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DEV	ELOPMENT REVIEW APPL	ICATION
STAFF CONTACT	PROJECT NO(! A LO CO . A L	1100 0004
NON-REFUNDABLE FEE(S) \$ 825.00	MIP- 19-01 REFUNDABLE DEPOSIT(S) # 2	VAR-19-04
	P 2,800	, OD TOTAL \$3,625.00
Appeal and Review (AP) * Le Conditional Use (CUP) Lo Design Review (DR) Mi Easement Vacation No Extraterritorial Ext. of Utilities Pla Final Plat or Plan (FP)	storic Review gislative Plan or Change t Line Adjustment (LLA) */** inor Partition (MIP) (Preliminary Plat or Plat on-Conforming Lots, Uses & Structures anned Unit Development (PUD) e-Application Conference (PA) */** reet Vacation e-walk Use, Sign Review Permit, and Tem	Water Resource Area Protection/Single Lot (WAP) Water Resource Area Protection/Wetland (WAP) Williamette & Tualatin River Greenway (WRG) Zone Change
ite Location/Address:		Assessor's Map No.: 25-1E-14CA
222 41 0		Tax Lot(s): 1000
2332 Arbor Dr		Total Land Area: 14,888
rief Description of Proposal: livide the property into two arcel 2 is being created for pu	parcels. Parcel 1 will co apose of constructing a	ntain the existing residence. detached SFR with class 1 varian
pplicant Name: Ryan Pfeifer		Phone: 503 753 - 8571
ddress: 79 SW Ouk St.		Email: ryan@hyniton Kastoro.com
ty State Zip: fortland, OR 4720	4	*
wner Name (required): Deborah Wall	Ker	Phone: # 303 - 598 - 5687
Idress: 820 Country Road 194		Email: WHEN CHICAMAN WAS THE
ty State Zip: Parker, Colorado 80/3	9	tacdogs@gmail.com
Insultant Name: Lyan Pfeifer		Phone: 503-753-8571
Idress: 79 SW Oak St.		Email: Yyan @ hamilton Kashoro com
ty State Zip: Portland, OR, 9726	94	
All application fees are non-refundable (excl. The owner/applicant or their representative. A denial or approval may be reversed on app. Three (3) complete hard-copy sets (single si One (1) complete set of digital application of large sets of plans are required in application.	should be present at all public hearing peal. No permit will be in effect until the ded) of application materials must be naterials must also be submitted on Continuous tion please submit only two sets.	s. ne appeal period has expired. submitted with this application.
		s on site review by authorized staff. I hereby agree to
	application. Acceptance of this application degulations adopted after the application is a	loes not infer a complete submittal. All amendments pproved shall be enforced where applicable.
N. P.Mily	4/29/19	469/19
pplicant's signature	Date Owner's sig	nature (required) Date
logment Review Application (Rev. 2011.07)		APR \$ 0 2019



Expedited Land Division Acknowledgement Form

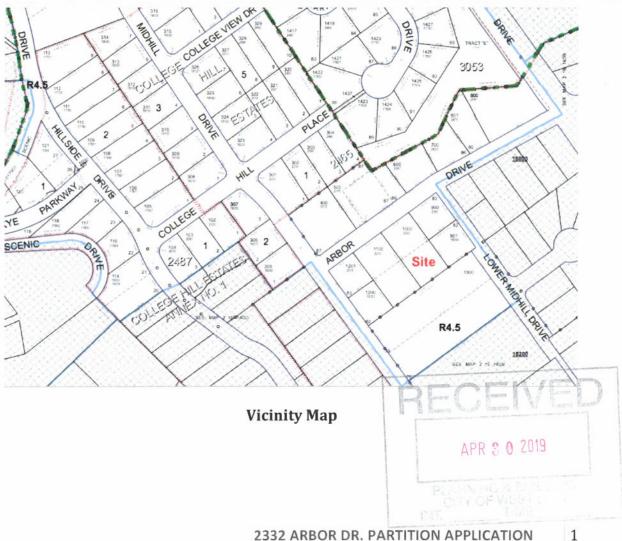
All applicants for partitions and subdivisions must acknowledge, by completing this form, that they were notified about the ELD process and must indicate whether they intend to apply for an ELD or a standard subdivision or partition using the procedures set forth in the City of West Linn's Community 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 X
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 Name: Ryan Pfeifer Applicant Signature: Date: 4-29-19 Applicant Mailing Address: 79 SV Oak St. Portland, OR 97204
Applicant Mailing Address: 79 SV 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
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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.



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. <u>General</u>. 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. <u>Sizes</u>. 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. <u>Double frontage lots and parcels</u>. 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. <u>Flag lots</u>. 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. <u>Large lots or parcels</u>. 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
- 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. <u>Grading</u>. 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. <u>Storm detention and treatment</u>. 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. <u>Utility easements</u>. 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.

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.

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. <u>Mix requirement</u>. 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: All heritage trees, as defined in the municipal code, shall be saved. All trees that are considered significant by virtue of their size, type, location, health, or numbers shall be saved pursuant to CDC 55.100 and are inventoried as such in the arborist report attached hereto.

Chapter 48 ACCESS. EGRESS AND CIRCULATION

48.025 ACCESS CONTROL

- B. Access control standards.
 - 1. <u>Traffic impact analysis requirements</u>. 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 offstreet 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. <u>Subdivisions</u> 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. <u>Double-frontage lots</u>. 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. <u>Shared driveways</u>. 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. <u>Exception</u>. 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. <u>Street connectivity and formation of blocks required</u>. 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. <u>Block length and perimeter</u>. The maximum block length shall not exceed 800 feet or 1,800 feet along an arterial.
 - 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.

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. <u>Storm detention and treatment</u>. 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. <u>These comments are PRELIMINARY in nature</u>. 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:

one /

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 apepper@westlinnoregon.gov or 503-722-3434

<u>Tualatin Valley Fire & Rescue Comments</u>: contact Jason Arn at <u>jason.arn@tvfr.com</u> 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



2950 NW 29th Ave Suite 400 Portland, OR 97210 Phone: (503) 226-7143

Email: tim@urbanforestpro.com

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 $1/3^{rd}$ of the property and one spruce on the front 1/3 (facing the property from the street). The middle $1/3^{rd}$ 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 $1/3^{rd}$ of the tree. Leaving most of the ash trees looking tall and spindly with little branch structure. The ground and trees in the back $1/3^{rd}$ 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.

Tree No.	Common Name	Scientific Name	DBH	Structure	Comments	Recom- mendation
001	Oregon Ash	Fraxinus latifolia	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	Fraxinus Latifolia	15	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered.	Remove due to construction
003	Oregon Ash	Fraxinus Latifolia	13	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
004	Oregon Ash	Fraxinus Latifolia	12	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
005	Oregon Ash	Fraxinus Latifolia	10	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
006	Oregon Ash	Fraxinus Latifolia	11.5	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
007	Oregon Ash	Fraxinus Latifolia	5	Poor	High canopy. Trunk crowding. Severe lean. Ivy covered. Excessive suckers.	Remove due to construction
008	Oregon Ash	Fraxinus Latifolia	15	Poor	High canopy. Ivy covered. Excessive suckers.	Remove due to construction

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

 $[\]star$ 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

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.
- No other activities should be allowed that will cause soil compaction within the tree protection zones.
- 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.
- Trees that have woody roots cut should be provided supplemental water during the summer months.
- 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.
- Any deviation from the recommendations in this section should receive prior approval from the project arborist.

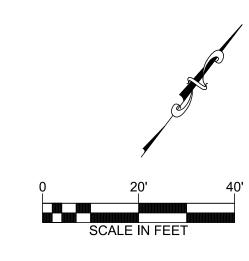
After Construction

- 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.
- 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.
- 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.
- 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.



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
- THE BUILDING FUOTINGS 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
- 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:

	<u>EXISTING</u>		EXISTING
DECIDUOUS TREE	\odot	STORM SEWER CLEAN OUT	0
		STORM SEWER CATCH BASIN	
CONIFEROUS TREE	₩	STORM SEWER MANHOLE	
	,	GAS METER	
FIRE HYDRANT	Q	GAS VALVE	\square
IRRIGATION		GUY WIRE ANCHOR	\leftarrow
WATER METER		POWER POLE	-0-
WATER VALVE	\bowtie	POWER VAULT	P
DOUBLE CHECK VALVE	•	POWER JUNCTION BOX	Δ
AIR RELEASE VALVE		POWER PEDESTAL	
SANITARY SEWER CLEANOUT	0	COMMUNICATIONS VAULT	C
SANITARY SEWER MANHOLE	0	COMMUNICATIONS JUNCTION BOX	\triangle
SIGN	-	STORM SEWER DOWN SPOUT	٥
STREET LIGHT	\$		
MAILBOX			
		EXISTING	
RIGHT OF WAY LINE		_ 	

LBUX		
	EXIS	STING
HT OF WAY LINE		
JNDARY LINE		
OPERTY LINE		
ITERLINE		
CH		>
RB		
GE OF PAVEMENT		
SEMENT		
ICE LINE		
AVEL EDGE		
NER LINE		— PWR —
RHEAD WIRE		— ОНШ —
MMUNICATIONS LINE		— сом —
ER OPTIC LINE		— CFO — — —
S LINE		— GAS ————
RM SEWER LINE		— STM —
IITARY SEWER LINE		— SAN ———
TER LINE		— WAT ———



EXPIRES

EXPIRES

O. 7. ZAR

WO. DATE

2332 ARBOR DRIV

PREPARED FOR: H & K GROUP, LLC.

2564 19TH ST SE Salem, Oregon 9730 (503) 399-3828 www.leiengineering.co

ENGINEERING& SURVEYINGOREGON

EN EN & S

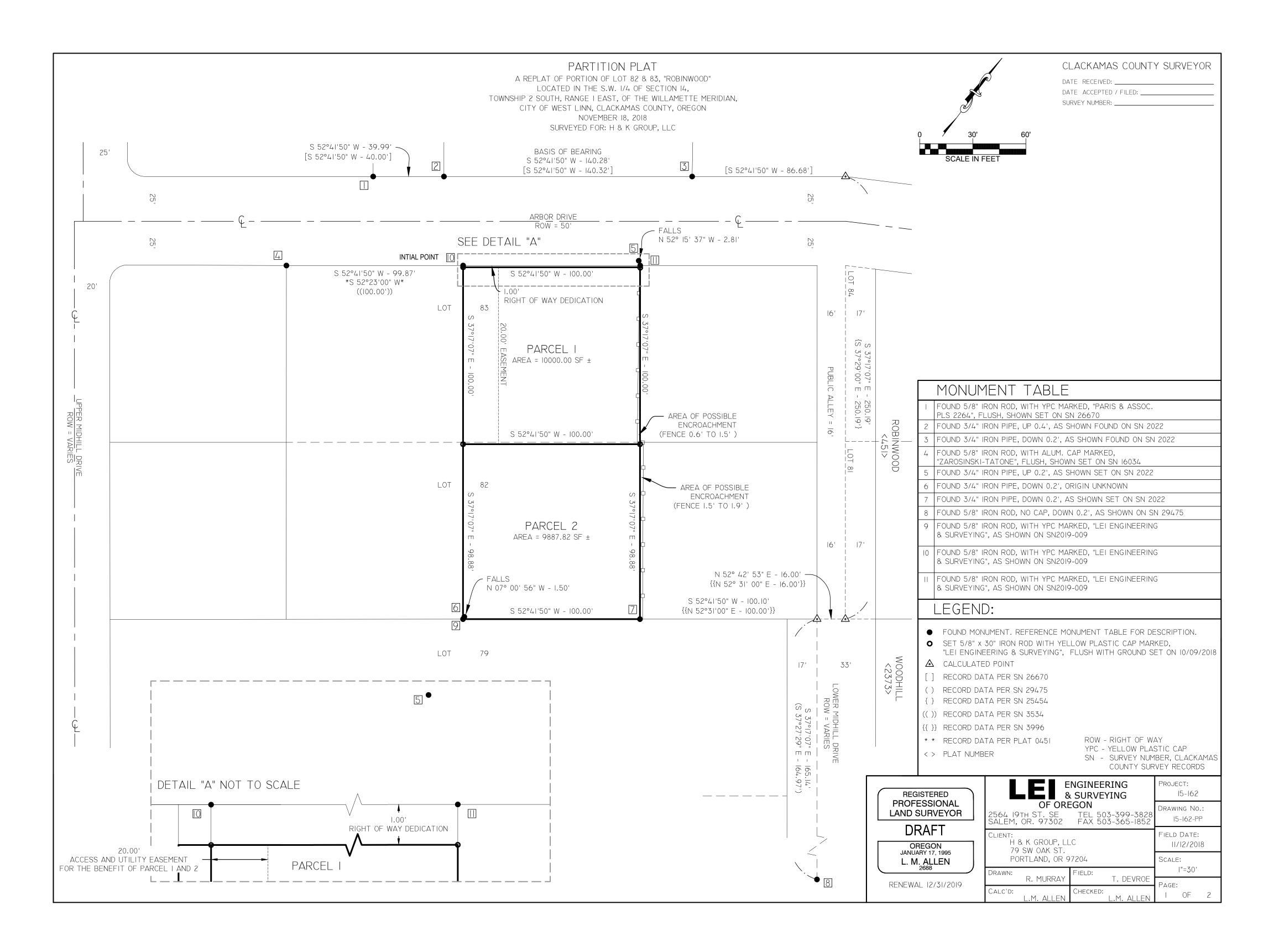
EXISTING CONDITIONS

SCALE

1"=20'
PROJECT NO.

15-162
TOTAL SHEETS

1



PARTITION PLAT NO.

A PORTION OF LOT 82 & 83, "ROBINWOOD" LOCATED IN THE S.W. 1/4 OF SECTION 14, TOWNSHIP 2 SOUTH, RANGE I 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 $\frac{\Delta 0}{2}$ 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 S' SOUTHEASTERLY LINE OF SAID LOT 82 A DISTANCE OF 100.00 FEET, THENCE LEAVING SAID SOUTHEASTERLY LINE N 37°17'07 WPARALLEL WITH THE SOUTHWESTERLY LINE OF SAID LOT 82 A DISTANCE OF SOUTHWESTERLY LINE OF SAID LOT 83 A DISTANCE OF 100.00 FEET TO TO BE THEIR VOLUNTARY ACT AND DEED. A POINT ON THE NORTHWESTERLY LINE OF SAID LOT 83, THENCE \$52°41'50 WON SAID NORTHWESTERLY LINE A DISTANCE OF 100.00 FEET TO THE POINT OF BEGINNING.

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

AN EXCLUSIVE 20.00 FEET IN WIDTH ACCESS AND UTILITY EASEMENT $\frac{1}{N}$ OVER, ACROSS AND UPON PARCEL I 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 \$52°41'50 WBETWEEN 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.

10NTE E NOTTON		DATE		
EBORAH A NOTTON		DATE		
ACKNOWLEDGMENT:				
STATE OF OREGON)			
COUNTY OF CLACKAMAS) SS.)		ALLY ADDEADED	NAONITE
NOWN ALL PEOPLE BY THE	HESE PRESENTS, UN THIS			

IN WITNESS WHEREOF I SET MY HAND THIS ____ DAY OF _____, 2019.

98.88 FEET TO A POINT ON THE SOUTHEASTERLY LINE OF SAID LOT BEING DULY SWORN, AND BEING THE IDENTICAL PERSON MENTIONED IN THE FOREGOING INSTRUMENT, EXECUTED SAID 83, THENCE CONTINUING N 37°17'07 W PARALLEL WITH THE INSTRUMENT BEFORE ME, A NOTARY PUBLIC FOR THE STATE OF OREGON, AND ACKNOWLEDGED THE FORGOING INSTRUMENT

NOTARY SIGNATURE		
NOTARY PUBLIC-OREGON (PRINT NAME)	COMMISSION NUMBER	EXPIRES
STATE OF OREGON)) SS.	
COUNTY OF CLACKAMAS)	
KNOWN ALL PEOPLE BY TH	HESE PRESENTS, ON THIS $_$	DAY OF 2019, PERSONALLY APPEARED DEBORAH A NOTTON,
BEING DULY SWORN, AND E	BEING THE IDENTICAL PERS	ON MENTIONED IN THE FOREGOING INSTRUMENT, EXECUTED SAID
INSTRUMENT BEFORE ME, A	A NOTARY PUBLIC FOR THE	STATE OF OREGON, AND ACKNOWLEDGED THE FORGOING INSTRUMEN
TO BE THEIR VOLUNTARY A	ACT AND DEED.	

NOTARY SIGNATURE		
NOTARY PUBLIC-OREGON	COMMISSION NUMBER	EXPIRE
(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 DATE BOARD OF COMMISSIONERS DELEGATE PER COUNTY CODE CHAPTER II.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)
STATE OF OREGON)) SS. COUNTY OF CLACKAMAS)
) SS.
) SS. COUNTY OF CLACKAMAS) I DO HEREBY CERTIFY THAT THE ATTACHED PARTITION PLAT WAS RECEIVED FOR RECORD ON
) SS. COUNTY OF CLACKAMAS) I DO HEREBY CERTIFY THAT THE ATTACHED PARTITION PLAT WAS RECEIVED FOR RECORD ON THE DAY OF, 2019 AT O'CLOCKM. AS PARTITION PLAT NO





STORM DRAINAGE CALCULATIONS

FOR

Arbor Drive Partition 2322 Arbor Drive WEST LINN, OR 97068

April 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:	
Geotech Recommendations:	
Storm Rasin 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

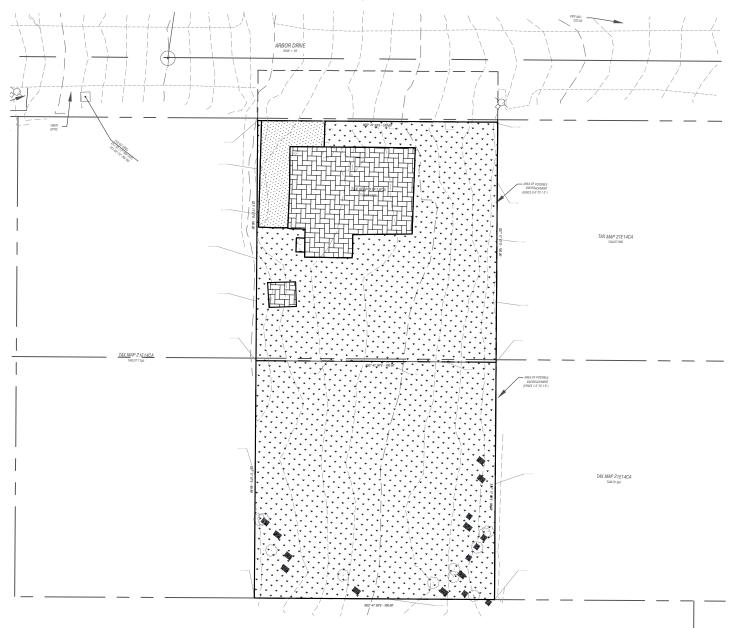
Storm Basin:

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

©2018 WDY, INC.

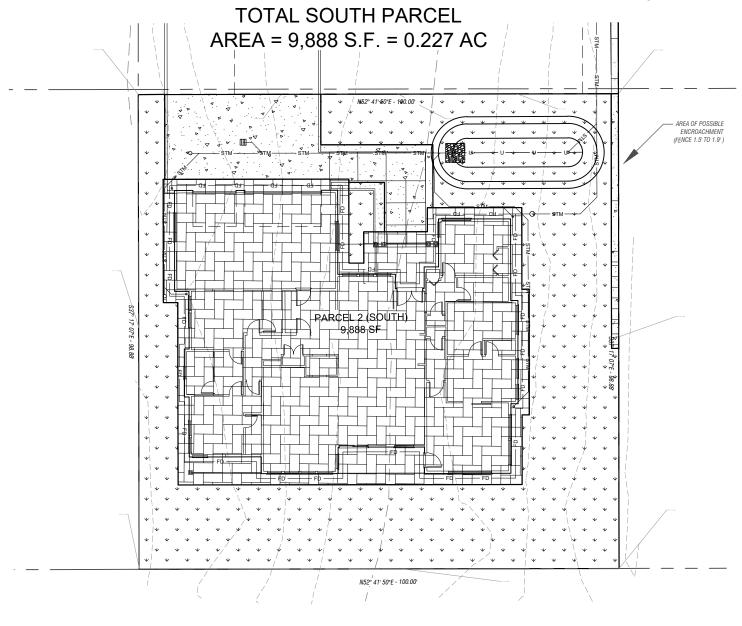


Structural · Civil Engineers

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 RESIDENTIALDate:APR 2019Job No.:19035Drawn:PRM

Client: H&K Sheet: STM-



TAX MAP 21E14CA



PROPOSED NEW PAVEMENT 0 SF CN=98



PROPOSED NEW **CONCRETE 931 SF** CN=98





Date:





PROPOSED NORTH PARCEL AREA MAP

Client:



Structural · Civil Engineers

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"

H&K

Job Name: ARBOR DRIVE RESIDENTIAL

Job No.: 19035 **Drawn:** ©2018 WDY, INC.

APR 2019

PRM Sheet:

SIMPLIFIED APPROACH FORM

PROIECT INFORMATION WORKSHEET

PROJECT INFORMATION Permit Number: _____ CITY OF PORTLAND Site Address/R Number(s): Stormwater **Management** Development Description: Manual Total New or Redeveloped Impervious Area: Date:

	Signature:				
SIT	E CHARACTERISTICS				
S.1.	Do slopes exceed 20% anywhere within the project area?	☐ Yes	□No		
S. 2.	Are there springs, seeps, or a high groundwanywhere within the project area?	⁄ater table ☐ 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		
	ing prior test results at same site, ride Land Use case/permit number:				

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.
- 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.
- 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.

Required Infiltration	Required Infiltration Testing				
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)

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
Data

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.

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

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

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



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 wer 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.



STM-8

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
НА-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:

- 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 observered 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.



14835 SW 72nd Avenue Portland, Oregon 97224

Tel: (503) 598-8445 Fax: (503) 941-9281

SITE AERIAL AND EXPLORATION LOCATIONS

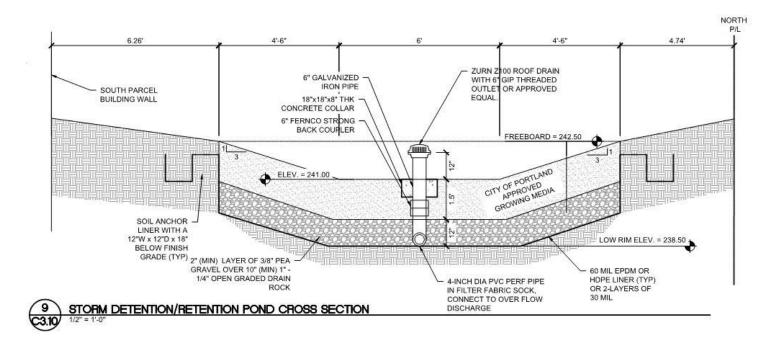




Structural • Civil Engineers

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.
- 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 BE SOLELY RESPONSIBLE TO PROVIDE FOR ALL NECESSARY TRAFFIC CONTROL PLANS, TEMPORARY SHORING AND OTHER INCIDENTAL WORK NEEDED FOR THE COMPLETION OF THE WORK.
- WHERE REFERENCE IS MADE TO IBC, ASTM, AISC, ACI OR OTHER STANDARDS, THE LATEST ISSUE AT THE BUILDING PERMIT DATE SHALL APPLY.
- ALL WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH THE PROJECT SPECIFICATIONS, THE "INTERNATIONAL BUILDING CODE" (IBC), THE INTERNATIONAL PLUMBING CODE (IPC) AND THE PROVISIONS OF "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION", 1996 EDITION, OREGON STATE HIGHWAY DIVISION (OSHD) AS AMENDED BY ALL OTHER STATE AND LOCAL CODES, JURISDICTIONS, PERMITS, AND BUILDING REQUIREMENTS THAT APPLY. THE CONTRACTOR SHALL OBTAIN ALL

