassy swales or sand filters, must be designed to treat runoff generates by a rainfall intensity of 0.19 inches per hour at a 5-minute Time of Concentration." The stormwater quality facility was designed using the rational method and sized to treat all the impervious area draining to it (See Technical Appendix: Exhibits: Exhibit 3 – Area Draining to PerkFilter Vault).

Water Quality Facility

Water quality will be achieved using a PerkFilter vault onsite. Water quality flow was calculated using the Rational Method (See Technical Appendix: Rational Method Water Quality Calculations). The City of Portland has a list of approved manufactured stormwater treatments technologies which includes Oldcastle's PerkFilter. The 18" PerkFilter Cartridge has the capacity to treat up to 10.2 gpm (0.0224 cfs) per cartridge. See calculation below for the number of cartridges required for the site.

$$\text{Number of Cartridge} = \frac{\text{WQ Flow}}{\text{Capacity}} \Rightarrow \frac{0.29 \text{ cfs}}{0.0224 \text{ cfs/cartridge}} = 12.9 \text{ cartridge} \Rightarrow \textbf{13 Cartridges}$$

WATER QUANTITY

Detention Guidelines

The City of Milwaukie's Public Works Standards states that the post developed release rate shall not exceed the corresponding predeveloped runoff rate for the 2, 5, 10, and 25-year storm events. Runoff will be detained onsite with the use of an underground chamber. The final design of the detention system will be submitted with the final design.

SUMMARY

The stormwater management system for the Rowe Middle School Modernization will follow the City of Milwaukie's Public Work Standards and the stormwater quality facility follows the City of Portland's SWMM. The proposed storm system will meet and exceed the City of Milwaukie's stormwater management requirements.

TECHNICAL APPENDIX

Exhibits

- FIRM 41005C0017D
- Hydrologic Soil Group for Clackamas County Area, Oregon
- Table 2-2a Runoff Curve Numbers
- Exhibit 1 – Existing Conditions
- Exhibit 2 – Proposed Conditions
- Exhibit 3 – Area Draining to PerkFilter Vault

Drawings

- Sheet C-101 Existing Conditions Plan
- Sheet C-201 Site Construction Plan and Grading Overview
- Sheet C-202 Site Construction Plan and Grading Details I
- Sheet C-203 Site Construction Plan and Grading Details II
- Sheet C-301 Utility Plan Overview
- Sheet C-302 Utility Plan Areas I
- Sheet C-303 Utility Plan Areas II
- Sheet C-304 Public Storm Line Plan and Profile

Calculations

- Rational Method Water Quality Calculation

Hydrographs

- Existing and Post-Developed Runoff Hydrographs

Geotechnical Report

- Geotechnical Engineering Report Building Additions by Professional Services Industries, Inc, November 7, 2017.

Operations and Maintenance

- Will be submitted with final design

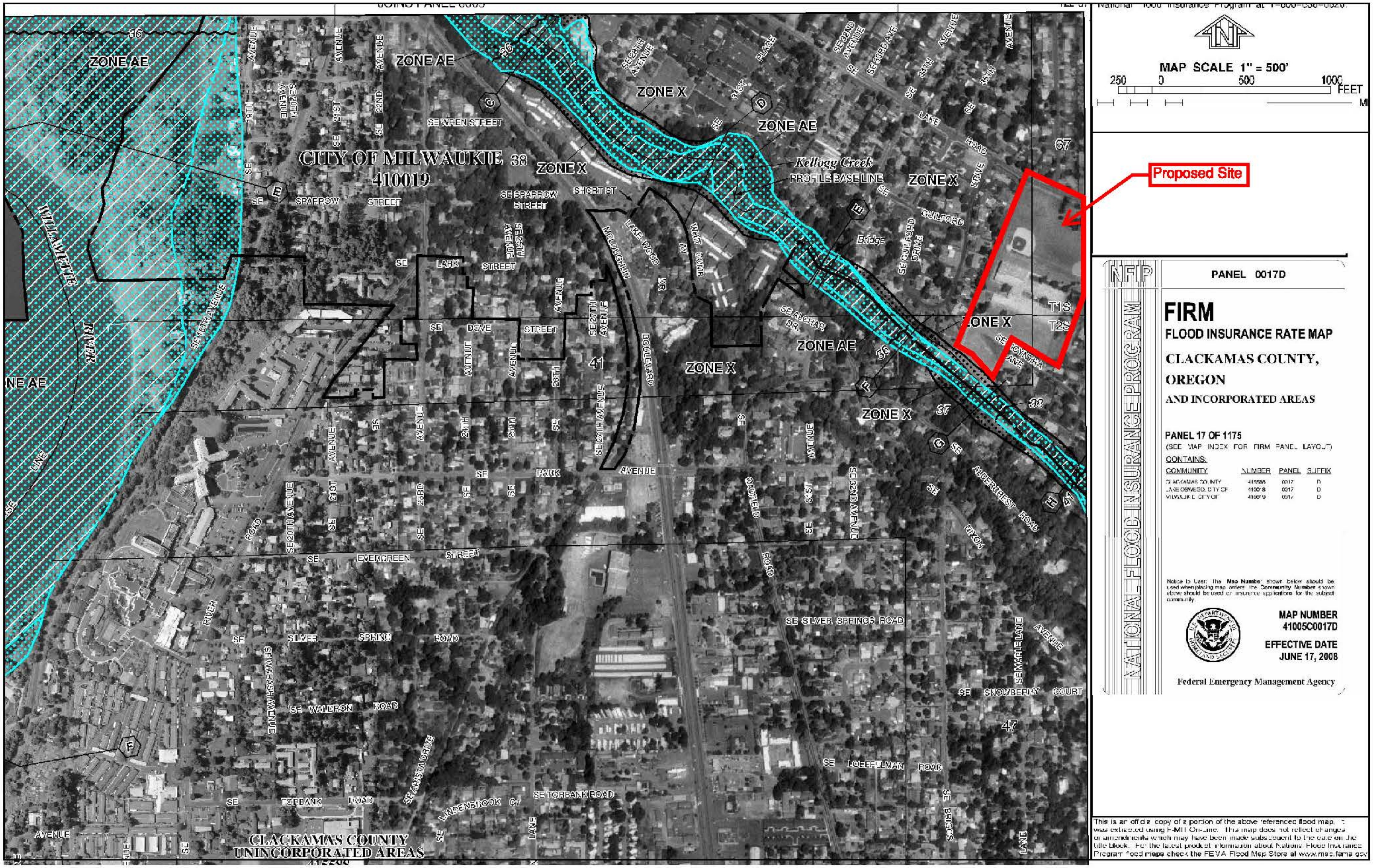
REFERENCES

1. Soil Survey of Multnomah County Area. National Resource Conservation Service

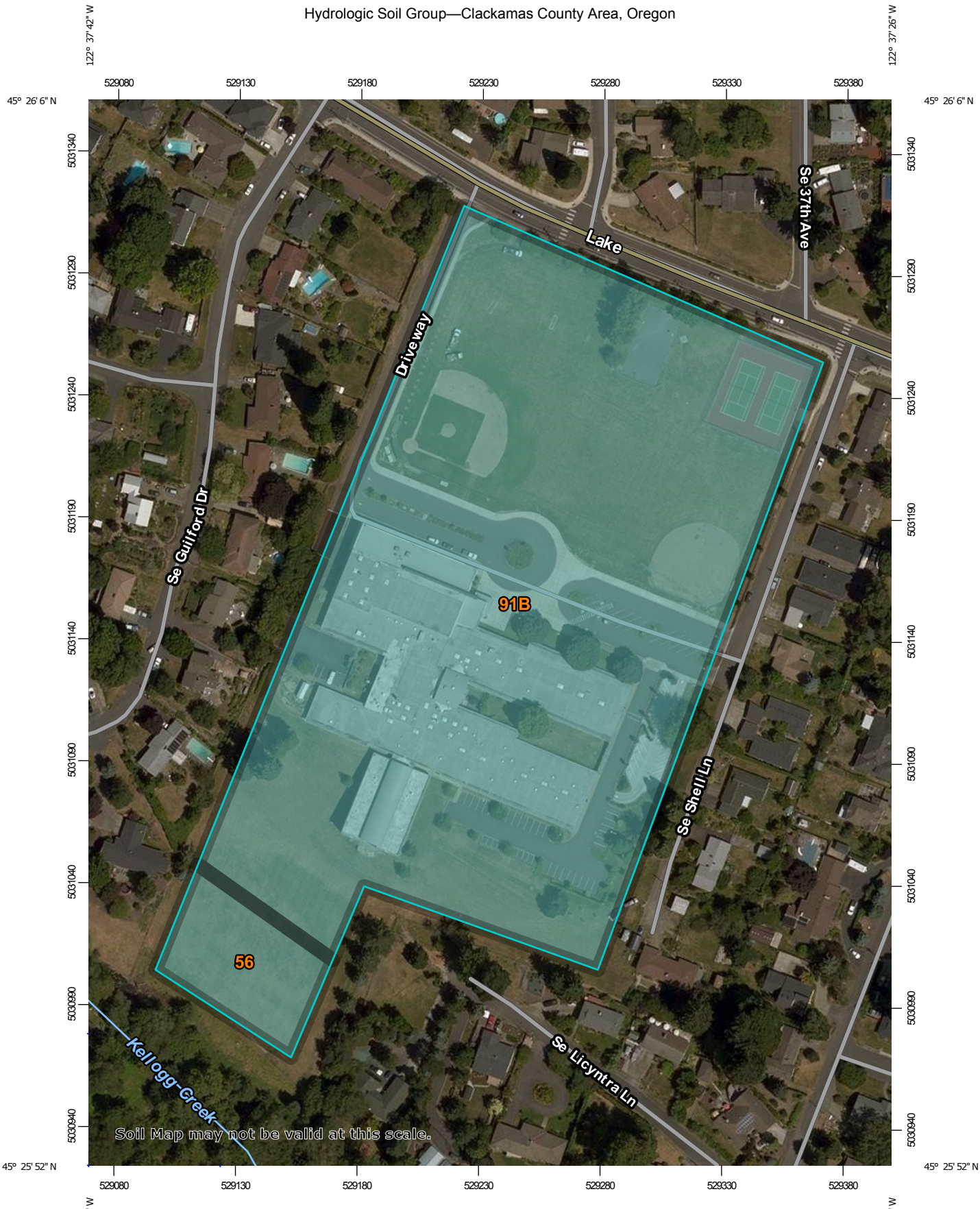
2. City of Portland's Stormwater Management Manual Issued in August 2016

3. City of Milwaukie's Public Works Standards, last revised February 4, 2015.

EXHIBITS



Proposed Site
MAP SCALE 1" = 500'
250 0 500 1000 FEET
PANEL 0017D
FIRM
FLOOD INSURANCE RATE MAP
CLACKAMAS COUNTY, OREGON
AND INCORPORATED AREAS
PANEL 17 OF 1175
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
MAP NUMBER 41005C0017D
EFFECTIVE DATE JUNE 17, 2008
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov
ZONE AE
ZONE X
CITY OF MILWAUKIE 410019
CLACKAMAS COUNTY UNINCORPORATED AREAS
Kellogg Creek
PROFILE BASE LINE
WILLAMETTE RIVER
SE WREN STREET
SE SPARROW STREET
LARK STREET
DOVE STREET
PARK AVENUE
SE EVERGREEN STREET
SE SILVER SPRINGS ROAD
SE WALDRON ROAD
SE TORBANK ROAD
SE LOEFFELMAN ROAD
SE SNOWBERRY COURT
ALDERCREST ROAD
SE GUILFORD DRIVE
SE ALCHAR DR.
LAKE ROAD
MCLOUGHLIN BOULEVARD
OATFIELD ROAD
SE 32ND AVENUE
SE 27TH AVENUE
SE 19TH AVENUE
T1S
T2S



Map Scale: 1:2,130 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Clackamas County Area, Oregon
Survey Area Data: Version 11, Sep 16, 2016

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 26, 2014—Sep 5, 2014

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
56	McBee silty clay loam	C	0.7	6.0%
91B	Woodburn silt loam, 3 to 8 percent slopes	C	11.5	94.0%
Totals for Area of Interest			**12.2**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Table 2-2a Runoff curve numbers for urban areas [1/]

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area [2/]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.) [3/]:					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) [4/]		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation) [5/]		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

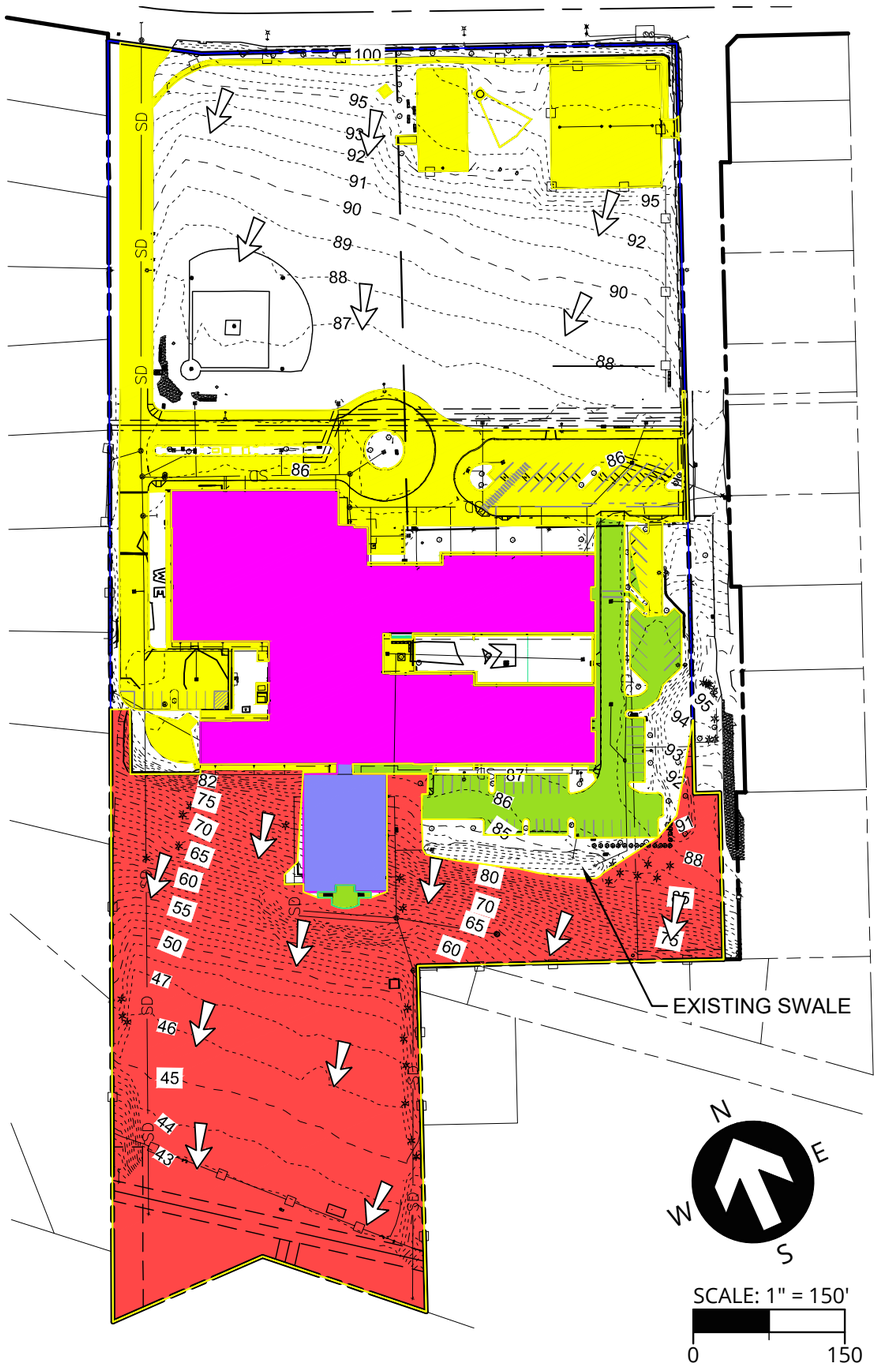
1 Average runoff condition, and $I_a = 0.2S$.

2 The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.

3 CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

4 Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.

5 Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.



LEGEND

- EXISTING IMPERVIOUS AREA DRAINING TO 24" OUTFALL
- EXISTING ROOF AREA DRAINING TO 24" OUTFALL
- EXISTING IMPERVIOUS AREA DRAINING TO SWALE
- EXISTING ROOF AREA DRAINING TO SWALE
- PERVIOUS AREA DRAINING TO KELLOGG CREEK
- PROJECT BOUNDARY
- SD — EXISTING STORM DRAIN
- D — EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- 100 — EXISTING MAJOR CONTOUR
- 92 — EXISTING MINOR CONTOUR

TOTAL SITE AREA - 14.23 ACRES
- EXISTING IMPERVIOUS AREA DRAINING TO 24" OUTFALL - 2.43 ACRES
- EXISTING ROOF AREA DRAINING TO 24" OUTFALL - 1.80 ACRES
- EXISTING IMPERVIOUS AREA DRAINING TO SWALE - 0.62 ACRES
- EXISTING ROOF AREA DRAINING TO SWALE - 0.22 ACRES
- EXISTING PERVIOUS AREA - 5.04 ACRES
- PERVIOUS AREA DRAINING TO KELLOGG CREEK - 4.12 ACRES

HYDROLOGIC SOILS GROUP C
CN - 74, OPEN SPACE IN GOOD CONDITION
TIME OF CONCENTRATION - 5 MINUTES

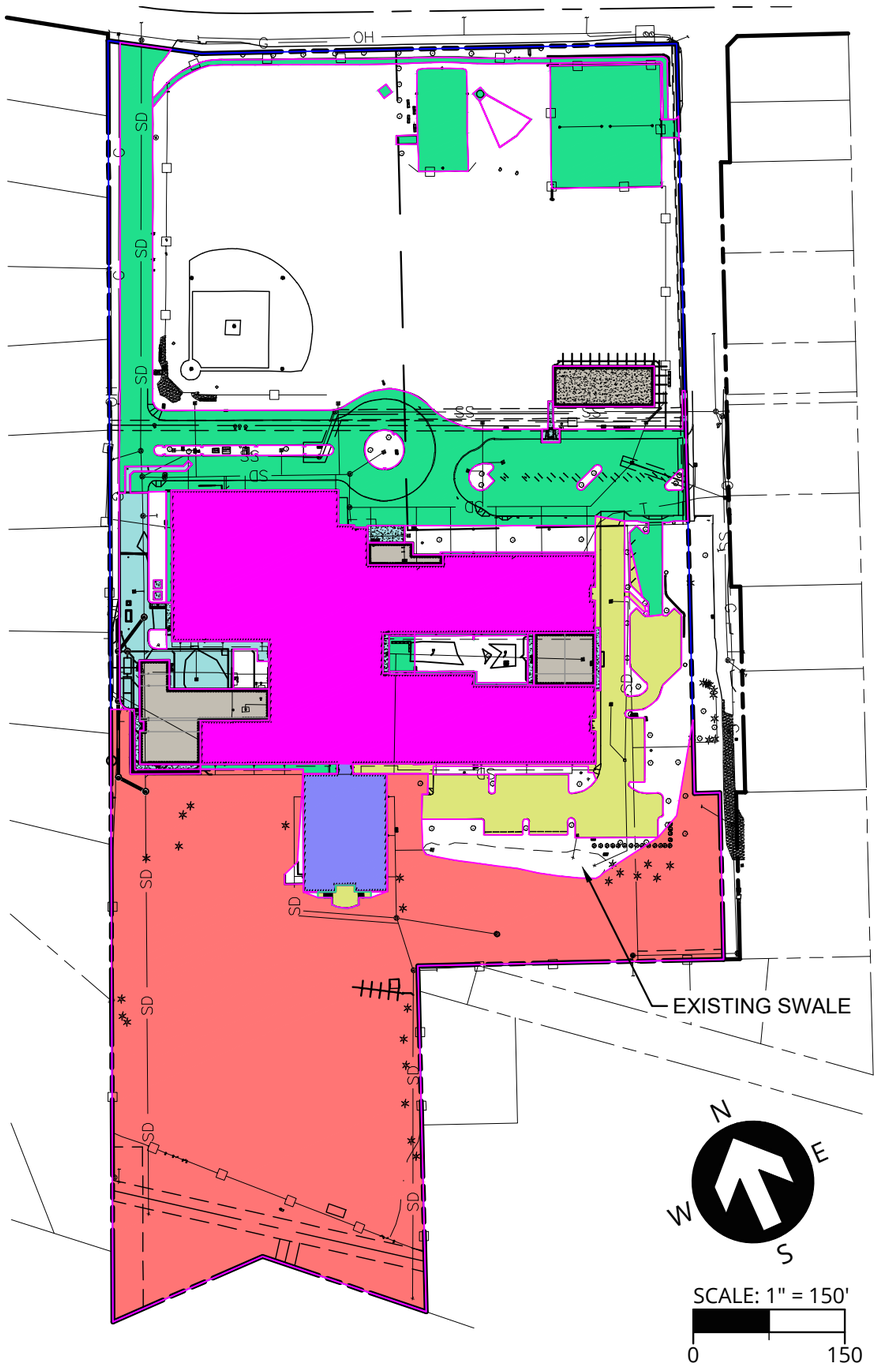
ROWE MIDDLE SCHOOL MODERNIZATION

12/19/2017

NORTH CLACKAMAS SCHOOL DISTRICT

EXHIBIT 1 - EXISTING CONDITIONS

3J CONSULTING
CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING



LEGEND

- NEW/MODIFIED IMPERVIOUS AREA
- PROPOSED ROOF AREA
- EXISTING IMPERVIOUS AREA DRAINING TO 24" OUTFALL
- EXISTING ROOF AREA DRAINING TO 24" OUTFALL
- EXISTING IMPERVIOUS AREA DRAINING TO SWALE
- EXISTING ROOF AREA DRAINING TO SWALE
- PERVIOUS AREA DRAINING TO KELLOGG CREEK
- PROJECT BOUNDARY
- SD — EXISTING STORM DRAIN
- D — EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- 100 — EXISTING MAJOR CONTOUR
- 92 — EXISTING MINOR CONTOUR

TOTAL SITE AREA - 14.23 ACRES
- NEW & MODIFIED IMPERVIOUS AREA - 0.31 ACRES
- PROPOSED ROOF AREA - 0.36 ACRES
- EXISTING IMPERVIOUS AREA DRAINING TO 24" OUTFALL - 2.06 ACRES
- EXISTING ROOF AREA DRAINING TO 24" OUTFALL - 1.80 ACRES
- EXISTING IMPERVIOUS AREA DRAINING TO SWALE - 0.62 ACRES
- EXISTING ROOF AREA DRAINING TO SWALE - 0.22 ACRES
- PERVIOUS AREA - 4.74 ACRES
- EXISTING PERVIOUS AREA DRAINING TO KELLOGG CREEK - 4.12 ACRES

HYDROLOGIC SOILS GROUP C
CN - 74, OPEN SPACE IN GOOD CONDITION
TIME OF CONCENTRATION - 5 MINUTES

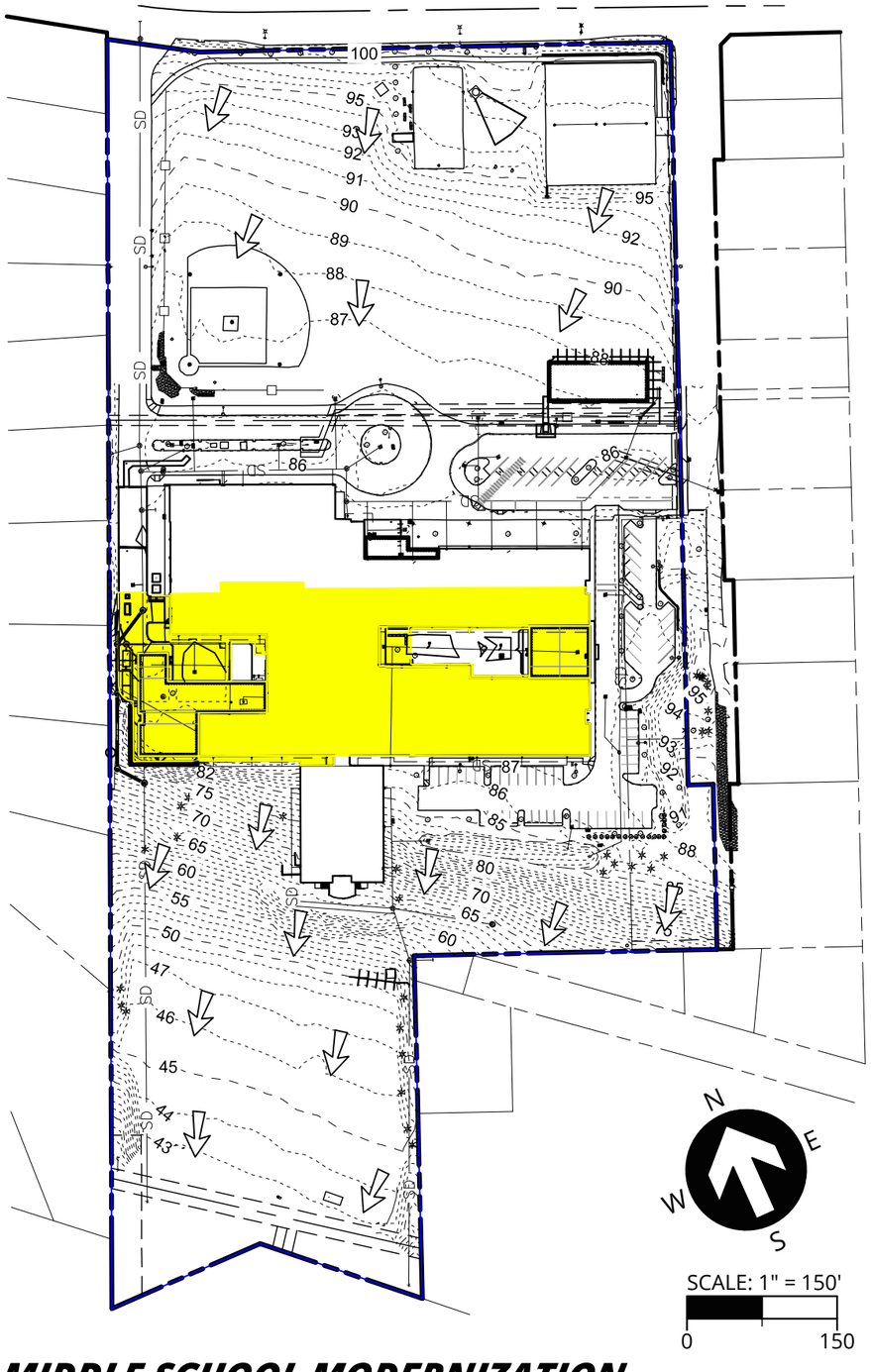
ROWE MIDDLE SCHOOL MODERNIZATION

12/19/2017

NORTH CLACKAMAS SCHOOL DISTRICT

EXHIBIT 2 - PROPOSED CONDITIONS

3J CONSULTING
CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING



LEGEND

IMPERVIOUS AREA DRAINING TO BAYFILTER VAULT

TOTAL OF 72,914 SF (1.67 ACRES) OF IMPERVIOUS AREA DRAINING TO THE BAYFILTER VAULT

ROWE MIDDLE SCHOOL MODERNIZATION

12/19/2017

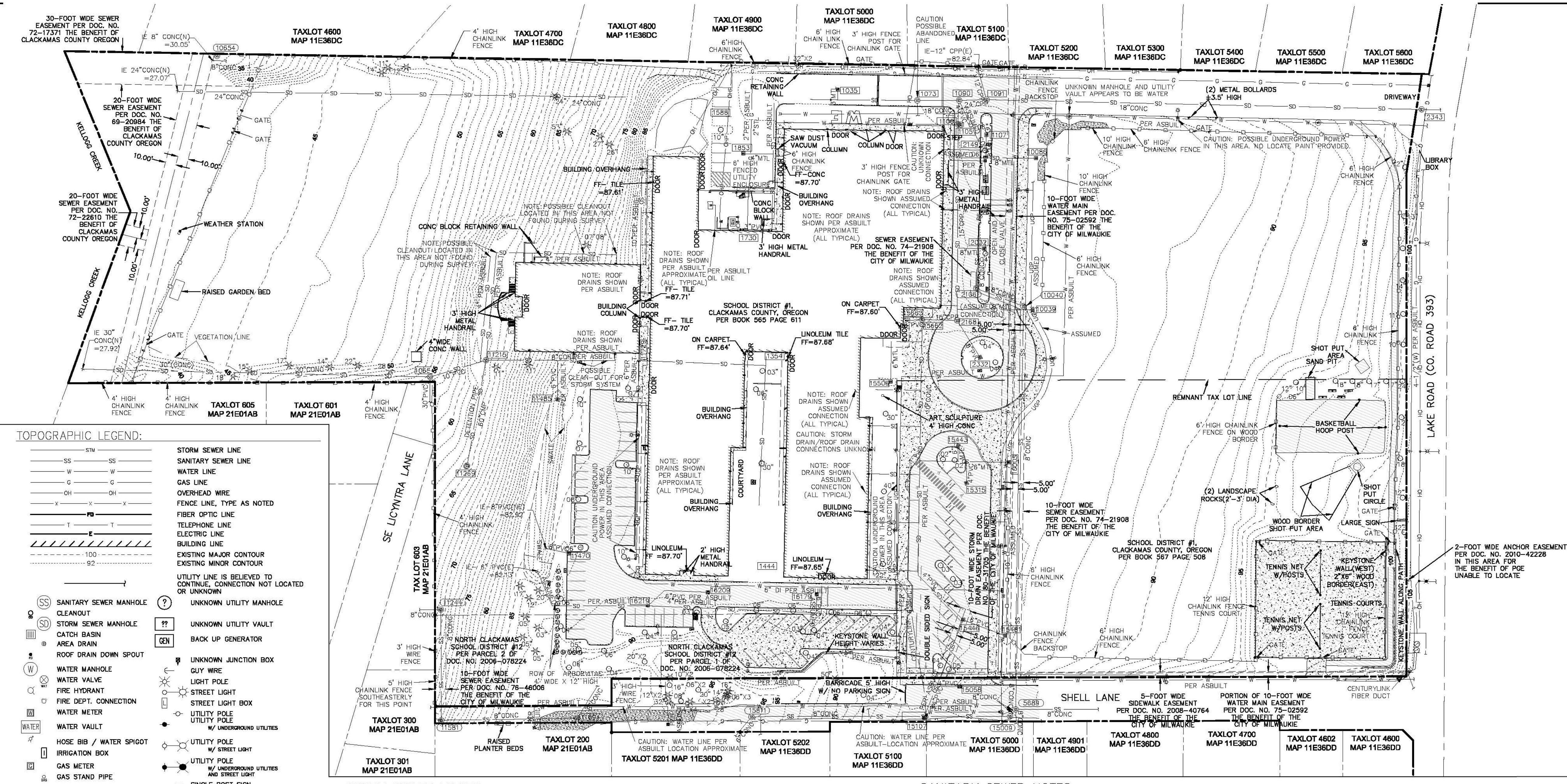
NORTH CLACKAMAS SCHOOL DISTRICT

EXHIBIT 3 - AREA DRAINING TO PERKFILTER VAULT

3J CONSULTING

CIVIL ENGINEERING | WATER RESOURCES | LAND USE PLANNING

DRAWINGS



TOPOGRAPHIC LEGEND:

- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- GAS LINE
- OVERHEAD WIRE
- FENCE LINE, TYPE AS NOTED
- FIBER OPTIC LINE
- TELEPHONE LINE
- ELECTRIC LINE
- BUILDING LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- SANITARY SEWER MANHOLE
- CLEANOUT
- STORM SEWER MANHOLE
- CATCH BASIN
- AREA DRAIN
- ROOF DRAIN DOWN SPOUT
- WATER MANHOLE
- WATER VALVE
- FIRE HYDRANT
- FIRE DEPT. CONNECTION
- WATER METER
- WATER VAULT
- HOSE BIB / WATER SPIGOT
- IRRIGATION BOX
- GAS METER
- GAS STAND PIPE
- ELECTRIC BOX
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TELEPHONE RISER
- EXISTING CONCRETE SURFACE
- EXISTING ASPHALT SURFACE
- EXISTING GRAVEL SURFACE
- FOUND MONUMENT
- UNKNOWN UTILITY MANHOLE
- UNKNOWN UTILITY VAULT
- BACK UP GENERATOR
- UNKNOWN JUNCTION BOX
- GUY WIRE
- LIGHT POLE
- STREET LIGHT
- STREET LIGHT BOX
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- DOUBLE POST SIGN
- FLAG POLE
- BENCH
- GATE POST
- BOLLARD
- HANDI-CAP PARKING SPACE
- SHRUB / BUSH
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- HHPR CONTROL POINT

ABBREVIATIONS:

CMP = CORRUGATED METAL PIPE
CONC = CONCRETE
CPP = CORRUGATED PLASTIC PIPE
MTL = METAL
IE = INVERT ELEVATION
PVC = PLASTIC PVC PIPE

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

STORM SEWER NOTES

1035 CATCH BASIN-OIL TRAP
RIM=86.50'
IE 3"MTL(SE)=85.60'
BOTTOM=83.35'

1073 STORM MANHOLE
RIM=86.86'
NOTE: VALVE IN MANHOLE(NE) MAY BE ABANDONED LINE
IE 18"CONC(NE)=78.91'
IE 18"CONC(SW)=78.86
BOTTOM=78.91'

1090 STORM MANHOLE
RIM=86.26'
IE 4"PVC(NE)=79.86'
IE 24"CPP(NE)=79.76'
IE 15"CPP(SE)=79.71'
IE 18"CONC(SW)=79.61'
BOTTOM=79.71'

1091 STORM MANHOLE
RIM=86.18'
IE 18"CONC(NE)=80.48'
IE 12"CPP(NW)=81.18'
IE 24"CPP(SW)=80.13'
BOTTOM=80.23'

1105 STORM MANHOLE
RIM=85.93'
IE 15"CPP(SE)=79.73'
BOTTOM=77.23'
NOTE:1106 AND 1105 ARE ONE STRUCTURE

1106 STORM MANHOLE
RIM=86.03'
IE TOP OF VERTICAL PIPE=83.43'
IE OF VERTICAL PIPE=79.78'
BOTTOM=77.33'
NOTE:1106 AND 1105 ARE ONE STRUCTURE

1107 CATCH BASIN-OIL TRAP
RIM=84.88'
IE 8"MTL(SE)=83.13'
BOTTOM=81.18'

1354 CATCH BASIN-OIL TRAP
RIM=87.35'
IE 4" MTL(S)=85.85
SUMP=84.85'

1444 CATCH BASIN-OIL TRAP
RIM=87.25'
IE SECOND RIM=86.45'
SUMP=85.35'

1588 STORM MANHOLE
RIM=86.80'
FILLED W/DIRT-GRAVEL
APPEARS TO BE ABANDONED
BOTTOM=85.30'

1730 AREA DRAIN-OIL TRAP
RIM=87.20'
IE 3"PVC(NE)=86.50'
BOTTOM=86.15'

1853 CATCH BASIN-OIL TRAP
RIM=86.48'
IE 4"MTL(NE)=85.53'
BOTTOM=83.28'

2032 CATCH BASIN-OIL TRAP
RIM=84.75'
IE 8"MTL(SW)=83.00'
BOTTOM=81.05'

2149 CLEAN-OUT
RIM=85.96'
IE 4"CONC(SW)=±83.1'

2168 STORM MANHOLE
RIM=86.13'
IE 8"PVC(NE)=82.55'
IE 15"CPP(SW)=82.13'
IE 15"CPP(NW)=82.10'
BOTTOM=82.13'

2332 CATCH BASIN-OIL TRAP
RIM=84.57'
IE 8"PVC(SW)=82.82'
BOTTOM=80.87'

2343 STORM MANHOLE
RIM=98.64'
IE 18"CONC(NE)=90.09'
IE 18"CONC(SW)=89.74'
BOTTOM=90.04'

10005 CATCH BASIN
RIM=85.41'
IE 6" MTL(SW)=84.16'
BOTTOM=82.41'

10039 CATCH BASIN
RIM=85.75'
IE 8" MTL(SW)=84.00'
BOTTOM=82.05'

10086 CATCH BASIN
RIM=86.08'
IE 8" MTL(SW)=83.83'
BOTTOM=81.88'

10652 STORM MANHOLE
RIM=55.23'
IE 10"PVC(N)=51.58'
IE 30"CONC(SE)=51.52'
IE 30"CONC(SW)=51.23'
BOTTOM=51.33'

11215 STORM MANHOLE
RIM=62.59'
IE 8"CONC(NE)=54.39'
IE 60"CMP(SE)=52.99'
IE 10"VERTICAL PIPE(SW)
TOP=58.19
BOTTOM=52.79'
BOTTOM=48.89'

11269 STORM MANHOLE
RIM=64.91'
IE 60"CMP(NW)=53.01'
BOTTOM=53.21'

11470 CATCH BASIN
RIM=85.68'
IE 8"PVC(SW)=83.98'
BOTTOM=81.98'

11485 CATCH BASIN-OIL TRAP
RIM=80.30'
IE 6"PVC(NW)=79.25'
BOTTOM=77.10'

11729 CLEAN-OUT
RIM=87.35'

15058 CATCH BASIN
FULL OF WATER
RIM=85.94'
IE 4"PVC(SW)=84.34'
BOTTOM=77.10'

15107 CATCH BASIN
FULL OF WATER
RIM=85.77'
IE 4"PVC(NW)=84.57'
BOTTOM=82.87'

15315 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=85.97'
IE 4"PVC(NW)=85.32'
WATER LEVEL=85.34'
BOTTOM=81.98'

15443 CATCH BASIN-OIL TRAP
RIM=85.85'
IE 6"MTL(SE)=84.65'
BOTTOM=82.65'

15446 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=85.32'
IE(NE)=NOT FOUND
IE 4"PVC(SW)=84.64'
IE(SE)=82.92
UNABLE TO SEE A PIPE
BOTTOM=82.67'

15481 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.62'
IE 6"PVC(SW)=85.32'
BOTTOM=83.42'

15506 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.70'
IE 6"PVC(NW)=85.32'
BOTTOM=83.42'

15662 STORM MANHOLE
RIM=87.14'
IE 6"PVC(SW)=83.16'
IE 10"CONC(SE)=82.69'
IE 15"CPP(NE)=82.64'
BOTTOM=82.68'

15663 CLEAN-OUT
RIM=87.49'
IE 6"(NE)PVC=±83.3'

16179 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.43'
IE 6"PVC(SE)=84.83'
BOTTOM=82.73'

16209 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.46'
IE 6"PVC(SW)=84.96'
BOTTOM=82.76'

16219 CLEAN-OUT
RIM=87.10'

SANITARY SEWER NOTES

2106 SANITARY MANHOLE
RIM=85.62'
IE 8"CONC(NW)=77.32'
IE 8"CONC(NE)=77.12'
BOTTOM=77.32'

5689 SANITARY MANHOLE
RIM=87.20'
IE 8"CONC(NE)=77.00'
IE 8"CONC(SE)=76.58'
IE 8"CONC(S)=75.45'* MAY BE ABANDONED
IE 8"CONC(NW)=75.40'
IE 8"CONC(SE)=75.35'
BOTTOM=75.40'

10040 SANITARY MANHOLE
RIM=86.58'
IE 8"CONC(SW)=76.83'
IE 8"CONC(SE)=76.68'
BOTTOM=76.83'

10654 SANITARY MANHOLE
RIM=31.94'
UNABLE TO OPEN BOLTED SHUT

11244 SANITARY MANHOLE
RIM=70.22'
IE 8"CONC(SE)=64.82'
IE 8"CONC(SW)=64.32'
BOTTOM=76.83'

11581 SANITARY MANHOLE
RIM=76.90'
IE 8"CONC(NE)=71.50'
IE 8"CONC(NW)=69.20'
OTTOM=76.83'

11694 SANITARY MANHOLE
RIM=89.51'
IE 8"CONC(NW)=81.31'
IE 8"CONC(SW)=81.11'
BOTTOM=81.21'

15009 SANITARY MANHOLE
RIM=86.85'
IE 8"CONC(SW)=76.85'
IE 8"CONC(NW)=77.00'
BOTTOM=76.95'

15811 SANITARY MANHOLE
RIM=95.23'
IE 6"CONC(SE)=87.33'
IE 8"CONC(NE)=86.13'
BOTTOM=86.63'

LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 36, TOWNSHIP 1 SOUTH, RANGE 1 EAST, AND THE NORTHEAST ONE-QUARTER OF SECTION 1, TOWNSHIP 2 SOUTH, RANGE 1 EAST, WILLAMETTE MERIDIAN CITY OF MILWAUKIE, CLACKAMAS COUNTY, OREGON

FIELD WORK DATES: 10/13/17-11/3/17

EXISTING CONDITIONS PLAN

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS AND PHYSICAL SITE OBSERVATIONS. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

VERTICAL DATUM:

ELEVATION DATUM IS BASED ON THE CITY OF MILWAUKIE BENCH MARK NO. 12, OBTAINED FROM PROJECT CONTROL BY COMPASS ENGINEERS, PROJECT NO. 9835.00-4754, ROWE MIDDLE SCHOOL, DATED 01/15/2001.

BENCHMARK NO. 12 ELEVATION = 109.394'

HORIZONTAL DATUM

HORIZONTAL DATUM IS ASSUMED, BASED ON PROJECT CONTROL OBTAINED FROM COMPASS ENGINEERS PROJECT NO. 9835.00-4754, ROWE MIDDLE SCHOOL, DATED 01/15/2001.

FLOOD PLAIN NOTES

ZONE X (UN-SHADED) THE SITE IS LOCATED WITHIN ZONE X (UN-SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 41005C0017D
FEMA'S DEFINITION OF ZONE X (UN-SHADED) IS AN AREA OF MINIMAL FLOOD HAZARD, USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE X IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

ZONE X (SHADED) THE SITE IS LOCATED WITHIN ZONE X (SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 41005C0017D
FEMA'S DEFINITION OF ZONE X (SHADED) IS AN AREA OF MODERATE FLOOD HAZARD, USUALLY THE AREA BETWEEN THE LIMITS OF THE 100-YEAR AND 500-YEAR FLOODS. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

ZONE AE THE SITE IS LOCATED WITHIN ZONE AE PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 41005C0017D
FEMA'S DEFINITION OF ZONE AE ARE IS BASE FLOODPLAIN WHERE BASE FLOOD ELEVATIONS ARE PROVIDED. AE ZONES ARE NOW USED ON NEW FORMAT FIRMS INSTEAD OF A1-A30 ZONES. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, MANDATORY FLOOD INSURANCE PURCHASE REQUIREMENTS APPLY.

SCALE: 1" = 50'
0 50' 100'

REGISTERED PROFESSIONAL ENGINEER 80069PE
OREGON MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

EXISTING CONDITIONS PLAN
ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

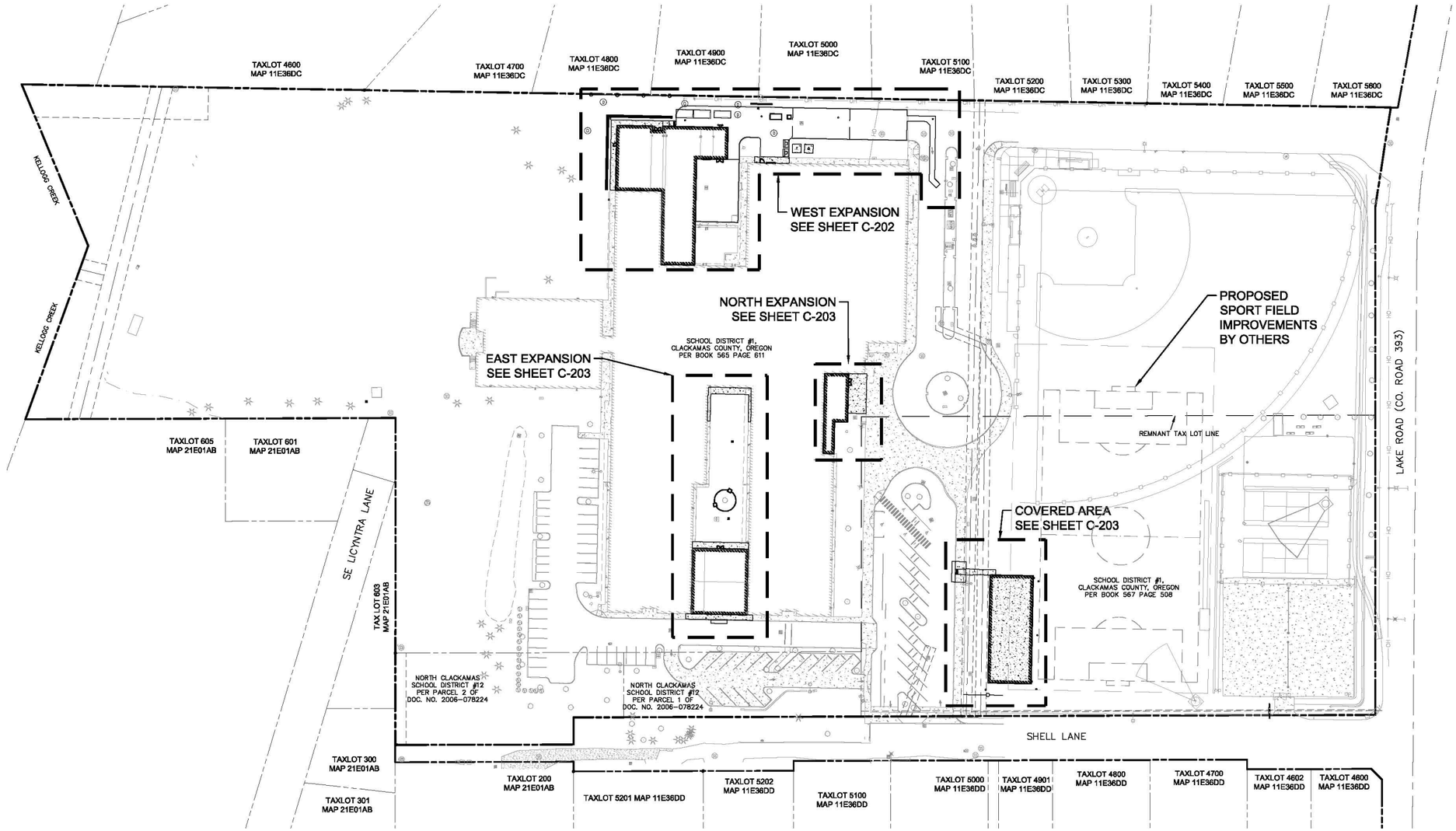
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-101

P:\17411-ROWE MS MODERNIZATION\CAD\C\17411-C100-EXISTING CONDITIONS.DWG



LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ARCHITECTURAL GRIDLINES
- PROPOSED TREE PROTECTING FENCING
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT

Know what's below. Call before you dig.

SCALE: 1" = 50'
0 50' 100'

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

SITE PLAN AND GRADING OVERVIEW
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
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5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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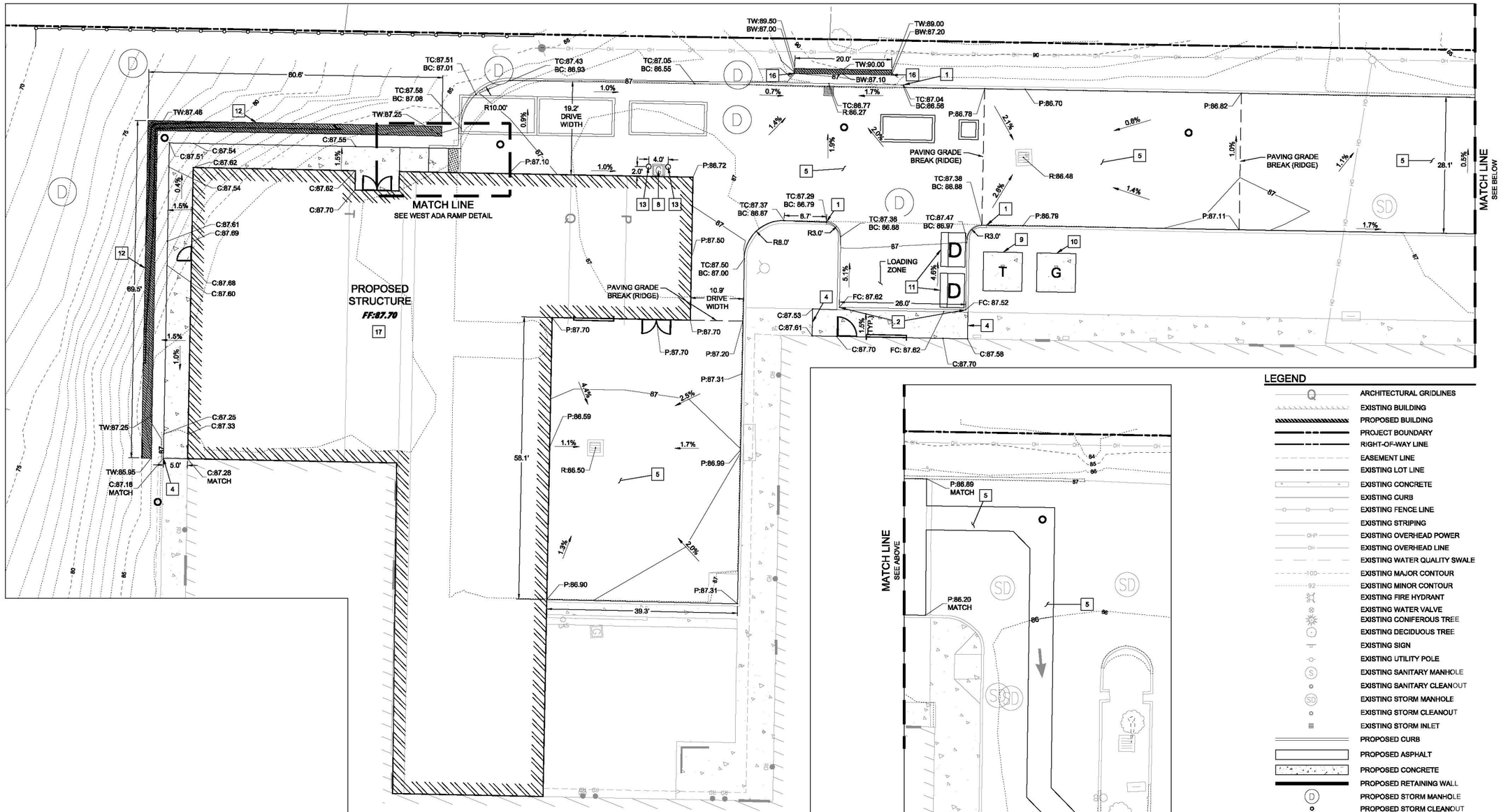
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

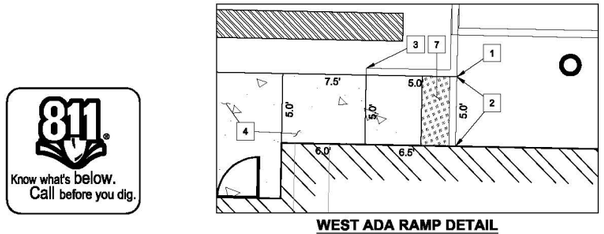
SHEET NUMBER
C-201

P:\17411-ROWE MS MODERNIZATION\CAD\CDV\17411-C200-SITE PLAN.DWG



WEST EXPANSION PLAN
SCALE: 1" = 10'

WEST EXPANSION PLAN
SCALE: 1" = 10'



WEST ADA RAMP DETAIL
SCALE: 1" = 5'

811
Know what's below.
Call before you dig.

CONSTRUCTION KEY NOTES

1. CONSTRUCT VERTICAL CURB PER DETAIL 8 ON SHEET C-402.
2. CONSTRUCT FLUSH CURB PER DETAIL 7 ON SHEET C-402.
3. CONSTRUCT CURB END PER DETAIL 6 ON SHEET C-402.
4. CONSTRUCT PRIVATE SIDEWALK PER 'CONCRETE SIDEWALKS' SECTION AND DETAIL 9 ON SHEET C-402.
5. CONSTRUCT PAVEMENT SECTION PER ON-SITE CROSS SECTION 'HMAC PAVING - HEAVY DUTY' SECTION ON SHEET C-403.
7. INSTALL TACTILE DOMES PER DETAIL 10 ON SHEET C-403.
8. PROPOSED GAS METER LOCATION. FINAL DESIGN BY OTHERS.
9. INSTALL CONCRETE PEDESTAL FOR ELECTRICAL TRANSFORMER. FINAL DESIGN BY OTHERS.
10. INSTALL CONCRETE PEDESTAL FOR GENERATOR. FINAL DESIGN BY OTHERS.
11. PROPOSED DUMPSTER LOCATION.
12. PROPOSED RETAINING WALL. SEE SHEET C-251 FOR PROFILE AND LAYOUT INFORMATION. FINAL DESIGN AND PERMITTING, BY OTHERS.
13. INSTALL 4' HIGH BOLLARD PER DETAIL 11 ON SHEET C-403.
16. INSTALL PROPOSED RETAINING WALL. KEYSTONE STANDARD 80LB BLOCK WALL OR EQUIVALENT.
17. PROPOSED BUILDING IMPROVEMENTS. SEE ARCHITECTURAL PLANS FOR CONTINUATION.

LEGEND

- ARCHITECTURAL GRIDLINES
- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- C:XXX PROPOSED CONCRETE ELEVATION
- P:XXX PROPOSED PAVEMENT ELEVATION
- FC:XXX PROPOSED FLUSH CURB ELEVATION
- BC:XXX PROPOSED BOTTOM OF CURB ELEVATION
- TC:XXX PROPOSED TOP OF CURB ELEVATION
- TW:XXX PROPOSED TOP OF WALL ELEVATION
- BW:XXX PROPOSED BOTTOM OF WALL ELEVATION
- FF:XXX FINISHED FLOOR ELEVATION
- X.X% PROPOSED SLOPE
- PROPOSED ASPHALT GRADE BREAK

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

SITE PLAN AND GRADING DETAILS I
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
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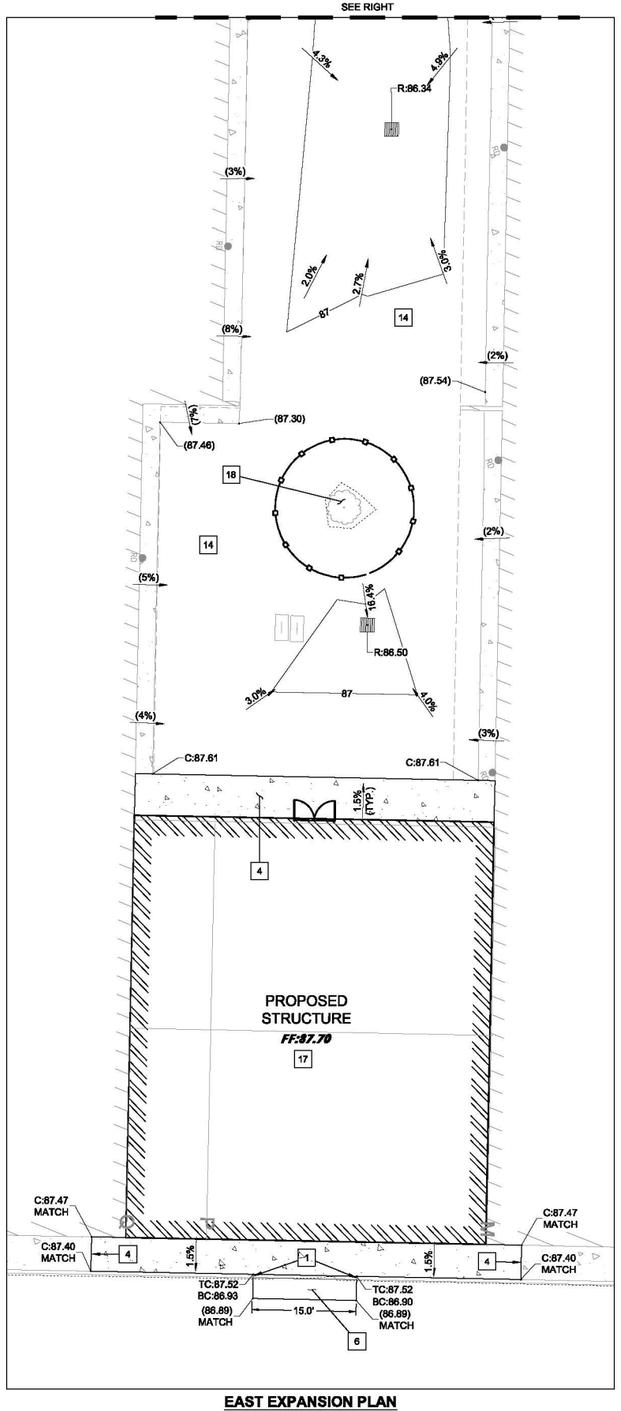
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

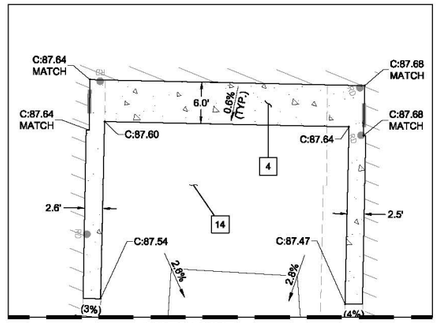
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-202

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C200-SITE PLAN.DWG

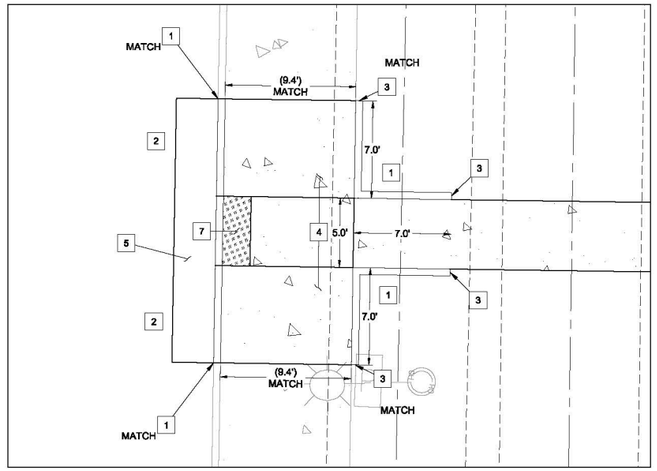


EAST EXPANSION PLAN
SCALE: 1" = 10'

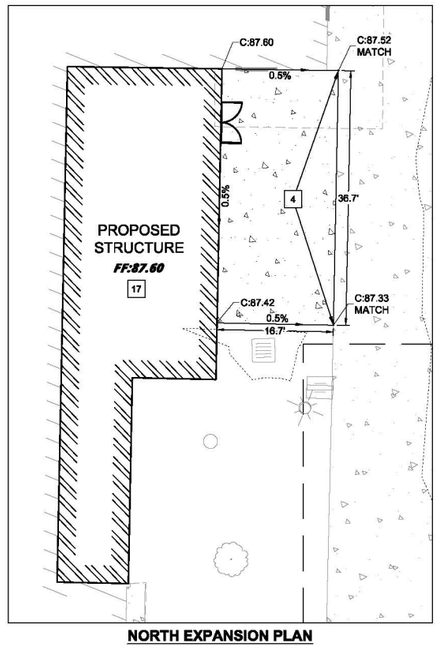


MATCH LINE - SEE LEFT

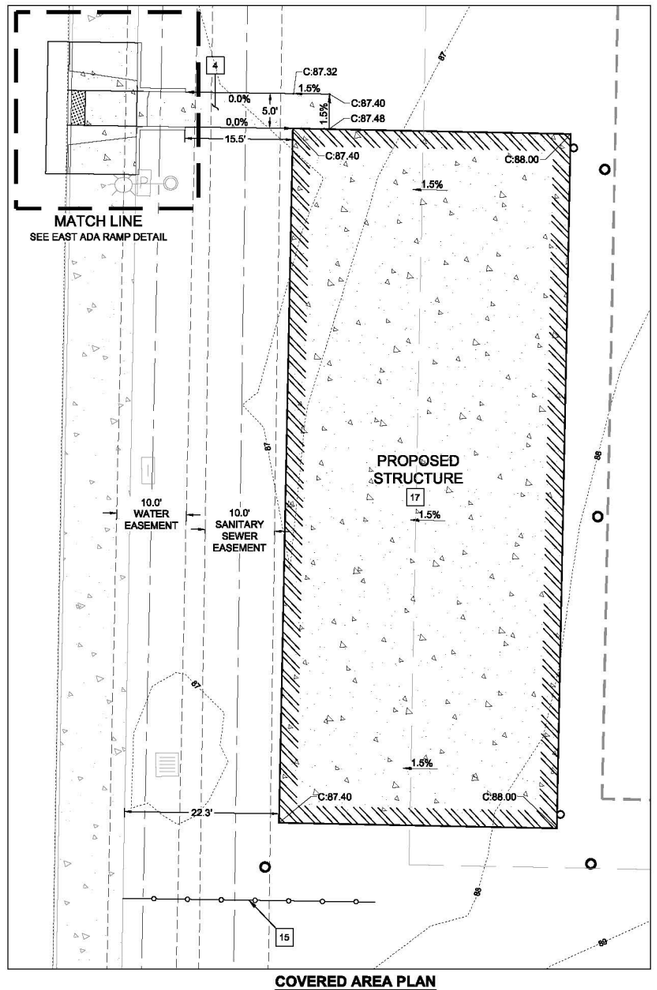
EAST EXPANSION PLAN
SCALE: 1" = 10'



EAST ADA RAMP DETAIL
SCALE: 1" = 5'



NORTH EXPANSION PLAN
SCALE: 1" = 10'



COVERED AREA PLAN
SCALE: 1" = 10'

LEGEND

- ARCHITECTURAL GRIDLINES
- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- C:XXX — PROPOSED CONCRETE ELEVATION
- P:XXX — PROPOSED PAVEMENT ELEVATION
- FC:XXX — PROPOSED FLUSH CURB ELEVATION
- BC:XXX — PROPOSED BOTTOM OF CURB ELEVATION
- TC:XXX — PROPOSED TOP OF CURB ELEVATION
- TW:XXX — PROPOSED TOP OF WALL ELEVATION
- BW:XXX — PROPOSED BOTTOM OF WALL ELEVATION
- FF:XXX — FINISHED FLOOR ELEVATION
- X.X% — PROPOSED SLOPE
- PROPOSED TREE PROTECTING FENCING

CONSTRUCTION KEY NOTES

1. CONSTRUCT VERTICAL CURB PER DETAIL 8 ON SHEET C-402.
2. CONSTRUCT FLUSH CURB PER DETAIL 7 ON SHEET C-402.
3. CONSTRUCT CURB END PER DETAIL 6 ON SHEET C-402.
4. CONSTRUCT PRIVATE SIDEWALK PER 'CONCRETE SIDEWALKS' SECTION AND DETAIL 9 ON SHEET C-402.
5. CONSTRUCT PAVEMENT SECTION PER ON-SITE CROSS SECTION 'HMAC PAVING - HEAVY DUTY' SECTION ON SHEET C-403.
6. CONSTRUCT PAVEMENT SECTION PER ON-SITE CROSS SECTION 'HMAC PAVING - LIGHT DUTY' SECTION ON SHEET C-403.
7. INSTALL TACTILE DOMES PER DETAIL 10 ON SHEET C-403.
8. PROPOSED GAS METER LOCATION. FINAL DESIGN BY MEP ENGINEER.
9. PROPOSED ELECTRICAL TRANSFORMER LOCATION. FINAL DESIGN BY MEP ENGINEER.
10. PROPOSED ELECTRICAL GENERATOR LOCATION. FINAL DESIGN BY MEP ENGINEER.
11. PROPOSED DUMPSTER LOCATION.
12. PROPOSED RETAINING WALL. SEE SHEET C-251 FOR PROFILE AND LAYOUT INFORMATION. FINAL DESIGN AND PERMITTING, BY OTHERS.
13. INSTALL 4' HIGH BOLLARD PER DETAIL 11 ON SHEET C-403.
14. GROUNDCOVER REPLACED PER LANDSCAPING ARCHITECT.
15. INSTALL 6' HIGH CHAIN LINK FENCE.
17. PROPOSED BUILDING IMPROVEMENTS. SEE ARCHITECTURAL PLANS FOR CONTINUATION.
18. PROTECT EXISTING TREE DURING CONSTRUCTION. DO NOT GRADE WITHIN TREE PROTECTION FENCING.

Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

SITE PLAN AND GRADING DETAILS II
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

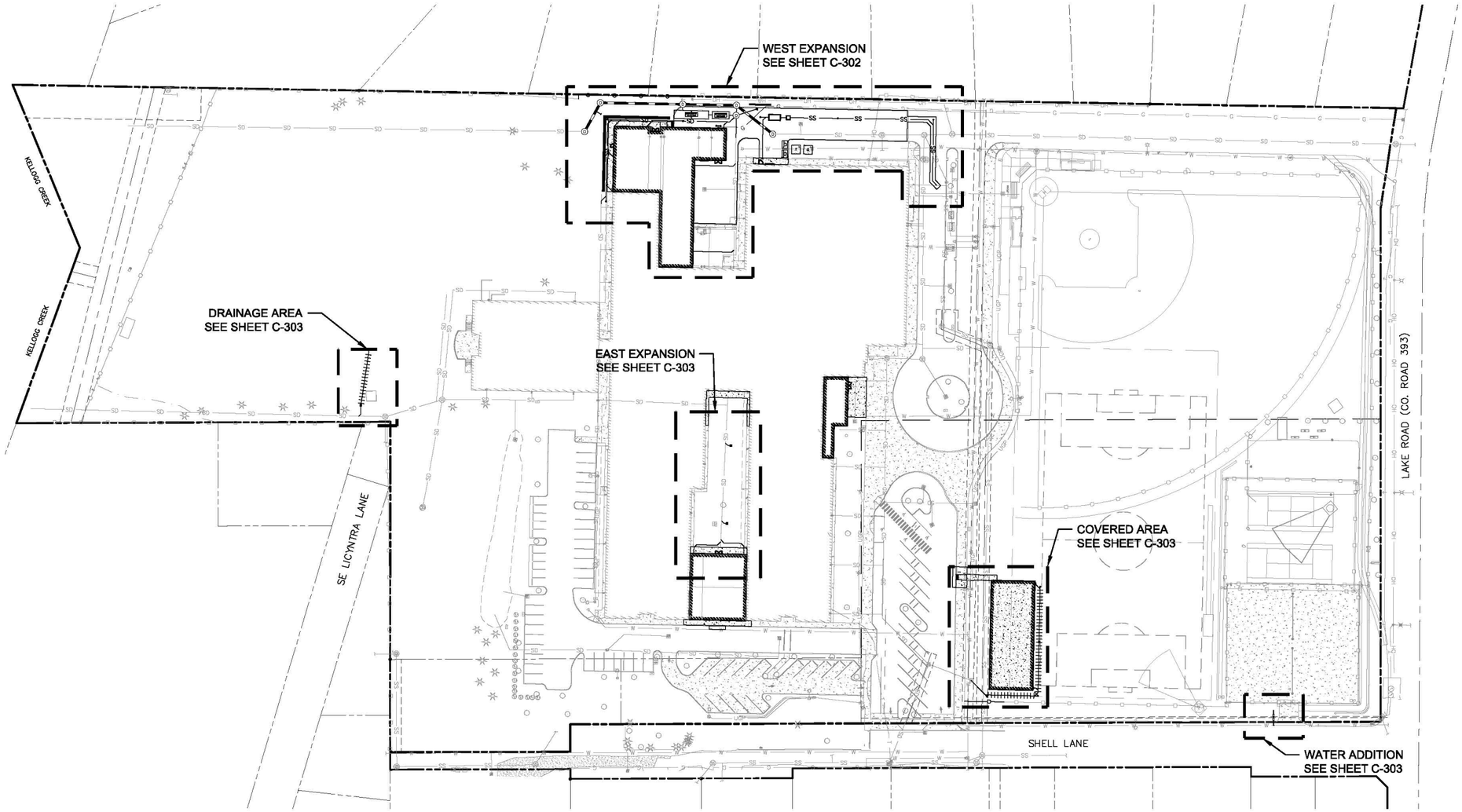
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-203

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C200-SITE PLAN.DWG



LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING FRENCH DRAIN
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING CABLE LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED STORM MAIN
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED WATER SERVICE

811 Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

P:\17411-ROWE MS MODERNIZATION\CAD\GDV\17411-C300-UTILITY PLAN.DWG

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

UTILITY PLAN OVERVIEW
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
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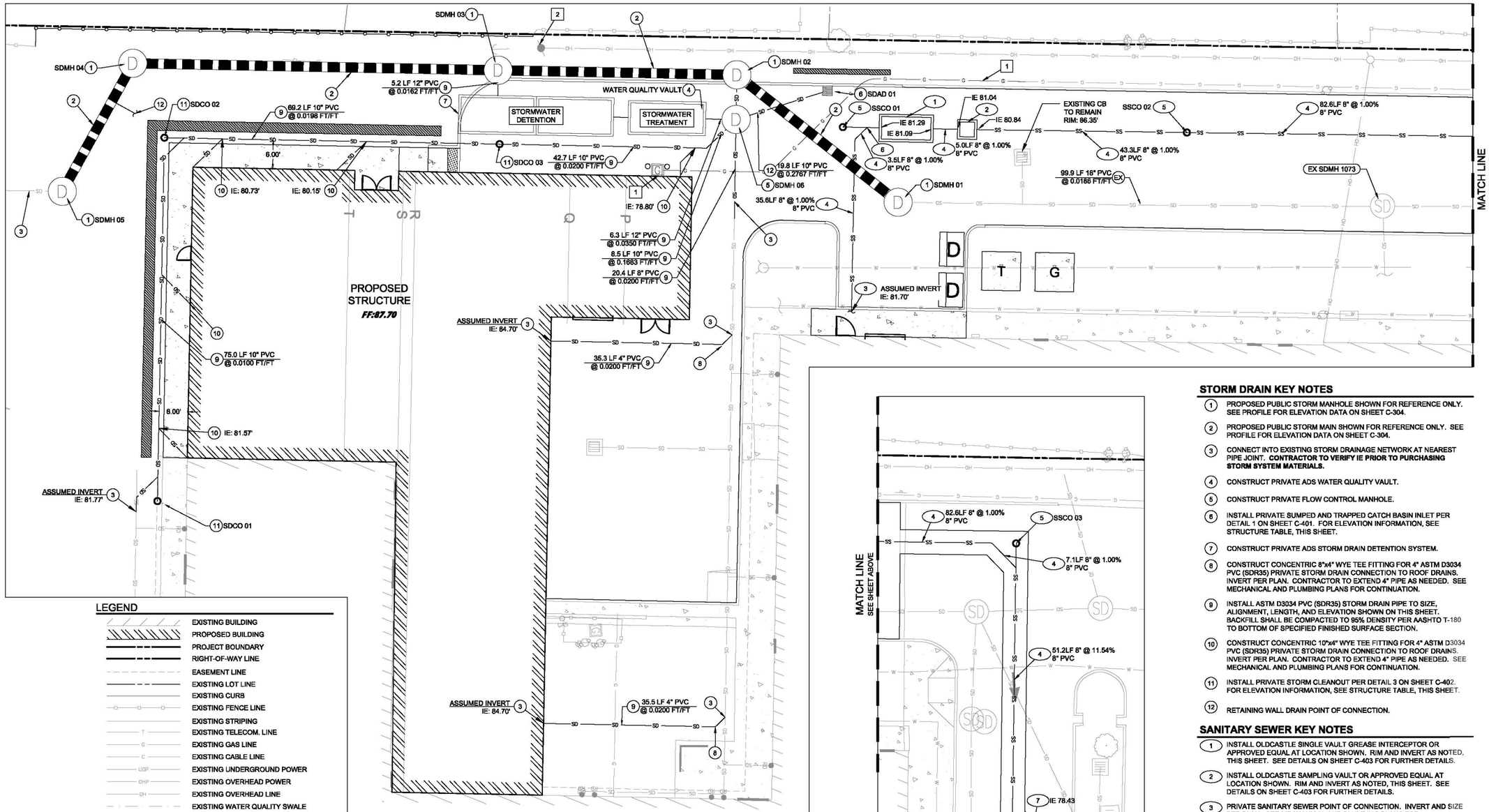
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-301



LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING FENCE LINE
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- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
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- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED RETAINING WALL
- PROPOSED STORM MAIN
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- ARCHITECT GRIDLINE

WEST EXPANSION PLAN
SCALE: 1" = 10'

WEST EXPANSION PLAN
SCALE: 1" = 10'

CLEANOUT DATA

SDCO 01
RIM = 88.73'
IE 10" OUT (NW): 81.72
IE 10" OUT (S): 81.72

SDCO 02
RIM = 81.51'
IE 10" OUT (NE): 80.97

SDCO 03
RIM = 86.84'
IE 10" OUT (NE): 79.60

CATCH BASIN DATA

SDAD 01
RIM: 86.29
IE 10" OUT (S): 82.79

CLEANOUT DATA

SSCO 01
RIM = 86.48'
IE 8" OUT (NE): 81.37

SSCO 02
RIM = 81.14'
IE 8" OUT (SW): 80.41

SSCO 03
RIM = 86.73'
IE 8" OUT (SE): 79.58

STORM DRAIN KEY NOTES

1. PROPOSED PUBLIC STORM MANHOLE SHOWN FOR REFERENCE ONLY. SEE PROFILE FOR ELEVATION DATA ON SHEET C-304.
2. PROPOSED PUBLIC STORM MAIN SHOWN FOR REFERENCE ONLY. SEE PROFILE FOR ELEVATION DATA ON SHEET C-304.
3. CONNECT INTO EXISTING STORM DRAINAGE NETWORK AT NEAREST PIPE JOINT. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**
4. CONSTRUCT PRIVATE ADS WATER QUALITY VAULT.
5. CONSTRUCT PRIVATE FLOW CONTROL MANHOLE.
6. INSTALL PRIVATE SUMPED AND TRAPPED CATCH BASIN INLET PER DETAIL 1 ON SHEET C-401. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
7. CONSTRUCT PRIVATE ADS STORM DRAIN DETENTION SYSTEM.
8. CONSTRUCT CONCENTRIC 8"x4" WYE TEE FITTING FOR 4" ASTM D3034 PVC (SDR35) PRIVATE STORM DRAIN CONNECTION TO ROOF DRAINS. INVERT PER PLAN. CONTRACTOR TO EXTEND 4" PIPE AS NEEDED. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
9. INSTALL ASTM D3034 PVC (SDR35) STORM DRAIN PIPE TO SIZE, ALIGNMENT, LENGTH, AND ELEVATION SHOWN ON THIS SHEET. BACKFILL SHALL BE COMPACTED TO 95% DENSITY PER AASHTO T-180 TO BOTTOM OF SPECIFIED FINISHED SURFACE SECTION.
10. CONSTRUCT CONCENTRIC 10"x4" WYE TEE FITTING FOR 4" ASTM D3034 PVC (SDR35) PRIVATE STORM DRAIN CONNECTION TO ROOF DRAINS. INVERT PER PLAN. CONTRACTOR TO EXTEND 4" PIPE AS NEEDED. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
11. INSTALL PRIVATE STORM CLEANOUT PER DETAIL 3 ON SHEET C-402. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
12. RETAINING WALL DRAIN POINT OF CONNECTION.

SANITARY SEWER KEY NOTES

1. INSTALL OLDCASTLE SINGLE VAULT GREASE INTERCEPTOR OR APPROVED EQUAL AT LOCATION SHOWN. RIM AND INVERT AS NOTED, THIS SHEET. SEE DETAILS ON SHEET C-403 FOR FURTHER DETAILS.
2. INSTALL OLDCASTLE SAMPLING VAULT OR APPROVED EQUAL AT LOCATION SHOWN. RIM AND INVERT AS NOTED, THIS SHEET. SEE DETAILS ON SHEET C-403 FOR FURTHER DETAILS.
3. PRIVATE SANITARY SEWER POINT OF CONNECTION. INVERT AND SIZE PER PLAN. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
4. INSTALL 4" ASTM D3034 PVC (SDR35) SANITARY SEWER PIPE TO ALIGNMENT, LENGTH, AND SLOPE SHOWN ON THIS SHEET.
5. INSTALL PRIVATE SANITARY CLEANOUT PER DETAIL 3 ON SHEET C-402. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
6. INSTALL CONCENTRIC WYE TEE FITTING FOR LATERAL CONNECTION AT LOCATION SHOWN.
7. CONNECT PROPOSED SANITARY SEWER INTO EXISTING SANITARY NETWORK AT LOCATION SHOWN. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING SANITARY SYSTEM MATERIALS.**

DRY UTILITIES KEY NOTES

1. INSTALL NATURAL GAS LINE AT LOCATION SHOWN. FINAL DESIGN AND CONTINUATION BY OTHERS.
2. INSTALL NEW UTILITY POLE. FINAL DESIGN BY OTHERS.

Know what's below. Call before you dig. 811

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

UTILITY PLAN AREAS I
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

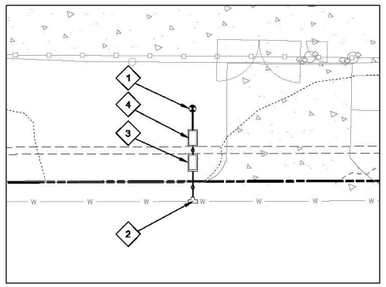
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

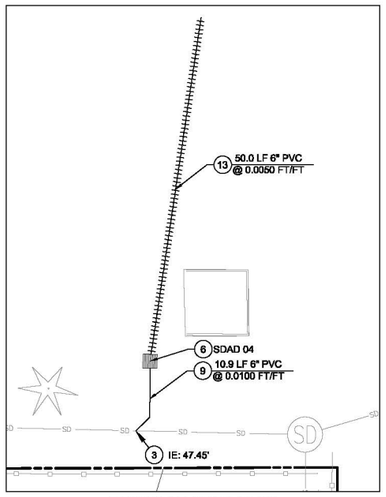
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-302

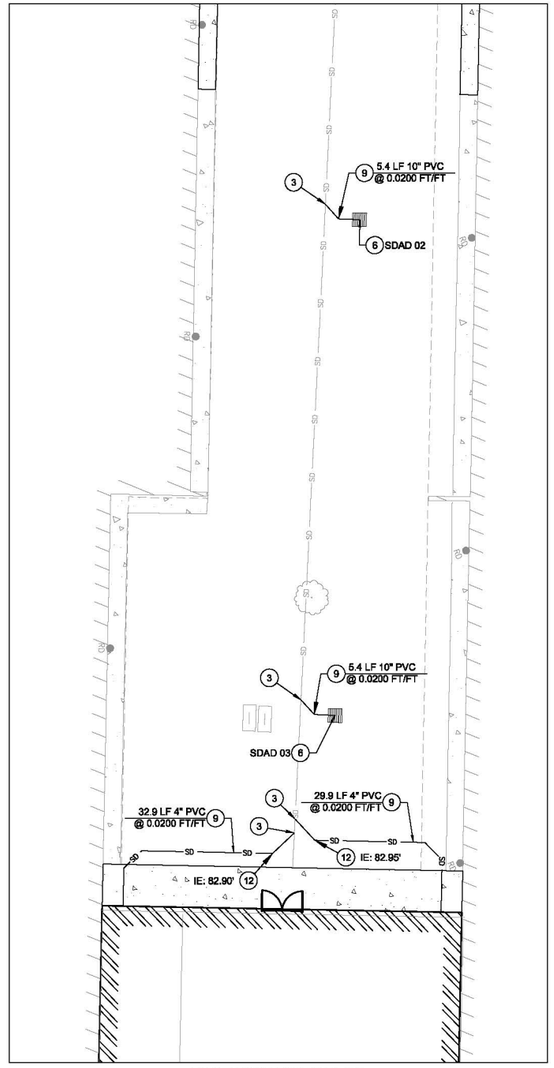
P:\17411-ROWE MS MODERNIZATION\CAD\C3D\17411-C300-UTILITY PLAN.DWG



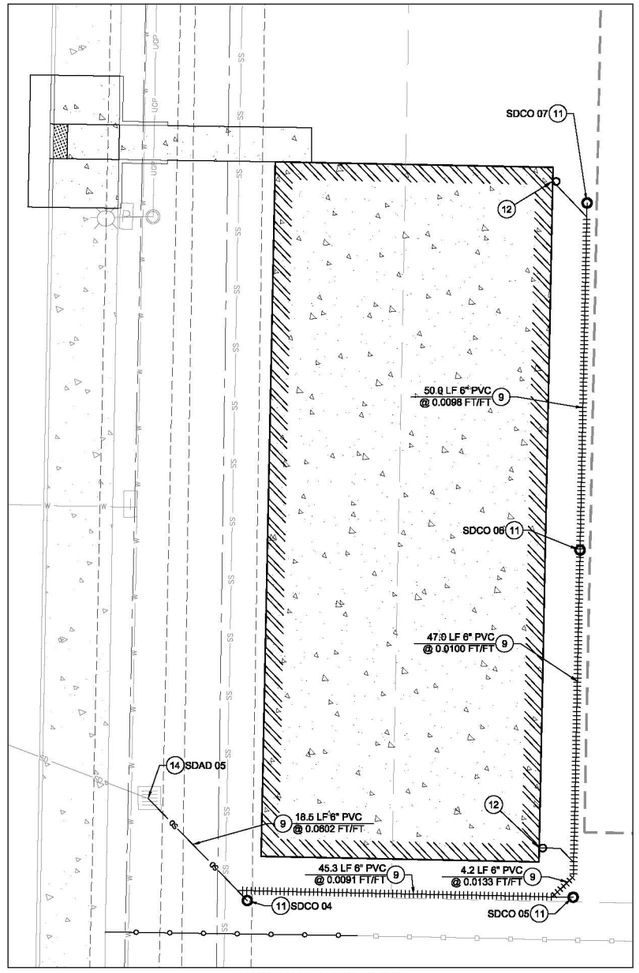
WATER ADDITION PLAN
1" = 10'



DRAINAGE AREA PLAN
1" = 10'



EAST EXPANSION PLAN
SCALE: 1" = 10'



COVERED AREA PLAN
SCALE: 1" = 10'

LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING CABLE LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED STORM MAIN
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED FRENCH DRAIN
- PROPOSED WATER SERVICE

STORM DRAIN KEY NOTES

3. CONNECT INTO EXISTING STORM DRAINAGE NETWORK AT NEAREST PIPE JOINT. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**
6. INSTALL PRIVATE SUMPED AND TRAPPED CATCH BASIN INLET PER DETAIL 1 ON SHEET C-401. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
9. INSTALL ASTM D3034 PVC (SDR35) STORM DRAIN PIPE TO SIZE, ALIGNMENT, LENGTH, AND ELEVATION SHOWN ON THIS SHEET. BACKFILL SHALL BE COMPACTED TO 95% DENSITY PER AASHTO T-180 TO BOTTOM OF SPECIFIED FINISHED SURFACE SECTION.
11. INSTALL PRIVATE STORM CLEANOUT PER DETAIL 3 ON SHEET C-402. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
12. CONSTRUCT CONCENTRIC 6"X4" WYE TEE FITTING FOR 4" ASTM D3034 PVC (SDR35) PRIVATE STORM DRAIN CONNECTION TO ROOF DRAINS. INVERT PER PLAN. CONTRACTOR TO EXTEND 4" PIPE AS NEEDED. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
13. INSTALL FRENCH DRAIN PIPE TO SIZE, ALIGNMENT, LENGTH, AND ELEVATION SHOWN ON THIS SHEET. SEE DETAIL 2 ON SHEET C-402.
14. CONNECT INTO EXISTING STORM DRAINAGE NETWORK AT AREA DRAIN. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**

WATER SYSTEM KEY NOTES

1. INSTALL WOODFORD Y34 YARD HYDRANT OR APPROVED EQUIVALENT WITH "NON-POTABLE WATER" SIGN AT LOCATION SHOWN.
2. INSTALL 1" WATER SERVICE. SEE CITY OF MILWAUKIE DETAIL 401 ON SHEET C-404.
3. INSTALL 1" DOUBLE CHECK ASSEMBLY (MAKE & MODEL PER OREGON HEALTH AUTHORITY CURRENT APPROVED LIST). SEE CITY OF MILWAUKIE DETAIL 411A AND 411B ON SHEET C-404.
4. INSTALL 1" DOMESTIC WATER METER VAULT. SEE CITY OF MILWAUKIE DETAIL 401 ON SHEET C-404.

CLEANOUT DATA

SDAD 05
RIM = 87.16'
IE 6" OUT (SW): 86.65

SDCO 04
RIM = 87.27'
IE 6" OUT (W): 85.55

SDCO 05
RIM = 86.48'
IE 6" OUT (SW): 85.96

SDCO 06
RIM = 87.48'
IE 6" OUT (SE): 86.47

SDCO 07
RIM = 87.48'
IE 6" OUT (SE): 86.98

CATCH BASIN DATA

SDAD 02
RIM: 87.42
IE 10" OUT (SW): 86.16

SDAD 03
RIM: 87.49
IE 10" OUT (SW): 85.90

SDAD 04
RIM: 50.58
IE 6" IN (NW): 47.73
IE 6" OUT (SE): 47.53

Know what's below. Call before you dig.

SCALE: 1" = 10'
0 '0' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

UTILITY PLAN AREAS II
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-303

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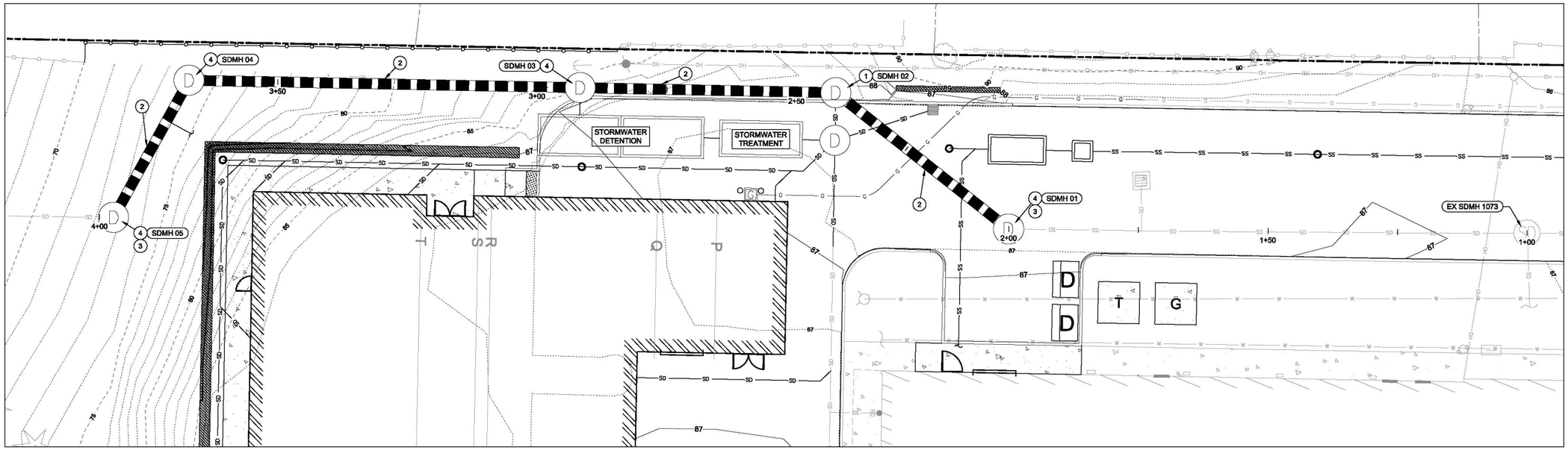
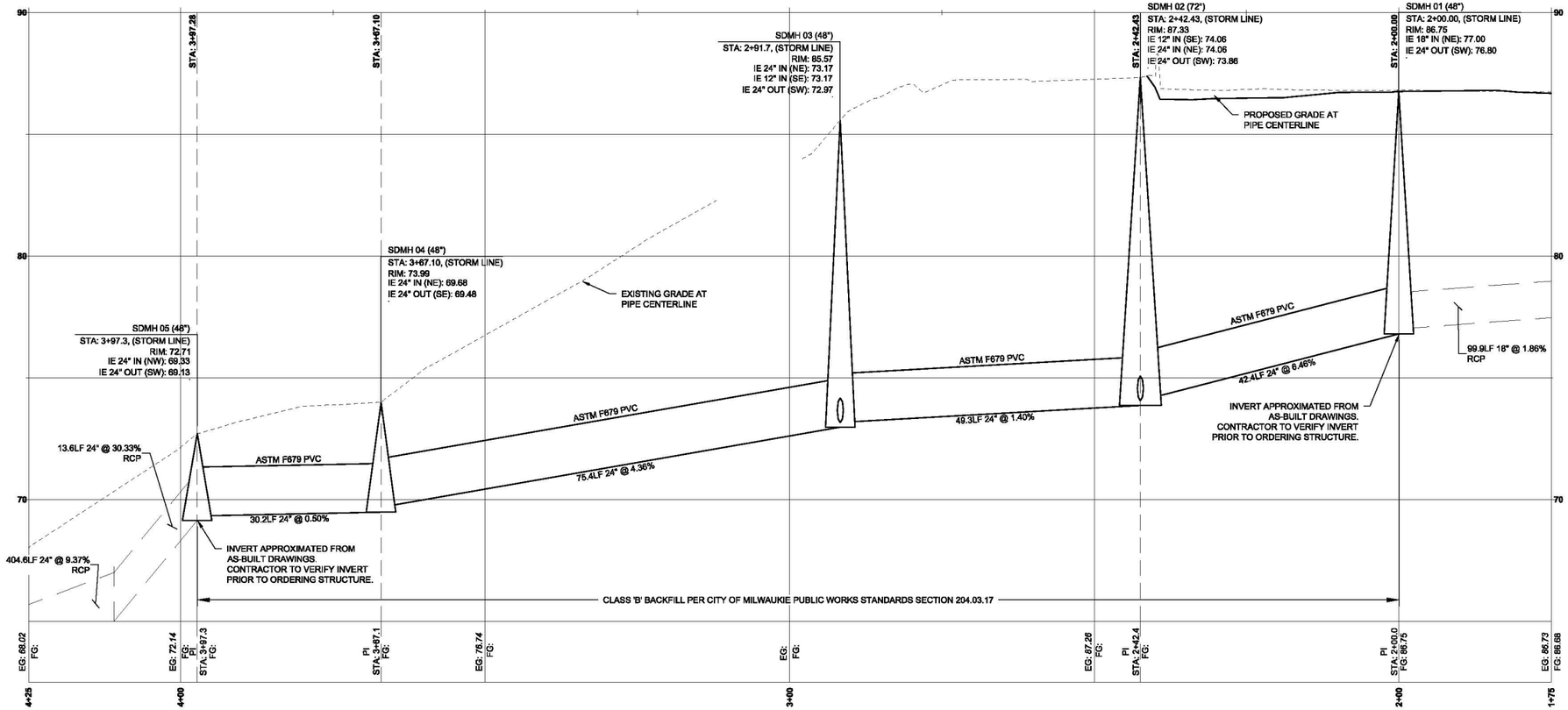


PUBLIC STORM IMPROVEMENT PLAN

SCALE: 1" = 10'



PUBLIC STORM IMPROVEMENT PROFILE

SCALE: HORIZONTAL - 1" = 10'
VERTICAL - 1" = 4'

LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING CABLE LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING STORM INLET
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORM MAIN
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED AREA DRAIN

STORM DRAIN KEY NOTES

1. CONSTRUCT 72" MANHOLE PER CITY OF MILWAUKIE STD. DWG. 306, 615, AND 616. SEE SHEET C-401 - C-402 FOR DETAILS.
2. INSTALL 24" ASTM F679 PVC (PS46) STORM DRAIN PIPE TO ALIGNMENT SHOWN, THIS SHEET. SEE PROFILE FOR ELEVATION DATA, THIS SHEET.
3. PROPOSED MANHOLE TO BE CONSTRUCTED IN-LINE WITH EXISTING STORM NETWORK. CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.
4. CONSTRUCT 48" MANHOLE PER CITY OF MILWAUKIE STD. DWG. 306, 615, AND 616. SEE SHEET C-401 - C-402 FOR DETAILS.

811 Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

PUBLIC STORM LINE PLAN AND PROFILE

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
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(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-304

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CALCULATIONS

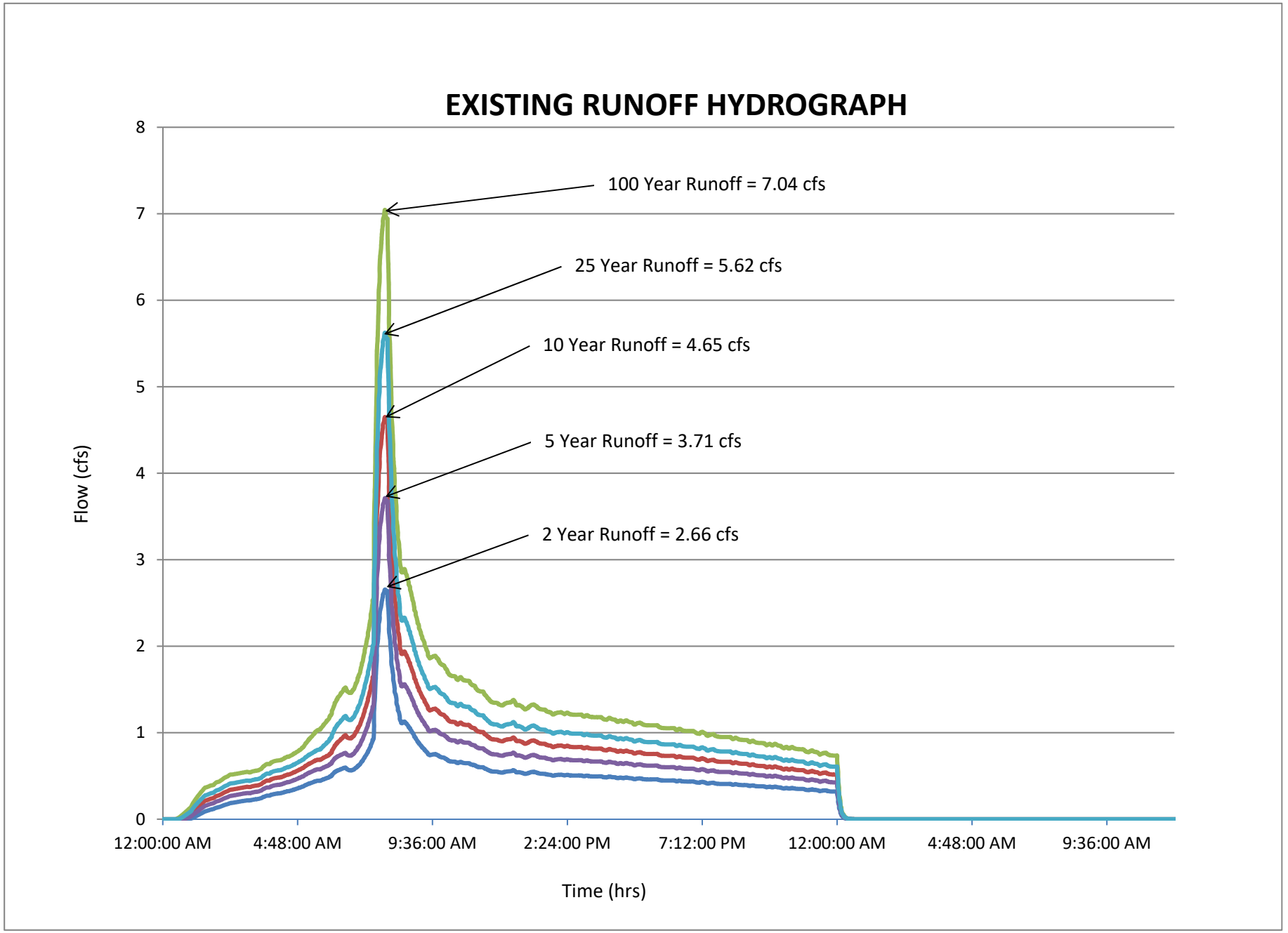
RATIONAL METHOD WATER QUALITY CALCULATIONS

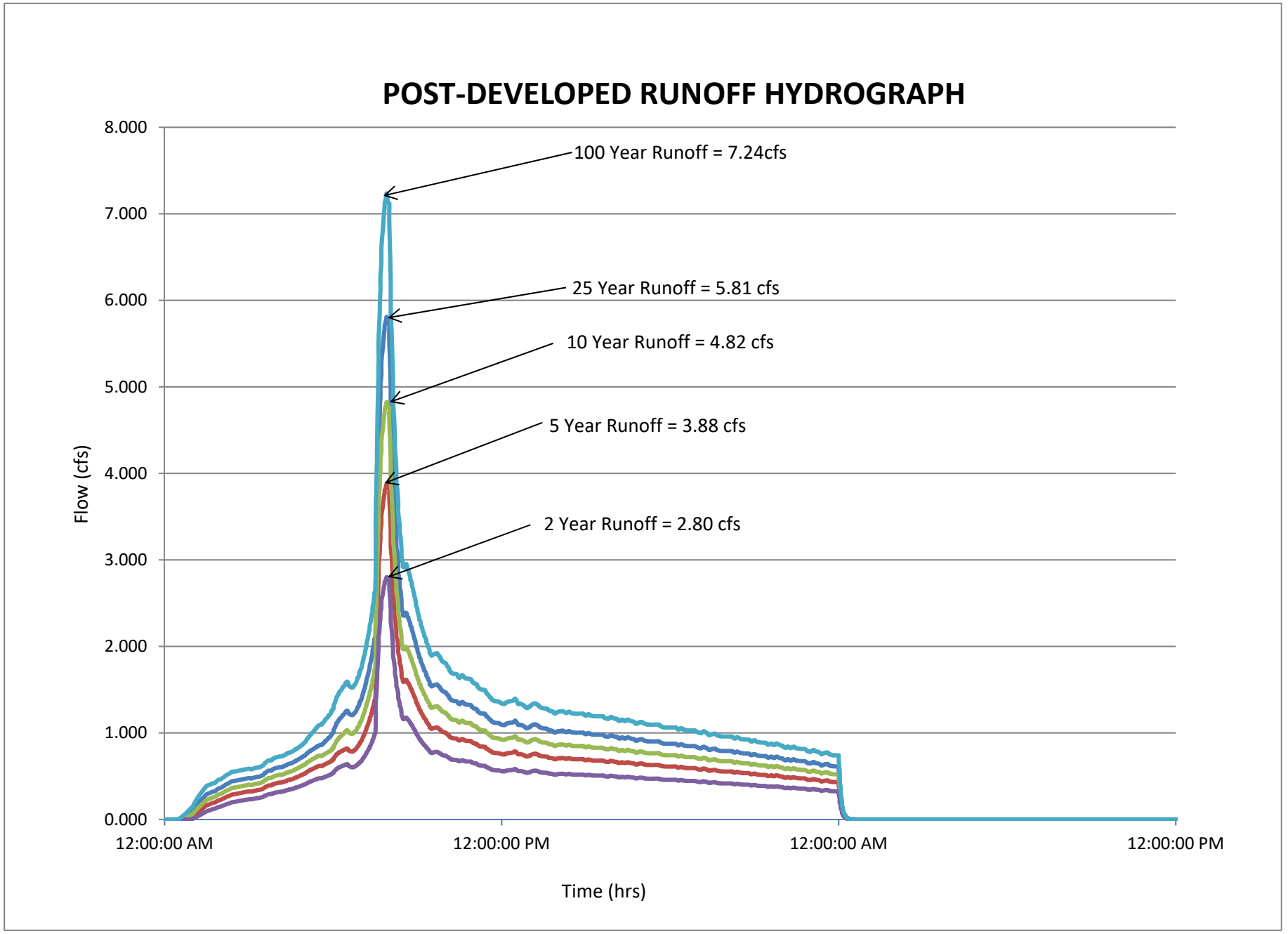
PROJECT NAME	ROWE MIDDLE SCHOOL
PROJECT NO.	17411 BY: JBC

Design Storm: WQ

DESIGN SECTION		DESIGN CALCULATIONS							
UPPER MH / STA	LOWER MH / STA	TOTAL TIME T_t minutes	INCR. TIME T minutes	INTENSITY I in./hr.	INCR. AREA A acres	RUNOFF COEFF. C coeff.	EQUIV. CA acres	TOTAL EQUIV. ∑CA acres	RUNOFF Q cfs
Hollywood Station									
WQ VAULT	-	**5.00**	#REF!	0.19	**1.67**	**0.90**	1.50	1.50	0.29

HYDROGRAPHS


EXISTING RUNOFF HYDROGRAPH
100 Year Runoff = 7.04 cfs
25 Year Runoff = 5.62 cfs
10 Year Runoff = 4.65 cfs
5 Year Runoff = 3.71 cfs
2 Year Runoff = 2.66 cfs
Flow (cfs)
0
1
2
3
4
5
6
7
8
12:00:00 AM
4:48:00 AM
9:36:00 AM
2:24:00 PM
7:12:00 PM
12:00:00 AM
4:48:00 AM
9:36:00 AM
Time (hrs)


POST-DEVELOPED RUNOFF HYDROGRAPH
8.000
7.000
6.000
5.000
4.000
3.000
2.000
1.000
0.000
Flow (cfs)
100 Year Runoff = 7.24cfs
25 Year Runoff = 5.81 cfs
10 Year Runoff = 4.82 cfs
5 Year Runoff = 3.88 cfs
2 Year Runoff = 2.80 cfs
12:00:00 AM
12:00:00 PM
12:00:00 AM
12:00:00 PM
Time (hrs)

GEOTECHNICAL REPORT

GEOTECHNICAL ENGINEERING REPORT
Building Additions

Rowe Middle School
3606 SE Lake Road
Milwaukie, Oregon 97222

Prepared for:

North Clackamas School District
12451 SE Fuller Road
Milwaukie, Oregon 97224

Prepared by:

Professional Service Industries, Inc.
6032 North Cutter Circle, Suite 480
Portland, Oregon 97217

November 7, 2017

PSI PROJECT NO. 07041118

6032 N. Cutter Circle, Suite 480
Portland, OR 97217
phone: 503.289.1778
fax: 503.289.1918
intertek.com/building
psiusa.com

November 7, 2017

North Clackamas School District
12451 SE Fuller Rd
Milwaukie, OR 97222

Attention: Mr. Doug Hobbs
North Clackamas School District
(503)353-6058
hobbsd@nclack.k12.or.us

SUBJECT: Proposed Building Additions
Rowe Middle School
3606 SE Lake Rd
Milwaukie, Oregon 97222
PSI Report No. **070411118**

Dear Mr. Hobbs:

Professional Service Industries, Inc. (PSI), an Intertek Company, is pleased to submit this geotechnical engineering report for the proposed building additions at Rowe Middle School in Milwaukie, Oregon. This report summarizes the work accomplished and provides PSI's recommendations for design and construction of the proposed project. PSI performed the requested geotechnical investigation services in general accordance with the scope of work outlined in PSI proposal number 0704-222672, approved October 9th, 2017 through purchase order number 1800922.

Based on the results of our field investigation, laboratory testing and engineering analysis, the proposed site is suitable for the construction of the proposed improvements from a geotechnical standpoint, provided the recommendations of this report are followed.

PSI thanks you for choosing us as your consultant for this project. Please contact the undersigned at (503) 289-1778, if you have any questions or we may be of further service.

Respectfully Submitted,

PROFESSIONAL SERVICE INDUSTRIES, INC.

REGISTERED PROFESSIONAL ENGINEER
91607
OREGON
SEPT. 14, 2016
MICHAEL S. PLACE
11-7-17
Exp 12-31-18

Luke Kevan, EI
Staff Engineer

Michael S. Place, PE
Principal Engineer

TABLE OF CONTENTS

FIGURES

LIST OF APPENDICES

1 PROJECT INFORMATION

1.1 PROJECT AUTHORIZATION

This report presents the results of PSI's geotechnical investigation performed for the proposed school renovation project located at 3606 SE Lake Road in Milwaukie, Oregon (see Figure 1 titled, "*Site Vicinity Map"*). This exploration was performed for North Clackamas School District (NCSD) in general accordance with PSI proposal 0704-222672 dated September 18, 2017.

1.2 PROJECT DESCRIPTION

Project information was provided to PSI by Mr. Marc Bargenda of Heery International on Friday September 15, 2017 via email. PSI was provided with a drawing titled, "Rowe MS New Expansion", undated, prepared by Mahlum. Further, PSI received more information via email on October 12, 2017 concerning the condition of the tennis courts in the northeast portion of the property. PSI was asked to perform hand augers next to the existing courts and to provide recommendations for the construction of two new courts.

PSI understands that North Clackamas School District (NCSD) is planning to renovate the existing structure currently in use as Rowe Middle School. The structure of the school will receive building additions. One on the south west corner of the building, one on the north side of the building next to the main office, and one on the east side of the building in the courtyard.

PSI understands that the building will continue to be utilized as a school structure; therefore, based on the 2014 Oregon Structural Specialty Code (OSSC), a site-specific seismic hazard study is required. Structural loads were not provided to us; however, based on past experience with similar projects, PSI anticipates foundation loads will be approximately 3 kips/foot and column loads up to 80 kips for strip footings and column footings respectively.

Should any of the above information or assumptions made by PSI be inconsistent with the planned construction, it is requested that you contact us immediately to allow us to make any necessary modifications to this report.

1.3 PURPOSE AND SCOPE-OF-SERVICES

The purpose of this exploration was to evaluate the subsurface conditions at the site and to develop geotechnical design criteria for support of foundations for the planned project. PSI has also completed a site-specific hazard study for the project site.

1.3.1 FIELD EXPLORATION PROGRAM

General

PSI completed our field exploration of the project site Thursday October 19, 2017. Field activities consisted of 3 Cone Penetration Tests (CPT), 2 geoprobe soil explorations, 2 hand auger borings with dynamic cone penetration tests, and geophysical testing using refraction micrometer (ReMi®) methods. The various explorations and ReMi® positions were determined and marked in the field by PSI, and are shown on Figure 2, *Site Exploration Map*. PSI notified Oregon's Utility Notification Center to indicate the approximate location of underground utilities in the vicinity of the proposed soundings and geoprobes prior to commencing field activities. Further, PSI hired the private utility locators to further ensure no utilities were disturbed during the explorations.

The CPTs are designated CPT-01, CPT-02, and CPT-03. The planned depths of CPT soundings were to 60 feet below existing ground surface (bgs). However, every CPT encountered refusal between depths of 24 to 40 feet bgs. Groundwater was encountered at the location of CPT-01 at a depth of approximately 30 feet bgs.

PSI completed two geoprobe explorations at the site, designated GP-01 and GP-02. The planned depth of the explorations was 30 feet bgs, however, the actual depths of the explorations were approximately 20 feet and 32 feet bgs respectively. The geoprobes were pushed and sampled to observe the stratigraphy and variability of subsurface soil conditions and to obtain physical soil samples for laboratory testing. Soil samples recovered from the explorations were sealed in airtight sample bags to retain in situ moisture and carefully transported to PSI's laboratory for additional examination and testing.

A representative of PSI's geotechnical staff was present during the exploration activities to record encountered subsurface soil and groundwater conditions, and to obtain soil samples for laboratory testing.

The soil profiles shown on the CPT and geoprobe logs represent the conditions only at the actual exploration locations. Variations between exploration locations may occur and should be expected. The stratifications represent the approximate boundary between subsurface materials; the actual transitions may be gradual.

Cone Penetration Test with Pore-Pressure Readings (CPTu)

CPTu is an in-situ testing method used to determine the geotechnical engineering properties of soils and to delineate soil lithology. CPTu data is commonly used in the analysis and design of foundations. CPTu probing is a fast and cost-effective method for identifying subsurface soil types and evaluating the engineering properties of soils.

During a CPTu, the electric cone (tip angle 60°, section area 10 cm²) and the sounding rods are pushed continuously into the ground. Intermittent measurements of the cone resistance (q_c), sleeve friction (f_s), and pore pressure (u) are measured and recorded by

the electric cone while it is being pushed into the ground. The measurements from a CPTu can be used to correlate multitude of geotechnical parameters, including:

- Undrained shear strength (su)
- Effective friction angle (φ', degree)
- Coefficient of consolidation (Cv, cm^2/sec)
- Overconsolidation Ratio (OCR)

The results of the measured and correlated data are used in various geotechnical analyses, including: soil behavior type, soil bearing capacity, estimated settlement, liquefaction settlement, lateral spread, foundation-design criteria, slope stability, and seismic site class.

Sampling Procedures

Throughout the geoprobe exploration, soil samples were obtained from the borings using a 2.3-inch DT 22 geoprobe sampler. The sampler was driven into the soil a total distance of 48 inches using a hydraulic percussion hammer. All sampling methods were in general accordance with the current standard of practice for sampling with a geoprobe.

Field Classification

Soil samples were initially classified visually in the field. Consistency, color, relative moisture, degree of plasticity, peculiar odors and other distinguishing characteristics of the soil samples were noted. The terminology used in the soil classifications and other modifiers are depicted in the General Notes and on the Soil Classification Chart in Appendix A, *CPT Logs, Soil Investigation Logs, General Notes, and Soil Classification Chart*.

Geoprobe and Hand Auger Boring Logs

A summary geoprobe and hand auger exploration logs are located at the end of this report in Appendix A. The left-hand portion of the logs depicts the interpretation of the soil encountered in the soil explorations, sample locations, and depths. The right-hand portion of the log shows the results of the water contents determinations, groundwater information, and other summary laboratory information.

The soil profile shown on the exploration logs represents the conditions only at actual exploration locations. Variations may occur and should be expected. The stratifications represent the approximate boundary between subsurface materials; the actual transition may be gradual.

1.3.2 REFRACTION MICROTREMOR (REMI)

One Refraction Microtremor (ReMi) array was performed at the project site (see Figure 2 titled, "*Site Exploration Map"*). The ReMi method uses standard P-wave recording equipment and ambient noise to determine shear-wave velocities. The equipment used for our ReMi evaluation included a Seismic Source DAQLink III 24-Bit ADC acquisition

system and STC-85 - SM-4 10-hertz geophones developed by Seismic Source Technology. Field acquisition of the data incorporated 24 geophone locations with equal spacing of 15 feet. SeisOpt ReMi Version 4.0 (Vspect and Disper modules) software developed by Optim LLC was used to process the collected data, and to create the shear wave velocity profile. To provide a robust data profile, both individual recordings and multiple summed (stacked) recordings were evaluated.

Each individual record of the traces is pre-processed to reduce or eliminate anomalies in the raw data. The data is then processed to produce a velocity spectrum. This process involves computing a surface wave, phase velocity dispersion spectral ratio image by p-tau and Fourier transforms across the array. This process is described in the document titled, "*Faster, Better: Shear-wave Velocity to 100 Meters Depth from Refraction Microtremor Arrays*", Bulletin of the Seismological Society of America by Louie, J, N. (2001). The resulting spectrum is in the slowness-frequency (p-f) domain. The p-f transformation helps segregate the Rayleigh Wave arrivals from other surface waves, body waves, sound waves, etc. The p-f image is generated for each record, and a final p-f image for each test is generated by combining some, or all, of the individual images.

The fundamental mode dispersion curve on the final p-f image can be seen as a distinct trend from the aliasing and wave-field transformation truncation artifact trends in the spectra. Once the fundamental mode dispersion curve is visually interpreted, data points along this curve are picked. Using the picked data points, an interactive forward-modeling process is used to model a shear wave velocity profile, with a resulting dispersion curve that approximately matches the picked data points. The process and resulting velocity profiles are able to identify the various velocity layers in the subsurface, including velocity inversions within the profile.

The results of the ReMi testing indicates that the weighted-average shear wave velocity in the upper 100 feet of the project site (VS_{100}) is approximately 1,358 feet per second (i.e., the weighted-average shear wave velocity in the upper 30 meters of the project site [VS_{30}] is approximately 414 meters per second). This indicates that the project site is classified as a Site Class "C", in accordance with ASCE 7-10 (see Appendix C).

1.3.3 SITE-SPECIFIC SEISMIC HAZARD STUDY

The site-specific seismic hazard study (SHA) has been completed to satisfy the requirements of the 2014 Oregon Structural Specialty Code (OSSC). The State of Oregon considers education facilities "special occupancy structures", which require site-specific seismic hazard analysis to be performed, based on the 2014 OSSC. The 2014 OSSC is predominantly based on the 2012 International Building Code (IBC). PSI performed this ground motion hazard analysis according to the updated provisions provided in FEMA 750 (2009) and ASCE 7 (2010), which are incorporated into the 2012 International Building Code (IBC) and 2014 OSSC.

The purpose of the SHA was to evaluate the potential seismic hazards associated with regional and local seismicity, and to estimate the effect those hazards might have on the site. PSI's work was based on the potential for regional and local seismic activity as

described in existing scientific literature, and on the subsurface conditions at the site, as determined by the geotechnical explorations and geophysical testing at the project site. Specifically, PSI's Scope-of-Services for this site-specific SHA study included the following tasks:

1) A review of the literature, including published papers, maps, open-file reports, seismic histories and catalogs, works' in progress, and other sources of information regarding the tectonic setting, regional and local geology, and historical seismic activity that might have a significant effect on the site.

2) Compilation, examination, and evaluation of existing subsurface data gathered at and in the vicinity of the site, including analyses of CPTu data and shear wave velocity measurements. This information was used to prepare a generalized subsurface profile for the site.

3) Identification of the potential seismic events appropriate for the site and characterization of those events in terms of a series of generalized design events.

4) Office studies, based on the generalized subsurface profile and the generalized design earthquakes, resulting in conclusions and recommendations concerning:
   a. Specific seismic events that might have a significant effect on the site;
   b. Potential for seismic energy amplification at the site; and,
   c. Recommended site-specific acceleration response spectrum for the site.

5) The U.S. Geological Survey (USGS) database was examined for recorded earthquakes within 1000 km of the site and at least a moment magnitude (M_W) of 4, or that caused ground shaking at the site more intense than the Modified Mercalli III intensity.

6) The 2008 USGS probabilistic seismic hazard deaggregation was performed for the project site location for a 2,475-year return period (2% probability of exceedance in 50 years). USGS 2008 provides result for the B/C interface (V_{s30} = 760 m/sec), which are modified using site modification factors.

7) Probabilistic seismic hazard analysis (PSHA) was performed using EZ-Frisk™ Version 7.65 (Build 004) by Fugro Consultants, Inc. The PSHA was based on identified seismic sources, appropriate attenuation relationships for the site using a site-specific shear wave velocity (V_{s30}), and the maximum rotational component of motion (MRC). PSI measured the V_{s30} using refraction microtremor (ReMi) geophysical methods at the project site. The PSHA was used to develop site specific bedrock response spectra for 2,475-year recurrence interval earthquakes.

8) Recommended response spectra are provided based on our site-specific analysis in accordance with ASCE 07-10 using the 2008 USGS national seismic hazard maps.

9) Other seismic hazards, including earthquake-induced landslides, regional subsidence, and fault displacement were considered.

2 SITE AND SUBSURFACE CONDITIONS

2.1 SITE DESCRIPTION

Rowe Middle School is located at 3606 SE Lake Road in Milwaukie, Oregon. The site is surrounded by residential developments to the north, south, east and west. Also, to the south runs Kellogg Creek.

Based on available topographic information, PSI understands that the northern portion of the project site is relatively flat and sits at an elevation of approximately 110 feet above mean sea level. However, the area south of the school building has varying slopes. This portion of the site appears to have a total change in slope of about 30 feet over a length of 400 feet section, from the back edge of the school to the creek.

2.2 GEOLOGIC SETTING

2.2.1 REGIONAL GEOLOGY

On a regional scale, the site is located in the northern end of the Willamette Valley Provence, which is bordered by the Cascade mountains on the east and the Tualatin mountain range to the west, with the Columbia River to the north. The valley lies approximately 200 km inland from the surface expression of the Cascadia Subduction Zone, an active plate boundary along which remnants of the Farallon Plate (the Gorda, Juan de Fuca, and Explorer plates) are being subducted beneath the western edge of the North American continent. The configuration of these plates and the location, extent, and geometry of the surface expression of the subduction zone are shown schematically on Figure 4 titled, "*Tectonic Map of the Pacific Northwest*." The subduction zone is a broad, eastward-dipping zone of contact between the upper portion of the subducting slabs of the Gorda, Juan de Fuca, and Explorer plates and the over-riding North America Plate. Although seismic activity is clearly associated with converging plate margins in other parts of the world, there is little direct evidence of significant seismic activity attributable to the Cascadia Subduction Zone.

On a local scale, the site lies in the south-western portion of the Columbia River Basin. The sediments collected into this basin record multiple Ice Age floods that originated in Montana, poured through the Cascades (via the Columbia River), and backed up in the valley before eventually draining to the Pacific Ocean. The valley is underlain by alluvial deposits near rivers and their ancestral floodplains, which is underlain by glacial till from outwash flooding that deposited a variety of silt, sand, and gravel. The glacial till is further underlain by Miocene and Pleistocene volcanic rocks of the Columbia River Basalt group. The distribution of nearby faults relative to the site is depicted on Figure 3 titled, "*Geologic Map"*; Figure 4 titled, "*Tectonic Map of the Pacific Northwest"*; and Figure 5 titled, "*USGS Fault Map*." The relationship between specific earthquakes and individual faults in this area is not well understood, since few of the faults in the area are expressed clearly at the ground surface, and the foci of local earthquakes have not been located with precision.

Precise, quantitative information regarding historic seismic activity in the Pacific Northwest is sparse. Events that may have occurred in the region prior to settlement of the Oregon Territory in the mid-nineteenth century are speculative and have not been clearly identified in terms of location, magnitude, or frequency. From the mid-nineteenth century to the time of the installation of the first dependable seismometers in the area (about 1940), reliable information regarding location and magnitude is not available, although rough estimates of these parameters have been based on records of eyewitness accounts. Since about 1940, seismographic records of increasing sophistication and accuracy are available for local events larger than about 3.5 Richter (local) magnitude (M_L). For this project, we examined a catalog (Open File Report 0-94-04) obtained from the Oregon Department of Geology and Mineral Industries (DOGAMI) containing a list of those earthquakes known to have occurred in Oregon during the period of 1883 to 1993. Recent events that may have generated measurable accelerations in the vicinity of the project site are the 1962 Vancouver Earthquake and the 1993 Scotts Mills Earthquake. The larger of these events, the M_L 5.0 Vancouver Earthquake of 1962, produced peak horizontal accelerations of approximately 0.14 g at Portland State University, approximately 55 km northeast of the site (Dehlinger, et al., 1963).

2.2.2 LOCAL GEOLOGY

Based on available geologic data, the site is described as “Alluvium” “Qal” from the Quarternary era. Which is generally described as river and stream deposits of silt, sand and gravel composed of mixed lithologies. These are largely confined to Willamette River channel and valley bottoms of tributary streams.

Based on a review of nearby well logs and the findings of this report, PSI found that lean clays underlie the project site down to about 17 feet bgs on the east side of the school; this is followed by clayey sands down to about 40 feet bgs. At 40 feet bgs our CPT exploration noted very dense gravelly sand where refusal was reached. Based on the results of the ReMi testing, PSI expects these to be very dense gravelly soils. On the north and the west side of the school, PSI encountered clayey sands from the ground surface down to about 25 feet bgs. At the location of HA-01 PSI was unable to penetrate more than six inches below the ground surface due to the presence of gravelly soils. At Hand auger 2, PSI encountered silty sand from the ground surface to a depth of 5 feet bgs.

According to the Oregon Department of Geology and Mineral Industries’ Statewide Geohazards, the project site is listed as a zone of high susceptibility to liquefaction, and is expected to be in a zone susceptible of severe earthquake shaking. The southern portion of the property is in a zone of high susceptibility to landslide hazards; however, the northern portion of the property is in a zone of low susceptibility to landslide hazard. This is due to the slope, described in section 2.1 of this report, directly south of the middle school.

