



**Mitigation and Bank Use Plan
for
Highland Terrace Subdivision
City of La Center, Washington**

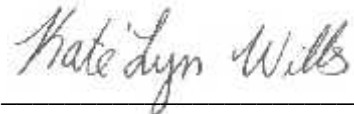
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The information and data in this report were compiled and prepared under the supervision and direction of the undersigned.



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PROPOSED PROJECT

Ecological Land Services, Inc. (ELS) has prepared this mitigation plan comprised of a bank use plan to address wetland impacts incurred during the Highland Terrace Subdivision development. The study area consists of Clark County Tax Parcels 258636-000, 258704-000, 258702-000, 258727-000, 258644-000, and 258763-000 located south of NW Bolen Street and north of NW Pacific Highway in La Center, Washington, within in a portion of Section 33, Township 5 North, Range 1 East, of the Willamette Meridian (Figure 1). The applicant is proposing to subdivide six adjacent parcels totaling approximately 26.06 acres, zoned as MDR-16, into 97 lots to be used for single-family dwellings with associated shared driveways, stormwater facilities, utility installation, and road improvements.

This project avoids wetland impacts to the greatest extent practical; however, to accomplish the proposed residential development and road construction, minor unavoidable direct, indirect and temporary impacts will occur to the wetlands onsite due to construction and development activities. The proposed fill and construction activities will impact four Category IV emergent slope wetlands (A-D) and one Category IV emergent, scrub-shrub, forested, depressional wetland (E). The purpose of the development is to construct single-family residential housing to meet local demand for housing in a rapidly growing area with access to the Interstate 5 corridor. The Highland Terrace Subdivision will have access to Clark County services and is intended for residential use based on its zoning and comprehensive plan designations. The proposed subdivision will accommodate the projected growth within Clark County, and the City of La Center through well planned use of existing land.

Topsoil will be stripped to between 8 and 12 inches deep with deeper stripping in isolated areas and stockpiled for future use in landscaping. Any additional stockpiled soil not used onsite will be hauled to an approved disposal site. Once the site is stripped, it will be graded. Once the site is prepared, utilities will be installed, followed by road construction, home construction, and finally landscaping. Construction equipment is anticipated to include scrapers, bulldozers, loaders, graders, rollers, backhoes, excavators, dump trucks, compactors, concrete trucks, and water trucks. Additionally, excavation and grading will occur within Wetland D and its buffer to create a stormwater pond to treat and filter stormwater runoff created by the new impervious surface of the subdivision. All permanent and indirect impacts to critical areas will be fully compensated for by the purchase of bank credits. Temporary impacts incurred during the creation of the stormwater pond will be compensated for onsite directly following construction by replanting the buffer area with native trees and shrubs. Construction is anticipated to begin in the spring of 2017. Additional project details including a planting plan can be found in the detailed engineering drawings located in Appendix A. Additionally, details can be found the Joint Aquatic Resource Permit Application prepared for the project.

The bank use plan was prepared following the Interagency Review Team for Washington State's Guidance Paper (2009), the Washington Department of Ecology's (Ecology) *Wetland Mitigation in Washington State* (2006), and the U.S. Army Corps of Engineers' (Corps) *Compensatory Mitigation for Losses of Aquatic Resources* (33 C.F.R. §332 (2008)) and addresses purchasing

credits at the East Fork Lewis Wetland Mitigation Bank (EFLMB or Bank) to compensate for direct and indirect wetland impacts.

EXISTING CONDITIONS

EXISTING AND SURROUNDING LAND USES

The two northern parcels (258704-000 and 258636-000) are bordered to the north by NW Bolen Street. These northern parcels share a gravel driveway which divides the parcels east to west. Both parcels contain single-family dwellings with numerous outbuildings and pastureland. The three southern parcels (258702-000, 258727-000, and 258644-000) are bordered to the south by NW Pacific Highway. Both the southwestern (258702-000) and southeastern parcel (258644-000) contain no structures and consist of pastureland. The southcentral parcel (258727-000) contains a single family dwelling with various outbuildings in the northeastern corner with pastureland and a small barn on the southern portion of the parcel. The eastern parcel (258763-000) contains two single family dwellings with numerous outbuildings and consists primarily of pastureland with a forested area containing a scrub-shrub understory along the southern boundary. Property surrounding the study area consists of single family residences and pastureland (Figure 2).

LANDSCAPE POSITION

The study area is within Watershed Resource Inventory Area (WRIA) 27 – Lewis Watershed, and is within the Hydrologic Unit Code (HUC): 17080002.

SITE ASSESSMENT

ELS conducted a site visit on March 23, 2016 to assess site conditions within the study area and to delineate wetlands onsite. There were four Category IV emergent, slope wetlands and one Category IV emergent, scrub-shrub, forested, depressional wetland delineated within the study area (Figure 2). The *Critical Areas Report for the Highland Terrace Subdivision, La Center, Washington* (ELS 2016) contains detailed information regarding delineation methodology.

VEGETATION

Dominant vegetation in the wetlands consisted mainly of; **Trees:** Oregon ash (*Fraxinus latifolia*), mature Pacific crabapple (*Malus fusca*); **Saplings/Shrubs:** Oregon ash, Pacific crabapple, evergreen blackberry (*Rubus laciniatus*); **Herbs:** reed canarygrass (*Phalaris arundinacea*), creeping buttercup (*Ranunculus repens*), orchard grass (*Dactylis glomerata*), velvet grass (*Holcus lanatus*), soft rush (*Juncus effuses*); and **Woody vines:** Himalayan blackberry (*Rubus armeniacus*).

Dominant vegetation in the upland areas consisted mainly of; **Trees:** Oregon ash, mature Pacific crabapple; **Saplings/Shrubs:** common snowberry (*Symphoricarpos albus*), Oregon ash, Pacific crabapple, evergreen blackberry; **Herbs:** meadow foxtail (*Alopecurus pratensis*), swordfern (*Polystichum munitum*), creeping buttercup, orchard grass, velvet grass; and **Woody vines:** Himalayan blackberry.

SOILS

The U.S.D.A. National Resources Conservation Service (NRCS) map depicts seven soil units within the study area: (CwA) Cove silty clay loam, thin solum, 0 to 3 percent slopes; (GeB) Gee silt loam, 0 to 9 percent slopes; (GeD) Gee silt loam, 8 to 20 percent slopes; (GeE) Gee silt loam, 20 to 30 percent slopes; (HcB) Hesson clay loam, 0 to 8 percent slopes; (HoG) Hillsboro silt loam, 30 to 65 percent slopes; (OdB) Odne silt loam, 0 to 5 percent slopes (NRCS 2015 (Figure 4). Cove silty clay loam, thin solum, consists of very deep, poorly drained soils found on flood plains from alluvial deposits. Gee silt loam consists of very deep, moderately well drained soil found on terraces from alluvial deposits. Hesson clay loam consists of very deep, well drained soil found on terraces from alluvial deposits. Hillsboro silt loam consists of very deep, well drained soil found on terraces from alluvial deposits. Odne silt loam consists of very deep, poorly drained soil found on terraces and in drainageways from alluvial deposits. Cove silty clay loam, thin solum and Odne silt loam are both mapped as hydric on the NRCS Hydric Soil List for Washington (2014). Appendix A of the *Critical Areas Report for the Highland Terrace Subdivision, La Center, Washington* (ELS 2016) contains wetland determination data sheets, which document the vegetation and soils within the test plots.

HYDROLOGY

ELS delineated four slope wetlands (A-D) and one depressional wetland (E) onsite. Wetlands A and B are emergent, slope wetlands located at the base of sloped pastureland within the southern parcels and is regularly mowed. Both wetlands (A and B) drain into roadside ditches along NW Pacific Highway and flow southeast. Wetlands C and D are emergent, slope wetlands located mid-hillslope within the eastern parcel. Wetland C is upslope of Wetland D and likely drains to it through groundwater. The area surrounding both wetlands (C and D) has been disturbed via clearing in the past. Wetland E is an emergent, scrub/shrub, forested, depressional wetland located adjacent to NW Pacific Highway. A berm approximately 3-feet tall divides the wetland from the road and roadside ditch, however, the wetland drains to the ditch via a culvert under an existing driveway in this location. Wetland hydrology likely comes from a shallow groundwater table, hillside runoff, and precipitation. Hydroperiods of the wetlands include seasonally flooded, occasionally flooded, and saturated only. All of the wetland test plots met primary hydrology indicators including Surface Water (A1), High Water Table (A2), Saturation (A3), and Water-Stained Leaves (B9). The wetlands provide flood storage and delay, and groundwater recharge functions.

CRITICAL AREAS

Wetlands

Four slope wetlands (A-D) and one depressional wetland (E) were delineated onsite. Wetlands A and B are emergent, slope wetlands that total 29,542 square feet and 19,643 square feet respectively. Wetlands C and D are smaller emergent, slope wetlands that total 1,385 square feet and 1,156 square feet respectively. Wetland E is an emergent, scrub-shrub, forested, depressional wetland that totals 594 square feet. The wetland boundaries were delineated by changes in topography, vegetation, and evidence of hydrology. Dominant vegetation in the wetlands consisted mainly of; Oregon ash, mature and sapling Pacific crabapple, evergreen blackberry, reed canarygrass, creeping buttercup, orchard grass, velvet grass, soft rush and Himalayan blackberry. Wetland hydrology likely comes from a shallow groundwater table, hillside runoff, and precipitation. Hydroperiods of the wetlands include seasonally flooded, occasionally

flooded, and saturated only. The wetlands provide flood storage and delay, and groundwater recharge functions. According to the *Washington State Wetland Rating System for Western Washington: 2014 Update* (Hruby); Wetlands A-D are Category IV slope wetlands scoring 5 points for water quality functions, 3 points for hydrologic functions, and 5 points for habitat functions, while Wetland E is a Category IV depressional wetland scoring 5 points for water quality functions, 4 points for hydrologic functions, and 5 points for habitat functions. Appendix B of the *Critical Areas Report for the Highland Terrace Subdivision, La Center, Washington* (ELS 2016) contains the wetland rating forms.

Buffers

Standard wetland buffers are based on land use intensity in conjunction with the wetland rating category from the wetland rating form (*LCMC 18.300.090.6.h*). Table 18.300.090(6)(h)(i)-1 of the LCMC was used to determine the buffer width. Residential land with more than one residential unit per acre is considered a high intensity land use according to *Guidance on Widths of Buffers and Ratios for Compensatory Mitigation for Use with the Western Washington Wetland Rating System* (Table 8C-3); therefore the designated buffer width for Wetlands A-E is 50-feet. The buffer area is dominated by mowed pasture grasses with scattered trees and shrubs. Table 1 below summarizes and Figure 2 depicts the critical areas onsite.

Table 1. Summary of Critical Areas.

Critical Area	Category ¹ /Cowardin Class ² /HGM Class ³	Size Onsite	Buffer Width ⁴
Wetland A	IV, emergent, slope	29,542 sq. ft.	50 feet
Wetland B	IV, emergent, slope	19,643 sq. ft.	50 feet
Wetland C	IV, emergent, slope	1,385 sq. ft.	50 feet
Wetland D	IV, emergent, slope	1,156 sq. ft.	50 feet
Wetland E	IV, emergent, scrub-shrub, forested, depressional	594 sq. ft.	50 feet

¹Hruby 2004

²Cowardin et al. 1979

³NRCS 2008

⁴LCMC 18.300.090(6)(h)(i)-1

AVOIDANCE AND MINIMIZATION OF IMPACTS

The preferred mitigation sequencing of first avoidance, then minimization, and finally compensation for unavoidable wetland impacts was taken into consideration during the project design process. The proposed development was originally designed to completely avoid Wetlands A and B, however, the City of La Center requires that the roadway access for the subdivision be aligned with the exiting Larson Road located across NW Pacific Highway south

of the study area, as well as roadway improvements to NW Pacific Highway. Therefore, unavoidable wetland impacts are proposed due to the redesigned access road crossing Wetland A and the road improvement to NW Pacific Highway in the southern Portions of Wetlands A and B (Figure 3). Direct impacts to Wetlands D and E were avoided entirely through planning and project design. Wetland impacts will be mitigated by ensuring no net loss of wetland areas or functions through purchasing credits at the East Fork Lewis Mitigation Bank.

UNAVOIDABLE WETLAND IMPACT ACREAGE

Wetlands A and B will have unavoidable direct wetland impacts of 9,622 and 2,190 square feet respectively, due to road alignment and improvements. Additionally, Wetlands A and B will have indirect wetland impacts of 18,987 and 10,985 square feet respectively, due to insufficient buffer width. Wetland C will be filled entirely (1,385 square feet) due to lot development. Wetlands D and E will have indirect wetland impact of 817 and 594 square feet respectively, due to insufficient buffer width. Additionally, Wetland D and its buffer will be temporarily impacted by 1,156 and 13,111 square feet, respectively, due to the creation of the stormwater pond. Table 2 below summarizes the impacts to wetlands and buffers.

Table 2. Summary of Wetland Impacts.

Impact Area	Category¹	Cowardin Class²	HGM Class³	Impact Type	Impact Amount
Wetland A	IV	Emergent	Slope	Direct (fill)	0.22 acres (9,622 sq. ft.)
				Indirect (insufficient buffer)	0.44 acres (18,987 sq. ft.)
Wetland B	IV	Emergent	Slope	Direct (fill)	0.05 acres (2,190 sq. ft.)
				Indirect (insufficient buffer)	0.25 acres (10,985 sq. ft.)
Wetland C	IV	Emergent	Slope	Direct (fill)	0.03 acres (1,385 sq. ft.)
Wetland D	IV	Emergent	Slope	Indirect (insufficient buffer)	0.02 acres (817 sq. ft.)
Wetland D Buffer				Temporary (grading)	0.03 acres (1,156 sq. ft.)
				Temporary (grading)	0.30 acres (13,111 sq. ft.)
Wetland E	IV	Emergent, Scrub-Shrub, Forested	Depressional	Indirect (insufficient buffer)	0.01 acres (594 sq. ft.)
¹ Hruby 2004				Direct Total	13,197 sq. ft.

² Cowardin et al. 1979 ³ NRCS 2008		(0.30 acre)
	Indirect Total	31,383 sq. ft. (0.72 acre)
	Temporary Total	14,267 sq. ft. (0.33 acre)

STORMWATER MANAGEMENT

Wetland D will be used as a stormwater detention pond with an overflow control structure added at the outlet of the wetland. Washington Department of Ecology’s (Ecology 2014) Stormwater Management Manual for Western Washington (Appendix I-D) provides guidelines for using wetlands when managing stormwater. Guide sheet 1 pertains to criteria that exclude wetlands from serving as a stormwater treatment facilities if they are either a Category I or II as determined by the Washington State Wetland Rating System of Western Washington (2014) or if they provide habitat for threatened or endangered species. Guide Sheet 1 does not apply to this project due to Wetland D being a Category IV wetland with low habitat functions. Guide Sheet 3B defines criteria to protect the wetlands described in Guide Sheet 1 (Category I and II) and therefore, does not pertain to this project. Guide Sheet 2 pertains to criteria that allow wetlands to be used as stormwater treatment facilities while, Guide Sheet 3A and 3C pertain to protection of wetlands when being used as stormwater facilities. Below are the paraphrased criteria listed from Guide Sheets 2, 3A and 3C in italics followed by a discussion of how this project meets the guidelines in regular font.

Guide Sheet 2: Criteria for including wetlands as a treatment or flow control BMP/facility

A wetland can be physically or hydrologically altered to meet the requirements of a treatment of flow control BMP/facility if ALL of the following criteria are met:

1. The wetland is classified as Category IV in the “Washington State Wetland Rating System of Western Washington,” or Category III wetland with a habitat score of 19 points or less.

Wetland D is a Category IV wetland according to the rating system (ELS 2016).

2. Demonstrate that there will be “no net loss” of functions and values of the wetland as a result of the structural or hydrologic modifications done to provide control of runoff and water quality.

As a result of the structural modifications of Wetland D into a stormwater pond followed by enhancement plantings, the wetland will have an increased storage capacity and an increased abundance and diversity of native plants including the addition of scrub-shrub and forested vegetation classes. Heavy machinery will be used to accomplish grading for the construction of the stormwater pond within Wetland D and its buffer. Typically heavy equipment can damage the soil structure of the wetland, however, the functions and values that exist currently in Wetland D are low and will be increased by the alteration of the wetland into a stormwater pond and thus, will be self-mitigating.

3. The wetland does not contain a breeding population of any native amphibian species.

The wetland is 1,156 sq. ft. of emergent, herbaceous vegetation with sparse Himalayan and evergreen blackberry around the fringes. The wetland experiences saturation during the wet season, with less than 25 percent of the area experiencing occasional and seasonal flooding. The ponding that does occur within Wetland D is less than 6 inches at any given time as the wetland is a slope and drainage continues downslope. Due to the lack of suitable scrub-shrub vegetation and the small amount of ponding Wetland D experiences there is little to no available habitat to sustain a breeding population of amphibians. No amphibians were seen or heard during the site visit.

4. The hydrologic functions of the wetland can be improved as outlined in Questions 3,4,5 of Chart 4 and Questions 2,3,4 of Chart 5 in the “Guide for Selecting Mitigation Sites Using a Watershed Approach”.

The hydrologic functions of Wetland D can be improved as outlined in Ecology’s 2009 *Guide for Selecting Mitigation Sites Using a Watershed Approach* Chart 4, Questions 4 and 5 and Chart 5, Questions 2 and 3, by creation of the stormwater pond. Currently the conveyance system is directly downslope drainage as groundwater or channeled surface water during storm events, therefore, the wetland doesn’t allow much storage. The creation of the stormwater pond will alter the conveyance system to allow water to be retained and create a greater depth of storage.

5. The wetland lies in the natural routing of the runoff, and the discharge follows the natural routing.

Wetland D lies in the natural routing of the runoff and the discharge follows the natural routing.

Guide Sheet 3: Wetland protection guidelines

Although this guide sheet is intended primarily for the protection of the wetlands listed in Guide Sheet 1; this guidance still should be applied, as practical, for wetlands listed in Guide Sheet 2 when they are modified to meet stormwater requirements.

Guide Sheet 3A: General guidelines for protecting functions and values of wetlands

- 1. Consult regulations issued under federal and state laws that govern the discharge of pollutants. Wetlands are classified as “Waters of the United States” and “Waters of the State” in Washington.*

Dewatering devices shall discharge into the stormwater pond which will contain a sediment trap in the northern portion. No discharge will be made to a paved street or stormwater collection system without first being treated to remove sediment.

- 2. Maintain the wetland buffer required by local regulations.*

All impacts to the wetland and its buffer during the construction of the stormwater pond will be compensated for onsite directly following construction by planting the buffer area with native trees and shrubs. For planting details, see engineering drawings in Appendix A.

- 3. Retain areas of native vegetation connecting the wetland and its buffer with nearby wetlands and other contiguous area of native vegetation.*

The only areas of native vegetation connecting the wetland and its buffer to another nearby wetland (Wetland E) will be retained during the course of this project.

4. *Avoid compaction of soils and introduction of exotic plant species during any work in a wetland.*

Equipment used to construct the stormwater pond will exert a ground pressure of less than 2 pounds per square inch to avoid soil compaction. Care will be taken to avoid the introduction of exotic plant species during this project.

5. *Avoid general urban impacts (e.g. littering and vegetation destruction). Examples are protecting existing buffer zones; discouraging access, especially by vehicles, by planting outside the wetland; and encouragement of stewardship by a homeowners' association.*

General urban impacts, such as littering, vegetation destruction, and pet use, will be minimized by protection of the existing buffer via densely planting the buffer to discourage access. For planting details, see engineering drawings in Appendix A. Additionally, a homeowner's association will be responsible for the protection and maintenance of the stormwater pond after construction.

6. *Fences can be used to restrict dogs and pedestrian access, but they also interfere with wildlife movements. Fences should generally not be installed when wildlife would be restricted and intrusion is relatively minor.*

Fencing is only proposed along the northern edge of the buffer to restrict pedestrian and dog access while still allowing wildlife movement to the south and towards the only other nearby wetland (E).

7. *If the wetland inlet will be modified for the stormwater management project, use a diffuse flow method to discharge water into the wetland in order to prevent flow channelization.*

The wetland inlet will be modified by the addition of a flow spreader to prevent flow channelization with a trash screen to prevent garbage and debris from entering the wetland.

Guide Sheet 3C: Guidelines for protecting wetlands from pollutants

Protecting a wetland from pollutants generated by a development should include the following measures:

1. *Use effective erosion control at construction sites in the wetland's drainage catchment.*

The contractor shall install and maintain BMP's as shown in the engineering drawings (found in Appendix A) and perform all actions necessary to prevent erosion, and control sediment from leaving the construction site. The site contractor shall comply with the City of La Center Code Chapter 18.320, *Stormwater and Erosion Control*.

2. *Institute a program of source control BMPs and minimize the pollutants that will enter storm runoff that drains to the wetland.*

The contractor shall install and maintain BMP's as shown in the engineering drawings (found in Appendix A) and perform all actions necessary to prevent erosion, and control sediment from

leaving the construction site. The site contractor shall comply with the City of La Center Code Chapter 18.320, *Stormwater and Erosion Control*.

3. For wetlands that meet the criteria in Guide Sheet 1, provide a water quality control facility consisting of one or more treatment BMPs to treat runoff entering the wetland.

Wetland D does not meet the criteria in Guide Sheet 1 due to its wetland rating of Category IV.

IMPACTED WETLAND FUNCTIONS

WETLANDS A AND B

Water Quality

Wetlands A and B will be directly impacted by 9,622 and 2,190 square feet respectively, due to road alignment and improvements. Additionally, Wetlands A and B will be indirectly impacted by 18,987 and 10,985 square feet respectively, due to insufficient buffer width. Wetlands A and B are both Category IV emergent, slope wetlands. The areas that will be impacted are sloped areas dominated by various pasture grasses that are regularly mowed or grazed. The wetlands provide a medium level of water quality functions (5 out of 9 possible), scoring low for site potential, medium for landscape potential and medium for value of water quality functions. The average slope of wetlands A and B is between 2 and 5 percent with dense, uncut, herbaceous plants covering approximately ¼ of the area. Greater than 10 percent of the area within 150 feet upslope of the wetland is in land uses that generate pollutants. The road side ditch that both Wetlands A and B drain directly to discharges within a mile directly to an unnamed tributary of Brezee Creek that is on the 303(d) list. Water quality is not expected to be impacted as construction will be completed during the dry season and there will be silt fencing on the downhill slope to filter potential sediment-laden water in case of a storm event.

Water Quantity

Wetlands A and B provide a low level of hydrologic functions (3 out of 9 possible), scoring low for site potential, landscape potential and for value of hydrologic functions. The vegetation characteristics are so lacking they don't provide any reduction in velocity of surface flows during storm events. Less than 25 percent of the area within 150 feet upslope of the wetlands is in land uses that generate excess runoff. No flooding problems have been identified downstream. The impacts to Wetlands A and B will eliminate some flood storage and delay.

Habitat

Wetlands A and B provide a medium level of habitat functions (5 out of 9 possible), scoring low for site potential, high for landscape potential and low for value of habitat functions. Both wetlands consist of only one Cowardin class, emergent. The types of hydroperiods present are seasonally flooded, occasionally flooded, and saturated only with the flooded areas comprising less than ¼ of the total area of the wetlands. There are less than 5 species of plants present in significant quantities in both wetlands and no special habitat features or priority habitats. Of a 1 km polygon surrounding the wetlands, the accessible habitat comprises approximately 10 to 19 percent, the undisturbed habitat comprises greater than 50 percent and less than 50 percent is in high intensity land uses.

WETLANDS C AND D

Water Quality

Wetland C will be filled entirely (1,385 square feet) due to lot development. Wetland D will be indirectly impacted by 817 square feet due to insufficient buffer width. Additionally, Wetland D will be temporarily impacted by 1,156 sq. ft. and the Wetland D buffer will be temporarily impacted by 13,111 sq. ft. due to grading for the creation of the stormwater pond. Wetlands C and D are both Category IV emergent, slope wetlands. The areas that will be impacted are sloped areas dominated by herbaceous wetland vegetation with a small amount of Himalayan and evergreen blackberry around the fringes of the wetland. The wetlands provide a medium level of water quality functions (5 out of 9 possible), scoring low for site potential, medium for landscape potential and medium for value of water quality functions. The average slope of Wetlands C and D is between 2 and 5 percent with dense, uncut, herbaceous plants covering approximately ¼ of the area. Greater than 10 percent of the area within 150 feet upslope of the wetland is in land uses that generate pollutants. The road side ditch that runs adjacent to NW Pacific Highway directly discharges within a mile directly to an unnamed tributary of Brezee Creek that is on the 303(d) list. Water quality is not expected to be impacted as construction will be completed during the dry season and there will be silt fencing on the downhill slope to filter potential sediment-laden water in case of a storm event.

Water Quantity

Wetlands C and D provide a low level of hydrologic functions (3 out of 9 possible), scoring low for site potential, landscape potential and for value of hydrologic functions. The vegetation characteristics are so lacking they don't provide any reduction in velocity of surface flows during storm events. Less than 25 percent of the area within 150 feet upslope of the wetlands is in land uses that generate excess runoff. No flooding problems have been identified downstream. The impacts to Wetland C will eliminate some flood storage and delay. Wetland D will experience an increase in depth of storage due to the creation of the stormwater pond.

Habitat

Wetlands C and D provide a medium level of habitat functions (5 out of 9 possible), scoring low for site potential, high for landscape potential and low for value of habitat functions. Both wetlands consist of only one Cowardin class, emergent. There is a small amount of scrub-shrub vegetation that covers less than 10 percent of the total wetland and consists only of Himalayan blackberry and evergreen blackberry. The types of hydroperiods present are seasonally flooded, occasionally flooded, and saturated only with the flooded areas comprising less than ¼ of the total area of the wetlands. There are between 5 and 19 species of plants present in both wetlands with a low interspersed of habitats and no special habitat features or priority habitats. Of a 1 km polygon surrounding the wetlands, the accessible habitat comprises approximately 10 to 19 percent, the undisturbed habitat comprises greater than 50 percent and less than 50 percent is in high intensity land uses. Temporary impacts to Wetland D will be compensated for onsite through enhancement plantings of native trees and shrubs to create ecological lift and to ensure no net loss of wetland function.

WETLAND E

Water Quality

Evergreen Homes NW
Highland Terrace Subdivision Mitigation and Bank Use Plan

Ecological Land Services, Inc.
May 2016

Wetland E will only be indirectly impacted by 594 square feet due to insufficient buffer width. Wetland E is a Category IV emergent, scrub-shrub, forested, depressional wetland. The areas that will be impacted are dominated by mature and immature Oregon ash and Pacific crabapple, as well as Himalayan blackberry. The wetland provides a moderate level of water quality functions (5 out of 9 possible), scoring low for site potential, medium for landscape potential and medium for value of water quality functions. Wetland E has an unstricted surface outlet via a culvert that drains the wetland under an existing gravel driveway to the roadside ditch adjacent to NW Pacific Highway. Approximately 1/10 of the wetland is covered by persistent, ungrazed plants with less than 1/2 of the total wetland experiencing seasonal ponding. The wetland receives stormwater discharges from NW Pacific Highway and is within 250 feet of at least one septic system. The road side ditch that runs adjacent to NW Pacific Highway directly discharges within a mile directly to an unnamed tributary of Brezee Creek that is on the 303(d) list. Water quality is not expected to be impacted as construction will be completed during the dry season and there will be silt fencing on the downhill slope to filter potential sediment-laden water in case of a storm event.

Hydrologic

Wetland E provides a low level of hydrologic functions (4 out of 9 possible), scoring low for site potential, medium for landscape potential and low for value of hydrologic functions. Wetland E has an unstricted surface outlet via a culvert that drains the wetland under an existing gravel driveway to the roadside ditch adjacent to NW Pacific Highway. During wet periods, the wetland experiences ponding approximately 0.5 feet to 2 feet deep. The area of the upstream basin that contributes surface water to the wetland is more than 100 times the size of the wetland unit. The wetland receives stormwater discharges from NW Pacific Highway. No flooding problems have been identified downstream. The impacts to Wetland E will eliminate some flood storage and delay.

Habitat

Wetland E provides a medium level of habitat functions (5 out of 9 possible), scoring low for site potential, high for landscape potential and low for value of habitat functions. The wetland consists of three Cowardin classes, emergent, scrub-shrub and forested. The types of hydroperiods present are seasonally flooded, occasionally flooded and saturated only with the flooded areas comprising less than 1/4 of the total area of the wetlands. There are less than 5 species of plants present in the wetland with a moderate interspersions of habitats and no special habitat features or priority habitats. Of a 1 km polygon surrounding the wetlands, the accessible habitat comprises approximately 10 to 19 percent, the undisturbed habitat comprises greater than 50 percent and less than 50 percent is in high intensity land uses.

MITIGATION SITE SELECTION RATIONALE

The wetlands proposed for impact are located within the service area for the EFLMB (Figure 4). The project site is located approximately 8 miles west of the Bank site between Jenny Creek, an unnamed tributary to Brezee Creek, and the South East Fork Lewis River within the western portion of the Lewis Watershed. The proposed wetland impacts lie within the northwestern

portion of the service area. Mitigating onsite would result in small, isolated wetlands with limited connectivity to other wetlands and habitat areas, and would have limited habitat potential due to the surrounding development. Therefore, the 0.30 acres of proposed direct wetland impact and the 0.72 acres of proposed indirect wetland impact will be mitigated by purchasing credits from the Bank as specified in the approved Mitigation Bank Instrument (MBI) for impacts to Category IV wetlands.

Rational for selecting this mitigation bank is as follows:

- The development project proposes impact to critical wetland functions that cannot be replaced onsite due to insufficient space for onsite mitigation. The impacted functions are water quality, hydrology, and habitat, which can be replaced within the Bank site.
- The wetland mitigation needs of the project correspond directly with the purpose, goals, and objectives of the Bank, as the Bank has identified that 113.26 acres are dedicated to wetland re-establishment, enhancement and preservation.

The 2008 *Compensatory Mitigation for Losses of Aquatic Resources, Final Rule* (Corps) recommends purchasing mitigation bank credits for ecological considerations (lower risk of failure and lower temporal loss of resources and services) and to avoid the maintenance and contingency issues and outright failures that often accompany permittee-responsible mitigation sites. Use of the Bank substantially lowers the risk of failure and temporal loss of resource functions and services over newly established, permittee-responsible mitigation sites. Additionally, there is insufficient space for onsite mitigation and any mitigation conducted onsite will be completely isolated by development. Offsite mitigation will be more meaningful and beneficial to the watershed. As described below, the functional lift anticipated by the Bank will adequately compensate for wetland functions impacted by the residential subdivision.

WETLAND FUNCTIONS PROVIDED AT MITIGATION BANK

The following is excerpted or paraphrased from the East Fork Lewis MBI:

Prior to establishment of the Bank, the site consisted of intensely farmed agricultural fields bisected by a series of ditches with groundwater was controlled by an extensive ditch and drain tile system. A Type F stream (tributary to Rock Creek) was historically diverted across (east) the northern portion of the Bank site, then turns to flow south along the eastern boundary. The onsite ditches and stream were considered Category IV, riverine flow-through wetlands. A Category III, slope/depressional forested wetland is also located within the narrow strip of land along the western Bank boundary that continues offsite to the west.

The primary ecological goals of the East Fork Lewis Wetland Mitigation Bank are as follows:

- Restore wetland hydrology by disabling the extensive ditch and drain tile system currently used to convey water off of the site.

- Establish a variety of native wetland habitat types, comparable to pre-agricultural conditions and in accordance with targeted hydrologic regimes and elevations across the site.
- Control invasive species, including but not limited to, reed canarygrass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*) across the site.
- Create and enhance wildlife habitat, structure and function of the site.

Grading activities and installation of large woody material and other habitat features at the Bank were completed in 2013 and 2014, and plant installation was completed in March 2014.

HYDROLOGY

Prior to Bank construction, groundwater, runoff, and flood water from the tributary to Rock Creek entering the Bank site was quickly and effectively conveyed downstream through the extensive drain tile and ditch system. Disabling drain tiles and plugging ditches will allow the site to saturate, creating new wetland area (108+ acres), which will significantly increase flood water storage within the watershed. This reduces peak flows downstream of the Bank, decreases downstream erosion, and provides groundwater recharge that helps to alleviate low flows downstream of the Bank site during the dry season.

WATER QUALITY

The Bank's contributing basin includes rural residences and paved roads that contribute untreated stormwater runoff to the Bank site. Because the contributing basin is largely undeveloped, it is expected that future land use in the surrounding area will only increase the level of sediments, nutrients, and toxics that could potentially enter the site. Post-construction wetland functions related to water quality, such as removing sediments, nutrients, metals, and toxic organic substances will significantly increase as vegetation establishes. Specifically, the wetland will store water seasonally and during flood events, slowing and reducing sediment transport, and multiple vegetative classes will filter metals and toxic organic substances and remove nutrients in the increased aerobic conditions. Furthermore, trees and shrubs planted along the tributary to Rock Creek will help keep the stream temperature cooler during the hot summer months.

WILDLIFE HABITAT

Overall habitat suitability for invertebrates, amphibians, wetland-associated birds, and wetland-associated mammals will improve tremendously over existing conditions of the Bank site, specifically because of the increase in wetland area containing a variety of hydroperiods (permanent, seasonal, and occasional inundation and/or saturation), vegetative species richness, habitat interspersion, the habitat features (large woody debris and bird nesting boxes), eventual canopy closure of forested wetland areas, and corridors to adjacent upland areas. Although the site has been designed to exclude resident and anadromous fish to prevent stranding, fish habitat in the onsite ditches and downstream is enhanced because plantings along the tributary to Rock Creek will provide temperature regulation and leaf litter. The wetlands will also increase groundwater recharge that will supplement low flows during the dry season, and the wetland vegetation will improve water quality entering the stream.

ANTICIPATED FUNCTIONAL LIFT

The goal of the Bank site is to re-establish high quality wetland and associated wildlife habitat providing for significant overall functional lift. The Bank site location within the landscape and its overall design will provide a significant ecological benefit to not only the immediate surrounding area, but throughout a large portion of the watershed. The Bank is currently in the establishment period having been planted in spring of 2014. The post-construction Bank site will consist of a forested, scrub-shrub, and emergent depressional flow-through wetland system that will contain a seasonal stream and a fish-bearing, perennial stream. A variety of water regimes, vegetation interspersions, and habitat features will provide diverse habitat opportunity for wildlife. The re-established wetlands will also increase flood storage, improve water quality, help prevent downstream erosion, recharge groundwater to supplement low summer flows and keep summer water temperatures cooler, similar to pre-agricultural conditions. The anticipated functional lift post-construction of the Bank consists of an overall increase in functions related to habitat, water quality and water quantity.