APPLICABLE CONSTRUCTION PERMITS AND SUBMIT TRAFFIC CONTROL PLANS PRIOR

- TO PROCEEDING WITH WORK EXISTING UTILITIES, SITE AND TOPOGRAPHIC INFORMATION SHOWN HEREON ARE BASED ON RECORD DRAWINGS PROVIDED BY OR MADE AVAILABLE BY THE OWNER. THE CONTRACTOR IS REQUIRED TO FIELD VERIFY THE LOCATION OF EXISTING FEATURES AND UTILITIES PRIOR TO CONSTRUCTION, AND SHALL ARRANGE FOR THE RELOCATION OF ANY IN CONFLICT WITH THE PROPOSED WORK. MINOR ADJUSTMENTS BASED ON FIELD CONDITIONS SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. LOCAL COUNTY AND CITY RECORD DRAWINGS SHOULD BE REVIEWED BY THE CONTRACTOR FOR THIS PURPOSE. THE EXISTENCE AND LOCATION OF EXISTING FEATURES ARE NOT GUARANTEED. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF INFORMATION OBTAINED FROM RECORD
- DRAWINGS OR INFORMATION PROVIDED BY OTHERS, IMPLIED OR OTHERWISE. ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH BY OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING (503) 232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL (800) 332-2344.
- CONTRACTOR SHALL CAREFULLY MAINTAIN BENCHMARKS, PROPERTY CORNERS, MONUMENTS, AND OTHER REFERENCE POINTS. IF SUCH POINTS ARE DISTURBED OR DESTROYED BY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL PAY FOR THEIR REPLACEMENT BY EMPLOYING A PROFESSIONAL LAND SURVEYOR TO RESET PROPERTY CORNERS AND OTHER SUCH MONUMENTS.
- CONTRACTOR TO COORDINATE AND PROVIDE INSTALLATION AS NECESSARY OF ALL PUBLIC AND PRIVATE UTILITIES FOR THIS PROJECT INCLUDING WATER SERVICE, SANITARY SEWER SERVICE, STORM DRAIN, ELECTRIC POWER, COMMUNICATIONS. CABLE TV, NATURAL GAS, STREET LIGHTS, ETC.
- 10. CONTRACTOR TO MAINTAIN ONE COMPLETE SET OF APPROVED DRAWINGS ON SITE FOR THE SOLE PURPOSE OF CONTRACTOR RECORDING AS-BUILT INSTALLATION OF IMPROVEMENTS. SUBMIT AS-BUILT PLANS TO OWNER.
- 11. ALL CONSTRUCTION ACTIVITY SHALL BE DONE IN A SAFE AND NEAT MANNER AND UNDER OBSERVATION BY CITY FORCES.
- 12. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL CONSTRUCTION SAFETY, HEALTH AND OTHER RULES AND REGULATIONS FROM OSHA, DEQ, STATE, AND LOCAL REGULATING AGENCIES FOR SAFETY AND INSTALLATION OF THE WORK INCLUDING BUT NOT LIMITED TO SHORING, BRACING, ERECTION / INSTALLATION, FALL PROTECTION, GUARDRAILS, ETC
- 13. ALL SEWER TRENCH LINES AND EXCAVATIONS SHALL BE PROPERLY SHORED AND BRACED TO PREVENT CAVING. UNUSUALLY DEEP EXCAVATIONS MAY REQUIRE EXTRA SHORING AND BRACING. ALL SHEETING, SHORING, AND BRACING OF TRENCHES SHALL CONFORM TO OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION (OSHA) REGULATIONS AND THE CITY OR COUNTY STANDARD CONSTRUCTION
- 14. ALL UNDERGROUND UTILITIES SHALL BE INSTALLED PRIOR TO CONSTRUCTION OF CURBS, RETAINING WALLS, OR PAVEMENT.
- 15. ALL WATER AND SEWERAGE APPURTENANCES SHALL CONFORM TO APWA, OREGON CHAPTER, "STANDARDS SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION"; THE APPROVED CONSTRUCTION DRAWINGS; AND CITY OF WEST LINN REQUIREMENTS.
- 16. ELEVATION DATUM IS BASED ON NGS DATA POINT "SHEPHERD AJ8191". 17. EXISTING TOPOGRAPHY, UTILITIES, AND ELEVATION DATUM ARE BASED ON THE OWNER'S TOPOGRAPHIC SURVEY PROVIDED BY THE OWNER/DEVELOPER. THE EXISTENCE AND LOCATION OF EXISTING FEATURES ARE NOT GUARANTEED. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST. THE ENGINEER/WDY ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF INFORMATION PROVIDED BY OTHERS, IMPLIED OR OTHERWISE.
- 18. DETAILS SHOWN ON THE DRAWINGS ARE INTENDED TO APPLY AT ALL SIMILAR
- CONDITIONS AND LOCATIONS. 19. DO NOT SCALE INFORMATION FROM DRAWINGS.
- CONTRACTOR TO REMOVE FROM SITE EXCESS SOIL OR OTHER MATERIALS NO REUSABLE FOR THIS PROJECT, AND COMPLY WITH ALL RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL REPORT.
- 21. APPROPRIATE BENCHING OF FILLS IS REQUIRED FOR FILLS OVER 5 FEET IN HEIGHT ON SLOPES IN EXCESS OF 5 HORIZONTAL TO 1 VERTICAL. THE GEOTECHNICAL ENGINEER SHALL INSPECT BENCHES PRIOR TO FILL PLACEMENT
- 22. CUT AND FILL SLOPES SHALL BE PROTECTED FROM EROSION. SUCH CONTROL MAY CONSIST OF APPROPRIATE REVEGETATION OR OTHER ACCEPTABLE MEANS AND METHODS. EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTHWORK
- 23. MATERIAL IN SOFT SPOTS WITHIN 5 FEET OF RIGHT-OF-WAYS, PAVEMENTS OR BUILDINGS SHALL BE REMOVED TO THE DEPTH REQUIRED TO PROVIDE A FIRM SUBGRADE AND SHALL BE REPLACED WITH 1-1/2" - 0" CRUSHED ROCK COMPACTED TO
- 24. THE NATIVE SUBGRADE SURFACE SHALL BE APPROVED BEFORE SCARIFYING OR PLACING ANY FILL OR BASE ROCK BY THE SOILS ENGINEER. THE UPPER 8 INCHES OF NATIVE SUBGRADE IS TO BE SCARIFIED. DRIED AND RECOMPACTED TO 90% MAXIMUM DRY DENSITY PER ASTM D698. PLACE GEOTEXTILE FABRIC (MIRAFI 500X, PROPEX GEOTEX 200ST, CONTECH C200 OR EQUAL) BELOW ALL VEHICULAR PAVEMENT. FOR WET WEATHER CONSTRUCTION (AS DETERMINED BY THE GEOTECHNICAL ENGINEER) A WORKING BLANKET OF PIT RUN OR CRUSHED ROCK IS TO BE LAID OVER GEOTEXTILE FABRIC. ON-SITE COMPACTION TESTS AND DEFLECTION TEST(S) PERFORMED WITH A 50,000 LB. VEHICLE MUST BE PERFORMED AND WITNESSED BY THE GEOTECHNICAL ENGINEER. NO DEFLECTION IS ALLOWED AND ALL BUILDING AND PAVEMENT AREAS MUST BE PROOF-ROLLED. DURING WET WEATHER CONSTRUCTION (AS DETERMINED BY THE SOILS ENGINEER), PROVIDE THE PROOF-ROLL TEST OVER THE BASE ROCK SURFACES PRIOR TO PLACEMENT OF ANY PAVEMENT
- 25. CRUSHED ROCK BASE MATERIAL AND PIPE ZONE MATERIAL SHALL BE CRUSHED ROCK CONFORMING TO OREGON DEPARTMENT OF TRANSPORTATION (ODOT) SECTION 00640 AND 00641 AND BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D1557.
- 26. 3/4 " 0" CRUSHED ROCK PIPE ZONE AND BACKFILL MATERIAL IS REQUIRED FOR ALL UTILITY LINES, CONDUITS AND LEVELING COURSES. REFER TO THE TYPICAL UTILITY CONDUIT TRENCH AND PAVEMENT DETAILS.
- 27. ASPHALTIC CONCRETE (A.C.) PAVEMENT SHALL BE A LEVEL 4 HMAC SUPER PAVE WITH AN ASPHALT CONTENT PER OREGON DOT CLASSIFICATION AND APPRVED JMFM FOR ALL LIFTS. PAVEMENT SHALL BE PLACED ONLY ON DRY, CLEAN AND PROPERLY PREPARED SURFACES, AND WHEN CONDITIONS MEET THE SPECIFICATIONS AS SET FORTH IN THE MOST RECENT EDITION OF THE OREGON DOT SPECIFICATIONS. ALL NEW PAVEMENT AREAS SHALL CONFORM TO THE TYPICAL PAVEMENT SECTION DETAIL. ALL A.C. PAVEMENT TO BE COMPACTED TO 91% OF MAXIMUM DENSITY PER ASTM D2041 FOR FIRST LIFTS LESS THAN 3-INCHES AND 92% COMPACTION SHALL BE REQUIRED
- FOR SUBSEQUENT LIFTS. 28. ALL JOINTS BETWEEN A.C AND CONCRETE STRUCTURES MUST BE TACKED WITH
- BITUMASTIC. NO EXCEPTIONS ALLOWED 29. ALL PORTLAND CEMENT CONCRETE PAVEMENT SHALL HAVE A 28 DAY MINIMUM ULTIMATE STRENGTH OF 4000 PSI. PROVIDE A MINIMUM OF (4) TEST CYLINDERS IN ACCORDANCE WITH CURRENT IBC AT EACH POUR.
- A. MINIMUM MIX REQUIREMENTS:

MORE THAN 15% BY WEIGHT

- CEMENT CONTENT PER YARD: 5 SACKS. II. MAXIMUM WATER/CEMENT RATIO: 0.45. FLY ASH MEETING ASTM C618 AND WITH LOSS ON IGNITION LESS THAN 3% MAY BE ADDED TO THE CEMENT, BUT NOT
- III. SLUMP: 3 INCH TO 4 INCH. DEVIATING FROM DESIGN SLUMP +1/2 INCH TO -1 INCH. WHEN CONCRETE IS TO BE PUMPED, ADD PLASTICIZERS MEETING ASTM C494 AND PROVIDE A NEW MIX DESIGN. DO NOT ADD WATER.
- IV. ADMIX: PROVIDE WATER REDUCING ADMIX (MASTER BUILDERS) AND REDUCE
- WATER USED BY 10% MINIMUM FOR ALL SLABS. V. AIR ENTRAINMENT: PER ACI 301 AND 306 AT ALL EXTERIOR SLABS AND FLAT WORK, 5.5% AIR MINIMUM. VI. ALL ADMIXTURES TO BE COMPATIBLE FROM SAME MANUFACTURER.

B. PLACE AND CURE ALL CONCRETE PER ACI CODES AND STANDARDS.

C. SLEEVES, PIPES OR CONDUITS OF ALUMINUM SHALL NOT BE EMBEDDED IN

- 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. INSTALL JOINTS AT ALL RE-ENTRANT CORNERS. E. PROVIDE 1/4" PREMOLDED EXPANSION JOINT MATERIAL BETWEEN SLABS AND WALLS THAT ARE NOT DOWELED TOGETHER, AND AROUND COLUMNS THAT DO NOT HAVE
- SLAB BLOCKOUTS. 31. ON-SITE HANDICAP/DISABILITY ACCESS ROUTES SHALL COMPLY WITH THE AMERICANS WITH DISABILITIES ACT (ADA), STATE AND LOCAL REGULATIONS. NOTIFY ARCHITECT AND ENGINEER PRIOR TO INSTALLING FINISH PAVEMENT IN CONFLICT WITH ADA REQUIREMENTS. CONTRACTOR TO VERIFY GRADING OF ADA PATHS OF TRAVEL AND PARKING STALLS AND CONTACT ENGINEER OF RECORD FOR ADDITION WORK IF EXISTING GRADING IS FOUND NOT TO MEET CODE
- REQUIREMENTS. IN GENERAL: F. MAXIMUM CROSS SLOPE OF ANY PAVEMENT PERPENDICULAR TO DIRECTION OF TRAVEL IS 2.0%
- G. MAXIMUM SLOPE OF WALKWAYS IN DIRECTION OF TRAVEL IS 5.0%. H. 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
- I. MAXIMUM SLOPE OF CURB RAMPS AND WINGS OF CURB RAMPS IS 8.33%. THE MAXIMUM LENGTH OF A CURB RAMP IS 6 FEET.
- J. PROVIDE FINISH PAVEMENT SURFACE TEXTURES IN ACCORDANCE WITH ADA. K. STRAIGHT GRADE FINISH PAVEMENT AND TOP OF CURB ELEVATIONS BETWEEN
- GIVEN ELEVATION POINTS. BLEND FINISH GRADES AT GRADE BREAKS. 32. PAVEMENT MARKINGS ON AC PAVEMENT SHALL BE MPI #32 ALKYD PAINT. INSTALL PER MANUFACTURERS RECOMMENDATIONS. VERIFY PAINT LOCATIONS, COLORS AND STENCILS WITH ARCHITECT.
- 33. ADA STALL PAVEMENT STENCILS SHALL BE THERMOPLASTIC STENCIL INSTALLED PER MANUFACTURES RECOMMENDATIONS.

02.0 CLEARING AND GRUBBING

- 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.
- NOTIFY ARCHITECT 2 BUSINESS DAYS BEFORE COMMENCING WORK 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.) FOUNDATIONS, FENCES, RAILINGS, MACHINERY, ETC. WITHIN THE CLEARING LIMITS. THE ITEMS LISTED ABOVE SHALL BE DISPOSED OF OFF-SITE. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO CONFIRM THE NUMBER AND TYPE OF STRUCTURES TO BE REMOVED. CONTRACTOR SHALL OBTAIN ALL NECESSARY DEMOLITION AND WORK PERMITS.
- ALL BURIED STRUCTURES (I.E. TANKS, LEACH LINES, DRAIN TILE, AND PIPES) NOT DESIGNATED TO REMAIN ON THE SITE. SHALL BE REMOVED AND THE RESULTING EXCAVATIONS SHALL BE PROPERLY INSPECTED, BACKFILLED AND COMPACTED PRIOR TO ANY GRADING OR FILLING OPERATIONS. THIS IS TO INCLUDE STUMPS AND ROOTBALLS OF TREES TO BE REMOVED FROM THE SITE. NOTIFY CITY FOR
- THE AREA OF THE SITE DESIGNATED ON THE PLAN TO BE REGRADED OR PAVED SHALL BE STRIPPED TO REMOVE ALL ORGANIC MATERIAL DOWN TO FIRM SUBGRADE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING SUBGRADE SOILS FROM OVERWORKING AND PROVIDE REPAIR TO DAMAGED SUBGRADE AT NO ADDITIONAL COST TO THE OWNER.
- 6. ALL UNSUITABLE MATERIAL (SOIL AND VEGETATION) REMOVED DURING THE CLEARING AND GRUBBING OPERATIONS SHALL BE REMOVED BY THE CONTRACTOR AND LEGALLY
- DISPOSED OF IN A SUITABLE LOCATION. EXCAVATORS MUST COMPLY WITH ALL PROVISIONS OF ORS 757.541 TO 757.571 INCLUDING NOTIFICATION OF ALL OWNERS OF UNDERGROUND FACILITIES AT USA LOCATES (681-7044), AT LEAST 48 BUSINESS HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS BEFORE COMMENCING AN EXCAVATION.
- 8. ALL EMBANKMENTS REQUIRED SHALL BE STRUCTURAL FILL MEETING THE REQUIREMENTS AND SPECIFICATIONS OF IBC CHAPTER 18.
- ALL EXCESS MATERIAL NOT UTILIZED ON-SITE SHALL BE LEGALLY DISPOSED OF BY THE
- 10. TREES NOT DESIGNATED TO BE REMOVED BY THE ARCHITECT SHALL BE PROTECTED AT ALL TIMES.
- SAWCUT STRAIGHT LINES TO MATCH EXISTING PAVEMENT WITH THE NEW PAVEMENT. 12. CONTRACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE TRAFFIC CONTROL ALONG THE EXISTING ROADS AS REQUIRED BY THE CITY OF WEST LINN.

03.0 PRIVATE UTILITIES

- CONTRACTOR TO PROVIDE UTILITY SUBMITTALS FOR REVIEW PRIOR TO INSTALLATION OF ALL PROPOSED UTILITY PIPES, CONDUITS, MANHOLES, BENDS/FITTINGS AND ALL OTHER SYSTEM APPURTENANCES
- 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.
- 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. ALL CONNECTIONS TO EXISTING PUBLIC STORM SEWER, SANITARY SEWER AND
- WATER MAINS REQUIRE ISSUANCE OF A PUBLIC WORKS PERMIT AND INSPECTION BY THE CITY OF WEST LINN AND THE WEST LINN WATER DISTRICT AS APPLICABLE. PRIVATE SANITARY SEWER LATERALS SHALL COMPLY WITH THE REFERENCED PUBLIC STANDARDS AND DRAWINGS FOR PUBLIC SANITARY SEWER. LAY THE 'T' AT A 2%
- 6. CAST IRON SANITARY OR STORM DRAIN PIPE AND JOINTS SHALL BE HUBLESS, SERVICE WEIGHT, AND MEET THE REQUIREMENTS OF CISPI 301. JOINTS SHALL BE MECHANICAL CLAMP RING TYPE, STAINLESS STEEL EXPANDING AND CONTRACTING SLEEVES WITH FULL CIRCLE NEOPRENE RIBBED GASKETS FOR POSITIVE SEAL. COUPLINGS AND SHIELDS TO BEAR THE MANUFACTURER'S REGISTERED INSIGNIA. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
- PVC SANITARY SEWER OR STORM DRAIN PIPE SHALL BE ASTM D3034, SDR-35. COMPATIBLE ASTM D3034 FITTINGS MUST BE USED WITH ASTM D3034 PIPE. ALL ASTM D3034 PIPE USED MUST BE OF WATER-TIGHT JOINTS AND TESTED FOR ROUNDNESS AFTER BACKFILL. PROVIDE PRESSURE TEST. PROVIDE TV VIDEO TAPE IF SO REQUIRED BY THE JURISDCITION HAVING AUTHORITY.
- HIGH DENSITY POLYETHYLENE (HDPE) STORM DRAIN PIPE AND ASSOCIATED HDPE FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM D 3350 OR ASTM 1248, TYPE III, CLASS C. CATEGORY 4, GRADE P33. 4 INCH TO 10 INCH PIPE SHALL MEET AASHTO M252 TYPE S; 12 INCH TO 36 INCH PIPE SHALL MEET AASHTO M294 TYPE S; 42 INCH TO 48 INCH SHALL MEET AASHTO MP6-95, TYPE S; AND 54 INCH TO 60 INCH SHALL MEET AASHTO M294, TYPE S. JOINTS SHALL BE BELL AND SPIGOT COUPLINGS, OR EQUIVALENT, AND CONFORM TO ASTM D3212. INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 WITH EXCEPTION THAT MINIMUM COVER IN TRAFFIC AREAS SHALL BE 18 INCHES.
- ABS SCHEDULE 40 SOLID WALL PLASTIC PIPE AND FITTINGS MEETING REQUIREMENTS OF ASTM D 2661 JOINED WITH PIPE CEMENT MEETING REQUIREMENTS OF ASTM 2235. DUCTILE IRON PIPE: AWWA C-151, CLASS 52, WITH GASKETED BELL & SPIGOT JOINTS,
- SEAL COATED PER AWWA C-104. 11. REINFORCED CONCRETE STORM DRAIN PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C76, CLASS IV. PROVIDE WATER TIGHT JOINTS USING RUBBER RING GASKETS
- BURIED EXTERIOR PERFORATED FOUNDATION DRAIN PIPE WITH CONTINUOUS FILTER FABRIC SOCK SHALL BE "ADS DRAINGUARD" OR PVC SCHED 40 PERFORATED PIPE WITH SOLVENT WELD JOINTS. INSTALL DRAIN PIPE AT 0.5% SLOPE UP FROM BOTTOM OF FOOTING IN EACH DIRECTION AROUND THE BLDG FROM THE BACKWATER VALVE(S) CONNECTION LOCATION(S) TO THE SITE STORM DRAINAGE SYSTEM. PROVIDE FILTER FABRIC WRAP AROUND A 24 INCH WIDE X 24 INCH HIGH (MIN.) CLEAN DRAIN ROCK BACKFILL SECTION AT PERIMETER OF BUILDING FOUNDATION. LAP FILTER FABRIC 12 INCHES OVER TOP OF DRAIN ROCK SECTION. TOP OF DRAIN ROCK TO BE 9 INCHES BELOW FINISH GRADE BESIDE BUILDING. SEE DWGS FOR TYPICAL FNDN DRAIN
- INSTALLATION DETAIL ABS OR PVC FOUNDATION DRAIN BACKWATER VALVES SHALL BE HORIZONTAL TYPE SIMILAR TO ASME A112.14.1, WITH REMOVABLE COVER AND SWING CHECK VALVE WITH
- GASKET. SEE DWGS FOR INSTALLATION DETAIL. 14. GEOCOMPOSITE DRAINAGE FABRIC SHALL BE "AQUADRAIN 15X, "MIRADRAIN 6200XL", OR ENGINEER PRE-APPROVED EQUAL.
- 15. AREA DRAINS IN LANDSCAPE AREAS SHALL BE 15"X15" TURF & LANDSCAPE AREA DRAINS MANUFACTURED BY THE 'LYNCH CO." WITH 4 INCH DIAMETER TRAPPED NO-HUB CONNECTION OUTLETS, EXTENSIONS AND GRATES WITH BARS AT 1 -1/4 INCH ON CENTER FOR COMPLETE ASSEMBLY.
- 16. EXTERIOR AREA DRAINS IN CONCRETE PAVEMENT AREAS SHALL BE "SMITH" FLOOR DRAINS WITH 12 INCH DIAMETER TOPS, DEEP BODY SEDIMENT BUCKETS, 4 INCH DIAMETER TRAPPED NO-HUB CONNECTION OUTLETS, EXTENSIONS AND GRATES FOR COMPLETE ASSEMBLY.

- 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. 20. COPPER WATER PIPE (3/4 INCH TO 2-1/2 INCH DIAMETER) SHALL BE TYPE 'K' HARD TEMPERED COPPER PER ANSI H23.1 WITH WROUGHT COPPER SOLDER JOINT FITTINGS PER ANSI B16.22.
- INSTALL ALL PLASTIC PIPE AND FITTINGS IN ACCORDANCE WITH ASTM D2321. 22. PROVIDE A DOUBLE CHECK VALVE ASSEMBLY IN AN ACCESSIBLE ROOM, CONCRETE BOX OR VAULT WITH OPENABLE LID(S) FOR ALL WATER SERVICE LINES 1 INCH AND LARGER. PROVIDE DETECTOR CHECK PLUMBING AND METER AT DOUBLE CHECK ASSEMBLIES FOR FIRE SERVICE LINES.
- 23. PROVIDE A PRESSURE REDUCING VALVE ASSEMBLY (INCLUDING GATE VALVES IMMEDIATELY UP AND DOWNSTREAM) IN AN ACCESSIBLE ROOM, CONCRETE BOX OR VAULT WITH OPENABLE LID(S) FOR ALL WATER SERVICE LINES WHERE MAXIMUM STATIC PRESSURE IS OR EXCEEDS EIGHTY (80) PSI. VALVES SHALL BE SET TO SUSTAIN A MAXIMUM PRESSURE OF 60 PSI AND SHALL BE OF A PRESSURE RATING TO ACCOMMODATE THE UPSTREAM PRESSURE INCLUDING AN ALLOWANCE OF 100 PSI FOR SURGE. VALVE SHALL BE CLAYTON 90-01 SERIES AS MANUFACTURED BY CAL-VAL
- CO., NEWPORT BEACH, CA OR WATER DISTRICT PRE-APPROVED. 24. ALL ELBOWS, BENDS, TEES, CROSSES AND DEAD ENDS ON WATER PIPES 3 INCHES AND
- LARGER IN SIZE SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS. 25. A MINIMUM DEPTH OF 30 INCHES IN PRIVATE LANDSCAPE AREAS AND 36 INCHES IN
- PRIVATE STREETS FROM FINISHED GRADE TO THE TOP OF WATER PIPE IS REQUIRED. 26. BLOW-OFF ASSEMBLIES ARE REQUIRED AT ALL DEAD-END PRIVATE WATER LINES.
- 27. ALL PRIVATE WATER LINES SHALL BE FLUSHED, PRESSURE TESTED AND DISINFECTED PER AWWA C600, SECTION 4 AND AWWA C601. 28. ALL WATER LINE CROSSINGS WITH SANITARY SEWER SHALL COMPLY WITH
- APPLICABLE DEQ AND OREGON STATE HEALTH DIVISION RULES AND REGULATIONS RELATING TO VERTICAL AND HORIZONTAL SEPARATION. 29. ALL NEW AND EXISTING MANHOLE RIMS, CATCH BASIN RIMS, CLEAN-OUTS AND OTHER INCIDENTAL STRUCTURES SHALL BE LOCATED AND ADJUSTED TO FINISH GRADE OR AS OTHERWISE INDICATED ON THE DRAWINGS.
- 30. PRECAST CONCRETE UTILITY VAULTS: A. REINFORCED PRECAST CONCRETE UTILITY VAULTS SHALL BE APPROVED BY THE OREGON STATE PLUMBING BOARD. PROVIDE COMPLETE ASSEMBLIES FOR INSTALLATION INCLUDING INLET AND OUTLET PIPING.
- B. GRADE RINGS: PROVIDE MANUFACTURER'S STANDARD PRECAST CONCRETE GRADE RINGS FOR ADJUSTING VAULT LIDS TO FINISH GRADE.
- C. MINIMUM STRUCTURAL REQUIREMENTS: I. CONCRETE: 28 DAY COMPRESSIVE STRENGTH FC = 4500 PSI
- II. REBAR: ASTM A-615 GRADE 60. III. MESH: ASTM A185 GRADE 65.
- IV. STEEL: ASTM A36 GRADE 36.
- V. GALVANIZING: ASTM A-123-89 AND A-153-87 (HOT DIPPED). VI. STEEL DESIGN: AISC MANUAL OF STEEL CONSTRUCTION, 9TH EDITION. VII. CONCRETE DESIGN: ACI-318-89 BUILDING CODE.
- ASTM C-857 MINIMUM STRUCTURAL DESIGN.
- LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES. VIII. LOADS: AASHTO H-20 16 KIP WHEEL LOAD WITH 30% IMPACT (10"X20"
- AASHTO LIVE LOAD SURCHARGE (2' SOIL) 8' DEPTH
- EFFECTIVE SOIL PRESSURE ABOVE WATER TABLE 80 P.C.F. EFFECTIVE SOIL PRESSURE ABOVE WATER TABLE - 45 P.C.F.
- IX. SOIL COVER: 1'-6" MINIMUM WITH WATER TABLE 3'-0" BELOW FINISHED GRADE. 5'0" MAXIMUM WITH WATER TABLE 3'-0" BELOW FINISHED GRADE
- 0' MINIMUM WITH WATER TABLE BELOW BOTTOM OF VAULT.
- 5'-0" MAXIMUM WITH WATER TABLE BELOW BOTTOM OF VAULT. D. ACCEPTABLE MANUFACTURERS
- I. UTILITY VAULT COMPANY, WILSONVILLE, OREGON II. ENGINEER PRE-APPROVED EQUAL MEETING SAME OR BETTER REQUIREMENTS.

04.0 CONSTRUCTION OBSERVATION, INSPECTION AND TESTING

- INDEPENDENT TESTING LAB TO BE RETAINED BY OWNER TO PROVIDE INSPECTIONS AND SPECIAL INSPECTIONS AS DESCRIBED HEREIN.
- 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 REINSPECTIONS. CONTRACTOR: DO NOT COVER WORK REQUIRED TO BE INSPECTED OR REINSPECTED PRIOR TO INSPECTION BEING MADE. IF WORK IS COVERED, UNCOVER AS NECESSARY. INSPECTORS SHALL PROMPTLY NOTIFY THE CONTRACTOR PRIOR TO LEAVING THE SITE AND OWNER'S REPRESENTATIVE OF SUBSTANDARD WORK AND PROVIDE A COPY
- 5. CONTRACTOR TO NOTIFY CIVIL ENGINEER WHEN UTILITY WORK BEGINS AND FOR OBSERVATION OF BASE ROCK PRIOR TO PLACING FINISH CURBS OR PAVEMENTS.

OF ALL REPORTS TO THE OWNER, ARCHITECT, ENGINEER, CONTRACTOR, AND

04.2 SPECIAL INSPECTIONS

- REQUIRED SPECIAL INSPECTIONS SHALL BE PERFORMED BY AN INDEPENDENT SPECIAL INSPECTOR PER SECTION 1701 OF THE INTERNATIONAL BUILDING CODE (IBC) FOR THE FOLLOWING:
- A. SOILS: I. FOUNDATION EXCAVATION TO BE OBSERVED BY OWNER'S GEOTECHNICAL ENGINEER FOR FIELD VERIFYING FOUNDATION DRAINAGE AND DEWATERING
- RECOMMENDATIONS II. NATIVE SUBGRADE SURFACE TO BE PROOF-ROLLED AND OBSERVED BY THE OWNER'S GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE PRIOR TO PLACEMENT OF ALL FILL OR BASE ROCK MATERIALS UNDER OR WITHIN 5 FEET OF ALL PAVEMENT AND BUILDING AREAS. DURING WET WEATHER CONSTRUCTION WHEN PROOF-ROLL OF NATIVE SUBGRADE MAY NOT BE APPROPRIATE (AS DETERMINED BY GEOTECHNICAL ENGINEER), PROVIDE PROOF-ROLL OF ALL BASE
- ROCK SURFACES PRIOR TO PLACEMENT OF ANY FINISH PAVEMENTS. III. DURING THE PLACEMENT OF ALL FILL, INCLUDING TRENCH BACKFILL AND BASE BELOW PAVEMENTS AND BUILDINGS, GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE TO VERIFY THAT MINIMUM COMPACTION REQUIREMENTS ARE
- MET. PROVIDE TEST FOR EACH 40 CUBIC YARDS PLACED. IV. GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE TO OBSERVE ALL PROOF
 - CONTACT: GEOPACIFIC ENGINEERING, INC., SCOTT HARDMAN, P.E., R.G.E. 7312 SW DURHAM RD. TIGARD, OR 97224
- (503) 598-8445 B. PAVEMENTS:
- VERIFY COMPACTION OF ASPHALT PAVEMENTS.
- II. VERIFY ULTIMATE STRENGTH, REINFORCEMENT SIZE, PLACEMENT AND GRADE OF CONCRETE PAVEMENTS. C. STORM DRAIN AND SANITARY PIPE
- I. CONTRACTOR TO PROVIDE HYDROSTATIC OR AIR TESTING OF ALL PIPES, JOINTS, MANHOLES, ETC. AS REQUIRED BY LOCAL AND STATE JURISDICTIONS. OBSERVE DEFLECTION TEST PERFORMED BY CONTRACTOR FOR ALL FLEXIBLE STORM AND SANITARY PIPE. DEFLECTION TEST TO BE IN ACCORDANCE WITH
- D. STORM FACILITY: BASIN LINER INSTALLATION AND PENETRATION SEALS.
- GRAVEL LAYER INSTALLATION. III. SOIL MEDIA INSTALLATION.

OREGON CHAPTER APWA 303.9.

