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**STAFF REPORT  
PLANNING MANAGER DECISION**

DATE: November 7, 2019

FILE NO.: MIP-19-01/VAR-19-04

REQUEST: Approval of a Two-Parcel Minor Partition and Class I Variance at 2332 Arbor Dr.

PLANNER: Darren Wyss, Associate Planner

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Planning Manager \_\_\_\_\_

City Engineer \_\_\_\_\_

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## GENERAL INFORMATION

**APPLICANT/  
CONSULTANT:**

Ryan Pfeifer  
322 NW 6<sup>th</sup> Ave. #200  
Portland, OR 97209

**OWNER:**

Deborah Walker  
820 Country Road 194  
Parker, CO 80139

**SITE LOCATION:**

2332 Arbor Drive

**SITE SIZE:**

20,000 square feet

**LEGAL**

**DESCRIPTION:**

Assessor's Map 2S-1E-14CA Tax Lot 1000

**COMP PLAN**

**DESIGNATION:**

Low-Density Residential

**ZONING:**

R-10, Single-Family Residential Detached  
(10,000 sq. ft. min. lot size)

**APPROVAL**

**CRITERIA:**

Community Development Code (CDC) Chapter 11: Single-Family Residential Detached, R-10; Chapter 48: Access, Egress and Circulation; Chapter 85: Land Division, General Provisions; Chapter 75: Variances and Special Waivers; Chapter 92: Required Improvements; Chapter 99: Procedures for Decision Making: Quasi-Judicial.

**120-DAY RULE:**

The application became complete on September 3, 2019. The 120-day period ends December 13, 2019.

**PUBLIC NOTICE:**

Notice was mailed to property owners within 500 feet of the subject property and to all neighborhood associations on October 2, 2019. A sign was placed on the property on October 9, 2019. The notice was also posted on the City's website on October 2, 2019. Therefore, public notice requirements of CDC Chapter 99 have been met.

## EXECUTIVE SUMMARY

The applicant seeks approval for a two-parcel partition at 2332 Arbor Drive, a 20,000 square foot parcel on the south side of Arbor Drive, between Upper and Lower Midhill Drives. The parcel is located in the Robinwood Neighborhood. The property is zoned R-10, as are the adjacent properties on the east and west, and the properties across Arbor Drive. The property to the rear is Midhill Park, a public park owned by the City and zoned R-4.5. Both proposed parcels will take access from Arbor Drive using a shared private access drive.

The adjacent, existing Arbor Drive right-of-way is 50 feet wide. The applicant will dedicate one-foot for right-of-way to accommodate a Local Street with Parking on One Side. With the dedication of 1,000 square feet, proposed Parcel 1 will be 10,000 square feet but Parcel 2 will only be 9,888 square feet and requires a Class I Variance for lot area.

The site has a slope of 10 percent or less. There are no environmental overlays on the property. There are no significant trees on site. The new homes will connect to an existing water main and sanitary sewer main located in Arbor Drive. New homes on the proposed parcels will be reviewed for compliance with setbacks at time of building permit application.

### **Public comments:**

Public comments submitted by Anne Beltman (see Exhibit PD-2) expressed concerns about lack of compliance with the following code criteria:

1. Granting a variance will increase traffic and potential conflict on an overused street.  
The subject property is large enough to accommodate two parcels under the current zoning. The variance was requested due to the need to dedicate one-foot of right-of-way in order to install half-street improvements that will help improve the pedestrian, bicycle, and automobile safety on the street. Arbor Drive is currently un-improved to the City's 52-foot standard local street cross-section, which includes sidewalks on both sides of the street. This development will be required to improve Arbor Drive along their frontage.
2. Granting a variance paves the way for future variances and changes the quality of the neighborhood.  
The subject property is large enough to accommodate two parcels under the current zoning. The variance was requested due to the need to dedicate one-foot of right-of-way in order to install half-street improvements. The Class I Variance requested is allowed under the current West Linn Community Development Code (CDC). Please see Staff Findings 47 to 48. All future land use applications will be evaluated against the code in place at the time of application and not by past precedent.
3. Changing the zoning from R-10 to R-4.5 will modify the yard more than 20 percent.  
The application does not change the zoning. The variance request is for lot area and not yard area. Please see Staff Findings 47 to 48 for more information.

4. Compliance with CDC 75.020.A.1(b-c); natural resources and effect on adjoining properties.

The subject property is large enough to accommodate two parcels under the current zoning. The variance was requested due to the need to dedicate one-foot of right-of-way in order to install half-street improvements. The variance does not affect adjoining properties as the required setbacks apply with or without the variance. The only effect of the variance will be on the buildable area of Parcel 2. There are no significant trees on site and the application met all CDC code requirements for natural resources (see Staff Findings 47 to 48)

5. Compliance with CDC 75.020.A.3(b); size and dimension of homes.

This code section addresses Class I Variances for sign dimensions and not applicable.

6. Compliance with CDC 85.010(A); lesson congestion and increase safety.

This section is the purpose statement of the chapter and not applicable. However, please see Staff Findings 20 to 29 that address the transportation system code requirements. The applicant will install half-street improvements that includes a sidewalk and pavement width to accommodate parking on one-side.

7. Compliance with CDC 85.010.B(2); sense of neighborhood and changing the zoning.

This section is the purpose statement of the chapter and not applicable. However, as discussed in Comment 1 above, the applicant has not requested a zone change.

8. Compliance with CDC 85.010.B(3); reducing pedestrian/vehicle conflicts.

This section is the purpose statement of the chapter and not applicable. However, the applicant is proposing the addition of one new home on the street, while at the same time making street improvements that includes the installation of a sidewalk and pavement width to accommodate parking on one-side. The improvements will help mitigate conflicts.

Public comments submitted by Allison and Seth Olson (see Exhibit PD-2) expressed concerns about lack of compliance with the following code criteria:

1. Compliance with CDC 75.020(1 & 4); yard requirements and effect on adjoining property.

This code section addresses Class I Variances for required yard dimensions and landscaping requirements and are not applicable. The applicant requested a Class I Variance for lot area and proposes a reduction in lot size by 1.12%, which is allowed by the code. No variance for yard dimensions or landscaping was submitted. The single-family home being constructed on Parcel 1 complies with R-10 zoning setbacks of 7.5 feet for side yards, 20 feet for front and rear yards, 35 foot maximum height, 35 percent maximum lot coverage, and maximum floor-to-area ratio of 0.45.

2. Compliance with CDC 85.010; lesson congestion and increase safety.

This section is the purpose statement of the chapter and not applicable. However, please see Staff Findings 20 to 29 that address the transportation system code requirements. The applicant will install half-street improvements that includes a sidewalk and pavement width to accommodate parking on one-side.

3. Compliance with 85.200.B(7); flag lots and precedent.

The subject property is large enough to accommodate two parcels under the current zoning. The use of a shared access drive is the only feasible access to Parcel 2 and is permitted by the CDC. There are numerous examples of flag lots and shared driveways all across the city, including in the Robinwood Neighborhood as allowed by the CDC. All future land use applications will be evaluated against the code in place at the time of application and not by past precedent.

4. Compliance with 85.200.B(8); Large lots or parcels.

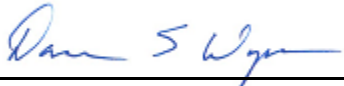
The subject property is being partitioned to 100% of allowed density (see Staff Finding 45). The single-family home being constructed on Parcel 1 complies with R-10 zoning setbacks of 7.5 feet for side yards, 20 feet for front and rear yards, 35 foot maximum height, 35 percent maximum lot coverage, and maximum floor-to-area ratio of 0.45. The future home to be constructed on Parcel 2 will also be required to meet R-10 setbacks, height, and size limitations.

## DECISION

The Planning Manager (designee) approves this application (MIP-19-01/VAR-19-04), based on: 1) the findings submitted by the applicant, which are incorporated by this reference, 2) supplementary staff findings included in the Addendum below, and 3) the addition of conditions of approval below. With these findings, the applicable approval criteria are met. The conditions are as follows:

1. **Site Plan.** With the exception of modifications required by these conditions, the final plat shall conform to the Partition Plat dated 11/12/2018 (Exhibit PD-1).
2. **Engineering Standards.** All public improvements and facilities associated with the approved site design, including but not limited to street improvements, driveway approaches, curb cuts, utilities, grading, onsite and offsite stormwater, street lighting, easements, easement locations, and connections for future extension of utilities are subject to conformance with the City Municipal Code and Community Development Code. These must be designed, constructed, and completed prior to final plat approval.
3. **Reciprocal Access and Utility Easement.** Prior to final plat approval, the applicant shall record a reciprocal access and utility easement and a mutual maintenance agreement for the shared use of the driveway located in the easement. The easement recording number shall be provided on the face of the final plat. The final plat shall show the easement at a width of 20 feet.

The provisions of the Community Development Code Chapter 99 have been met.

  
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Darren Wyss, Associate Planner

November 7, 2019

Date

Appeals to this decision must be filed with the West Linn Planning Department within 14 days of mailing date. Cost is \$400. An appeal to City Council of a decision by the Planning Director shall be heard on the record. The appeal must be filed by an individual who has established standing by submitting comments prior to the decision date. Approval will lapse 3 years from effective approval date if the final plat is not recorded.

Mailed this 7<sup>th</sup> day of November, 2019.

Therefore, the 14-day appeal period ends at 5 p.m., on November 21, 2019.

**ADDENDUM  
APPROVAL CRITERIA AND FINDINGS  
MIP-19-01/VAR-19-04**

This decision adopts the findings for approval contained within the applicant's submittal, with the following exceptions and additions:

*I. CHAPTER 11, SINGLE FAMILY RESIDENTIAL DETACHED, R-10  
11.030 PERMITTED USES  
(...)*

**Staff Finding 1: Staff incorporates the findings found on page 4 in the applicant submittal (Exhibit PD-1). The criteria are met.**

*11.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS*

*1. The minimum lot size shall be 10,000 square feet for a single-family detached unit:*

**Staff Finding 2: The applicant proposes two parcels sized at 10,000 square feet for Parcel 1 and 9,888 square feet for Parcel 2. The applicant has applied for a Class I Variance for Parcel 2, which allows a reduction of minimum lot area by five percent. Subject to approval of the Class I Variance (see Staff Findings 47 to 48), the criteria is met.**

*2. The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.  
(...)*

*10. The sidewall provisions of Chapter 43 CDC shall apply.*

**Staff Finding 3: Staff incorporates the findings found on pages 4-5 in the applicant submittal (Exhibit PD-1). The criteria are met.**

*II. CHAPTER 48, ACCESS CONTROL  
48.020 APPLICABILITY AND GENERAL PROVISIONS  
(...)*

*B. All lots shall have access from a public street or from a platted private street approved under the land division chapter.*

*(...)*

*E. Owners of two or more uses, structures, lots, parcels, or units of land may agree to utilize jointly the same access and egress when the combined access and egress of both uses, structures, or parcels of land satisfies the requirements as designated in this code; provided, that satisfactory legal evidence is presented to the City Attorney in the form of deeds, easements, leases, or contracts to establish joint use. Copies of said instrument shall be placed on permanent file with the City Recorder.*

*F. Property owners shall not be compelled to access their homes via platted stems of flag lots if other driveways and easements are available and approved by the City Engineer.*

**Staff Finding 4: Proposed Parcels 1 and 2 will take access from Arbor Drive, a public street, via a shared access drive. The shared access drive will be located in an easement across Parcel 1. The**

**applicant will record a reciprocal access easement and mutual maintenance agreement for the shared access drive per Condition of Approval 3. Subject to the Conditions of Approval, the criteria are met.**

#### 48.025 ACCESS CONTROL

##### B. Access Control Standards

1. *Traffic impact analysis requirements. The City or other agency with access jurisdiction may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements. (See also CDC [55.125](#), Traffic Impact Analysis.)*

**Staff Finding 5: No traffic impact analysis (TIA) is required since none of the criteria of 85.170.B(2) are met. For example, an Average Daily Trip count (ADT) increase of 250 is typically required before a TIA is needed. The addition of one additional home generates an ADT increase of 9.57 trips per day according to the Institute of Traffic Engineers (ITE) trip generation manual. The criteria is met.**

2. *The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.*

**Staff Finding 6: The proposal does not require backing onto a public street. Both proposed parcels will take access from Arbor Drive via a shared, private, access drive. A reciprocal access easement and mutual maintenance agreement will be recorded for the shared access drive per Condition of Approval 3. Subject to the Conditions of Approval, the criteria are met.**

3. *Access Options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods (planned access shall be consistent with adopted public works standards and TSP). These methods are “options” to the developer/subdivider.*

- a) *Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.*
- b) *Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., “shared driveway”). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.*
- c) *Option 3. Access is from a public street adjacent to the development lot or parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection (B)(6) of this section.*

**Staff Finding 7: Proposed Parcels 1 and 2 will take access from Arbor Drive, a public street adjacent to the development. The proposed parcels will share access via an access easement. A reciprocal access easement and mutual maintenance agreement will be recorded per Condition of Approval 3. Subject to the Conditions of Approval, the criteria is met.**

4. *Subdivisions fronting onto an arterial street.*

(...)



5. *Double frontage lots.*

**Staff Finding 8: Arbor Drive is classified as a Local Street and double-frontage lots are not proposed. The criteria is not applicable.**

6. *Access Spacing.*

a. *The access spacing standards found in the adopted TSP shall be applicable to all newly established public street intersections...variance section in the adopted TSP.*

b. *Private drives and other access ways are subject to the requirements of CDC 48.060.*

**Staff Finding 9: The applicant proposal does not include any new public street intersections. The proposal is for one private drive access to Arbor Drive, which will be shared by Parcels 1 and 2. Please see Staff Findings 15 to 17 for compliance with CDC 48.060. The criteria are met.**

7. *Number of access points. For single-family (detached and attached), two-family, and duplex housing types, one street access point is permitted per lot or parcel, when alley access cannot otherwise be provided; except that two access points may be permitted corner lots...*

**Staff Finding 10: The applicant proposes one access to Arbor Drive, a public street, via a private drive located in an easement shared by Parcels 1 and 2. The criteria are met.**

8. *Shared driveways. The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. (...)*

a. *Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street. When shared driveways or frontage streets are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway or street temporarily ends at the property line, but may be extended in the future as the adjacent lot or parcel develops. "Developable" means that a lot or parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).*

b. *Access easements (i.e., for the benefit of affected properties) shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.*

c. *Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, lot or parcel configuration, and similar conditions) prevent extending the street/driveway in the future*

**Staff Finding 11: Proposed Parcels 1 and 2 will take access from Arbor Drive, a public street with a functional classification as Local in the West Linn Transportation System Plan. The proposed parcels will share access via a shared private drive located in an access easement. A reciprocal access easement and mutual maintenance agreement will be recorded per Condition of Approval 3. All surrounding properties of the proposal are fully developed and prevent extension of the shared access or the development of a new street. The criteria are met.**

*C. Street connectivity and formation of blocks required. In order to promote efficient vehicular and pedestrian circulation throughout the City, land divisions and large site developments shall produce complete blocks bounded by a connecting network of public and/or private streets, in accordance with the following standards:*

1. *Block length and perimeter. The maximum block length shall not exceed 800 feet or 1,800 feet along an arterial.*
2. *Street standards. Public and private streets shall also conform to Chapter 92 CDC, Required Improvements, and to any other applicable sections of the West Linn Community Development Code and approved TSP.*
3. *Exception. Exceptions to the above standards may be granted when blocks are divided by one or more pathway(s), in conformance with the provisions of CDC 85.200(C), Pedestrian and Bicycle Trails, or cases where extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations preclude implementation, not just inconveniences or design challenges.*

**Staff Finding 12: The proposed land division includes no new public street and has one private drive serving as access for two units of land. Adjacent properties on all sides are fully developed and provide a functional limitation to implementation of block length standards as no new block can be formed. The criteria are met.**

#### 48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES

A. *Direct individual access from single-family dwellings and duplex lots to an arterial street, as designated in the transportation element of the Comprehensive Plan (...)*

**Staff Finding 13: Staff incorporates the findings found on page 14 in the applicant submittal (Exhibit PD-1). The criteria are met.**

B. *When any portion of any house is less than 150 feet from the adjacent right-of-way, access to the home is as follows:*

*(...)*

2. *Two to four single-family residential homes equals a 14 to 20 foot-wide paved or all-weather surface. Width shall depend on adequacy of line of sight and number of homes.*
3. *Maximum driveway grade shall be 15 percent...*
4. *The driveway shall include a minimum of 20 feet in length between the garage door and the back of sidewalk, or, if no sidewalk is proposed, to the paved portion of the right-of-way.*

C. *When any portion of one or more homes is more than 150 feet from the adjacent right-of-way, the provisions of subsection B of this section shall apply in addition to the following provisions.*

1. *A turnaround may be required as prescribed by the Fire Chief.*
2. *Minimum vertical clearance for the driveway shall be 13 feet, six inches.*
3. *A minimum centerline turning radius of 45 feet is required unless waived by the Fire Chief.*
4. *There shall be sufficient horizontal clearance on either side of the driveway so that the total horizontal clearance is 20 feet.*

**Staff Finding 14: Staff incorporates the findings found on page 15 in the applicant submittal (Exhibit PD-1). The criteria are met.**

D. *Access to five or more single-family homes...waived by variance.*

*(...)*

1. *Gated accessways to residential development other than a single-family home are prohibited.*

**Staff Finding 15: Staff incorporates the findings found on pages 15 and 16 in the applicant submittal (Exhibit PD-1). The criteria are met.**

*48.060 WIDTH AND LOCATION OF CURB CUTS AND ACCESS SEPARATION REQUIREMENTS**A. Minimum curb cut width shall be 16 feet.**B. Maximum curb cut width shall be 36 feet...**(...)**C. No curb cuts shall be allowed any closer to an intersecting street right-of-way line than the following:**(...)**6. On a local street when intersecting any other street, 35 feet.**(...)**D. There shall be a minimum distance between any two adjacent curb cuts on the same side of a public street, except for one-way entrances and exits, as follows:**(...)**9. Between any two curb cuts on the same lot or parcel on a local street, 30 feet.**(...)*

**Staff Finding 16:** The applicant proposes one 24 foot curb cut to accommodate the shared access drive. The proposed curb cut is located on Arbor Drive, a local street, and the closest intersecting street, Upper Midhill Drive, is a local street and located 190 feet to the west. The criteria are met.

*E. A rolled curb may be installed...**F. Curb cuts shall be kept at a minimum...*

**Staff Finding 17:** Staff incorporates the findings found on page 17 in the applicant submittal (Exhibit PD-1). The criteria are met.

*G. Adequate line of sight pursuant to engineering standards should be afforded at each driveway or accessway.*

**Staff Finding 18:** The applicant proposes one shared access drive and vision clearance will be confirmed by planning staff during the building permit process. The criteria are met.

*III. CHAPTER 85, GENERAL PROVISIONS**85.080 SUBSTANTIAL DEVIATION FROM APPROVED PLAN PROHIBITED**A. Approval of the tentative plan shall require the final plat to be in substantial conformance...however**B. Approval of the tentative plan...shall not constitute final acceptance of the plat of the proposed subdivision or partition for recording.*

**Staff Finding 19:** The City will ensure the final plat substantially conforms to the approved tentative plan by satisfaction of Condition of Approval 1. The criteria are met.

*85.200 APPROVAL CRITERIA*

*No tentative subdivision or partition plan shall be approved unless adequate public facilities will be available to provide service to the partition or subdivision area prior to final plat approval and the Planning Commission or Planning Director, as applicable, finds that the following standards have been satisfied, or can be satisfied by condition of approval.*

*A. Streets.*

1. *General. The location, width and grade of streets shall be considered in their relation to existing and planned streets...Internal streets are the responsibility of the developer. All streets bordering the development site are to be developed by the developer with, typically, half-street improvements or to City standards prescribed by the City Engineer. Additional travel lanes may be required to be consistent with adjacent road widths or to be consistent with the adopted Transportation System Plan (TSP) and any adopted updated plans.*

**Staff Finding 20: The proposal does not include any internal public streets. The applicant proposes installation of half-street improvements along the property's Arbor Drive frontage to meet the cross-section for a Local Street with Parking on One Side per City of West Linn Public Works Standards. The criteria is met.**

2. *Right-of-way widths shall depend upon which classification of street is proposed. The right-of-way widths are established in the adopted TSP.*

3. *Street widths. Street widths shall depend upon which classification of street is proposed. The classifications and required cross sections are established in the adopted TSP...*

4. *The decision-making body shall consider the City Engineer's recommendations on the desired right-of-way width, pavement width and street geometry of the various street types within the subdivision after consideration by the City Engineer of the following criteria:*

(...)

5. *Additionally, when determining appropriate street width, the decision-making body shall consider the following criteria:*

(...)

**Staff Finding 21: The proposal is located on Arbor Drive, a local street that has a 50 foot right-of-way width adjacent to the subject property. City standards for a Local Street with Parking on One Side are found in Exhibit 9 of the 2016 West Linn Transportation System Plan. The standards require a 52 foot right-of-way (6 foot sidewalks, 6 foot planter strips, 8 foot parking lane, and 10 foot travel lanes). The applicant has shown a dedication of one foot of additional right-of-way on the Partition Plan in order to accommodate the street design (Page 34, Exhibit PD-1). The criteria is met.**

6. *Reserve strips. Reserve strips or street plugs controlling the access to streets are not permitted unless owned by the City.*

7. *Alignment. All streets other than local streets or cul-de-sacs, as far as practical, shall be in alignment with existing streets by continuations of the centerlines thereof. The staggering of street alignments...*

8. *Future extension of streets. Where necessary to give access to or permit a satisfactory future subdivision of adjoining land, streets shall be extended to the boundary of the subdivision...*

9. *Intersection angles. Streets shall be laid out to intersect angles as near to right angles as practical...*

**Staff Finding 22: The applicant proposes no reserve strips, no new streets or intersections, and is precluded from any potential future extension of streets by existing development patterns. The criteria are met.**

10. *Additional right-of-way for existing streets. Wherever existing street rights-of-way adjacent to or within a tract are of inadequate widths based upon the standards of this chapter, additional right-of-way shall be provided at the time of subdivision or partition.*

**Staff Finding 23:** The proposal is located on Arbor Drive, a local street that has a 50 foot right-of-way width adjacent to the subject property. City standards for a Local Street with Parking on One Side are found in Exhibit 9 of the 2016 West Linn Transportation System Plan. The standards require a 52 foot right-of-way (6 foot sidewalks, 6 foot planter strips, 8 foot parking lane, and 10 foot travel lanes). The applicant has shown a dedication of one foot of additional right-of-way on the Partition Plan in order to accommodate the street design (Page 34, Exhibit PD-1). The criteria is met.

11. *Cul-de-sacs.*

a. *New cul-de-sacs and other closed-end streets...*

(...)

f. *All cul-de-sacs/closed-end streets shall terminate with a turnaround built to one of the following specifications (measurements are for the traveled way and do not include planter strips or sidewalks).*

**Staff Finding 24:** The applicant does not propose any new cul-de-sacs or closed-end streets. The criteria are met.

12. *Street Names*

13. *Grades and Curves*

14. *Access to local streets. Intersection of a local residential street with an arterial street may be prohibited...*

15. *Alleys*

**Staff Finding 25:** The applicant does not propose any new public streets. The proposed partition is adjacent to Arbor Drive, a City street with a functional classification of local street, and does not require access on to an arterial street. No alley is proposed. The applicant shall install a shared access drive located in the access easement per Condition of Approval 3. Subject to the Conditions of Approval, the criteria are met.

16. *Sidewalks. Sidewalks shall be installed per CDC 92.010(H), Sidewalks. The residential sidewalk width is six feet plus planter strip...or to match existing sidewalks or right-of-way limitations.*

17. *Planter strip. The planter strip is between the curb and sidewalk providing space for a grassed or landscaped area and street trees. The planter strip shall be at least 6 feet wide...or in response to right-of-way limitations.*

**Staff Finding 26:** The applicant will install 6 foot sidewalk and 6 foot planter strip along the subject property's frontage of Arbor Drive. The criteria are met.

18. *Streets and roads shall be dedicated without any reservations or restrictions.*

19. *All lots in a subdivision shall have access to a public street. Lots created by partition may have access to a public street via an access easement pursuant to the standards and limitations set forth for such accessways in Chapter 48 CDC.*

**Staff Finding 27:** The application is for a partition of an existing parcel. The applicant proposes a shared private access drive, located in an access easement, to Arbor Drive for the two newly created Parcels. Please see Applicant findings as well as Staff Findings 4 through 17. No new streets or roads are proposed. The applicant has shown a dedication of one foot of additional right-of-way on the Partition Plat in order to accommodate the street design (Page 34, Exhibit PD-1). Subject to the Conditions of Approval, the criteria is met.

20. *Gated streets. Gated streets are prohibited in all residential areas on both public and private streets. A driveway to an individual home may be gated.*

21. *Entryway treatments and street isle design...*

**Staff Finding 28: The applicant does not propose any gated streets or driveways, nor entryway treatments or street isle designs. These criteria are met.**

22. *Based upon the determination of the City Manager or the Manager's designee, the applicant shall construct or cause to be constructed, or contribute a proportionate share of the costs, for all necessary off-site improvements identified by the transportation analysis commissioned to address CDC 85.170(B)(2) that are required to mitigate impacts from the proposed subdivision...*

**Staff Finding 29: The proposal is not a subdivision. This criteria does not apply. However, the proposal will add one additional dwelling unit. The addition of one additional dwelling unit should only generate an ADT of 9.57 new trips per day according to the Institute of Traffic Engineers (ITE) trip generation tables at 9.57 trips per household. The proposal is in compliance with the City's Transportation System Plan and will not create impacts to existing off-site facilities that would trigger the need for improvements. The criteria is met.**

*B. Blocks and Lots.*

1. *General. The length, width, and shape of blocks shall be designed with due regard for the provision of adequate building sites for the use contemplated; consideration of the need for traffic safety, convenience, access, circulation, and control; and recognition of limitations and opportunities of topography and solar access.*

2. *Sizes. The recommended block size is 400 feet in length to encourage greater connectivity within the subdivision. Blocks shall not exceed 800 feet in length between street lines... Block sizes and proposed accesses must be consistent with the adopted TSP.*

**Staff Finding 30: The proposal is located on a section of Arbor Drive with an existing block length of 400 feet. The applicant does not propose new street connections or new blocks as existing development patterns preclude a new street connection across the subject property. The criteria are met.**

3. *Lot size and shape. Lot or parcel size, width, shape, and orientation shall be appropriate for the location of the subdivision or partition... Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for the off-street parking and service facilities required by the type of use proposed.*

**Staff Finding 31: Staff incorporates the findings found on page 7 in the applicant submittal (Exhibit PD-1). Please also see Staff Findings 2 through 3. The criteria are met.**

4. *Access. Access to subdivisions, partitions, and lots shall conform to the provisions of Chapter 48 CDC, Access, Egress and Circulation.*

**Staff Finding 32: Please see Staff Findings 4 through 17. Subject to the Conditions of Approval, the criteria is met.**

- 5. *Double Frontage lots and parcels.*
- 6. *Lot and parcel side lines.*

**Staff Finding 33: Staff incorporates the findings found on page 7 in the applicant submittal (Exhibit PD-1). The criteria are met.**

7. *Flag lots. Flag lots can be created where it can be shown that no other reasonable street access is possible to achieve the requested land division...Where two to four flag lots share a common accessway, the minimum street frontage and accessway shall be eight feet in width per lot...The following dimensional requirements shall apply to flag lots:*

(...)

8. *Large lots or parcels.*

**Staff Finding 34: Staff incorporates the findings found on page 7 in the applicant submittal (Exhibit PD-1). The criteria are met.**

C. *Pedestrian and bicycle trails.*

(...)

D. *Transit Facilities*

(...)

**Staff Finding 35: The West Linn Transportation System Plan does not identify any pedestrian or bicycle facilities on or adjacent to the subject property. The closest bus route is 580 feet distance and there are currently no adopted plans to add transit service to Arbor Drive. The applicant is not required to install any improvements outside of required street improvements. The criteria are met.**

E. *Grading. Grading of building sites shall conform to the following standards unless physical conditions demonstrate the propriety of other standards:*

1. *All cuts and fills shall comply with the excavation and grading provisions of the Uniform Building Code*

(...)

4. *The proposed grading shall be the minimum grading necessary to meet roadway standards, and to create appropriate building sites, considering maximum allowed driveway grades.*

**Staff Finding 36: The site is classified as Type IV lands as over 74% of the property has a slope less than 10%. Grading plans will be submitted and reviewed at the time of building permit application and will conform to the Uniform Building Code. The criteria are met.**

5. *Type I lands shall require a report submitted by an engineering geologist, and Type I and Type II lands shall require a geologic hazard report.*

6. *Per the submittals required by CDC 85.170(C)(3), the applicant must demonstrate that the proposed methods of rendering known or potential hazard sites safe for development, including proposed geotechnical remediation, are feasible and adequate to prevent landslides or other damage to property and safety. The review authority may impose conditions, including limits on type or intensity of land use, which it determines are necessary to mitigate known risks of landslides or property damage.*

7. *On land with slopes in excess of 12 percent, cuts and fills shall be regulated as follows:*

(...)

8. *Land over 50 percent slope shall be developed only where density transfer is not feasible.*

(...)

**Staff Finding 37:** The subject property is 74 percent Type IV lands. No geologic hazard report is required. However, the applicant submitted a Geotechnical Engineering Report prepared by GeoPacific Engineering and dated February 8, 2019 (see Exhibit PD-1) that includes general site characteristics, geologic descriptions, conclusions and recommendations. The report found both proposed parcels to be buildable. The criteria are met.

*F. Water.*

**Staff Finding 38:** Water is available in Arbor Drive to serve the proposed development. A registered civil engineer prepared the water provision plan. The City's public water system has sufficient capacity and pressure in this area. The criteria are met.

*G. Sewer.*

**Staff Finding 39:** Sanitary sewer is available in Arbor Drive to serve the proposed development. A registered civil engineer prepared the sanitary sewer plan. The City's sanitary sewer system has sufficient capacity to serve the proposed partition. The criteria are met.

*H. Storm detention and treatment. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards, there will be no adverse off-site impacts caused by the development (including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream), and there is sufficient factual data to support the conclusions of the submitted plan.*

**Staff Finding 40:** The applicant has submitted a Preliminary Drainage Report, prepared by a licensed engineer, which complies with the West Linn Public Works Design Standards, shows no adverse off-site impacts, and provides sufficient factual data to support the conclusions of the plan. The applicant also submitted a Geotechnical Engineering Report prepared by GeoPacific Engineering, Inc. The GeoPacific Report made specific recommendations to remediate any potential for geotechnical hazards related to grading, undocumented fill, and stormwater disposal. The applicant shall comply with the requirements and install improvements to meet the West Linn Public Works Design Standards per Condition of Approval 2. Subject to the Conditions of Approval, the criteria are met.

*I. Utility Easements. Subdivisions and partitions shall establish utility easements to accommodate the required service providers as determined by the City Engineer. The developer of the subdivision shall make accommodation for cable television wire in all utility trenches and easements so that cable can fully serve the subdivision.*

**Staff Finding 41:** The applicant will record a reciprocal access and utility easement per Condition of Approval 3 for utility services to Parcel 2. Per the Partition Plat, the applicant will record a new eight-foot wide public utility easement adjacent to the proposal's entire frontage of Arbor Drive. Subject to the Conditions of Approval, the criteria is met.

*J. Supplemental Provisions*

1. *Wetland and Natural Drainage Ways.*
2. *Willamette and Tualatin Greenways.*



3. *Street trees. Street trees are required as identified in the appropriate section of the municipal code and Chapter 54 CDC.*
4. *Lighting. All subdivision or alley lights shall meet West Linn Public Works Design Standards.*

**Staff Finding 42: Staff incorporates the findings found on page 9 in the applicant submittal (Exhibit PD-1). The criteria are met.**

5. *Dedications and exactions.*

*The City may require an applicant to dedicate land and/or construct a public improvement that provides a benefit to property or persons outside the property that is the subject of the application when the exaction is roughly proportional. No exaction shall be imposed unless supported by a determination that the exaction is roughly proportional to the impact of development.*

**Staff Finding 43: The applicant has shown a dedication of one-foot to the Arbor Drive right-of-way width to accommodate required street improvements. The proposal is in compliance with the City's Transportation System Plan and will not create impacts to existing off-site facilities that would trigger the need for additional improvements. The City's sanitary sewer and water systems have sufficient capacity to serve the site. The criteria are met.**

6. *Underground utilities.*

*All utilities...that may at times be above ground or overhead shall be buried underground in the case of new development. The exception would be in those cases where the area is substantially built out and adjacent properties have above-ground utilities and where the development site's frontage is under 200 feet and the site is less than one acre...*

**Staff Finding 44: The subject property meets all three exemption criteria. The area is built out with adjacent properties having above-ground utilities, 100 feet of site frontage, and less than an acre (20,000 square feet). The applicant is not required to underground existing utilities. The criteria are met.**

7. *Density requirement. Density shall occur at 70 percent or more of the maximum density allowed by the underlying zoning. These provisions would not apply when density is transferred from Type I and II lands as defined in CDC [02.030](#). Development of Type I or II lands are exempt from these provisions. Land divisions of three lots or less would also be exempt.*
8. *Mix requirement. The "mix" rule means that developers shall have no more than 15 percent of the R-2.1 and R-3 development as single-family residential. The intent is that the majority of the site shall be developed as medium high density multi-family housing.*

**Staff Finding 45: The subject property is 20,000 square feet. The property contains no Type I or II lands. The property is zoned R-10, which requires a minimum 10,000 square feet per parcel. The maximum number of parcels that can be created from the subject property is two (20,000/10,000), thus the proposal is for 100% of the maximum density. The "mix" rule does not apply. The criteria are met.**

9. *Heritage trees/significant tree and tree cluster protection.*

*All heritage trees, as defined in the Municipal Code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at his/her direction. All non-heritage trees and clusters of trees (three or more trees with overlapping dripline; however, native oaks need not have an*

*overlapping dripline) that are considered significant by virtue of their size, type, location, health, or numbers shall be saved pursuant to CDC 55.100(B)(2). Trees are defined per the municipal code as having a trunk six inches in diameter or 19 inches in circumference at a point five feet above the mean ground level at the base of the trunk.*

**Staff Finding 46: The subject property contains no heritage trees or significant trees. The City Arborist visited the site on June 11, 2019 and made the determination of no significant trees on site (page 31, Exhibit PD-1). The criteria are met.**

#### V. CHAPTER 75, REQUIRED IMPROVEMENTS

##### 92.020 IMPROVEMENTS IN PARTITIONS

*A. Class I Variance. Class I variances provide minor relief from certain code provisions where it can be demonstrated that the modification will not harm adjacent properties, and it conforms with any other code requirements. Class I variances are allowed for the following code provisions:*

*1. Required Yard and Minimum Lot Dimensional Requirements. Required yards may be modified up to 20 percent, lot dimensions by up to 10 percent and lot area by up to five percent if the decision-making authority finds that the resulting approval:*

**Staff Finding 47: The applicant has requested a variance for minor relief from the lot area requirement of 10,000 square foot minimum lot size. Parcel 1 is proposed to be 10,000 square feet. Parcel 2 is proposed to be 9,888 square feet, a 1.12% modification that qualifies for a Class I Variance. The criteria are met.**

- a. Provides for a more efficient use of the site;*
- b. Preserves and incorporates natural features into the overall design of the project;*
- c. Does not adversely affect adjoining properties in terms of light, air circulation, noise levels, privacy, and fire hazards; and*
- d. Provides for safe vehicular and pedestrian access to the site and safe on-site vehicular and pedestrian circulation.*

**Staff Finding 48: The need for the requested Class I Variance was created by the applicant dedicating 1 foot by 100 feet of property for right-of-way to accommodate street improvements. This 1.12% reduction in lot area will provide a more efficient use of the site by providing street improvements that increase the safety of pedestrians, bicycles, and automobiles in the right-of-way. The applicant has complied with all West Linn Community Development Code criteria related to natural resources and features. The 1.12% reduction in lot area will not adversely affect adjoining properties. The only impact will be that Parcel 2 has a lot depth of 99 feet as opposed to 100 feet and a buildable area of 59 feet by 85 feet as opposed to 60 feet by 85 feet. Any new home on Parcel 2 will be required to meet the minimum side-yard, rear-yard, and front-yard setbacks, regardless of the lot being 99 feet or 100 feet in depth. The criteria are met.**

#### VI. CHAPTER 92, REQUIRED IMPROVEMENTS

##### 92.020 IMPROVEMENTS IN PARTITIONS

*The same improvements shall be installed to serve each lot of a partition as are required of a subdivision. However, if the approval authority finds that the nature of development in the vicinity of the partition makes installation of some improvements unreasonable, at the written request of the applicant those improvements may be waived. If the street improvement requirements are waived, the applicant shall pay an in-lieu fee for off-site street improvements, pursuant to the provisions of CDC 85.200(A)(1).*

*In lieu of accepting an improvement, the Planning Director may recommend to the City Council that the improvement be installed in the area under special assessment financing or other facility extension policies of the City.*

**Staff Finding 49: The applicant proposes to install half-street improvements, which meet the City of West Linn Public Works Standards, on Arbor Drive adjacent to the subject property. The applicant will install the half-street improvements to meet the cross-section for a Local Street with Parking on One Side per the 2016 West Linn Transportation System Plan. Since the applicant has agreed to install the improvements, no nexus and proportionality analysis is required. The criteria are met.**

## PD-1 APPLICANT SUBMITTAL



Planning & Development • 22500 Salamo Rd #1000 • West Linn, Oregon 97068  
 Telephone 503.656.4211 • Fax 503.656.4106 • westlinnoregon.gov

### DEVELOPMENT REVIEW APPLICATION

For Office Use Only		
STAFF CONTACT Darren Wyss	PROJECT NO: MIP-19-01 / VAR-19-04	
NON-REFUNDABLE FEE(S) \$825.00	REFUNDABLE DEPOSIT(S) \$2,800.00	TOTAL \$3,625.00

**Type of Review (Please check all that apply):**

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Annexation (ANX)                      | <input type="checkbox"/> Historic Review   | <input type="checkbox"/> Subdivision (SUB)                               |
| <input type="checkbox"/> Appeal and Review (AP) *              | <input type="checkbox"/> Legislative Plan or Change                                  | <input type="checkbox"/> Temporary Uses *                                |
| <input type="checkbox"/> Conditional Use (CUP)                 | <input type="checkbox"/> Lot Line Adjustment (LLA) */**                              | <input type="checkbox"/> Time Extension *                                |
| <input type="checkbox"/> Design Review (DR)                    | <input checked="" type="checkbox"/> Minor Partition (MIP) (Preliminary Plat or Plan) | <input checked="" type="checkbox"/> Variance (VAR)                       |
| <input type="checkbox"/> Easement Vacation                     | <input type="checkbox"/> Non-Conforming Lots, Uses & Structures                      | <input type="checkbox"/> Water Resource Area Protection/Single Lot (WAP) |
| <input type="checkbox"/> Extraterritorial Ext. of Utilities    | <input type="checkbox"/> Planned Unit Development (PUD)                              | <input type="checkbox"/> Water Resource Area Protection/Wetland (WAP)    |
| <input type="checkbox"/> Final Plat or Plan (FP)               | <input type="checkbox"/> Pre-Application Conference (PA) */**                        | <input type="checkbox"/> Willamette & Tualatin River Greenway (WRG)      |
| <input type="checkbox"/> Flood Management Area                 | <input type="checkbox"/> Street Vacation   | <input type="checkbox"/> Zone Change                                     |
| <input type="checkbox"/> Hillside Protection & Erosion Control |  |  |

Home Occupation, Pre-Application, Sidewalk Use, Sign Review Permit, and Temporary Sign Permit applications require different or additional application forms, available on the City website or at City Hall.

**Site Location/Address:**

2332 Arbor Dr

Assessor's Map No.: 25-1E-14CA

Tax Lot(s): 1000

Total Land Area: 14,888

**Brief Description of Proposal:**

Divide the property into two parcels. Parcel 1 will contain the existing residence. Parcel 2 is being created for purpose of constructing a detached SFR with class 1 variance.

**Applicant Name:** Ryan Pfeifer  
(please print)

Phone: 503-753-8571

Address: 79 SW Oak St.

Email: ryan@hamiltonkashoro.com

City State Zip: Portland, OR 97204

**Owner Name (required):** Deborah Walker  
(please print)

Phone: 303-598-5687

Address: 820 Country Road 194

Email: ~~deborah.walker@coloradocountry.com~~

City State Zip: Parker, Colorado 80139

tacdog5@gmail.com

**Consultant Name:** Ryan Pfeifer  
(please print)

Phone: 503-753-8571

Address: 79 SW Oak St.

Email: ryan@hamiltonkashoro.com

City State Zip: Portland, OR, 97204

- All application fees are non-refundable (excluding deposit). Any overruns to deposit will result in additional billing.
- The owner/applicant or their representative should be present at all public hearings.
- A denial or approval may be reversed on appeal. No permit will be in effect until the appeal period has expired.
- Three (3) complete hard-copy sets (single sided) of application materials must be submitted with this application. One (1) complete set of digital application materials must also be submitted on CD in PDF format. If large sets of plans are required in application please submit only two sets.

\* No CD required / \*\* Only one hard-copy set needed

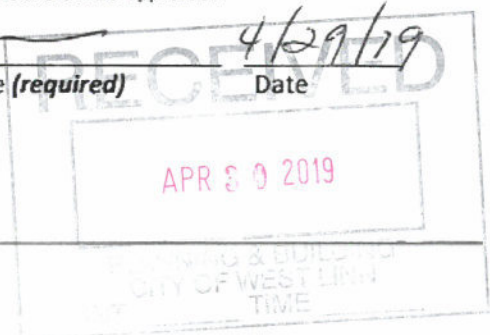
The undersigned property owner(s) hereby authorizes the filing of this application, and authorizes on site review by authorized staff. I hereby agree to comply with all code requirements applicable to my application. Acceptance of this application does not infer a complete submittal. All amendments to the Community Development Code and to other regulations adopted after the application is approved shall be enforced where applicable. Approved applications and subsequent development is not vested under the provisions in place at the time of the initial application.

Applicant's signature

4/29/19  
 Date

Owner's signature (required)

4/29/19  
 Date





## City of West Linn

### Expedited Land Division Acknowledgement Form

All applicants for partitions and subdivisions must acknowledge, by completing this form, that they were notified about the ELD process and must indicate whether they intend to apply for an ELD or a standard subdivision or partition using the procedures set forth in the City of West Linn's Community Development Code. Applicants who do not sign this form (page 1) and subsequently submit a land division application will have the land division processed under the ELD procedures per ORS 197.365. This completed form must accompany the separate ELD or standard subdivision or partition application form.

#### Are you intending to apply for an Expedited Land Division?

Yes  No

If "Yes", your application must include a written description of how the proposal satisfies ORS 197.360(1).

If "No", it indicates your intention to use the procedure set forth in the City of West Linn Community Development Code Land Division regulations.

Applicant Name: Ryan Pfeifer

Applicant Signature: *R. Pfeifer* Date: 4-29-19

Applicant Mailing Address: 79 SW Oak St. Portland, OR 97204

Owner's Name: Deborah Walker

Owner's Signature: \_\_\_\_\_ Date: \_\_\_\_\_

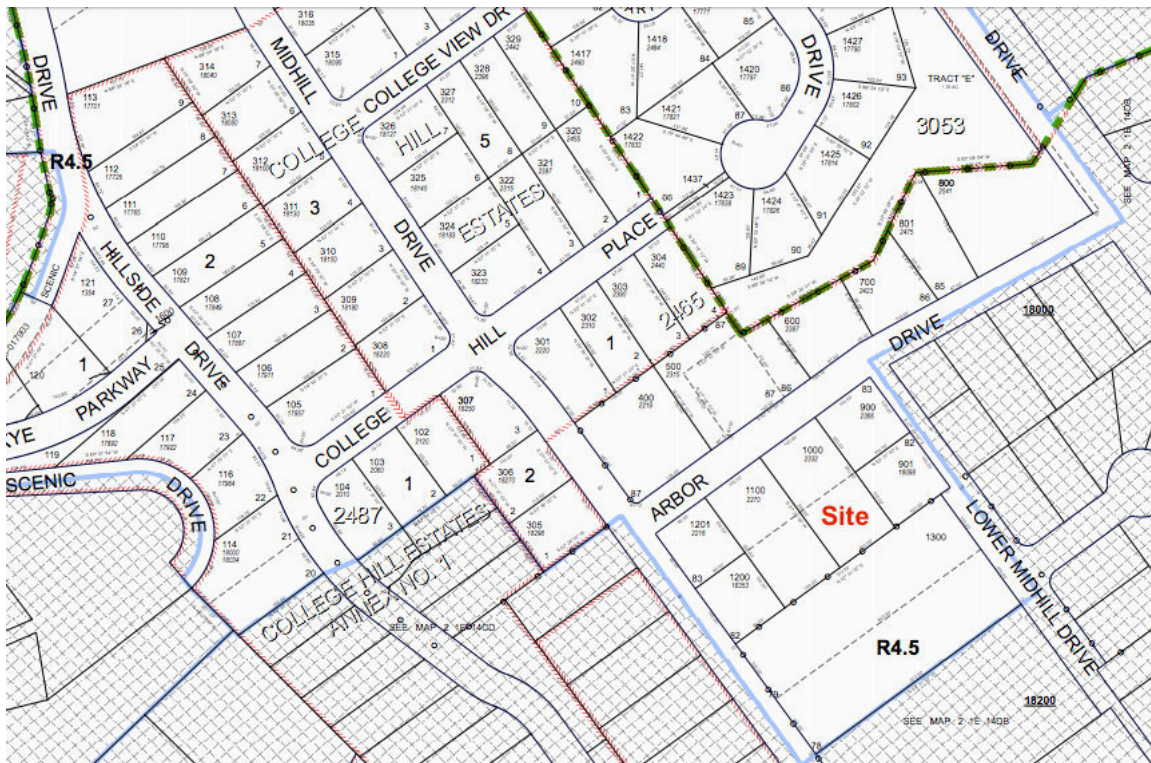
Owner's Mailing Address: 820 Country Road 194, Parker Colorado, 80139

Site Address: 2332 Arbor Dr

## Partition Narrative

### 2332 Arbor Dr., West Linn

**Proposal:** This application requests approval of a 2-lot partition and Class 1 Variance for the aforementioned address. The property is situated on the south side of Arbor Drive, approximately 90 feet West of Lower Midhill Drive. The subject property is 19,888 sq. ft. in area and is presently developed with a demolished single-family home. The proposed partition will divide the property into 2 lots, with the new lot being created for the purpose of constructing a detached-single-family home. An additional one-foot dedication is required along the properties Arbor Drive frontage to accommodate a 52-foot right-of-way. This required dedication will make one proposed lot 112 square feet short of the 10,000 square foot minimum lot size and will require a Class 1 variance, which allows a 5% reduction in lot size. Access to the proposed rear lot will be by an access easement. The subject property is zoned R-10. The property is described as Tax Lot 1000 of Clackamas County Assessor’s Map 2S-1E-14CA.



Vicinity Map

The proposed development conforms to the applicable provisions of the CDC as follows:

## Chapter 11 SINGLE-FAMILY RESIDENTIAL DETACHED, R-10

### 11.030 PERMITTED USES

The following are uses permitted outright in this zoning district:

1. Single-family detached residential unit.

**Comment: The application is for the creation of two parcels to accommodate a new single-family detached residential unit on Parcel 1 and one new single-family detached residential unit on Parcel 2. This use is permitted use by this section. The criterion is met.**

### 11.070 DIMENSIONAL REQUIREMENTS, USES PERMITTED OUTRIGHT AND USES PERMITTED UNDER PRESCRIBED CONDITIONS

Except as may be otherwise provided by the provisions of this code, the following are the requirements for uses within this zone:

1. The minimum lot size shall be 10,000 square feet for a single-family detached unit.

**Comment: Parcel 1 contains 10,000 sq. ft. Parcel 2 contains 9,888 sq. ft. A Class 1 variance allows a five percent reduction in lot size. The standard is met.**

2. The minimum front lot line length or the minimum lot width at the front lot line shall be 35 feet.

**Comment: Both proposed parcels will have a lot width of 100 feet. The standard is met.**

3. The average minimum lot width shall be 50 feet.

**Comment: Both proposed parcels will have a lot width of 100 feet. The standard is met.**

4. *Repealed by Ord. 1622.*

5. Except as specified in CDC [25.070\(C\)\(1\)](#) through (4) for the Willamette Historic District, the minimum yard dimensions or minimum building setback area from the lot line shall be:

- a. For the front yard, 20 feet; except for steeply sloped lots where the provisions of CDC [41.010](#) shall apply.



- b. For an interior side yard, seven and one-half feet.
- c. For a side yard abutting a street, 15 feet.
- d. For a rear yard, 20 feet.

**Comment: The property is not in the Willamette Historic District. Setbacks for the homes to be constructed will be reviewed at the time of building permit application, but will conform to these standards.**

6. The maximum building height shall be 35 feet, except for steeply sloped lots in which case the provisions of Chapter [41](#) CDC shall apply.

**Comment: Building height for new homes will be reviewed with the building permit, but will conform to these standards.**

7. The maximum lot coverage shall be 35 percent.

**Comment: Lot coverage for the homes to be constructed will be reviewed and comply with this standard at the time of the building permit application.**

8. The minimum width of an accessway to a lot which does not abut a street or a flag lot shall be 15 feet.

**Comment: The accessway to Parcel 2 is 20 feet in width. The standard is met.**

9. The maximum floor area ratio shall be 0.45. Type I and II lands shall not be counted toward lot area when determining allowable floor area ratio, except that a minimum floor area ratio of 0.30 shall be allowed regardless of the classification of lands within the property. That 30 percent shall be based upon the entire property including Type I and II lands. Existing residences in excess of this standard may be replaced to their prior dimensions when damaged without the requirement that the homeowner obtain a non-conforming structures permit under Chapter [66](#) CDC.

**Comment: Compliance to standards for the new construction will be reviewed with the building permits.**

10. The sidewall provisions of Chapter [43](#) CDC shall apply.

**Comment: Compliance of new homes will be reviewed with the building permits.**

## Chapter 85 GENERAL PROVISIONS

### 85.200 APPROVAL CRITERIA

No tentative subdivision or partition plan shall be approved unless adequate public facilities will be available to provide service to the partition or subdivision area prior to final plat

approval and the Planning Commission or Planning Director, as applicable, finds that the following standards have been satisfied, or can be satisfied by condition of approval.

A. Streets.

**Comment: No new streets are proposed. Both parcels front on Arbor Drive. Parcel 2 will be accessed via a shared driveway with Parcel 1. There is no opportunity for additional local street connections. The plan calls for an additional 1 foot dedication along the Arbor Drive frontage to accommodate a 52 foot right-of-way, consistent with staff comments in the pre-application notes.**

B. Blocks and lots.

1. General. The length, width, and shape of blocks shall be designed with due regard for the provision of adequate building sites for the use contemplated; consideration of the need for traffic safety, convenience, access, circulation, and control; and recognition of limitations and opportunities of topography and solar access.

**Comment: As mentioned, there is no opportunity for additional local street connections. The development pattern in this area is already established.**

2. Sizes. The recommended block size is 400 feet in length to encourage greater connectivity within the subdivision. Blocks shall not exceed 800 feet in length between street lines, except for blocks adjacent to arterial streets or unless topographical conditions or the layout of adjacent streets justifies a variation. Designs of proposed intersections shall demonstrate adequate sight distances to the City Engineer's specifications. Block sizes and proposed accesses must be consistent with the adopted TSP.

**Comment: As mentioned, there is no opportunity for additional local street connections. The development pattern in this area is already established.**

3. Lot size and shape. Lot or parcel size, width, shape, and orientation shall be appropriate for the location of the subdivision or partition, for the type of use contemplated, for potential utilization of solar access, and for the protection of drainageways, trees, and other natural features. No lot or parcel shall be dimensioned to contain part of an existing or proposed street. All lots or parcels shall be buildable. "Buildable" describes lots that are free of constraints such as wetlands, drainageways, etc., that would make home construction impossible. Lot or parcel sizes shall not be less than the size required by the zoning code unless as allowed by planned unit development (PUD).

Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for the off-street parking and service facilities required by the type of use proposed.

**Comment: The proposed lots are consistent with the dimensional standards of the R-10 zone and provide reasonable building sites for single-family detached homes, including the potential utilization of solar access. The lots do not include portions of existing streets.**

4. Access. Access to subdivisions, partitions, and lots shall conform to the provisions of Chapter 48 CDC, Access, Egress and Circulation.

**Comment: See discussion of chapter 48, below.**

5. Double frontage lots and parcels. Double frontage lots and parcels have frontage on a street at the front and rear property lines. Double frontage lots and parcels shall be avoided except where they are essential to provide separation of residential development from arterial streets or adjacent non-residential activities, or to overcome specific disadvantages of topography and orientation. A planting screen or impact mitigation easement at least 10 feet wide, and across which there shall be no right of access, may be required along the line of building sites abutting such a traffic artery or other incompatible use.

**Comment: No double frontage lots or parcels are proposed.**

6. Lot and parcel side lines. The lines of lots and parcels, as far as is practicable, should run at right angles to the street upon which they face, except that on curved streets they should be radial to the curve.

**Comment: The proposed lot side lines are perpendicular to the Arbor Drive right-of-way.**

7. Flag lots. Flag lots can be created where it can be shown that no other reasonable street access is possible to achieve the requested land division. A single flag lot shall have a minimum street frontage of 15 feet for its accessway.

**Comment: No flag lot is proposed, rather access easement from Parcel 1 in benefit of Parcel 2 to proposed rear lot.**

8. Large lots or parcels. In dividing tracts into large lots or parcels which, at some future time, are likely to be redivided, the approval authority may:

a. Require that the blocks be of such size and shape, and be so divided into building sites, and contain such easements and site restrictions as will provide for extension and opening of streets at intervals which will permit a subsequent division of any tract into lots or parcels of smaller size; or

b. Alternately, in order to prevent further subdivision or partition of oversized and constrained lots or parcels, restrictions may be imposed on the subdivision or partition plat.

**Comment: Not applicable. None of the parcels proposed are large enough to be capable of being re-divided.**

C. Pedestrian and bicycle trails.

**Comment: No Pedestrian or bicycle trails exist or are planned in this area.**

D. Transit facilities.

**Comment: The closest Tri-Met bus service is .1 miles away on Arbor Drive so there is no need for transit facilities.**

E. Grading. Grading of building sites shall conform to the following standards unless physical conditions demonstrate the propriety of other standards:

**Comment: Any and all grading plans will be reviewed at the time of building permit application.**

F. Water.

**Comment: Water service will be provided from the existing water line in Arbor Drive. No new public water lines are proposed. A new water meter for Parcel 2 will be provided in the public right-of-way, with private water service lines extending to Parcel 2 via the access easement strip.**

G. Sewer.

**Comment: No new public sewer lines are proposed. Parcel 1 will utilize existing private service lateral and Parcel 2 will be serviced by a new service extended down the access easement strip from the existing sewer line in Arbor Drive.**

H. Storm detention and treatment. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards, there will be no adverse off-site impacts caused by the development (including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream), and there is sufficient factual data to support the conclusions of the submitted plan.

**Comment:** Civil storm detention and treatment facility plan is outlined in attached drawings in accordance with the standards for the improvement of public and private drainage systems in the West Linn Public Works Design Standards. Supporting geotechnical engineering documentation supports the conclusions of the submitted plan.

I. Utility easements. Subdivisions and partitions shall establish utility easements to accommodate the required service providers as determined by the City Engineer. The developer of the subdivision shall make accommodation for cable television wire in all utility trenches and easements so that cable can fully serve the subdivision.

**Comment:** There are no new public utilities proposed and, therefore, no new requirements for public utility easements.

J. Supplemental provisions.

1. Wetland and natural drainageways.

**Comment:** There are no wetlands or drainageways on the subject property or on adjacent parcels.

2. Willamette and Tualatin Greenways.

**Comment:** The subject property is not located within the Willamette or Tualatin Greenway areas. There are no Habitat Conservation Areas on the property.

3. Street trees.

**Comment:** Street trees will be provided along the frontage of Parcel 1 in adherence with Chapter 54 CDC and will be reviewed at the time of building permit application.

4. Lighting.

**Comment:** Streetlights currently exist on the Arbor Dr. street frontage in accordance with West Linn Public Works Design Standards.

5. Dedications and exactions.

**Comment:** The site plans provides for an additional one foot dedicated along the Arbor Dr. frontage to accommodate a 52 foot right-of-way, consistent with what was discussed at the pre-application conference. No other exactions are warranted.

6. Underground utilities.

**Comment:** All new utilities will be placed underground.

7. Density requirement.

**Comment:** The subject area measure 19,888 square feet in site area. The minimum lot size of the R-10 zone is 10,000 sq. ft. Therefore; a class 1 variance will be required to allow for a 5% reduction in lot size. The standard is then met.

8. Mix requirement. The “mix” rule means that developers shall have no more than 15 percent of the R-2.1 and R-3 development as single-family residential. The intent is that the majority of the site shall be developed as medium high density multi-family housing.

**Comment:** The subject property does not fall into the applicable zoning so the provision does not apply.

9. Heritage trees/significant tree and tree cluster protection.

**Comment:** There are no heritage or significant trees on the property as confirmed by Mike Perkins [City Arborist]. Email confirmation is attached in partition application package.

## Chapter 48 ACCESS, EGRESS AND CIRCULATION

### 48.025 ACCESS CONTROL

B. Access control standards.

1. Traffic impact analysis requirements. The City or other agency with access jurisdiction may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements. (See also CDC [55.125](#), Transportation Impact Analysis.)

**Comment:** Because of the small size of this project, the City did not require a traffic impact analysis.

2. The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage

street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.

**Comment: There are no existing curb cuts that need to be closed. Both lots will share the existing single access onto Arbor Drive.**

3. Access options. When vehicle access is required for development (i.e., for off-street parking, delivery, service, drive-through facilities, etc.), access shall be provided by one of the following methods (planned access shall be consistent with adopted public works standards and TSP). These methods are “options” as approved by the City Engineer.

- a) Option 1. Access is from an existing or proposed alley or mid-block lane. If a property has access to an alley or lane, direct access to a public street is not permitted.
- b) Option 2. Access is from a private street or driveway connected to an adjoining property that has direct access to a public street (i.e., “shared driveway”). A public access easement covering the driveway shall be recorded in this case to assure access to the closest public street for all users of the private street/drive.
- c) Option 3. Access is from a public street adjacent to the development lot or parcel. If practicable, the owner/developer may be required to close or consolidate an existing access point as a condition of approving a new access. Street accesses shall comply with the access spacing standards in subsection (B)(6) of this section.

**Comment: Access to Parcel 2 will be via a 20 foot access easement.**

4. Subdivisions fronting onto an arterial street. New residential land divisions fronting onto an arterial street shall be required to provide alleys or secondary (local or collector) streets for access to individual lots. When alleys or secondary streets cannot be constructed due to topographic or other physical constraints, access may be provided by consolidating driveways for clusters of two or more lots (e.g., includes flag lots and mid-block lanes).

**Comment: The site does not front onto an arterial street. Arbor Drive is classified as a collector street. Therefore, no alleys or secondary streets are required for access to the lots.**

5. Double-frontage lots. When a lot or parcel has frontage onto two or more streets, access shall be provided first from the street with the lowest classification. For

example, access shall be provided from a local street before a collector or arterial street. When a lot or parcel has frontage opposite that of the adjacent lots or parcels, access shall be provided from the street with the lowest classification.

**Comment: No double-frontage lots are proposed in this application.**

6. Access spacing.

a. The access spacing standards found in the adopted Transportation System Plan (TSP) shall be applicable to all newly established public street intersections and non-traversable medians. Deviation from the access spacing standards may be granted by the City Engineer if conditions are met as described in the access spacing variances section in the adopted TSP.

b. Private drives and other access ways are subject to the requirements of CDC 48.060.

**Comment: No new public street intersections are proposed. The shared access drive complies with the requirements of the CDC.**

7. Number of access points. For single-family (detached and attached), two-family, and duplex housing types, one street access point is permitted per lot or parcel, when alley access cannot otherwise be provided; except that two access points may be permitted corner lots (i.e., no more than one access per street), subject to the access spacing standards in subsection (B)(6) of this section. The number of street access points for multiple family, commercial, industrial, and public/institutional developments shall be minimized to protect the function, safety and operation of the street(s) and sidewalk(s) for all users. Shared access may be required, in conformance with subsection (B)(8) of this section, in order to maintain the required access spacing, and minimize the number of access points.

**Comment: Only one access point per lot is proposed.**

8. Shared driveways. The number of driveway and private street intersections with public streets shall be minimized by the use of shared driveways with adjoining lots where feasible. The City shall require shared driveways as a condition of land division or site design review, as applicable, for traffic safety and access management purposes in accordance with the following standards:

a. Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street. When shared driveways or frontage streets are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway or street temporarily ends at the property line, but may be extended in the future as the adjacent lot or parcel develops.



“Developable” means that a lot or parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).

- b. Access easements (i.e., for the benefit of affected properties) shall be recorded for all shared driveways, including pathways, at the time of final plat approval or as a condition of site development approval.
- c. Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, lot or parcel configuration, and similar conditions) prevent extending the street/driveway in the future.

**Comment: The proposed shared driveway will have an easement shown on the partition plat.**

C. Street connectivity and formation of blocks required. In order to promote efficient vehicular and pedestrian circulation throughout the City, land divisions and large site developments shall produce complete blocks bounded by a connecting network of public and/or private streets, in accordance with the following standards:

1. Block length and perimeter. The maximum block length shall not exceed 800 feet or 1,800 feet along an arterial.
2. Street standards. Public and private streets shall also conform to Chapter 92 CDC, Required Improvements, and to any other applicable sections of the West Linn Community Development Code and approved TSP.
3. Exception. Exceptions to the above standards may be granted when blocks are divided by one or more pathway(s), in conformance with the provisions of CDC 85.200(C), Pedestrian and Bicycle Trails, or cases where extreme topographic (e.g., slope, creek, wetlands, etc.) conditions or compelling functional limitations preclude implementation, not just inconveniences or design challenges. (Ord. 1635 § 25, 2014; Ord. 1636 § 33, 2014; Ord. 1650 § 1 (Exh. A), 2016; Ord. 1675 § 40, 2018)

**Comment: Adjacent properties to the East and West are fully developed. This development is not large enough to warrant a connecting network of public or private streets. Additionally, pathways divide blocks to the south. Because of this, it is not possible to extend a local street through the site to create a new block.**

#### 48.030 MINIMUM VEHICULAR REQUIREMENTS FOR RESIDENTIAL USES

A. Direct individual access from single-family dwellings and duplex lots to an arterial street, as designated in the transportation element of the Comprehensive Plan, is prohibited for lots or parcels created after the effective date of this code where an alternate access is either available or is expected to be available by imminent development application. Evidence of alternate or future access may include temporary cul-de-sacs, dedications or stubouts on adjacent lots or parcels, or tentative street layout plans submitted at one time by adjacent

property owner/developer or by the owner/developer, or previous owner/developer, of the property in question.

In the event that alternate access is not available as determined by the Planning Director and City Engineer, access may be permitted after review of the following criteria:

1. Topography.
2. Traffic volume to be generated by development (i.e., trips per day).
3. Traffic volume presently carried by the street to be accessed.
4. Projected traffic volumes.
5. Safety considerations such as line of sight, number of accidents at that location, emergency vehicle access, and ability of vehicles to exit the site without backing into traffic.
6. The ability to consolidate access through the use of a joint driveway.
7. Additional review and access permits may be required by State or County agencies.

**Comment: Figure 17 in the TSP designates this stretch of Arbor Drive as a local street.**

B. When any portion of any house is less than 150 feet from the adjacent right-of-way, access to the home is as follows:

1. One single-family residence, including residences with an accessory dwelling unit as defined in CDC [02.030](#), shall provide 10 feet of unobstructed horizontal clearance. Dual-track or other driveway designs that minimize the total area of impervious driveway surface are encouraged.
2. Two to four single-family residential homes equals a 14- to 20-foot-wide paved or all-weather surface. Width shall depend upon adequacy of line of sight and number of homes.
3. Maximum driveway grade shall be 15 percent. The 15 percent shall be measured along the centerline of the driveway only. Variations require approval of a Class II variance by the Planning Commission pursuant to Chapter [75](#) CDC. Regardless, the last 18 feet in front of the garage shall be under 12 percent grade as measured along the centerline of the driveway only. Grades elsewhere along the driveway shall not apply.
4. The driveway shall include a minimum of 20 feet in length between the garage door and the back of sidewalk, or, if no sidewalk is proposed, to the paved portion of the right-of-way.

**Comment: The proposed driveway to Parcel 2 will comply with the minimum 10 foot unobstructed horizontal clearance standard. The grade is under 5 percent. The driveway complies with the 20 foot minimum length between garage and sidewalk. The proposed driveway will meet the criterion for minimum paved width.**

C. When any portion of one or more homes is more than 150 feet from the adjacent right-of-way, the provisions of subsection B of this section shall apply in addition to the following provisions.

1. A turnaround may be required as prescribed by the Fire Chief.
2. Minimum vertical clearance for the driveway shall be 13 feet, six inches.
3. A minimum centerline turning radius of 45 feet is required unless waived by the Fire Chief.
4. There shall be sufficient horizontal clearance on either side of the driveway so that the total horizontal clearance is 20 feet.

**Comment: If some portion of the home on Parcel 2 is more than 150 feet from Arbor Drive, the applicant will coordinate with the Fire Chief to determine whether a turnaround or other mitigating measures, such as sprinklers, are warranted. Compliance with other requirements of this section will be determined at the time of building permit application.**

D. Access to five or more single-family homes shall be by a street built to full construction code standards. All streets shall be public. This full street provision may only be waived by variance.

**Comment: The proposed access will not serve five or more single-family homes.**

E. Access and/or service drives for multi-family dwellings shall be fully improved with hard surface pavement:

**Comment: No multi-family development is proposed.**

F. Where on-site maneuvering and/or access drives are necessary to accommodate required parking, in no case shall said maneuvering and/or access drives be less than that required in Chapters 46 and 48 CDC.

**Comment: The proposed access drive complies with these standards.**

G. The number of driveways or curb cuts shall be minimized on arterials or collectors. Consolidation or joint use of existing driveways shall be required when feasible.

**Comment: The site consolidates access to make use of a single existing curb cut onto Arbor Drive.**

H. In order to facilitate through traffic and improve neighborhood connections, it may be necessary to construct a public street through a multi-family site.

**Comment: The site is not a multi-family site and there is no opportunity for a street connection due to development patterns to the North and South.**

I. Gated accessways to residential development other than a single-family home are prohibited. (Ord. 1408, 1998; Ord. 1463, 2000; Ord. 1513, 2005; Ord. 1584, 2008; Ord. 1590 § 1, 2009; Ord. 1636 § 34, 2014)

**Comment: No gated accessways are proposed.**

#### **48.040 MINIMUM VEHICLE REQUIREMENTS FOR NON-RESIDENTIAL USES**

**Comment: No non-residential uses are proposed.**

#### **48.050 ONE-WAY VEHICULAR ACCESS POINTS**

Where a proposed parking facility plan indicates only one-way traffic flow on the site, it shall be accommodated by a specific driveway serving the facility, and the entrance drive shall be situated closest to oncoming traffic, and the exit drive shall be situated farthest from oncoming traffic.

**Comment: No one-way traffic flow patterns are proposed.**

#### **48.060 WIDTH AND LOCATION OF CURB CUTS AND ACCESS SEPARATION REQUIREMENTS**

A. Minimum curb cut width shall be 16 feet.

**Comment: The existing curb cut for the proposed access drive complies with this minimum.**

B. Maximum curb cut width shall be 36 feet, except along Highway 43 in which case the maximum curb cut shall be 40 feet. For emergency service providers, including fire stations, the maximum shall be 50 feet.

**Comment: The proposed curb cut will not exceed 36 feet, as shown on the site plan.**

C. No curb cuts shall be allowed any closer to an intersecting street right-of-way line than the following:

1. On an arterial when intersected by another arterial, 150 feet.
2. On an arterial when intersected by a collector, 100 feet.
3. On an arterial when intersected by a local street, 100 feet.

4. On a collector when intersecting an arterial street, 100 feet.
5. On a collector when intersected by another collector or local street, 35 feet.
6. On a local street when intersecting any other street, 35 feet.

**Comment: Figure 17 in the TSP designates this section of Arbor Drive as a collector street and it intersects with Upper Midhill Drive, also a local street. This standard is met.**

D. There shall be a minimum distance between any two adjacent curb cuts on the same side of a public street, except for one-way entrances and exits, as follows:

1. On an arterial street, 150 feet.
2. On a collector street, 75 feet.
3. Between any two curb cuts on the same lot or parcel on a local street, 30 feet.

**Comment: The two parcels will share a single curb cut.**

E. A rolled curb may be installed in lieu of curb cuts and access separation requirements.

**Comment: Not proposed in this application.**

F. Curb cuts shall be kept to the minimum, particularly on Highway 43. Consolidation of driveways is preferred. The standard on Highway 43 is one curb cut per business if consolidation of driveways is not possible.

**Comment: The proposed plan makes use of a single curb cut to service both parcels, consistent with this provision.**

G. Adequate line of sight pursuant to engineering standards should be afforded at each driveway or accessway. (Ord. 1270, 1990; Ord. 1584, 2008; Ord. 1636 § 35, 2014)

**Comment: There are no obstructions to sight distance at the driveway location.**

## Chapter 55 DESIGN REVIEW

### 55.090 APPROVAL STANDARDS – CLASS I DESIGN REVIEW

The Planning Director shall make a finding with respect to the following criteria when approving, approving with conditions, or denying a Class I design review application:

A. The provisions of the following sections shall be met:

1. CDC [55.100\(B\)\(1\)](#) through (4), Relationship to the natural and physical environment, shall apply except in those cases where the proposed development site is substantially developed and built out with no remaining natural physical features that would be impacted.
2. CDC [55.100\(B\)\(5\)](#) and (6), architecture, et al., shall only apply in those cases that involve exterior architectural construction, remodeling, or changes.
3. Pursuant to CDC [55.085](#), the Director may require additional information and responses to additional sections of the approval criteria of this section depending upon the type of application.
4. The design standards or requirements identified in the base zone shall apply.

**Comment: The provisions are met as described in this application and the proposed site plan.**

- B. An application may be approved only if adequate public facilities will be available to provide service to the property at the time of occupancy.

**Comment: Evaluation of public facilities will be reviewed with the building permit application.**

- C. The Planning Director shall determine the applicability of the approval criteria in subsection A of this section. (Ord. 1408, 1998; Ord. 1544, 2007; Ord. 1675 § 44, 2018)

**Comment: The criterion is met.**

## **55.100 APPROVAL STANDARDS – CLASS II DESIGN REVIEW**

The approval authority shall make findings with respect to the following criteria when approving, approving with conditions, or denying a Class II design review application:

### **B. Relationship to the natural and physical environment.**

1. The buildings and other site elements shall be designed and located so that all heritage trees, as defined in the municipal code, shall be saved. Diseased heritage trees, as determined by the City Arborist, may be removed at his/her direction.
2. All heritage trees, as defined in the municipal code, all trees and clusters of trees (“cluster” is defined as three or more trees with overlapping driplines; however, native oaks need not have an overlapping dripline) that are considered significant by the City Arborist, either individually or in consultation with certified arborists or similarly qualified professionals, based on accepted arboricultural standards including consideration of their size, type, location, health, long term survivability, and/or

numbers, shall be protected pursuant to the criteria of subsections (B)(2)(a) through (f) of this section. In cases where there is a difference of opinion on the significance of a tree or tree cluster, the City Arborist's findings shall prevail. It is important to acknowledge that all trees are not significant and, further, that this code section will not necessarily protect all trees deemed significant.

**Comment: There are no heritage or significant trees on the property and. Mike Perkins [City Arborist] email confirmation attached to partition package.**

## Chapter 75 VARIANCES AND SPECIAL WAIVERS

### 75.020 CLASSIFICATION OF VARIANCES

A. Class I Variance. Class I variances provide minor relief from certain code provisions where it can be demonstrated that the modification will not harm adjacent properties, and it conforms with any other code requirements. Class I variances are allowed for the following code provisions:

1. Required Yard and Minimum Lot Dimensional Requirements. Required yards may be modified up to 20 percent, lot dimensions by up to 10 percent and lot area by up to five percent if the decision-making authority finds that the resulting approval:
  - a. Provides for a more efficient use of the site;
  - b. Preserves and incorporates natural features into the overall design of the project;
  - c. Does not adversely affect adjoining properties in terms of light, air circulation, noise levels, privacy, and fire hazards; and
  - d. Provides for safe vehicular and pedestrian access to the site and safe on-site vehicular and pedestrian circulation.

**Comment: Proposed lot dimensions of Parcel 1 meet the zoning minimum requirement, 10,000 sq. ft. Parcel 2 is 9,888 sq. ft., 112 sq. ft. below the R-10 zone minimum lot area. Parcel 2 will require a class 1 variance to allow for a 1-2% reduction in lot area below the minimum standard requirement. This allows for a more efficient use of the site. No adverse affect on adjoining properties will result from the creation of the additional parcel. Safe access to the site for vehicles and pedestrians is proposed via a 20 foot access easement to allow for pedestrian and vehicle circulation. All standards are met.**

2. Off-street parking dimensional and minimum number of space requirements may be modified up to 10 percent if the decision-making authority finds that the use is designed for a specific purpose, which is intended to be permanent in nature.

**Comment: Parking requirements are met. No deviations from dimensional and minimum number of space requirements are proposed.**

3. Dimensional sign requirements may be modified up to 10 percent if the decision-making authority finds that the proposed larger sign is:

- a. Necessary for adequate identification of the use on the property; and
- b. Compatible with the overall site plan, the structural improvements, and with the structures and uses on adjoining properties.

**Comment: No deviations from dimensional sign requirements are proposed.**

4. Landscaping requirements in the applicable zone may be modified up to 10 percent if the decision-making authority finds that the resulting approval:

- a. Provides for a more efficient use of the site;
- b. Preserves and incorporates natural features into the overall design of the project; and
- c. Will have no adverse effect on adjoining property.

**Comment: No deviations from landscaping requirements are proposed.**

## Chapter 92 REQUIRED IMPROVEMENTS

### 92.010 PUBLIC IMPROVEMENTS FOR ALL DEVELOPMENT

The following improvements shall be installed at the expense of the developer and meet all City codes and standards:

E. Storm detention and treatment. For Type I, II and III lands (refer to definitions in Chapter 02 CDC), a registered civil engineer must prepare a storm detention and treatment plan, at a scale sufficient to evaluate all aspects of the proposal, and a statement that demonstrates:

1. The location and extent to which grading will take place indicating general contour lines, slope ratios, slope stabilization proposals, and location and height of retaining walls, if proposed.
2. All proposed storm detention and treatment facilities comply with the standards for the improvement of public and private drainage systems located in the West Linn Public Works Design Standards.