WETLAND FUNCTIONS NOT MITIGATED AT MITIGATION BANK

The Bank site will adequately mitigate for all direct and indirect impacts to wetland functions proposed by the development project. There will, however, be a temporal loss of habitat functions while forested vegetation is establishing at the Bank site. Plant installation was completed in the spring of 2014 and project impacts will occur in the summer of 2017. Use of the Bank for mitigation does substantially lower the risk of failure and continued temporal loss of resource functions and services that often accompany permittee-responsible mitigation.

To ensure no net loss of function, temporary impacts incurred during the creation of the stormwater pond will be compensated for and enhanced from pre-project conditions onsite directly following construction via replanting the buffer area with native trees and shrubs. As a result of the structural modifications of Wetland D into a stormwater pond followed by enhancement plantings, the wetland will have an increased storage capacity and an increased abundance and diversity of native plants including the addition of scrub-shrub and forested vegetation classes. Since the alteration of Wetland D into a stormwater pond will create greater function and ecological lift than currently provided, the temporary impact will not cause a reduction in wetland function and therefore is self-mitigating. For planting details, see engineering drawings in Appendix A.

PROPOSED MITIGATION CREDITS

Table 3 below is taken from the East Fork Lewis MBI and lists the recommended credit ratios for purchasing credits based on the impacted resource category.

Table 3. Credits Recommended for Wetland and Buffer Impacts at East Fork Lewis Mitigation Bank.

Resource Impact	Bank Credits:Impact Area
Category I Wetland	Case-by-case
Category II Wetland	1.2:1
Category III Wetland	1:1
Category IV Wetland	0.85:1
Critical Area Buffer	Case-by-case

This mitigation and bank use plan proposes to purchase a total of 0.57 Bank credits to compensate for 0.30 acres of direct and 0.72 acres of indirect wetland impacts. Temporarily impacted areas will be restored to pre-project condition following construction. Bank credits will be purchase from EFLMB at a ratio of 0.85 to 1 as designated for impacts to Category IV wetlands. Bank credits required to compensate for indirect Category IV wetland impacts are proposed at a ratio of 0.85 to 1 with a 0.50 multiplier resulting in 0.31 credits needed to compensate for 0.72 acres of indirect impact. The 0.50 (50 percent) multiplier is based on the rationale that indirect impacts can be adequately compensated for by using 50 percent of the Bank’s required ratio for direct wetland impacts. Indirect impacts adversely affect the ability of the wetland to provide functions and values which the wetland provided prior to disturbance. Examples are changes in drainage characteristics, changes in water levels, and changes in wetland characteristics. Direct impacts result in immediate changes of hydrological characteristics of a wetland, loss of habitat, loss of flood storage, and loss of nutrient removal or retention. Indirect impacts do not result in these immediate changes, therefore mitigating at 50 percent of the Bank’s required ratio for direct wetland impacts is reasonable and scientifically sound. In addition, the 50 percent multiplier for indirect wetland impacts has been used on previous projects that were subsequently approved by both the Army Corps of Engineers and the Department of Ecology. The purchasing of 0.57 credits at the Bank will fully compensate for the quality of habitat lost and ensure there is no net loss of ecological function. Table 4 below details the mitigation ratios used to calculate the total number of Bank credits needed to compensate for the project impacts.

Table 4. Mitigation Bank credits proposed for project impacts.

Impact Type	Impact Amount	Mitigation Ratio	Indirect Impact Multiplier	Proposed Credit Purchase
Permanent Impact to Category IV Wetland A	0.22 acres (9,622 sq. ft.)	0.85:1	N/A	0.19
Indirect Impact to Category IV Wetland A	0.44 acres (18,987 sq. ft.)	0.85:1	0.50	0.19
Permanent Impact to Category IV Wetland B	0.05 acres (2,190 sq. ft.)	0.85:1	N/A	0.04
Indirect Impact to Category IV Wetland B	0.25 acres (10,985 sq. ft.)	0.85:1	0.50	0.11

Permanent Impact to Category IV Wetland C	0.03 acres (1,385 sq. ft.)	0.85:1	N/A	0.03
Indirect Impact to Category IV Wetland D	0.02 acres (817 sq. ft.)	0.85:1	0.50	0.01
Indirect Impact to Category IV Wetland E	0.01 acres (594 sq. ft.)	0.85:1	0.50	0.004
Total Permanent	0.30 acres (13,197 sq. ft.)	Total Permanent		0.26
Total Indirect	0.72 acres (31,383 sq. ft.)	Total Indirect		0.314
Total Credits				0.574

CREDIT PURCHASE OR TRANSFER TIMING

Evergreen Homes NW is negotiating a Buy/Sell Agreement with East Fork Lewis Mitigation Bank for purchasing mitigation credits that would appropriately mitigate for the proposed project impacts. This anticipated timing of purchase or transfer of the credits is late spring or early summer of 2017, immediately following permit issuance by the agencies with jurisdiction. Site construction is anticipated to begin immediately following permit issuance. Prior to impacting project wetlands, the applicant will submit proof of purchase (e.g. bill of sale) or transfer of credits to project managers for both Ecology and the Corps. Proof of the mitigation transfer will be provided in the form of a notification letter to the approving agencies. Upon service of this notification, the mitigation requirement to purchase 0.574 mitigation credits will be fully satisfied.

CONFIRMATION OF MITIGATION CREDIT AVAILABILITY

East Fork Lewis Mitigation Partners, LLC, the Bank Sponsor, has met all the required terms and conditions for the release of mitigation credits from the East Fork Lewis Mitigation Bank. Proof of the current number of available mitigation credits at the East Fork Lewis Mitigation Bank site can be confirmed by approving agency(s) through the Interagency Review Team.

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Gail Terzi

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Regulatory Branch, Seattle District
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PO Box C-3755
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Gail.M.Terzi@usace.army.mil

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Washington State Department of Ecology Water Quality Program (2012). *Stormwater Management Manual for Western Washington: Volume 1 Minimum Technical Requirements and Site Planning*. Publication #14-10-055.

FIGURES

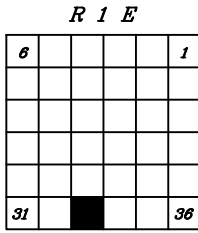
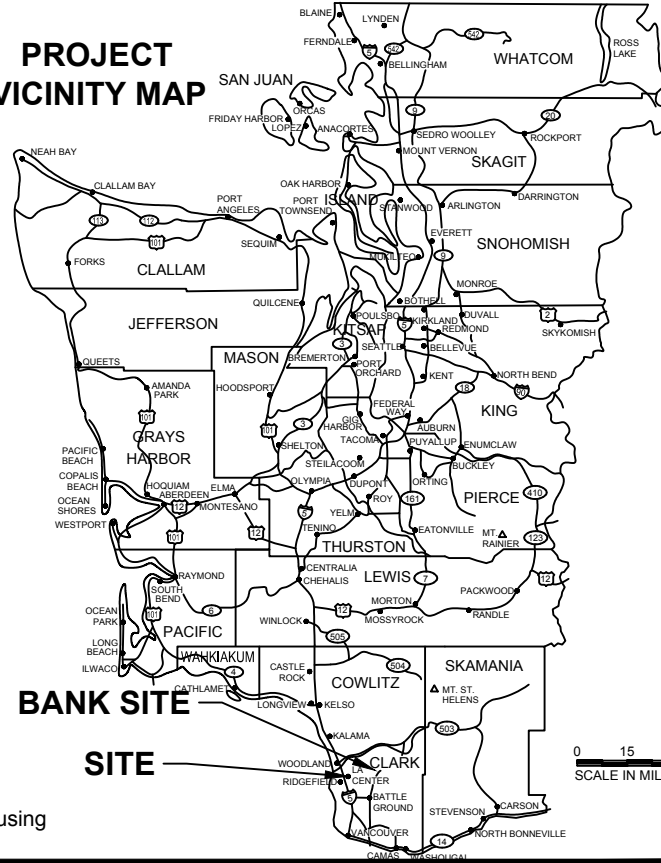
WASHINGTON



Latitude: 45.5211°
Longitude: -122.4104°

LOCATION MAP

PROJECT VICINITY MAP



NOTE:
USGS topographic quadrangle map reproduced using
MAPTECH Inc., Terrain Navigator Pro software.

PROPOSED: Wetland Fill

IN Wet. assoc. w/ E. Fork Lewis River
NEAR: La Center
COUNTY: Clark
STATE: WA
SHEET 1 OF 4
DATE: 5/9/16

VICINITY MAP

APPLICANT: Evergreen Homes NW
PROJECT NAME: Highland Terrace Subdivision
REFERENCE #: Not Yet Assigned
SITE LOCATION ADDRESS:
NW Pacific Hwy.
La Center, WA 98629

PURPOSE:

Construction of 97 lot subdivision

DATUM: NAD83

ADJACENT PROPERTY OWNERS:

SEE JARPA

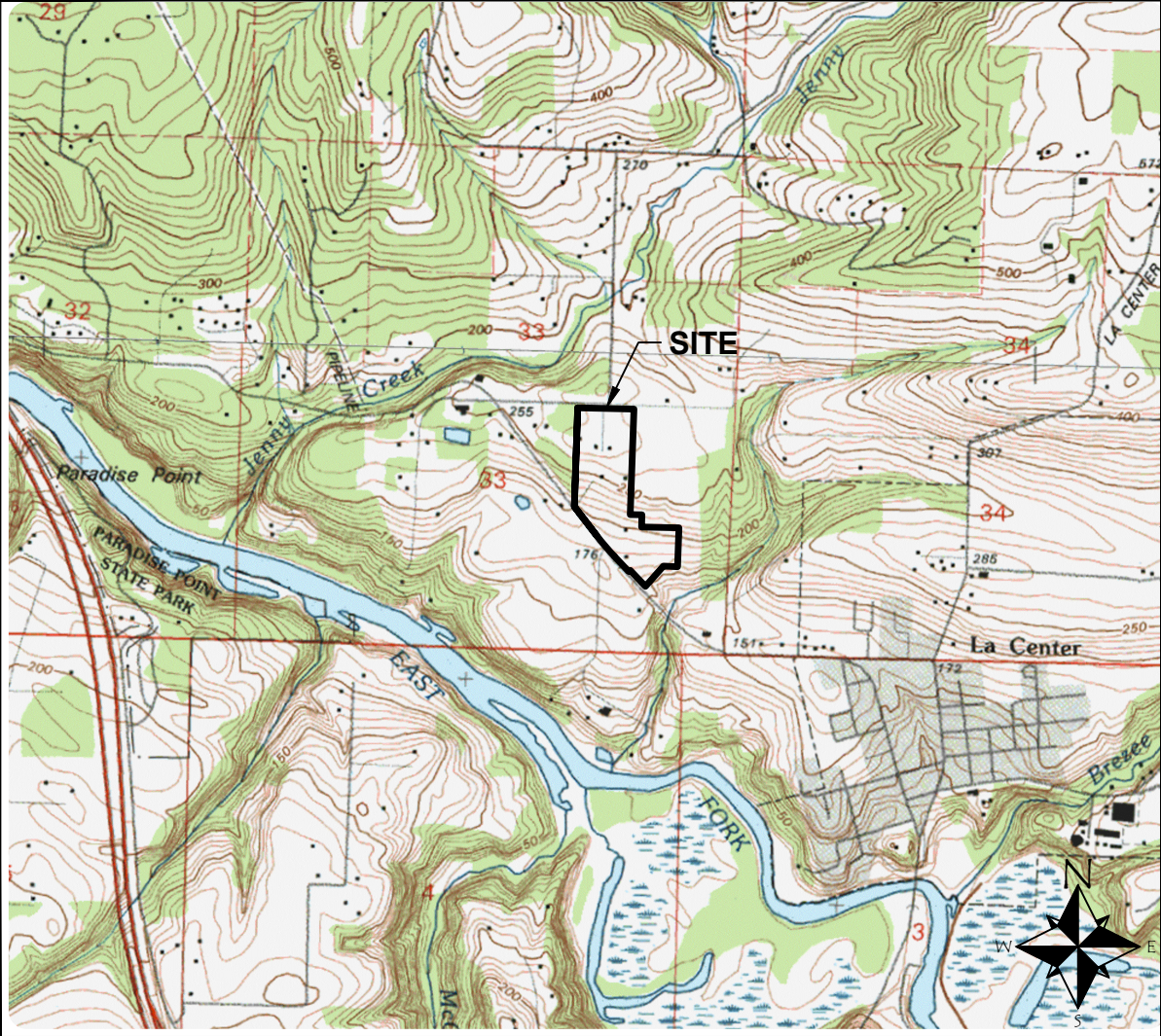


SCALE IN FEET

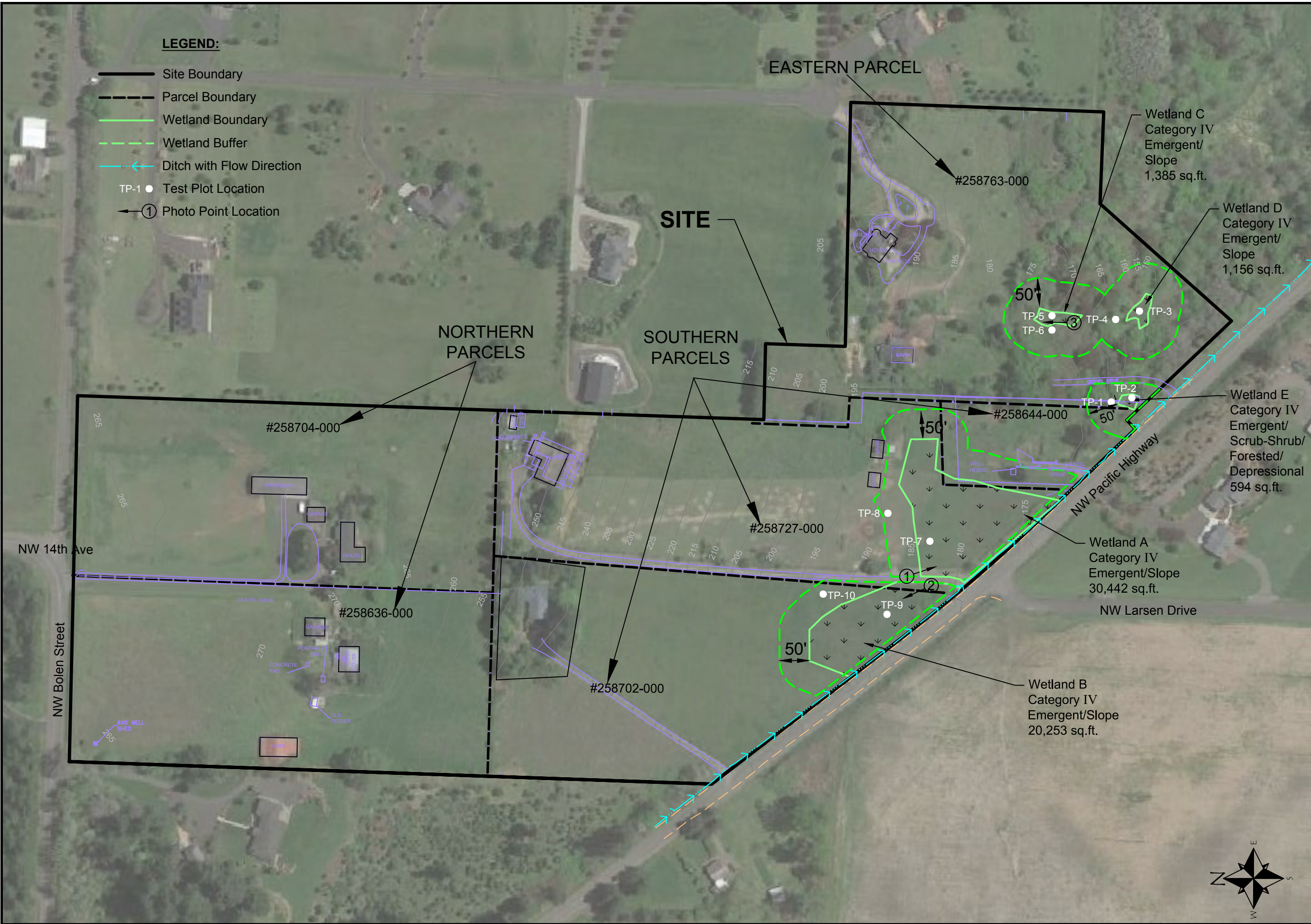
1157 3rd Ave., Suite 220A
Longview, WA 98632
Phone: (360) 578-1371



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- LEGEND:**
- Site Boundary
 - - - Parcel Boundary
 - Wetland Boundary
 - - - Wetland Buffer
 - Ditch with Flow Direction
 - TP-1 Test Plot Location
 - ① Photo Point Location

PROPOSED: Wetland Fill
 IN Wet. assoc. w/ E. Fork Lewis River
 NEAR: La Center
 COUNTY: Clark STATE: WA
 SHEET 2 OF 4
 DATE: 5/9/16

EXISTING CONDITIONS
 APPLICANT: Evergreen Homes NW
 PROJECT NAME: Highland Terrace Subdivision
 REFERENCE #: Not Yet Assigned
 ADJACENT PROPERTY OWNERS: SITE LOCATION ADDRESS:
 NW Pacific Hwy.
 La Center, WA 98629

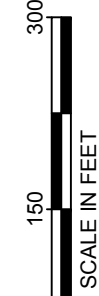
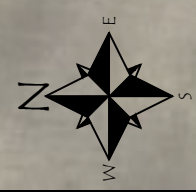
PURPOSE:
 Construction of 97 lot subdivision

DATUM: NAD83

ADJACENT PROPERTY OWNERS: SEE JARPA

1157 3rd Ave., Suite 220A
 Longview, WA 98632
 Phone: (360) 578-1371

Ecological Land Services



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LEGEND:

- Site Boundary
- Parcel Boundary
- Wetland Boundary
- Wetland Buffer
- Temporary Wetland & Buffer Impacts (14,267 sq.ft.) (0.33 ac.)
- Direct Wetland Impacts (13,197 sq.ft.) (0.30 ac.)
- Indirect Wetland Impacts (31,383 sq.ft.) (0.72 ac.)
- Ditch with Flow Direction
- Silt Fence

PROPOSED: Wetland Fill
 IN Wet. assoc. w/ E. Fork Lewis River
 NEAR: La Center
 COUNTY: Clark STATE: WA
 SHEET 3 OF 4
 DATE: 5/9/16

PROPOSED CONDITIONS
 APPLICANT: Evergreen Homes NW
 PROJECT NAME: Highland Terrace Subdivision
 REFERENCE #: Not Yet Assigned
 ADJACENT PROPERTY OWNERS: SITE LOCATION ADDRESS:
 NW Pacific Hwy.
 La Center, WA 98629

PURPOSE:
 Construction of 97 lot subdivision

DATUM: NAD83

ADJACENT PROPERTY OWNERS: SEE JARPA

0 150 300
 SCALE IN FEET

1157 3rd Ave., Suite 220A
 Longview, WA 98632
 Phone: (360) 578-1371

EASTERN PARCEL

SITE

NORTHERN PARCELS

SOUTHERN PARCELS

Wetland C
 Category IV
 Emergent/
 Slope
 1,385 sq.ft.

Wetland D
 Category IV
 Emergent/
 Slope
 1,156 sq.ft.

Wetland E
 Category IV
 Emergent/
 Scrub-Shrub/
 Forested/
 Depressional
 594 sq.ft.

Wetland A
 Category IV
 Emergent/Slope
 30,442 sq.ft.

Wetland B
 Category IV
 Emergent/Slope
 20,253 sq.ft.

NW 14th Ave

NW Bolen Street

NW Pacific Highway

NW Larsen Drive



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#258702-000

#258727-000

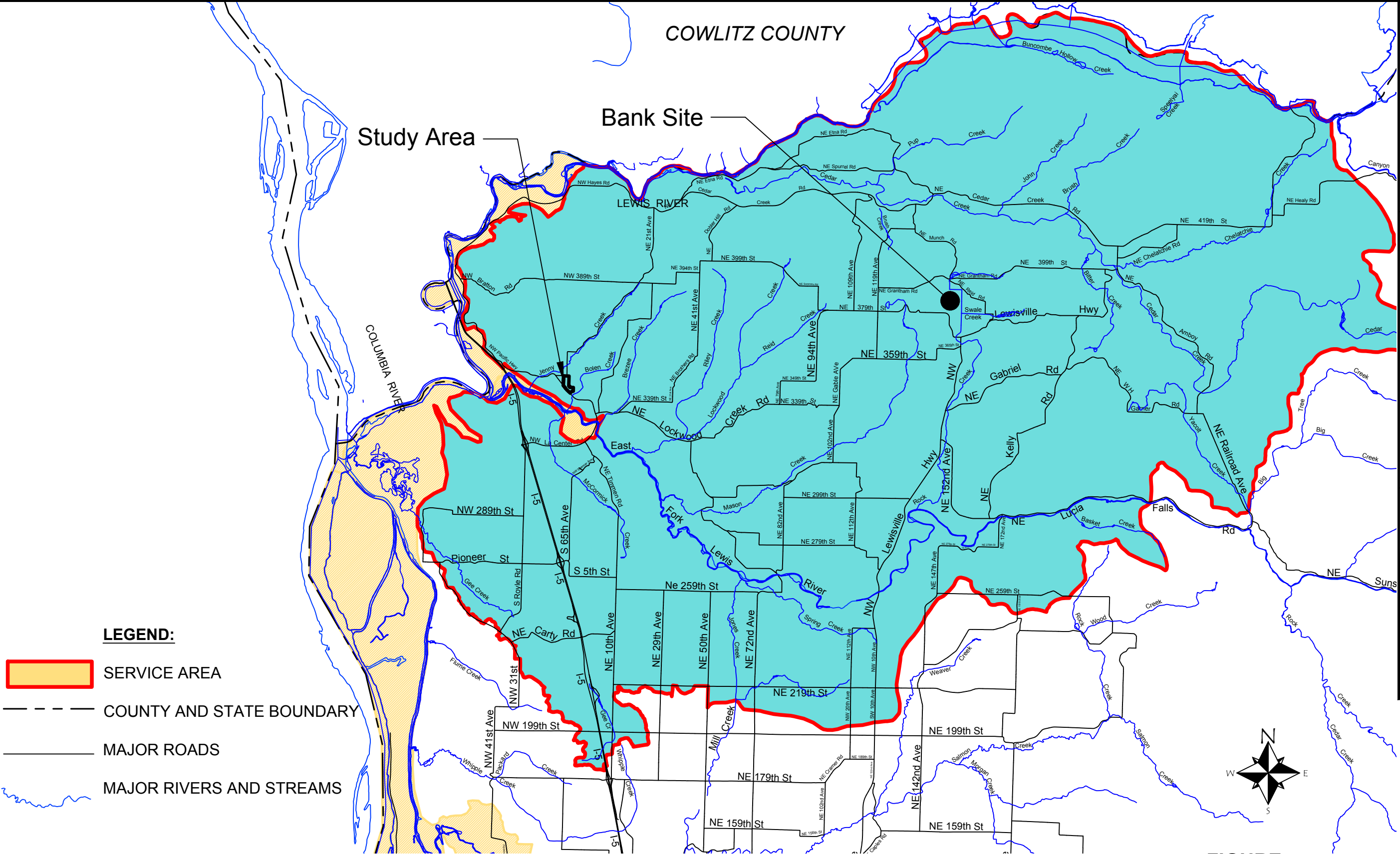
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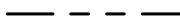


COWLITZ COUNTY

Study Area

Bank Site



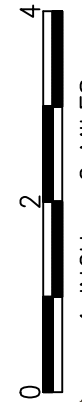
LEGEND:

-  SERVICE AREA
-  COUNTY AND STATE BOUNDARY
-  MAJOR ROADS
-  MAJOR RIVERS AND STREAMS

NOTES:

1. STATE, COUNTY, ROADS, RIVERS AND STREAM BOUNDARIES FROM ECOLOGY WEBSITE:
<http://www.wsdot.wa.gov/mapsdata/geodatacatalog/default.htm>
2. SERVICE ARE BOUNDARY BASED ON MAP PREPARED BY STEPHEN STANLEY WETLAND RESTORATION BIOLOGIST WASHINGTON DEPARTMENT OF ECOLOGY SEA PROGRAM.
3. MAP PREPARED BY ECOLOGICAL LAND SERVICES, INC., JUNE, 2008.

FIGURE
EAST FORK LEWIS RIVER
WETLAND MITIGATION BANK
SERVICE AREA



PURPOSE: Construction of 97 lot subdivision	EAST FORK MITIGATION BANK SERVICE MAP	PROPOSED: Wetland Fill
DATUM: NAD83	APPLICANT: Evergreen Homes NW	IN Wet. assoc. w/ E. Fork Lewis River
ADJACENT PROPERTY OWNERS: SEE JARPA	PROJECT NAME: Highland Terrace Subdivision	NEAR: La Center
	REFERENCE #: Not Yet Assigned	COUNTY: Clark
	SITE LOCATION ADDRESS: NW Pacific Hwy. La Center, WA 98629	STATE: WA
		SHEET 4 OF 4
		DATE: 5/5/16

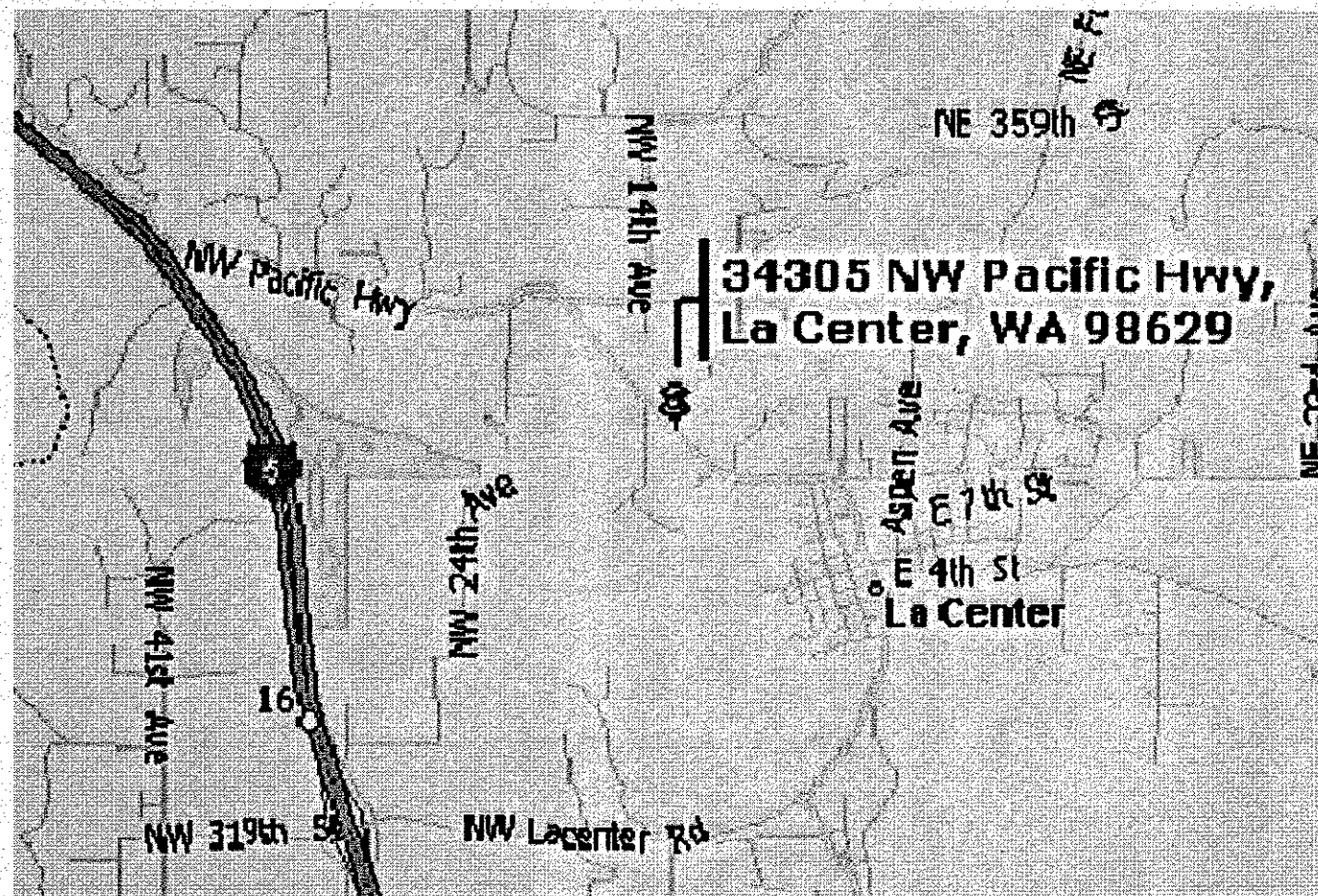


APPENDIX A: ENGINEERING FIGURES

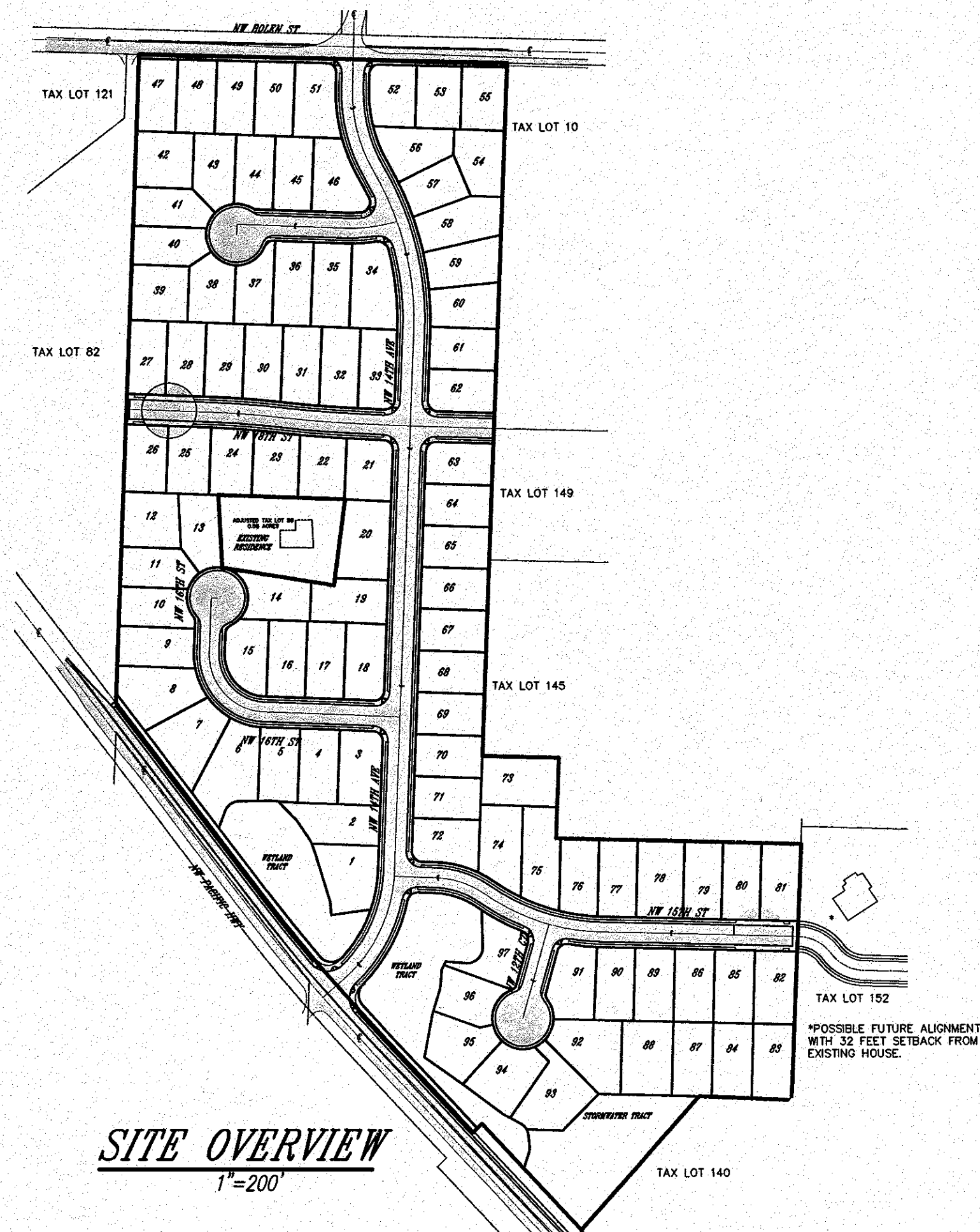
HIGHLAND TERRACE

DEVELOPER
 ALTUS CORPORATION
 12317 NW 30TH COURT
 VANCOUVER, WASHINGTON 98685

CONTACT
 STURTEVANT, GOLEMO, & ASSOCIATES
 2005 BROADWAY
 VANCOUVER, WASHINGTON 98663
 PHONE (360) 993-0911
 FAX (360) 993-0912



VICINITY MAP
 NO SCALE



SITE OVERVIEW
 1" = 200'

LEGEND

- INDICATES WATER VALVE
- INDICATES WATER METER
- INDICATES FIRE HYDRANT
- INDICATES STORM SEWER MANHOLE
- INDICATES WATER STAND PIPE
- INDICATES WELL
- INDICATES WETLAND FLAG
- INDICATES TELEPHONE PEDESTAL
- INDICATES MAILBOX
- INDICATES FIRE HYDRANT
- INDICATES ELECTRICAL SERVICE BOX
- INDICATES GUY WIRE
- INDICATES SANITARY MANHOLE
- INDICATES LUMINAIRE
- INDICATES POWER POLE WITH DIRECTION OF OVERHEAD LINES
- INDICATES 5 FOOT CONTOUR INTERVAL
- INDICATES 1 FOOT CONTOUR INTERVAL
- INDICATES EDGE OF PAVEMENT
- INDICATES EDGE OF GRAVEL
- INDICATES WATER LOCATE
- INDICATES FIBER OPTIC LOCATE
- INDICATES GAS LOCATE
- INDICATES TELEPHONE LOCATE

SURVEY

THE SURVEY WAS PERFORMED BY MINISTER-GLAESER SURVEYING (MGS) IN DECEMBER 2005.