CIVIL ABBREVIATIONS

ABBR	ABBREVIATION	GSP	GALVANIZED STEEL PIPE
AC	ASPHALT CONCRETE	GUT	GUTTER
ACCDG	ACCORDING	G.V.	GATE VALVE
AD	AREA DRAIN	HDPE	HIGH-DENSITY-POLYETHYLENE
ADA	AMERICANS WITH DISABILITIES ACT ALTERNATE APPROXIMATELY ARCHITECTURAL AIR RELIEF VALVE BEGIN CURB RETURN BACKFLOW BUILDING BLOW-OFF BACK OF CURB BOTTOM BEGINNING POINT BEGIN RETURN BACK OF SIDEWALK CAST IRON OF CURB INLET CONTROL JOINT CENTER LINE CLEAR CENTER CLEANOUT COMMUNICATIONS CONCRETE CONNECTION CONTINUOUS CITY OF PORTLAND CROWN (OF ROADWAY) COMBINED SEWER CULVERT DOUBLE DOUBLE CHECK DOUBLE CHECK DOUBLE CHECK DOUBLE IRON OF DITCH INLET DIA OF Ø	HORIZ	HORIZONTAL
ALT	ALTERNATE	H.P.	HIGH POINT
ADDV	ADDDOVIMATELY	11.7	LIFICHT
APPX	APPROXIMATELY	HI	HEIGH I
ARCH	ARCHITECTURAL	I.E. or IE	INVERT ELEVATION
ARV	AIR RELIFF VALVE	INFO	INFORMATION
PCP	DECIM CUIDD DETUDM	INIT	INTEDIOD
DCK	DEGIN CORD RETURN	IINI	INTERIOR
BF	BACKFLOW	I.P. or IP	INFLECTION POINT
BLDG	BUILDING	I.R.	IRON ROD
BO.	BLOW_OFF	JT	JOINT
DOC	DACK OF CURR	1	LENCTH
BOC	BACK OF CORB	L	LENGIH
ВОТ	BOTTOM	LBS or #	POUNDS
RP or RP	REGINNING POINT	IF "	LINEAR FFFT
DD	DECIN DETIION	LIN	LINEAD
חת	DEGIN RETURN	LIN	LINEAR
BS	BACK OF SIDEWALK	LI	LEF I
BS S	BACK OF SIDEWALK SLOPE	MANUF	MANUFACTURER
RTWN	RETWEEN	MAT'I	MATERIAL
DW	DA OKAMATED	MAIL	MATERIAL
BW	BACKWATER	MAX	MAXIMUM
CB	CATCH BASIN	MECH	MECHANICAL
Cl	CAST IRON or CURB INLET	M .I	MECHANICAL JOINT
C I	CONTROL IOINT	IVI. U.	MANUAL CONT
	CONTINUE JOHN I	МП	MANHULE
CL or C/L	CENTER LINE	MIN	MINIMUM
CLR	CLEAR	(N) or N	NFW
CNTD	CENTED	(11) 01 11	NON CUDINIC
CNTR	CENTER	N.S.	NUN SHRINK
CO	CLE ANOU I	N.T.S.	NOT TO SCALE
COM	COMMUNICATIONS	O.C. or OC	ON CENTER
CONC	CONCRETE	0.0. 0. 00	OII WATER SERARATOR
COND	CONNECTION	U.W.S.	OIL WATER SEPARATOR
CONN	CONNECTION	PL or P/L	PROPERTY LINE
CONT	CONTINUOUS	P.C. or PC	POINT OF CURVATURE
COP	CITY OF PORTLAND	D.C.C DCC	POINT OF COUNTER CURVATURE
001	ODOUBL (OF DOADWAY)	P.C.C. or PCC	POINT OF COUNTER CORVATORE
CRN or CRWN	CROWN (OF ROADWAY)	PERFORATED	
CSO	COMBINED SEWER	P.P. or PP	PRIMARY POWER or POWER POLE
CHLV	CULVERT	DDOD.	DDODOSED
DDI	DOLIDI E	FROF	POINT OF TANOFNOY
DBL	DOUBLE	P.I. or PI	POINT OF TANGENCY
DC	DOUBLE CHECK	PVC	POLYVINYL-CHLORIDE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	PIIF	PUBLIC LITHITY FASEMENT
DET	DETAIL	D.W.	DUDITO MODICO
DET	DETAIL DITOUR INVEST. DIA 4	P.W.	PUBLIC WORKS
DI	DUCTILE IRON or DITCH INLET DIA or Ø	R or RAD	RADIUS
DIAMETER		R.D. or RD	ROOF DRAIN
DIM	DIMENSION		
		REQ'D	REQUIRED
DOM	DOMESTIC	RDCR	REDUCER
DP	DEEP	R.P.	RADIUS POINT
DS	DOWN SPOUT	RT	RIGHT
DW	DRY WELL		
D W	DICT WELL	R/W or ROW	RIGHT-OF-WAY SLOPE
D/W	DRIVEWAY	S	SLOPE
DWG	DRAWING	SAN or S.S.	
ΕΛ	FACH		
LA	END OUDD DETUDN	SCHED	SCHEDULE
ECR	END CORB RETORN	SED	SEDIMENTATION
EG	EXISTING GRADE	SERV	SERVICE
F.I	FXPANSION JOINT	SHT	
	ELEVATION		SHEET
EL OF ELEV	ELE VA IION	SIM	SIMILAR
ELEC	ELECTRIC or ELECTRICAL	SPECS	SPECIFICATIONS
EMBED	EMBEDMENT	STA	STATION
FOP	EDGE OF PAVEMENT		
E O D	ENGINEED OF DECODE	STD	STANDARD
E.U.R.	ENGINEER OF RECORD	ST.D.	STORM DRAIN
E.P. or EP	ENDING POINT	STM	STORM SEWER
EQ	DOMESTIC DEEP DOWN SPOUT DRY WELL DRIVEWAY DRAWING EACH END CURB RETURN EXISTING GRADE EXPANSION JOINT ELEVATION ELECTRIC OF ELECTRICAL EMBEDMENT EDGE OF PAVEMENT ENGINEER OF RECORD ENDING POINT EQUAL END RETURN EROSION AND SEDIMENT CONTROL	STL	STORM DRAIN STORM SEWER STEEL
FR	FND RETURN		STRUCTURAL
ESC	END RETURN EROSION AND SEDIMENT CONTROL EACH WAY		
ESU	LINUSION AND SEDIMENT CONTROL	SW or SDWLK	SIDEWALK
EW	EACH WAY	TC	TOP OF CURB
EX or EXIST	EXISTING	TELEP	TELEPHONE
EXT	EXTERIOR	TAF	
		T.O.F.	TOP OF FOOTING
FD	FOUND	T.O.S.	TOP OF SLAB
FDC	FIRE DEPARTMENT CONNECTION	T.O.W.	TOP OF WALL
	FOUNDATION	TYP	
FF	FINISH FLOOR	115	TYPICAL
		U.E.	UNDERGROUND ELECTRICAL U.O.N
FG	FINISH GRADE	UNLESS OTHE	RWISE NOTED
FH	FIRE HYDRANT	U.P.	UNDERGROUND POWER
FIN	FINISH		
		U.R.M.	UNREINFORCED MASONRY
FL	FLOW LINE	U.T.	UNDERGROUND TELEPHONE
FL S	FLOW LINE SLOPE	V.B.	VALVE BOX
FLG	FLANGE	VERT	
			VERTICAL
FLR	FLOOR	VLT	VAULT
FP	FINISH PAVEMENT	WTR	WATER
FOC	FACE OF CURB	W.J.	WET JOINT
FTG	FOOTING		
		W.M.	WATER METER
GA	GAGE or GAUGE	W.Q.	WATER QUALITY
GALV	GALVANIZED	WV	WATER VALVE
GB	GRADE BREAK	W.W.F.	MELDED MIDE EXDDIO
GEN	GENERAL	W/	WITH
GR	GROUND	w/o	WITHOUT
GS	GROUND SHOT	11/0	WITHOUT

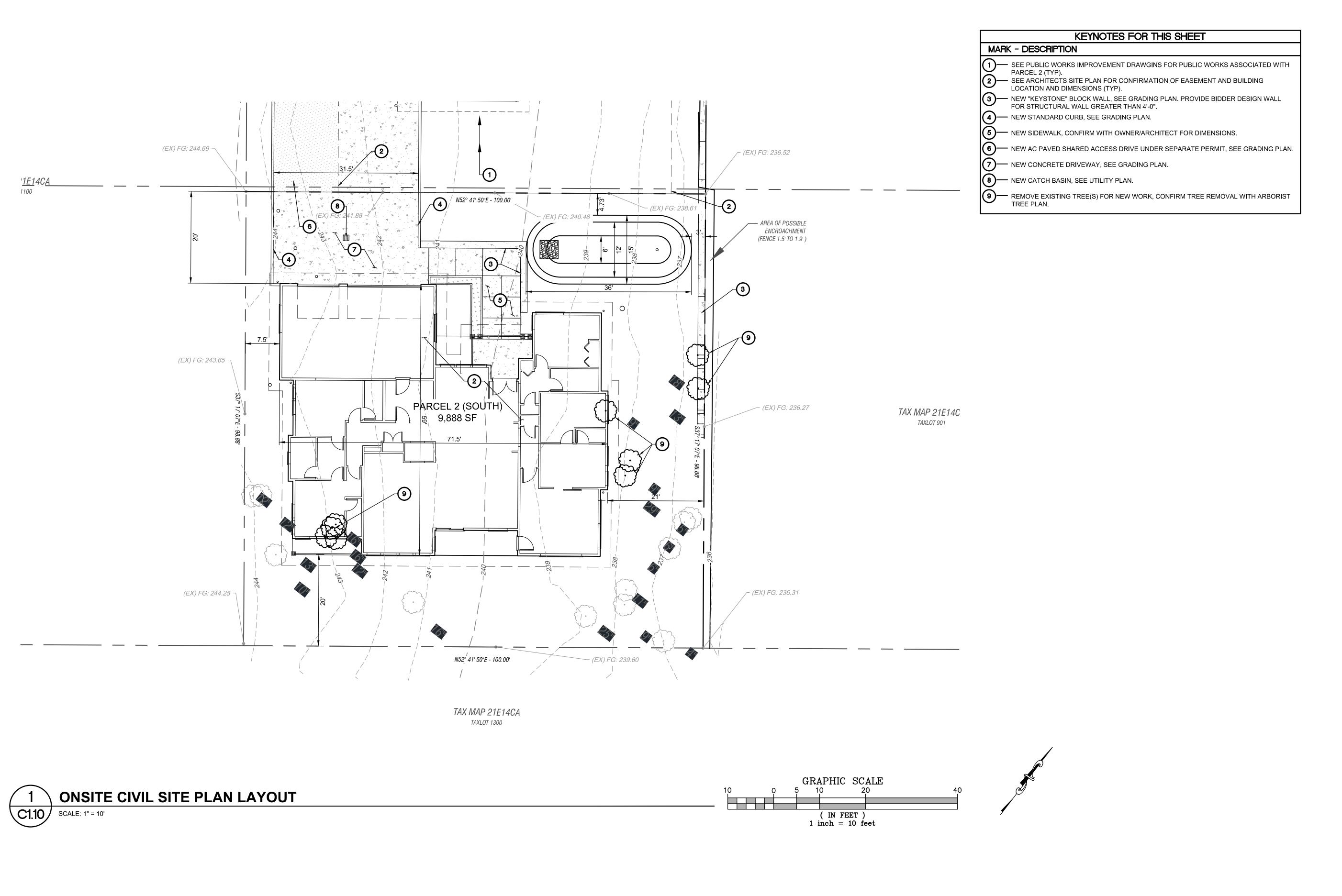
	CIVIL DRAWINGS					
Sheet Number	Sheet Litle					
C1.00	ONSITE CIVIL NOTES AND ABBREVIATIONS					
C1.10	ONSITE CIVIL SITE PLAN LAYOUT					
C2.00	ONSITE CIVIL EROSION AND SEDIMENT					
	CONTROL					
C2.10	ONSITE CIVIL UTILITY PLAN					
C2.20	ONSITE CIVIL GRADING PLAN					
C3.00	ONSITE CIVIL DETAILS					
C3.10	ONSITE CIVIL DETAILS					

OREGON RENEWS: 12-31-2019

22 ST

SHEET

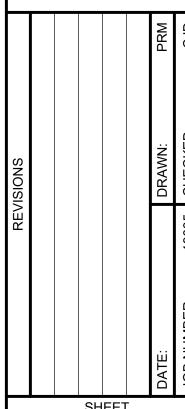
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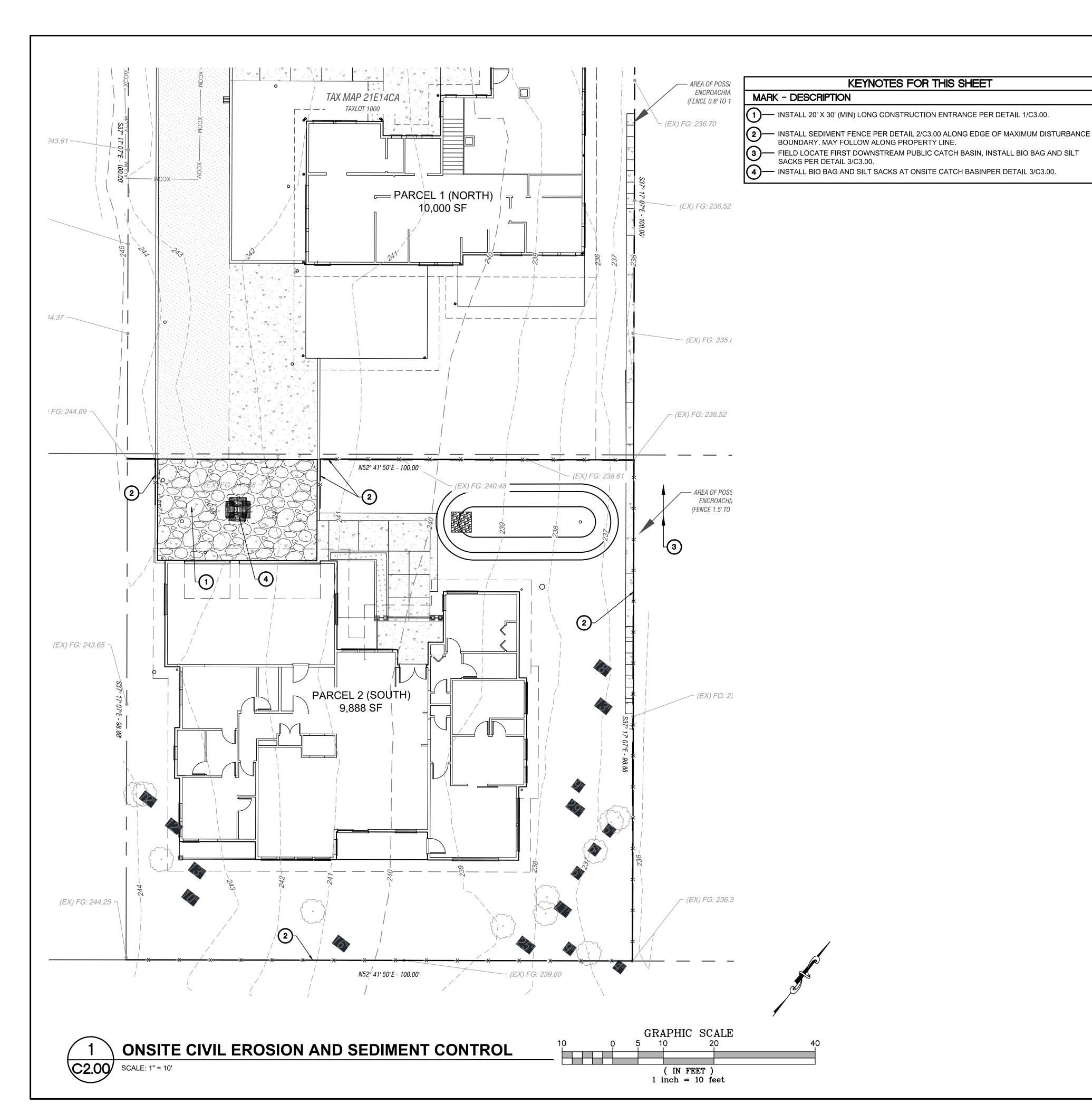


RENEWS: 12-31-2019

2322 ARBOR DRIVE WEST LINN, OR 97068

ARBOR DRIVE





EMERGENCY CONTACT: TBD

08.0 EROSION CONTROL NOTES

- APPLICANT/CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER INSTALLATION AND MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL MEASURES, IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL
- 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.

- 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.
- 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.
- 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.
- THE ESC FACILITIES SHALL BE INSPECTED DAILY BY THE APPLICANT/CONTRACTOR AND MAINTAINED AS NECESSARY TO ENSURE THEIR CONTINUED FUNCTIONING.
- 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.
- 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.
- 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.) 5. 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

- 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
- 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
- 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.
- SEDIMENT FENCES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
- 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

- 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.
- 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.
- 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.
- 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.
- 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. 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
- 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.

OREGON . DESU

RENEWS: 12-31-2019

322 EST

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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.

- 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.

— INSTALL STANDARD CLEANOUT. SEE DETAIL 8/C3.00 OR 9/C3.00, SET RIM TO FINISH GRADE. FIELD VERIFY.

 COORDINATE WITH FRANCHISE UTILITY PROVIDERS TO EXTEND SERVICE TO PARCEL 2 BUILDING. EXTEND SERVICE FROM EXISTING UTILITY STUBS INSTALLED UNDER PARCEL PERMIT.

 COORDINATE WITH GAS PROVIDER TO EXTEND SERVICE TO PARCEL 2 BUILDING. EXTEND SERVICE FROM EXISTING GAS STUB INSTALLED UNDER PARCEL 1 PERMIT. 10 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. — 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 OUT FALL. I.E. AT OUT FALL = 241.50.

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.

 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

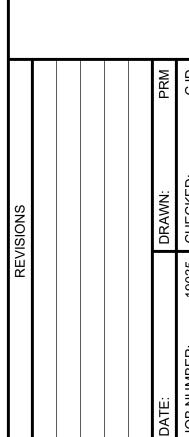
RENEWS: 12-31-2019

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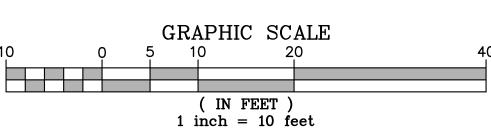
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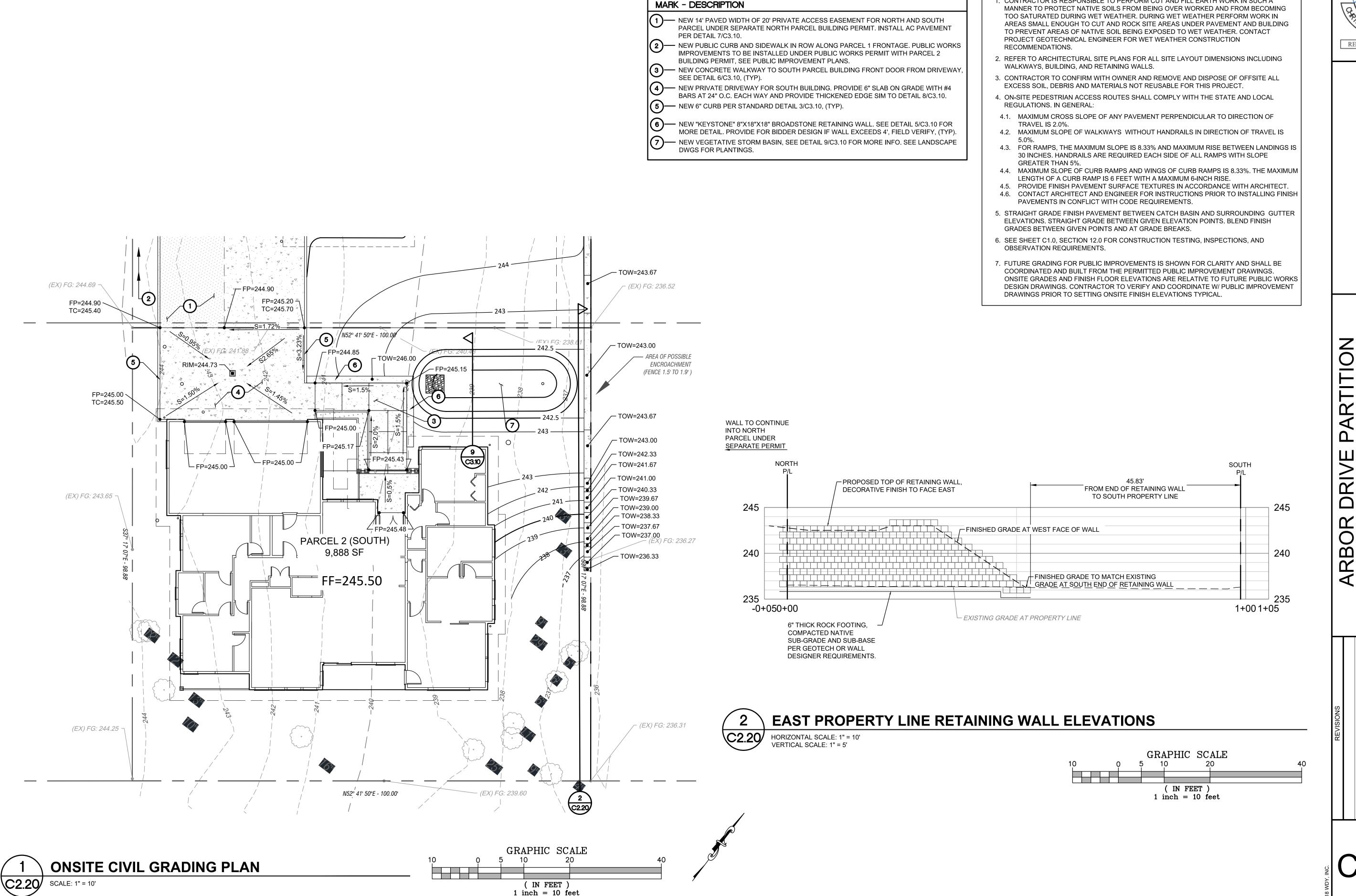
2322, WEST



4 of 7

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





KEYNOTES FOR THIS SHEET

GRADING NOTES:

1. CONTRACTOR IS RESPONSIBLE TO PERFORM CUT AND FILL EARTH WORK IN SUCH A

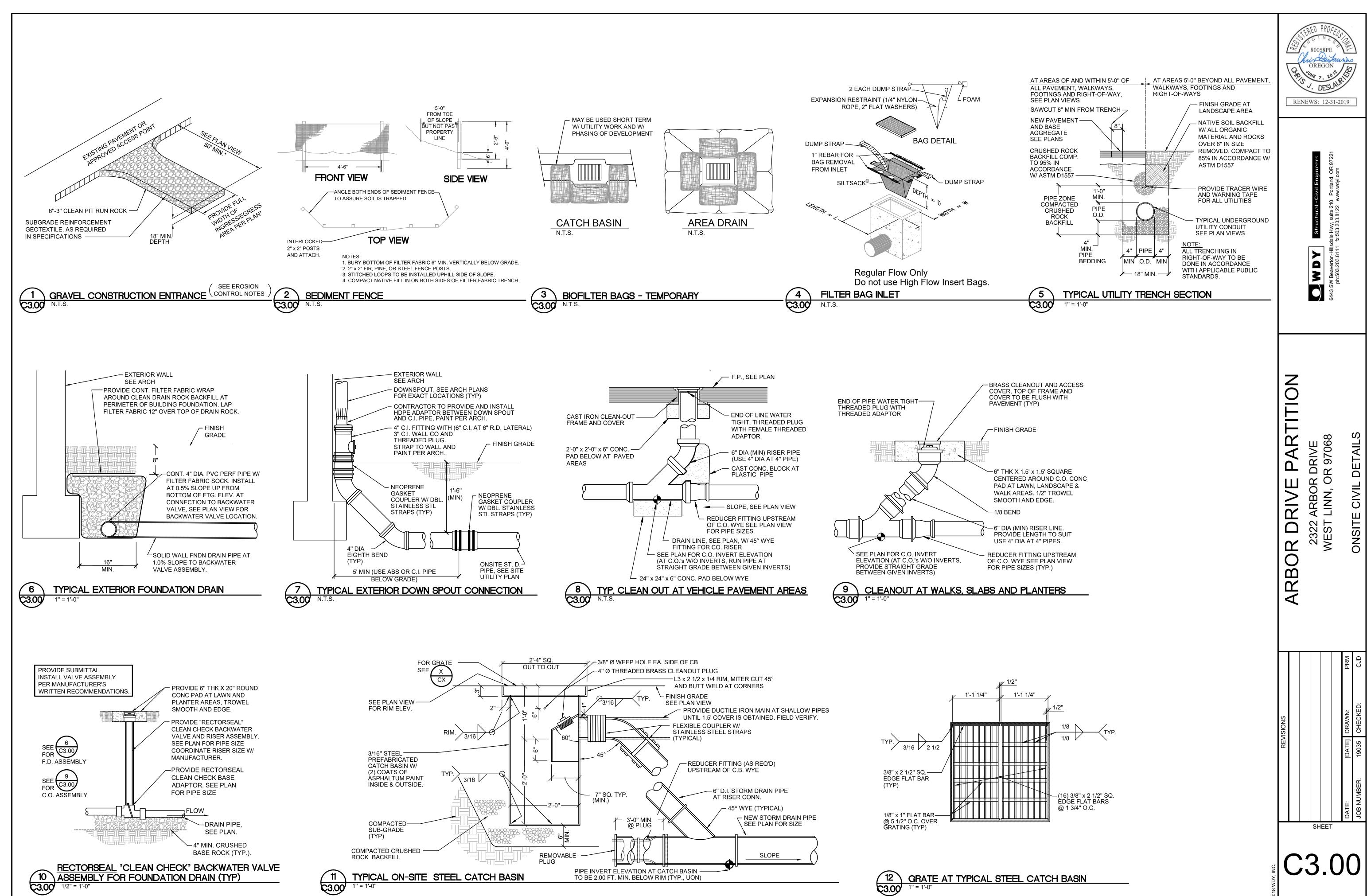
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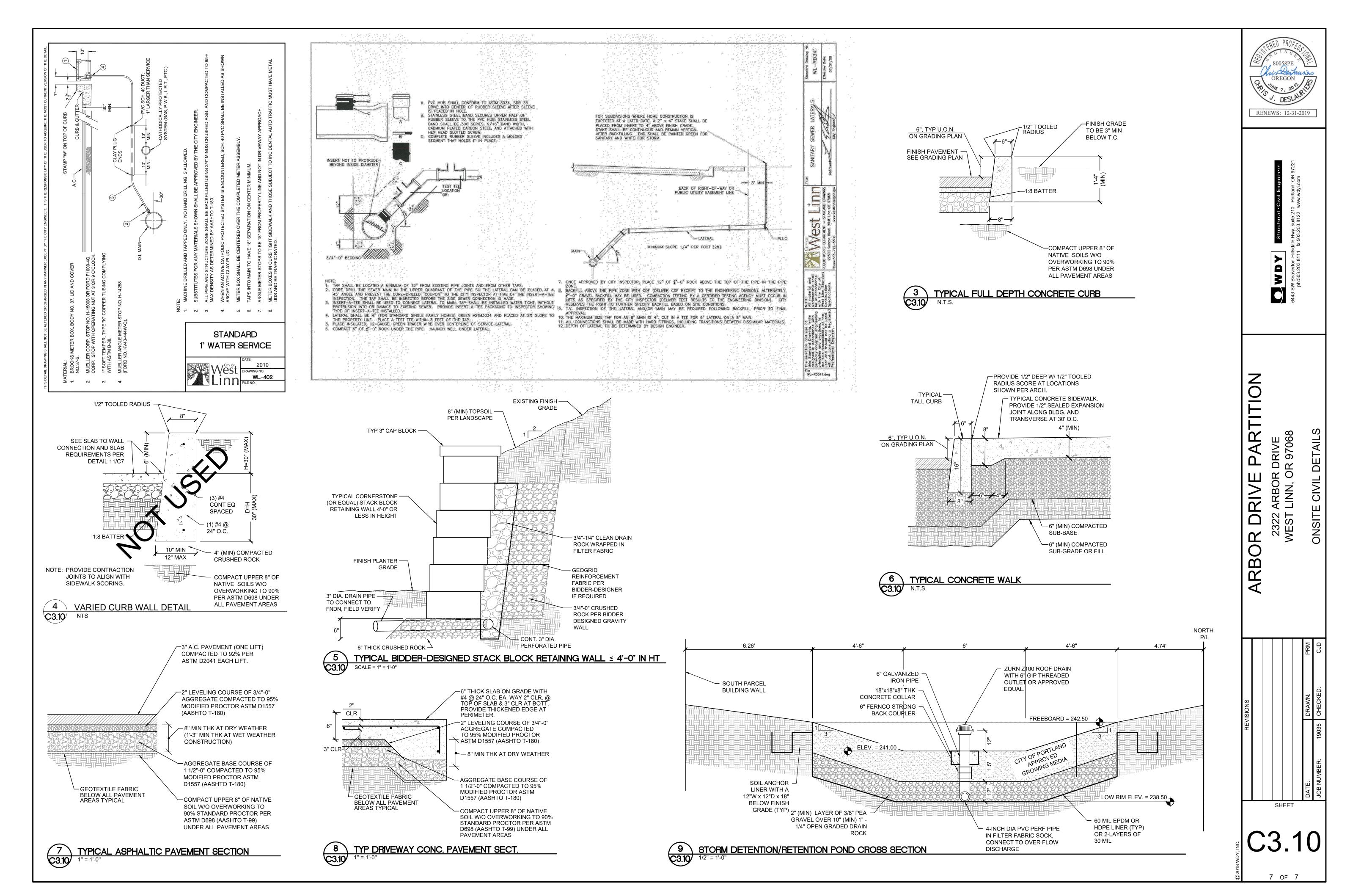
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PRELIMINARY STORM DRAINAGE **CALCULATIONS**

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:	
Geotech Recommendations:	
Storm Rasin 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 STM-2

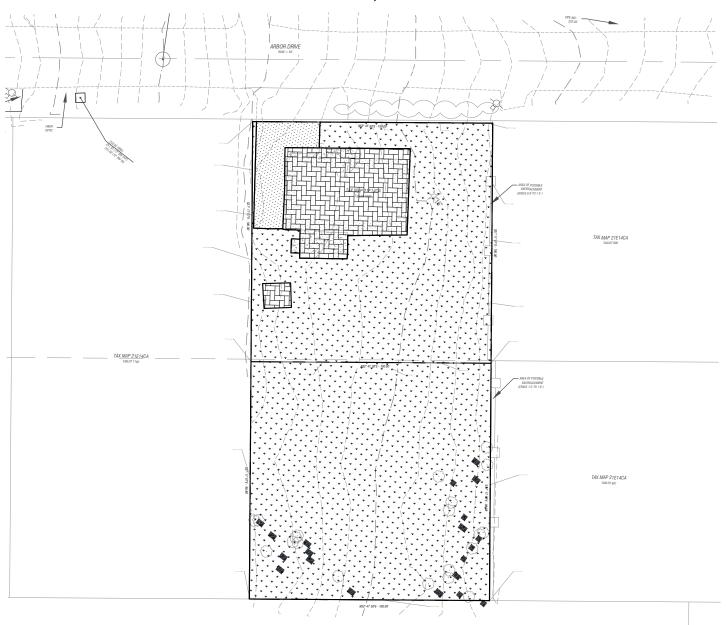
Storm Basin:

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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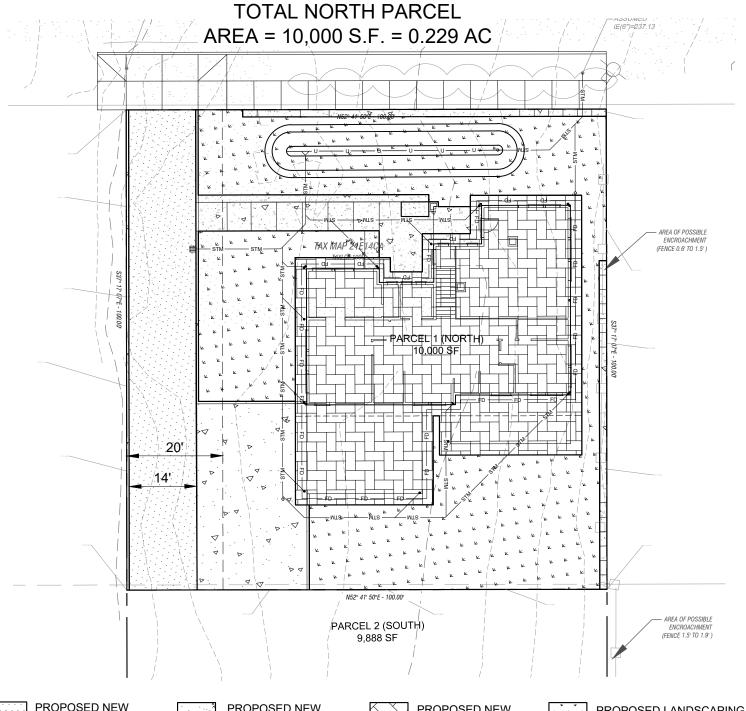


Structural · Civil Engineers

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 RESIDENTIALDate:MAR 2019Job No.:19035Drawn:PRM

Client: H&K Sheet: STM-3





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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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:

©2018 WDY, INC.