3. There will be no adverse off-site impacts, including impacts from increased intensity of runoff downstream or constrictions causing ponding upstream.
4. There is sufficient factual data to support the conclusions of the plan.
5. Per CDC [99.035](#), the Planning Director may require the information in subsections (E)(1), (2), (3) and (4) of this section for Type IV lands if the information is needed to properly evaluate the proposed site plan.

**Comment:** The applicant proposes to provide a rain garden on Parcel 2 to accommodate runoff for the new home, to be included with the building permit application. There will be a rain garden on Parcel 1 to accommodate runoff for the new home, to be included with the building permit application. There will be a requirement to provide frontage improvements along Arbor Drive. The applicant will retain the services of a civil engineer to design these improvements, including storm water management. The use of independent storm drainage swales between the proposed home locations and the East property line may be the best solution.

**City of West Linn  
PRE-APPLICATION CONFERENCE MEETING  
SUMMARY NOTES  
November 15, 2018**

**SUBJECT:** Proposed 2-lot partition and Class I Variance for 2332 Arbor Drive  
**FILE:** PA-18-31  
**ATTENDEES:** Applicant Representatives: Kevin Kashoro & Ryan Pfeifer (Hamilton Kashoro)  
 Staff: Darren Wyss, (Planning); Amy Pepper (Engineering);

*The following is a summary of the meeting discussion provided to you from staff meeting notes. Additional information may be provided to address any "follow-up" items identified during the meeting. These comments are PRELIMINARY in nature. Please contact the Planning Department with any questions regarding approval criteria, submittal requirements, or any other planning-related items. Please note disclaimer statement below.*

**Project Details**

**Site Address:** 2332 Arbor Drive  
**Tax Not No.:** 2S 1E 14CA tax lot 1000  
**Site Area:** 20,000 sq. ft.  
**Neighborhood:** Robinwood  
**Comp. Plan:** Low Density Residential  
**Zoning:** R-10: Single-Family Residential, Detached  
**Environmental Overlays:** None ✓  
**Applicable CDC Chapters:** Chapter 11: R-10 Zoning; Chapter 48: Access, Egress, and Circulation, Chapter 85: General Provisions, Chapter 75: Variances and Special Waivers, and Chapter 92, Required Improvements ✓

**Summary**

The applicant proposes to create one additional lot, for the purpose of constructing a detached-single-family home, by partitioning an approximately 20,000 sq. ft. parcel. There is an existing home that is proposed to be demolished and replaced with a new single-family home. This use is permitted outright. The applicant will be required to dedicate an additional one foot along its Arbor Drive frontage, a local street, to accommodate a 52 foot right-of-way. This required dedication will make one proposed lot 100 square feet short of the 10,000 square foot minimum lot size. A Class I Variance allows a five percent reduction in lot area. Access to the proposed rear lot will be by an access easement. Contact TVF&R for private drive clearance/turnaround requirements. The subject property will require a stormwater infiltration report. A significant tree inventory is required. Please contact the City Arborist to coordinate a significance determination (Mike Perkins 503-742-6046 or mperkins@westlinnoregon.gov).

There are existing water, sanitary sewer, and stormwater lines located in Arbor Drive.

**Engineering Comments:** contact Amy Pepper at [apecpper@westlinnoregon.gov](mailto:apecpper@westlinnoregon.gov) or 503-722-3434

**Tualatin Valley Fire & Rescue Comments:** contact Jason Arn at [jason.arn@tvfr.com](mailto:jason.arn@tvfr.com) or 503-259-1500

## Process

For the Partition Review, address the submittal requirements and responses to the criteria of CDC Chapter 85 and associated/referenced regulations in Chapters 11, 48, and 92. For the Class I Variance address requirements of CDC Chapter 75. N/A is not an acceptable response to the approval criteria.

Submittal requirements may be waived by the Planning Manager following a request by the applicant. Such a request must identify the specific grounds for the waiver and must be submitted to the Planning Manager (or designee) in letter form (email is acceptable).

A neighborhood meeting is not required per 99.038.

The applicant was advised of the expedited process as outlined in HB 3223.

The deposit for a minor partition is \$2,800 and a Class I Variance fee is \$825.

You may access the West Linn Community Development Code (CDC) online at <http://westlinnoregon.gov/cdc>.

Once the application and deposit/fee are submitted, the City has 30 days to determine if the application is complete or not. If the application is not complete, the applicant has 180 days to make it complete or provide written notice to staff that no other information will be provided.

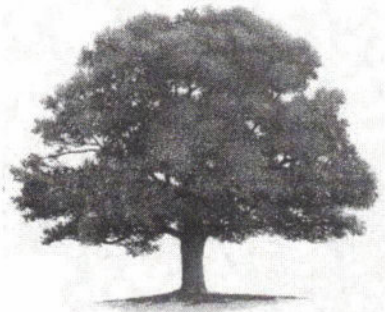
Once the submittal is declared complete, staff will prepare a staff report and schedule a date for the Planning Manager's decision. There is a 14-day window following the Planning Manager's decision to appeal the decision to City Council. If no appeal has been received by the close of the appeal period, the Planning Manager's decision is final and the applicant may move forward with the development of their proposal.

Pre-application notes are void after 18 months. After 18 months with no application approved or in process, a new pre-application conference is required.

### ***Typical land use applications can take 6-10 months from beginning to end.***

**DISCLAIMER:** This summary discussion covers issues identified to date. It does not imply that these are the only issues. The burden of proof is on the applicant to demonstrate that all approval criteria have been met. These notes do not constitute an endorsement of the proposed application ***or provide any assurance of potential outcomes***. Staff responses are based on limited material presented at this pre-application meeting. New issues, requirements, etc. could emerge as the application is developed. Pre-application notes are void after 18 months. After 18 months with no application approved or in process, a new pre-application conference is required. Any changes to the CDC standards may require a different design or submittal.

# Urban Forest PRO



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 Portland, OR 97210  
 Phone: (503) 226-7143  
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## Arborist Report

April 02, 2019

**To:** Hamilton & Kashoro Group, LLC.

**From:** Matt Page, ISA Certified Arborist PN-6227A, ISA Tree Risk Assessment Qualified

**Re:** Tree Plan for Building 2 new homes at 2332 Arbor Dr. West Linn, Or 97068

### Summary

This report provides recommendations for meeting the requirements from the "West Linn Tree Technical Manual" for the proposed construction of 2 buildings at 2332 Arbor Dr. West Linn, Or 97068. Included in this report is an updated site map showing tree protection plans (attachment 2). Out of the 21 trees on this property 4 trees will be retained. Trees to be retained shall have a root protection zone fence put in place in accordance with the "West Linn Tree Technical Manual".

**Site visit:** I inspected the site on March 28, 2019. The purpose of this inspection was to take a tree inventory, tree survey, number, and tag the trees on this property.

The first thing I noticed was that an existing home had been removed down to a foundation at the front of the property closest to Arbor Dr. A small grove of native trees on the back 1/3<sup>rd</sup> of the property and one spruce on the front 1/3 (facing the property from the street). The middle 1/3<sup>rd</sup> of the property consists of mostly grass. This property is for the most part flat. Most of the trees are phototropic (reaching upward for the light because they are in the middle of a stand of trees) having the majority of there canopies in the top 1/3<sup>rd</sup> of the tree. Leaving most of the ash trees looking tall and spindly with little branch structure. The ground and trees in the back 1/3<sup>rd</sup> of the property are covered with ivy and decaying tree debris. Making it harder to determine trunk and root issues.

**Inventory:**

The condition of the trees surveyed are indicated as being Very Good, Good, Fair, Poor, Very Poor or Dead. Trees rated as Very Good are prime specimens with no visible defects. Trees rated as good may have minor defects but are stable trees in good health. Trees rated as Fair usually contain at least one visible defect that may become significant sometime in the future. Poor trees contain at least significant one visible defect that may be structural or cosmetic. Poor trees usually display reduced vigor and may be candidates for removal. Trees rated as Very Poor contain significant defects that are hazardous, or near hazardous and are recommended for removal.

<b>Tree No.</b>	<b>Common Name</b>	<b>Scientific Name</b>	<b>DBH</b>	<b>Structure</b>	<b>Comments</b>	<b>Recommendation</b>
001	Oregon Ash	<i>Fraxinus latifolia</i>	14"	poor	High canopy (all foliage at top 1/3 of tree). Trunk crowding. Severe lean. Ivy covered	Remove due to construction
002	Oregon Ash	<i>Fraxinus Latifolia</i>	15	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered.	Remove due to construction
003	Oregon Ash	<i>Fraxinus Latifolia</i>	13	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
004	Oregon Ash	<i>Fraxinus Latifolia</i>	12	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
005	Oregon Ash	<i>Fraxinus Latifolia</i>	10	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
006	Oregon Ash	<i>Fraxinus Latifolia</i>	11.5	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
007	Oregon Ash	<i>Fraxinus Latifolia</i>	5	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
008	Oregon Ash	<i>Fraxinus Latifolia</i>	15	Poor	High canopy. Ivy covered. Excessive suckers.	Remove due to construction

009	Hawthorn	<i>Crataegus</i>	4	Fair	Over full canopy. Slight lean.	Retain or remove *
010	Oregon Ash	<i>Fraxinus Latifolia</i>	9	Poor	High canopy. Trunk crowding. Ivy covered	Remove due to construction
011	Oregon Ash	<i>Fraxinus Latifolia</i>	11	Poor	High canopy. Trunk crowding. Ivy covered	Remove due to construction
012	Cottonwood	<i>Populus nigra</i>	26	Fair	High canopy. Ivy covered.	Remove due to construction
013	Oregon Ash	<i>Fraxinus Latifolia</i>	6.5	Poor	High canopy. Slight lean. Ivy covered.	Remove due to construction
014	Oregon Ash	<i>Fraxinus Latifolia</i>	7.5	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered.	Remove due to construction
015	Oregon Ash	<i>Fraxinus Latifolia</i>	6	Very Poor	Top missing. Foliage suckers only. Trunk crowding. Severe lean. Ivy covered.	Remove due to condition
016	Cottonwood	<i>Populus nigra</i>	22.5	Fair	High canopy. Over corrected lean. Ivy covered.	Remove due to construction
017	Oregon Ash	<i>Fraxinus Latifolia</i>	9	Very Poor	Over-reaching top. Severe lean. Ivy covered.	Remove due to condition and construction
018	Cottonwood	<i>Populus nigra</i>	18	Poor	Severe lean. Over corrected trunk. Canopy heavy on lean side of tree.	Remove due to construction
019	Oregon Ash	<i>Fraxinus Latifolia</i>	11	Poor	High canopy. Severe lean. Trunk taper. Twisted trunk.	Retain
020	Oregon Ash	<i>Fraxinus Latifolia</i>	15	Fair	Severe lean. Heavy canopy on lean side of tree. Ivy covered.	Retain
021	Spruce	<i>Picea</i>	15	Fair	Co-dominate top. Over full. Signs of boring pests	Remove due to construction

\* Tree # 009 Does not qualify as tree under "West Linn Tree Technical Manual" under tree definition (DBH is under 6.37 inches)

## Tree Protection Recommendations

The prescriptive path for tree protection in “West Linn Tree Technical Manual” under “Specifications for tree protection during construction” in section “Tree protection Zone” encompasses a radius around a tree that is equivalent to 1/2 foot per inch of trunk diameter.

Trees # 013,014,019, and 020 should be adequately protected by placing tree protection fencing in the locations shown in attachment 2.

- A tree protection fence shall be placed at locations shown on site map and site plan.
- All heavy equipment is to stay outside root protection zone fencing.
- No digging or excavating will take place within the root zone.
- Any existing stockpiles within the tree protection zone shall be moved using hand tools only prior to the tree protection fence being installed.
- The tree protection fence shall remain in place until all construction activities are complete.
- Storage of equipment or materials (including soil) is prohibited inside the root protection zones.

## Additional Tree Protection Requirements

The following additional tree protection standards are required in section:

- Protection fencing consisting of a minimum 6-foot-high metal chain link construction fence, secured with 8-foot metal posts shall be established at the edge of the root protection zone. Metal fence post shall be set at a depth of 2 feet under ground and post spacing shall not be more than 10 feet apart.
- When a root protection zone extends beyond the development site, protection fencing is not required to extend beyond the development site. Existing structures and/or existing secured fencing at least 3.5 feet tall can serve as the required protective fencing.
- Signage designating the protection zone and penalties for violations shall be secured in a prominent location on each protection fence.
- The following is prohibited within the root protection zone of each tree or outside the limits of the development impact area unless otherwise approved by project arborist: ground disturbance or construction activity including vehicle or equipment access (but excluding access on existing streets or driveways), storage of equipment or materials including soil, temporary or permanent stockpiling, proposed buildings, impervious surfaces, underground utilities, excavation or fill, trenching or other work activities.

**Conclusion**

The recommendations in this report meet the requirements in the "West Linn Tree Technical Manual" for the proposed construction at 2332 Arbor Dr. If the protection recommendations are adhered to during construction, the trees to be retained should be adequately protected.

Please contact me if you have Questions, concerns, or need any additional information.

Sincerely, 

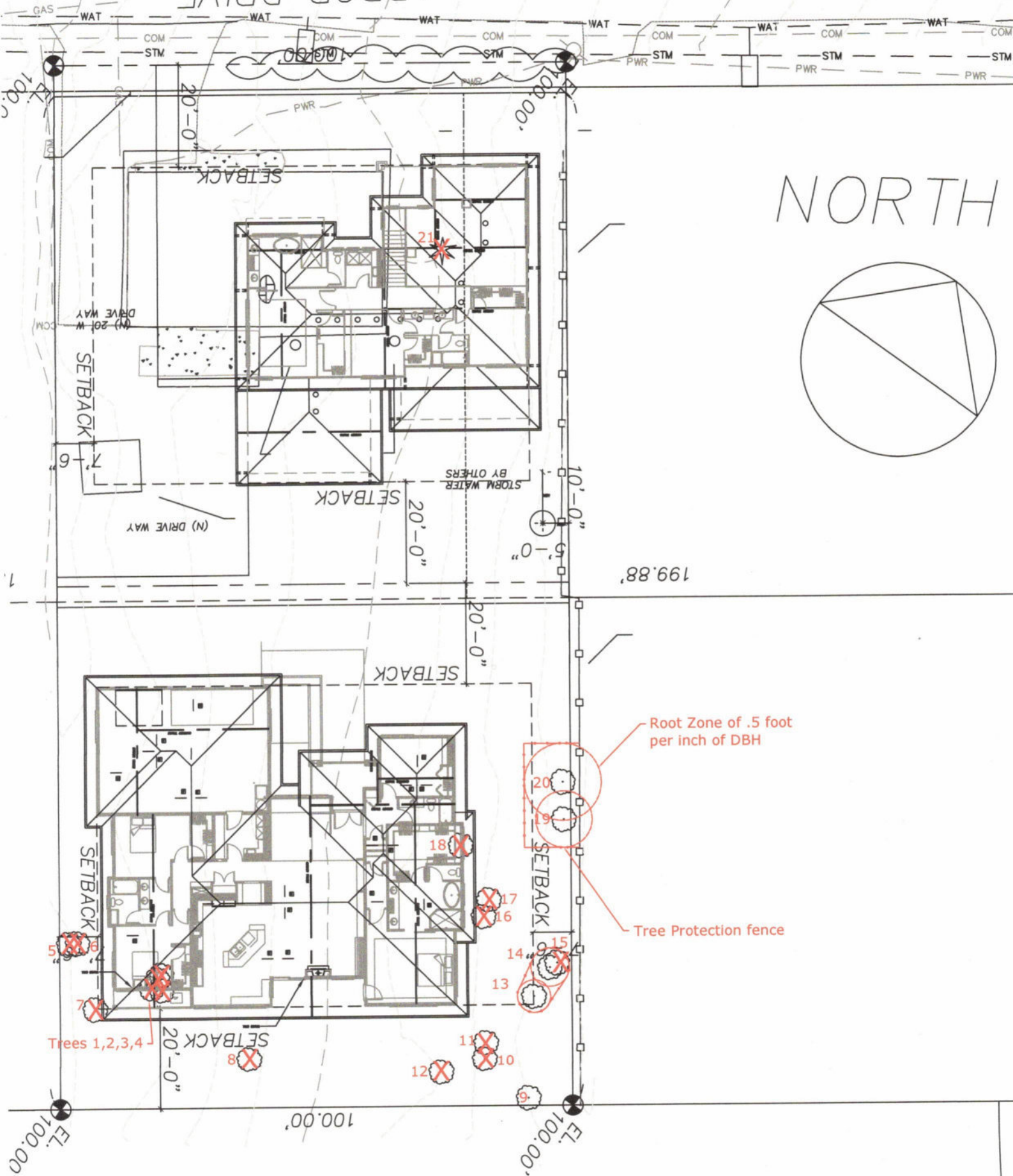
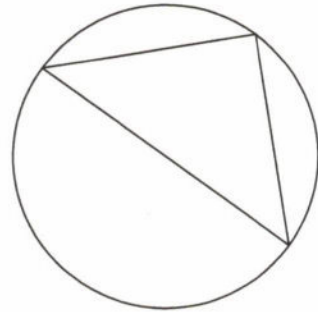
Matt Page  
ISA Certified Arborist PN-6227A  
ISA Tree Risk Assessment Qualified

- Attachment 1: Site Plan with TPZ fencing shown
- Attachment 2: Additional Tree Protection Recommendations
- Attachment 3: Assumptions and Limiting Conditions



ARBOR DRIVE

NORTH



## Attachment 2

### Tree Protection Recommendations

#### Before Construction Begins

1. Notify all contractors of tree protection procedures. For successful tree protection on a construction site, all contractors must know and understand the goals of tree protection.
  - a. Hold a tree protection meeting with all contractors to explain the goals of tree protection.
  - b. Have all contractors sign memoranda of understanding regarding the goals of tree protection. The memoranda should include a penalty for violating the tree protection plan. The penalty should equal the resulting fines issued by the local jurisdiction plus the appraised value of the tree(s) within the violated tree protection zone per the current Trunk Formula Technique as outlined in the current addition of the *Guide for Plant Appraisal* by the Council of Tree & Landscape Appraisers. The penalty should be paid to the owner of the property.
2. Fencing
  - a. Tree protection fencing should be set in the locations shown in attachment 2.
  - b. The fencing should be put in place before the ground is cleared in order to protect the trees and the soil around the trees from disturbances.
  - c. Fencing should be established by the project arborist based on the needs of the trees to be protected and to facilitate construction.
  - d. Fencing should be secured by metal posts to prevent it from being moved by contractors, sagging, or falling.
  - e. Fencing should remain in the position that is established by the project arborist until final project approval.
3. Signage
  - a. All tree protection fencing should have signage as follows so that all contractors understand the purpose of the fencing:

**TREE PROTECTION ZONE**

**DO NOT REMOVE OR ADJUST THE LOCATION OF THIS TREE**  
**PROTECTION FENCING**  
**UNAUTHORIZED ENCROACHMENT MAY RESULT IN FINES**

Please contact the project arborist if alterations to the location of the tree protection fencing are necessary.

- b. Signage should be placed every 50-feet or less.

#### During Construction

1. Protection guidelines within the tree protection zones:
  - a. No new buildings; grade change or cut and fill, during or after construction; new impervious surfaces; or utility or drainage field placement should be allowed within the tree protection zones.

- b. No traffic should be allowed within the tree protection zones. This includes but is not limited to vehicle, heavy equipment, even repeated foot traffic.
  - c. No storage of materials including but not limited to soil, construction material, or waste from the site should be permitted within the tree protection zones. Waste includes but is not limited to concrete washout, gasoline, diesel, paint, cleaner, thinners, etc.
  - d. Construction trailers should not be parked/placed within the tree protection zones.
  - e. No vehicles should be allowed to park within the tree protection zones.
  - f. No other activities should be allowed that will cause soil compaction within the tree protection zones.
2. The trees should be protected from any cutting, skinning, or breaking of branches, trunks, or woody roots.
  3. The project arborist should be notified prior to the cutting of woody roots from the trees that are to be retained to evaluate and oversee the proper cutting of roots with sharp cutting tools. Cut roots should be immediately covered with soil or mulch to prevent them from drying out.
  4. Trees that have woody roots cut should be provided supplemental water during the summer months.
  5. Any unnecessary passage of utilities through the tree protection zones should be by means of tunneling under woody roots by hand digging or boring with oversight by the project arborist.
  6. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

#### **After Construction**

1. Carefully landscape the areas within the tree protection zones. Do not allow trenching for irrigation or other utilities within the tree protection zones.
2. Carefully plant new plants within the tree protection zones. Avoid cutting woody roots of trees that are retained.
3. Do not install permanent irrigation within the tree protection zones unless it is drip irrigation to support a specific planting or the irrigation is approved by the project arborist.
4. Provide adequate drainage within the tree protection zones and do not alter hydrology significantly from the existing conditions for the trees to be retained.
5. Pruning of retained trees should be one of the last steps of the landscaping process before the final placement of trees, shrubs, ground covers, mulch or turf.
6. Provide for the ongoing inspection and treatment of insect and disease populations that can damage the retained trees and plants.
7. The retained trees may need to be fertilized if recommended by the project arborist.
8. Any deviation from the recommendations in this section should receive prior approval from the project arborist.

### **Attachment 3**

#### **Assumptions and Limiting Conditions**

1. Any legal description provided to the consultant is assumed to be correct. The information provided by Hamilton & Kashoro Group; LLC was the basis for this report.
2. It is assumed that this property is not in violation of any other codes, statutes, ordinances, or other governmental regulations.
3. The consultant is not responsible for information gathered from others involved in various activities pertaining to this project. Care has been taken to obtain information from reliable sources.
4. Loss or alteration of any part of this delivered report invalidates the entire report.
5. Drawings and information contained in this report may not be to scale and are intended to be used as display points of reference only.
6. The consultant's role is only to make recommendations. Inaction on the part of those receiving the report is not the responsibility of the consultant.
7. The purpose of this report is to provide protection recommendations for the tree(s) to be retained that will have greater than 25% of their optimal root zones impacted by construction.



Ryan Pfeifer <ryan@hamiltonkashoro.com>

---

## 2332 Arbor Dr

---

**Perkins, Michael** <mperkins@westlinnoregon.gov>  
To: Ryan Pfeifer <ryan@hamiltonkashoro.com>  
Cc: "Wyss, Darren" <dwyss@westlinnoregon.gov>

Tue, Jun 11, 2019 at 3:43 PM

Hi Ryan – there are no significant trees at this site

[Quoted text hidden]

**Michael Perkins**

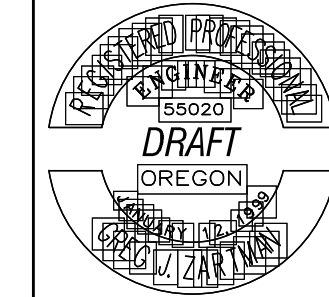
City Arborist/Park Development Coordinator  
Parks and Recreation

[22500 Salamo Rd.](#)  
West Linn, Oregon 97068  
[mperkins@westlinnoregon.gov](mailto:mperkins@westlinnoregon.gov)  
[westlinnoregon.gov](http://westlinnoregon.gov)  
503-742-6046

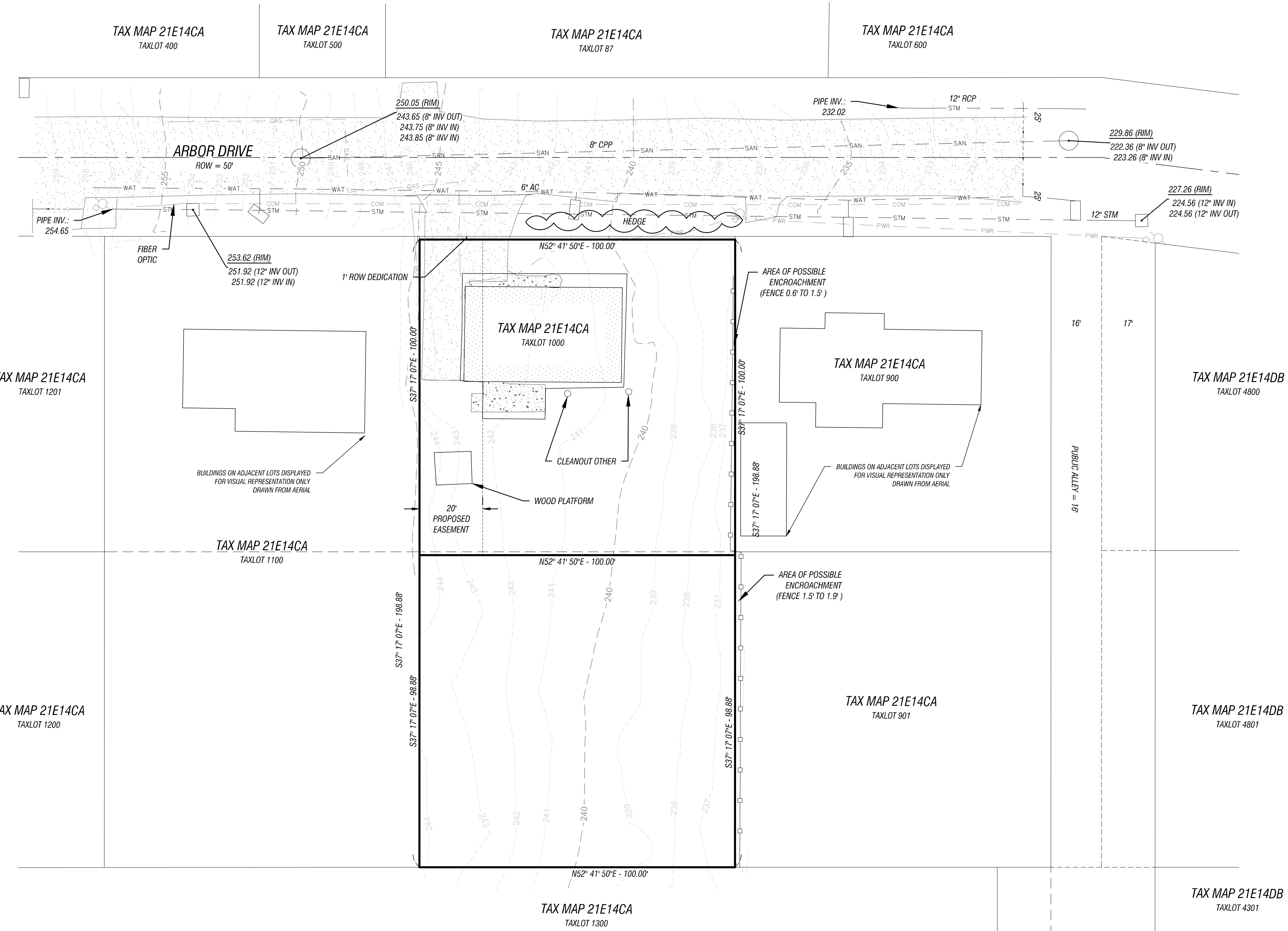
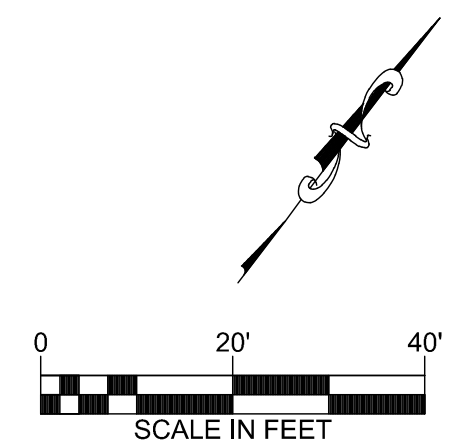


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BY	
REVISION	
NO.	DATE



**GENERAL NOTES:**

- THE LOCATION OF UTILITIES SERVING THE PROPERTY HAVE BEEN DETERMINED BY OBSERVED EVIDENCE, TOGETHER WITH MARKINGS PROVIDED BY UTILITY COMPANIES, 811 OREGON UTILITY NOTIFICATION CENTER TICKET # 19034269. THE LOCATION OF THE UTILITIES, SHOWN HEREON, DETERMINED BY ABOVE GROUND EVIDENCE, IS APPROXIMATE. LEI MAKES NO WARRANTIES TO THE LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL CALL FOR PRIVATE UTILITY LOCATES AND FIELD VERIFY ALL UTILITIES BEFORE CONSTRUCTION ACTIVITIES.
- THE BOUNDARY SHOWN ON THIS MAP IS FOR ENGINEERING PURPOSES ONLY. NO MONUMENTATION SHALL BE SET AND THIS MAP SHALL NOT BE FILED WITH THE COUNTY AS RECORD. CONTROL SHOWN HEREON IS FOR CONSTRUCTION USE, AND IS TEMPORARY.
- THE BUILDING FOOTINGS WERE NOT EASILY ACCESSIBLE AND THEREFORE, THE BUILDING LIMITS SHOWN HEREON, WERE MEASURED FROM THE BUILDING FASCIA.
- ON-SITE UTILITY LOCATIONS ARE APPROXIMATE, OBSERVED FROM ABOVE GROUND EVIDENCE, AND PIPE LOCATIONS AND DIRECTIONS ARE APPROXIMATED WITH THE USE OF CITY MAPS. NO AS-BUILT PLANS HAVE BEEN PROVIDED OR REVIEWED AT THIS TIME. CATCH BASINS WITH RIM ELEVATIONS ONLY SHOWN ARE GIBSON STEEL CATCH BASINS AND THE INVERT OF THE STORM PIPE CANNOT BE OBSERVED FROM THE SURFACE.
- LEI MAKES NO WARRANTIES TO THE EXACT COUNT OF THE TREES ON THE PROPERTY, AS LOCATIONS OF TREES WITH RESPECT TO PROPERTY LINES IS APPROXIMATE, AND NOT GUARANTEED. REFERENCE ARBORIST REPORT FOR EXACT INFORMATION REGARDING TREES ON THE PROPERTY (SPECIES, DBH, CONDITION, ECT). TREES ARE MEASURED FROM THE NEAREST FACE THAT CAN BE OBSERVED FROM THE INSTRUMENT AT THE TIME OF MEASUREMENT, AND ELEVATION IS NOT RECORDED, AS TREE OBSERVATIONS ARE NOT USED TO PRODUCE THE TIN SURFACE AND CAN BE MEASURED USING DIRECT REFLECTION ON THE NEAREST OBSERVABLE FACE. TREES ALONG THE PROPERTY LINES ARE NOT GUARANTEED TO BE ON OR OFF OF THE PROPERTY, AS NO BOUNDARY SURVEY HAS BEEN PERFORMED AT THIS TIME. LEI MAKES NO WARRANTIES ON POTENTIAL ENCROACHMENTS TO THE PROPERTY.
- HORIZONTAL DATUM LOCAL ASSUMED. VERTICAL DATUM BASED ON NGS DATA POINT "SHEPHERD AJ8191".

**LEGEND:**

DECIDUOUS TREE	EXISTING	STORM SEWER CLEAN OUT	EXISTING
CONIFEROUS TREE		STORM SEWER CATCH BASIN	
FIRE HYDRANT		STORM SEWER MANHOLE	
IRRIGATION		GAS METER	
WATER METER		GAS VALVE	
WATER VALVE		GUY WIRE ANCHOR	
DOUBLE CHECK VALVE		POWER POLE	
AIR RELEASE VALVE		POWER VAULT	
SANITARY SEWER CLEANOUT		POWER JUNCTION BOX	
SANITARY SEWER MANHOLE		POWER PEDESTAL	
SIGN		COMMUNICATIONS VAULT	
STREET LIGHT		COMMUNICATIONS JUNCTION BOX	
MAILBOX		STORM SEWER DOWN SPOUT	
	EXISTING		
RIGHT OF WAY LINE			
BOUNDARY LINE			
PROPERTY LINE			
CENTERLINE			
DITCH			
CURB			
EDGE OF PAVEMENT			
EASEMENT			
FENCE LINE			
GRAVEL EDGE			
POWER LINE			
OVERHEAD WIRE			
COMMUNICATIONS LINE			
FIBER OPTIC LINE			
GAS LINE			
STORM SEWER LINE			
SANITARY SEWER LINE			
WATER LINE			

2332 ARBOR DRIVE  
 PREPARED FOR: H & K GROUP, LLC.

2564 19TH ST SE  
 Salem, Oregon 97302  
 (503) 399-3828  
 www.leiengineering.com

**LEI ENGINEERING & SURVEYING**  
 OF OREGON

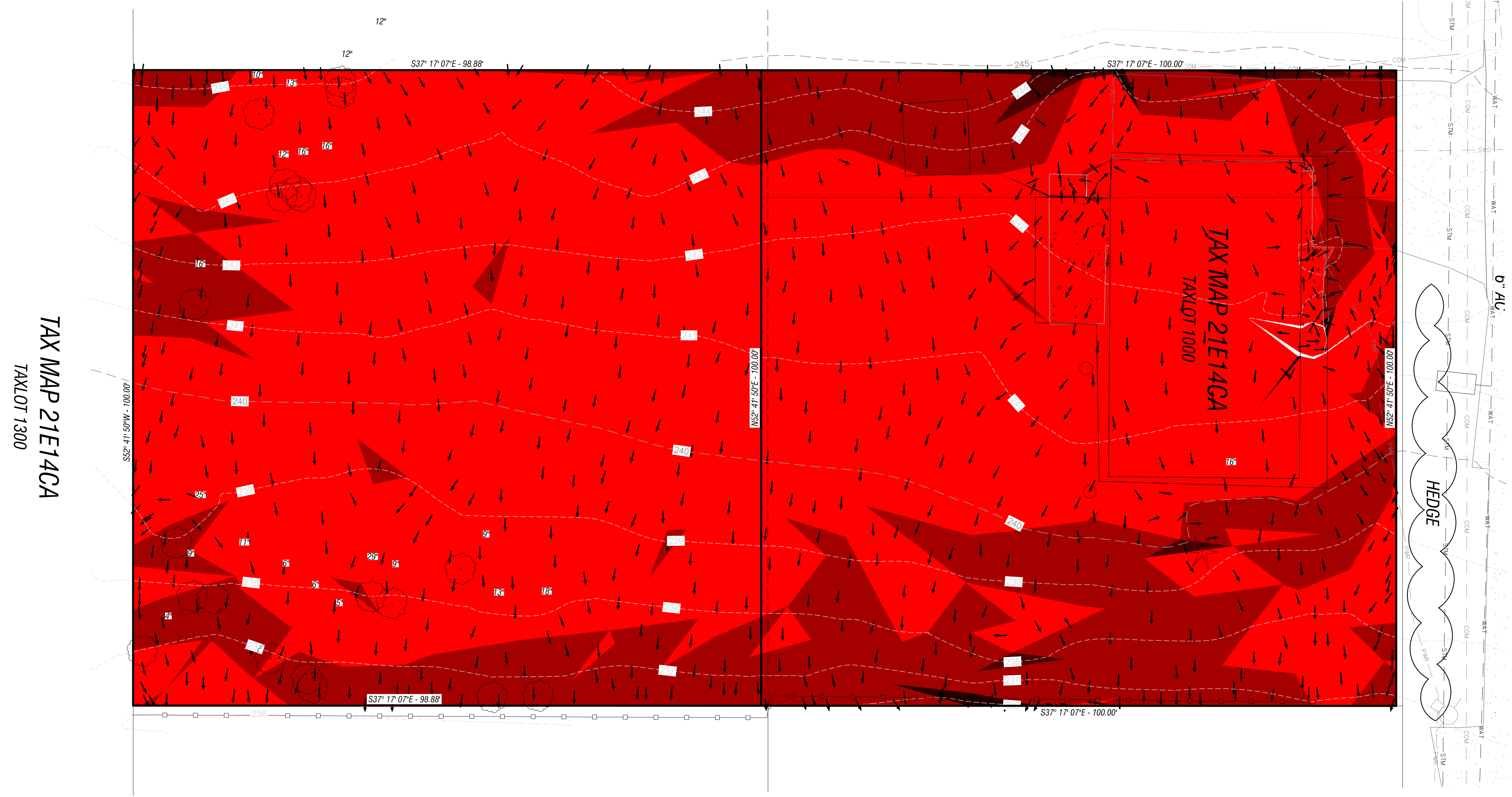
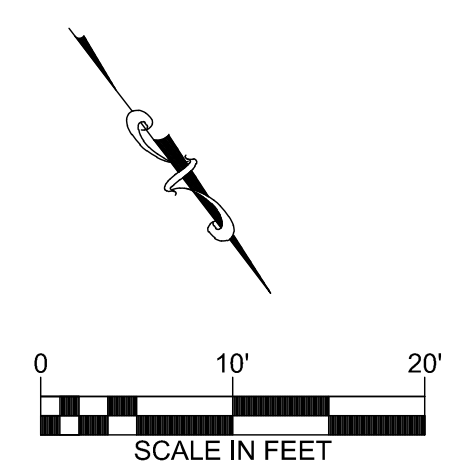
EXISTING CONDITIONS

SCALE	1" = 20'
PROJECT NO.	15-162
TOTAL SHEETS	1
	EX-1

2564 19TH ST SE, SALEM, OR 97302, 2015-05-21, 2:14 PM



EXPIRES	
BY	
REVISION	
NO.	
DATE	



Slopes Table

Number	Minimum Slope	Maximum Slope	Area	% OF TOTAL AREA	Color
1	0.00%	10.00%	14747.42	74%	Red
2	10.00%	25.00%	4979.81	24%	Dark Red
3	25.00%	50.00%	92.24	1%	Black
4	50.00%	100.00%	57.52	1%	Black

LEGEND:

- DECIDUOUS TREE
- CONIFEROUS TREE
- FIRE HYDRANT
- IRRIGATION
- WATER METER
- WATER VALVE
- DOUBLE CHECK VALVE
- AIR RELEASE VALVE
- SANITARY SEWER CLEANOUT
- SANITARY SEWER MANHOLE
- SIGN
- STREET LIGHT
- MAILBOX
- RIGHT OF WAY LINE
- BOUNDARY LINE
- PROPERTY LINE
- CENTERLINE
- DITCH
- CURB
- EDGE OF PAVEMENT
- EASEMENT
- FENCE LINE
- GRAVEL EDGE
- POWER LINE
- OVERHEAD WIRE
- COMMUNICATIONS LINE
- FIBER OPTIC LINE
- GAS LINE
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- STORM SEWER CLEAN OUT
- STORM SEWER CATCH BASIN
- STORM SEWER MANHOLE
- GAS METER
- GAS VALVE
- GUY WIRE ANCHOR
- POWER POLE
- POWER VAULT
- POWER JUNCTION BOX
- POWER PEDESTAL
- COMMUNICATIONS VAULT
- COMMUNICATIONS JUNCTION BOX
- STORM SEWER DOWN SPOUT

2332 ARBOR DRIVE

H & K GROUP, LLC.

2564 197th St SE  
 Seattle, WA 98148  
 (206) 999-3828  
 www.leiengineering.com

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 OF OREGON

SLOPE MAP

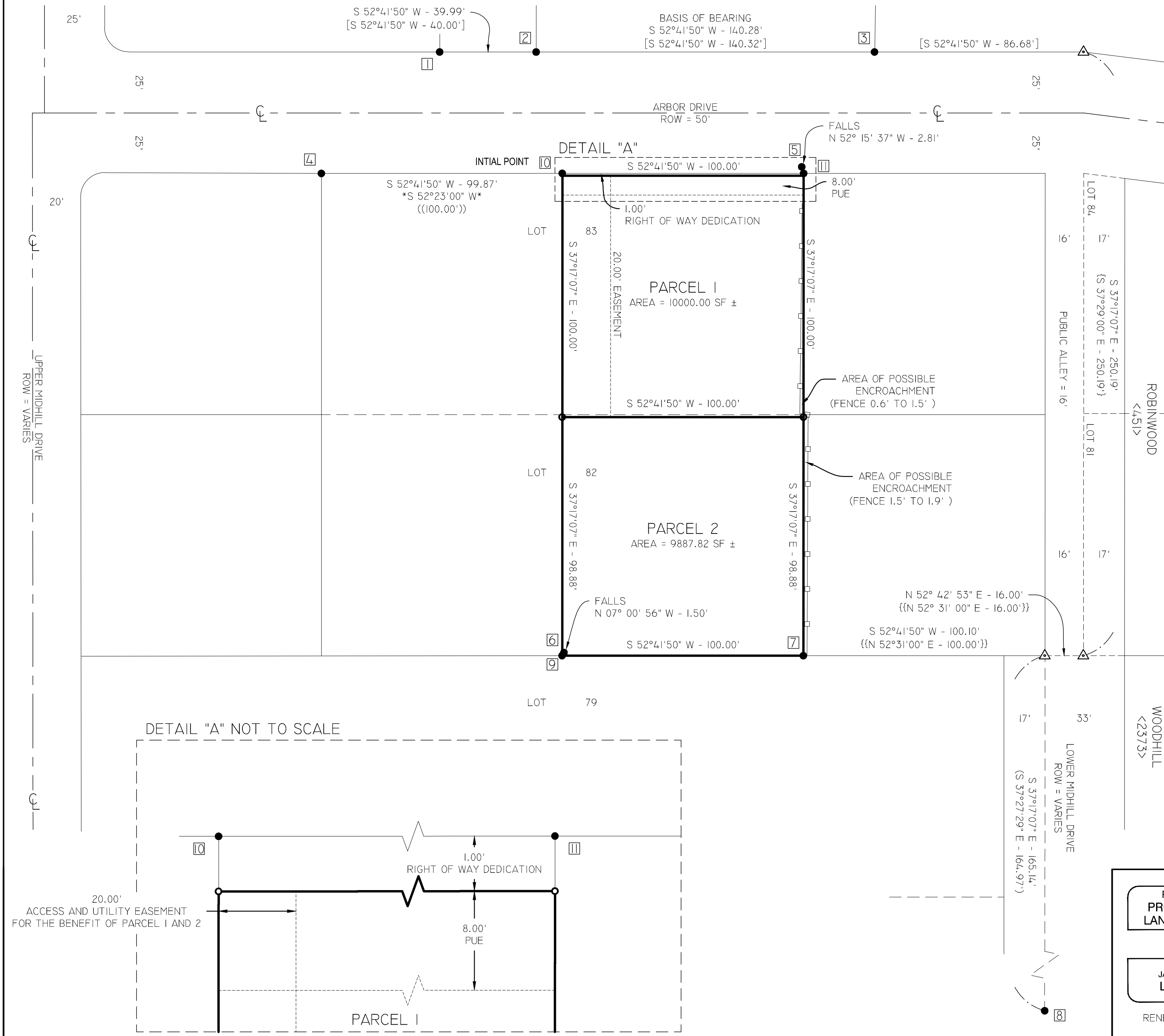
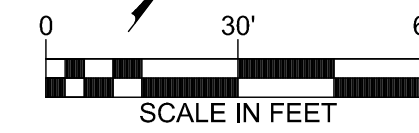
SCALE	1" = 10'
PROJECT NO.	15-162
TOTAL SHEETS	1

SM-1

**PARTITION PLAT**  
 A REPLAT OF PORTION OF LOT 82 & 83, "ROBINWOOD"  
 LOCATED IN THE S.W. 1/4 OF SECTION 14,  
 TOWNSHIP 2 SOUTH, RANGE 1 EAST, OF THE WILLAMETTE MERIDIAN,  
 CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON  
 NOVEMBER 18, 2018  
 SURVEYED FOR: H & K GROUP, LLC

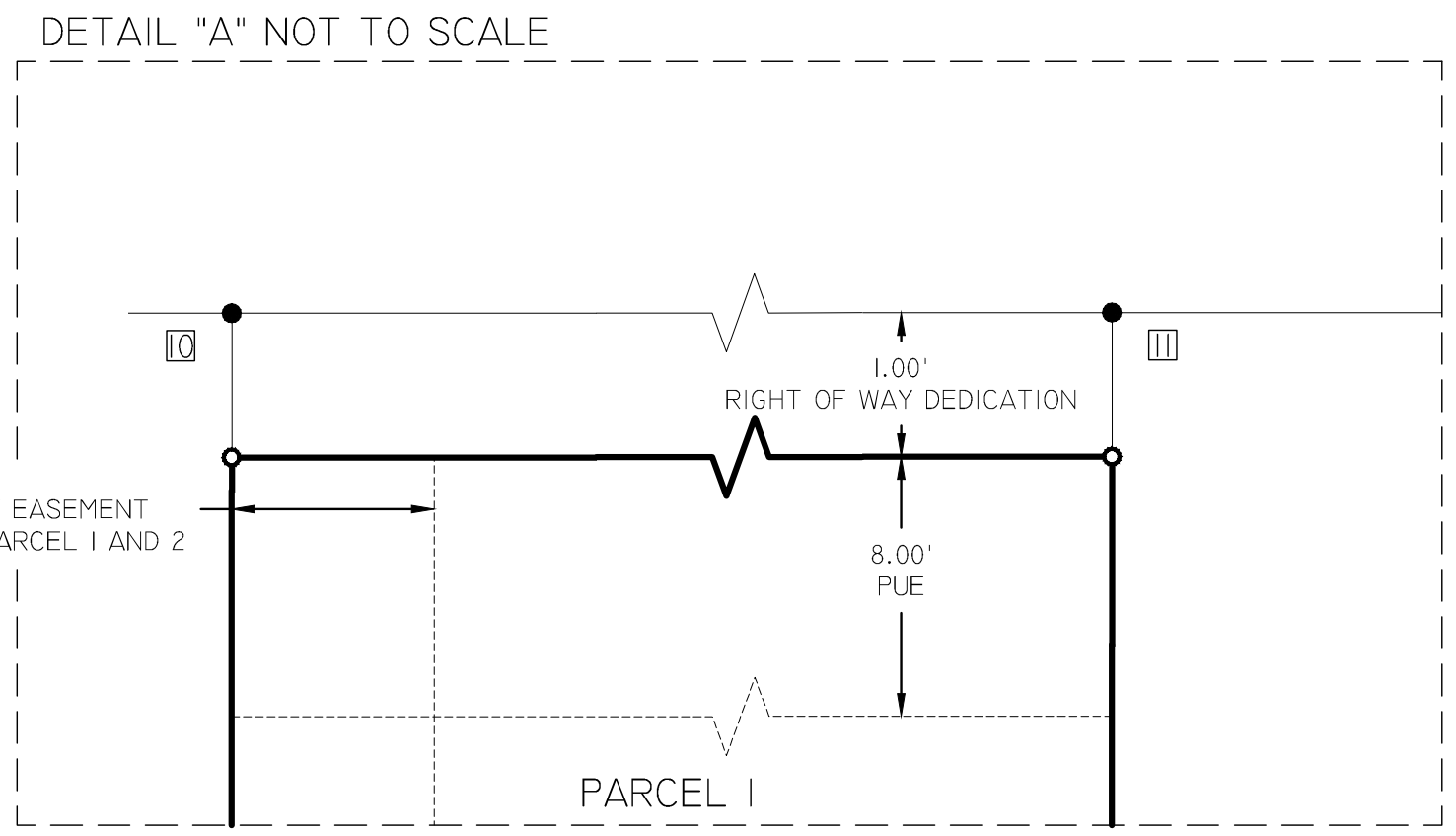
CLACKAMAS COUNTY SURVEYOR

DATE RECEIVED: \_\_\_\_\_  
 DATE ACCEPTED / FILED: \_\_\_\_\_  
 SURVEY NUMBER: \_\_\_\_\_



MONUMENT TABLE	
1	FOUND 5/8" IRON ROD, WITH YPC MARKED, "PARIS & ASSOC. PLS 2264", FLUSH, SHOWN SET ON SN 26670
2	FOUND 3/4" IRON PIPE, UP 0.4', AS SHOWN FOUND ON SN 2022
3	FOUND 3/4" IRON PIPE, DOWN 0.2', AS SHOWN FOUND ON SN 2022
4	FOUND 5/8" IRON ROD, WITH ALUM. CAP MARKED, "ZAROSINSKI-TATONE", FLUSH, SHOWN SET ON SN 16034
5	FOUND 3/4" IRON PIPE, UP 0.2', AS SHOWN SET ON SN 2022
6	FOUND 3/4" IRON PIPE, DOWN 0.2', ORIGIN UNKNOWN
7	FOUND 3/4" IRON PIPE, DOWN 0.2', AS SHOWN SET ON SN 2022
8	FOUND 5/8" IRON ROD, NO CAP, DOWN 0.2', AS SHOWN ON SN 29475
9	FOUND 5/8" IRON ROD, WITH YPC MARKED, "LEI ENGINEERING & SURVEYING", AS SHOWN ON SN2019-009
10	FOUND 5/8" IRON ROD, WITH YPC MARKED, "LEI ENGINEERING & SURVEYING", AS SHOWN ON SN2019-009
11	FOUND 5/8" IRON ROD, WITH YPC MARKED, "LEI ENGINEERING & SURVEYING", AS SHOWN ON SN2019-009

LEGEND:	
●	FOUND MONUMENT. REFERENCE MONUMENT TABLE FOR DESCRIPTION.
○	SET 5/8" x 30" IRON ROD WITH YELLOW PLASTIC CAP MARKED, "LEI ENGINEERING & SURVEYING", FLUSH WITH GROUND SET ON 10/09/2018
△	CALCULATED POINT
[ ]	RECORD DATA PER SN 26670
( )	RECORD DATA PER SN 29475
{ }	RECORD DATA PER SN 25454
(( ))	RECORD DATA PER SN 3534
{{ }}	RECORD DATA PER SN 3996
**	RECORD DATA PER PLAT 0451
< >	PLAT NUMBER
ROW	RIGHT OF WAY
YPC	YELLOW PLASTIC CAP
SN	SURVEY NUMBER, CLACKAMAS COUNTY SURVEY RECORDS
PUE	PUBLIC UTILITY EASEMENT



REGISTERED PROFESSIONAL LAND SURVEYOR <b>DRAFT</b> OREGON JANUARY 17, 1995 L. M. ALLEN 2688 RENEWAL 12/31/2019	<b>LEI ENGINEERING &amp; SURVEYING OF OREGON</b> 2564 19TH ST. SE SALEM, OR. 97302 TEL 503-399-3828 FAX 503-365-1852 CLIENT: H & K GROUP, LLC 79 SW OAK ST. PORTLAND, OR 97204	PROJECT: 15-162
		DRAWING No.: 15-162-PP
		FIELD DATE: 11/12/2018
		SCALE: 1"=30'
		PAGE: 1 OF 2
	DRAWN: R. MURRAY CALC'D: L.M. ALLEN	FIELD: T. DEVROE CHECKED: L.M. ALLEN



# PARTITION PLAT NO. \_\_\_\_\_

A PORTION OF LOT 82 & 83, "ROBINWOOD"  
 LOCATED IN THE S.W. 1/4 OF SECTION 14,  
 TOWNSHIP 2 SOUTH, RANGE 1 EAST, OF THE WILLAMETTE MERIDIAN,  
 CITY OF WEST LINN, CLACKAMAS COUNTY, OREGON  
 NOVEMBER 19, 2018  
 SURVEYED FOR: H & K GROUP, LLC

CLACKAMAS COUNTY SURVEYOR

DATE RECEIVED: \_\_\_\_\_  
 DATE ACCEPTED / FILED: \_\_\_\_\_  
 SURVEY NUMBER: \_\_\_\_\_

**SURVEYOR'S CERTIFICATE:**

I, L. M. ALLEN, A REGISTERED LAND SURVEYOR IN THE STATE OF OREGON, DO HEREBY CERTIFY THAT I HAVE CORRECTLY SURVEYED AND MARKED WITH PROPER MONUMENTS THE LAND REPRESENTED ON THIS PLAT, BEING A RE-PLAT OF PORTIONS OF LOT 82 AND LOT 83 OF "ROBINWOOD" SUBDIVISION IN THE CITY OF WEST LINN, COUNTY OF CLACKAMAS IN THE STATE OF OREGON AS THE SAME ARE DESCRIBED IN THE DEED RECORDED AS 2011--033325 IN THE RECORDS OF CLACKAMAS COUNTY AND DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTIAL POINT MARKED BY A 5/8" IRON ROD WITH A YELLOW PLASTIC CAP STAMPED "LEI ENGINEERING & SURVEYING" MARKING THE SOUTHWEST CORNER OF LOT 83 IN "ROBINWOOD" SUBDIVISION IN THE CITY OF WEST LINN, THENCE S 37°17'07"E ON THE SOUTHWESTERLY LINE OF SAID LOT 83 A DISTANCE OF 100.00 TO THE SOUTHWEST CORNER OF LOT 82 OF SAID SUBDIVISION, THENCE CONTINUING S 37°17'07"E ON THE SOUTHWESTERLY LINE OF SAID LOT 82 A DISTANCE OF 98.88 FEET TO THE SOUTHEAST CORNER THEREOF, THENCE N 52°41'50"E ON THE SOUTHEASTERLY LINE OF SAID LOT 82 A DISTANCE OF 100.00 FEET , THENCE LEAVING SAID SOUTHEASTERLY LINE N 37°17'07" W PARALLEL WITH THE SOUTHWESTERLY LINE OF SAID LOT 82 A DISTANCE OF 98.88 FEET TO A POINT ON THE SOUTHEASTERLY LINE OF SAID LOT 83, THENCE CONTINUING N 37°17'07" W PARALLEL WITH THE SOUTHWESTERLY LINE OF SAID LOT 83 A DISTANCE OF 100.00 FEET TO A POINT ON THE NORTHWESTERLY LINE OF SAID LOT 83, THENCE S 52°41'50" W ON SAID NORTHWESTERLY LINE A DISTANCE OF 100.00 FEET TO THE POINT OF BEGINNING.

EXCEPTING THEREFROM: THE WESTERLY 1.00 FEET DECLARED DEDICATED FOR STREET WIDENING

AN EXCLUSIVE 20.00 FEET IN WIDTH ACCESS AND UTILITY EASEMENT OVER, ACROSS AND UPON PARCEL 1 BENEFITTING PARCEL 2 AS SHOWN HEREON IS CREATED AND GRANTED BY THIS PARTITION.

\_\_\_\_\_  
 L.M. ALLEN, PLS DATE

**NARRATIVE:**

THE PURPOSE OF THIS SURVEY PLAT IS TO PARTITION INTO TWO (2) PARCELS THAT TRACT OF LAND DESCRIBED IN THE DEED RECORD 2011--033325, RECORDS OF CLACKAMAS COUNTY, OREGON.

ALL FOUND MONUMENTS AS SHOWN HEREON, WERE ACCEPTED AS MARKING THE TRUE CORNERS WITHIN REASONABLE SURVEY MEASUREMENT TOLERANCES UNLESS OTHERWISE NOTED. THE BEARING OF S 52°41'50" W BETWEEN FOUND MONUMENT #11 AND FOUND MONUMENT #10 WAS ADOPTED CONFORMING TO CLACKAMAS COUNTY SURVEY RECORD SN2019--009.

**DECLARATION:**

KNOW ALL PERSONS BY THESE PRESENTS THAT MONTE E NOTTON AND DEBORAH A NOTTON ARE THE OWNERS OF THE LAND REPRESENTED ON THIS PLAT AND DESCRIBED IN THE ACCOMPANYING SURVEYOR'S CERTIFICATE AND HAVE CAUSED THE SAME TO BE SURVEYED AND PARTITIONED INTO PARCELS, WITH EASEMENTS GRANTED AND DEDICATE TO THE PUBLIC THE RIGHT-OF-WAY EXPANSION AS SHOWN HEREON.

IN WITNESS WHEREOF I SET MY HAND THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2019.

\_\_\_\_\_  
 MONTE E NOTTON DATE

\_\_\_\_\_  
 DEBORAH A NOTTON DATE

**ACKNOWLEDGMENT:**

STATE OF OREGON )  
 ) SS.

COUNTY OF CLACKAMAS )  
 KNOWN ALL PEOPLE BY THESE PRESENTS, ON THIS \_\_\_\_ DAY OF \_\_\_\_ 2019, PERSONALLY APPEARED MONTE E NOTTON, BEING DULY SWORN, AND BEING THE IDENTICAL PERSON MENTIONED IN THE FOREGOING INSTRUMENT, EXECUTED SAID INSTRUMENT BEFORE ME, A NOTARY PUBLIC FOR THE STATE OF OREGON, AND ACKNOWLEDGED THE FORGOING INSTRUMENT TO BE THEIR VOLUNTARY ACT AND DEED.

\_\_\_\_\_  
 NOTARY SIGNATURE

\_\_\_\_\_  
 NOTARY PUBLIC-OREGON COMMISSION NUMBER EXPIRES  
 (PRINT NAME)

STATE OF OREGON )  
 ) SS.

COUNTY OF CLACKAMAS )  
 KNOWN ALL PEOPLE BY THESE PRESENTS, ON THIS \_\_\_\_ DAY OF \_\_\_\_ 2019, PERSONALLY APPEARED DEBORAH A NOTTON, BEING DULY SWORN, AND BEING THE IDENTICAL PERSON MENTIONED IN THE FOREGOING INSTRUMENT, EXECUTED SAID INSTRUMENT BEFORE ME, A NOTARY PUBLIC FOR THE STATE OF OREGON, AND ACKNOWLEDGED THE FORGOING INSTRUMENT TO BE THEIR VOLUNTARY ACT AND DEED.

\_\_\_\_\_  
 NOTARY SIGNATURE

\_\_\_\_\_  
 NOTARY PUBLIC-OREGON COMMISSION NUMBER EXPIRES  
 (PRINT NAME)

**CLACKAMAS COUNTY APPROVALS:**

CLACKAMAS COUNTY PLANNING FILE NO. \_\_\_\_\_

APPROVED THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2019.

BY: \_\_\_\_\_  
 CLACKAMAS COUNTY PLANNING COMMISSION DIRECTOR DATE

APPROVED THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2019.

BY: \_\_\_\_\_  
 CLACKAMAS COUNTY SURVEYOR; AND CLACKAMAS COUNTY BOARD OF COMMISSIONERS DELEGATE PER COUNTY CODE CHAPTER 11.02

ALL TAXES, FEES, ASSESSMENTS AND OTHER CHARGES AS PROVIDED BY O.R.S. 92.095 HAVE BEEN PAID THRU JUNE 30, \_\_\_\_\_.  
 APPROVED THIS \_\_\_\_ DAY OF \_\_\_\_\_, 2019.

CLACKAMAS COUNTY ASSESSOR AND TAX COLLECTOR  
 BY: \_\_\_\_\_  
 DEPUTY DATE

STATE OF OREGON )  
 ) SS.

COUNTY OF CLACKAMAS )

I DO HEREBY CERTIFY THAT THE ATTACHED PARTITION PLAT WAS RECEIVED FOR RECORD ON THE \_\_\_\_ DAY OF \_\_\_\_\_, 2019 AT \_\_\_\_ O'CLOCK \_\_.M.

AS PARTITION PLAT NO. \_\_\_\_\_  
 DOCUMENT NO. \_\_\_\_\_

SHERRY HALL, CLACKAMAS COUNTY CLERK

BY: \_\_\_\_\_  
 DEPUTY DATE

REGISTERED PROFESSIONAL LAND SURVEYOR  <b>DRAFT</b>  OREGON JANUARY 17, 1995 <b>L. M. ALLEN</b> 2688  RENEWAL 12/31/2019	<b>LEI ENGINEERING &amp; SURVEYING OF OREGON</b> 2564 19TH ST. SE TEL 503-399-3828 SALEM, OR. 97302 FAX 503-365-1852	PROJECT: 15-162
	CLIENT: H & K GROUP, LLC 79 SW OAK ST. PORTLAND, OR 97204	DRAWING No.: 15-162-PP
	DRAWN: R. MURRAY FIELD: T. DEVROE	FIELD DATE: 2/14/2018
	CALC'D: L.M. ALLEN CHECKED: L.M. ALLEN	SCALE: 1"=30'
		PAGE: 2 OF 2



Structural • Civil Engineers

**STORM DRAINAGE  
CALCULATIONS**

**FOR**

**Arbor Drive Partition**  
2322 Arbor Drive  
WEST LINN, OR 97068

**April 15, 2019**



RENEWS: 12-31-2019

**TABLE OF CONTENTS/INCLUSIONS:**

**Storm Drainage Narrative:.....STM-1 to STM-2**  
**Tributary Area Maps:.....STM-3 to STM-4**  
**Simplified Approach Form:.....STM-5 to STM-6**  
**Geotech Recommendations:.....STM-7 to STM-9**  
**Storm Basin Detail:.....STM-10**



Hamilton and Kashoro  
79 Oak Street  
Portland, OR 97204

April 15, 2019

**RE: Arbor Drive Partition “Storm Drainage Narrative and Analysis Report”**

Dear Ryan Pfeifer and Kevin Kashoro,

At your request, WDY, Inc. has completed the following storm drainage calculations for the 2322 Arbor Drive Partition project in West Linn, Oregon. The purpose of this report is to show the analysis and design of storm water, water quality and detention systems utilizing City of Portland style Storm Planters also known as “rain gardens” to provide detention and water quality for all new and redeveloped impervious areas. The storm drainage detention and water quality systems are designed per the City of West Linn’s Design Standards for Storm Drain Requirements. The water quality meets the 2016 City of Portland’s Stormwater Management Manual (SWMM) standards for the “Simplified Approach” which the City of West Linn accepts for water quality and detention design for small projects.

**Site Existing Conditions**

The existing site is currently one tax lot of 19,888 sf that consists of two buildings, a gravel access easement, a concrete driveway and walkway. The remaining area of the lot is generally covered in native vegetation and dense tree cover. The northwesterly property line fronts Arbor Drive. The site slopes consistently across the site at approximately 7.5% from the southwesterly property line down to the northeasterly direction. It is assumed that the site currently drains overland and storm runoff enters the public system at the nearest downstream public catch basin. There is no known private storm lateral to this site. The existing buildings, concrete slabs and any other existing features onsite will be demolished, and the site will be stripped prior to new construction.

**Proposed New Site Development:**

The proposed development will partition the one property into two separate tax lots. The proposed partition will split the existing 19,888 sf residential property into two, nearly equivalent, parcels (Parcel 1 north lot = 10,000 sf; Parcel 2 south lot = 9,888 sf). Each parcel will obtain separate building permits, and as such require separate analysis. The south parcel 2 is required to construct public improvements, which will be permitted separately.

The City of West Linn has a policy of considering infiltration onsite when infiltration rates are greater than or equal to 2in/hr. The project geotechnical investigations recommended that infiltration will not be feasible due to the soil type and very low infiltration rates discovered on site. Based on these recommendations and the proximity of the storm basin to the public right of way and proposed building foundation, a lined storm basin was used in the stormwater design.

The Parcel 2 south lot proposes to construct an approximately 4,361 sf (impervious roof area) residential home. The total impervious area of the proposed South Parcel 2 development is 5,292 sf including roof, driveway and sidewalk. All new or redeveloped impervious area will drain to the new storm basin designed to provide water quality and detention to meet City of West Linn storm water policies.

Arbor Drive Residential Partition  
"Stormwater Design Narrative"

Page 2

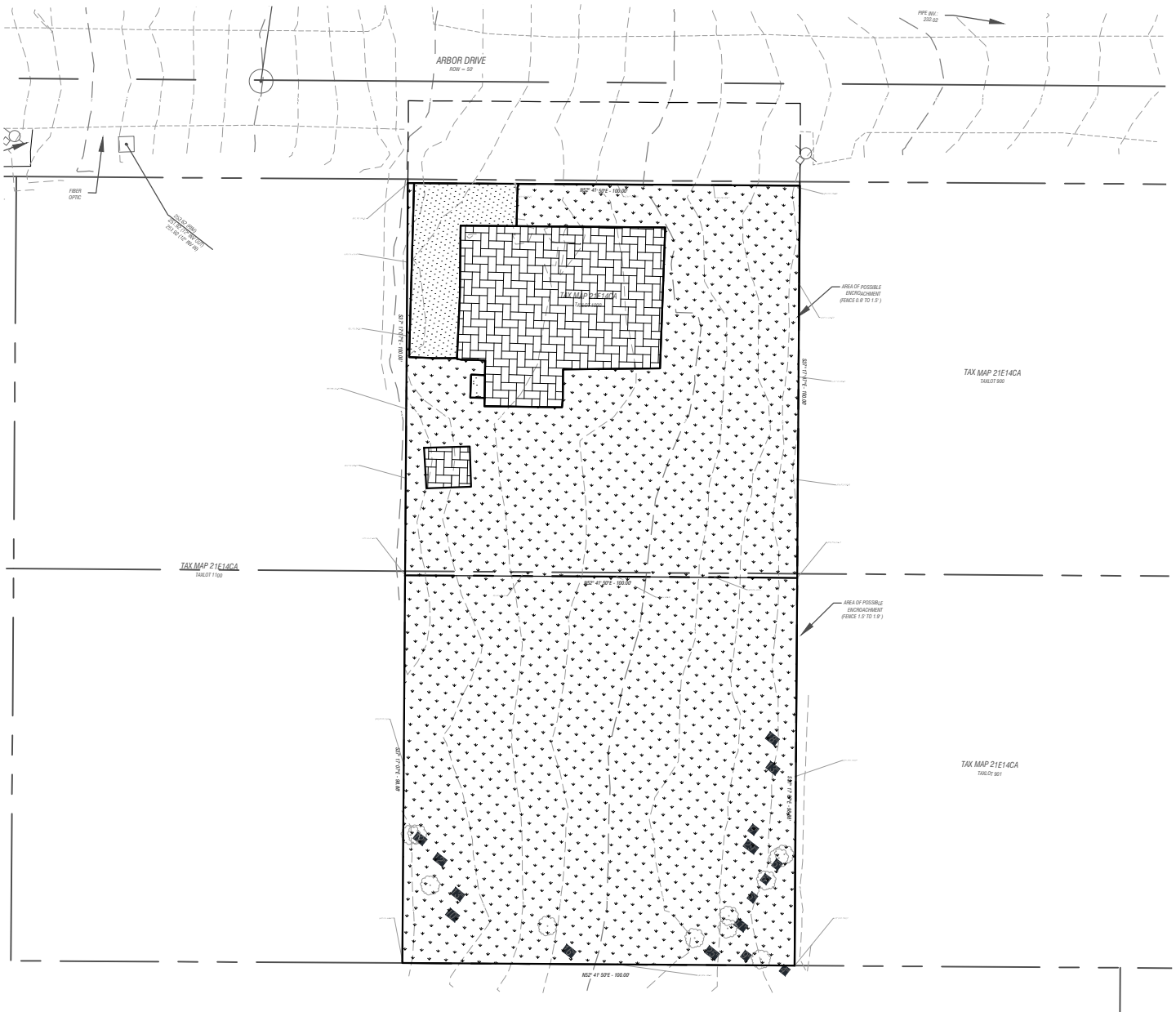
**Storm Basin:**

The new storm basin has 3H:1V side slopes, a total top of basin foot print of 492 sf and a bottom area is 154 sf. The total storage depth is 1.0 feet with 0.5 feet of freeboard and the total depth of the storm basin water quality and detention volume being 1.5 feet. Roof water from the new building (3,070 sf) will directly discharge to the storm basin and the driveway will discharge to a catch basin with a trapped and sumped outlet that provides initial pre-treatment per DEQ standards prior to discharging to the basin. This storm basin was designed using the City of Portland's Simplified Approach for water quality and detention. Please refer to the completed Simplified Approach form for more information.

Sincerely,  
Chris DesLauriers, PE



TOTAL SITE = 19,888 S.F. = 0.456 AC



EXISTING CONCRETE & PAVEMENT  
723 SF  
CN=98



EXISTING ROOF  
2,177 SF  
CN=98



EXISTING LANDSCAPING  
7,100 SF  
CN=86



EXISTING CONDITIONS MAP

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6443 SW Beaverton-Hillsdale Hwy, suite 210  
Portland, Oregon 97221  
ph:503.203.8111 fx:503.203.8122  
www.wdyi.com

**SCALE:** 1" = 20'-0"

**Job Name:** ARBOR DRIVE RESIDENTIAL

**Date:** APR 2019

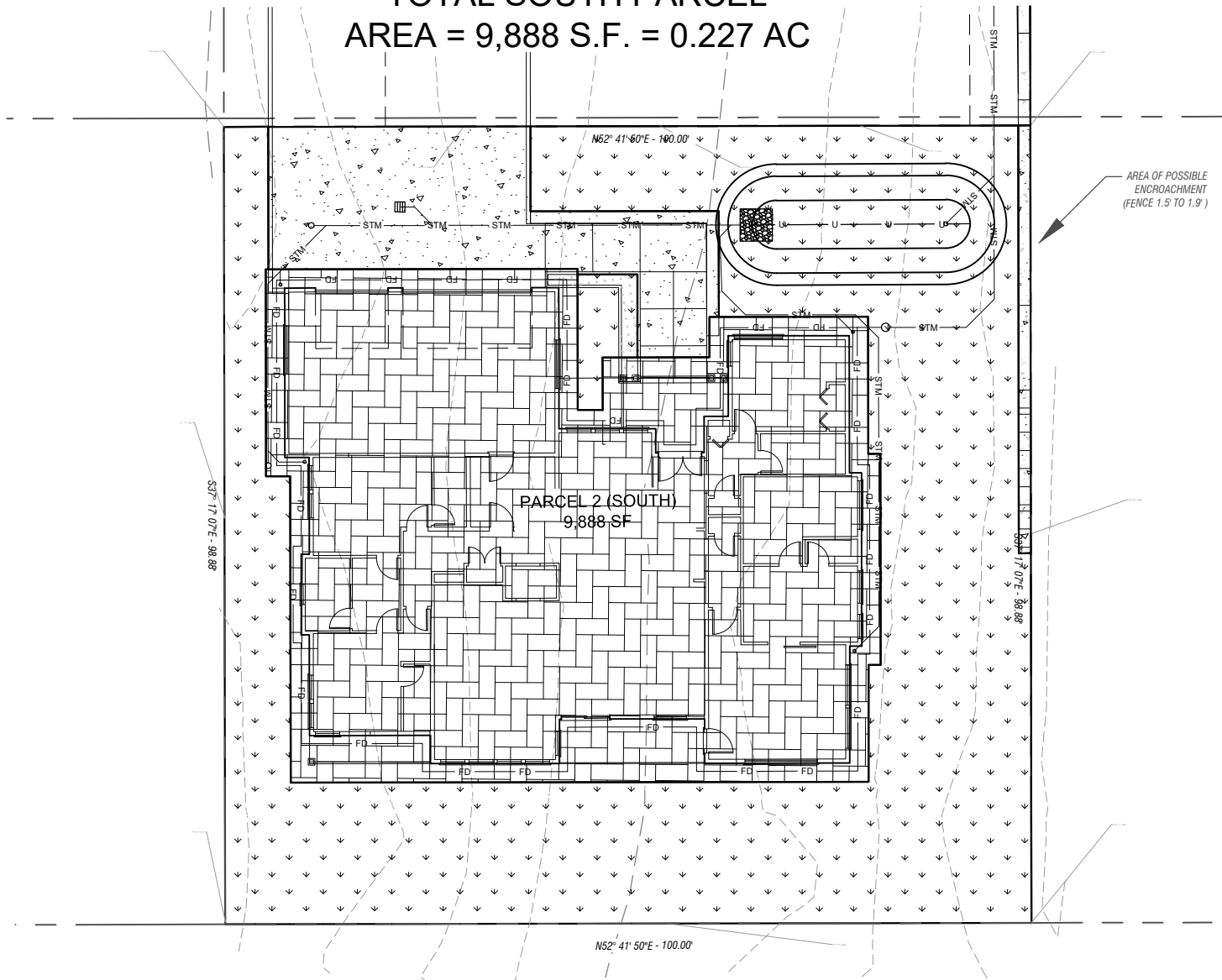
**Job No.:** 19035

**Drawn:** PRM


**Client:** H&K


**Sheet:** STM-3


TOTAL SOUTH PARCEL  
AREA = 9,888 S.F. = 0.227 AC




TAX MAP 21E14CA  
TAXLOT 1300

- 

PROPOSED NEW PAVEMENT 0 SF  
CN=98
- 

PROPOSED NEW CONCRETE 931 SF  
CN=98
- 

PROPOSED NEW ROOF 4,361SF  
CN=98
- 

PROPOSED LANDSCAPING 4,596 SF  
CN=86



## PROPOSED NORTH PARCEL AREA MAP

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 Portland, Oregon 97221  
 ph:503.203.8111 fx:503.203.8122  
 www.wdyi.com

**SCALE:** 1" = 20'-0"

**Job Name:** ARBOR DRIVE RESIDENTIAL

**Date:** APR 2019

**Job No.:** 19035

**Drawn:** PRM

**Client:** H&K

**Sheet:** STM-4



# SIMPLIFIED APPROACH FORM

## PROJECT INFORMATION WORKSHEET

### PROJECT INFORMATION

Permit Number: \_\_\_\_\_ Phone: \_\_\_\_\_

Name: \_\_\_\_\_ Email: \_\_\_\_\_

Site Address/R Number(s): \_\_\_\_\_

Development Description: \_\_\_\_\_

Total New or Redeveloped Impervious Area: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

### SITE CHARACTERISTICS

S.1. Do slopes exceed 20% anywhere within the project area?  Yes  No

S.2. Are there springs, seeps, or a high groundwater table anywhere within the project area?  Yes  No

**If answer to S.1 or S.2 is yes**, than lined or partial infiltration facility with an overflow to an approvable discharge point is required.

S.3. Is there a required geotechnical report?  Yes  No

S.4. Required infiltration testing complete?  Yes  No

If using prior test results at same site, provide Land Use case/permit number: \_\_\_\_\_

### Required Infiltration Testing

Date of Test: \_\_\_\_\_

Depth of Excavation (ft): \_\_\_\_\_

	TEST 1	TEST 2	TEST 3
A. Time (of day)			
B. Duration (hours) (1 hour minimum)			
C. Initial Water Depth (inches)			
D. Final Water Depth (inches)			
E. Infiltration Rate* (inches/hour)			

\*Infiltration Rate = Initial Depth (in) – Final Depth (in) / Duration of Test (hours)

### SIMPLIFIED INFILTRATION TESTING PROCEDURE

The Simplified Approach provides a method that a nonprofessional can use for design of simple stormwater systems on small projects. A geotechnical report or different infiltration test may be required at the discretion of the assigned BES plan reviewer. See Section 2.3.6 for infiltration testing requirements.

#### Test instructions:

1. Conduct test in and/or near location of proposed infiltration facility.
2. Excavate a test hole a minimum of 16" in depth, or to the bottom of the proposed infiltration system, whichever is greater. If a hard pan layer is encountered that prevents further excavation, or if noticeable moisture/water is encountered in the soil, stop and measure this depth and note it on the SIM form. If further excavation is not possible, conduct the test at this depth.
3. Fill the hole with water to a depth of at least 6" from the bottom of the hole. Record the amount of time required for the water to draw down to the bottom of the test pit. Check the water level at regular intervals to ensure accurate data collection.
4. Repeat the process two more times for a total of 3 rounds of testing. Conduct the tests in succession to accurately portray the soil's ability to infiltrate at different levels of saturation. The 3rd test provides the best measure of the infiltration rate at saturated conditions.
5. Record infiltration test data in the table at left and certify the results.