BENCH MARK:

BRASS DISK IN TOP OF CONCRETE POST IN CENTER OF ROADSIDE DITCH OF NW 339TH STREET.
 POINT NAME: 900_NW339S1
 ELEVATION = 146.968 NGVD 29/47
 CALCULATED BY CLARK COUNTY GEOID MODEL.

NOTE:

A UTILITY LOCATE WAS CALLED FOR ON 08-23-05 UNDER TICKET NUMBER 5280607, & 12-05-05 UNDER TICKET NUMBER 5405724. THE UNDERGROUND UTILITIES AS SHOWN ON THIS TOPOGRAPHIC MAP ARE AS MARKED AT THE TIME OF THIS SURVEY. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE ONLY. UNDERGROUND CONNECTIONS ARE SHOWN AS STRAIGHT LINES BETWEEN SURFACE LOCATIONS BUT MAY CONTAIN BENDS OR CURVES NOT SHOWN. SOME UNDERGROUND LOCATIONS HEREON MAY HAVE BEEN TAKEN FROM PUBLIC RECORDS. M.G.S. ASSUMES NO LIABILITY FOR THE ACCURACY OF PUBLIC RECORDS.

GENERAL NOTES

- ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE LATEST STANDARDS AND PRACTICES OF THE CITY OF LA CENTER AND THE 2002 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION" AS PREPARED BY W.S.D.O.T. AND A.P.W.A.
- EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY FROM UTILITY RECORDS AND AS VISIBLE AT THE SITE FROM UTILITY LOCATES. CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION.
- A MINIMUM OF 48 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION, THE CONTRACTOR WILL BE RESPONSIBLE TO NOTIFY THE UTILITY COMPANIES FOR LOCATION MARK-UP OF ALL EXISTING UTILITIES AT (360) 696-4848.
- THE CONTRACTOR SHALL NOTIFY THE CITY OF LA CENTER AT (360) 263-2782 AND CLARK PUBLIC UTILITIES AT (360) 992-8019 2 DAYS PRIOR TO THE START OF CONSTRUCTION. INSPECTIONS AND APPROVAL OF THE CONSTRUCTION WILL BE BY THE CITY OF LA CENTER AND CLARK PUBLIC UTILITIES. A SATISFACTORY PRESSURE AND BACTERIOLOGICAL TEST FOR THE WATER CONSTRUCTION IS REQUIRED FOR APPROVAL BY CLARK PUBLIC UTILITIES.
- WHERE EXISTING SERVICES MUST BE INTERRUPTED, THE CONTRACTOR SHALL OBTAIN APPROVAL FROM CLARK PUBLIC UTILITIES AND THE UTILITY SHALL NOTIFY ALL CUSTOMERS THAT ARE TO BE AFFECTED AS TO THE DATE, TIME, AND DURATION OF THE INTERRUPTION. THE CONTRACTOR SHALL SCHEDULE CONSTRUCTION TO PROVIDE MINIMUM INTERRUPTION OF SERVICES AS DETERMINED BY CLARK PUBLIC UTILITIES. UNDER NO CIRCUMSTANCES WILL THE CONTRACTOR SCHEDULE A WATER MAIN SHUT DOWN WITHOUT THE REQUIRED 24 HOUR NOTICE. THE CONTRACTOR SHALL NOT OPERATE CLARK PUBLIC UTILITY'S WATER FACILITIES WITHOUT APPROVAL FROM THE UTILITY.
- A MINIMUM OF 10 FEET HORIZONTAL SEPARATION AND 18 INCHES VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN ALL EXISTING AND PROPOSED WATER AND SEWER LINES.
- ALL THE FLAG LOTS SHALL HAVE A 20-FOOT WIDE UNOBSTRUCTED ACCESS ROAD MARKED "FIRE LANE".

SHEET INDEX

SHEET	DESCRIPTION
1	COVER SHEET
2	GRADING AND EROSION CONTROL - SOUTH
3	GRADING AND EROSION CONTROL - NORTH
4	STREET & STORM - SOUTH
5	STREET & STORM - NORTH
6	SANITARY & WATER - SOUTH
7	SANITARY & WATER - NORTH
8	PROFILES - NW PACIFIC HWY
9	PROFILES - NW 14TH ST
10	PROFILES - NW 12TH CT-15TH ST-16TH ST
11	PROFILES - NW 18TH ST-19TH ST-BOLEN ST
12	EROSION CONTROL DETAILS
13	ROADWAY DETAILS
14	STANDARD STORM DETAILS I
15	STANDARD STORM DETAILS II
16	STANDARD SANITARY DETAILS
17	PRESSURE SANITARY DETAILS
18	STANDARD WATER DETAILS-CPU
SS1	SIGNING AND STRIPING - SOUTH
SS2	SIGNING AND STRIPING-NORTH
LS1	POND LANDSCAPE PLAN

CITY OF LA CENTER

 Public Works Director DATE

 City Engineer DATE

**CITY OF LA CENTER
 SANITARY SEWER SYSTEM**

RIO# _____

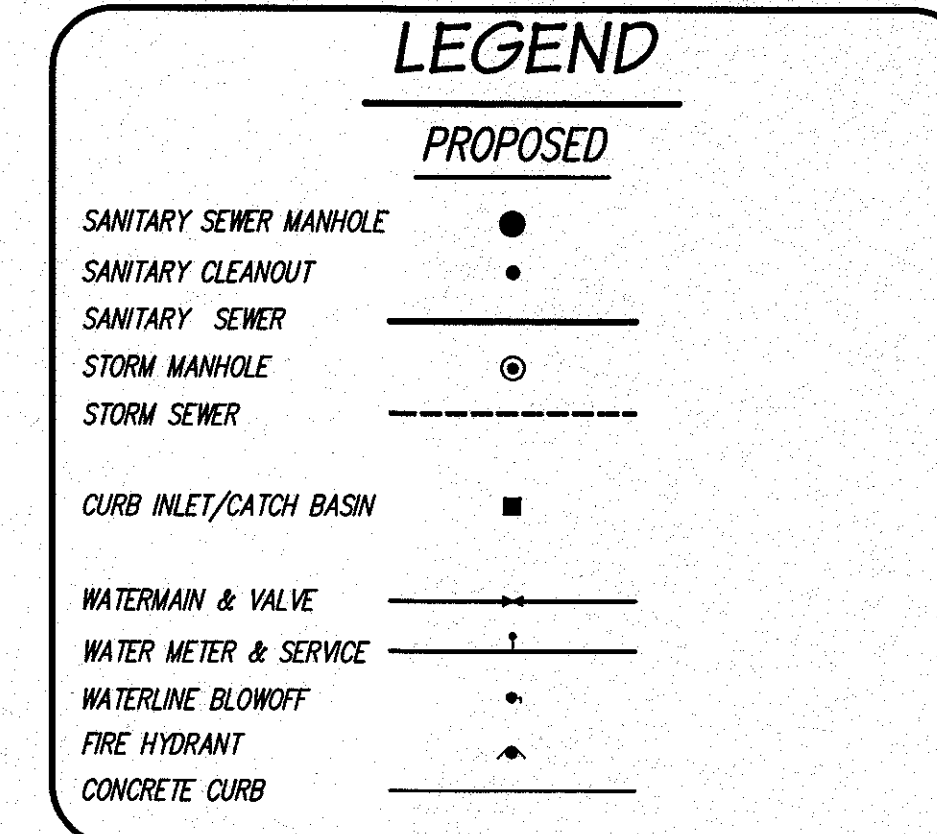
 APPROVED DATE

**APPROVED CLARK P.U.D.
 WATER UTILITIES**

R.I.O. #267333

FIRE DISTRICT APPROVAL

 APPROVED DATE



STURTEVANT, GOLEMO, & ASSOCIATES

CIVIL ENGINEERING ~ LAND PLANNING
 DEVELOPMENT SERVICES

2005 BROADWAY
 VANCOUVER, WA 98663
 PHONE (360)993-0911
 FAX (360)993-0912



COVER SHEET

HIGHLAND TERRACE

SUBDIVISION

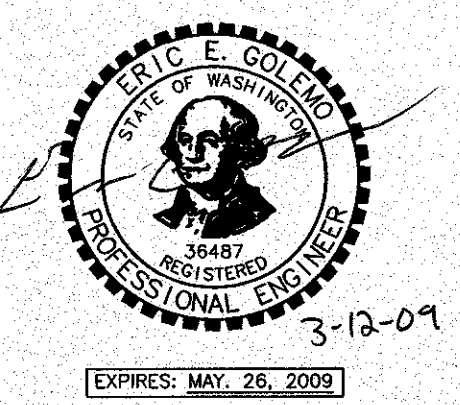
LA CENTER

REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'

JOB NUMBER 0536 SHEET 1 of 18

DATE PLOTTED: Thu, 25, 2009 - 4:17 PM C:\DRAWING FILES\HW\PROJECTS\HIGHLAND TERRACE\HW\JOB-0536-001-SET\JOB-0536.DWG

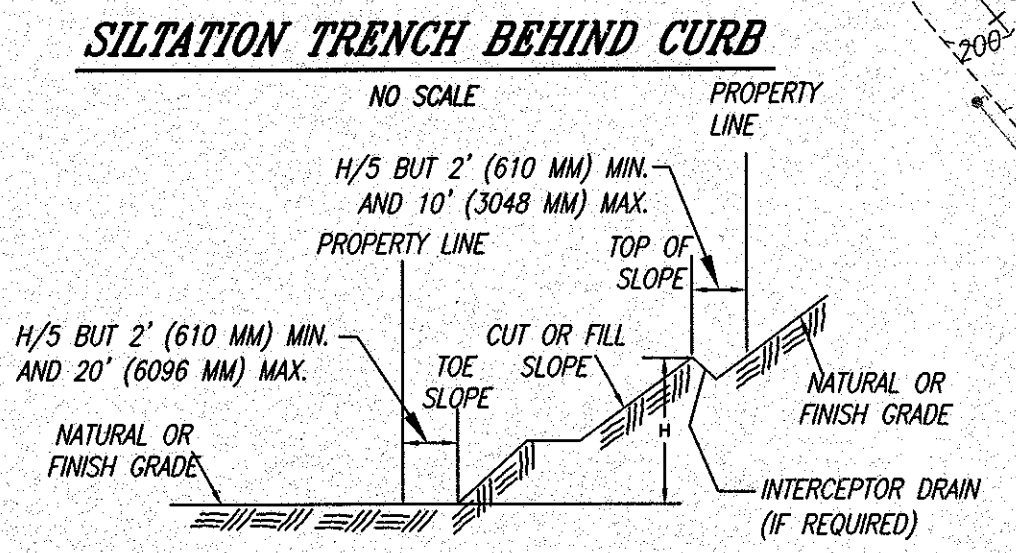


ITEM	STRUCTURAL		NONSTRUCTURAL		TOTAL STRUCTURAL & NON-STRUCTURAL CUT GRADING VOLUME
	CUT	FILL	CUT	FILL	
SITE GRADING	62,300	44,200	19,700	19,700	96,600
TRENCH SPOOLS	14,600	---	---	---	
COMPACTION	---	9,600	---	---	
HAUL-OFF	---	23,100	---	---	
TOTAL	76,900	76,900	19,700	19,700	

NOTES: IT IS ASSUMED THAT NONSTRUCTURAL FILL WILL BE USED TO FILL THE LAST 12" ON THE LOTS. THESE QUANTITIES ARE APPROXIMATE. CONTRACTOR IS ADVISED TO COMPUTE QUANTITIES INDEPENDENTLY FOR ESTIMATING AND BIDDING.

LEGEND

- FILL AREA
- CUT AREA
- FLOW ARROW
- GRAVEL CONSTRUCTION ENTRANCE
- TEMPORARY STORM INLET PROTECTION
- TEMPORARY SILT FENCE
- FINISHED GRADE CONTOURS
- EXISTING GRADE CONTOURS



NOTE: GRADING ACTIVITIES MUST BE AT LEAST TWO (2) FEET AWAY FROM PROPERTY BOUNDARIES

IBC APPENDIX J GRADING DETAIL

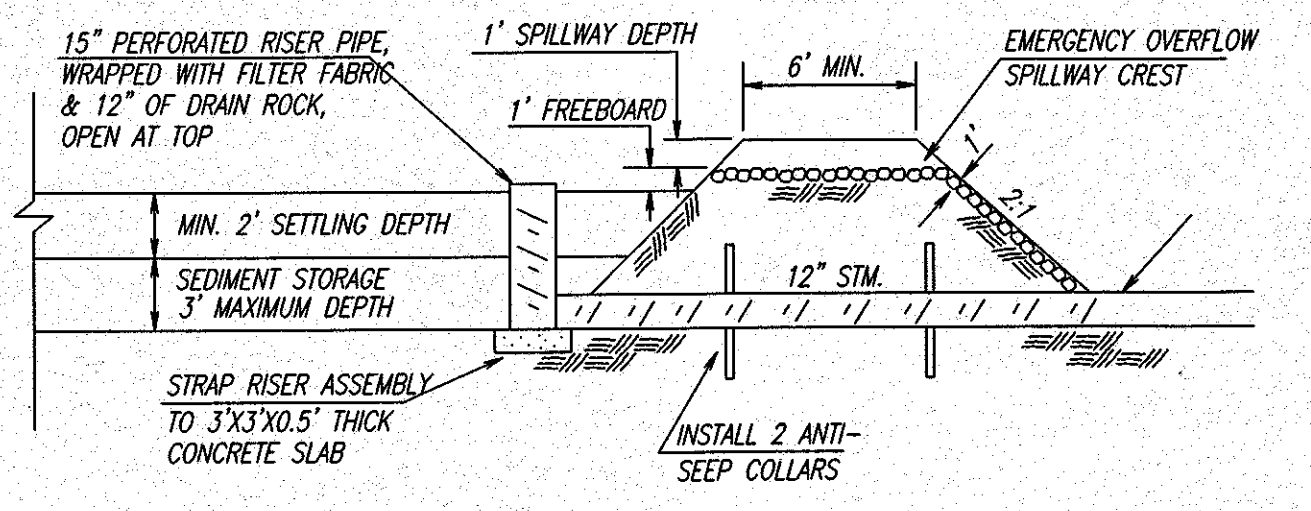
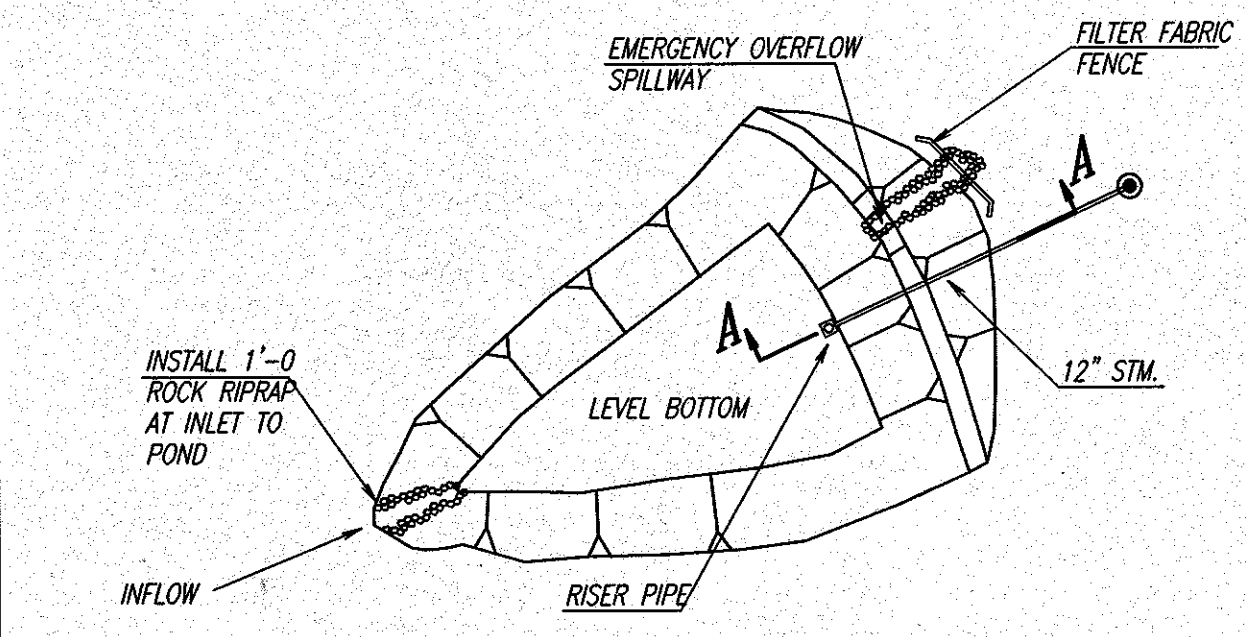
- GENERAL NOTES:**
- ALL STRIPPING, GRUBBING, GRADING, AND COMPACTION ARE TO BE DONE IN ACCORDANCE WITH THE SOIL ENGINEER'S REQUIREMENTS.
 - STRIPPING DEPTHS ARE ESTIMATED TO BE 8" TO 12", WITH DEEPER STRIPPING POSSIBLY NECESSARY IN ISOLATED AREAS. THE CONTRACTOR SHALL VERIFY THE EXACT STRIPPING DEPTHS AND LOCATIONS WITH THE SOIL ENGINEER, AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY AND COORDINATE THIS WITH THE SOIL ENGINEER. STURTEVANT GOLEMO, AND ASSOCIATES DOES NOT HAVE THE RESPONSIBILITY FOR DETERMINING THE ADEQUACY OF THE STRIPPING OPERATION.
 - THE GRADING QUANTITIES ARE BASED ON THE STRIPPING DEPTH NOTED PREVIOUSLY, AND ON EXISTING GROUND AND FINISHED DESIGNED ROUGH GRADING ELEVATIONS. STURTEVANT GOLEMO, AND ASSOCIATES HAS USED THIS INFORMATION TO DETERMINE CUTS AND FILLS ON THIS PLAN.
 - THE CONTRACTOR IS ADVISED TO MAKE HIS OWN TAKEOFF OF EARTHWORK QUANTITIES AND DETERMINE HIS OWN QUANTITIES FOR BIDDING. THE CONTRACTOR IS ADVISED TO DIG TEST HOLES OR USE WHATEVER METHOD HE DEEMS NECESSARY TO DETERMINE EARTHWORK QUANTITIES. EARTHWORK QUANTITIES MAY VARY DEPENDING ON SUCH VARIABLES AS COMPACTION, SHRINKAGE, CONTRACTOR'S METHOD OF OPERATION, STRIPPING DEPTHS, AND ACCURACY OF THE EARTHWORK TAKEOFF. WITH THE SIGNING OF THE CONTRACT FOR THE CONSTRUCTION OF THESE IMPROVEMENTS, THE CONTRACTOR AGREES THAT HIS COST FOR CONSTRUCTING THE GRADING IMPROVEMENTS, AND DISPOSAL OF THE EXCESS MATERIAL IF NECESSARY, IS SATISFACTORY AND THERE WILL BE NO ADDITIONAL CHARGE FOR THIS ITEM.
 - WHEEL WASH MAY BE REQUIRED BY THE INSPECTOR DEPENDING ON SOIL CONDITIONS AT THE TIME OF CONSTRUCTION.

- EROSION CONTROL NOTES:**
- EROSION CONTROL MEASURES SHOWN ON THE EROSION CONTROL PLAN ARE THE MINIMUM REQUIRED. ADDITIONAL MEASURES MAY BE REQUIRED TO CONTROL EROSION AND SEDIMENT.
 - EROSION CONTROL MEASURES SHOWN ARE FOR DRY WEATHER CONSTRUCTION. ADJUSTMENTS WILL BE REQUIRED IF WET WEATHER CONSTRUCTION IS UNDERTAKEN.
 - STURTEVANT, GOLEMO & ASSOCIATES HAS INITIATED THE NPDES PERMITTING PROCESS. THE CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETING THE PROCESS, AND OBTAINING AND MAINTAINING THE FINAL NPDES PERMIT.
 - THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) BE ON-SITE AT ALL TIMES DURING CONSTRUCTION. STURTEVANT, GOLEMO & ASSOCIATES CAN PREPARE THAT SWPPP IF DESIRED.

- SELECTED GEOTECHNICAL ENGINEERING NOTES:**
- DURING THE GEOTECHNICAL ENGINEERING STUDY A LAYER OF GRAY FAT CLAY WAS ENCOUNTERED IN THE NORTHWEST PORTION OF THE SITE. FOR HOME CONSTRUCTION THIS CLAY LAYER MUST BE AT LEAST 2' BELOW THE LOWEST FOUNDATION ELEVATION. THIS MAY REQUIRE OVER-EXCAVATION OF THE FAT CLAY LAYER AND REPLACEMENT WITH NON-EXPANSIVE STRUCTURAL FILL OR ADDITIONAL FILL PLACEMENT ON EXISTING SOILS OVERLAYING THE FAT CLAY LAYER.
 - EXPOSED FAT CLAY SHOULD BE PREVENTED FROM SUBSTANTIAL DRYING AND SHOULD BE MOISTURE-CONDITIONED PRIOR TO PLACEMENT OF FILL ABOVE IT TO REDUCE FUTURE EXPANSION POTENTIAL. EXCAVATED FAT CLAY MATERIAL MAY BE REUSED AS STRUCTURAL FILL ELSEWHERE ON THE SITE IF THOROUGHLY MIXED WITH LEAN SANDY CLAYS, PROPERLY MOISTURE CONDITIONED, AND COMPACTED. GRADING ACTIVITIES IN EXPANSIVE SOILS AREAS SHOULD BE CLOSELY OBSERVED BY A LICENSED GEOTECHNICAL ENGINEER OR DESIGNATED REPRESENTATIVE.
 - THE TEST PITS FROM THE GEOTECHNICAL ENGINEERING STUDY SHALL BE RE-EXCAVATED AND BACKFILLED WITH STRUCTURAL FILL.
 - WHERE FILL IS PLACED ON SLOPES GREATER THAN 5H:1V THERE SHOULD BE A HORIZONTAL BENCH AT LEAST 10' INTO THE SLOPE.
 - CUT OR FILL SLOPES IN EXCESS OF 30 FEET TALL NEED TO BE TERRACED IN ACCORDANCE WITH THE 2003 INTERNATIONAL BUILDING CODE (IBC), SECTION J109.
 - FILL SLOPES SHOULD BE CONSTRUCTED WITH A MAXIMUM LIFT OF 12 INCHES.
 - WET WEATHER CONSTRUCTION MAY REQUIRE ADDITIONAL BASE ROCK AND GEOTEXTILE FABRIC FOR ROADS.

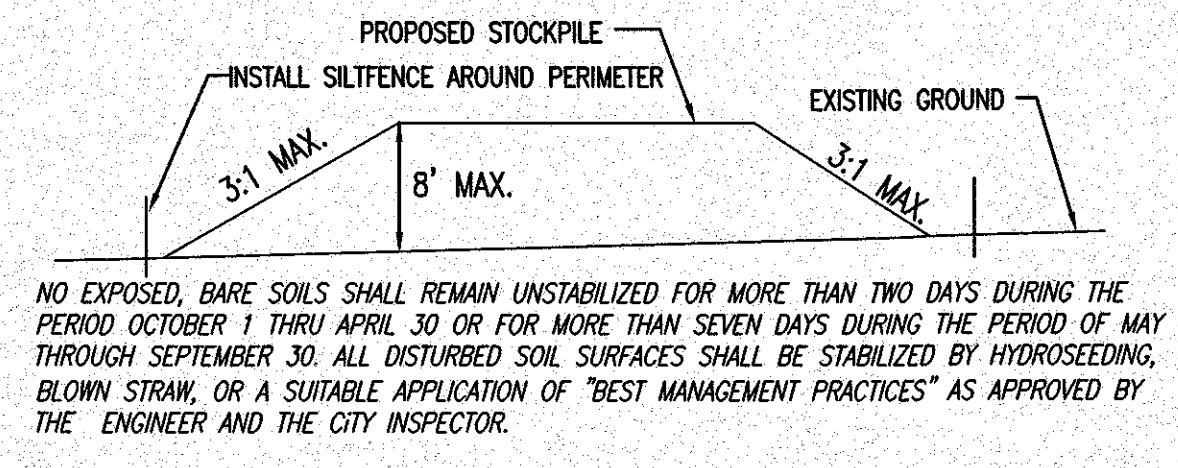
SEE THE MITIGATION PLAN BY ECOLOGICAL LAND SERVICES, INC. DATED DECEMBER 2008 FOR MORE INFORMATION

SEE THE GEOTECHNICAL ENGINEERING REPORT BY COLUMBIA WEST ENGINEERING DATED SEPTEMBER 30, 2005 FOR MORE INFORMATION



TEMP SEDIMENTATION POND DETAIL
 NO SCALE

TEMPORARY SEDIMENT POND NOTE:
 TEMPORARY SEDIMENT POND TO BE CONSTRUCTED IN LOCATION OF PROPOSED DETENTION POND. OUTLET WILL BE CONNECTED TO PROPOSED STORM LINE THAT DRAINS TO EXISTING FACILITY. IF THE PROPOSED STORM LINE IS NOT CONSTRUCTED FIRST THEN WATER WILL NEED TO BE PUMPED FROM THE TEMPORARY SEDIMENT POND.



NO EXPOSED, BARE SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN TWO DAYS DURING THE PERIOD OCTOBER 1 THRU APRIL 30 OR FOR MORE THAN SEVEN DAYS DURING THE PERIOD OF MAY 1 THROUGH SEPTEMBER 30. ALL DISTURBED SOIL SURFACES SHALL BE STABILIZED BY HYDROSEEDING, BLOWN STRAW, OR A SUITABLE APPLICATION OF "BEST MANAGEMENT PRACTICES" AS APPROVED BY THE ENGINEER AND THE CITY INSPECTOR.

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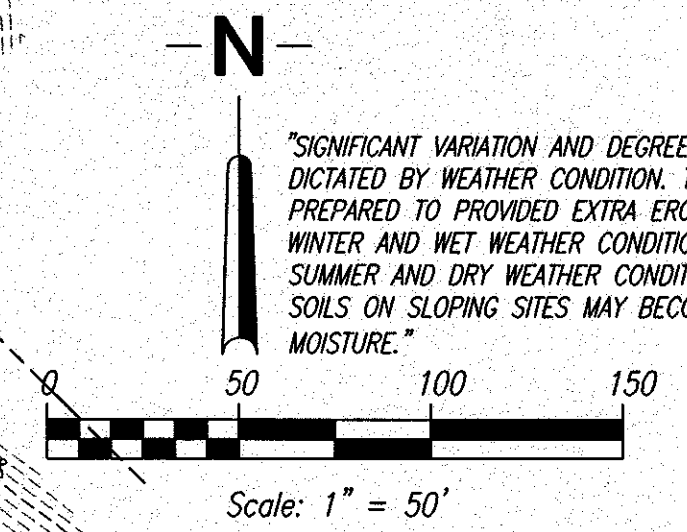
GRADING AND EROSION CONTROL - SOUTH

**HIGHLAND TERRACE
 SUBDIVISION**

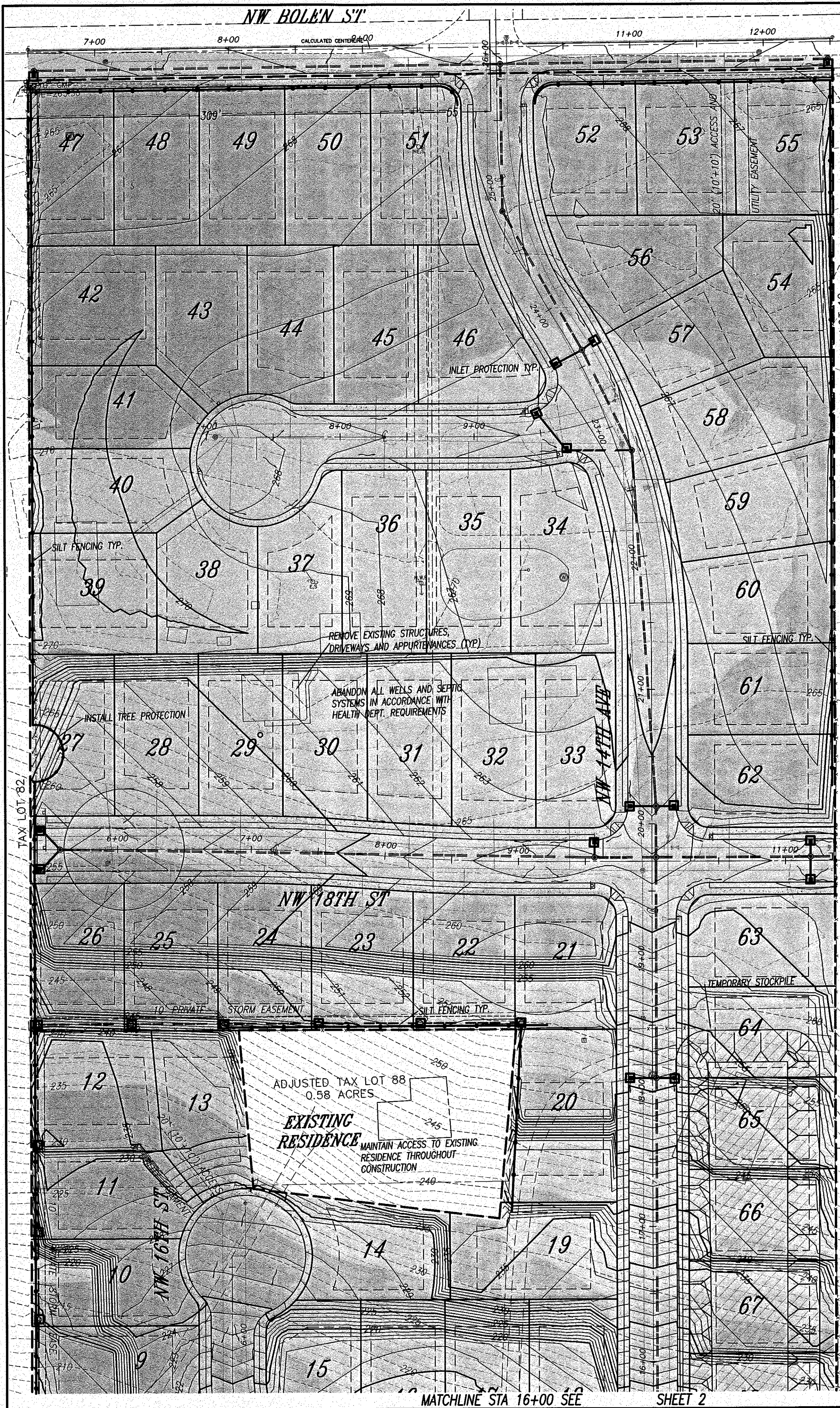
REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEC
 SCALE: 1" = 50'

JOB NUMBER: 0536
 SHEET: 2 of 18



DATE PLOTTED: Mar. 12, 2009 - 12:58 PM SGA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE 4-FINAL\0536-CR001.DWG

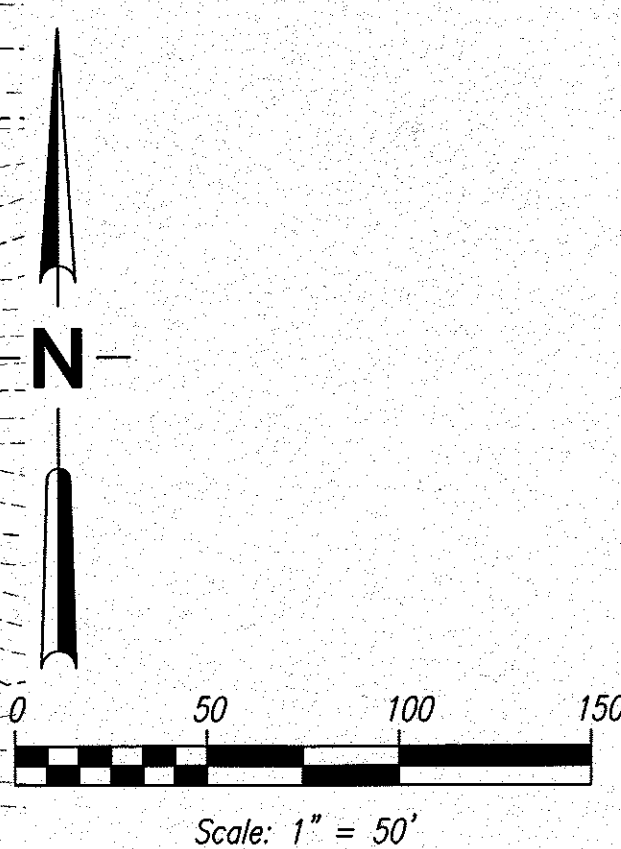


STANDARD NOTES FOR EROSION CONTROL PLAN

- 1) THE CONTRACTOR SHALL INSTALL AND MAINTAIN BMP'S AS SHOWN AND PERFORM ALL ACTIONS NECESSARY TO PREVENT EROSION, AND CONTROL SEDIMENT FROM LEAVING THE CONSTRUCTION SITE. SITE CONTRACTOR SHALL COMPLY WITH CITY OF LA CENTER CODE CHAPTER 14.10.
- 2) ALL EROSION CONTROL MEASURES SHALL BE IN-PLACE AND IN WORKING CONDITION PRIOR TO DISTURBING AND EXPOSING ANY SOIL SURFACES (I.E. SILT FENCE, CONSTRUCTION ENTRANCE, SEDIMENTATION BARRIERS, SEDIMENTATION TRAPS).
- 3) ALL EROSION PREVENTION AND CONTROL BMP'S SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO INSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. NEEDED REPAIRS SHALL BE MADE AS SOON AS PRACTICABLE. THEY ARE TO REMAIN IN PLACE AND OPERATIONAL DURING ALL PHASES OF CONSTRUCTION. CONSTRUCTION ACTIVITIES SHALL NOT CONTINUE OR RESUME UNTIL REPAIRS TO EROSION CONTROL FACILITIES ARE MADE AND THE FACILITIES ARE FUNCTIONAL. ANY SEDIMENT LEAVING THE SITE OR DISCHARGING TO A SENSITIVE AREA SHALL BE STOPPED AND CONTROLLED IMMEDIATELY. CONTAMINATED AREAS SHALL BE CLEANED AND RESTORED.
- 4) CLEARING LIMITS AND WORK AREA LIMITS SHALL BE DELINEATED AND MARKED. DO NOT DISTURB MORE AREA THAN NEEDED FOR CONSTRUCTION REQUIREMENTS.
- 5) ALL SENSITIVE OR CRITICAL AREAS (WETLANDS, STEEP SLOPES, NATURAL WATERWAYS), AND BUFFERS SHALL ALL BE CLEARLY DELINEATED AND CLEARLY MARKED, AND PROTECTED FROM SEDIMENT DEPOSITION.
- 6) SEDIMENT LADEN RUNOFF SHALL BE PREVENTED FROM ENTERING ALL EXISTING STORM WATER CATCH BASINS AND INLETS AFFECTED BY CONSTRUCTION.
- 7) NO EXPOSED, BARE SOILS SHALL REMAIN UNSTABILIZED FOR MORE THAN TWO DAYS DURING THE PERIOD OCTOBER 1 THRU APRIL 30 OR FOR MORE THAN SEVEN DAYS DURING THE PERIOD OF MAY 1 THROUGH SEPTEMBER 30. ALL DISTURBED SOIL SURFACES SHALL BE STABILIZED BY A SUITABLE APPLICATION OF "BEST MANAGEMENT PRACTICES".
- 8) WHERE FEASIBLE, NO MORE THAN 500 FEET OF TRENCH SHALL BE OPEN AT ONE TIME. EXCAVATED MATERIAL SHALL BE PLACED ON THE UP-HILL SIDE OF TRENCHES PROVIDED IT DOES NOT CONFLICT WITH SAFETY REQUIREMENTS.
- 9) DEWATERING DEVICES SHALL DISCHARGE INTO A SEDIMENT TRAP OR SEDIMENT POND. NO DISCHARGE SHALL BE MADE TO A PAVED STREET OR STORMWATER COLLECTION SYSTEM WITHOUT FIRST REMOVING SEDIMENT.
- 10) CUT AND FILL SLOPES SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION. EROSION SHALL BE CONTROLLED AND PREVENTED BY SUCH MEASURES AS ROUGHENING THE SURFACE, INSTALLATION OF INTERCEPTOR DITCHES, TERRACING, COVERING WITH MATTING, MULCH OR PLASTIC SHEETING. RUNOFF SHALL BE PREVENTED FROM ENTERING A SLOPE AND FROM UNDERCUTTING THE BASE OF SLOPES.
- 11) ANY SOIL OR DEBRIS TRANSPORTED ONTO ROADWAYS AND SIDEWALKS SHALL BE REMOVED. DEPOSITS SHALL BE COMPLETELY REMOVED BY SHOVELING AND/OR SWEEPING. WASHING SHALL NOT BE UTILIZED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE COUNTY.