PRM

MAR 2019

Job No.: 19035 **Drawn:**

Sheet: S H&K Client:

ORTLAND P		311	MPLIF	PROJECT INFOR			• • • • • • • • • • • • • • • • • • • •	
7	PROJECT INFORM	1ATION	ı				STM-5	
1851	Permit Number:			Phone:				
	Name:			Email:				
Stormwater Management Manual		Site Address/R Number(s): Development Description:						
	-			Date:				
SITE CHARA	CTERISTICS			Required Infiltra Date of Test:		_		
S.1. Do slopes exc within the pro	eed 20% anywhere oject area?	☐ Yes	No	Depth of Excavation (f				
	ngs, seeps, or a high ground hin the project area?				TEST 1	TEST 2	TEST 3	
If answer to S.1 or	S.2 is yes, than lined or part	tial infiltrati	ion facility	A. Time (of day)				
	o an approvable discharge po uired geotechnical report?	•		B. Duration (hours) (1 hour minimum)				
·	.4. Required infiltration testing complete?			C. Initial Water Depth (inches)				
.	esults at same site,			D. Final Water Depth				

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.
- 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.
- 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.

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

Test pit location (site plan sketch)

(inches)

E. Infiltration Rate*

(inches/hour)

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			

SIMPLIFIED APPROACH FORM

PROPOSED STORMWATER FACILITIES

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**.

	STORMWATER FACILITY TYPE	TOTAL AREA MANAGED BY FACILITY TYPE (SF)	FACILITY SIZING FORMULA	FACILITY SIZE (SF)
OUS ION QUE	Tree Credit		Complete Tree Credit Worksheet and attach	n/a
IMPERVIOUS AREA REDUCTION TECHNIQUE	Ecoroof		1:1 ratio only	n/a
IMF REI TE	Pervious Pavement		1:1 ratio only	n/a
_	Downspout Extension		Area x 0.10	
SURFACE INFILTRATION OR FILTRATION	Rain Garden		Area x 0.10	
FACE INFILTRAT OR FILTRATION	Basin		Area x 0.09	
CE IN	Swale		Area x 0.09	
URFA	Planter		Area x 0.06	
v ·	Filter Strip (paved areas only)		Area x 0.20	
SUBSURFACE DISPOSAL UIC	Soakage Trench		Westside soakage trench no longer an option under the simplified approach. Only a single soakage trench sizing possible. See below for sizing information.	
SUBS DISI	Drywell		Enter drywell type and quantity for facility size. See below for sizing information.	
TOTAL IMPERVIOUS AREA MANAGED			Total Impervious Area Managed must match Redeveloped Impervious Area. Site plans m facility location, drainage areas, overflows a	ust identify stormwater

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

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



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 wer 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.



STM-8

Table 2 Callinary of Infiltration rest Results	Table 2- Summa	y 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:

- 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 observered 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.



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SITE AERIAL AND EXPLORATION LOCATIONS

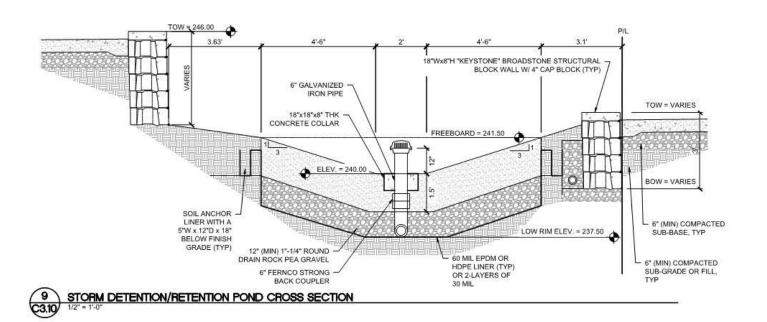




Structural • Civil Engineers

Job Name: Arbor Drive Residential Partition Job No: 19035 Sheet No: STM - 10

Client: Hamilton and Kashoro Date: March 2019 By: PRM



CIVIL NOTES

01.0 GENERAL

- THESE NOTES SET MINIMUM STANDARDS FOR CONSTRUCTION. THE DRAWINGS GOVERN OVER THE GENERAL NOTES TO THE EXTENT SHOWN.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS ON DRAWINGS AND IN FIELD. NOTIFY OWNER'S REPRESENTATIVE OF ANY DISCREPANCIES PRIOR TO
- PROCEEDING WITH WORK CONTRACTOR SHALL BE SOLELY RESPONSIBLE TO PROVIDE FOR ALL NECESSARY TRAFFIC CONTROL PLANS, TEMPORARY SHORING AND OTHER INCIDENTAL WORK NEEDED FOR THE COMPLETION OF THE WORK.
- WHERE REFERENCE IS MADE TO IBC, ASTM, AISC, ACI OR OTHER STANDARDS, THE LATEST ISSUE AT THE BUILDING PERMIT DATE SHALL APPLY.
- ALL WORK AND MATERIALS SHALL BE IN COMPLIANCE WITH THE PROJECT SPECIFICATIONS, THE "INTERNATIONAL BUILDING CODE" (IBC), THE INTERNATIONAL
- PLUMBING CODE (IPC) AND THE PROVISIONS OF "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION", 1996 EDITION, OREGON STATE HIGHWAY DIVISION (OSHD), AS AMENDED BY ALL OTHER STATE AND LOCAL CODES, JURISDICTIONS, PERMITS, AND BUILDING REQUIREMENTS THAT APPLY. THE CONTRACTOR SHALL OBTAIN ALL APPLICABLE CONSTRUCTION PERMITS AND SUBMIT TRAFFIC CONTROL PLANS PRIOR TO PROCEEDING WITH WORK.
- EXISTING UTILITIES, SITE AND TOPOGRAPHIC INFORMATION SHOWN HEREON ARE BASED ON RECORD DRAWINGS PROVIDED BY OR MADE AVAILABLE BY THE OWNER. THE CONTRACTOR IS REQUIRED TO FIELD VERIFY THE LOCATION OF EXISTING FEATURES AND UTILITIES PRIOR TO CONSTRUCTION, AND SHALL ARRANGE FOR THE RELOCATION OF ANY IN CONFLICT WITH THE PROPOSED WORK. MINOR ADJUSTMENTS BASED ON FIELD CONDITIONS SHALL BE MADE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. LOCAL COUNTY AND CITY RECORD DRAWINGS SHOULD BE REVIEWED BY THE CONTRACTOR FOR THIS PURPOSE. THE EXISTENCE AND LOCATION OF EXISTING FEATURES ARE NOT GUARANTEED. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF INFORMATION OBTAINED FROM RECORD DRAWINGS OR INFORMATION PROVIDED BY OTHERS, IMPLIED OR OTHERWISE.
- ATTENTION EXCAVATORS: OREGON LAW REQUIRES YOU TO FOLLOW RULES ADOPTED BY OREGON UTILITY NOTIFICATION CENTER. THOSE RULES ARE SET FORTH BY OAR 952-001-0010 THROUGH OAR 952-001-0090. YOU MAY OBTAIN COPIES OF THESE RULES FROM THE CENTER BY CALLING (503) 232-1987. IF YOU HAVE ANY QUESTIONS ABOUT THE RULES, YOU MAY CONTACT THE CALL CENTER. YOU MUST NOTIFY THE CENTER AT LEAST 2 BUSINESS DAYS, BUT NOT MORE THAN 10 BUSINESS DAYS, BEFORE COMMENCING AN EXCAVATION. CALL (800) 332-2344.
- CONTRACTOR SHALL CAREFULLY MAINTAIN BENCHMARKS, PROPERTY CORNERS, MONUMENTS, AND OTHER REFERENCE POINTS. IF SUCH POINTS ARE DISTURBED OR DESTROYED BY CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL PAY FOR THEIR REPLACEMENT BY EMPLOYING A PROFESSIONAL LAND SURVEYOR TO RESET PROPERTY CORNERS AND OTHER SUCH MONUMENTS.
- CONTRACTOR TO COORDINATE AND PROVIDE INSTALLATION AS NECESSARY OF ALL PUBLIC AND PRIVATE UTILITIES FOR THIS PROJECT INCLUDING WATER SERVICE, SANITARY SEWER SERVICE, STORM DRAIN, ELECTRIC POWER, COMMUNICATIONS, CABLE TV, NATURAL GAS, STREET LIGHTS, ETC.
- 10. CONTRACTOR TO MAINTAIN ONE COMPLETE SET OF APPROVED DRAWINGS ON SITE FOR THE SOLE PURPOSE OF CONTRACTOR RECORDING AS-BUILT INSTALLATION OF IMPROVEMENTS. SUBMIT AS-BUILT PLANS TO OWNER.
- 11. ALL CONSTRUCTION ACTIVITY SHALL BE DONE IN A SAFE AND NEAT MANNER AND UNDER OBSERVATION BY CITY FORCES.
- 12. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR COMPLYING WITH ALL CONSTRUCTION SAFETY, HEALTH AND OTHER RULES AND REGULATIONS FROM OSHA, DEQ, STATE, AND LOCAL REGULATING AGENCIES FOR SAFETY AND INSTALLATION OF THE WORK INCLUDING BUT NOT LIMITED TO SHORING, BRACING, ERECTION / INSTALLATION, FALL PROTECTION, GUARDRAILS, ETC.
- 13. ALL SEWER TRENCH LINES AND EXCAVATIONS SHALL BE PROPERLY SHORED AND BRACED TO PREVENT CAVING. UNUSUALLY DEEP EXCAVATIONS MAY REQUIRE EXTRA SHORING AND BRACING. ALL SHEETING, SHORING, AND BRACING OF TRENCHES SHALL CONFORM TO OREGON OCCUPATIONAL SAFETY AND HEALTH DIVISION (OSHA) REGULATIONS AND THE CITY OR COUNTY STANDARD CONSTRUCTION SPECIFICATIONS.
- 14. ALL UNDERGROUND UTILITIES SHALL BE INSTALLED PRIOR TO CONSTRUCTION OF CURBS, RETAINING WALLS, OR PAVEMENT.
- 15. ALL WATER AND SEWERAGE APPURTENANCES SHALL CONFORM TO APWA, OREGON CHAPTER, "STANDARDS SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION"; THE APPROVED CONSTRUCTION DRAWINGS; AND CITY OF WEST LINN REQUIREMENTS.
- 16. ELEVATION DATUM IS BASED ON NGS DATA POINT "SHEPHERD AJ8191". 17. EXISTING TOPOGRAPHY, UTILITIES, AND ELEVATION DATUM ARE BASED ON THE OWNER'S TOPOGRAPHIC SURVEY PROVIDED BY THE OWNER/DEVELOPER. THE EXISTENCE AND LOCATION OF EXISTING FEATURES ARE NOT GUARANTEED. ADDITIONAL UNDERGROUND UTILITIES MAY EXIST. THE ENGINEER/WDY ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF INFORMATION PROVIDED BY OTHERS, IMPLIED OR OTHERWISE.
- 18. DETAILS SHOWN ON THE DRAWINGS ARE INTENDED TO APPLY AT ALL SIMILAR
- CONDITIONS AND LOCATIONS. 19. DO NOT SCALE INFORMATION FROM DRAWINGS.
- 20. CONTRACTOR TO REMOVE FROM SITE EXCESS SOIL OR OTHER MATERIALS NOT REUSABLE FOR THIS PROJECT, AND COMPLY WITH ALL RECOMMENDATIONS OF THE PROJECT GEOTECHNICAL REPORT.
- 21. APPROPRIATE BENCHING OF FILLS IS REQUIRED FOR FILLS OVER 5 FEET IN HEIGHT ON SLOPES IN EXCESS OF 5 HORIZONTAL TO 1 VERTICAL. THE GEOTECHNICAL ENGINEER SHALL INSPECT BENCHES PRIOR TO FILL PLACEMENT
- 22. CUT AND FILL SLOPES SHALL BE PROTECTED FROM EROSION. SUCH CONTROL MAY CONSIST OF APPROPRIATE REVEGETATION OR OTHER ACCEPTABLE MEANS AND METHODS. EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EARTHWORK
- 23. MATERIAL IN SOFT SPOTS WITHIN 5 FEET OF RIGHT-OF-WAYS, PAVEMENTS OR BUILDINGS SHALL BE REMOVED TO THE DEPTH REQUIRED TO PROVIDE A FIRM SUBGRADE AND SHALL BE REPLACED WITH 1-1/2" - 0" CRUSHED ROCK COMPACTED TO
- 24. THE NATIVE SUBGRADE SURFACE SHALL BE APPROVED BEFORE SCARIFYING OR PLACING ANY FILL OR BASE ROCK BY THE SOILS ENGINEER. THE UPPER 8 INCHES OF NATIVE SUBGRADE IS TO BE SCARIFIED. DRIED AND RECOMPACTED TO 90% MAXIMUM DRY DENSITY PER ASTM D698. PLACE GEOTEXTILE FABRIC (MIRAFI 500X, PROPEX GEOTEX 200ST, CONTECH C200 OR EQUAL) BELOW ALL VEHICULAR PAVEMENT. FOR WET WEATHER CONSTRUCTION (AS DETERMINED BY THE GEOTECHNICAL ENGINEER) A WORKING BLANKET OF PIT RUN OR CRUSHED ROCK IS TO BE LAID OVER GEOTEXTILE FABRIC. ON-SITE COMPACTION TESTS AND DEFLECTION TEST(S) PERFORMED WITH A 50,000 LB. VEHICLE MUST BE PERFORMED AND WITNESSED BY THE GEOTECHNICAL ENGINEER. NO DEFLECTION IS ALLOWED AND ALL BUILDING AND PAVEMENT AREAS. MUST BE PROOF-ROLLED. DURING WET WEATHER CONSTRUCTION (AS DETERMINED BY THE SOILS ENGINEER), PROVIDE THE PROOF-ROLL TEST OVER THE BASE ROCK SURFACES PRIOR TO PLACEMENT OF ANY PAVEMENT
- 25. CRUSHED ROCK BASE MATERIAL AND PIPE ZONE MATERIAL SHALL BE CRUSHED ROCK CONFORMING TO OREGON DEPARTMENT OF TRANSPORTATION (ODOT) SECTION 00640 AND 00641 AND BE COMPACTED TO 95% OF MAXIMUM DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D1557.
- 26. 3/4 " 0" CRUSHED ROCK PIPE ZONE AND BACKFILL MATERIAL IS REQUIRED FOR ALL UTILITY LINES, CONDUITS AND LEVELING COURSES. REFER TO THE TYPICAL UTILITY CONDUIT TRENCH AND PAVEMENT DETAILS.
- 27. ASPHALTIC CONCRETE (A.C.) PAVEMENT SHALL BE A LEVEL 4 HMAC SUPER PAVE WITH AN ASPHALT CONTENT PER OREGON DOT CLASSIFICATION AND APPRVED JMFM FOR ALL LIFTS. PAVEMENT SHALL BE PLACED ONLY ON DRY, CLEAN AND PROPERLY PREPARED SURFACES, AND WHEN CONDITIONS MEET THE SPECIFICATIONS AS SET FORTH IN THE MOST RECENT EDITION OF THE OREGON DOT SPECIFICATIONS. ALL NEW PAVEMENT AREAS SHALL CONFORM TO THE TYPICAL PAVEMENT SECTION DETAIL. ALL A.C. PAVEMENT TO BE COMPACTED TO 91% OF MAXIMUM DENSITY PER ASTM D2041 FOR FIRST LIFTS LESS THAN 3-INCHES AND 92% COMPACTION SHALL BE REQUIRED FOR SUBSEQUENT LIFTS.
- 28. ALL JOINTS BETWEEN A.C AND CONCRETE STRUCTURES MUST BE TACKED WITH BITUMASTIC. NO EXCEPTIONS ALLOWED.
- 29. ALL PORTLAND CEMENT CONCRETE PAVEMENT SHALL HAVE A 28 DAY MINIMUM ULTIMATE STRENGTH OF 4000 PSI. PROVIDE A MINIMUM OF (4) TEST CYLINDERS IN ACCORDANCE WITH CURRENT IBC AT EACH POUR.
- A. MINIMUM MIX REQUIREMENTS: CEMENT CONTENT PER YARD: 5 SACKS.
- II. MAXIMUM WATER/CEMENT RATIO: 0.45. FLY ASH MEETING ASTM C618 AND WITH LOSS ON IGNITION LESS THAN 3% MAY BE ADDED TO THE CEMENT, BUT NOT
- III. SLUMP: 3 INCH TO 4 INCH. DEVIATING FROM DESIGN SLUMP +1/2 INCH TO -1 INCH. WHEN CONCRETE IS TO BE PUMPED, ADD PLASTICIZERS MEETING ASTM C494 AND PROVIDE A NEW MIX DESIGN. DO NOT ADD WATER.
- IV. ADMIX: PROVIDE WATER REDUCING ADMIX (MASTER BUILDERS) AND REDUCE WATER USED BY 10% MINIMUM FOR ALL SLABS.
- V. AIR ENTRAINMENT: PER ACI 301 AND 306 AT ALL EXTERIOR SLABS AND FLAT WORK, 5.5% AIR MINIMUM.
- VI. ALL ADMIXTURES TO BE COMPATIBLE FROM SAME MANUFACTURER. B. PLACE AND CURE ALL CONCRETE PER ACI CODES AND STANDARDS. C. SLEEVES, PIPES OR CONDUITS OF ALUMINUM SHALL NOT BE EMBEDDED IN

- 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. INSTALL JOINTS AT ALL RE-ENTRANT CORNERS. E. PROVIDE 1/4" PREMOLDED EXPANSION JOINT MATERIAL BETWEEN SLABS AND WALLS
- THAT ARE NOT DOWELED TOGETHER, AND AROUND COLUMNS THAT DO NOT HAVE SLAB BLOCKOUTS. 31. ON-SITE HANDICAP/DISABILITY ACCESS ROUTES SHALL COMPLY WITH THE AMERICANS
- WITH DISABILITIES ACT (ADA), STATE AND LOCAL REGULATIONS. NOTIFY ARCHITECT AND ENGINEER PRIOR TO INSTALLING FINISH PAVEMENT IN CONFLICT WITH ADA REQUIREMENTS. CONTRACTOR TO VERIFY GRADING OF ADA PATHS OF TRAVEL AND PARKING STALLS AND CONTACT ENGINEER OF RECORD FOR ADDITION WORK IF EXISTING GRADING IS FOUND NOT TO MEET CODE REQUIREMENTS. IN GENERAL:
- F. MAXIMUM CROSS SLOPE OF ANY PAVEMENT PERPENDICULAR TO DIRECTION OF TRAVEL IS 2.0%.
- G. MAXIMUM SLOPE OF WALKWAYS IN DIRECTION OF TRAVEL IS 5.0% H. 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
- I. MAXIMUM SLOPE OF CURB RAMPS AND WINGS OF CURB RAMPS IS 8.33%. THE MAXIMUM LENGTH OF A CURB RAMP IS 6 FEET.
- J. PROVIDE FINISH PAVEMENT SURFACE TEXTURES IN ACCORDANCE WITH ADA. K. STRAIGHT GRADE FINISH PAVEMENT AND TOP OF CURB ELEVATIONS BETWEEN GIVEN ELEVATION POINTS. BLEND FINISH GRADES AT GRADE BREAKS.
- PAVEMENT MARKINGS ON AC PAVEMENT SHALL BE MPI #32 ALKYD PAINT. INSTALL PER MANUFACTURERS RECOMMENDATIONS. VERIFY PAINT LOCATIONS, COLORS AND
- STENCILS WITH ARCHITECT. 33. ADA STALL PAVEMENT STENCILS SHALL BE THERMOPLASTIC STENCIL INSTALLED PER MANUFACTURES RECOMMENDATIONS.

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.
- NOTIFY ARCHITECT 2 BUSINESS DAYS BEFORE COMMENCING WORK. 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.) FOUNDATIONS, FENCES, RAILINGS, MACHINERY, ETC. WITHIN THE CLEARING LIMITS. THE ITEMS LISTED ABOVE SHALL BE DISPOSED OF OFF-SITE. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO CONFIRM THE NUMBER AND TYPE OF STRUCTURES TO BE REMOVED. CONTRACTOR SHALL OBTAIN ALL NECESSARY DEMOLITION AND WORK PERMITS.
- ALL BURIED STRUCTURES (I.E. TANKS, LEACH LINES, DRAIN TILE, AND PIPES) NOT DESIGNATED TO REMAIN ON THE SITE, SHALL BE REMOVED AND THE RESULTING EXCAVATIONS SHALL BE PROPERLY INSPECTED, BACKFILLED AND COMPACTED PRIOR TO ANY GRADING OR FILLING OPERATIONS. THIS IS TO INCLUDE STUMPS AND ROOTBALLS OF TREES TO BE REMOVED FROM THE SITE. NOTIFY CITY FOR
- THE AREA OF THE SITE DESIGNATED ON THE PLAN TO BE REGRADED OR PAVED SHALL BE STRIPPED TO REMOVE ALL ORGANIC MATERIAL DOWN TO FIRM SUBGRADE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING SUBGRADE SOILS FROM OVERWORKING AND PROVIDE REPAIR TO DAMAGED SUBGRADE AT NO ADDITIONAL
- 6. ALL UNSUITABLE MATERIAL (SOIL AND VEGETATION) REMOVED DURING THE CLEARING AND GRUBBING OPERATIONS SHALL BE REMOVED BY THE CONTRACTOR AND LEGALLY
- DISPOSED OF IN A SUITABLE LOCATION. EXCAVATORS MUST COMPLY WITH ALL PROVISIONS OF ORS 757.541 TO 757.571 INCLUDING NOTIFICATION OF ALL OWNERS OF UNDERGROUND FACILITIES AT USA LOCATES (681-7044), AT LEAST 48 BUSINESS HOURS, BUT NOT MORE THAN 10 BUSINESS DAYS BEFORE COMMENCING AN EXCAVATION.
- ALL EMBANKMENTS REQUIRED SHALL BE STRUCTURAL FILL MEETING THE REQUIREMENTS AND SPECIFICATIONS OF IBC CHAPTER 18.
- 9. ALL EXCESS MATERIAL NOT UTILIZED ON-SITE SHALL BE LEGALLY DISPOSED OF BY THE CONTRACTOR.
- 10. TREES NOT DESIGNATED TO BE REMOVED BY THE ARCHITECT SHALL BE PROTECTED AT ALL TIMES.
- 11. SAWCUT STRAIGHT LINES TO MATCH EXISTING PAVEMENT WITH THE NEW PAVEMENT. 12. CONTRACTOR SHALL PROVIDE AND MAINTAIN ADEQUATE TRAFFIC CONTROL ALONG

THE EXISTING ROADS AS REQUIRED BY THE CITY OF WEST LINN.