### Test pit location (site plan sketch)

Key information to include: 1) Site or parcel, 2) Adjacent road(s) or cross street(s), 3) Test pit location with dimensions



### Certification of Infiltration Results (required)

I acknowledge the accuracy of these infiltration testing results.

Signature of tester (required) \_\_\_\_\_

Print Name \_\_\_\_\_

Date \_\_\_\_\_

# SIMPLIFIED APPROACH FORM

## PROPOSED STORMWATER FACILITIES

### Proposed Stormwater Facilities

Please note: Each individual taxlot is required to manage the stormwater runoff it generates from new construction or redevelopment on the same lot to the maximum extent feasible. The following table includes accepted simplified stormwater management facilities as described in Chapter 2 of the 2016 Stormwater Management Manual. Copies of the manual are available online at [www.portlandoregon.gov/bes/swmm](http://www.portlandoregon.gov/bes/swmm).

	STORMWATER FACILITY TYPE	TOTAL AREA MANAGED BY FACILITY TYPE (SF)	FACILITY SIZING FORMULA	FACILITY SIZE (SF)
<b>IMPERVIOUS AREA REDUCTION TECHNIQUE</b>	Tree Credit		Complete Tree Credit Worksheet and attach	n/a
	Ecoroof		1:1 ratio only	n/a
	Pervious Pavement		1:1 ratio only	n/a
<b>SURFACE INFILTRATION OR FILTRATION</b>	Downspout Extension		Area x 0.10	
	Rain Garden		Area x 0.10	
	Basin		Area x 0.09	
	Swale		Area x 0.09	
	Planter		Area x 0.06	
	Filter Strip (paved areas only)		Area x 0.20	
<b>SUBSURFACE DISPOSAL UIC</b>	Soakage Trench		Westside soakage trench no longer an option under the simplified approach. Only a single soakage trench sizing possible. <i>See below for sizing information.</i>	
	Drywell		Enter drywell type and quantity for facility size. <i>See below for sizing information.</i>	
<b>TOTAL IMPERVIOUS AREA MANAGED</b>			Total Impervious Area Managed must match Total New or Redeveloped Impervious Area. Site plans must identify stormwater facility location, drainage areas, overflows and escape routes.	

Subsurface facilities can receive overflow from impervious area reduction techniques or surface infiltration/filtration facilities or can be used independently to manage runoff. If stormwater is generated from anything other than roof area, stormwater facilities are subject to UIC requirements (see Chapter 1 for UIC requirements).

### Sizing Charts:

DRYWELL TYPE	AREA MANAGED	SOAKAGE TRENCH	LENGTH PER 1,000 SF OF IA	WIDTH	DEPTH	SIZING
2'x2' mini drywell	Up to 500 sf	Soakage Trench	20'	2.5'	1.5'	AREA x 0.05
28"x5'	Up to 1,000 sf					
4'x5'	Up to 3,000 sf					
4'x10'	Up to 6,000 sf					



beneath this the soils were generally characterized by a medium stiff to stiff consistency. This material extended to depths of 3.5 to 4.5 feet below the ground surface.

**Residual Soil:** Underlying the Willamette Formation soils were a stiff, light brown, clayey SILT (ML) soils, with light gray, extremely soft (R0) to soft (R2) heavily weathered basalt derived from weathering of the Columbia River Basalt Formation. This material extended beyond the maximum depth of our hand auger explorations. Due to the inability to excavate through the weathered basalt fragments using conventional hand auger equipment the maximum depth of explorations was 5 feet below ground existing surface.

### **Groundwater and Soil Moisture**

On January 31, 2019, groundwater seepage was not encountered in our hand auger soil borings. Soil moistures observed were generally considered to be moist to very moist in the upper 3 feet and damp to moist within the remainder of the soil profile of our hand auger explorations. According to the *Estimated Depth to Groundwater in the Portland, Oregon Area, (United States Geological Survey, 2018)*, groundwater is expected to be present at an approximate depth of 105-115 feet below the ground surface. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater may be encountered in localized areas. Seeps and springs may exist in areas not explored and may become evident during site grading.

### **Infiltration Testing**

On January 31, 2019, soil infiltration testing was performed using the falling-head method within all hand auger soil boring locations, in accordance with the methodology of the 2014 City of Portland Stormwater Management Manual. The approximate locations of the subsurface explorations are displayed in Figure 3. The test locations were pre-saturated prior to testing. During testing the water level was measured to the nearest 0.1 inch from a fixed point, and the change in water level was recorded at regular intervals until three successive measurements showing a consistent infiltration rate were achieved.

Table 2 summarizes the results of the falling-head infiltration testing. Infiltration rates have been reported without applying a factor of safety. Groundwater was not encountered within our hand auger soil boring explorations which extended to a maximum depth approximately 5 feet. Infiltration was not observed during the falling-head infiltration test at these elevations. We recommend that stormwater infiltration not be conducted as part of the residential development, and that other types of systems such as flow-through planters, side-street swales, or connecting to available public storm systems be considered during site development.

**Table 2- Summary of Infiltration Test Results**

Exploration Designation	Depth (feet)	Soil Type	Infiltration Rate(in/hr)	Hydraulic Head Range (inches)
HA-1	4	SILT (ML)	0	12
HA-2	5	SILT (ML)	0	12
HA-3	4	SILT (ML)	0	12

**CONCLUSIONS AND RECOMMENDATIONS**

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and sufficient geotechnical monitoring is incorporated into the construction phases of the project. The primary geotechnical concerns associated with development at the property are:

- 1) The low permeability of onsite soils. Onsite infiltration testing in all hand auger soil borings displayed no observable infiltration during testing and soils observed in our hand auger explorations to 5 feet in depth were characteristic of low permeability.
- 2) The presence of soft native soils in the upper two to three feet. Soils in the upper two to three feet were observed to be soft to medium stiff. Moisture conditioning and re-compaction or over-excavation and/or replacement with structural fill may be necessary for adequate foundation support.

**Site Preparation Recommendations**

Areas of proposed buildings, new roadways, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures should be demolished and any cavities structurally backfilled. Inorganic debris and organic materials from clearing should be removed from the site.

Existing fill and any organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. The estimated depth necessary for removal of topsoil is approximately 8 to 10 inches – deeper stripping may be necessary to remove large tree roots in isolated areas. A thicker topsoil layer with evidence of being disturbed was observed in hand auger boring location HA-1. A greater depth of stripping will be necessary in this vicinity. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.



Base image provided by Portland Maps

**Legend**



Hand Auger Designation,  
 Approximate Location,  
 and Depth of Rock Refusal



Site Boundary

Date: 2.5.2019 Drawn by: MTB



APPROXIMATE SCALE 1"=30'



Job Name: **Arbor Drive Residential Partition**

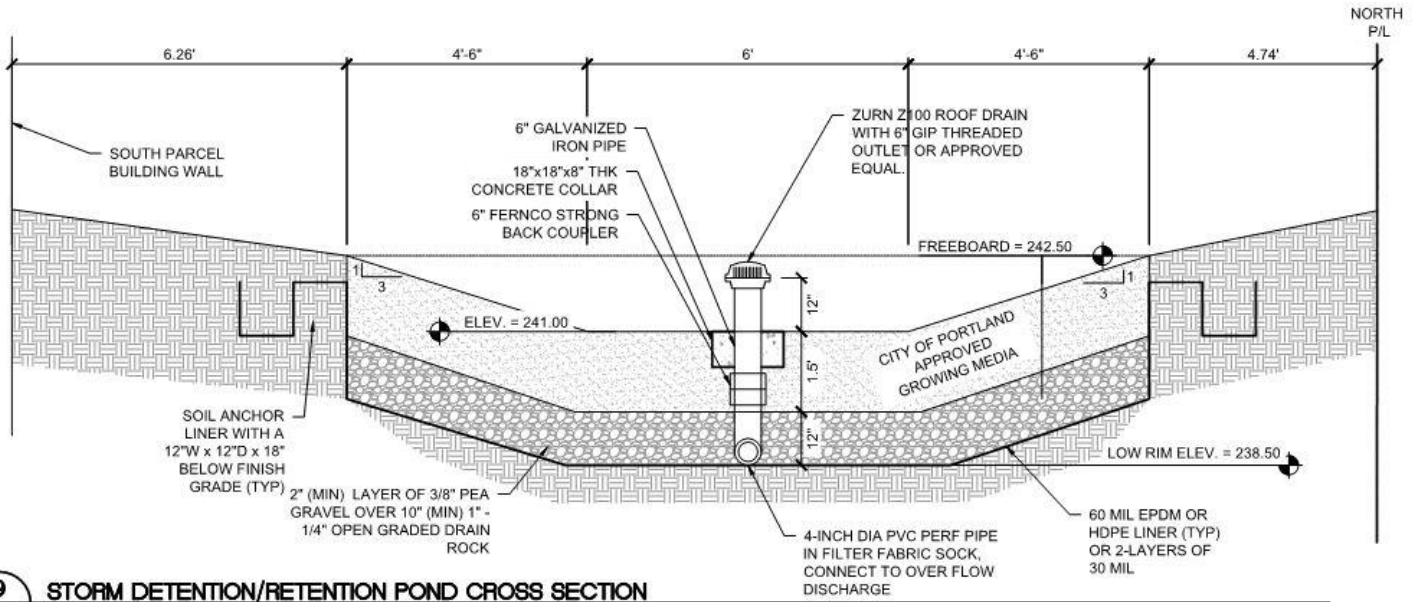
Job No: **19035**

Sheet No: **STM - 10**

Client: **Hamilton and Kashoro**

Date: **April 2019**

By: **PRM**



CIVIL NOTES

- 01.0 GENERAL
1. THESE NOTES SET MINIMUM STANDARDS FOR CONSTRUCTION. THE DRAWINGS GOVERN OVER THE GENERAL NOTES TO THE EXTENT SHOWN.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON DRAWINGS AND IN FIELD. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO PROCEEDING WITH WORK.
3. CONTRACTOR SHALL SOLELY BE RESPONSIBLE TO PROVIDE FOR ALL NECESSARY TRAFFIC CONTROL PLANS, TEMPORARY SHORING AND OTHER INCIDENTAL WORK NEEDED FOR THE COMPLETION OF THE WORK.
... (rest of list items 1-29)

STRUCTURAL CONCRETE UNLESS EFFECTIVELY COATED.

- D. PROVIDE CONTROL JOINTS IN ALL SLABS ON GRADE AS SHOWN ON PLANS. IN AREAS WHERE JOINTS ARE NOT SHOWN, INSTALL IN SQUARE PATTERN AT 15' ON CENTER EACH WAY MAXIMUM.
E. PROVIDE 14' WIDED EXPANDED JOINT REINFORCEMENT BETWEEN SLABS AND WALLS THAT ARE NOT DOWELED TOGETHER, AND AROUND COLUMNS THAT DO NOT HAVE SLAB BLOCKOUTS.
... (rest of list items 31-33)

02.0 CLEARING AND GRUBBING

- 1. ALL CONSTRUCTION AND MATERIALS WITHIN THE PUBLIC RIGHT-OF-WAY SHALL CONFORM TO THESE PLANS AND THE APPLICABLE REQUIREMENTS OF CITY OF WEST LINN, STATE OF OREGON AND FEDERAL EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES.
2. NOTIFY ARCHITECT 2 BUSINESS DAYS BEFORE COMMENCING WORK.
3. CONTRACTOR SHALL REMOVE ALL TREES, SHRUBS, RUBBISH, AND MAN-MADE STRUCTURES INCLUDING BUT NOT LIMITED TO CONCRETE SLABS, WALLS, VAULTS, FOOTINGS, ASPHALTIC PAVED SURFACES, GRAVELED AREAS, SHED OR OTHER FREE-STANDING BUILDINGS (CONSTRUCTED OF WOOD, CONCRETE, METAL, ETC.).
... (rest of list items 4-12)

03.0 PRIVATE UTILITIES

- 1. CONTRACTOR TO PROVIDE UTILITY SUBMITTALS FOR REVIEW PRIOR TO INSTALLATION OF ALL PRIVATE UTILITY PIPES, CONDUITS, MANHOLES, BENDS/FITTINGS AND ALL OTHER SYSTEM APPURTENANCES.
2. SANITARY SEWER, STORM DRAIN AND WATER LINES IN PRIVATE PROPERTY SHALL BE PRIVATELY OWNED, MAINTAINED AND OPERATED. PROVIDE TRACER WIRE AND WARNING TAPE FOR ALL PLASTIC UTILITY LINES.
3. ALL PRIVATE CATCH BASINS, AREA DRAINS, STORM DRAIN PIPE, SANITARY SEWER PIPE AND WATER PIPE AND APPURTENANCES SHALL MEET THE REQUIREMENTS OF THE LATEST INTERNATIONAL PLUMBING CODE AS APPLICABLE.
... (rest of list items 4-20)

EXTERIOR CLEANOUTS IN WALKWAYS SHALL BE J.R. SMITH 4023-U WITH HEAVY DUTY NICKEL BRONZE TOP, TAPER HEAD, ABS PLUG AND TOP SECURED WITH VANDAL PROOF SCREWS, FLUSH AT FINISH GRADE.

- 17. EXTERIOR CLEANOUTS IN WALKWAYS SHALL BE J.R. SMITH 4023-U WITH HEAVY DUTY NICKEL BRONZE TOP, TAPER HEAD, ABS PLUG AND TOP SECURED WITH VANDAL PROOF SCREWS, FLUSH AT FINISH GRADE.
18. ALL SEWER LINES SHALL BE LAID IN A STRAIGHT ALIGNMENT AND IN A UNIFORM GRADE BETWEEN MANHOLES. CLEANOUTS OR OTHER STRUCTURES.
19. PVC WATER PIPE (3/4" TO 2-1/2" DIAMETER) SHALL CONFORM WITH ASTM D2241, 160 PSI PIPE. JOINTS SHALL BE SOLVENT CEMENT WELDED CONFORMING WITH ASTM D2672 OR ASTM 03036. SOLVENT CEMENT SHALL CONFORM TO ASTM D 2564.
... (rest of list items 20-30)

04.0 CONSTRUCTION OBSERVATION, INSPECTION AND TESTING

- 04.1 GENERAL
1. INDEPENDENT TESTING LAB TO BE RETAINED BY OWNER TO PROVIDE INSPECTIONS AND SPECIAL INSPECTIONS AS DESCRIBED HEREIN.
2. CONTRACTOR IS RESPONSIBLE TO COORDINATE AND PROVIDE ON SITE ACCESS TO ALL REQUIRED INSPECTIONS AND NOTIFY GEOTECHNICAL ENGINEER AND TESTING LABS IN TIME TO MAKE SUCH INSPECTIONS AND ALL NECESSARY REINSTRUCTIONS.
3. CONTRACTOR DO NOT COVER WORK REQUIRED TO BE INSPECTED OR REINSPECTED PRIOR TO INSPECTION BEING MADE. IF WORK IS COVERED, UNCOVER AS NECESSARY.
4. INSPECTORS SHALL PROMPTLY NOTIFY THE CONTRACTOR PRIOR TO LEAVING THE SITE AND OWNER'S REPRESENTATIVE OF SUBSTANDARD WORK AND PROVIDE A COPY OF ALL REPORTS TO THE OWNER, ARCHITECT, ENGINEER, CONTRACTOR, AND BUILDING OFFICIAL.
... (rest of list items 4.2)

CIVIL ABBREVIATIONS

Table with 4 columns: ABBR, ABBREVIATION, GSP, GALVANIZED STEEL PIPE. Includes items like ACCDG, ADA, ADA ALT, APPX, ARCH, ARV, BCR, BLDG, BO, BOC, BOT, B.P. or BP, BR, BS, B.S, BTWN, BW, CB, CI, CJ, CL or C/L, CLR, CNTR, CO, COM, CONN, CONT, CRN or CRWN, CSO, CULV, DBL, DC, DCDA, DET, DI, DIM, DOM, DP, DS, DW, D/W, E, E.A, ECR, EG, EJ, EL or ELV, ELEC, EMBD, EOP, E.P. or EP, EQ, ER, ESC, EW, EX or EXIST, EXT, FDC, FDN, FF, FC, FH, FIN, FL, FL S, FLG, FLR, FP, FOC, FTG, GA, GALV, GB, GEN, GR, GS.

CIVIL DRAWINGS

Table with 2 columns: Sheet Number, Sheet Title. Includes items: C1.00, C1.10, C2.00, C2.10, C2.20, C3.00, C3.10.



WDY logo and contact information: 6443 SW Beaverton-Hillsdale Hwy, suite #10, Portland, OR 97221. Phone: 503.203.8122, website: www.wdy.com

ARBOR DRIVE PARTITION

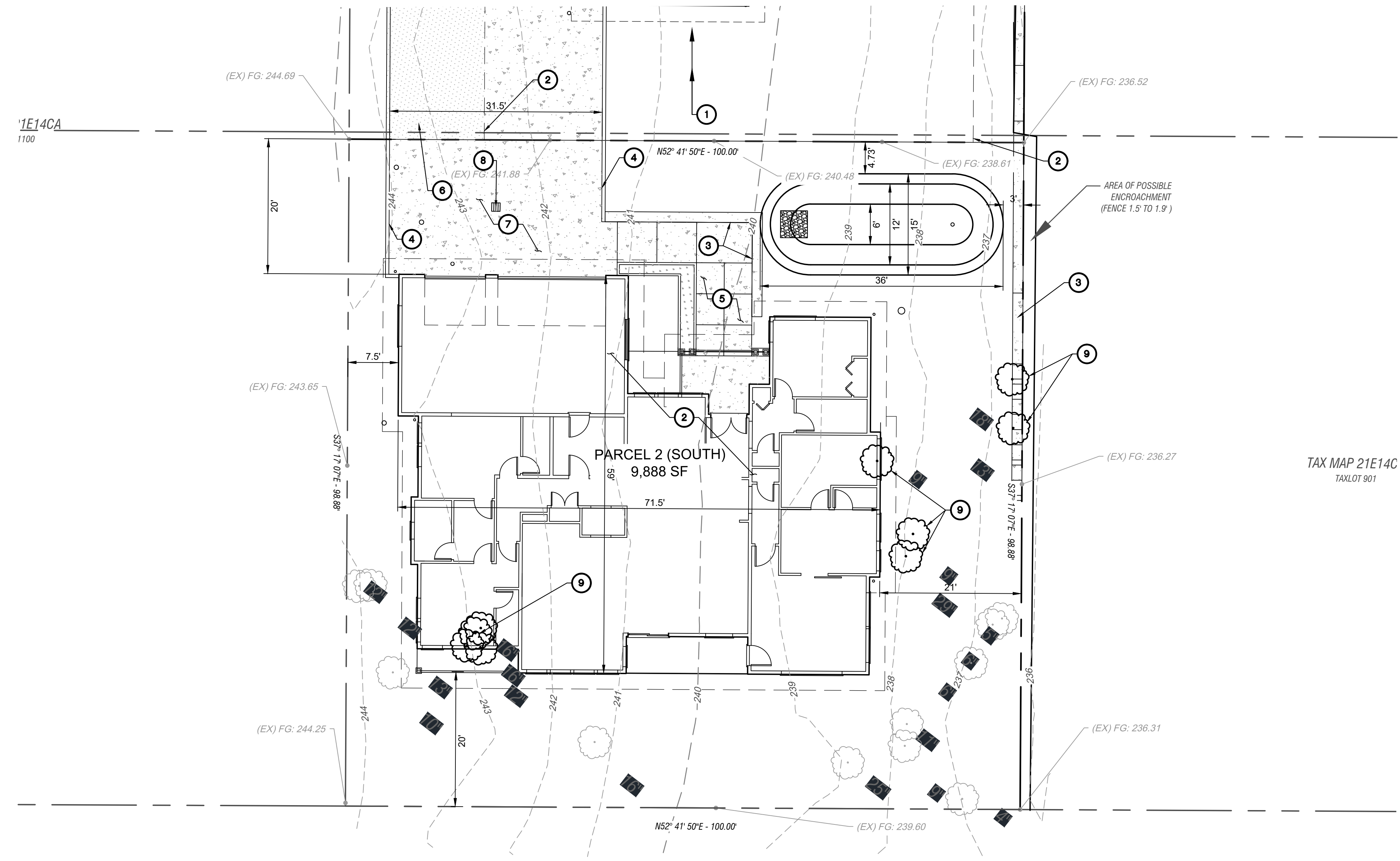
2322 ARBOR DRIVE WEST LINN, OR 97068

ONSITE CIVIL NOTES AND ABBREVIATIONS

Table with 4 columns: REVISIONS, DRAWN, CHECKED, DATE, JOB NUMBER. Includes values like 19035, 16/05/20.

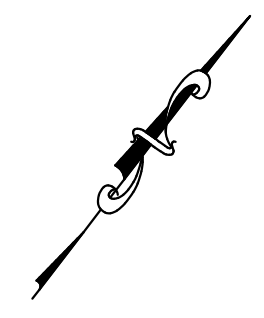
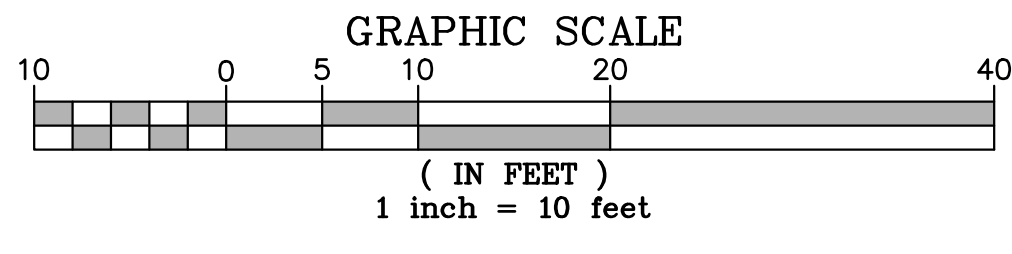
SHEET

C1.00



KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	SEE PUBLIC WORKS IMPROVEMENT DRAWINGS FOR PUBLIC WORKS ASSOCIATED WITH PARCEL 2 (TYP).
2	SEE ARCHITECT'S SITE PLAN FOR CONFIRMATION OF EASEMENT AND BUILDING LOCATION AND DIMENSIONS (TYP).
3	NEW "KEYSTONE" BLOCK WALL, SEE GRADING PLAN. PROVIDE BIDDER DESIGN WALL FOR STRUCTURAL WALL GREATER THAN 4'-0".
4	NEW STANDARD CURB, SEE GRADING PLAN.
5	NEW SIDEWALK, CONFIRM WITH OWNER/ARCHITECT FOR DIMENSIONS.
6	NEW AC PAVED SHARED ACCESS DRIVE UNDER SEPARATE PERMIT, SEE GRADING PLAN.
7	NEW CONCRETE DRIVEWAY, SEE GRADING PLAN.
8	NEW CATCH BASIN, SEE UTILITY PLAN.
9	REMOVE EXISTING TREE(S) FOR NEW WORK, CONFIRM TREE REMOVAL WITH ARBORIST TREE PLAN.

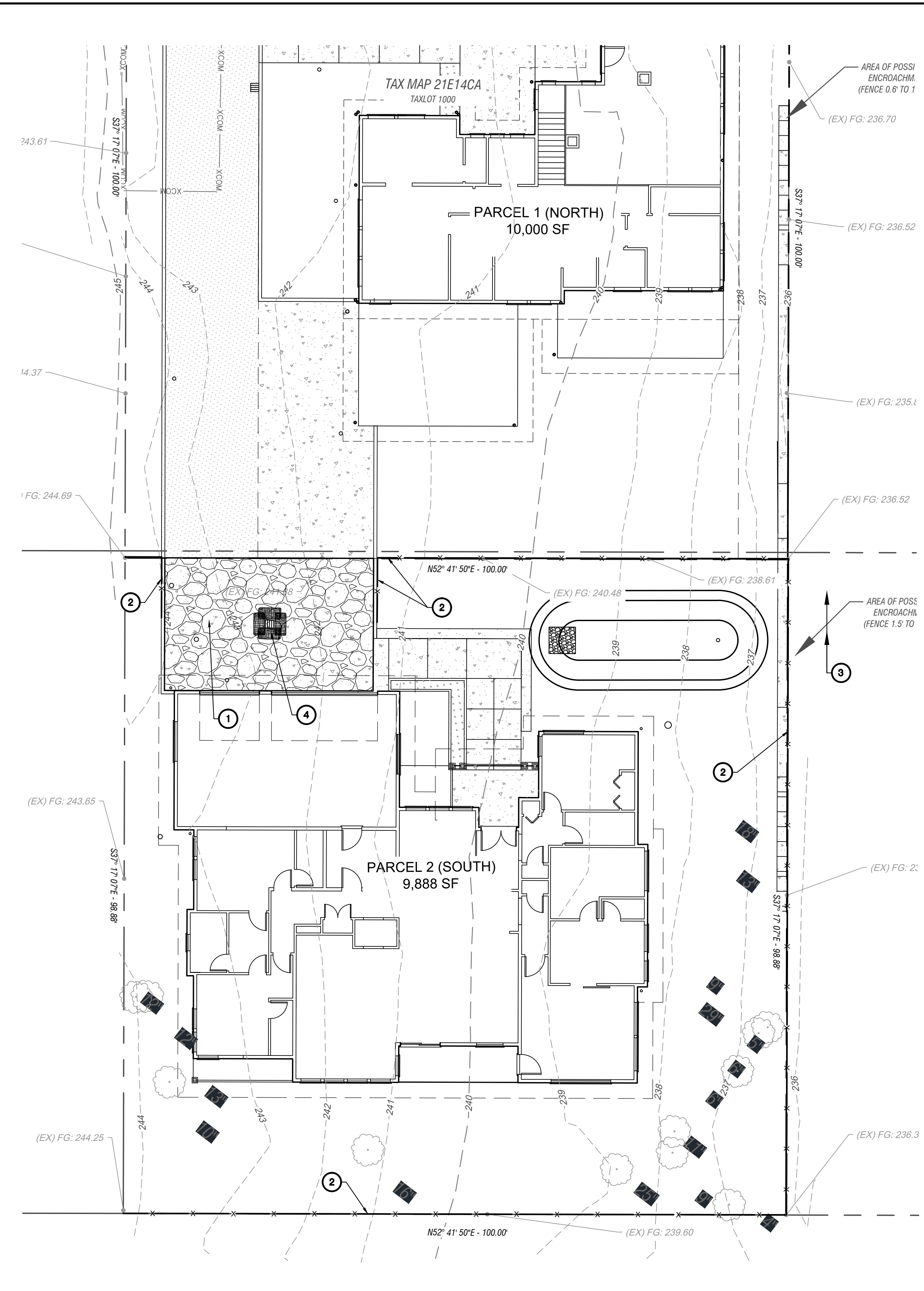
**1**  
**C1.10** **ONSITE CIVIL SITE PLAN LAYOUT**  
SCALE: 1" = 10'



**ARBOR DRIVE PARTITION**  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
ONSITE CIVIL SITE PLAN LAYOUT

REVISIONS	DATE	DRAWN:	CHECKED:	PRM	CJD

**C1.10**



KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	INSTALL 20' X 30' (MIN) LONG CONSTRUCTION ENTRANCE PER DETAIL 1/C3.00.
2	INSTALL SEDIMENT FENCE PER DETAIL 2/C3.00 ALONG EDGE OF MAXIMUM DISTURBANCE BOUNDARY. MAY FOLLOW ALONG PROPERTY LINE.
3	FIELD LOCATE FIRST DOWNSTREAM PUBLIC CATCH BASIN, INSTALL BIO BAG AND SILT SACKS PER DETAIL 3/C3.00.
4	INSTALL BIO BAG AND SILT SACKS AT ONSITE CATCH BASIN PER DETAIL 3/C3.00.

EMERGENCY CONTACT: TBD

**08.0 EROSION CONTROL NOTES**

1. APPLICANT/CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
2. THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE OWNER CONSTRUCTION IS COMPLETE.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AND MODIFIED BY THE CONTRACTOR/OWNER AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
7. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE MORE THAN 1/3 THE BARRIER HEIGHT. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATIONS SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
8. STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. STORM DRAIN INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.
10. THE CONTRACTOR SHALL EMPLOY BMP'S TO PROTECT THE PUBLIC RIGHT-OF-WAY FROM SEDIMENT DURING CONSTRUCTIONS. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.
11. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.
12. IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.
13. THE CONTRACTOR/DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.
14. APPROVAL OF THIS EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).
15. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM FROM VEHICLES ONTO ROADWAYS OR INTO THE STORMWATER COLLECTION SYSTEM SHALL BE REMOVED OR CLEANED UP IMMEDIATELY, AND NO LATER THAN THE END OF THE WORK DAY. THE USE OF WATER TRUCKS TO WASH THE MATERIAL OFF THE ROADWAY IS NOT ALLOWED. WATER TRUCKS MAY BE USED IMMEDIATELY BEFORE SWEEPERS OR VACUUM SYSTEMS TO LOOSEN SEDIMENT, PROVIDED THAT THE DISCHARGE TO THE STORMWATER COLLECTION SYSTEM DOES NOT OCCUR.

**10.0 SEDIMENT FENCES**

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6" OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.
3. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES. ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION SHALL BE BACKFILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.
4. SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
5. SEDIMENT FENCES SHALL BE INSPECTED BY CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

**11.0 STANDARD NOTES FOR TEMPORARY EROSION CONTROL GRASSES**

1. PERMANENT COVER MUST BE ESTABLISHED PRIOR TO THE REMOVAL OF ANY EROSION CONTROL MEASURES ON ALL EXPOSED GROUND SURFACES AT THE END OF THE CONSTRUCTION PERIOD.
2. TEMPORARY GRASS COVER MEASURES MUST BE SEED BY SEPTEMBER 1 AND FULLY ESTABLISHED BY NOVEMBER 1 OR OTHER COVER MEASURES WILL HAVE TO BE IMPLEMENTED UNTIL ADEQUATE GRASS COVERAGE IS ACHIEVED.
3. HYDROMULCH SHALL BE APPLIED WITH GRASS SEED AT A RATE OF 2,000 LB/ACRE. (SEED MUST BE APPLIED AT 275 LB/ACRE.) ON SLOPES STEEPER THAN 10 PERCENT (10%) OR WHEN APPLIED BETWEEN SEPTEMBER 15 AND APRIL 15, HYDROSEED AND MULCH SHALL BE APPLIED WITH A BONDING AGENT (TACKIFIER). APPLICATION RATE AND METHODOLOGY TO BE IN ACCORDANCE WITH SEED SUPPLIER RECOMMENDATIONS.
4. IF STRAW IS USED IN CONJUNCTION WITH HYDRO MULCH, IT MUST BE DRY, LOOSE, WEED-FREE, AND APPLIED AT A RATE OF 4,000 LB/ACRE AND SHALL HAVE A MINIMUM DEPTH IN-PLACE OF 2 INCHES. ANCHOR STRAW BY WORKING IN BY HAND OR WITH EQUIPMENT (ROLLERS, CLEAT TRACKS, ETC.).
5. STRAW MULCH SHALL BE SPREAD UNIFORMLY IMMEDIATELY FOLLOWING SEEDING.
6. SOIL PREPARATION - TOP SOIL SHOULD BE PREPARED ACCORDING TO LANDSCAPE PLANS, IF AVAILABLE, OR RECOMMENDATIONS OF GRASS SEED SUPPLIER. IT IS RECOMMENDED THAT SLOPES BE ROUGHENED BEFORE SEEDING BY "TRACK-WALKING" (DRIVING A CRAWLING TRACTOR UP AND DOWN SLOPES TO LEAVE A PATTERN OF CLEAT IMPRINTS PARALLEL TO SLOPE CONTOURS) OR OTHER METHOD TO PROVIDE MORE STABLE SITES FOR SEEDS TO REST.
7. SEEDING - REQUIRED SEED MIXES ARE AS FOLLOWS. SIMILAR MIXES MAY BE SUBSTITUTED IF APPROVED BY THE CITY AND STILL TOTAL 275 LB/ACRE.
  - A. DWARF GRASS MIX (LOW HEIGHT, LOW MAINTENANCE); DWARF PERENNIAL RYEGRASS, 80% BY WEIGHT; CREEPING RED FESCUE, 20% BY WEIGHT; 275 LB/ACRE.
  - B. STANDARD HEIGHT GRASS MIX: ANNUAL RYEGRASS, 40% BY WEIGHT; TURF-TYPE FESCUE, 60% BY WEIGHT; 275 LB/ACRE.
8. FERTILIZATION FOR GRASS SEED - IN ACCORDANCE WITH SUPPLIER'S RECOMMENDATIONS. DEVELOPMENT AREAS WITHIN 50 FEET OF WATER BODIES AND WETLANDS MUST USE A NON-PHOSPHORUS FERTILIZER.
9. WATERING - SEEDING SHALL BE SUPPLIED WITH ADEQUATE MOISTURE TO ESTABLISH GRASS. SUPPLY WATER AS NEEDED, ESPECIALLY IN ABNORMALLY HOT OR DRY WEATHER OR ON ADVERSE SITES. WATER APPLICATION RATES SHOULD BE CONTROLLED TO PROVIDE ADEQUATE MOISTURE WITHOUT CAUSING RUNOFF.
10. RE-SEEDING - AREAS WHICH FAIL TO ESTABLISH GRASS COVER ADEQUATE TO PREVENT EROSION SHALL BE RE-SEED AS SOON AS SUCH AREAS ARE IDENTIFIED, AND ALL APPROPRIATE MEASURES TAKEN TO ESTABLISH ADEQUATE COVER.



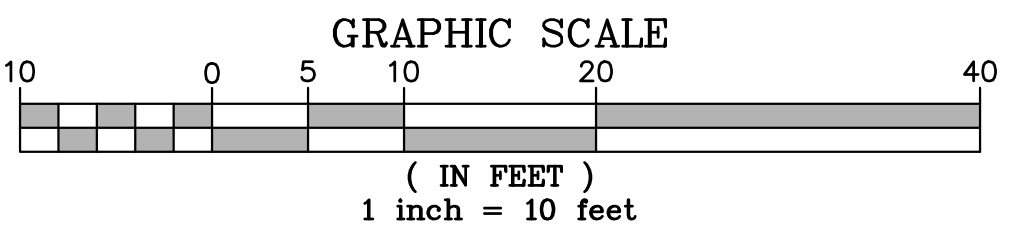
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**ARBOR DRIVE PARTITION**  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068

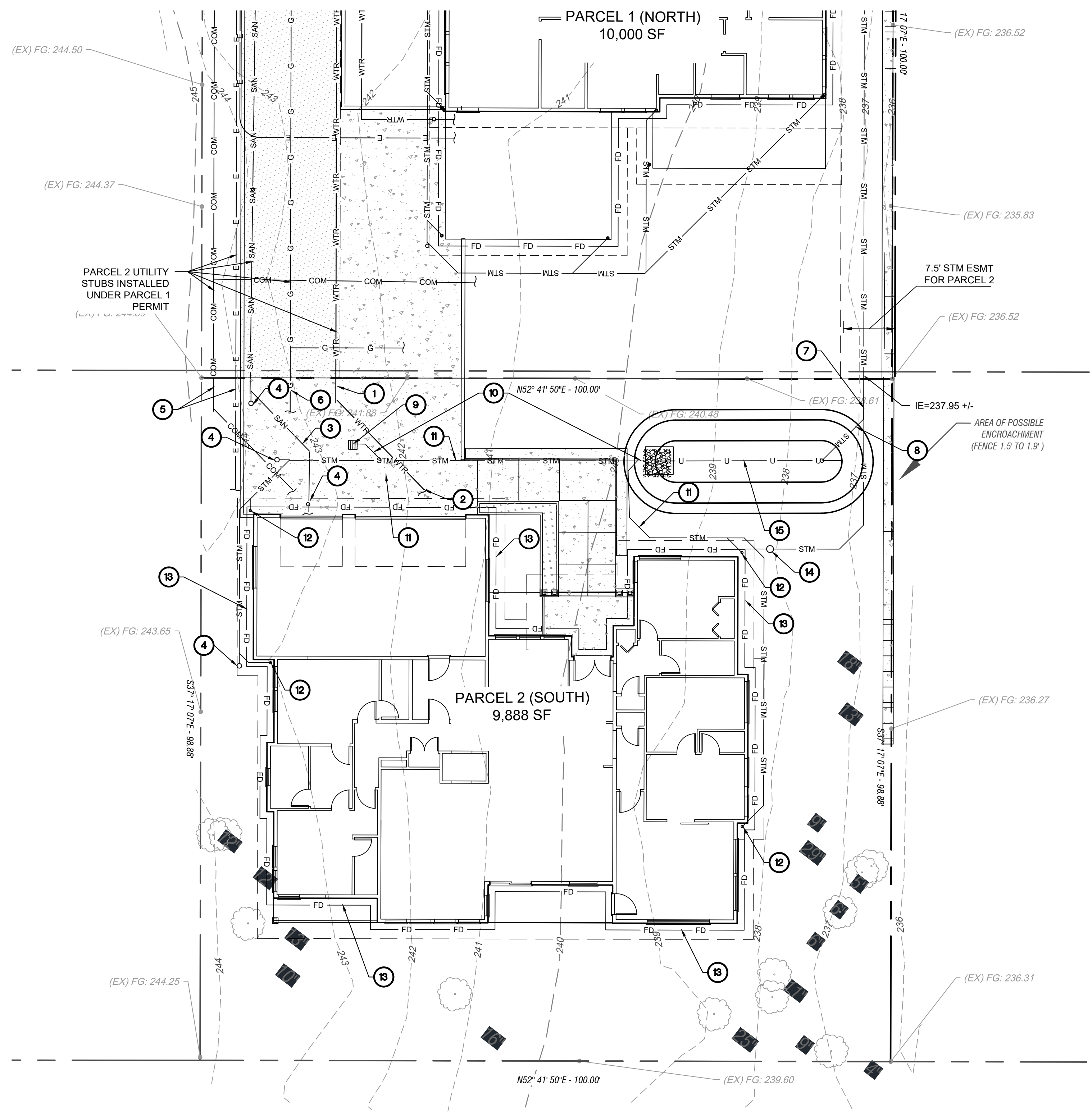
**ONSITE CIVIL EROSION AND SEDIMENT CONTROL PLAN**

REVISIONS	DATE	BY	CHECKED	PRM	CJD

**1** **ONSITE CIVIL EROSION AND SEDIMENT CONTROL**  
 C2.00 SCALE: 1" = 10'

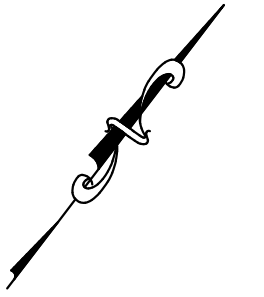
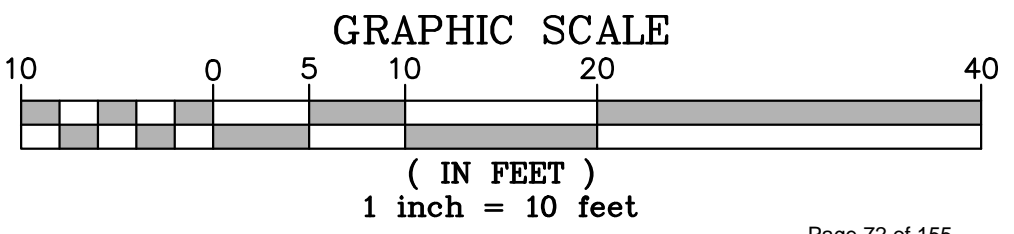


**C2.00**



KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	INSTALL COPPER DOMESTIC WATER LATERAL TO SERVICE PARCEL 2. CONNECT TO EXISTING PARCEL 2 WATER LINE STUB INSTALLED UNDER PARCEL 1 PERMIT. SIZE TO BE CONFIRMED BY OWNER. COORDINATE WITH CITY FOR SETTING METER.
2	EXTEND COPPER DOMESTIC WATER LINE TO BUILDING. COORDINATE WITH PLUMBING FOR CONTINUATION INTO BLDG.
3	INSTALL 6" PVC, ASTM, D3034, DR-35 S.S. LATERAL TO PARCEL 2 BUILDING AT 2.0% (MIN) SLOPE. CONNECT TO EXISTING PARCEL 2 S.S. STUB INSTALLED UNDER PARCEL 1 PERMIT. COORDINATE W/ PLUMBING FOR CONTINUATION INTO BUILDING.
4	INSTALL STANDARD CLEANOUT. SEE DETAIL 8/C3.00 OR 9/C3.00. SET RIM TO FINISH GRADE. FIELD VERIFY.
5	COORDINATE WITH FRANCHISE UTILITY PROVIDERS TO EXTEND SERVICE TO PARCEL 2 BUILDING. EXTEND SERVICE FROM EXISTING UTILITY STUBS INSTALLED UNDER PARCEL 1 PERMIT.
6	COORDINATE WITH GAS PROVIDER TO EXTEND SERVICE TO PARCEL 2 BUILDING. EXTEND SERVICE FROM EXISTING GAS STUB INSTALLED UNDER PARCEL 1 PERMIT.
7	INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM LINE AT 1.0% SLOPE. CONNECT TO EXISTING PARCEL 2 STM LATERAL INSTALLED UNDER PARCEL 1 PERMIT. ASSUMED I.E. 6" AT PUBLIC MAIN = 236.94. IE AT SOUTH PARCEL PROPERTY LINE = 237.95 (FIELD VERIFY).
8	INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM PIPE AT 1.0% SLOPE FROM STORM BASIN OVER FLOW TO NEW STORM LATERAL.
9	INSTALL NEW CATCH BASIN PER DETAILS 11 & 12/C3.00. SEE GRADING PLAN FOR RIM ELEVATION.
10	INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM AT 1.0% (MIN) SLOPE FROM CATCH BASIN AND OUTFALL AT WEST END OF BASIN. FIELD VERIFY SLOPE. INSTALL 4' X 4' X 12" THK RIP RAP PAD W/ 6" TO 12" ROUND ROCK UNDERLAIN BY GEOTECHNICAL FABRIC AT OUTFALL. I.E. AT OUTFALL = 241.50.
11	INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM AT 1.0% (MIN) SLOPE AROUND BUILDING FOR ROOF DRAIN DOWNSPOUTS. FIELD VERIFY SLOPE. (TYP)
12	INSTALL ROOF DRAIN DOWN SPOUT SIM TO DETAIL 7/C3.00. CONNECT DOWN SPOUT TO SITE CONVEYANCE WITH 4" ABS SCHED 40 STM LATERAL AT 1.0% MIN SLOPE. COORDINATE WITH ARCHITECTS BUILDING DRAWINGS TO CONFIRM DOWN SPOUT LOCATIONS AND FIELD VERIFY SLOPES. (TYP). COORDINATE AND VERIFY DOWN SPOUT LOCATIONS WITH ARCH DRAWINGS.
13	INSTALL 4" FOUNDATION DRAIN AROUND BUILDING TO SLOPE AT 0.5% MIN SLOPE DOWN TO NORTH EAST CORNER OF BUILDING. FOUNDATION DRAIN INVERT SHALL NOT BE BELOW BOTTOM OF FOOTING BY MORE THAN 3-INCHES AT ANY LOCATION AND SHALL NOT BE ABOVE FOOTING. CONNECT TO BACK WATER VALVE WITH SOLID NON-PERF PIPE ABS SCHED 40 OR PVC D30304, SDR-35 STM PIPE AT 1.0% SLOPE. TYP. FIELD VERIFY.
14	INSTALL FOUNDATION DRAIN BACK WATER VALVE SIM TO DETAIL 10/C3.00. FIELD VERIFY INVERT WITH STM LATERAL AND SET CLEAN-OUT RIM TO FINISH GRADE. CONNECT TO STM LATERAL WITH 4" ABS SCHED 40 AT 1.0% (MIN) SLOPE. FIELD VERIFY.
15	INSTALL 4-INCH DIA PVC PERF-PIPE IN FILTER FABRIC SOCK AT BOTTOM OF ROCK SECTION FOR THE LENGTH OF THE STORM BASIN. CONNECT TO OVER FLOW. SEE DETAIL 9/C3.10

**1** ONSITE CIVIL UTILITY PLAN  
**C2.10** SCALE: 1" = 10'



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 2322 ARBOR DRIVE  
 WEST LINN, OR 97068  
 ONSITE CIVIL UTILITY PLAN

REVISIONS	DATE:	DRAWN:	PRM	CJD
	JOB NUMBER:	19035	CHECKED:	

**C2.10**

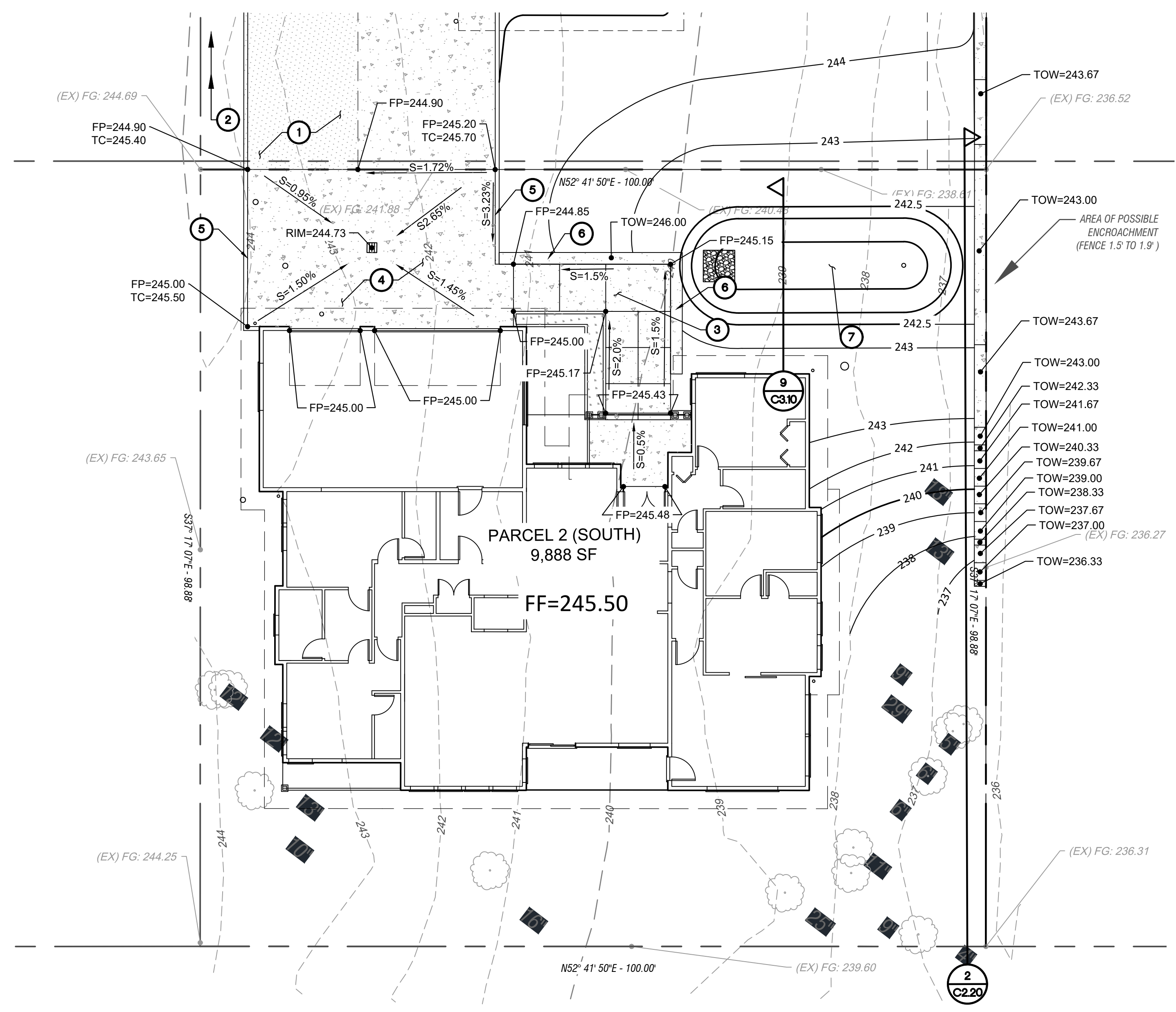




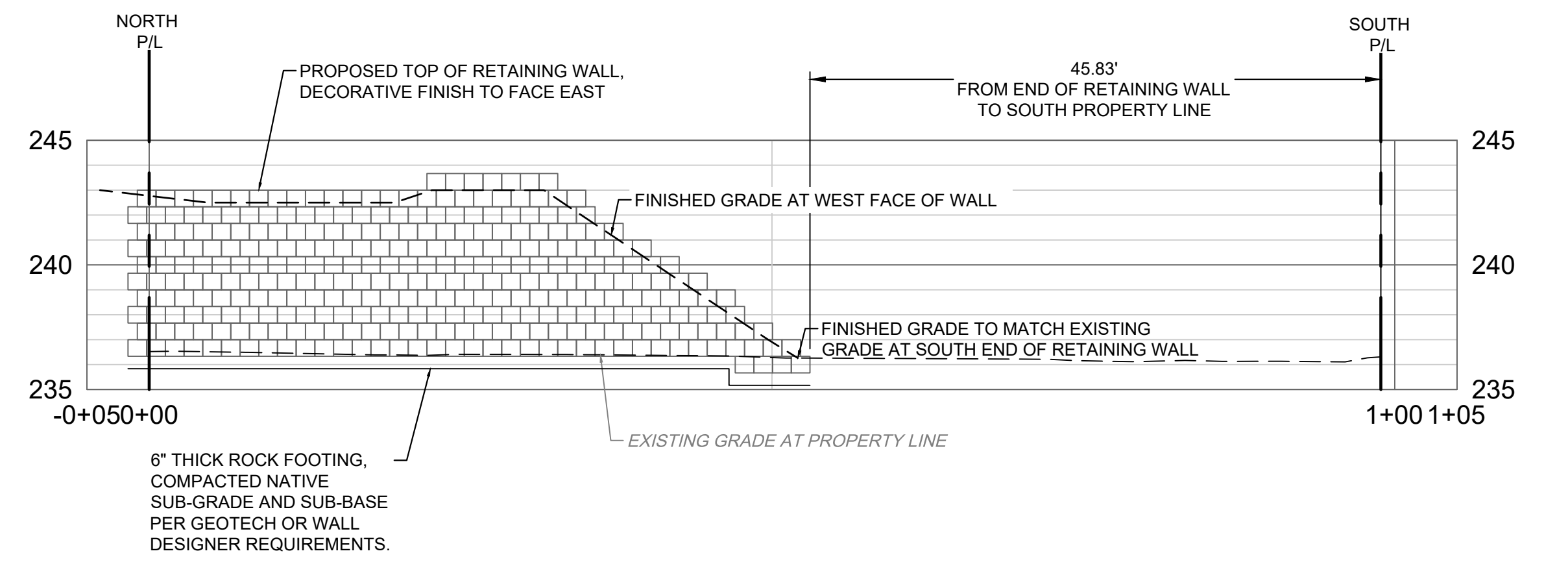
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KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	NEW 14' PAVED WIDTH OF 20' PRIVATE ACCESS EASEMENT FOR NORTH AND SOUTH PARCEL UNDER SEPARATE NORTH PARCEL BUILDING PERMIT. INSTALL AC PAVEMENT PER DETAIL 7/C3.10.
2	NEW PUBLIC CURB AND SIDEWALK IN ROW ALONG PARCEL 1 FRONTAGE. PUBLIC WORKS IMPROVEMENTS TO BE INSTALLED UNDER PUBLIC WORKS PERMIT WITH PARCEL 2 BUILDING PERMIT. SEE PUBLIC IMPROVEMENT PLANS.
3	NEW CONCRETE WALKWAY TO SOUTH PARCEL BUILDING FRONT DOOR FROM DRIVEWAY. SEE DETAIL 6/C3.10, (TYP).
4	NEW PRIVATE DRIVEWAY FOR SOUTH BUILDING. PROVIDE 6" SLAB ON GRADE WITH #4 BARS AT 24" O.C. EACH WAY AND PROVIDE THICKENED EDGE SIM TO DETAIL 8/C3.10.
5	NEW 6" CURB PER STANDARD DETAIL 3/C3.10, (TYP).
6	NEW "KEystone" 8"x18"x18" BROADSTONE RETAINING WALL. SEE DETAIL 5/C3.10 FOR MORE DETAIL. PROVIDE FOR BIDDER DESIGN IF WALL EXCEEDS 4', FIELD VERIFY, (TYP).
7	NEW VEGETATIVE STORM BASIN. SEE DETAIL 9/C3.10 FOR MORE INFO. SEE LANDSCAPE DWGS FOR PLANTINGS.

- GRADING NOTES:
- CONTRACTOR IS RESPONSIBLE TO PERFORM CUT AND FILL EARTH WORK IN SUCH A MANNER TO PROTECT NATIVE SOILS FROM BEING OVER WORKED AND FROM BECOMING TOO SATURATED DURING WET WEATHER. DURING WET WEATHER PERFORM WORK IN AREAS SMALL ENOUGH TO CUT AND ROCK SITE AREAS UNDER PAVEMENT AND BUILDING TO PREVENT AREAS OF NATIVE SOIL BEING EXPOSED TO WET WEATHER. CONTACT PROJECT GEOTECHNICAL ENGINEER FOR WET WEATHER CONSTRUCTION RECOMMENDATIONS.
  - REFER TO ARCHITECTURAL SITE PLANS FOR ALL SITE LAYOUT DIMENSIONS INCLUDING WALKWAYS, BUILDING, AND RETAINING WALLS.
  - CONTRACTOR TO CONFIRM WITH OWNER AND REMOVE AND DISPOSE OF OFFSITE ALL EXCESS SOIL, DEBRIS AND MATERIALS NOT REUSABLE FOR THIS PROJECT.
  - ON-SITE PEDESTRIAN ACCESS ROUTES SHALL COMPLY WITH THE STATE AND LOCAL REGULATIONS. IN GENERAL:
    - MAXIMUM CROSS SLOPE OF ANY PAVEMENT PERPENDICULAR TO DIRECTION OF TRAVEL IS 2.0%.
    - MAXIMUM SLOPE OF WALKWAYS WITHOUT HANDRAILS IN DIRECTION OF TRAVEL IS 5.0%.
    - FOR RAMPS, THE MAXIMUM SLOPE IS 8.33% AND MAXIMUM RISE BETWEEN LANDINGS IS 30 INCHES. HANDRAILS ARE REQUIRED EACH SIDE OF ALL RAMPS WITH SLOPE GREATER THAN 5%.
    - MAXIMUM SLOPE OF CURB RAMPS AND WINGS OF CURB RAMPS IS 8.33%. THE MAXIMUM LENGTH OF A CURB RAMP IS 6 FEET WITH A MAXIMUM 6-INCH RISE.
    - PROVIDE FINISH PAVEMENT SURFACE TEXTURES IN ACCORDANCE WITH ARCHITECT.
    - CONTACT ARCHITECT AND ENGINEER FOR INSTRUCTIONS PRIOR TO INSTALLING FINISH PAVEMENTS IN CONFLICT WITH CODE REQUIREMENTS.
  - STRAIGHT GRADE FINISH PAVEMENT BETWEEN CATCH BASIN AND SURROUNDING GUTTER ELEVATIONS. STRAIGHT GRADE BETWEEN GIVEN ELEVATION POINTS. BLEND FINISH GRADES BETWEEN GIVEN POINTS AND AT GRADE BREAKS.
  - SEE SHEET C1.0, SECTION 12.0 FOR CONSTRUCTION TESTING, INSPECTIONS, AND OBSERVATION REQUIREMENTS.
  - FUTURE GRADING FOR PUBLIC IMPROVEMENTS IS SHOWN FOR CLARITY AND SHALL BE COORDINATED AND BUILT FROM THE PERMITTED PUBLIC IMPROVEMENT DRAWINGS. ONSITE GRADES AND FINISH FLOOR ELEVATIONS ARE RELATIVE TO FUTURE PUBLIC WORKS DESIGN DRAWINGS. CONTRACTOR TO VERIFY AND COORDINATE W/ PUBLIC IMPROVEMENT DRAWINGS PRIOR TO SETTING ONSITE FINISH ELEVATIONS TYPICAL.

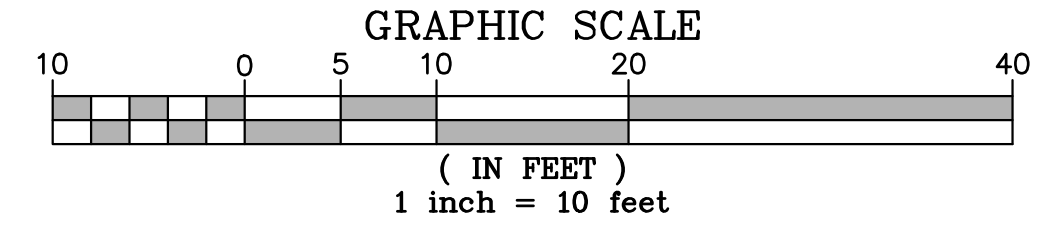


WALL TO CONTINUE INTO NORTH PARCEL UNDER SEPARATE PERMIT

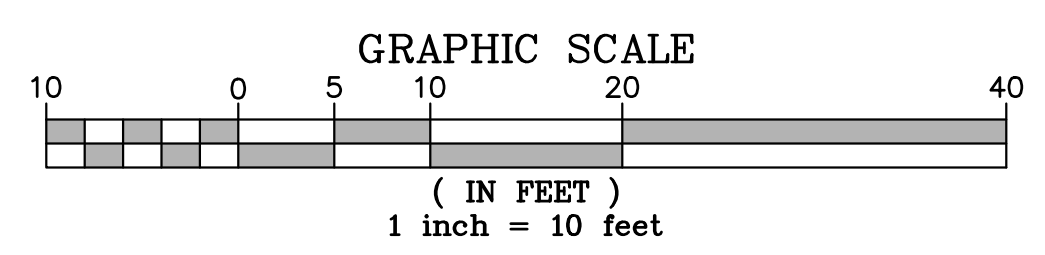


**2 EAST PROPERTY LINE RETAINING WALL ELEVATIONS**

HORIZONTAL SCALE: 1" = 10'  
VERTICAL SCALE: 1" = 5'



**1 ONSITE CIVIL GRADING PLAN**  
SCALE: 1" = 10'



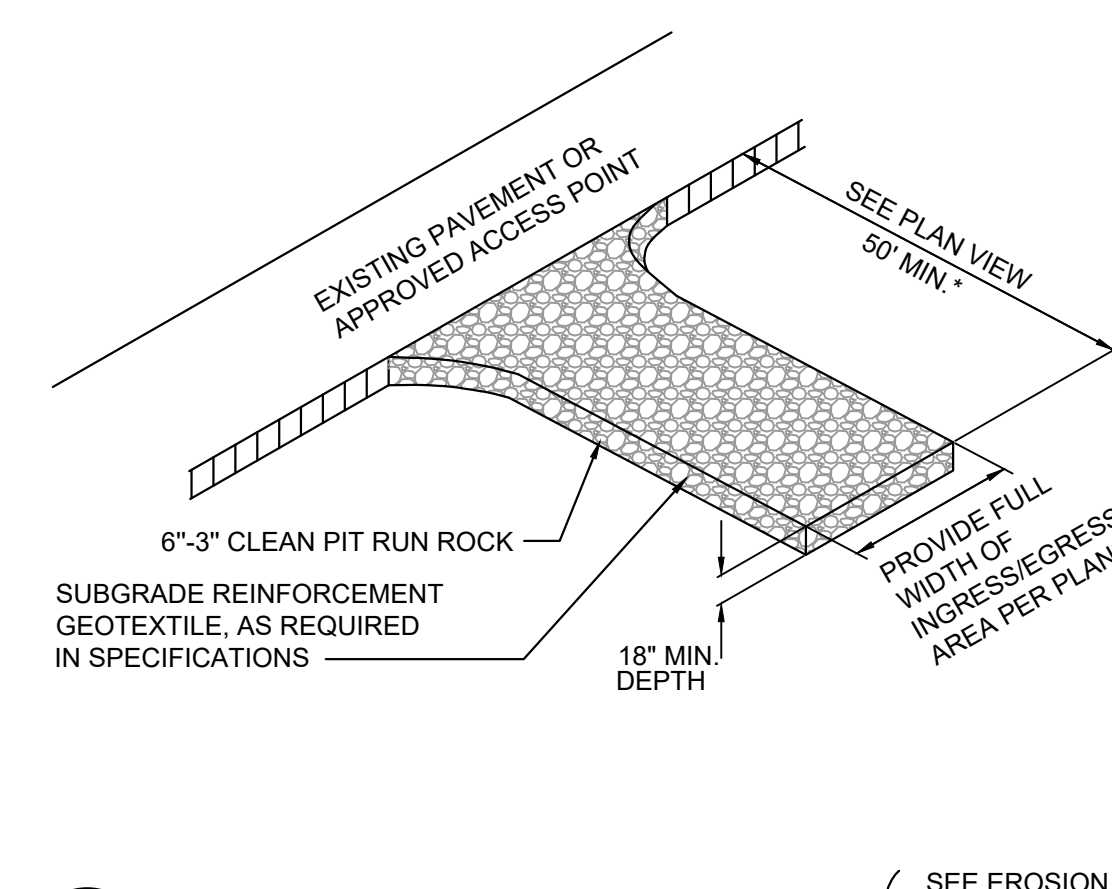
**ARBOR DRIVE PARTITION**  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
ONSITE CIVIL GRADING PLAN

REVISIONS	DATE	DRAWN	CHECKED	PRM	C/D

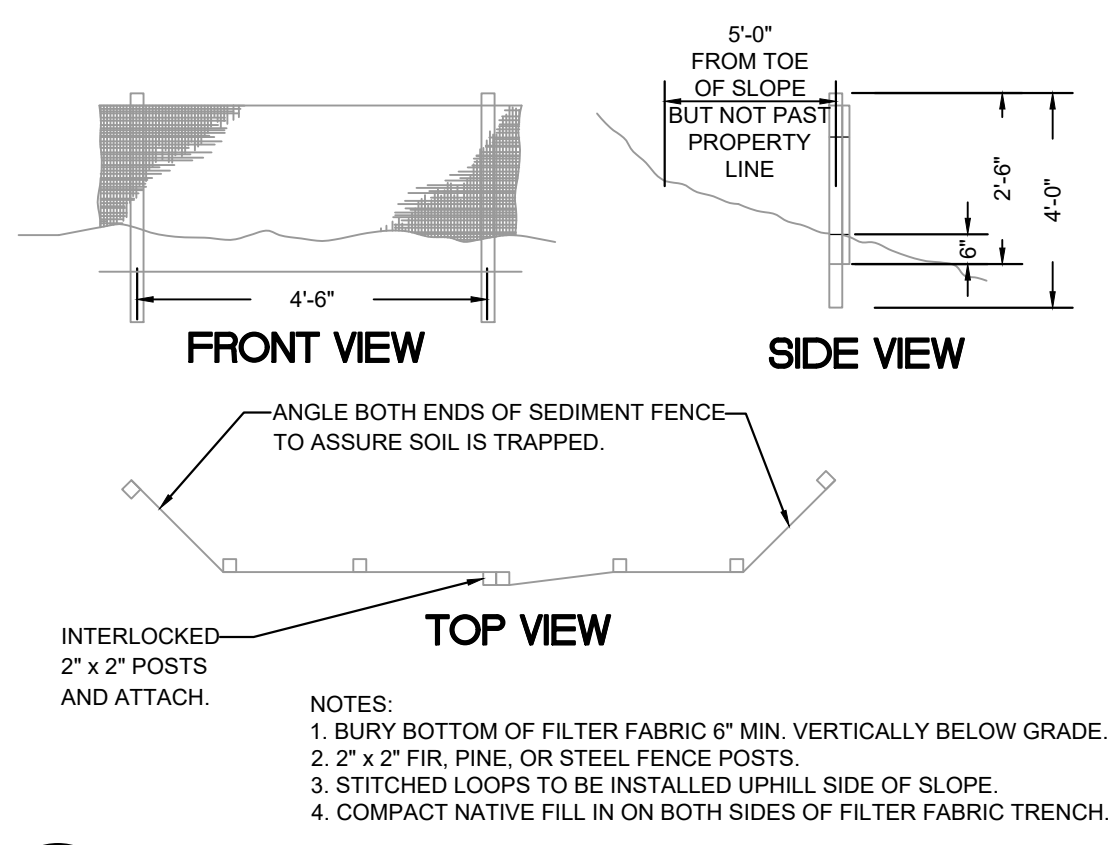
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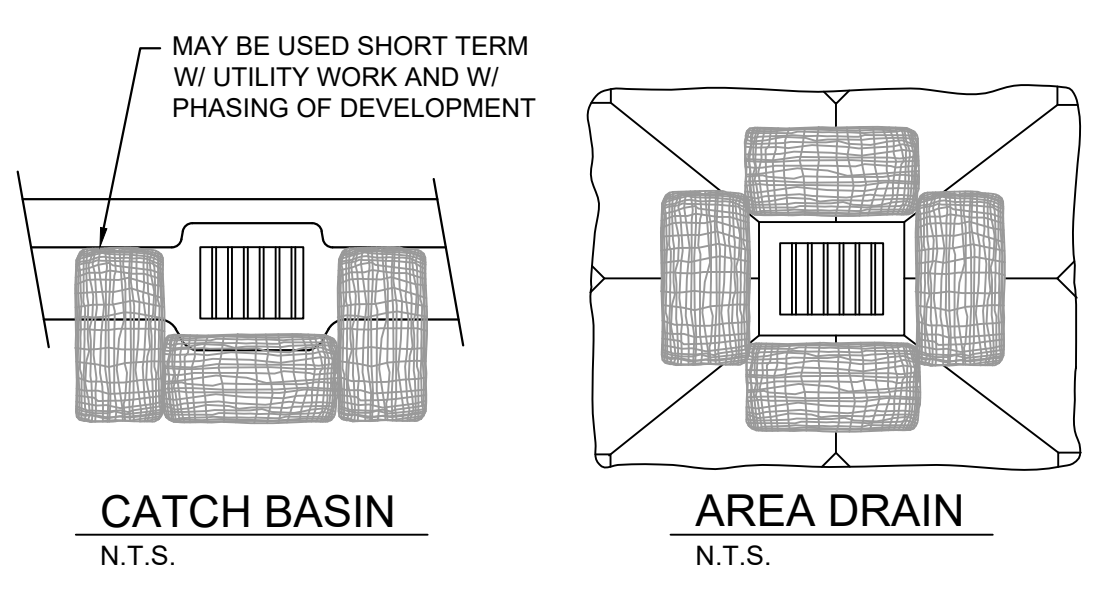
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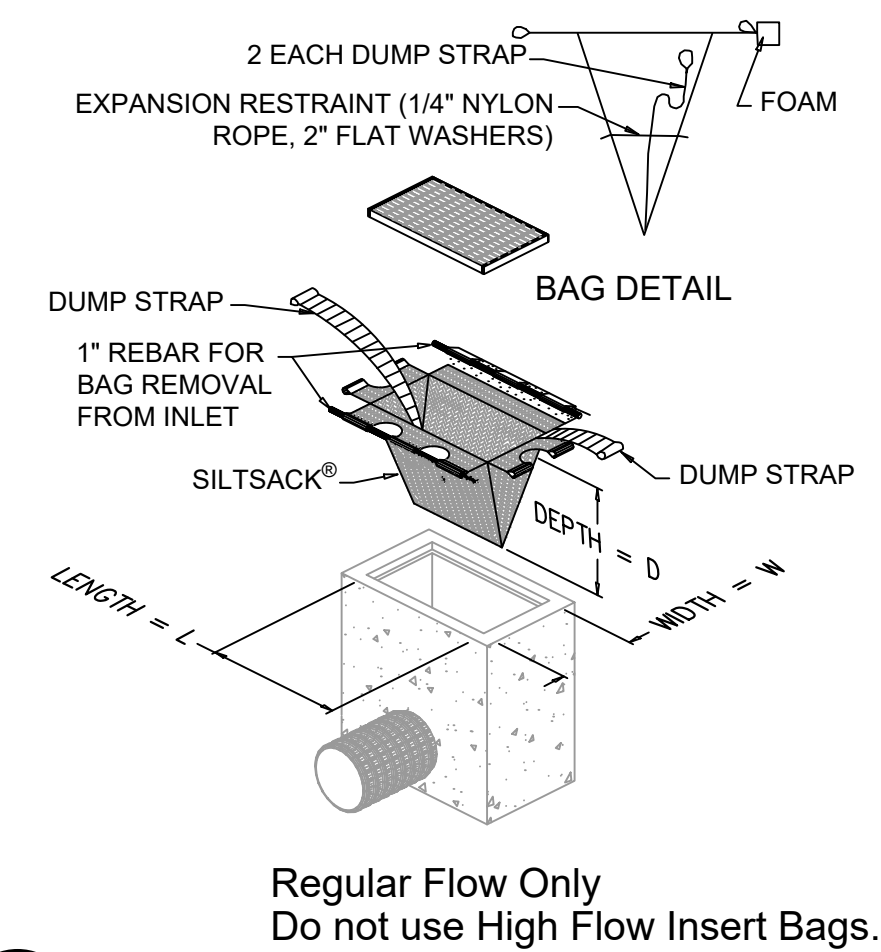
1 GRAVEL CONSTRUCTION ENTRANCE (SEE EROSION CONTROL NOTES)  
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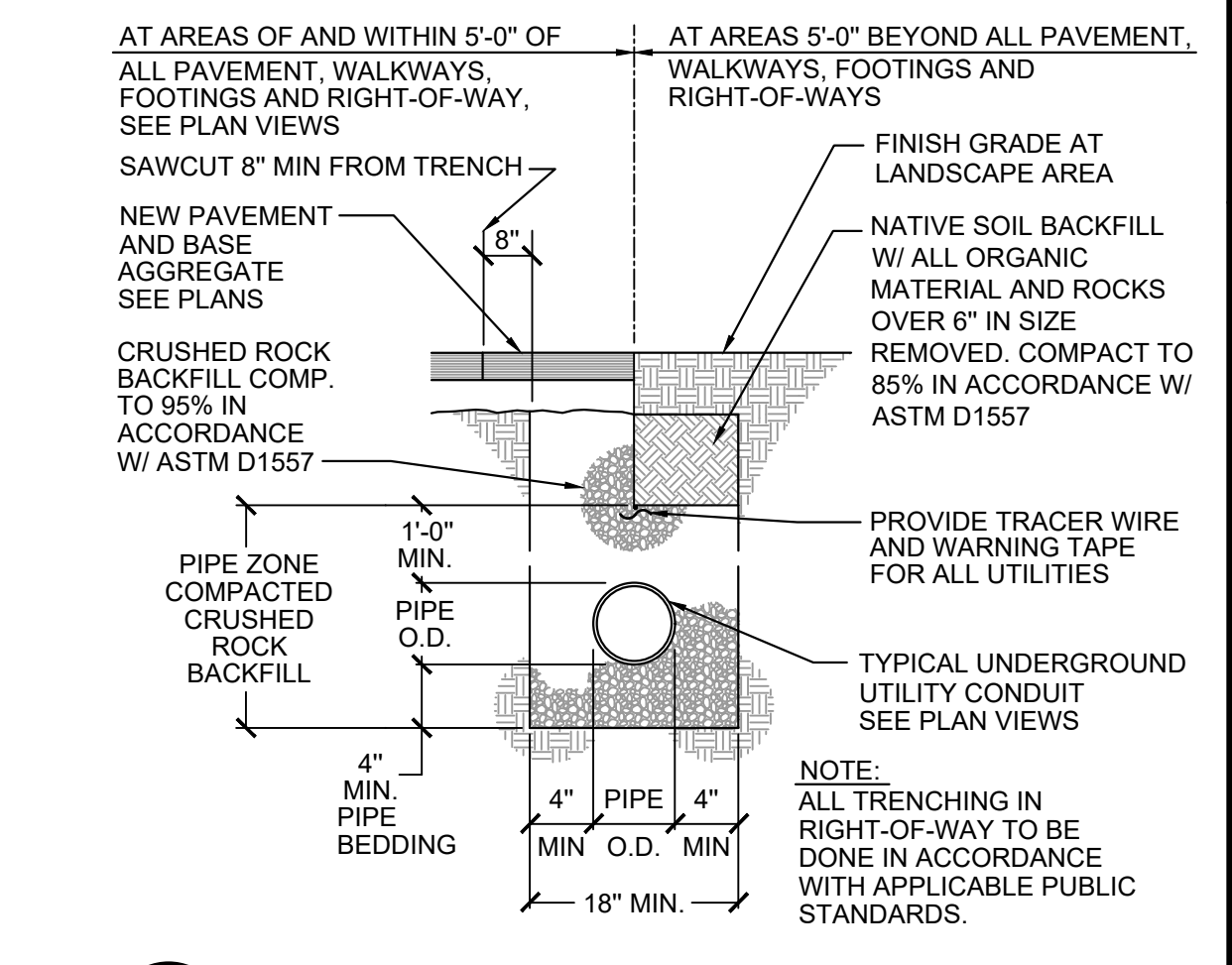
2 SEDIMENT FENCE  
N.T.S. C3.00