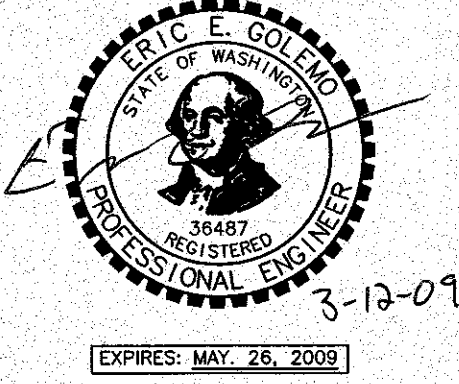
STANDARD NOTES FOR EROSION CONTROL PLAN (CONTINUED)

- 12) ALL PERMANENT INFILTRATION SYSTEMS SHALL BE ISOLATED AND PROTECTED FROM SEDIMENT LADEN RUNOFF ENTERING TO AVOID RISK OF REDUCING THE ABILITY OF THE SYSTEMS TO INFILTRATE. ISOLATION AND PROTECTION SHALL NOT BE REMOVED UNTIL THE DRAINAGE AREA TRIBUTARY TO THE SYSTEM IS COMPLETELY STABILIZED.
- 13) ALL CONVEYANCE CHANNELS, BOTH TEMPORARY AND PERMANENT SHALL BE STABILIZED TO PREVENT EROSION OF THE CHANNEL. STABILIZATION SHALL EXTEND TO AREAS AT OUTLETS AND DOWNSTREAM REACHES VULNERABLE TO EROSION RESULTING FROM FLOW DISCHARGING FROM THE CHANNEL.
- 14) IF BMP'S SHOWN ARE UTILIZED BUT ARE INSUFFICIENT TO PREVENT SEDIMENT FROM REACHING WATER BODIES, ADJACENT PROPERTIES, OR PUBLIC RIGHTS-OF-WAY; ADDITIONAL BMP'S SHALL BE IMPLEMENTED IMMEDIATELY TO PREVENT FURTHER ENCROACHMENT OF SEDIMENT.
- 15) STABILIZED AREAS SHALL BE PROVIDED FOR EMPLOYEE PARKING AND STORAGE OF CONSTRUCTION MATERIALS. ERODEABLE STOCKPILES OF EARTHEN MATERIALS, SUCH AS TOPSOIL, SILTY AND CLAYEY SOILS; AND LANDSCAPE MATERIALS, SHALL BE COVERED WHEN NOT BEING INCORPORATED IN THE WORK. EROSION CONTROL BMP'S SHALL BE UTILIZED AS NECESSARY TO PREVENT SEDIMENT LADEN RUNOFF FROM LEAVING OR SEDIMENT BEING TRANSPORTED FROM THESE AREAS FROM VEHICLE ACTIVITY.
- 16) ALL POLLUTANTS OTHER THAN SEDIMENT THAT OCCUR DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORM WATER.
- 17) THE CONTRACTOR SHALL KEEP AN INSPECTION LOG OF THE CONDITION OF THE EROSION CONTROL FACILITIES. EROSION CONTROL FACILITIES SHALL BE INSPECTED AT LEAST WEEKLY AND AFTER EACH RAINFALL. THE INSPECTION LOG SHALL BE KEPT AT THE PROJECT SITE AT A DESIGNATED LOCATION AND SHALL BE AVAILABLE FOR REVIEW BY THE COUNTY. AN INDIVIDUAL THAT HAS SUCCESSFULLY COMPLETED THE COUNTY'S EROSION CONTROL CERTIFICATION COURSE SHALL PERFORM INSPECTIONS AND MAINTAIN THE LOG.
- 18) ALL TEMPORARY BMP'S SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED. TRAPPED SEDIMENT SHALL BE DEPOSITED AND STABILIZED ON SITE. AREAS DISTURBED RESULTING FROM REMOVAL SHALL BE PERMANENTLY STABILIZED.
- 19) CONSTRUCTION SHALL NOT BE CONSIDERED COMPLETE AND ACCEPTABLE UNTIL ALL DISTURBED SOIL SURFACES HAVE BEEN PROTECTED FROM EROSION WITH PERMANENT LANDSCAPING, COVERING WITH IMPERVIOUS SURFACES, RESTORED TO ORIGINAL UNDISTURBED CONDITION OR PERMANENTLY STABILIZED.
- 20) VEGETATED STABILIZATION AND LANDSCAPING SHALL BE FERTILIZED, WATERED AND MAINTAINED TO INSURE THAT GROWTH OF VEGETATION IS ESTABLISHED AND SUSTAINED.
- 21) DURING DRY WEATHER CONSTRUCTION PERIODS THE CONTRACTOR SHALL PROVIDE PROJECT-SPECIFIC DUST CONTROL MEASURES THAT MAY INCLUDE: SEEDING, MULCHING, MATTING, WATER, TACKIFIER, OR CHEMICAL SOIL STABILIZERS. THE CONTRACTOR SHALL MAINTAIN THE DUST CONTROL MEASURES THROUGH DRY WEATHER PERIODS UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED. IMMEDIATELY RE-STABILIZE AREAS DISTURBED BY CONTRACTOR'S OPERATIONS OR OTHER ACTIVITIES (WIND, WATER, VANDALISM, ETC.).



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GRADING AND EROSION CONTROL - NORTH

**HIGHLAND TERRACE
SUBDIVISION**

LA CENTER WA

REVISIONS

DESIGNED BY: JDR
DRAWN BY: JDR
CHECKED BY: EEG
SCALE: 1" = 50'

JOB NUMBER SHEET
0536 3 of 18

CURB RETURN TABLE

	R	L	Δ	ER	1/4 PT	1/2 PT	3/4 PT	ER
①	35'	54.03'	88°27'	176.73	177.22	177.71	178.23	178.85
②	35'	58.11'	95°8'	179.16	178.72	178.83	179.49	180.16
③	25'	34.96'	80°7'	187.13	187.71	188.26	188.68	189.00
④	25'	39.27'	90°0'	190.48	190.80	191.47	192.32	193.06
⑤	25'	36.64'	83°59'	186.10	185.85	185.30	184.42	183.51
⑥	25'	36.64'	83°59'	183.51	184.35	185.06	185.52	185.72
⑦	25'	39.27'	90°0'	212.97	212.78	212.29	211.52	210.47
⑧	25'	39.27'	90°0'	219.89	218.78	217.67	216.74	216.17

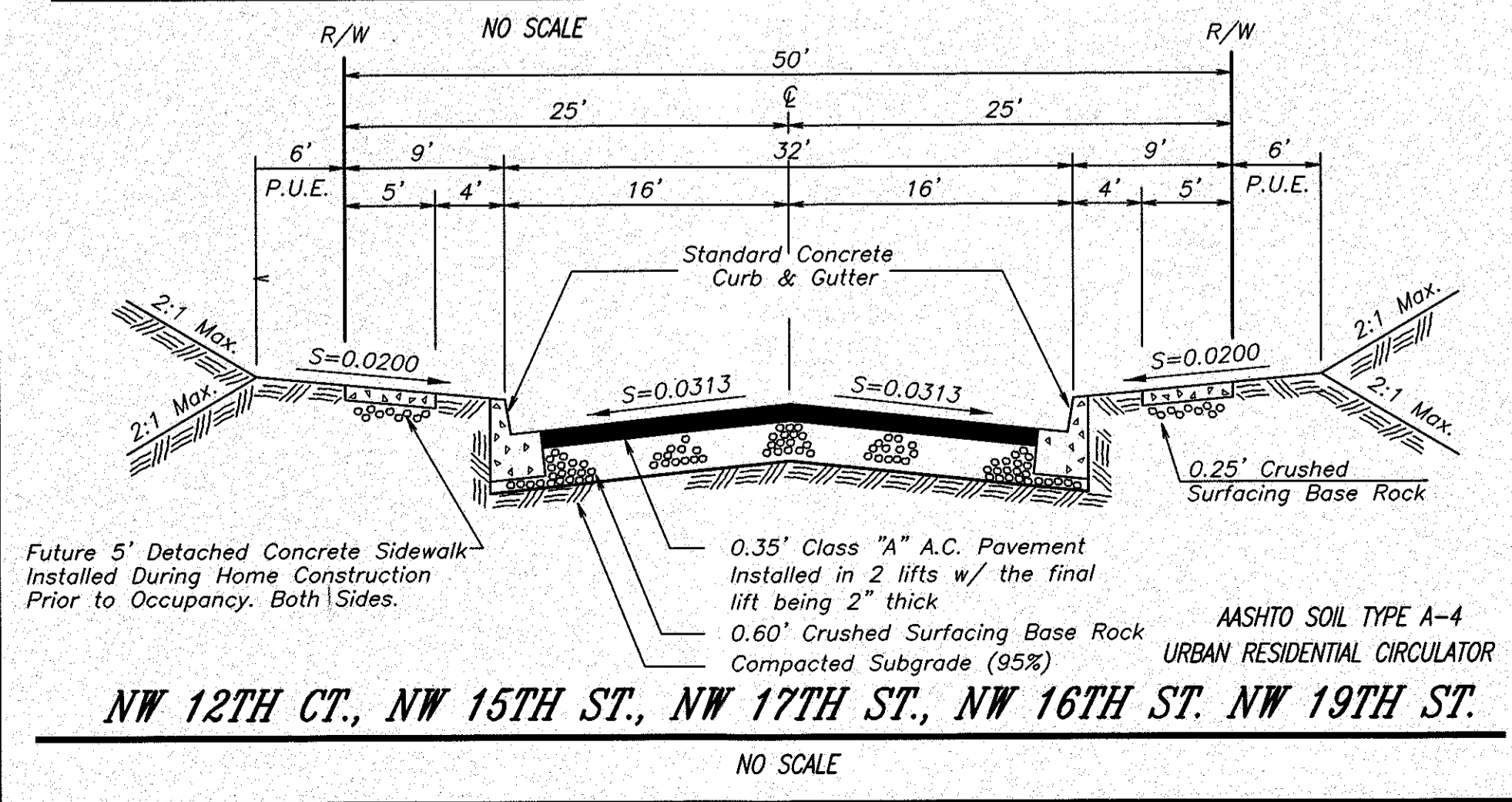
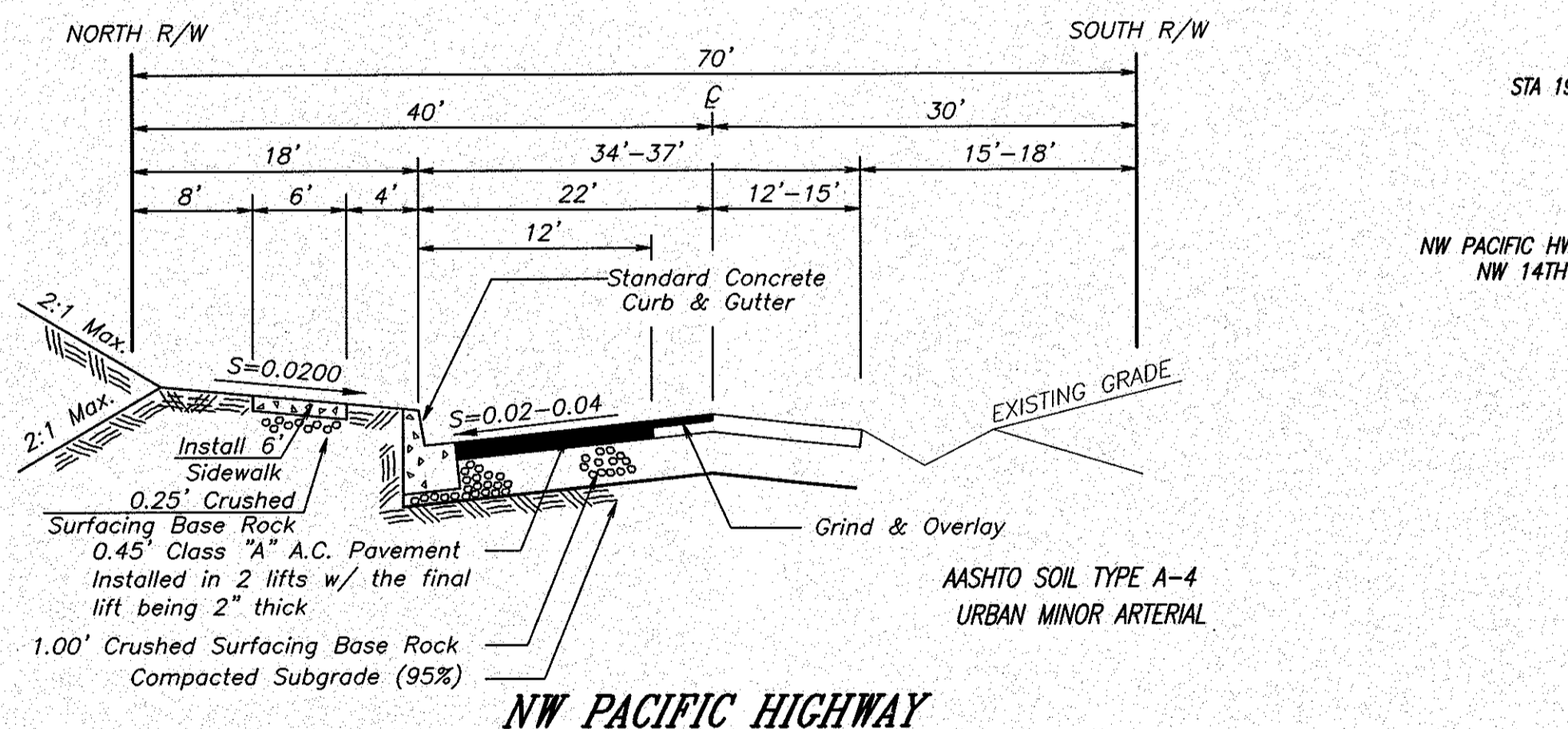
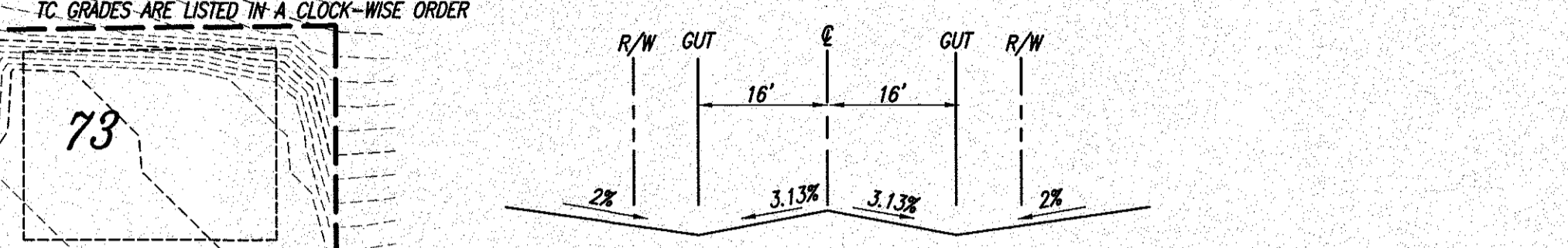
NOTE: TC ELEVATIONS AS SHOWN REFLECT PROJECTED TC GRADE. RETURN GRADES GREATER THAN 2% MUST BE STEPPED AT ADA-RAMP LOCATIONS TO ATTAIN 2% MAXIMUM X-SLOPE. TC GRADES ARE LISTED IN A CLOCK-WISE ORDER.

NW 15TH ST

	LOCATION	STATION	OFFSET	ELEVATION
①	END CURB BEGIN TEMP TURNAROUND WING	15+73.73	16'	188.84 TC 189.14 FG
②	1/4 PT	16+15.79	45'	190.35 FG
③	VALLEY GUTTER	16+15.79	16'	189.77 FG
④	BEGIN CURB END TEMP TURNAROUND WING	16+57.85	16'	190.91 TC 190.41 FG

LOT	DISTANCE FROM DOWNSTREAM STRUCTURE	LENGTH	IE AT END
76	0+00	15'	181.9
77	WEEP	HOLE	
78	WEEP	HOLE	
79	WEEP	HOLE	
*80	WEEP	HOLE	
*81	WEEP	HOLE	
82	0+00	30'	176.0
83	0+00	13'	157.7
84	0+00	13'	162.7
85	0+00	30'	176.0
86	0+00	30'	174.0
87	0+00	13'	162.0
88	0+00	13'	162.0
89	0+00	30'	174.0
90	WEEP	HOLE	
91	0+54	29'	172.7
92	0+32	17'	158.8
93	0+58	19'	160.0
94	1+25	19'	167.0
95	0+26	44'	167.6
96	0+09	58'	168.4
97	0+49	38'	173.0

*ROOFS TO SPLASHBLOCK TO STREET UNTIL TEMP. TURNAROUND IS REMOVED AND PERMANENT CURB WITH WEEP HOLES IS INSTALLED.



LOT	DISTANCE FROM DOWNSTREAM STRUCTURE	LENGTH	IE AT END
1	0+00	34'	186.4
2	0+00	16'	191
3	0+00	36'	200.9
4	0+00	5'	196.5
5	0+00	5'	190.2
6	0+00	5'	188.8
7	0+00	5'	189.8
8	0+00	5'	196.0
9	0+00	5'	205.6
15	HOLE	WEEP	
16	0+00	15'	209.5
17	0+00	16'	209.5
18	0+73	27'	211.5
68	0+00	18'	218.3
69	1+98	30'	204.6
70	1+28	30'	202.9
71	0+62	30'	196.3
72	0+00	36'	188.2
73	0+00	173'	205.4
74	0+84	29'	183.4
75	0+00	17'	181.9

NW 12TH CT

	ANGLE FROM CTR	TC ELEVATION
①	PC 16.5°	176.86
②	PRC 33.6°	174.95
③	90°	172.15
④	135°	171.52
⑤	LOW PT 200°	171.28
⑥	225°	171.43
⑦	270°	172.15
⑧	PRC 326.4°	174.95
⑨	PC 343.5°	176.86

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ERIC E. GOULD
 STATE OF WASHINGTON
 REGISTERED PROFESSIONAL ENGINEER
 3-12-09
 EXPIRES: MAY, 26, 2009

HIGHLAND TERRACE SUBDIVISION

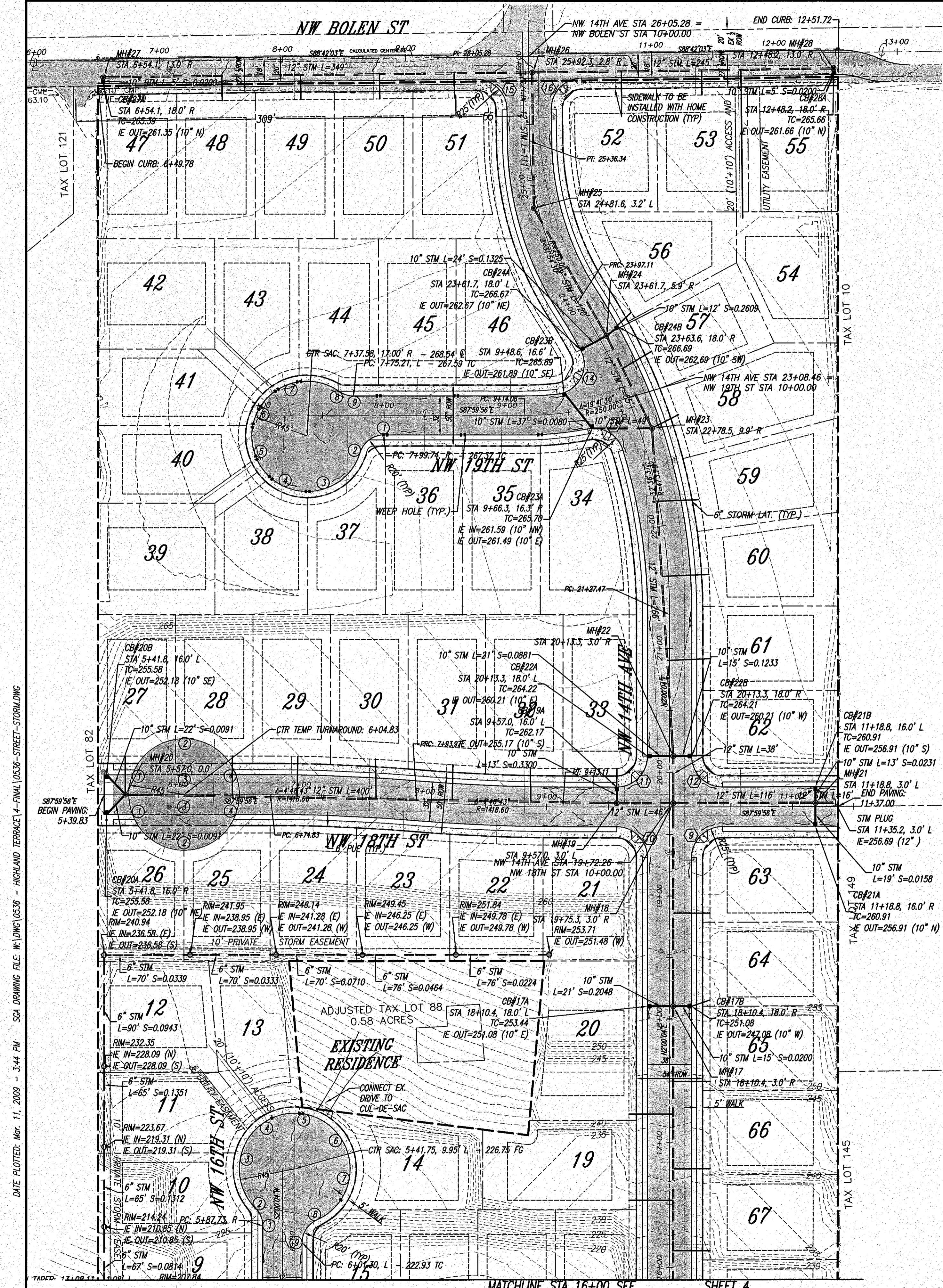
STREET & STORM - SOUTH

REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
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 SCALE: 1" = 50'

JOB NUMBER: 0536 SHEET: 4 of 18

DATE PLOTTED: Mar. 12, 2009 - 1:03 PM SCA DRAWING FILE: W:\DWG\0336 - HIGHLAND TERRACE 4 - FINAL\0336- STREET-STORM.DWG



CURB RETURN TABLE

	R	L	Δ	ER	1/4 PT	1/2 PT	3/4 PT	ER
⑨	25'	39.27'	90°0'	260.73	261.25	261.65	261.79	261.68
⑩	25'	39.27'	90°0'	262.15	262.10	261.74	261.23	260.73
⑪	25'	39.27'	90°0'	264.22	263.70	263.19	262.67	262.17
⑫	25'	39.27'	90°0'	261.68	262.31	262.95	263.58	264.21
⑬	25'	36.69'	84°5'	265.72	265.74	265.94	266.16	266.22
⑭	25'	48.77'	111°46'	266.67	266.56	266.20	265.93	265.94
⑮	25'	39.27'	90°0'	268.29	268.25	268.03	267.76	267.68
⑯	25'	39.27'	90°0'	267.68	267.80	268.01	268.13	268.12

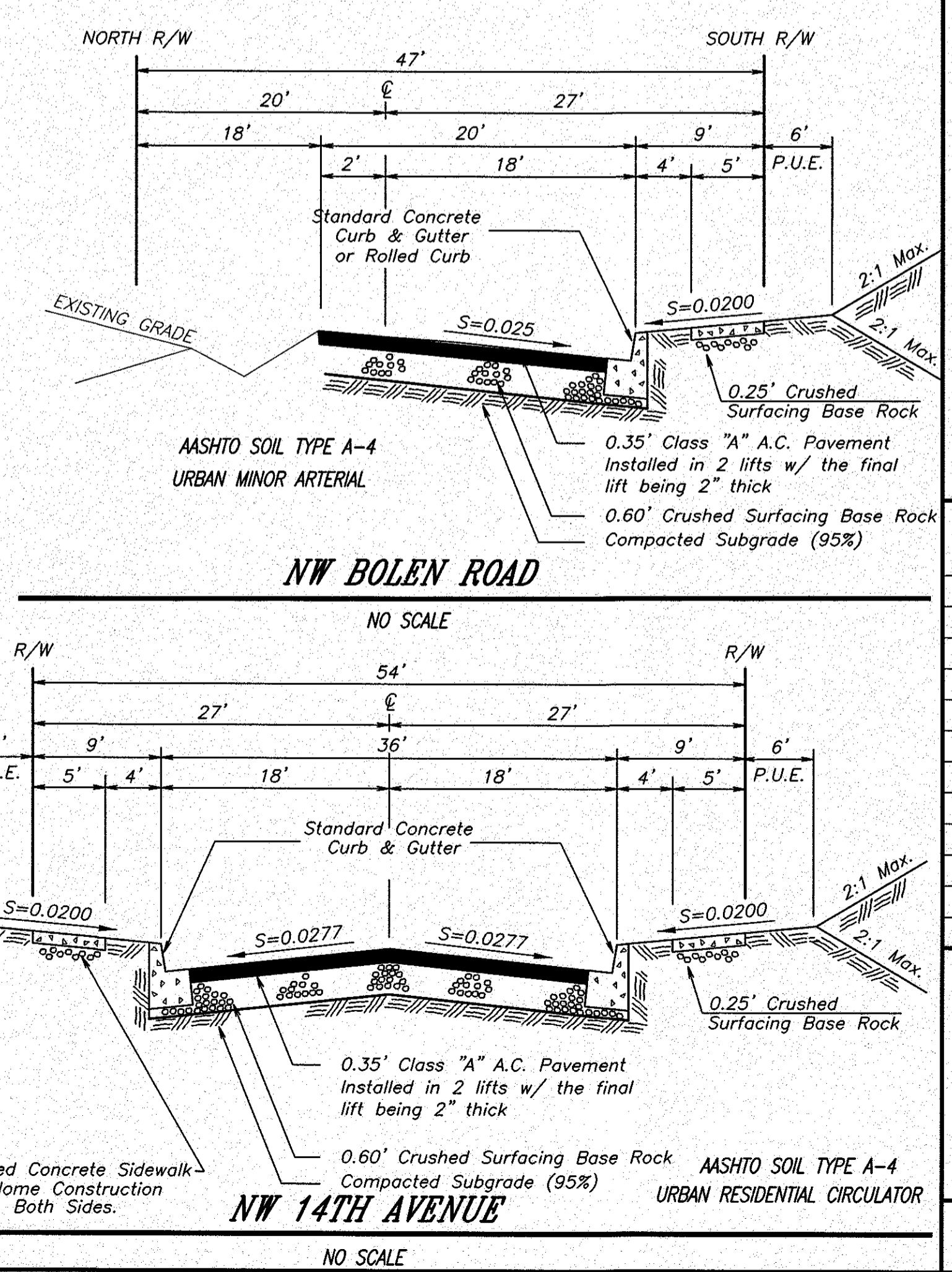
NOTE: TC ELEVATIONS AS SHOWN REFLECT PROJECTED TO GRADE. RETURN GRADES GREATER THAN 2% MUST BE STEPPED AT ADA RAMP LOCATIONS TO ATTAIN 2% MAXIMUM X-SLOPE. TC GRADES ARE LISTED IN A CLOCK-WISE ORDER.