2.3 SEISMIC AND TECTONIC SETTING

Due to the limited history of earthquakes in Oregon, the geologic and seismologic information available for identifying the nature of the seismicity at the site is incomplete, and large uncertainties are associated with any estimates of the probable magnitude, location, and frequency of occurrence of earthquakes that might affect the site. For this reason, several methods were used to model the seismic sources during evaluation of seismic hazard at this site. This study has relied on existing information, primarily from published articles and the USGS Quaternary fault database, to develop the input parameters for the PSHA. The PSHA input parameters generally consist of: maximum earthquake magnitude, slip rate (rate of strain accumulation), and recurrence interval (Personius, 2002).

The information that is available indicates that the seismic hazards at the site can be grouped into three independent categories: subduction zone events related to sudden slip between the upper surface of the Juan de Fuca plate and the lower surface of the North American plate, subcrustal events related to deformation and volume changes within the subducted mass of the Juan de Fuca plate, and local crustal events associated with movement on shallow, local faults within and adjacent to the Portland Basin. The tectonic setting is depicted on Figure 4 titled, "*Tectonic Map of the Pacific Northwest.*" Based on our review of currently available information, we have developed generalized design earthquakes for each of these categories. The design earthquakes are characterized by three important properties: size, location relative to the subject site, and the peak horizontal bedrock accelerations produced by the event. In this study, size is expressed in Richter (local) magnitude (M_L), surface wave magnitude (M_S), Japanese Meteorological Association magnitude (M_{JMA}), or moment magnitude (M_W); location is expressed as epicentral or focal distance, measured radially from the subject site in kilometers; and peak horizontal bedrock accelerations are expressed in gravities (1 g = 980.6 cm/sec/sec).

2.3.1 CASCADIA SUBDUCTION ZONE (CSZ)

The CSZ is a megathrust structure that forms the convergent plate boundary between the subducting Explorer, Juan de Fuca, and Gorda Plates and the overriding North America Plate, and extends from offshore northern California to southern British Columbia. Subduction is driven by eastward movement of the Explorer, Juan de Fuca, and Gorda Plates due to sea-floor spreading at the Gorda-Juan de Fuca-Explorer Mid-Ocean Ridge System. The subduction plates are the remnants of the Farallon Plate, which once underlay most of the eastern Pacific and has been converging with the North America Plate since at least the Jurassic period (Atwater, 1970; Duncan and Kulm, 1989). Tectonic elements associated with the subduction zone include: 1) an accretionary wedge of sediments deformed by a broad fold and thrust belt and east-striking strike-slip faults; 2) a forearc basin of sedimentary and igneous rocks that accumulated during plate collision, broken in places by minor Quaternary faults and folds; and 3) a volcanic arc (Cascade Range) consisting of Eocene through Quaternary volcanic rocks, active andesitic volcanoes, and numerous, mostly extensional, Quaternary faults. The historic seismicity on the CSZ is limited. There are numerous records of intraplate events on the Gorda block

and in the Puget Sound area; however, there are few or no records of these in Central CSZ. Geological studies show that great megathrust earthquakes have occurred repeatedly in the past 7,000 years (e.g., Atwater and others, 1995; Clague, 1997; Goldfinger, 2003; and Kelsey, 2005), and geodetic studies (e.g., Hyndman and Wang, 1995; Savage, et al., 2000) indicate rate of strain accumulation consistent with the assumption that the CSZ is locked beneath offshore northern California, Oregon, Washington, and southern British Columbia (Fluck and others, 1997; Wang, et al., 2001). Numerous geological and geophysical studies suggest the CSZ may be segmented (Hughes and Carr, 1980; Weaver and Michaelson, 1985; Guffanti and Weaver, 1988; Goldfinger, 1994; Kelsey, et al., 1994; Mitchell, et al., 1994; Personius, 1995; Nelson and Personius, 1996; Witter, 1999), but the most recent studies suggest that for the last great earthquake in 1700, most of the subduction zone ruptured in a single Mw 9 earthquake (Satake, et al., 1996; Atwater and Hemphill-Haley; Clague, et al., 2000).

The surface trace of the subduction zone megathrust is located offshore in deep water, so paleoseismic studies have focused on "off fault" evidence of subduction zone earthquakes, such as coseismic uplift and subsidence, earthquake-induced turbidite and tsunami records, and liquefaction features caused by seismic shaking. However, it is difficult to discern whether some of these paleoseismic features are related to displacements on crustal faults, which may or may not deform concurrent with subduction zone earthquakes (McNeill, et al., 1998; Yeats, et al., 2001; Kelsey, et al., 2002; Witter, et al., 2003).

Studies indicate coastal subsidence, tsunamis, liquefaction, and turbidite triggering consistent with a massive earthquake on the CSZ about 300 years ago. Tree rings in cedars rooted in the youngest buried soil beneath wetlands in southwestern Washington date tree death from submergence to between August AD 1699 and May AD 1700 (Atwater, et al., 1991; Atwater and Yamaguchi, 1991; Yamaguchi, et al., 1997; Jacoby, et al., 1997; Benson, et al., 2001). Historical documents from Japanese harbors inundated by a tsunami and trans-Pacific tsunami modeling show that the tsunami from a Cascadia megathrust earthquake was generated by a M_w =9 earthquake on the subduction zone on January 26, 1700 (Satake, et al., 1996; 2003).

Numerous detailed studies of coastal subsidence, tsunamis, and turbidites yield a wide range of recurrence intervals, but the most complete records (>4,000 years) indicate average intervals of 350 to 600 years between great earthquakes on the CSZ (Adams, 1990; Atwater and Hemphill-Haley, 1997; Witter, 1999; Clague, et al., 2000; Goldfinger, et al., 2002; Kelsey, et al., 2002; Kelsey, et al., 2005; Witter, et al., 2003). Magnetic anomaly studies on the Juan de Fuca plate and geodetic studies indicate a rate of oblique convergence of about 35 to 45 mm/yr in a northeast direction across the subduction zone. The total structure length is approximately 754 km. Fault rupture is expected to produce estimated M_w of 8.3 to 9.0 earthquakes.

2.3.2 SUBCRUSTAL EVENT

Estimates of the probable size, location, and frequency of subcrustal events in the Pacific Northwest are generally based on comparisons of the Cascadia Subduction Zone with

active convergent plate margins in other parts of the world and on the historical seismic record for the region surrounding Puget Sound, where significant events known to have occurred within the subducting Juan de Fuca plate have been recorded. Published estimates of the probable maximum size of these events range from moment magnitude (M_w) of 7.0 to 7.5. Published information regarding the location and geometry of the subduction zone indicates that minimum focal distances of 40 to 60 km (measured from Portland) are probable (Weaver and Shedlock, 1989). Estimates of recurrence intervals applicable to the Portland area are not available.

2.3.3 LOCAL CRUSTAL EVENT

The history of local seismic activity is commonly used as a basis for determining the size and frequency to be expected of local crustal events. Although the historical record of local earthquakes is relatively short (the earliest reported seismic event in the area occurred in 1841), it can serve as a guide for estimating the potential for seismic activity in the area. A significant earthquake could occur on a local fault near the site within the design life of the proposed structure. Such an event would cause ground shaking at the site that could be more intense than the CSZ event, though the duration would be shorter. The precise relationship between specific earthquakes and individual faults is not well understood, since few of the faults in the area are expressed at the ground surface, and the foci of the observed earthquakes have not been located with precision.

A table of the mapped faults within approximately 25 miles to the site is provided in Table 1.

Table 1: Mapped Nearby Crustal Faults

Fault Name	Approximate Distance and Direction from Site (miles)
Portland Hills Fault	0.4, East
Oatfield Fault	1.0, Southwest
Damascus Tickle Creek Fault	3.0, West
Bolton Fault	3.7, South
Grant Butte Fault	4.7, Northeast
East Bank Fault	5.5, North
Canby-Mollala Fault	5.7, Southwest
Beaverton Fault Zone	8.9, Northwest
Helvetia Lake Fault	16.0, Northeast
Lacamas Lake Fault	16.1, Northeast
Newberg Fault	19.0, Southwest
Gales Creek Fault Zone	24.5, West
Mount Angel Fault	24.9, South

The mapped faults are located on Figure 5 titled, "*USGS Fault Map*."

A summary of published USGS deaggregation data for the proposed improvements is provided below with respect to the seismic source, distance from site, and percent contribution to the seismic hazard based on the USGS probabilistic model and seismic hazard curve:

Table 2: USGS Dynamic: Conterminous U.S. 2008 (v3.3.1)

Summary statistics for above PSHA PGA deaggregation, R=distance, e=epsilon:
Contribution from this GMPE(%): 100.0
Mean src-site R= 47.67 km; M= 7.41; ε_o = 0.86σ; Mean calculated for all sources.
Modal src-site R= 83.92 km; M= 9.34; ε_o = 0.72σ; CONTRIB.= 9.19%; Mode (largest r-m bin)
MODE R*= 83.92 km; M*= 9.34; ε_o = 0.6 σ; CONTRIB.= 7.78%; Mode (largest ε_o bin)
Modal-source dmetric: distance to rupture surface (Rrup or Rcd)

Principal sources (faults, subduction, random seismicity having > 3% contribution)

Source Category:	% contr.	R(km)	M	epsilon0 (mean values).
Cascadia Megathrust	74.18	83.92	9.11	0.84
Portland Hills	16.36	3.01	6.76	-0.25
Grant Butte 50	7.13	7.98	6.19	1.21
Bolton	2.10	4.62	6.16	0.46

Based on the deaggregation of the USGS PSHA, it concludes that the Cascadia Subduction Zone Megathrust (i.e., the rupture of the entire CSZ) is the primary contributor of the probabilistic seismic hazard.

2.4 HISTORICAL SEISMICITY

There is a limited database of historic earthquakes for Oregon due to a relatively short period of written records (approximately 170 years) and a regional rate of seismicity that is lower than that in the neighboring states of California and Washington. Table 4 lists the largest historical earthquakes felt in Oregon. Figure 6, *Historical Seismicity*, depicts historical seismicity in Western Oregon on the central and southern CSZ (Burns, 2008). As shown on the figure, the Portland area is located in a zone of higher historic seismicity. Over 500 km to the south, the subducting Gorda Plate has been subject to considerably more historic earthquakes, primarily offshore of northern California and associated with the subduction trench axis. The historic record of moderate-sized earthquakes (M 5.0 to 7.0) in both the Puget Sound and Gorda Plate areas is generally associated with intraslab earthquakes. In the Puget Sound area, these moderate to large earthquakes are deep (40 to 60 km) and over 200 km from the deformation front of the subduction zone. At the Gorda Block, the earthquakes are shallower (up to 40 km) and located along the deformation front. Wong (2005) hypothesizes that due to subduction zone geometry, geophysical conditions and local geology, Oregon may not be subject to intra-slab earthquakes.

Table 3: Largest historical Earthquakes Felt in Oregon

Date	Latitude	Longitude	Magnitude	Modified Mercalli Intensity	Location
11/23/1873			6.8		Near Brookings, OR
10/12/1877	45.5	122.5	5.3	VII	Portland, OR
7/15/1936			6.4		Milton-Freewater, OR
4/13/1949	47.1	122.7	7	VIII	Olympia, WA
11/5/1962	45.6	122.6	5.3		Portland, OR
4/29/1965	47.4	122.4	6.8	VIII	Puget Sound, WA
1968	42.3	119.8	5.1		Adel, OR
4/12/1976			4.8		Maupin, OR
4/25/1992			7		Cape Mendocino, CA
3/25/1993	45.04	122.6	5.6		Scotts Mills, OR
9/21/1993	42.4	122.09	6		Klamath Falls, OR
2/28/2001	47.2	122.7	6.8		Nisqually, WA
6/14/2005	41.33	125.86	7	IV	near Crescent City, CA

Notes: 1) Data from Advanced National Seismic System (ANSS), US Geological Survey (USGS), and Johnson A. and Madin, I, 1994, Earthquake Database for Oregon, 1983 through October 25, 1993: Oregon Department of Geology and Mineral Industries Open File Report 0-94-4.
2) Magnitudes are M_s, M_L, mb or based on felt area of Modified Mercalli Intensity. Maximum reported magnitudes are listed on the table.

2.5 SUBSURFACE CONDITIONS

To evaluate the sites subsurface conditions, PSI utilized, CPT's, Geoprobes and Hand augers. CPT logs provide a soil behavior type and do not identify the soil. So, in order to build the soil profile, PSI relied on both the Geoprobe logs and the CPT logs combined with engineering judgement. PSI encountered approximately 3 inches of topsoil materials in proposed development areas vegetated with grass. Underlying the surficial materials, approximately 20 feet of sandy silt materials underlie the site. At about 20 feet below the ground surface the soil type changes to a silty sand.

PSI's boring logs are presented in Appendix A. These logs include soil descriptions, stratifications, and location of the samples obtained. The stratifications shown on the boring logs represent the conditions only at the actual exploration location. Variations between exploration locations may occur and should be expected. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual.

PSI encountered groundwater at a depth of approximately 30 feet bgs in exploration locations CPT-01, and GP-02. Based on the depth to groundwater, groundwater is not anticipated to impact construction, however perched groundwater may exist in isolated locations at certain times of year and should be accounted for during construction.

3 GROUND MOTION HAZARD ANALYSIS

PSI has conducted a Probabilistic Seismic Hazard Analysis (PSHA) and a Deterministic Seismic Hazard Analysis (DSHA) to develop seismic design response spectrum and design acceleration parameters for comparison to the general procedure spectrum and design parameters. PSI's seismic hazard analyses were performed for a site located at a coordinate of 45.4332 degrees North, -122.6262 degrees West.

3.1 PROBABILISTIC SEISMIC HAZARD ANALYSIS

The input for a Probabilistic Seismic Hazard Analysis (PSHA) consists of three significant components:

1) Identification of earthquake sources, locations, and physical characteristics (e.g., dip angle, rupture width, length, etc.);
2) Characterization of the seismicity rate for each seismic source using an appropriate model (e.g., exponential or normal distribution); and,
3) Selection of empirical attenuation relationships that describe how the characteristics of the strong ground motions change as the waves propagate from the seismic source to a given site location.

These components include aleatory and epistemic uncertainties associated with our limited knowledge and understanding of the fault sources and their predicted behavior. Aleatory uncertainty describes the probabilistic randomness associated with estimating fault behavior and earthquakes. Epistemic uncertainty is associated with our incomplete knowledge or understanding of the seismic model or parameters. The PSHA method combines and incorporates these uncertainties to obtain a probabilistic ground motion, which is defined by the likelihood of an earthquake of a specific magnitude occurring within a specific length of time.

A logic tree is used to evaluate these uncertainties in a PSHA. A logic tree assigns each model parameter a "tree branch" and a relative weight (some fraction of 1.0), based on the level of confidence in that quantified parameter. Multiple levels of tree branches can be assigned corresponding to levels of confidence associated with factors such as fault location, appropriate recurrence model, or probability of activity. The seismic hazard is then calculated by summing up the weighted hazards, each calculated independently from the branches of the logic tree.

Probabilistic seismic hazard analyses are typically completed in one of two ways to generate ground surface earthquake characteristics:

1) A PSHA is completed using empirical attenuation relationships for estimating ground motion parameters (e.g., peak acceleration, acceleration response spectra) on bedrock. A dynamic soil response model is then used to simulate the propagation of representative earthquake motions from a defined bedrock layer through a soil column, with pertinent soil properties identified through a geotechnical investigation at the site. This modeling provides the characteristics of

the design earthquake motions at specified depths of interest, usually at the ground surface or at depths representative of the proposed foundations.

2) The PSHA is completed using attenuation relationships derived from historical earthquake recording stations at soil sites. The individual attenuation relationships provide ground surface characteristics as a function of the site conditions at the recording station. In this procedure, the ground surface motions (i.e., PGA, PGV, response spectra) are obtained directly from the PSHA results.

Site-Specific PSHA, located in appendix D, depicts the GMPEs used in PSI's analysis.

PROBABILISTIC CONSIDERATIONS

The probability of occurrence of an earthquake of a specific magnitude at a given location is commonly expressed by its return period, i.e., the average length of time between successive occurrences of an earthquake of that size or larger at that location. The return period of a design earthquake can be calculated once a project design life and some measure of the acceptable risk that the design earthquake might occur or be exceeded are specified. For this project, a design life of 50 years and an acceptable probability of exceedance of 2% have been considered, in accordance with the requirements of the 2014 OSSC. The relationship between the return period, the design life, and the exceedance probability is such that the choice of a 50-year design life and a 2% probability of exceedance result in a return period of approximately 2,475 years.

3.2 DETERMINISTIC SEISMIC HAZARD ANALYSIS

PSI performed a screening for the Deterministic Seismic Hazard Analysis (DSHA) concurrently with the PSHA to estimate the ground motions at the site, and to help define the risk-targeted maximum considered earthquake (MCE_R) in accordance with Section 21.2.2 of ASCE 7 (2010). A DSHA is completed by estimating ground motions for characteristic magnitude earthquakes at the location of active seismic sources in the region. Typically, the characteristic earthquakes are analyzed using an average of the same attenuation relationships used for the PSHA for consistency.

The deterministic spectral response acceleration at each period is defined as the largest 84th percentile, 5 percent damped spectral response acceleration in the direction of maximum horizontal response computed, i.e., the maximum rotated component (MRC), at that period for characteristic earthquakes on all known active faults within the region. The ordinates of the deterministic ground motions response spectrum should not be taken as lower than the corresponding ordinates of the response spectrum (i.e., the "Deterministic Lower Limit") determined in accordance with Figure 21.2-1, where F_a and F_v are determined using Tables 11.4-1 and 11.4-2, respectively.

Deaggregation of the PSHA indicates that the seismic source contributing the most seismic hazard to this project site is the M_w 9.0 megathrust CSZ earthquake. The DSHA was evaluated with respect to the "Deterministic Lower Limit", which was calculated based on ASCE 7-10, Figure 21.2-1. PSI concluded that the DSHA was higher than the "Deterministic Lower Limit".

3.3 RESULTS

ASCE 7 (2010) defines the site-specific MCE_R as the lower of the probabilistic MCE_R and the deterministic MCE_R. The ground motion associated with the probabilistic MCE_R is defined as a 2 percent in 50-year hazard level spectrum with 5 percent damping. The probabilistic MCE_R was determined to be less than the deterministic MCE_R. The probabilistic MCE_R has been adjusted by the risk-targeted coefficients (C_{RS} and C_{R1}) in Chapter 22 of ASCE 7-10, and reduced by a factor of 2/3, in accordance with Section 21.3, to obtain the design response spectrum, S_a.

As indicated in ASCE 7-10, when the site-specific procedure is used to determine the ground motion in accordance with Section 21.3, the parameter S_{DS} shall be taken as the spectral acceleration, S_a, obtained from the site-specific spectra at a period of 0.2s, except that it shall not be taken less than 90 percent of the peak spectral acceleration, S_a, at any period larger than 0.2 s. The parameter S_{D1} shall be taken as the greater of the spectral acceleration, S_a, at a period of 1 s or two times the spectral acceleration, S_a, at a period of 2 sec. The parameters S_{MS} and S_{M1} shall be taken as 1.5 times S_{DS} and S_{D1}, respectively. The value obtained as described above shall not be less than 80 percent of the values determined in accordance with ASCE 7-10 Section 11.4.3 for S_{MS} and S_{M1} and Section 11.4.4 for S_{DS} and S_{D1}. The results of the evaluation are shown in appendix D, and summarized in Table 4 which summarizes the comparison of the response spectra. The recommended spectrum is also graphically depicted in APPENDIX D.

Table 4: Recommended Site-Specific Design Response Spectrum

Spectral Period	2% in 50 Year Mean Prob. (1)	Risk Coeff. (C_R) (2)	Prob. MCE_R (3)	84th Percentile Mean Det. (4)	Det. Lower Limit (5)	Site-Specific MCE_R (6)	2/3 Site-Specific MCE_R (7)	General Design Response (8)	80% of General Design Response (9)	Recommended Site-Specific Design Response Spectrum (10)
(seconds)	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*
0.000	0.420	0.901	0.379	1.335	0.606	0.379	0.252	0.283	0.227	0.252
0.085	0.646	0.901	0.582	2.025	---	0.582	0.388	0.548	0.439	0.439
0.100	0.712	0.901	0.641	2.177	---	0.641	0.428	0.599	0.479	0.479
0.117	0.774	0.901	0.698	2.326	---	0.698	0.465	0.657	0.525	0.525
0.200	0.988	0.901	0.890	2.793	1.515	0.890	0.593	0.657	0.525	0.593
0.300	0.996	0.898	0.894	2.897	1.515	0.894	0.596	0.657	0.525	0.596
0.400	0.996	0.895	0.891	2.920	1.515	0.891	0.594	0.657	0.525	0.594
0.500	0.930	0.892	0.830	2.865	1.515	0.830	0.553	0.657	0.525	0.553
0.586	0.849	0.889	0.755	2.705	1.515	0.755	0.503	0.657	0.525	0.525
0.600	0.836	0.889	0.743	2.678	1.515	0.743	0.495	0.641	0.513	0.513
0.700	0.785	0.885	0.695	2.526	1.515	0.695	0.463	0.549	0.439	0.463
0.800	0.742	0.882	0.654	2.346	1.515	0.654	0.436	0.481	0.384	0.436
0.900	0.695	0.879	0.611	2.150	1.515	0.611	0.407	0.427	0.342	0.424
1.000	0.652	0.876	0.571	1.984	1.515	0.571	0.381	0.384	0.308	0.424
1.100	0.604	0.876	0.529	1.803	1.515	0.529	0.353	0.350	0.280	0.353
1.200	0.565	0.876	0.495	1.649	0.754	0.495	0.330	0.320	0.256	0.330

Table 4: Recommended Site-Specific Design Response Spectrum (Cont.)

Spectral Period	2% in 50 Year Mean Prob. (1)	Risk Coeff. (C_R) (2)	Prob. MCE_R (3)	84th Percentile Mean Det. (4)	Det. Lower Limit (5)	Site-Specific MCE_R (6)	2/3 Site-Specific MCE_R (7)	General Design Response (8)	80% of General Design Response (9)	Recommended Site-Specific Design Response Spectrum (10)
(seconds)	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*	*(g)*
1.300	0.531	0.876	0.465	1.513	0.692	0.465	0.310	0.296	0.237	0.310
1.400	0.501	0.876	0.439	1.395	0.638	0.439	0.292	0.275	0.220	0.292
1.500	0.472	0.876	0.413	1.291	0.593	0.413	0.275	0.256	0.205	0.275
1.600	0.445	0.876	0.389	1.180	0.553	0.389	0.260	0.240	0.192	0.260
1.700	0.421	0.876	0.369	1.084	0.519	0.369	0.246	0.226	0.181	0.246
1.800	0.401	0.876	0.351	1.001	0.488	0.351	0.234	0.214	0.171	0.234
1.900	0.381	0.876	0.334	0.927	0.461	0.334	0.222	0.202	0.162	0.222
2.000	0.363	0.876	0.318	0.863	0.437	0.318	0.212	0.192	0.154	0.212
2.100	0.338	0.876	0.296	0.805	0.415	0.296	0.198	0.183	0.146	0.198
2.200	0.317	0.876	0.278	0.753	0.395	0.278	0.185	0.175	0.140	0.185
2.300	0.299	0.876	0.262	0.708	0.377	0.262	0.175	0.167	0.134	0.175
2.400	0.280	0.876	0.245	0.667	0.361	0.245	0.164	0.160	0.128	0.164
2.500	0.264	0.876	0.231	0.630	0.346	0.231	0.154	0.154	0.123	0.154
2.600	0.248	0.876	0.218	0.597	0.332	0.218	0.145	0.148	0.118	0.145
2.700	0.235	0.876	0.206	0.566	0.319	0.206	0.137	0.142	0.114	0.137
2.800	0.223	0.876	0.195	0.538	0.307	0.195	0.130	0.137	0.110	0.130
2.900	0.212	0.876	0.186	0.513	0.296	0.186	0.124	0.133	0.106	0.124
3.000	0.203	0.876	0.178	0.489	0.286	0.178	0.118	0.128	0.103	0.118
3.100	0.194	0.876	0.170	0.468	0.277	0.170	0.113	0.124	0.099	0.113
3.200	0.185	0.876	0.162	0.448	0.268	0.162	0.108	0.120	0.096	0.108
3.300	0.178	0.876	0.156	0.429	0.259	0.156	0.104	0.117	0.093	0.104
3.400	0.171	0.876	0.150	0.412	0.251	0.150	0.100	0.113	0.090	0.100
3.500	0.165	0.876	0.144	0.397	0.244	0.144	0.096	0.110	0.088	0.096
3.600	0.159	0.876	0.139	0.382	0.237	0.139	0.093	0.107	0.085	0.093
3.700	0.154	0.876	0.135	0.368	0.231	0.135	0.090	0.104	0.083	0.090
3.800	0.149	0.876	0.130	0.355	0.224	0.130	0.087	0.101	0.081	0.087
3.900	0.144	0.876	0.126	0.342	0.218	0.126	0.084	0.099	0.079	0.084
4.000	0.140	0.876	0.123	0.331	0.213	0.123	0.082	0.096	0.077	0.082

Table 5 Notes:
(1) From EZ-Frisk PSHA output.
(2) From ASCE 7-10 Figures 22-17 and 22-18.
(3) = (1) x (2).
(4) From EZ-Frisk DSHA output.
(5) Calculated based on Fa and Fv per ASCE 7-10.
(6) The lesser of (3) and greater of (4) and (5).
(7) = (6) x2/3
(8) Calculated based on Sds and Sd1 per ASCE 7-10, Section 11.4.5.
(9) = (8) x 0.8
(10) Generally = (9); increased at periods of 0.2 and 1.0 seconds due to provisions in ASCE 7-10, Section 21.4.

PSI has presented a summary of the seismic design parameters is presented in accordance with ASCE 7-10 and ASCE 41-13 in Table 5.

Table 5: Summary of Seismic Design Parameters

Building Code	S_{XS}	S_{X1}	S_{DS}	S_{D1}
ASCE 41-13: BSE-1E (20% in 50 years)	0.349	0.186	---	---
ASCE 41-13: BSE-1N (10% in 50 years)	0.657	0.384	---	---
ASCE 41-13: BSE-2E (5% in 50 years)	0.788	0.453	---	---
ASCE 41-13: BSE-2N (2% in 50 years)	0.985	0.576	---	---
ASCE 7-10 (2% in 50 years) Code-Based (Table 5)	---	---	0.657	0.384

3.4 SEISMIC HAZARD DISCUSSION

3.4.1 SURFACE RUPTURE

The Portland Hills Fault is located approximately 0.4 miles to the east. Based on the limited information about this fault and its low displacement rate (estimated to be less than 0.2 millimeters per year), it is our opinion that the potential for fault rupture at the site is low.

3.4.2 LIQUEFACTION POTENTIAL

In general, liquefaction is a condition where soils lose intergranular strength due to abrupt increases in pore water pressure. Pore water pressure increases typically occur during dynamic loading such as ground shaking during a seismic event. Liquefaction, should it occur on a site, can induce ground settlement and lateral spreading, which can result in damage to the structures. For liquefaction to occur, the following conditions must be present:

- The soil sediments must be in saturated or near-saturated conditions. At least 80-85 percent saturation is generally considered necessary for the liquefaction to occur.
- The soil must be predominately composed of non-plastic material such as sand or silt.
- The soil must be in a relatively loose state.
- The soil must be subjected to dynamic loading, such as an earthquake.

Based on the subsurface conditions encountered at the site, the potential for liquefaction is high at the site during a seismic event due to very shallow groundwater and loose sands with low fines content. The site is mapped as having high liquefaction potential, based on the Oregon Department of Geology and Mineral Industries (DOGAMI) and the results

of our liquefaction analysis confirms this assessment of the sites liquefaction susceptibility.

The estimated liquefaction settlement analysis has been performed based on worst-case scenarios with conservative modeling equations and parameters. Results of our studies indicate that the soils from approximately 32 to 40 feet below ground surface may liquefy under a strong earthquake of magnitude 9.3 at a maximum considered earthquake acceleration of 0.408g, based on data obtained from the Unified Hazard Tool (Reference 3). This is illustrated in the liquefaction analysis summary in the Appendix D.

Based on our analysis of the soils encountered during our investigation, the soils encountered are susceptible to liquefaction, with a potential for liquefaction-induced settlement of approximately 1 inch during a major seismic event with the liquefaction occurring at depths as shallow as 32 feet bgs and intending down to depths as low as 40 feet bgs. Due to the fact that only 8 feet of confined liquefiable soils exist below the site a depth of 32 feet and the fact that only 1 inch of settlement is anticipated, PSI does not believe that these liquefaction induced settlements will manifest at the surface.

3.4.3 SLOPE STABILITY

The site is mapped on the DOGAMI HazVu website as “Landsliding Unlikely” on the northern end of the site and as “Landsliding Likely” on the south end of the site where a 3 Horizontal to 1 Vertical slope exists. A slope stability analysis to assess the conditions of this slope were outside our scope of services on this project so further assessment of landslide susceptibility at this site has not been provided.

3.4.4 OTHER POTENTIAL HAZARDS

PSI offers Table 6 below as a summary of other potential site hazards noted during our investigation.

Table 6: Qualitative Seismic Site Assessments*

Seismic Amplification	Severe	The site has the potential for very strong to severe earthquake shaking.
Flood Plain	Low	The site is not located in the effective FEMA 100-year flood plain.

Based on DOGAMI HazVu http://www.oregongeology.org/hazvu/

4 CONCLUSIONS AND RECOMMENDATIONS

The subsurface explorations indicate that near surface soils generally consist of fine-textured clayey soils. Soft soil conditions were encountered in proposed development areas and should be appropriately stabilized as recommended in the following Subgrade Preparation section.

4.1 SITE PREPARATION

4.1.1 SITE STRIPPING

PSI recommends stripping and removing existing vegetation, topsoil, existing concrete, and asphalt from proposed development and site grading areas. Topsoil was observed approximately 7 to 15 inches thick in our soil borings. Unknown fill materials, demolition debris or existing structures and remnants of previous structures encountered during site excavation and site construction operations should be completely removed from proposed development areas. Though not anticipated to be encountered below the surficial materials, any unsuitable materials encountered should be removed including vegetation/organics, organic soils, undocumented fills, soft/wet soils, and construction debris.

4.1.2 SUBGRADE PREPARATION

After stripping proposed development areas, the exposed subgrade should be evaluated by the Geotechnical Engineer for subgrade support conditions. Soft soils should be completely removed around building areas.

A proof roll using a fully-loaded tandem-axle truck should be performed on finished subgrade elevations to identify any loose or unsuitable areas of subgrade. Loose or unsuitable soils in these areas should be over-excavated and replaced with properly placed and properly compacted structural fill, in accordance with section 4.1.4 of this report.

4.1.3 WET WEATHER CONSTRUCTION

It has been our experience that during warm, dry weather, the moisture content of the upper few feet of fine-grained soils (silts and clays) will decrease, below this depth the moisture content of the soil tends to remain relatively unchanged and well above the optimum moisture content for compaction. As a result, the subcontractor must use care to protect clayey or silty subgrade from disturbance by construction traffic, particularly during wet weather. The contractor must employ construction equipment and procedures that prevent disturbance and softening of the subgrade soils. The use of excavation equipment equipped with smooth-edged buckets for excavation with the concurrent placement of granular work pads tends to minimize the potential for subgrade disturbance. Permanent cut and fill slopes should be limited to 2-horizontal to 1-vertical (2H:1V) or flatter to minimize erosion and the risk of slope instability.

4.1.4 STRUCTURAL FILL MATERIALS

The Geotechnical Engineer should observe the subgrade prior to placing structural fill or structures to document the subgrade condition and stability. In areas where unsuitable soils are encountered, and over-excavation occurs below footings, the over-excavation and structural fill should extend laterally a minimum distance that is equal to the depth of the excavation below the footing.

Proper control of placement and compaction of new fills should be monitored by the Geotechnical Engineer. Fill materials should be placed in individual lifts not exceeding 12 inches in un-compacted thickness for large compactors such as rollers and hoe-packs. Smaller compactors such as plate compactors and jumping jacks may require thinner lifts to meet compaction requirements. Each lift is to be compacted to a minimum of 95 percent of the maximum dry density within 2 percent of the optimum moisture content, as determined in accordance with ASTM D1557 (modified Proctor). A sufficient number of in-place density tests should be performed on each lift of fill, as determined by PSI.

Tested structural fill materials that do not achieve either the required dry density or moisture content range shall be recorded, the location noted, and reported to the Contractor and Owner. A re-test of the area should be performed after the Contractor performs remedial measures.

Re-Use of Native Soils

Near surface coarse grained soils such as sand and gravel may be considered for re-use as structural fill provided they can be suitably moisture conditioned to meet their required compaction requirement, but should not be used below footings. Onsite soils to be reused should be absent of deleterious materials (e.g., construction debris, organics) and have particle sizes of no greater than 3 inches. It has been our experience that when fine grained soils, such as these onsite soils, are outside of optimum moisture content, they may be difficult to properly moisture condition. Special care should be taken if these materials are to be re-used, especially during wet-weather conditions as they may become difficult if not impossible to compacted.

During construction, the Geotechnical Engineer should confirm the acceptability of soils onsite for the re-use as structural fill.

Structural Fill

Fill placed at the project site should be installed as properly compacted structural fill. PSI recommends using imported granular material for structural fill, especially if placement and compaction take place in wet weather. Imported granular material for structural fill should consist of pit-run or quarry-run rock, crushed rock, crushed gravel, or sand. The material should be well-graded between coarse and fine material, angular in shape, have a plasticity index of 8 or less, and have less than 10 percent by weight passing the U.S. Standard No. 200 Sieve (75-µm).

Drain Rock

Drain rock, “capillary break” material, or “free-draining” material should have less than 2% passing the No. 200 (75-µm) sieve (washed analysis). Examples of materials that would satisfy this requirement include ¾-inch to ¼-inch or 1½-inch to ¾-inch crushed rock.

Utility Trench Backfill

Utilities trenches should be backfilled with granular structural fill such as sand, sand and gravel, fragmented rock, or recycled concrete with constituents less than 2 inches in maximum diameter, and less than 10 percent passing the U.S. Standard No. 200 sieve (washed analysis).

Utility trench backfill should be placed in accordance with our recommendations for compaction of structural fill listed above. However, areas greater than 3 feet in depth, and at least 5 feet outside of the edge of footings may use the compaction criteria of at least 90 percent of ASTM D1557. A sufficient number of in-place density tests should be performed on each lift of the fill as determined by PSI. Compaction by jetting or flooding should not be permitted.

4.2 EXCAVATIONS

Excavations should be made in accordance with applicable Federal and State Occupational Safety and Health Administration regulations. Near surface soil may be considered class C soils and may be temporarily cut at slopes as steep as 1 Horizontal to 1 Vertical. Actual inclinations will ultimately depend on the soil conditions encountered during earthwork and should be evaluated in the field. While PSI may provide certain approaches for trench excavations, the contractor should be responsible for selecting the excavation technique, monitoring the trench excavations for safety, and providing shoring, as required, to protect personnel and adjacent improvements. The information provided below is for use by the Owner and Engineer and should not be interpreted to mean that PSI is assuming responsibility for the Contractor’s actions or site safety.

The Contractor should be aware that excavation and shoring should conform to the requirements specified in the applicable local, state, and federal safety regulations, such as OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations. PSI understands that such regulations are being strictly enforced, and if not followed, the Contractor may be liable for substantial penalties.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering the excavations. The bottom of the excavations should be sloped to a collection point. Collected water within the foundation and utility trench excavations should be discharged to a suitable location outside the construction limits.

Excavation and construction operations may expose the on-site soils to inclement weather conditions. The stability of exposed soils may deteriorate due to a change in

moisture content or the action of heavy or repeated construction traffic. Accordingly, foundation and pavement area excavations must be protected from the elements and from the action of repetitive or heavy construction loadings.

4.3 FOUNDATIONS

The proposed building can be supported on conventional shallow spread and strip footings at this project site, provided the subgrade is prepared in accordance with the recommendations in this report.

Shallow foundations should bear on existing soils compacted to a firm and unyielding state, as determined by the geotechnical engineer, or structural fill compacted in accordance with section 4.1.4 of this report. Foundations founded on subgrades prepared in this manner may be designed with an allowable bearing pressure 3,000 pounds per square (psf). This value applies to the total of dead load and/or frequently applied live load. This recommended net allowable bearing capacity can be increased by one-third for the total of all loads (i.e., dead, live and wind or seismic). The ultimate bearing capacity can be estimated by multiplying the net allowable bearing capacity by a factor of 3.0.

Horizontal forces can be resisted partially or completely by frictional forces developed between the base of the spread footings and the underlying soils. The total shearing resistance between the foundation footprint and the soil should be taken as the normal force (i.e., the sum of all vertical forces, dead load plus real live load, times the coefficient of friction between the soil and the base of the footing). PSI recommends utilizing an ultimate coefficient of friction value of 0.25 for the near surface clayey soils. If additional lateral resistance is required, ultimate passive earth pressures against embedded footings or walls can be computed using a pressure based on an equivalent fluid with a unit weight of 250 pcf. This value assumes that backfill around footings will be placed as engineered fill, and that a factor of safety for the passive pressure will be utilized in the design.

PSI recommends that column footings and wall-type footings have a minimum width of 24 inches and 18 inches, respectively, even if those dimensions result in stresses below the allowable bearing capacity. The purpose of limiting the footing size is to prevent excessive shear deformation and to provide for vertical stability. Additionally, exterior, and interior footings should be embedded 18 inches and 12 inches below finished grades, respectively.

Around the vicinity of CPT-01 there is a slope of about 3:1. If the building is to be constructed with 5 feet of this slope PSI recommends that footings be extended at least 4 feet below existing grades. Footings more than 5 feet away from the slope may be founded at the depths described above, but if different footing heights are required footing should be stepped down maintaining a level base of the base of footings. Please note this deeper section of footing is based on the current ground surface. If modifications to the slope are to occur PSI should be notified to assist in determining the appropriate depth of footings in these areas.

4.4 SETTLEMENT

The building foundation loads, and floor live loads will cause settlement due to consolidation, or compression, of the underlying soils. Settlements will vary depending upon the foundation systems utilized. For shallow foundations constructed on subgrades prepared in the manner discussed in this report, PSI calculates that a 5-foot square column and 18-inch wide strip with 3,000 pounds per square foot of bearing pressure, embedded 18 inches, will experience less than 1-inch of static settlement and less than ½ inch of differential static settlement over a 40-foot span.

4.5 FLOOR SUPPORT

Where slab-on-grade floors are constructed, the slab-on-grade should be underlain by firm native soils or engineered structural fill and at least 8 inches of clean granular material to provide uniform support and minimize the risk of the capillary rise of moisture. Granular material, such as ¾-inch to ¼-inch crushed rock having less than 2 percent passing the No. 200 sieve would be suitable for this purpose. The crushed rock should be compacted to a firm and unyielding state, as determined by the Geotechnical Engineer. In addition, it will be appropriate to install a durable vapor-retarding membrane beneath the slab-on-grade to limit the risk of damp floors in areas that will have moisture-sensitive materials placed directly on the floor. The vapor-retarding membrane should be installed in accordance with the manufacturer's recommendations.

In our opinion, for subgrade consisting of a minimum of 8-inch thick section of crushed drain rock, prepared as recommended and properly compacted fill, a modulus of subgrade reaction, *k* value, of 150 pounds per cubic inch (pci) may be used in the grade slab design based on values typically obtained from 1-foot diameter plate load tests. However, depending on how the slab load is applied, the value will have to be geometrically modified. The value should be adjusted for larger areas using the following expression for cohesionless soil:

Modulus of Subgrade Reaction, $k_s = \frac{k}{B}$ for cohesive soil; and,

where: k_s = coefficient of vertical subgrade reaction for loaded area;
k = coefficient of vertical subgrade reaction for 1-foot diameter circular area; and,
B = width of area loaded, in feet

4.6 RETAINING WALLS

Design lateral earth pressures against a retaining wall or other embedded structure depend on the drainage condition provided behind the wall, the geometry of the backfill slope, and the type of construction, i.e., the ability of the wall to yield. The two possible conditions regarding drainage include providing drainage to the area behind the

embedded wall or designing the structure to be water tight. We recommend that permanent drainage be provided behind retaining walls. In the event that any other embedded structures, such as utility vaults, are designed to be watertight, it should be assumed that the water table may rise to the ground surface at some time during the design life of the development.

The two possible conditions regarding the ability of the wall to yield include the active and at-rest earth pressure cases. The active earth pressure case is applicable to a wall that is capable of yielding slightly away from the backfill by either sliding or rotating about its base. A conventional cantilevered retaining wall is an example of a wall that can develop the active earth pressure case by yielding. The at-rest earth pressure case is applicable to a wall that is considered to be relatively rigid and laterally supported at the top and bottom and therefore is unable to yield.

PSI recommends that crushed drain rock be used for backfill within 2 feet of the retaining wall. The crushed drain rock section should be wrapped in an approved geotextile filter fabric. Assuming that the backfill area is horizontal and will be completely drained, yielding walls can be designed for an active earth pressure using an equivalent fluid unit weight of 35 pounds per cubic foot (pcf). Correspondingly, non-yielding walls can be designed for an at-rest earth pressure using an equivalent fluid unit weight of 55 pcf.

If groundwater is allowed to build up behind the retaining wall, hydrostatic pressure should be applied in addition to the earth pressures.

To account for the surcharge loading due to a uniformly distributed floor live load, an additional lateral pressure of half the floor live load should be added to the above-mentioned lateral earth pressures. To account for seismic loading, the earth pressures should be increased by at least 40 percent. The resultant of the additional seismic force can be assumed to act as a distance of 0.6H measured up from the base of the wall, where H equals the overall height of the wall.

Over-compaction of the backfill behind walls should be avoided. In this regard, we recommend compacting the backfill to about 90% of the maximum dry density (ASTM D1557). Heavy compactors and large pieces of construction equipment should not operate within 5 feet of embedded walls to avoid the buildup of excessive lateral pressures. Compaction close to the walls should be accomplished using hand-operated vibratory plate compactors.

4.7 DRAINAGE

Based on subsurface soil conditions, PSI does not recommend storm water infiltration for disposal. Near surface soils are fine textured and likely slow draining. Storm water at the site should be collected and appropriately discharged to approved location.

PSI recommends footing drains be placed around the exterior of the building foundation to reduce the potential for lateral migration of moisture into the building envelope. Roof drains should be connected to a tight-line pipe leading to storm drain facilities.

Pavement surfaces and open-space areas should be sloped such that surface water runoff is collected and routed to suitable discharge points to prevent ponding of surface water and saturation of the base course. This is particularly important in cut sections or at low points within the paved areas, such as around stormwater catch basins. Effective means to prevent saturation of the base course include installing weep holes in the sidewalls to catch basins. PSI also recommends that ground surfaces adjacent to buildings be sloped to facilitate positive drainage away from the buildings.

4.8 ASPHALT COVERED TENNIS COURTS

On October 12, 2017 Professional Service Industries was contacted by Heery via email and asked to evaluate subsurface conditions around the existing tennis courts located in the northeast corner of the property. It is PSI's understanding that NCSD would like to construct two new tennis courts directly adjacent to the existing courts. NCSD expressed concerns regarding cracking that is occurring at the existing tennis courts, and wanted recommendations to prevent cracking in the new courts. Upon evaluations of the site conditions PSI notice ponding water on the existing courts, and did not notice any movement of the slight slope in this vicinity. These clues lead PSI to believe that the cracking is likely being cause by poor drainage or frost heave. Poor drainage leads to saturation of the native soil directly below the existing asphalt which leads to weakening of the soil and thus cracks in the asphalt. Frost heave occurs when moist to wet fine grained soil below the existing pavement freezes. When the water in the soil freezes it causes volume of the mass below the asphalt to expand, which leads to cracking in the asphalt.

PSI recommends that the subgrade in this area be prepared as instructed in section 4.1.2. Further, PSI recommends the soil in this area be over-excavated at least 18 inches, which is below the frost depth in the Portland area, and replaced with 18 inches of free draining material as specified in section 4.1.4 of this report. Finally, the instructions for drainage in section 4.7 of this report, should be followed as well. This includes sloping the tennis courts slightly such that surface water is collected and routed to suitable discharge points. Also, footing drains must be placed around the exterior of the asphalt pad to ensure moisture does not weaken the soil directly below the drain rock.

5 GEOTECHNICAL RISK AND REPORT LIMITATIONS

The concept of risk is an important aspect of the geotechnical evaluation. The primary reason for this is that the analytical methods used to develop geotechnical recommendations do not comprise an exact science. The analytical tools which geotechnical engineers use are generally empirical and must be used in conjunction with engineering judgment and experience. Therefore, the solutions and recommendations presented in the geotechnical evaluation should not be considered risk-free and, more importantly, are not a guarantee that the interaction between the soils and the proposed structure will perform as planned. The engineering recommendations presented in the preceding sections constitute PSI's professional estimate of those measures that are necessary for the proposed structure to perform according to the proposed design based on the information generated and referenced during this evaluation, and PSI's experience in working with these conditions.

The recommendations submitted for this project are based on the information provided to PSI. If there are any revisions to the plans for this project or if deviations from the subsurface conditions noted in this report are encountered during construction, PSI must be notified immediately to determine if changes to PSI's recommendations are required. If PSI is not retained to perform these functions, PSI cannot be responsible for the impact of those conditions on the performance of the project.

The stratification shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratification represents the approximate boundary between subsurface materials; however, the actual transition may be gradual, abrupt, or not clearly defined.

The Geotechnical Engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

6 DESIGN REVIEW AND CONSTRUCTION MONITORING

After plans and specifications are complete, PSI should review the final design and specifications to verify that the earthwork and foundation recommendations are properly interpreted and implemented. It is considered imperative that the Geotechnical Engineer and/or their representative be present during earthwork operations and foundation installations to observe the field conditions with respect to the design assumptions and specifications. PSI will not be responsible for interpretations and field quality-control observations made by others. PSI would be pleased to provide these services for this project. This report has been prepared for the exclusive use of North Clackamas School District for specific application to building additions at Rowe Middle School in Milwaukie, Oregon.

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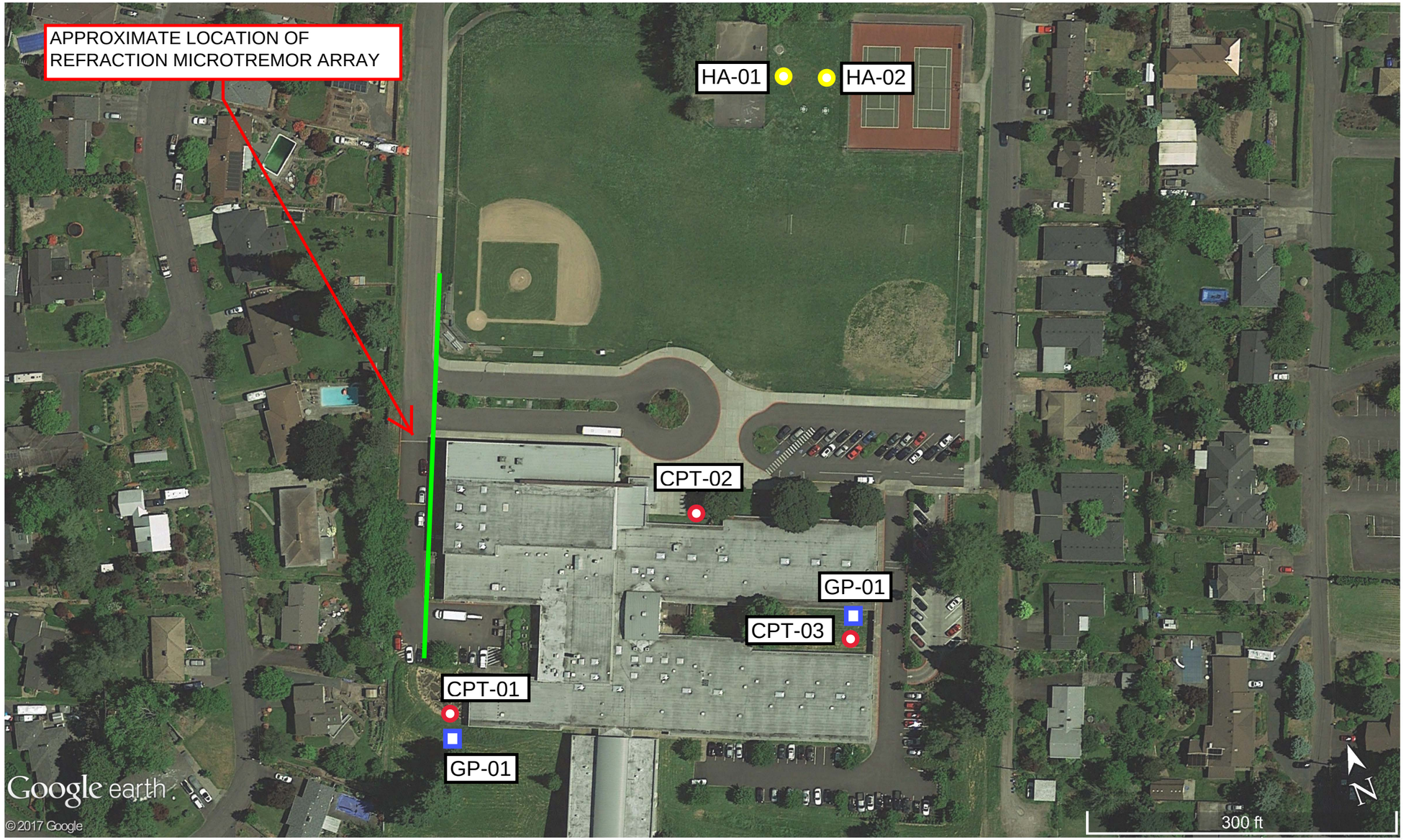
FIGURES

Intertek psi	DATE: NOVEMBER 2017	PROPOSED ROWE MIDDLE SCHOOL EXPANSION 3606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**SITE VICINITY MAP**	**FIGURE 1**



Legend:

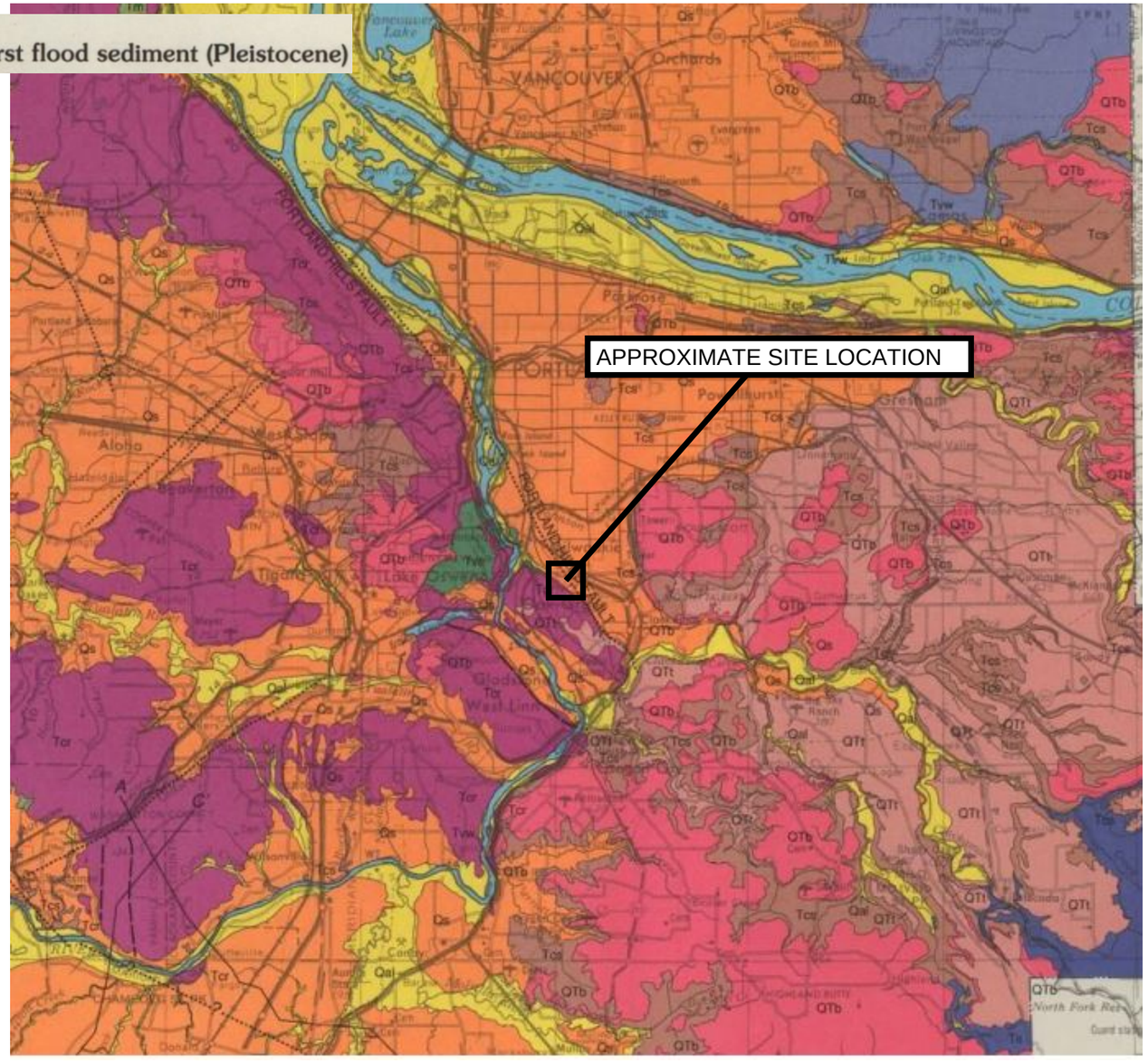
- Cone penetration Test Location
- Geoprobe Boring
- Refraction Microtremor Line
- Hand Auger

Notes:

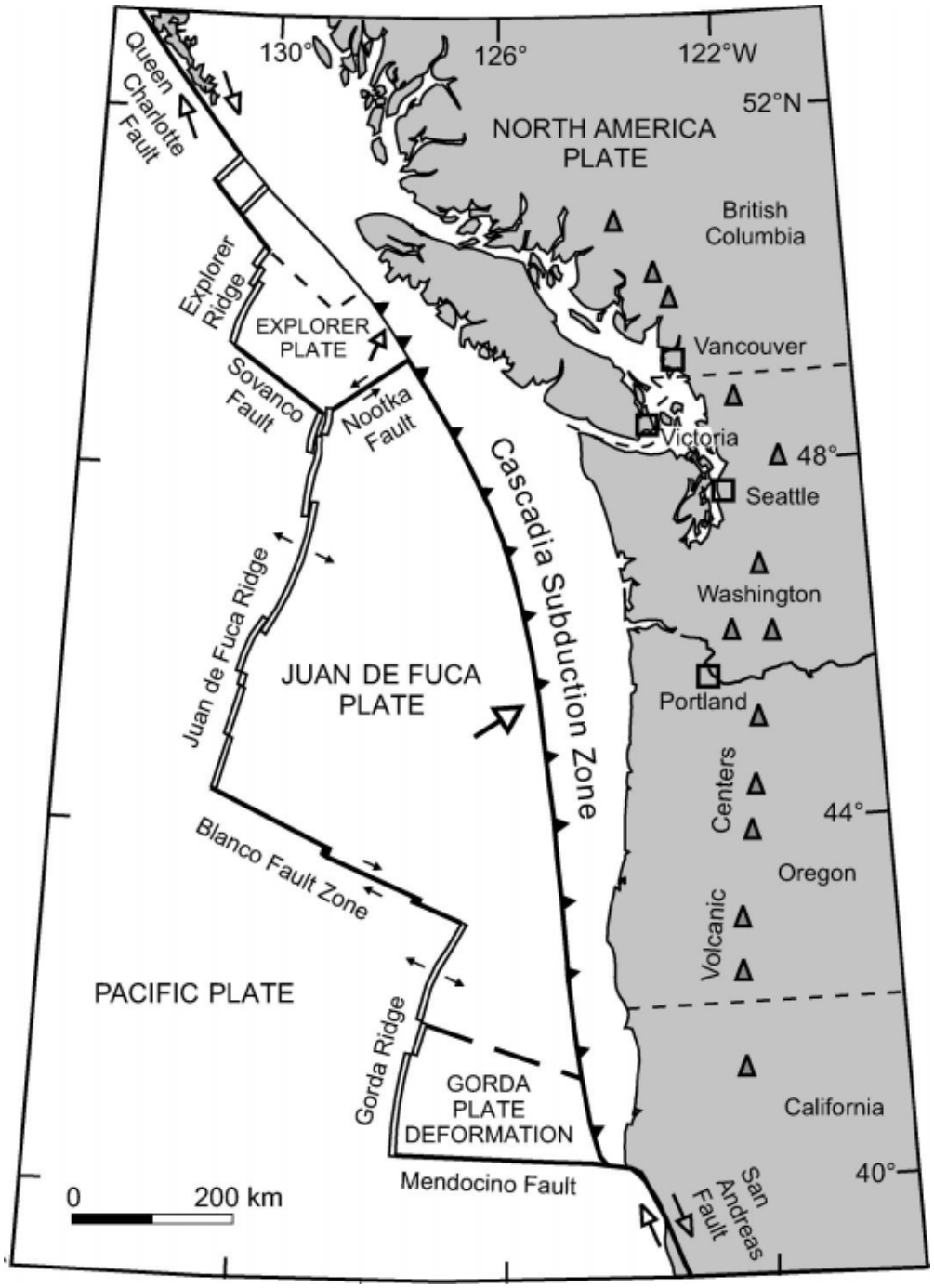
All locations are approximate. Base map obtained from Google Earth.