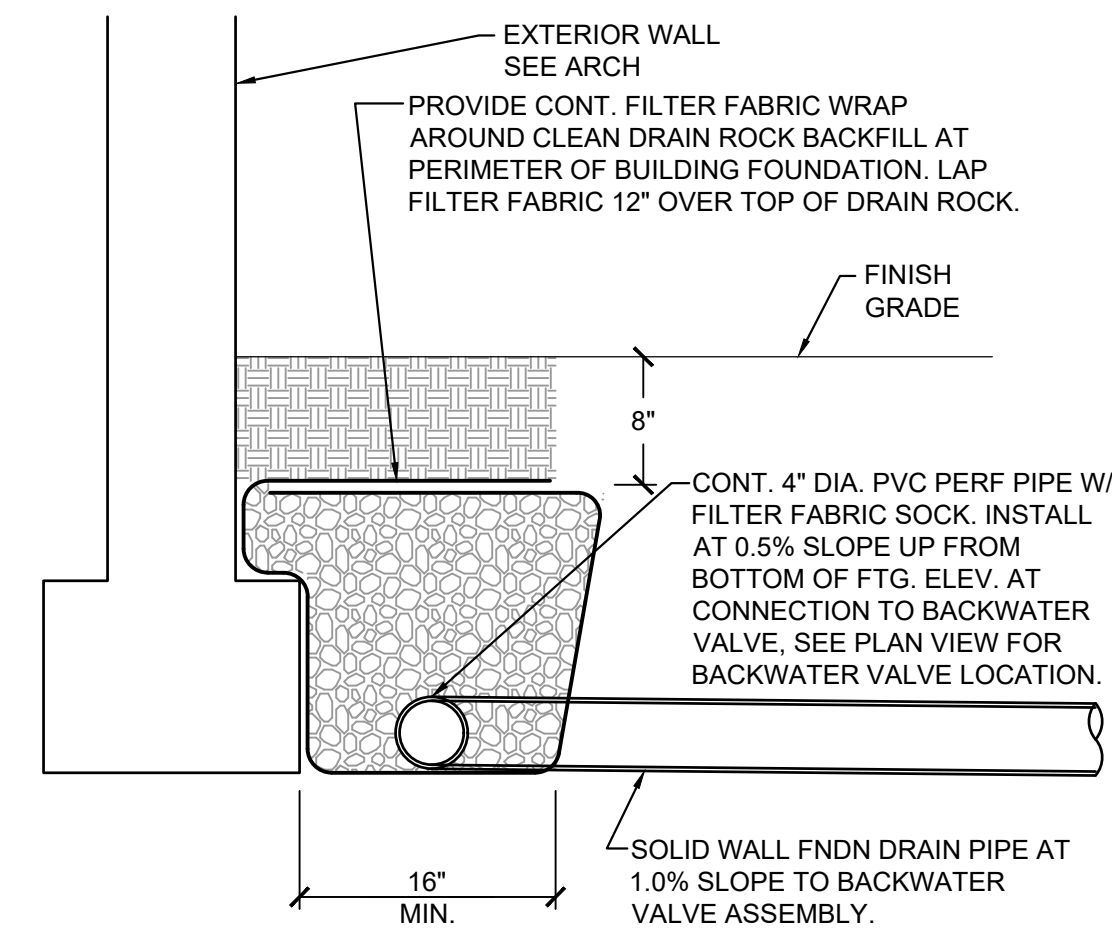
3 BIOFILTER BAGS - TEMPORARY  
N.T.S. C3.00



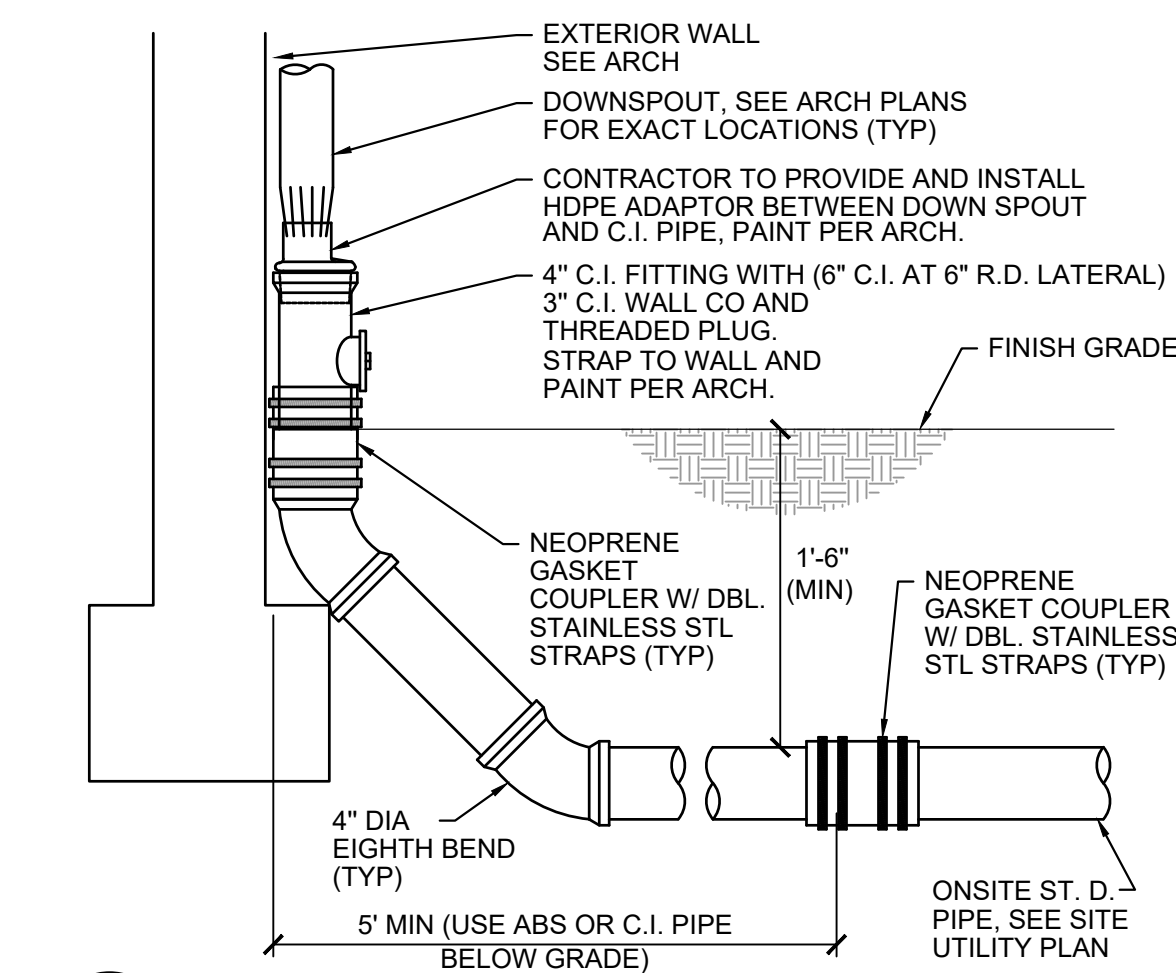
4 FILTER BAG INLET  
N.T.S. C3.00



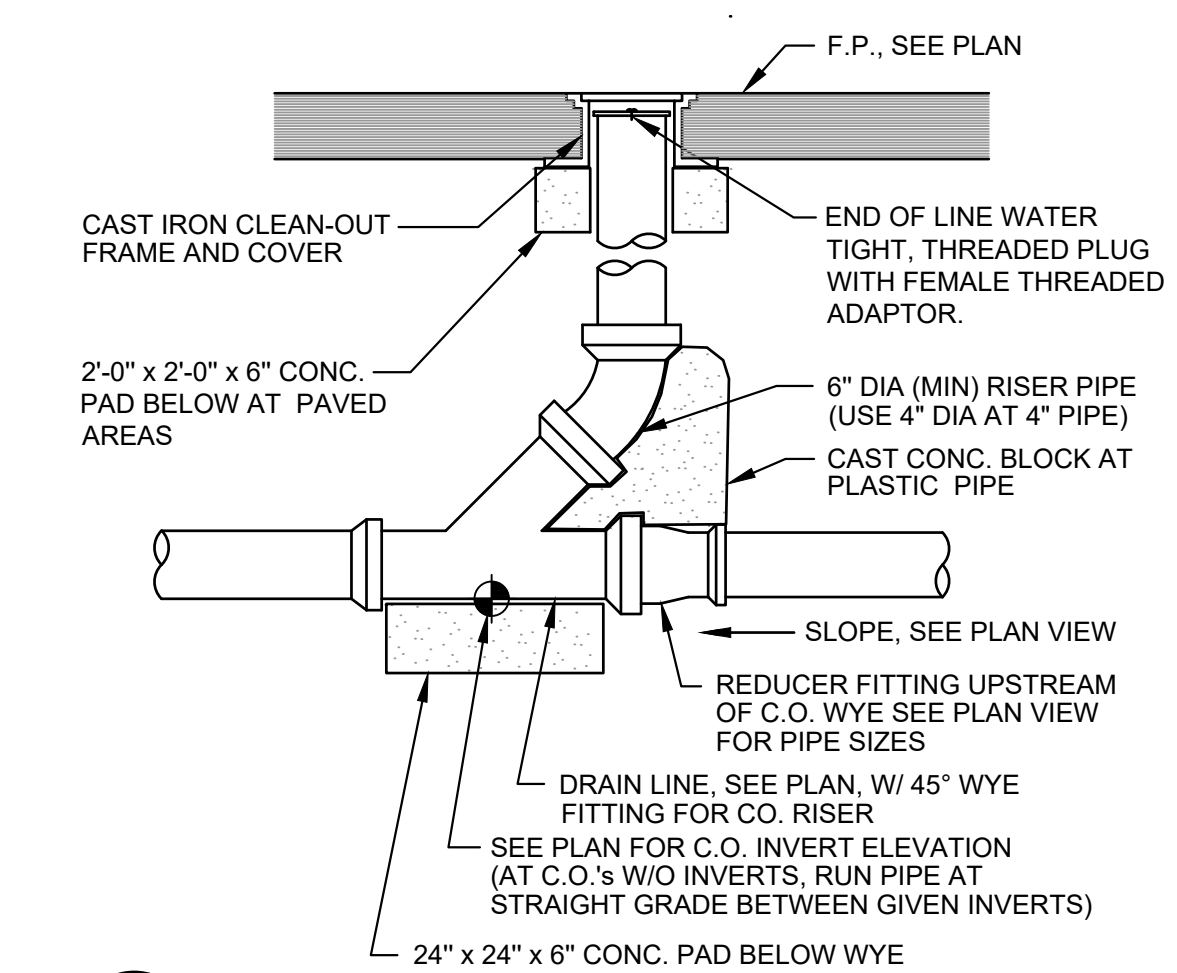
5 TYPICAL UTILITY TRENCH SECTION  
1" = 1'-0" C3.00



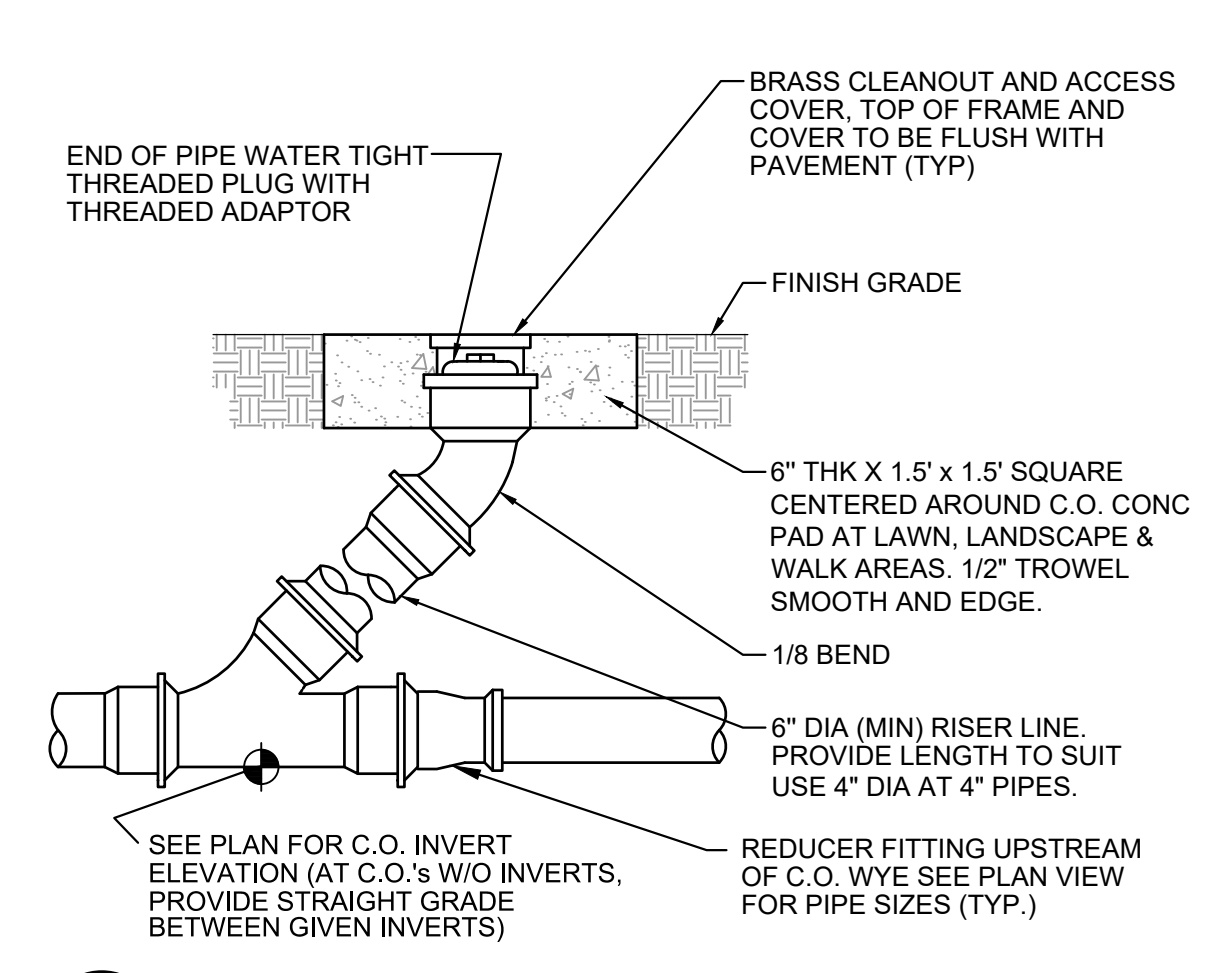
6 TYPICAL EXTERIOR FOUNDATION DRAIN  
1" = 1'-0" C3.00



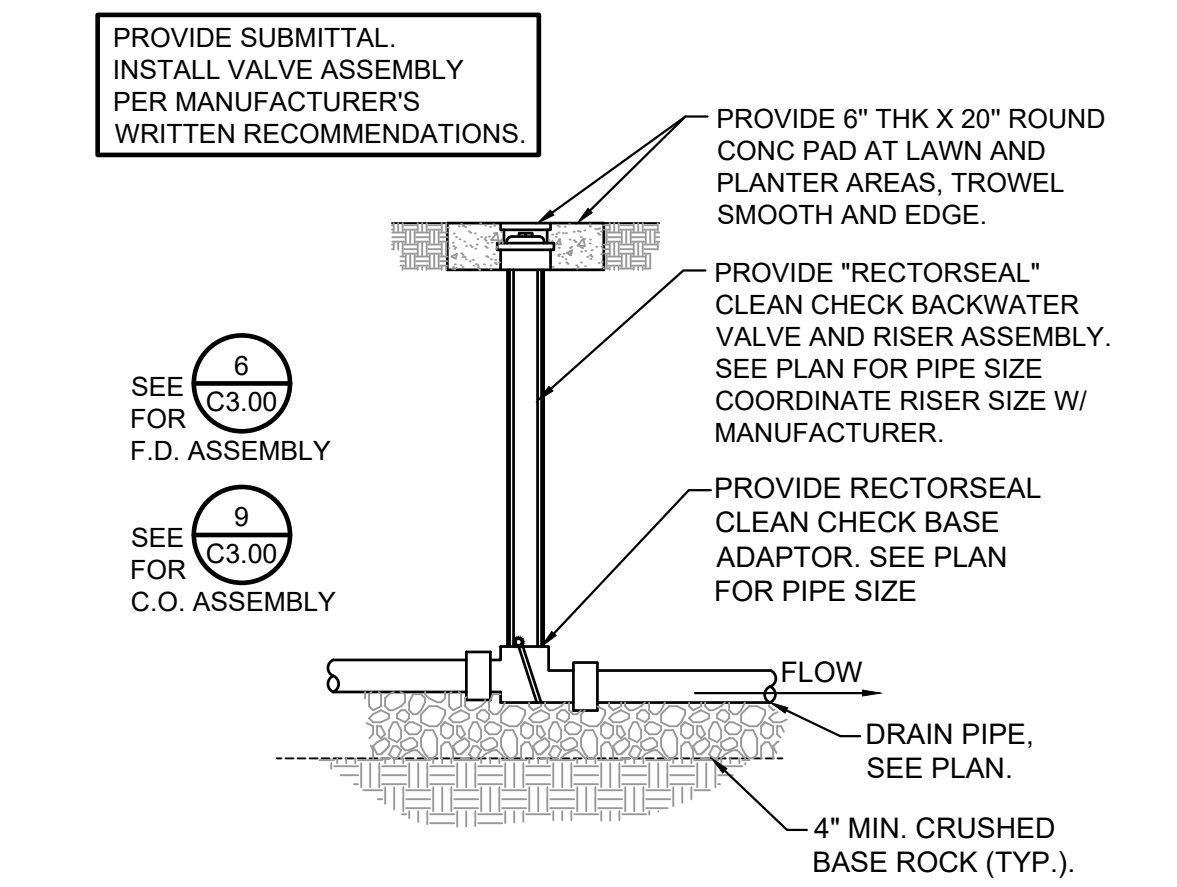
7 TYPICAL EXTERIOR DOWN SPOUT CONNECTION  
N.T.S. C3.00



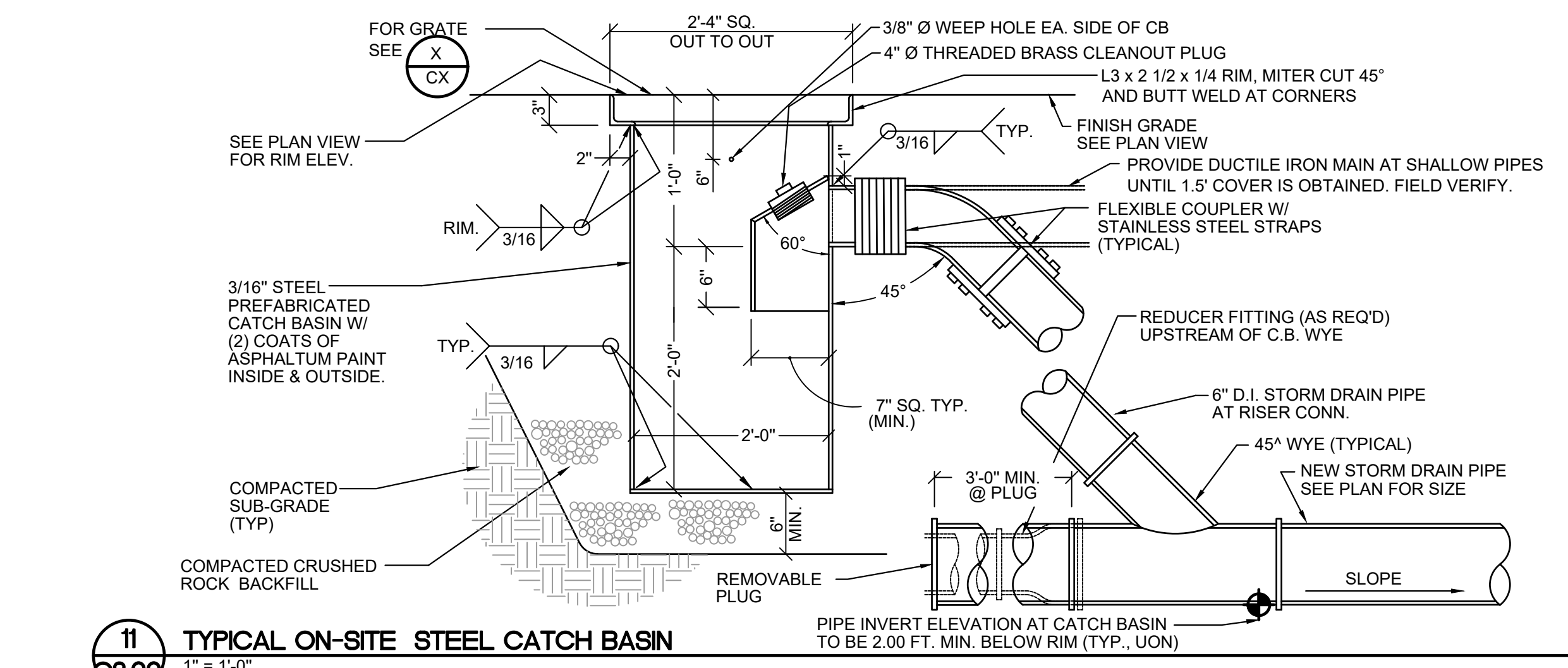
8 TYP. CLEAN OUT AT VEHICLE PAVEMENT AREAS  
N.T.S. C3.00



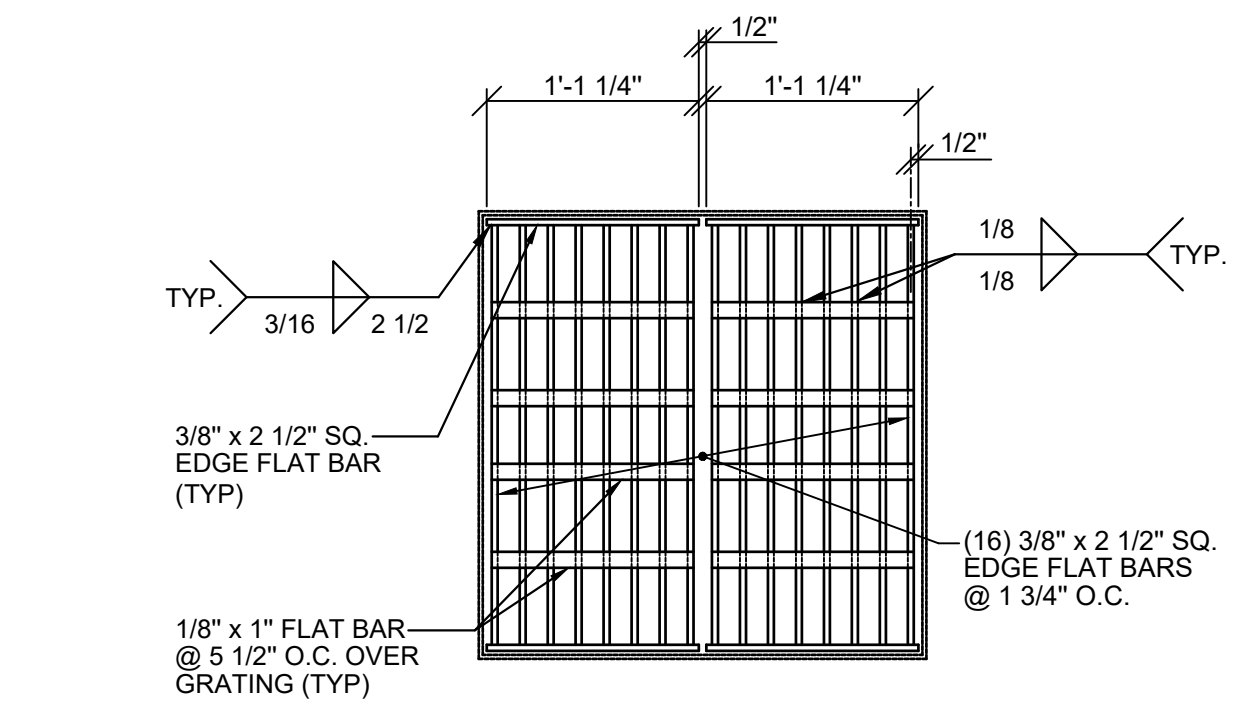
9 CLEANOUT AT WALKS, SLABS AND PLANTERS  
1" = 1'-0" C3.00



10 RECTORSEAL 'CLEAN CHECK' BACKWATER VALVE ASSEMBLY FOR FOUNDATION DRAIN (TYP)  
1/2" = 1'-0" C3.00



11 TYPICAL ON-SITE STEEL CATCH BASIN  
1" = 1'-0" C3.00

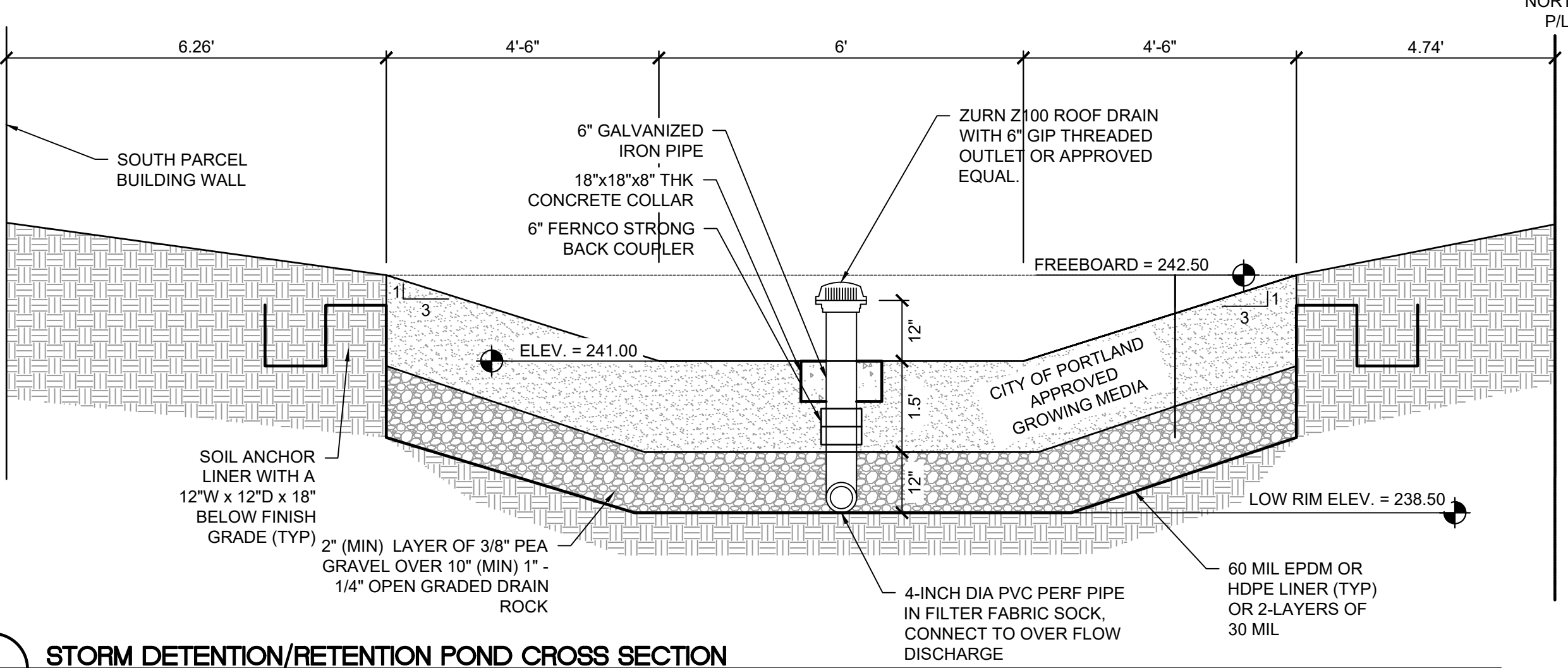
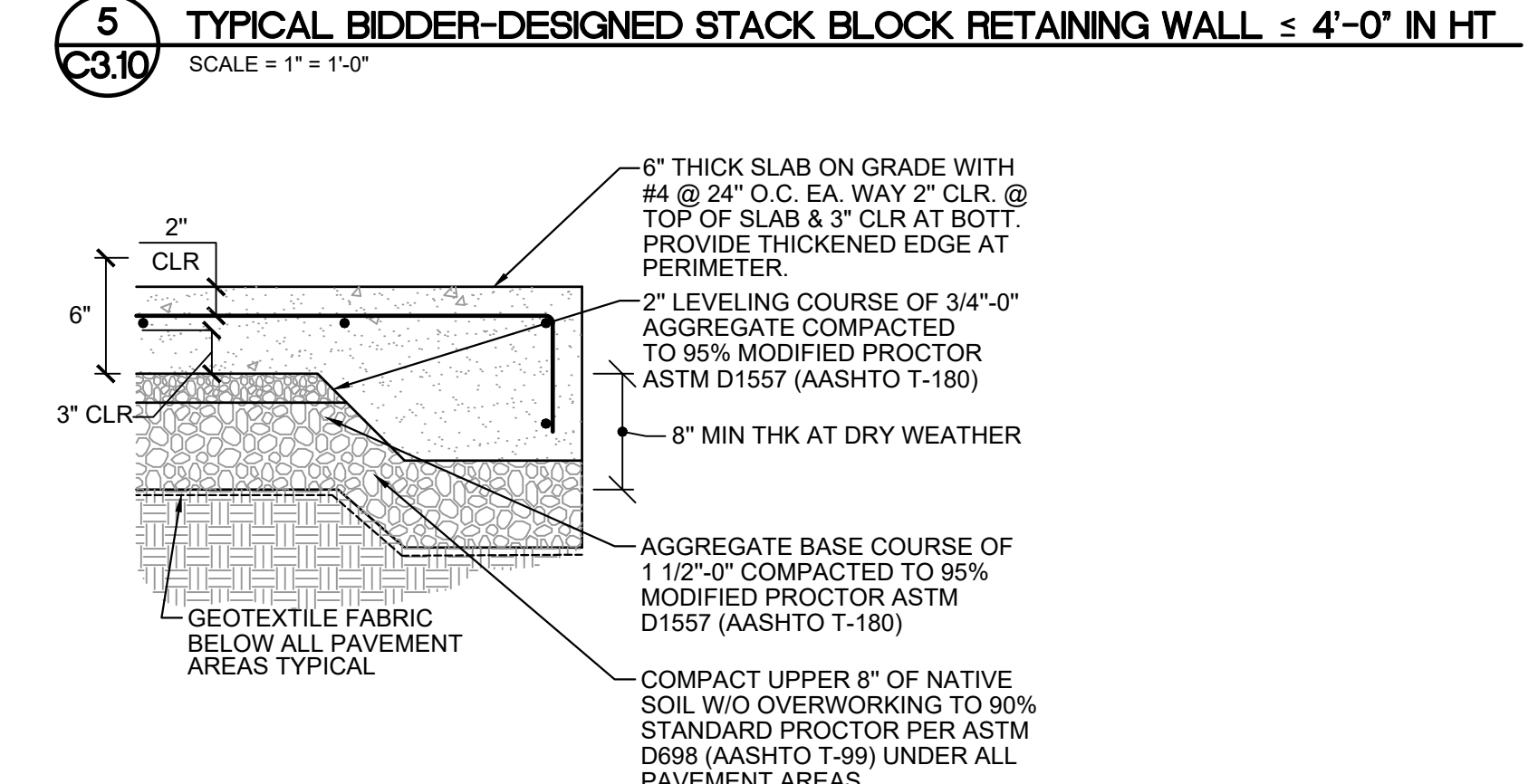
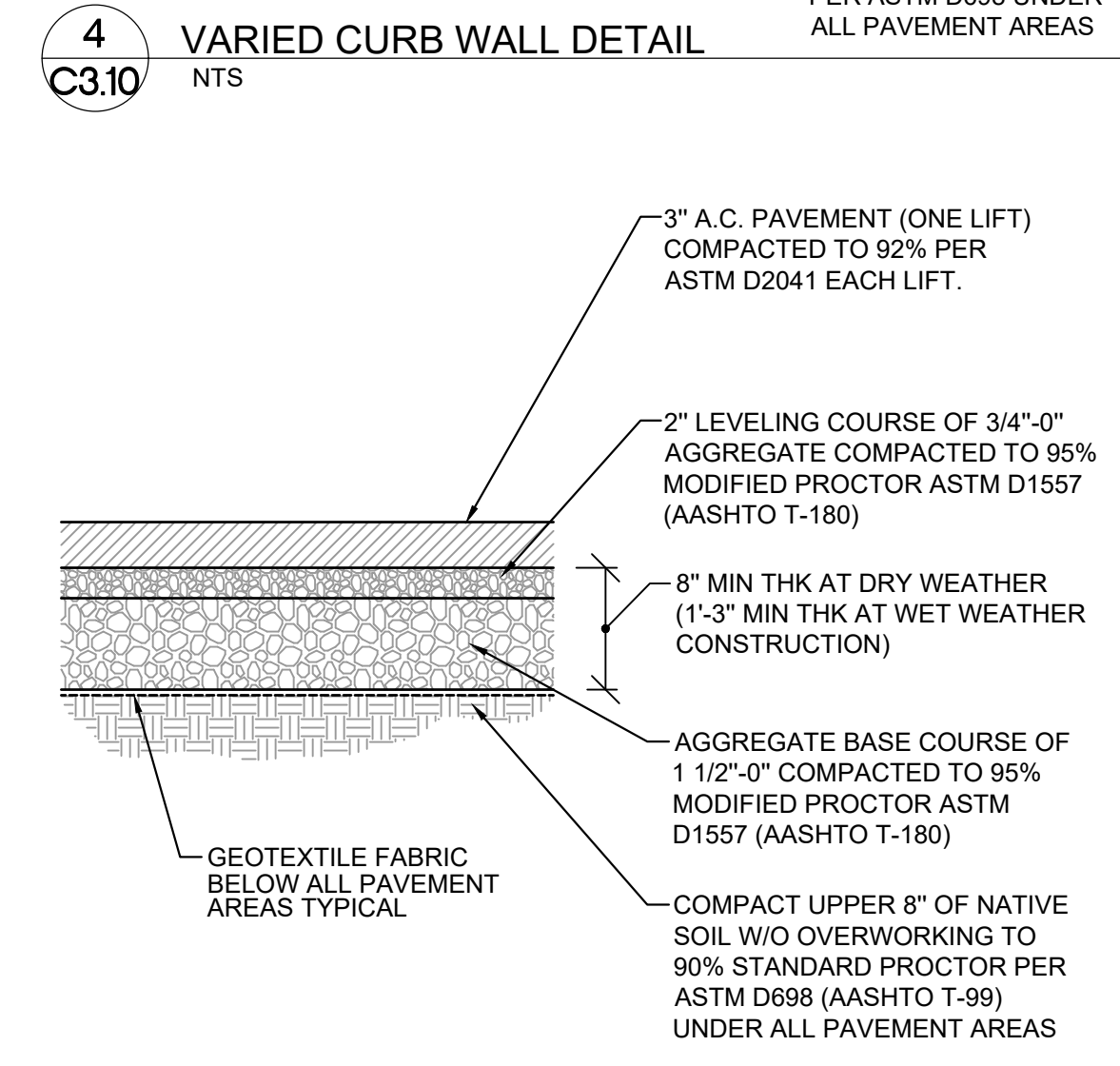
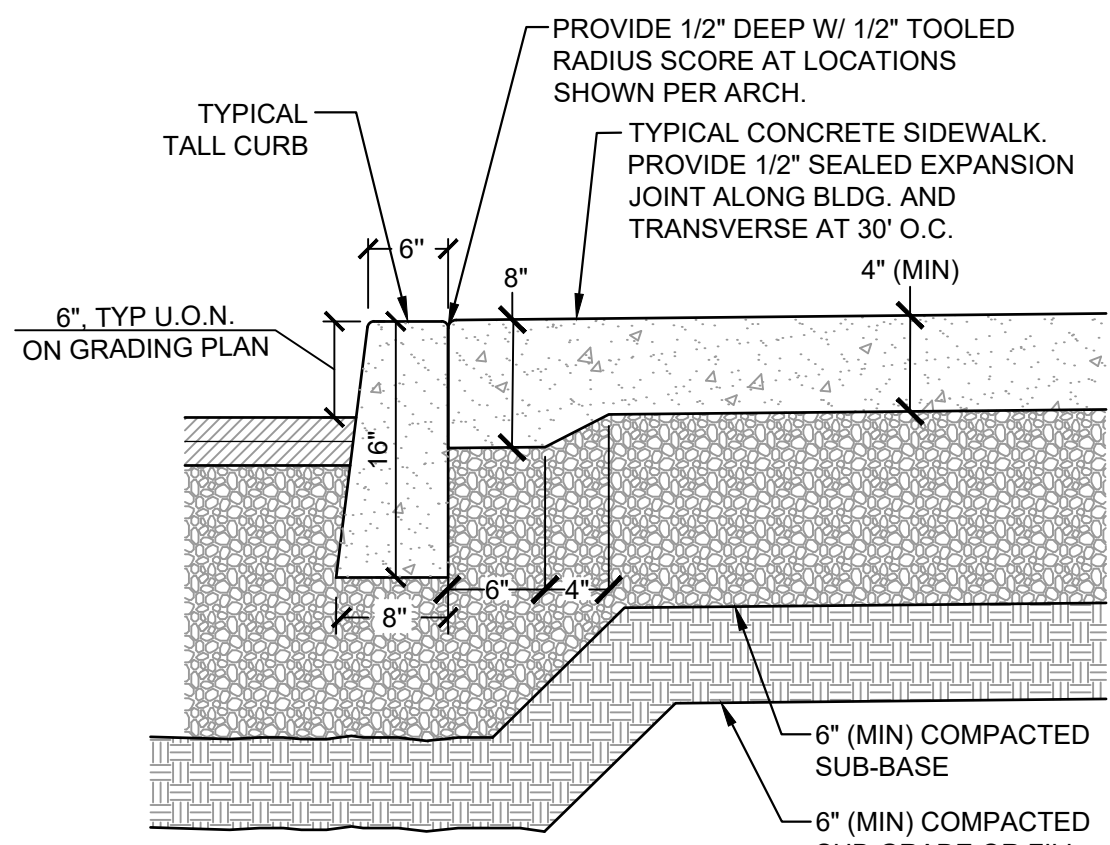
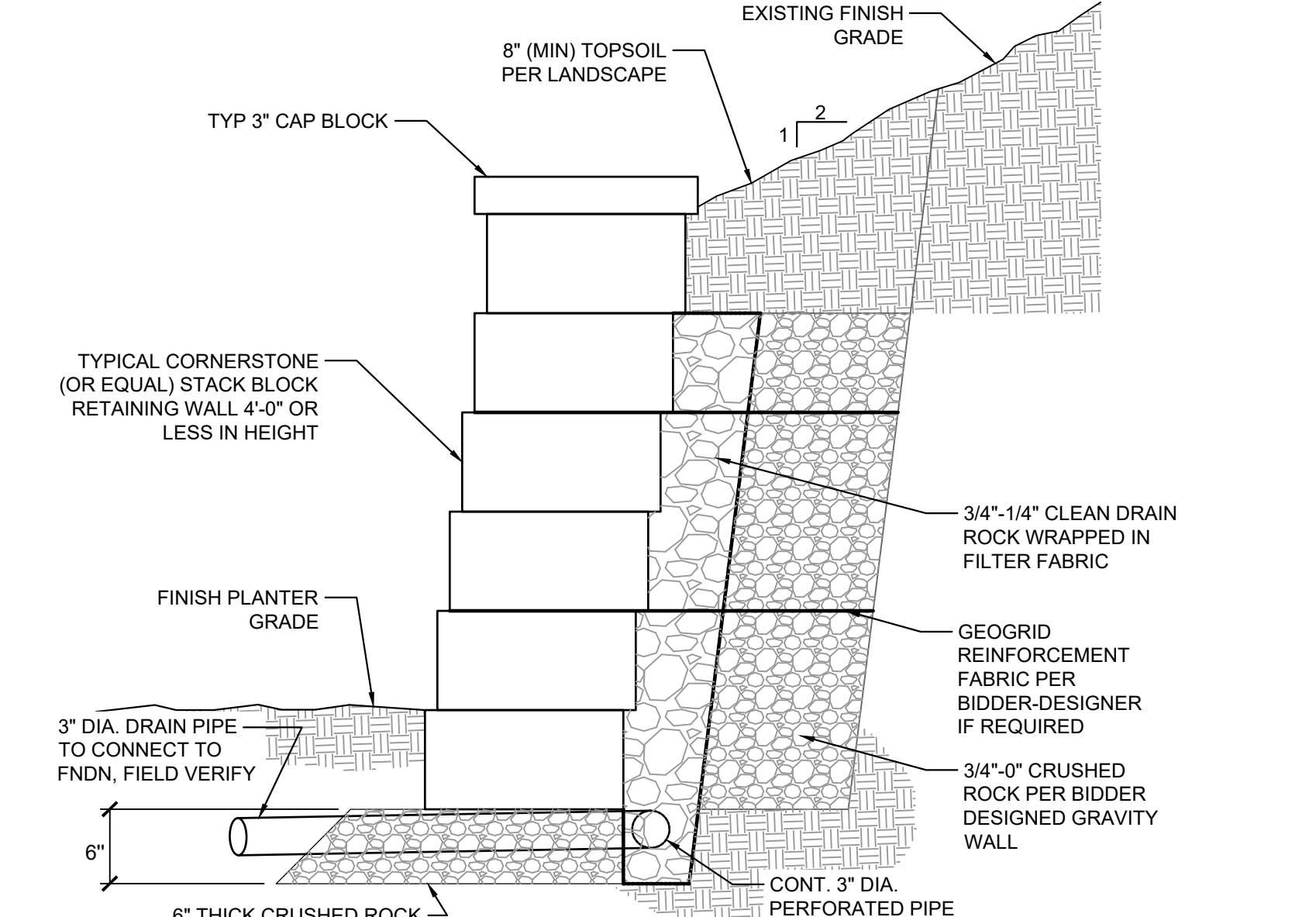
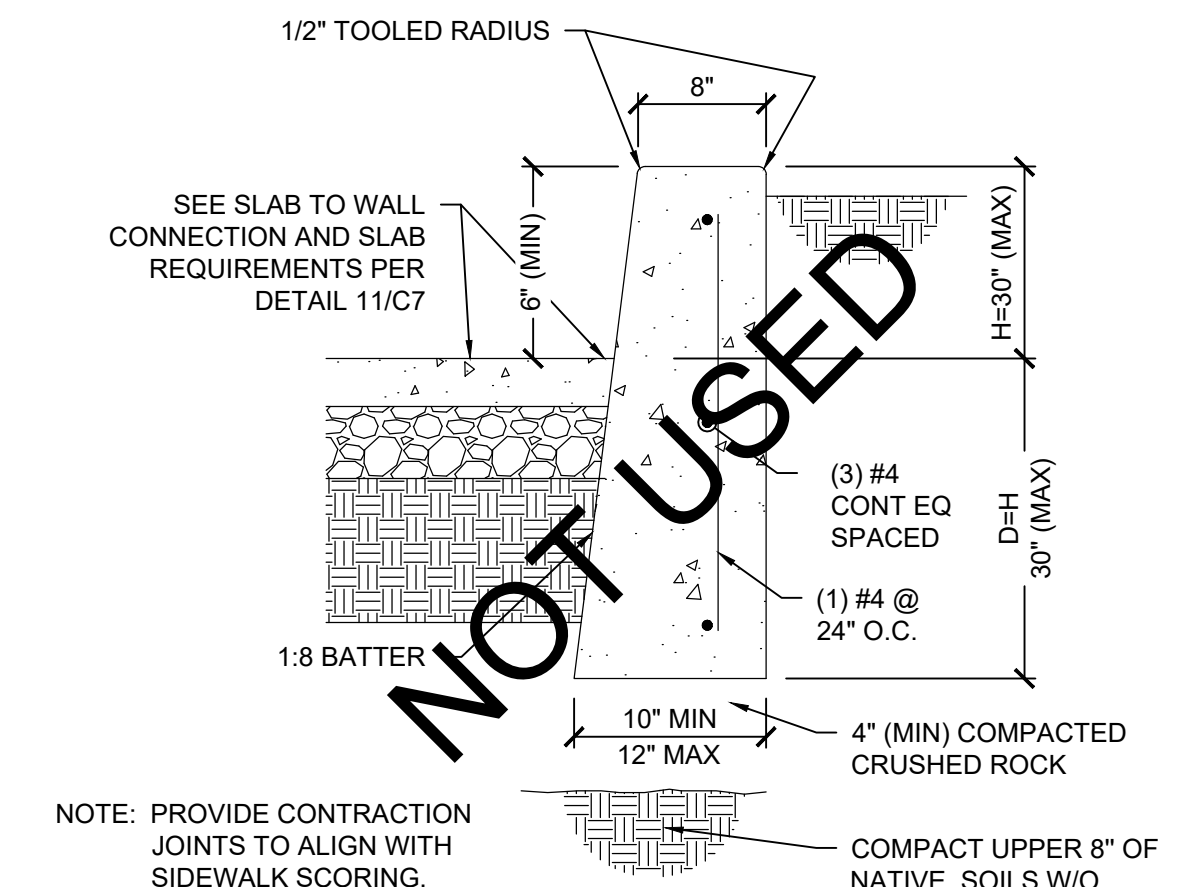
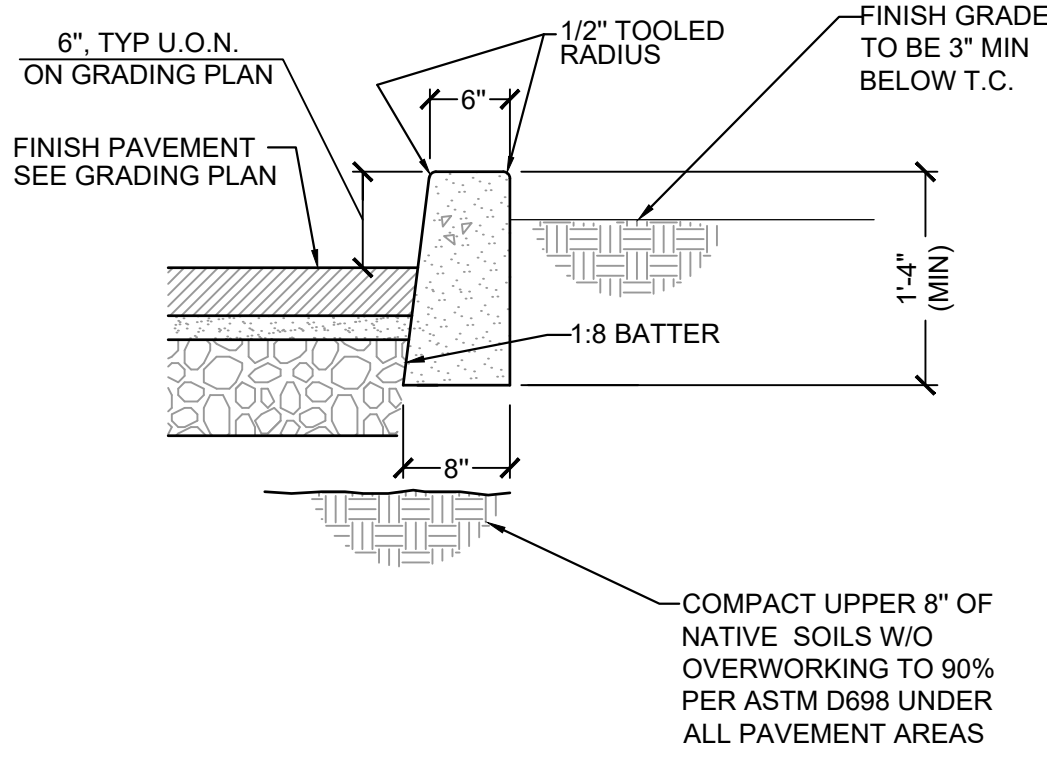
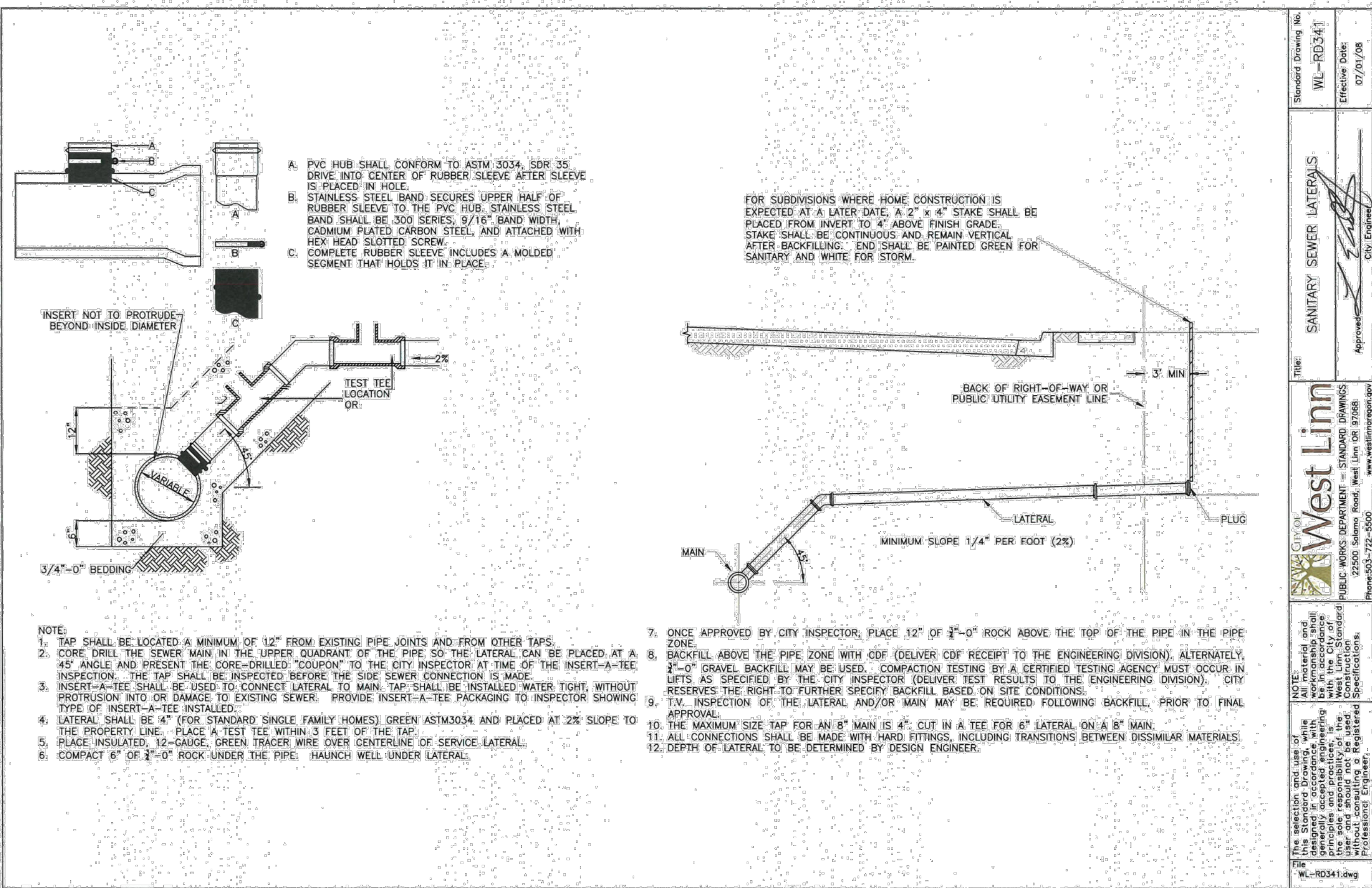
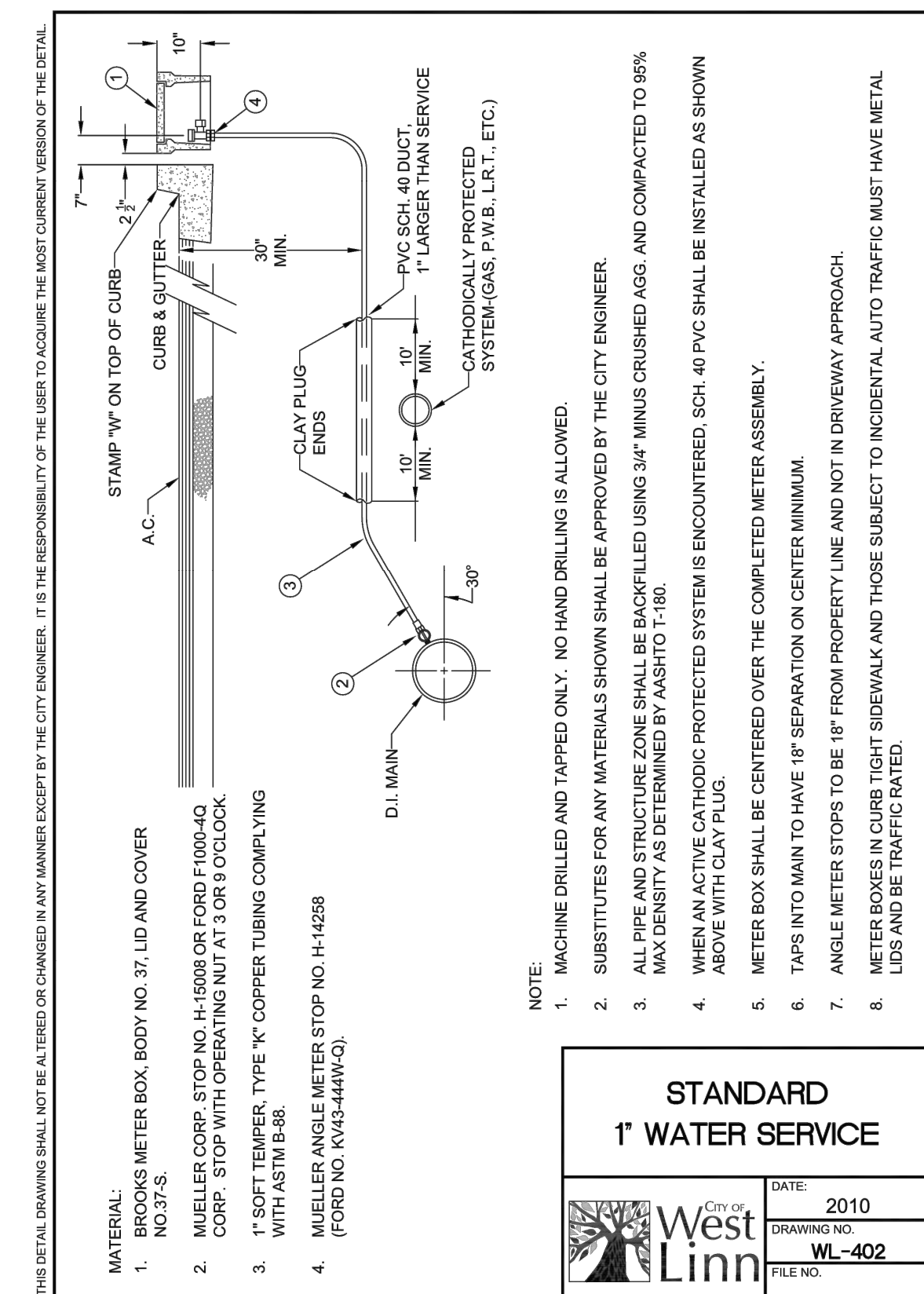


12 GRATE AT TYPICAL STEEL CATCH BASIN  
1" = 1'-0" C3.00

ARBOR DRIVE PARTITION  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
ONSITE CIVIL DETAILS

Table with columns for REVISIONS, DATE, DRAWN, CHECKED, JOB NUMBER, and C/D.

C3.00



West Linn  
PUBLIC WORKS DEPARTMENT - STANDARD DRAWING  
22500 Science Road, West Linn, OR 97146  
Phone: 503-772-5500  
www.westlinn.gov

Sanitary Sewer Lateral  
WL-RD341  
Effective Date: 07/07/08  
City Engineer

REGISTERED PROFESSIONAL ENGINEER  
80058PE  
Chris Deslauriers  
OREGON  
JUNE 7, 2012  
CHRIS J. DESLAURIERS  
RENEWS: 12-31-2019

WDY  
Structural-Civil Engineers  
6443 SW Beaverton-Hillsdale Hwy, suite 210 Portland, OR 97221  
ph: 503.203.8111 fx: 503.203.8122 www.wdy.com

**ARBOR DRIVE PARTITION**  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
ONSITE CIVIL DETAILS

REVISIONS	DATE	DRAWN:	CHECKED:	PRM	C/D

JOB NUMBER: 19035

**C3.10**



**PRELIMINARY STORM DRAINAGE  
CALCULATIONS**

**FOR**

**Arbor Drive Partition**  
2322 Arbor Drive  
WEST LINN, OR 97068

**March 15, 2019**

**TABLE OF CONTENTS/INCLUSIONS:**

**Storm Drainage Narrative:.....STM-1 to STM-2**  
**Tributary Area Maps:.....STM-3 to STM-4**  
**Simplified Approach Form:.....STM-5 to STM-6**  
**Geotech Recommendations:.....STM-7 to STM-9**  
**Storm Basin Detail:.....STM-10**



Hamilton and Kashoro  
79 Oak Street  
Portland, OR 97204

STM-1  
March 15, 2019

**RE: Arbor Drive Partition Preliminary “Storm Drainage Narrative and Analysis Report”**

Dear Ryan Pfeifer and Kevin Kashoro,

At your request, WDY, Inc. has completed the following storm drainage calculations for the 2322 Arbor Drive Partition project in West Linn, Oregon. The purpose of this report is to show the analysis and design of storm water, water quality and detention systems utilizing City of Portland style Storm Planters also known as “rain gardens” to provide detention and water quality for all new and redeveloped impervious areas. The storm drainage detention and water quality systems are designed per the City of West Linn’s Design Standards for Storm Drain Requirements. The water quality meets the 2016 City of Portland’s Stormwater Management Manual (SWMM) standards for the “Simplified Approach” which the City of West Linn accepts for water quality and detention design for small projects.

**Site Existing Conditions**

The existing site is currently one tax lot of 19,888 sf that consists of two buildings, a gravel access easement, a concrete driveway and walkway. The remaining area of the lot is generally covered in native vegetation and dense tree cover. The northwesterly property line fronts Arbor Drive. The site slopes consistently across the site at approximately 7.5% from the southwesterly property line down to the northeasterly direction. It is assumed that the site currently drains overland and storm runoff enters the public system at the nearest downstream public catch basin. There is no known private storm lateral to this site. The existing buildings, concrete slabs and any other existing features onsite will be demolished, and the site will be stripped prior to new construction.

**Proposed New Site Development:**

The proposed development will partition the one property into two separate tax lots. The proposed partition will split the existing 19,888 sf residential property into two, nearly equivalent, parcels (Parcel 1 north lot = 10,000 sf; Parcel 2 south lot = 9,888 sf). Each parcel will obtain separate building permits, and as such require separate analysis. The south parcel 2 is required to construct public improvements, and these improvements are considered in this design.

The City of West Linn has a policy of considering infiltration onsite when infiltration rates are greater than or equal to 2in/hr. The project geotechnical investigations recommended that infiltration will not be feasible due to the soil type and very low infiltration rates discovered on site. Based on these recommendations and the proximity of the storm basin to the public right of way and proposed building foundation, a lined storm basin was used in the stormwater design.

The Parcel 1 north lot proposes to construct an approximately 3,070 sf (impervious roof area) for the residential home with a 20-foot access easement to Parcel 2 of which 14 feet is asphalt pavement. The total impervious area of the proposed North Parcel 1 development is 6,108 sf including roof, pavement and sidewalks. All new or redeveloped impervious area will drain to the new storm basin designed to provide water quality and detention to meet City of West Linn storm water policies.

Arbor Drive Residential Partition  
"Stormwater Design Narrative"

Page 2

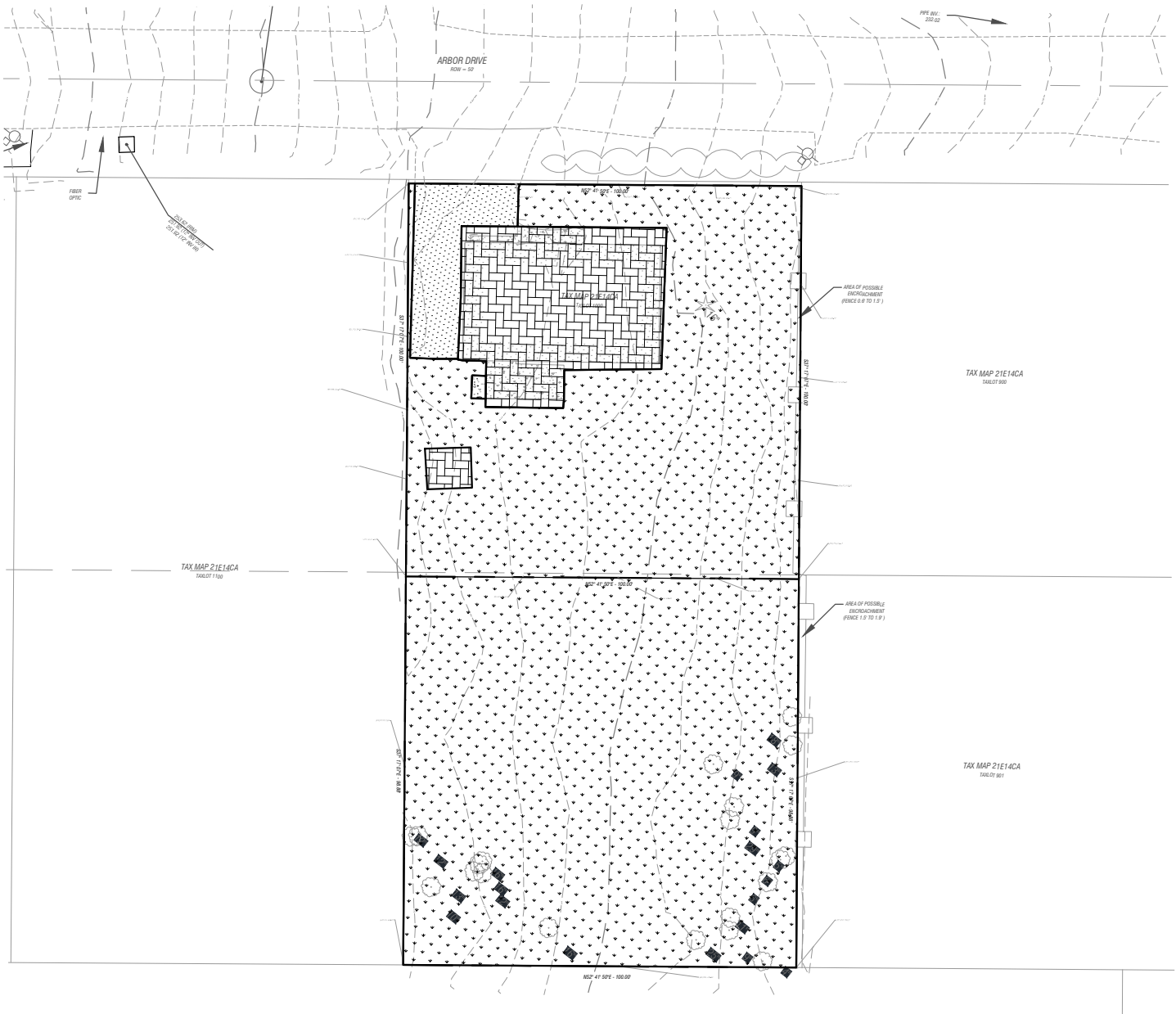
**Storm Basin:**


The new storm basin has 3H:1V side slopes, a total top of basin foot print of 568 sf and a bottom area is 89 sf. The total storage depth is 1.0 feet with 0.5 feet of freeboard and the total depth of the storm basin water quality and detention volume being 1.5 feet. Roof water from the new building (3,070 sf) will directly discharge to the basin and the driveway will discharge to a catch basin with a trapped and sumped outlet that provides initial pre-treatment per DEQ standards prior to discharging to the basin. This storm basin was designed using the City of Portland's Simplified Approach for water quality and detention. Please refer to the completed Simplified Approach form for more information.


Sincerely,  
Chris DesLauriers, PE




TOTAL SITE = 19,888 S.F. = 456 AC



 EXISTING CONCRETE & PAVEMENT  
723 SF  
CN=98

 EXISTING ROOF  
2,177 SF  
CN=98

 EXISTING LANDSCAPING  
7,100 SF  
CN=86



**EXISTING CONDITIONS MAP**

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**Structural · Civil Engineers**

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Portland, Oregon 97221  
ph:503.203.8111 fx:503.203.8122  
www.wdyi.com

**SCALE:** 1" = 20'-0"

**Job Name:** ARBOR DRIVE RESIDENTIAL

**Date:** MAR 2019

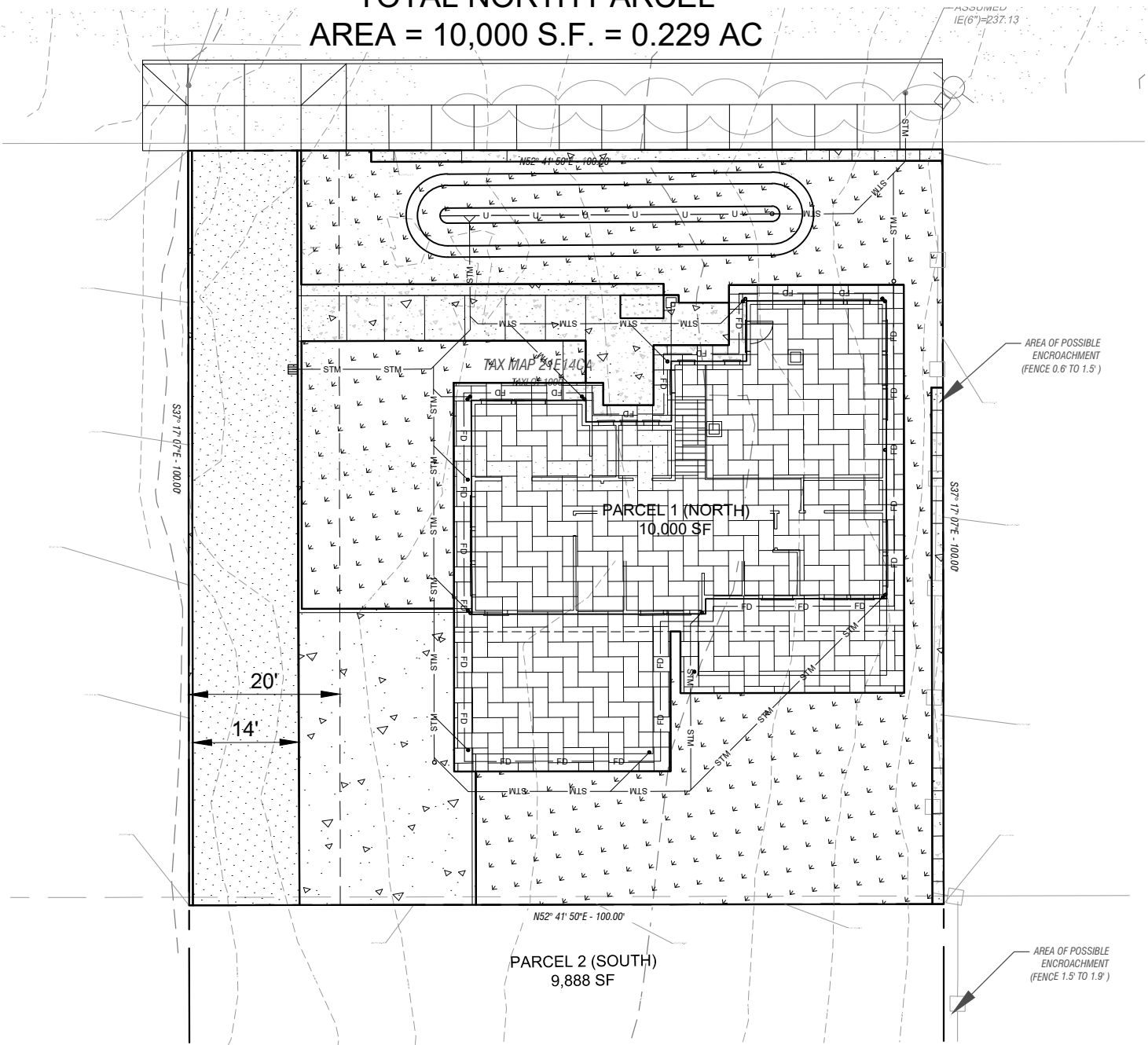
**Job No.:** 19035

**Drawn:** PRM

**Client:** H&K

**Sheet:** **STM-3**

TOTAL NORTH PARCEL  
 AREA = 10,000 S.F. = 0.229 AC



- PROPOSED NEW PAVEMENT** 1,402 SF  
 CN=98
- PROPOSED NEW CONCRETE** 1,635 SF  
 CN=98
- PROPOSED NEW ROOF** 3,070 SF  
 CN=98
- PROPOSED LANDSCAPING** 3,893 SF  
 CN=86



**PROPOSED NORTH PARCEL AREA MAP**

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 Portland, Oregon 97221  
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 www.wdyi.com

**SCALE:** 1" = 20'-0"

**Job Name:** ARBOR DRIVE RESIDENTIAL

**Date:** MAR 2019

**Job No.:** 19035

**Drawn:** PRM

**Client:** H&K

**Sheet:** **STM-4**





# SIMPLIFIED APPROACH FORM

## PROJECT INFORMATION WORKSHEET

STM-8

### PROJECT INFORMATION

STM-5

Permit Number: \_\_\_\_\_ Phone: \_\_\_\_\_

Name: \_\_\_\_\_ Email: \_\_\_\_\_

Site Address/R Number(s): \_\_\_\_\_

Development Description: \_\_\_\_\_

Total New or Redeveloped Impervious Area: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

### SITE CHARACTERISTICS

S.1. Do slopes exceed 20% anywhere within the project area?  Yes  No

S.2. Are there springs, seeps, or a high groundwater table anywhere within the project area?  Yes  No

**If answer to S.1 or S.2 is yes**, than lined or partial infiltration facility with an overflow to an approvable discharge point is required.

S.3. Is there a required geotechnical report?  Yes  No

S.4. Required infiltration testing complete?  Yes  No

If using prior test results at same site, provide Land Use case/permit number: \_\_\_\_\_

### Required Infiltration Testing

Date of Test: \_\_\_\_\_

Depth of Excavation (ft): \_\_\_\_\_

	TEST 1	TEST 2	TEST 3
A. Time (of day)			
B. Duration (hours) (1 hour minimum)			
C. Initial Water Depth (inches)			
D. Final Water Depth (inches)			
E. Infiltration Rate* (inches/hour)			

\*Infiltration Rate = Initial Depth (in) – Final Depth (in) / Duration of Test (hours)

### SIMPLIFIED INFILTRATION TESTING PROCEDURE

The Simplified Approach provides a method that a nonprofessional can use for design of simple stormwater systems on small projects. A geotechnical report or different infiltration test may be required at the discretion of the assigned BES plan reviewer. See Section 2.3.6 for infiltration testing requirements.

#### Test instructions:

1. Conduct test in and/or near location of proposed infiltration facility.
2. Excavate a test hole a minimum of 16" in depth, or to the bottom of the proposed infiltration system, whichever is greater. If a hard pan layer is encountered that prevents further excavation, or if noticeable moisture/water is encountered in the soil, stop and measure this depth and note it on the SIM form. If further excavation is not possible, conduct the test at this depth.
3. Fill the hole with water to a depth of at least 6" from the bottom of the hole. Record the amount of time required for the water to draw down to the bottom of the test pit. Check the water level at regular intervals to ensure accurate data collection.
4. Repeat the process two more times for a total of 3 rounds of testing. Conduct the tests in succession to accurately portray the soil's ability to infiltrate at different levels of saturation. The 3rd test provides the best measure of the infiltration rate at saturated conditions.
5. Record infiltration test data in the table at left and certify the results.

### Test pit location (site plan sketch)

Key information to include: 1) Site or parcel, 2) Adjacent road(s) or cross street(s), 3) Test pit location with dimensions



### Certification of Infiltration Results (required)

I acknowledge the accuracy of these infiltration testing results.

Signature of tester (required)

Print Name

Date

# SIMPLIFIED APPROACH FORM

## PROPOSED STORMWATER FACILITIES

STM-8

### Proposed Stormwater Facilities

STM-6

Please note: Each individual taxlot is required to manage the stormwater runoff it generates from new construction or redevelopment on the same lot to the maximum extent feasible. The following table includes accepted simplified stormwater management facilities as described in Chapter 2 of the 2016 Stormwater Management Manual. Copies of the manual are available online at [www.portlandoregon.gov/bes/swmm](http://www.portlandoregon.gov/bes/swmm).

	STORMWATER FACILITY TYPE	TOTAL AREA MANAGED BY FACILITY TYPE (SF)	FACILITY SIZING FORMULA	FACILITY SIZE (SF)
<b>IMPERVIOUS AREA REDUCTION TECHNIQUE</b>	Tree Credit		Complete Tree Credit Worksheet and attach	n/a
	Ecoroof		1:1 ratio only	n/a
	Pervious Pavement		1:1 ratio only	n/a
<b>SURFACE INFILTRATION OR FILTRATION</b>	Downspout Extension		Area x 0.10	
	Rain Garden		Area x 0.10	
	Basin		Area x 0.09	
	Swale		Area x 0.09	
	Planter		Area x 0.06	
	Filter Strip (paved areas only)		Area x 0.20	
<b>SUBSURFACE DISPOSAL UIC</b>	Soakage Trench		Westside soakage trench no longer an option under the simplified approach. Only a single soakage trench sizing possible. <i>See below for sizing information.</i>	
	Drywell		Enter drywell type and quantity for facility size. <i>See below for sizing information.</i>	
<b>TOTAL IMPERVIOUS AREA MANAGED</b>			Total Impervious Area Managed must match Total New or Redeveloped Impervious Area. Site plans must identify stormwater facility location, drainage areas, overflows and escape routes.	

Subsurface facilities can receive overflow from impervious area reduction techniques or surface infiltration/filtration facilities or can be used independently to manage runoff. If stormwater is generated from anything other than roof area, stormwater facilities are subject to UIC requirements (see Chapter 1 for UIC requirements).

### Sizing Charts:

DRYWELL TYPE	AREA MANAGED
2'x2' mini drywell	Up to 500 sf
28"x5'	Up to 1,000 sf
4'x5'	Up to 3,000 sf
4'x10'	Up to 6,000 sf

SOAKAGE TRENCH	LENGTH PER 1,000 SF OF IA	WIDTH	DEPTH	SIZING
Soakage Trench	20'	2.5'	1.5'	AREA x 0.05

beneath this the soils were generally characterized by a medium stiff to stiff consistency. This material extended to depths of 3.5 to 4.5 feet below the ground surface.

**Residual Soil:** Underlying the Willamette Formation soils were a stiff, light brown, clayey SILT (ML) soils, with light gray, extremely soft (R0) to soft (R2) heavily weathered basalt derived from weathering of the Columbia River Basalt Formation. This material extended beyond the maximum depth of our hand auger explorations. Due to the inability to excavate through the weathered basalt fragments using conventional hand auger equipment the maximum depth of explorations was 5 feet below ground existing surface.

### **Groundwater and Soil Moisture**

On January 31, 2019, groundwater seepage was not encountered in our hand auger soil borings. Soil moistures observed were generally considered to be moist to very moist in the upper 3 feet and damp to moist within the remainder of the soil profile of our hand auger explorations. According to the *Estimated Depth to Groundwater in the Portland, Oregon Area, (United States Geological Survey, 2018)*, groundwater is expected to be present at an approximate depth of 105-115 feet below the ground surface. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater may be encountered in localized areas. Seeps and springs may exist in areas not explored and may become evident during site grading.

### **Infiltration Testing**

On January 31, 2019, soil infiltration testing was performed using the falling-head method within all hand auger soil boring locations, in accordance with the methodology of the 2014 City of Portland Stormwater Management Manual. The approximate locations of the subsurface explorations are displayed in Figure 3. The test locations were pre-saturated prior to testing. During testing the water level was measured to the nearest 0.1 inch from a fixed point, and the change in water level was recorded at regular intervals until three successive measurements showing a consistent infiltration rate were achieved.