NW 15TH ST

LOCATION	STATION	OFFSET	ELEVATION	
①	END CURB BEGIN TEMP TURNAROUND WING	15+73.73	16'	189.64 TC 189.14 FG
②	1/4 PT	16+15.79	45'	190.35 FG
③	VALLEY GUTTER	16+15.79	16'	189.77 FG
④	BEGIN CURB END TEMP TURNAROUND WING	16+57.85	16'	190.91 TC 190.41 FG

LOT	DISTANCE FROM DOWNSTREAM STRUCTURE	LENGTH	IE AT END
10	0+00	5'	211.0
11	0+00	5'	219.5
12	0+00	5'	228.2
13	WEEP HOLE	HOLE	
X-LOT	WEEP HOLE	HOLE	
14	WEEP HOLE	HOLE	
19	1+17	35'	229.3
20	1+86	35'	237.3
21	0+00	5'	251.6
22	0+00	5'	249.9
23	0+00	5'	246.4
24	0+00	5'	241.4
25	0+00	5'	239.1
26	0+00	5'	236.7
27	0+00	29'	252.8
28	3+13	32'	252.8
29	2+60	33'	254.0
30	1+96	32'	255.0
31	1+34	28'	256.2
32	0+70	27'	257.5
33	0+00	15'	258.5
34	WEEP HOLE	HOLE	
35	WEEP HOLE	HOLE	
36	WEEP HOLE	HOLE	
37	WEEP HOLE	HOLE	
38	WEEP HOLE	HOLE	
39	WEEP HOLE	HOLE	
40	WEEP HOLE	HOLE	
41	WEEP HOLE	HOLE	
42	WEEP HOLE	HOLE	
43	WEEP HOLE	HOLE	
44	WEEP HOLE	HOLE	
45	WEEP HOLE	HOLE	
46	WEEP HOLE	HOLE	
47	16'	0+00	262.6
48	20'	2+52	263.0
49	20'	1+88	263.4
50	20'	1+24	263.9
51	20'	0+64	264.4
52	20'	0+73	264.0
53	20'	1+38	263.2
54	121'	1+70	264.8
55	15'	0+00	263.5
56	15'	0+00	263.0
57	27'	0+55	262.9
58	22'	0+00	262.6
59	34'	2+07	262.2
60	38'	1+46	261.9
61	35'	0+77	261.6
62	15'	0+00	260.3
63	30'	0+76	253.6
64	16'	2+00	248.7
65	30'	0+13	242.0
66	30'	1+42	233.7
67	30'	0+76	226.5

NW 16TH ST			NW 19TH ST				
	ANGLE FROM CTR	TC ELEVATION		ANGLE FROM CTR	TC ELEVATION		
①	PC	18.8'	224.15	①	PC	17.9'	267.37
②	PRC	34.3'	225.40	②	PRC	35.8'	267.71
③		90'	227.51	③		90'	268.14
④		135'	228.79	④		135'	268.49
⑤	HI PT	180'	229.21	⑤	HI PT	180'	268.80
⑥		235'	228.79	⑥		235'	268.49
⑦		270'	227.51	⑦		270'	268.14
⑧	PRC	325.7'	225.40	⑧	PRC	324.2'	267.71
⑨	PC	343.5'	222.93	⑨	PC	337.6'	267.59



STURTEVANT, GOLEMO, & ASSOCIATES
 CIVIL ENGINEERING ~ LAND PLANNING
 DEVELOPMENT SERVICES

2005 BROADWAY
 VANCOUVER, WA 98663
 PHONE (360)993-0911
 FAX (360)993-0912

HIGHLAND TERRACE SUBDIVISION

STREET & STORM - NORTH

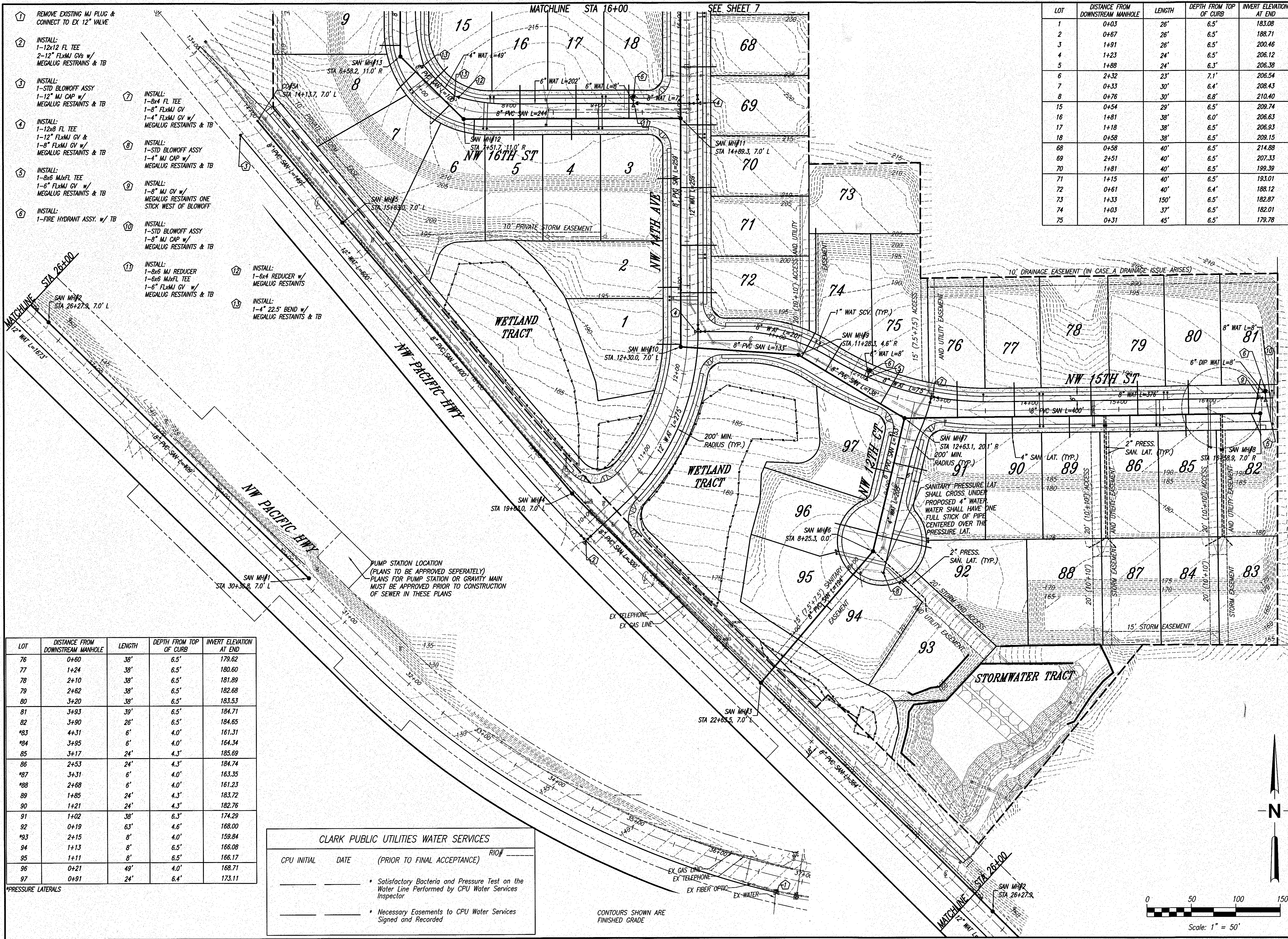
REVISIONS

DESIGNED BY:	JDR
DRAWN BY:	JDR
CHECKED BY:	EEG
SCALE:	1" = 50'

JOB NUMBER: 0536 SHEET: 5 of 18

DATE PLOTTED: Mar. 11, 2009 - 3:44 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE 4 - FINAL\0536-STREET-STORING.DWG

DATE PLOTTED: Mar. 12, 2009 - 1:26 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE 14-FINAL\0536-SANITARY-WATER.DWG



LOT	DISTANCE FROM DOWNSTREAM MANHOLE	LENGTH	DEPTH FROM TOP OF CURB	INVERT ELEVATION AT END
76	0+60	38'	6.5'	179.62
77	1+24	38'	6.5'	180.60
78	2+10	38'	6.5'	181.89
79	2+62	38'	6.5'	182.68
80	3+20	38'	6.5'	183.53
81	3+93	39'	6.5'	184.71
82	3+90	26'	6.5'	184.65
*83	4+31	6'	4.0'	161.31
*84	3+95	6'	4.0'	164.34
85	3+17	24'	4.3'	185.69
86	2+53	24'	4.3'	184.74
*87	3+31	6'	4.0'	163.35
*88	2+68	6'	4.0'	161.23
89	1+85	24'	4.3'	183.72
90	1+21	24'	4.3'	182.76
91	1+02	38'	6.3'	174.29
92	0+19	63'	4.6'	168.00
*93	2+15	8'	4.0'	159.84
94	1+13	8'	6.5'	166.08
95	1+11	8'	6.5'	166.17
96	0+21	49'	4.0'	168.71
97	0+91	24'	6.4'	173.11

*PRESSURE LATERALS

CLARK PUBLIC UTILITIES WATER SERVICES			
CPU INITIAL	DATE	(PRIOR TO FINAL ACCEPTANCE)	RIO#

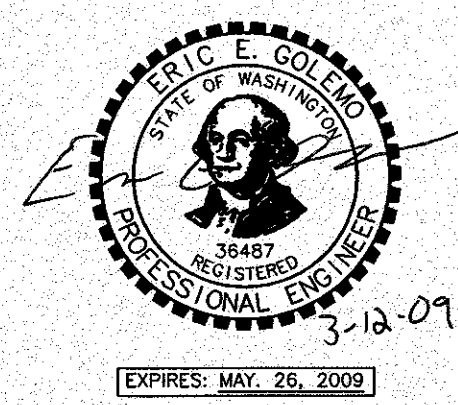
* Satisfactory Bacteria and Pressure Test on the Water Line Performed by CPU Water Services Inspector
 * Necessary Easements to CPU Water Services Signed and Recorded

CONTOURS SHOWN ARE FINISHED GRADE

LOT	DISTANCE FROM DOWNSTREAM MANHOLE	LENGTH	DEPTH FROM TOP OF CURB	INVERT ELEVATION AT END
1	0+03	26'	6.5'	183.08
2	0+67	26'	6.5'	188.71
3	1+91	26'	6.5'	200.46
4	1+23	24'	6.5'	206.12
5	1+88	24'	6.3'	206.38
6	2+32	23'	7.1'	206.54
7	0+33	30'	6.4'	208.43
8	0+76	30'	6.8'	210.40
15	0+54	29'	6.5'	209.74
16	1+81	38'	6.0'	206.63
17	1+18	38'	6.5'	206.93
18	0+58	38'	6.5'	209.15
68	0+58	40'	6.5'	214.88
69	2+51	40'	6.5'	207.33
70	1+81	40'	6.5'	199.39
71	1+15	40'	6.5'	193.01
72	0+61	40'	6.4'	188.12
73	1+33	150'	6.5'	182.87
74	1+03	37'	6.5'	182.01
75	0+31	45'	6.5'	179.78

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SANITARY & WATER - SOUTH

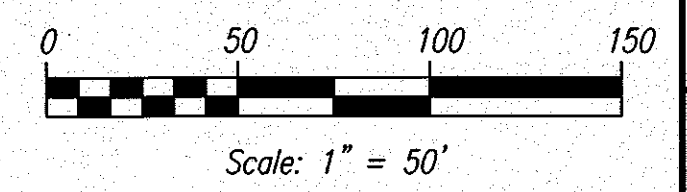
**HIGHLAND TERRACE
 SUBDIVISION**

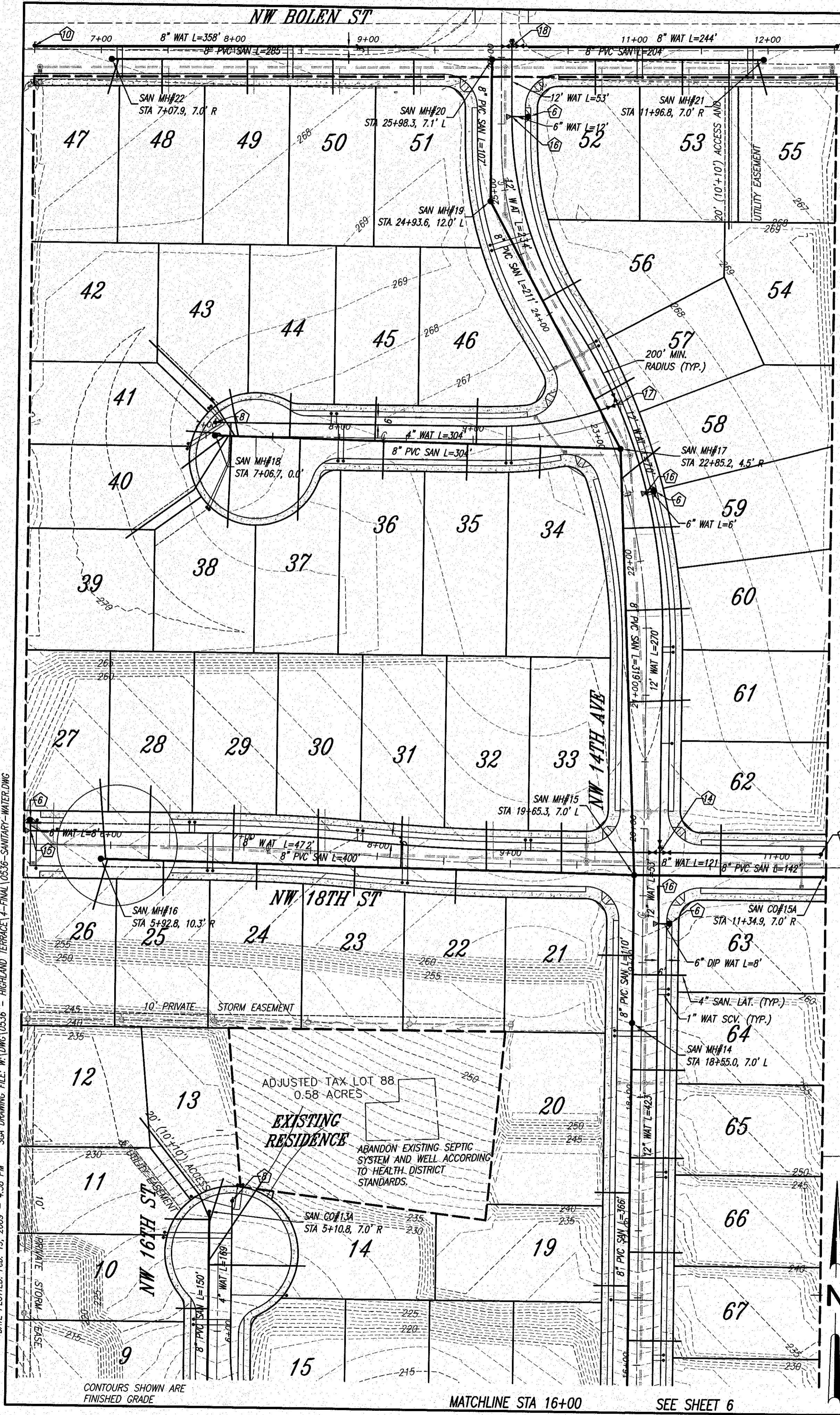
LA CENTER

REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'

JOB NUMBER: 0536
 SHEET: 6 of 18





WATER NOTES

- ALL MATERIALS AND INSTALLATION SHALL CONFORM TO CLARK PUBLIC UTILITIES STANDARDS, WASHINGTON STATE DEPARTMENT OF HEALTH OFFICE OF DRINKING WATER RULES AND REGULATIONS, THE LATEST VERSION OF THE AWWA STANDARDS AND THE 2002 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION BY WSDOT AND THE APWA.
- A CLARK PUBLIC UTILITIES INSPECTOR SHALL BE ON SITE DURING CONSTRUCTION. CONTACT 992-8019 A MINIMUM OF TWO WORKING DAYS PRIOR TO COMMENCING WORK.
- THE CONTRACTOR SHALL CALL FOR UTILITY LOCATES A MINIMUM OF TWO WORKING DAYS PRIOR TO COMMENCING WORK.
- THE WATER FACILITIES SHALL BECOME THE PROPERTY OF CLARK PUBLIC UTILITIES AFTER A SATISFACTORY BACTERIA AND PRESSURE TEST HAVE BEEN PERFORMED BY THE UTILITY. ALL MATERIALS AND WORKMANSHIP ARE SUBJECT TO A ONE YEAR WARRANTY, COMMENCING AT ACCEPTANCE OF FINAL TESTING. REPLACEMENT AND/OR REPAIRS OF DEFECTIVE MATERIALS SHALL BE THE DEVELOPERS/OWNERS RESPONSIBILITY.
- THE LOCATION AND NUMBER OF THE WATER SERVICES FOR SUBDIVISIONS, SHORT PLATS AND OTHER PRIVATE DEVELOPMENTS SHALL BE DETERMINED BY THE DEVELOPER.
- ALL WORK WITHIN THE COUNTY RIGHT-OF-WAY SHALL CONFORM TO THE PROJECT SPECIFIC CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS.
- A MINIMUM OF 10 FEET HORIZONTAL SEPARATION AND 18 INCHES VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN ALL EXISTING AND PROPOSED WATER AND SEWER LINES.
- A TAPPING COMPANY APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
- WHEN ASBESTOS CONCRETE PIPE IS ENCOUNTERED, THE CONTRACTOR SHALL SUPPLY WORKERS WHO ARE CERTIFIED TO WORK ON ASBESTOS CONCRETE PIPE.
- THE CONTRACTOR SHALL TRANSFER AND/OR ABANDON EXISTING SERVICES AS DIRECTED BY THE INSPECTOR.
- ALL WATER MAINS SHALL HAVE 3 FEET OF MINIMUM COVER FROM TOP OF PIPE TO FINISH GRADE.
- THE CONTRACTOR SHALL USE CONSTRUCTION METHODS THAT PROTECT THE PIPE INTERIORS, FITTINGS AND VALVES AGAINST CONTAMINATION.
- THE INSTALLED WATER MAIN SHALL BE PRESSURE TESTED AT A MINIMUM OF 150 PSI OR 1.5 TIMES THE WORKING PRESSURE, WHICHEVER IS GREATER. THE TEST WILL BE PERFORMED BY THE CLARK PUBLIC UTILITIES INSPECTOR. THE CONTRACTOR SHALL PROVIDE ASSISTANCE AS NEEDED.
- THE INSTALLED WATER MAIN SHALL BE THOROUGHLY DISINFECTED AND FLUSHED IN ACCORDANCE WITH THE CLARK PUBLIC UTILITIES STANDARDS AND REQUIREMENTS. ONLY CLARK PUBLIC UTILITIES EMPLOYEES ARE PERMITTED TO FILL AND FLUSH THE WATER MAIN. THE CONTRACTOR SHALL PROVIDE ASSISTANCE AS NEEDED. IN AREAS WHERE THE DE-CHLORINATION OF FLUSHED WATER IS NOT POSSIBLE, THE CONTRACTOR SHALL PROVIDE WATER TRUCKS TO FLUSH INTO.
- PRIOR TO ACCEPTING THE SYSTEM OR ALLOWING THE MAIN TO BE PUT IN SERVICE, A WATER SAMPLE SHALL BE TAKEN BY THE CLARK PUBLIC UTILITIES INSPECTOR AND A TEST PERFORMED BY AN ACCREDITED LAB TO INSURE NO HAZARDOUS EXIST.
- ANY PIPE, FITTINGS OR VALVES THAT CANNOT BE DISINFECTED WITH THE MAIN LINE BY CHLORINE FOR 24 HOURS SHALL HAVE THE INTERIORS SWABBED WITH A 5% HYPOCHLORITE SOLUTION BEFORE INSTALLATION.
- CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AT ALL TEES, BENDS, BLOW-OFFS, DEAD ENDS AND WHERE INDICATED ON THE PLANS.
- ALL MJ FITTINGS SHALL BE RESTRAINED USING MJ MECHANICAL RESTRAINT FOLLOWER GLANDS.

WATER MAIN INSTALLATION REQUIREMENTS

FIRE HYDRANTS

- 6" WATER PIPE LEADING TO FIRE HYDRANTS SHALL BE DIP AND SHALL BE ONE CONTINUOUS PIECE OF PIPE. IF THE RUN IS LONGER THAN ONE PIECE OF PIPE, THEN ALL PIPE JOINTS SHALL BE MECHANICALLY RESTRAINED WITH "FIELD-LOK" GASKETS OR OTHER CPU APPROVED RESTRAINTS.

HORIZONTAL INSTALLATION

- UNLESS OTHERWISE STATED ON THE PLAN, NO UNRESTRAINED PIPE JOINTS WILL BE ALLOWED WITHIN 12' OF ANY FITTING, VALVE OR MJ RESTRAINT.

VERTICAL INSTALLATION

- DIP SHALL BE USED IN ANY LOCATIONS REQUIRING VERTICAL BENDS. ALL VERTICAL BENDS WILL REQUIRE MEGA LUG RESTRAINTS OR OTHER CPU APPROVED RESTRAINTS AT THE MJ FITTINGS. IN ADDITION, NO UNRESTRAINED PIPE JOINTS WILL BE ALLOWED WITHIN A PRE-DETERMINED DISTANCE FROM THE BENDS. THIS DISTANCE SHALL BE REFERRED TO AS THE "RESTRAINED LENGTH" AND SHALL BE SPECIFIED ON THE PLAN. IF THE RESTRAINED LENGTH IS NOT SPECIFIED, THE CONTRACTOR SHALL NOT INSTALL THE VERTICAL BENDS UNTIL CPU APPROVES THE REQUIRED RESTRAINED LENGTH.

ALLOWABLE CPU MAIN LINE PIPE MATERIAL

- DUCTILE IRON PIPE SHALL MEET THE FOLLOWING REQUIREMENTS:
 - PIPE
 - DUCTILE IRON PIPE SHALL CONFORM TO ANSI A21.51 OR AWWA C151. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS. ALL DUCTILE IRON PIPE SHALL BE GAUGED. UNLESS SPECIFICALLY NOTED ON THE CONTRACT DRAWINGS, 3"-12" PIPE SHALL BE PRESSURE CLASS 350. PIPE SIZES GREATER THAN 12" MAY BE PRESSURE CLASS 250, 300 OR 350, AS REQUIRED BY CPU AND NOTED ON THE DRAWINGS.
 - POLYVINYL CHLORIDE (PVC) PRESSURE PIPE (4"-30"). PROVIDE UNPLASTICIZED PVC PLASTIC PIPE WITH INTEGRAL BELL AND SPIGOT JOINTS. PIPE SHALL BE SUITABLE FOR POTABLE WATER SERVICE. PVC PIPE SHALL MEET THE FOLLOWING REQUIREMENTS:
 - PIPE
 - LARGE DIAMETER PIPE (14"-30"). PIPE SHALL MEET THE REQUIREMENTS OF AWWA C905. PROVIDE P.C. 165 PIPE MEETING THE REQUIREMENTS OF DR 25, UNLESS OTHERWISE NOTED ON THE DRAWING. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS.
 - SMALL DIAMETER PIPE (4"-12"). PIPE SHALL MEET THE REQUIREMENTS OF AWWA C900. PROVIDE P.C. 150 PIPE MEETING THE REQUIREMENTS OF DR 18, UNLESS OTHERWISE NOTED ON THE DRAWINGS. USE PUSH-ON JOINTS EXCEPT WHERE OTHER JOINT TYPES ARE NOTED ON THE CONTRACT DRAWINGS.
 - HIGH DENSITY POLYETHYLENE (HDPE) PIPE (REQUIRES CPU APPROVAL PRIOR TO USE). HDPE PIPE SHALL MEET THE FOLLOWING REQUIREMENTS:
 - PIPE
 - HDPE PIPE SHALL BE SDR 9, WPR 200 OR SDR 11, WPR 160 AS SPECIFIED ON THE PLANS, MEETING THE REQUIREMENTS OF AWWA C-906, WITH A FULLY COLORED, CO-EXTRUDED STRIPED OUTER SHELL IN CONFORMANCE WITH THE UCC (UNIFORM COLOR CODE).
 - THE PIPING AND FITTINGS SHALL BE PRODUCED FROM A PE 3408 POLYETHYLENE RESIN. THE HDPE PIPE SHALL MEET THE SPECIFICATIONS AND REQUIREMENTS OF ASTM F714 AND SHALL BE CERTIFIED AS MANUFACTURED TO ISO 9001 STANDARDS. HDPE FITTINGS SHALL BE IN ACCORDANCE WITH ASTM D3261 AND SHALL BE FULLY PRESSURE RATED. PROVIDE ALL FITTINGS NECESSARY FOR A FULL AND COMPLETE INSTALLATION, INCLUDING ADDITIONAL FITTINGS TO THOSE SHOWN ON THE PLAN WHERE NECESSARY.

BACKFLOW PROTECTION NOTE

 - ALL WATER SERVICES 1/2" OR LARGER WILL REQUIRE A DOUBLE CHECK VALVE ASSEMBLY AS MINIMUM BACKFLOW PROTECTION. USE AN AIR GAP OR REDUCED PRESSURE BACKFLOW ASSEMBLY WHERE STATE LAW AND REGULATION REQUIRE.
 - ALL WATER SERVICES, IRRIGATION SYSTEMS AND BUILDING FIRE PROTECTION SYSTEMS SHALL HAVE THE APPROPRIATE BACKFLOW PROTECTION AS REQUIRED BY STATE LAW AND REGULATIONS. IT IS THE DEVELOPER'S/CONTRACTOR'S RESPONSIBILITY TO INSURE THE CORRECT TYPE OF BACKFLOW DEVICE IS INSTALLED AND IN PROPER WORKING ORDER. CLARK PUBLIC UTILITIES RESERVES THE RIGHT TO INSPECT ALL BACKFLOW DEVICES FOR COMPLIANCE AND REQUIRE ANY NEEDED CORRECTIONS TO SAID DEVICE.

- INSTALL: 1-FIRE HYDRANT ASSY. w/ TB
- INSTALL: 1-STD BLOWOFF ASSY
1-4" MJ CAP w/
MEGALUG RESTRAINTS & TB
- INSTALL: 1-STD BLOWOFF ASSY
1-8" MJ CAP w/
MEGALUG RESTRAINTS & TB
- INSTALL: 1-12x8 FL CROSS
1-12" FLxMJ GV
2-8" FLxMJ GVs
w/ MEGALUG RESTRAINTS & TB
- INSTALL: 1-8x6 MxFL TEE
1-6" FLxMJ GV
1-8" MJ CAP w/
MEGALUG RESTRAINTS & TB
- INSTALL: 1-12x6 MxFL TEE
1-6" FLxMJ GV w/
MEGALUG RESTRAINTS & TB
- INSTALL: 1-12x4 FL TEE
1-12" FLxMJ GV
1-4" FLxMJ GV w/
MEGALUG RESTRAINTS & TB
- INSTALL: 1-12x8 FL CROSS
1-12" FLxMJ GV
2-8" FLxMJ GVs
1-12" MJ CAP w/
MEGALUG RESTRAINTS & TB

WATER LEGEND

- ⊕ - VALVE
- ⊖ - THRUSTBLOCK
- - WATER SERVICE
- ⊙ - FIRE HYDRANT
- FL - FLANGE
- MJ - MECHANICAL JOINT
- GV - GATE VALVE

WATER SERVICE PRESSURE NOTE:
CLARK PUBLIC UTILITIES DOES NOT INSTALL PRESSURE REDUCING VALVES (PRV) AT THE WATER SERVICE BOXES. IT IS THE DEVELOPER'S/CUSTOMER'S RESPONSIBILITY TO INSTALL AND MAINTAIN AND PRV'S ON THE CUSTOMER'S SIDE OF THE WATER SERVICE. IT IS ESTIMATED THAT THE STATIC WATER PRESSURE AT THE METERS WILL BE APPROXIMATELY ___ TO ___ PSI, DEPENDING ON RESERVOIR LEVEL AND ELEVATION AT THE METER.

- SANITARY SEWER**
- ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE LATEST STANDARDS AND PRACTICES OF CITY OF LA CENTER AND THE 2002 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION" AS PREPARED BY W.S.D.O.T AND A.P.W.A.
 - A UTILITY INSPECTOR SHALL BE ON SITE DURING ALL CONSTRUCTION. THE CONTRACTOR SHALL SCHEDULE WORK ACCORDINGLY. CONTACT (360) 263-2782 2 DAYS PRIOR TO CONSTRUCTION.
 - SERVICE LATERALS SHALL BE EXTENDED 6' BEHIND THE RIGHT-OF-WAY LINE AND LATERALS ENDS SHALL BE MARKED WITH A 10' LONG 2"x4" WITH TRACING WIRE WRAPPED AROUND THE LATERAL AND 2"x4".
 - ALL SERVICE LATERAL PIPING SHALL BE GLUED JOINT, SCH. 40, 4" ABS.
 - BACKFILL FOR SANITARY SEWER SHALL BE SELECT NATIVE MATERIAL OR IMPORTED GRANULAR MATERIAL. BACKFILL COMPACTION SHALL BE 95% MAXIMUM RELATIVE DENSITY.
 - PRIOR TO BACKFILLING SEWER SERVICE LATERAL ENDS AND SEWER MAIN CLEAN OUTS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER WITHIN 24 HOURS SO THAT CONSTRUCTION AND PRE-PAVING AS-BUILT INFORMATION CAN BE OBTAINED. IF THE CONTRACTOR CHOOSES TO BACKFILL PRIOR TO NOTIFICATION, THE CONTRACTOR WILL BE HELD RESPONSIBLE TO EXPOSE THE ENDS OF SERVICE LATERALS AND SEWER MAIN CLEAN-OUTS AT THE CONTRACTOR'S EXPENSE.
 - ALL SANITARY SEWER MAINS SHALL BE 8" PVC (SDR 35) THAT MEET THE TESTING REQUIREMENTS DESCRIBED IN ASTM 3034.
 - TRENCH BACKFILL MUST BE APPROVED IMPORT, NO NATIVE MATERIAL.
 - TRENCH REQUIRED TO HAVE WATER STOPS TO MINIMIZE WATER MIGRATION.
 - ALL PIPE LINES AT GRADES GREATER THAN 20% ARE REQUIRED TO HAVE CONCRETE SLOPE ANCHORS.
 - SANITARY SEWER CONSTRUCTION, INSPECTION AND ACCEPTANCE SHALL COMPLY WITH TITLE 13 (PUBLIC UTILITIES) AND CHAPTER 13.10 (SEWER SYSTEM RULES AND REGULATIONS).

LOT	DISTANCE FROM DOWNSTREAM MANHOLE	LENGTH	DEPTH FROM TOP OF CURB	INVERT ELEVATION AT END
9	0+13	23'	7.2'	212.43
10	0+78	24'	8.0'	216.82
11	1+44	33'	7.1'	221.44
12	1+45	92'	6.5'	222.68
13	1+42	35'	6.5'	222.89
X-LOT	1+13	71'	6.5'	223.00
14	1+10	72'	6.5'	221.28
19	1+69	26'	6.5'	227.67
20	2+39	26'	6.5'	235.66
21	0+50	26'	6.5'	252.91
22	1+34	25'	9.0'	253.23
23	2+10	22'	9.0'	251.73
24	2+83	19'	9.0'	250.25
25	3+53	26'	8.2'	249.59
26	3+95	39'	6.9'	250.02
27	3+96	60'	6.5'	250.44
28	3+64	55'	6.5'	251.13
29	3+01	43'	6.5'	252.38
30	2+37	42'	6.5'	253.64
31	1+75	38'	6.5'	254.89
32	1+11	36'	6.5'	256.02
33	0+55	37'	6.5'	256.14
34	0+60	24'	6.5'	259.67
35	1+15	27'	6.5'	260.21
36	1+78	29'	6.5'	260.84
37	2+40	62'	6.5'	261.75
38	2+92	69'	6.4'	262.38
39	2+94	111'	5.9'	263.23
40	2+97	41'	6.5'	262.09
41	2+99	27'	6.5'	262.30
42	2+89	97'	5.7'	262.91
43	2+87	36'	6.5'	261.98
44	2+48	34'	6.5'	261.52
45	1+84	33'	6.5'	260.90
46	1+08	35'	6.5'	260.14
47	2+80	27'	6.5'	261.91
48	2+47	26'	6.5'	261.47
49	1+83	26'	6.2'	261.21
50	1+19	26'	5.9'	260.96
51	0+59	26'	5.9'	260.72
52	0+77	26'	6.5'	261.59
53	1+43	26'	6.3'	261.05
54	1+78	127'	3.7'	263.21
55	1+99	27'	5.3'	261.30
56	1+26	33'	6.5'	260.73
57	0+47	34'	6.5'	260.34
58	2+96	37'	6.5'	260.03
59	2+59	42'	6.5'	259.78
60	1+98	48'	6.5'	259.49
61	1+30	46'	6.5'	259.15
62	0+65	38'	6.5'	255.22
63	0+36	40'	6.5'	251.92
64	3+31	40'	6.5'	245.88
65	2+65	40'	6.5'	238.70
66	1+95	40'	6.5'	230.57
67	1+29	40'	6.5'	223.01

STURTEVANT, COLEMO, & ASSOCIATES
 CIVIL ENGINEERING ~ LAND PLANNING
 DEVELOPMENT SERVICES

2005 BROADWAY
 VANCOUVER, WA 98663
 PHONE (360)993-0911
 FAX (360)993-0912

SANITARY & WATER - NORTH

HIGHLAND TERRACE

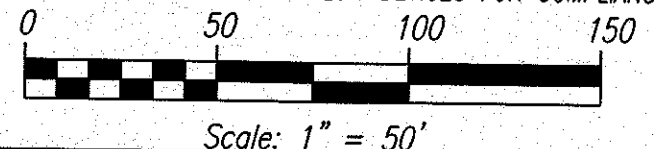
SUBDIVISION

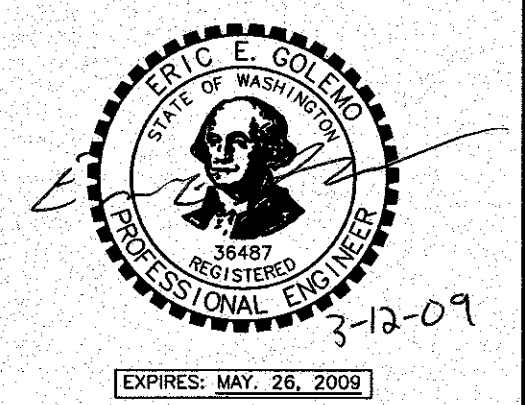
LA CENTER

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'

JOB NUMBER: 0536 SHEET: 7 of 18

DATE PLOTTED: Feb. 19, 2009 - 4:59 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE\4-FINAL\0536-SANITARY-WATER.DWG





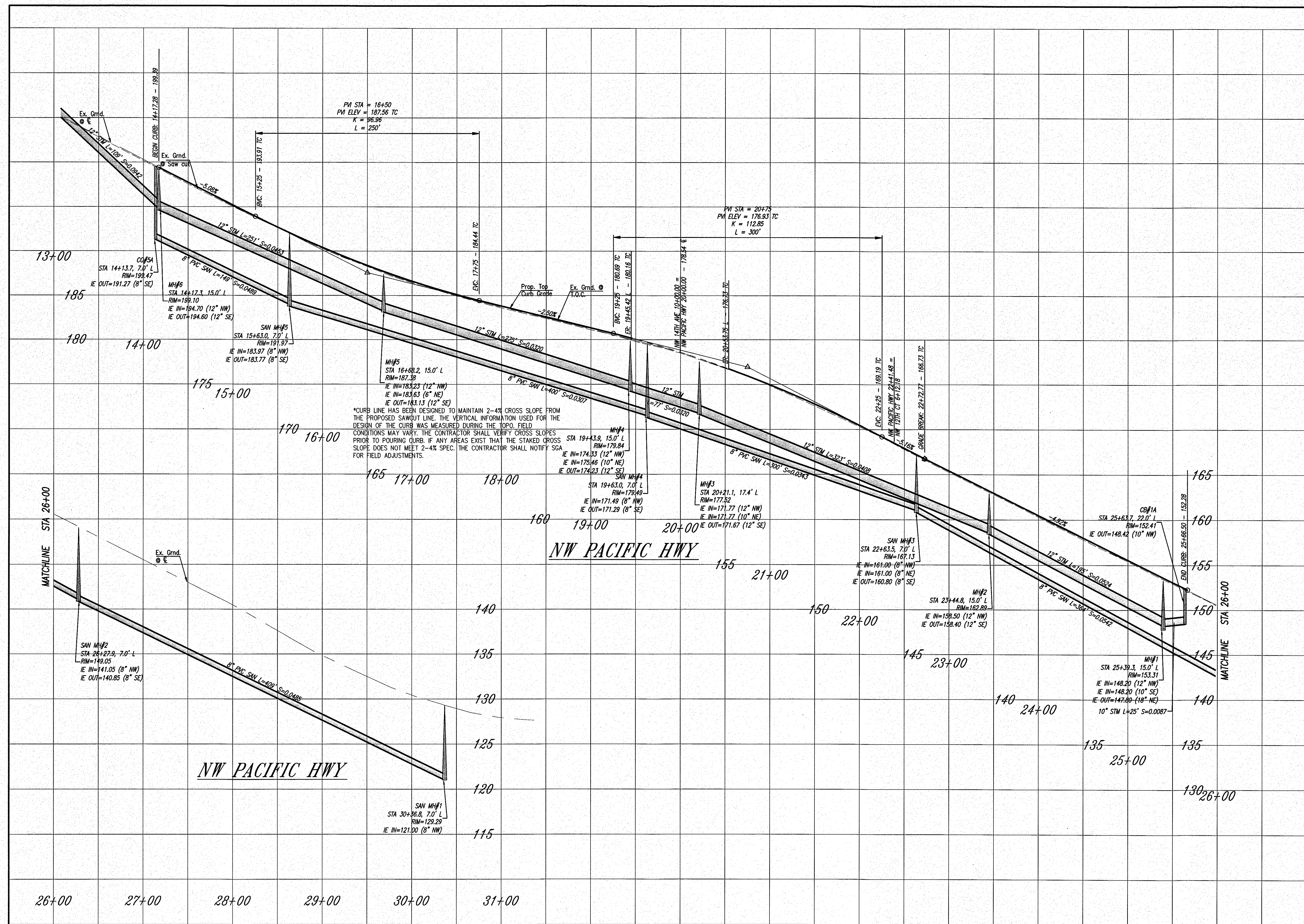
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**HIGHLAND TERRACE
SUBDIVISION**

LA CENTER

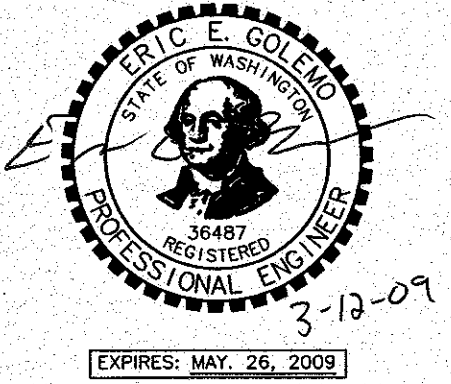
PROFILES - NW PACIFIC HWY

DME PLOTTED: Feb. 11, 2009 - 11:51 AM SGA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE\4-FINAL\0536-PROFILES.DWG