03.0 PRIVATE UTILITIES

- 1. CONTRACTOR TO PROVIDE UTILITY SUBMITTALS FOR REVIEW PRIOR TO INSTALLATION OF ALL PROPOSED UTILITY PIPES, CONDUITS, MANHOLES, BENDS/FITTINGS AND ALL OTHER SYSTEM APPURTENANCES.
- 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.
- 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. 4. ALL CONNECTIONS TO EXISTING PUBLIC STORM SEWER, SANITARY SEWER AND
- WATER MAINS REQUIRE ISSUANCE OF A PUBLIC WORKS PERMIT AND INSPECTION BY THE CITY OF WEST LINN AND THE WEST LINN WATER DISTRICT AS APPLICABLE. PRIVATE SANITARY SEWER LATERALS SHALL COMPLY WITH THE REFERENCED PUBLIC STANDARDS AND DRAWINGS FOR PUBLIC SANITARY SEWER. LAY THE 'T' AT A 2%
- CAST IRON SANITARY OR STORM DRAIN PIPE AND JOINTS SHALL BE HUBLESS, SERVICE WEIGHT, AND MEET THE REQUIREMENTS OF CISPI 301. JOINTS SHALL BE MECHANICAL CLAMP RING TYPE, STAINLESS STEEL EXPANDING AND CONTRACTING SLEEVES WITH FULL CIRCLE NEOPRENE RIBBED GASKETS FOR POSITIVE SEAL. COUPLINGS AND SHIELDS TO BEAR THE MANUFACTURER'S REGISTERED INSIGNIA. INSTALL IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
- PVC SANITARY SEWER OR STORM DRAIN PIPE SHALL BE ASTM D3034, SDR-35. COMPATIBLE ASTM D3034 FITTINGS MUST BE USED WITH ASTM D3034 PIPE. ALL ASTM D3034 PIPE USED MUST BE OF WATER-TIGHT JOINTS AND TESTED FOR ROUNDNESS AFTER BACKFILL. PROVIDE PRESSURE TEST. PROVIDE TV VIDEO TAPE IF SO REQUIRED BY THE JURISDCITION HAVING AUTHORITY.
- HIGH DENSITY POLYETHYLENE (HDPE) STORM DRAIN PIPE AND ASSOCIATED HDPE FITTINGS SHALL MEET THE REQUIREMENTS OF ASTM D 3350 OR ASTM 1248, TYPE III, CLASS C, CATEGORY 4, GRADE P33. 4 INCH TO 10 INCH PIPE SHALL MEET AASHTO M252 TYPE S: 12 INCH TO 36 INCH PIPE SHALL MEET AASHTO M294 TYPE S: 42 INCH TO 48 INCH SHALL MEET AASHTO MP6-95, TYPE S; AND 54 INCH TO 60 INCH SHALL MEET AASHTO M294, TYPE S. JOINTS SHALL BE BELL AND SPIGOT COUPLINGS, OR EQUIVALENT, AND CONFORM TO ASTM D3212. INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D2321 WITH EXCEPTION THAT MINIMUM COVER IN TRAFFIC
- AREAS SHALL BE 18 INCHES. ABS SCHEDULE 40 SOLID WALL PLASTIC PIPE AND FITTINGS MEETING REQUIREMENTS OF ASTM D 2661 JOINED WITH PIPE CEMENT MEETING REQUIREMENTS OF ASTM 2235. DUCTILE IRON PIPE: AWWA C-151, CLASS 52, WITH GASKETED BELL & SPIGOT JOINTS,
- SEAL COATED PER AWWA C-104. REINFORCED CONCRETE STORM DRAIN PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C76, CLASS IV. PROVIDE WATER TIGHT JOINTS USING RUBBER RING GASKETS.
- 12. BURIED EXTERIOR PERFORATED FOUNDATION DRAIN PIPE WITH CONTINUOUS FILTER FABRIC SOCK SHALL BE "ADS DRAINGUARD" OR PVC SCHED 40 PERFORATED PIPE WITH SOLVENT WELD JOINTS. INSTALL DRAIN PIPE AT 0.5% SLOPE UP FROM BOTTOM OF FOOTING IN EACH DIRECTION AROUND THE BLDG FROM THE BACKWATER VALVE(S) CONNECTION LOCATION(S) TO THE SITE STORM DRAINAGE SYSTEM. PROVIDE FILTER FABRIC WRAP AROUND A 24 INCH WIDE X 24 INCH HIGH (MIN.) CLEAN DRAIN ROCK BACKFILL SECTION AT PERIMETER OF BUILDING FOUNDATION. LAP FILTER FABRIC 12 INCHES OVER TOP OF DRAIN ROCK SECTION. TOP OF DRAIN ROCK TO BE 9 INCHES BELOW FINISH GRADE BESIDE BUILDING. SEE DWGS FOR TYPICAL FNDN DRAIN
- INSTALLATION DETAIL 13. ABS OR PVC FOUNDATION DRAIN BACKWATER VALVES SHALL BE HORIZONTAL TYPE SIMILAR TO ASME A112.14.1, WITH REMOVABLE COVER AND SWING CHECK VALVE WITH GASKET. SEE DWGS FOR INSTALLATION DETAIL
- 14. GEOCOMPOSITE DRAINAGE FABRIC SHALL BE "AQUADRAIN 15X, "MIRADRAIN 6200XL", OR **ENGINEER PRE-APPROVED EQUAL**
- AREA DRAINS IN LANDSCAPE AREAS SHALL BE 15"X15" TURF & LANDSCAPE AREA DRAINS MANUFACTURED BY THE 'LYNCH CO." WITH 4 INCH DIAMETER TRAPPED NO-HUB CONNECTION OUTLETS, EXTENSIONS AND GRATES WITH BARS AT 1 -1/4 INCH ON CENTER FOR COMPLETE ASSEMBLY.
- EXTERIOR AREA DRAINS IN CONCRETE PAVEMENT AREAS SHALL BE "SMITH" FLOOR DRAINS WITH 12 INCH DIAMETER TOPS, DEEP BODY SEDIMENT BUCKETS, 4 INCH DIAMETER TRAPPED NO-HUB CONNECTION OUTLETS, EXTENSIONS AND GRATES FOR COMPLETE ASSEMBLY.

- 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.
- 20. COPPER WATER PIPE (3/4 INCH TO 2-1/2 INCH DIAMETER) SHALL BE TYPE 'K' HARD TEMPERED COPPER PER ANSI H23.1 WITH WROUGHT COPPER SOLDER JOINT FITTINGS PER ANSI B16.22. 21. INSTALL ALL PLASTIC PIPE AND FITTINGS IN ACCORDANCE WITH ASTM D2321.
- 22. PROVIDE A DOUBLE CHECK VALVE ASSEMBLY IN AN ACCESSIBLE ROOM, CONCRETE BOX OR VAULT WITH OPENABLE LID(S) FOR ALL WATER SERVICE LINES 1 INCH AND LARGER. PROVIDE DETECTOR CHECK PLUMBING AND METER AT DOUBLE CHECK ASSEMBLIES FOR FIRE SERVICE LINES.
- 23. PROVIDE A PRESSURE REDUCING VALVE ASSEMBLY (INCLUDING GATE VALVES IMMEDIATELY UP AND DOWNSTREAM) IN AN ACCESSIBLE ROOM, CONCRETE BOX OR VAULT WITH OPENABLE LID(S) FOR ALL WATER SERVICE LINES WHERE MAXIMUM STATIC PRESSURE IS OR EXCEEDS EIGHTY (80) PSI. VALVES SHALL BE SET TO SUSTAIN A MAXIMUM PRESSURE OF 60 PSI AND SHALL BE OF A PRESSURE RATING TO ACCOMMODATE THE UPSTREAM PRESSURE INCLUDING AN ALLOWANCE OF 100 PSI FOR SURGE. VALVE SHALL BE CLAYTON 90-01 SERIES AS MANUFACTURED BY CAL-VAL
- CO., NEWPORT BEACH, CA OR WATER DISTRICT PRE-APPROVED 24. ALL ELBOWS, BENDS, TEES, CROSSES AND DEAD ENDS ON WATER PIPES 3 INCHES AND
- LARGER IN SIZE SHALL BE PROVIDED WITH CONCRETE THRUST BLOCKS. 25. A MINIMUM DEPTH OF 30 INCHES IN PRIVATE LANDSCAPE AREAS AND 36 INCHES IN
- PRIVATE STREETS FROM FINISHED GRADE TO THE TOP OF WATER PIPE IS REQUIRED. 26. BLOW-OFF ASSEMBLIES ARE REQUIRED AT ALL DEAD-END PRIVATE WATER LINES.
- 27. ALL PRIVATE WATER LINES SHALL BE FLUSHED, PRESSURE TESTED AND DISINFECTED PER AWWA C600, SECTION 4 AND AWWA C601.

28. ALL WATER LINE CROSSINGS WITH SANITARY SEWER SHALL COMPLY WITH

- APPLICABLE DEQ AND OREGON STATE HEALTH DIVISION RULES AND REGULATIONS RELATING TO VERTICAL AND HORIZONTAL SEPARATION. 29. ALL NEW AND EXISTING MANHOLE RIMS, CATCH BASIN RIMS, CLEAN-OUTS AND OTHER
- INCIDENTAL STRUCTURES SHALL BE LOCATED AND ADJUSTED TO FINISH GRADE OR AS OTHERWISE INDICATED ON THE DRAWINGS 30. PRECAST CONCRETE UTILITY VAULTS: A. REINFORCED PRECAST CONCRETE UTILITY VAULTS SHALL BE APPROVED BY THE
- OREGON STATE PLUMBING BOARD. PROVIDE COMPLETE ASSEMBLIES FOR INSTALLATION INCLUDING INLET AND OUTLET PIPING B. GRADE RINGS: PROVIDE MANUFACTURER'S STANDARD PRECAST CONCRETE GRADE
- RINGS FOR ADJUSTING VAULT LIDS TO FINISH GRADE.
- C. MINIMUM STRUCTURAL REQUIREMENTS: I. CONCRETE: 28 DAY COMPRESSIVE STRENGTH FC = 4500 PSI
- II. REBAR: ASTM A-615 GRADE 60.
- III. MESH: ASTM A185 GRADE 65. IV. STEEL: ASTM A36 GRADE 36.
- V. GALVANIZING: ASTM A-123-89 AND A-153-87 (HOT DIPPED). VI. STEEL DESIGN: AISC MANUAL OF STEEL CONSTRUCTION, 9TH EDITION.
- CONCRETE DESIGN: ACI-318-89 BUILDING CODE.
- ASTM C-857 MINIMUM STRUCTURAL DESIGN. LOADING FOR UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES. VIII. LOADS: AASHTO H-20 16 KIP WHEEL LOAD WITH 30% IMPACT (10"X20"
- AASHTO LIVE LOAD SURCHARGE (2' SOIL) 8' DEPTH
- EFFECTIVE SOIL PRESSURE ABOVE WATER TABLE 80 P.C.F. EFFECTIVE SOIL PRESSURE ABOVE WATER TABLE - 45 P.C.F.
- IX. SOIL COVER: 1'-6" MINIMUM WITH WATER TABLE 3'-0" BELOW FINISHED GRADE.
- 5'0" MAXIMUM WITH WATER TABLE 3'-0" BELOW FINISHED GRADE 0' MINIMUM WITH WATER TABLE BELOW BOTTOM OF VAULT.
- 5'-0" MAXIMUM WITH WATER TABLE BELOW BOTTOM OF VAULT. D. ACCEPTABLE MANUFACTURERS
- I. UTILITY VAULT COMPANY, WILSONVILLE, OREGON II. ENGINEER PRE-APPROVED EQUAL MEETING SAME OR BETTER REQUIREMENTS.

04.0 CONSTRUCTION OBSERVATION, INSPECTION AND TESTING

- INDEPENDENT TESTING LAB TO BE RETAINED BY OWNER TO PROVIDE INSPECTIONS
- AND SPECIAL INSPECTIONS AS DESCRIBED HEREIN. 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 REINSPECTIONS. CONTRACTOR: DO NOT COVER WORK REQUIRED TO BE INSPECTED OR REINSPECTED PRIOR TO INSPECTION BEING MADE. IF WORK IS COVERED, UNCOVER AS NECESSARY. 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 CONTRACTOR TO NOTIFY CIVIL ENGINEER WHEN UTILITY WORK BEGINS AND FOR OBSERVATION OF BASE ROCK PRIOR TO PLACING FINISH CURBS OR PAVEMENTS.

04.2 SPECIAL INSPECTIONS

- REQUIRED SPECIAL INSPECTIONS SHALL BE PERFORMED BY AN INDEPENDENT SPECIAL INSPECTOR PER SECTION 1701 OF THE INTERNATIONAL BUILDING CODE (IBC) FOR THE FOLLOWING:
- A. SOILS: I. FOUNDATION EXCAVATION TO BE OBSERVED BY OWNER'S GEOTECHNICAL ENGINEER FOR FIELD VERIFYING FOUNDATION DRAINAGE AND DEWATERING
- RECOMMENDATIONS II. NATIVE SUBGRADE SURFACE TO BE PROOF-ROLLED AND OBSERVED BY THE OWNER'S GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE PRIOR TO PLACEMENT OF ALL FILL OR BASE ROCK MATERIALS UNDER OR WITHIN 5 FEET OF ALL PAVEMENT AND BUILDING AREAS. DURING WET WEATHER CONSTRUCTION WHEN PROOF-ROLL OF NATIVE SUBGRADE MAY NOT BE APPROPRIATE (AS DETERMINED BY GEOTECHNICAL ENGINEER), PROVIDE PROOF-ROLL OF ALL BASE ROCK SURFACES PRIOR TO PLACEMENT OF ANY FINISH PAVEMENTS.
- III. DURING THE PLACEMENT OF ALL FILL, INCLUDING TRENCH BACKFILL AND BASE BELOW PAVEMENTS AND BUILDINGS, GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE TO VERIFY THAT MINIMUM COMPACTION REQUIREMENTS ARE MET. PROVIDE TEST FOR EACH 40 CUBIC YARDS PLACED.
- IV. GEOTECHNICAL ENGINEER OR HIS REPRESENTATIVE TO OBSERVE ALL PROOF CONTACT: GEOPACIFIC ENGINEERING, INC., SCOTT HARDMAN, P.E., R.G.E.
- (503) 598-8445 B PAVEMENTS:

7312 SW DURHAM RD.

TIGARD, OR 97224

- I. VERIFY COMPACTION OF ASPHALT PAVEMENTS.
- II. VERIFY ULTIMATE STRENGTH, REINFORCEMENT SIZE, PLACEMENT AND GRADE OF CONCRETE PAVEMENTS. C. STORM DRAIN AND SANITARY PIPE: I. CONTRACTOR TO PROVIDE HYDROSTATIC OR AIR TESTING OF ALL PIPES, JOINTS,
- MANHOLES, ETC. AS REQUIRED BY LOCAL AND STATE JURISDICTIONS. II. OBSERVE DEFLECTION TEST PERFORMED BY CONTRACTOR FOR ALL FLEXIBLE STORM AND SANITARY PIPE. DEFLECTION TEST TO BE IN ACCORDANCE WITH
- OREGON CHAPTER APWA 303.9. D. STORM FACILITY: BASIN LINER INSTALLATION AND PENETRATION SEALS.
- GRAVEL LAYER INSTALLATION.
- III. SOIL MEDIA INSTALLATION.

CIVIL ABBREVIATIONS

ABBR	ABBREVIATION	GSP	GALVANIZED STEEL PIPE
AC ACCDG	ASPHALT CONCRETE ACCORDING	GUT G.V	GUTTER GATE VALVE
		G.V. HDPE	HIGH-DENSITY-POLYETHYLENE
ADA	AMERICANS WITH DISABILITIES ACT	HORIZ	HORIZONTAL
ALT	ALTERNATE	H.P.	HIGH POINT
APPX	APPROXIMATELY	HT	HEIGHT
ARCH	AREA DRAIN AMERICANS WITH DISABILITIES ACT ALTERNATE APPROXIMATELY ARCHITECTURAL AIR RELIEF VALVE BEGIN CURB RETURN BACKFLOW BUILDING BLOW-OFF BACK OF CURB BOTTOM BEGINNING POINT BEGIN RETURN BACK OF SIDEWALK BACK OF SIDEWALK BACK OF SIDEWALK CAST IRON or CURB INLET	I.E. or IE	INVERT ELEVATION
ARV	AIR RELIEF VALVE	INFO	INFORMATION
BCK	BEGIN CURB RETURN	IN I	INTERIOR INFLECTION POINT IRON ROD
BI DC	BUILDING	I.P. or IP	INFLECTION POINT
BO	BI OW—OFF	JT	JOINT
BOC	BACK OF CURB	Ľ	LENGTH
BOT	BOTTOM	LBS or #	POUNDS
B.P. or BP	BEGINNING POINT	LF "	POUNDS LINEAR FEET
BR	BEGIN RETURN	LIN	LINEAR
BS	BACK OF SIDEWALK	LT	LEFT
BS S	BACK OF SIDEWALK SLOPE	MANUF	MANUFACTURER
D I WIN	BETWEEN BACKWATER CATCH BASIN CAST IRON or CURB INLET CONTROL JOINT CENTER LINE CLEAR	MAT'L MAX MECH	MATERIAL
CR	CATCH BASIN	MAX MECH	MAXIMUM MECHANICAL
CI	CAST IRON or CURB INLET	M .l	MECHANICAL JOINT
CJ	CONTROL JOINT	MH	MANHOLE
CL or C/L	CENTER LINE	MIN	MINIMUM
CLR	CLEAR	(N) or N	NEW
CNTR	CENTER	Ň.Ś.	NON SHRINK
CO	CLEANOUT	N.T.S.	NOT TO SCALE
COM	COMMUNICATIONS	O.C. or OC	ON CENTER
CONC	CATCH BASIN CAST IRON OF CURB INLET CONTROL JOINT CENTER LINE CLEAR CENTER CLEANOUT COMMUNICATIONS CONCRETE CONNECTION CONTINUOUS CITY OF PORTLAND CROWN (OF ROADWAY) COMBINED SEWER CULVERT DOUBLE DOUBLE CHECK DOUBLE CHECK DOUBLE CHECK DOUBLE CHECK DETERMINET CASTERMINET DOUBLE CHECK DOUBLE CHECK DOUBLE CHECK DOUBLE CASTERMINET CONTROL CONTR	0.W.S.	OIL WATER SEPARATOR
CONN	CONTINUOUS	PL or P/L	PROPERTY LINE
CONT	CITY OF DODTI AND	P.C. or PC	POINT OF CURVATURE
CDN or CDWN	CDOWN (OF DOADWAY)	P.C.C. or PCC	POINT OF COUNTER CURVATURE
CRN OF CRWIN	COMPINED SEWER	PERFURATED	PRIMARY POWER or POWER POLE PROPOSED
CUI V	CUI VERT	P.P. OF PP	PROPOSED
DBL	DOUBLE	P T or PT	POINT OF TANGENCY
DC	DOUBLE CHECK	PVC	POLYVINYL—CHLORIDE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY	P.U.E.	PUBLIC UTILITY EASEMENT
DET	DETAIL	P.W.	PUBLIC WORKS
DI	DUCTILE IRON or DITCH INLET DIA or Ø	R or RAD	RADIUS
DIAMETER	DIMENSION	R.D. or RD	
DIM	DIMENSION	REQ'D	REQUIRED
DOM DP	DOMESTIC DEEP	RDCR	REDUCER
DF	DOWN SPOUT	R.P. RT	RADIUS POINT
DW	DRY WELL		RIGHT OF WAY
D/W	DRIVEWAY	R/W OF ROW	RIGHT-OF-WAY SLOPE
DWG	DRAWING	SAN or S.S.	
EA	EACH		SCHEDULE
ECR	END CURB RETURN	SED	SEDIMENTATION
EG	EXISTING GRADE	SERV	SERVICE
EJ	EXPANSION JOINT	SHT	SHEET
EL or ELEV ELEC	ELEVATION ELECTRIC or ELECTRICAL	SIM	SIMILAR
	EMBEDMENT	SPECS	SPECIFICATIONS
EOP	EMBEDMENT EDGE OF PAVEMENT ENGINEER OF RECORD	STA STD	STATION STANDARD
E.O.R.	ENGINEER OF RECORD	ST.D.	STORM DRAIN
E.P. or EP	ENDING POINT		STORM SEWER
EQ	EQUAL	STL	STEEL
	END RETURN	STRUCT	STRUCTURAL
ESC EW	EROSION AND SEDIMENT CONTROL	SW or SDWLK	
EW EX or EXIST	EACH WAY EXISTING	TC	TOP OF CURB
EXT	EXTERIOR	TELEP	TELEPHONE
FD	FOUND	T.O.F. T.O.S.	TOP OF FOOTING TOP OF SLAB
FDC	FIRE DEPARTMENT CONNECTION	T.O.W.	TOP OF WALL
FNDN	FOUNDATION	TYP	TYPICAL
FF	FINISH FLOOR	Ü.E.	UNDERGROUND ELECTRICAL U.O.N
FG	FINISH GRADE	UNLESS OTHER	rwise noted
FH	FIRE HYDRANT	U.P.	UNDERGROUND POWER
FIN	FINISH	U.R.M.	UNREINFORCED MASONRY
FL FL S	FLOW LINE FLOW LINE SLOPE	U.T.	UNDERGROUND TELEPHONE
FLG	FLANGE	V.B. VERT	VALVE BOX VERTICAL
FLR	FLOOR	VER I VLT	VERTICAL VAULT
FP	FINISH PAVEMENT	WTR	WATER
FOC	FACE OF CURB	W.J.	WET JOINT
FTG	FOOTING	W.M.	WATER METER
GA	GAGE or GAUGE	W.Q.	WATER QUALITY
GALV	GALVANIZED	WV	WATER VALVE
GB CEN	GRADE BREAK	W.W.F.	WELDED WIRE FABRIC
GEN GR	GENERAL GROUND	W/	WITH
GR GS	GROUND SHOT	W/ 0	WITHOUT
	55511B 51151		

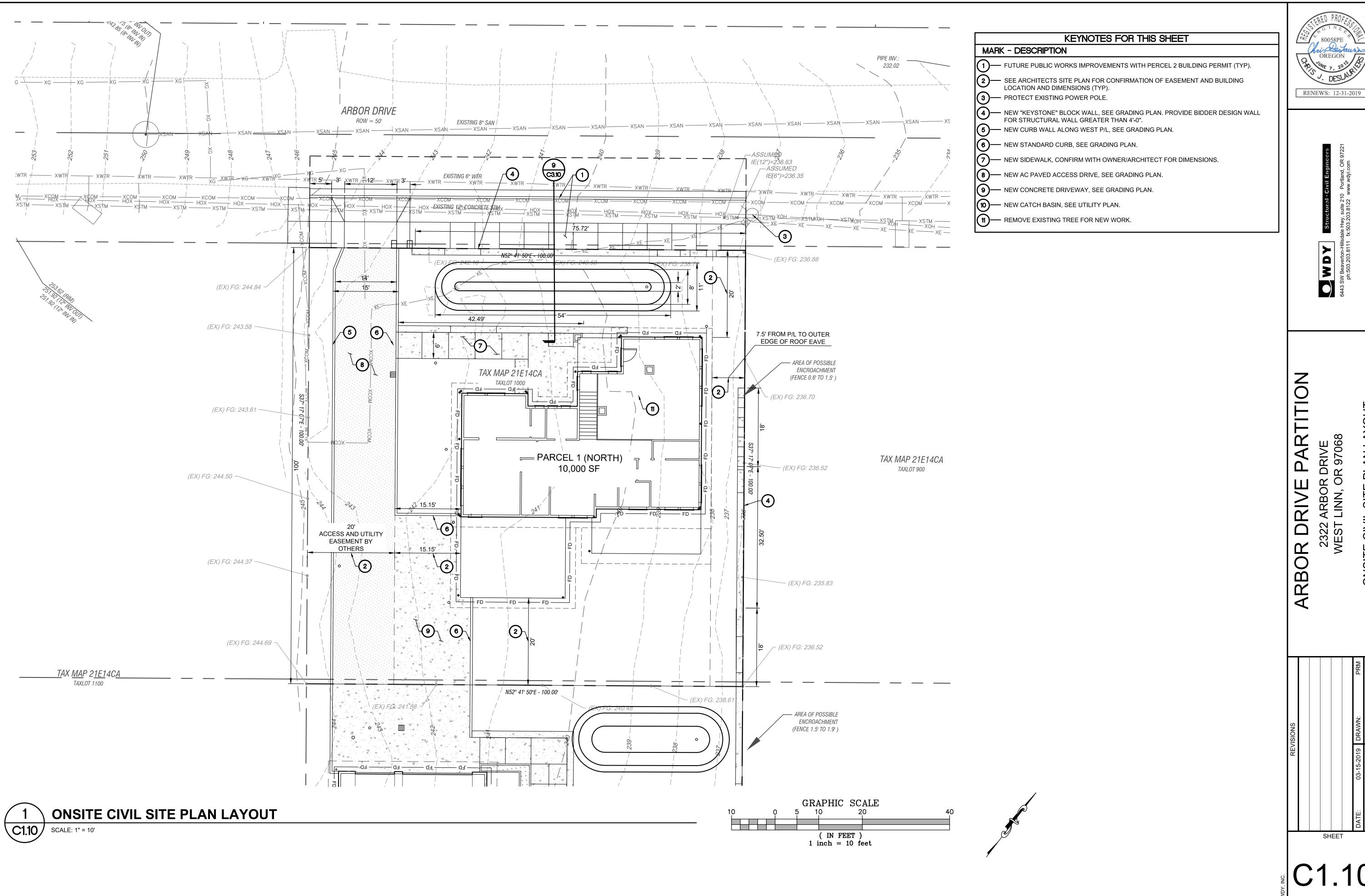
	CIVIL DRAWINGS					
Sheet	Sheet Sheet Title					
Number	Cheet Title					
C1.00	ONSITE CIVIL NOTES AND ABBREVIATIONS					
C1.10	ONSITE CIVIL SITE PLAN LAYOUT					
C2.00	ONSITE CIVIL EROSION AND SEDIMENT					
	CONTROL PLAN					
C2.10	ONSITE CIVIL UTILITY PLAN					
C2.20	ONSITE CIVIL GRADING PLAN					
C3.00	ONSITE CIVIL DETAILS					
C3.10	ONSITE CIVIL DETAILS					

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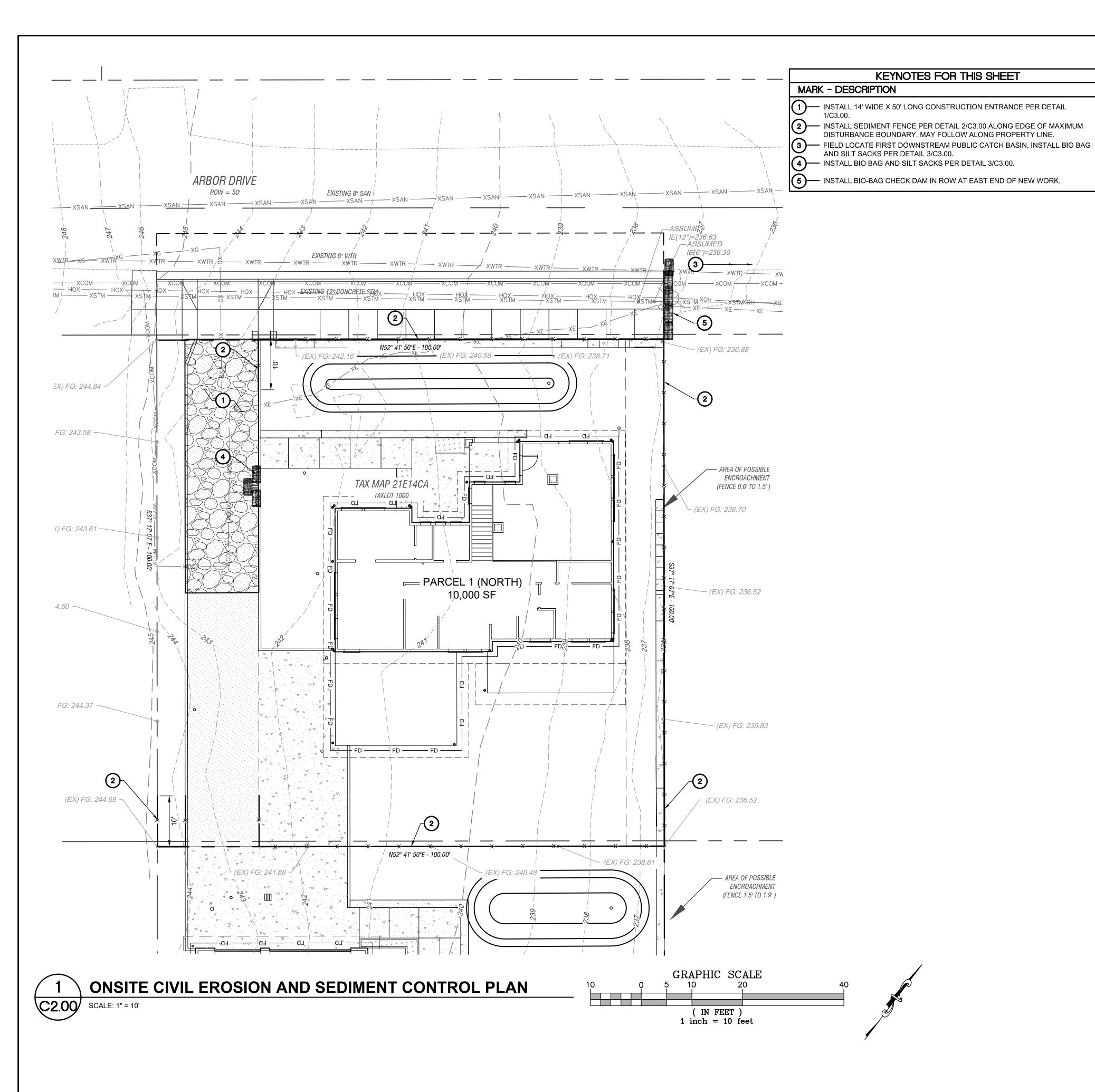
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OREGON 6



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 BEGLILATIONS
- 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 HUBISDICTION. AND
- 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.
- 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.
- 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.
 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

- . 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

- 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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443 SW Beaverton-Hillsdale ph:503.203.8111 fx:5