Intertek psi	DATE: NOVEMBER 2017	PROPOSED ROWE MIDDLE SCHOOL EXPANSION 3606 SE LAKE RD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**SITE EXPLORATION MAP**	**FIGURE 2**

Qs Alluvium and glacial–outburst flood sediment (Pleistocene)

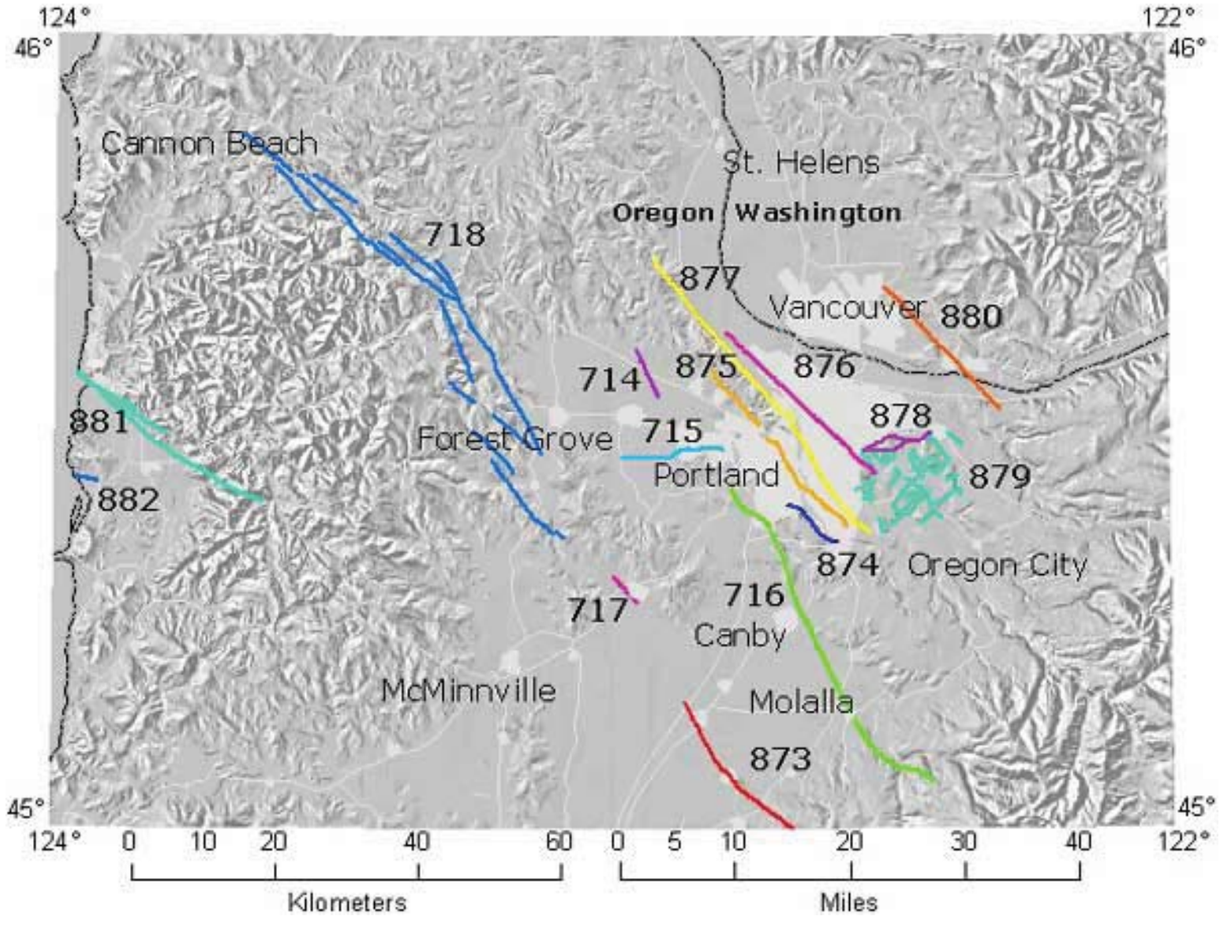


Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**GEOLOGIC MAP**	**FIGURE 3**



TECTONIC MAP OF PACIFIC NORTHWEST, SHOWING ORIENTATION AND EXTENT OF CASCADIA SUBDUCTION ZONE
(MODIFIED FROM DRAGERT AND OTHERS, 1994)

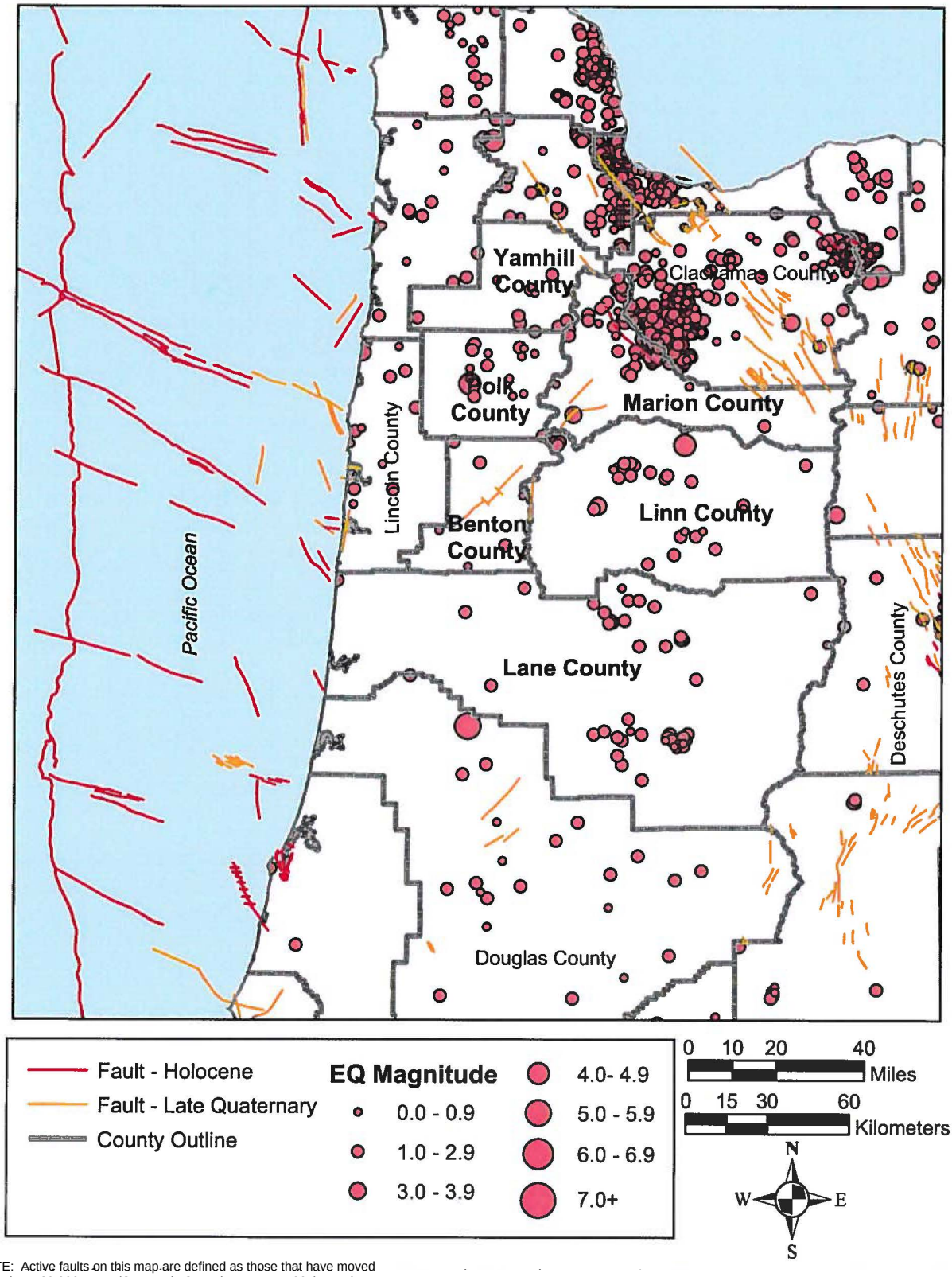
Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKEROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**TECTONIC MAP OF THE PACIFIC NORTHWEST**	**FIGURE 4**



Number	Name
714	Helvetia fault
715	Beaverton fault zone
716	Canby-Molalla fault
717	Newberg fault
718	Gales Creek fault zone
873	Mount Angel fault
874	Bolton fault
875	Oatfield fault
876	East Bank fault
877	Portland Hills fault
878	Grand Butte fault
879	Damascus-Tickle Creek fault zone
880	Lacamas Lake fault
881	Tillamook Bay fault zone
882	Happy Camp fault

Last modified January 27, 2006
URL http://earthquake.usgs.gov/regional/qfaults/or/van.html

Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER: 07041118
PSI, INC. 6032 N. CUTTER CIRCLE, SUITE 480 PORTLAND, OREGON 97217 (503) 289-1778	DRAWN BY: LIK	**FAULT MAP**	**FIGURE 5**



NOTE: Active faults on this map are defined as those that have moved in the last 780,000 years (Geomatrix Consultants, Inc., 1995). Faults active in the last 20,000 years are colored red. Faults active between 20,000 and 780,000 years ago are colored gold.

SOURCE: Oregon Department of Geology and Mineral Industries IMS-24

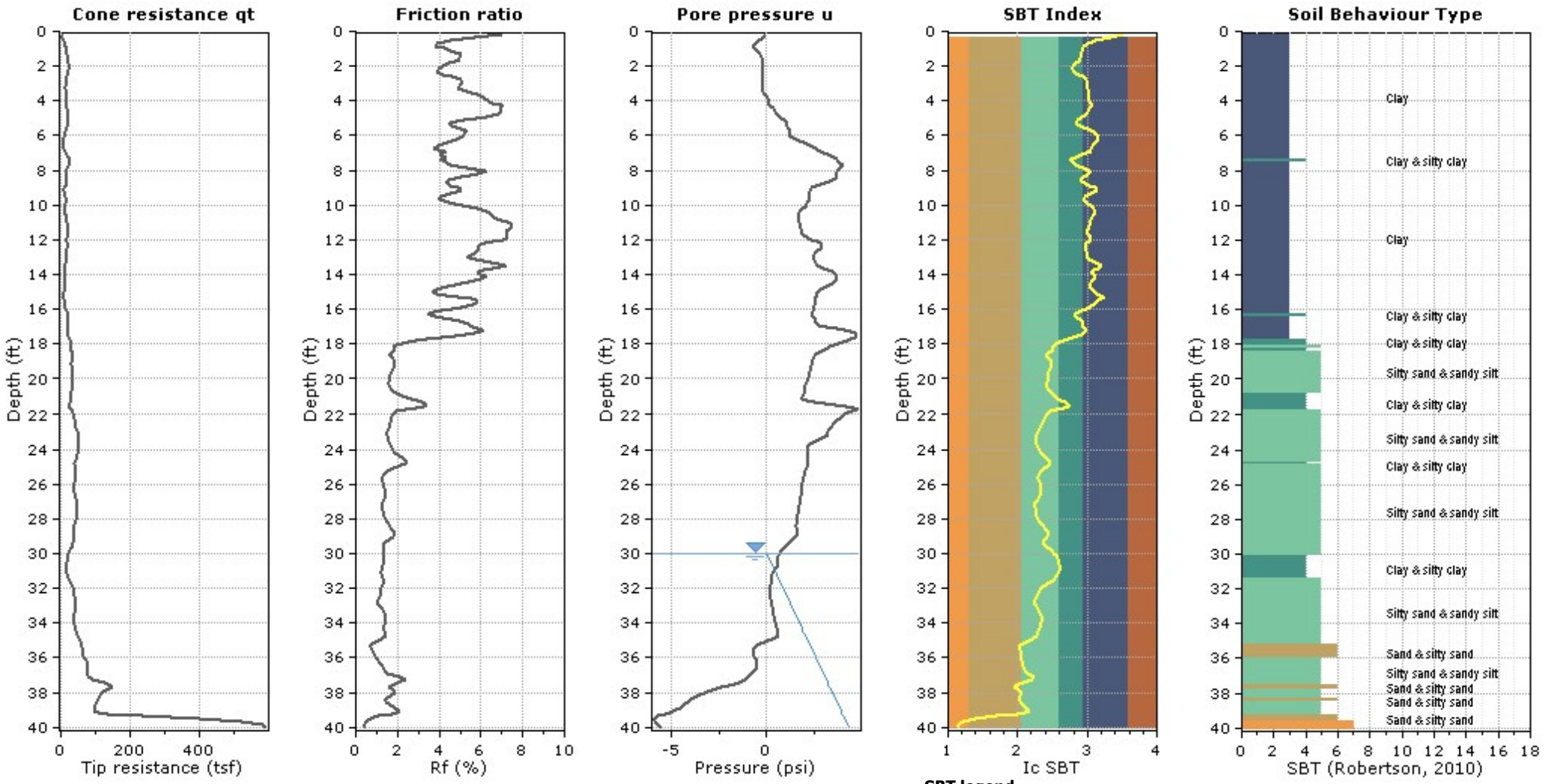
Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKE ROAD PORTLAND, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**HISTORIC SEISMICITY**	**FIGURE 6**

APPENDIX A – CPT LOGS, SOIL INVESTIGATION LOGS, GENERAL NOTES, AND SOIL CLASSIFICATION CHART

Professional Service Industries, Inc.
6032 North Cutter Circel, Suite 480
Portland, Oregon
www.intertek.com/building

CPT-01
Total depth: 40.03 ft, Date: 10/19/2017
Surface Elevation: 89.00 ft
Coords: lat 45.433195° lon -122.626172°
Cone Type: Hogentogler
Cone Operator: D. Murrell

Project: **Rowe Middle School Expansion**
Location: **3606 SE Lake Road, Milwaukie, Oregon**



Professional Service Industries, Inc.
6032 North Cutter Circel, Suite 480
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Total depth: 40.03 ft, Date: 10/19/2017
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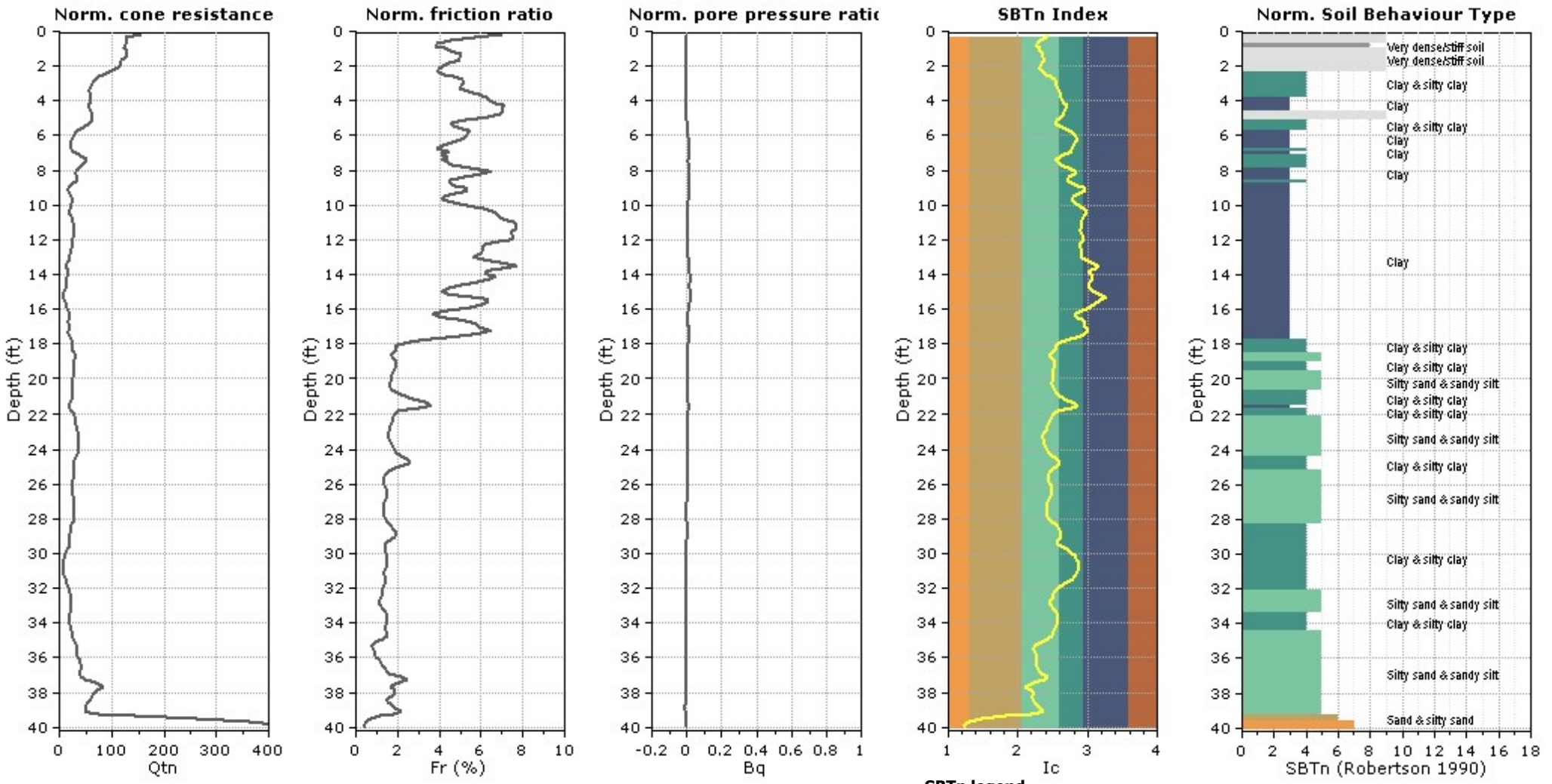

Professional Service Industries, Inc.
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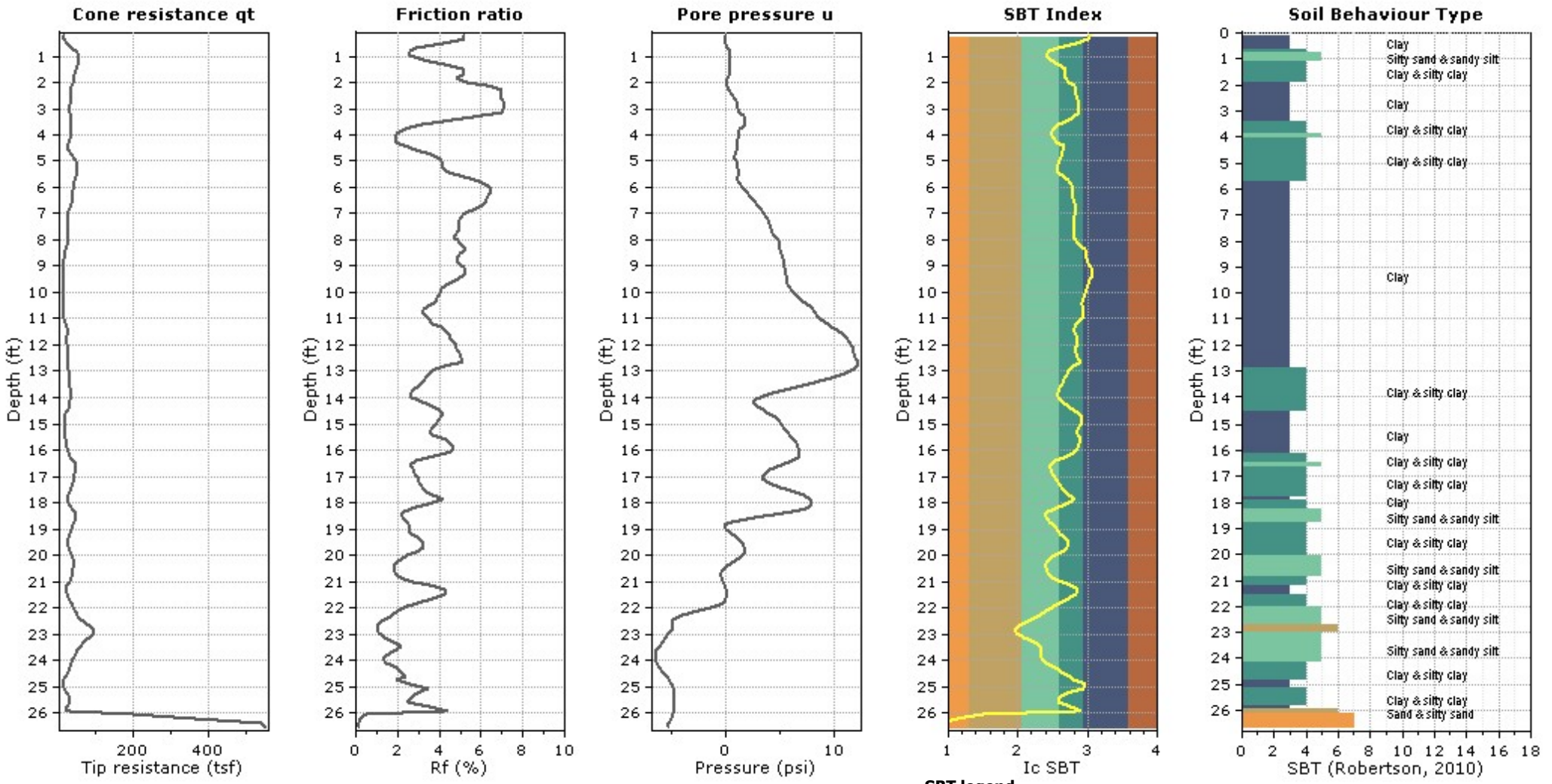
Portland, Oregon
www.intertek.com/building

CPT-2
Total depth: 26.58 ft, Date: 10/19/2017
Surface Elevation: 93.00 ft
Coords: lat 45.433195° lon -122.626172°
Cone Type: Hogentogler
Cone Operator: D. Murrell

Project: **Rowe Middle School Expansion**
Location: **3606 SE Lake Road, Milwaukie, Oregon**



Professional Service Industries, Inc.
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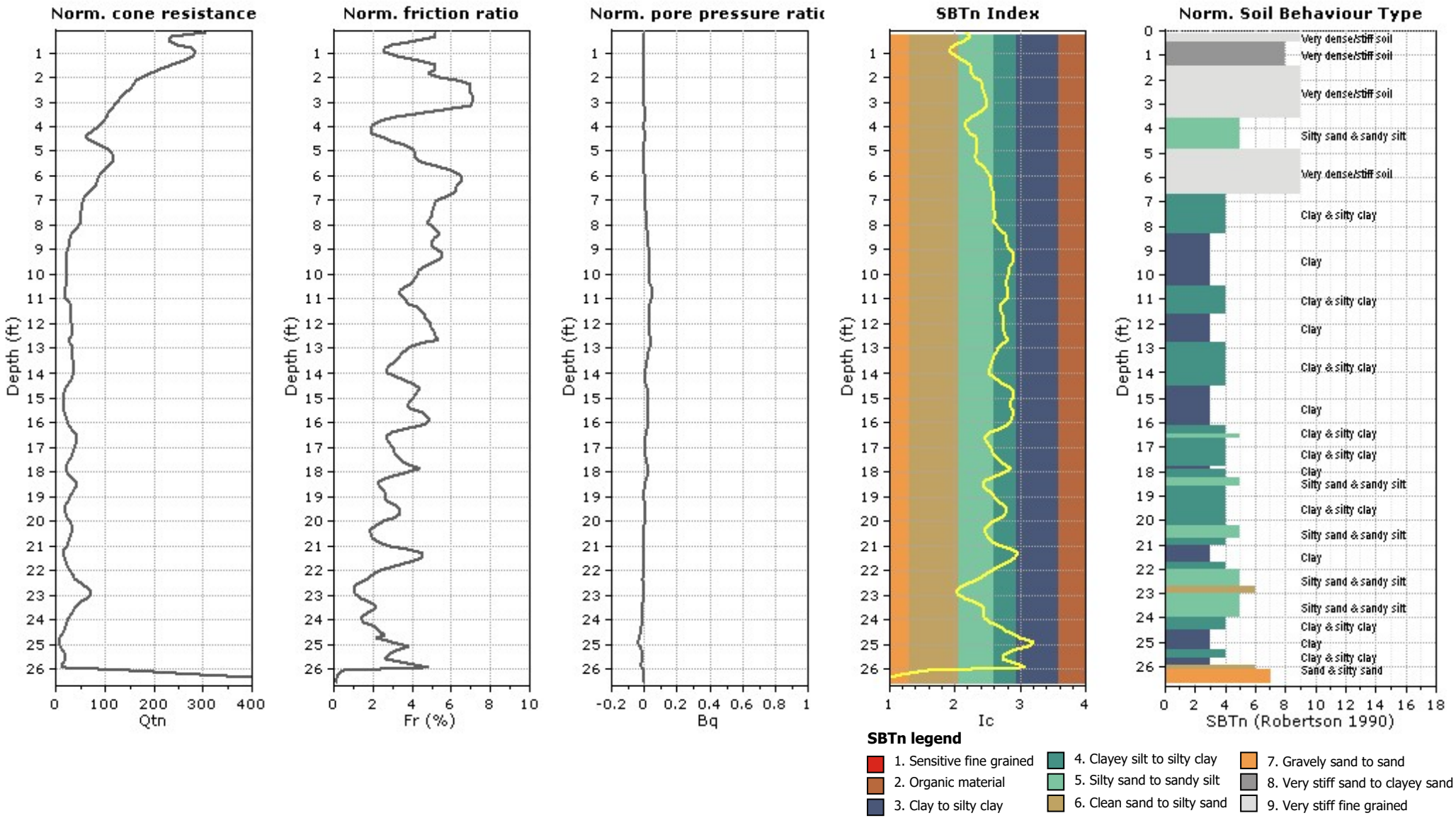
CPT-2
Total depth: 26.58 ft, Date: 10/19/2017
Surface Elevation: 93.00 ft
Coords: lat 45.433195° lon -122.626172°
Cone Type: Hogentogler
Cone Operator: D. Murrell

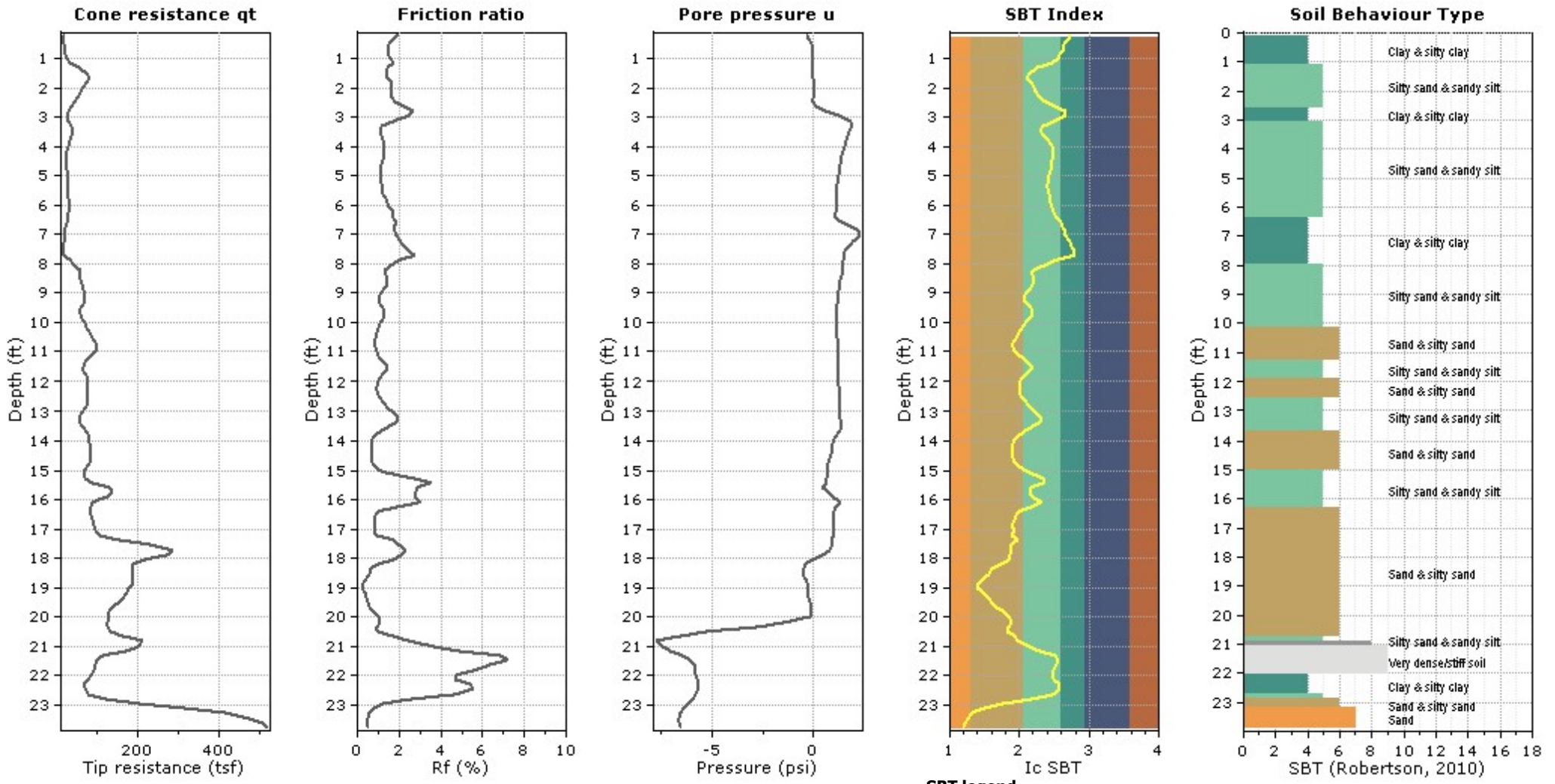
Project: **Rowe Middle School Expansion**
Location: **3606 SE Lake Road, Milwaukie, Oregon**



Professional Service Industries, Inc.
6032 North Cutter Circel, Suite 480
Portland, Oregon
www.intertek.com/building

CPT-3
Total depth: 23.79 ft, Date: 10/19/2017
Surface Elevation: 93.00 ft
Coords: lat 45.43277° lon -122.625782°
Cone Type: Hogentogler
Cone Operator: D. Murrell

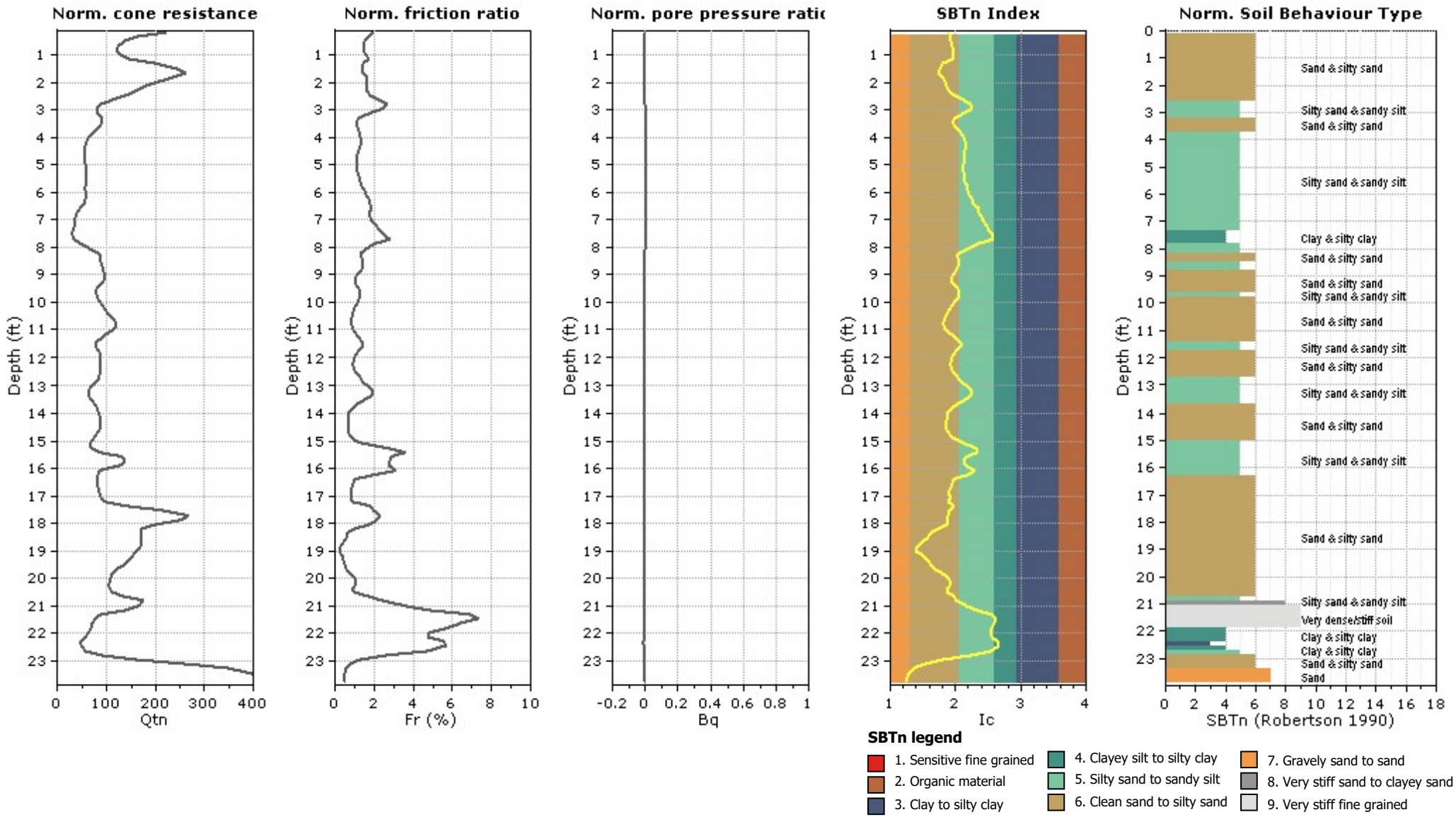
Project: **Rowe Middle School Expansion**
Location: **3606 SE Lake Road, Milwaukie, Oregon**



Professional Service Industries, Inc.
6032 North Cutter Circel, Suite 480
Portland, Oregon
www.intertek.com/building

CPT-3
Total depth: 23.79 ft, Date: 10/19/2017
Surface Elevation: 93.00 ft
Coords: lat 45.43277° lon -122.625782°
Cone Type: Hogentogler
Cone Operator: D. Murrell

Project: **Rowe Middle School Expansion**
Location: **3606 SE Lake Road, Milwaukie, Oregon**



Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

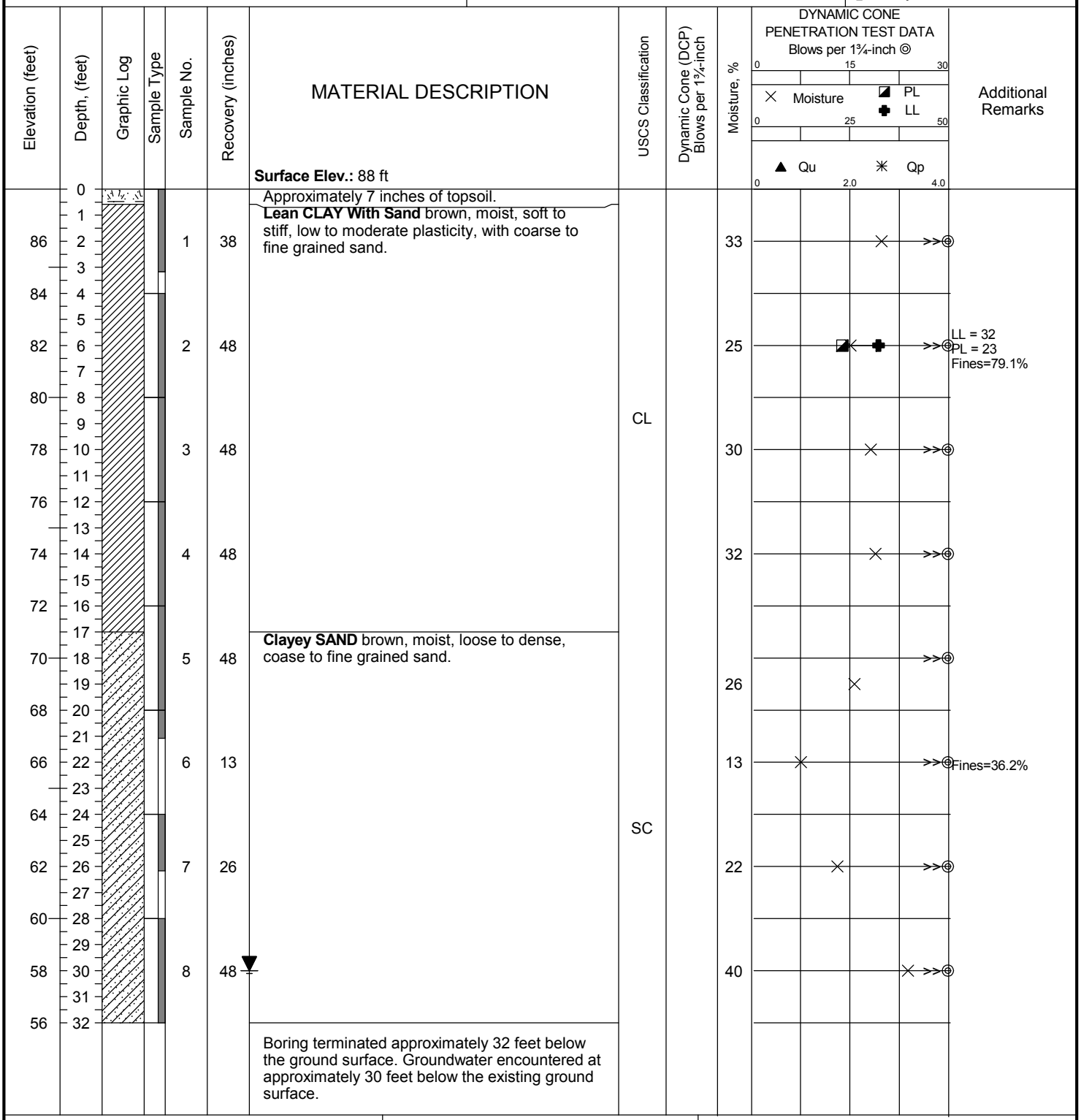
LOG OF GP-01

PSI Job No.: 07041118
Project: Rowe Middle School
Location: Milwaukie
Oregon

Excavation Method: Geoprobe
Sampling Method: Hand Auger
DCP Type: Automatic
Boring Location:

WATER LEVELS

While Drilling	30 feet
Upon Completion	30 feet
Delay	N/A



Completion Depth:	32.0 ft
Date Boring Started:	10/19/17
Date Boring Completed:	10/19/17
Logged By:	L. Kevan
Excavation Contractor:	PSI, Inc.

Sample Types:
- Shelby Tube
- Dynamic Cone (DCP)
- Grab Sample

Latitude: 45.4329°
Longitude: -122.6273°
Excavation Equipment: Geoprobe
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF GP-02

PSI Job No.: 07041118
Project: Rowe Middle School
Location: Milwaukie
Oregon

Excavation Method: Geoprobe
Sampling Method: Hand Auger
DCP Type: Automatic
Boring Location:

WATER LEVELS	
While Drilling	N/A
Upon Completion	N/A
Delay	N/A

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ / Moisture / PL / LL / Qu / Qp	Additional Remarks
						Surface Elev.: 93 ft					
	0					Approximately 7 inches of topsoil.					
92	1										
	2			1		**Clayey SAND** brown, moist, loose to dense, coase to fine grained sand.			13		
90	3										
	4										
88	5										
	6			2					16		
86	7										
	8										
84	9										
	10			3			SC		15		
82	11										
	12										
80	13										
	14			4					23		Fines=42.8%
78	15										
	16										
76	17								14		
	18			5							
74	19					**Poorly-Graded GRAVEL with sand** brown, moist, dense, coase to fine grained with coarse to fine grained sand.	GP		15		
	20					Boring terminated approximately 20 feet below the ground surface. No groundwater encountered.					
									8		

Completion Depth: 20.0 ft
Date Boring Started: 10/19/17
Date Boring Completed: 10/19/17
Logged By: L. Kevan
Excavation Contractor: PSI, Inc.

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 45.4328°
Longitude: -122.6257°
Excavation Equipment: Geoprobe
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

Professional Service Industries, Inc.
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Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF HA-01

PSI Job No.: 07041118
Project: Rowe Middle School
Location: Milwaukie
Oregon

Excavation Method: Hand Auger
Sampling Method: Hand Auger
DCP Type:
Boring Location:

WATER LEVELS

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ 0 15 30; × Moisture; ◪ PL; ✚ LL; 0 25 50; ▲ Qu; ✳ Qp; 0 2.0 4.0	Additional Remarks
	0			1		**Surface Elev.:** 98 ft **Poorly-Graded GRAVEL with sand** brown, moist, dense, coase to fine grained gravel with coarse to fine grained sand.	GP	10			
				2				10			
				3				25			
						Boring terminated approxmately 6 inches below the existing ground surface due to auger refusal.			22	×	

Completion Depth: 0.5 ft
Date Boring Started: 10/19/17
Date Boring Completed: 10/19/17
Logged By: L. Kevan
Excavation Contractor: PSI, Inc.

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 45.4342°
Longitude: -122.6253°
Excavation Equipment: Hand Auger
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

Professional Service Industries, Inc.
6032 N. Cutter Circle, Suite 480
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Telephone: (503) 289-1778
Fax: (503) 289-1918

LOG OF HA-02

PSI Job No.: 07041118
Project: Rowe Middle School
Location: Milwaukie
Oregon

Excavation Method: Hand Auger
Sampling Method: Hand Auger
DCP Type:
Boring Location:

WATER LEVELS

Surface Elev.: 99 ft

Elevation (feet)	Depth, (feet)	Graphic Log	Sample Type	Sample No.	Recovery (inches)	MATERIAL DESCRIPTION	USCS Classification	Dynamic Cone (DCP) Blows per 1¾-inch	Moisture, %	DYNAMIC CONE PENETRATION TEST DATA Blows per 1¾-inch ◎ 0 15 30; Moisture, PL, LL 0 25 50; Qu, Qp 0 2.0 4.0	Additional Remarks
	0			1		Approximately 7 inches of topsoil.		0.5			
				2				0.5			
				3		**Clayey SAND** brown, moist, medium dense, coase to fine grained sand.		1			
				4				2			
				5				3			
98	1			6				4			
				7				5			
				8				4			
				9				5			
				10				3			
				11				5			
	2			13	1			4			
				12				4			
				14				5			
				15				4			
				16				4			
				17			SC	3			
96	3			18				3			
				19				4			
				20				3			
				21				2			
				22				2			
				23				2			
	4			24				3			
				25				3			
				26				3			
				27				4			
				28				3			
				29				4			
94	5			30		Boring terminated approximately 5 feet below the ground surface. No groundwater encountered.		5			

Completion Depth: 5.0 ft
Date Boring Started: 10/19/17
Date Boring Completed: 10/19/17
Logged By: L. Kevan
Excavation Contractor: PSI, Inc.

Sample Types:
Shelby Tube
Dynamic Cone (DCP)
Grab Sample

Latitude: 45.4341°
Longitude: -122.6251°
Excavation Equipment: Hand Auger
Remarks:

The stratification lines represent approximate boundaries. The transition may be gradual.

GENERAL NOTES

SAMPLE IDENTIFICATION

The Unified Soil Classification System (USCS), AASHTO 1988 and ASTM designations D2487 and D-2488 are used to identify the encountered materials unless otherwise noted. Coarse-grained soils are defined as having more than 50% of their dry weight retained on a #200 sieve (0.075mm); they are described as: boulders, cobbles, gravel or sand. Fine-grained soils have less than 50% of their dry weight retained on a #200 sieve; they are defined as silts or clay depending on their Atterberg Limit attributes. Major constituents may be added as modifiers and minor constituents may be added according to the relative proportions based on grain size.

DRILLING AND SAMPLING SYMBOLS

SFA: Solid Flight Auger - typically 4" diameter flights, except where noted.
HSA: Hollow Stem Auger - typically 3¼" or 4¼ I.D. openings, except where noted.
M.R.: Mud Rotary - Uses a rotary head with Bentonite or Polymer Slurry
R.C.: Diamond Bit Core Sampler
H.A.: Hand Auger
P.A.: Power Auger - Handheld motorized auger

SS: Split-Spoon - 1 3/8" I.D., 2" O.D., except where noted.
ST: Shelby Tube - 3" O.D., except where noted.
RC: Rock Core
TC: Texas Cone
BS: Bulk Sample
PM: Pressuremeter
CPT-U: Cone Penetrometer Testing with Pore-Pressure Readings

SOIL PROPERTY SYMBOLS

N: Standard "N" penetration: Blows per foot of a 140 pound hammer falling 30 inches on a 2-inch O.D. Split-Spoon.
N_{60}: A "N" penetration value corrected to an equivalent 60% hammer energy transfer efficiency (ETR)
Q_u: Unconfined compressive strength, TSF
Q_p: Pocket penetrometer value, unconfined compressive strength, TSF
w%: Moisture/water content, %
LL: Liquid Limit, %
PL: Plastic Limit, %
PI: Plasticity Index = (LL-PL),%
DD: Dry unit weight, pcf
▼,▽,⧩ Apparent groundwater level at time noted

RELATIVE DENSITY OF COARSE-GRAINED SOILS

Relative Density	N - Blows/foot
Very Loose	0 - 4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	50 - 80
Extremely Dense	80+

ANGULARITY OF COARSE-GRAINED PARTICLES

Description	Criteria
Angular:	Particles have sharp edges and relatively plane sides with unpolished surfaces
Subangular:	Particles are similar to angular description, but have rounded edges
Subrounded:	Particles have nearly plane sides, but have well-rounded corners and edges
Rounded:	Particles have smoothly curved sides and no edges

GRAIN-SIZE TERMINOLOGY

Component	Size Range
Boulders:	Over 300 mm (>12 in.)
Cobbles:	75 mm to 300 mm (3 in. to 12 in.)
Coarse-Grained Gravel:	19 mm to 75 mm (¾ in. to 3 in.)
Fine-Grained Gravel:	4.75 mm to 19 mm (No.4 to ¾ in.)
Coarse-Grained Sand:	2 mm to 4.75 mm (No.10 to No.4)
Medium-Grained Sand:	0.42 mm to 2 mm (No.40 to No.10)
Fine-Grained Sand:	0.075 mm to 0.42 mm (No. 200 to No.40)
Silt:	0.005 mm to 0.075 mm
Clay:	<0.005 mm

PARTICLE SHAPE

Description	Criteria
Flat:	Particles with width/thickness ratio > 3
Elongated:	Particles with length/width ratio > 3
Flat & Elongated:	Particles meet criteria for both flat and elongated

RELATIVE PROPORTIONS OF FINES

Descriptive Term	% Dry Weight
Trace:	< 5%
With:	5% to 12%
Modifier:	>12%

GENERAL NOTES

(Continued)

CONSISTENCY OF FINE-GRAINED SOILS

Q_U - TSF	N - Blows/foot	Consistency
0 - 0.25	0 - 2	Very Soft
0.25 - 0.50	2 - 4	Soft
0.50 - 1.00	4 - 8	Firm (Medium Stiff)
1.00 - 2.00	8 - 15	Stiff
2.00 - 4.00	15 - 30	Very Stiff
4.00 - 8.00	30 - 50	Hard
8.00+	50+	Very Hard

MOISTURE CONDITION DESCRIPTION

Description	Criteria
Dry:	Absence of moisture, dusty, dry to the touch
Moist:	Damp but no visible water
Wet:	Visible free water, usually soil is below water table

RELATIVE PROPORTIONS OF SAND AND GRAVEL

Descriptive Term	% Dry Weight
Trace:	< 15%
With:	15% to 30%
Modifier:	>30%

STRUCTURE DESCRIPTION

Description	Criteria
Stratified:	Alternating layers of varying material or color with layers at least ¼-inch (6 mm) thick
Laminated:	Alternating layers of varying material or color with layers less than ¼-inch (6 mm) thick
Fissured:	Breaks along definite planes of fracture with little resistance to fracturing
Slickensided:	Fracture planes appear polished or glossy, sometimes striated
Blocky:	Cohesive soil that can be broken down into small angular lumps which resist further breakdown
Lensed:	Inclusion of small pockets of different soils
Layer:	Inclusion greater than 3 inches thick (75 mm)
Seam:	Inclusion 1/8-inch to 3 inches (3 to 75 mm) thick extending through the sample
Parting:	Inclusion less than 1/8-inch (3 mm) thick

SCALE OF RELATIVE ROCK HARDNESS

Q_U - TSF	Consistency
2.5 - 10	Extremely Soft
10 - 50	Very Soft
50 - 250	Soft
250 - 525	Medium Hard
525 - 1,050	Moderately Hard
1,050 - 2,600	Hard
>2,600	Very Hard

ROCK BEDDING THICKNESSES

Description	Criteria
Very Thick Bedded	Greater than 3-foot (>1.0 m)
Thick Bedded	1-foot to 3-foot (0.3 m to 1.0 m)
Medium Bedded	4-inch to 1-foot (0.1 m to 0.3 m)
Thin Bedded	1¼-inch to 4-inch (30 mm to 100 mm)
Very Thin Bedded	½-inch to 1¼-inch (10 mm to 30 mm)
Thickly Laminated	1/8-inch to ½-inch (3 mm to 10 mm)
Thinly Laminated	1/8-inch or less "paper thin" (<3 mm)

ROCK VOIDS

Voids	Void Diameter
Pit	<6 mm (<0.25 in)
Vug	6 mm to 50 mm (0.25 in to 2 in)
Cavity	50 mm to 600 mm (2 in to 24 in)
Cave	>600 mm (>24 in)

GRAIN-SIZED TERMINOLOGY

(Typically Sedimentary Rock)

Component	Size Range
Very Coarse Grained	>4.76 mm
Coarse Grained	2.0 mm - 4.76 mm
Medium Grained	0.42 mm - 2.0 mm
Fine Grained	0.075 mm - 0.42 mm
Very Fine Grained	<0.075 mm

ROCK QUALITY DESCRIPTION

Rock Mass Description	RQD Value
Excellent	90 -100
Good	75 - 90
Fair	50 - 75
Poor	25 -50
Very Poor	Less than 25

DEGREE OF WEATHERING

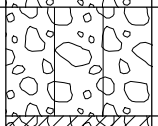
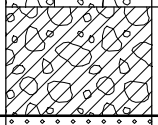
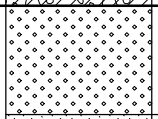
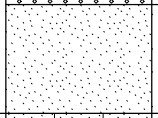
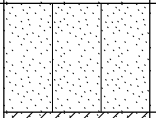
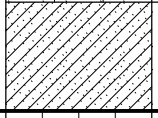
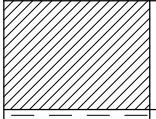
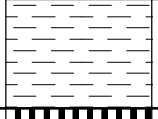
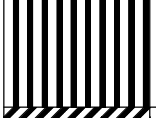
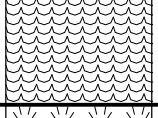
Slightly Weathered: Rock generally fresh, joints stained and discoloration extends into rock up to 25 mm (1 in), open joints may contain clay, core rings under hammer impact.

Weathered: Rock mass is decomposed 50% or less, significant portions of the rock show discoloration and weathering effects, cores cannot be broken by hand or scraped by knife.

Highly Weathered: Rock mass is more than 50% decomposed, complete discoloration of rock fabric, core may be extremely broken and gives clunk sound when struck by hammer, may be shaved with a knife.

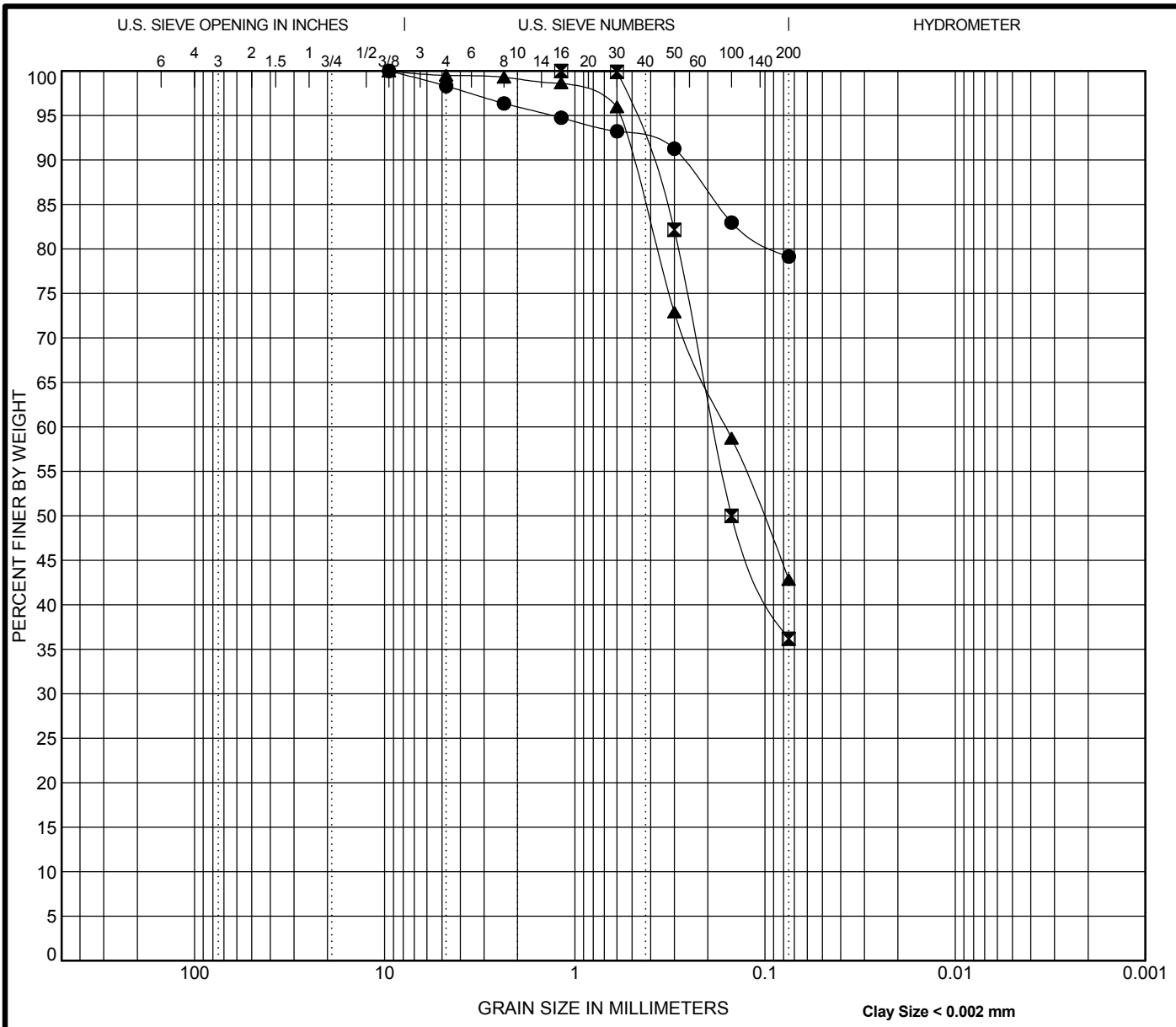
SOIL CLASSIFICATION CHART

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

MAJOR DIVISIONS			SYMBOLS: GRAPH	SYMBOLS: LETTER	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

psi

APPENDIX B – LABORATORY TEST RESULTS



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	LL	PL	PI	Cc	Cu
●	GP-01	6.0		32	23	9		
⊠	GP-01	22.0						
▲	GP-02	14.0						

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	GP-01	6.0	9.5				1.7	19.2	79.1	
⊠	GP-01	22.0	1.18	0.186			0.0	63.8	36.2	
▲	GP-02	14.0	9.5	0.16			0.5	56.7	42.8	

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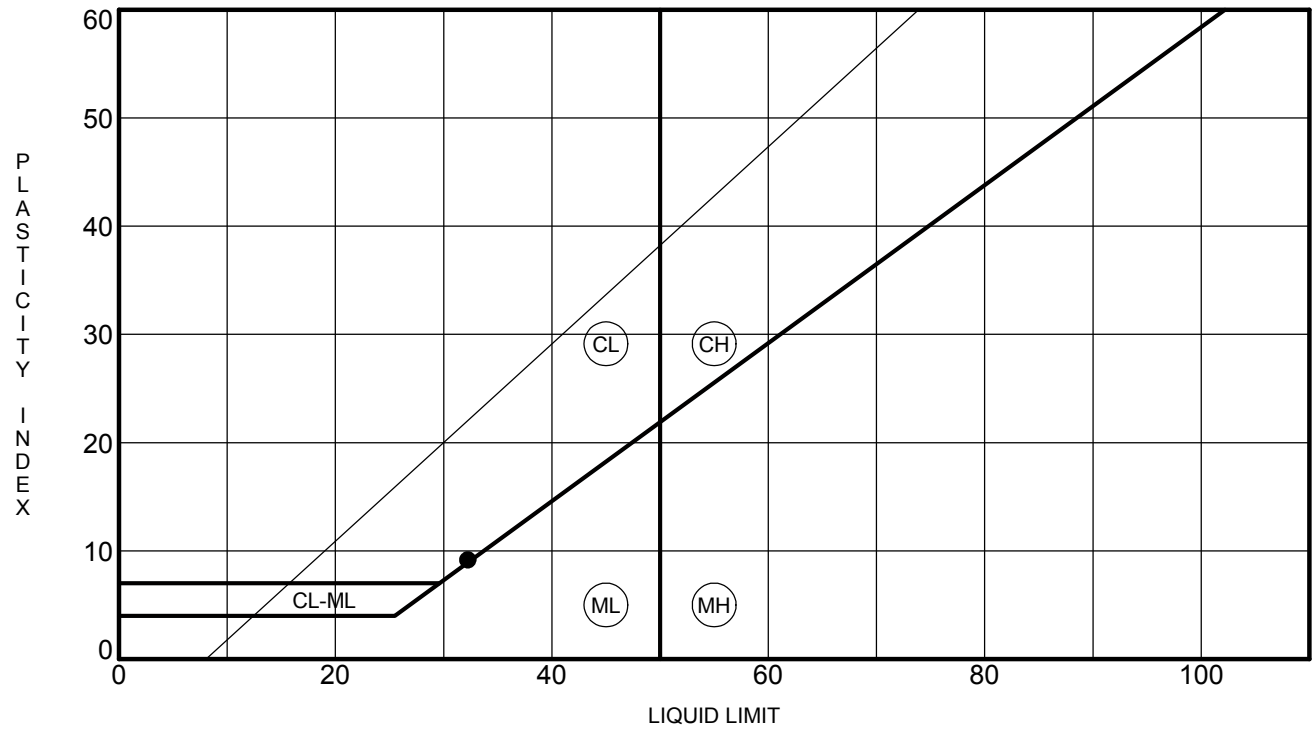
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

GRAIN SIZE DISTRIBUTION

Project: Rowe Middle School
PSI Job No.: 07041118
Location: Milwaukie
Oregon



	Boring	Depth (ft)	LL	PL	PI	Fines	Classification (*Visual)
●	**GP-01**	**6.0**	**32**	**23**	**9**	**79.1**	

Professional Service Industries, Inc.
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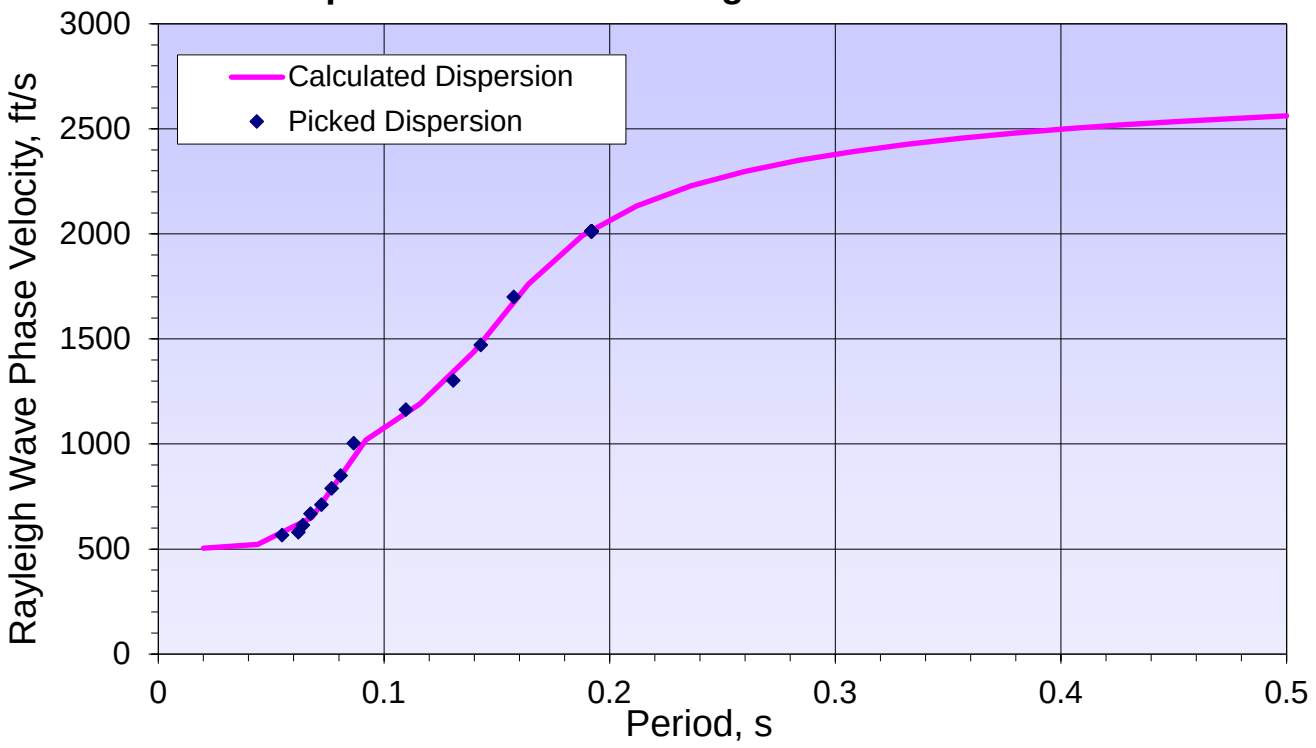
Portland, OR 97219
Telephone: (503) 289-1778
Fax: (503) 289-1918