REVISIONS

DESIGNED BY: JDR
DRAWN BY: JDR
CHECKED BY: EEG
SCALE: 1" = 50'



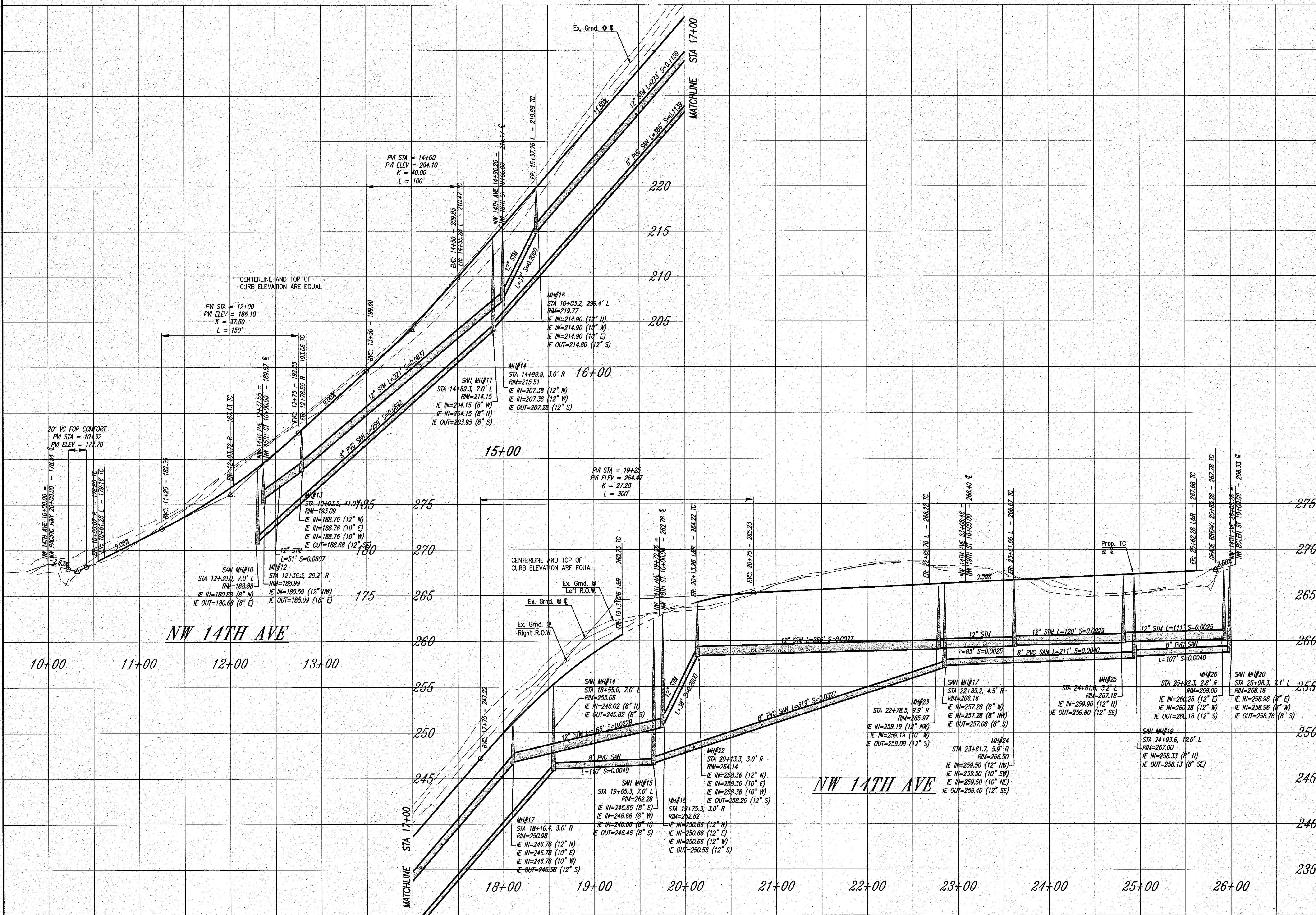
**HIGHLAND TERRACE
 SUBDIVISION**

PROFILES - NW 14TH ST

WA

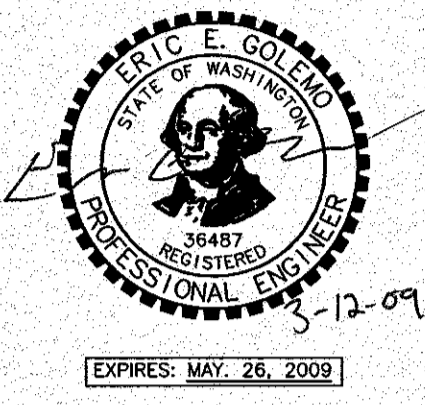
LA CENTER

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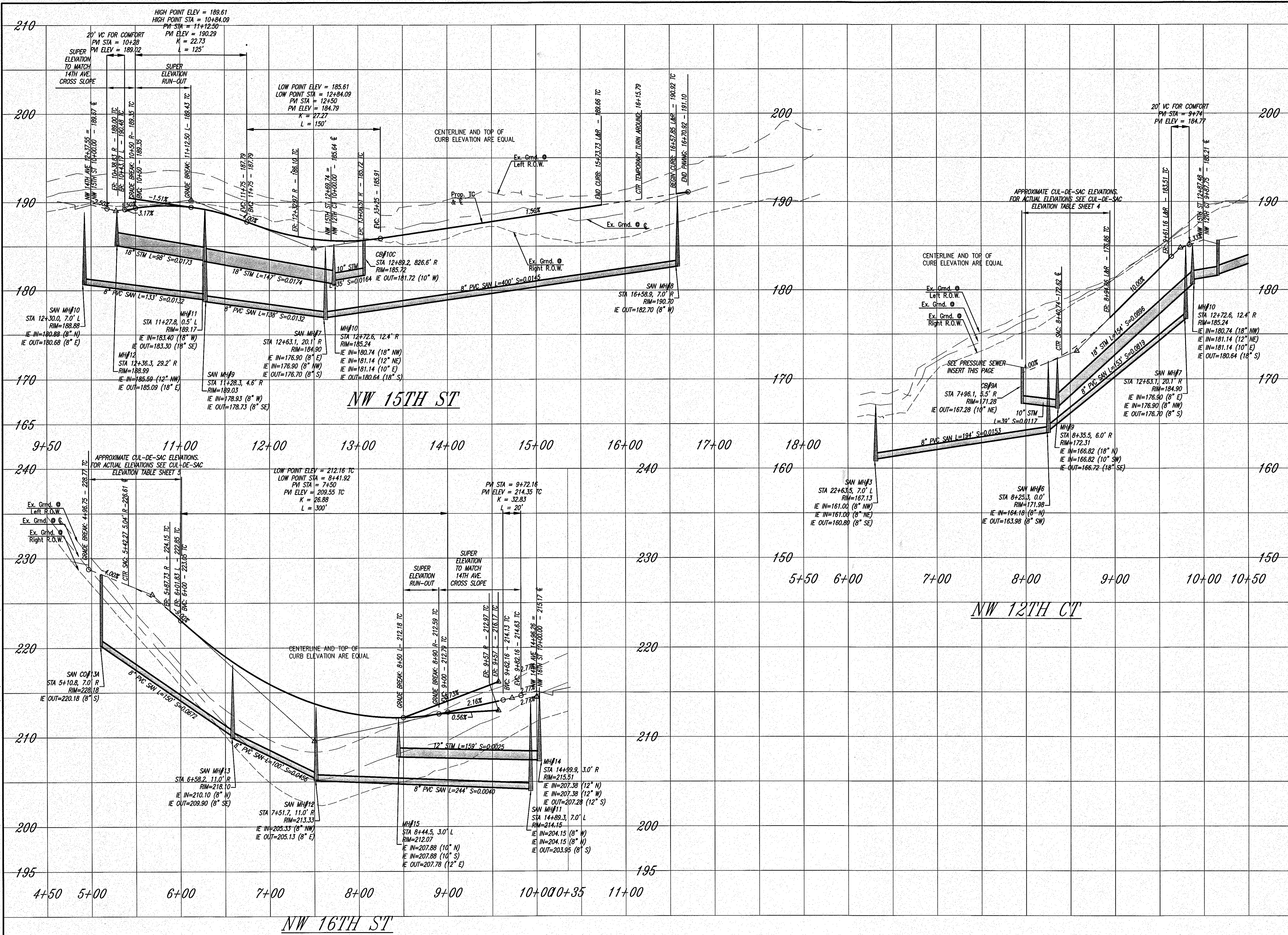
REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'



**HIGHLAND TERRACE
 SUBDIVISION**

PROFILES - NW 12TH CT-15TH ST-16TH ST

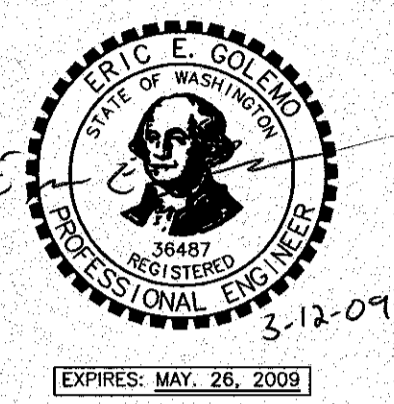


DATE PLOTTED: Mar. 12, 2009 - 2:29 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE\4-FINAL\0536-PROFILES.DWG

REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'

JOB NUMBER: 0536
 SHEET: 10 of 18



ROADWAY DETAILS

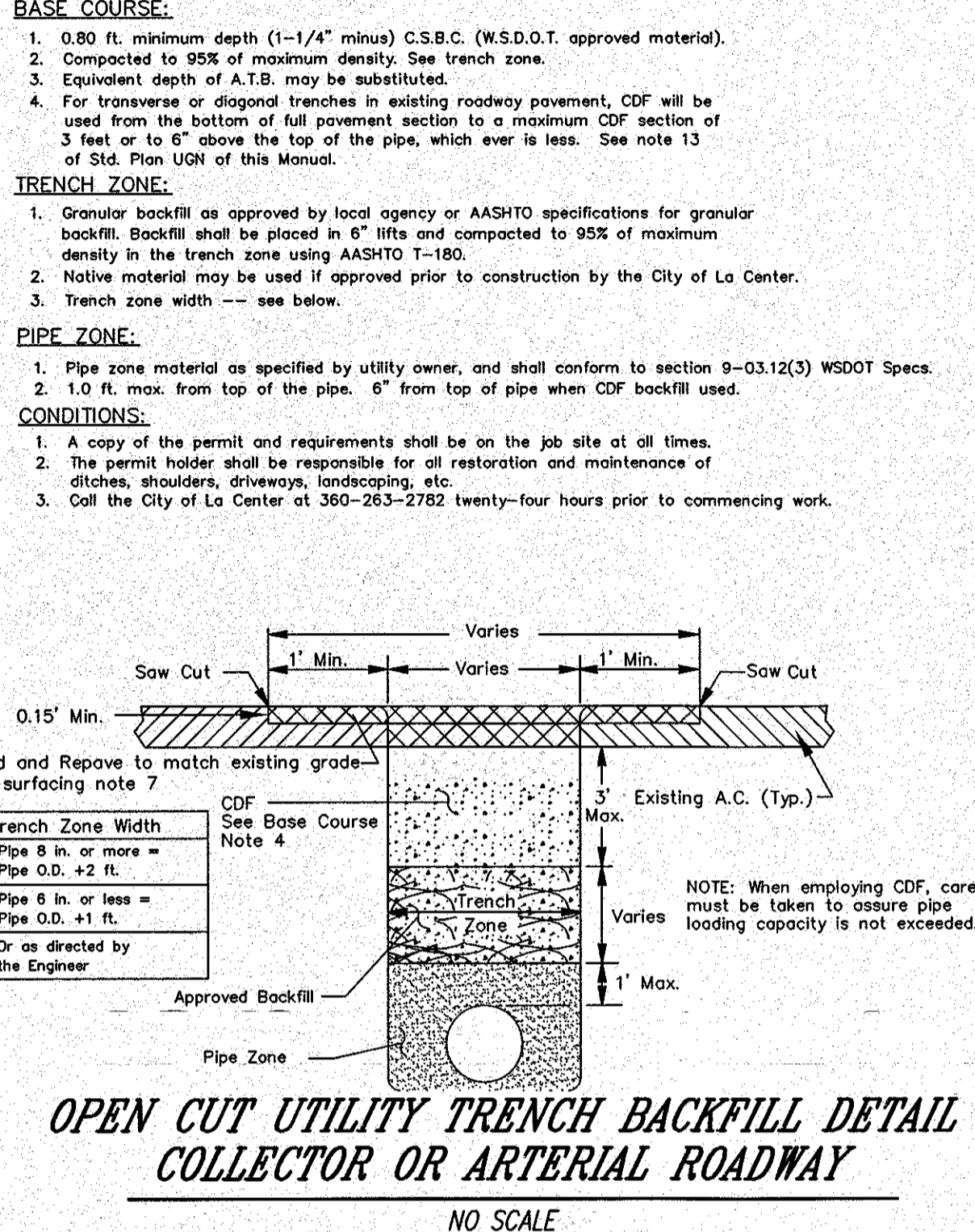
HIGHLAND TERRACE SUBDIVISION

LA CENTER

REVISIONS	
DESIGNED BY:	JDR
DRAWN BY:	JDR
CHECKED BY:	EEG
SCALE:	1" = 50'
JOB NUMBER	SHEET
0536	13 of 18

OPEN CUT UTILITY TRENCH BACKFILL DETAIL (COLLECTOR OR ARTERIAL)

- SURFACING:**
- All A.C.P. shall be saw cut to provide a straight, clean edge prior to paving.
 - The cut line shall be one continuous straight line from the outer excavation limits of manhole, valve box, etc. to manhole, valve box, etc.
 - Pave with an 0.5 ft. minimum compacted depth A.C.P., or match existing or design section, whichever is greater.
 - Lifts for A.C.P. (Class A) shall be 0.15 ft. minimum and 0.35 ft. maximum for non-surface lifts (0.25 maximum for surface lifts); the temperature shall be 250 degree minimum, 350 degree maximum, compacted to 92% of the theoretical maximum.
 - All joints shall be locked, sealed and sanded.
 - Trench shall be plotted until paved.
 - For longitudinal installation, full lane width including turn lanes restoration shall be required or as directed by Clark County. For transverse installation refer to surfacing restoration of detail U6. See Section 12.20A.120.C.
- BASE COURSE:**
- 0.80 ft. minimum depth (1-1/4" minus) C.S.B.C. (W.S.D.O.T. approved material).
 - Compacted to 95% of maximum density. See trench zone.
 - Equivalent depth of A.T.B. may be substituted.
 - For transverse or diagonal trenches in existing roadway pavement, CDF will be used from the bottom of full pavement section to a maximum CDF section of 3 feet or to 6" above the top of the pipe, whichever is less. See note 13 of Std. Plan UGN of this Manual.
- TRENCH ZONE:**
- Granular backfill as approved by local agency or AASHTO specifications for granular backfill. Backfill shall be placed in 6" lifts and compacted to 95% of maximum density in the trench zone using AASHTO T-180.
 - Native material may be used if approved prior to construction by the City of La Center.
 - Trench zone width -- see below.
- PIPE ZONE:**
- Pipe zone material as specified by utility owner, and shall conform to section 9-03.12(3) WSDOT Specs.
 - 1.0 ft. max. from top of the pipe. 6" from top of pipe when CDF backfill used.
- CONDITIONS:**
- A copy of the permit and requirements shall be on the job site at all times.
 - The permit holder shall be responsible for all restoration and maintenance of ditches, shoulders, driveways, landscaping, etc.
 - Call the City of La Center at 360-263-2782 twenty-four hours prior to commencing work.

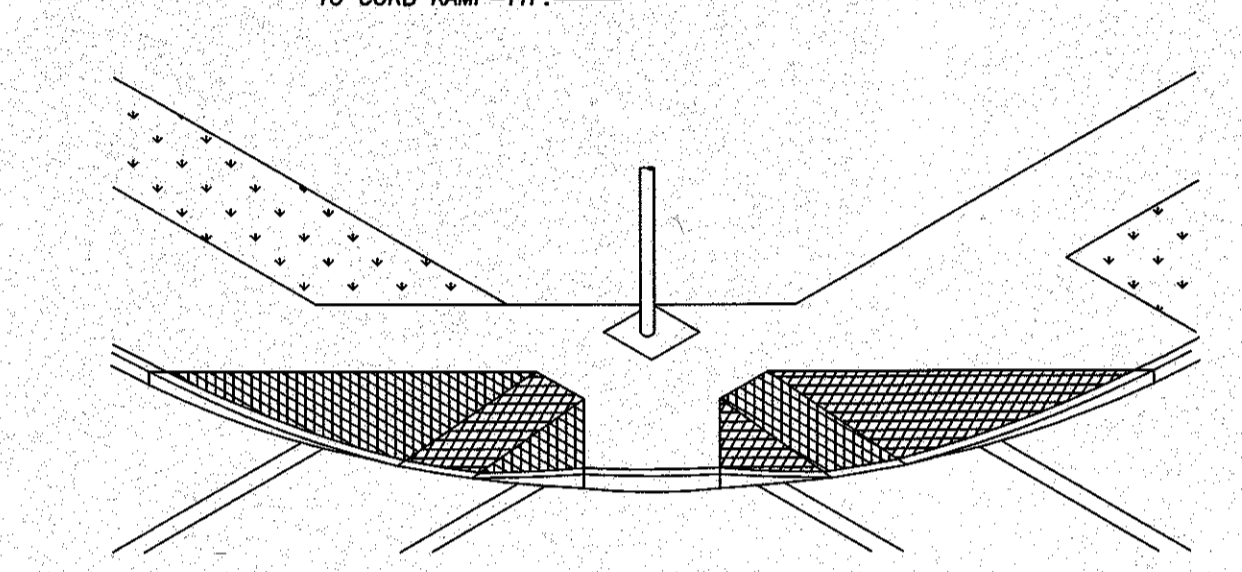


OPEN CUT UTILITY TRENCH BACKFILL DETAIL COLLECTOR OR ARTERIAL ROADWAY

NO SCALE

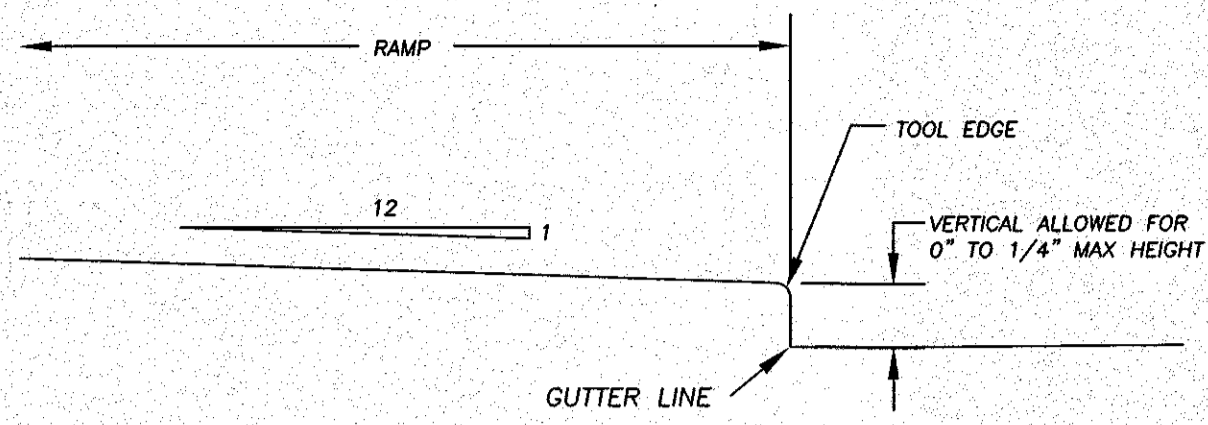
NEW CONSTRUCTION FOR USE WITH SIDEWALKS LOCATED ANYWHERE IN THE RIGHT-OF-WAY

- NOTES:**
- RAMPS TO BE POURED SEPARATELY FROM SIDEWALK.
 - CROSSWALKS TO BE CENTERED ON SIGNAL POLE TO POLE CENTERLINES. CURB RAMP TO BE CENTERED WITHIN CROSSWALK.
 - SIDEWALK SLOPE TO BE 2% MAXIMUM RADIALLY AROUND CORNER SECTION. SINGLE RAMPS CAN BE INSTALLED.
 - TRAFFIC SIGNAL POLE LOCATED ON RP-RP LINE AT 11" FROM CURB FACE.



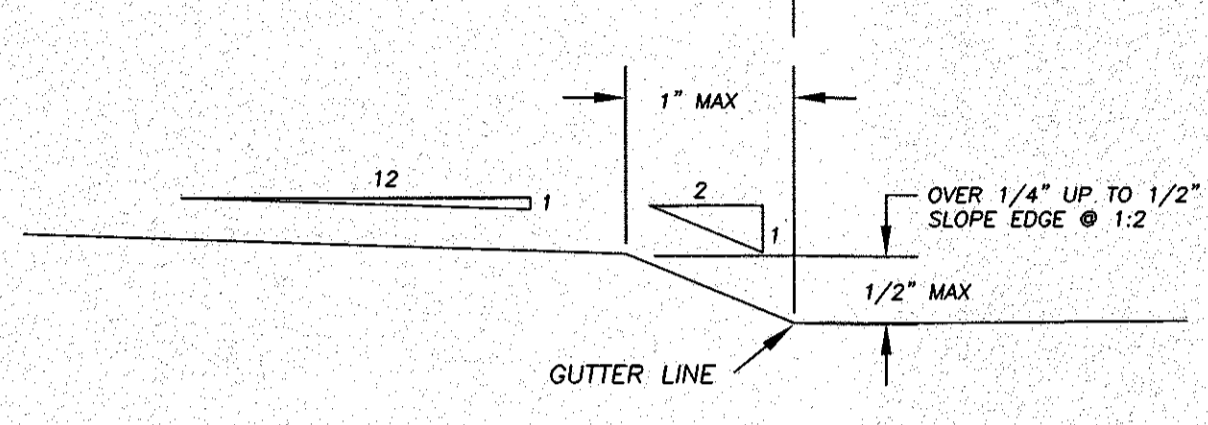
TYPE 1 RAMP

NO SCALE



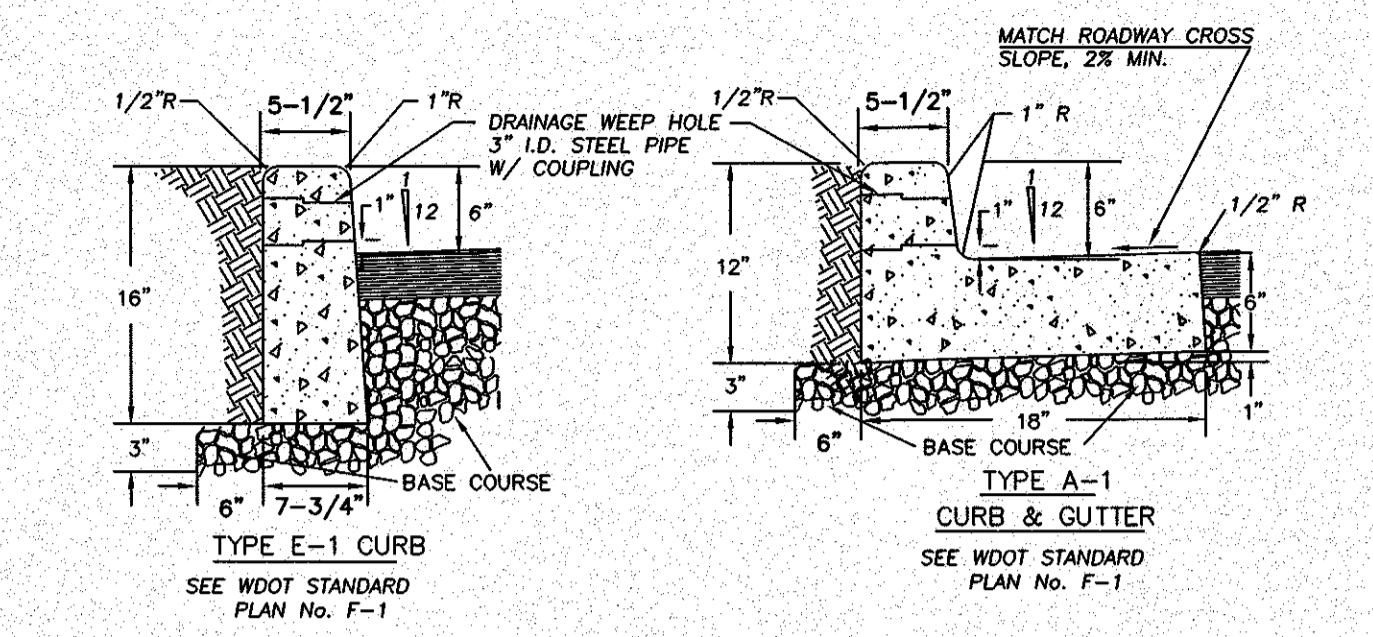
RAMP LIP DETAIL

NO SCALE



CONCRETE CURBS

NO SCALE



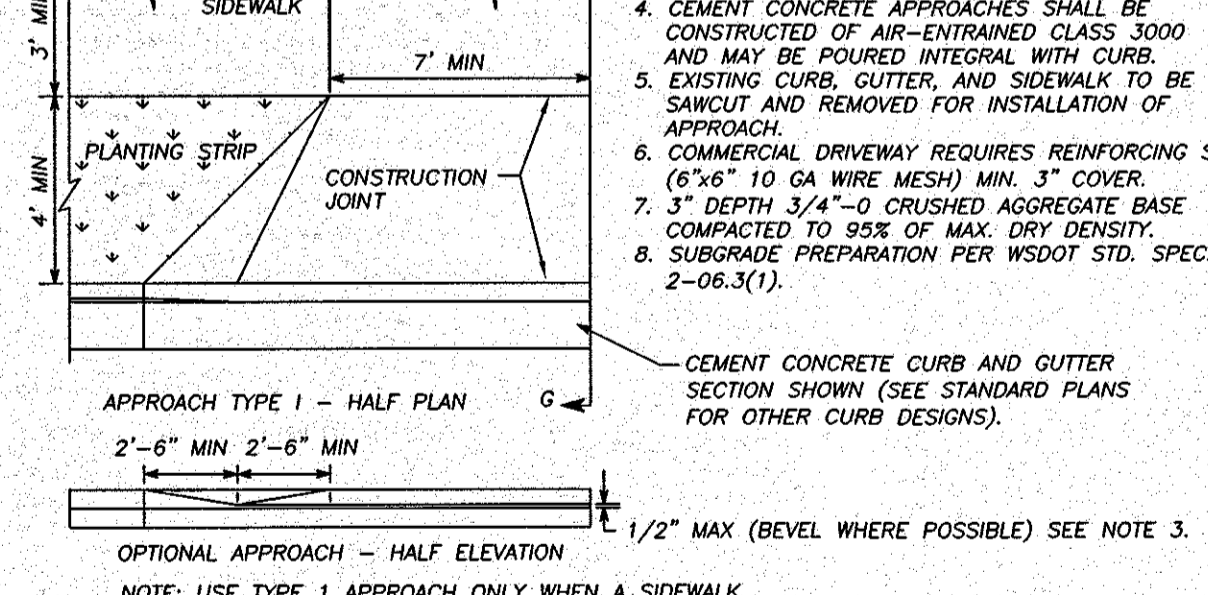
TYPE A-1 CURB & GUTTER

NO SCALE

- NOTES:**
- CONCRETE SHALL BE 3000 PSI MIN. (CLASS 3000) 3 1/2" SLUMP (MAX).
 - CURBS ADJACENT TO PAVEMENT OR SIDEWALK TO HAVE EXPANSION AND/OR CONTRACTION JOINTS TO MATCH EXISTING PATTERNS.
 - 3/8" EXPANSION JOINTS TO BE PROVIDED AT EACH POINT OF TANGENCY OF THE CURB, COLD JOINTS, EACH SIDE OF INLET STRUCTURES AND DRIVEWAYS. MATERIAL TO BE PRE-MOLDED, ASPHALT IMPREGNATED AND NON EXTRUDING.
 - CONTRACTION JOINT SPACING NOT TO EXCEED 15 FEET. THE DEPTH OF THE JOINT SHALL BE AT LEAST 1-1/2 INCHES. WEEP HOLES TO BE CENTERED WITH CONTRACTION JOINTS.
 - BASE COURSE SHALL BE TO SUBGRADE OF STREET SECTION OR 3 INCHES, WHICHEVER IS GREATER, AND SHALL EXTEND 6" BEHIND THE CURB.
 - DRAINAGE WEEP HOLES TO BE 3" I.D. PLASTIC PIPE WITH COUPLING. FINISH PIPE END FLUSH WITH FACE OF CURB.
 - GROUT ANY VOIDS IN CONCRETE SURROUNDING PIPE.
 - DRAINAGE ACCESS THROUGH EXISTING CURBS SHALL BE CORE DRILLED.
 - CURB TO BE BRUSH FINISHED. ALL EXISTING EDGES SHALL BE SAWCUT.
 - ALL MATERIALS AND WORKMANSHIP FOR TYPE E-1 & A-1 SHALL BE IN ACCORDANCE WITH WDOT STANDARD PLAN No. F-1, APPROVED 7/18/97 OR MOST CURRENT REVISION.