Table 2 summarizes the results of the falling-head infiltration testing. Infiltration rates have been reported without applying a factor of safety. Groundwater was not encountered within our hand auger soil boring explorations which extended to a maximum depth approximately 5 feet. Infiltration was not observed during the falling-head infiltration test at these elevations. We recommend that stormwater infiltration not be conducted as part of the residential development, and that other types of systems such as flow-through planters, side-street swales, or connecting to available public storm systems be considered during site development.

**Table 2- Summary of Infiltration Test Results**

Exploration Designation	Depth (feet)	Soil Type	Infiltration Rate(in/hr)	Hydraulic Head Range (inches)
HA-1	4	SILT (ML)	0	12
HA-2	5	SILT (ML)	0	12
HA-3	4	SILT (ML)	0	12

**CONCLUSIONS AND RECOMMENDATIONS**

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and sufficient geotechnical monitoring is incorporated into the construction phases of the project. The primary geotechnical concerns associated with development at the property are:

- 1) The low permeability of onsite soils. Onsite infiltration testing in all hand auger soil borings displayed no observable infiltration during testing and soils observed in our hand auger explorations to 5 feet in depth were characteristic of low permeability.
- 2) The presence of soft native soils in the upper two to three feet. Soils in the upper two to three feet were observed to be soft to medium stiff. Moisture conditioning and re-compaction or over-excavation and/or replacement with structural fill may be necessary for adequate foundation support.

**Site Preparation Recommendations**


Areas of proposed buildings, new roadways, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures should be demolished and any cavities structurally backfilled. Inorganic debris and organic materials from clearing should be removed from the site.

Existing fill and any organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. The estimated depth necessary for removal of topsoil is approximately 8 to 10 inches – deeper stripping may be necessary to remove large tree roots in isolated areas. A thicker topsoil layer with evidence of being disturbed was observed in hand auger boring location HA-1. A greater depth of stripping will be necessary in this vicinity. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.




Base image provided by Portland Maps

**Legend**

**HA-1**  
  
 Hand Auger Designation,  
 Approximate Location,  
 and Depth of Rock Refusal

  
 Site Boundary

Date: 2.5.2019 Drawn by: MTB  
  
 APPROXIMATE SCALE 1"=30'



Job Name: **Arbor Drive Residential Partition**

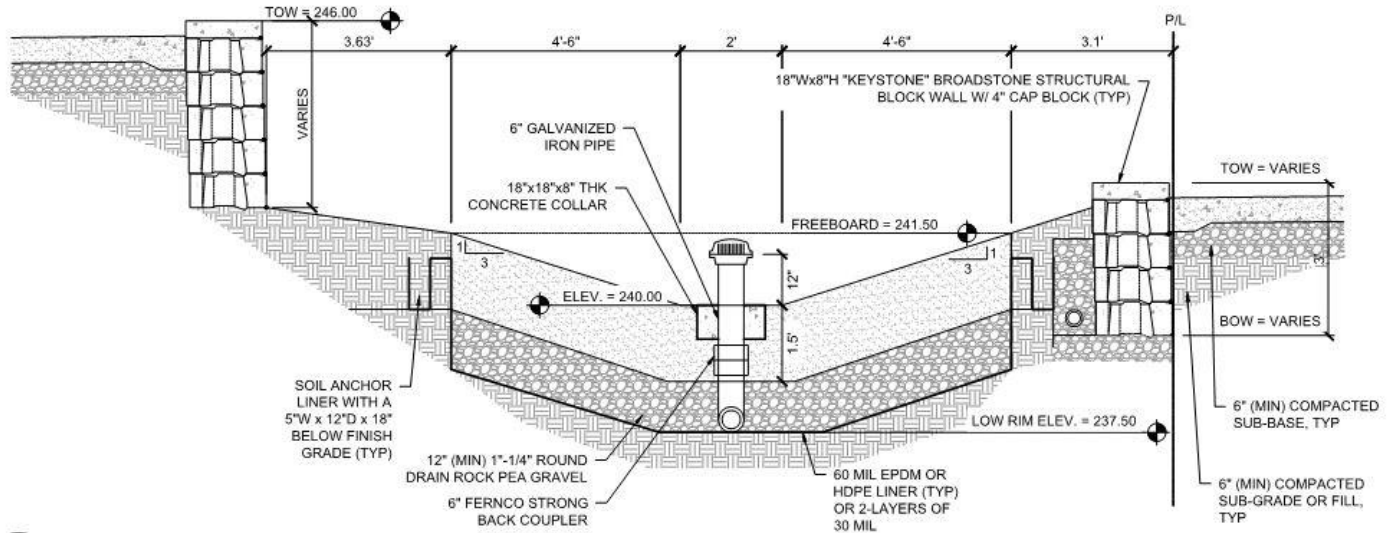
Job No: **19035**

Sheet No: **STM - 10**

Client: **Hamilton and Kashoro**

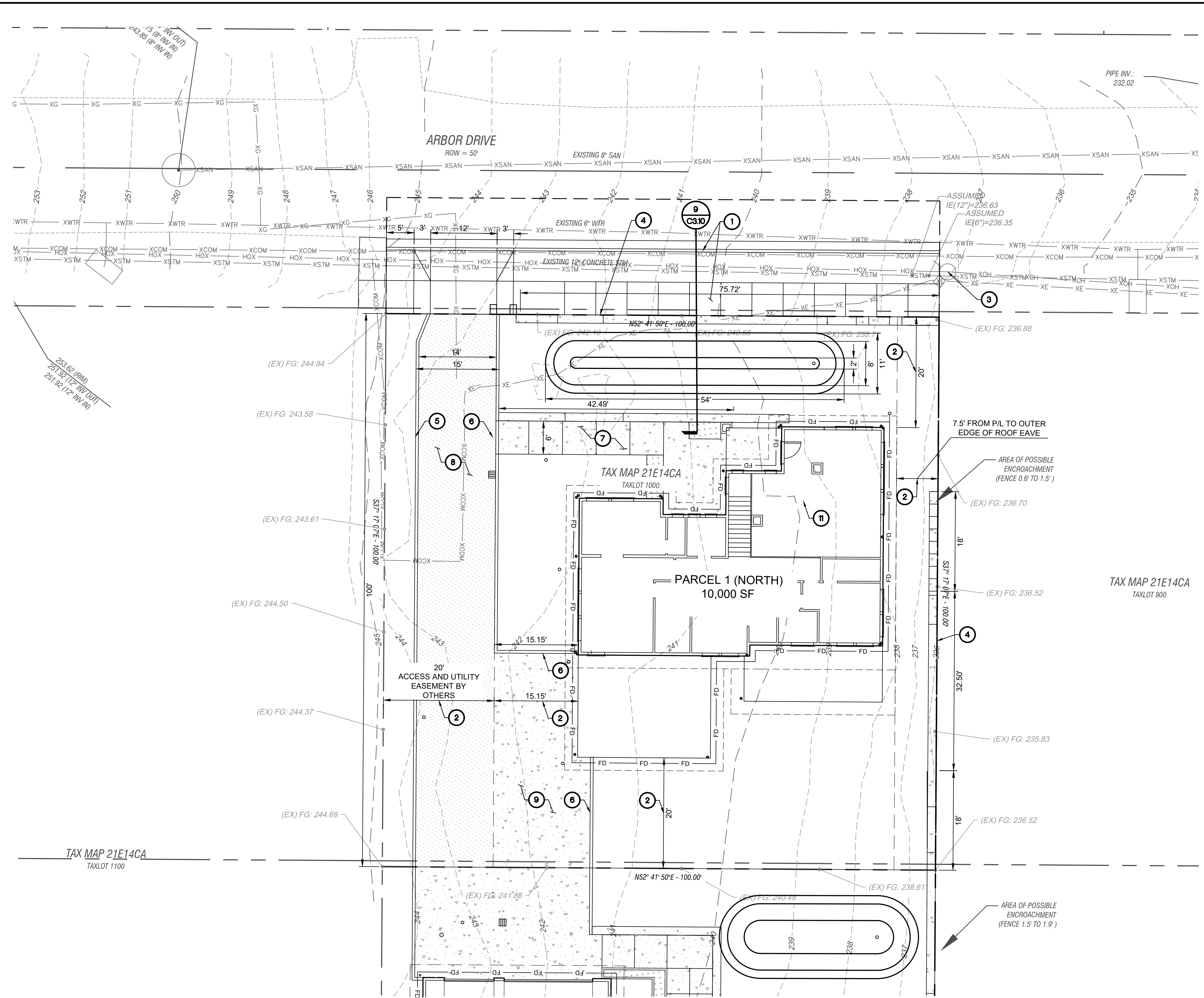
Date: **March 2019**

By: **PRM**



**9** **STORM DETENTION/RETENTION POND CROSS SECTION**  
 1/2" = 1'-0"





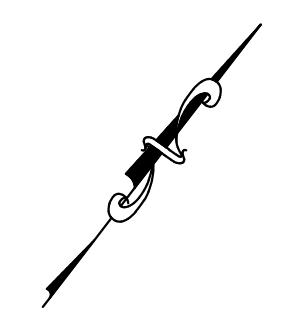
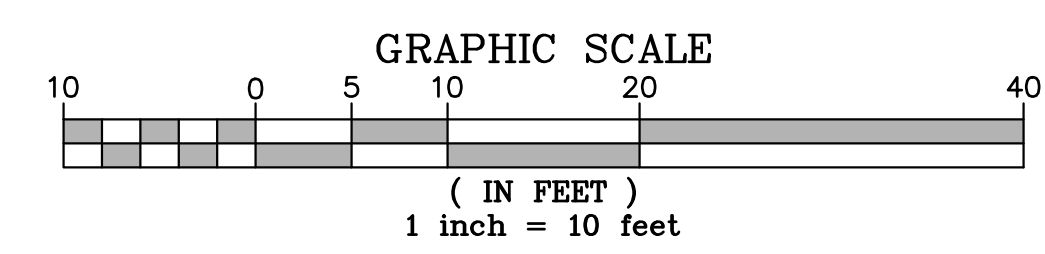
KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	FUTURE PUBLIC WORKS IMPROVEMENTS WITH PERCEL 2 BUILDING PERMIT (TYP).
2	SEE ARCHITECTS SITE PLAN FOR CONFIRMATION OF EASEMENT AND BUILDING LOCATION AND DIMENSIONS (TYP).
3	PROTECT EXISTING POWER POLE.
4	NEW "KEystone" BLOCK WALL, SEE GRADING PLAN. PROVIDE BIDDER DESIGN WALL FOR STRUCTURAL WALL GREATER THAN 4'-0".
5	NEW CURB WALL ALONG WEST P/L, SEE GRADING PLAN.
6	NEW STANDARD CURB, SEE GRADING PLAN.
7	NEW SIDEWALK, CONFIRM WITH OWNER/ARCHITECT FOR DIMENSIONS.
8	NEW AC PAVED ACCESS DRIVE, SEE GRADING PLAN.
9	NEW CONCRETE DRIVEWAY, SEE GRADING PLAN.
10	NEW CATCH BASIN, SEE UTILITY PLAN.
11	REMOVE EXISTING TREE FOR NEW WORK.



**WDY** Structural - Civil Engineers  
 6443 SW Beaverton-Hillsdale Hwy, Suite 210 Portland, OR 97221  
 ph:503.203.8111 fx:503.203.8122 www.wdy.com

**ARBOR DRIVE PARTITION**  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068  
 ONSITE CIVIL SITE PLAN LAYOUT

**1** ONSITE CIVIL SITE PLAN LAYOUT  
 C1.10 SCALE: 1" = 10'



REVISIONS	PRM	C/D
DATE: 03-15-2019	DRAWN:	CHECKED:
JOB NUMBER: 19005		

**C1.10**



KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	INSTALL 14" WIDE X 50' LONG CONSTRUCTION ENTRANCE PER DETAIL 1/C3.00.
2	INSTALL SEDIMENT FENCE PER DETAIL 2/C3.00 ALONG EDGE OF MAXIMUM DISTURBANCE BOUNDARY. MAY FOLLOW ALONG PROPERTY LINE.
3	FIELD LOCATE FIRST DOWNSTREAM PUBLIC CATCH BASIN, INSTALL BIO BAG AND SILT SACKS PER DETAIL 3/C3.00.
4	INSTALL BIO BAG AND SILT SACKS PER DETAIL 3/C3.00.
5	INSTALL BIO-BAG CHECK DAM IN ROW AT EAST END OF NEW WORK.

**EMERGENCY CONTACT: RYAN PFEIFER 503-753-8571**

**08.0 EROSION CONTROL NOTES**

1. APPLICANT/CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.
2. THE IMPLEMENTATION OF THESE ESC PLANS AND CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE ESC FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED BY THE LOCAL JURISDICTION, AND VEGETATION/LANDSCAPING IS ESTABLISHED. THE DEVELOPER SHALL BE RESPONSIBLE FOR MAINTENANCE AFTER THE PROJECT IS APPROVED UNTIL THE OWNER CONSTRUCTION IS COMPLETE.
3. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN SHALL BE CLEARLY MARKED IN THE FIELD PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE MARKINGS SHALL BE MAINTAINED BY THE APPLICANT/CONTRACTOR FOR THE DURATION OF CONSTRUCTION.
4. THE ESC FACILITIES SHOWN ON THIS PLAN MUST BE CONSTRUCTED IN CONJUNCTION WITH ALL CLEARING AND GRADING ACTIVITIES, AND IN SUCH A MANNER AS TO INSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT ENTER THE DRAINAGE SYSTEM, ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.
5. THE ESC FACILITIES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING CONSTRUCTION PERIOD, THESE ESC FACILITIES SHALL BE UPGRADED AND MODIFIED BY THE CONTRACTOR/OWNER AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DOES NOT LEAVE THE SITE.
6. THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
7. AT NO TIME SHALL SEDIMENT BE ALLOWED TO ACCUMULATE MORE THAN 1/3 THE BARRIER HEIGHT. ALL CATCH BASINS AND CONVEYANCE LINES SHALL BE CLEANED PRIOR TO PAVING. THE CLEANING OPERATIONS SHALL NOT FLUSH SEDIMENT-LADEN WATER INTO THE DOWNSTREAM SYSTEM.
8. STABILIZED GRAVEL ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO INSURE THAT ALL PAVED AREAS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.
9. STORM DRAIN INLETS, BASINS, AND AREA DRAINS SHALL BE PROTECTED UNTIL PAVEMENT SURFACES ARE COMPLETED AND/OR VEGETATION IS RE-ESTABLISHED.
10. THE CONTRACTOR SHALL EMPLOY BMP'S TO PROTECT THE PUBLIC RIGHT-OF-WAY FROM SEDIMENT DURING CONSTRUCTIONS. PAVEMENT SURFACES AND VEGETATION ARE TO BE PLACED AS RAPIDLY AS POSSIBLE.
11. SEEDING SHALL BE PERFORMED NO LATER THAN SEPTEMBER 1 FOR EACH PHASE OF CONSTRUCTION.
12. IF THERE ARE EXPOSED SOILS OR SOILS NOT FULLY ESTABLISHED FROM OCTOBER 1ST THROUGH APRIL 30TH, THE WET WEATHER EROSION PREVENTION MEASURES WILL BE IN EFFECT. SEE THE EROSION PREVENTION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (CHAPTER 4) FOR REQUIREMENTS.
13. THE CONTRACTOR/DEVELOPER SHALL REMOVE ESC MEASURES WHEN VEGETATION IS FULLY ESTABLISHED.
14. APPROVAL OF THIS EROSION/SEDIMENTATION CONTROL (ESC) PLAN DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT ROAD OR DRAINAGE DESIGN (E.G. SIZE AND LOCATION OF ROADS, PIPES, RESTRICTORS, CHANNELS, RETENTION FACILITIES, UTILITIES, ETC.).
15. ALL MATERIALS SPILLED, DROPPED, WASHED OR TRACKED FROM FROM VEHICLES ONTO ROADWAYS OR INTO THE STORMWATER COLLECTION SYSTEM SHALL BE REMOVED OR CLEANED UP IMMEDIATELY, AND NO LATER THAN THE END OF THE WORK DAY. THE USE OF WATER TRUCKS TO WASH THE MATERIAL OFF THE ROADWAY IS NOT ALLOWED. WATER TRUCKS MAY BE USED IMMEDIATELY BEFORE SWEEPERS OR VACUUM SYSTEMS TO LOOSEN SEDIMENT, PROVIDED THAT THE DISCHARGE TO THE STORMWATER COLLECTION SYSTEM DOES NOT OCCUR.

**10.0 SEDIMENT FENCES**

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6" OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. THE FILTER FABRIC FENCE SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE. THE FENCE POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND A MINIMUM OF 24 INCHES.
3. THE FABRIC SHALL NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES. ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION SHALL BE BACKFILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.
4. SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
5. SEDIMENT FENCES SHALL BE INSPECTED BY CONTRACTOR IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

**11.0 STANDARD NOTES FOR TEMPORARY EROSION CONTROL GRASSES**

1. PERMANENT COVER MUST BE ESTABLISHED PRIOR TO THE REMOVAL OF ANY EROSION CONTROL MEASURES ON ALL EXPOSED GROUND SURFACES AT THE END OF THE CONSTRUCTION PERIOD.
2. TEMPORARY GRASS COVER MEASURES MUST BE SEEDED BY SEPTEMBER 1 AND FULLY ESTABLISHED BY NOVEMBER 1 OR OTHER COVER MEASURES WILL HAVE TO BE IMPLEMENTED UNTIL ADEQUATE GRASS COVERAGE IS ACHIEVED.
3. HYDROMULCH SHALL BE APPLIED WITH GRASS SEED AT A RATE OF 2,000 LB/ACRE. (SEED MUST BE APPLIED AT 275 LB/ACRE.) ON SLOPES STEEPER THAN 10 PERCENT (10%) OR WHEN APPLIED BETWEEN SEPTEMBER 15 AND APRIL 15, HYDROSEED AND MULCH SHALL BE APPLIED WITH A BONDING AGENT (TACKIFIER). APPLICATION RATE AND METHODOLOGY TO BE IN ACCORDANCE WITH SEED SUPPLIER RECOMMENDATIONS.
4. IF STRAW IS USED IN CONJUNCTION WITH HYDRO MULCH, IT MUST BE DRY, LOOSE, WEED-FREE, AND APPLIED AT A RATE OF 4,000 LB/ACRE AND SHALL HAVE A MINIMUM DEPTH IN-PLACE OF 2 INCHES. ANCHOR STRAW BY WORKING IN BY HAND OR WITH EQUIPMENT (ROLLERS, CLEAT TRACKS, ETC.).
5. STRAW MULCH SHALL BE SPREAD UNIFORMLY IMMEDIATELY FOLLOWING SEEDING.
6. SOIL PREPARATION - TOP SOIL SHOULD BE PREPARED ACCORDING TO LANDSCAPE PLANS, IF AVAILABLE, OR RECOMMENDATIONS OF GRASS SEED SUPPLIER. IT IS RECOMMENDED THAT SLOPES BE ROUGHENED BEFORE SEEDING BY "TRACK-WALKING" (DRIVING A CRAWLING TRACTOR UP AND DOWN SLOPES TO LEAVE A PATTERN OF CLEAT IMPRINTS PARALLEL TO SLOPE CONTOURS) OR OTHER METHOD TO PROVIDE MORE STABLE SITES FOR SEEDS TO REST.
7. SEEDING - REQUIRED SEED MIXES ARE AS FOLLOWS. SIMILAR MIXES MAY BE SUBSTITUTED IF APPROVED BY THE CITY AND STILL TOTAL 275 LB/ACRE.
  - A. DWARF GRASS MIX (LOW HEIGHT, LOW MAINTENANCE): DWARF PERENNIAL RYEGRASS, 80% BY WEIGHT; CREEPING RED FESCUE, 20% BY WEIGHT; 275 LB/ACRE.
  - B. STANDARD HEIGHT GRASS MIX: ANNUAL RYEGRASS, 40% BY WEIGHT; TURF-TYPE FESCUE, 60% BY WEIGHT; 275 LB/ACRE.
8. FERTILIZATION FOR GRASS SEED - IN ACCORDANCE WITH SUPPLIER'S RECOMMENDATIONS. DEVELOPMENT AREAS WITHIN 50 FEET OF WATER BODIES AND WETLANDS MUST USE A NON-PHOSPHORUS FERTILIZER.
9. WATERING - SEEDING SHALL BE SUPPLIED WITH ADEQUATE MOISTURE TO ESTABLISH GRASS. SUPPLY WATER AS NEEDED, ESPECIALLY IN ABNORMALLY HOT OR DRY WEATHER OR ON ADVERSE SITES. WATER APPLICATION RATES SHOULD BE CONTROLLED TO PROVIDE ADEQUATE MOISTURE WITHOUT CAUSING RUNOFF.
10. RE-SEEDING - AREAS WHICH FAIL TO ESTABLISH GRASS COVER ADEQUATE TO PREVENT EROSION SHALL BE RE-SEEDED AS SOON AS SUCH AREAS ARE IDENTIFIED, AND ALL APPROPRIATE MEASURES TAKEN TO ESTABLISH ADEQUATE COVER.



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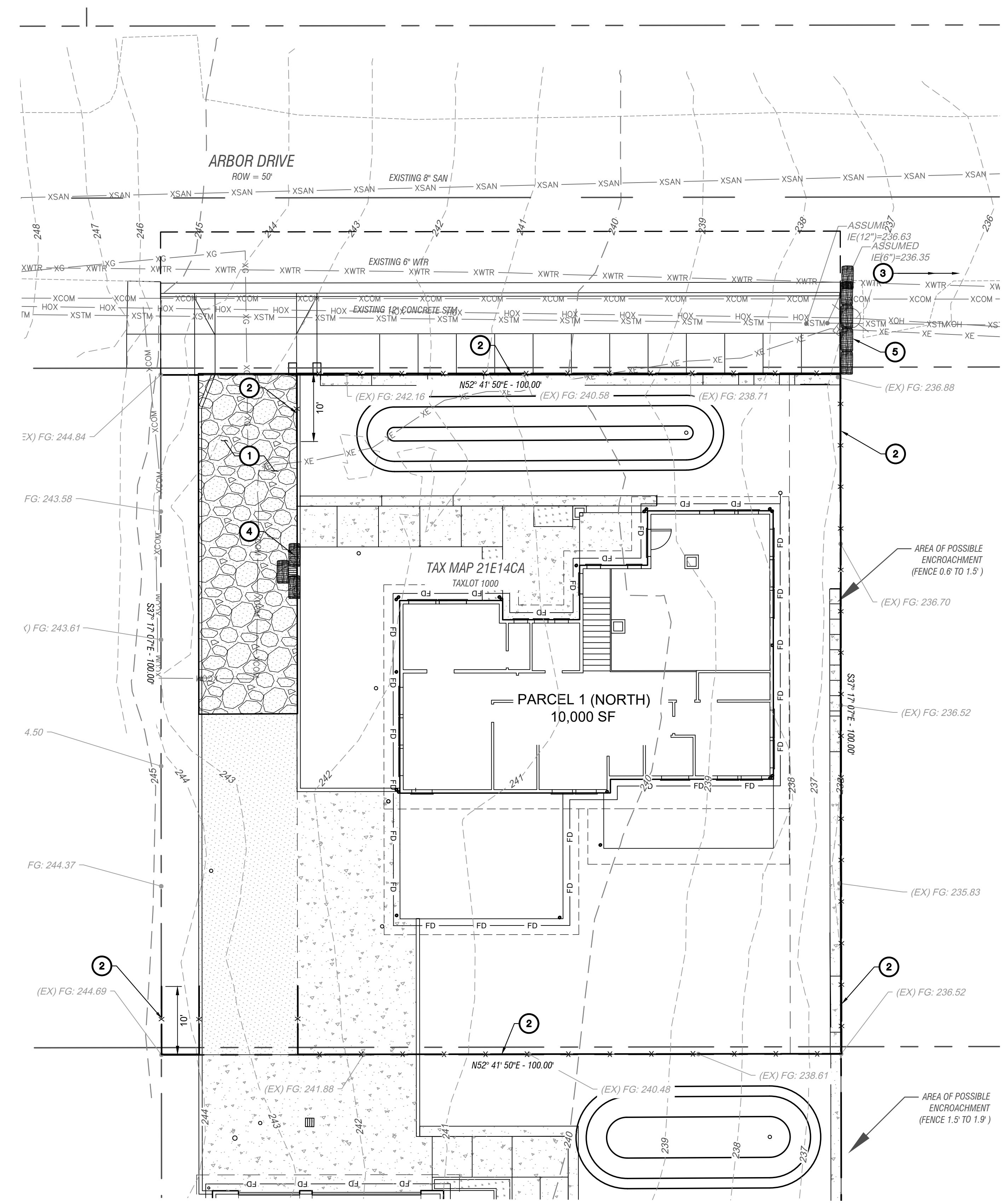
**ARBOR DRIVE PARTITION**  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068

**ONSITE CIVIL EROSION AND SEDIMENT CONTROL PLAN**

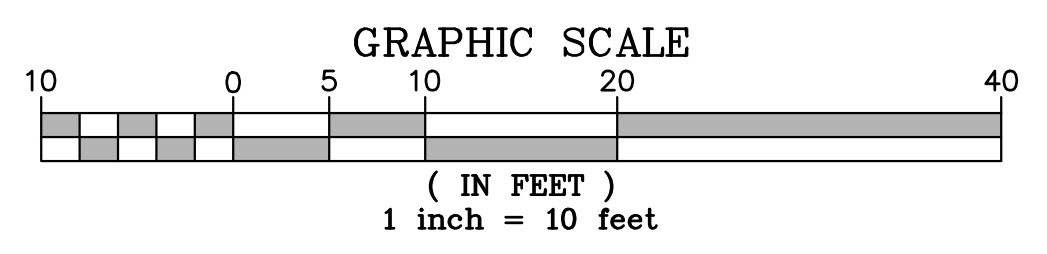
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	03-15-2019			

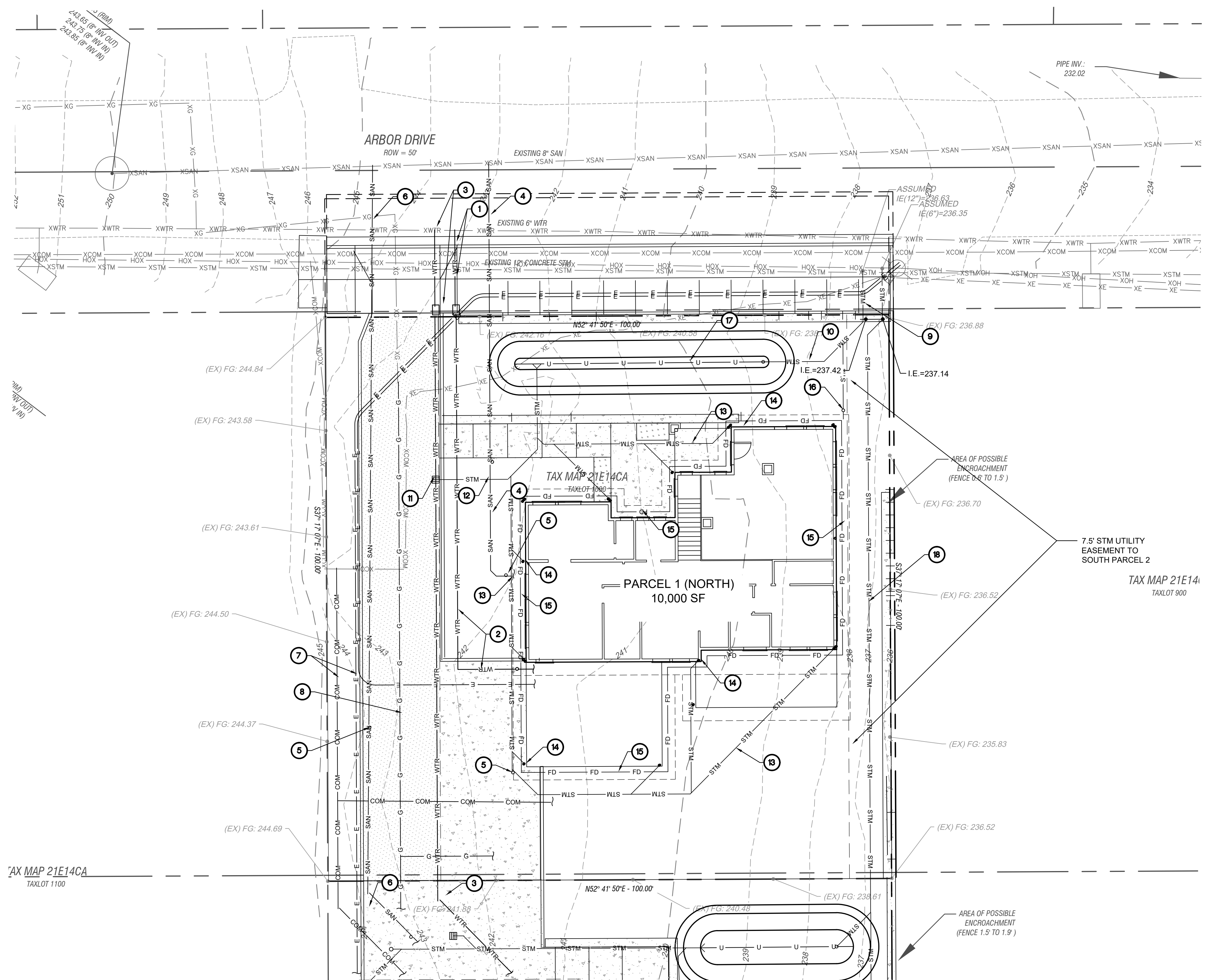
JOB NUMBER: 19035 CHECKED:

**C2.00**



**1** ONSITE CIVIL EROSION AND SEDIMENT CONTROL PLAN  
 SCALE: 1" = 10'





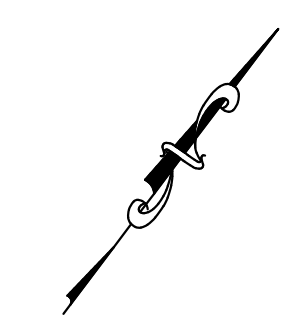
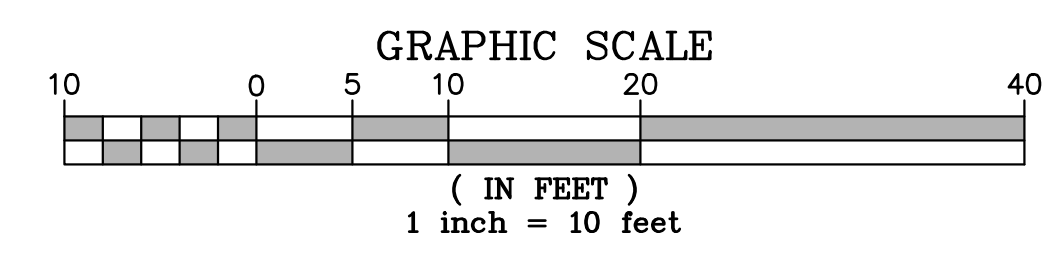
- ### KEYNOTES FOR THIS SHEET
- MARK - DESCRIPTION**
- 1 - INSTALL COPPER DOMESTIC WATER SERVICE AND METER FOR PARCEL 1, SEE CITY DWG WL-402/C3.10. SIZE TO BE CONFIRMED BY OTHERS.
  - 2 - EXTEND COPPER DOMESTIC WATER LINE TO BUILDING. COORDINATE WITH PLUMBING FOR CONTINUATION INTO BLDG.
  - 3 - INSTALL COPPER DOMESTIC WATER SERVICE AND METER FOR PARCEL 2, SEE CITY DWG WL-402/C3.10. SIZE TO BE CONFIRMED BY OTHERS. PROVIDE TEMPORARY CAP AND 2x4 STAKE AT END OF LATERAL FOR FUTURE BUILDING. EXTEND 3' INTO PARCEL 2.
  - 4 - INSTALL 4" PVC, ASTM, D3034, DR-35 S.S. LATERAL TO PARCEL 1 BUILDING AT 2.0% (MIN) SLOPE. SEE CITY DETAIL ON SHEET C3.10. COORDINATE W/ PLUMBING FOR CONTINUATION INTO BUILDING.
  - 5 - INSTALL CLEANOUT 3'-0" FROM FNDN. SEE DETAIL 9/C3.0, SET RIM TO FINISH GRADE. FIELD VERIFY.
  - 6 - INSTALL 4" PVC, ASTM, D3034, DR-35 S.S. LATERAL TO PARCEL 2. EXTEND 3' INTO P.I.L. PROVIDE TEMPORARY CAP AND 2x4 MARKER.
  - 7 - COORDINATE WITH FRANCHISE UTILITY PROVIDERS TO SERVICE PARCEL 1 BUILDING AND PARCEL 2 FUTURE BUILDING.
  - 8 - COORDINATE WITH GAS PROVIDER TO EXTEND GAS SERVICE TO PARCEL 1 BUILDING AND STUB TO PARCEL 2.
  - 9 - INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM LATERAL AT 1.0% SLOPE, CONNECT TO PUBLIC STM MAIN SIM TO CITY DETAIL ON SHEET C3.10. ASSUMED I.E. 6" AT PUBLIC MAIN = 237.33
  - 10 - INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM PIPE AT 1.0% SLOPE FROM STORM BASIN OVER FLOW TO NEW STORM LATERAL.
  - 11 - INSTALL NEW CATCH BASIN PER DETAILS 11 & 12/C3.00.
  - 12 - INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM AT 1.0% (MIN) SLOPE FROM CATCH BASIN AND OUTFALL AT WEST END OF BASIN FIELD VERIFY SLOPE. INSTALL 4' X 4' X 12" THK RIP RAP PAD W/ 6" TO 12" ROUND ROCK UNDERLAIN BY GEOTECHNICAL FABRIC AT OUTFALL. I.E. AT OUTFALL = 240.65
  - 13 - INSTALL 6" DIA PVC, ASTM, D3034, SDR-35 STM AT 1.0% (MIN) SLOPE AROUND BUILDING FOR ROOF DRAIN DOWNSPOUTS. FIELD VERY SLOPE. (TYP)
  - 14 - INSTALL ROOF DRAIN DOWN SPOUT SIM TO DETAIL 7/C3.00. CONNECT DOWN SPOUT TO SITE CONVEYANCE WITH 4" ABS SCHED 40 STM LATERAL AT 1.0% MIN SLOPE. COORDINATE WITH ARCHITECTS BUILDING DRAWINGS TO CONFIRM DOWN SPOUT LOCATIONS AND FIELD VERIFY SLOPES. (TYP)
  - 15 - INSTALL FOUNDATION DRAIN AROUND BUILDING TO SLOPE AT 0.5% MIN SLOPE DOWN TO NORTH EAST CORNER OF BUILDING. FOUNDATION DRAIN INVERT SHALL NOT BE BELOW BOTTOM OF FOOTING BY MORE THAN 3-INCHES AT ANY LOCATION AND SHALL NOT BE ABOVE FOOTING. CONNECT TO BACK WATER VALVE WITH SOLID NON-PERF PIPE ABS SCHED 40 OR PVC D3034, SDR-35 STM PIPE AT 1.0% SLOPE.
  - 16 - INSTALL FOUNDATION DRAIN BACK WATER VALVE SIM TO DETAIL 10/C3.00. FIELD VERIFY INVERT WITH STM LATERAL AND SET CLEAN-OUT RIM TO FINISH GRADE.
  - 17 - INSTALL 4-INCH DIA PVC PERF-PIPE IN FILTER FABRIC SOCK AT BOTTOM OF ROCK SECTION FOR THE LENGTH OF THE STORM BASIN, CONNECT TO OVER FLOW, SEE DETAIL 9/C3.10
  - 18 - INSTALL 6-INCH DIA PVC, ASTM, D3034, DR-35 STM PIPE LATERAL AT 1.0% SLOPE TO SOUTH PARCEL 2. I.E. AT PROPERTY LINE=239.14 +/-, FIELD VERIFY. CONNECT TO PUBLIC STM MAIN SIM TO CITY DETAIL ON SHEET C3.10. ASSUMED I.E. 6" AT PUBLIC MAIN = 237.05



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**ARBOR DRIVE PARTITION**  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068  
**ONSITE CIVIL UTILITY PLAN**

**1** **ONSITE CIVIL UTILITY PLAN**  
**C2.10** SCALE: 1" = 10'



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	03-15-2019		19035		

**C2.10**

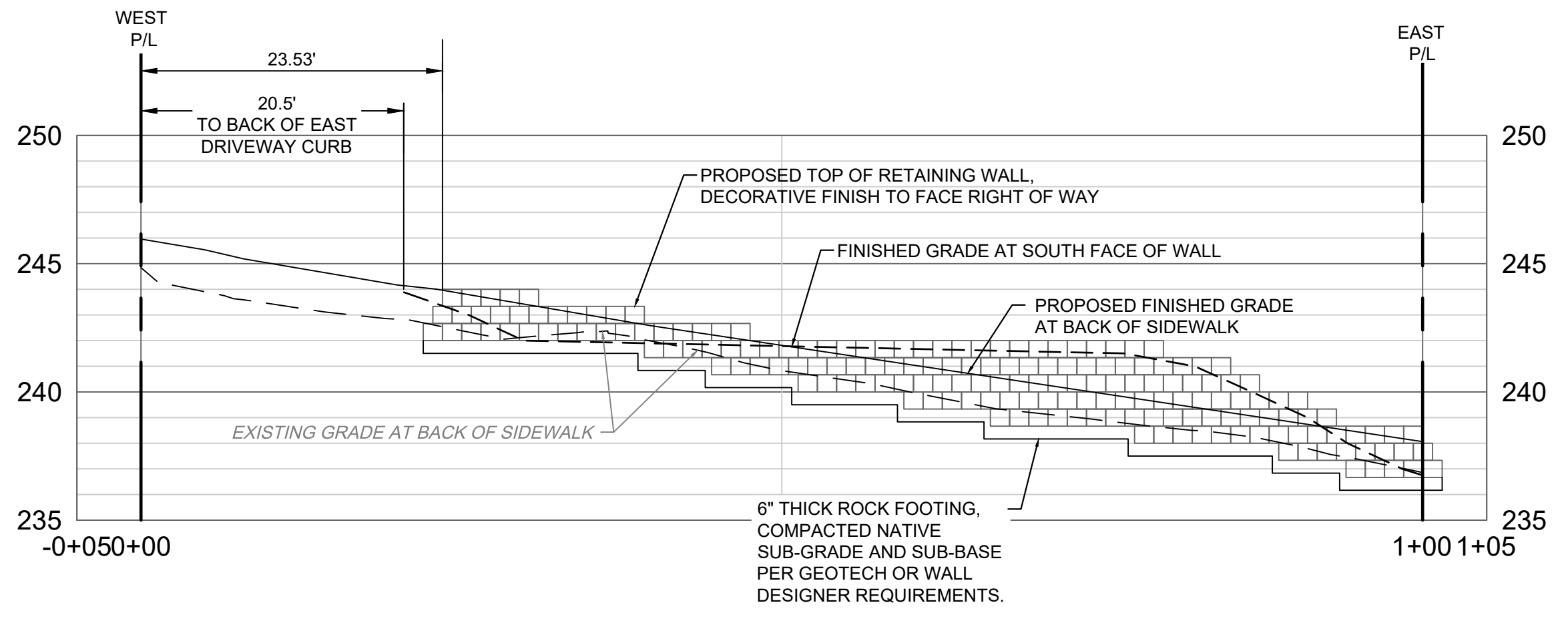
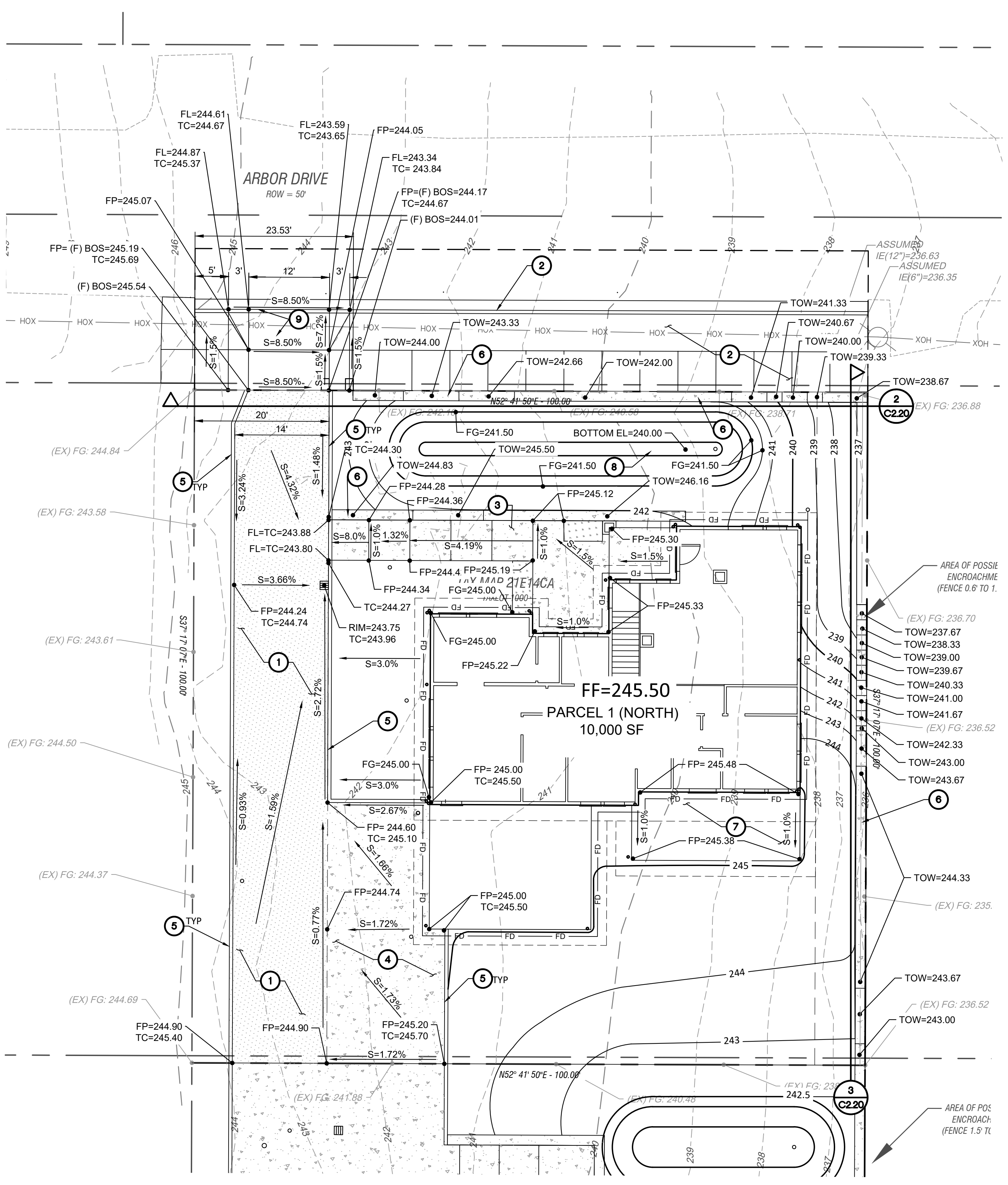
**KEYNOTES FOR THIS SHEET**

MARK	DESCRIPTION
1	NEW 14' PAVED WIDTH OF 20' PRIVATE ACCESS EASEMENT FOR NORTH AND SOUTH PARCEL. SOUTH PARCEL UNDER SEPARATE BUILDING PERMIT. INSTALL AC PAVEMENT PER DETAIL 7/C3.10.
2	NEW PUBLIC CURB AND SIDEWALK EAST OF DRIVEWAY APRON TO BE INSTALLED UNDER FUTURE SEPARATE PUBLIC WORKS PERMIT. THIS WORK IS SHOWN FOR COORDINATION, (TYP).
3	NEW CONCRETE WALKWAY TO NORTH PARCEL BUILDING FRONT DOOR, SEE DETAIL 8/C3.10.
4	NEW PRIVATE DRIVEWAY AND PARKING FOR NORTH BUILDING. COORDINATE WITH ARCH AND OWNER FOR PAVEMENT MATERIAL. SEE DETAIL 7/C3.10 FOR AC DRIVEWAY OR PROVIDE 6" SLAB ON GRADE WITH #4 BARS AT 24" O.C. EACH WAY AND PROVIDE THICKENED EDGE SIM TO DETAIL 8/C3.10.
5	NEW 6" CURB PER STANDARD DETAIL 3/C3.10, (TYP).
6	NEW "KEYSTONE" 8"x18"x18" BROADSTONE RETAINING WALL OR APPROVED EQUAL. SEE DETAIL 5/C3.10 FOR MORE DETAIL. PROVIDE FOR BIDDER DESIGN IF WALL EXCEEDS 4' FIELD VERIFY.
7	NEW CONCRETE PATIO, SIM TO SIDEWALK DETAIL 6/C3.10.
8	NEW VEGETATIVE STORM BASIN, SEE DETAIL 1/C3.00 FOR MORE INFO. SEE LANDSCAPE DWGS FOR PLANTINGS.
9	NEW DRIVEWAY APRON TO BE INSTALLED SIM TO CITY DETAIL WL-736/C3.10.

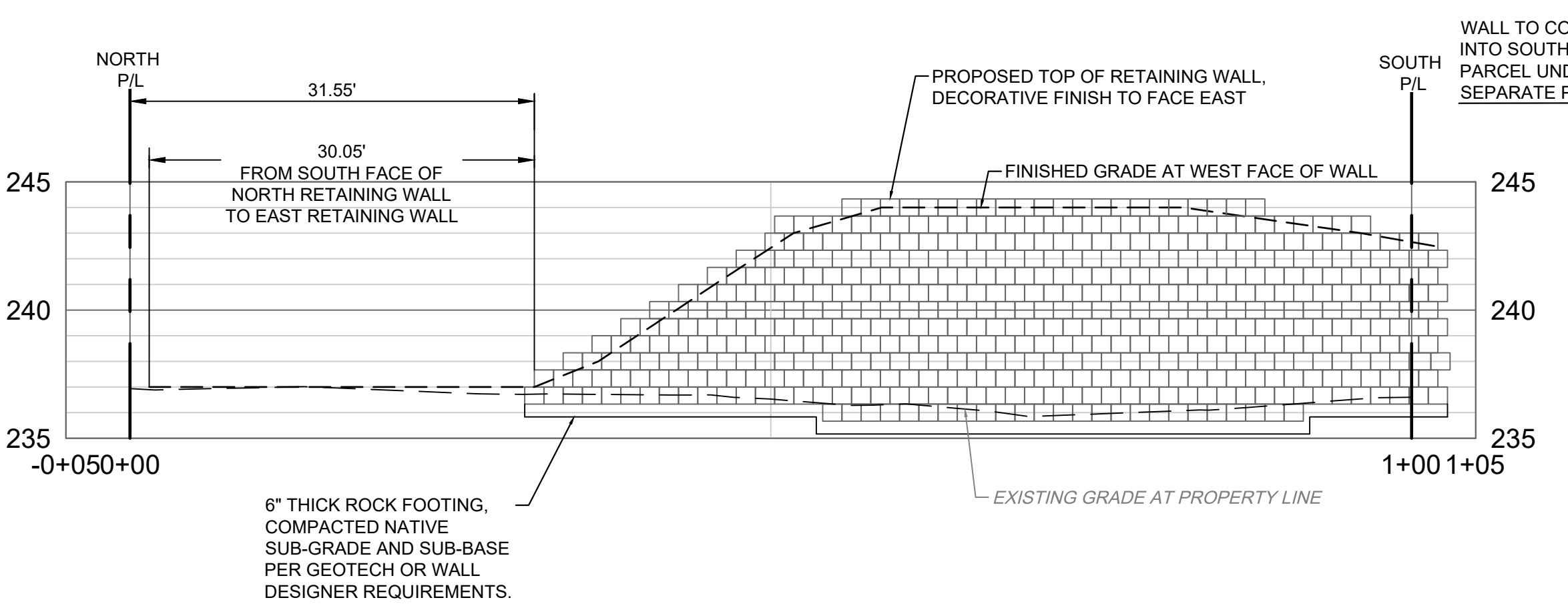
- GRADING NOTES:**
- CONTRACTOR IS RESPONSIBLE TO PERFORM CUT AND FILL EARTH WORK IN SUCH A MANNER TO PROTECT NATIVE SOILS FROM BEING OVER WORKED AND FROM BECOMING TOO SATURATED DURING WET WEATHER. DURING WET WEATHER PERFORM WORK IN AREAS SMALL ENOUGH TO CUT AND ROCK SITE AREAS UNDER PAVEMENT AND BUILDING TO PREVENT AREAS OF NATIVE SOIL BEING EXPOSED TO WET WEATHER. CONTACT PROJECT GEOTECHNICAL ENGINEER FOR WET WEATHER CONSTRUCTION RECOMMENDATIONS.
  - REFER TO ARCHITECTURAL SITE PLANS FOR ALL SITE LAYOUT DIMENSIONS INCLUDING WALKWAYS, BUILDING, AND RETAINING WALLS.
  - CONTRACTOR TO CONFIRM WITH OWNER AND REMOVE AND DISPOSE OF OFFSITE ALL EXCESS SOIL, DEBRIS AND MATERIALS NOT REUSABLE FOR THIS PROJECT.
  - ON-SITE PEDESTRIAN ACCESS ROUTES SHALL COMPLY WITH THE STATE AND LOCAL REGULATIONS. IN GENERAL:
    - MAXIMUM CROSS SLOPE OF ANY PAVEMENT PERPENDICULAR TO DIRECTION OF TRAVEL IS 2.0%.
    - MAXIMUM SLOPE OF WALKWAYS WITHOUT HANDRAILS IN DIRECTION OF TRAVEL IS 5.0%.
    - FOR RAMPS, THE MAXIMUM SLOPE IS 8.33% AND MAXIMUM RISE BETWEEN LANDINGS IS 30 INCHES. HANDRAILS ARE REQUIRED EACH SIDE OF ALL RAMPS WITH SLOPE GREATER THAN 5%.
    - MAXIMUM SLOPE OF CURB RAMPS AND WINGS OF CURB RAMPS IS 8.33%. THE MAXIMUM LENGTH OF A CURB RAMP IS 6 FEET WITH A MAXIMUM 6-INCH RISE.
    - PROVIDE FINISH PAVEMENT SURFACE TEXTURES IN ACCORDANCE WITH ARCHITECT.
    - CONTACT ARCHITECT AND ENGINEER FOR INSTRUCTIONS PRIOR TO INSTALLING FINISH PAVEMENTS IN CONFLICT WITH CODE REQUIREMENTS.
  - STRAIGHT GRADE FINISH PAVEMENT BETWEEN CATCH BASIN AND SURROUNDING GUTTER ELEVATIONS. STRAIGHT GRADE BETWEEN GIVEN ELEVATION POINTS. BLEND FINISH GRADES BETWEEN GIVEN POINTS AND AT GRADE BREAKS.
  - SEE SHEET C1.0, SECTION 12.0 FOR CONSTRUCTION TESTING, INSPECTIONS, AND OBSERVATION REQUIREMENTS.
  - FUTURE GRADING FOR PUBLIC IMPROVEMENTS IS SHOWN FOR CLARITY AND SHALL BE COORDINATED AND BUILT FROM THE PERMITTED PUBLIC IMPROVEMENT DRAWINGS. ONSITE GRADES AND FINISH FLOOR ELEVATIONS ARE RELATIVE TO FUTURE PUBLIC WORKS DESIGN DRAWINGS. CONTRACTOR TO VERIFY AND COORDINATE W/ PUBLIC IMPROVEMENT DRAWINGS PRIOR TO SETTING ONSITE FINISH ELEVATIONS TYPICAL.



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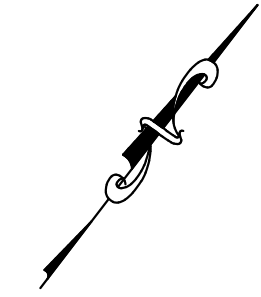
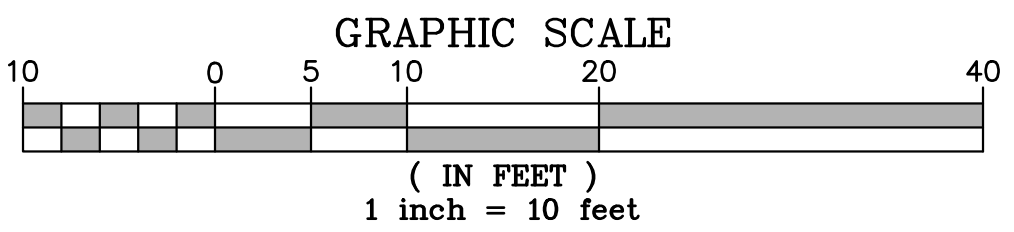


**2 NORTH PROPERTY LINE RETAINING WALL ELEVATIONS**  
 C2.20 HORIZONTAL SCALE: 1" = 10', VERTICAL SCALE: 1" = 5'



**3 EAST PROPERTY LINE RETAINING WALL ELEVATIONS**  
 C2.20 HORIZONTAL SCALE: 1" = 10', VERTICAL SCALE: 1" = 5'

**1 ONSITE CIVIL GRADING PLAN**  
 C2.20 SCALE: 1" = 10'



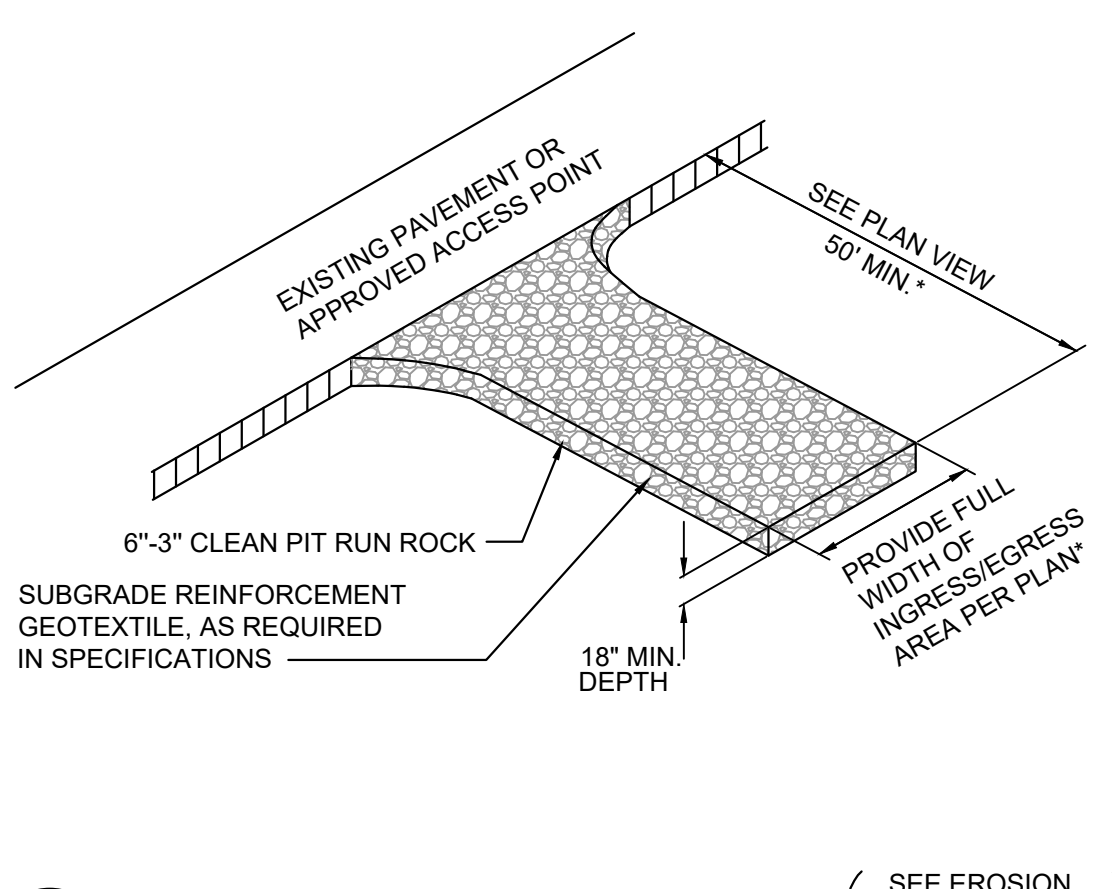
**ARBOR DRIVE PARTITION**  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068  
 ONSITE CIVIL GRADING PLAN

REVISIONS	DATE	DRAWN	CHECKED	PRM	CJD
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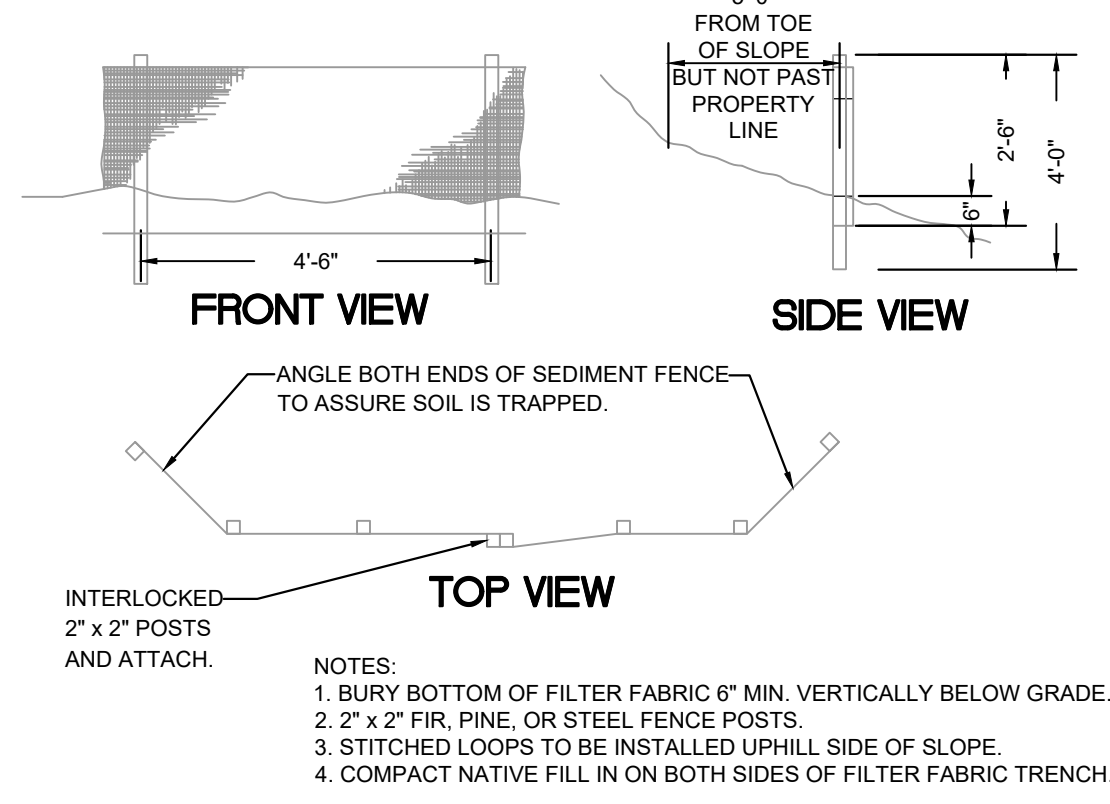
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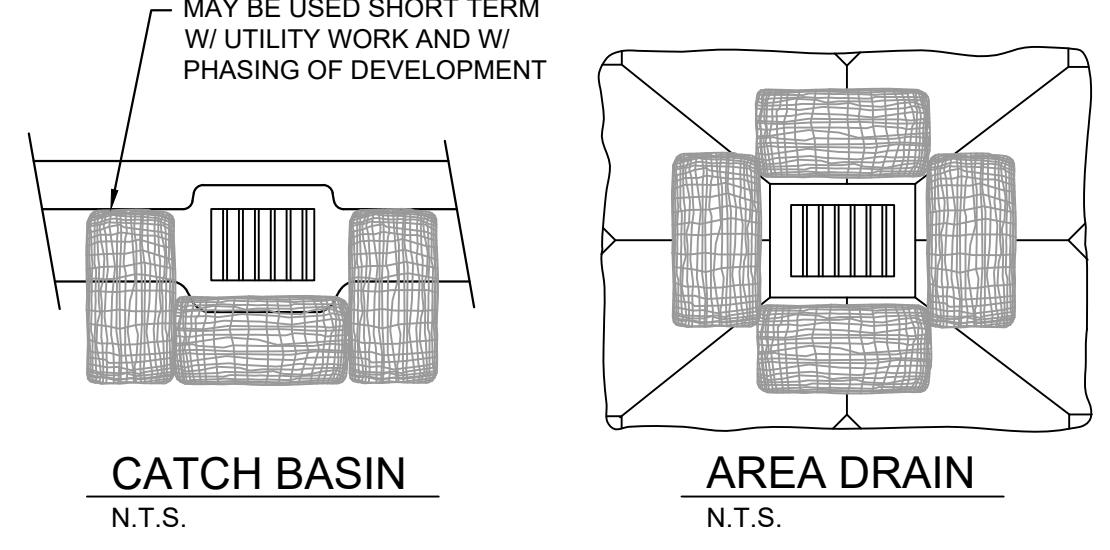
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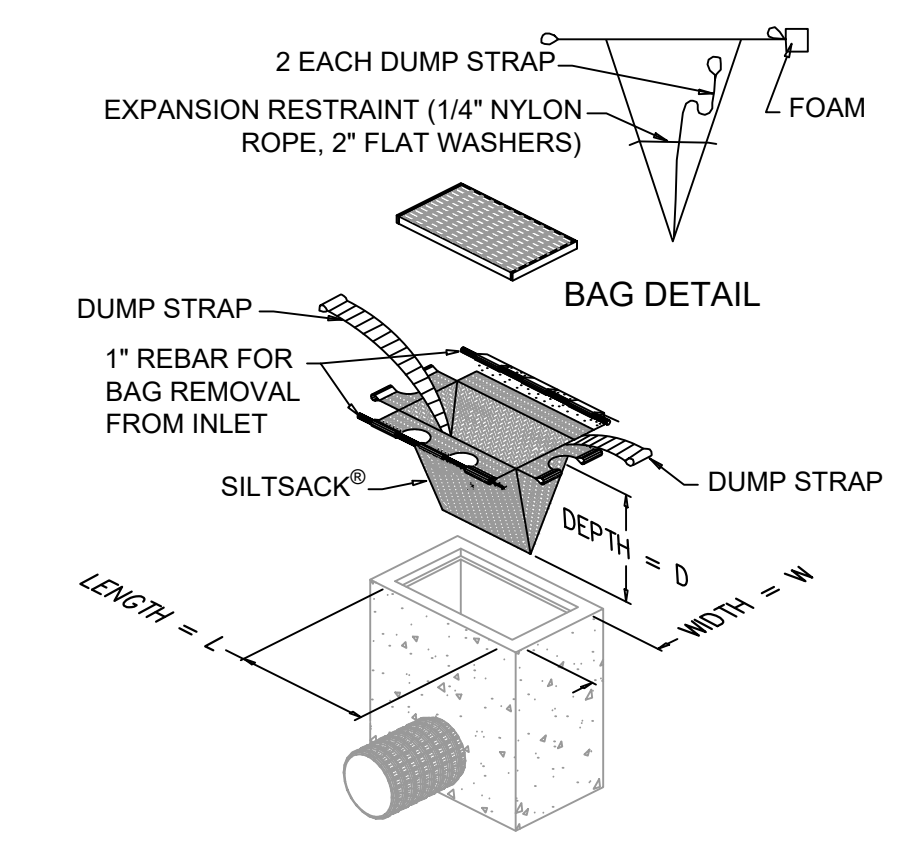
**1** GRAVEL CONSTRUCTION ENTRANCE (SEE EROSION CONTROL NOTES)  
N.T.S.



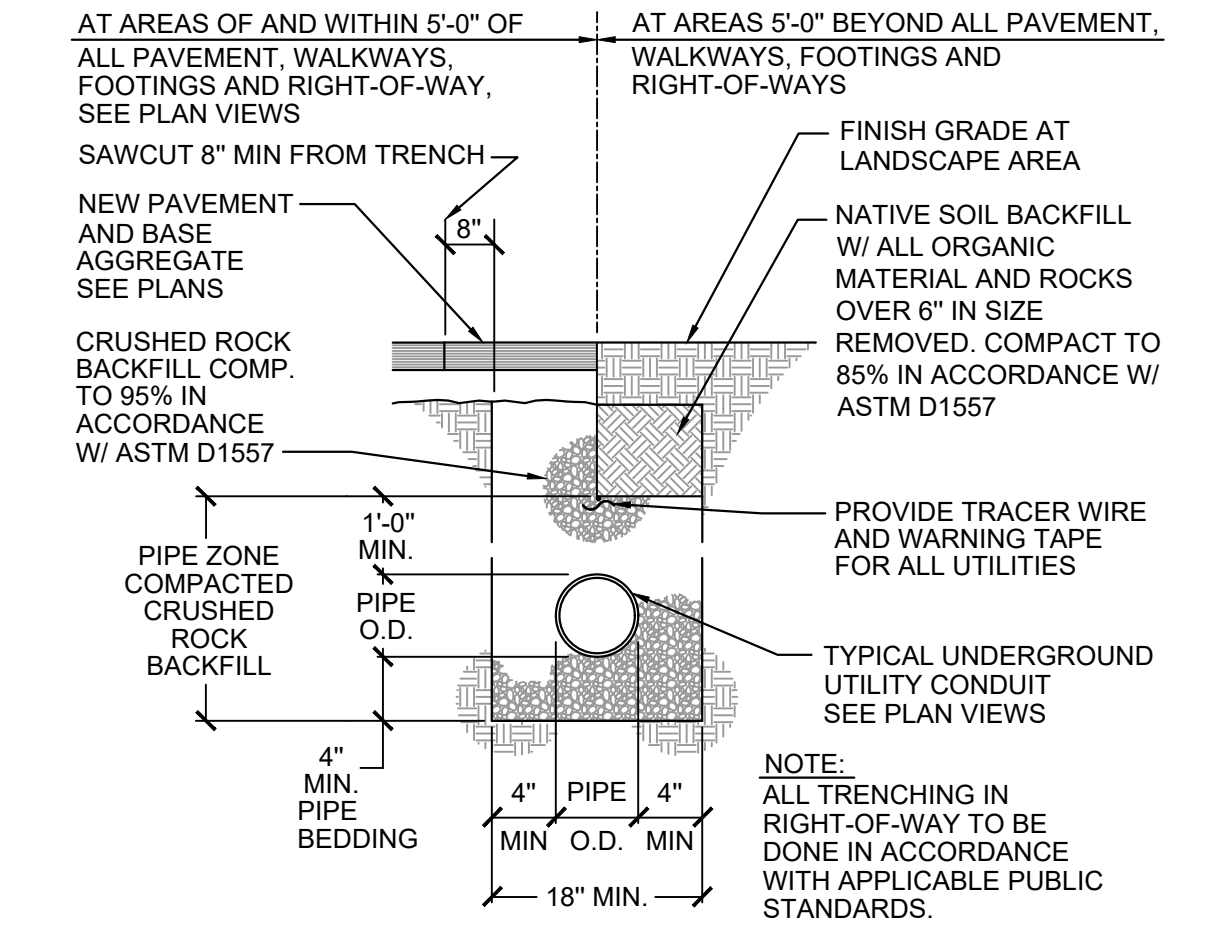
**2** SEDIMENT FENCE  
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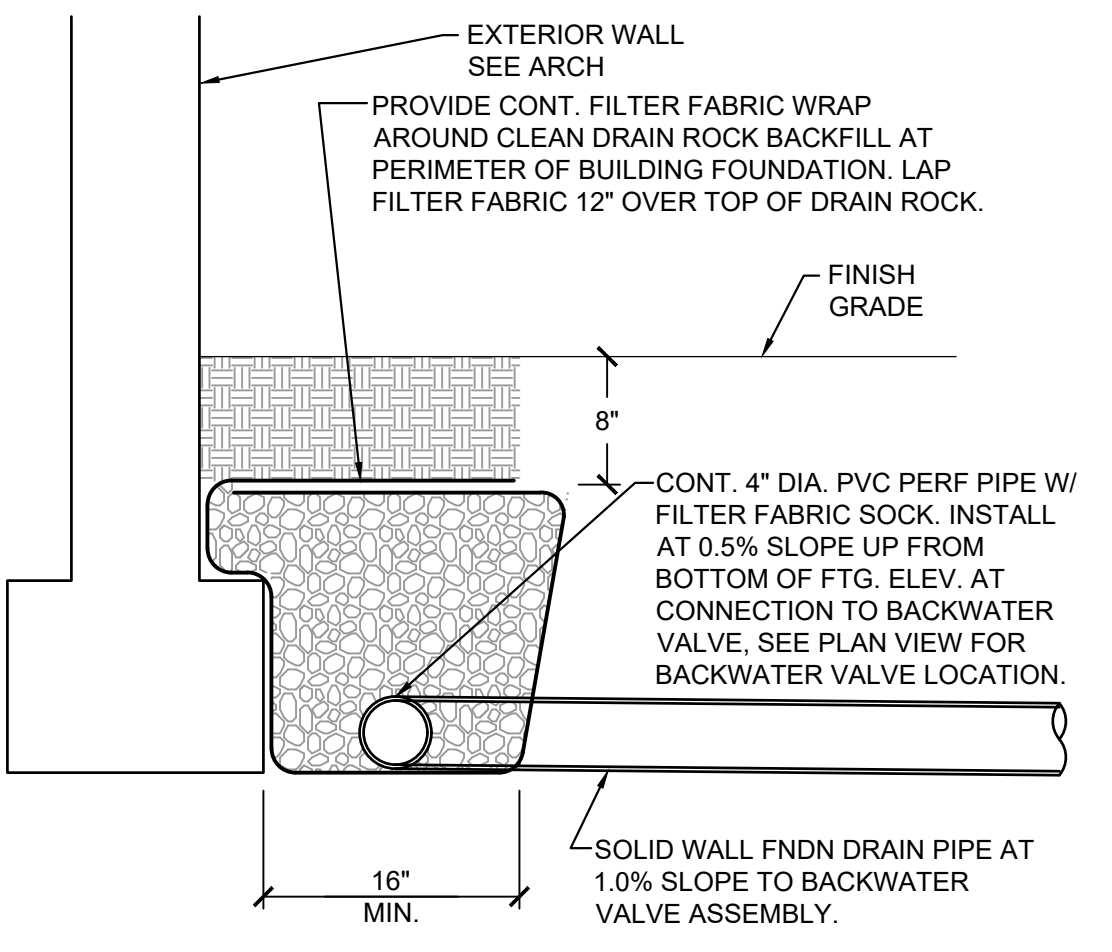
**3** BIOFILTER BAGS - TEMPORARY  
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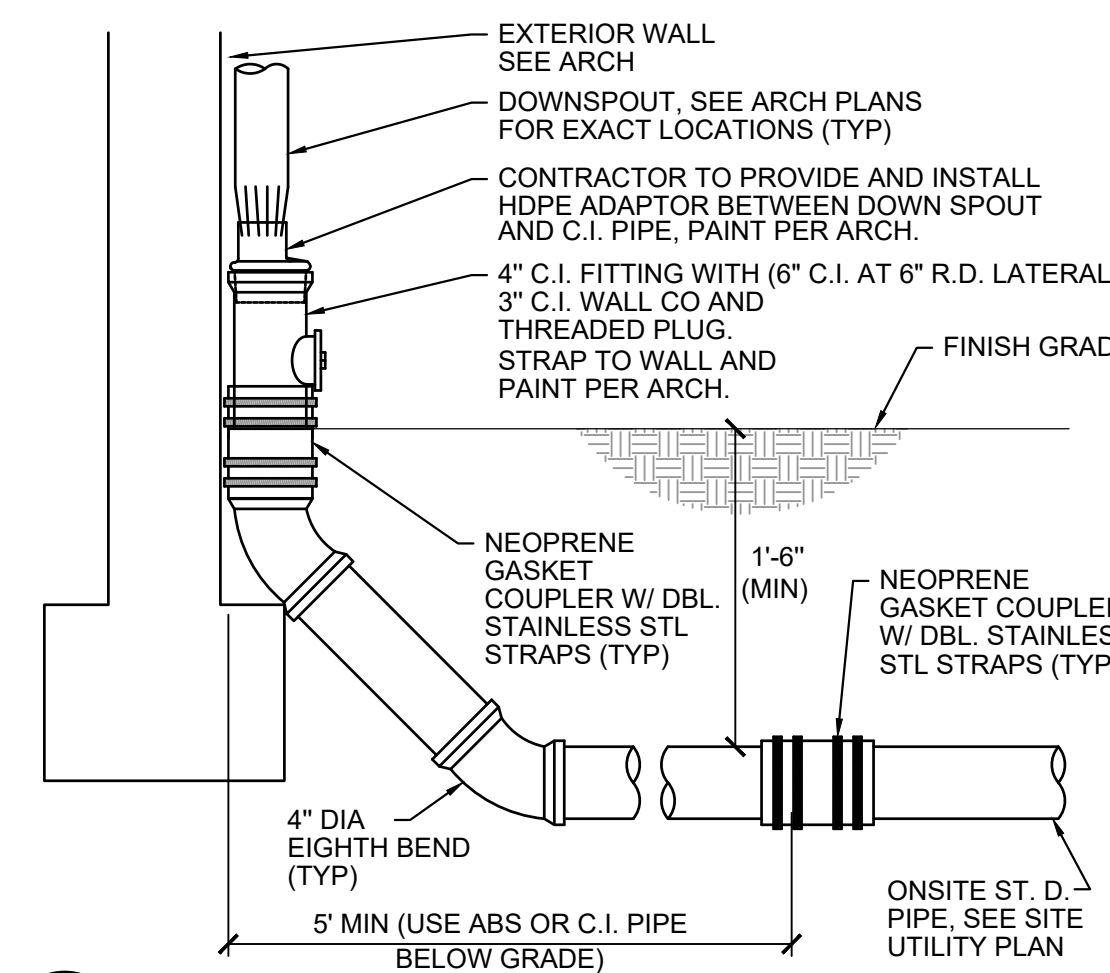
**4** FILTER BAG INLET  
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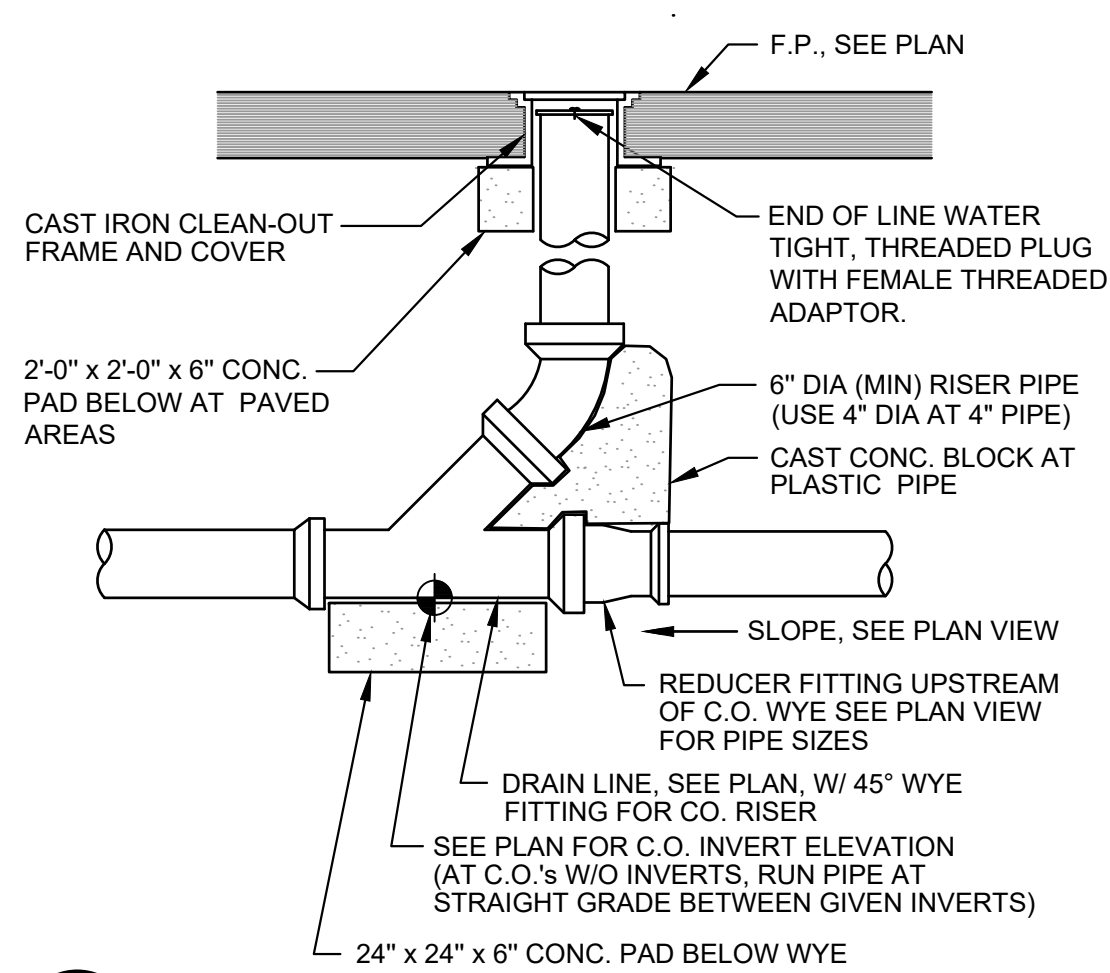
**5** TYPICAL UTILITY TRENCH SECTION  
1" = 1'-0"



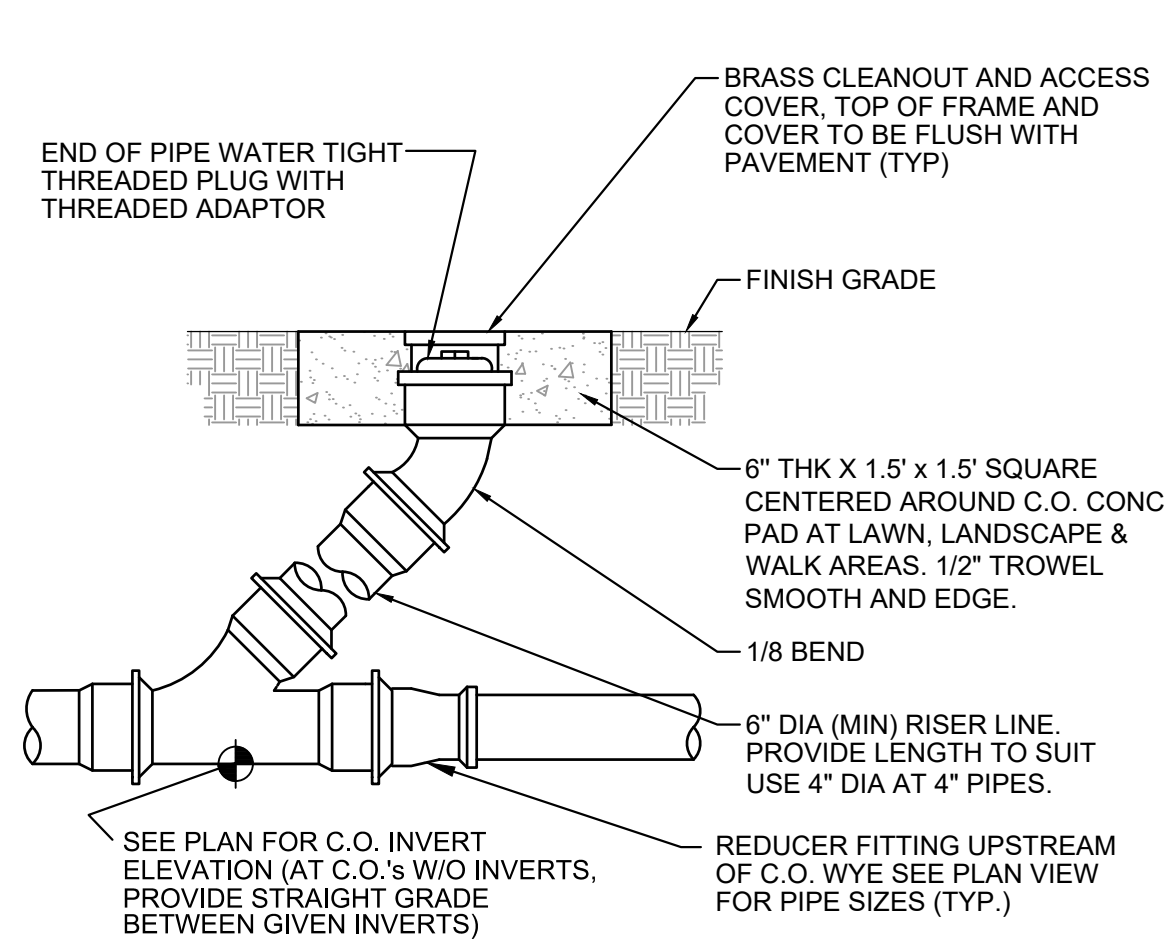
**6** TYPICAL EXTERIOR FOUNDATION DRAIN  
1" = 1'-0"



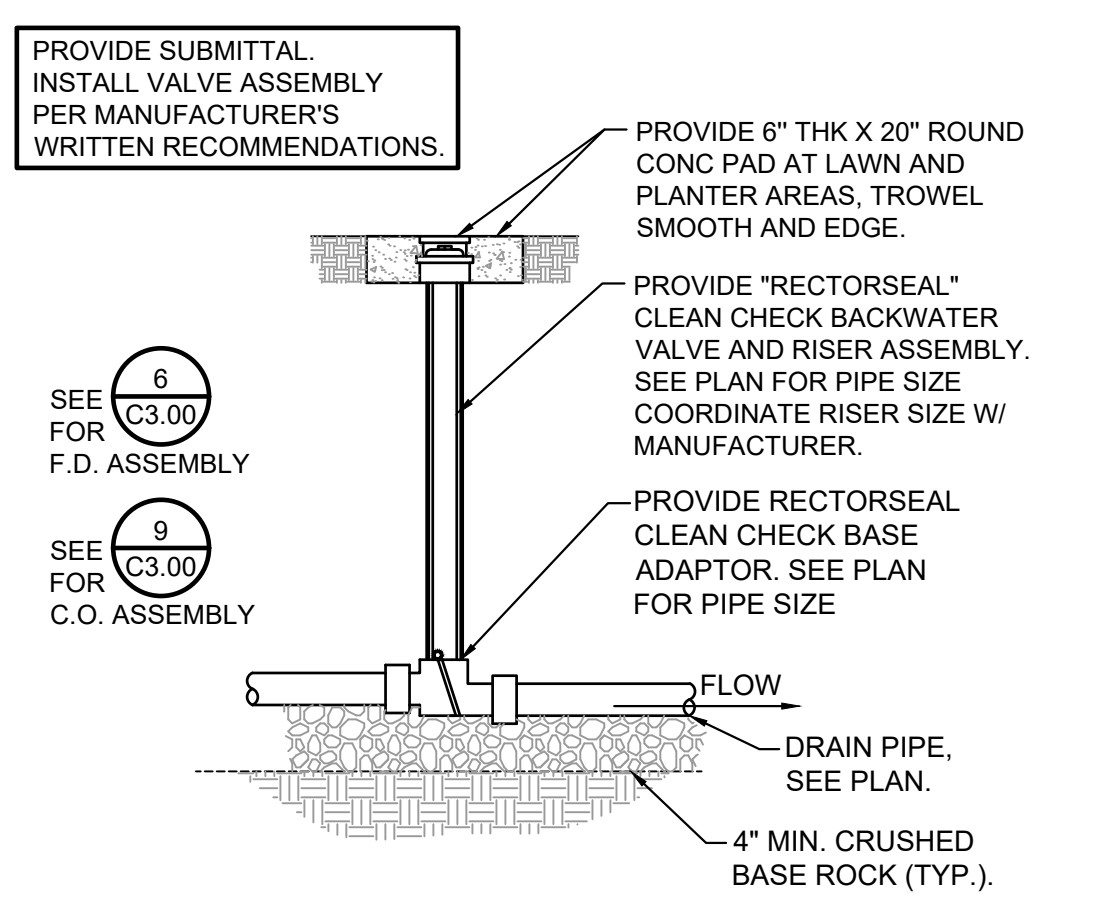
**7** TYPICAL EXTERIOR DOWN SPOUT CONNECTION  
N.T.S.