ATTERBERG LIMIT RESULTS

PSI Job No.: 07041118
Project: Rowe Middle School
Location: Milwaukie
Oregon

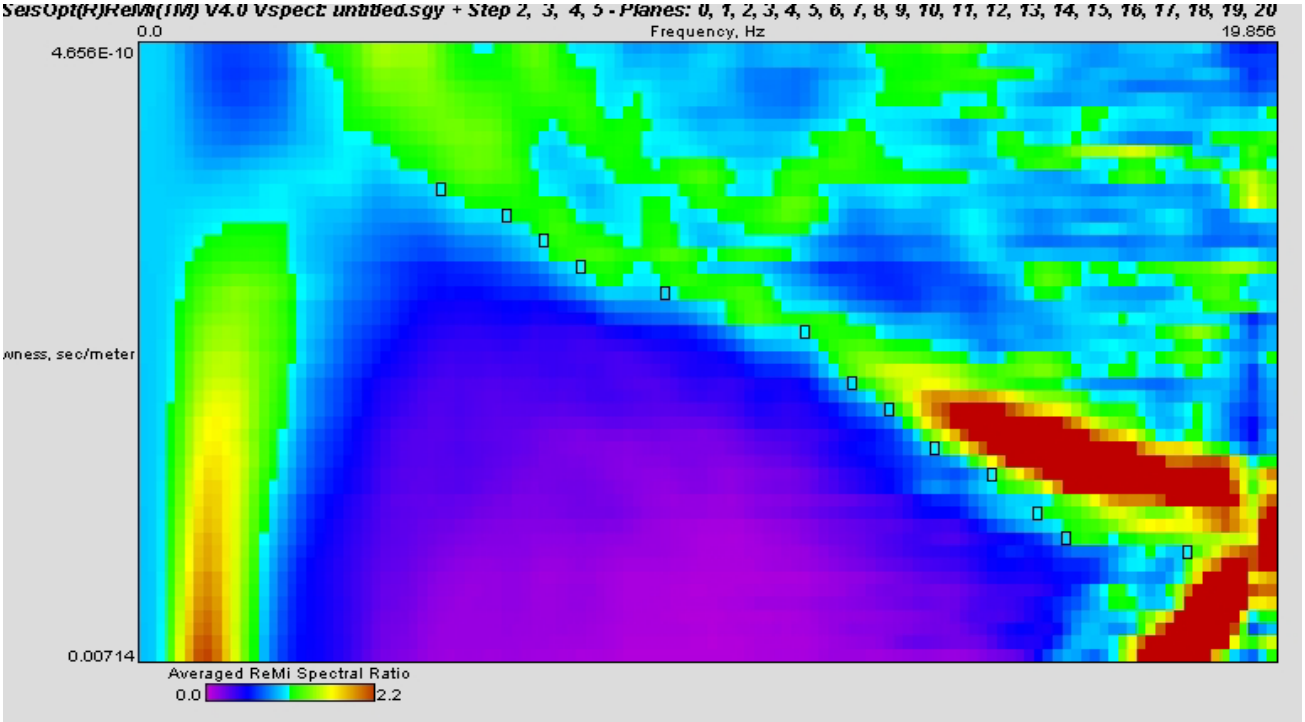
APPENDIX C – GEOPHYSICAL TEST RESULTS

Dispersion Curve Showing Picks and Fit



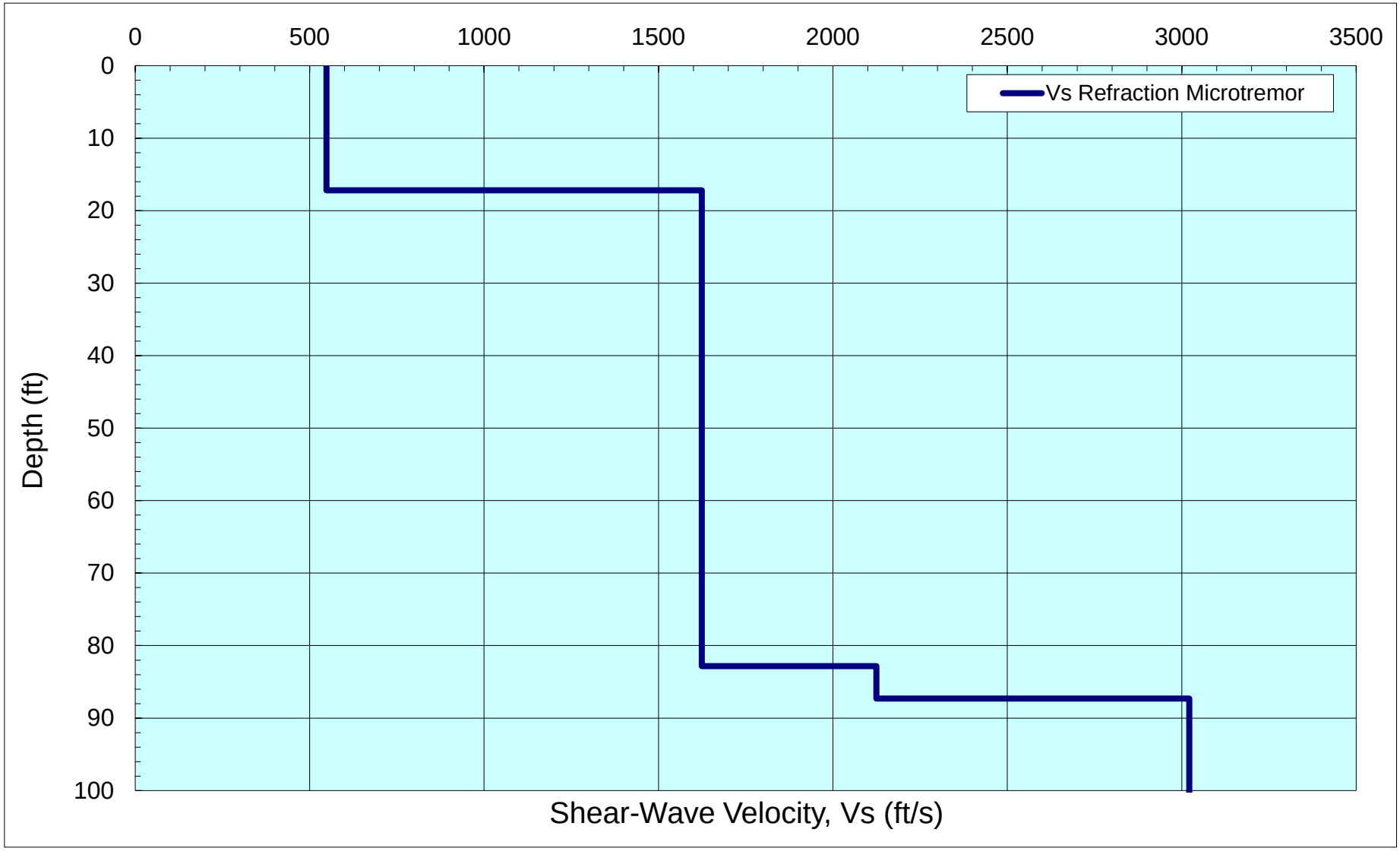
Geophone Spacing (ft) 15 Sampling Interval (ms) 2

p-f Image with Dispersion Modeling Picks



Line Number	Array 1 (Geophones 1-24)
Project Number	07041118
Project Name	Rowe Middle School
Location	3606 SE Lake Rd Milwaukie, OR

Shear Wave Velocity Profile Vs. Depth



IBC Site Class	**C**
Average Shearwave Velocity within 100 feet, V_s (ft/s)	**1,280**

Line Number	**Array 1 (Geophones 1-24)**
Project Number	07041118
Project Name	Rowe Middle School
Location	3606 SE Lake Rd Milwaukie, OR

APPENDIX D – LIQUEFACTION ANALYSIS AND SITE SPECIFIC ANLYSIS RESULTS

Professional Service Industries, Inc.
6032 North Cutter Circel, Suite 480
Portland, Oregon
www.intertek.com/building

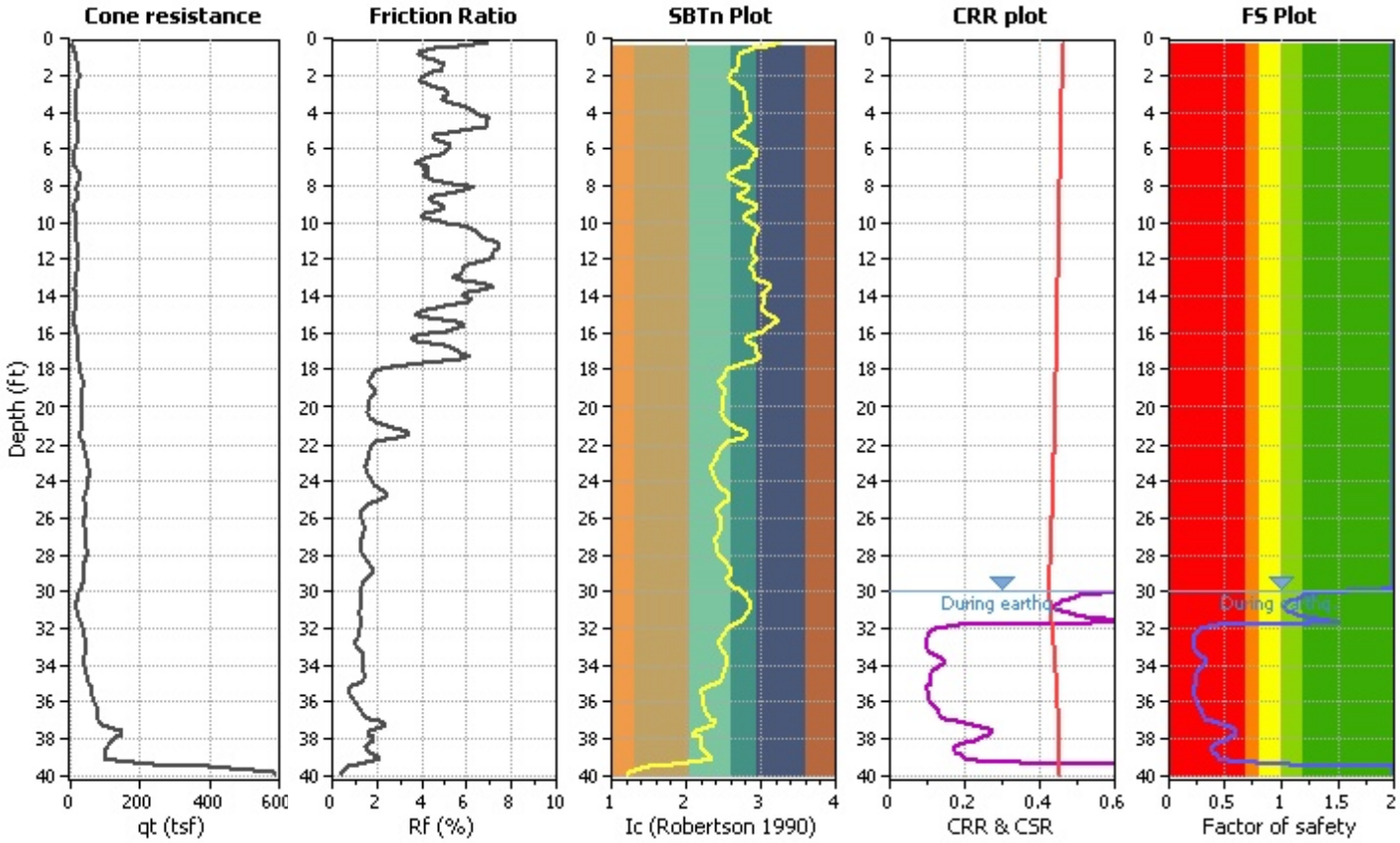
LIQUEFACTION ANALYSIS REPORT

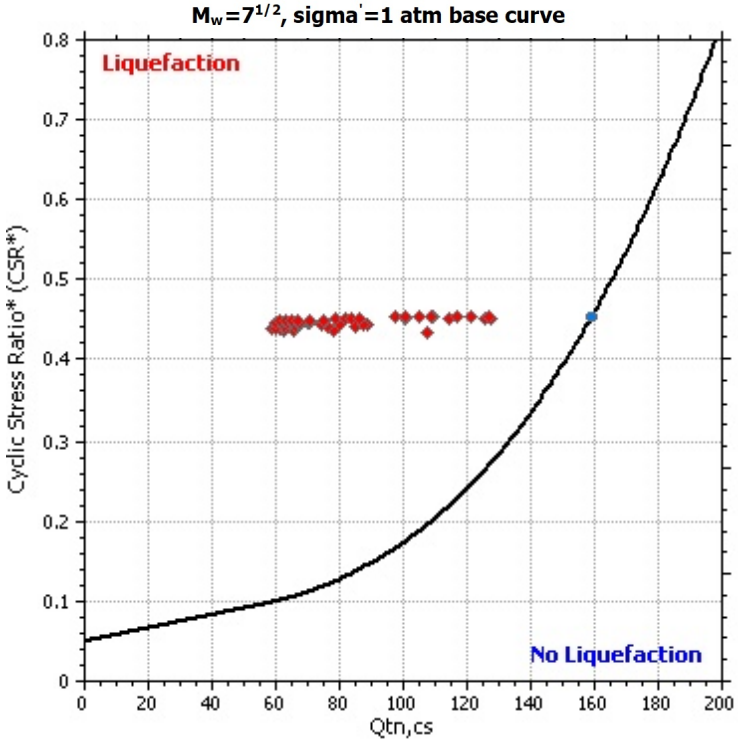
Project title : Rowe Middle School Expansion **Location : 3606 SE Lake Road, Milwaukie, Oregon**

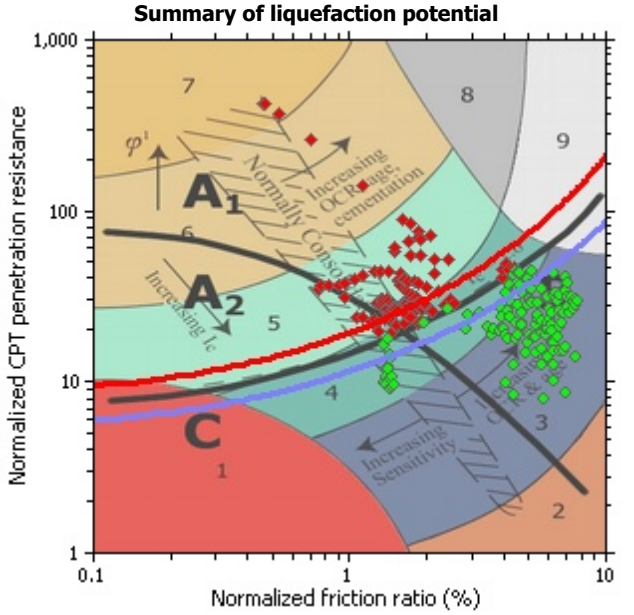
CPT file : CPT-01

Input parameters and analysis data

Analysis method:	Robertson (2009)	G.W.T. (in-situ):	30.00 ft	Use fill:	No	Clay like behavior applied:	All soils
Fines correction method:	Robertson (2009)	G.W.T. (earthq.):	30.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	9.30	Ic cut-off value:	2.60	Trans. detect. applied:	No	MSF method:	Method based
Peak ground acceleration:	0.41	Unit weight calculation:	Based on SBT	K_σ applied:	No		

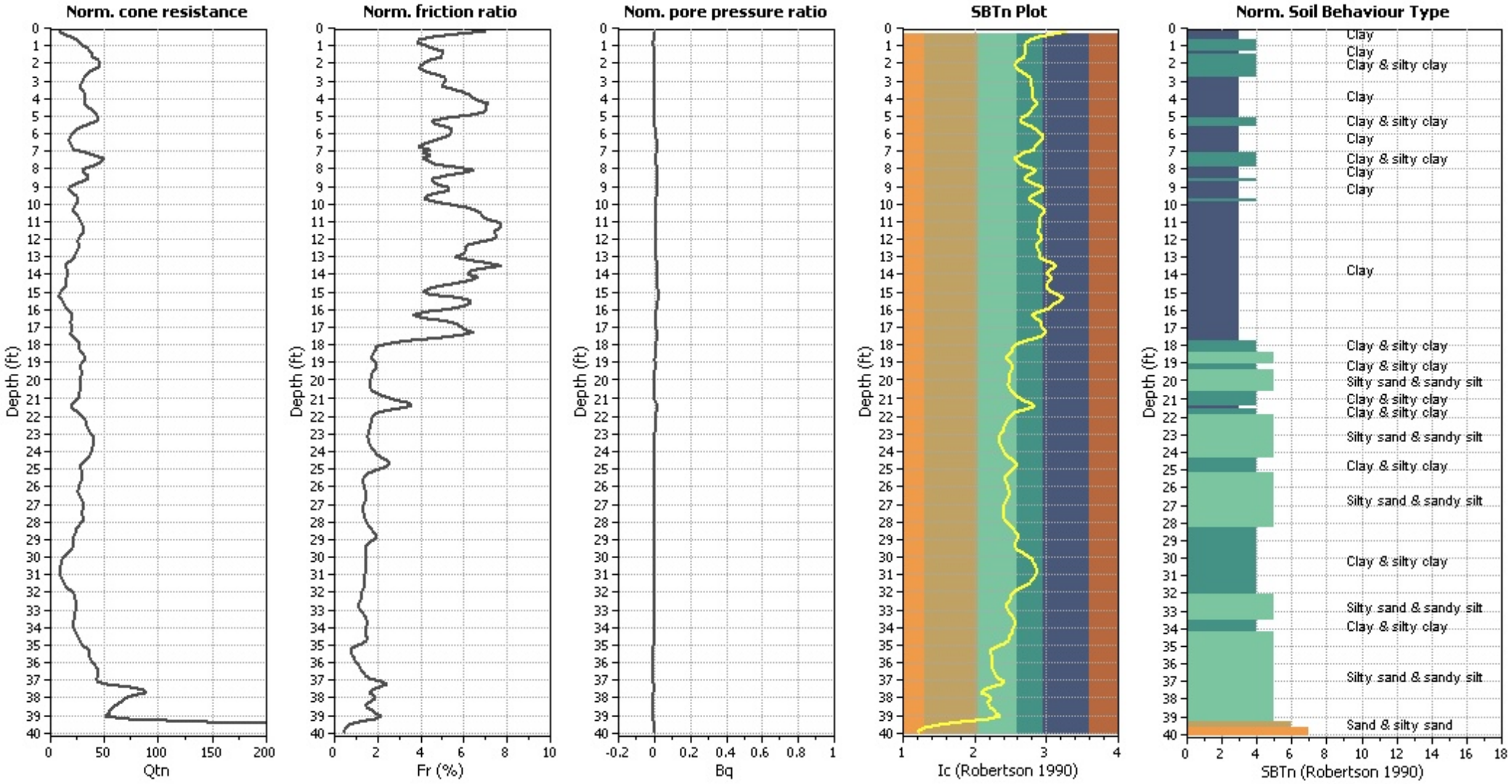






Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plots (normaliz



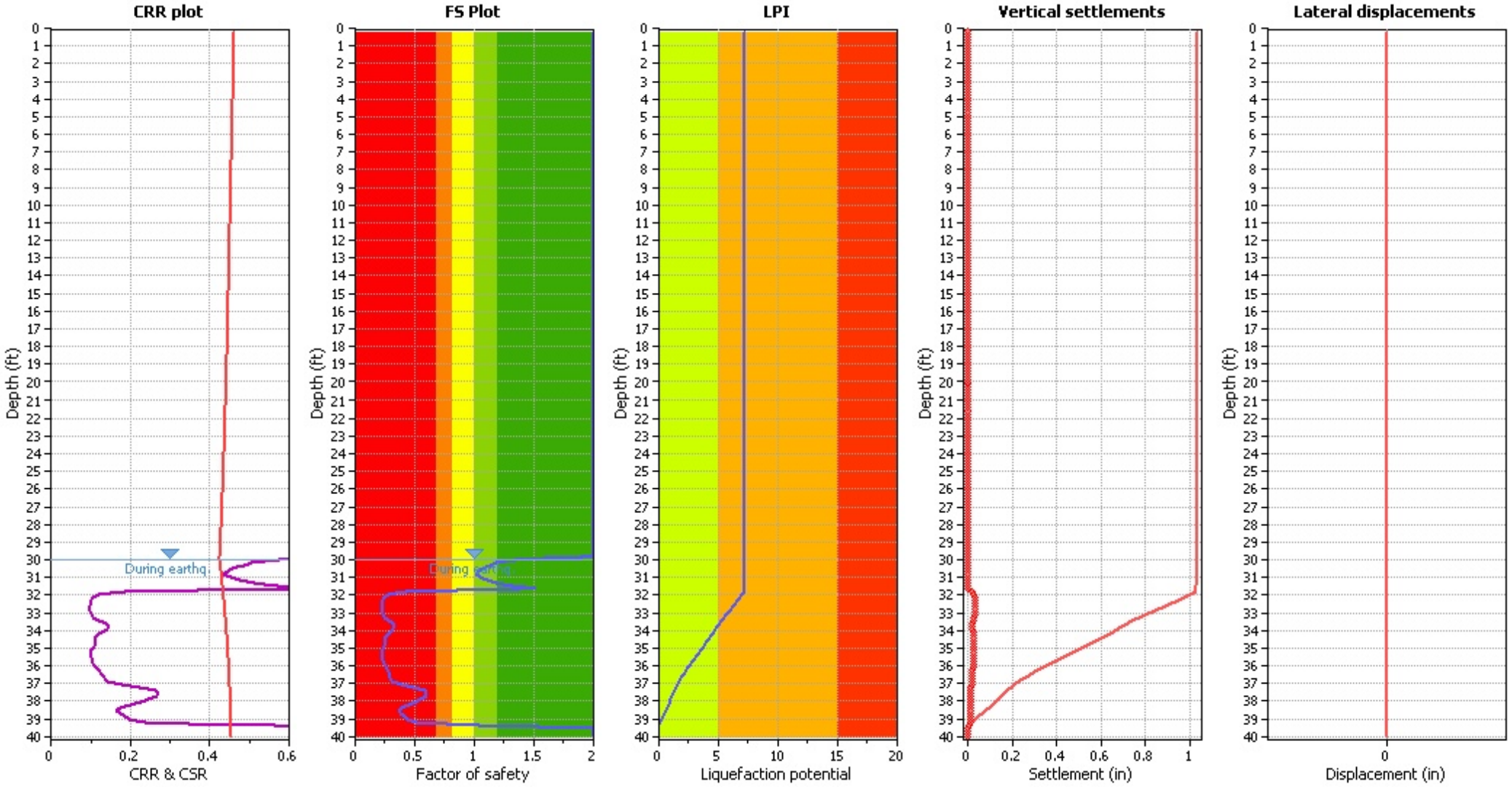
Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	9.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	30.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	Robertson (2009)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	9.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	30.00 ft	Fill height:	N/A	Limit depth:	N/A

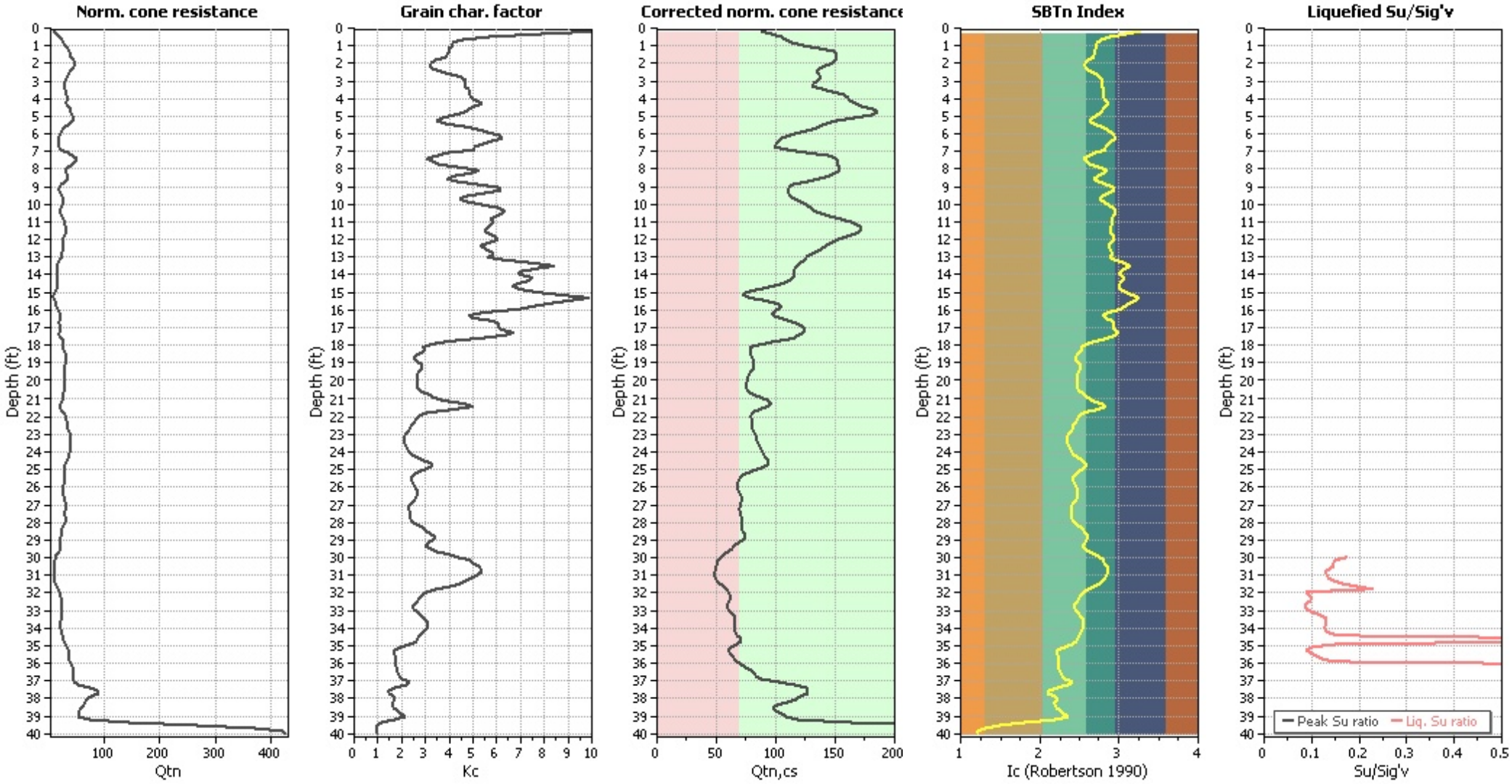
F.S. color scheme

- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

LPI color scheme

- Very high risk
- High risk
- Low risk

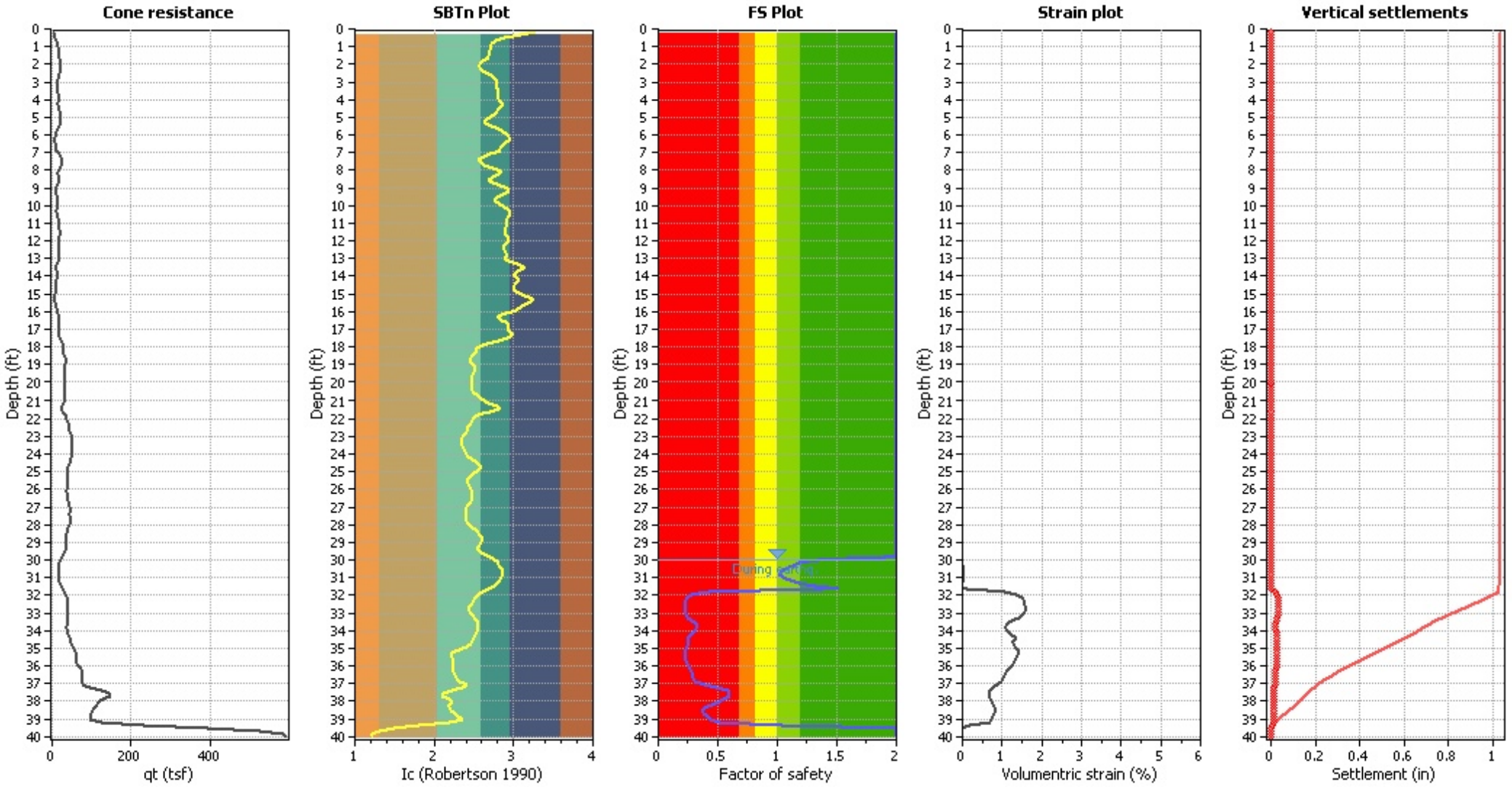
Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

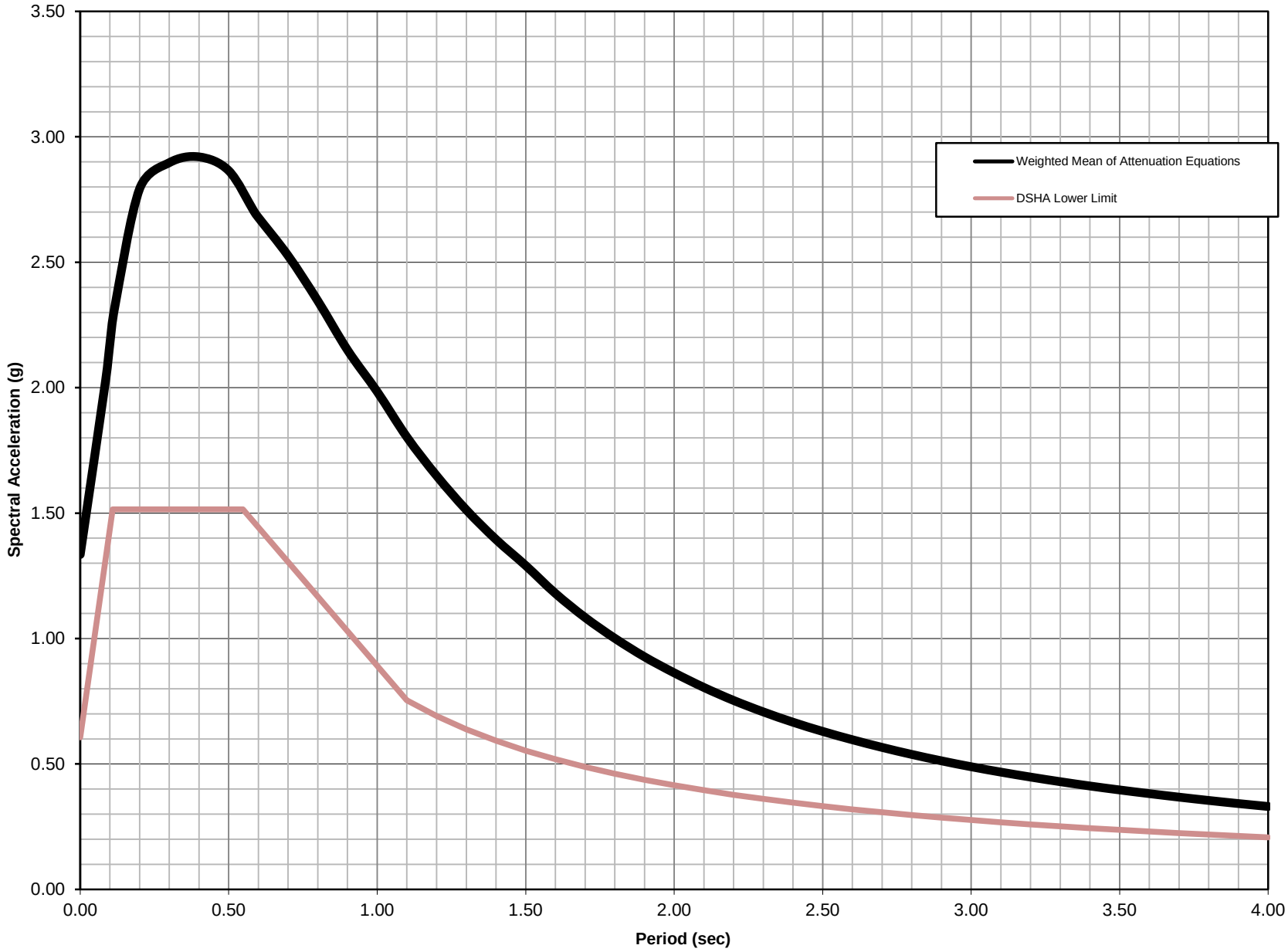
Analysis method:	Robertson (2009)	Depth to water table (erthq.):	30.00 ft	Fill weight:	N/A
Fines correction method:	Robertson (2009)	Average results interval:	3	Transition detect. applied:	No
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	No
Earthquake magnitude M_w:	9.30	Unit weight calculation:	Based on SBT	Clay like behavior applied:	All soils
Peak ground acceleration:	0.41	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	30.00 ft	Fill height:	N/A	Limit depth:	N/A

Estimation of post-earthquake settlements

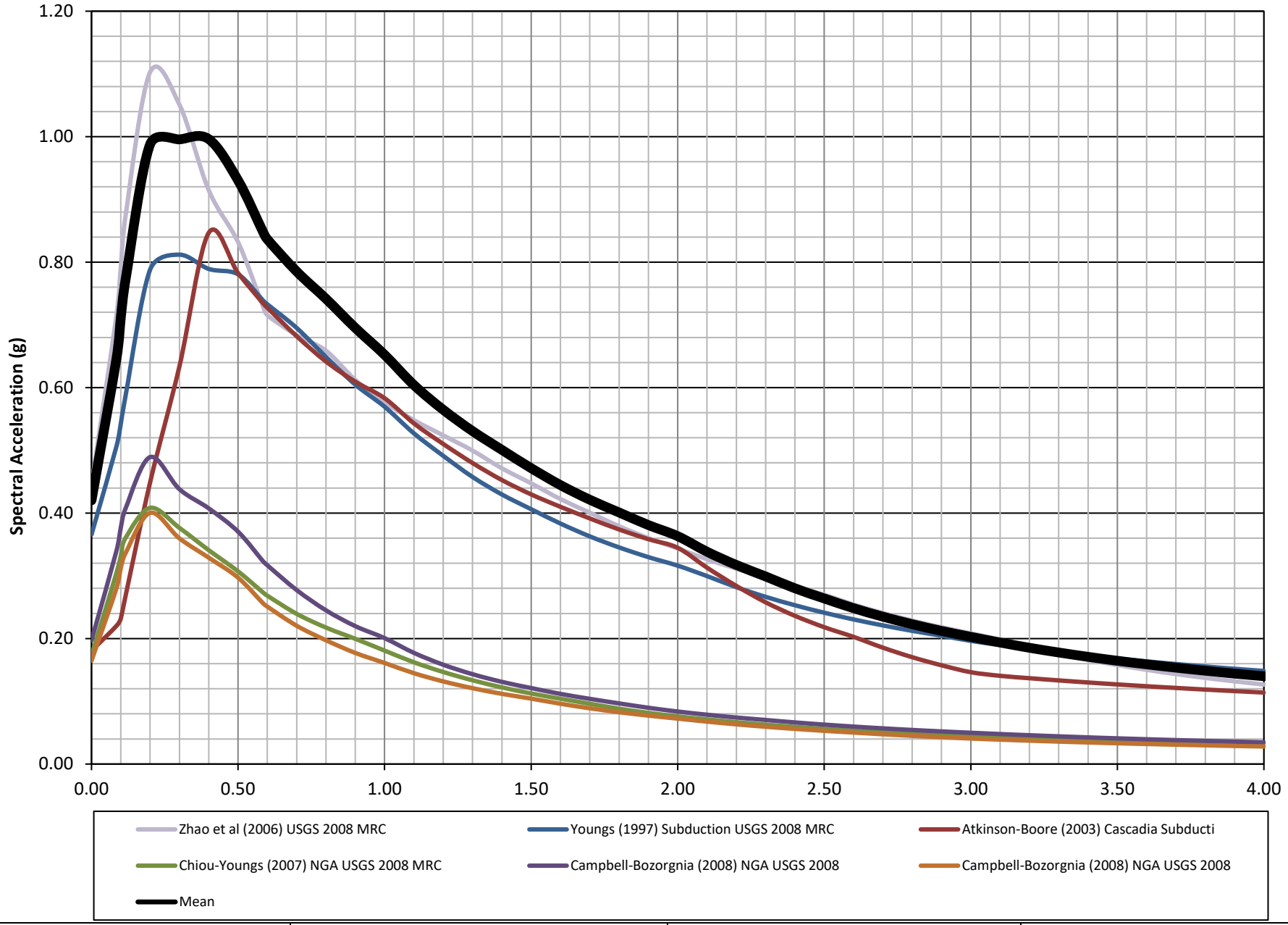


Abbreviations

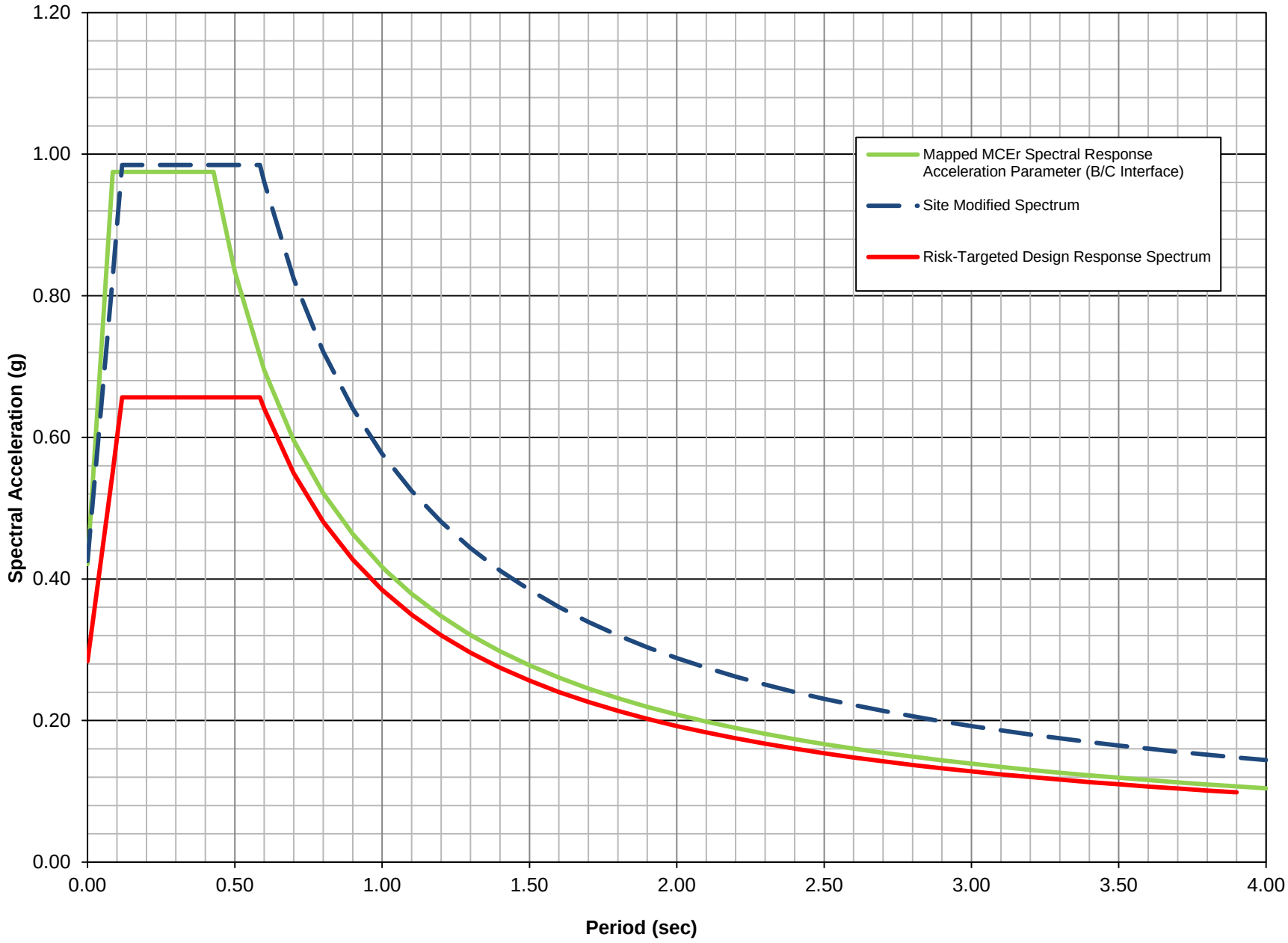
q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain



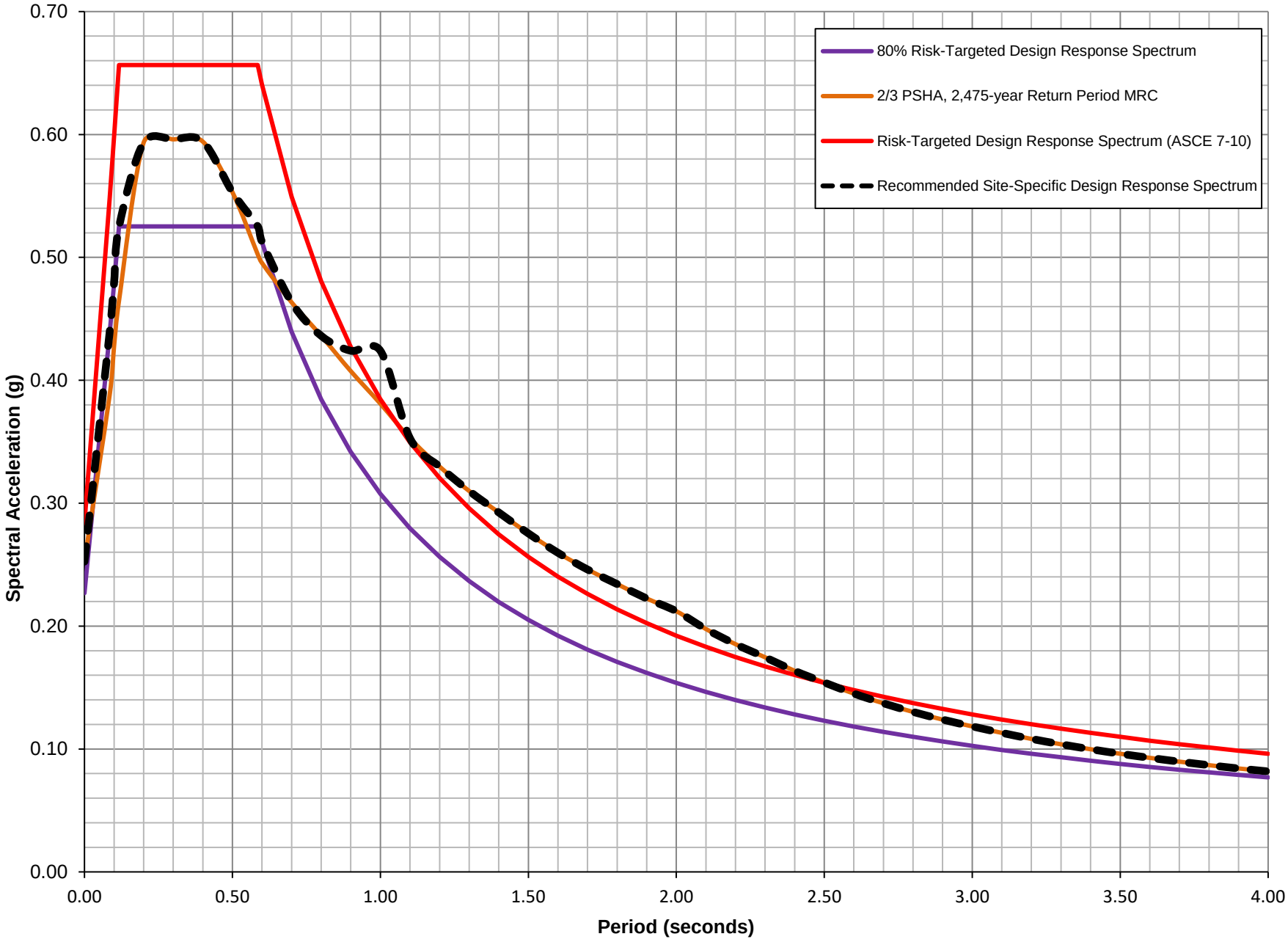
Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**SITE-SPECIFIC DSHA**	**APPENDIX D**



Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 070411018
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**SITE-SPECIFIC PSHA** **2,475-Year Return Period**	**APPENDIX D**



Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 3606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**GENERAL PROCEDURE**	**APPENDIX D**



Intertek psi	DATE: NOVEMBER 2017	PROPOSED BUILDING ADDITION ROWE MIDDLE SCHOOL 13606 SE LAKE ROAD MILWAUKIE, OREGON	PSI PROJECT NUMBER 07041118
PSI, INC. **6032 N. CUTTER CIRCLE, SUITE 480** **PORTLAND, OREGON 97217** **(503) 289-1778**	DRAWN BY: LIK	**RECOMMENDED SITE-SPECIFIC DESIGN RESPONSE SPECTRUM**	**APPENDIX D**

OPERATIONS AND MAINTENANCE

(Will be submitted with final design)

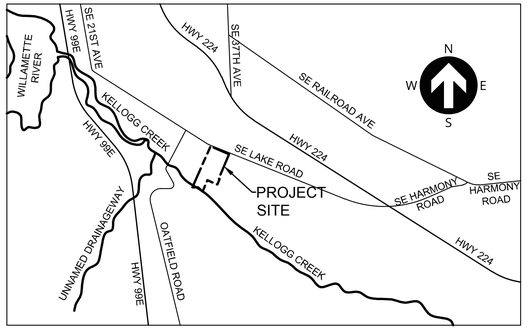
CSU MODIFICATION

FOR

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

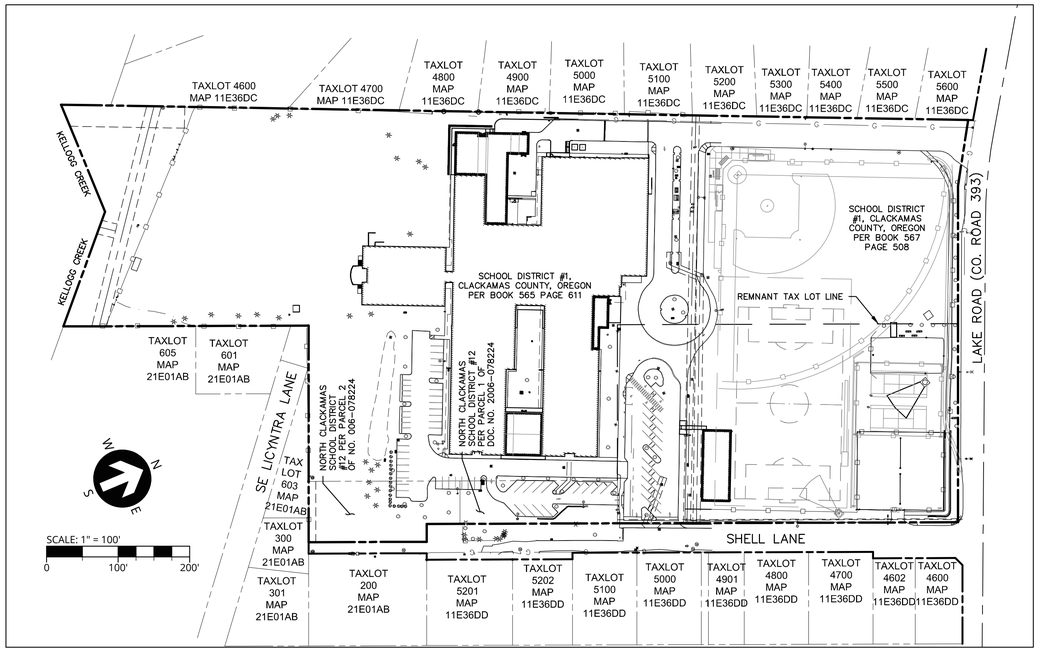
PREPARED FOR

NORTH CLACKAMAS SCHOOL DISTRICT



VICINITY MAP

NOT TO SCALE



SITE MAP

SCALE: 1" = 100'

TAX LOTS 5700, 5900, AND 100, SE 1/4 OF SECTION 36, T.1S., R.1E., AND NE 1/4 OF SECTION 1, T.2S., R.1E., W.M., CITY OF MILWAUKIE, CLACKAMAS COUNTY, OREGON

VERTICAL DATUM: ELEVATION DATUM IS BASED ON THE CITY OF MILWAUKIE BENCH MARK NO. 12, OBTAINED FROM PROJECT CONTROL BY COMPASS ENGINEERS, PROJECT NO. 9835.00-4754, ROWE MIDDLE SCHOOL, DATED 01/15/2001.

BENCHMARK NO. 12 ELEVATION = 109.394'

CIVIL SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
C-001	COVER SHEET
C-101	EXISTING CONDITIONS PLAN
C-102	DEMOLITION PLAN
C-122	PRELIMINARY EROSION AND SEDIMENT CONTROL PLAN
C-123	GRADING AND UTILITY CONSTRUCTION ESCP
C-124	EROSION AND SEDIMENT CONTROL DETAILS I
C-125	EROSION AND SEDIMENT CONTROL DETAILS II
C-201	SITE PLAN AND GRADING OVERVIEW
C-202	SITE PLAN AND GRADING DETAILS I
C-203	SITE PLAN AND GRADING DETAILS II
C-251	RETAINING WALL PLAN AND PROFILE
C-301	UTILITY PLAN OVERVIEW
C-302	UTILITY PLAN AREAS I
C-303	UTILITY PLAN AREAS II
C-304	PUBLIC STORM LINE PLAN AND PROFILE
C-401	DETAILS I
C-402	DETAILS II
C-403	DETAILS III
C-404	DETAILS IV

ARCHITECT SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
LU-111	ARCHITECTURAL BUILDING PLAN
LU-112	EXTERIOR BUILDING ELEVATIONS
LU-113	COVERED PLAY STRUCTURE

LANDSCAPE ARCHITECT SHEET LIST TABLE

SHEET NUMBER	SHEET TITLE
L-100	LANDSCAPING PLAN

PROJECT TEAM

OWNER/APPLICANT
NORTH CLACKAMAS SCHOOL DISTRICT
ATTN: DAVID HOBBS
4444 SE LAKE ROAD
MILWAUKIE, OR 97222
EMAIL: hobbsd@nclack.k12.or.us

SURVEYOR
HARPER HOUF PETERSON RIGHELLIS INC.
205 SE SPOKANE STREET, SUITE 200
PORTLAND, OR 97202
CONTACT: JOHN CAMPBELL, PLS
PHONE: (503) 221-1131
EMAIL: johnc@hhpr.com

ARCHITECT
MAHLUM ARCHITECTS INC
1231 NW HOYT STREET, SUITE 102
PORTLAND, OR 97209
CONTACT: SEAN MURPHY
PHONE: (503) 224-4032
EMAIL: smurphy@mahlum.com

GEOTECHNICAL ENGINEER
PROFESSIONAL SERVICE INDUSTRIES, INC.
6032 NORTH CUTTER CIRCLE, SUITE 480
PORTLAND, OR 97217
CONTACT: MICHAEL PLACE, PE
PHONE: (503) 289-1778

PLANNING
3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: ANDREW TULL
PHONE: (503) 946-9365
EMAIL: andrew.tull@3j-consulting.com

CIVIL ENGINEER
3J CONSULTING, INC.
5075 SW GRIFFITH DRIVE, SUITE 150
BEAVERTON, OR 97005
CONTACT: CHASE WELBORN, PE
PHONE: (503) 946-9365
EMAIL: chase.welborn@3j-consulting.com

LANDSCAPE ARCHITECT
WALKER MACY
111 SW OAK STREET, SUITE 200
PORTLAND, OR 97204
CONTACT: ALYSSA MACHLE JOHN
PHONE: (503) 228-3122
EMAIL: amachlejohn@walkermacy.com

UTILITIES & SERVICES

WATER, SEWER, STORM
CITY OF MILWAUKIE PUBLIC WORKS
6101 SE JOHNSON CREEK BLVD
MILWAUKIE, OR 97206
PHONE: (503) 786-7600
EMAIL: publicworks@milwaukieoregon.gov

GAS
NW NATURAL
220 NW 2ND AVENUE
PORTLAND, OR
PHONE: (503) 226-4211
EMERGENCY: (800) 882-3377

POLICE, ROADS, PARKS
CITY OF MILWAUKIE

POWER
PORTLAND GENERAL ELECTRIC
1705 EAST BURNSIDE
GRESHAM, OR 97030
CONTACT: SERVICE COORDINATOR
PHONE: (503) 323-6700

FIRE
CLACKAMAS COUNTY FIRE
STATION NUMBER 4
6600 SE LAKE ROAD
MILWAUKIE, OR 97222
CLACKAMAS CO. DISTRICT #1

SCHOOLS
NORTH CLACKAMAS SCHOOL DISTRICT

SITE INFORMATION

SITE ADDRESS
3606 SE LAKE ROAD,
MILWAUKIE, OR 97222

TAX LOT(S)
11E36DC5700

JURISDICTION
CITY OF MILWAUKIE

FLOOD HAZARD
MAP NUMBER: 41005C0017D
ZONE X (UNSHADED), ZONE X (SHADED), ZONE AE

ZONING
R10 - LOW DENSITY RESIDENTIAL

LOCATION
SE 1/4 OF SECTION 36, T.1S., R.1E.,
AND NE 1/4 OF SECTION 1, T.2S., R.1E.
W.M., CITY OF MILWAUKIE,
CLACKAMAS COUNTY, OREGON

Know what's **below.** Call before you dig.

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:20 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

COVER SHEET
ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

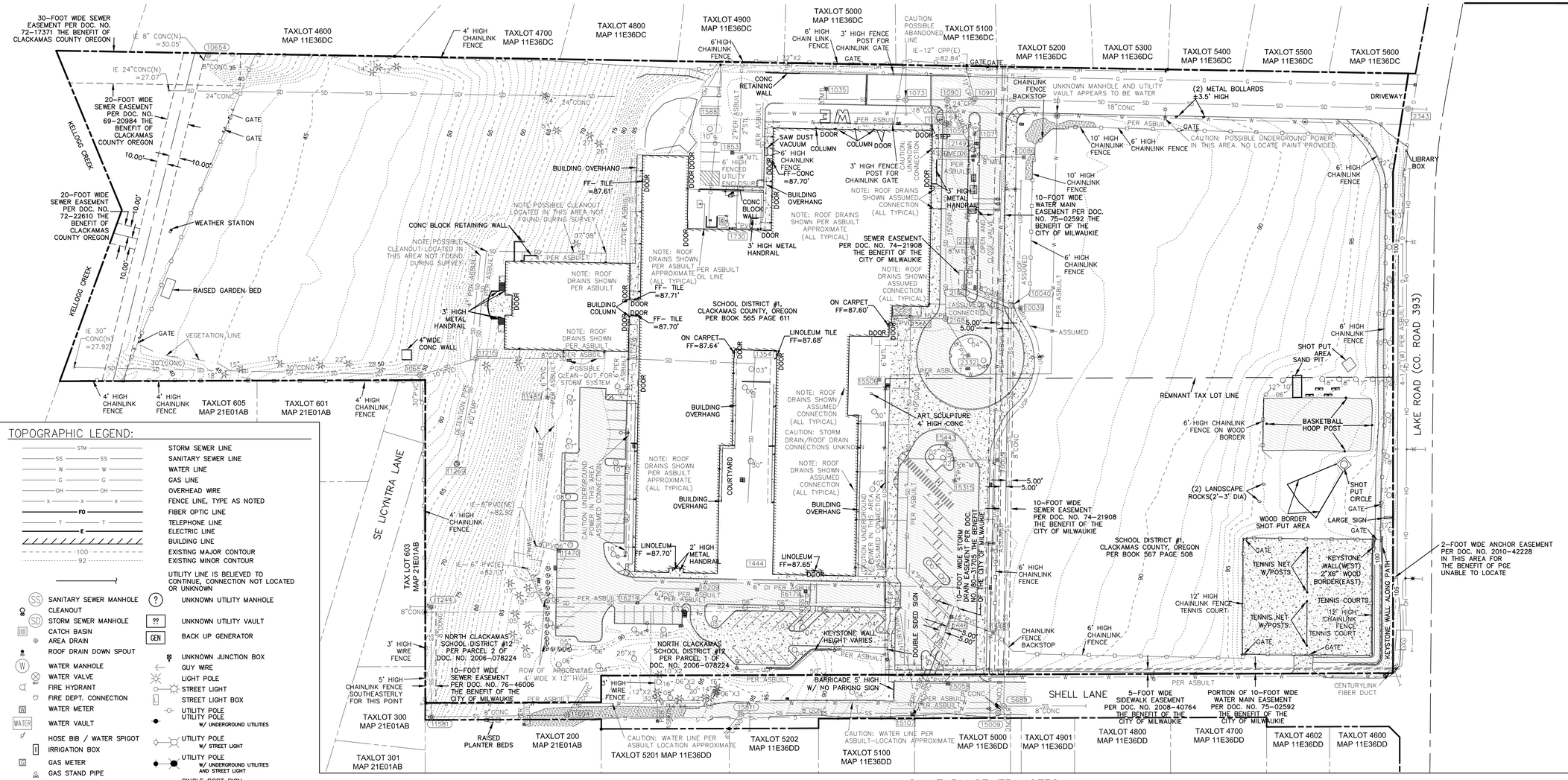
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-001

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C000-COVER SHEET.DWG



TOPOGRAPHIC LEGEND:

- STM — STORM SEWER LINE
- SS — SANITARY SEWER LINE
- W — WATER LINE
- G — GAS LINE
- OH — OVERHEAD WIRE
- X — FENCE LINE, TYPE AS NOTED
- FO — FIBER OPTIC LINE
- T — TELEPHONE LINE
- E — ELECTRIC LINE
- BUILDING LINE
- 100 — EXISTING MAJOR CONTOUR
- 92 — EXISTING MINOR CONTOUR
- UTILITY LINE IS BELIEVED TO CONTINUE, CONNECTION NOT LOCATED OR UNKNOWN
- SANITARY SEWER MANHOLE
- CLEANOUT
- STORM SEWER MANHOLE
- CATCH BASIN
- AREA DRAIN
- ROOF DRAIN DOWN SPOUT
- WATER MANHOLE
- WATER VALVE
- FIRE HYDRANT
- FIRE DEPT. CONNECTION
- WATER METER
- WATER VAULT
- HOSE BIB / WATER SPIGOT
- IRRIGATION BOX
- GAS METER
- GAS STAND PIPE
- ELECTRIC BOX
- TELEPHONE BOX
- TELEPHONE MANHOLE
- TELEPHONE RISER
- EXISTING CONCRETE SURFACE
- EXISTING ASPHALT SURFACE
- EXISTING GRAVEL SURFACE
- FOUND MONUMENT
- UNKNOWN UTILITY MANHOLE
- UNKNOWN UTILITY VAULT
- BACK UP GENERATOR
- UNKNOWN JUNCTION BOX
- GUY WIRE
- LIGHT POLE
- STREET LIGHT
- STREET LIGHT BOX
- UTILITY POLE
- UTILITY POLE W/ UNDERGROUND UTILITIES
- UTILITY POLE W/ STREET LIGHT
- UTILITY POLE W/ UNDERGROUND UTILITIES AND STREET LIGHT
- SINGLE POST SIGN
- DOUBLE POST SIGN
- FLAG POLE
- BENCH
- GATE POST
- BOLLARD
- HANDI-CAP PARKING SPACE
- SHRUB / BUSH
- CONIFEROUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- DECIDUOUS TREE (APPROXIMATE DIAMETER BREAST HIGH AS NOTED)
- HHPR CONTROL POINT

ABBREVIATIONS:

CMP	=	CORRUGATED METAL PIPE
CONC	=	CONCRETE
CPP	=	CORRUGATED PLASTIC PIPE
MTL	=	METAL
IE	=	INVERT ELEVATION
PVC	=	PLASTIC PVC PIPE

NOTE: SYMBOLS SHOWN HEREON ARE FOR GRAPHICAL REPRESENTATION PURPOSES AND DO NOT NECESSARILY SHOW SHAPE, SIZE, ROTATION, CONDITION, TYPE, ETC. OF THE ACTUAL PHYSICAL IMPROVEMENTS THAT THEY REPRESENT. CONDITION, TYPE, ROTATION, ETC. MAY VARY AMONGST ITEMS SHOWN BY THE SAME SYMBOL.