DRIVE R 97068

OR DRIVE PAR 2322 ARBOR DRIVE WEST LINN, OR 97068

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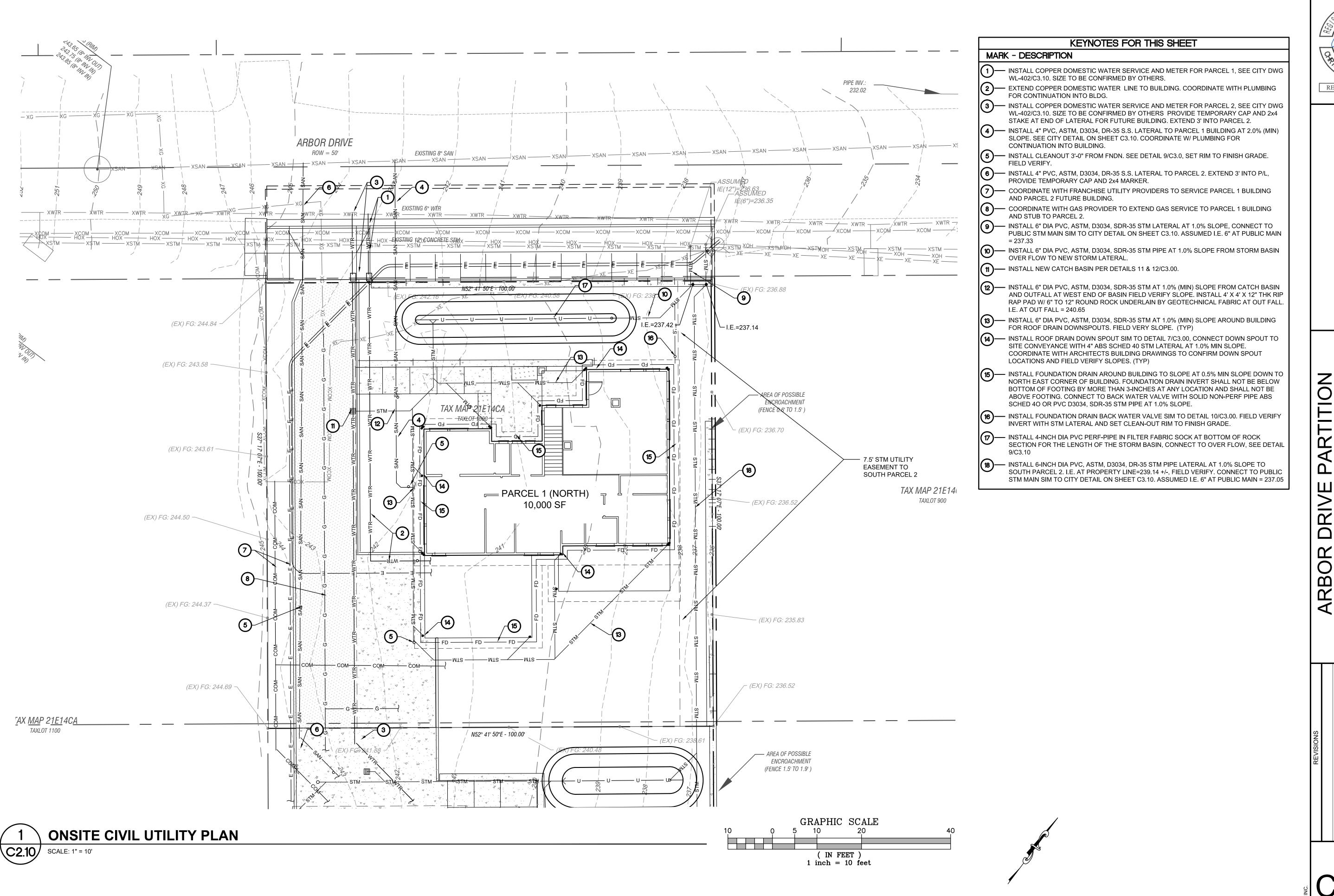
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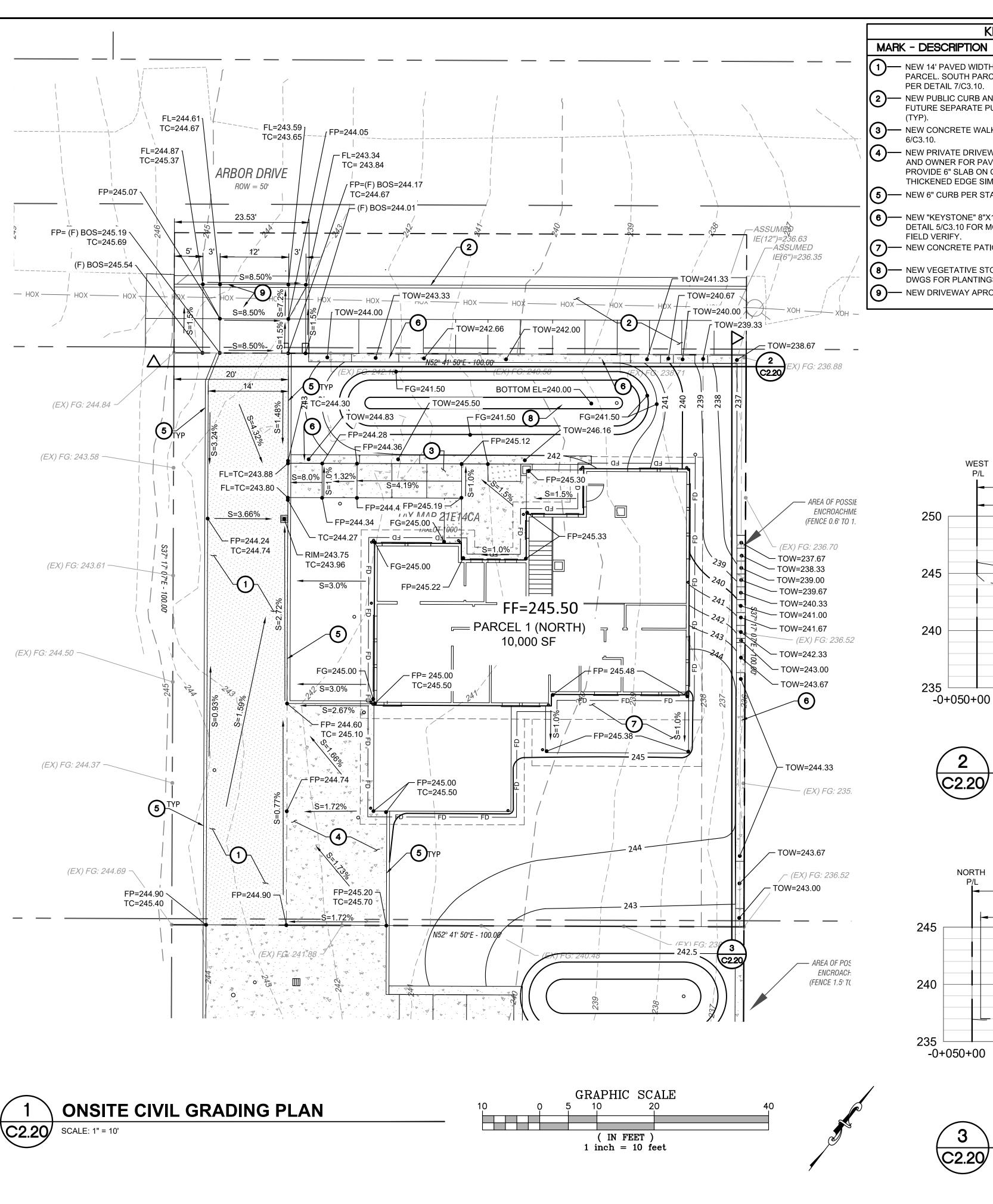
WDY, INC.



OREGON

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2322 WEST



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,

--- NEW CONCRETE WALKWAY TO NORTH PARCEL BUILDING FRONT DOOR, SEE DETAIL

- 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).

WEST

NORTH

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',

7 NEW CONCRETE PATIO, SIM TO SIDEWALK DETAIL 6/C3.10.

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.

23.53'

20.5'

DRIVEWAY CURB

TO BACK OF EAST

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

31.55'

30.05' FROM SOUTH FACE OF

NORTH RETAINING WALL

TO EAST RETAINING WALL

6" THICK ROCK FOOTING, COMPACTED NATIVE SUB-GRADE AND SUB-BASE

PER GEOTECH OR WALL

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

DESIGNER REQUIREMENTS.

EXISTING GRADE AT BACK OF SIDEWALK -

GRADING NOTES:

←PROPOSĖD TOP OF RETAINING WALL,

6" THICK ROCK FOOTING,

SUB-GRADE AND SUB-BASE PER GEOTECH OR WALL DESIGNER REQUIREMENTS.

COMPACTED NATIVE

NORTH PROPERTY LINE RETAINING WALL ELEVATIONS

DECORATIVE FINISH TO FACE RIGHT OF WAY

FINISHED GRADE AT SOUTH FACE OF WALL

PROPOSED FINISHED GRADE

AT BACK OF SIDEWALK

-PROPOSED TOP OF RETAINING WALL,

DECORATIVE FINISH TO FACE EAST

- EXISTING GRADE AT PROPERTY LINE

1. 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.

2. REFER TO ARCHITECTURAL SITE PLANS FOR ALL SITE LAYOUT DIMENSIONS INCLUDING WALKWAYS, BUILDING, AND RETAINING WALLS.

3. CONTRACTOR TO CONFIRM WITH OWNER AND REMOVE AND DISPOSE OF OFFSITE ALL EXCESS SOIL, DEBRIS AND MATERIALS NOT REUSABLE FOR THIS PROJECT.

4. ON-SITE PEDESTRIAN ACCESS ROUTES SHALL COMPLY WITH THE STATE AND LOCAL **REGULATIONS. IN GENERAL:**

4.1. MAXIMUM CROSS SLOPE OF ANY PAVEMENT PERPENDICULAR TO DIRECTION OF TRAVEL IS 2.0%.

4.2. MAXIMUM SLOPE OF WALKWAYS WITHOUT HANDRAILS IN DIRECTION OF TRAVEL IS 4.3. 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%.** 4.4. 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 4.5. PROVIDE FINISH PAVEMENT SURFACE TEXTURES IN ACCORDANCE WITH ARCHITECT.

4.6. CONTACT ARCHITECT AND ENGINEER FOR INSTRUCTIONS PRIOR TO INSTALLING FINISH PAVEMENTS IN CONFLICT WITH CODE REQUIREMENTS

5. 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.

6. SEE SHEET C1.0, SECTION 12.0 FOR CONSTRUCTION TESTING, INSPECTIONS, AND OBSERVATION REQUIREMENTS.

7. 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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250

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240

WALL TO CONTINUE

SEPARATE PERMIT

INTO SOUTH

245

240

1+001+05

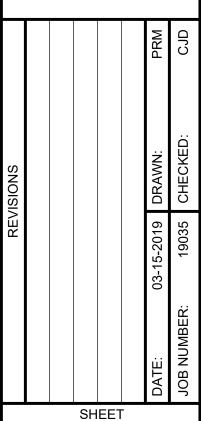
PARCEL UNDER

1+001+05

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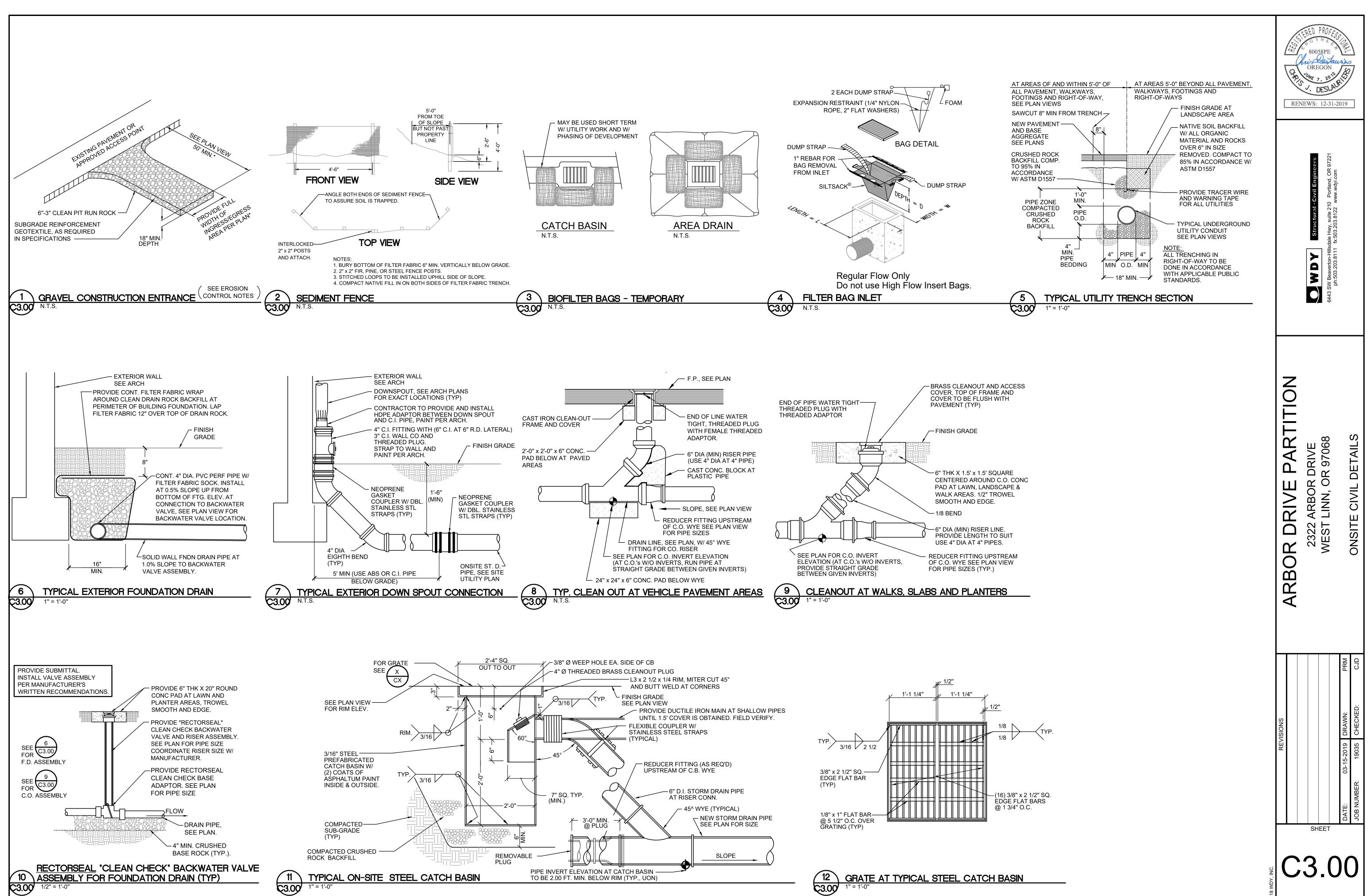
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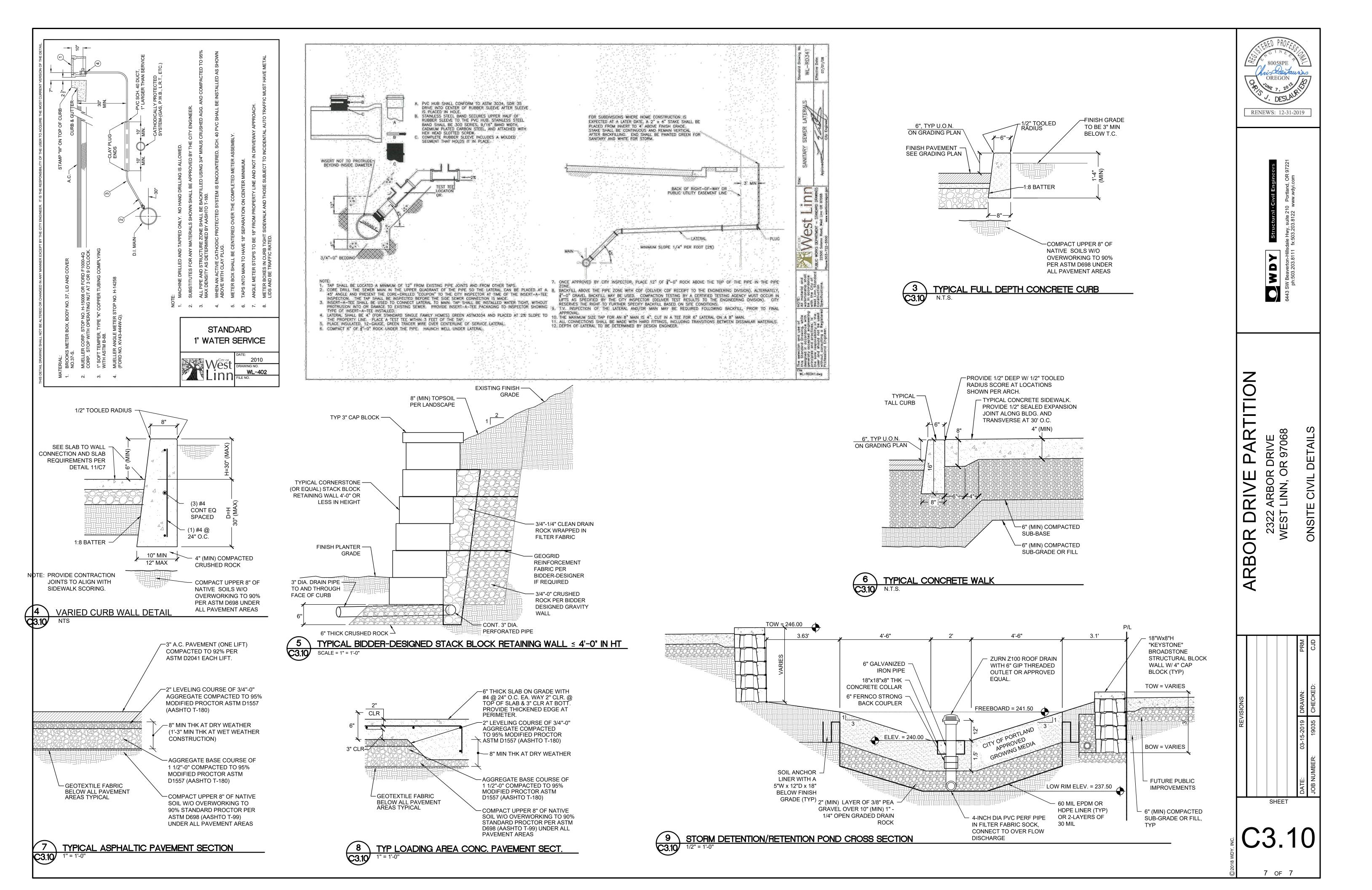
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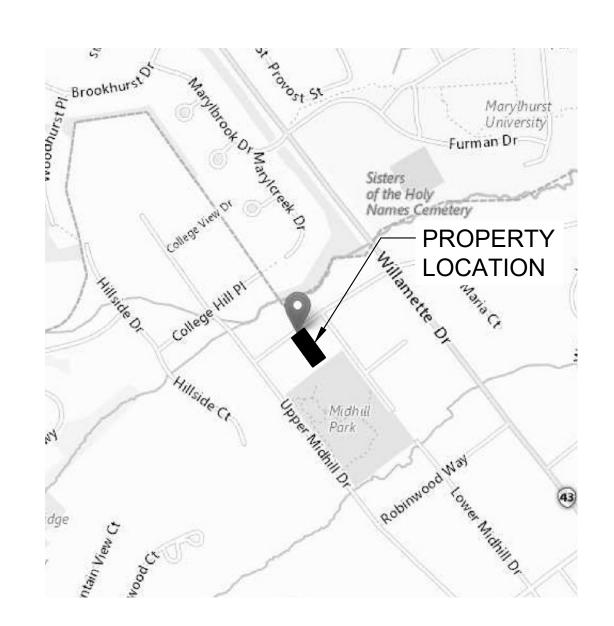
EAST PROPERTY LINE RETAINING WALL ELEVATIONS





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



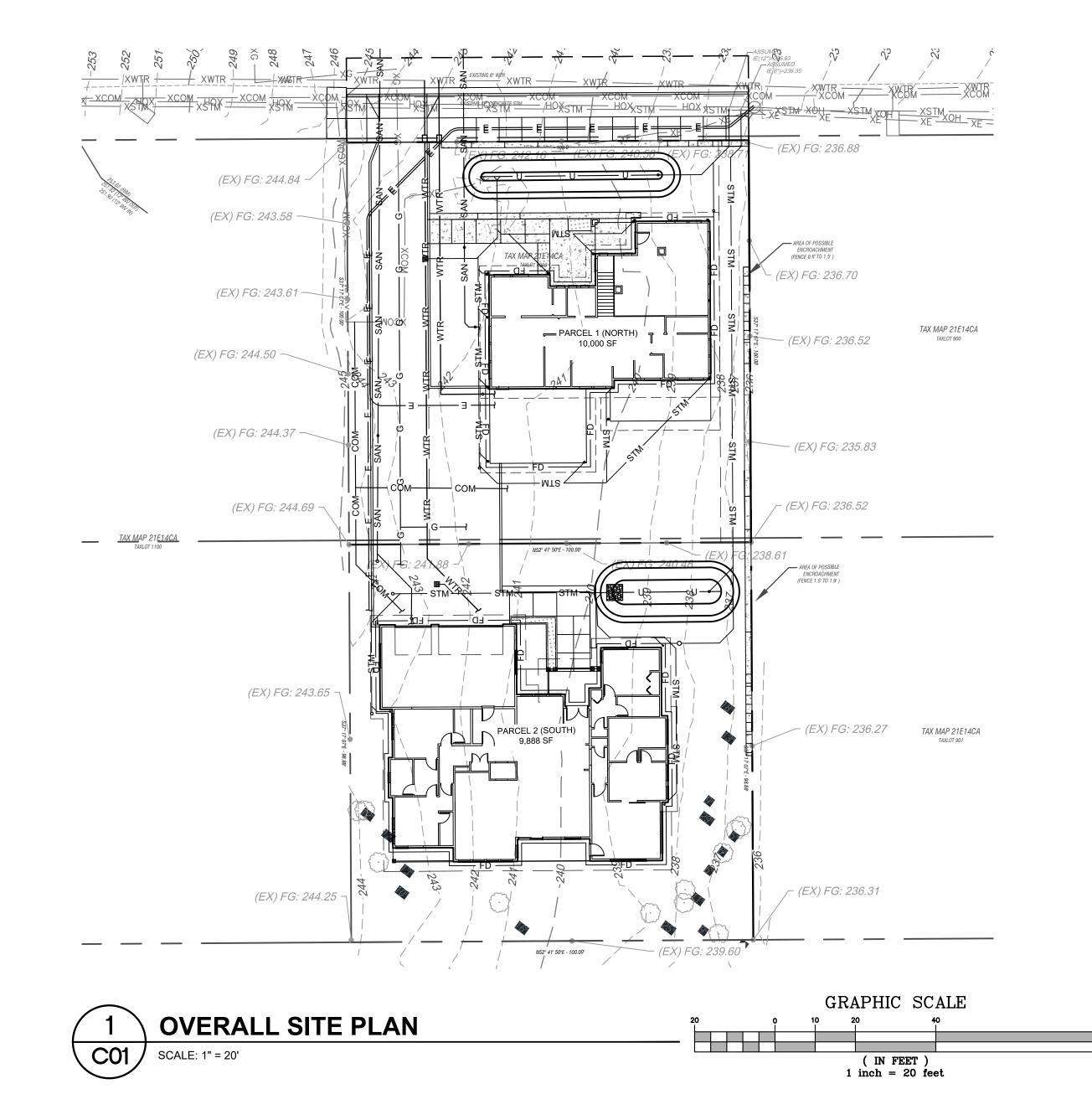
VICINITY MAP

HAMILTON & KASHORO

PORTLAND, OR 97204

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

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				



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 (NOTE: THE TELEPHONE NUMBER FOR THE OREGON UTILITY NOTIFICATION CENTER IS 503-232-1987). POTENTIAL UNDERGROUND FACILITY OWNERS Dig Safely. 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 503-464-7777 **CENTURYLINK** 1-800-573-1311 CITY BUREAU OF MAINTENANCE 503-823-1700

503-823-4874

1-800-483-1000

CITY WATER

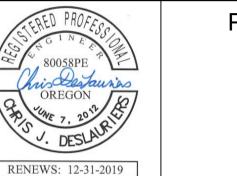
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APPROVALS: REG. PROF. ENGR. PRINCIPAL ENGINEER CITY ENGINEER REG. PROF. ENGR.

PREPARED FOR THE CITY OF WEST LINN





PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068

COVER SHEET

SHEET NO.

1 of 9

- A "Public Works Permit" is required for any work taking place within thepublic right-of-way or public Cityeasements.
- 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 regionallaws.
- 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).
- 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)

- Ensure both your driveway approach and driveway slab inspection are approved prior to pouring either-- elevation changes in one will affect the
- 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 new ADA standards.
- Approach maximum width is 36', minimum width is 16' measured from topof full depth curb to top of full depth curb. Driveway wings
- to be 3'wide. 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
- 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.
- 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.
- 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
- 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

- Whenever a sewer lateral is to be installed or repaired in a public right-of-wayor public City easement, a Public Works Permit must be obtained. A City Building Permit is required for sewer work on private
- 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.
- 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.
- 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
- Main tap shall be located a minimum of 12" from existing pipe joints and 12" from other taps.
- New taps shall be core drilled and installed at a 45 degree angle to the mainand per WL-303 (retain core drilled "coupon" for inspection).
- Taps shall be done with an "Insert-a-Tee" fitting (requests to use comparible materials must be approved by the City in writing prior to installation). Inserta 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-teeinstalled.
- Install a test tee on private lateral within 3 feet of main, water test will be conducted by Plumbing
- Inspector. Run pipe at 2% min. slope to property, install green tracer wire on lateralpipe.
- Cleanouts are required every 100' of pipe or 135 degrees of bends perthe Plumbing code. Bends
- greater than 45 degrees are notpermitted. 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. 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) 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. Tightly compact 6" of 3/4- rock under the pipe.

REVISIONS

- Backfill trench with clean, well-graded 3/2"-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.

See "Street Cut" section for trench restoration requirements.

- WATER LINES
 - 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.
 - 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

- 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 andcondition). 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. All street cuts must have a 6" T-cut as shown in West Linn Standard Drawing
- undisturbed base. The T-cut should be done after trench is backfilled. Hot mix asphalt shall be used to top off the trench. Depth of asphalt dependson street classification and shall be installed in equal lifts as specified in the Public Works Standards. 4" depth for local streets, 5" for

WL-203. Asphalt edges shall be sawcut back an additional 6" beyond

- collectors, and 6" for arterials. Tack all vertical edges prior to paving.
- 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.

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.