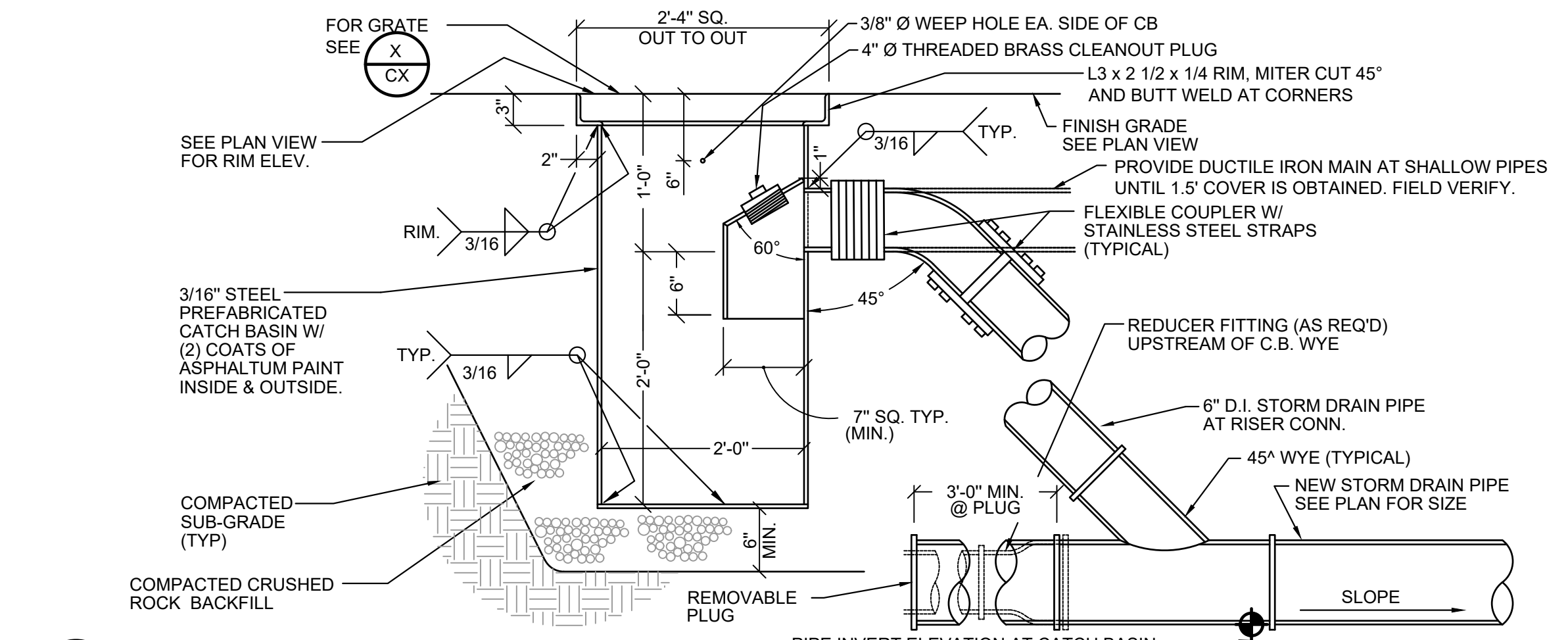
**8** TYP. CLEAN OUT AT VEHICLE PAVEMENT AREAS  
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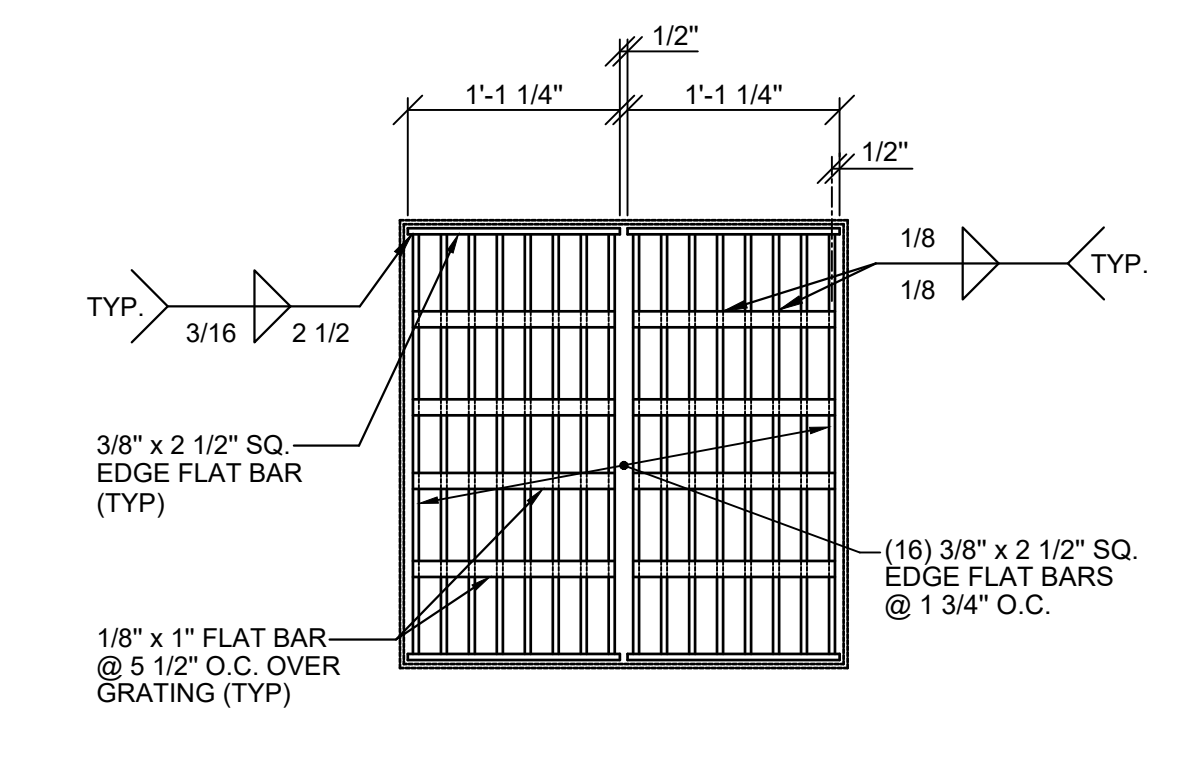
**9** CLEANOUT AT WALKS, SLABS AND PLANTERS  
1" = 1'-0"



**10** RECTORSEAL "CLEAN CHECK" BACKWATER VALVE ASSEMBLY FOR FOUNDATION DRAIN (TYP)  
1/2" = 1'-0"



**11** TYPICAL ON-SITE STEEL CATCH BASIN  
1" = 1'-0"



**12** GRATE AT TYPICAL STEEL CATCH BASIN  
1" = 1'-0"

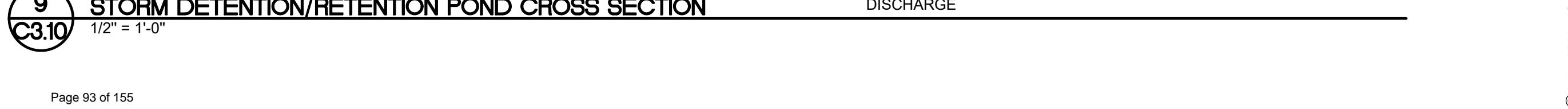
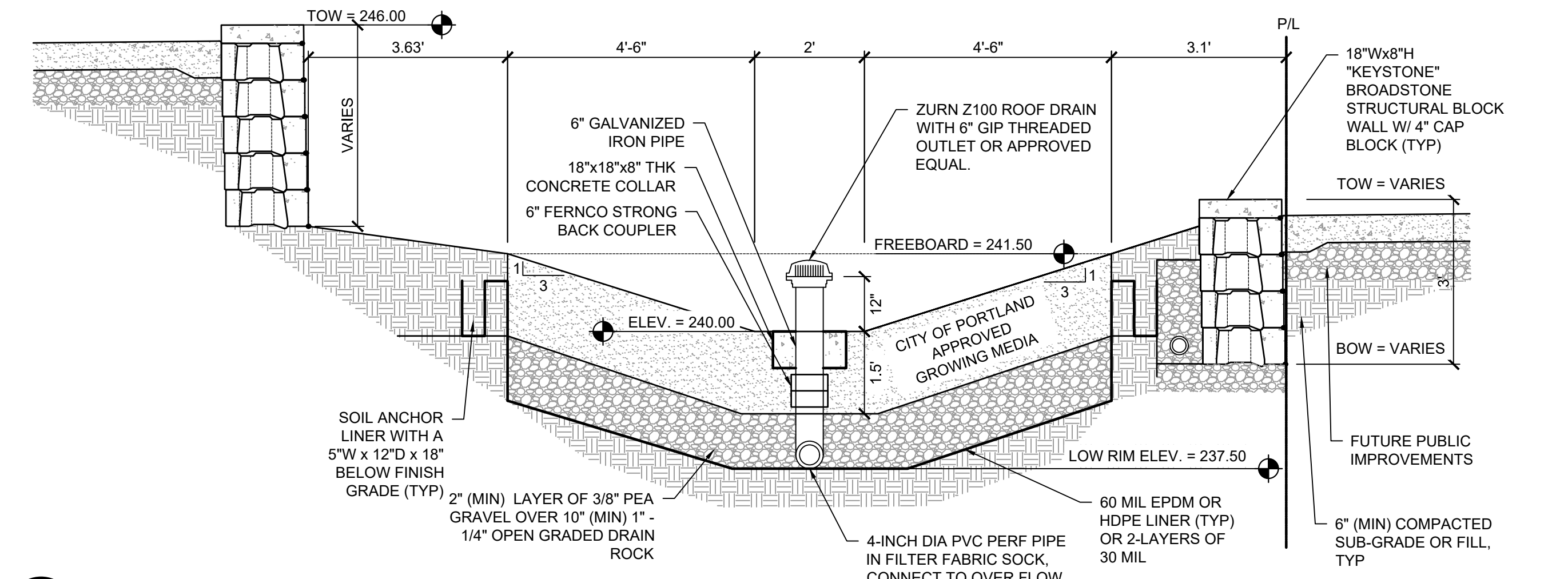
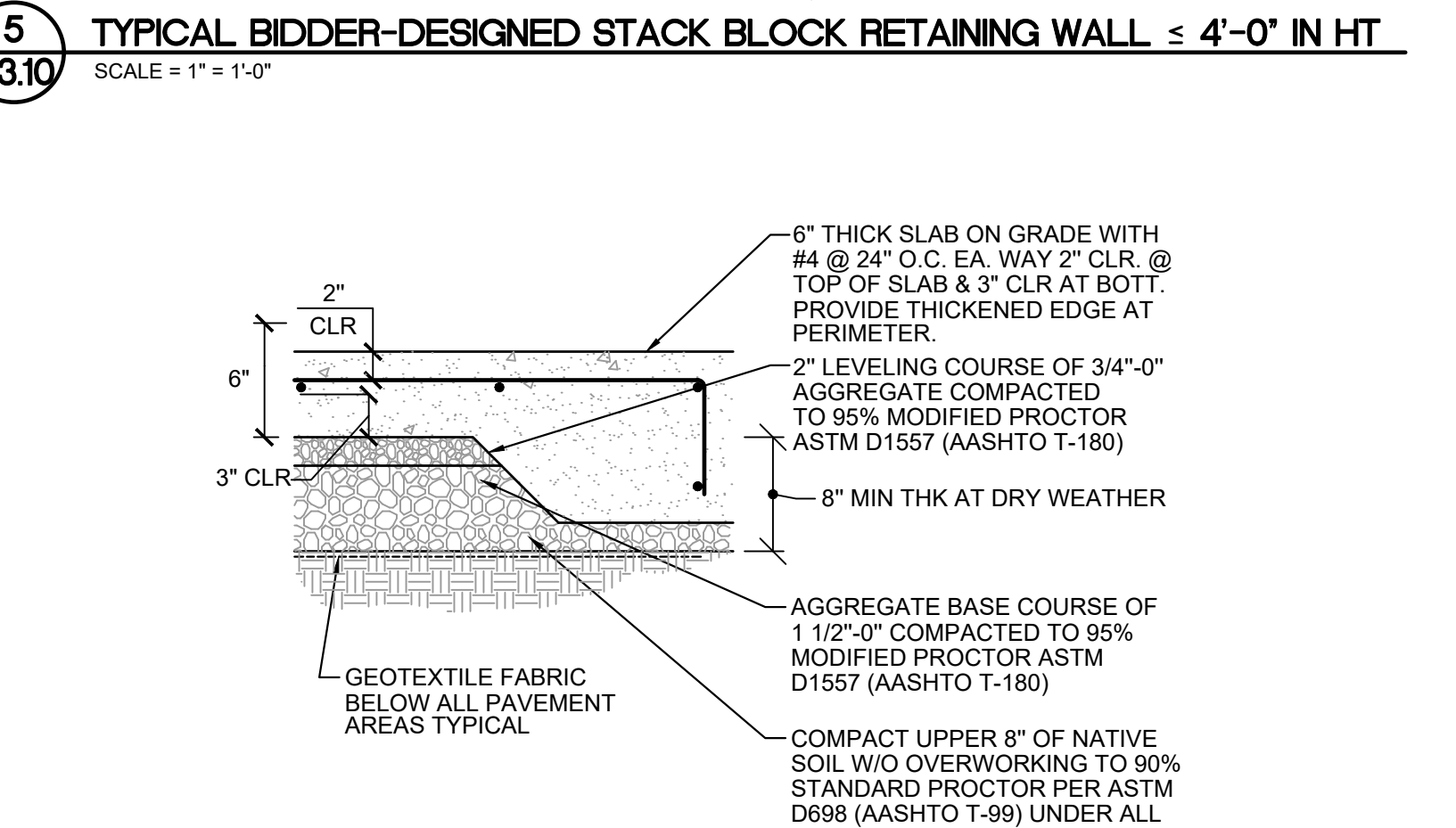
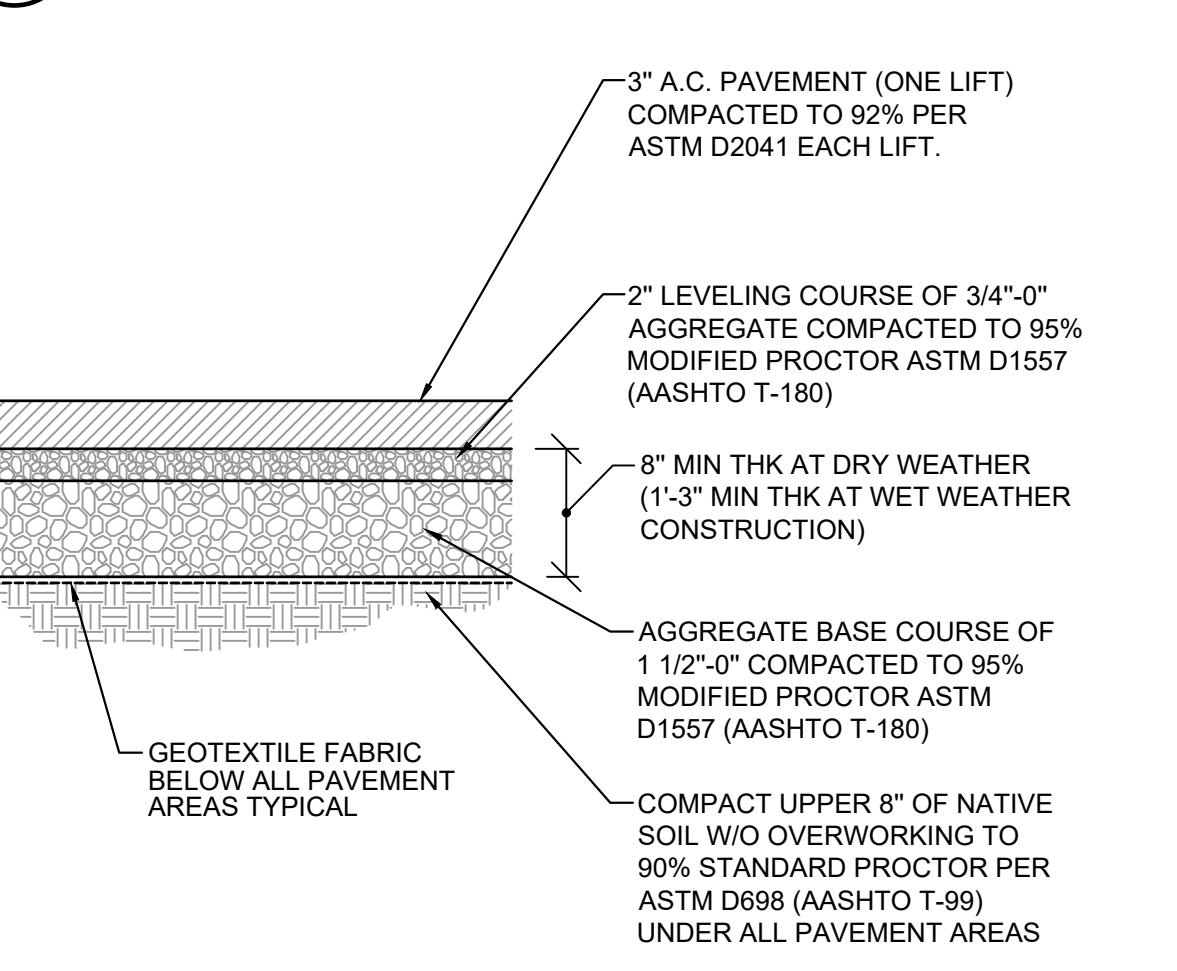
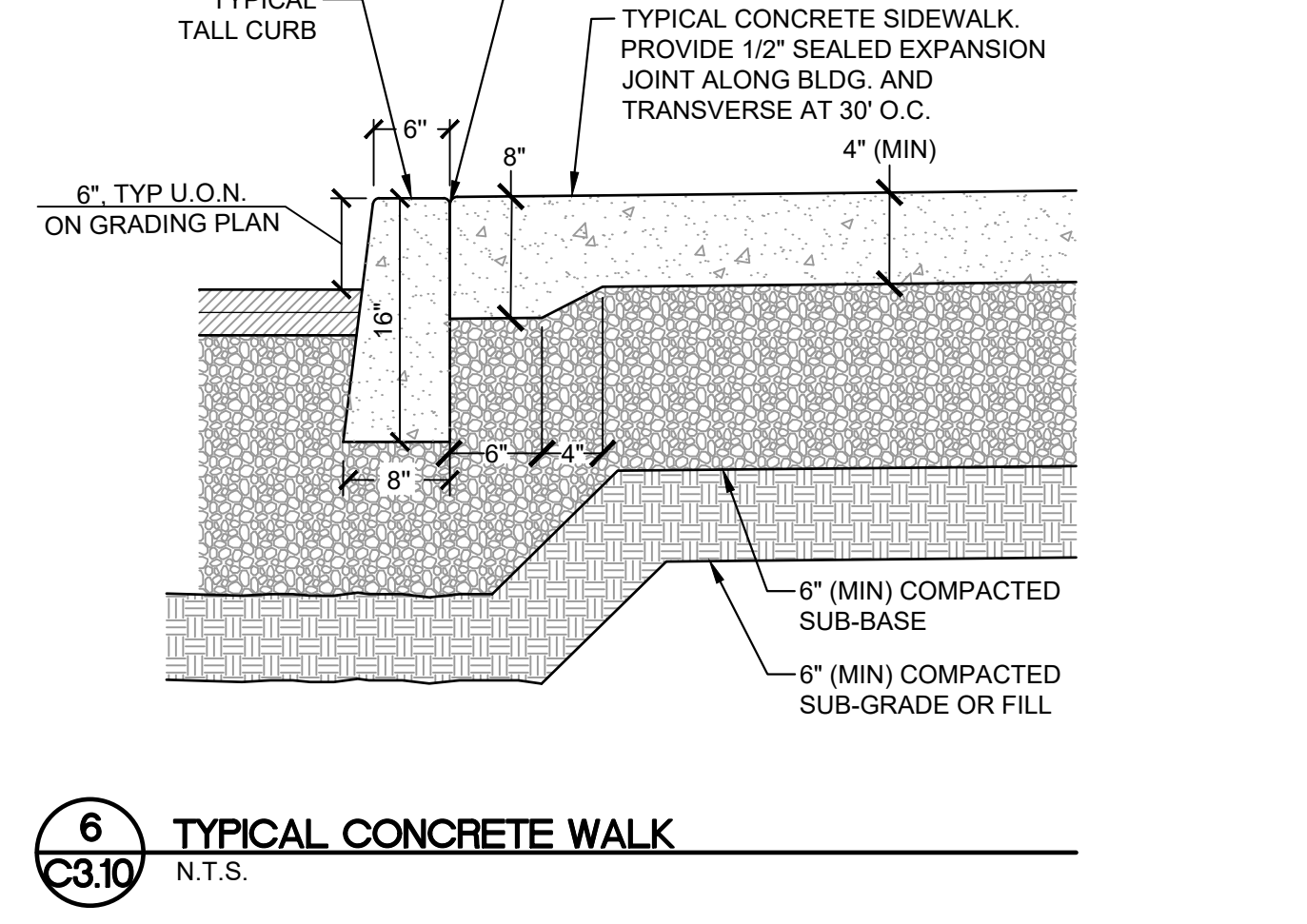
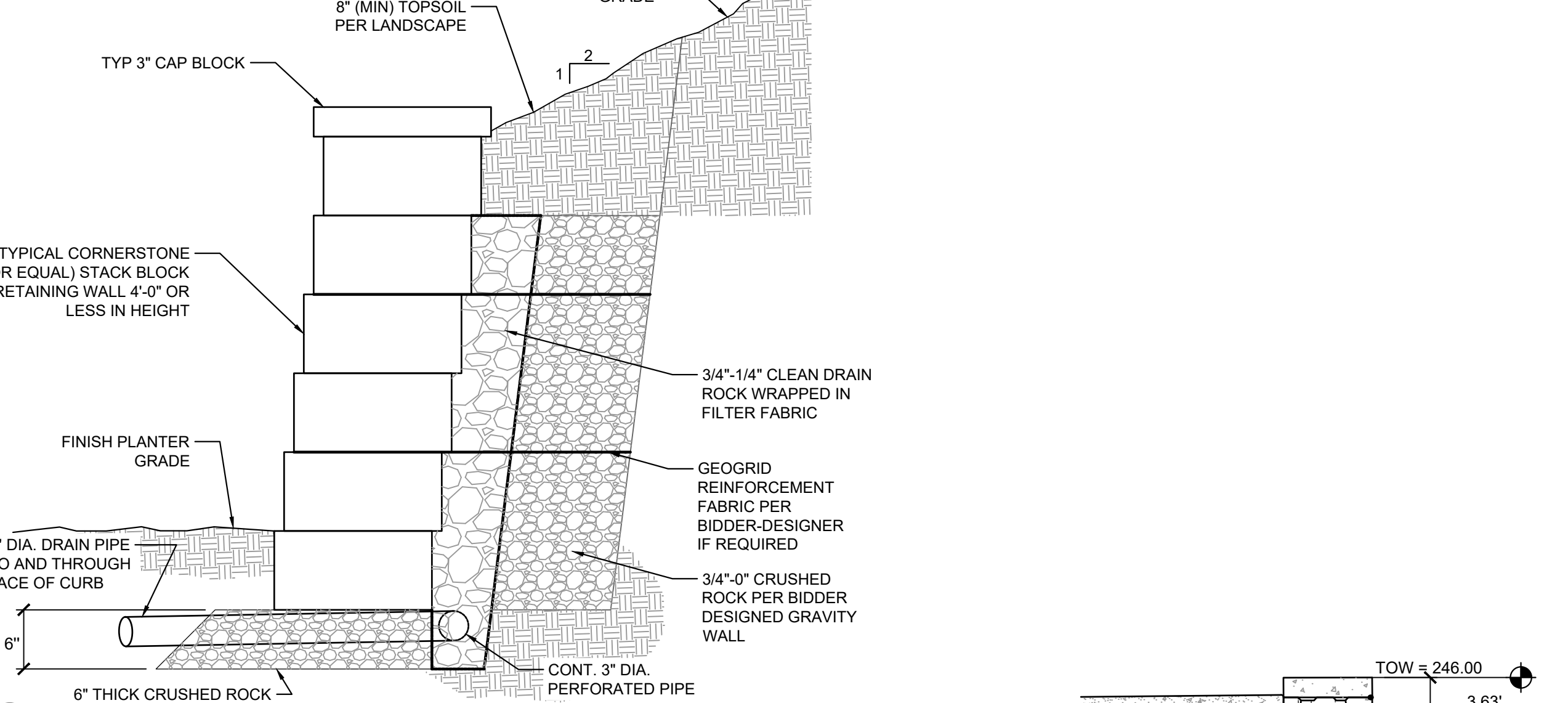
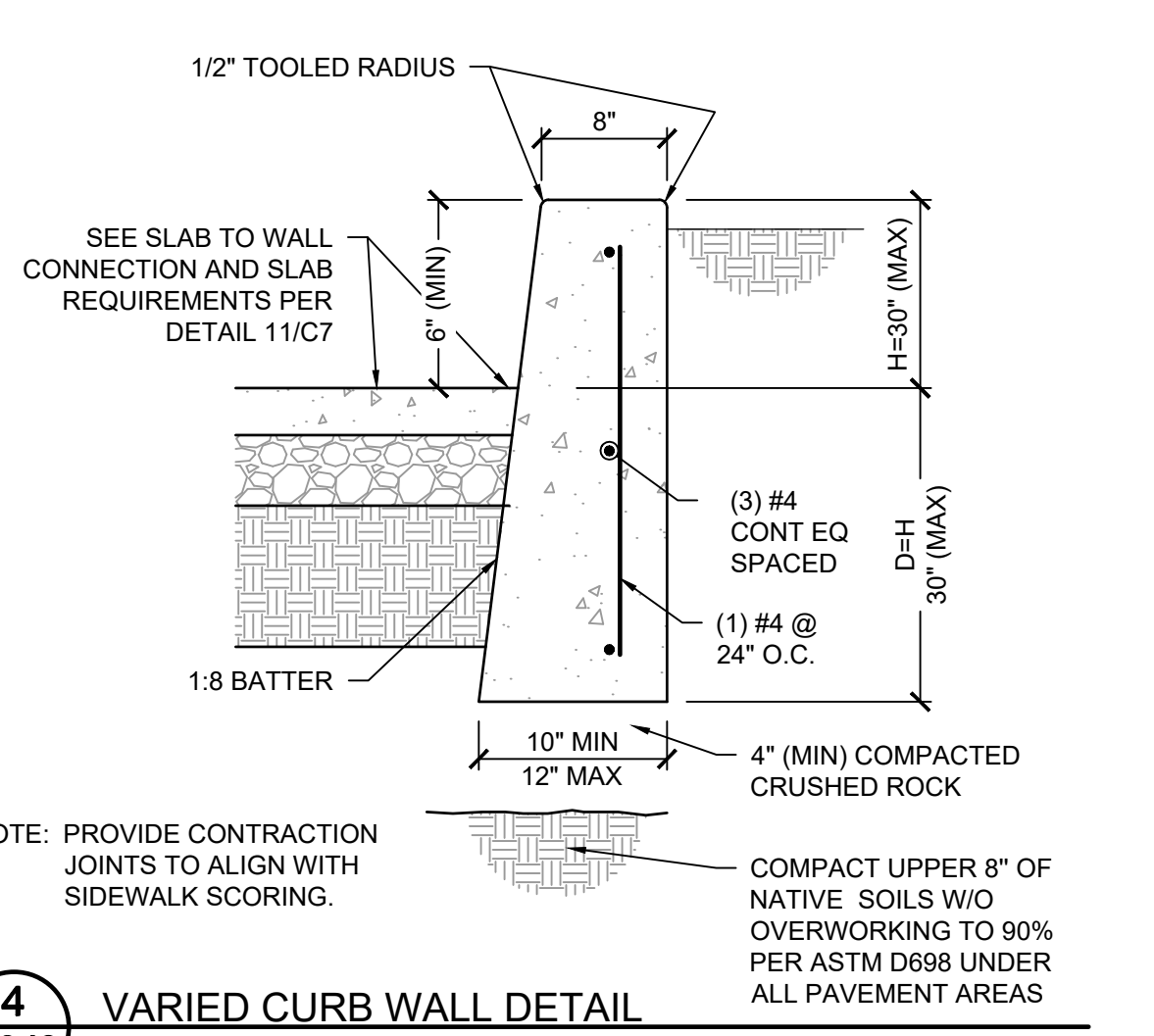
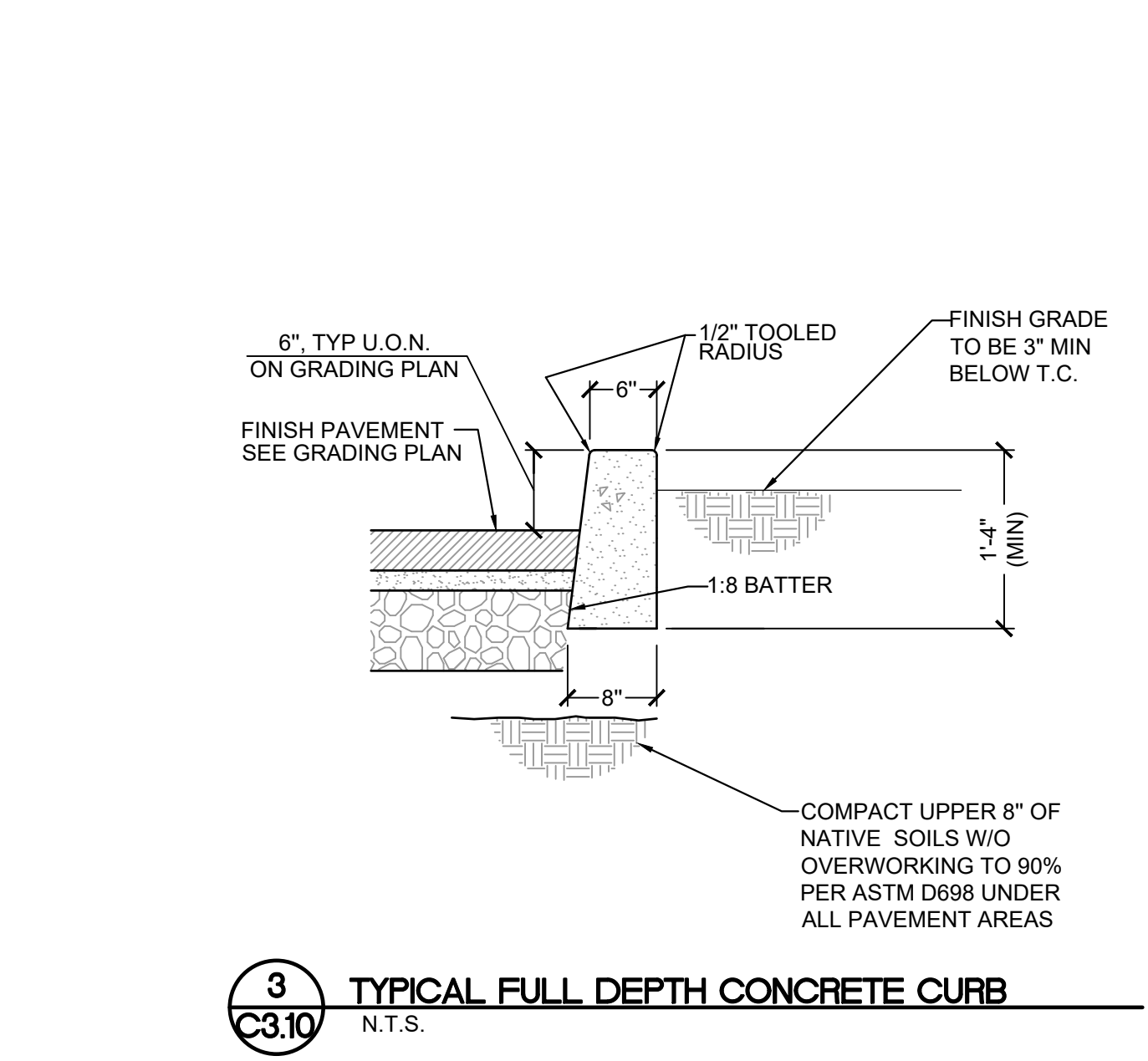
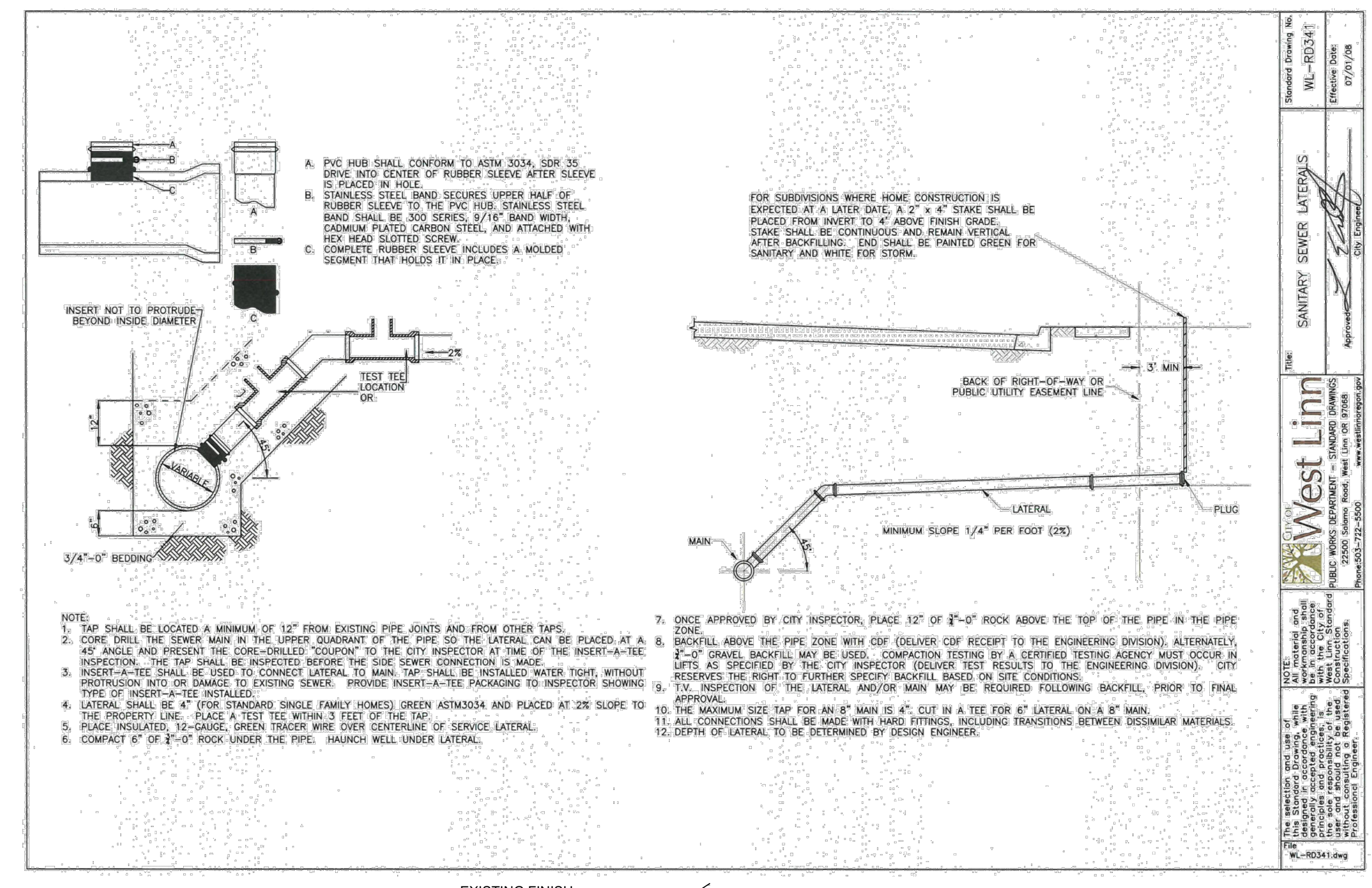
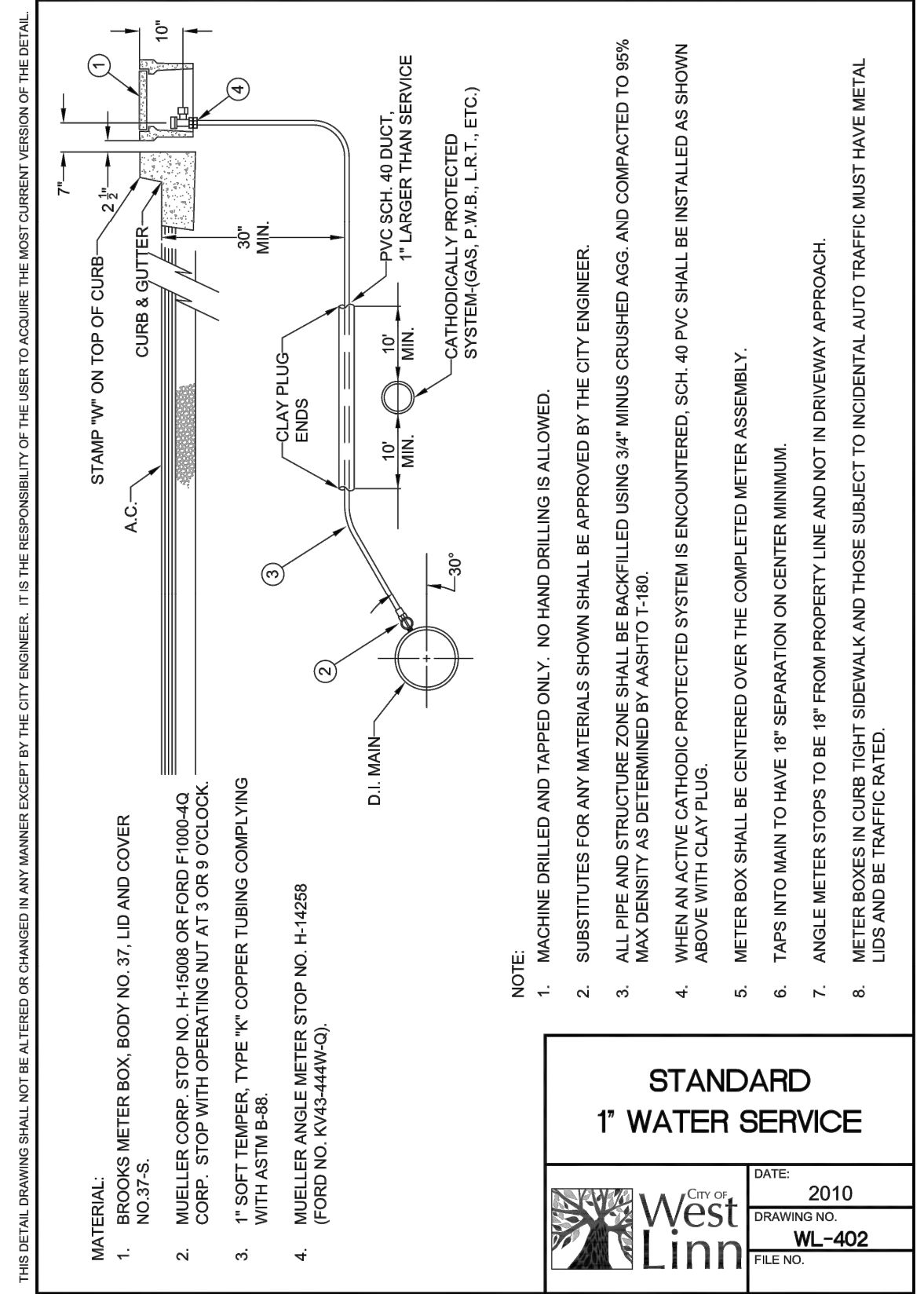
ARBOR DRIVE PARTITION  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
ONSITE CIVIL DETAILS

REVISIONS	PRM	CJD

DATE:	03-15-2019	DRAWN:	
JOB NUMBER:	19035	CHECKED:	

SHEET  
**C3.00**



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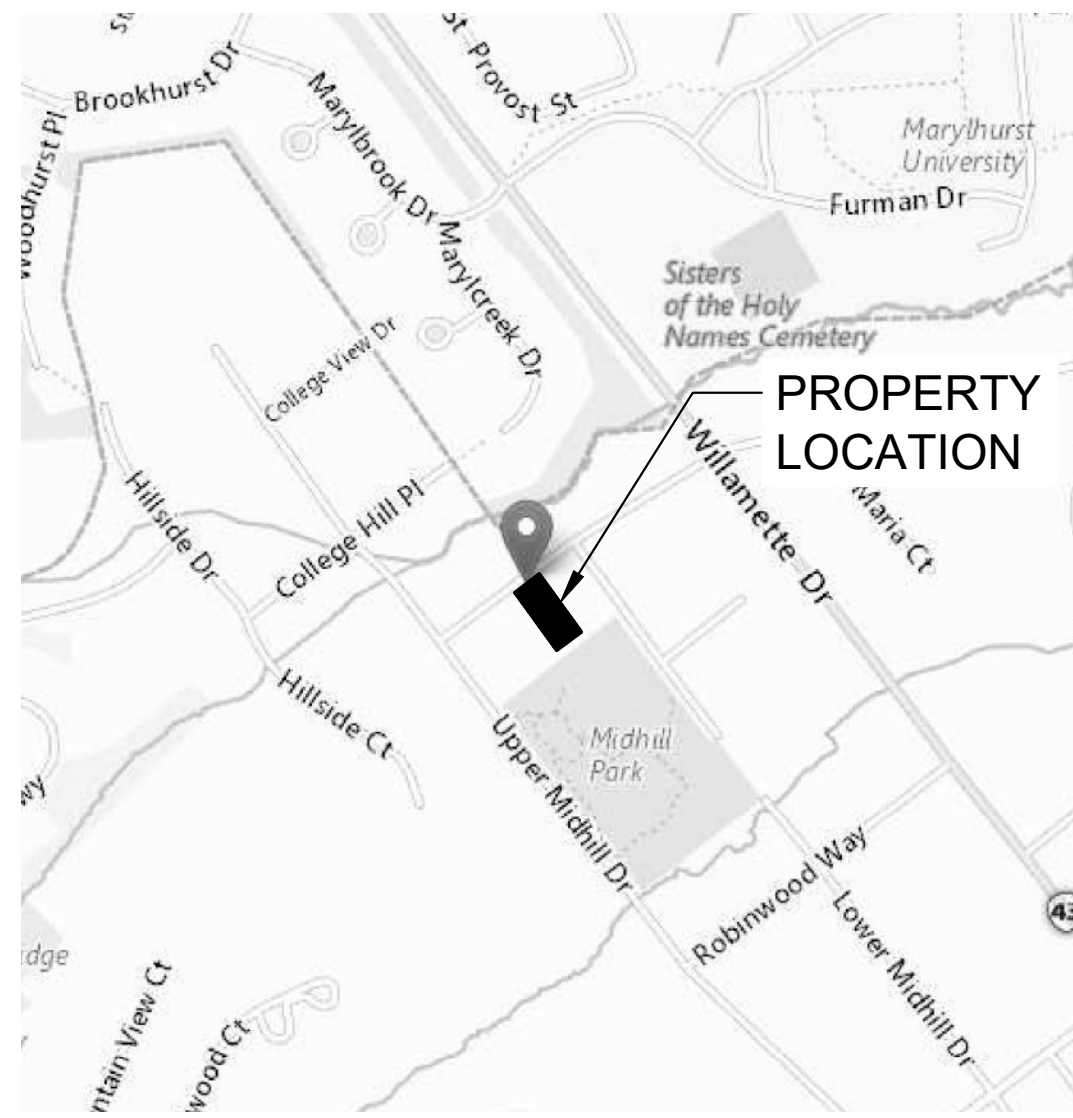
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JOB NUMBER: 19035

**C3.10**

# PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068 ALONG ARBOR DRIVE.

TAX LOT 1000, WEST LINN LOCATED IN SECTION 14, TOWNSHIP 2 SOUTH, RANGE 1 EAST, WILLAMETTE MERIDIAN, CITY OF PORTLAND, CLACKAMAS COUNTY, OREGON

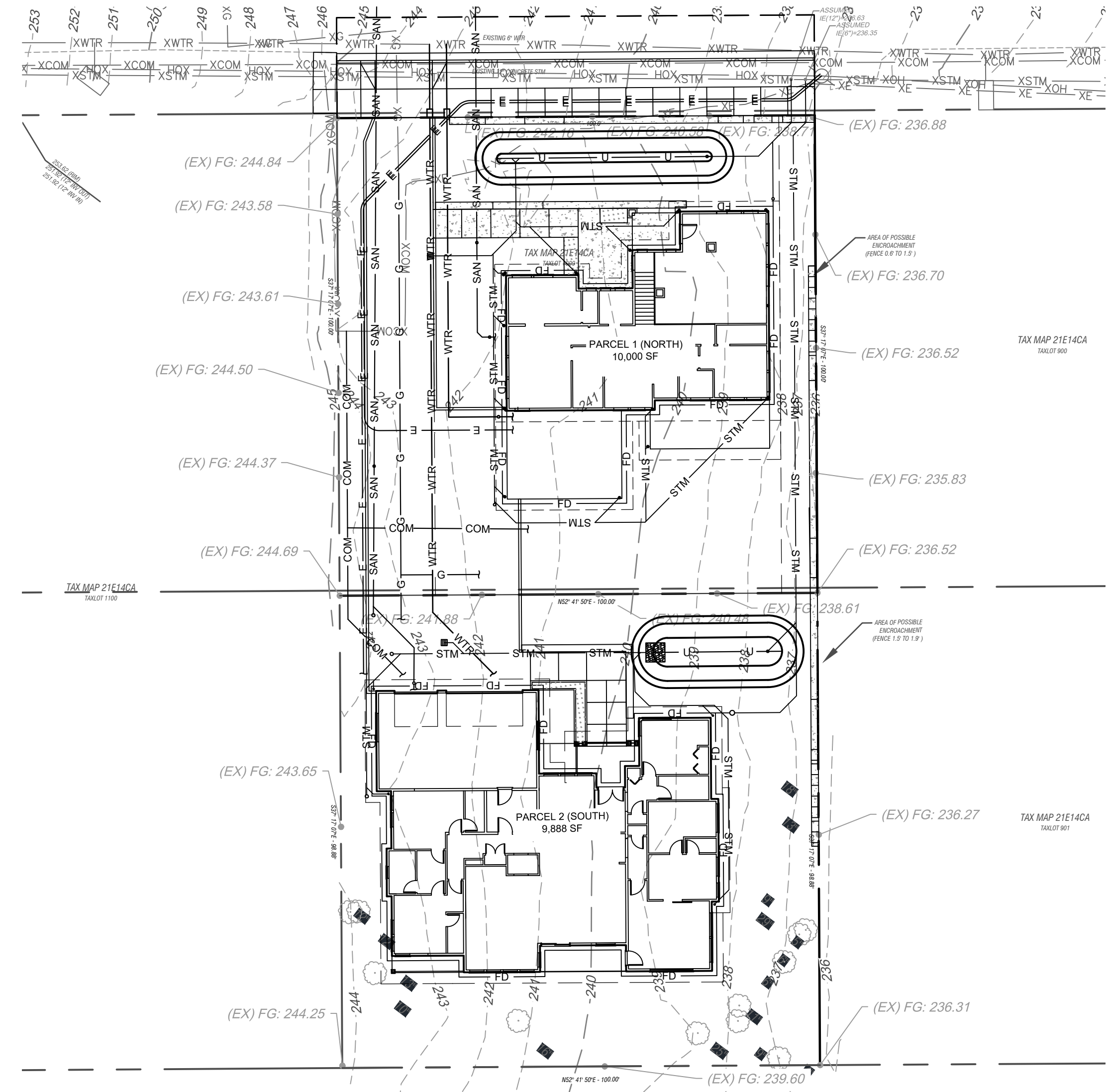


VICINITY MAP

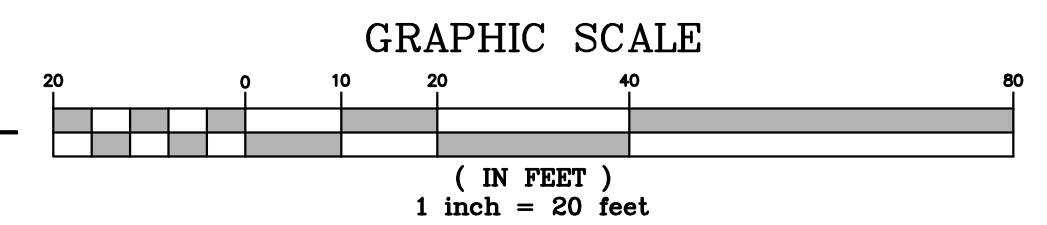
HAMILTON & KASHORO

PORTLAND, OR 97204

6443 SW BEAVERTON-HILLSDALE HWY, STE 210  
PORTLAND, OR 97221  
ATTN: CHRISTOPHER DESLAURIERS  
F: 503-203-8122



**1**  
**C01** **OVERALL SITE PLAN**  
SCALE: 1" = 20'



**NOTICE TO EXCAVATORS:**

ATTENTION: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY THE OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH IN OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THE RULES BY CALLING THE CENTER.

(NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987).

**POTENTIAL UNDERGROUND FACILITY OWNERS**



Call the Oregon One-Call Center  
DIAL 811 or 1-800-332-2344

**EMERGENCY TELEPHONE NUMBERS**

NW NATURAL GAS  
M-F 7am-6pm 503-226-4211 Ext.4313  
AFTER HOURS 503-226-4211  
PGE 503-464-7777  
CENTURYLINK 1-800-573-1311  
CITY BUREAU OF MAINTENANCE 503-823-1700  
CITY WATER 503-823-4874  
VERIZON 1-800-483-1000

**CIVIL DRAWINGS**

Sheet Number	Sheet Title
C01	Cover Sheet
C02	Civil Notes & Abbreviations
C03	Existing Conditions
C04	Demolition Plan
CX01	Roadway Cross Sections
PP01	Arbor Drive Plan and Profile
DT01	Arbor Drive Driveway Grading
DT02	Standard Details
ESC01	Erosion & Sediment Control Plan

		DESIGNED BY CJD	DATE APPROVED							
	CONSTRUCTED BY	CAD BY PRM	SECTION ENGR	APPROVALS:		PREPARED FOR THE CITY OF WEST LINN	 6443 SW Beaverton-Hillsdale Hwy, suite 210 Portland, OR 97221 ph:503.203.8111 fx:503.203.8122 www.wdyi.com	 RENEWS: 12-31-2019	PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068	JOB NO.
	PROJECT COMPLETED	CHECKED BY CJD	REVIEWER	PRINCIPAL ENGINEER _____ REG. PROF. ENGR.					COVER SHEET	SHEET NO. <b>C01</b>
	MAP CORRECTED BY			CITY ENGINEER _____ REG. PROF. ENGR.					1 OF 9	
NO.	DATE	DESCRIPTION	APPD.	REVISIONS		FINAL MAP DATA				

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CIVIL NOTES

Disclaimer: This is a simplified listing of information on common Public Works Permit construction issues and is, by no means, an exhaustive list of City requirements. Please refer to the City of West Linn Public Works Construction Standards, APWA Standard Specifications for Public Works Construction, Federal ADA standards, City Municipal Code, and City Community Development code for in-depth and complete information.

- GENERAL
1. A "Public Works Permit" is required for any work taking place within the public right-of-way or public City easements.
2. All work shall conform to the current City of West Linn Public Works Construction Standards manual, American Public Works Association (APWA) Standard Specifications for Public Works Construction, City Municipal Code, City Community Development Code, and all ADA regulations, in addition to all applicable federal, state, and regional laws.
3. Street closures are typically not permitted. City Manager approval is required for street closures. One lane of traffic must remain open at all times and traffic shall be guided by certified flaggers and appropriate signage per the Manual on Uniform Traffic Control (MUTCD).
4. An 18 month warranty on all work in the right-of-way is required of all Public Work permit contractors.

- CONCRETE WORK (SIDEWALKS/DRIVEWAYS/APPROACHES/CURB)
1. Ensure both your driveway approach and driveway slab inspection are approved prior to pouring either-- elevation changes in one will affect the other.
2. Compliance with current ADA requirements is required whenever replacement of sidewalks and approaches occurs. Generally, this means that the sidewalk cross slope (slope towards to the street) cannot exceed 2% (even through the approach area). Pedestrian curb ramps may also need to be redesigned to comply with ADA standards.
3. Approach maximum width is 36'; minimum width is 16' measured from top of full depth curb to top of full depth curb. Driveway wings to be 3' wide.
4. Sidewalk shall have 6" concrete depth in areas subject to automobile traffic, 4" depth in areas only subject to pedestrian traffic. A minimum depth of 2" of clean, well compacted 3/4" - 0" gravel is required on a firm subgrade beneath all forms.
5. Sidewalk and driveway concrete panels shall be removed and replaced in whole-- No partial repairs. If damage occurs to edge of adjacent panel the panel must be removed and replaced.
6. Removed and replaced curb sections cannot be smaller than 3' and must have straight sawcut connections. Rebar doweling and reinforcement may be required by the inspector. Perpendicular and parallel rebar doweling is always required when a curb face is removed in situations where only a planter strip is behind the curb being removed.
7. Concrete shall have a broom finish perpendicular to pedestrian travel and an edge shine to match surrounding panels (a standard 3" shine is typical for new construction). Contraction joints are required, but expansion joints/boards/felt are not permitted in the right-of-way. Concrete shall be standard grey, commercially mixed, and be a minimum of 3300 psi after 28 days.
8. Driveway approaches are assessed a street cut deposit for the width of the approach due to possible damage caused to the street during removal of the existing approach/curb. If street is damaged, contractor must sawcut a straight and uniform patch with sufficient width to allow compaction in lifts (minimum width of a plate whacker) and restore with the appropriate depth of hot mix asphalt and sand seal joints.

- SEWER/STORM PIPE REPAIR AND TAPS
1. Whenever a sewer lateral is to be installed or repaired in a public right-of-way or public City easement, a Public Works Permit must be obtained. A City Building Permit is required for sewer work on private property.
2. All fees, SDC charges, deposits, bonds, and other charges established by City code shall be paid or provided prior to the issuance of a Public Works Permit to install a sewer lateral. No roof, surface, foundation, footing or other ground water drains shall be connected to the City Sanitary Sewer System.
3. Shared sewer laterals (i.e. "party line sewers") are not permitted per Plumbing Code. If a shared sewer lateral is encountered during repair of an existing system, the sewer laterals shall be separated and each lateral shall be run in its entirety from the home to the main independently. The cost of separation shall be paid by the property owners. Cost sharing shall be determined by the affected property owners.
4. No new main taps are allowed if the property currently has a sewer connection; the existing tap shall be used. In the event that in the City Engineer's opinion the existing tap is unusable the City Engineer may allow a new tap after proper decommissioning of the existing tap is completed.
5. Main tap shall be located a minimum of 12" from existing pipe joints and 12" from other taps.
6. New taps shall be core drilled and installed at a 45 degree angle to the main and per WL-303 (retain core drilled "coupon" for inspection). Taps shall be done with an "Insert-a-Tee" fitting (requests to use comparable materials must be approved by the City in writing prior to installation). Insert a tee shall match lateral pipe type/size and main pipe type/size. Tap shall be installed water tight, without protrusion or damage to existing main pipe. Provide inspector insert-a-tee packaging showing type of insert-a-tee installed.
7. Install a test tee on private lateral within 3 feet of main, water test will be conducted by Plumbing Inspector.
8. Run pipe at 2% min. slope to property, install green tracer wire on lateral pipe.
9. Cleanouts are required every 100' of pipe or 135 degrees of bends per the Plumbing code. Bends greater than 45 degrees are not permitted.
10. Use of hard fittings is required whenever possible. When hard fittings are not available and a flexible fitting (i.e. Fernco) is needed, it shall be supplied with a stainless steel shear band when possible.
11. A backwater valve may be required by the Plumbing Inspector depending on site circumstances (e.g. if nearest downstream manhole cover is above elevation of home)
12. Inspection and approval by City personnel is required prior to backfill. Recorded video inspection is often required of repairs/installations following backfill. Video camera shall be on showing running water into pipe, then stop water flow and allow a few minutes for all water to flow from pipe. Run video camera SLOWLY down and up pipe once all water is out of pipe to ensure no standing water/offset joints.
13. Tightly compact 6" of 3/4" rock under the pipe.

- 17. Backfill trench with clean, well-graded 3/4"-0 angular gravel compacted in lifts to min. 95% density per AASHTO T-180. Compaction testing by a certified testing firm will be required. Alternately, controlled density fill (CDF) may be used in lieu of compaction tested gravel. Contractor to provide detailed as-built site plan showing dimensions, depths, and bends.
18. See "Street Cut" section for trench restoration requirements.
19. WATER LINES
1. The water line from the main to the meter (and the meter itself) is maintained by the City Water Department in most cases. Please contact the Water Dept. at (503)656-6081 if you have concerns about your water lateral on the street side of the meter.
2. The water line behind the meter is privately maintained by the homeowner. A Building Dept. permit is required for this work and a licensed plumber must typically perform this work.

- STREET CUTS/TRENCHES
1. All trenches in street asphalt areas must be backfilled with 3/4"-0 gravel compacted in 12" maximum lifts and tested at multiple depths by a certified testing company to minimum 95% per AASHTO T-180. The compaction tested gravel area must extend a minimum of 4 feet outside of street edge (or as specified onsite by City personnel depending on trench depth and condition).
a. Alternately, Controlled density fill (CDF) may be specified. Pipe shall be bedded in 6" and covered with 12" of 3/4"-0 gravel prior to filling trench with CDF. CDF may also be specifically required by the onsite inspector in some instances due to site conditions.
2. All street cuts must have a 6" T-cut as shown in West Linn Standard Drawing WL-203. Asphalt edges shall be sawcut back an additional 6" beyond undisturbed base. The T-cut should be done after trench is backfilled.
3. Hot mix asphalt shall be used to top off the trench. Depth of asphalt depends on street classification and shall be installed in equal lifts as specified in the Public Works Standards. 4" depth for local streets, 5" for collectors, and 6" for arterials.
4. Tack all vertical edges prior to paving.
5. Sand seal all seams thoroughly with an approved sealant. Lack of adequate sealer or premature cracking of joints is one of the most common warranty call-backs.

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CIVIL ABBREVIATIONS

Table with 3 columns: Abbreviation, Description, and Symbol/Notes. Includes entries like ABBR, AC, ACCD, ADA, ALT, APPX, ARCH, ARV, BCR, BF, BLDG, BO, BOC, BOT, B.P. or BP, BR, BS, BS S, BTWN, BW, CB, CI, CJ, CL or C/L, CLR, CNTR, CD, COM, CONC, CONN, CONT, COP, CRN or CRWN, CSO, CULV, DBL, DC, DCCA, DET, DI, DIAMETER, DIM, DOM, DP, DS, DW, D/W, DWG, EA, ECR, EG, EJ, EL or ELEV, ELEC, EMBED, EOP, E.O.R., E.P. or EP, EQ, ER, ESC, EW, EX or EXIST, EXT, FD, FDC, FNDN, FF, FG, FH, FIN, FL, FL S, FLG, FLR, FP, FOC, FTG, GA, GALV, GB, GEN, GR, GS, GSP, GUT, G.V., HDPE, HORIZ, H.P., HT, I.E. or IE, INFO, I.P. or IP, I.R., JT, L, LBS or #, LF, LIN, LT, MANUF, MATT, MAX, MECH, M.J., MH, MIN, (N) or N, N.S., N.T.S., O.W. or OC, O.W.S., PL or P/L, P.C. or PC, P.C.C. or PCC, PERFORATED, P.P. or PP, PROP, P.T. or PT, PVC, P.U.E., P.W., R or RAD, R.D. or RD, REQ'D, RDCR, R.P., RT, R/W or ROW, S, SAN or S.S., SCHED, SED, SERV, SHT, SIM, SPECS, STA, STD, ST.D., STM, STL, STRUCT, SW or SDMLK, TC, TELEP, T.O.F., T.O.S., T.O.W., TYP, U.E., U.P., U.R.M., U.T., V.B., VERT, VLT, WTR, W.J., W.M., W.Q., WY, W.W.F., W/, W/O, GALVANIZED STEEL PIPE, GUTTER, GATE VALVE, HIGH-DENSITY-POLYETHYLENE, HORIZONTAL, HIGH POINT, HEIGHT, INVERT ELEVATION, INTERIOR, INFLECTION POINT, IRON ROD, JOINT, LENGTH, POUNDS, LINEAR FEET, LINEAR, LEFT, MANUFACTURER, MATERIAL, MAXIMUM, MECHANICAL, MECHANICAL JOINT, MANHOLE, MINIMUM, NEW, NON SHRINK, NOT TO SCALE, ON CENTER, OIL WATER SEPARATOR, PROPERTY LINE, POINT OF CURVATURE, POINT OF COUNTER CURVATURE PERFORMED, PRIMARY POWER or POWER POLE, PROPOSED, POINT OF TANGENCY, POLYNYL-CHLORIDE, PUBLIC UTILITY EASEMENT, PUBLIC WORKS, RADIIUS, ROOF DRAIN, REQUIRED, REDUCER, RADIUS POINT, RIGHT, RIGHT-OF-WAY SLOPE, SANITARY SEWER SCHEDULE, SEDIMENTATION, SERVICE, SHEET, SIMILAR, SPECIFICATIONS, STATION, STANDARD, STORM DRAIN, STORM SEWER, STEEL, STRUCTURAL, SIDEWALK, TOP OF CURB, TELEPHONE, TOP OF FOOTING, TOP OF SLAB, TOP OF WALL, TYPICAL, UNDERGROUND ELECTRICAL U.O.N., UNDERGROUND POWER, UNREINFORCED MASONRY, UNDERGROUND TELEPHONE, VALVE BOX, VERTICAL, VAULT, WATER, WET JOINT, WATER METER, WATER QUALITY, WATER VALVE, WELDED WIRE FABRIC, WITH, WITHOUT.

Table of EXISTING symbols and their corresponding descriptions: DECIDUOUS TREE, CONIFEROUS TREE, FIRE HYDRANT, IRRIGATION, WATER METER, WATER VALVE, DOUBLE CHECK VALVE, AIR RELEASE VALVE, SANITARY SEWER CLEANOUT, SANITARY SEWER MANHOLE, SIGN, STREET LIGHT, MAILBOX, STORM SEWER CLEAN OUT, STORM SEWER CATCH BASIN, STORM SEWER MANHOLE, GAS METER, GAS VALVE, GUY WIRE ANCHOR, POWER POLE, POWER VAULT, POWER JUNCTION BOX, POWER PEDESTAL, COMMUNICATIONS VAULT, COMMUNICATIONS JUNCTION BOX, STORM SEWER DOWN SPOUT.

Table of EXISTING line styles and their corresponding descriptions: RIGHT OF WAY LINE, BOUNDARY LINE, PROPERTY LINE, CENTERLINE, DITCH, CURB, EDGE OF PAVEMENT, EASEMENT, FENCE LINE, GRAVEL EDGE, POWER LINE, OVERHEAD WIRE, COMMUNICATIONS LINE, FIBER OPTIC LINE, GAS LINE, STORM SEWER LINE, SANITARY SEWER LINE, WATER LINE.

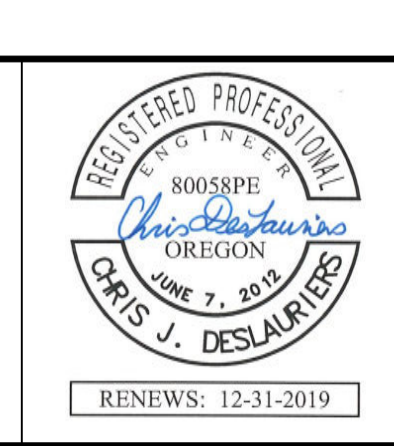
PROPOSED LEGEND table with symbols and descriptions: STREET TREE AND TREE WELL, CONCRETE, ORANGE CONSTRUCTION FENCE, SEDIMENT CONTROL WATTLES, CURB.

Administrative table with columns: NO., DATE, DESCRIPTION, APPD., REVISIONS, FINAL MAP DATA. Includes fields for DESIGNED BY (CJD), DATE APPROVED, SECTION ENGR, CHECKED BY (CJD), REVIEWER, and APPROVALS (PRINCIPAL ENGINEER, CITY ENGINEER).