STORM SEWER NOTES

1035 CATCH BASIN-OIL TRAP
RIM=86.50'
IE 3"MTL(SE)=85.60'
BOTTOM=83.35'

1073 STORM MANHOLE
RIM=86.86'
NOTE: VALVE IN MANHOLE(NE) MAY BE ABANDONED LINE
IE 18"CONC(NE)=78.91'
IE 18"CONC(SW)=78.86
BOTTOM=78.91'

1090 STORM MANHOLE
RIM=86.26'
IE 4"PVC(NE)=79.86'
IE 24"CPP(NE)=79.76'
IE 15"CPP(SE)=79.71'
IE 18"CONC(SW)=79.61'
BOTTOM=79.71'

1091 STORM MANHOLE
RIM=86.18'
IE 18"CONC(NE)=80.48'
IE 12"CPP(NW)=81.18'
IE 24"CPP(SW)=80.13'
BOTTOM=80.23'

1105 STORM MANHOLE
RIM=85.93'
IE 15"CPP(SE)=79.73'
BOTTOM=77.23'
NOTE:1106 AND 1105 ARE ONE STRUCTURE

1106 STORM MANHOLE
RIM=86.03'
IE TOP OF VERTICAL PIPE=83.43'
IE OF VERTICAL PIPE=79.78'
BOTTOM=77.33'
NOTE:1106 AND 1105 ARE ONE STRUCTURE

1107 CATCH BASIN-OIL TRAP
RIM=84.88'
IE 8"MTL(SE)=83.13'
BOTTOM=81.18'

1354 CATCH BASIN-OIL TRAP
RIM=87.35'
IE 4" MTL(S)=85.85
SUMP=84.85'

1444 CATCH BASIN-OIL TRAP
RIM=87.25'
IE SECOND RIM=86.45'
SUMP=85.35'

1588 STORM MANHOLE
RIM=86.80'
FILLED W/DIRT-GRAVEL APPEARS TO BE ABANDONED
BOTTOM=85.30'

1730 AREA DRAIN-OIL TRAP
RIM=87.20'
IE 3"PVC(NE)=86.50'
BOTTOM=86.15'

1853 CATCH BASIN-OIL TRAP
RIM=86.48'
IE 4"MTL(NE)=85.53'
BOTTOM=83.28'

2032 CATCH BASIN-OIL TRAP
RIM=84.75'
IE 8"MTL(SW)=83.00'
BOTTOM=81.05'

2149 CLEAN-OUT
RIM=85.96'
IE 4"CONC(SW)=±83.1'

2168 STORM MANHOLE
RIM=86.13'
IE 8"PVC(NE)=82.55'
IE 15"CPP(SW)=82.13'
IE 15"CPP(NW)=82.10'
BOTTOM=82.13'

2332 CATCH BASIN-OIL TRAP
RIM=84.57'
IE 8"PVC(SW)=82.82'
BOTTOM=80.87'

2343 STORM MANHOLE
RIM=98.64'
IE 18"CONC(NE)=90.09'
IE 18"CONC(SW)=89.74'
BOTTOM=90.04'

10005 CATCH BASIN
RIM=85.41'
IE 6" MTL(SW)=84.16'
BOTTOM=82.41'

10039 CATCH BASIN
RIM=85.75'
IE 8" MTL(SW)=84.00'
BOTTOM=82.05'

10086 CATCH BASIN
RIM=86.08'
IE 8"MTL(SE)=83.83'
BOTTOM=81.88'

10652 STORM MANHOLE
RIM=55.23'
IE 10"PVC(N)=51.58'
IE 30"CONC(SE)=51.52'
IE 30"CONC(SW)=51.23'
BOTTOM=51.33'

11215 STORM MANHOLE
RIM=62.59'
IE 8"CONC(NE)=54.39'
IE 60"CMP(SE)=52.99'
IE 10"VERTICAL PIPE(SW)
TOP=58.19
BOTTOM=52.79'
BOTTOM=48.89'

11269 STORM MANHOLE
RIM=64.91'
IE 60"CMP(NW)=53.01'
BOTTOM=53.21'

11470 CATCH BASIN
RIM=85.68'
IE 8"PVC(SW)=83.98'
BOTTOM=81.98'

11485 CATCH BASIN-OIL TRAP
RIM=80.30'
IE 6"PVC(NW)=79.25'
BOTTOM=77.10'

11729 CLEAN-OUT
RIM=87.35'

15058 CATCH BASIN
FULL OF WATER
RIM=85.94'
IE 4"PVC(SW)=84.34'
BOTTOM=77.10'

15107 CATCH BASIN
FULL OF WATER
RIM=85.77'
IE 4"PVC(NW)=84.57'
BOTTOM=82.87'

15315 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=85.97'
IE 4"PVC(NW)=85.32'
WATER LEVEL=85.34'
BOTTOM=81.98'

SANITARY SEWER NOTES

2106 SANITARY MANHOLE
RIM=85.62'
IE 8"CONC(NW)=77.32'
IE 8"CONC(NE)=77.12'
BOTTOM=77.32'

5443 CATCH BASIN-OIL TRAP
RIM=85.85'
IE 6"MTL(SE)=84.65'
BOTTOM=82.65'

5446 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=85.32'
IE(NE)=NOT FOUND
IE 4"PVC(SW)=84.64'
IE(SE)=82.92
UNABLE TO SEE A PIPE
BOTTOM=82.67'

5481 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.62'
IE 6"PVC(SW)=85.32'
BOTTOM=83.42'

5506 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.70'
IE 6"PVC(NW)=85.32'
BOTTOM=83.42'

5662 STORM MANHOLE
RIM=87.14'
IE 6"PVC(SW)=83.16'
IE 10"CONC(SE)=82.69'
IE 15"CPP(NE)=82.64'
BOTTOM=82.68'

5663 CLEAN-OUT
RIM=87.49'
IE 6"(NE)PVC=±83.3'

6179 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.43'
IE 6"PVC(SE)=84.83'
BOTTOM=82.73'

6209 CATCH BASIN-OIL TRAP
FULL OF WATER
RIM=86.46'
IE 6"PVC(SW)=84.96'
BOTTOM=82.76'

6219 CLEAN-OUT
RIM=87.10'

10040 SANITARY MANHOLE
RIM=86.58'
IE 8"CONC(SW)=76.83'
IE 8"CONC(SE)=76.68'
BOTTOM=76.83'

10654 SANITARY MANHOLE
RIM=31.94'
UNABLE TO OPEN BOLTED SHUT

11244 SANITARY MANHOLE
RIM=70.22'
IE 8"CONC(SE)=64.82'
IE 8"CONC(SW)=64.32'
BOTTOM=76.83'

11581 SANITARY MANHOLE
RIM=76.90'
IE 8"CONC(NE)=71.50'
IE 8"CONC(NW)=69.20'
OTTOM=76.83'

11694 SANITARY MANHOLE
RIM=89.51'
IE 8"CONC(NW)=81.31'
IE 8"CONC(SW)=81.11'
BOTTOM=81.21'

15009 SANITARY MANHOLE
RIM=86.85'
IE 8"CONC(SW)=76.85'
IE 8"CONC(NW)=77.00'
BOTTOM=76.95'

15811 SANITARY MANHOLE
RIM=95.23'
IE 6"CONC(SE)=87.33'
IE 8"CONC(NE)=86.13'
BOTTOM=86.63'

LOCATED IN THE SOUTHEAST ONE-QUARTER OF SECTION 36, TOWNSHIP 1 SOUTH, RANGE 1 EAST, AND THE NORTHEAST ONE-QUARTER OF SECTION 1, TOWNSHIP 2 SOUTH, RANGE 1 EAST, WILLAMETTE MERIDIAN
CITY OF MILWAUKIE, CLACKAMAS COUNTY, OREGON

FIELD WORK DATES: 10/13/17-11/3/17

EXISTING CONDITIONS PLAN

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS AND PHYSICAL SITE OBSERVATIONS. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

FLOOD PLAIN NOTES

ZONE X (UN-SHADED) THE SITE IS LOCATED WITHIN ZONE X (UN-SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER **41005C0017D**
FEMA'S DEFINITION OF ZONE X (UN-SHADED) IS AN AREA OF MINIMAL FLOOD HAZARD, USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE X IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

ZONE X (SHADED) THE SITE IS LOCATED WITHIN ZONE X (SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER **41005C0017D**
FEMA'S DEFINITION OF ZONE X (SHADED) IS AN AREA OF MODERATE FLOOD HAZARD, USUALLY THE AREA BETWEEN THE LIMITS OF THE 100-YEAR AND 500-YEAR FLOODS. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

ZONE AE THE SITE IS LOCATED WITHIN ZONE AE PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER **41005C0017D**
FEMA'S DEFINITION OF ZONE AE ARE IS BASE FLOODPLAIN WHERE BASE FLOOD ELEVATIONS ARE PROVIDED. AE ZONES ARE NOW USED ON NEW FORMAT FIRMS INSTEAD OF A1-A30 ZONES. IN COMMUNITIES THAT PARTICIPATE IN THE NFIP, MANDATORY FLOOD INSURANCE PURCHASE REQUIREMENTS APPLY.

VERTICAL DATUM:

ELEVATION DATUM IS BASED ON THE CITY OF MILWAUKIE BENCH MARK NO. 12, OBTAINED FROM PROJECT CONTROL BY COMPASS ENGINEERS, PROJECT NO. 9835.00-4754, ROWE MIDDLE SCHOOL, DATED 01/15/2001.

BENCHMARK NO. 12 ELEVATION = 109.394'

HORIZONTAL DATUM

HORIZONTAL DATUM IS ASSUMED, BASED ON PROJECT CONTROL OBTAINED FROM COMPASS ENGINEERS PROJECT NO. 9835.00-4754, ROWE MIDDLE SCHOOL, DATED 01/15/2001.

SCALE: 1" = 50'
0 50' 100'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:02:26 AM
OREGON
MAR. 11, 2014
CHASE K. WELSORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

EXISTING CONDITIONS PLAN
ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

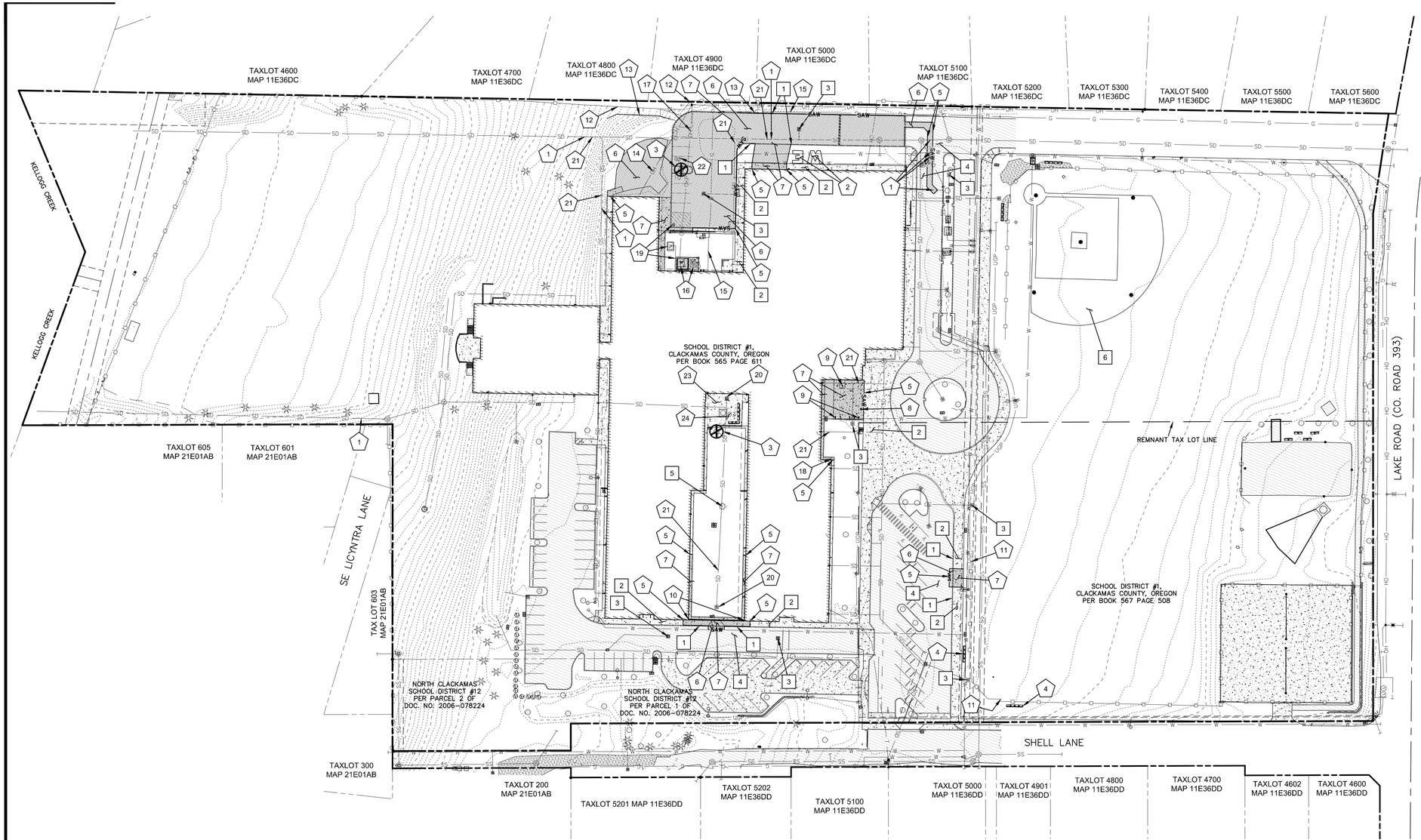
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-101

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C100-EXISTING CONDITIONS.DWG



LEGEND

- EXISTING BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING: WHITE
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- TREE TO BE REMOVED
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED SAWCUT LINE
- PROPOSED HARDSCAPE REMOVAL

GENERAL NOTES

1. DEMOLITION NOTES ARE FOR CLARIFICATION ONLY AND ARE SHOWN FOR THE CONTRACTOR'S BENEFIT. THESE NOTES ARE NOT INTENDED TO BE COMPREHENSIVE. THE CONTRACTOR SHALL REMOVE OR RELOCATE ALL EXISTING ON-SITE IMPROVEMENTS NECESSARY TO ACCOMMODATE THE PROPOSED CONSTRUCTION.
2. ALL STRUCTURES, SIGNS, HYDRANTS, SEGMENTAL WALLS, OR OTHER APPURTENCES WITHIN THE RIGHT OF WAY ARE THE PROPERTY OF THE CITY OR COUNTY. CONTRACTOR SHALL COORDINATE WITH THE CITY TO DETERMINE ITEMS THAT SHALL BE SALVAGED AND RETAINED BY THE CITY.
3. ALL STRUCTURES, SIGNS, HYDRANTS, SEGMENTAL WALLS, OR OTHER APPURTENCES WITHIN THE PROJECT SITE ARE THE PROPERTY OF THE NORTH CLACKAMAS SCHOOL DISTRICT (NCSD). CONTRACTOR SHALL COORDINATE WITH THE NCSD MAINTENANCE DEPARTMENT TO DETERMINE ITEMS THAT SHALL BE SALVAGED AND RETAINED BY THE NCSD.
4. CONTRACTOR IS TO REMOVE ALL EXISTING SURFACE IMPROVEMENTS AND DEBRIS WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED. ALL DEBRIS FOUND ON SITE SHALL BE DISPOSED OF IN ACCORDANCE WITH APPLICABLE STATE CODES.
5. CONTRACTOR SHALL PROTECT EXISTING FEATURES WHICH ARE TO REMAIN.
6. CONTRACTOR SHALL ADJUST ALL EXISTING MANHOLE RIMS, DRAINAGE STRUCTURES, VALVE BOXES, VAULT LIDS AND UTILITY ACCESS STRUCTURES TO FINISH GRADE WITHIN AREAS AFFECTED BY PROPOSED CONSTRUCTION.
7. CONSTRUCTION AND DEMOLITION ACTIVITIES SHALL BE PHASED IN SUCH A MANNER AS TO ENSURE THAT PUBLIC ACCESS ROADS ARE NOT BLOCKED AND REMAIN OPERATIONAL. CONTRACTOR TO COORDINATE WITH PROPERTY OWNERS TO MAINTAIN RESIDENTIAL ACCESS THROUGHOUT CONSTRUCTION OR FOR ANY INTERRUPTION OF USE.
8. CONTRACTOR SHALL VERIFY ALL EXISTING UTILITIES PRIOR TO BEGINNING CONSTRUCTION.

CONSTRUCTION KEY NOTES

1. PROTECT EXISTING CURB TO REMAIN.
2. PROTECT EXISTING SIDEWALK TO REMAIN.
3. PROTECT EXISTING CATCH BASIN TO REMAIN
4. PROTECT EXISTING ASPHALT / CONCRETE PAVEMENT TO REMAIN.
5. PROTECT EXISTING TREE TO REMAIN.
6. REFER TO PLANS BY HHPR FOR ALL SPORTS FIELD DEMOLITION AND CONSTRUCTION.

DEMOLITION KEY NOTES

1. POTHOLE VERIFY EXISTING UTILITY FOR HORIZONTAL AND VERTICAL LOCATION.
2. REMOVE EXISTING WOOD BOARD PLANTERS AND DISPOSE OFF-SITE.
3. REMOVE EXISTING TREE AND DISPOSE OFF-SITE.
4. REMOVE EXISTING BENCHES AND RETURN TO SCHOOL DISTRICT MAINTENANCE DEPARTMENT.
5. SAWCUT EXISTING ASPHALT / CONCRETE PAVEMENT AND CONCRETE CURB / SIDEWALK AT LOCATION SHOWN.
6. REMOVE EXISTING ASPHALT SURFACING AND DISPOSE OFF-SITE.
7. REMOVE EXISTING CONCRETE CURB / SIDEWALK AND DISPOSE OFF-SITE.
8. DISCONNECT AND REMOVE EXISTING WATER FOUNTAIN AND ASSOCIATED APPURTENANCES. DISPOSE OFF-SITE.
9. REMOVE EXISTING FLAGPOLE AND BIKE RACKS. RETURN TO SCHOOL DISTRICT MAINTENANCE DEPARTMENT.
10. REMOVE EXISTING SECURITY WALL TO COURTYARD AND DISPOSE OFF-SITE.
11. REMOVE EXISTING FENCING AND ASSOCIATED APPURTENANCES, DISPOSE OFF-SITE.
12. REMOVE EXISTING FENCING AND ASSOCIATED APPURTENANCES. REINSTALL OR REPLACE AT OFFSET ALIGNMENT AFTER COMPLETION OF CONSTRUCTION.
13. REMOVE EXISTING RETAINING WALL AND DISPOSE OFF-SITE.
14. DISCONNECT AND REMOVE EXISTING OVERHEAD WIRE AND DISPOSE OFF-SITE.
15. DISCONNECT EXISTING UNDERGROUND NATURAL GAS LINE AND RELOCATE OUTSIDE OF NEW BUILDING FOOTPRINT.
16. DISCONNECT EXISTING ELECTRICAL TRANSFORMER AND GENERATOR, DISPOSE OFF-SITE.
17. DISCONNECT EXISTING UNDERGROUND ELECTRICAL LINE AND REROUTE TO NEW TRANSFORMER LOCATION.
18. DISCONNECT EXISTING TELEPHONE VAULT AND RELOCATE OUTSIDE OF NEW BUILDING FOOTPRINT.
19. REMOVE EXISTING OIL / FUEL TANK, FUEL LINE, AND FILLER PORT AND DISPOSE OFF-SITE.
20. REMOVE EXISTING STORM CATCH BASIN.
21. REMOVE EXISTING UNDERGROUND STORM LINES TO NEAREST PIPE JOINT, TO BE CONTINUED PER NEW UTILITY PLAN (SEE SHEET C-301).
22. REMOVE EXISTING STORM MANHOLE AND DISPOSE OFF-SITE.
23. REMOVE EXISTING CONCRETE SURFACING AND DISPOSE OFF-SITE.
24. REMOVE EXISTING SITE FURNITURE AND DISPOSE OFFSITE.

Know what's below. Call before you dig.

SCALE: 1" = 50'
0 50' 100'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:26 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

DEMOLITION PLAN

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

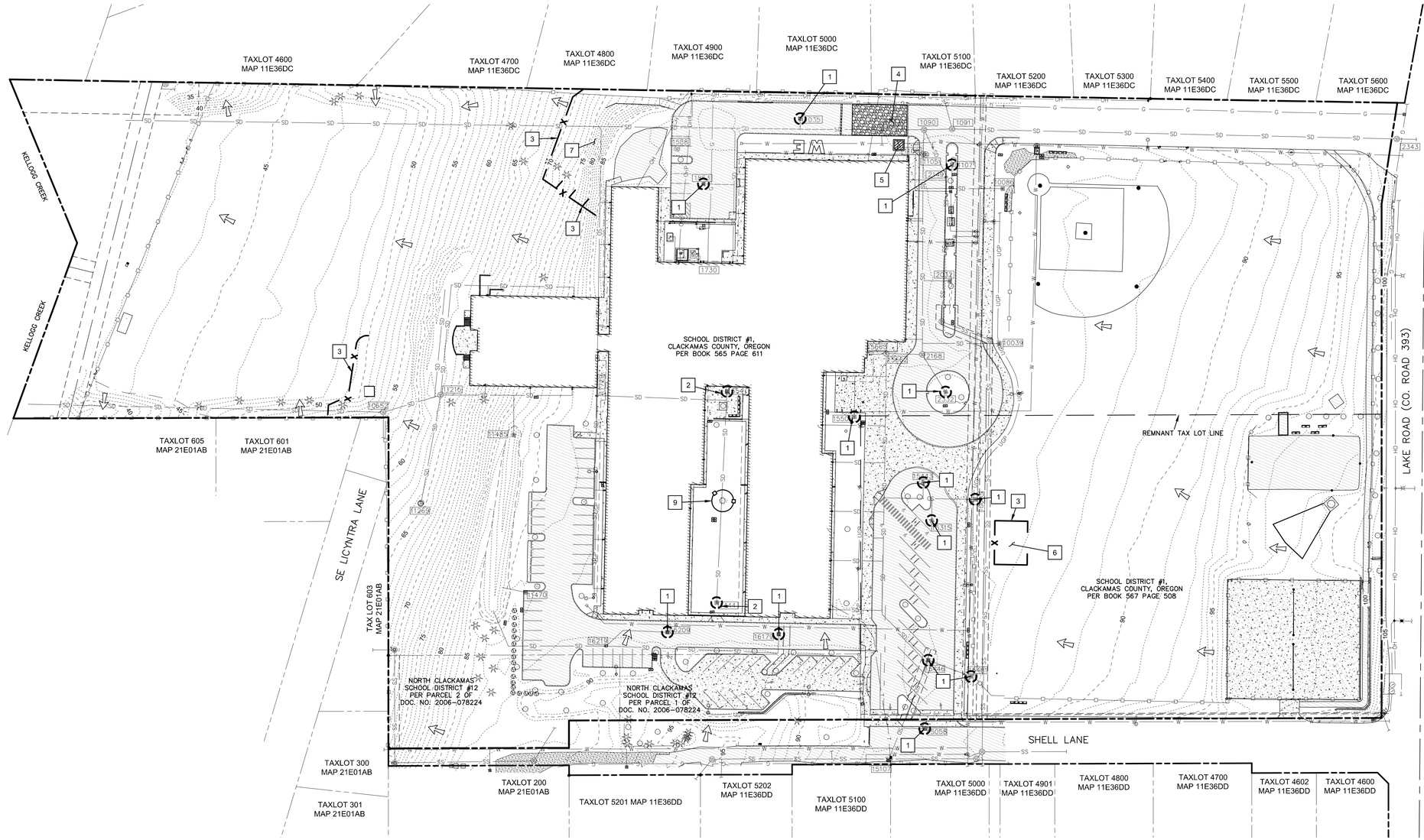
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-102

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C110-DEMOLITION PLANS.DWG



LEGEND

- EXISTING BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING: WHITE
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- TREE TO BE REMOVED
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED SILT FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED INLET PROTECTION
- PROPOSED TREE PROTECTING FENCING
- EXISTING SURFACE RUN-OFF DIRECTION

PRE-CONSTRUCTION, CLEARING, AND DEMOLITION NOTES

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. SEDIMENT BARRIERS APPROVED FOR USE INCLUDE SEDIMENT FENCE, BERMS CONSTRUCTED OUT OF MULCH, CHIPPINGS, OR OTHER SUITABLE MATERIAL, STRAW WATTLES, OR OTHER APPROVED MATERIALS.
3. SENSITIVE RESOURCES INCLUDING, BUT NOT LIMITED TO, TREES, WETLANDS, AND RIPARIAN PROTECTION AREAS SHALL BE CLEARLY DELINEATED WITH ORANGE CONSTRUCTION FENCING OR CHAIN LINK FENCING IN A MANNER THAT IS CLEARLY VISIBLE TO ANYONE IN THE AREA. NO ACTIVITIES ARE PERMITTED TO OCCUR BEYOND THE CONSTRUCTION BARRIER.
4. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, STREET SWEEPING, AND VACUUMING, MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
5. RUN-ON AND RUN-OFF CONTROLS SHALL BE IN PLACE AND FUNCTIONING PRIOR TO BEGINNING SUBSTANTIAL CONSTRUCTION ACTIVITIES. RUN-ON AND RUN-OFF CONTROL MEASURES INCLUDE: SLOPE DRAINS (WITH OUTLET PROTECTION), CHECK DAMS, SURFACE ROUGHENING, AND BANK STABILIZATION.

GENERAL NOTES

1. THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES NEED TO BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.
2. PRE-DEVELOPED RUN-OFF SHEET FLOWS EASTERLY INTO ON-SITE DRAINAGE AND SOUTHERLY ONTO ADJACENT PROPERTIES.

EROSION CONTROL KEY NOTES

1. INSTALL INLET PROTECTION PER DETAIL 4-18 AND 4-19 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
2. INSTALL INLET PROTECTION PER DETAIL 4-18 AND 4-19 ON SHEET C-124. MAINTAIN UNTIL CATCH BASIN IS REMOVED.
3. INSTALL SEDIMENT FENCING AT LOCATION SHOWN PER DETAIL 4-23 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
4. INSTALL CONSTRUCTION ENTRANCE AT LOCATION SHOWN PER DETAIL 4-13 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
5. PROVIDE ABOVE-GROUND CONCRETE WASHOUT AT LOCATION SHOWN. MAINTAIN THROUGHOUT CONSTRUCTION. DISPOSE OF CONCRETE MATERIAL OFF-SITE WHEN BASIN IS MORE THAN 50% FULL.
6. MAINTAIN TOPSOIL STOCKPILE FOR REUSE. COVER PER DETAIL 4-3 ON SHEET C-124.
7. INSTALL SLOPE PROTECTION PER DETAIL 4-1 ON SHEET C-124. SLOPES SHALL BE ROUGHENED PER DETAIL 4-10 OR 4-11 ON SHEET C-124 AS NEEDED.
9. INSTALL TREE PROTECTION FENCING PER DETAIL ON SHEET C125.

STORM SEWER NOTES

1035 CATCH BASIN–OIL TRAP
RIM=86.50'
IE 3"MTL(SE)=85.60'
BOTTOM=83.35'

1073 STORM MANHOLE
RIM=86.86'
NOTE: VALVE IN MANHOLE(NE) MAY BE ABANDONED LINE
IE 18"CONC(NE)=78.91'
IE 18"CONC(SW)=78.86
BOTTOM=78.91'

1090 STORM MANHOLE
RIM=86.26'
IE 4"PVC(NE)=79.86'
IE 24"CPP(NE)=79.76'
IE 15"CPP(SE)=79.71'
IE 18"CONC(SW)=79.61'
BOTTOM=79.71'

1091 STORM MANHOLE
RIM=86.18'
IE 18"CONC(NE)=80.48'
IE 12"CPP(NW)=81.18'
IE 24"CPP(SW)=80.13'
BOTTOM=80.23'

1105 STORM MANHOLE
RIM=85.93'
IE 15"CPP(SE)=79.73'
BOTTOM=77.23'
NOTE:1106 AND 1105 ARE ONE STRUCTURE

1106 STORM MANHOLE
RIM=86.03'
IE TOP OF VERTICAL PIPE=83.43'
IE OF VERTICAL PIPE=79.78'
BOTTOM=77.33'
NOTE:1106 AND 1105 ARE ONE STRUCTURE

1107 CATCH BASIN–OIL TRAP
RIM=84.88'
IE 8"MTL(SE)=83.13'
BOTTOM=81.18'

1269 STORM MANHOLE
RIM=64.91'
IE 60"CMP(NW)=53.01'
BOTTOM=53.21'

1354 CATCH BASIN–OIL TRAP
RIM=87.35'
IE 4" MTL(S)=85.85
SUMP=84.85'

1470 CATCH BASIN
RIM=85.68'
IE 8"PVC(SW)=83.98'
BOTTOM=81.98'

1444 CATCH BASIN–OIL TRAP
RIM=87.25'
IE SECOND RIM=86.45'
SUMP=85.35'

1485 CATCH BASIN–OIL TRAP
RIM=80.30'
IE 6"PVC(NW)=79.25'
BOTTOM=77.10'

1588 STORM MANHOLE
RIM=86.80'
FILLED W/DIRT–GRAVEL APPEARS TO BE ABANDONED
BOTTOM=85.30'

1729 CLEAN–OUT
RIM=87.35'

1730 AREA DRAIN–OIL TRAP
RIM=87.20'
IE 3"PVC(NE)=86.50'
BOTTOM=86.15'

15058 CATCH BASIN
FULL OF WATER
RIM=85.94'
IE 4"PVC(SW)=84.34'
BOTTOM=77.10'

1853 CATCH BASIN–OIL TRAP
RIM=86.48'
IE 4"MTL(NE)=85.53'
BOTTOM=83.28'

15107 CATCH BASIN
FULL OF WATER
RIM=85.77'
IE 4"PVC(NW)=84.57'
BOTTOM=82.87'

2032 CATCH BASIN–OIL TRAP
RIM=84.75'
IE 8"MTL(SW)=83.00'
BOTTOM=81.05'

15315 CATCH BASIN–OIL TRAP
FULL OF WATER
RIM=85.97'
IE 4"PVC(NW)=85.32'
WATER LEVEL=85.34'
BOTTOM=81.98'

2149 CLEAN–OUT
RIM=85.96'
IE 4"CONC(SW)=±83.1'

15443 CATCH BASIN–OIL TRAP
RIM=85.85'
IE 6"MTL(SE)=84.65'
BOTTOM=82.65'

2168 STORM MANHOLE
RIM=86.13'
IE 8"PVC(NE)=82.55'
IE 15"CPP(SW)=82.13'
IE 15"CPP(NW)=82.10'
BOTTOM=82.13'

15446 CATCH BASIN–OIL TRAP
FULL OF WATER
RIM=85.32'
IE(NE)=NOT FOUND
IE 4"PVC(SW)=84.64'
IE(SE)=82.92
UNABLE TO SEE A PIPE
BOTTOM=82.67'

2332 CATCH BASIN–OIL TRAP
RIM=84.57'
IE 8"PVC(SW)=82.82'
BOTTOM=80.87'

15481 CATCH BASIN–OIL TRAP
FULL OF WATER
RIM=86.62'
IE 6"PVC(SW)=85.32'
BOTTOM=83.42'

2343 STORM MANHOLE
RIM=98.64'
IE 18"CONC(NE)=90.09'
IE 18"CONC(SW)=89.74'
BOTTOM=90.04'

15508 CATCH BASIN–OIL TRAP
FULL OF WATER
RIM=86.70'
IE 6"PVC(NW)=85.32'
BOTTOM=83.42'

10005 CATCH BASIN
RIM=85.41'
IE 6" MTL(SW)=84.16'
BOTTOM=82.41'

15662 STORM MANHOLE
RIM=87.14'
IE 6"PVC(SW)=83.16'
IE 10"CONC(SE)=82.69'
IE 15"CPP(NE)=82.64'
BOTTOM=82.68'

10039 CATCH BASIN
RIM=85.75'
IE 8" MTL(SW)=84.00'
BOTTOM=82.05'

15663 CLEAN–OUT
RIM=87.49'
IE 6"(NE)PVC=±83.3'

10086 CATCH BASIN
RIM=86.08'
IE 8" MTL(SW)=83.83'
BOTTOM=81.88'

16179 CATCH BASIN–OIL TRAP
FULL OF WATER
RIM=86.4.3'
IE 6"PVC(SE)=84.83'
BOTTOM=82.73'

10652 STORM MANHOLE
RIM=55.23'
IE 10"PVC(N)=51.58'
IE 30"CONC(SE)=51.52'
IE 30"CONC(SW)=51.23'
BOTTOM=51.33'

16209 CATCH BASIN–OIL TRAP
FULL OF WATER
RIM=86.46'
IE 6"PVC(SW)=84.96'
BOTTOM=82.76'

11215 STORM MANHOLE
RIM=62.59'
IE 8"CONC(NE)=54.39'
IE 60"CMP(SE)=52.99'
IE 10"VERTICAL PIPE(SW)
TOP=58.19
BOTTOM=52.79'
BOTTOM=48.89'

16219 CLEAN–OUT
RIM=87.10'

Know what's below. Call before you dig.

SCALE: 1" = 50'
0 50' 100'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:26 AM
OREGON
MAR. 11, 2014
CHASE K. WELSORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

PRELIMINARY EROSION AND SEDIMENT CONTROL PLAN

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

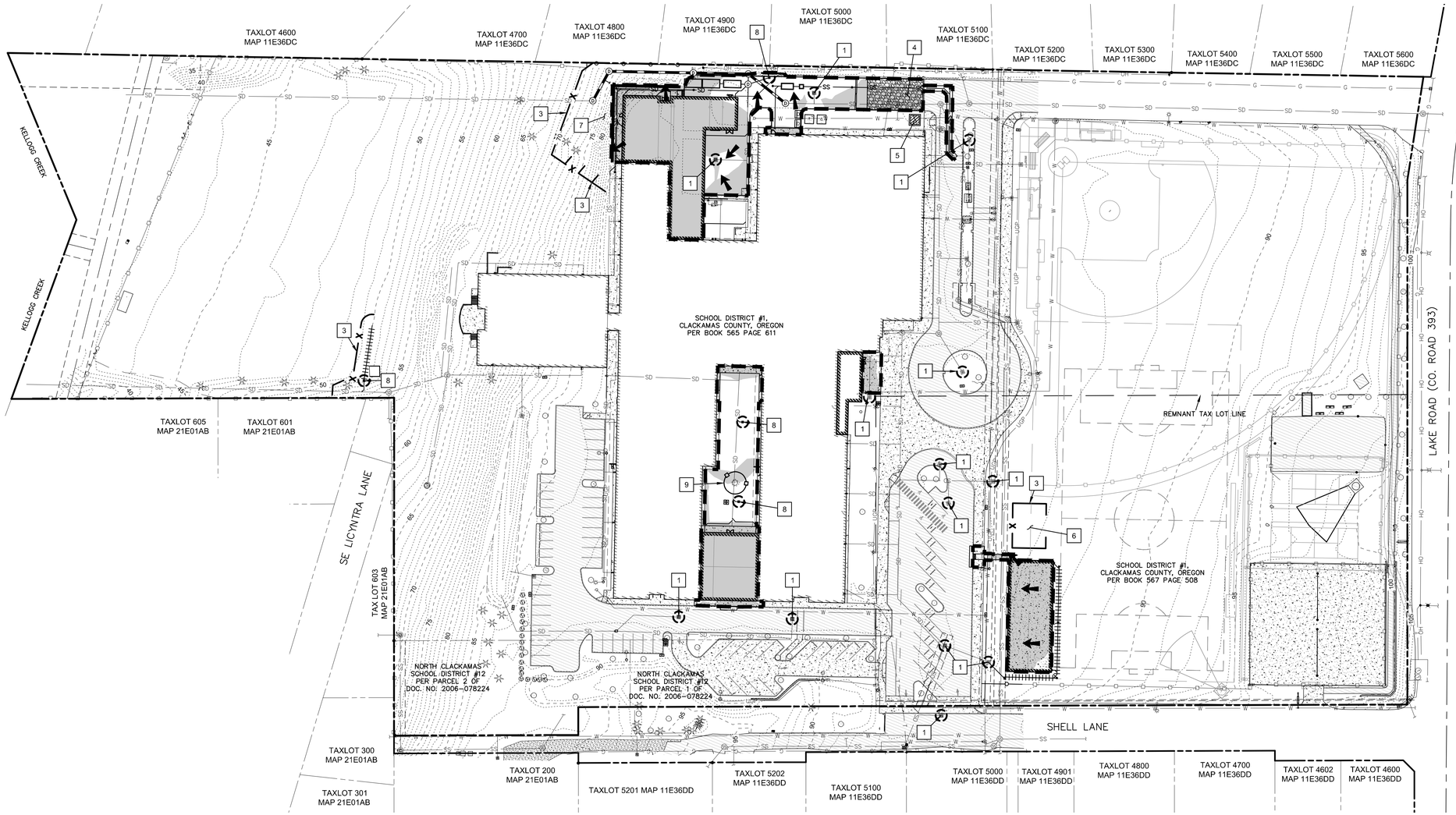
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-122

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C120-1200C PLANS.DWG



LEGEND

- EXISTING BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING ASPHALT
- EXISTING CURB
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- EXISTING TELECOM. LINE
- EXISTING GAS LINE
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- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
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- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
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- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED SILT FENCING
- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED INLET PROTECTION
- PROPOSED FILL AREAS
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED SURFACE RUN-OFF DIRECTION
- PROPOSED GRADING LIMITS

EROSION CONTROL KEY NOTES

1. INSTALL INLET PROTECTION PER DETAIL 4-18 AND 4-19 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
3. INSTALL SEDIMENT FENCING AT LOCATION SHOWN PER DETAIL 4-23 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
4. CONSTRUCT CONSTRUCTION ENTRANCE AT LOCATION SHOWN PER DETAIL 4-13 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
5. PROVIDE ABOVE-GROUND CONCRETE WASHOUT AT LOCATION SHOWN. MAINTAIN THROUGH CONSTRUCTION, DISPOSE OF CONCRETE MATERIAL OFF-SITE WHEN BASIN IS 75% FULL.
6. MAINTAIN TOPSOIL STOCKPILE FOR REUSE, COVER PER DETAIL 4-3 ON SHEET C-124.
7. INSTALL SLOPE PROTECTION PER DETAIL 4-1 ON SHEET C-124. SLOPES SHALL BE ROUGHENED PER DETAIL 4-10 OR 4-11 ON SHEET C-124 AS NEEDED.
8. PROTECT NEW CATCH BASIN, INSTALL INLET PROTECTION PER DETAIL 4-18 AND 4-19 ON SHEET C-124. MAINTAIN THROUGH CONSTRUCTION.
9. INSTALL TREE PROTECTION FENCING PER DETAIL ON SHEET C125.

EROSION AND SEDIMENT CONTROL BMP IMPLEMENTATION

1. ALL BASE ESC MEASURES (INLET PROTECTION, PERIMETER SEDIMENT CONTROL, GRAVEL CONSTRUCTION ENTRANCES, ETC.) MUST BE IN PLACE, FUNCTIONAL, AND APPROVED IN AN INITIAL INSPECTION, PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES.
2. LONG TERM SLOPE STABILIZATION MEASURES "INCLUDING MATTING" SHALL BE IN PLACE OVER ALL EXPOSED SOILS BY OCTOBER 1.
3. THE STORM WATER FACILITY IMPROVEMENTS SHALL BE CONSTRUCTED PRIOR TO THE STORM WATER SYSTEM FUNCTIONING AND SITE REPAVING.
4. INLET PROTECTION SHALL BE IN-PLACE IMMEDIATELY AFTER CATCH BASIN INSTALLASTION IN UNPAVED AREAS. INLET PROTECTION SHALL BE REPLACED IMMEDIATELY FOLLOWING PAVING.

GENERAL GRADING NOTES

1. THESE EROSION AND SEDIMENT CONTROL PLANS ASSUME "DRY WEATHER" CONSTRUCTION. "WET WEATHER" CONSTRUCTION MEASURES NEED TO BE APPLIED BETWEEN OCTOBER 1ST AND MAY 31ST.
2. REFER TO "GEOTECHNICAL ENGINEERING REPORT - BUILDING ADDITIONS" BY PROFESSIONAL SERVICE INDUSTRIES, INC, DATED NOVEMBER 07, 2017. ALL SITE EARTHWORK PREPARATION AND EXECUTION SHALL CONFORM IN ALL RESPECTS TO THE RECOMMENDATIONS AND DESIGN REQUIREMENTS OF THIS DOCUMENT. PSI PRJ. #07041118
3. ALL PROPOSED GRADING SHOWN IS REFERENCED TO FINISHED GRADE.

GRADING, STREET AND UTILITY EROSION AND SEDIMENT CONSTRUCTION NOTES

1. SEED USED FOR TEMPORARY OR PERMANENT SEEDING SHALL BE COMPOSED OF ONE OF THE FOLLOWING MIXTURES, UNLESS OTHERWISE AUTHORIZED:
   A. VEGETATED CORRIDOR AREAS REQUIRE NATIVE SEED MIXES. SEE RESTORATION PLAN FOR APPROPRIATE SEED MIX.
   B. DWARF GRASS MIX (MIN. 100 LB./AC.): DWARF PERENNIAL RYEGRASS (80% BY WEIGHT); CREEPING RED FESCUE (20% BY WEIGHT)
   C. STANDARD HEIGHT GRASS MIX (MIN. 100LB./AC.): ANNUAL RYEGRASS (40% BY WEIGHT); TURF-TYPE FESCUE (60% BY WEIGHT)
2. SLOPE TO RECEIVE TEMPORARY OR PERMANENT SEEDING SHALL HAVE THE SURFACE ROUGHENED BY MEANS OF TRACK-WALKING OR THE USE OF OTHER APPROVED IMPLEMENTS. SURFACE ROUGHENING IMPROVES SEED BEDDING AND REDUCES RUN-OFF VELOCITY.
3. LONG TERM SLOPE STABILIZATION MEASURES SHALL INCLUDE THE ESTABLISHMENT OF PERMANENT VEGETATIVE COVER VIA SEEDING WITH APPROVED MIX AND APPLICATION RATE. SLOPES SHALL BE ROUGHENED PER DETAIL 4-10 OR 4-11 ON SHEET C-124.
4. TEMPORARY SLOPE STABILIZATION MEASURES SHALL INCLUDE: COVERING EXPOSED SOIL WITH PLASTIC SHEETING, STRAW MULCHING, WOOD CHIPS, OR OTHER APPROVED MEASURES.
5. STOCKPILED SOIL OR STRIPPINGS SHALL BE PLACED IN A STABLE LOCATION AND CONFIGURATION. DURING "WET WEATHER" PERIODS, STOCKPILES SHALL BE COVERED WITH PLASTIC SHEETING OR STRAW MULCH. SEDIMENT FENCE IS REQUIRED AROUND THE PERIMETER OF THE STOCKPILE.
6. EXPOSED CUT OR FILL AREAS SHALL BE STABILIZED THROUGH THE USE OF TEMPORARY SEEDING AND MULCHING, EROSION CONTROL BLANKETS OR MATS, MID-SLOPE SEDIMENT FENCES OR WATTLES, OR OTHER APPROPRIATE MEASURES. SLOPES EXCEEDING 25% MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES.
7. AREAS SUBJECT TO WIND EROSION SHALL USE APPROPRIATE DUST CONTROL MEASURES INCLUDING THE APPLICATION OF A FINE SPRAY OF WATER, PLASTIC SHEETING, STRAW MULCHING, OR OTHER APPROVED MEASURES.
8. CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES INCLUDING, BUT NOT LIMITED TO, TIRE WASHES, STREET SWEEPING, AND VACUUMING MAY BE BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. ACTIVE INLETS TO STORM WATER SYSTEMS SHALL BE PROTECTED THROUGH THE USE OF APPROVED INLET PROTECTION MEASURES. ALL INLET PROTECTION MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED AS NEEDED.
10. SATURATED MATERIALS THAT ARE HAULED OFF-SITE MUST BE TRANSPORTED IN WATER-TIGHT TRUCKS TO ELIMINATE SPILLAGE OF SEDIMENT AND SEDIMENT-LADEN WATER.
11. AN AREA SHALL BE PROVIDED FOR THE WASHING OUT OF CONCRETE TRUCKS IN A LOCATION THAT DOES NOT PROVIDE RUN-OFF THAT CAN ENTER THE STORM WATER SYSTEM. IF THE CONCRETE WASH-OUT AREA CAN NOT BE CONSTRUCTED GREATER THAN 50' FROM ANY DISCHARGE POINT, SECONDARY MEASURES SUCH AS BERMS OR TEMPORARY SETTLING PITS MAY BE REQUIRED. THE WASH-OUT SHALL BE LOCATED WITHIN SIX FEET OF TRUCK ACCESS AND BE CLEANED WHEN IT REACHES 50% OF THE CAPACITY.
12. SWEEPINGS FROM EXPOSED AGGREGATE CONCRETE SHALL NOT BE TRANSFERRED TO THE STORM WATER SYSTEM. SWEEPINGS SHALL BE PICKED UP AND DISPOSED IN THE TRASH.
13. AVOID PAVING IN WET WEATHER WHEN PAVING CHEMICALS CAN RUN-OFF INTO THE STORM WATER SYSTEM.
14. USE BMPS SUCH AS CHECK-DAMS, BERMS, AND INLET PROTECTION TO PREVENT RUN-OFF FROM REACHING DISCHARGE POINTS.
15. COVER CATCH BASINS, MANHOLES, AND OTHER DISCHARGE POINTS WHEN APPLYING SEAL COAT, TACK COAT, ETC. TO PREVENT INTRODUCING THESE MATERIALS TO THE STORM WATER SYSTEM.

Know what's **below.** Call before you dig.

SCALE: 1" = 40'
0 40' 80'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:26 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

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GRADING AND UTILITY CONSTRUCTION ESCP

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

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(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-123

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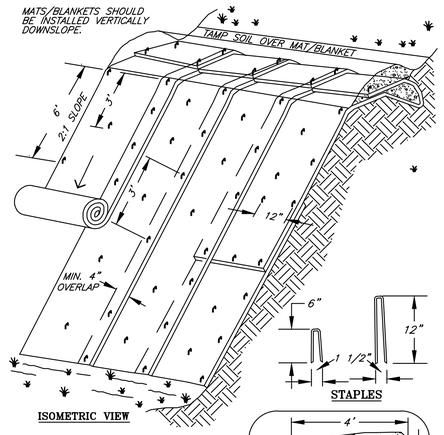


TYPICAL SLOPE SOIL STABILIZATION

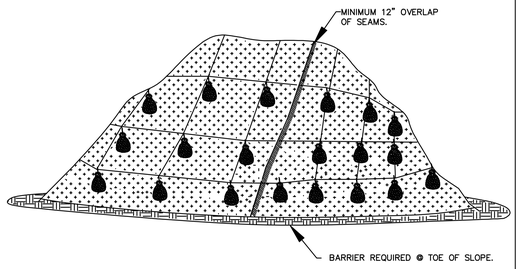
NOT TO SCALE

NOTES:
1. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
4. STAKING OR STAPLING LAYOUT PER MANUFACTURERS SPECIFICATIONS.

FILE: BLNKTSLP

MATTING – SLOPE INSTALLATION

DETAIL DRAWING 4–1 REVISED 01–09

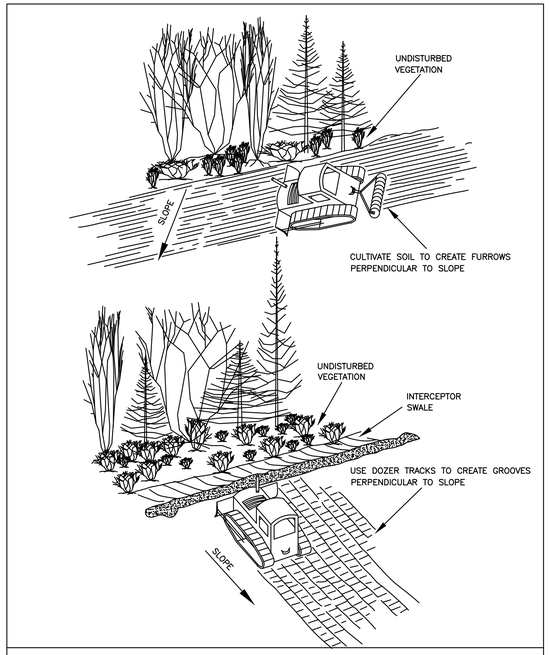


PLASTIC SHEETING

NOTES:
1. MINIMUM 12" OVERLAP OF ALL SEAMS REQUIRED.
2. BARRIER REQUIRED @ TOE OF STOCK PILE.
3. COVERING MAINTAINED TIGHTLY IN PLACE BY USING SANDBAGS OR TIRES ON ROPES WITH A MAXIMUM 10' GRID SPACING IN ALL DIRECTIONS.

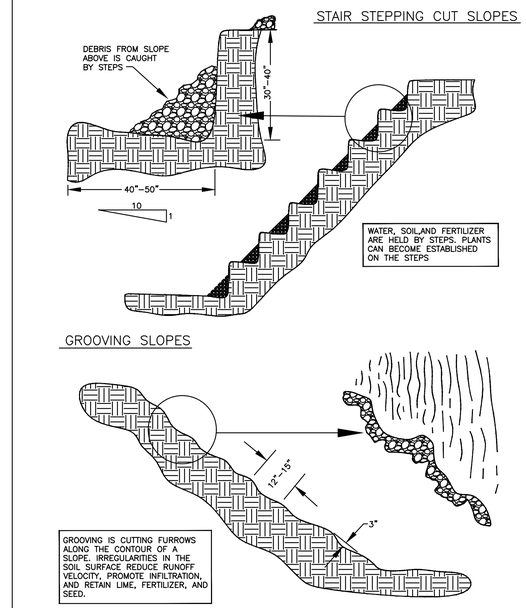
PLASTIC SHEETING

DETAIL DRAWING 4–3 REVISED 01–09



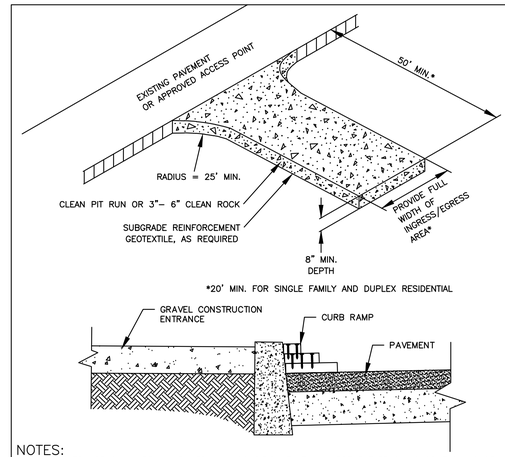
SURFACE ROUGHENING - CAT TRACKING

DETAIL DRAWING 4–10 REVISED 01–09



SURFACE ROUGHENING - STAIR STEPPING/GROOVING

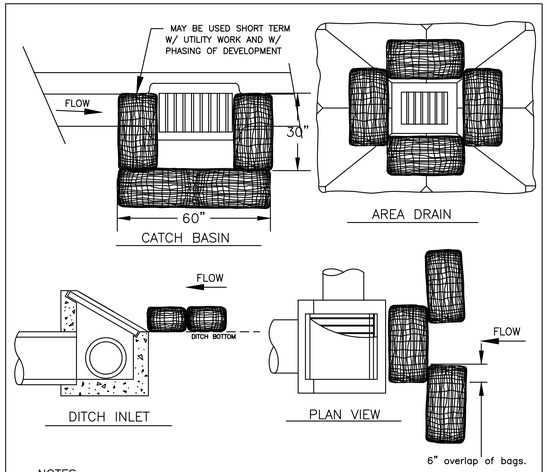
DETAIL DRAWING 4–11 REVISED 01–09



NOTES:
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT–OF–WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF– WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. WHERE RUNOFF CONTAINING SEDIMENT LADEN WATER IS LEAVING THE SITE VIA THE CONSTRUCTION ENTRANCE, OTHER MEASURES SHALL BE IMPLEMENTED TO DIVERT RUNOFF THROUGH AN APPROVED FILTERING SYSTEM.
5. DIMENSIONS
   SINGLE FAMILY
   20' LONG BY 20' WIDE 8" DEEP OF ¾" MINUS CLEAN ROCK.
   COMMERCIAL
   50' LONG BY 20' WIDE 3–6" CLEAN ROCK, GOVERNING AUTHORITY MAY REQUIRE GEOTEXTILE FABRIC TO PREVENT SUB–SOIL PUMPING.

CONSTRUCTION ENTRANCE

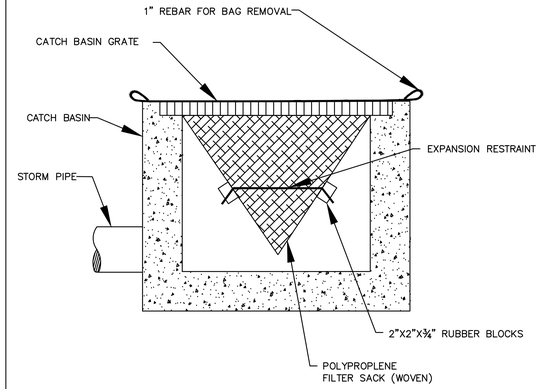
DETAIL DRAWING 4–13 REVISED 01–09



NOTES:
1. ADDITIONAL MEASURES MUST BE CONSIDERED DEPENDING ON SOIL TYPES.
2. BIO–FILTER BAGS SHOULD BE STAKED WHERE APPLICABLE USING (2) 1"x2"WOODEN STAKES OR APPROVED EQUAL PER BAG.
3. WHEN USING 30" BIO–BAGS TO PROTECT A CATCH BASIN YOU MUST HAVE 4 BAGS AND THEY SHALL BE OVERLAPPED BY 6".

INLET PROTECTION TYPE 4

DETAIL DRAWING 4–18 REVISED 01–09

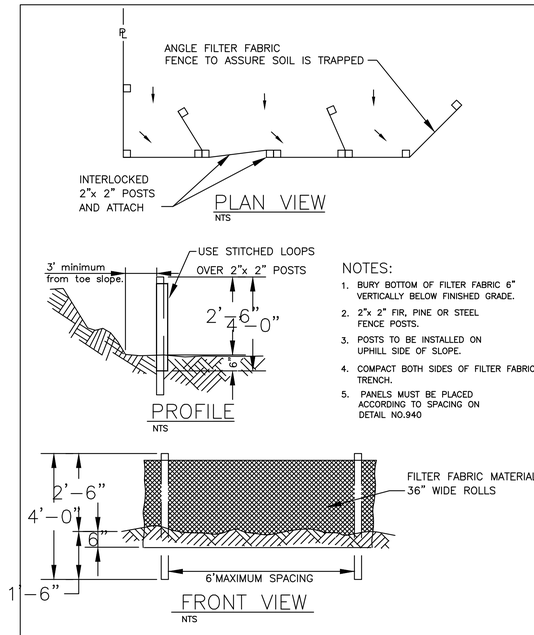


WOVEN POLYPROPLENE SACK

NOTE:
1. RECESSED CURB INLET CATCH BASINS MUST BE BLOCKED WHEN USING FILTER FABRIC INLET SACKS. SIZE OF FILTER FABRIC INLET SACKS TO BE DETERMINED BY MANUFACTURER.

INLET PROTECTION TYPE 5

DETAIL DRAWING 4–19 REVISED 01–09



NOTES:
1. BURY BOTTOM OF FILTER FABRIC 6" VERTICALLY BELOW FINISHED GRADE.
2. 2"x 2" FIR, PINE OR STEEL FENCE POSTS.
3. POSTS TO BE INSTALLED ON UPHILL SIDE OF SLOPE.
4. COMPACT BOTH SIDES OF FILTER FABRIC TRENCH.
5. PANELS MUST BE PLACED ACCORDING TO SPACING ON DETAIL NO.940

SEDIMENT FENCE

DETAIL DRAWING 4–23 REVISED 01–09

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C120-1200C PLANS.DWG

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

EROSION AND SEDIMENT CONTROL DETAILS I

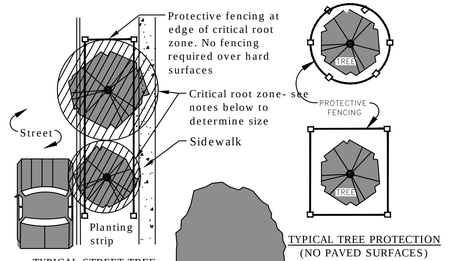
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

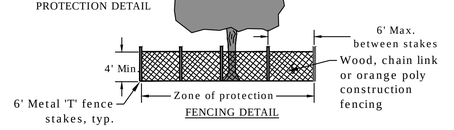
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-124



TYPICAL STREET TREE PROTECTION DETAIL

TYPICAL TREE PROTECTION (NO PAVED SURFACES)



FENCING DETAIL

Notes:

1) The critical root zone (CRZ) shall be an area with a radius at least 5' from the edge of the tree dripline. 2) The CRZ shall be marked and protected by a construction fence placed around the perimeter prior to construction. 3) No soil grade changes or compaction shall take place within the CRZ except as directed. 4) No storage of material shall be allowed within the CRZ. 5) If work is done within the CRZ, care must be taken to minimize root disturbance. Special care shall be taken during excavation and removal of existing curb, gutter, and sidewalks to avoid damage to tree roots. Locate existing tree roots using hand tools or other approved methods such as an airspade. 6) Protective fencing is required when the work area is within the CRZ of trees, except where portions of the CRZ are covered with pavement such as streets or walks. 7) No root over 2" shall be cut without approval of the urban forester (or an approved arborist). Roots shall be cut with approved saws. No roots over 2" shall be cut or torn during trenching with power equipment such as backhoes and trenchers. Utility lines and irrigation or other pipes shall be installed by hand digging or tunneling under roots, as necessary, to avoid cutting roots 2" and larger.

TREE PROTECTION FENCING

N.T.S.