CIVIL ABBREVIATIONS

	OIVIL ADDILLVIATIO	7110	
ABBR	ABBREVIATION	GSP	GALVANIZED STEEL PIPE
AC	ASPHALT CONCRETE	GUT	GUTTER
ACCDG	ACCORDING	G.V.	GATE VALVE
AD	AREA DRAIN	HDPE	HIGH-DENSITY-POLYETHYLENE
ADA	AMERICANS WITH DISABILITIES ACT	HORIZ	HORIZONTAL
ALT	ALTERNATE	H.P.	HIGH POINT
APPX	APPROXIMATELY	HT	HEIGHT
ARCH	ARCHITECTURAL	I.E. or IE	INVERT ELEVATION
ARV	AIR RELIEF VALVE	INFO	INFORMATION
BCR	BEGIN CURB RETURN	INT	INTERIOR
BF	BACKFLOW	I.P. or IP	INFLECTION POINT
BLDG	BUILDING	I.R.	IRON ROD
BO	BLOW-OFF	JT	JOINT
BOC	BACK OF CURB	Ĺ	LENGTH
BOT	BOTTOM	LBS or #	POUNDS
B.P. or BP		LF	LINEAR FEET
BR BR	BEGIN RETURN		LINEAR
BS	BACK OF SIDEWALK	LIN LT	LEFT
BS S	BACK OF SIDEWALK SLOPE	MANUF	MANUFACTURER
BTWN	BETWEEN	MAT'L	MATERIAL
BW	BACKWATER	MAX	MAXIMUM
CB	CATCH BASIN	MECH M.J. MH	MECHANICAL
CI	CAST IRON or CURB INLET	M.J.	MECHANICAL JOINT
CJ	CONTROL JOINT		MANHOLE
CL or C/L	CENTER LINE	MIN	MINIMUM
CLR	CLEAR	(N) or N	NEW
CNTR	CENTER	Ň.Ś.	NON SHRINK
CO	CLEANOUT	N.T.S.	NOT TO SCALE
COM	COMMUNICATIONS	O.C. or OC	ON CENTER
CONC	CONCRETE	0.0. 01 00 0.W.S.	OIL WATER SEPARATOR
CONN	CONNECTION		PROPERTY LINE
CONT	CONTINUOUS	P.C. or PC	POINT OF CURVATURE
COP	CITY OF PORTLAND		
		P.C.C. or PCC	POINT OF COUNTER CURVATURE PERF
	CROWN (OF ROADWAT)	PERFORATED	DOWNER DOWER DOVE
CSO	COMBINED SEWER	P.P. or PP	
CULV	CULVERT	PROP	PROPOSED
DBL	DOUBLE	P.T. or PT	POINT OF TANGENCY
DC	DOUBLE CHECK		POLYVINYL-CHLORIDE
DCDA	DOUBLE CHECK DETECTOR ASSEMBLY		
DET	DETAIL	P.W.	PUBLIC WORKS
DI	DUCTILE IRON or DITCH INLET DIA or Ø	R or RAD	RADIUS
DIAMETER	DIMENOION	R.D. or RD	ROOF DRAIN
DIM	DIMENSION	REQ'D	REQUIRED
DOM	DOMESTIC	RDCR	REDUCER
DP	DEEP	R.P.	RADIUS POINT
DS	DOWN SPOUT	RT	RIGHT
DW	DRY WELL	R/W or ROW	RIGHT-OF-WAY
D/W	DRIVEWAY	S	SLOPE
DWG	DRAWING	SAN or S.S.	SANITARY SEWER
EA	EACH	SCHED	SCHEDULE
ECR	END CURB RETURN	SED	SEDIMENTATION
EG	EXISTING GRADE	SERV	SERVICE
EJ	EXPANSION JOINT	SHT	SHEET
EL or ELEV		SIM	SIMILAR
ELEC	ELECTRIC or ELECTRICAL	SPECS	SPECIFICATIONS
EMBED	EMBEDMENT	STA	STATION
EOP	EDGE OF PAVEMENT	STD	STANDARD
E.O.R.	ENGINEER OF RECORD	ST.D.	STORM DRAIN
E.P. or EP	ENDING POINT	STM	STORM SEWER
EQ	EQUAL	STL	STEEL
ER	END RETURN		STRUCTURAL
ESC	EROSION AND SEDIMENT CONTROL	SW or SDWLK	
EW	EACH WAY	TC	TOP OF CURB
EX or EXIST	EXISTING	TELEP	TELEPHONE
EXT	EXTERIOR	T.O.F.	TOP OF FOOTING
FD	FOUND	T.O.S.	TOP OF SLAB
FDC	FIRE DEPARTMENT CONNECTION	T.O.W.	TOP OF WALL
FNDN	FOUNDATION	TYP	TYPICAL
FF	FINISH FLOOR	U.E.	
FG	FINISH GRADE		RWISE NOTED
FH	FIRE HYDRANT	U.P.	
FIN	FINISH	U.R.M.	UNDERGROUND POWER UNREINFORCED MASONRY
FL	FLOW LINE	U.T.	UNDERGROUND TELEPHONE
FL S	FLOW LINE SLOPE	0.1. V.B.	VALVE BOX
FLG	FLANGE	v.b. VERT	VERTICAL
	FLOOR	VLT	VAULT
FLR		WTR	WATER
FLR FP	FINISH PAVEMENT		II/\ ILI\
FP	FINISH PAVEMENT FACE OF CURB		WET JOINT
	FINISH PAVEMENT FACE OF CURB FOOTING	W.J.	WET JOINT WATER METER
FP FOC	FACE OF CURB	W.J. W.M.	WATER METER
FP FOC FTG	FACE OF CURB FOOTING	W.J. W.M. W.Q.	WATER METER WATER QUALITY
FP FOC FTG GA	FACE OF CURB FOOTING GAGE or GAUGE	W.J. W.M. W.Q. WV	WATER METER WATER QUALITY WATER VALVE
FP FOC FTG GA GALV	FACE OF CURB FOOTING GAGE or GAUGE GALVANIZED	W.J. W.M. W.Q. WV W.W.F.	WATER METER WATER QUALITY WATER VALVE WELDED WIRE FABRIC
FP FOC FTG GA GALV GB	FACE OF CURB FOOTING GAGE OR GAUGE GALVANIZED GRADE BREAK GENERAL GROUND	W.J. W.M. W.Q. WV W.W.F. W/	WATER METER WATER QUALITY WATER VALVE WELDED WIRE FABRIC WITH
FP FOC FTG GA GALV GB GEN	FACE OF CURB FOOTING GAGE or GAUGE GALVANIZED GRADE BREAK GENERAL	W.J. W.M. W.Q. WV W.W.F.	WATER METER WATER QUALITY WATER VALVE WELDED WIRE FABRIC
FP FOC FTG GA GALV GB GEN GR	FACE OF CURB FOOTING GAGE OR GAUGE GALVANIZED GRADE BREAK GENERAL GROUND	W.J. W.M. W.Q. WV W.W.F. W/	WATER METER WATER QUALITY WATER VALVE WELDED WIRE FABRIC WITH

	EXISTING		EXISTING
DECIDUOUS TREE	\bigcirc	STORM SEWER CLEAN OUT	
		STORM SEWER CATCH BASIN	
CONIFEROUS TREE		STORM SEWER MANHOLE	
	/ \	GAS METER	
FIRE HYDRANT	Q	GAS VALVE	\square
IRRIGATION		GUY WIRE ANCHOR	\leftarrow
WATER METER		POWER POLE	-0-
WATER VALVE	\bowtie	POWER VAULT	P
DOUBLE CHECK VALVE	•	POWER JUNCTION BOX	
AIR RELEASE VALVE	-	POWER PEDESTAL	
SANITARY SEWER CLEANOUT	0	COMMUNICATIONS VAULT	С
SANITARY SEWER MANHOLE	\bigcirc	COMMUNICATIONS JUNCTION BOX	\triangle
SIGN		STORM SEWER DOWN SPOUT	
STREET LIGHT	\$		
MAILBOX	MB		

EXISTING RIGHT OF WAY LINE **BOUNDARY LINE** PROPERTY LINE CENTERLINE CURB EDGE OF PAVEMENT ______ **EASEMENT** FENCE LINE GRAVEL EDGE _____ XE ____ XE ____ POWER LINE _____ XOH _____ XOH _____ OVERHEAD WIRE _____XCOM _____XCOM _____ COMMUNICATIONS LINE _____ XFO _____ XFO ____ FIBER OPTIC LINE —— XG ——— XG ——— XG —— GAS LINE _____ XSTM _____ XSTM ____ STORM SEWER LINE ----- XSAN ----- XSAN -----SANITARY SEWER LINE _____ XWTR _____ XWTR _____ WATER LINE

PROPOSED LEGEND

STREET TREE AND TREE WELL CONCRETE ——x—— ORANGE CONSTRUCTION FENCE ——o— SEDIMENT CONTROL WATTLES CURB

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DATE APPROVED CONSTRUCTED BY -CAD BY SECTION ENGR ROJECT COMPLETED _ PRM MAP CORRECTED BY _ HECKED BY REVIEWER CHECKED BY_ NO. DATE DESCRIPTION

FINAL MAP DATA

REG. PROF. ENGR. REG. PROF. ENGR.

APPROVALS:

PRINCIPAL ENGINEER

CITY ENGINEER

PREPARED FOR THE CITY OF WEST LINN



ph:503.203.8111 fx:503.203.8122 www.wdyi.com

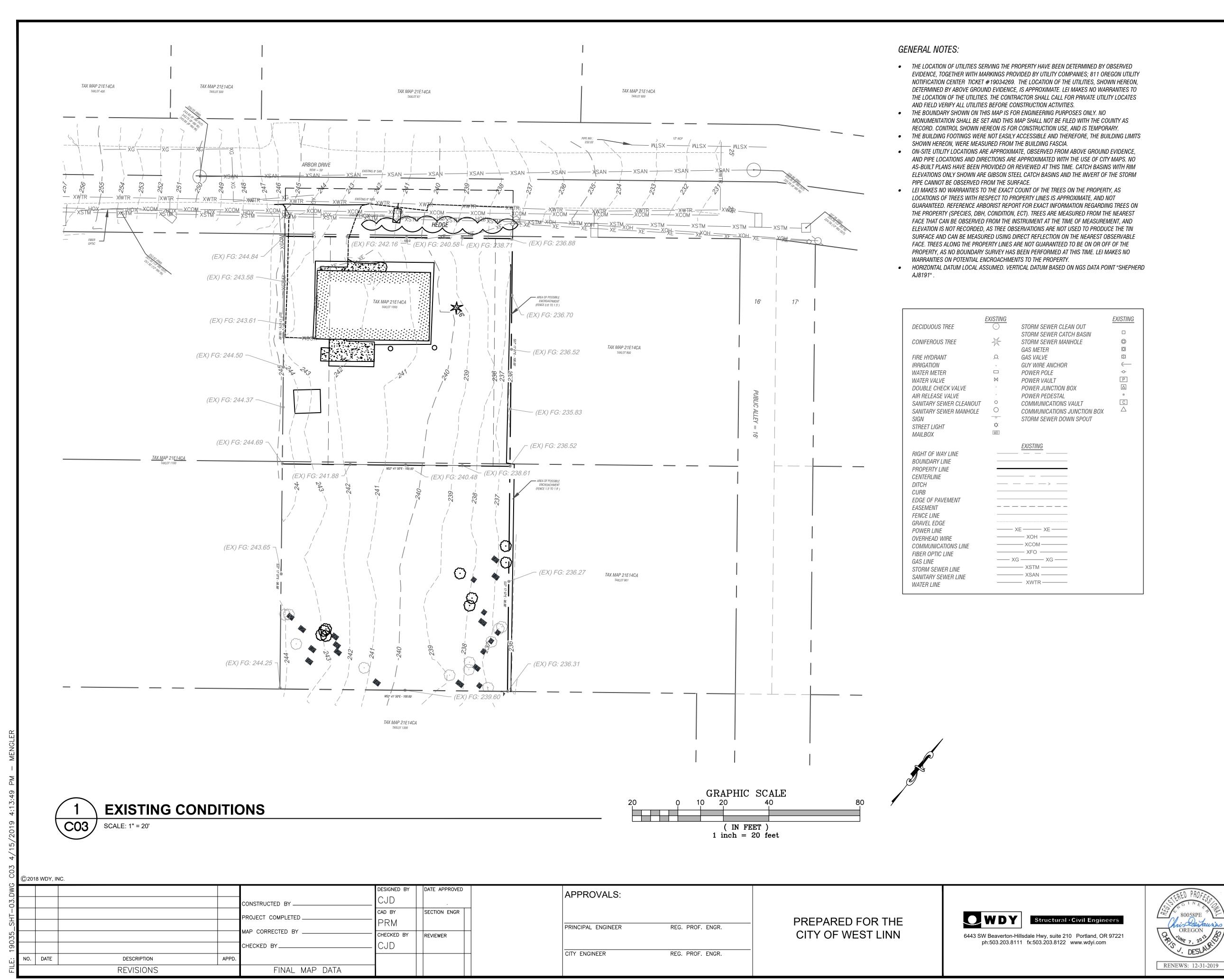


PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068

CIVIL NOTES & ABBREVIATIONS

SHEET NO.

2 of 9



JOB NO.

EXISTING CONDITIONS

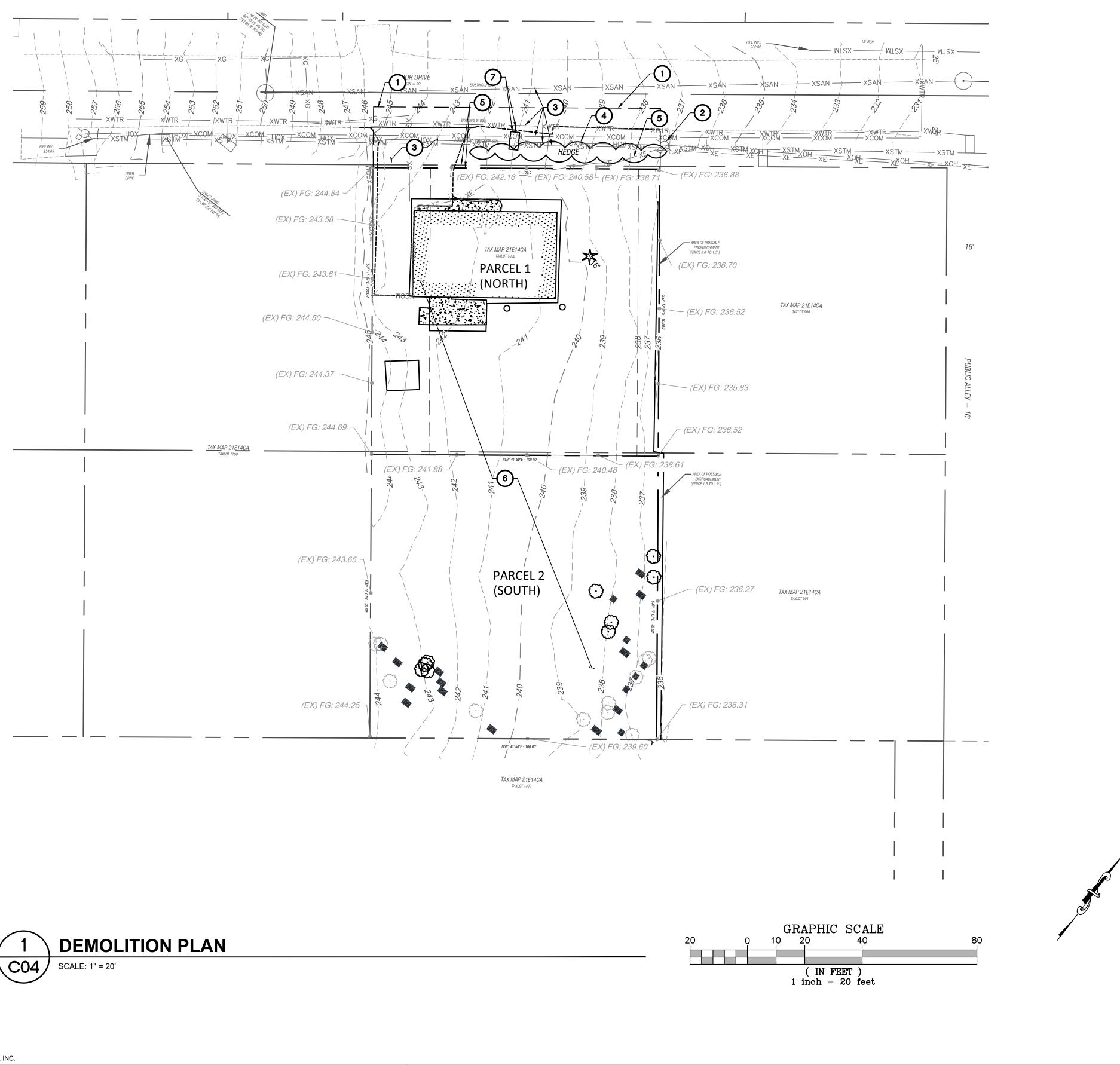
PUBLIC IMPROVEMENTS FOR

2322 ARBOR DRIVE

WEST LINN, OR 97068

SHEET NO.

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.

CITY OF WEST LINN TO KILL EXISTING WATER METER AND LATERAL, UNDER SEPARATE

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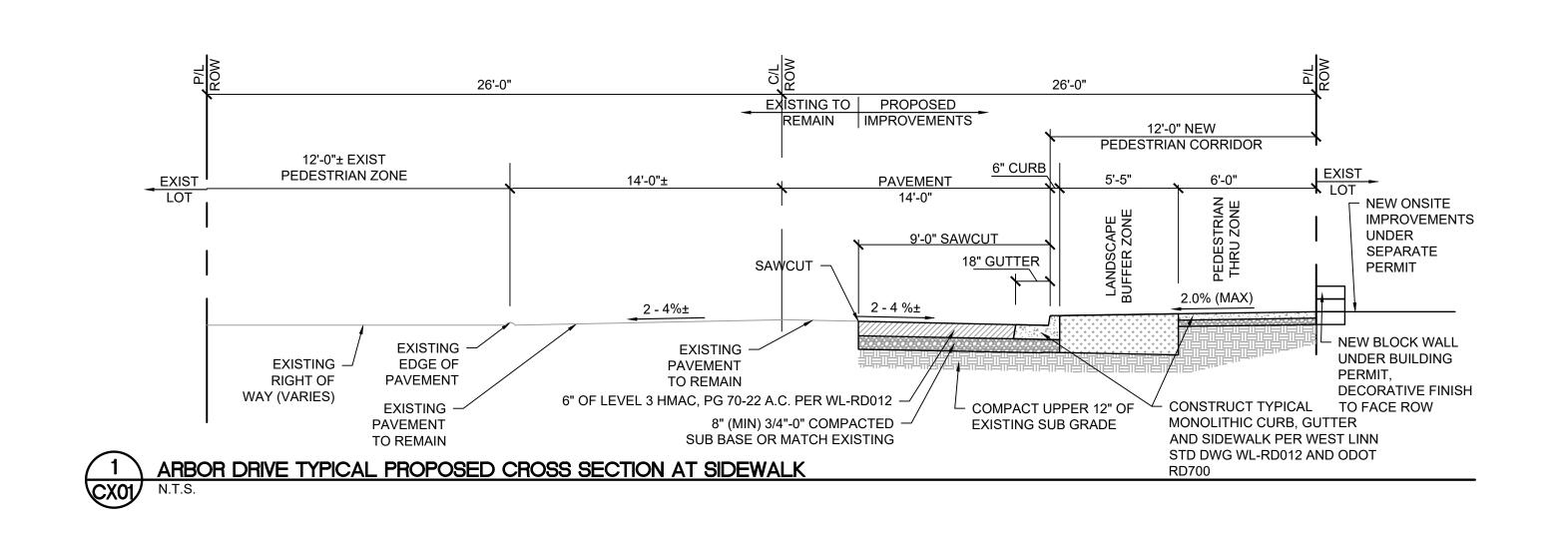


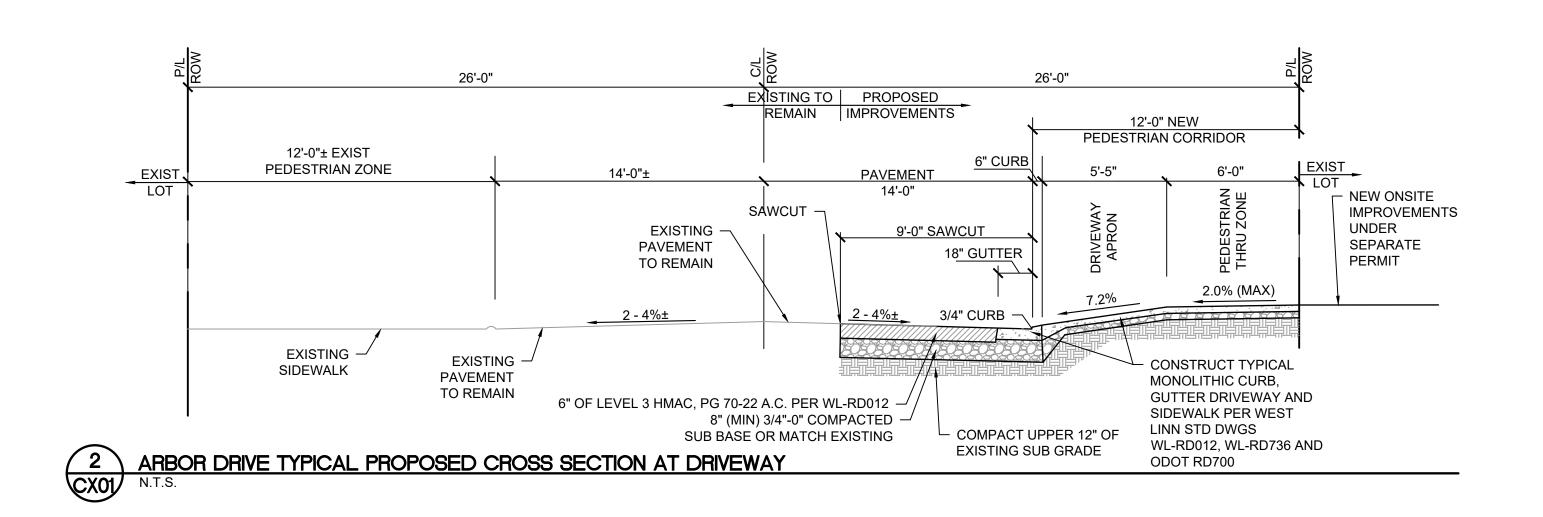
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DEMOLITION PLAN

sheet no.

4 of 9





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REVISIONS

REVISIONS

REVIEWER

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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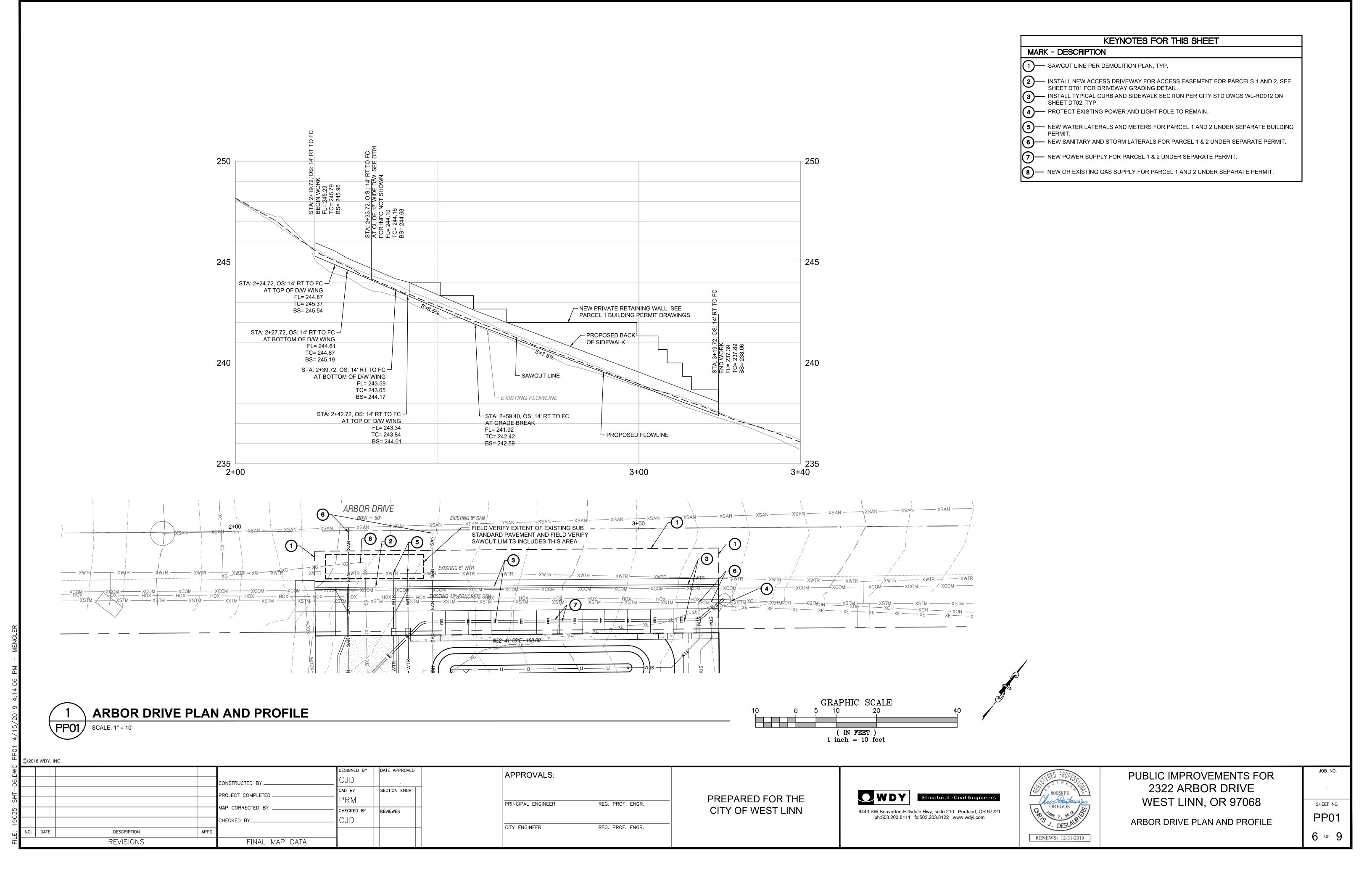
PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068