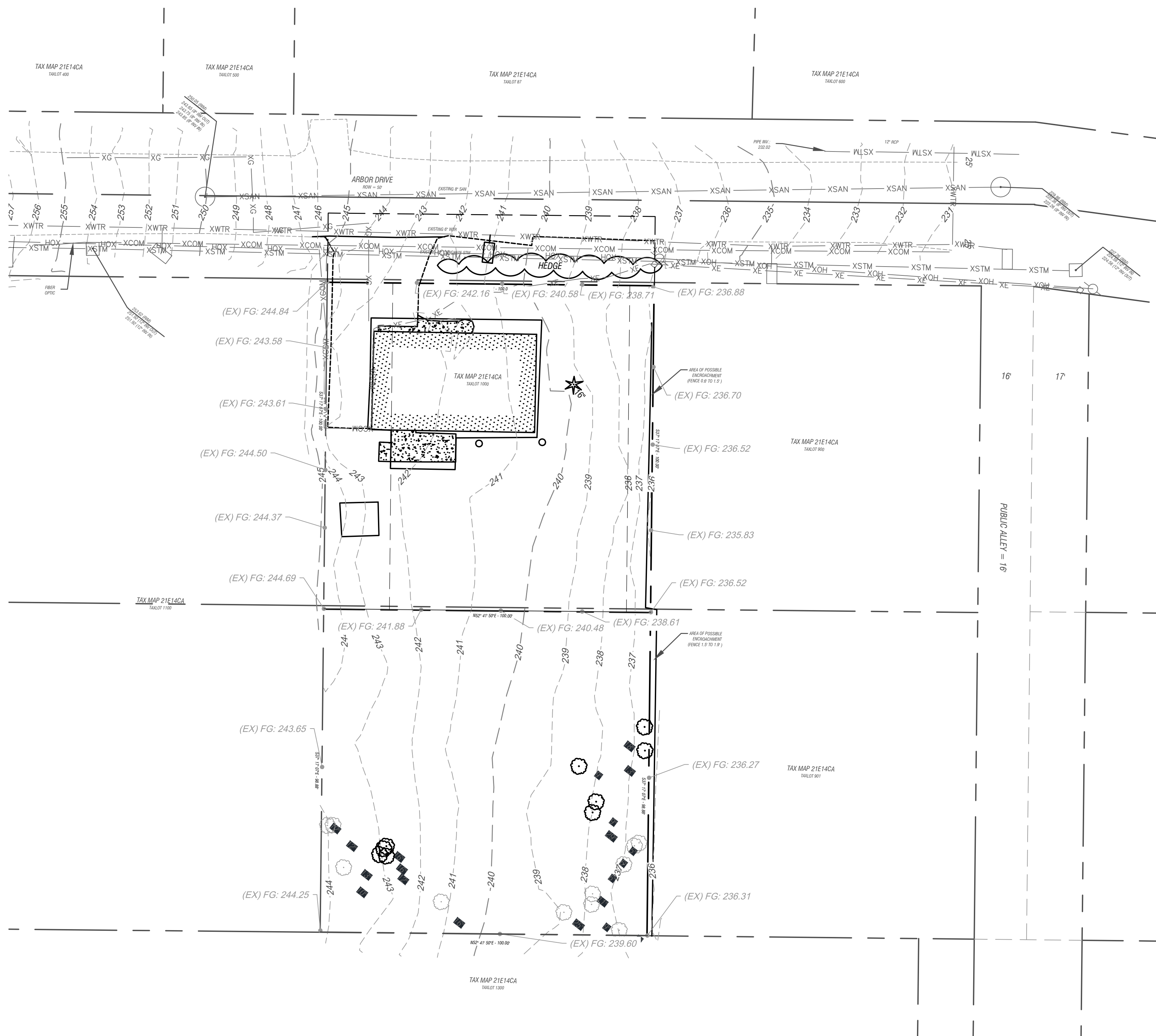
APPROVALS table with columns: PRINCIPAL ENGINEER, REG. PROF. ENGR., CITY ENGINEER, REG. PROF. ENGR.

PREPARED FOR THE CITY OF WEST LINN

WDY logo and contact information: 6443 SW Beaverton-Hillsdale Hwy, suite 210 Portland, OR 97221. ph:503.203.8111 fx:503.203.8122 www.wdy.com



PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068 CIVIL NOTES & ABBREVIATIONS. SHEET NO. C02, 2 OF 9.

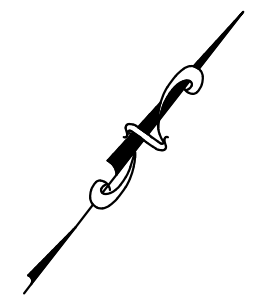
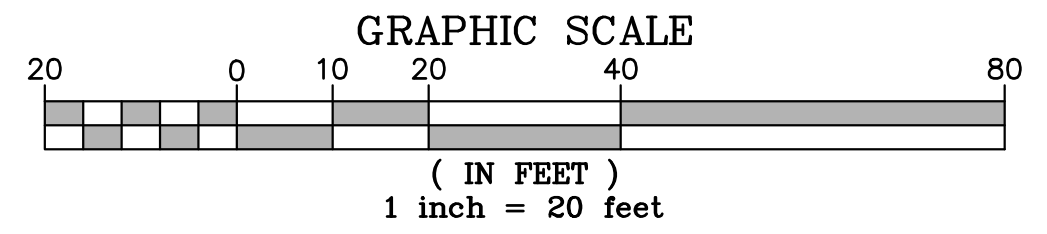


GENERAL NOTES:

- THE LOCATION OF UTILITIES SERVING THE PROPERTY HAVE BEEN DETERMINED BY OBSERVED EVIDENCE, TOGETHER WITH MARKINGS PROVIDED BY UTILITY COMPANIES; 811 OREGON UTILITY NOTIFICATION CENTER TICKET #19034269. THE LOCATION OF THE UTILITIES, SHOWN HEREON, DETERMINED BY ABOVE GROUND EVIDENCE, IS APPROXIMATE. LEI MAKES NO WARRANTIES TO THE LOCATION OF THE UTILITIES. THE CONTRACTOR SHALL CALL FOR PRIVATE UTILITY LOCATES AND FIELD VERIFY ALL UTILITIES BEFORE CONSTRUCTION ACTIVITIES.
- THE BOUNDARY SHOWN ON THIS MAP IS FOR ENGINEERING PURPOSES ONLY. NO MONUMENTATION SHALL BE SET AND THIS MAP SHALL NOT BE FILED WITH THE COUNTY AS RECORD. CONTROL SHOWN HEREON IS FOR CONSTRUCTION USE, AND IS TEMPORARY.
- THE BUILDING FOOTINGS WERE NOT EASILY ACCESSIBLE AND THEREFORE, THE BUILDING LIMITS SHOWN HEREON, WERE MEASURED FROM THE BUILDING FASCIA.
- ON-SITE UTILITY LOCATIONS ARE APPROXIMATE, OBSERVED FROM ABOVE GROUND EVIDENCE, AND PIPE LOCATIONS AND DIRECTIONS ARE APPROXIMATED WITH THE USE OF CITY MAPS. NO AS-BUILT PLANS HAVE BEEN PROVIDED OR REVIEWED AT THIS TIME. CATCH BASINS WITH RIM ELEVATIONS ONLY SHOWN ARE GIBSON STEEL CATCH BASINS AND THE INVERT OF THE STORM PIPE CANNOT BE OBSERVED FROM THE SURFACE.
- LEI MAKES NO WARRANTIES TO THE EXACT COUNT OF THE TREES ON THE PROPERTY, AS LOCATIONS OF TREES WITH RESPECT TO PROPERTY LINES IS APPROXIMATE, AND NOT GUARANTEED. REFERENCE ARBORIST REPORT FOR EXACT INFORMATION REGARDING TREES ON THE PROPERTY (SPECIES, DBH, CONDITION, ECT). TREES ARE MEASURED FROM THE NEAREST FACE THAT CAN BE OBSERVED FROM THE INSTRUMENT AT THE TIME OF MEASUREMENT, AND ELEVATION IS NOT RECORDED, AS TREE OBSERVATIONS ARE NOT USED TO PRODUCE THE TIN SURFACE AND CAN BE MEASURED USING DIRECT REFLECTION ON THE NEAREST OBSERVABLE FACE. TREES ALONG THE PROPERTY LINES ARE NOT GUARANTEED TO BE ON OR OFF OF THE PROPERTY, AS NO BOUNDARY SURVEY HAS BEEN PERFORMED AT THIS TIME. LEI MAKES NO WARRANTIES ON POTENTIAL ENCROACHMENTS TO THE PROPERTY.
- HORIZONTAL DATUM LOCAL ASSUMED. VERTICAL DATUM BASED ON NGS DATA POINT "SHEPHERD A18191".

EXISTING		EXISTING	
DECIDUOUS TREE		STORM SEWER CLEAN OUT	
CONIFEROUS TREE		STORM SEWER CATCH BASIN	
FIRE HYDRANT		STORM SEWER MANHOLE	
IRRIGATION		GAS METER	
WATER METER		GAS VALVE	
WATER VALVE		GUY WIRE ANCHOR	
DOUBLE CHECK VALVE		POWER POLE	
AIR RELEASE VALVE		POWER VAULT	
SANITARY SEWER CLEANOUT		POWER JUNCTION BOX	
SANITARY SEWER MANHOLE		POWER PEDESTAL	
SIGN		COMMUNICATIONS VAULT	
STREET LIGHT		COMMUNICATIONS JUNCTION BOX	
MAILBOX		STORM SEWER DOWN SPOUT	
EXISTING			
RIGHT OF WAY LINE			
BOUNDARY LINE			
PROPERTY LINE			
CENTERLINE			
DITCH			
CURB			
EDGE OF PAVEMENT			
EASEMENT			
FENCE LINE			
GRAVEL EDGE			
POWER LINE			
OVERHEAD WIRE			
COMMUNICATIONS LINE			
FIBER OPTIC LINE			
GAS LINE			
STORM SEWER LINE			
SANITARY SEWER LINE			
WATER LINE			

**1 EXISTING CONDITIONS**  
**C03** SCALE: 1" = 20'



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DESIGNED BY	CJD	DATE APPROVED	
CAD BY	PRM	SECTION ENGR	
CHECKED BY	CJD	REVIEWER	
APPROVALS:			
PRINCIPAL ENGINEER		REG. PROF. ENGR.	
CITY ENGINEER		REG. PROF. ENGR.	

CONSTRUCTED BY	
PROJECT COMPLETED	
MAP CORRECTED BY	
CHECKED BY	
NO. DATE DESCRIPTION APPD.	
REVISIONS	
FINAL MAP DATA	

PREPARED FOR THE  
**CITY OF WEST LINN**

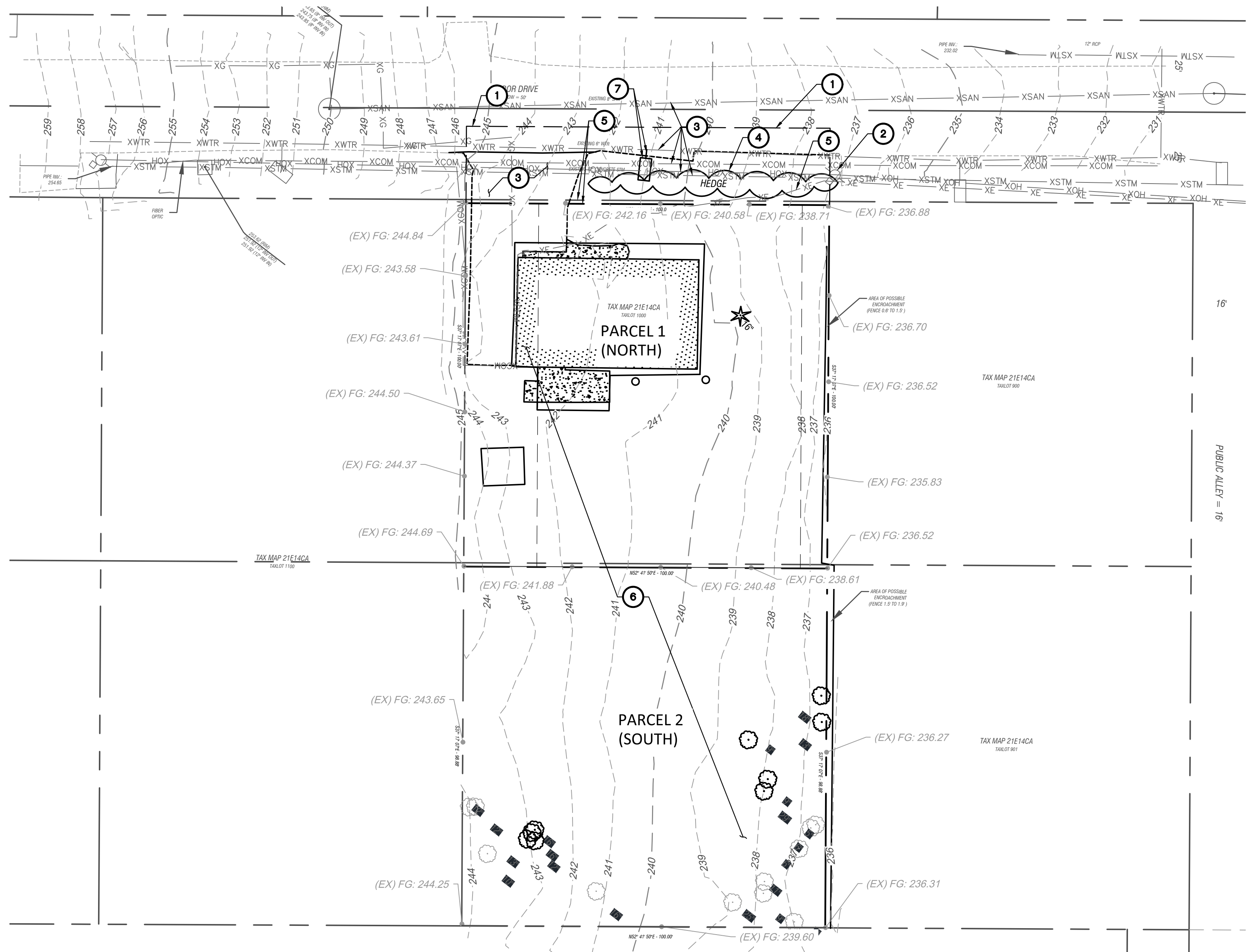
**WDY** Structural-Civil Engineers  
 6443 SW Beaverton-Hillsdale Hwy, suite 210 Portland, OR 97221  
 ph:503.203.8111 fx:503.203.8122 www.wdyj.com



PUBLIC IMPROVEMENTS FOR  
**2322 ARBOR DRIVE**  
**WEST LINN, OR 97068**  
 EXISTING CONDITIONS

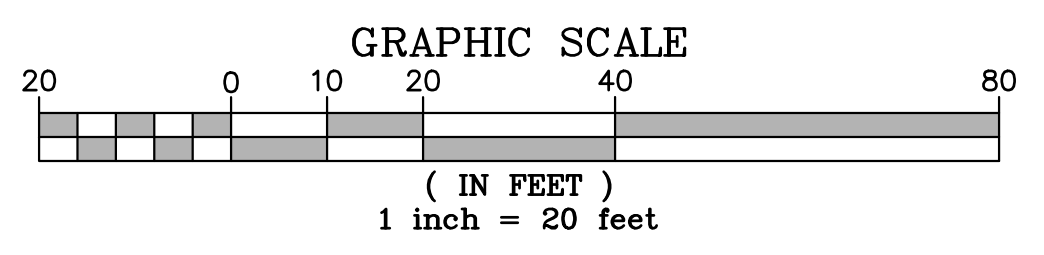
JOB NO.  
 SHEET NO.  
**C03**  
 3 OF 9





KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	SAWCUT LINE AS SHOWN 21 FEET AWAY FROM PROPERTY LINE IN RIGHT OF WAY. REMOVE PAVEMENT SOUTH OF SAWCUT AND DISCARD.
2	PROTECT EXISTING POWER POLE TO REMAIN.
3	PROTECT ALL EXISTING PUBLIC AND FRANCHISE UTILITIES DURING CONSTRUCTION.
4	REMOVE EXISTING HEDGE IN RIGHT OF WAY AND DISCARD, BACKFILL WITH COMPACTED CRUSHED ROCK.
5	1 FOOT DEDICATION TO THE CITY OF WEST LINN. COMPLETED WITH PARTITION PLAT.
6	SEE ARCHITECTS DWGS FOR ALL ONSITE DEMO, TO BE PERFORMED UNDER SEPARATE PERMIT, TYP.
7	CITY OF WEST LINN TO KILL EXISTING WATER METER AND LATERAL, UNDER SEPARATE PERMIT.

**1**  
**C04** DEMOLITION PLAN  
SCALE: 1" = 20'



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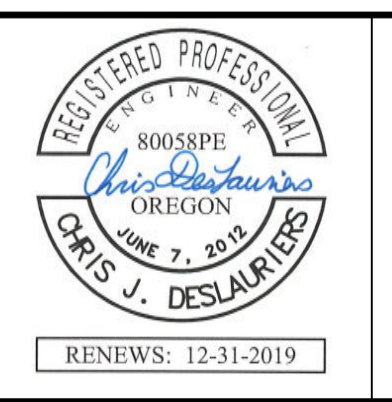
NO.	DATE	DESCRIPTION	APPD.
REVISIONS			
FINAL MAP DATA			

DESIGNED BY CJD	DATE APPROVED
CAD BY PRM	SECTION ENGR
CHECKED BY CJD	REVIEWER

APPROVALS:	
PRINCIPAL ENGINEER	REG. PROF. ENGR.
CITY ENGINEER	REG. PROF. ENGR.

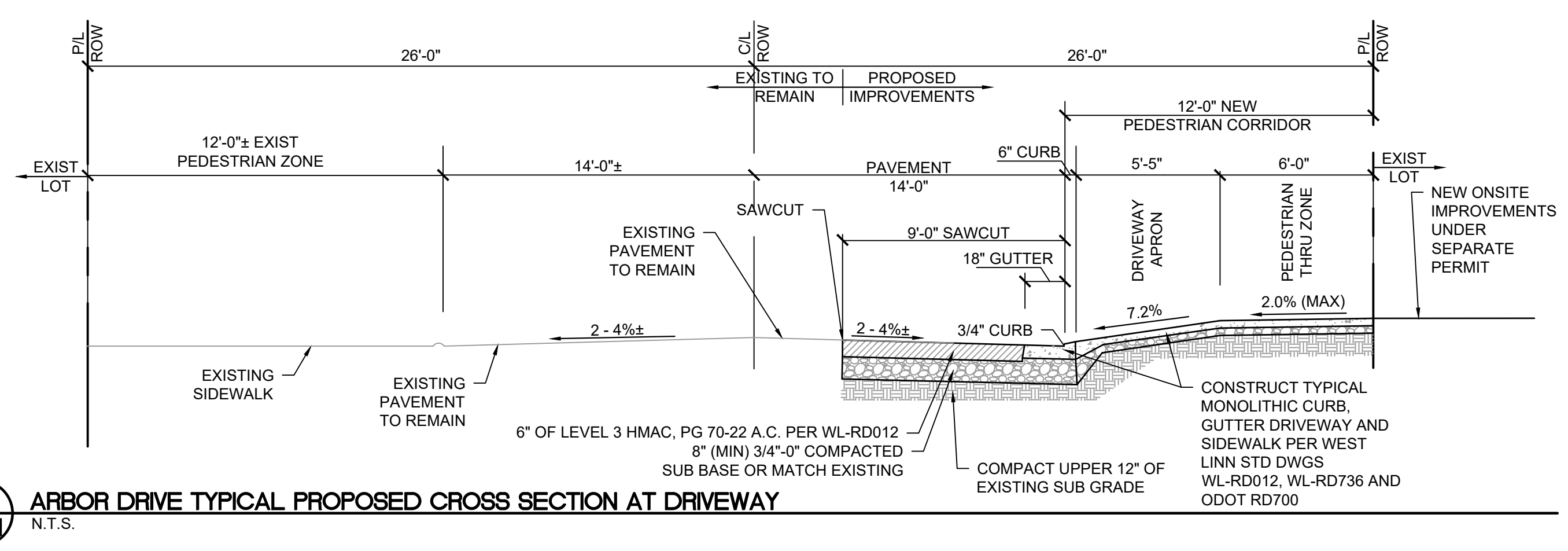
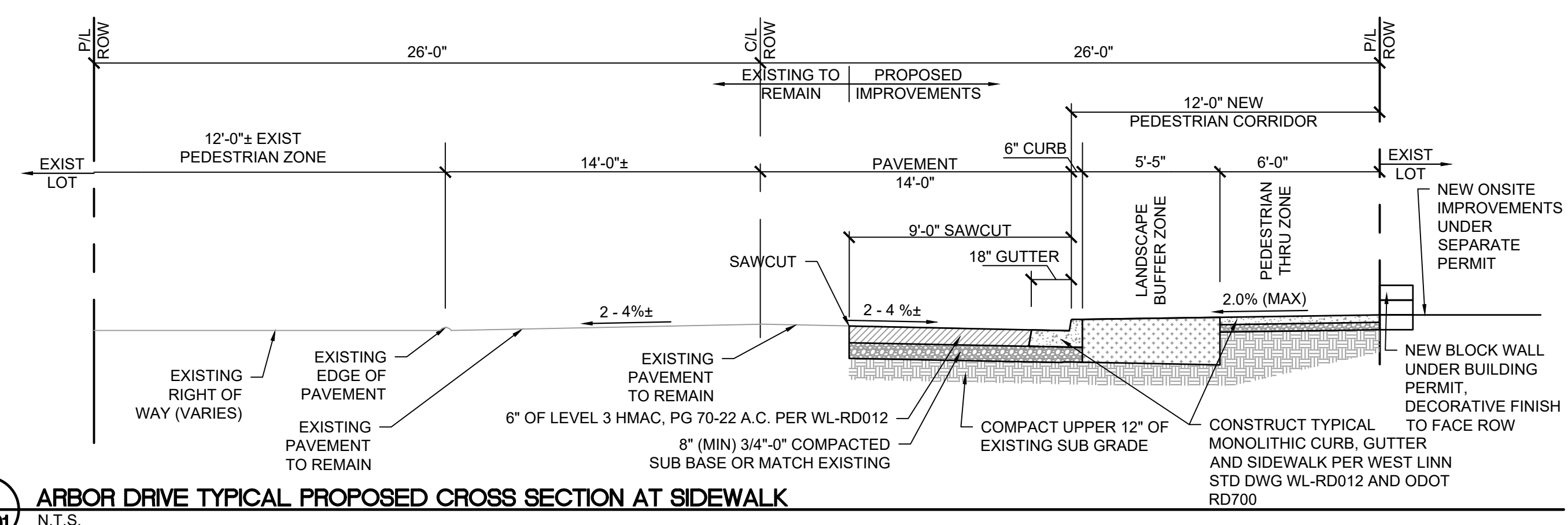
PREPARED FOR THE  
CITY OF WEST LINN

**WDY** Structural • Civil Engineers  
6443 SW Beaverton-Hillsdale Hwy, suite 210 Portland, OR 97221  
ph:503.203.8111 fx:503.203.8122 www.wdyi.com



PUBLIC IMPROVEMENTS FOR  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
DEMOLITION PLAN

JOB NO.	
SHEET NO.	C04
	4 OF 9



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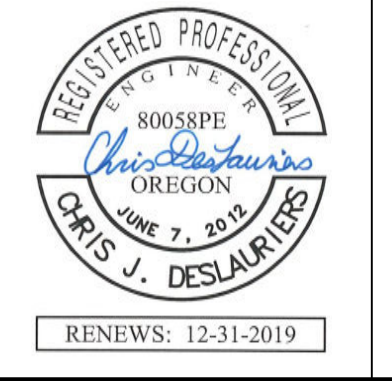
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MAP CORRECTED BY			
CHECKED BY			
NO.	DATE	DESCRIPTION	APPD.
REVISIONS			
FINAL MAP DATA			

APPROVALS:	
PRINCIPAL ENGINEER	REG. PROF. ENGR.
CITY ENGINEER	REG. PROF. ENGR.

PREPARED FOR THE  
CITY OF WEST LINN

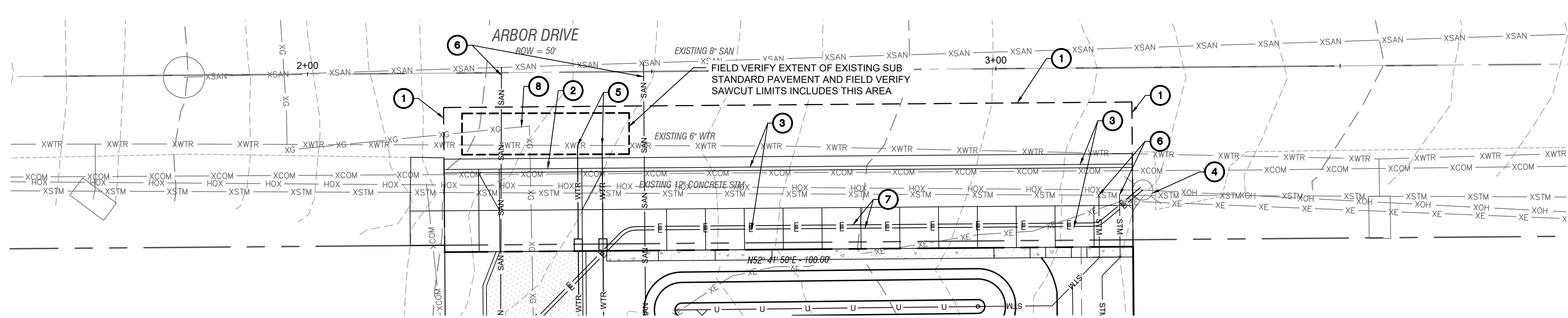
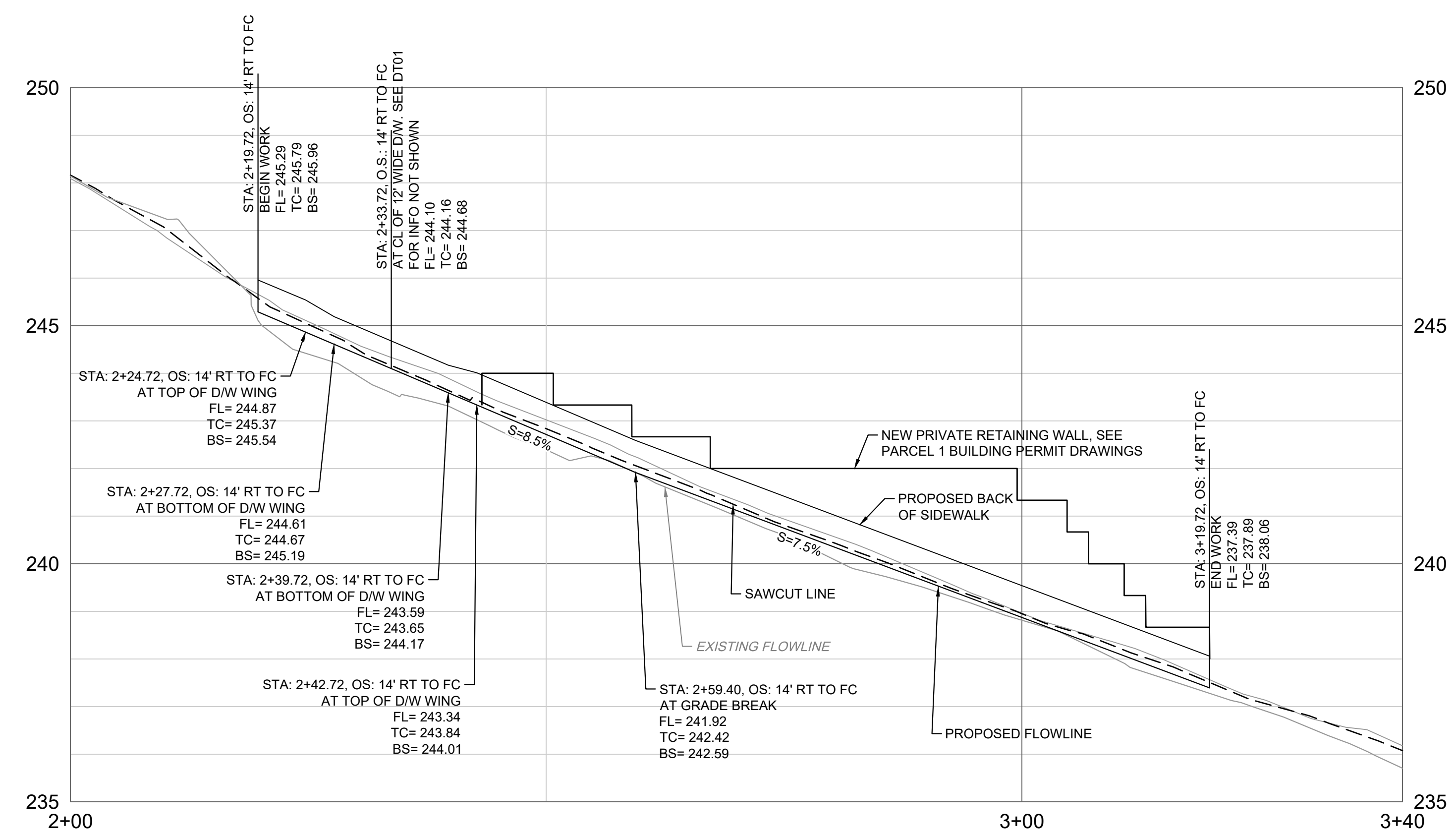
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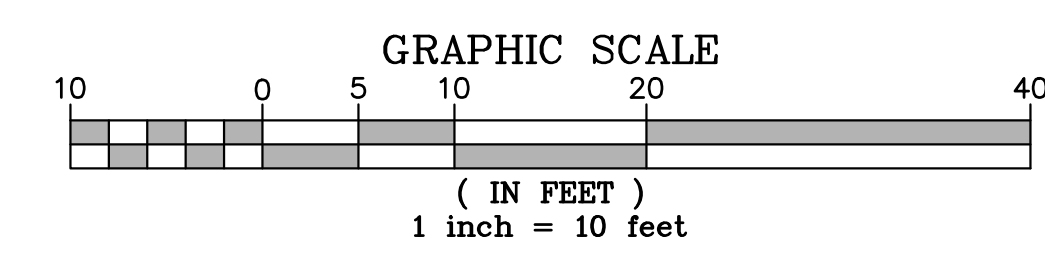
PUBLIC IMPROVEMENTS FOR  
2322 ARBOR DRIVE  
WEST LINN, OR 97068  
ROADWAY CROSS SECTIONS

JOB NO.  
SHEET NO.  
**CX01**  
5 OF 9

KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	SAWCUT LINE PER DEMOLITION PLAN, TYP.
2	INSTALL NEW ACCESS DRIVEWAY FOR ACCESS EASEMENT FOR PARCELS 1 AND 2. SEE SHEET DT01 FOR DRIVEWAY GRADING DETAIL.
3	INSTALL TYPICAL CURB AND SIDEWALK SECTION PER CITY STD DWGS WL-RD012 ON SHEET DT02, TYP.
4	PROTECT EXISTING POWER AND LIGHT POLE TO REMAIN.
5	NEW WATER LATERALS AND METERS FOR PARCEL 1 AND 2 UNDER SEPARATE BUILDING PERMIT.
6	NEW SANITARY AND STORM LATERALS FOR PARCEL 1 & 2 UNDER SEPARATE PERMIT.
7	NEW POWER SUPPLY FOR PARCEL 1 & 2 UNDER SEPARATE PERMIT.
8	NEW OR EXISTING GAS SUPPLY FOR PARCEL 1 AND 2 UNDER SEPARATE PERMIT.

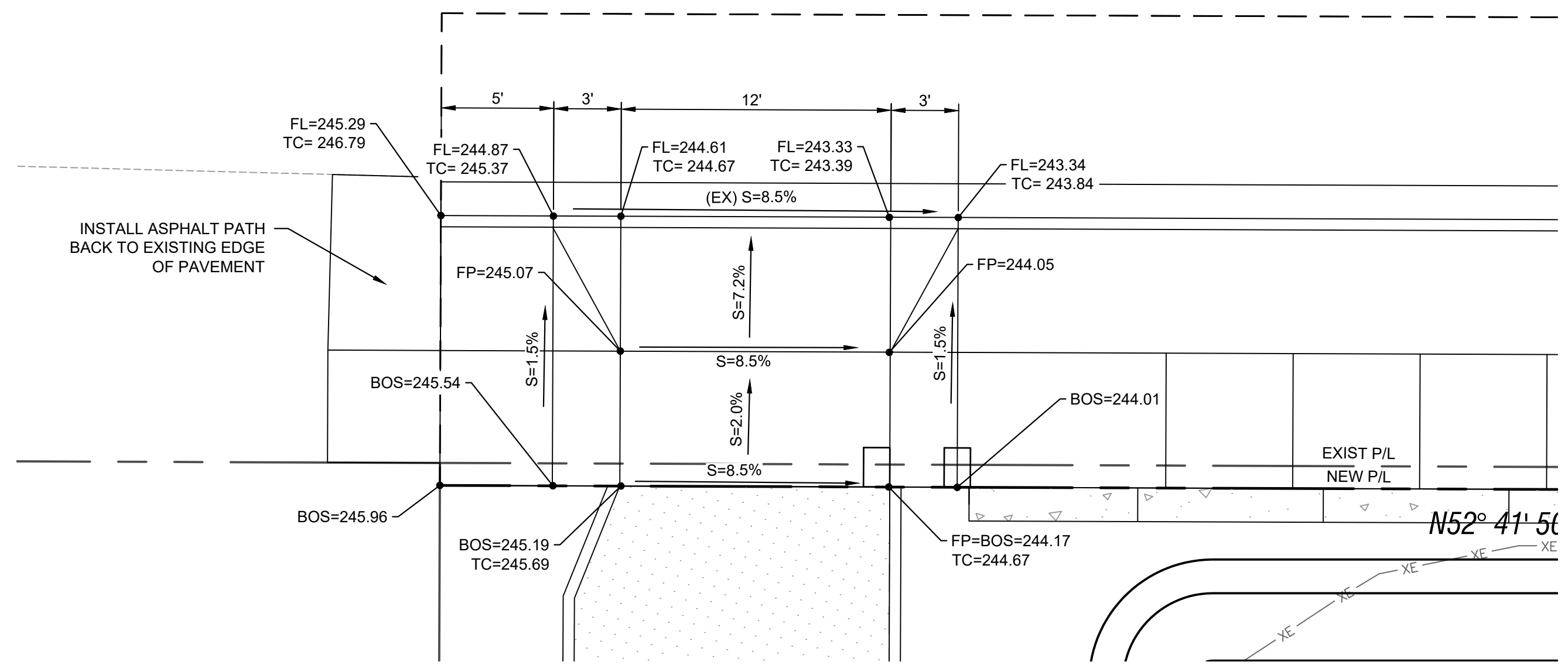


**1 ARBOR DRIVE PLAN AND PROFILE**  
 PP01 SCALE: 1" = 10'

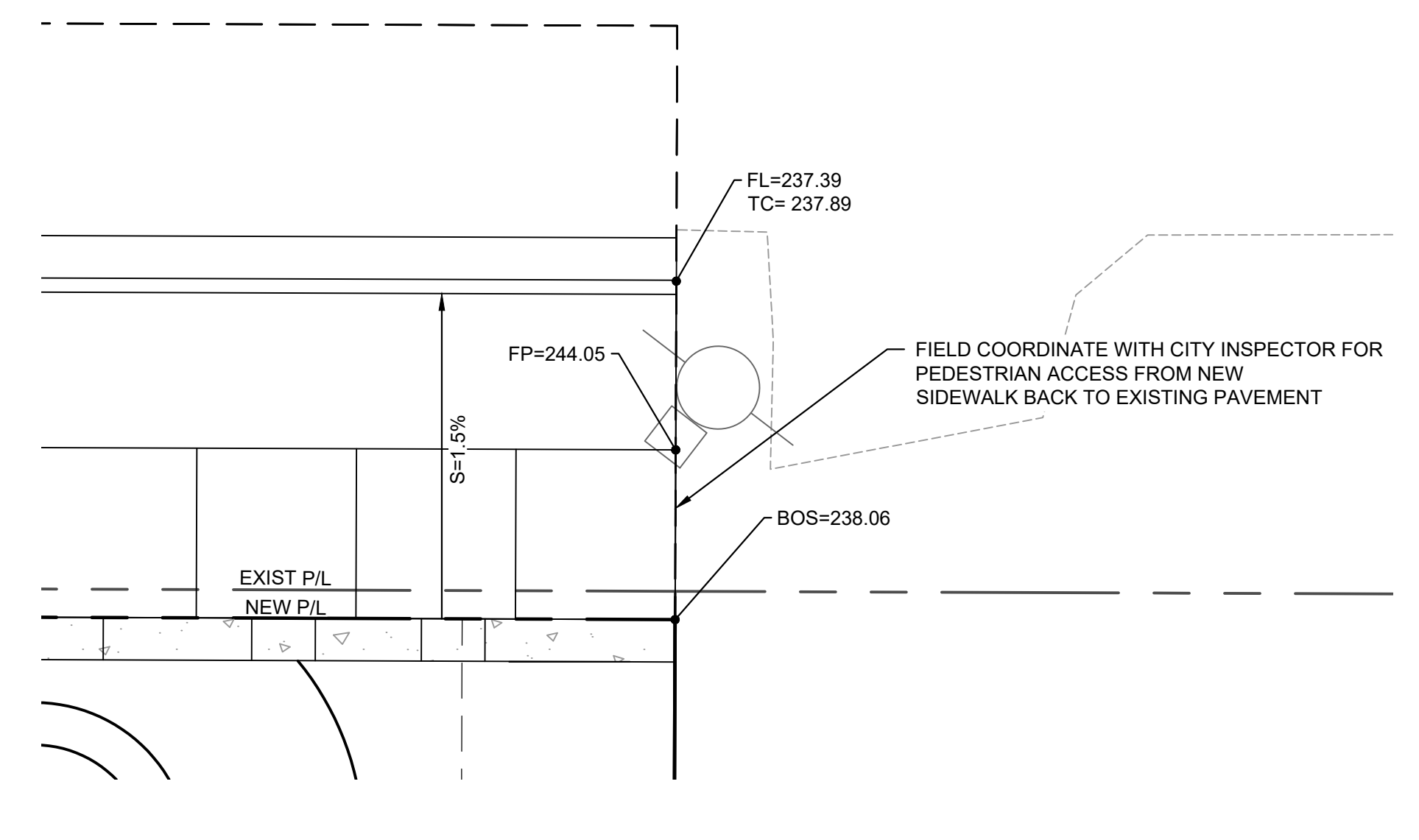
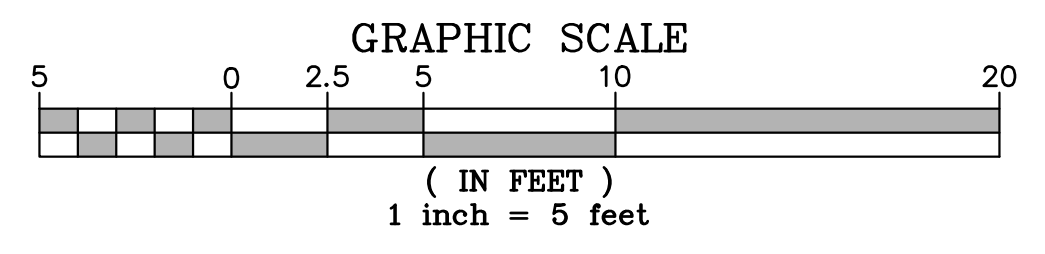


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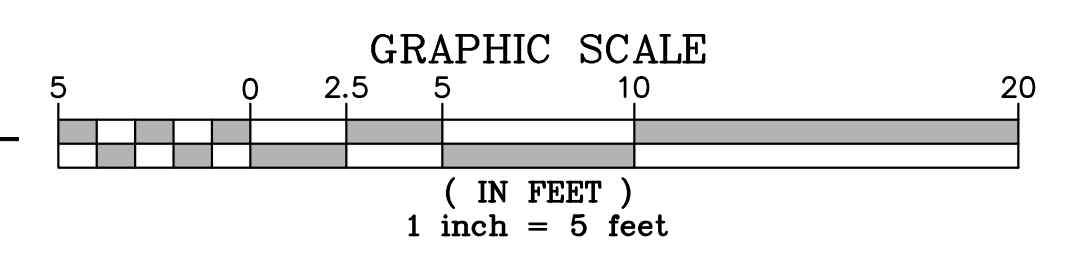
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**1 ARBOR DRIVE DRIVEWAY GRADING**  
 DT01 SCALE: 1" = 5'



**1 EAST END OF SIDEWALK DETAIL**  
 DT01 SCALE: 1" = 5'



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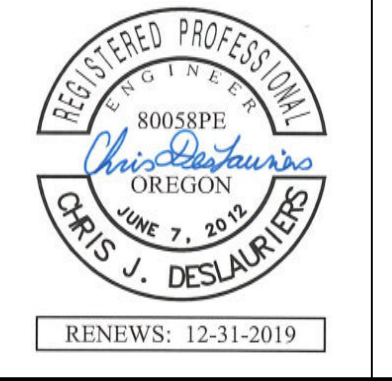
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CITY ENGINEER	REG. PROF. ENGR.

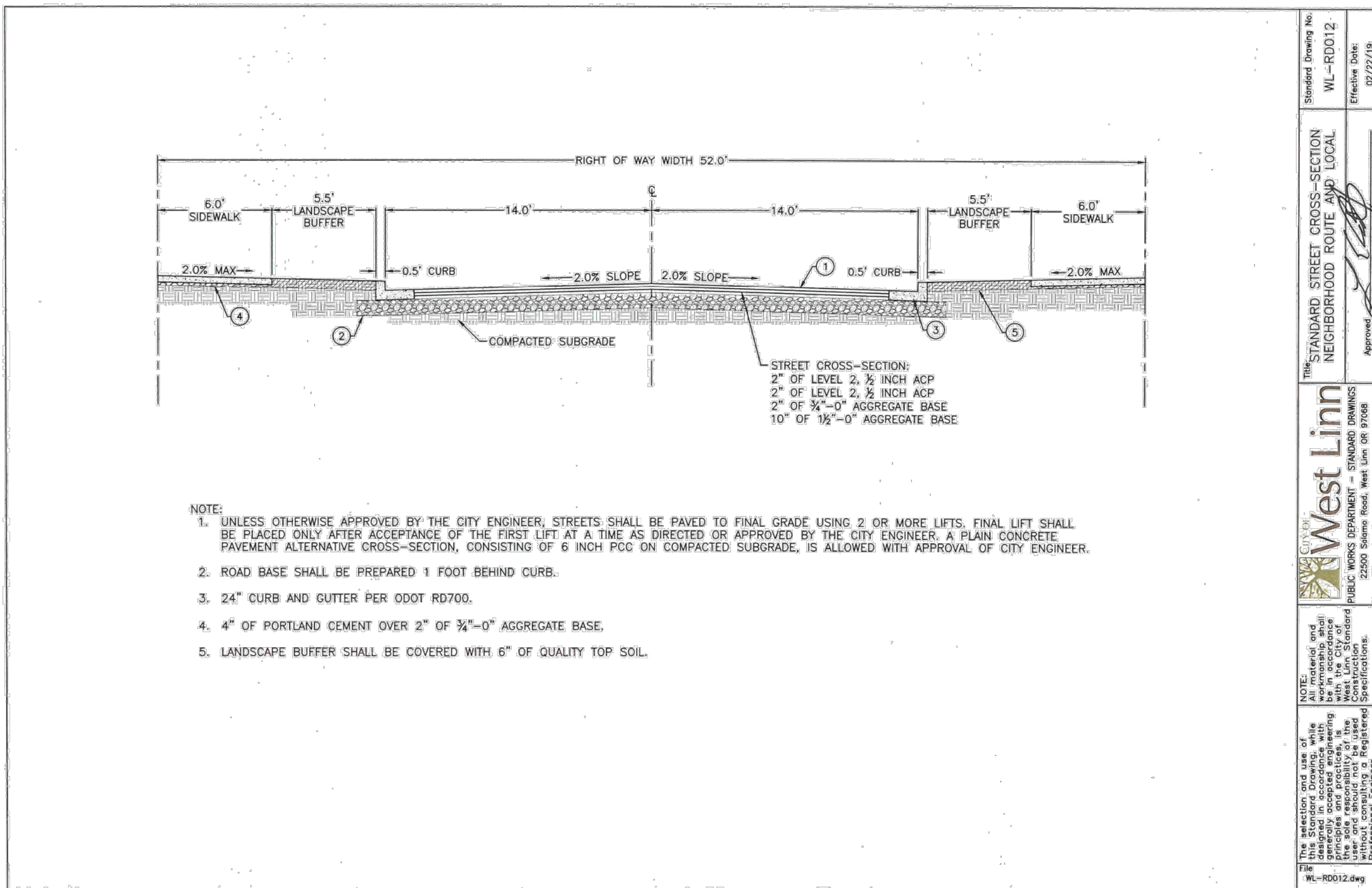
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 ARBOR DRIVE DRIVEWAY GRADING

JOB NO.	
SHEET NO.	DT01
	7 OF 9

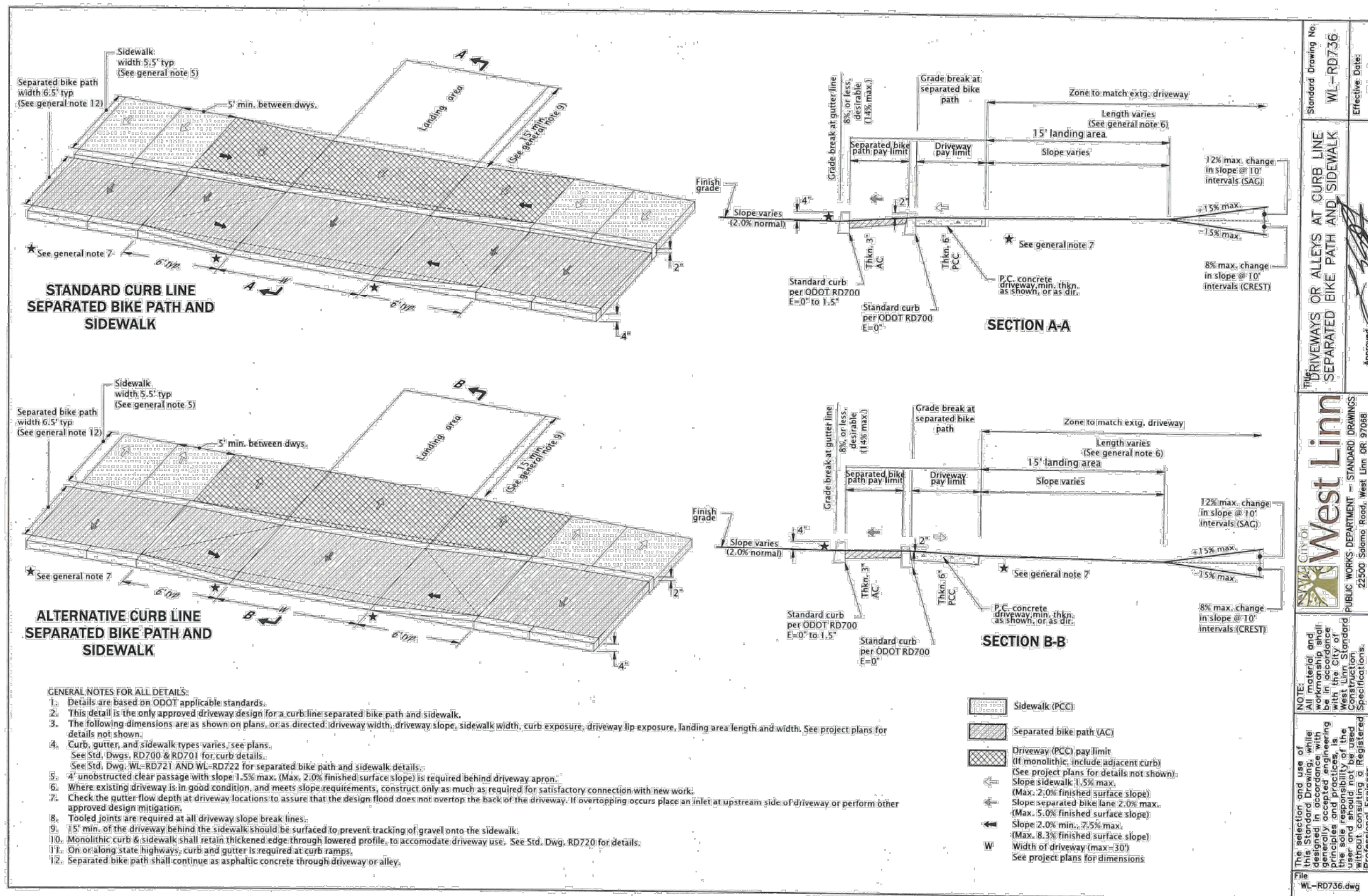
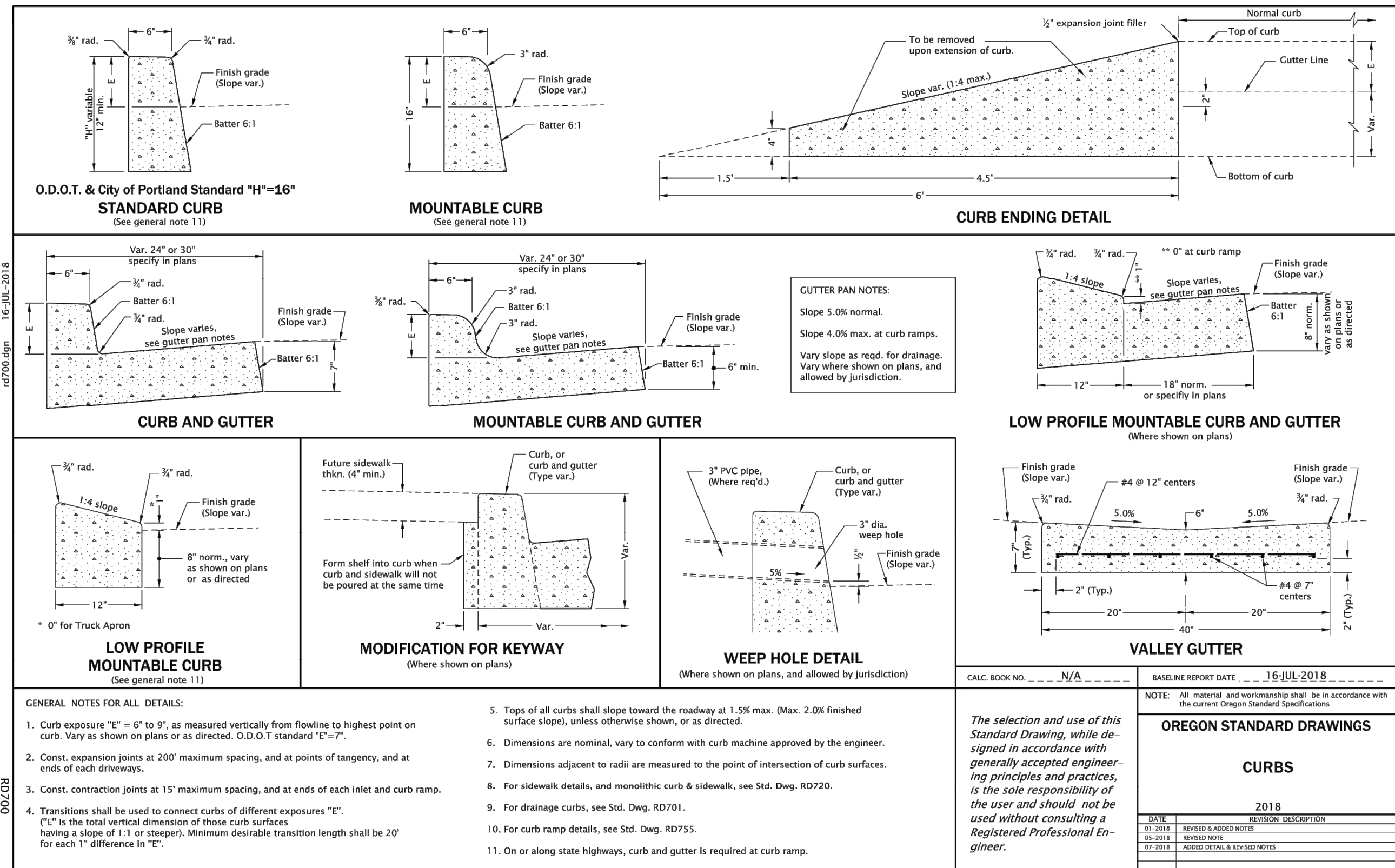


- NOTE:
- UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER, STREETS SHALL BE PAVED TO FINAL GRADE USING 2 OR MORE LIFTS. FINAL LIFT SHALL BE PLACED ONLY AFTER ACCEPTANCE OF THE FIRST LIFT AT A TIME AS DIRECTED OR APPROVED BY THE CITY ENGINEER. A PLAIN CONCRETE PAVEMENT ALTERNATIVE CROSS-SECTION, CONSISTING OF 6 INCH PCC ON COMPACTED SUBGRADE, IS ALLOWED WITH APPROVAL OF CITY ENGINEER.
  - ROAD BASE SHALL BE PREPARED 1 FOOT BEHIND CURB.
  - 24" CURB AND GUTTER PER ODOT RD700.
  - 4" OF PORTLAND CEMENT OVER 2" OF 3/4"-0" AGGREGATE BASE.
  - LANDSCAPE BUFFER SHALL BE COVERED WITH 6" OF QUALITY TOP SOIL.

Standard Drawing No. WL-RD012  
 Effective Date: 02/22/19  
 Approved: [Signature]  
 City Engineer

West Linn  
 PUBLIC WORKS DEPARTMENT - STANDARD DRAWINGS  
 Phone: 503.222.5500  
 www.westlinncity.gov

NOTE: This section and use of this drawing is in accordance with the current Oregon Standard Specifications for Public Works Construction and the City of West Linn Specifications. User and contractor shall be responsible for obtaining the latest edition of the Oregon Standard Specifications and the City of West Linn Specifications.



Standard Drawing No. WL-RD735  
 Effective Date: 02/22/19  
 Approved: [Signature]  
 City Engineer

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NOTE: This section and use of this drawing is in accordance with the current Oregon Standard Specifications for Public Works Construction and the City of West Linn Specifications. User and contractor shall be responsible for obtaining the latest edition of the Oregon Standard Specifications and the City of West Linn Specifications.

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CAD BY	PRM	SECTION ENGR	
CHECKED BY	CJD	REVIEWER	
CHECKED BY			

CONSTRUCTED BY	
PROJECT COMPLETED	
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CHECKED BY	

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		REVISIONS	
		FINAL MAP DATA	

APPROVALS:

PRINCIPAL ENGINEER	REG. PROF. ENGR.
CITY ENGINEER	REG. PROF. ENGR.

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 CITY OF WEST LINN

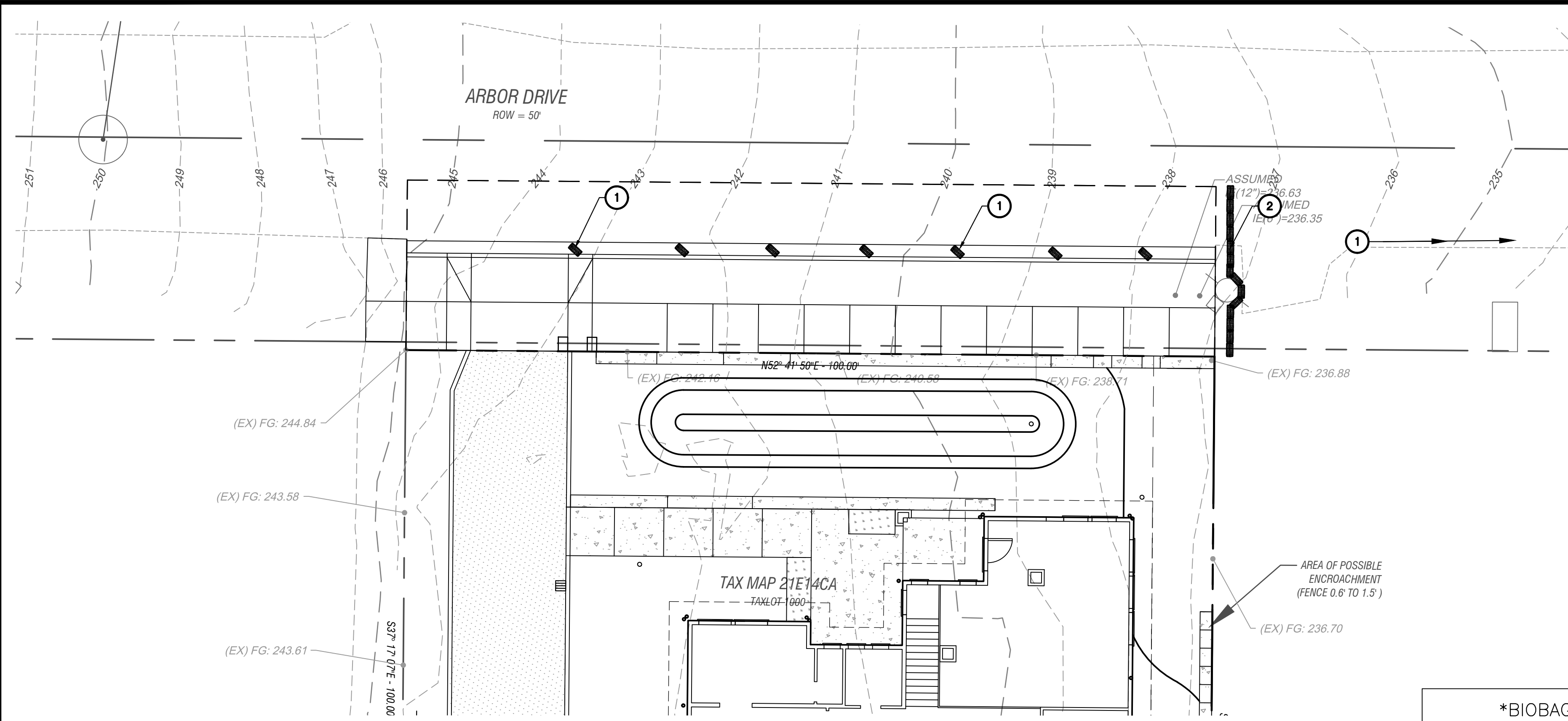
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PUBLIC IMPROVEMENTS FOR  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068

STANDARD DETAILS

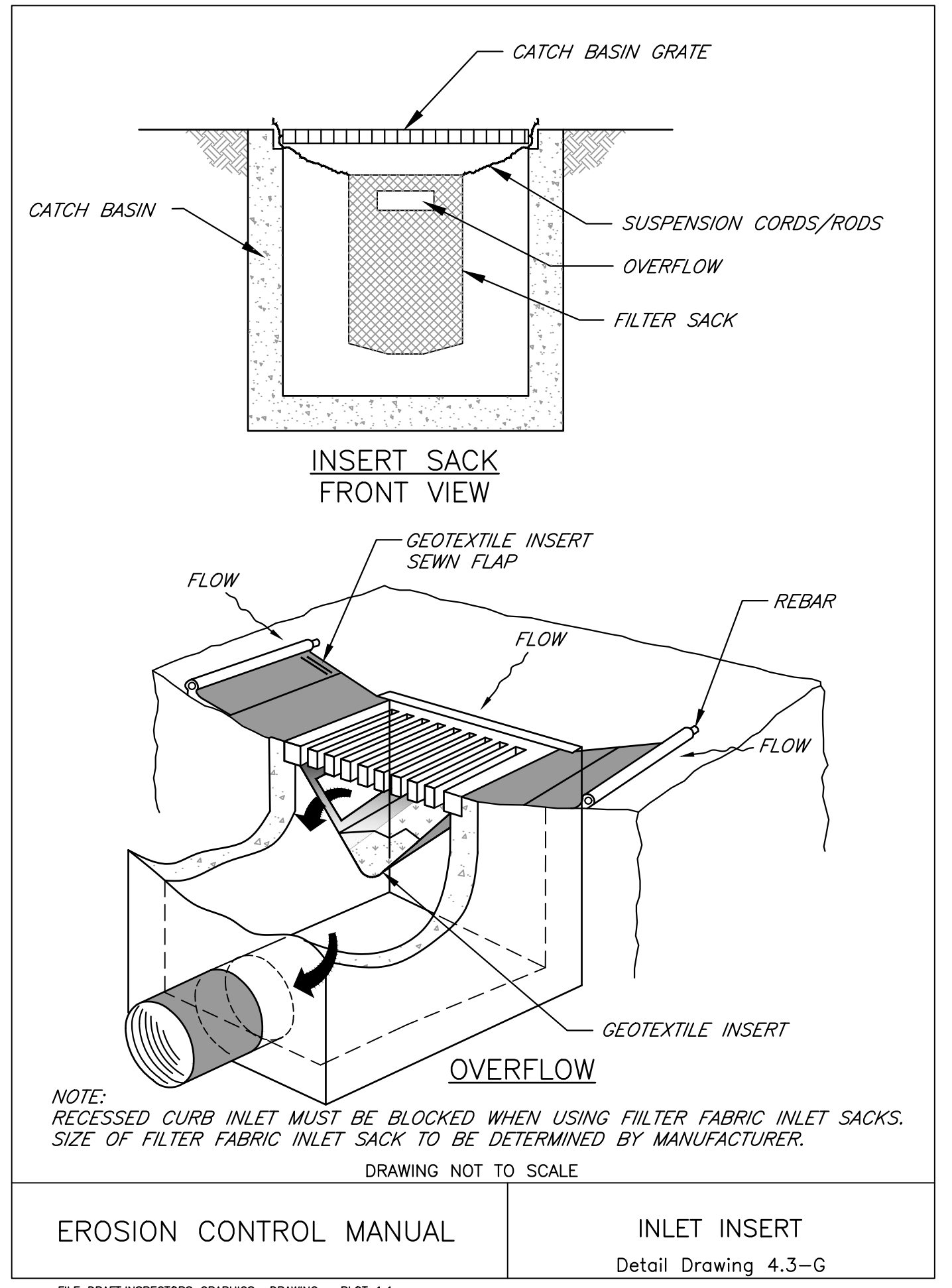
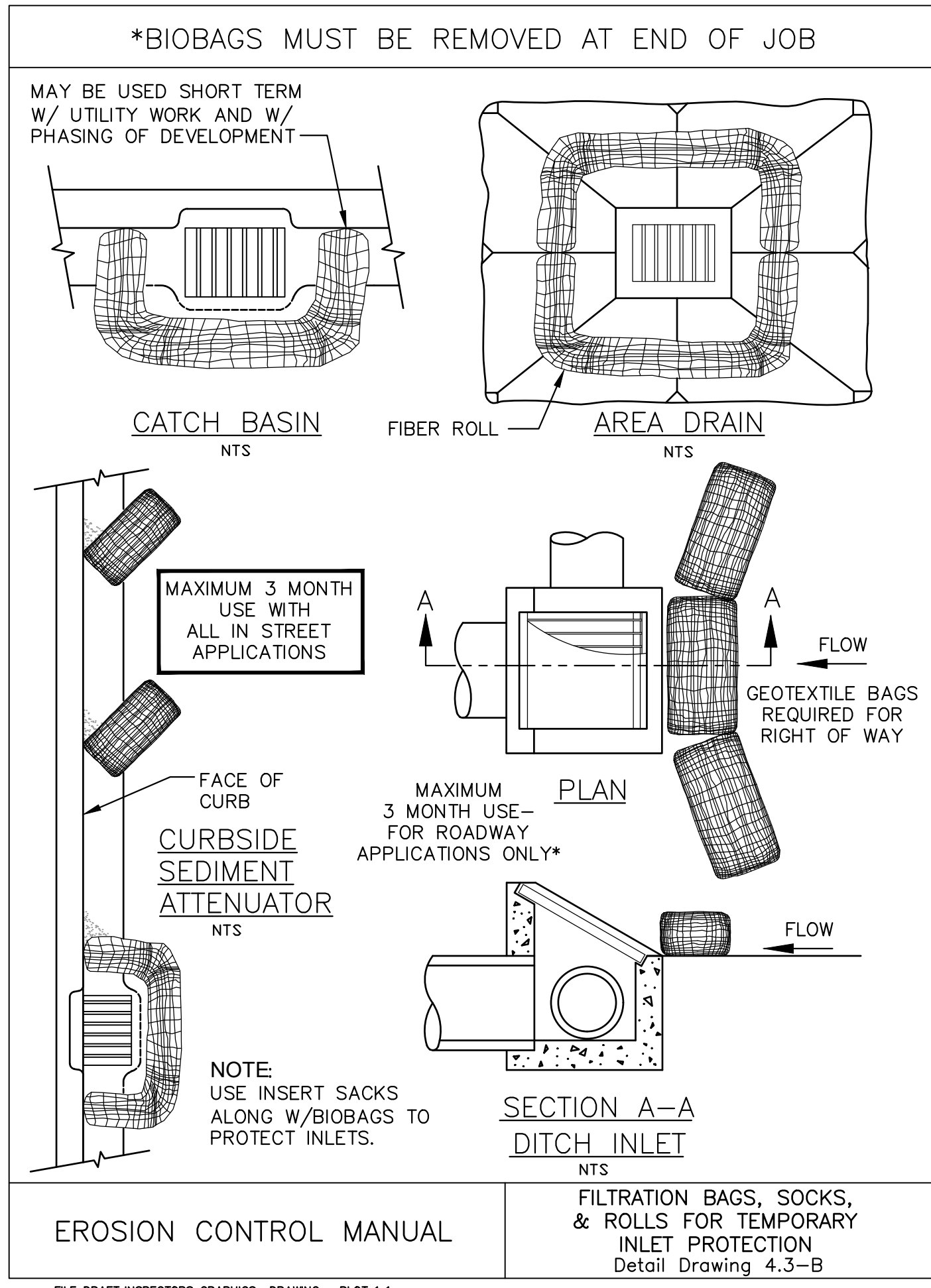
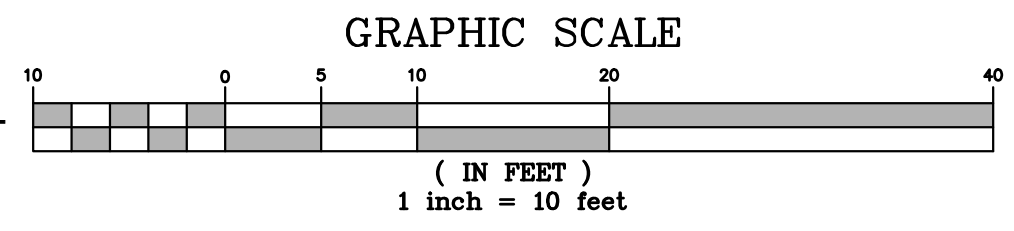
JOB NO.	
SHEET NO.	DT02
	8 of 9



KEYNOTES FOR THIS SHEET	
MARK	DESCRIPTION
1	PROVIDE BIO-BAG AND SILT SACK PROTECTION AT FIRST DOWN STREAM CATCH BASIN PER DETAILS 4.3-B AND 4.3-G, THIS SHEET.
2	PROVIDE BIO-BAG CHECK DAM AT DOWNSTREAM EDGE OF PROPERTY LINE ALONG NEW WORK IN ROW.

EMERGENCY CONTACT: RYAN PFEIFER AT 503-208-3622

**1 EROSION & SEDIMENT CONTROL PLAN**  
 ESC01 SCALE: 1" = 10'



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REVISIONS			
FINAL MAP DATA			

APPROVALS:

PRINCIPAL ENGINEER	REG. PROF. ENGR.
CITY ENGINEER	REG. PROF. ENGR.

PREPARED FOR THE  
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PUBLIC IMPROVEMENTS FOR  
 2322 ARBOR DRIVE  
 WEST LINN, OR 97068  
 EROSION & SEDIMENT CONTROL PLAN

JOB NO.
SHEET NO.
ESC01
9 OF 9



## **Geotechnical Engineering Report**

2332 Arbor Drive  
West Linn, Oregon

GeoPacific Engineering, Inc. Project No. 19-5136  
February 8, 2019



**Real-World Geotechnical Solutions**  
**Investigation • Design • Construction Support**

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- 2 Lidar Based Vicinity Map with Mapped Landslides
- 3 Site Aerial and Exploration Locations



**Real-World Geotechnical Solutions  
Investigation • Design • Construction Support**

February 8, 2019  
Project No. 19-5136

**Ryan Pfeifer**  
**Hamilton and Kashoro, LLC.**  
79 SW Oak Street  
Portland, Oregon 97204  
Email: [ryan@hamiltonkashoro.com](mailto:ryan@hamiltonkashoro.com)

**SUBJECT: GEOTECHNICAL ENGINEERING REPORT  
2332 ARBOR DRIVE  
WEST LINN, OREGON 97068**

### **PROJECT INFORMATION**

This report presents the results of a geotechnical engineering study conducted by GeoPacific Engineering, Inc. (GeoPacific) for the above-referenced project. The purpose of our investigation was to evaluate subsurface conditions at the site, and to provide geotechnical recommendations for site development. This geotechnical study was performed in accordance with GeoPacific Proposal No. P-6353, dated December 17, 2018, and your subsequent authorization of our proposal and *General Conditions for Geotechnical Services*.

### **SITE AND PROJECT DESCRIPTION**

The subject property is composed of one parcel, identified as 21E14CA01000 and located on the south side of Arbor Drive in the City of West Linn, Clackamas County, Oregon. The property is approximately 0.46 acres in size and slopes to the northeast at grades of 10 percent, in the direction of the Willamette River. The site is bordered by Arbor Drive to the northeast, by Midhill Park to the southeast, and by residential properties to the southwest and northeast. Ground elevations range from 235 to 245 feet above mean sea level. The site is currently occupied by one home and shed on the northwest side of the property. Vegetation consists of numerous dense trees to the southeast and grass lawns to the northwest.

It is our understanding that proposed development separates the property into three parcels creating two building lots for single family homes, construction of a private drive, and associated underground utilities. The existing house is to remain as the northwestern lot. A grading plan was not provided for our review; however, we anticipate cuts and fill will be less than 4 feet.

## **REGIONAL GEOLOGIC SETTING**

The subject site lies within the Willamette Valley/Puget Sound lowland, a broad structural depression situated between the Coast Range on the west and the Cascade Range on the east. A series of discontinuous faults subdivide the Willamette Valley into a mosaic of fault-bounded, structural blocks (Yeats et al., 1996). Uplifted structural blocks form bedrock highlands, while down-warped structural blocks form sedimentary basins.

The subject site is underlain by Quaternary age (last 1.6 million years) loess, a windblown silt deposit that mantles older deposits, basalt bedrock, and elevated areas in the Portland region (Beeson et al., 1989; Madin, 1990). The loess generally consists of massive silt deposited following repeated catastrophic flooding events in the Willamette Valley, the last of which occurred about 10,000 years ago. In localized areas, the loess includes buried paleosols that developed between depositional events. Regionally, the total thickness of loess ranges from 5 feet to greater than 100 feet.

The loess is underlain by the Columbia River Basalt Formation (Madin, 1990). The Miocene aged (about 14.5 to 16.5 million years ago) Columbia River Basalts are a thick sequence of lava flows which form the crystalline basement of the Tualatin Valley. The basalts are composed of dense, finely crystalline rock that is commonly fractured along blocky and columnar vertical joints. Individual basalt flow units typically range from 25 to 125 feet thick and interflow zones are typically vesicular, scoriaceous, brecciated, and sometimes include sedimentary rocks.

## **REGIONAL SEISMIC SETTING**

At least three major fault zones capable of generating damaging earthquakes are thought to exist in the vicinity of the subject site. These include the Portland Hills Fault Zone, the Gales Creek-Newberg-Mt. Angel Structural Zone, and the Cascadia Subduction Zone.

### **Portland Hills Fault Zone**

The Portland Hills Fault Zone is a series of NW-trending faults that include the central Portland Hills Fault, the western Oatfield Fault, and the eastern East Bank Fault. These faults occur in a northwest-trending zone that varies in width between 3.5 and 5.0 miles. The combined three faults vertically displace the Columbia River Basalt by 1,130 feet and appear to control thickness changes in late Pleistocene (approx. 780,000 years) sediment (Madin, 1990). The Portland Hills Fault occurs along the Willamette River at the base of the Portland Hills and is about 3 miles northeast of the site. The Oatfield Fault occurs along the western side of the Portland Hills and is about 2 miles east of the site. The Oatfield Fault is considered to be potentially seismogenic (Wong, et al., 2000). Madin and Mabey (1996) indicate the Portland Hills Fault Zone has experienced Late Quaternary (last 780,000 years) fault movement; however, movement has not been detected in the last 20,000 years. The East Bank Fault occurs along the eastern margin of the Willamette River, and is located approximately 8.5 miles northeast of the site. The accuracy of the fault mapping is stated to be within 500 meters (Wong, et al., 2000). No historical seismicity is correlated with the mapped portion of the Portland Hills Fault Zone, but in 1991 a M3.5 earthquake occurred on a NW-trending shear plane located 1.3 miles east

of the fault (Yelin, 1992). Although there is no definitive evidence of recent activity, the Portland Hills Fault Zone is assumed to be potentially active (Geomatrix Consultants, 1995).

### **Gales Creek-Newberg-Mt. Angel Structural Zone**

The Gales Creek-Newberg-Mt. Angel Structural Zone is a 50-mile-long zone of discontinuous, NW-trending faults that lies about 16.5 miles southwest of the subject site. These faults are recognized in the subsurface by vertical separation of the Columbia River Basalt and offset seismic reflectors in the overlying basin sediment (Yeats et al., 1996; Werner et al., 1992). A geologic reconnaissance and photogeologic analysis study conducted for the Scoggins Dam site in the Tualatin Basin revealed no evidence of deformed geomorphic surfaces along the structural zone (Unruh et al., 1994). No seismicity has been recorded on the Gales Creek Fault or Newberg Fault (the fault closest to the subject site); however, these faults are considered to be potentially active because they may connect with the seismically active Mount Angel Fault and the rupture plane of the 1993 M5.6 Scotts Mills earthquake (Werner et al. 1992; Geomatrix Consultants, 1995).

### **Cascadia Subduction Zone**

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year (Goldfinger et al., 1996). A growing body of geologic evidence suggests that prehistoric subduction zone earthquakes have occurred (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). This evidence includes: (1) buried tidal marshes recording episodic, sudden subsidence along the coast of northern California, Oregon, and Washington, (2) burial of subsided tidal marshes by tsunami wave deposits, (3) paleoliquefaction features, and (4) geodetic uplift patterns on the Oregon coast. Radiocarbon dates on buried tidal marshes indicate a recurrence interval for major subduction zone earthquakes of 250 to 650 years with the last event occurring 300 years ago (Atwater, 1992; Carver, 1992; Peterson et al., 1993; Geomatrix Consultants, 1995). The inferred seismogenic portion of the plate interface lies roughly along the Oregon coast at depths of between 20 and 40 miles.

## **FIELD EXPLORATION AND SUBSURFACE CONDITIONS**

Our site-specific exploration for this report was conducted on January 31, 2019. A total of three exploratory hand auger borings (HA-1 through HA-3) were excavated at the site to practical refusal on weathered basalt fragments at a maximum depth of 5 feet below the existing ground surface (bgs) using hand auger equipment provided by GeoPacific. The approximate locations of the explorations are indicated on Figure 3. It should be noted that hand auger locations were positioned in the field by pacing or taping distances from apparent property corners and other site features. As such, the locations of the explorations should be considered approximate.