DETAIL - TYPE 1 CEMENT CONCRETE APPROACH

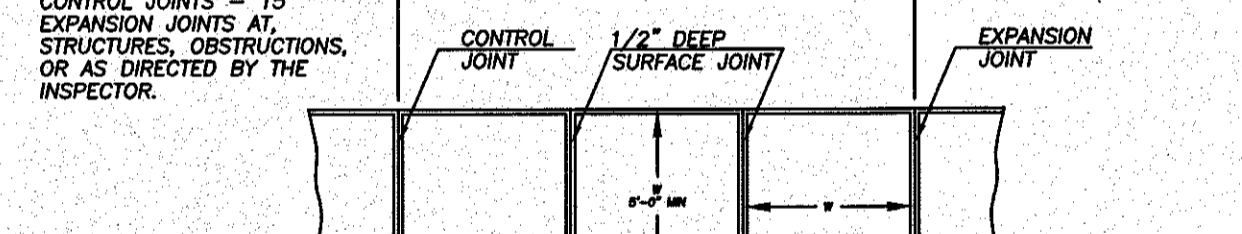
NO SCALE



DETAIL - TYPE 1 CEMENT CONCRETE APPROACH

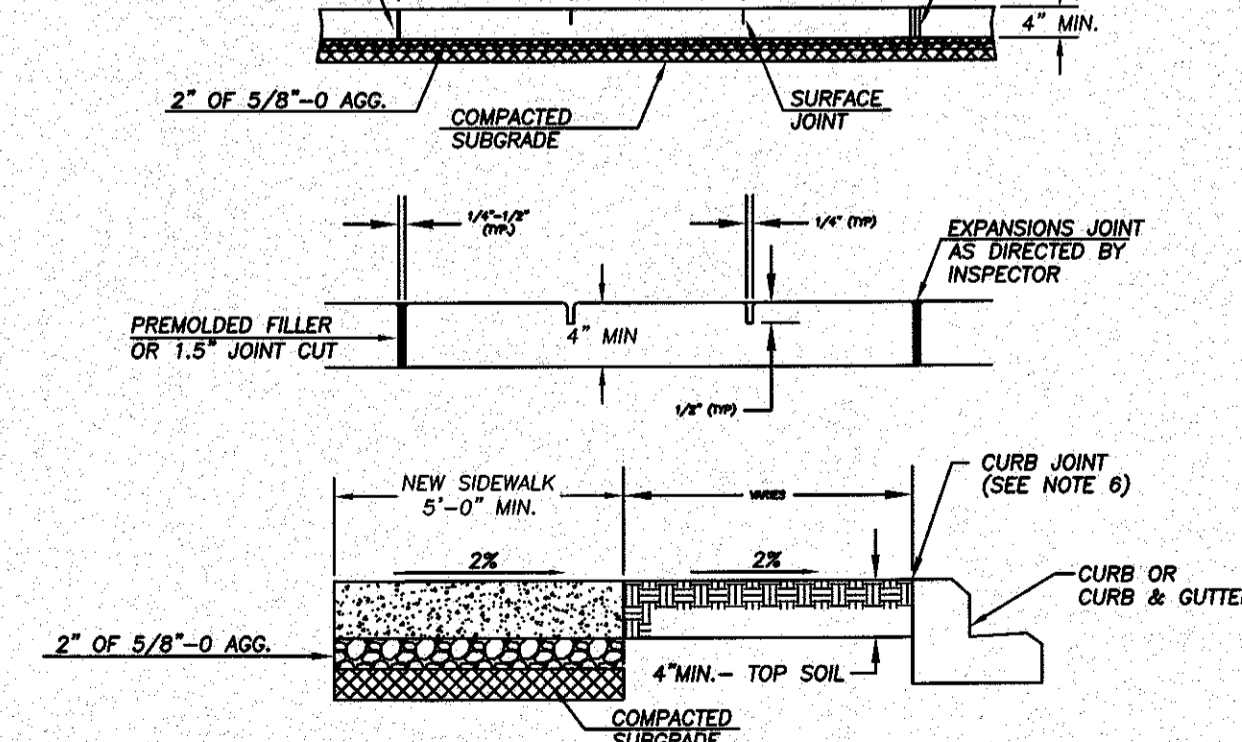
NO SCALE

JOINT SPACING:



CEMENT CONCRETE APPROACH DETAIL - TYPE 3

NO SCALE

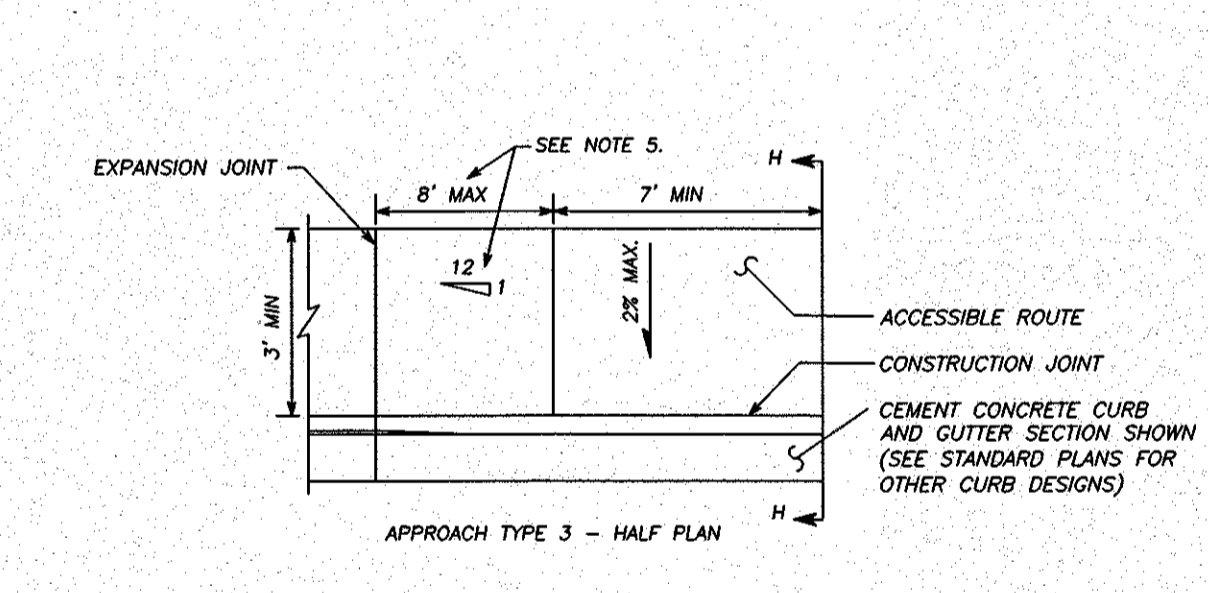


CEMENT CONCRETE APPROACH DETAIL - TYPE 3

NO SCALE

CEMENT CONCRETE APPROACH DETAIL - TYPE 3

NO SCALE



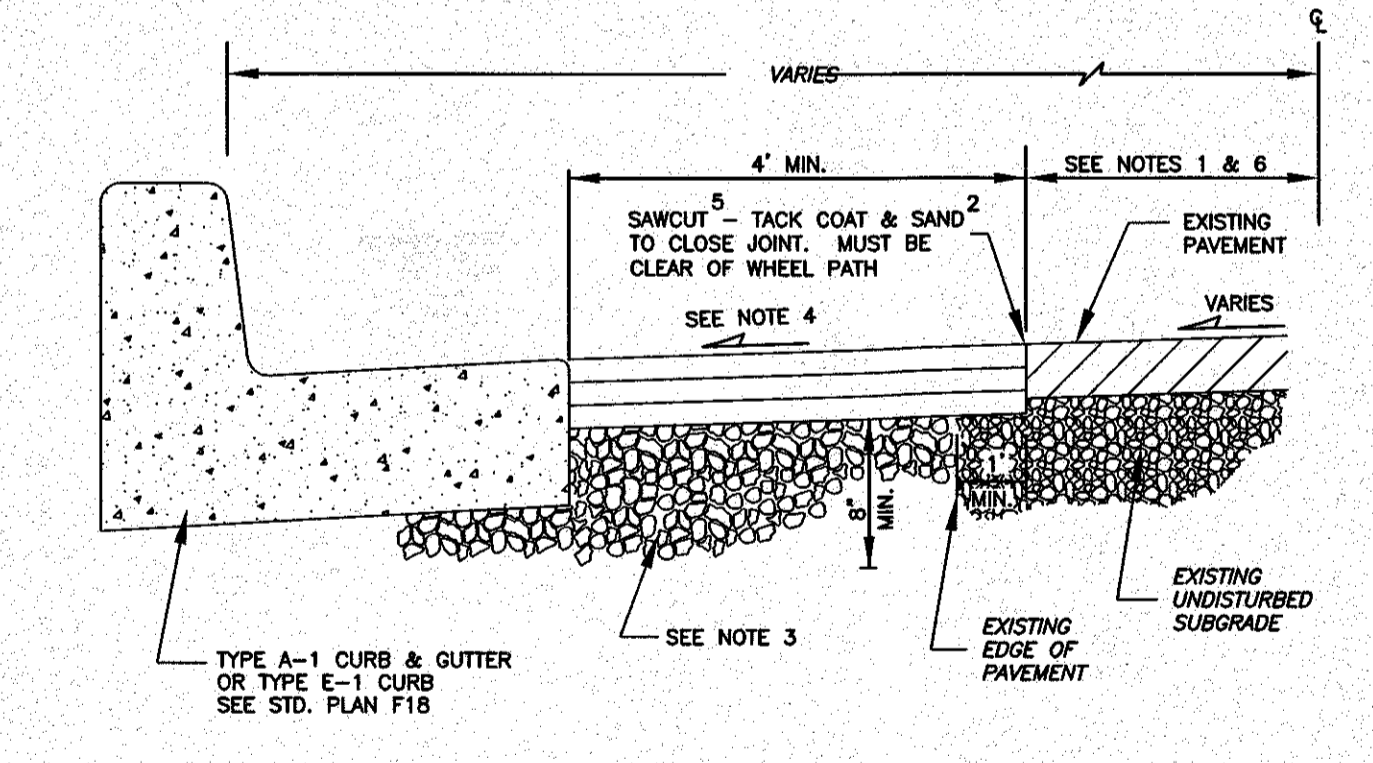
CEMENT CONCRETE APPROACH DETAIL - TYPE 3

NO SCALE

- NOTES:**
- A MINIMUM 3' WIDE ACCESSIBLE ROUTE SHALL BE MAINTAINED IN ALL PEDESTRIAN ACCESSIBLE AREAS.
 - EXISTING CURB, GUTTER AND SIDEWALK TO BE SAWCUT AND REMOVED FOR INSTALLATION OF APPROACH.
 - CHANGES IN LEVEL UP TO 1/4" MAY BE VERTICAL AND WITHOUT EDGE TREATMENT. CHANGES IN LEVEL BETWEEN 1/4" AND 1/2" SHALL BE BEVELED WITH A SLOPE NO GREATER THAN 2:1.
 - TRANSITION AREA TO BE SLOPED AT 1v TO 12h, UNLESS STREET GRADE WOULD CREATE A TRANSITION LENGTH GREATER THAN 8'. THEN THE MAXIMUM LENGTH OF 8' GOVERNS SLOPE.
 - CEMENT CONCRETE APPROACHES SHALL BE CONSTRUCTED OF AIR-ENTRAINED CONCRETE CLASS 3000 AND MAY BE POURED INTEGRAL WITH CURB.
 - SAWCUT AND REMOVE ANY EXISTING FAILING ASPHALT CONCRETE PAVEMENT.
 - COMMERCIAL DRIVEWAY REQUIRES REINFORCING STEEL (6"x6"x10 GA MESH) MIN. 3" COVER.
 - 3" DEPTH 3/4"-0 CRUSHED AGGREGATE BASE COMPACTED TO 95% OF MAX. DRY DENSITY.
 - SUBGRADE PREPARED PER WSDOT STD. SPEC. 2-06.3(1).

PAVEMENT WIDENING (FRONTAGE IMPROVEMENT)

NO SCALE

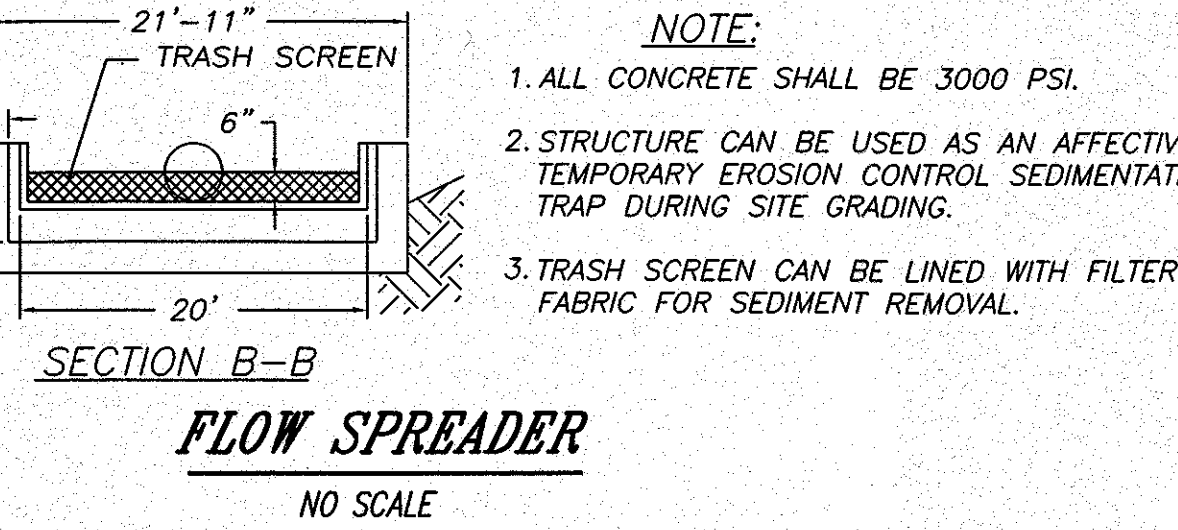
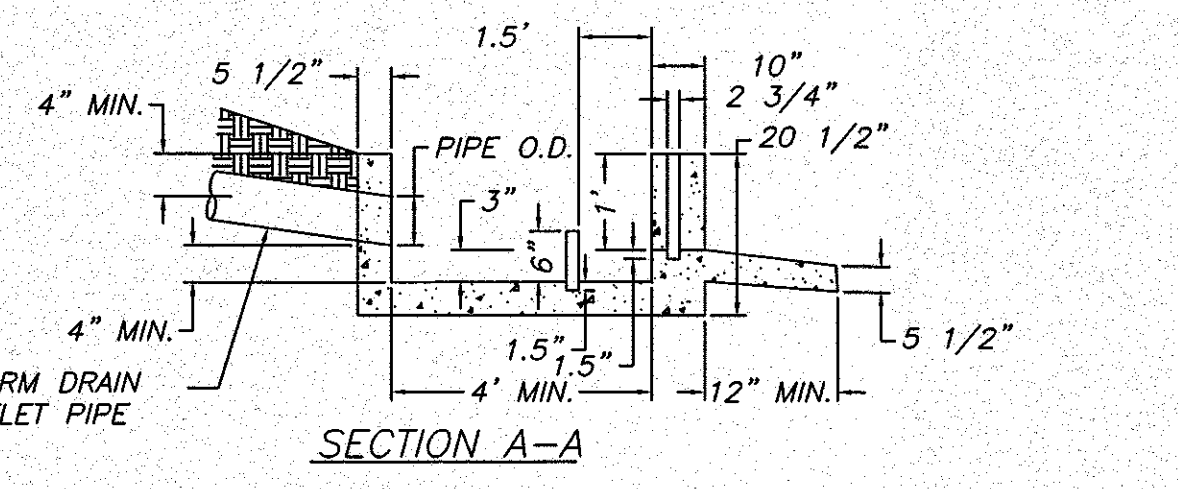
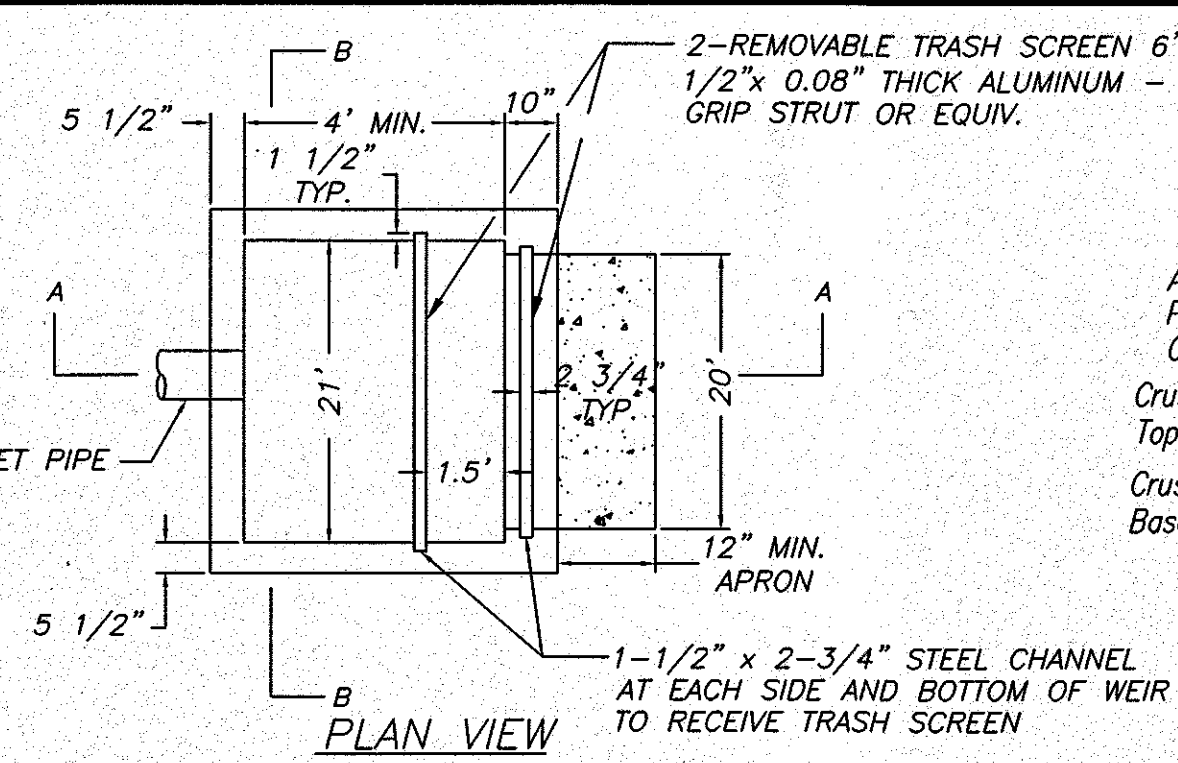
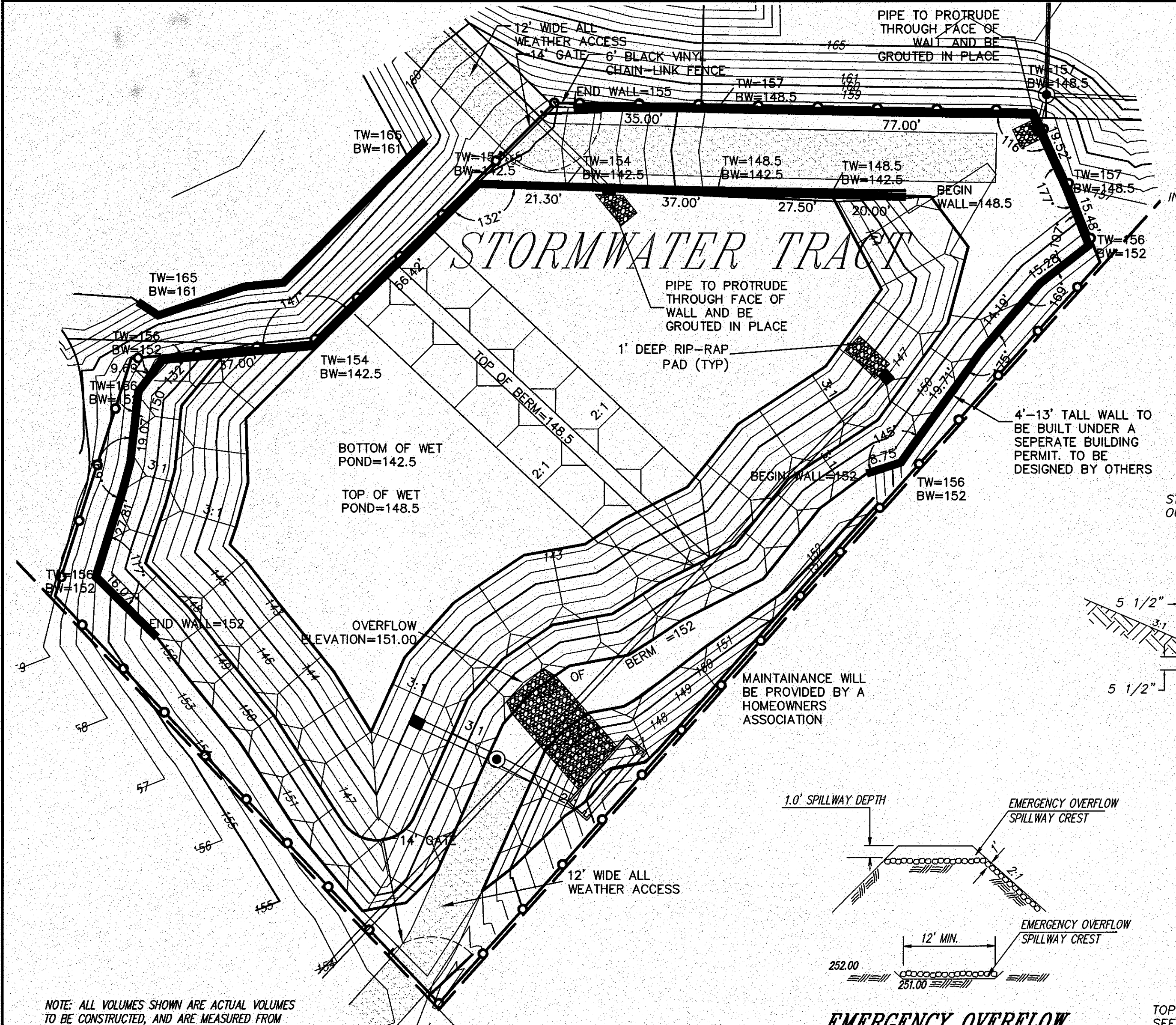


PAVEMENT WIDENING (FRONTAGE IMPROVEMENT)

NO SCALE

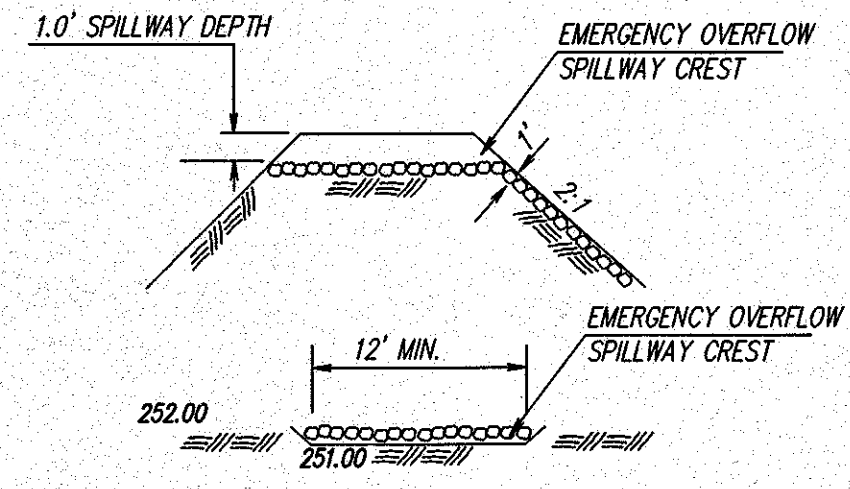
- NOTES:**
- WHERE FRONTAGE IMPROVEMENTS ARE REQUIRED, THE CITY WILL PERFORM PAVEMENT DEFLECTION TESTING TO DETERMINE THE EXTENT OF IMPROVEMENTS.
 - THE EDGES OF ALL EXISTING ASPHALT SURFACES SHALL BE SAWCUT TO PROVIDE A STRAIGHT, CLEAN EDGE. A TACK COAT SHALL BE APPLIED PER THE STANDARD SPECIFICATIONS. ALL JOINTS SHALL BE SEALED WITH CRS-1 AND SANDED.
 - DEPTH OF ASPHALT CONCRETE PAVEMENT AND BASE ROCK OF THE RESTORED ROAD SECTION TO BE PER TYPICAL ROADWAY SECTION AS SHOWN IN THE TRANSPORTATION STANDARD DRAWINGS 1 THROUGH 27, OR AS APPROVED BY REVIEWING AUTHORITY. COMPACT SUBGRADE AND CRUSHED AGGREGATE TO 95% OF MAXIMUM DRY DENSITY.
 - MATCH EXISTING PAVEMENT SLOPE. NO FLATTER THAN 2% OR STEEPER THAN 4% WITHOUT SPECIFIC COUNTY APPROVAL.
 - SAWCUT AND REMOVE ANY EXISTING FAILING ASPHALT CONCRETE PAVEMENT.
 - SAWCUT, REMOVE AND RESTORE A MINIMUM OF 1' TO A MAXIMUM HALF STREET WIDTH OF THE EXISTING ROAD SECTION.
 - PAVE WITH MINIMUM OF 0.35 ft. MINIMUM COMPACTED DEPTH A.C.P., OR MATCH EXISTING OR DESIGN SECTION WHICHEVER IS GREATER.
 - LIFTS FOR A.C.P. (CLASS A) SHALL BE INSTALLED AT 0.15 ft. MINIMUM AND 0.35 ft. MAXIMUM FOR NON-SURFACE LIFTS, AND 0.25 ft. MAXIMUM FOR THE FINAL SURFACE LIFT. THE TEMPERATURE SHALL BE 250 DEGREE MINIMUM AND 350 DEGREE MAXIMUM, AND COMPACTED TO 92% OF THEORETICAL MAXIMUM.

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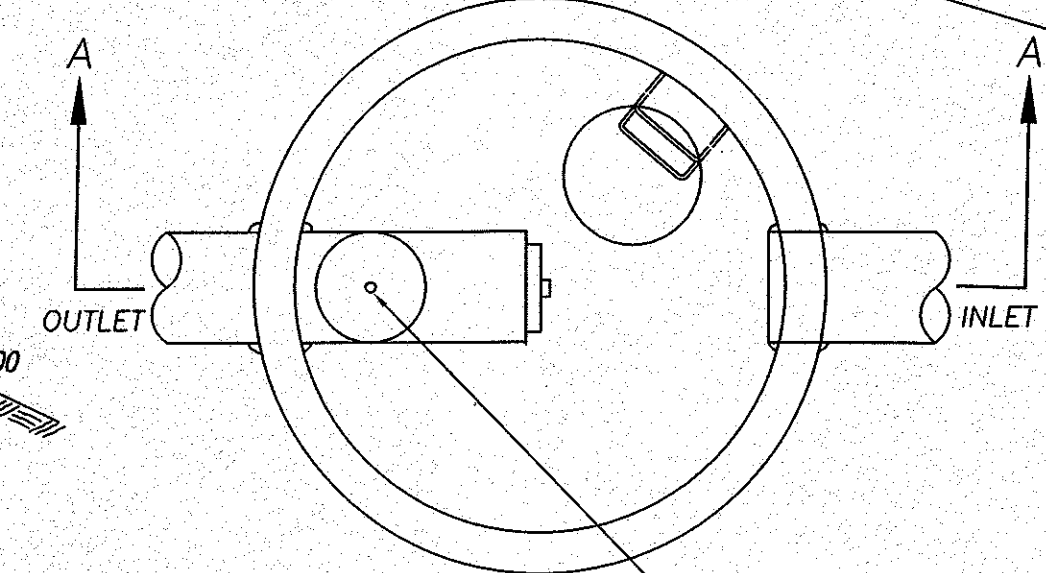
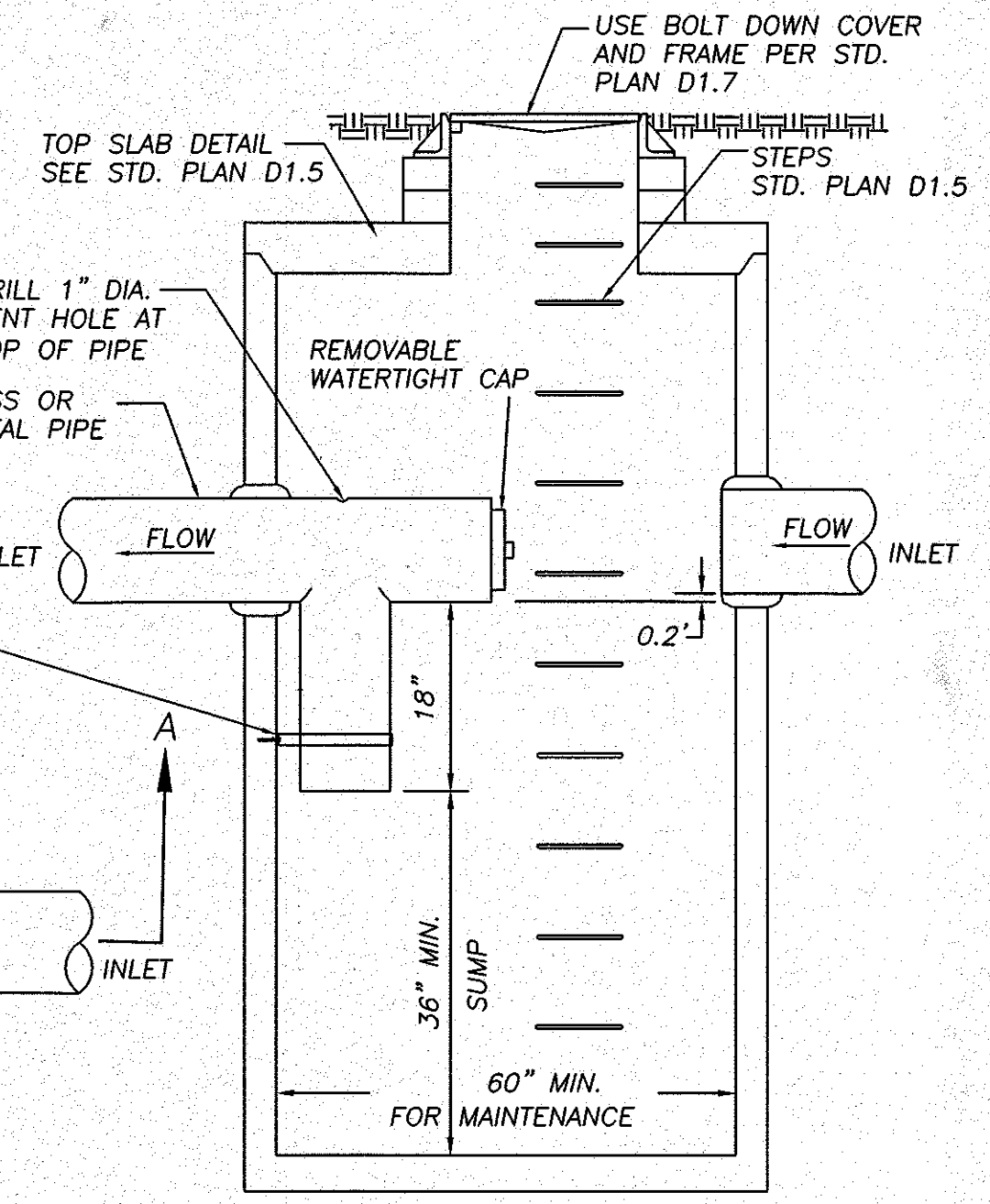


- NOTE:**
1. ALL CONCRETE SHALL BE 3000 PSI.
 2. STRUCTURE CAN BE USED AS AN EFFECTIVE TEMPORARY EROSION CONTROL SEDIMENTATION TRAP DURING SITE GRADING.
 3. TRASH SCREEN CAN BE LINED WITH FILTER FABRIC FOR SEDIMENT REMOVAL.

FLOW SPREADER
NO SCALE

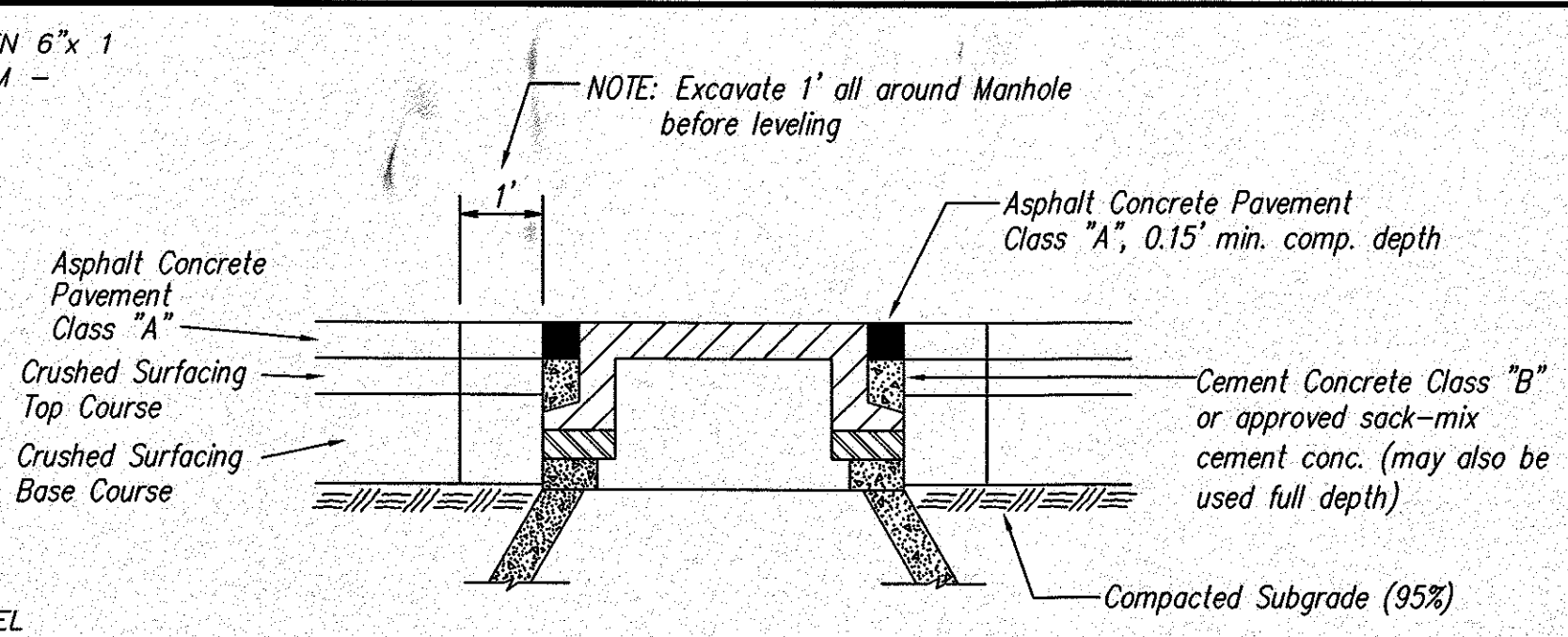


EMERGENCY OVERFLOW
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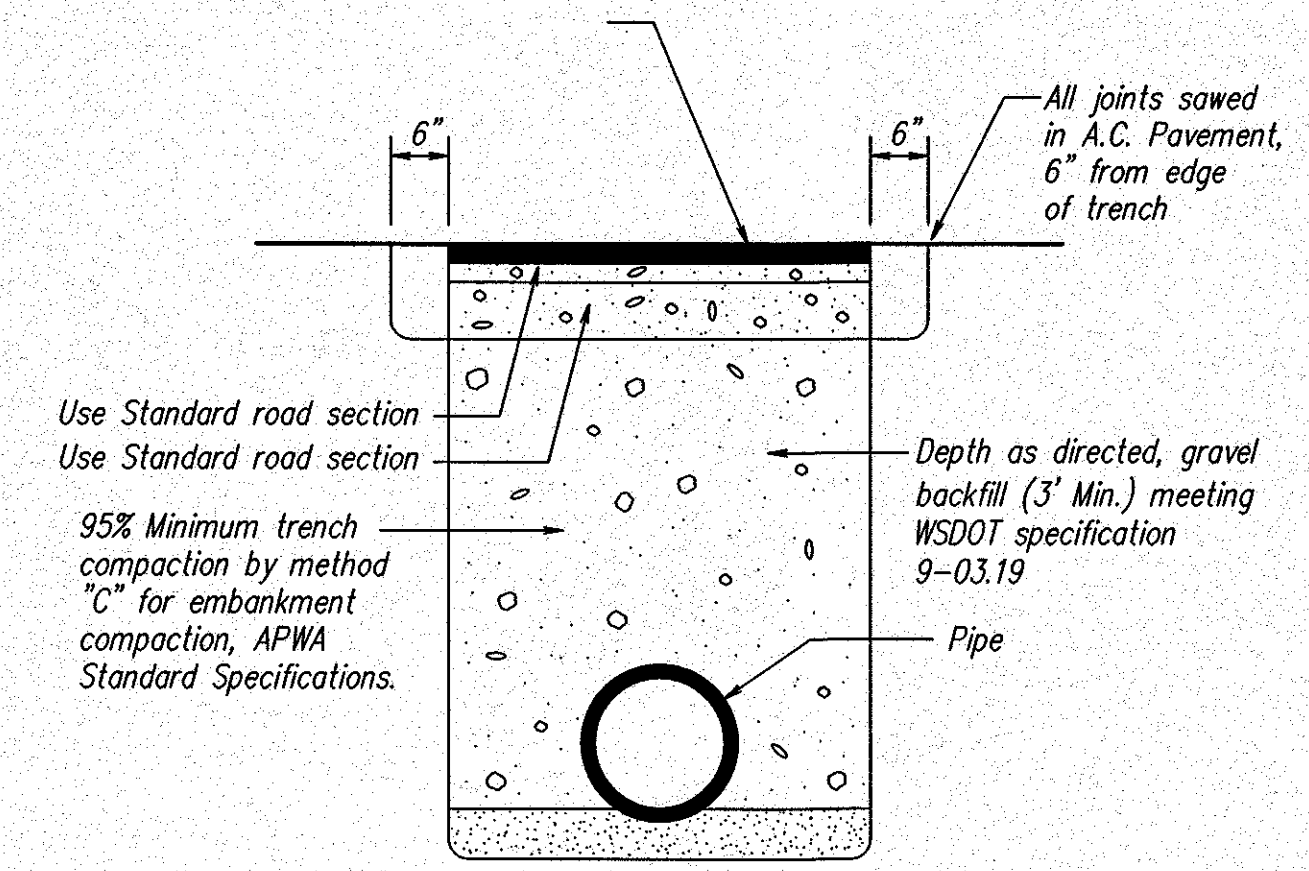


- NOTES:**
1. EXCEPT AS SHOWN OR NOTED, UNITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS FOR WSDOT CATCH BASIN TYPE 2, 60" MINIMUM DIAMETER. SEE WSDOT STANDARD PLAN B-1e
 2. FOR DETAILS SHOWING GRADE RING, LADDER, STEPS, HANDHOLDS, AND TOP SLABS, SEE STD. PLAN D1.5