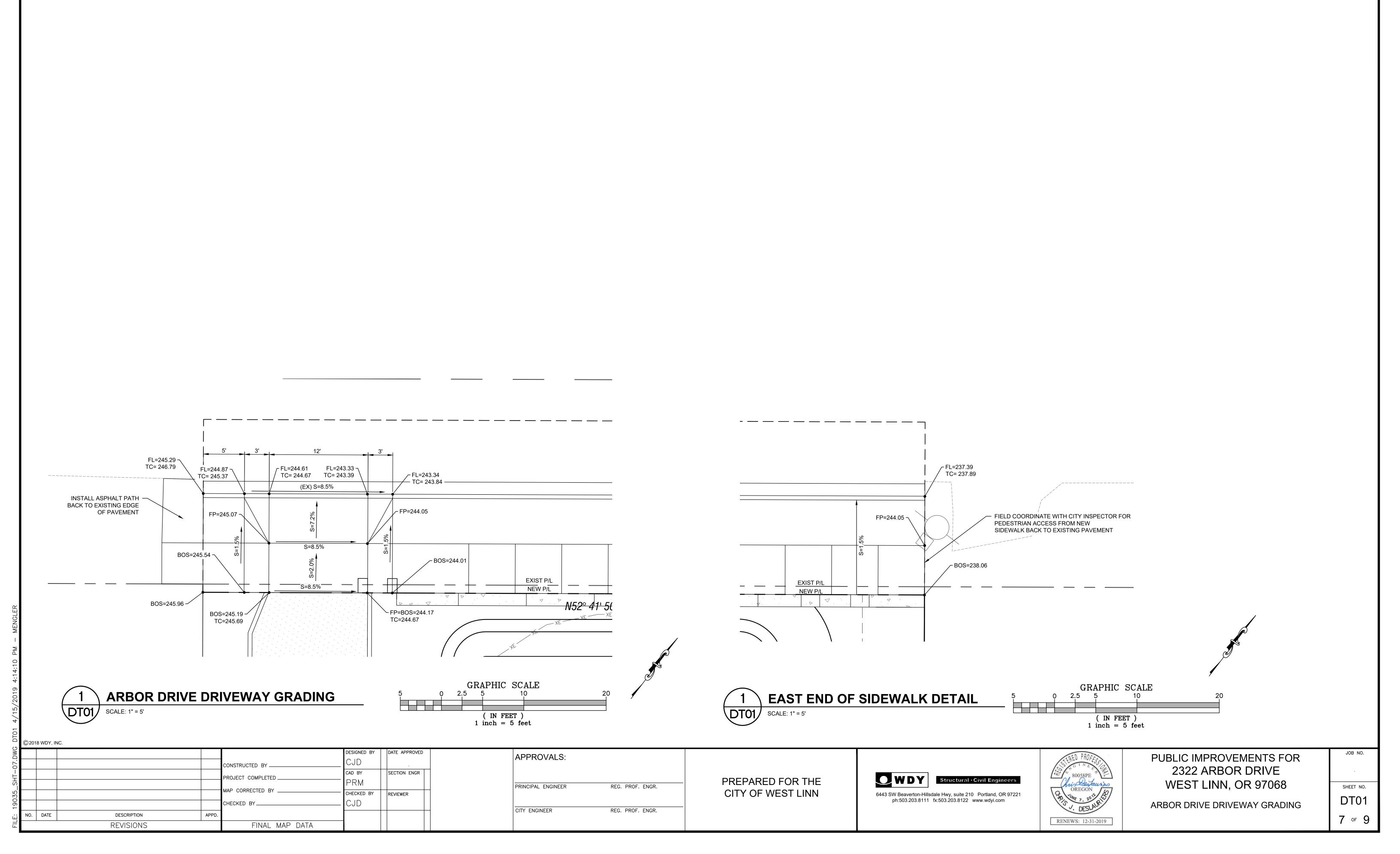
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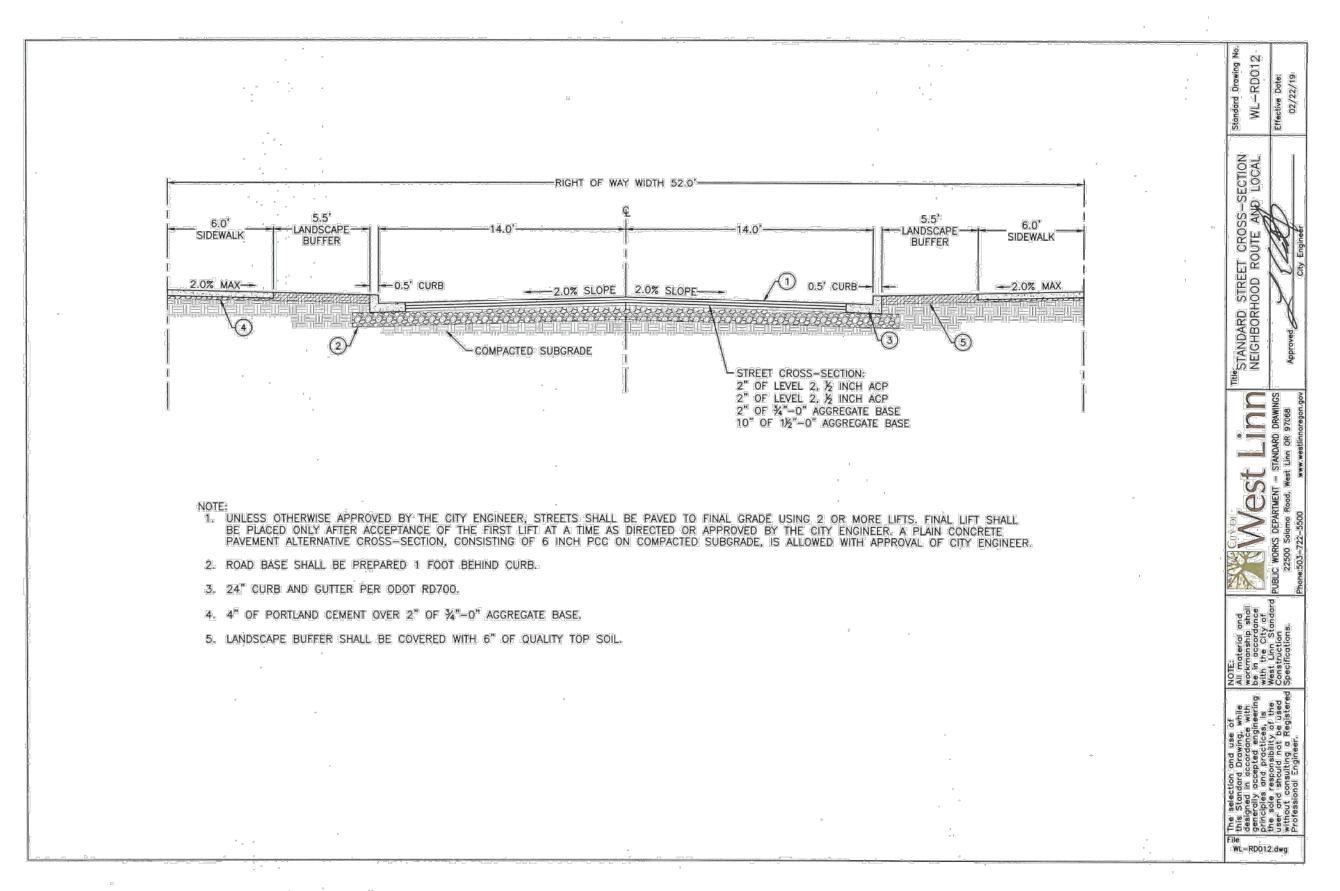
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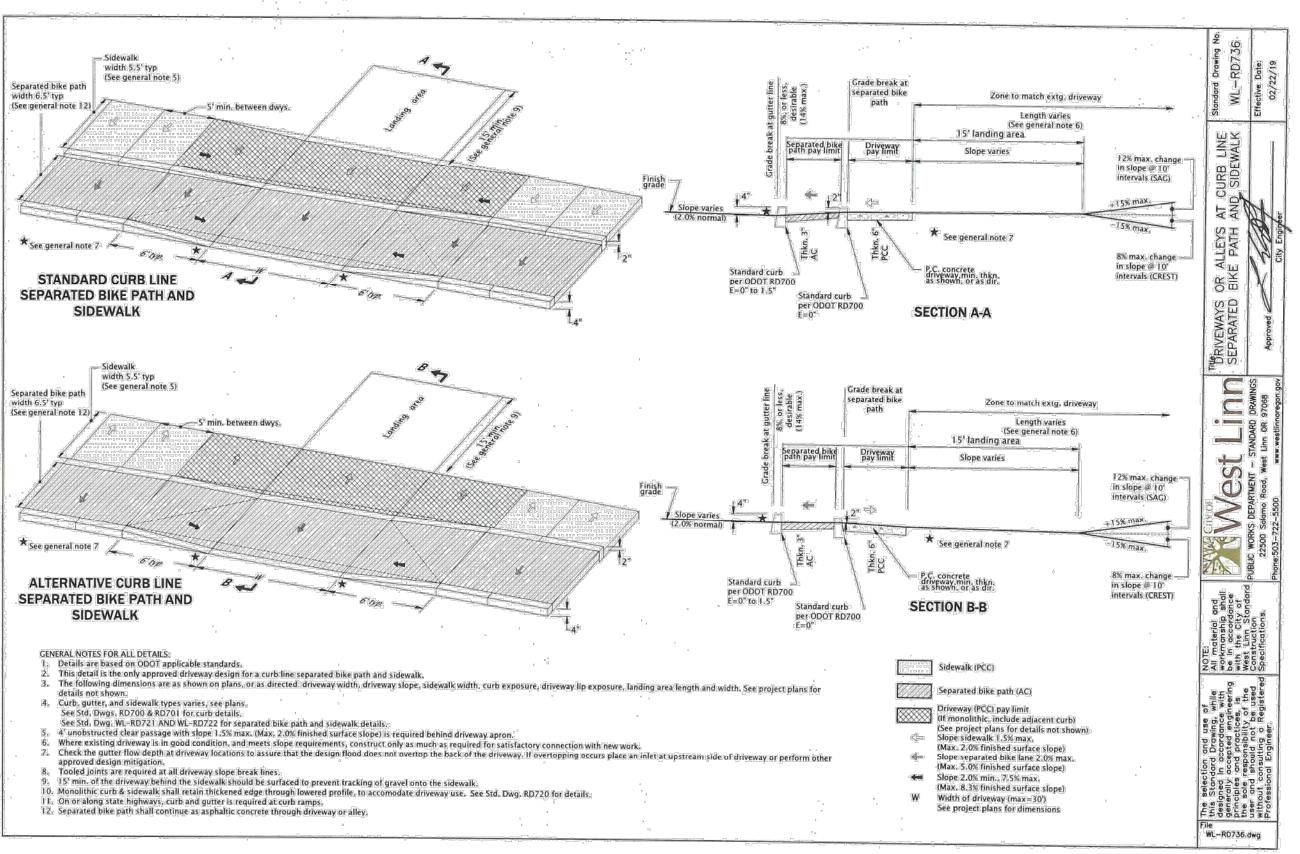
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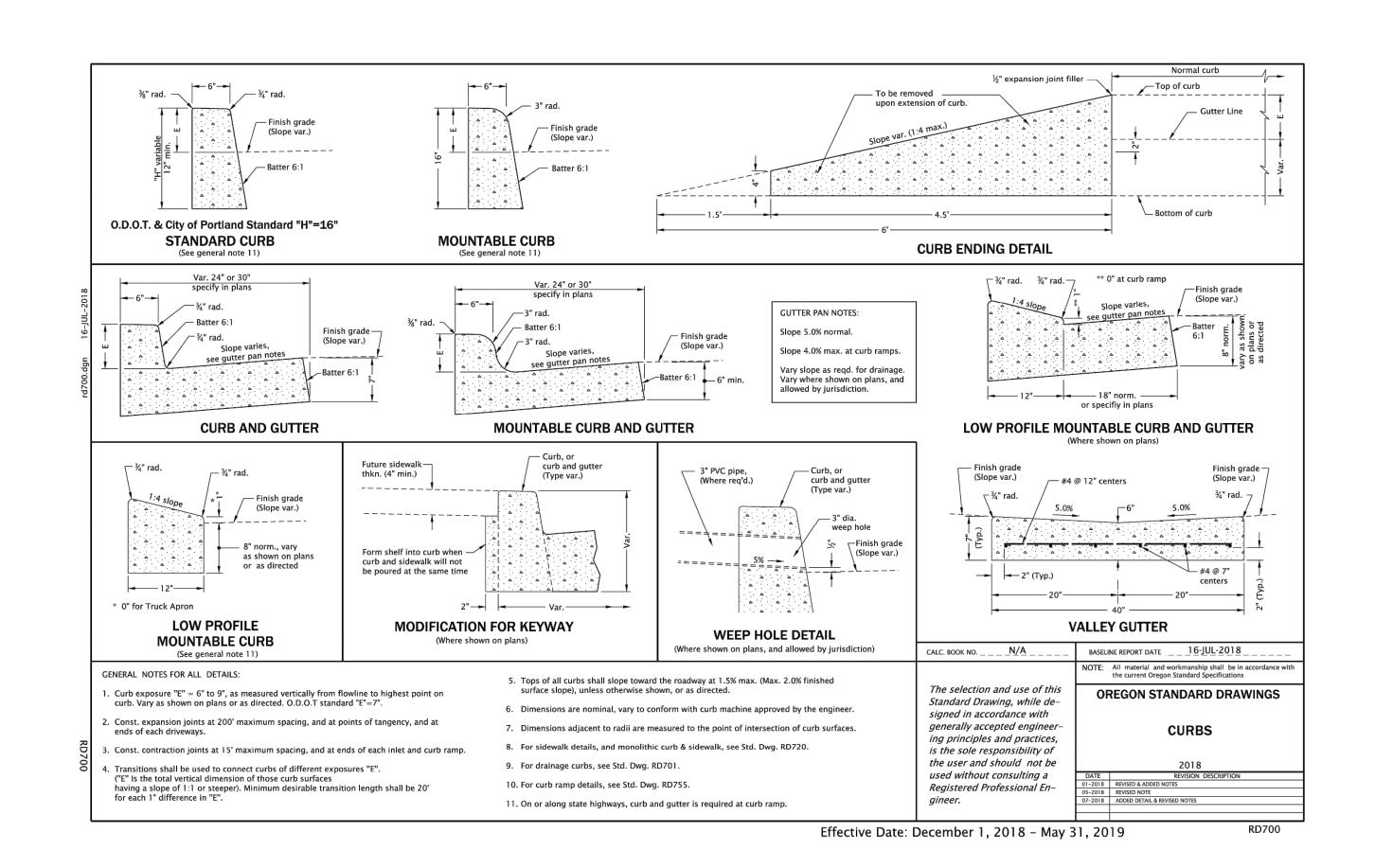
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FINAL MAP DATA

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REVISIONS

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PREPARED FOR THE CITY OF WEST LINN

Structural • Civil Engineers

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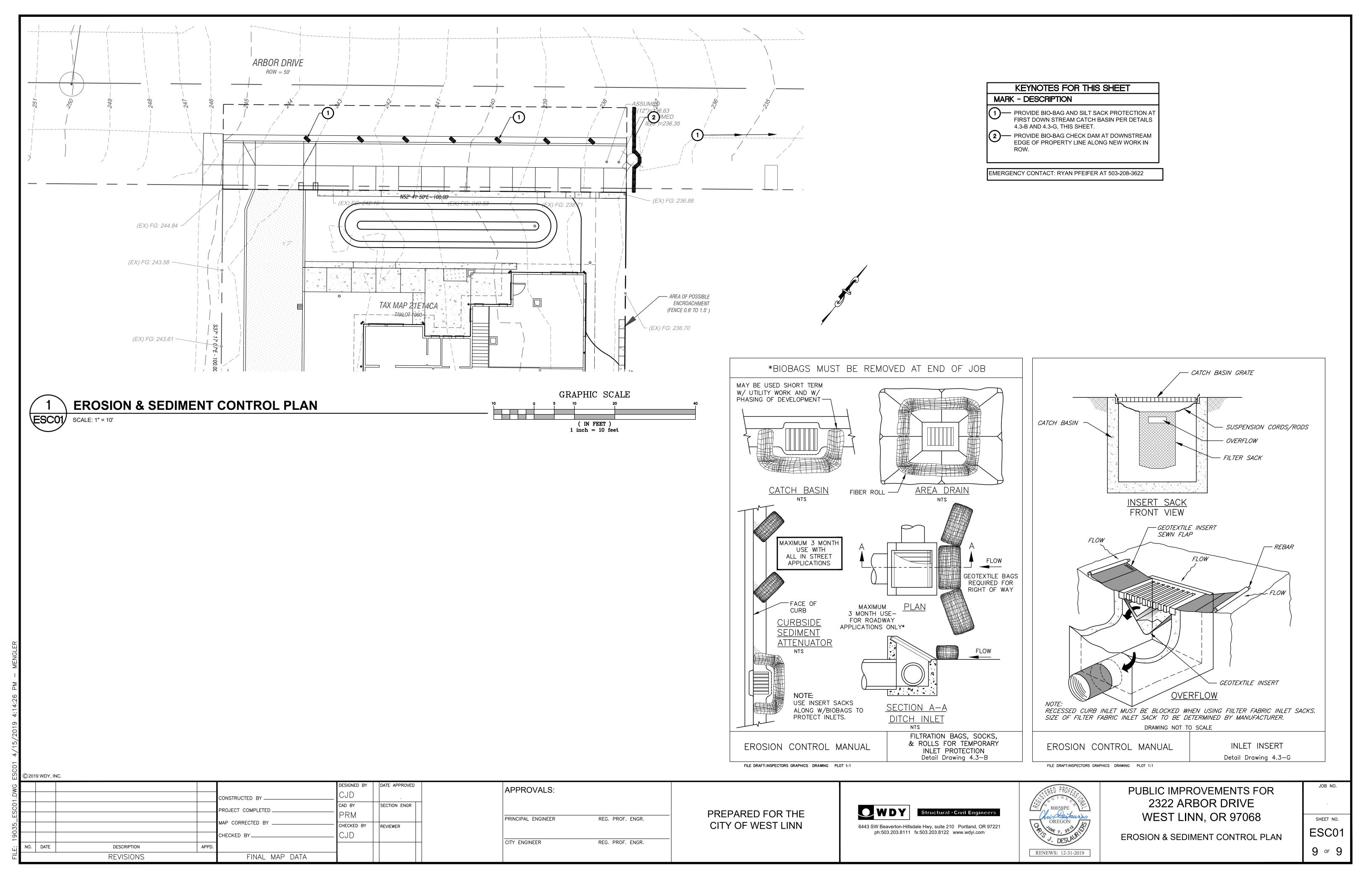
PUBLIC IMPROVEMENTS FOR 2322 ARBOR DRIVE WEST LINN, OR 97068

STANDARD DETAILS

SHEET NO.

JOB NO.

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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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Real-World Geotechnical Solutions Investigation • Design • Construction Support

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- 3 Site Aerial and Exploration Locations

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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

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	ODOT Rock Unconfined				
Hardness Rating	Field Criteria	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 finegrained 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 wer 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:

- 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 observered 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 yd³, 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.

9



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/ft² 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 ft³ 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 5	0 yrs		
Site Modified Peak Ground Acceleration	0.454 g		
Short Period, S _s	0.973 g		
1.0 Sec Period, S ₁	0.416 g		
Soil Factors for Site Class D:			
Fa	1.111		
F _v	1.584		
$SD_s = 2/3 \times F_a \times S_s$	0.720 g		
$SD_1 = 2/3 \times F_v \times S_1$	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.

EXPIRES: 06/30/20 19

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

Michael T. Baker Geotechnical Staff

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REFERENCES

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CHECKLIST OF RECOMMENDED GEOTECHNICAL TESTING AND OBSERVATION

Item	Procedure	Timing	By Whom	Done
No.		J	, -	
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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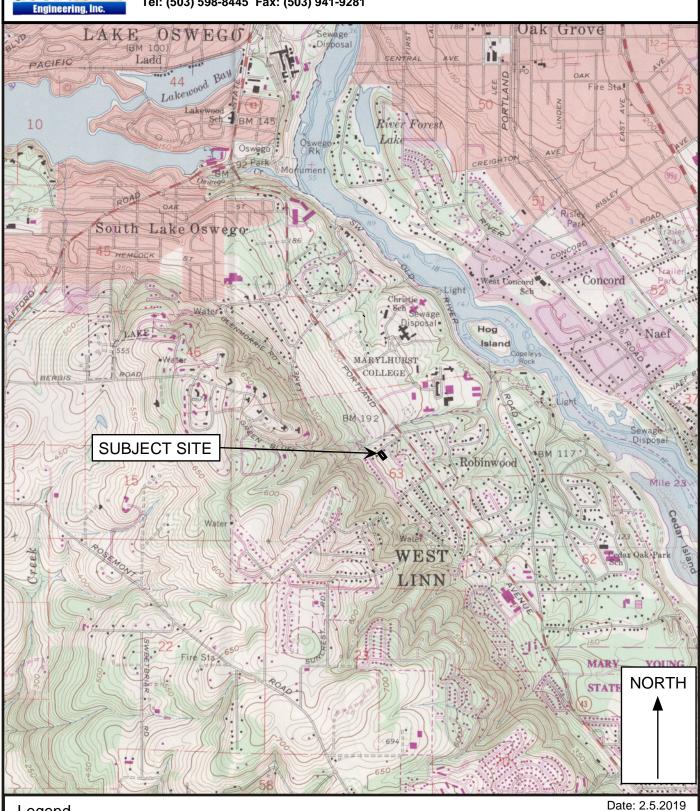
FIGURES



14835 SW 72nd Avenue Portland, Oregon 97224

Tel: (503) 598-8445 Fax: (503) 941-9281

VICINITY MAP



Legend

Approximate Scale 1 in = 2,000 ft

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

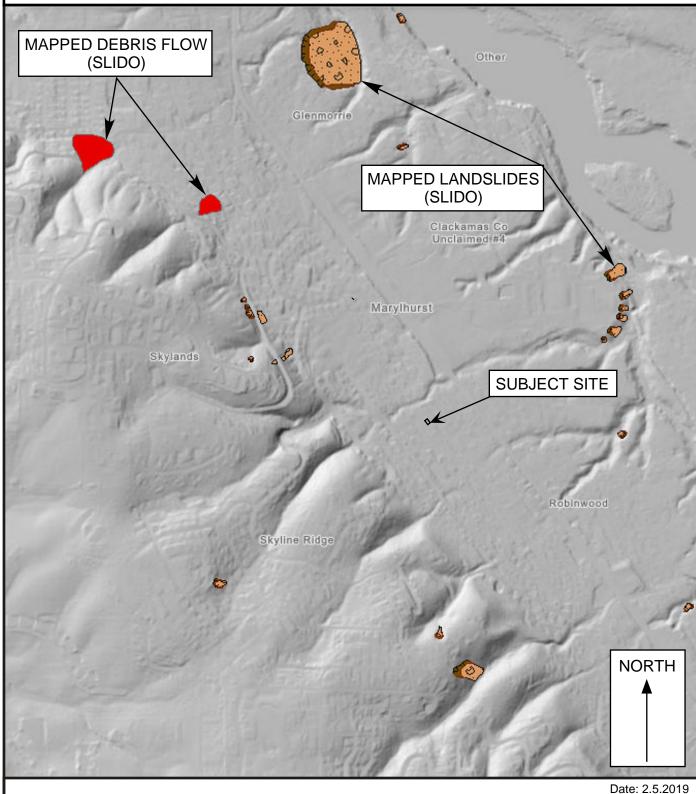
FIGURE 1



14835 SW 72nd Avenue Portland, Oregon 97224

Tel: (503) 598-8445 Fax: (503) 941-9281

LIDAR BASED VICINITY MAP - WITH MAPPED LANDSLIDES



Legend

Approximate Scale 1 in = 1,000 ft

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



14835 SW 72nd Avenue Portland, Oregon 97224

Tel: (503) 598-8445 Fax: (503) 941-9281

SITE AERIAL AND EXPLORATION LOCATIONS





EXPLORATION LOGS



14835 SW 72nd Avenue Portland, Oregon 97224

Tel: (503) 598-8445 Fax: (503) 941-9281

HAND AUGER LOG

Project: 2332 Arbor Drive Project No. 19-5136 Boring No. **HA-1** West Linn, Oregon Water Bearing Zone Sample Type Moisture Content (%) Depth (ft) N-Value **Material Description** 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 Medium stiff to stiff, clayey SILT (ML), light brown, strong orange and gray mottling, moderately plastic, micaceous, moist [Willamette Formation / Loess] 100 to 3 Stiff, clayey SILT (ML), light brown, friable, micaceous, light gray extremely soft (R0) to soft (R2) heavily weathered basalt fragments, damp [Residual Soil] 4 Hand Auger Soil Boring terminated at 4 feet due to refusal on Weathered Basalt Fragments. 5 No groundwater seepage encountered in excavation. 6-7-8 -9-10-11-LEGEND Date Drilled: 1.31.2019 Logged By: MTB ∇ 1,000 g Surface Elevation: 237 Feet Bag Sample Seepage Static Water Table Split-Spoon Water Bearing Zone Shelby Tube Sample



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HAND AUGER LOG

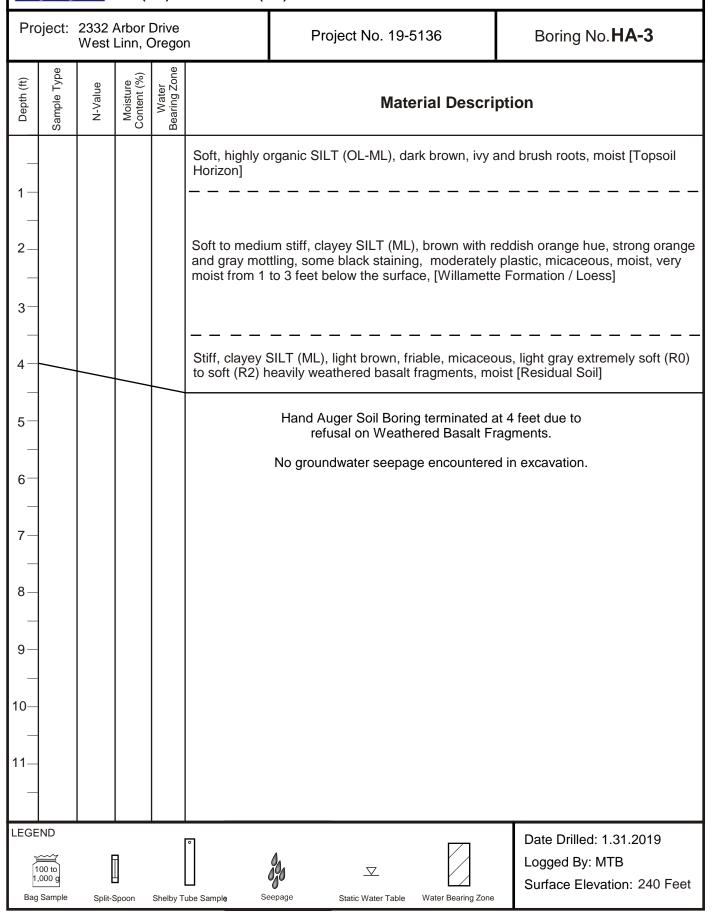
Project: 2332 Arbor Drive Project No. 19-5136 Boring No. **HA-2** West Linn, Oregon Water Bearing Zone Sample Type Moisture Content (%) Depth (ft) N-Value **Material Description** Soft, highly organic SILT (OL-ML), dark brown, ivy and brush roots, moist [Topsoil Horizon] 1 -Medium stiff to stiff, clayey SILT (ML), light brown with reddish orange hue, strong 2orange and gray mottling from 1 to 3 feet below the surface, micaceous, damp [Willamette Formation / Loess] 3 Medium stiff to stiff, SILT (ML), light brown, friable, micaceous, damp [Willamette 4 Formation / Loess] Stiff, clayey SILT (ML), light brown, micaceous, light gray extremely soft (R0) to soft (R2) heavily weathered basalt fragments, damp [Residual Soil] 5 Hand Auger Soil Boring terminated at 5 feet due to refusal on Weathered Basalt Fragments. 6 No groundwater seepage encountered in excavation. 7-8 -9-10-11-LEGEND Date Drilled: 1.31.2019 Logged By: MTB ∇ 1,000 g Surface Elevation: 239 Feet Bag Sample Shelby Tube Sample Seepage Static Water Table Water Bearing Zone Split-Spoon



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Tel: (503) 598-8445 Fax: (503) 941-9281

HAND AUGER LOG





PHOTGRAPHIC LOG



Real-World Geotechnical Solutions Investigation • Design • Construction Support



Center of site facing southeast



Real-World Geotechnical Solutions Investigation • Design • Construction Support



Center of site facing northwest



121 SW Morrison Street, Suite 300 Portland, OR 97204 Phn - (503)222-3651 (800)929-3651

Fax - (877)242-3513

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 First American Title Insurance Company Public Record Report for New Subdivision or Land Partition Order No. 7019-3192977

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.

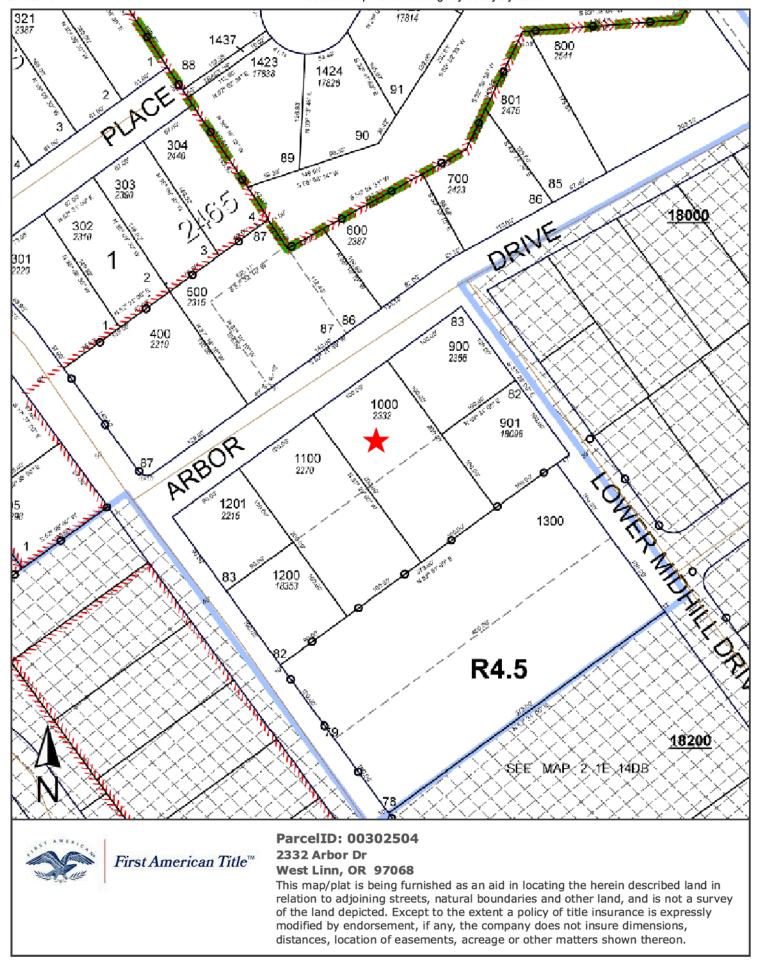
NOTE: Taxes for the year 2018-2019 PAID IN FULL
Tax Amount: \$2,692.76
Map No.: 21E14CA01000
Property ID: 00302504
Tax Code No.: 003-002

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.

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 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.:
Date:

1011 - 7019148274

02/22/2019

Our File No.: 7019-3192977 Title Officer: Dona Lane

Escrow Officer:

Customer ID: 5805264

Liability Amounts

Attention: Melissa Fessler

Your Ref.: 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

Printed On: 02/22/2019, 9:20 AM **Requester:** GC **Page:** 1

AFTER RECORDING, RETURN TO: James S. Bruce 7420 SW Bridgeport Road, Suite 101 Portland, OR 97224 Clackamas County Official Records Sherry Hall, County Clerk

ds **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; 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.

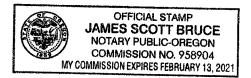
The true consideration for this transfer consists of \$0.00 (zero dollars) and estate planning purposes.

IN WHENESS 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: 2/3/21