During the explorations, GeoPacific observed and recorded pertinent soil information such as color, stratigraphy, strength, and soil moisture content. At the completion of each test, the hand auger

borings were backfilled with onsite soils. Soils were classified in general accordance with the Unified Soil Classification System (USCS). Rock hardness was classified in accordance with Table 1, modified from the ODOT Rock Hardness Classification Chart.

**Table 1. Rock Hardness Classification Chart**

ODOT Rock Hardness Rating	Field Criteria	Unconfined Compressive Strength	Typical Equipment Needed for Excavation
Extremely Soft (R0)	Indented by thumbnail	<100 psi	Small excavator
Very Soft (R1)	Scratched by thumbnail, crumbled by rock hammer	100-1,000 psi	Small excavator
Soft (R2)	Not scratched by thumbnail, indented by rock hammer	1,000-4,000 psi	Medium excavator (slow digging with small excavator)
Medium Hard (R3)	Scratched or fractured by rock hammer	4,000-8,000 psi	Medium to large excavator (slow to very slow digging), typically requires chipping with hydraulic hammer or mass excavation)
Hard (R4)	Scratched or fractured w/ difficulty	8,000-16,000 psi	Slow chipping with hydraulic hammer and/or blasting
Very Hard (R5)	Not scratched or fractured after many blows, hammer rebounds	>16,000 psi	Blasting

Summary hand auger soils boring logs are attached. The stratigraphic contacts shown on the individual logs represent the approximate boundaries between soil types. The actual transitions may be more gradual. The soil and groundwater conditions depicted are only for the specific dates and locations reported, and therefore, are not necessarily representative of other locations and times. Soil and groundwater conditions encountered in the explorations are summarized below.

**Soils**

**Topsoil Horizon / Disturbed Soil:** Directly underlying the ground surface in all hand auger explorations was a topsoil horizon consisting of dark brown, highly organic SILT (OL). The topsoil horizon was generally loose, contained fine roots throughout, and extended to depths of 10 to 12 inches. A thicker layer of topsoil, approximately 18 inches, was observed in hand auger HA-1, which contained wood fragments. The thicker topsoil in this vicinity was considered to be disturbed topsoil.

**Willamette Formation:** Underlying the topsoil horizon in all hand auger explorations were fine-grained loess soils belonging to the Willamette Formation. The light brown clayey SILT (ML) soils were typically soft to medium stiff in the upper 3 feet, with strong gray and orange colored mottling,

beneath this the soils were generally characterized by a medium stiff to stiff consistency. This material extended to depths of 3.5 to 4.5 feet below the ground surface.

**Residual Soil:** Underlying the Willamette Formation soils were a stiff, light brown, clayey SILT (ML) soils, with light gray, extremely soft (R0) to soft (R2) heavily weathered basalt derived from weathering of the Columbia River Basalt Formation. This material extended beyond the maximum depth of our hand auger explorations. Due to the inability to excavate through the weathered basalt fragments using conventional hand auger equipment the maximum depth of explorations was 5 feet below ground existing surface.

### Groundwater and Soil Moisture

On January 31, 2019, groundwater seepage was not encountered in our hand auger soil borings. Soil moistures observed were generally considered to be moist to very moist in the upper 3 feet and damp to moist within the remainder of the soil profile of our hand auger explorations. According to the *Estimated Depth to Groundwater in the Portland, Oregon Area, (United States Geological Survey, 2018)*, groundwater is expected to be present at an approximate depth of 105-115 feet below the ground surface. It is anticipated that groundwater conditions will vary depending on the season, local subsurface conditions, changes in site utilization, and other factors. Perched groundwater may be encountered in localized areas. Seeps and springs may exist in areas not explored and may become evident during site grading.

### Infiltration Testing

On January 31, 2019, soil infiltration testing was performed using the falling-head method within all hand auger soil boring locations, in accordance with the methodology of the 2014 City of Portland Stormwater Management Manual. The approximate locations of the subsurface explorations are displayed in Figure 3. The test locations were pre-saturated prior to testing. During testing the water level was measured to the nearest 0.1 inch from a fixed point, and the change in water level was recorded at regular intervals until three successive measurements showing a consistent infiltration rate were achieved.

Table 2 summarizes the results of the falling-head infiltration testing. Infiltration rates have been reported without applying a factor of safety. Groundwater was not encountered within our hand auger soil boring explorations which extended to a maximum depth approximately 5 feet. Infiltration was not observed during the falling-head infiltration test at these elevations. We recommend that stormwater infiltration not be conducted as part of the residential development, and that other types of systems such as flow-through planters, side-street swales, or connecting to available public storm systems be considered during site development.

**Table 2- Summary of Infiltration Test Results**

Exploration Designation	Depth (feet)	Soil Type	Infiltration Rate(in/hr)	Hydraulic Head Range (inches)
HA-1	4	SILT (ML)	0	12
HA-2	5	SILT (ML)	0	12
HA-3	4	SILT (ML)	0	12

**CONCLUSIONS AND RECOMMENDATIONS**

Our investigation indicates that the proposed development is geotechnically feasible, provided that the recommendations of this report are incorporated into the design and sufficient geotechnical monitoring is incorporated into the construction phases of the project. The primary geotechnical concerns associated with development at the property are:

- 1) The low permeability of onsite soils. Onsite infiltration testing in all hand auger soil borings displayed no observable infiltration during testing and soils observed in our hand auger explorations to 5 feet in depth were characteristic of low permeability.
- 2) The presence of soft native soils in the upper two to three feet. Soils in the upper two to three feet were observed to be soft to medium stiff. Moisture conditioning and re-compaction or over-excavation and/or replacement with structural fill may be necessary for adequate foundation support.

**Site Preparation Recommendations**

Areas of proposed buildings, new roadways, and areas to receive fill should be cleared of vegetation and any organic and inorganic debris. Existing buried structures should be demolished and any cavities structurally backfilled. Inorganic debris and organic materials from clearing should be removed from the site.

Existing fill and any organic-rich topsoil should then be stripped from construction areas of the site or where engineered fill is to be placed. The estimated depth necessary for removal of topsoil is approximately 8 to 10 inches – deeper stripping may be necessary to remove large tree roots in isolated areas. A thicker topsoil layer with evidence of being disturbed was observed in hand auger boring location HA-1. A greater depth of stripping will be necessary in this vicinity. The final depth of soil removal will be determined on the basis of a site inspection after the stripping/ excavation has been performed. Stripped topsoil should preferably be removed from the site. Any remaining topsoil should be stockpiled only in designated areas and stripping operations should be observed and documented by the geotechnical engineer or his representative.

Any remaining undocumented fills and subsurface structures (tile drains, basements, driveway and landscaping fill, old utility lines, septic leach fields, etc.) should be removed and the excavations backfilled with engineered fill.

Once stripping of a particular area is approved, the area must be ripped or tilled to a depth of 12 inches, moisture conditioned, root-picked, and compacted in-place prior to the placement of engineered fill or crushed aggregate base for pavement. Exposed subgrade soils should be evaluated by the geotechnical engineer. For large areas, this evaluation is normally performed by proof-rolling the exposed subgrade with a fully loaded scraper or dump truck. For smaller areas where access is restricted, the subgrade should be evaluated by probing the soil with a steel probe. Soft/loose soils identified during subgrade preparation should be compacted to a firm and unyielding condition, over-excavated and replaced with engineered fill (as described below) or stabilized with rock prior to placement of engineered fill. The depth of over-excavation, if required, should be evaluated by the geotechnical engineer at the time of construction.

### **Engineered Fill**

All grading for the proposed development should be performed as engineered grading in accordance with the applicable building code at time of construction with the exceptions and additions noted herein. The presence of soft soils in the upper 2 feet and numerous large trees with associated root systems will likely require additional measures for structural support. We recommend that the upper 2 feet of soils in structural areas be moisture conditioned and re-compacted or replacement with structural fill.

Proper test frequency and earthwork documentation usually requires daily observation and testing during stripping, rough grading, and placement of engineered fill. Imported fill material must be approved by the geotechnical engineer prior to being imported to the site. Oversize material greater than 6 inches in size should not be used within 3 feet of foundation footings, and material greater than 12 inches in diameter should not be used in engineered fill.

Engineered fill should be compacted in horizontal lifts not exceeding 8 inches using standard compaction equipment. We recommend that engineered fill be compacted to at least 95% of the maximum dry density determined by ASTM D698 (Standard Proctor) or equivalent. Field density testing should conform to ASTM D2922 and D3017, or D1556. All engineered fill should be observed and tested by the project geotechnical engineer or his representative. Rocky fill may need to be evaluated by proofrolling and should be placed wet of optimum moisture content. Typically, one density test is performed for at least every 2 vertical feet of fill placed or every 500 yd<sup>3</sup>, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor be held contractually responsible for test scheduling and frequency.

Site earthwork will be impacted by soil moisture and shallow groundwater conditions. Earthwork in wet weather would likely require extensive use of cement or lime treatment, or other special measures, at considerable additional cost compared to earthwork performed under dry-weather conditions.



### **Excavating Conditions and Utility Trench Backfill**

All temporary cuts in excess of 4 feet in height should be sloped in accordance with U.S. Occupational Safety and Health Administration (OSHA) regulations (29 CFR Part 1926) or be shored. The existing native soils classify as Type B Soil and temporary excavation side slope inclinations as steep as 1H:1V may be assumed for planning purposes. This cut slope inclination is applicable to excavations above the water table only. Maintenance of safe working conditions, including temporary excavation stability, is the responsibility of the contractor. Actual slope inclinations at the time of construction should be determined based on safety requirements and actual soil and groundwater conditions.

Saturated soils and groundwater may be encountered in utility trenches, particularly during the wet season. We anticipate that dewatering systems consisting of ditches, sumps and pumps would be adequate for control of perched groundwater. Regardless of the dewatering system used, it should be installed and operated such that in-place soils are prevented from being removed along with the groundwater.

Vibrations created by traffic and construction equipment may cause some caving and raveling of excavation walls. In such an event, lateral support for the excavation walls should be provided by the contractor to prevent loss of ground support and possible distress to existing or previously constructed structural improvements.

PVC pipe should be installed in accordance with the procedures specified in ASTM D2321. We recommend that trench backfill be compacted to at least 95% of the maximum dry density obtained by Modified Proctor ASTM D1557 or equivalent. Initial backfill lift thickness for a ¾"-0 crushed aggregate base may need to be as great as 4 feet to reduce the risk of flattening underlying flexible pipe. Subsequent lift thickness should not exceed 1 foot. If imported granular fill material is used, then the lifts for large vibrating plate-compaction equipment (e.g. hoe compactor attachments) may be up to 2 feet, provided that proper compaction is being achieved and each lift is tested. Use of large vibrating compaction equipment should be carefully monitored near existing structures and improvements due to the potential for vibration-induced damage.

Adequate density testing should be performed during construction to verify that the recommended relative compaction is achieved. Typically, one density test is taken for every 4 vertical feet of backfill on each 200-lineal-foot section of trench.

### **Erosion Control Considerations**

During our field exploration program, we did not observe soil types that would be considered highly susceptible to erosion except in areas of moderately sloping topography. In our opinion, the primary concern regarding erosion potential will occur during construction, in areas that have been stripped of vegetation. Erosion at the site during construction can be minimized by implementing the project erosion control plan, which should include judicious use of straw wattles and silt fences. If used, these erosion control devices should be in place and remain in place throughout site preparation and construction.

Erosion and sedimentation of exposed soils can also be minimized by quickly re-vegetating exposed areas of soil, and by staging construction such that large areas of the project site are not denuded and exposed at the same time. Areas of exposed soil requiring immediate and/or temporary protection against exposure should be covered with either mulch or erosion control netting/blankets. Areas of exposed soil requiring permanent stabilization should be seeded with an approved grass seed mixture, or hydroseeded with an approved seed-mulch-fertilizer mixture.

### **Wet Weather Earthwork**

Soils underlying the site are likely to be moisture sensitive and may be difficult to handle or traverse with construction equipment during periods of wet weather. Earthwork is typically most economical when performed under dry weather conditions. Earthwork performed during the wet-weather season will probably require expensive measures such as cement treatment or imported granular material to compact areas where fill may be proposed to the recommended engineering specifications. If earthwork is to be performed or fill is to be placed in wet weather or under wet conditions when soil moisture content is difficult to control, the following recommendations should be incorporated into the contract specifications.

- Earthwork should be performed in small areas to minimize exposure to wet weather. Excavation or the removal of unsuitable soils should be followed promptly by the placement and compaction of clean engineered fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance. Under some circumstances, it may be necessary to excavate soils with a backhoe to minimize subgrade disturbance caused by equipment traffic;
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water;
- Material used as engineered fill should consist of clean, granular soil containing less than 5 percent passing the No. 200 sieve. The fines should be non-plastic. Alternatively, cement treatment of on-site soils may be performed to facilitate wet weather placement;
- The ground surface within the construction area should be sealed by a smooth drum vibratory roller, or equivalent, and under no circumstances should be left uncompacted and exposed to moisture. Soils which become too wet for compaction should be removed and replaced with clean granular materials;
- Excavation and placement of fill should be observed by the geotechnical engineer to verify that all unsuitable materials are removed, and suitable compaction and site drainage is achieved; and
- Geotextile silt fences, straw wattles, and fiber rolls should be strategically located to control erosion.

## **Spread Foundations**

The proposed residential structures may be supported on shallow foundations bearing on engineered fill placed and compacted over competent native soils, appropriately designed and constructed as recommended in this report. Foundation design, construction, and setback requirements should conform to the applicable building code at the time of construction. For maximization of bearing strength and protection against frost heave, spread footings should be embedded at a minimum depth of 12 inches below exterior grade. Foundations should be designed by a licensed structural engineer.

The anticipated allowable soil bearing pressure is 1,500 lbs/ft<sup>2</sup> for footings bearing on moisture conditioned and re-compacted native soils and/or structural fill. A maximum chimney and column load of 30 kips is recommended for the site. The recommended maximum allowable bearing pressure may be increased by 1/3 for short-term transient conditions such as wind and seismic loading. For heavier loads, the geotechnical engineer should be consulted. The coefficient of friction between on-site soil and poured-in-place concrete may be taken as 0.42, which includes no factor of safety. The maximum anticipated total and differential footing movements (generally from soil expansion and/or settlement) are 1 inch and ¾ inch over a span of 20 feet, respectively. We anticipate that the majority of the estimated settlement will occur during construction, as loads are applied. Excavations near structural footings should not extend within a 1H:1V plane projected downward from the bottom edge of footings.

Footing excavations should penetrate through topsoil and any loose soil to competent subgrade that is either

- 1) suitable for bearing support (approximately 2 feet below ground surface),
- 2) moisture conditioned and compacted and/or
- 3) over-excavated and replaced with structural fill.

All footing excavations should be trimmed neat, and all loose or softened soil should be removed from the excavation bottom prior to placing reinforcing steel bars. Due to the moisture sensitivity of on-site native soils, foundations constructed during the wet weather season may require over-excavation of footings and backfill with compacted, crushed aggregate.

Our recommendations are for house construction incorporating raised wood floors and conventional spread footing foundations. If living space of the structures will incorporate basements, a geotechnical engineer should be consulted to make additional recommendations for retaining walls, water-proofing, underslab drainage and wall subdrains. After site development, a Final Soil Engineer's Report should either confirm or modify the above recommendations.

## **Concrete Slabs-on-Grade**

Preparation of areas beneath concrete slab-on-grade floors should be performed as recommended in the *Site Preparation* section. Care should be taken during excavation for foundations and floor slabs, to avoid disturbing subgrade soils. If subgrade soils have been adversely impacted by wet weather or otherwise disturbed, the surficial soils should be scarified to a minimum depth of 8 inches,

moisture conditioned to within about 3 percent of optimum moisture content and compacted to engineered fill specifications. Alternatively, disturbed soils may be removed, and the removal zone backfilled with additional crushed rock.

For evaluation of the concrete slab-on-grade floors using the beam on elastic foundation method, a modulus of subgrade reaction of 150 kcf (87 pci) should be assumed for the fine-grained soils anticipated to be present in the upper four feet at the site. This value assumes the concrete slab system is designed and constructed as recommended herein, with a minimum thickness of 8 inches of 1½"-0 crushed aggregate beneath the slab. The total thickness of crushed aggregate will be dependent on the subgrade conditions at the time of construction and should be verified visually by proof-rolling. Under-slab aggregate should be compacted to at least 90 percent of its maximum dry density as determined by ASTM D1557 (Modified Proctor) or equivalent.

In areas where moisture will be detrimental to floor coverings or equipment inside the proposed structure, appropriate vapor barrier and damp-proofing measures should be implemented. A commonly applied vapor barrier system consists of a 10-mil polyethylene vapor barrier placed directly over the capillary break material. Other damp/vapor barrier systems may also be feasible. Appropriate design professionals should be consulted regarding vapor barrier and damp proofing systems, ventilation, building material selection and mold prevention issues, which are outside GeoPacific's area of expertise.

### **Permanent Below-Grade Walls**

Lateral earth pressures against below-grade retaining walls will depend upon the inclination of any adjacent slopes, type of backfill, degree of wall restraint, method of backfill placement, degree of backfill compaction, drainage provisions, and magnitude and location of any adjacent surcharge loads. At-rest soil pressure is exerted on a retaining wall when it is restrained against rotation. In contrast, active soil pressure will be exerted on a wall if its top is allowed to rotate or yield a distance of roughly 0.001 times its height or greater.

If the subject retaining walls will be free to rotate at the top, they should be designed for an active earth pressure equivalent to that generated by a fluid weighing 35 pcf for level backfill against the wall. For restrained wall, an at-rest equivalent fluid pressure of 55 pcf should be used in design, again assuming level backfill against the wall. These values assume that the recommended drainage provisions are incorporated, and hydrostatic pressures are not allowed to develop against the wall.

During a seismic event, lateral earth pressures acting on below-grade structural walls will increase by an incremental amount that corresponds to the earthquake loading. Based on the Mononobe-Okabe equation and peak horizontal accelerations appropriate for the site location, seismic loading should be modeled using the active or at-rest earth pressures recommended above, plus an incremental rectangular-shaped seismic load of magnitude 6.5H, where H is the total height of the wall.

We assume relatively level ground surface below the base of the walls. As such, we recommend passive earth pressure of 320 pcf for use in design, assuming wall footings are cast against

competent native soils or engineered fill. If the ground surface slopes down and away from the base of any of the walls, a lower passive earth pressure should be used and GeoPacific should be contacted for additional recommendations.

A coefficient of friction of 0.42 may be assumed along the interface between the base of the wall footing and subgrade soils. The recommended coefficient of friction and passive earth pressure values do not include a safety factor, and an appropriate safety factor should be included in design. The upper 12 inches of soil should be neglected in passive pressure computations unless it is protected by pavement or slabs on grade.

The above recommendations for lateral earth pressures assume that the backfill behind the subsurface walls will consist of properly compacted structural fill, and no adjacent surcharge loading. If the walls will be subjected to the influence of surcharge loading within a horizontal distance equal to or less than the height of the wall, the walls should be designed for the additional horizontal pressure. For uniform surcharge pressures, a uniformly distributed lateral pressure of 0.3 times the surcharge pressure should be added. Traffic surcharges may be estimated using an additional vertical load of 250 psf (2 feet of additional fill), in accordance with local practice.

The recommended equivalent fluid densities assume a free-draining condition behind the walls so that hydrostatic pressures do not build-up. This can be accomplished by placing a 12 to 18-inch wide zone of sand and gravel containing less than 5 percent passing the No. 200 sieve against the walls. A 3-inch minimum diameter perforated, plastic drain pipe should be installed at the base of the walls and connected to a suitable discharge point to remove water in this zone of sand and gravel. The drain pipe should be wrapped in filter fabric (Mirafi 140N or other as approved by the geotechnical engineer) to minimize clogging.

Wall drains are recommended to prevent detrimental effects of surface water runoff on foundations – not to dewater groundwater. Drains should not be expected to eliminate all potential sources of water entering a basement or beneath a slab-on-grade. An adequate grade to a low point outlet drain in the crawlspace is required by code. Underslab drains are sometimes added beneath the slab when placed over soils of low permeability and shallow, perched groundwater.

Water collected from the wall drains should be directed into the local storm drain system or other suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the wall drains in order to reduce the potential for clogging. The drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building.

GeoPacific should be contacted during construction to verify subgrade strength in wall keyway excavations, to verify that backslope soils are in accordance with our assumptions, and to take density tests on the wall backfill materials.

Structures should be located a horizontal distance of at least  $1.5H$  away from the back of the retaining wall, where  $H$  is the total height of the wall. GeoPacific should be contacted for additional foundation recommendations where structures are located closer than  $1.5H$  to the top of any wall.

**Drainage**

The upslope edge of perimeter footings may be provided with a drainage system consisting of 3-inch diameter, slotted, plastic pipe embedded in a minimum of 1 ft<sup>3</sup> per lineal foot of clean, free-draining gravel or uncompacted 3/4"-0 rock. Water collected from the footing drains should be directed into the local storm drain system or another suitable outlet. A minimum 0.5 percent fall should be maintained throughout the drain and non-perforated pipe outlet. Down spouts and roof drains should not be connected to the foundation drains in order to reduce the potential for clogging. The footing drains should include clean-outs to allow periodic maintenance and inspection. Grades around the proposed structure should be sloped such that surface water drains away from the building. Footing drain recommendations are given to prevent detrimental effects of groundwater on foundations and should not be expected to eliminate all potential sources of water entering a crawlspace. An adequate grade to a low point outlet drain in the crawlspace is required by code.

**Seismic Design and Soil Liquefaction**

The Oregon Department of Geology and Mineral Industries (Dogami), Oregon HazVu: 2019 Statewide GeoHazards Viewer indicates that the site is in an area where severe ground shaking is anticipated during an earthquake (Dogami HazVu, 2019). Structures should be designed to resist earthquake loading in accordance with the methodology described in the 2015 International Building Code (IBC) with applicable Oregon Structural Specialty Code (OSSC) revisions (current 2014). We recommend Site Class D be used for design per the OSSC, Table 1613.5.2 and as defined in ASCE 7, Chapter 20, Table 20.3-1. Specific design values determined for the site using the ATC (Applied Technology Council) *ASCE7-10 Hazards by Location online Tool* website are summarized below in Table 3.

**Table 3 - Recommended Earthquake Ground Motion Factors (2010 ASCE-7)**

Parameter	Value
Location (Lat, Long), degrees	45.3944548, -122.6523473
Probabilistic Ground Motion Values, 2% Probability of Exceedance in 50 yrs	
Site Modified Peak Ground Acceleration	0.454 g
Short Period, S <sub>s</sub>	0.973 g
1.0 Sec Period, S <sub>1</sub>	0.416 g
Soil Factors for Site Class D:	
F <sub>a</sub>	1.111
F <sub>v</sub>	1.584
SD <sub>s</sub> = 2/3 x F <sub>a</sub> x S <sub>s</sub>	0.720 g
SD <sub>1</sub> = 2/3 x F <sub>v</sub> x S <sub>1</sub>	0.439 g
Seismic Design Category	D

Soil liquefaction is a phenomenon wherein saturated soil deposits temporarily lose strength and behave as a liquid in response to earthquake shaking. Soil liquefaction is generally limited to loose, granular soils located below the water table. According to the Oregon HazVu: Statewide Geohazards Viewer, the subject site is regionally characterized as having a *high* risk of soil liquefaction (DOGAMI: HazVu, 2019). During our investigation, we observed fine grained clayey silt loess over clayey silt and weathered basalt residual soil. Based on our observations of the soil types onsite the risk of soil liquefaction is low.

### UNCERTAINTIES AND LIMITATIONS

We have prepared this report for the owner and his/her consultants for use in design of this project only. The conclusions and interpretations presented in this report should not be construed as a warranty of the subsurface conditions. Experience has shown that soil and groundwater conditions can vary significantly over small distances. Inconsistent conditions can occur between explorations that may not be detected by a geotechnical study. If, during future site operations, subsurface conditions are encountered which vary appreciably from those described herein, GeoPacific should be notified for review of the recommendations of this report, and revision of such if necessary.

Within the limitations of scope, schedule and budget, GeoPacific executed these services in accordance with generally accepted professional principles and practices in the fields of geotechnical engineering and engineering geology at the time the report was prepared. No warranty, express or implied, is made. The scope of our work did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous or toxic substances in the soil, surface water, or groundwater at this site.

We appreciate this opportunity to be of service.

Sincerely,

**GEOPACIFIC ENGINEERING, INC.**



Michael T. Baker  
Geotechnical Staff



EXPIRES: 06/30/20 19

James D. Imbrie, G.E., C.E.G.  
Principal Geotechnical Engineer

## REFERENCES

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**Geotechnical Engineering Report**  
**Project No. 19-5136, 2332 Arbor Drive, West Linn, Oregon**



Yeats, R.S., Graven, E.P., Werner, K.S., Goldfinger, C., and Popowski, T., 1996, Tectonics of the Willamette Valley, Oregon: in Assessing earthquake hazards and reducing risk in the Pacific Northwest, v. 1: U.S. Geological Survey Professional Paper 1560, P. 183-222, 5 plates, scale 1: 100,000.

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**CHECKLIST OF RECOMMENDED GEOTECHNICAL TESTING AND OBSERVATION**

Item No.	Procedure	Timing	By Whom	Done
1	Preconstruction meeting	Prior to beginning site work	Contractor, Developer, Civil and Geotechnical Engineers	
2	Fill removal from site or sorting and stockpiling	Prior to mass stripping	Soil Technician/ Geotechnical Engineer	
3	Stripping, aeration, and root-picking operations	During stripping	Soil Technician	
4	Compaction testing of engineered fill (95% of Standard Proctor)	During filling, tested every 2 vertical feet	Soil Technician	
5	Compaction testing of trench backfill (95% of Standard Proctor)	During backfilling, tested every 4 vertical feet for every 200 lineal feet	Soil Technician	
6	Street Subgrade Inspection	Prior to placing base course	Soil Technician	
7	Base course compaction (95% of Modified Proctor)	Prior to paving, tested every 200 lineal feet	Soil Technician	
8	Footing Subgrade Inspection	Prior to placement of forms	Soil Technician/ Geotechnical Engineer	
9	Final Geotechnical Engineer's Report	Completion of project	Geotechnical Engineer	



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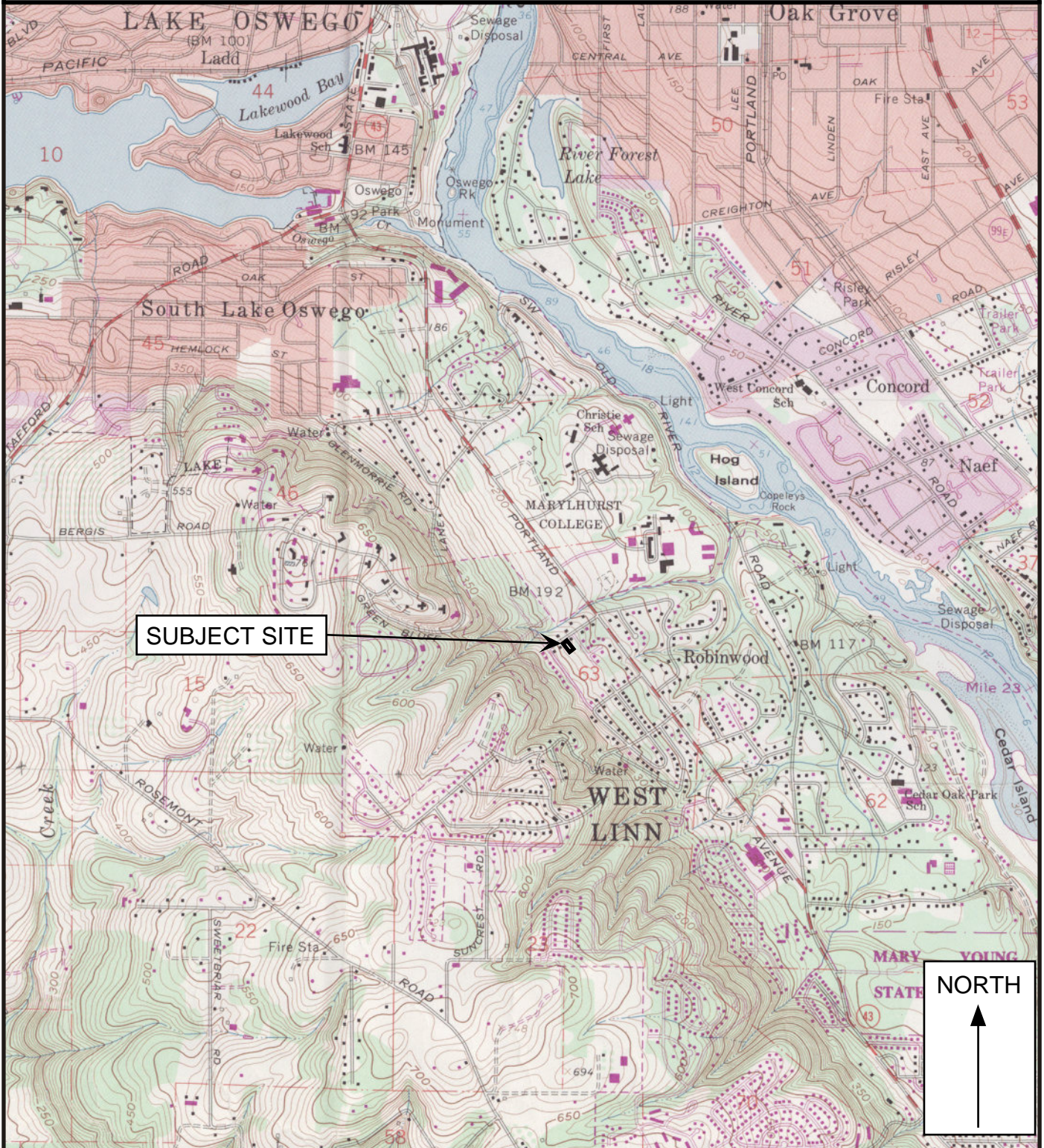
## FIGURES



14835 SW 72nd Avenue  
 Portland, Oregon 97224  
 Tel: (503) 598-8445 Fax: (503) 941-9281

STM - 124

**VICINITY MAP**



**Legend**

Approximate Scale 1 in = 2,000 ft

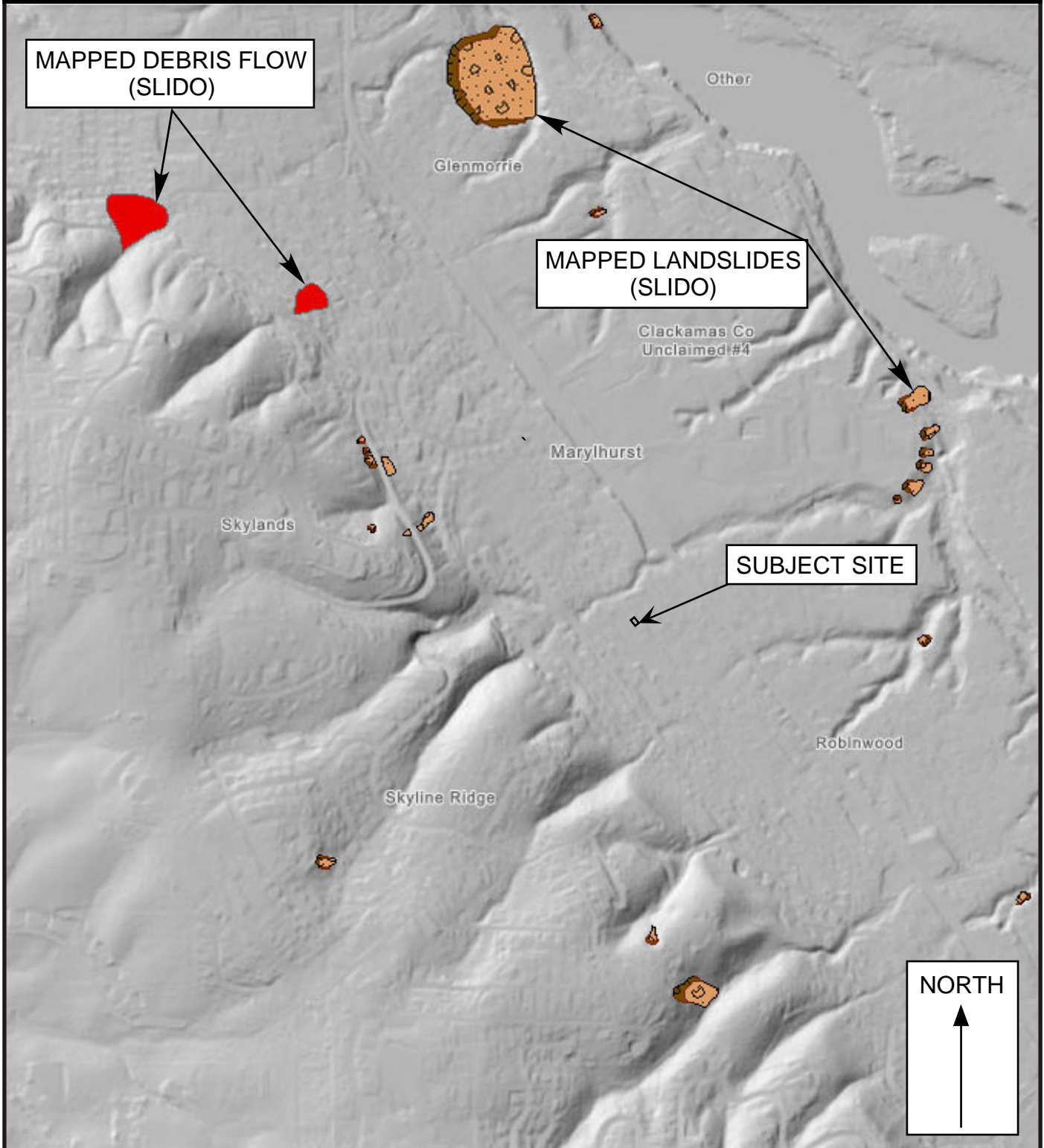
Date: 2.5.2019  
 Drawn by: MTB

Base map: U.S. Geological Survey 7.5 minute Topographic Map Series, Lake Oswego, Oregon Quadrangle, 1961 (Photorevised 1984)

Project: 2332 Arbor Drive  
 West Linn, Oregon

Project No. 19-5136

FIGURE 1



**Legend**

Approximate Scale 1 in = 1,000 ft

Date: 2.5.2019

Drawn by: MTB

Base map: Oregon Department of Geology and Mineral Industries, 2019, Statewide Landslide Information Database for Oregon (SLIDO): <http://www.gis.dogami.oregon.gov/slido>

Project: 2332 Arbor Drive  
West Linn, Oregon

Project No. 19-5136

FIGURE 2



Base image provided by Portland Maps

**Legend**



Hand Auger Designation,  
 Approximate Location,  
 and Depth of Rock Refusal



Site Boundary

Date: 2.5.2019 Drawn by: MTB



APPROXIMATE SCALE 1"=30'



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## EXPLORATION LOGS









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# HAND AUGER LOG

Project: 2332 Arbor Drive West Linn, Oregon	Project No. 19-5136	Boring No. <b>HA-1</b>
--	---------------------	------------------------

Depth (ft)	Sample Type	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
1					Soft to medium stiff, highly organic SILT (OL-ML), brown, grass roots, slightly plastic, wood fragments observed to 18 inches below the surface, moist [Topsoil Horizon/ Disturbed Soil]
2					
3					Medium stiff to stiff, clayey SILT (ML), light brown, strong orange and gray mottling, moderately plastic, micaceous, moist [Willamette Formation / Loess]
4					Stiff, clayey SILT (ML), light brown, friable, micaceous, light gray extremely soft (R0) to soft (R2) heavily weathered basalt fragments, damp [Residual Soil]
5					Hand Auger Soil Boring terminated at 4 feet due to refusal on Weathered Basalt Fragments.  No groundwater seepage encountered in excavation.
6					
7					
8					
9					
10					
11					

<b>LEGEND</b>  Bag Sample  Split-Spoon  Shelby Tube Sample  Seepage  Static Water Table  Water Bearing Zone	Date Drilled: 1.31.2019 Logged By: MTB Surface Elevation: 237 Feet
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# HAND AUGER LOG

Project: 2332 Arbor Drive West Linn, Oregon	Project No. 19-5136	Boring No. <b>HA-2</b>
--	---------------------	------------------------

Depth (ft)	Sample Type	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
1					Soft, highly organic SILT (OL-ML), dark brown, ivy and brush roots, moist [Topsoil Horizon]
2					Medium stiff to stiff, clayey SILT (ML), light brown with reddish orange hue, strong orange and gray mottling from 1 to 3 feet below the surface, micaceous, damp [Willamette Formation / Loess]
3					
4					Medium stiff to stiff, SILT (ML), light brown, friable, micaceous, damp [Willamette Formation / Loess]
5					Stiff, clayey SILT (ML), light brown, micaceous, light gray extremely soft (R0) to soft (R2) heavily weathered basalt fragments, damp [Residual Soil]
6					Hand Auger Soil Boring terminated at 5 feet due to refusal on Weathered Basalt Fragments.
7					No groundwater seepage encountered in excavation.
8					
9					
10					
11					

<b>LEGEND</b>  Bag Sample  Split-Spoon  Shelby Tube Sample  Seepage  Static Water Table  Water Bearing Zone						Date Drilled: 1.31.2019 Logged By: MTB Surface Elevation: 239 Feet
--	--	--	--	--	--	--



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# HAND AUGER LOG

Project: 2332 Arbor Drive West Linn, Oregon	Project No. 19-5136	Boring No. <b>HA-3</b>
--	---------------------	------------------------

Depth (ft)	Sample Type	N-Value	Moisture Content (%)	Water Bearing Zone	Material Description
1					Soft, highly organic SILT (OL-ML), dark brown, ivy and brush roots, moist [Topsoil Horizon]
2					Soft to medium stiff, clayey SILT (ML), brown with reddish orange hue, strong orange and gray mottling, some black staining, moderately plastic, micaceous, moist, very moist from 1 to 3 feet below the surface, [Willamette Formation / Loess]
4					Stiff, clayey SILT (ML), light brown, friable, micaceous, light gray extremely soft (R0) to soft (R2) heavily weathered basalt fragments, moist [Residual Soil]
5					Hand Auger Soil Boring terminated at 4 feet due to refusal on Weathered Basalt Fragments.  No groundwater seepage encountered in excavation.
6					
7					
8					
9					
10					
11					

<b>LEGEND</b>						Date Drilled: 1.31.2019
						Logged By: MTB
Bag Sample	Split-Spoon	Shelby Tube Sample	Seepage	Static Water Table	Water Bearing Zone	Surface Elevation: 240 Feet



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## PHOTGRAPHIC LOG



**Center of site facing southeast**



**Center of site facing northwest**



**PUBLIC RECORD REPORT  
FOR NEW SUBDIVISION OR LAND PARTITION**

THIS REPORT IS ISSUED BY THE ABOVE-NAMED COMPANY ("THE COMPANY") FOR THE EXCLUSIVE USE OF:

LEI Engineering & Surveying  
2564 19th Street SE  
Salem, OR 97302  
Phone: (503)399-3828  
Fax: (503)365-1852

Date Prepared : February 22, 2019  
Effective Date : 8:00 A.M on February 12, 2019  
Order No. : 7019-3192977  
Reference :

The information contained in this report is furnished by First American Title Company of Oregon (the "Company") as an information service based on the records and indices maintained by the Company for the county identified below. This report is not title insurance, is not a preliminary title report for title insurance, and is not a commitment for title insurance. No examination has been made of the Company's records, other than as specifically set forth in this report. Liability for any loss arising from errors and/or omissions is limited to the lesser of the fee paid or the actual loss to the Customer, and the Company will have no greater liability by reason of this report. This report is subject to the Definitions, Conditions and Stipulations contained in it.

**REPORT**

- A. The Land referred to in this report is located in the County of Clackamas, State of Oregon, and is described as follows:

As fully set forth on Exhibit "A" attached hereto and by this reference made a part hereof.

- B. As of the Effective Date, the tax account and map references pertinent to the Land are as follows:

As fully set forth on Exhibit "A" attached hereto and by this reference made a part hereof.

- C. As of the Effective Date and according to the Public Records, we find title to the land apparently vested in:

As fully set forth on Exhibit "B" attached hereto and by this reference made a part hereof

- D. As of the Effective Date and according to the Public Records, the Land is subject to the following liens and encumbrances, which are not necessarily shown in the order of priority:

As fully set forth on Exhibit "C" attached hereto and by this reference made a part hereof.

**EXHIBIT "A"**  
**(Land Description Map Tax and Account)**

PART OF LOTS 82 AND 83, ROBINWOOD, IN THE CITY OF WEST LINN, COUNTY OF CLACKAMAS AND STATE OF OREGON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE MOST NORTHERLY CORNER OF SAID LOT 83; THENCE SOUTHWESTERLY, FOLLOWING THE NORTHWESTERLY LINE OF SAID LOT 83, 200 FEET TO THE TRUE PLACE OF BEGINNING OF THE TRACT TO BE DESCRIBED; THENCE SOUTHEASTERLY, PARALLEL WITH THE NORTHEASTERLY LINE OF LOTS 83 AND 82, TO THE SOUTHEASTERLY LINE OF SAID LOT 82; THENCE NORTHEASTERLY, TRACING THE SOUTHEASTERLY LINE OF SAID LOT 82, 100 FEET TO THE MOST SOUTHEASTERLY CORNER OF A TRACT CONVEYED TO ROBERT VALENTINE, ET UX, BY CONTRACT OF SALE RECORDED MARCH 28, 1951 IN BOOK 442, PAGE 596, CLACKAMAS COUNTY DEED RECORDS; THENCE NORTHWESTERLY, FOLLOWING THE SOUTHWESTERLY LINE OF SAID VALENTINE TRACT, 200 FEET TO THE SOUTHWESTERLY CORNER OF SAID VALENTINE TRACT; THENCE SOUTHWESTERLY, FOLLOWING THE NORTHWESTERLY LINE OF SAID LOT 83, 100 FEET TO THE TRUE POINT OF BEGINNING.

Map No.: 21E14CA01000  
Tax Account No.: 00302504

**EXHIBIT "B"**  
**(Vesting)**

Deborah Anne Walker, Trustee or her successor Trustee(s), in the Deborah Anne Walker Revocable Living Trust U/D/T January 24, 2019



**EXHIBIT "C"**  
**(Liens and Encumbrances)**

1. Taxes for the current fiscal year are reduced by reason of Veteran Service Connected Exemption. If the exempt status is terminated under the statute prior to July 1, said property will be taxed at 100% of the assessed value.
2. City liens, if any, of the City of West Linn.
3. Proof should be furnished that the following judgment is not against Deborah Walker

A Judgment for the amount herein stated and any other amounts due.

Case No.:	SC093298
Entered:	October 13, 2009
Amount:	\$737.25 , plus interest, costs, and attorney's fees, if any
Creditor:	Asset Systems Inc
Debtor:	Deborah Walker

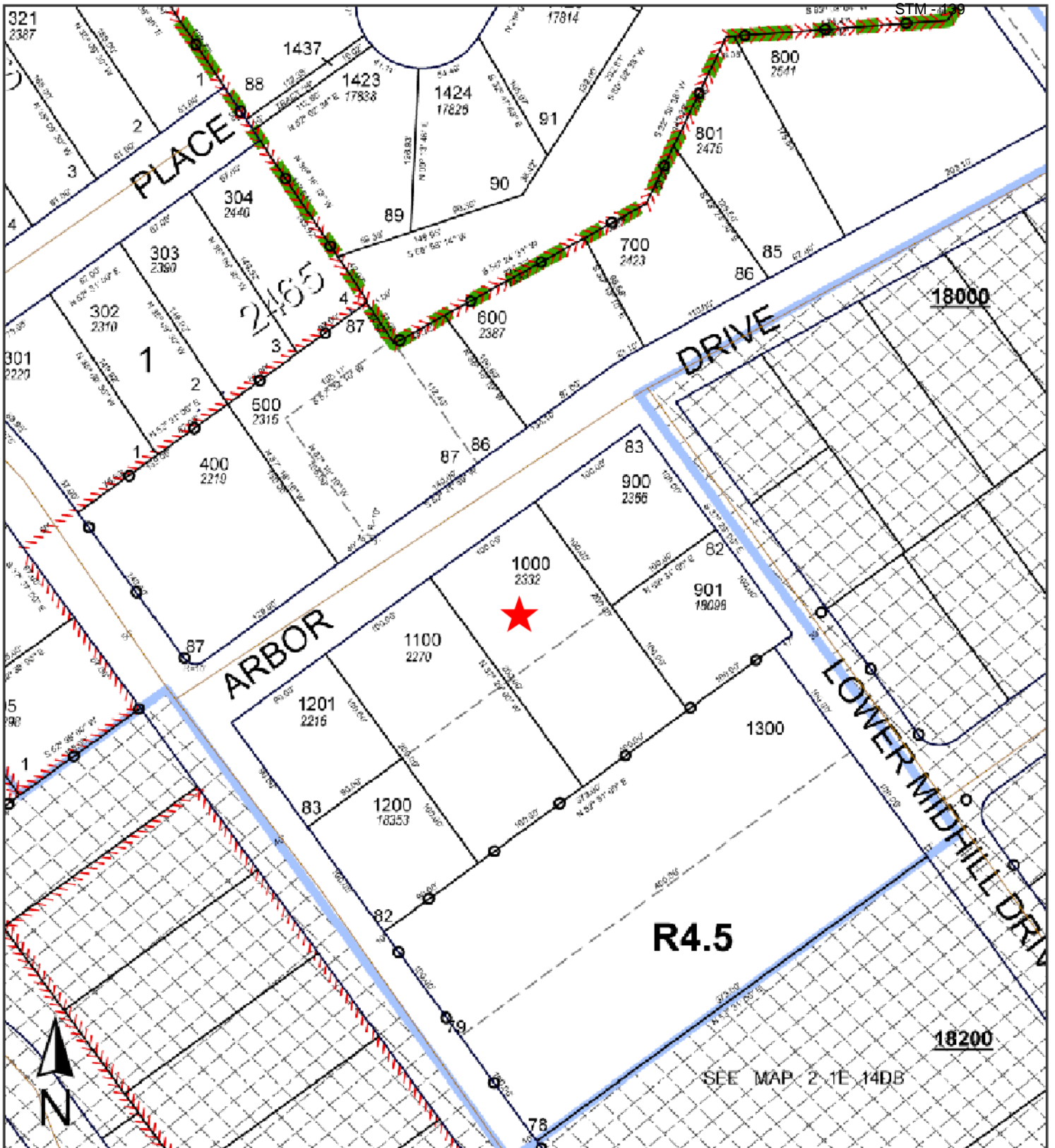
NOTE: A Statement of Identity which, when completed and returned will assist in checking such judgements and/or liens. This report is subject to such additional exceptions as may then appear proper.

NOTE: Taxes for the year 2018-2019 PAID IN FULL

Tax Amount:	\$2,692.76
Map No.:	21E14CA01000
Property ID:	00302504
Tax Code No.:	003-002

## DEFINITIONS, CONDITIONS AND STIPULATIONS

1. **Definitions.** The following terms have the stated meaning when used in this report:
  - (a) "Customer": The person or persons named or shown as the addressee of this report.
  - (b) "Effective Date": The effective date stated in this report.
  - (c) "Land": The land specifically described in this report and improvements affixed thereto which by law constitute real property.
  - (d) "Public Records": Those records which by the laws of the state of Oregon impart constructive notice of matters relating to the Land.
  
2. **Liability of the Company.**
  - (a) This is not a commitment to issue title insurance and does not constitute a policy of title insurance.
  - (b) The liability of the Company for errors or omissions in this public record report is limited to the amount of the charge paid by the Customer, provided, however, that the Company has no liability in the event of no actual loss to the Customer.
  - (c) No costs (including, without limitation attorney fees and other expenses) of defense, or prosecution of any action, is afforded to the Customer.
  - (d) In any event, the Company assumes no liability for loss or damage by reason of the following:
    - (1) Taxes or assessments which are not shown as existing liens by the records of any taxing authority that levies taxes or assessments on real property or by the Public Records.
    - (2) Any facts, rights, interests or claims which are not shown by the Public Records but which could be ascertained by an inspection of the land or by making inquiry of persons in possession thereof.
    - (3) Easements, liens or encumbrances, or claims thereof, which are not shown by the Public Records.
    - (4) Discrepancies, encroachments, shortage in area, conflicts in boundary lines or any other facts which a survey would disclose.
    - (5) (i) Unpatented mining claims; (ii) reservations or exceptions in patents or in Acts authorizing the issuance thereof, (iii) water rights or claims or title to water.
    - (6) Any right, title, interest, estate or easement in land beyond the lines of the area specifically described or referred to in this report, or in abutting streets, roads, avenues, alleys, lanes, ways or waterways.
    - (7) Any law, ordinance or governmental regulation (including but not limited to building and zoning laws, ordinances or regulations) restricting, regulating, prohibiting or relating to (i) the occupancy, use or enjoyment on the land; (ii) the character, dimensions or location of any improvement now or hereafter erected on the land; (iii) a separation in ownership or a change in the dimensions or area of the land or any parcel of which the land is or was a part; or (iv) environmental protection, or the effect of any violation of these laws, ordinances or governmental regulations, except to the extent that a notice of the enforcement thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the Public Records at the effective date hereof.
    - (8) Any governmental police power not excluded by 2(d)(7) above, except to the extent that notice of the exercise thereof or a notice of a defect, lien or encumbrance resulting from a violation or alleged violation affecting the land has been recorded in the Public Records at the effective date hereof.
    - (9) Defects, liens, encumbrances, adverse claims or other matters created, suffered, assumed, agreed to or actually known by the Customer.
  
3. **Report Entire Contract.** Any right or action or right of action that the Customer may have or may bring against the Company arising out of the subject matter of this report must be based on the provisions of this report. No provision or condition of this report can be waived or changed except by a writing signed by an authorized officer of the Company. By accepting this form report, the Customer acknowledges and agrees that the Customer has elected to utilize this form of public record report and accepts the limitation of liability of the Company as set forth herein.
  
4. **Charge.** The charge for this report does not include supplemental reports, updates or other additional services of the Company.



*First American Title™*

**ParcelID: 00302504**

**2332 Arbor Dr  
West Linn, OR 97068**

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.



**First American**

**First American Title Insurance Company**

121 SW Morrison Street, Suite 300

Portland, OR 97204

Phone: (503)222-3651 / Fax: (877)242-3513

**PR:** NWEST

**Ofc:** 7019 (1011)

**Final Invoice**

**To:** LEI Engineering & Surveying  
2564 19th Street SE  
Salem, OR 97302

**Invoice No.:** 1011 - 7019148274

**Date:** 02/22/2019

**Our File No.:** 7019-3192977

**Title Officer:** Dona Lane

**Escrow Officer:**

**Customer ID:** 5805264

**Attention:** Melissa Fessler

**Your Ref.:**

**Liability Amounts**

**RE: Property:**  
2332 Arbor Drive, West Linn, OR 97068

**Buyers:**

**Sellers:** Walker, Deborah A Living Trust

Description of Charge	Invoice Amount
Guarantee: Subdivision/Plat Certificate	\$275.00

**INVOICE TOTAL \$275.00**

**Comments:**

**Thank you for your business!**

*To assure proper credit, please send a copy of this Invoice and Payment to:*

*Attention: Accounts Receivable Department*

*PO Box 31001-2281*

*Pasadena, CA 91110-2281*

AFTER RECORDING, RETURN TO:  
James S. Bruce  
7420 SW Bridgeport Road, Suite 101  
Portland, OR 97224

Clackamas County Official Records  
Sherry Hall, County Clerk

**2019-005183**

01/31/2019 10:45:00 AM

D-D                      Cnt=1 Stn=75 CONNIE  
\$10.00 \$16.00 \$10.00 \$62.00

**\$98.00**

**GRANTOR'S NAME AND ADDRESS:**

Deborah A. Walker  
2332 Arbor Drive  
West Linn, OR 97068

**GRANTEE'S NAME AND ADDRESS:**

Deborah Anne Walker, Trustee or her successor Trustee(s), in the Deborah Anne Walker Revocable Living Trust U/D/T January 24, 2019, and any amendments thereto.  
2332 Arbor Drive  
West Linn, OR 97068

**UNLESS REQUESTED OTHERWISE, SEND ALL TAX STATEMENTS TO:**

Deborah Anne Walker  
2332 Arbor Drive  
West Linn, OR 97068

**STATUTORY WARRANTY DEED**

Deborah A. Walker, Surviving Spouse of Monte E. Notton, Grantor, hereby convey and warrant to Deborah Anne Walker, Trustee or her successor Trustee(s), in the Deborah Anne Walker Revocable Living Trust U/D/T January 24, 2019, Grantee, all right, title, and interest in and to the following described real property, commonly known as 2332 Arbor Drive, in the State of Oregon and County of Clackamas, free of encumbrances, except as specifically set forth herein:

Part of Lots 82 and 83, ROBINWOOD, in the City of West Linn, County of Clackamas and State of Oregon, described as follows:

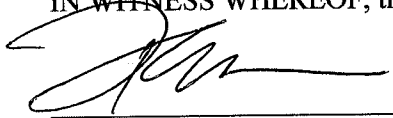
Beginning at the most Northerly corner of said Lot 83; thence Southwesterly, following the Northwesterly line of said Lot 83, 200 feet to the true place of beginning of the tract to be described; thence Southeasterly, parallel with the Northeasterly line of Lots 83 and 82, to the Southeasterly line of said Lot 82; thence Northeasterly, tracing the Southeasterly line of said Lot 82, 100 feet to the most Southeasterly corner of a tract conveyed to Robert Valentine, et ux, by Contract of Sale recorded March 28, 1951, in Book 442, Page 596, Clackamas County Deed Records; thence Northwesterly, following the Southwesterly line of said Valentine Tract, 200 feet to the Southwesterly corner of said Valentine Tract; thence Southwesterly, following the Northwesterly line of said Lot 83, 100 feet to the true point of beginning.

This property is free of encumbrances, except: Those of Record.

THIS INSTRUMENT WILL NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS. BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT, THE PERSON ACQUIRING FEE TITLE OF THE PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES AND TO DETERMINE ANY LIMITS ON LAWSUITS AGAINST FARMING OR FOREST PRACTICES AS DEFINED IN ORS 30.930.

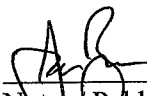
The true consideration for this transfer consists of \$0.00 (zero dollars) and estate planning purposes.

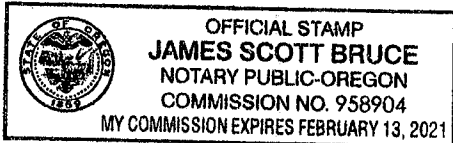
IN WITNESS WHEREOF, the Grantor has executed this instrument 24th day of January, 2019.

  
\_\_\_\_\_  
Deborah A. Walker

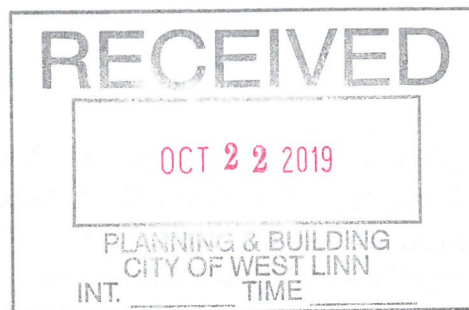
STATE OF OREGON )  
County of Washington ) ss.

This instrument was acknowledged before me on January 24, 2019, by Deborah A. Walker.

  
\_\_\_\_\_  
Notary Public for Oregon  
My Commission Expires: 2/13/21



## PD-2 PUBLIC COMMENT



October 22, 2019

To whom it may concern,

I am writing this letter in opposition to the request for a two-lot Minor Partition and a Class I Variance for minimum lot size at Partition and Class II Variance for minimum lot size at 2332 Arbor Drive.

I have been a member of the Robinwood neighborhood for 17 years and previously worked with the Neighborhood Association and the City of West Linn to try to improve the livability of our neighborhood.

While on paper, granting this lot partition and variance may seem like a minor or even reasonable thing to do, it sets a bad precedent and has the potential to significantly and negatively affect the neighborhood. Granting a variance to the zoning of this property will not only increase traffic and potential conflict on a street that is already overused according to recent traffic studies, but also paves the way for future variances and a significant change to the quality of the neighborhood.

The city should not let the potential for making a quick buck come at the expense of maintaining the livability of our neighborhoods. Furthermore, the request is being made by a developer with no personal concern or connection to the neighborhood he/she seeks to alter. It is simply a “build as much as you can, make a big profit and disappear before problems arise” mentality that has no place in this neighborhood. Unfortunately, with the potential for development at the end of Upper Midhill, we are very familiar and wary of this.

Emotions and personal beliefs aside, I also do not feel that it meets the criteria for approval.

In looking through the CDC,

- Chapter 75 Section 1 states that “Required yards may be modified up to 20 percent”. It seems that changing from an R10 to an R4.5 type of zone and including 2 houses on the lot size would change the yard by more than 20%.
- Chapter 75 Section 1b’s goal “Preserves and incorporates natural features into the overall design of the project”. In order to accommodate the new very large house that has been built AND a second home, a significant portion of the large and pre-existing trees on the lot will need to come down. This does NOT preserve the natural features of this once beautifully wooded lot. Furthermore, since the back of this property abuts the neighborhood park, cutting down more trees and putting a second home right up against the park would negatively affect the “adjacent property” that was created for the benefit of the entire neighborhood. It could be argued that this concern is also applicable to the statements in Section 1c “Does not adversely affect adjoining properties in terms of light, air circulation, noise levels, privacy, and fire hazards”



- Chapter 75, Section 3b states for variance to be granted, the site must be “Compatible with the overall site plan, the structural improvements, and with the structures and uses on adjoining properties.” The size and dimensions of the main structure on this property are already significantly larger and not compatible with the structures on adjoining properties that are all single level homes. Allowing this site to have an additional home, would be even more incompatible and unsightly than it currently is.
- With regard to Chapter 85, Section A states that the intent is to “to lessen congestion in the streets; to increase street safety”. As mentioned earlier, adding more housing to this very busy main through street will increase traffic on the already overburdened infrastructure of this neighborhood that has no sidewalks or bike designated lanes. A variance would do NOTHING to lessen congestion or increase street safety.
- Chapter 85, Section B2 was created “To improve our sense of neighborhood and community”. By changing the zoning for increased density, the current sense of neighborhood is greatly altered and, sets a dangerous precedent for just piling homes and people on top of each other. Many people in this neighborhood moved here for the sense of community but while still having the ability to have some privacy and space.
- Chapter 85, Section B3 reports a goal of reducing “pedestrian/vehicle conflicts and create a safe and attractive environment for pedestrians and bicyclists”. As has already been stated, increased density on this very busy street with a fair amount of pedestrian traffic (walking to and from the bus stop at the Highway 43 intersection) as well as cyclists is a poor decision and puts our neighbors at increased risk of injury.

Thank you for the opportunity to present my concerns (and that of MANY of my neighbors not included in the 500' zone) that strongly oppose this variance. I hope that you will do the right thing for our neighborhood and deny this request.

Thank you,

Anne Beltman



18298 Upper Midhill Drive

West Linn, OR 97068

503-675-1948

To: City of West Linn

We are the Olson Family that lives at 18233 Upper Midhill Dr, West Linn, OR. We were asked to examine chapters 11, 48, 75, 85, 92, and 99 of the Community Development Code for a lot that was purchased by a developer at 2332 Arbor Drive.

After reviewing all of these chapters, we feel this property proposal is in violation of chapters 75 and 85. In chapter 75, based on the criteria below.

*75.020.01: Required Yard and Minimum Lot Dimensional Requirements. Required yards may be modified up to 20 percent, lot dimensions by up to 10 percent and lot area by up to five percent if the decision-making authority finds that the resulting approval*

*75.020.04: Landscaping requirements in the applicable zone may be modified up to 10 percent if the decision-making authority finds that the resulting approval:*

- a. Provides for a more efficient use of the site;*
- b. Preserves and incorporates natural features into the overall design of the project; and*
- c. Will have no adverse effect on adjoining property.*

The two main reasons they are in violation of this section of chapter 75 is that they are modifying the yard by more than 20% and that it will have an adverse effect on adjoining property. This lot was originally built for one house. When the developer bought the property they demolished the prior house and built a house that was significantly larger, extends to both property lines (almost no yard on the sides), and is much taller. They are hoping to build another house just as large behind this house. It will in fact take away almost the entire yard that existed before leaving very little of the existing yard that was intended originally for that property. The other reason is that this additional house directly behind the new one being built will block the view of the surrounding houses next to this lot. Owners of the other houses purchased that property expecting to not have blocked views of the protected park land behind this lot and of the area down the hill on Arbor. Here is a picture to try to capture the size difference of the house the developer is currently building compared to the rest of the neighborhood. The one planned for the back part of this lot is of a similar size, hence reducing out almost all yard and views for neighbors.



The violation in  Relative size of new construction compared to neighboring house. A similar sized house is planned to be built right behind this one.

**85.010:** *The purpose of the land division provisions of this code is to implement the Comprehensive Plan; to provide rules and standards governing the approval of plats of subdivisions (four lots or more) and partitions (three lots or fewer); to help direct the development pattern; to lessen congestion in the streets; to increase street safety; to efficiently provide water, sewage, and storm drainage service; and to conserve energy resources.*

**85.020.07:** ***Flag lots.** Flag lots can be created where it can be shown that no other reasonable street access is possible to achieve the requested land division. A single flag lot shall have a minimum street frontage of 15 feet for its accessway. Where two to four flag lots share a common accessway, the minimum street frontage and accessway shall be eight feet in width per lot. Common accessways shall have mutual maintenance agreements and reciprocal access and utility easements. The following dimensional requirements shall apply to flag lots*

**85.020.08:** *Large lots or parcels. In dividing tracts into large lots or parcels which, at some future time, are likely to be redivided, the approval authority may:*

- a. Require that the blocks be of such size and shape, and be so divided into building sites, and contain such easements and site restrictions as will provide for extension and opening of streets at intervals which will permit a subsequent division of any tract into lots or parcels of smaller size; or*
- b. Alternately, in order to prevent further subdivision or partition of oversized and constrained lots or parcels, restrictions may be imposed on the subdivision or partition plat.*

As mentioned earlier, this developer is planning to build another large house directly behind the current large house being built. The only way to get into that back lot is through a shared driveway. This would be the first shared driveway allowed within the Robinwood neighborhood (flaglot). Below are pictures taken to show the driveway and the overall view of the lots surrounding it. Note that other divided lots have direct street access, so this would be the only one that is a large house directly behind another house sharing a driveway with the house in front. It sets a bad precedent for overcrowding in the future if this is allowed.



Picture shows this is a flaglot with only one shared driveway to get to the back lot.

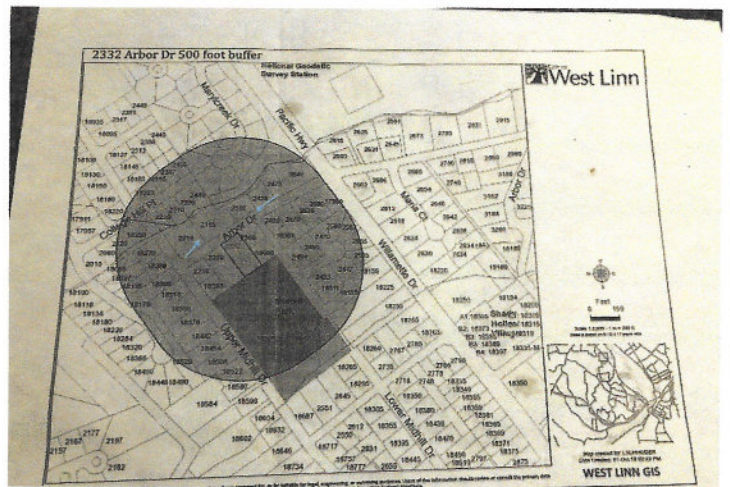


Chart shows that other split lots have direct access to the street

This flaglot that the developer is trying to create is going to set a bad precedent across other developers. Meaning that if one developer can buy a lot to split up into two lots in order to build two enormous houses almost completely reducing out the yards and having one shared driveway, other developers will do

this to the point where the Robinwood neighborhood becomes overcrowded with very little remaining green space. Traffic then would become a major problem as well.

Thanks for taking our written testimony seriously!

Sincerely,

Handwritten signatures of Allison and Seth Olson. The signature on the left is for Allison, and the signature on the right is for Seth.

Allison and Seth Olson  
18233 Upper Midhill Dr  
West Linn, OR 97068

## **PD-3 AFFADAVIT AND NOTICE PACKET**

### AFFIDAVIT OF NOTICE

We, the undersigned do hereby certify that, in the interest of the party (parties) initiating a proposed land use, the following took place on the dates indicated below:

**GENERAL**

File No. MIP-19-01/VAR-19-04 Applicant's Name RYAN PFEIFER  
Development Name 2332 Arbor Dr Minor Partition  
Scheduled Meeting/Decision Date 10-22-2019

**NOTICE:** Notices were sent at least 20 days prior to the scheduled hearing, meeting, or decision date per Section 99.080 of the Community Development Code. (check below)

**TYPE A**

- A. The applicant (date) 10-2-19 (signed) RS
- B. Affected property owners (date) 10-2-19 (signed) RS
- C. School District/Board (date) \_\_\_\_\_ (signed) \_\_\_\_\_
- D. Other affected gov't. agencies (date) \_\_\_\_\_ (signed) \_\_\_\_\_
- E. Affected neighborhood assns. (date) 10-2-19 (signed) RS
- F. All parties to an appeal or review (date) \_\_\_\_\_ (signed) \_\_\_\_\_

At least 10 days prior to the scheduled hearing or meeting, notice was published/posted:

Tidings (published date) N/A (signed) RS  
City's website (posted date) 10-2-19 (signed) RS

**SIGN**

At least 10 days prior to the scheduled hearing, meeting or decision date, a sign was posted on the property per Section 99.080 of the Community Development Code.

(date) 10-9-2019 (signed) [Signature]

**NOTICE:** Notices were sent at least 14 days prior to the scheduled hearing, meeting, or decision date per Section 99.080 of the Community Development Code. (check below)

**TYPE B** \_\_\_\_\_

- A. The applicant (date) \_\_\_\_\_ (signed) \_\_\_\_\_
- B. Affected property owners (date) \_\_\_\_\_ (signed) \_\_\_\_\_
- C. School District/Board (date) \_\_\_\_\_ (signed) \_\_\_\_\_
- D. Other affected gov't. agencies (date) \_\_\_\_\_ (signed) \_\_\_\_\_
- E. Affected neighborhood assns. (date) \_\_\_\_\_ (signed) \_\_\_\_\_

Notice was posted on the City's website at least 10 days prior to the scheduled hearing or meeting.  
Date: \_\_\_\_\_ (signed) \_\_\_\_\_

**STAFF REPORT** mailed to applicant, City Council/Planning Commission and any other applicable parties 10 days prior to the scheduled hearing.

(date) \_\_\_\_\_ (signed) \_\_\_\_\_

**FINAL DECISION** notice mailed to applicant, all other parties with standing, and, if zone change, the County surveyor's office.

(date) 11/2/2019 (signed) [Signature]

**CITY OF WEST LINN  
NOTICE OF UPCOMING  
PLANNING MANAGER DECISION  
FILE NO. MIP-19-01/VAR-19-04**

The West Linn Planning Manager is considering a request for a two-lot Minor Partition and a Class I Variance for minimum lot size at 2332 Arbor Drive.

The decision will be based on the approval criteria in Chapters 11, 48, 75, 85, 92, and 99 of the Community Development Code (CDC). The approval criteria from the CDC are available for review at City Hall, at the City Library, and at <http://www.westlinnoregon.gov/cdc>.

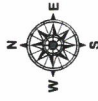
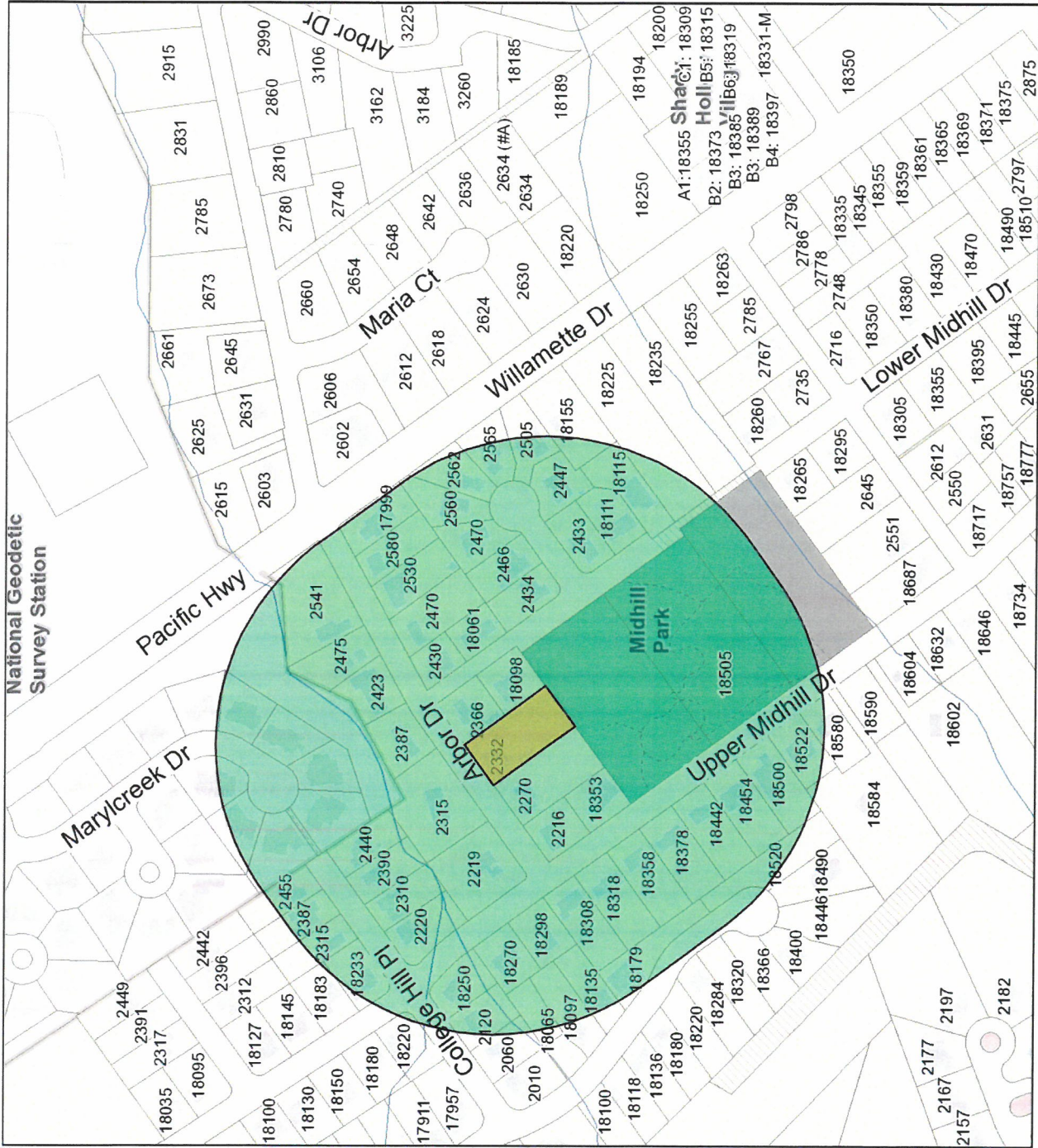
You have received this notice because County records indicate that you own property within 500 feet of this property (Tax Lot 1000 of Clackamas County Assessor Map 21E 14CA) or as otherwise required by Chapter 99 of the CDC.

All relevant materials in the above noted file are available for inspection at no cost at City Hall, and on the city web site <https://westlinnoregon.gov/planning/2332-arbor-drive-2-lot-partition-class-i-variance> or copies may be obtained for a minimal charge per page. A public hearing will not be held on this decision. **Anyone wishing to present written testimony for consideration on this matter shall submit all material before 4:00 p.m. on October 22, 2019. Persons interested in party status should submit their letter along with any concerns related to the proposal by the comment deadline.** For further information, please contact Darren Wyss, Associate Planner, City Hall, 22500 Salamo Rd., West Linn, OR 97068, (503)742-6064, [dwyss@westlinnoregon.gov](mailto:dwyss@westlinnoregon.gov).

Any appeals to this decision must be filed within 14 days of the final decision date with the Planning Department. **It is important to submit all testimony in response to this notice.** Failure to raise an issue in person or by letter, or failure to provide sufficient specificity to afford the decision-maker an opportunity to respond to the issue, precludes the raising of the issue at a subsequent time on appeal or before the Land Use Board of Appeals.



# 2332 Arbor Dr 500 foot buffer



Scale 1:3,600 - 1 in = 300 ft  
 Scale is based on 8-1/2 x 11 paper size



Map created by: LSCHRODER  
 Date Created: 01-Oct-19 02:22 PM

## WEST LINN GIS

DISCLAIMER: This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. Map scale is approximate. Source: West Linn GIS (Geographic Information System) MapOutput.





**NOTICE OF UPCOMING  
PLANNING MANAGER DECISION**

**PROJECT # MIP-19-01/VAR-19-04  
MAIL: 10/2/2019 TIDINGS: n/a**

**CITIZEN CONTACT INFORMATION**

To lessen the bulk of agenda packets and land use application notice, and to address the concerns of some City residents about testimony contact information and online application packets containing their names and addresses as a reflection of the mailing notice area, this sheet substitutes for the photocopy of the testimony forms and/or mailing labels. A copy is available upon request.

## PD-4 COMPLETENESS LETTER



CITY OF  
**West Linn**

September 3, 2019

Ryan Pfeifer  
79 SW Oak Street  
Portland, OR 97204

SUBJECT: MIP-19-01/VAR-19-04 application for 2-Lot Minor Partition and Class I Variance for at 2332 Arbor Drive

Ryan:

You submitted this application on April 30, 2019. The Planning and Engineering Departments found that this application was incomplete on May 23, 2019. All required information was subsequently provided on August 15, 2019 and the application has now been deemed **complete**. The city has 120 days to exhaust all local review; that period ends December 13, 2019.

Please be aware that determination of a complete application does not guarantee a recommendation of approval from staff for your proposal as submitted – it signals that staff believes you have provided the necessary information for the Planning Director to render a decision on your proposal.

A 20-day public notice will be prepared and mailed. This notice will identify the earliest potential decision date by the Planning Director.

Please contact me at 503-742-6064, or by email at [dwyss@westlinnoregon.gov](mailto:dwyss@westlinnoregon.gov) if you have any questions or comments.

Sincerely,

A handwritten signature in blue ink that reads "Darren Wyss".

Darren Wyss  
Associate Planner