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C-120-1200C PLANS.DWG

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

EROSION AND SEDIMENT CONTROL DETAILS II

ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

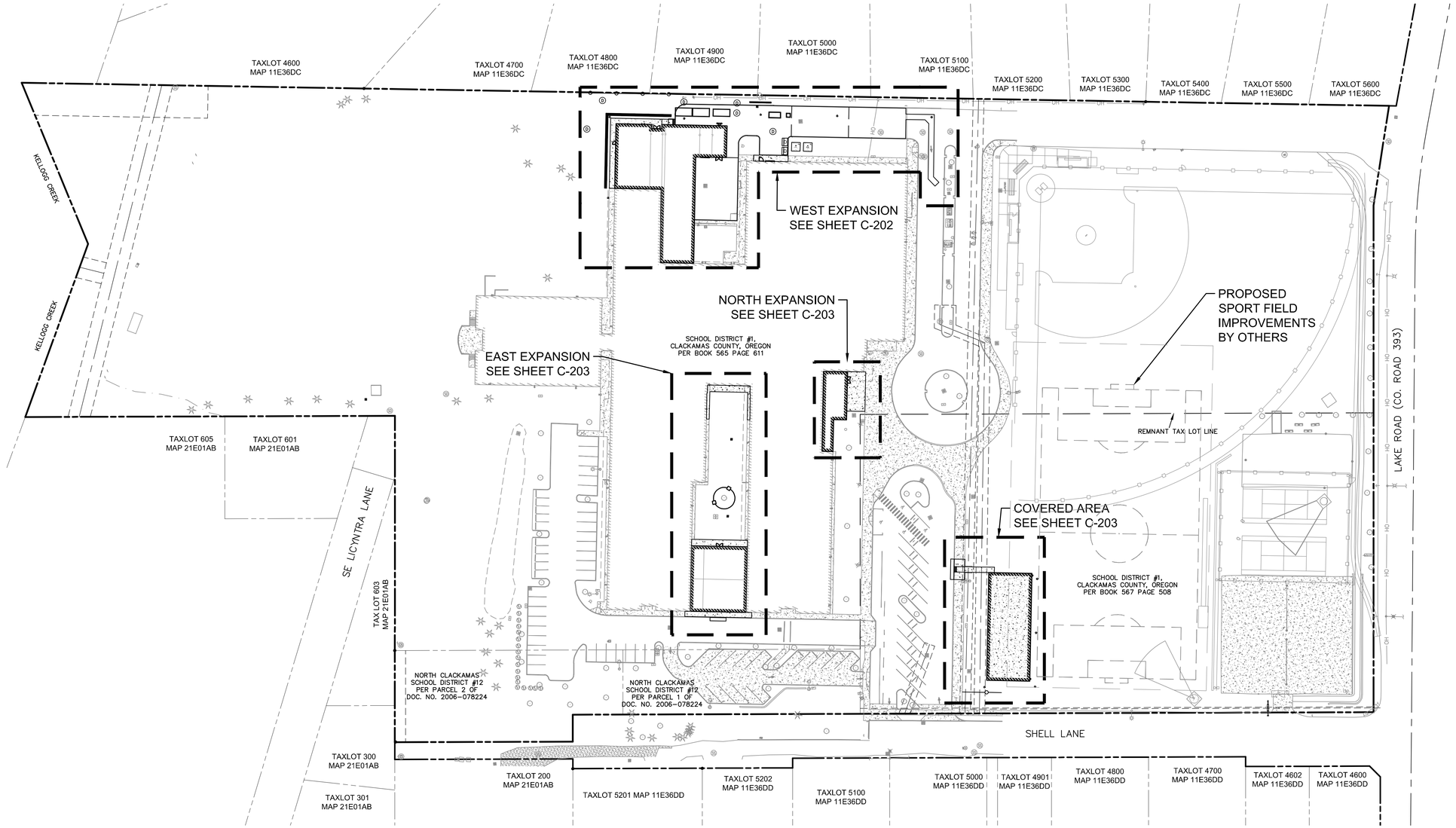
mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-125



LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- ARCHITECTURAL GRIDLINES
- PROPOSED TREE PROTECTING FENCING
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT

Know what's below. Call before you dig.

SCALE: 1" = 50'
0 50' 100'

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C200-SITE PLAN.DWG

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:26 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

SITE PLAN AND GRADING OVERVIEW

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
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LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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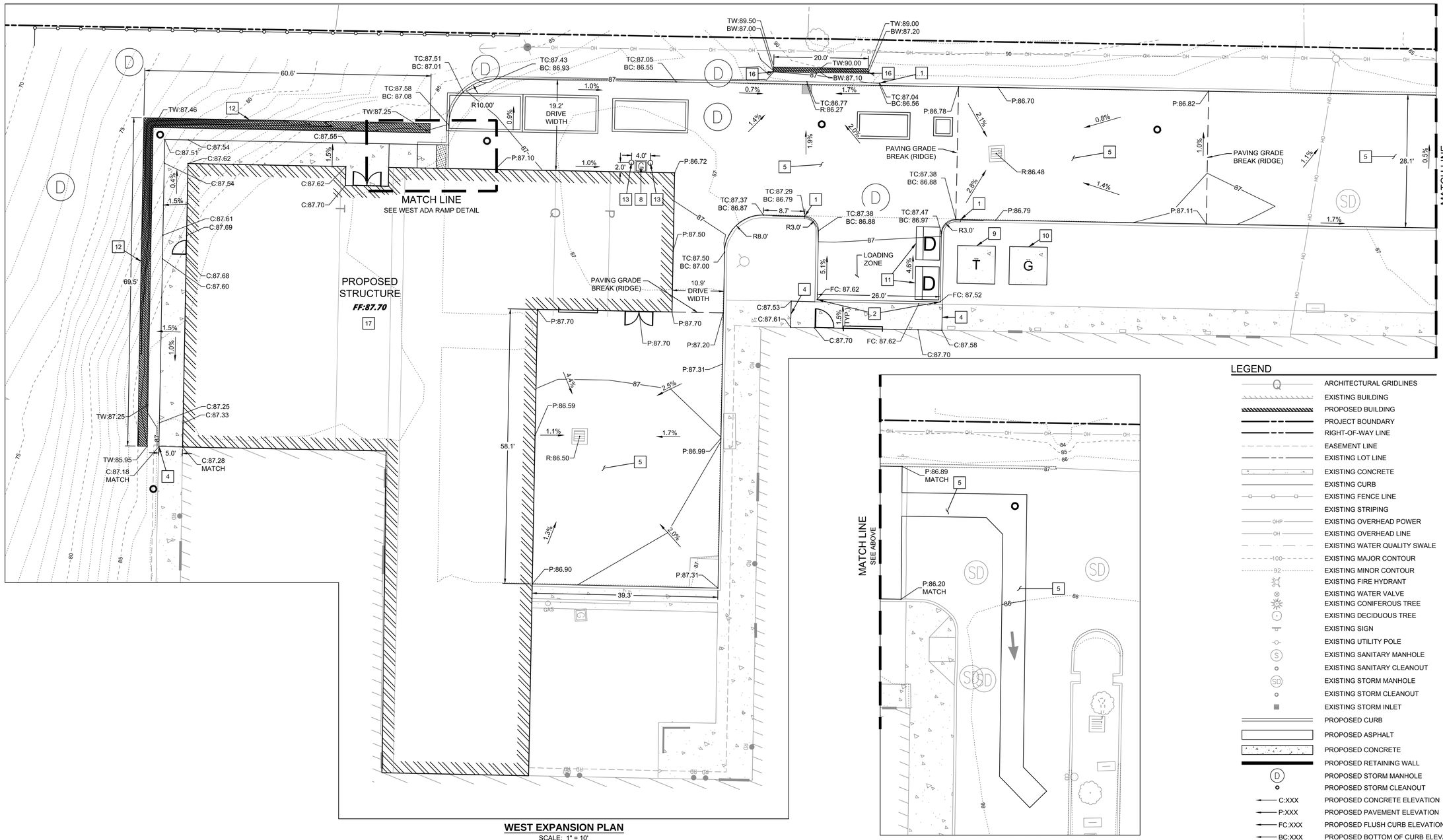
(206) 441-4151 OFFICE
(206) 441-0478 FAX

1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

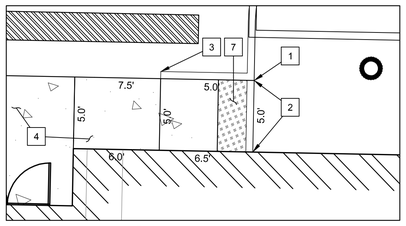
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-201



WEST EXPANSION PLAN
SCALE: 1" = 10'

WEST EXPANSION PLAN
SCALE: 1" = 10'



WEST ADA RAMP DETAIL
SCALE: 1" = 5'

Know what's below. Call before you dig.

CONSTRUCTION KEY NOTES

1. CONSTRUCT VERTICAL CURB PER DETAIL 8 ON SHEET C-402.
2. CONSTRUCT FLUSH CURB PER DETAIL 7 ON SHEET C-402.
3. CONSTRUCT CURB END PER DETAIL 6 ON SHEET C-402.
4. CONSTRUCT PRIVATE SIDEWALK PER 'CONCRETE SIDEWALKS' SECTION AND DETAIL 9 ON SHEET C-402.
5. CONSTRUCT PAVEMENT SECTION PER ON-SITE CROSS SECTION 'HMAC PAVING - HEAVY DUTY' SECTION ON SHEET C-403.
7. INSTALL TACTILE DOMES PER DETAIL 10 ON SHEET C-403.
8. PROPOSED GAS METER LOCATION. FINAL DESIGN BY OTHERS.
9. INSTALL CONCRETE PEDESTAL FOR ELECTRICAL TRANSFORMER. FINAL DESIGN BY OTHERS.
10. INSTALL CONCRETE PEDESTAL FOR GENERATOR. FINAL DESIGN BY OTHERS.
11. PROPOSED DUMPSTER LOCATION.
12. PROPOSED RETAINING WALL. SEE SHEET C-251 FOR PROFILE AND LAYOUT INFORMATION. FINAL DESIGN AND PERMITTING, BY OTHERS.
13. INSTALL 4' HIGH BOLLARD PER DETAIL 11 ON SHEET C-403.
16. INSTALL PROPOSED RETAINING WALL. KEYSTONE STANDARD 80LB BLOCK WALL OR EQUIVALENT.
17. PROPOSED BUILDING IMPROVEMENTS. SEE ARCHITECTURAL PLANS FOR CONTINUATION.

LEGEND

- ARCHITECTURAL GRIDLINES
- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- OHP — EXISTING OVERHEAD POWER
- OH — EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- 100 — EXISTING MAJOR CONTOUR
- 92 — EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- S — EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- SD — EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- D — PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- C:XXX — PROPOSED CONCRETE ELEVATION
- P:XXX — PROPOSED PAVEMENT ELEVATION
- FC:XXX — PROPOSED FLUSH CURB ELEVATION
- BC:XXX — PROPOSED BOTTOM OF CURB ELEVATION
- TC:XXX — PROPOSED TOP OF CURB ELEVATION
- TW:XXX — PROPOSED TOP OF WALL ELEVATION
- BW:XXX — PROPOSED BOTTOM OF WALL ELEVATION
- FF:XXX — FINISHED FLOOR ELEVATION
- X.X% — PROPOSED SLOPE
- PROPOSED ASPHALT GRADE BREAK

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:36 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

SITE PLAN AND GRADING DETAILS I
ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
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5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

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(206) 441-0478 FAX

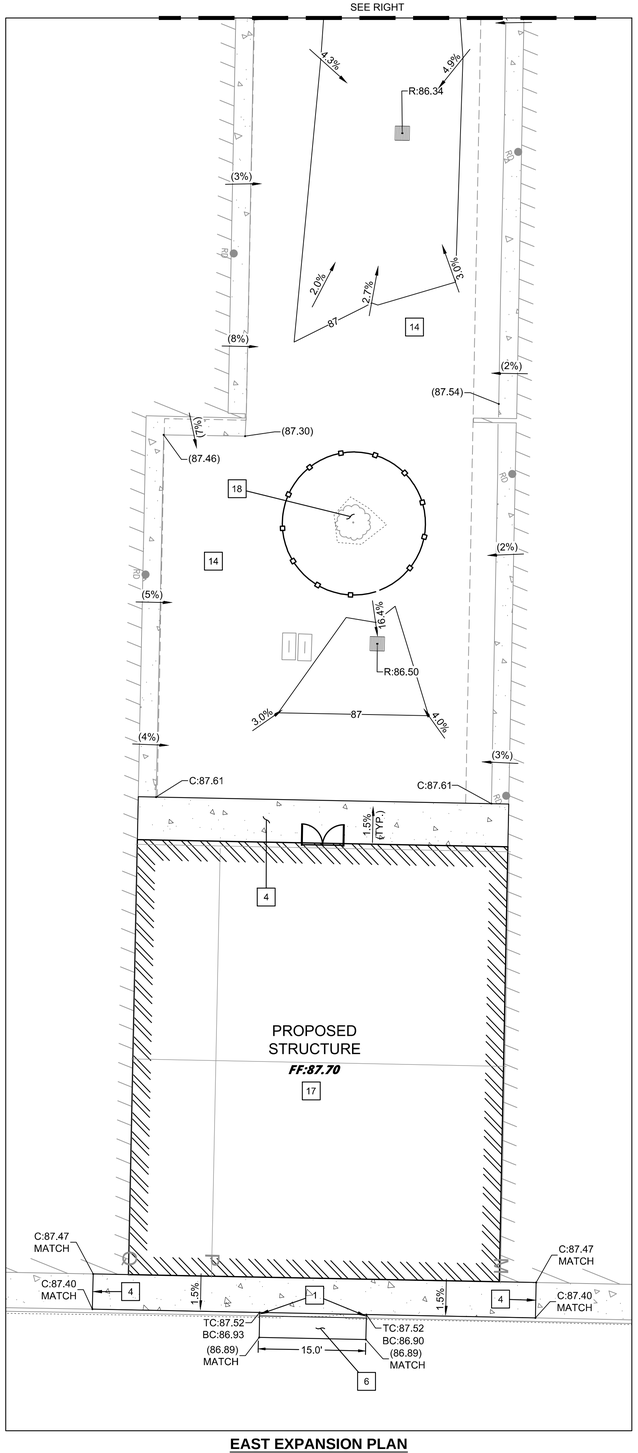
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

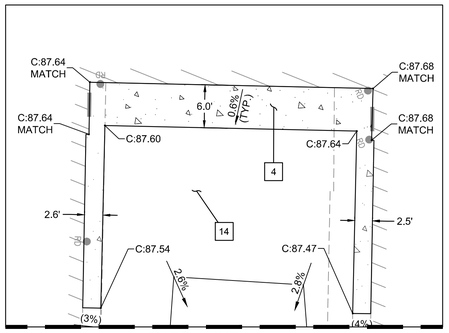
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-202

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C200-SITE PLAN.DWG

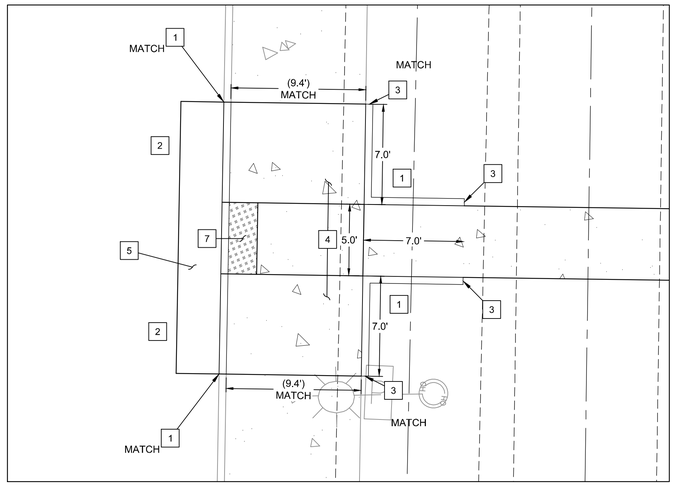


EAST EXPANSION PLAN
SCALE: 1" = 10'

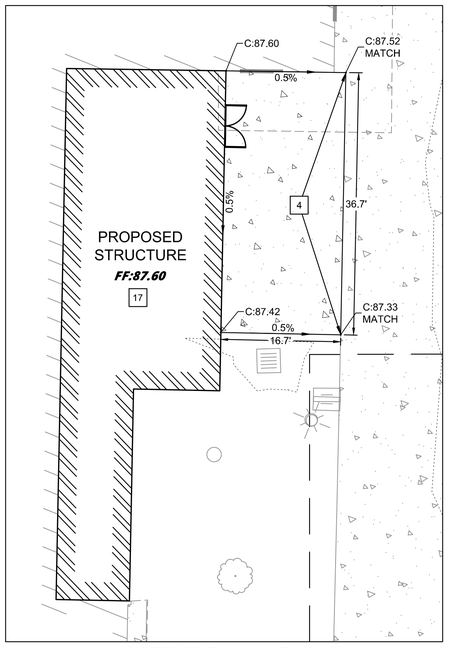


MATCH LINE - SEE LEFT

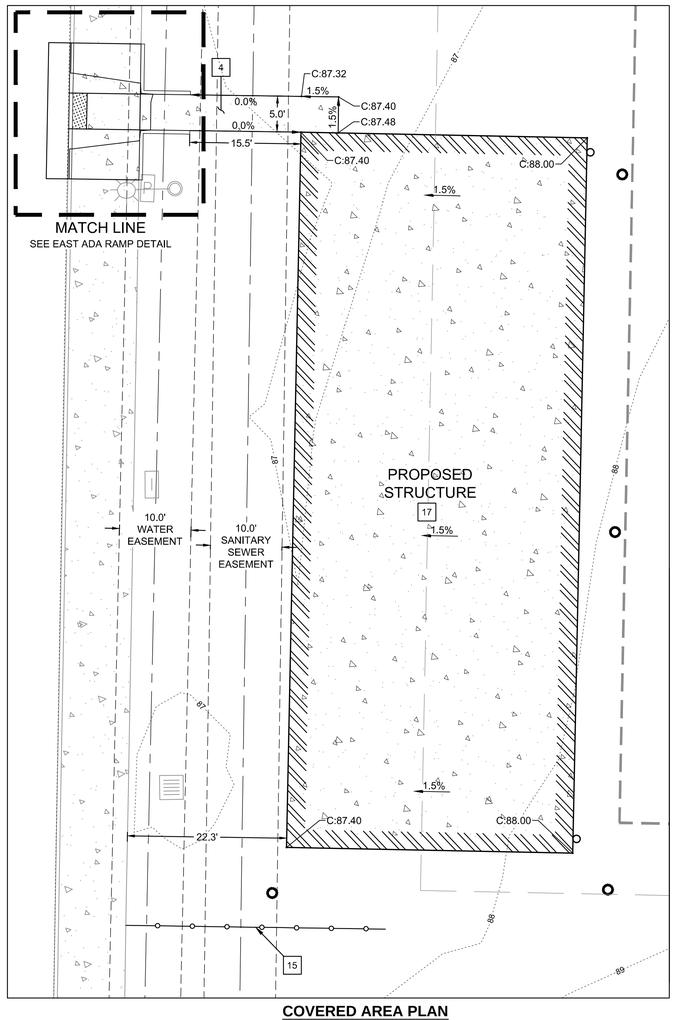
EAST EXPANSION PLAN
SCALE: 1" = 10'



EAST ADA RAMP DETAIL
SCALE: 1" = 5'



NORTH EXPANSION PLAN
SCALE: 1" = 10'



COVERED AREA PLAN
SCALE: 1" = 10'

LEGEND

- ARCHITECTURAL GRIDLINES
- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- OHP — EXISTING OVERHEAD POWER
- OH — EXISTING OVERHEAD LINE
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- 92 — EXISTING MINOR CONTOUR
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- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
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- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED CURB
- PROPOSED ASPHALT
- PROPOSED CONCRETE
- PROPOSED RETAINING WALL
- D — PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- C:XXX — PROPOSED CONCRETE ELEVATION
- P:XXX — PROPOSED PAVEMENT ELEVATION
- FC:XXX — PROPOSED FLUSH CURB ELEVATION
- BC:XXX — PROPOSED BOTTOM OF CURB ELEVATION
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- TW:XXX — PROPOSED TOP OF WALL ELEVATION
- BW:XXX — PROPOSED BOTTOM OF WALL ELEVATION
- FF:XXX — FINISHED FLOOR ELEVATION
- X.X% — PROPOSED SLOPE
- PROPOSED TREE PROTECTING FENCING

CONSTRUCTION KEY NOTES

1. CONSTRUCT VERTICAL CURB PER DETAIL 8 ON SHEET C-402.
2. CONSTRUCT FLUSH CURB PER DETAIL 7 ON SHEET C-402.
3. CONSTRUCT CURB END PER DETAIL 6 ON SHEET C-402.
4. CONSTRUCT PRIVATE SIDEWALK PER 'CONCRETE SIDEWALKS' SECTION AND DETAIL 9 ON SHEET C-402.
5. CONSTRUCT PAVEMENT SECTION PER ON-SITE CROSS SECTION 'HMAC PAVING - HEAVY DUTY' SECTION ON SHEET C-403.
6. CONSTRUCT PAVEMENT SECTION PER ON-SITE CROSS SECTION 'HMAC PAVING - LIGHT DUTY' SECTION ON SHEET C-403.
7. INSTALL TACTILE DOMES PER DETAIL 10 ON SHEET C-403.
8. PROPOSED GAS METER LOCATION. FINAL DESIGN BY MEP ENGINEER.
9. PROPOSED ELECTRICAL TRANSFORMER LOCATION. FINAL DESIGN BY MEP ENGINEER.
10. PROPOSED ELECTRICAL GENERATOR LOCATION. FINAL DESIGN BY MEP ENGINEER.
11. PROPOSED DUMPSTER LOCATION.
12. PROPOSED RETAINING WALL. SEE SHEET C-251 FOR PROFILE AND LAYOUT INFORMATION. FINAL DESIGN AND PERMITTING, BY OTHERS.
13. INSTALL 4' HIGH BOLLARD PER DETAIL 11 ON SHEET C-403.
14. GROUNDCOVER REPLACED PER LANDSCAPING ARCHITECT.
15. INSTALL 6' HIGH CHAIN LINK FENCE.
17. PROPOSED BUILDING IMPROVEMENTS. SEE ARCHITECTURAL PLANS FOR CONTINUATION.
18. PROTECT EXISTING TREE DURING CONSTRUCTION. DO NOT GRADE WITHIN TREE PROTECTION FENCING.

Know what's below. Call before you dig.

N
SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:36 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

SITE PLAN AND GRADING DETAILS II
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
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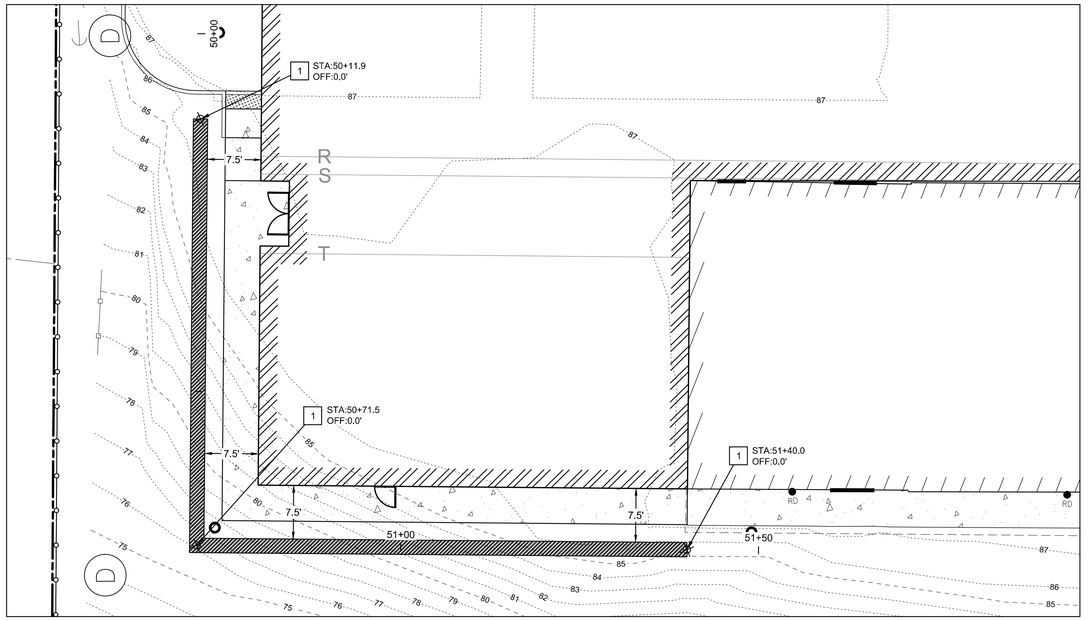
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

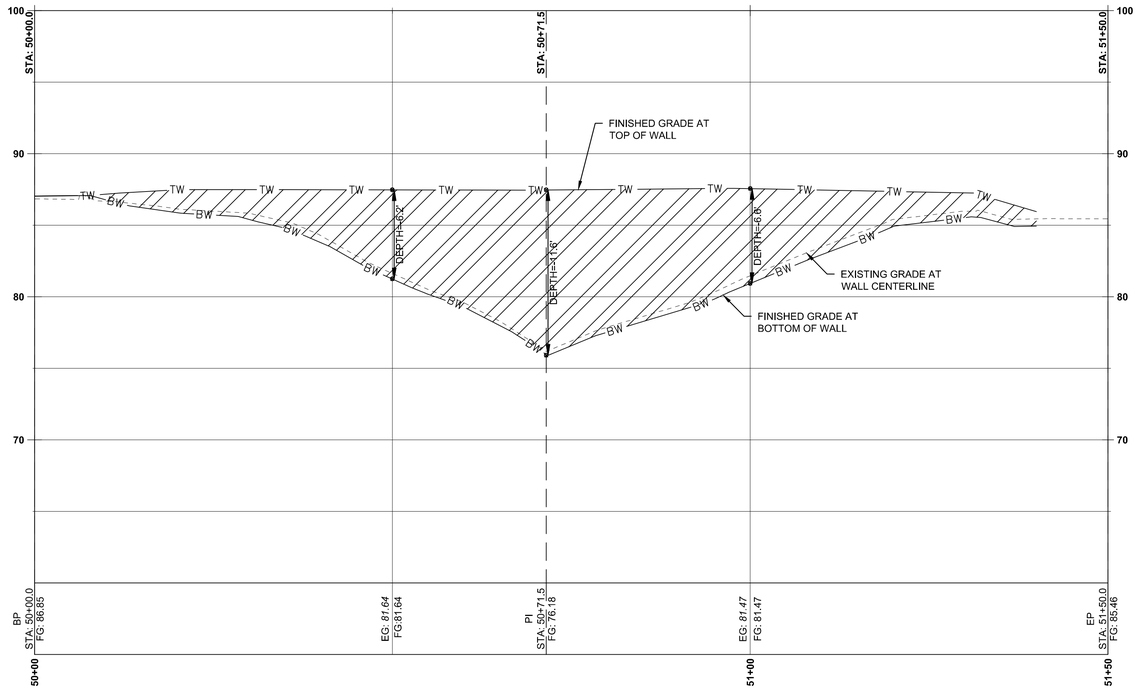
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-203

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C200-SITE PLAN.DWG



RETAINING WALL PLAN
SCALE: 1" = 10'



RETAINING WALL PROFILE
SCALE: HORIZONTAL - 1" = 10'
VERTICAL - 1" = 2'

LEGEND

- EXISTING BUILDING
- PROJECT BOUNDARY
- EXISTING ADJACENT PROPERTY LINE
- EXISTING CONCRETE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STORM DRAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED CONCRETE
- PROPOSED FENCE
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED RETAINING WALL

CONSTRUCTION KEY NOTES

1 PROPOSED RETAINING WALL TO BE DESIGNED AND PERMITTED BY OTHERS.

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:36 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

RETAINING WALL PLAN AND PROFILE
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

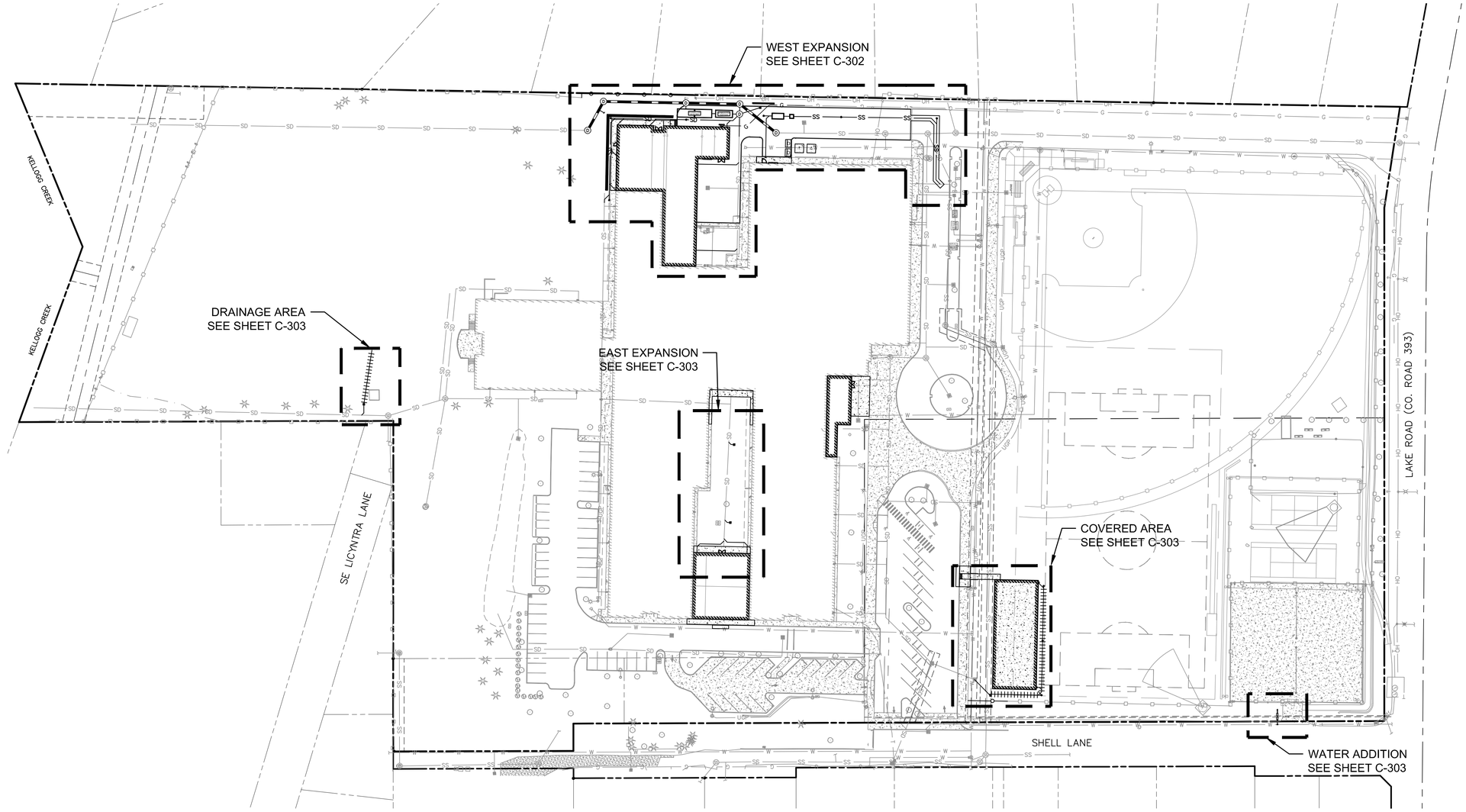
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-251

811 Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C250-RETAINING WALL PLAN AND PROFILE.DWG



LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING FRENCH DRAIN
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING CABLE LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED STORM MAIN
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED WATER SERVICE

Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
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Preliminary
12/21/2017 10:10:36 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
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ISSUED FOR
CSU MODIFICATION

UTILITY PLAN OVERVIEW

ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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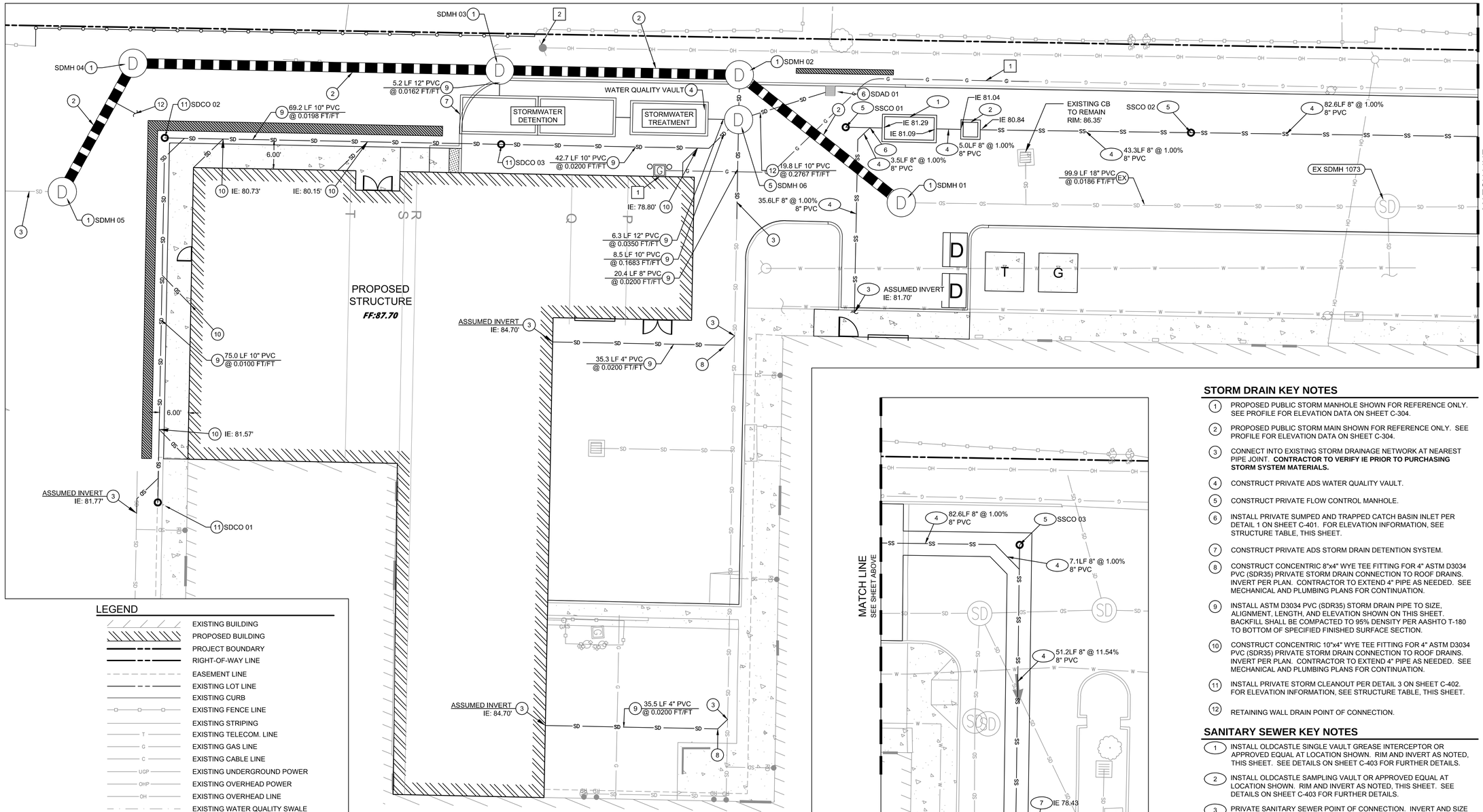
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-301

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C300-UTILITY PLAN.DWG



LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- EXISTING TELECOM. LINE
- EXISTING GAS LINE
- EXISTING CABLE LINE
- EXISTING UNDERGROUND POWER
- EXISTING OVERHEAD POWER
- EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- EXISTING SANITARY SEWER
- EXISTING STORM DRAIN
- EXISTING WATER MAIN
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED RETAINING WALL
- PROPOSED STORM MAIN
- PROPOSED STORM LATERAL / LEAD
- PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- ARCHITECT GRIDLINE

WEST EXPANSION PLAN
SCALE: 1" = 10'

WEST EXPANSION PLAN
SCALE: 1" = 10'

CLEANOUT DATA

SDCO 01
RIM = 86.73'
IE 10" OUT (NW): 81.72
IE 10" OUT (S): 81.72

SDCO 02
RIM = 81.51'
IE 10" OUT (NE): 80.97

SDCO 03
RIM = 86.84'
IE 10" OUT (NE): 79.60

CATCH BASIN DATA

SDAD 01
RIM: 86.29
IE 10" OUT (S): 82.79

CLEANOUT DATA

SSCO 01
RIM = 86.48'
IE 8" OUT (NE): 81.37

SSCO 02
RIM = 81.14'
IE 8" OUT (SW): 80.41

SSCO 03
RIM = 86.73'
IE 8" OUT (SE): 79.56

STORM DRAIN KEY NOTES

1. PROPOSED PUBLIC STORM MANHOLE SHOWN FOR REFERENCE ONLY. SEE PROFILE FOR ELEVATION DATA ON SHEET C-304.
2. PROPOSED PUBLIC STORM MAIN SHOWN FOR REFERENCE ONLY. SEE PROFILE FOR ELEVATION DATA ON SHEET C-304.
3. CONNECT INTO EXISTING STORM DRAINAGE NETWORK AT NEAREST PIPE JOINT. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**
4. CONSTRUCT PRIVATE ADS WATER QUALITY VAULT.
5. CONSTRUCT PRIVATE FLOW CONTROL MANHOLE.
6. INSTALL PRIVATE SUMPED AND TRAPPED CATCH BASIN INLET PER DETAIL 1 ON SHEET C-401. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
7. CONSTRUCT PRIVATE ADS STORM DRAIN DETENTION SYSTEM.
8. CONSTRUCT CONCENTRIC 8"x4" WYE TEE FITTING FOR 4" ASTM D3034 PVC (SDR35) PRIVATE STORM DRAIN CONNECTION TO ROOF DRAINS. INVERT PER PLAN. CONTRACTOR TO EXTEND 4" PIPE AS NEEDED. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
9. INSTALL ASTM D3034 PVC (SDR35) STORM DRAIN PIPE TO SIZE, ALIGNMENT, LENGTH, AND ELEVATION SHOWN ON THIS SHEET. BACKFILL SHALL BE COMPACTED TO 95% DENSITY PER AASHTO T-180 TO BOTTOM OF SPECIFIED FINISHED SURFACE SECTION.
10. CONSTRUCT CONCENTRIC 10"x4" WYE TEE FITTING FOR 4" ASTM D3034 PVC (SDR35) PRIVATE STORM DRAIN CONNECTION TO ROOF DRAINS. INVERT PER PLAN. CONTRACTOR TO EXTEND 4" PIPE AS NEEDED. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
11. INSTALL PRIVATE STORM CLEANOUT PER DETAIL 3 ON SHEET C-402. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
12. RETAINING WALL DRAIN POINT OF CONNECTION.

SANITARY SEWER KEY NOTES

1. INSTALL OLDCASTLE SINGLE VAULT GREASE INTERCEPTOR OR APPROVED EQUAL AT LOCATION SHOWN. RIM AND INVERT AS NOTED, THIS SHEET. SEE DETAILS ON SHEET C-403 FOR FURTHER DETAILS.
2. INSTALL OLDCASTLE SAMPLING VAULT OR APPROVED EQUAL AT LOCATION SHOWN. RIM AND INVERT AS NOTED, THIS SHEET. SEE DETAILS ON SHEET C-403 FOR FURTHER DETAILS.
3. PRIVATE SANITARY SEWER POINT OF CONNECTION. INVERT AND SIZE PER PLAN. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
4. INSTALL 4" ASTM D3034 PVC (SDR35) SANITARY SEWER PIPE TO ALIGNMENT, LENGTH, AND SLOPE SHOWN ON THIS SHEET.
5. INSTALL PRIVATE SANITARY CLEANOUT PER DETAIL 3 ON SHEET C-402. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
6. INSTALL CONCENTRIC WYE TEE FITTING FOR LATERAL CONNECTION AT LOCATION SHOWN.
7. CONNECT PROPOSED SANITARY SEWER INTO EXISTING SANITARY NETWORK AT LOCATION SHOWN. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING SANITARY SYSTEM MATERIALS.**

DRY UTILITIES KEY NOTES

1. INSTALL NATURAL GAS LINE AT LOCATION SHOWN. FINAL DESIGN AND CONTINUATION BY OTHERS.
2. INSTALL NEW UTILITY POLE. FINAL DESIGN BY OTHERS.

Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:36 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

UTILITY PLAN AREAS I
ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

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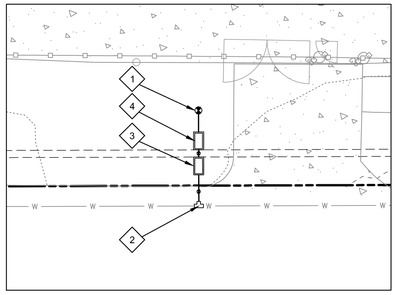
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

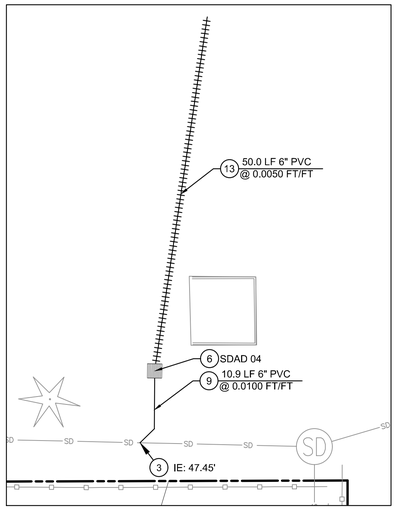
PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-302

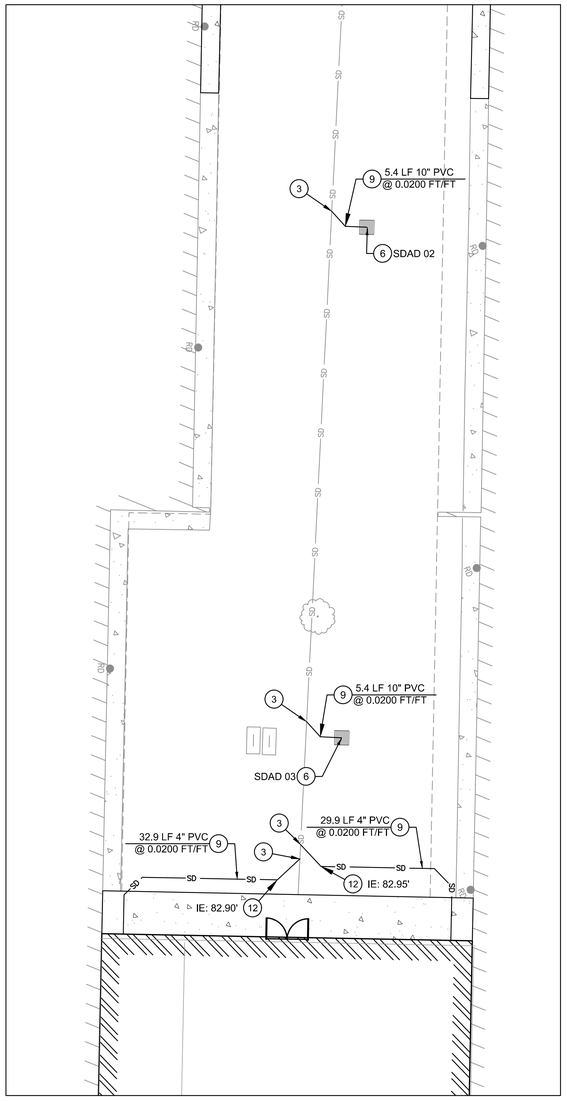
P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C300-UTILITY PLAN.DWG



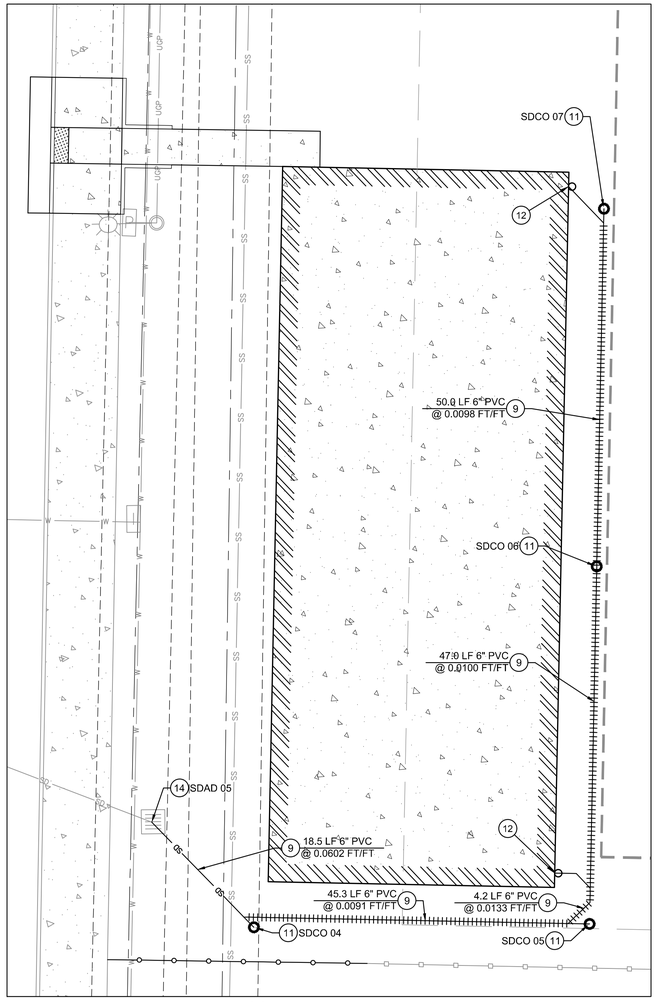
WATER ADDITION PLAN
1" = 10'



DRAINAGE AREA PLAN
1" = 10'



EAST EXPANSION PLAN
SCALE: 1" = 10'



COVERED AREA PLAN
SCALE: 1" = 10'

LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- T — EXISTING TELECOM. LINE
- G — EXISTING GAS LINE
- C — EXISTING CABLE LINE
- UGP — EXISTING UNDERGROUND POWER
- OHP — EXISTING OVERHEAD POWER
- OH — EXISTING OVERHEAD LINE
- EXISTING WATER QUALITY SWALE
- SS — EXISTING SANITARY SEWER
- SD — EXISTING STORM DRAIN
- W — EXISTING WATER MAIN
- 100 — EXISTING MAJOR CONTOUR
- 92 — EXISTING MINOR CONTOUR
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
- EXISTING CONIFEROUS TREE
- EXISTING DECIDUOUS TREE
- EXISTING SIGN
- EXISTING UTILITY POLE
- (S) EXISTING SANITARY MANHOLE
- EXISTING SANITARY CLEANOUT
- (SD) EXISTING STORM MANHOLE
- EXISTING STORM CLEANOUT
- EXISTING STORM INLET
- PROPOSED STORM MAIN
- SD — PROPOSED STORM LATERAL / LEAD
- (D) PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED FRENCH DRAIN
- W — PROPOSED WATER SERVICE

STORM DRAIN KEY NOTES

3. CONNECT INTO EXISTING STORM DRAINAGE NETWORK AT NEAREST PIPE JOINT. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**
6. INSTALL PRIVATE SUMPED AND TRAPPED CATCH BASIN INLET PER DETAIL 1 ON SHEET C-401. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
9. INSTALL ASTM D3034 PVC (SDR35) STORM DRAIN PIPE TO SIZE, ALIGNMENT, LENGTH, AND ELEVATION SHOWN ON THIS SHEET. BACKFILL SHALL BE COMPACTED TO 95% DENSITY PER AASHTO T-180 TO BOTTOM OF SPECIFIED FINISHED SURFACE SECTION.
11. INSTALL PRIVATE STORM CLEANOUT PER DETAIL 3 ON SHEET C-402. FOR ELEVATION INFORMATION, SEE STRUCTURE TABLE, THIS SHEET.
12. CONSTRUCT CONCENTRIC 6"X4" WYE TEE FITTING FOR 4" ASTM D3034 PVC (SDR35) PRIVATE STORM DRAIN CONNECTION TO ROOF DRAINS. INVERT PER PLAN. CONTRACTOR TO EXTEND 4" PIPE AS NEEDED. SEE MECHANICAL AND PLUMBING PLANS FOR CONTINUATION.
13. INSTALL FRENCH DRAIN PIPE TO SIZE, ALIGNMENT, LENGTH, AND ELEVATION SHOWN ON THIS SHEET. SEE DETAIL 2 ON SHEET C-402.
14. CONNECT INTO EXISTING STORM DRAINAGE NETWORK AT AREA DRAIN. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**

WATER SYSTEM KEY NOTES

1. INSTALL WOODFORD Y34 YARD HYDRANT OR APPROVED EQUIVALENT WITH "NON-POTABLE WATER" SIGN AT LOCATION SHOWN.
2. INSTALL 1" WATER SERVICE. SEE CITY OF MILWAUKIE DETAIL 401 ON SHEET C-404.
3. INSTALL 1" DOUBLE CHECK ASSEMBLY (MAKE & MODEL PER OREGON HEALTH AUTHORITY CURRENT APPROVED LIST). SEE CITY OF MILWAUKIE DETAIL 411A AND 411B ON SHEET C-404.
4. INSTALL 1" DOMESTIC WATER METER VAULT. SEE CITY OF MILWAUKIE DETAIL 401 ON SHEET C-404.

CLEANOUT DATA

SDAD 05
RIM = 87.16'
IE 6" OUT (SW): 86.65

SDCO 04
RIM = 87.27'
IE 6" OUT (W): 85.55

SDCO 05
RIM = 86.48'
IE 6" OUT (SW): 85.96

SDCO 06
RIM = 87.48'
IE 6" OUT (SE): 86.47

SDCO 07
RIM = 87.48'
IE 6" OUT (SE): 86.96

CATCH BASIN DATA

SDAD 02
RIM: 87.42
IE 10" OUT (SW): 86.16

SDAD 03
RIM: 87.49
IE 10" OUT (SW): 85.90

SDAD 04
RIM: 50.68
IE 6" IN (NW): 47.73
IE 6" OUT (SE): 47.53

811 Know what's below. Call before you dig.

N
W E
S

SCALE: 1" = 10'
0 10' 20'

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:36 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

UTILITY PLAN AREAS II
ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
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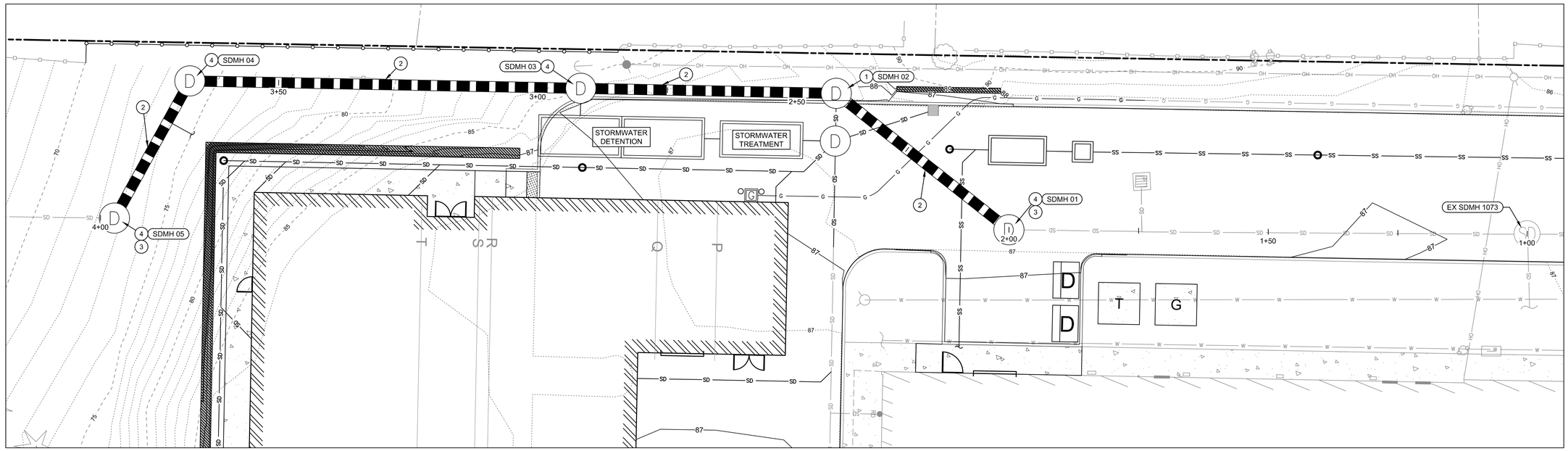
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

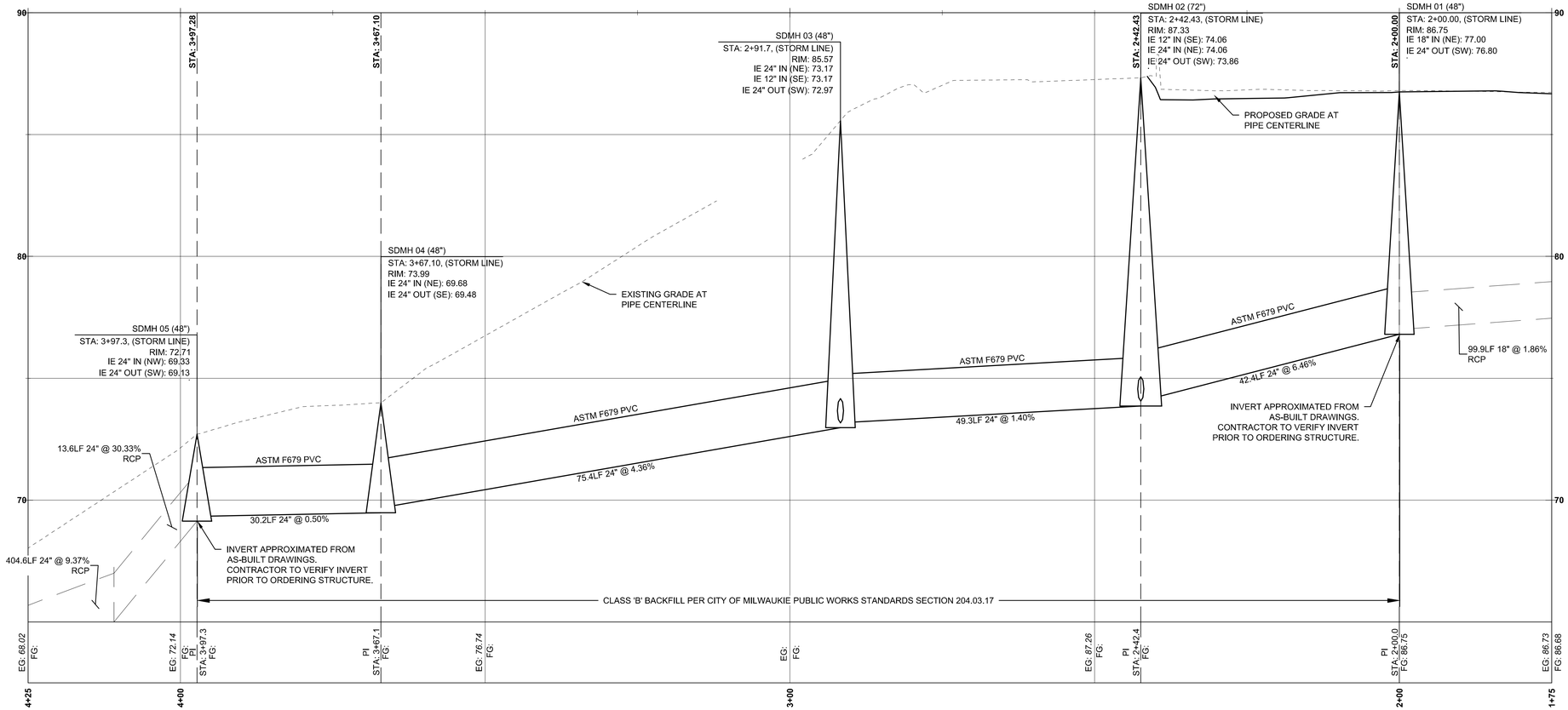
SHEET NUMBER
C-303

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C300-UTILITY PLAN.DWG



PUBLIC STORM IMPROVEMENT PLAN

SCALE: 1" = 10'



PUBLIC STORM IMPROVEMENT PROFILE

SCALE: HORIZONTAL - 1" = 10'
VERTICAL - 1" = 4'

LEGEND

- EXISTING BUILDING
- PROPOSED BUILDING
- PROJECT BOUNDARY
- RIGHT-OF-WAY LINE
- EASEMENT LINE
- EXISTING LOT LINE
- EXISTING CURB
- EXISTING FENCE LINE
- EXISTING STRIPING
- T — EXISTING TELECOM. LINE
- G — EXISTING GAS LINE
- C — EXISTING CABLE LINE
- UGP — EXISTING UNDERGROUND POWER
- OHP — EXISTING OVERHEAD POWER
- OH — EXISTING OVERHEAD LINE
- SD — EXISTING STORM DRAIN
- W — EXISTING WATER MAIN
- 100 — EXISTING MAJOR CONTOUR
- 92 — EXISTING MINOR CONTOUR
- EXISTING STORM INLET
- 110 — PROPOSED MAJOR CONTOUR
- 108 — PROPOSED MINOR CONTOUR
- PROPOSED STORM MAIN
- SD — PROPOSED STORM LATERAL / LEAD
- (D) PROPOSED STORM MANHOLE
- PROPOSED STORM CLEANOUT
- PROPOSED AREA DRAIN

STORM DRAIN KEY NOTES

1. CONSTRUCT 72" MANHOLE PER CITY OF MILWAUKIE STD. DWG. 306, 615, AND 616. SEE SHEET C-401 - C-402 FOR DETAILS.
2. INSTALL 24" ASTM F679 PVC (PS46) STORM DRAIN PIPE TO ALIGNMENT SHOWN, THIS SHEET. SEE PROFILE FOR ELEVATION DATA, THIS SHEET.
3. PROPOSED MANHOLE TO BE CONSTRUCTED IN-LINE WITH EXISTING STORM NETWORK. **CONTRACTOR TO VERIFY IE PRIOR TO PURCHASING STORM SYSTEM MATERIALS.**
4. CONSTRUCT 48" MANHOLE PER CITY OF MILWAUKIE STD. DWG. 306, 615, AND 616. SEE SHEET C-401 - C-402 FOR DETAILS.

Know what's below. Call before you dig.

SCALE: 1" = 10'
0 10' 20'

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C300-UTILITY PLAN.DWG

REGISTERED PROFESSIONAL ENGINEER
80069PE
Preliminary
12/21/2017 10:10:37 AM
OREGON
MAR. 11, 2014
CHASE K. WELBORN
EXPIRES: 06/30/18

PUBLISH DATE
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ISSUED FOR
CSU MODIFICATION

PUBLIC STORM LINE PLAN AND PROFILE

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150; BEAVERTON, OR 97005

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71 COLUMBIA | FLOOR 4
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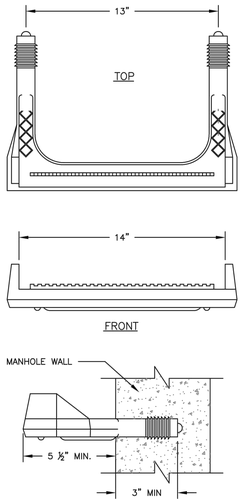
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-304



NOTES:

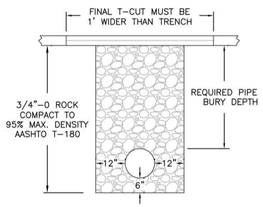
1. STEPS SHALL BE DEFORMED STEEL REINFORCED POLYPROPYLENE PLASTIC CONFORMING WITH ASTM C478 AND ASTM A615.
2. ALL STEPS WITHIN A MANHOLE SHALL BE OF THE SAME DESIGN TYPE AND SIZE. (MIXING OF UNMATCHED STEPS WITHIN THE SAME MANHOLE IS NOT PERMITTED.)
3. LOOSE STEPS SHALL BE CAUSE FOR REJECTION OF THAT CONE OR SECTION.
4. STEPS ARE TO BE DRIVEN INTO PRE-FORMED HOLES IN PRECAST CONCRETE SECTIONS BY THE MANHOLE MANUFACTURER PRIOR TO DELIVERY TO THE JOB SITE.
5. MINIMUM HORIZONTAL PULLOUT LOAD SHALL BE 1500 LBS.
6. STEPS SHALL BE ALIGNED VERTICALLY.
7. STEPS SHALL BE SPACED 12" O.C.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Manhole Step — DRAWING NO. 306

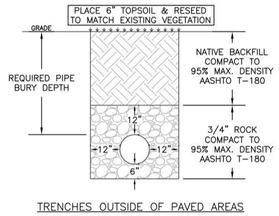
APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	RESIZED DIMENSIONS AND TEXT	12/10	MCP



TRENCHES WITHIN PAVED AREAS

ASPHALT REPLACEMENT DEPTH	
CLASSIFICATION	DEPTH (IN.)
ARTERIAL/INDUSTRIAL	8 OR EXISTING
COLLECTOR	6 OR EXISTING
LOCAL	4 OR EXISTING



TRENCHES OUTSIDE OF PAVED AREAS

NOTES:

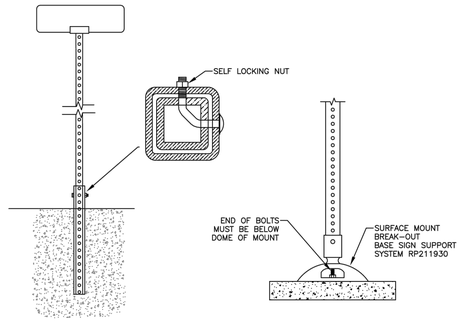
1. ADDITIONAL REPAIR IS REQUIRED FOR STREETS PAVED WITHIN THE LAST 5 YEARS. SEE STANDARD DETAIL NO. 516.
2. FINAL SAWCUTS MUST BE 6" WIDER THAN THE WIDTH OF THE ROLLER USED FOR COMPACTION
3. PAVING SHALL CONSIST OF CLASS "C" MODIFIED ASPHALT CONCRETE AND BE PLACED IN LIFTS. EACH LIFT OF PAVEMENT SHALL HAVE A MAXIMUM DEPTH OF 3" & MINIMUM DEPTH OF 2".
4. INFRARED ASPHALT REPAIRS MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEERING DIRECTOR.
5. UNDERMINED, BROKEN OR CRACKED PAVEMENT EDGES SHALL BE SAWCUT AND REMOVED AT THE DISCRETION OF THE ENGINEERING DIRECTOR.
6. CONTROL DENSITY FILL (CDF) MAY BE REQUIRED AT ENGINEER'S DISCRETION.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Trench Patch — DRAWING NO. 515

APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	ADDED 8" ASPHALT FOR INDUSTRIAL AREAS	12/11	MCP
2	REVISED NOTES	12/12	MTC
3	ADDED T-CUT LANGUAGE	12/14	AJR



BURY MOUNT — CONCRETE SURFACE MOUNT

NOTES:

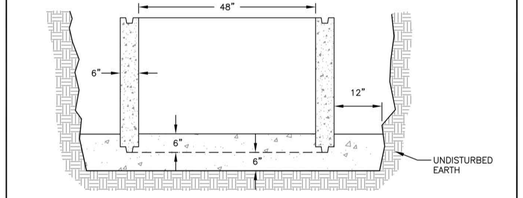
1. SIGN COMBINATION AND MINIMUM SIGN MOUNTING HEIGHT SHALL DETERMINE POST LENGTH. A 10' (MIN.) POST SHALL BE USED. A COMBINATION OF SIGNS GREATER THAN 36" IN HEIGHT SHALL REQUIRE A 12' (MIN.) POST.
2. SIGN POST SIZING SHALL BE BASED ON OREGON STANDARD DRAWING TM682 (85 MPH SQUARE TUBE SIGN SUPPORT SIZING CHART). THE MINIMUM POST SIZE SHALL BE 2" X 2" 12 GA. SQUARE TUBE. IF THE SIGN PANEL AREA IS GREATER THAN THAT ALLOWED BY A 2" X 2" POST, THEN A 2 ½" X 2 ½" 12 GA. POST SHALL BE USED. IF A LARGER SUPPORT IS REQUIRED, THEN WOOD SIGN SUPPORTS SHALL BE USED AS PER OREGON STANDARD DRAWING TM670.
3. NYLON SPACERS SHALL BE USED TO PREVENT CONTACT BETWEEN GLAVANIZED STEEL AND ALUMINUM MATERIAL SURFACES.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

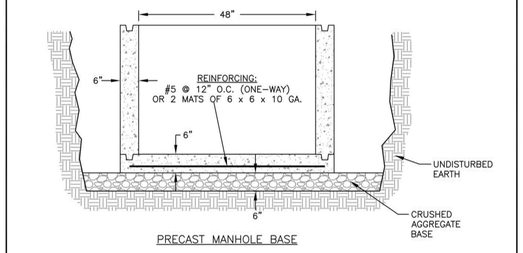
Steel Street Sign Mounting — DRAWING NO. 525

APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	NEW DRAWING	12/14	AJR



CAST-IN-PLACE MANHOLE BASE



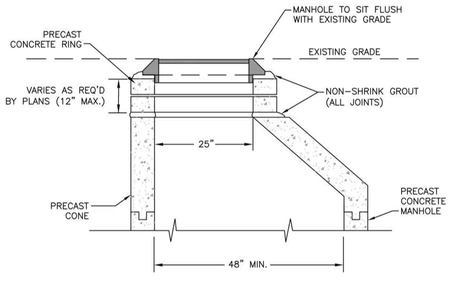
PRECAST MANHOLE BASE

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Manhole Base — DRAWING NO. 615

APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	RECREATED DRAWING FOR CLARITY	12/10	MCP

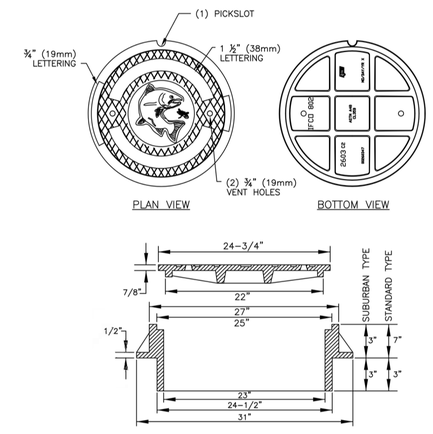


CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Manhole Riser Details — DRAWING NO. 616

APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	RESIZED DIMENSIONS AND TEXT	12/10	MCP



NOTES:

1. USE SUBURBAN TYPE ONLY IN NON-TRAFFIC AREAS, AND ONLY WITH APPROVAL BY THE CITY.
2. COVER AND FRAME SHALL BE GRAY CAST IRON ASTM A-48 CLASS 30.
3. COVER AND FRAME TO BE MACHINED TO A TRUE BEARING ALL AROUND.
4. NOTCH LID FOR LIFTING HOOK.

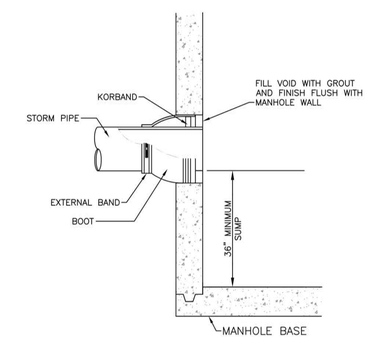
LIDS MAY BE PURCHASED FROM THE CITY OR THE MANUFACTURER

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Storm Manhole Frame and Lid — DRAWING NO. 617

APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	REVISED DRYWELL LID TYPE	03/10	BSA
2	REMOVED NOTE ALLOWING OPEN GRATES	12/10	MCP
3	CHANGED LID DETAIL	12/12	MTC



NOTES:

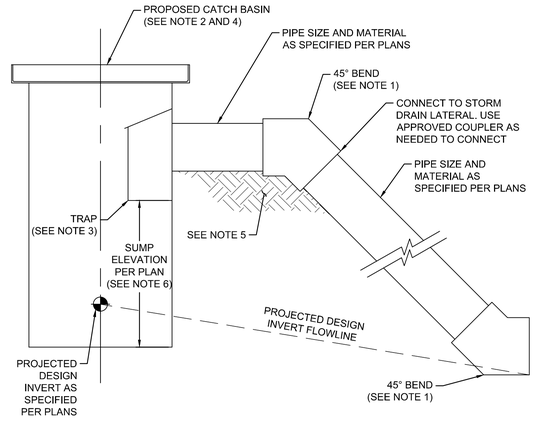
1. USE FLEXIBLE MANHOLE CONNECTION KOR-N-SEAL OR CITY ENGINEER APPROVED EQUIVALENT.
2. STRUCTURE OPENING(S) TO BE PRECAST OR CORE DRILLED ONLY.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Manhole Connection Detail — DRAWING NO. 619

APPROVED JASON RICE 12/14 — CITY ENGINEER — DATE

NO.	REVISIONS	DATE	BY
1	ADDED 36" SUMP REQUIREMENT	12/10	MCP
2	CHANGED DRAWING NUMBER	12/12	MTC



GENERAL NOTES

1. INSTALL VERTICAL AND HORIZONTAL 45° BENDS AS NECESSARY TO CONNECT EXISTING STUB TO PROPOSED CATCH BASIN LOCATION.
2. CATCH BASIN SHALL BE MADE OF APPROVED MATERIAL AND SIZED PER 2014 OPSC 1101.10.1.
3. CATCH BASIN TRAP SHALL BE CONSTRUCTED PER 2014 OPSC 1101.10.2.
4. CATCH BASIN GRATE SHALL BE MADE OF AN APPROVED MATERIAL AND DESIGN PER 2014 OPSC 1101.10.4.
5. DRAINAGE PIPE SHALL BE INSTALLED ON A FIRM BED THROUGHOUT ITS ENTIRE LENGTH PER 2014 OPSC 1101.10.5.
6. CATCH BASIN DEPTH SHALL ADHERE TO GUIDELINES SET IN 2014 OPSC 1101.10.1.

PRIVATE CATCH BASIN (1 / C401)
SCALE: N.T.S.

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PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

DETAILS I

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

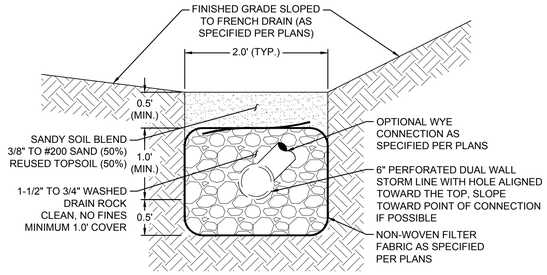
NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-401



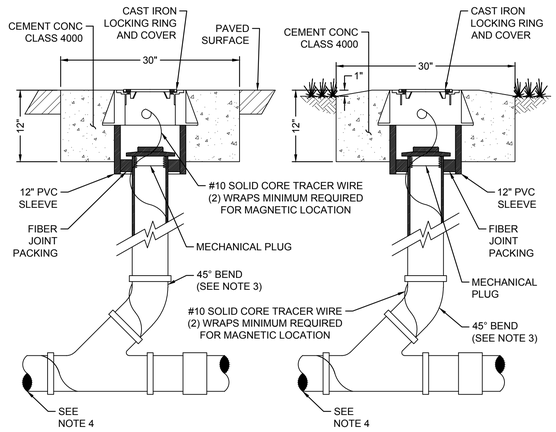
GENERAL NOTES

1. CONNECTIONS INTO THE FRENCH DRAIN SHALL COMPLY WITH 2014 OPS 1101.11 AND 1105.0.
2. PIPING SHALL BE INSTALLED TO WITHSTAND ALL ANTICIPATED LOADS (2014 OPSC 1101.10.5)
3. FITTINGS SHALL BE AS REQUIRED IN 2014 OPSC 706.0 (2014 OPSC 1102.3.1)

FRENCH DRAIN DETAIL

SCALE: N.T.S.

2 C401



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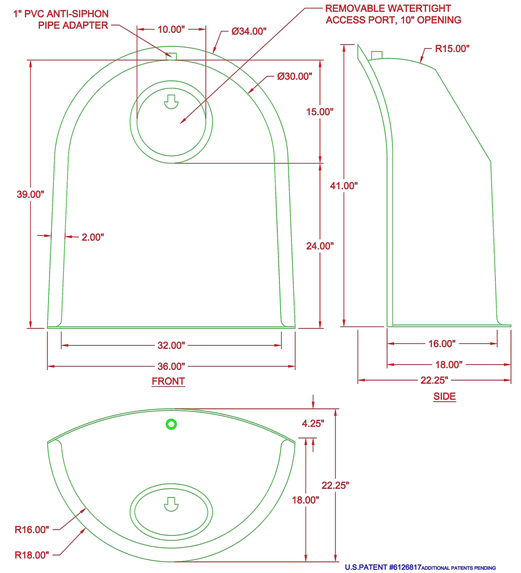
GENERAL NOTES

1. CLEANOUT PLUG AND FITTING SIZE AND MATERIALS TO BE SPECIFIED PER PLANS (AND PER 2014 OPSC 707.1, TABLE 7-6)
2. CLEANOUTS SHALL BE DESIGNED TO BE GAS- AND WATERTIGHT (2014 OPSC 707.3)
3. SANITARY TEE, SWEEP, OR WYE FITTING SHALL BE OF AN APPROVED BEND OR EQUIVALENT SWEEP (2014 OPSC 706.1)
4. PIPE SIZE, TYPE, AND ELEVATION AS SPECIFIED PER PLANS.

PRIVATE CLEANOUT

SCALE: N.T.S.

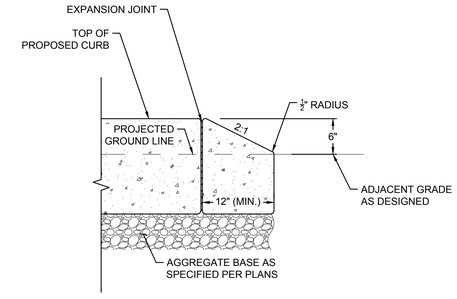
3 C401



SNOUT OIL & DEBRIS STOP FOR FCMH

SCALE: N.T.S.

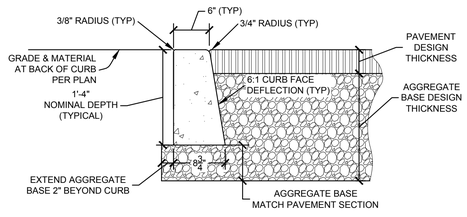
5 C401



CURB END

SCALE: N.T.S.

6 C402



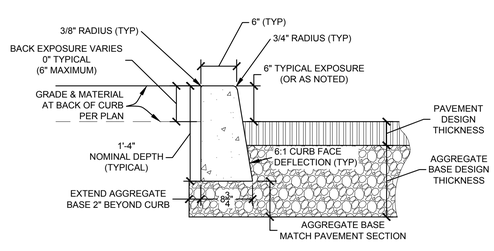
GENERAL NOTES

1. CONCRETE TO BE 3300 PSI TYPE IA PORTLAND CEMENT CONCRETE (28-DAY STRENGTH)
2. MAXIMUM CONTRACTION JOINT SPACING TO BE 15FT
3. CONTRACTION JOINTS SHALL BE PROVIDED BY INSERTING A THIN, OILED STEEL SHEET INTO THE FRESH CONCRETE TO FORCE COARSE AGGREGATE AWAY FROM THE JOINT.
4. INSERT STEEL SHEETS TO 1/2 CURB DEPTH.
5. REMOVE STEEL SHEETS AFTER INITIAL SET, PRIOR TO REMOVAL OF FRONT CURB FORM.
6. ALIGN CURB JOINTS TO ADJACENT SIDEWALK OR DRIVEWAY CONCRETE SURFACE JOINTS.
7. ALL JOINT EDGES AND SCORING TO BE TOOLED
8. AGGREGATE BASE MATERIAL TO CONFORM TO SPECIFICATIONS OF PAVEMENT DESIGN, BY OTHERS
9. ADJACENT ASPHALT GRADE TO BE EQUAL TO OR GREATER THAN FLUSH CURB GRADE.

TYPE 1 CURB: "FLUSH" CURB

SCALE: N.T.S.

7 C402



GENERAL NOTES

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2. MAXIMUM CONTRACTION JOINT SPACING TO BE 15FT
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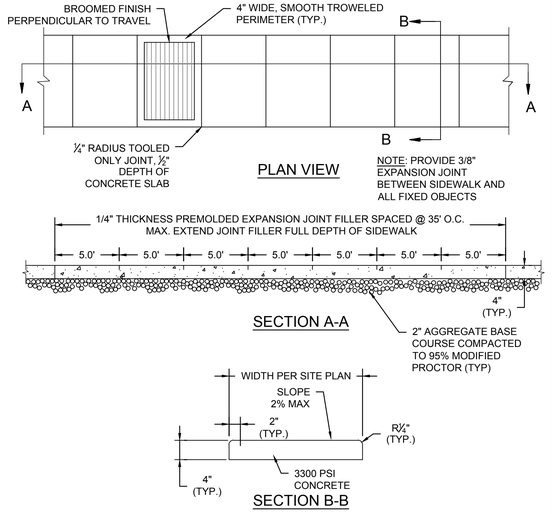
6. ALIGN CURB JOINTS TO ADJACENT SIDEWALK OR DRIVEWAY CONCRETE SURFACE JOINTS.
7. ALL JOINT EDGES AND SCORING TO BE TOOLED
8. AGGREGATE BASE MATERIAL TO CONFORM TO SPECIFICATIONS OF PAVEMENT DESIGN, BY OTHERS

TYPE 2 CURB: "VERTICAL" -OR- "STANDARD" CURB

SCALE: N.T.S.

8 C402



PRIVATE SIDEWALK

SCALE: N.T.S.

9 C402

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PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

DETAILS II

ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

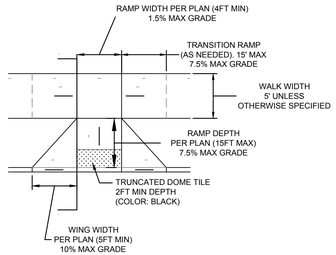
mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX
1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX
MAHLUM ARCHITECTS INC

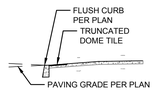
BMP, INC.
53 MT. ARCHER ROAD, LYME, CT. 06371
(800) 504-8008 FAX: (860)434-3195

DESCRIPTION	DATE	SCALE
30R SNOUT OIL & DEBRIS STOP	10/04/99	NONE
	DRAWING NUMBER	3OR

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

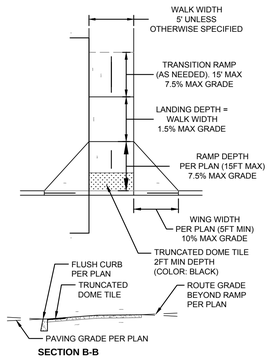
SHEET NUMBER
C-402





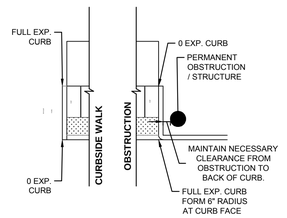
SECTION A-A

PERPENDICULAR RAMP

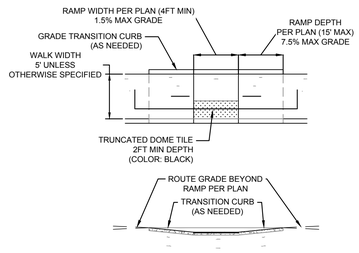


SECTION B-B

IN-LINE RAMP



WING ALTERNATIVES



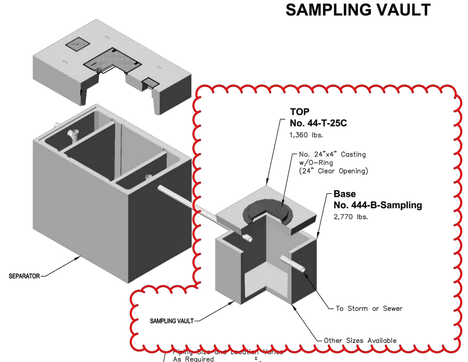
SECTION C-C

PARALLEL RAMP

ADA RAMP DETAILS
SCALE: N.T.S.

10
C403

SAMPLING VAULT



END VIEW

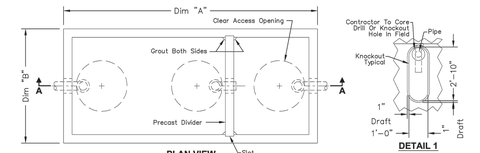
Note: Designed for 0 to 5'-0" of Cover

Oldcastle Precast®	SAMPLING VAULT	SAMPLING VAULT
PO Box 323, Wilsonville, Oregon 97070-0323	File Name: 020ECO444 SAMPLING	
Tel: (503) 682-2844 Fax: (503) 682-2657	Issue Date: 2016	
	oldcastleprecast.com/wilsonville	

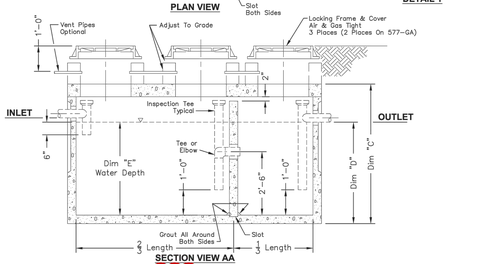
3.0

GREASE INTERCEPTOR SINGLE VAULT SYSTEM

600 – 7,000 Gallon System



PLAN VIEW **DETAIL 1**



SECTION VIEW AA

Gallon Capacity	600	800	1000	1500	2000	2500	3000	4000	5000	6000	7000
Model No.	577-GA	577-GA	4484-GA	5106-GA	612-GA	612-GA	712-GA	712-GA	814-GA	818-GA	818-GA
Dim "A"	7'-0"	7'-0"	9'-4"	11'-2"	12'-8"	12'-8"	13'-1"	13'-1"	15'-7"	19'-11"	19'-11"
Dim "B"	4'-8"	4'-8"	5'-4"	5'-8"	6'-8"	6'-8"	6'-0"	8'-0"	9'-7"	9'-11"	9'-11"
Dim "C"	7'-0"	7'-0"	7'-0"	7'-2"	8'-0"	8'-0"	8'-7"	8'-7"	10'-0 1/2"	10'-5"	10'-5"
Dim "D"	3'-7"	4'-8"	4'-8"	4'-3"	4'-7"	5'-6 1/2"	5'-1"	6'-8"	7'-4"	7'-1"	8'-0"
Dim "E"	3'-3"	4'-4"	3'-11"	3'-11"	4'-3"	4'-9"	4'-8"	6'-3"	6'-1"	5'-8"	6'-7"
Water Depth					9 1/2"						

Design Criteria:

Number Of Meals Per Peak Hours × Waste Flow Rate × Retention Time × Storage Factor = Capacity In Gallons

Uniform Plumbing Code – Appendix H

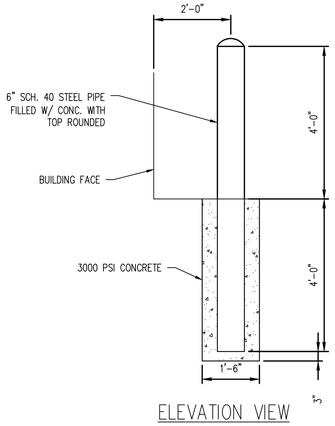
Notes:

1. Concrete: 28 Day Compressive Strength f'c = 7000 psi
2. Rebar: ASTM A-615 Grade 60
3. Mesh: ASTM A-185 Grade 65
4. Design: ACI-318-02 Building Code
   ASTM C-857 "Minimum Structural Design
   Loading For Underground Precast Concrete
   Utility Structures"
5. Loads: H-20 Truck Wheel w/ 30% Impact Per AASHTO
6. Fill w/ Clean Water Prior To Start-Up Of System
7. Contractor To Supply & Install All Piping & Sampling Tees
8. Gray Water Only, Black Water Shall Be Carried By Separate Side Sewer

SCALE: 3/8 = 1'-0"

Items Shown Are Subject To Change Without Notice
Issue Date: April 2016

131

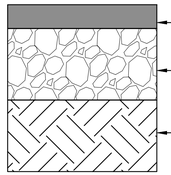


ELEVATION VIEW

BOLLARDS DETAIL
SCALE: N.T.S.

11
C403

PRIVATE ON-SITE PAVING CROSS SECTIONS

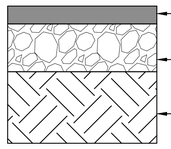


4" - LEVEL 2, 1/2", DENSE ACP PER OSSC 00745, COMPACT TO 91% OF SPECIFIC GRAVITY PER AASHTO T-209

12" CRUSHED ROCK BASE (3/4" - 0") COMPACT TO 95% OF MAX DENSITY PER ASTM D-1557

12" SUBGRADE COMPACT TO 92% OF MAX DENSITY PER ASTM D-1557

HMAC PAVING - HEAVY DUTY

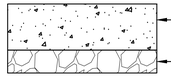


3" - LEVEL 2, 1/2", DENSE ACP PER OSSC 00745, COMPACT TO 91% OF SPECIFIC GRAVITY PER AASHTO T-209

8" CRUSHED ROCK BASE (3/4" - 0") COMPACT TO 95% OF MAX DENSITY PER ASTM D-1557

12" SUBGRADE COMPACT TO 92% OF MAX DENSITY PER ASTM D-1557

HMAC PAVING - LIGHT DUTY



4" - 3,300 PSI CONCRETE (3,000 PSI 28-DAY STRENGTH)

2" CRUSHED ROCK BASE (3/4" - 0") COMPACT TO 95% OF MAX DENSITY PER ASTM D-1557

CONCRETE SIDEWALKS

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PUBLISH DATE
12-22-2017
ISSUED FOR
CSU MODIFICATION

DETAILS III

ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

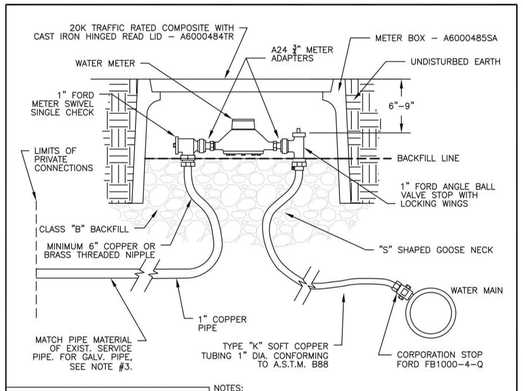
mahlum
71 COLUMBIA | FLOOR 4
SEATTLE WA 98104
(206) 441-4151 OFFICE
(206) 441-0478 FAX

1231 NW HOYT | SUITE 102
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

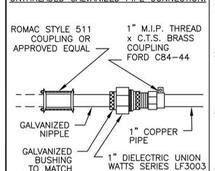
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
TAX LOT(S) | 11E36DC5700
LAND USE # | N/A
DESIGNED BY | CKW, JKG, SRC
CHECKED BY | BKF, JDH

SHEET NUMBER
C-403



UNTHREADED GALVANIZED PIPE CONNECTION:



NOTES:

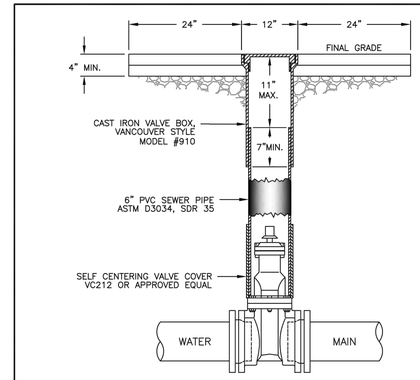
1. IF COPPER TUBING CROSSES CATHODICALLY PROTECTED LINE, ENCASE COPPER IN POLYETHYLENE TUBING FOR 24" (CENTERED AT THE CROSSING LINE) AND FASTEN WITH 2" WIDE ADHESIVE TAPE THAT IS COMPATIBLE WITH POLYETHYLENE.
2. PLACE METER BOXES (1) LOCATED BEHIND THE SIDEWALK WHERE THERE IS SUFFICIENT RIGHT–OF–WAY, (2) WITHIN THE PLANTER STRIP, EXCLUDING WATER QUALITY FACILITIES, (3) WITHIN THE SIDEWALK WITH THE BACK OF THE METER BOX AT THE BACK EDGE OF THE SIDEWALK.
3. CONNECT GALVANIZED SERVICE PIPE; (1) AT EXISTING THREADED FITTING WITHIN 5 FEET OF WATER METER; (2) RETHREAD EXISTING GALVANIZED SERVICE PIPE; (3) IF EXISTING PIPE IS IN POOR CONDITION AND CANNOT BE RETHREADED, USE UNTHREADED GALVANIZED PIPE CONNECTION DETAIL.
4. IF METER BOX IS LOCATED IN THE SIDEWALK, DIELECTRIC UNION WILL BE INSTALLED (1) 6" FROM BACK OF METER INSIDE OF METER BOX, (2) BEHIND BACK OF SIDEWALK.

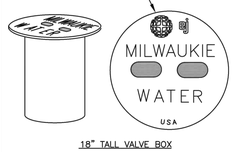
CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Standard 1 Inch Water Service

DRAWING NO. 401

APPROVED	DATE	NO.	REVISIONS	DATE	BY
		3	DRAWING REVISED	12/13	MCP
		4	REMOVED COPPERSETTER	11/13	AJR
CITY ENGINEER	DATE	5	ADDED DIELECTRIC UNION NOTE	12/14	AJR





18" TALL VALVE BOX

NOTES:

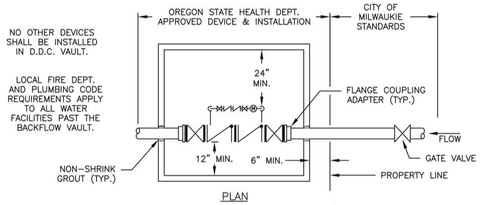
1. VALVE BOXES SHALL BE CENTERED DIRECTLY OVER THE VALVE NUT IN A VERTICAL POSITION.
2. VALVE BOX TOP SHALL BE ADJUSTED TO MEET FINISHED GRADE.
3. PVC SHALL BE ONE CONTINUOUS PIECE – NO BELLS OR COUPLERS.
4. VALVE NUT EXTENSIONS SHALL BE USED TO BRING VALVE NUT WITHIN 4 FEET OF FINAL GRADE.
5. VALVE CAN SHALL BE ENCASED IN 2'x2' PAD IN UNIMPROVED AREAS. REPAIRS WITHIN PAVED STREET REQUIRE A MINIMUM 5'x5' ASPHALT PATCH.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Standard Valve Box Detail

DRAWING NO. 410

APPROVED	DATE	NO.	REVISIONS	DATE	BY
		1	GENERAL FORMATTING	12/10	MCP
		2	DRAWING REVISED; VALVE BOX REDRAWN	12/12	MTC
CITY ENGINEER	DATE	3	DRAWING NUMBER CHANGED	12/13	AJR



D.D.C. SIZE	UTILITY VAULT for DOUBLE DETECTOR CHECK DEVICE	
	VAULT	LID
3"	577–LA	LID 57–T–2–332P
4"	577–LA	LID 57–T–2–332P
6"	676–LA	LID 676–T–2–332P
8"	687–2–LA	LID 687–T–2–332P
10"	5106–1–LA	LID 5106–3–T–3–332P

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Double Detector Check Vault

DRAWING NO. 411A

APPROVED	DATE	NO.	REVISIONS	DATE	BY
CITY ENGINEER	DATE				

CITY OF MILWAUKIE
REQUIREMENTS FOR BACKFLOW PREVENTION ASSEMBLY
INSTALLATIONS ON 1 1/2" AND LARGER DOMESTIC SERVICES

AN APPROVED BACKFLOW PREVENTION ASSEMBLY IS REQUIRED ON ALL 1 1/2" AND LARGER DOMESTIC METER SIZE SERVICES, ALL IRRIGATION AND MOST FIRELINE SYSTEMS. AN ASSEMBLY WILL BE APPROVED BY THE CITY OF MILWAUKIE ONLY IF THE STATE OF OREGON HEALTH DIVISION HAS APPROVED ITS USE AS A BACKFLOW ASSEMBLY. THE ASSEMBLY SHALL BE INSTALLED AT THE PROPERTY LINE. THE PROPOSED LOCATION MUST BE APPROVED BY THE WATER DIVISON CROSS–CONNECTION SPECIALIST OR CITY ENGINEER. A WATER SERVICE SHALL NOT BE TURNED ON UNTIL ALL REQUIRED BACKFLOW PREVENTION ASSEMBLIES ARE INSTALLED, INSPECTED, TESTED AND REGISTERED WITH THE CITY OF MILWAUKIE CROSS CONNECTION SPECIALIST. COSTS OF ALL INSTALLATIONS, INCLUDING ALL COSTS OF INITIAL INSPECTION AND TESTING FEES, SHALL BE THE RESPONSIBILITY OF THE CUSTOMER. THE COSTOMER WILL BE RESPONSIBLE FOR ALL MAINTENANCE AND TESTING OF THE ASSEMBLY AND VAULT WHEN USED.

TO ENSURE PROPER OPERATION AND ACCESSIBILITY OF ALL BACKFLOW PREVENTION ASSEMBLIES, THE FOLLOWING REQUIREMENTS SHALL APPLY TO INSTALLATION OF THESE ASSEMBLIES UNLESS SPECIFICALLY APPROVED BY THE WATER DIVISION CROSS CONNECTION SPECIALIST OR CITY ENGINEER.

1. NO PART OF THE BACKFLOW PREVENTION ASSEMBLY SHALL BE SUBMERGED IN WATER OR INSTALLED IN A LOCATION SUBJECT TO FLOODING. IF INSTALLED IN A VAULT OR CHAMBER, ADEQUATE DRAINAGE SHALL BE PROVIDED BY EITHER DRAINAGE TO DAYLIGHT OR BY SUMP PUMP WITH HIGH WATER ALARM SYSTEM. TEST COCKS SHALL BE PLUGGED. THE PLUGS SHALL NOT BE OF DISSIMILAR METALS.
2. THE ASSEMBLY MUST BE PROTECTED FROM FREEZING AND OTHER SEVERE WEATHER CONDITIONS.
3. ONLY ASSEMBLIES APPROVED FOR VERTICAL INSTALLATION MAY BE INSTALLED VERTICALLY.
4. THE ASSEMBLY SHALL BE READILY ACCESSIBLE WITH ADEQUATE ROOM FOR MAINTENANCE AND TESTING. DEVICES 2 INCHES AND SMALLER SHALL HAVE AT LEAST A 12–INCH CLEARANCE BELOW AND ON BOTH SIDES OF THE ASSEMBLY; AND IF LOCATED IN A VAULT, THE TOP OF THE ASSEMBLY SHALL BE BETWEEN 12 AND 24 INCHES BELOW GRADE.
5. ALL ASSEMBLIES LARGER THAN 2 INCHES SHALL HAVE A 12–INCH CLEARANCE ON THE BACKSIDE, A 24–INCH CLEARANCE ON THE TEST–COCK SIDE, AND 12 INCHES BELOW THE DEVICE ASSEMBLIES. ADEQUATE CLEARANCE (3 INCHES MINIMUM) MUST BE MAINTAINED ABOVE O.S.&Y. GATE VALVE STEM. HEADROOM OF 6'0" IS REQUIRED IN VAULTS. ACCESS TO THE ASSEMBLY AND TO ANY VAULT OF CHAMBER SHALL REMAIN CLEAR AT ALL TIMES. AN OR/OSHA APPROVED CHAMBER LADDER THAT ENTENDS 3 FT. ABOVE SURFACE OF VAULT SHALL BE INSTALLED.
6. NO INDICATING VALVES ARE ALLOWED ON DOUBLE CHECK ASSEMBLIES.
7. ONLY APPROVED DOUBLE CHECK DETECTOR CHECK VALVE ASSEMBLIES ARE TO BE USED FOR SYSTEM CONTAINMENT ON FIRE LINE SERVICES IN THE CITY OF MILWAUKIE. THE METER ON BYPASS ASSEMBLIES SHALL READ IN CUBIC FEET.
8. IF A FIRE LINE FLOW, OR TAMPER SWITCH IS INSTALLED, IT MUST BE CONNECTED TO A MONITORED FIRE DETECTION SYSTEM APPROVED BY THE FIRE MARSHAL. NO INSTALLATION WILL MODIFY THE BACKFLOW ASSEMBLY OR INTERFERE WITH ITS OPERATION OR MAINTENANCE.
9. ALL BACKFLOW ASSEMBLY SHALL BE INSTALLED AT THE SERVICE CONNECTION TO THE PREMISES PER OREGON, ADMINISTRATIVE RULES 333–61–070, CROSS CONNECTION CONTROL REQUIREMENTS, UNLESS SPECIFICALLY APPROVED BY THE WATER DIVISION CROSS CONNECTION SPECIALIST OR CITY ENGINEER.
10. ALL PIPE BETWEEN MAIN AND DEVICE SHALL BE RESTRAINED. USE MEGA–LUG RETAINER GLANDS ON MJ FITTINGS AND FIELD–LOK GASKETS ON BELL JOINTS. UNI–FLANGE ADAPTERS MAY BE USED IN VAULTS.

CITY OF MILWAUKIE, OREGON – PUBLIC WORKS DEPT.

Double Detector Check Vault Notes

DRAWING NO. 411B

APPROVED	DATE	NO.	REVISIONS	DATE	BY
		1	COMBINED DRAWINGS 411B AND 411C	12/11	MCP
CITY ENGINEER	DATE				

PUBLISH DATE
12-22-2017

ISSUED FOR
CSU MODIFICATION

DETAILS IV

ROWE MIDDLE SCHOOL ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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PORTLAND OR 97209
(503) 224-4032 OFFICE
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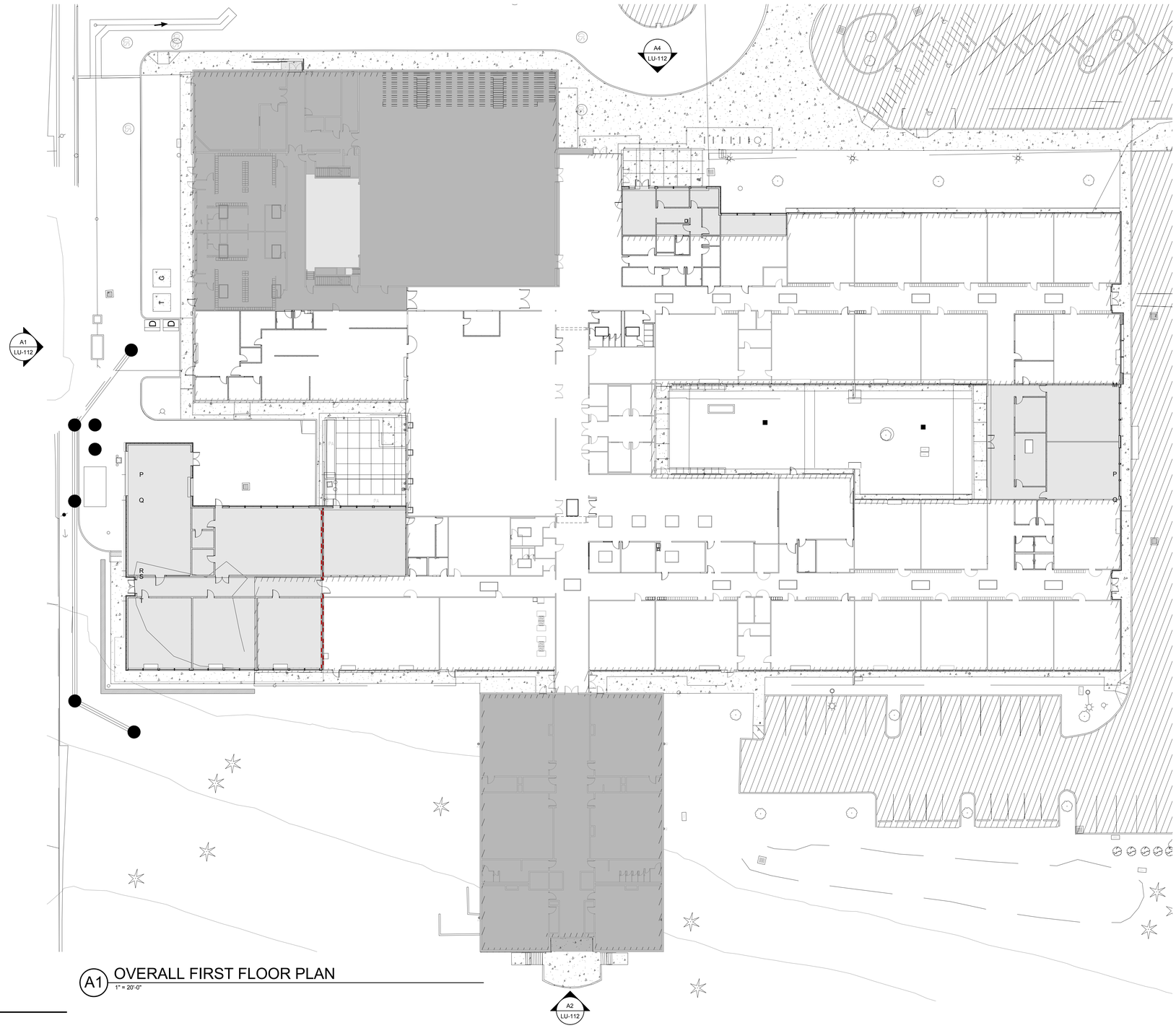
MAHLUM ARCHITECTS INC

PROJECT INFORMATION

3J PROJECT #	17411
TAX LOT(S)	11E36DC5700
LAND USE #	N/A
DESIGNED BY	CKW, JKG, SRC
CHECKED BY	BKF, JDH

SHEET NUMBER
C-404

P:\17411-ROWE MS MODERNIZATION\CAD\CD\17411-C400-DETAILS.DWG



A1 OVERALL FIRST FLOOR PLAN
1" = 20'-0"

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PUBLISH DATE
12/08/17

ISSUED FOR
PERMIT SET

ARCHITECTURAL BUILDING PLAN
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
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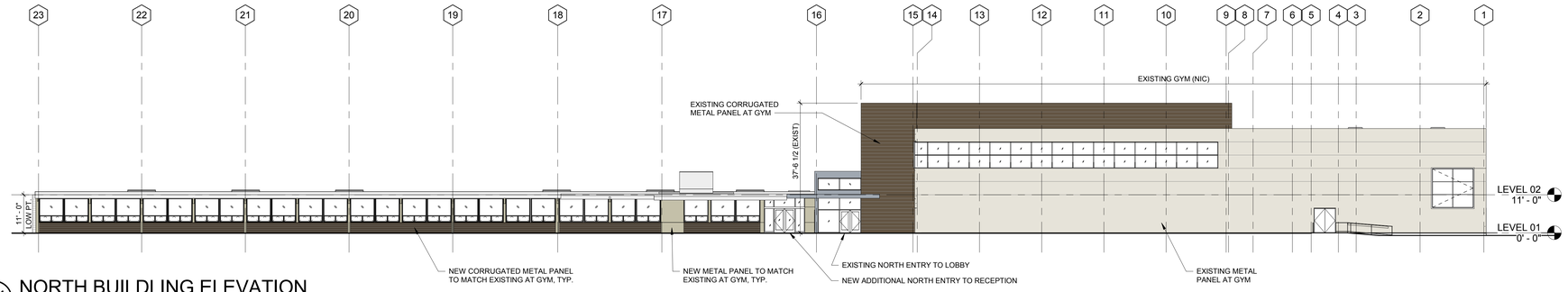
PORTLAND OR 97209
(503) 224-4032 OFFICE
(503) 224-0918 FAX

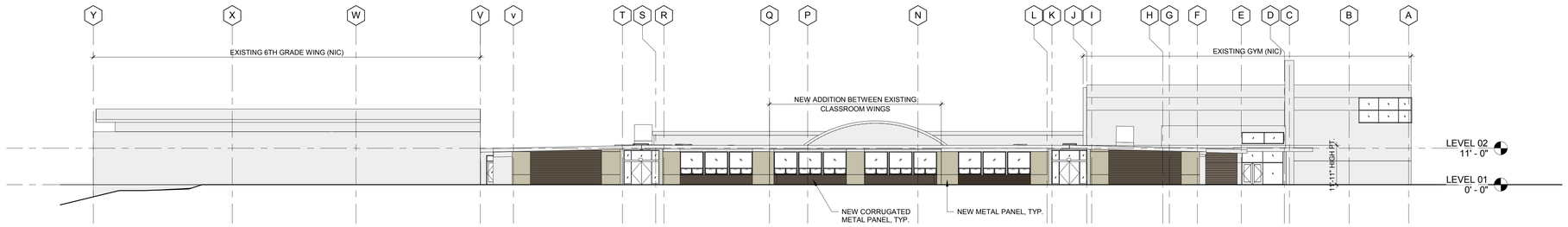
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
MAHLUM PRJ # | **2017907.00**
TAX LOT(S) | 11E36DC5700
DESIGNED BY | **NB, SM**
CHECKED BY | **NB, SM**

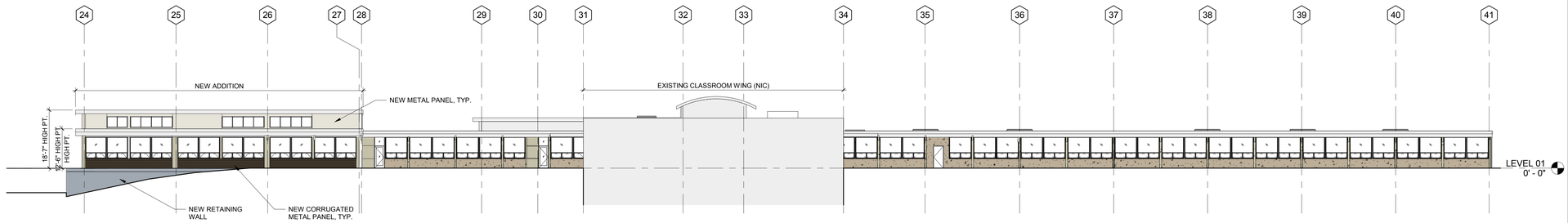
SHEET NUMBER
LU-111



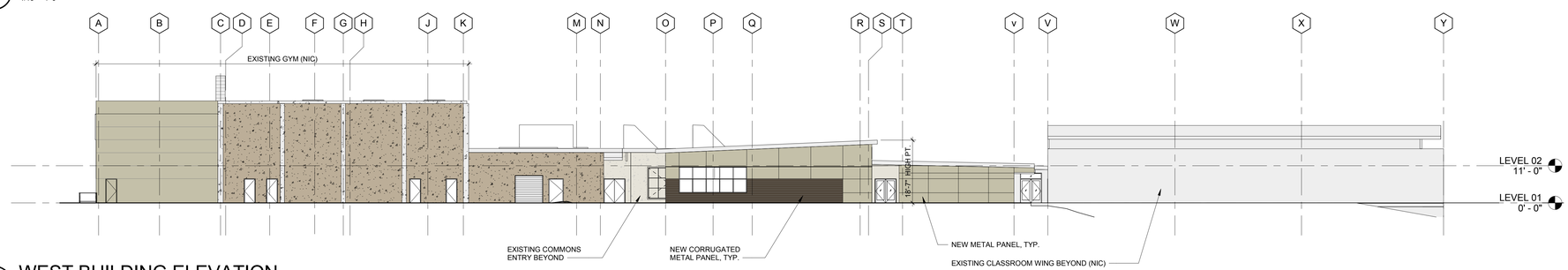
A4 NORTH BUILDLING ELEVATION
1/16" = 1'-0"



A3 EAST BUILDING ELEVATION
1/16" = 1'-0"



A2 SOUTH BUILDING ELEVATION
1/16" = 1'-0"



A1 WEST BUILDING ELEVATION
1/16" = 1'-0"

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PUBLISH DATE
12/11/17

ISSUED FOR
PERMIT SET

EXTERIOR BUILDING ELEVATIONS
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

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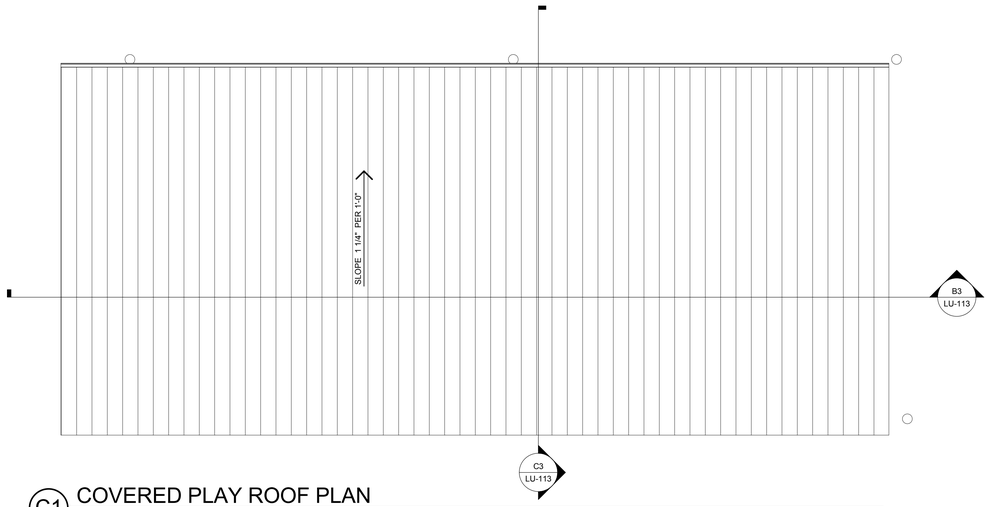
(503) 224-4032 OFFICE
(503) 224-0918 FAX

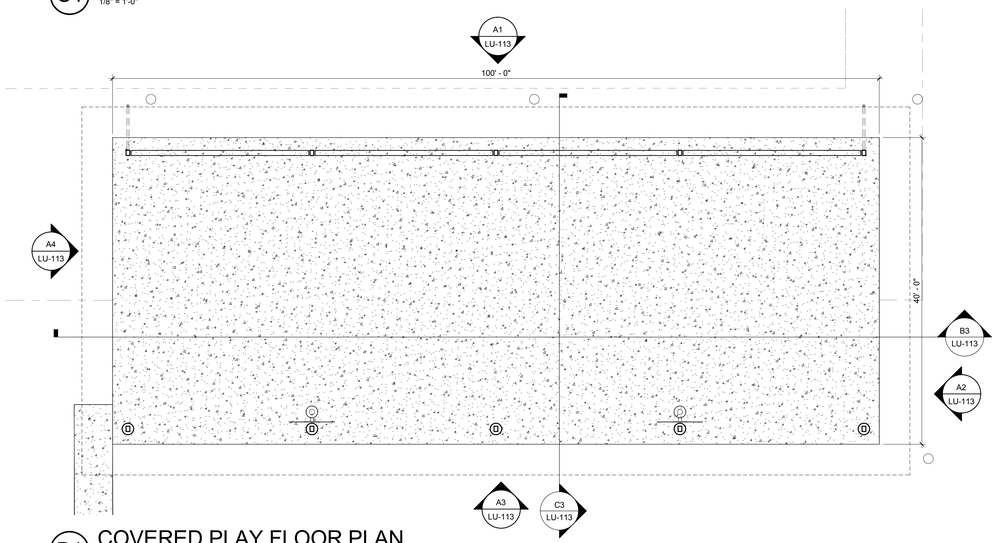
MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
MAHLUM PRJ # | **2017907.00**
TAX LOT(S) | 11E36DC5700
DESIGNED BY | **NB, SM**
CHECKED BY | **NB, SM**

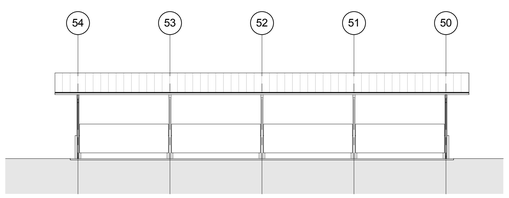
SHEET NUMBER
LU-112



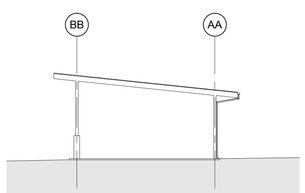
C1 COVERED PLAY ROOF PLAN
1/8" = 1'-0"



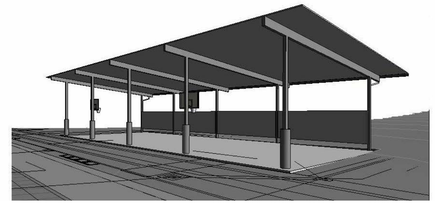
B1 COVERED PLAY FLOOR PLAN
1/8" = 1'-0"



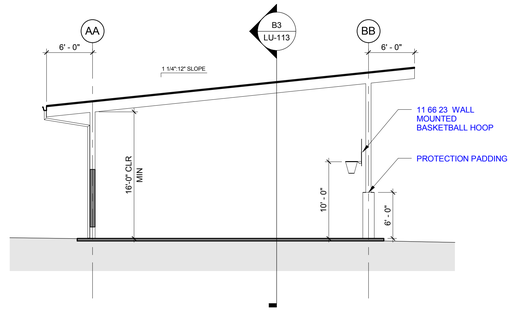
A1 NORTH ELEVATION
1/16" = 1'-0"



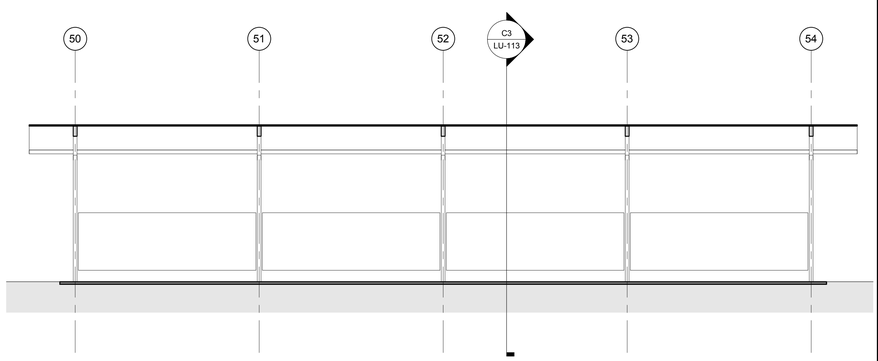
A2 EAST ELEVATION
1/16" = 1'-0"



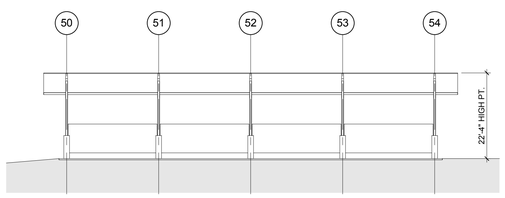
C4 D CONCEPT
12" = 1'-0"



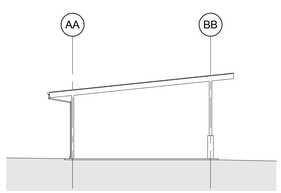
C3 N-S SECTION
1/8" = 1'-0"



B3 E-W SECTION
1/8" = 1'-0"



A3 SOUTH ELEVATION
1/16" = 1'-0"



A4 WEST ELEVATION
1/16" = 1'-0"

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PUBLISH DATE
12/11/17

ISSUED FOR
PERMIT SET

COVERED PLAY STRUCTURE
ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
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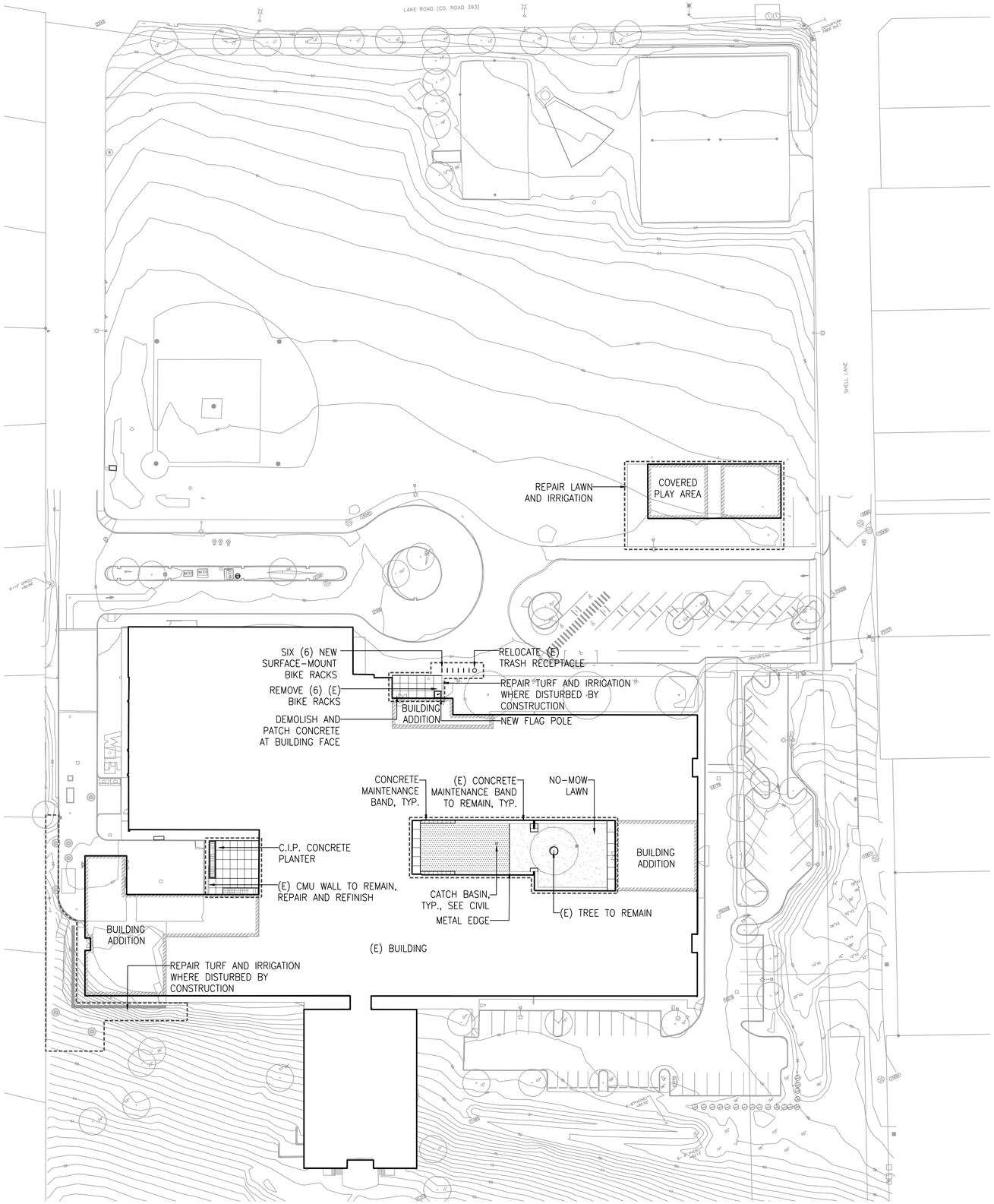
(503) 224-0918 FAX

MAHLUM ARCHITECTS INC

PROJECT INFORMATION
3J PROJECT # | 17411
MAHLUM PRJ # | **2017907.00**
TAX LOT(S) | 11E36DC5700
DESIGNED BY | NB, SM
CHECKED BY | NB, SM

SHEET NUMBER
LU-113



LEGEND

- LIMIT OF WORK
- EXISTING TREE
- CONCRETE PAVING – PEDESTRIAN
- AGGREGATE PAVING – PEDESTRIAN
- NO-MOW LAWN AREA
- PLANTING AREA
- CIP CONCRETE PLANTER WALL

0 10 20 40 80
SCALE: 1" = 40'-0"

PUBLISH DATE
12/15/17
ISSUED FOR
LAND USE

ROWE MIDDLE SCHOOL
ADDITION AND MODERNIZATION

NORTH CLACKAMAS SCHOOL DISTRICT
3606 SE LAKE ROAD, MILWAUKIE, OR 97222

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
LAND USE PLANNING
5075 SW GRIFFITH DRIVE, SUITE 150, BEAVERTON, OR 97005

PROJECT INFORMATION
3J PROJECT # | 17411
MAHLUM PRJ # | 2017907
TAX LOT(S) | 11E36DC5700
DESIGNED BY | AJ
CHECKED BY | IH

SHEET NUMBER
L100

F:\WORK\P3420.01 ROWE MIDDLE SCHOOL\DRAW\PLOTS\P3420.01_L100 LAND USE PLAN.DWG