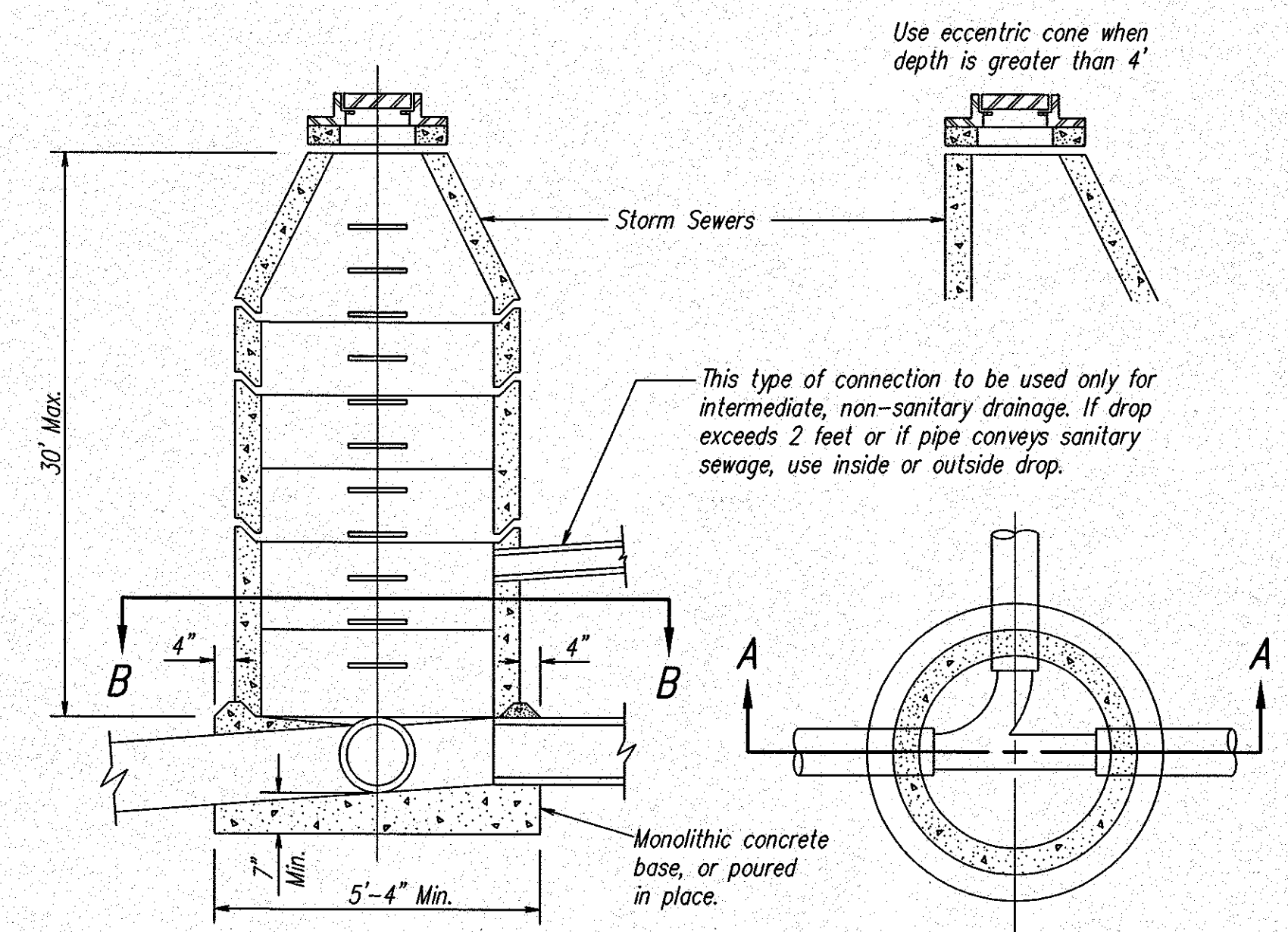
POLLUTION CONTROL MANHOLE
NO SCALE



FINAL ADJUSTMENT FOR FACILITIES IN ROADWAY
NO SCALE

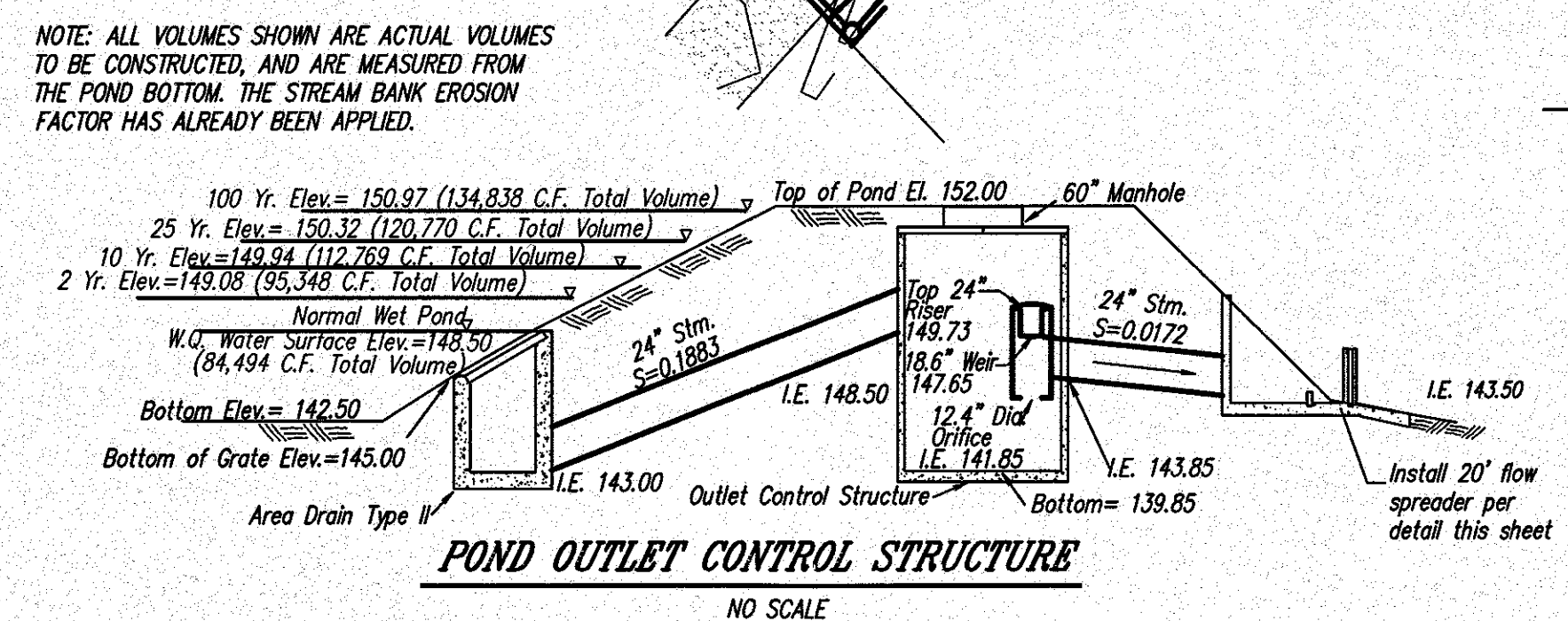


TRENCH COMPACTION
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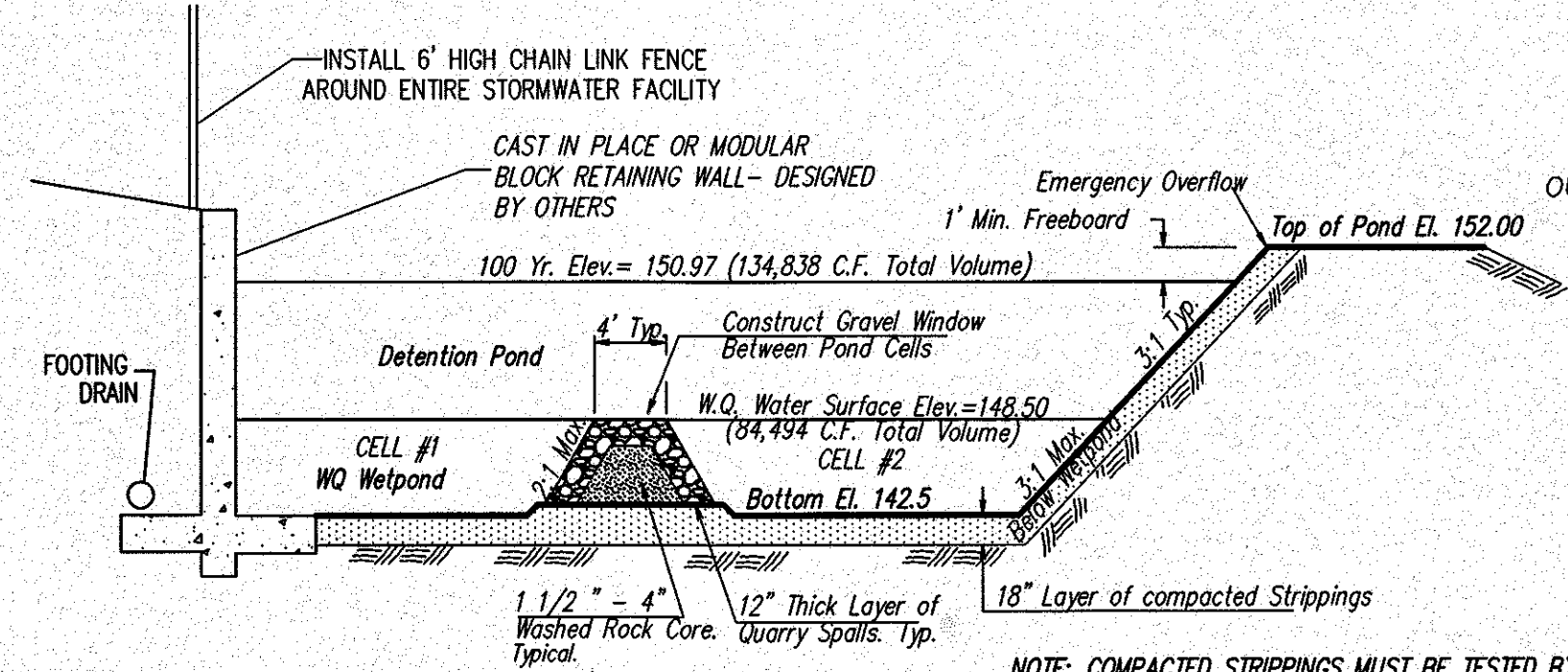


STANDARD MANHOLE
NO SCALE

STANDARD DETAILS DRAINAGE CONSTRUCTION



POND OUTLET CONTROL STRUCTURE
NO SCALE



WATER QUALITY/ DETENTION POND
NO SCALE

NOTE: COMPACTED STRIPPINGS MUST BE TESTED BY THE GEOTECH ENGINEER TO CONFIRM IT CONTAINS THE NECESSARY 5% ORGANICS AND 5 MILLIEQUIVALENTS PER 100 GRAMS OF CATION EXCHANGE CAPACITY FOR STORMWATER TREATMENT.
IF THIS CANNOT BE OBTAINED, A LOW PERMEABILITY LINER OR TREATMENT LINER WILL BE REQUIRED IN CELL #1 AND CELL #2. (BELOW ELEV = 147)

DATE PLOTTED: Mar. 12, 2009 - 1:52 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE - FINAL\0536-COVER-DETAILS.DWG

STANDARD STORM DETAILS II

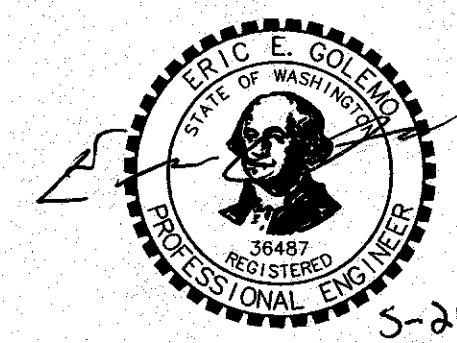
**HIGHLAND TERRACE
SUBDIVISION**

WA
LA CENTER

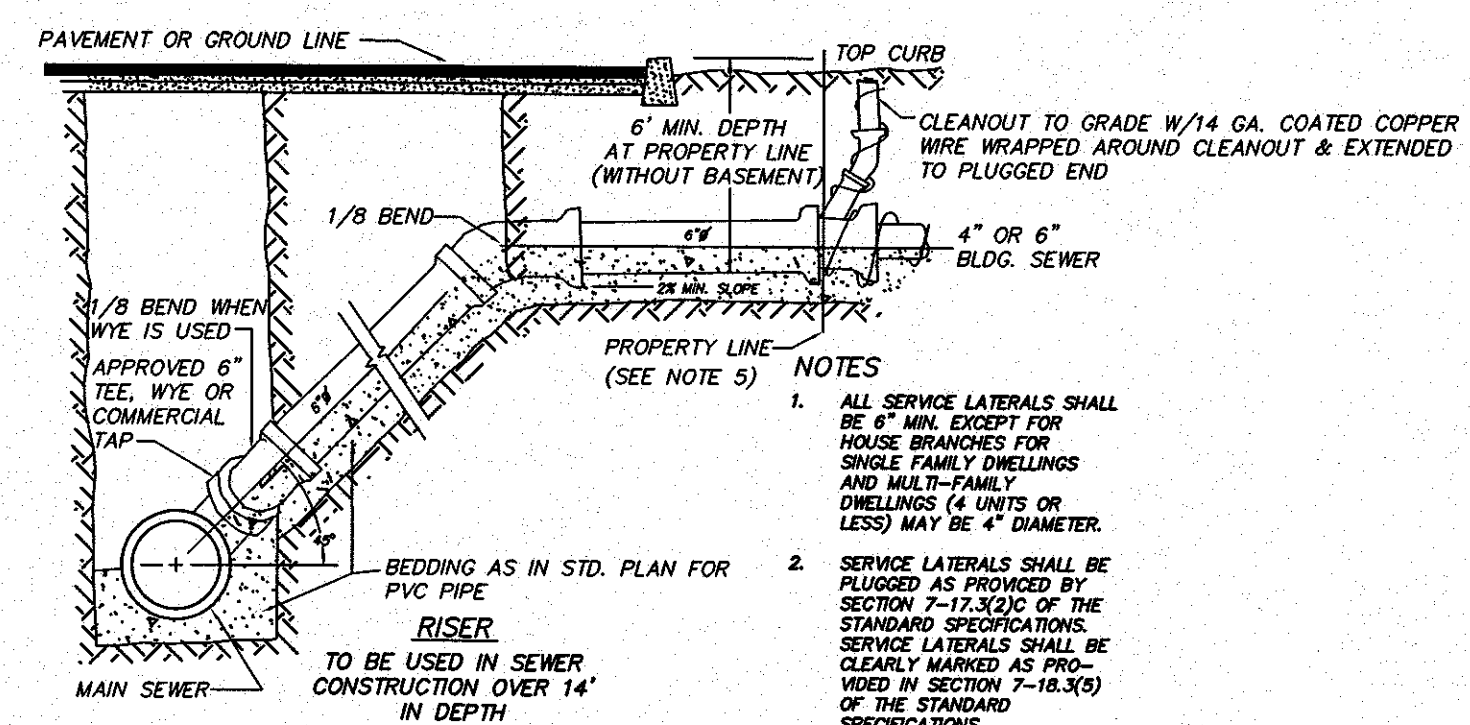
REVISIONS

DESIGNED BY: JDR
DRAWN BY: JDR
CHECKED BY: EEG
SCALE: 1" = 20'

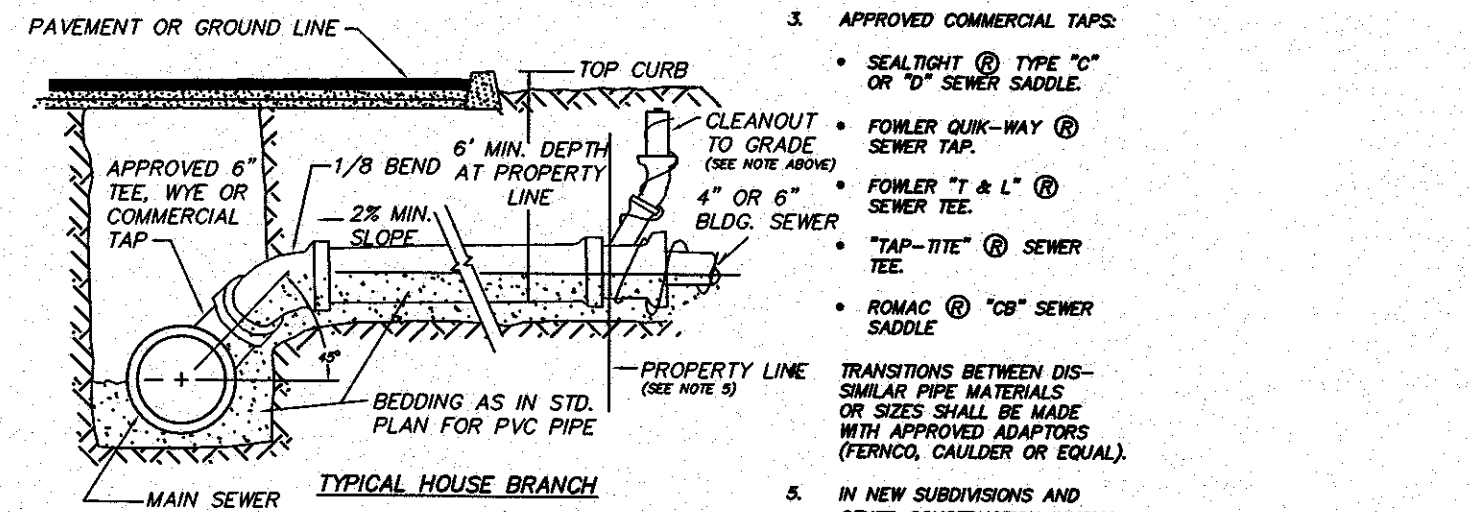
JOB NUMBER: 0536
SHEET: 15 of 18



HIGHLAND TERRACE SUBDIVISION
 STANDARD SANITARY DETAILS
 LA CENTER



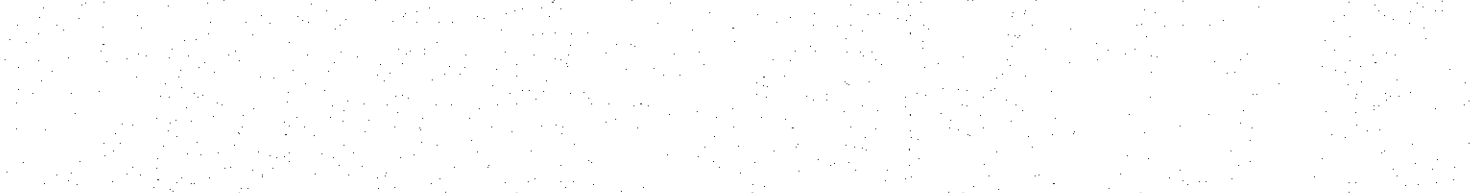
- NOTES**
1. ALL SERVICE LATERALS SHALL BE 6" MIN. DEPTH AT PROPERTY LINE (WITHOUT BASEMENT) AND 4" OR 6" BLDG. SEWER.
 2. SERVICE LATERALS SHALL BE PLUGGED AS PROVIDED BY SECTION 7-17.3(2) OF THE STANDARD SPECIFICATIONS. SERVICE LATERALS SHALL BE CLEARLY MARKED AS PROVIDED IN SECTION 7-18.3(3) OF THE STANDARD SPECIFICATIONS.
 3. APPROVED COMMERCIAL TAPS:
 - SEALTIGHT® TYPE "C" OR "D" SEWER SADDLE.
 - FOWLER QUICK-WAY® SEWER TAP.
 - FOWLER "T" & "L"® SEWER TEE.
 - TAP-ITE® SEWER TEE.
 - ROMAC® "CB" SEWER SADDLE.
 4. TRANSITIONS BETWEEN DIS-SIMILAR PIPE MATERIALS OR SEWER TEE SHALL BE MADE WITH APPROVED ADAPTORS (FERRO, CALDLER OR EQUAL).
 5. IN NEW SUBDIVISIONS AND OTHER CONSTRUCTION INVOLVING NEW ROADS, INSTALL LATERALS TO 6 FEET BEHIND PROPERTY LINE FOR SEWERS IN STREET RIGHT-OF-WAY.



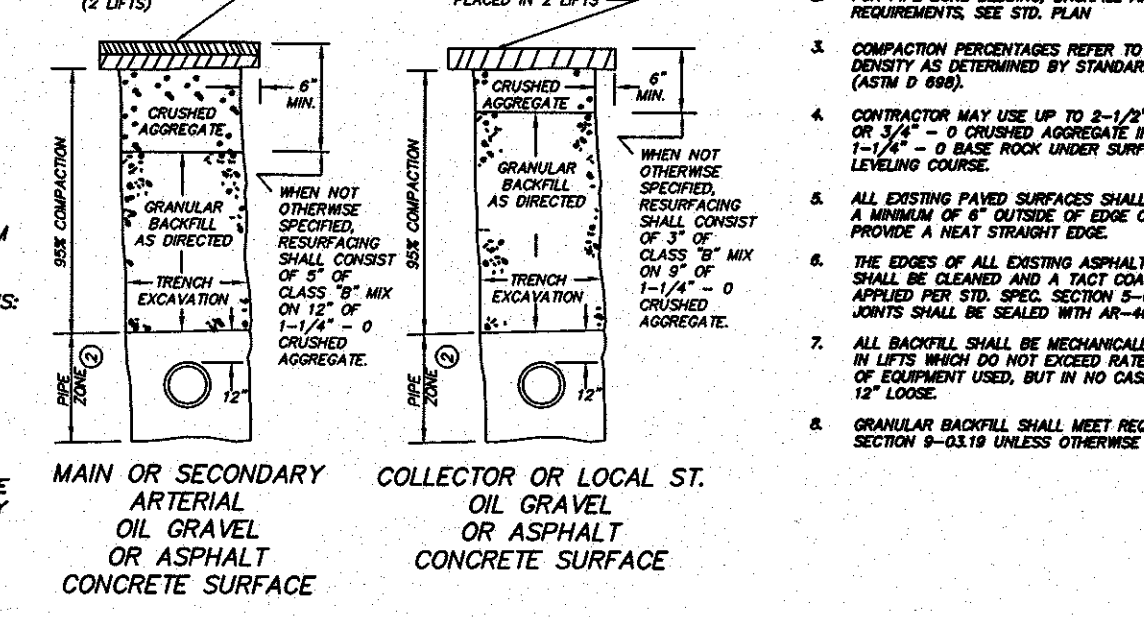
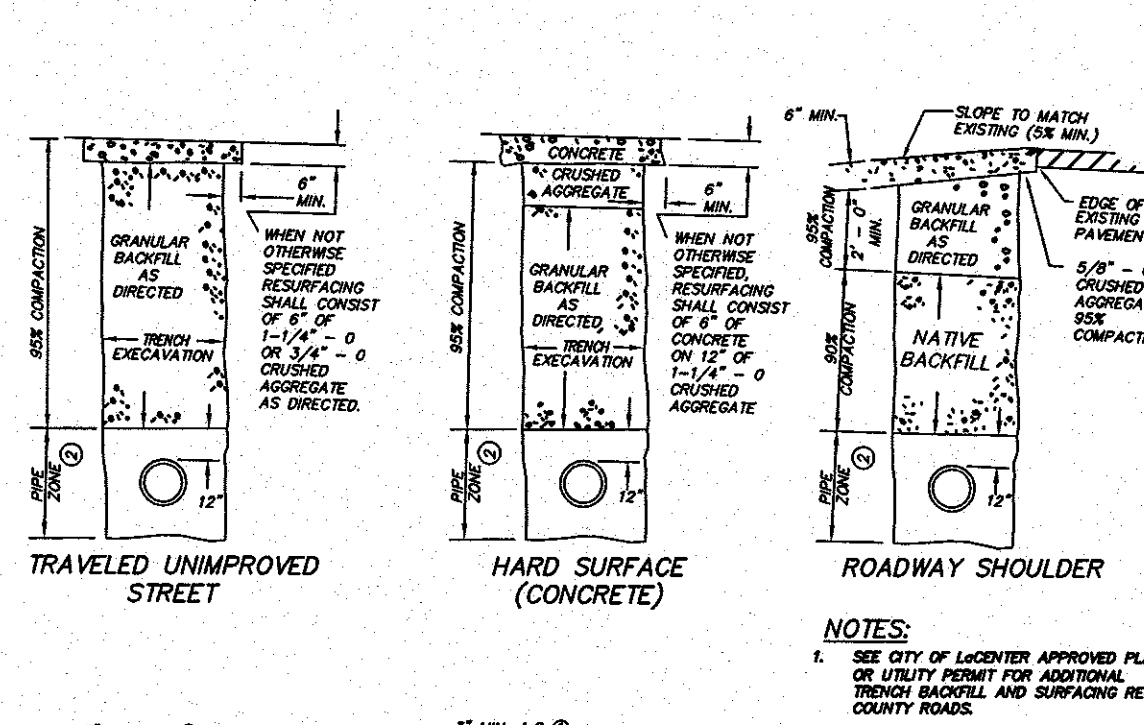
SERVICE LATERAL CONNECTIONS

CONSTRUCTION SPECIFICATIONS FOR SANITARY SEWER

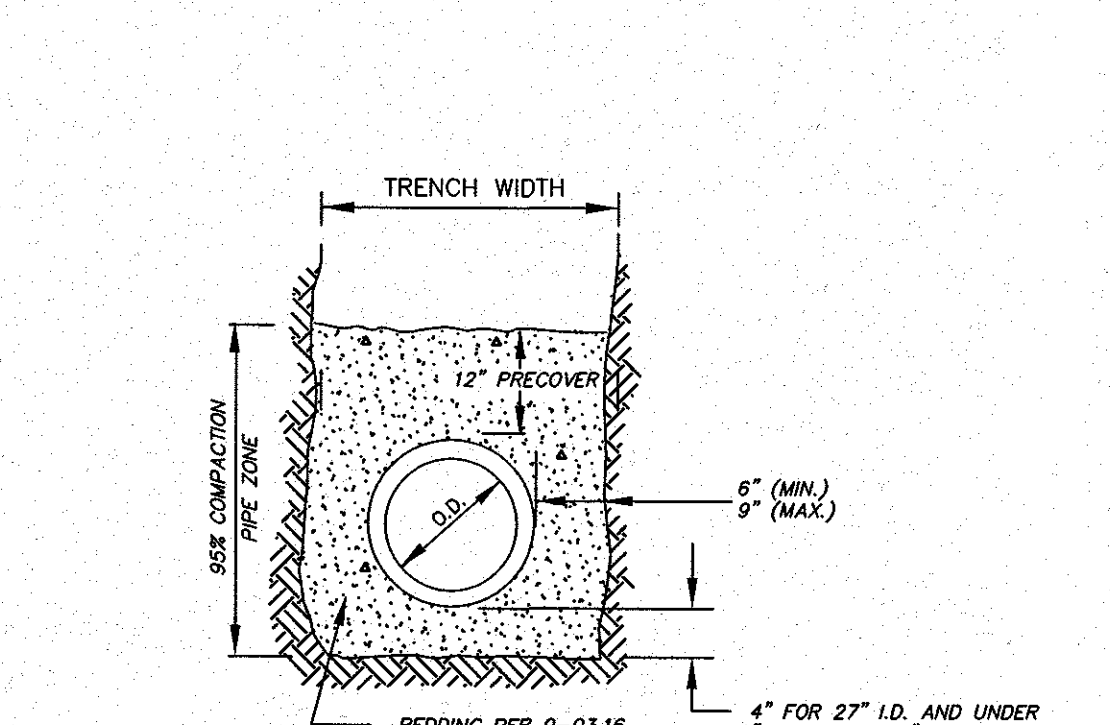
1. All materials and installation of sanitary sewers shall be in conformance with the 1994 edition of the Standard Specifications for Road, Bridge, and Municipal Construction, hereinafter referred to as the "Standard Specifications" prepared by the Washington State Chapter of the American Public Works Association (APWA) and the Washington State Department of Transportation, except as noted herein or on the standard plans. Wherever the standard specifications refer to the owner as either the "State" or "Secretary" or when reference is made to the Department of Transportation it shall be understood that the standard specifications should read the "Clark Public Utilities".
2. All sanitary sewer construction is subject to inspection and approval by Clark Public Utilities, Department of Public Works. The contractor shall notify the Sanitary Utility (992-8020) least 48 hours prior to the start of construction. Clark Public Utilities shall require that a preconstruction conference be held prior to the start of construction.
3. The contractor is required to notify all utilities 48 hours prior to commencement of work. The contractor may contact the Utility Coordinating Council of Clark County (698-4848) in lieu of contacting individual utilities.
4. Final acceptance of sanitary sewers are subject to Sections 1-05.11, 1-05.12, 7-17.3(4), 7-17.3(4)E, 7-17.3(4)H and 7-17.3(4)I of the Standard Specifications. The contractor shall guarantee all work for a period of two (2) years.
5. All pipe and fittings shall conform to the following:
 - A. Polyvinylchloride (PVC) sewer pipe 15" diameter or less shall conform to ASTM D3034, SDR 35 or ASTM F 789. It shall have a minimum pipe stiffness of 46 psi. PVC pipe 18" diameter and larger shall conform to ASTM F 670 or ASTM F 704, Series 405. All PVC pipe shall have an integral ball gasketed joint with elastomeric gasket and shall be furnished in 12-1/2 foot laying lengths.
 - B. Ductile iron (DI) pipe shall conform to ANSI A21.51 or AWWA C151, with push-on joints, Class 52, unless otherwise noted.
6. Installation of pipe and manholes shall conform to the following:
 - A. PVC pipe shall be installed in accordance with manufacturer's recommendations and shall conform to standard plans for Flexible Pipe Bedding and Typical Trench Sections.
 - B. Construction of Manholes shall conform with the Standard Precast Manhole Detail.
7. Manholes, service lateral connections, trench excavation, pipe bedding and street restoration, and appurtenances shall conform to the details shown on the standard plans. All other construction shall conform to the standard details contained in the Standard Plans for Road, Bridge and Municipal Construction.
8. The contractor shall comply with the provisions of all permits issued, or easements granted to the city in conjunction with the construction of sanitary sewers. The contractor shall obtain all necessary permits for work within the city right-of-way.
9. The contractor shall submit an approved traffic control plan. Inside the city this plan shall be approved by the City Engineer. Approval shall be obtained prior to beginning construction.



STANDARD SEWER CLEANOUT

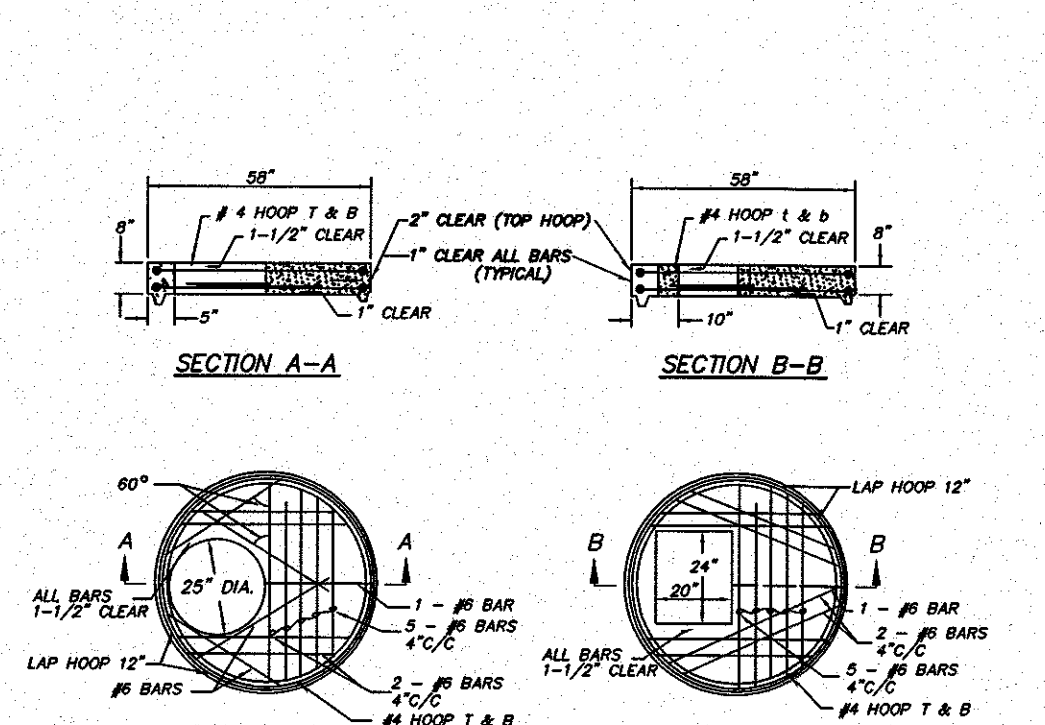


TYPICAL TRENCH SECTIONS: BACKFILL, BEDDING & SURFACING



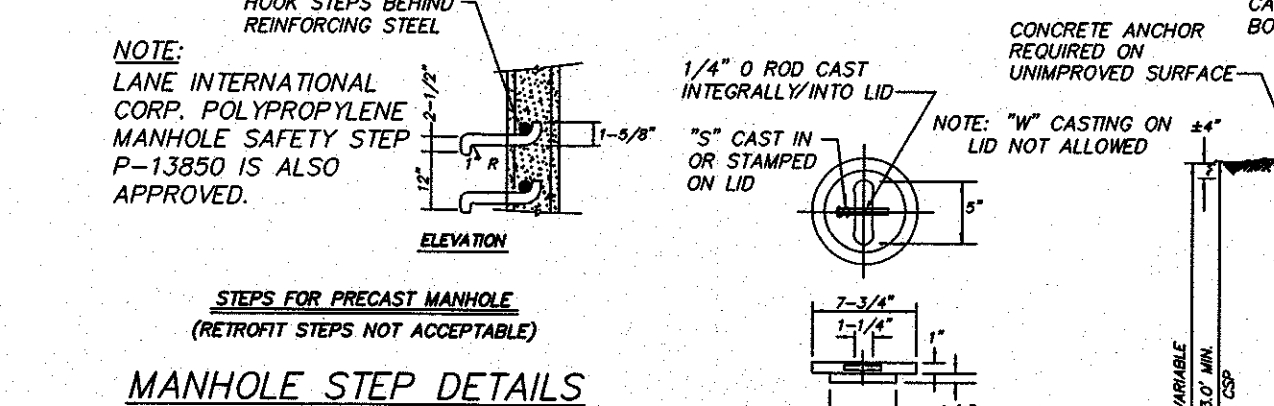
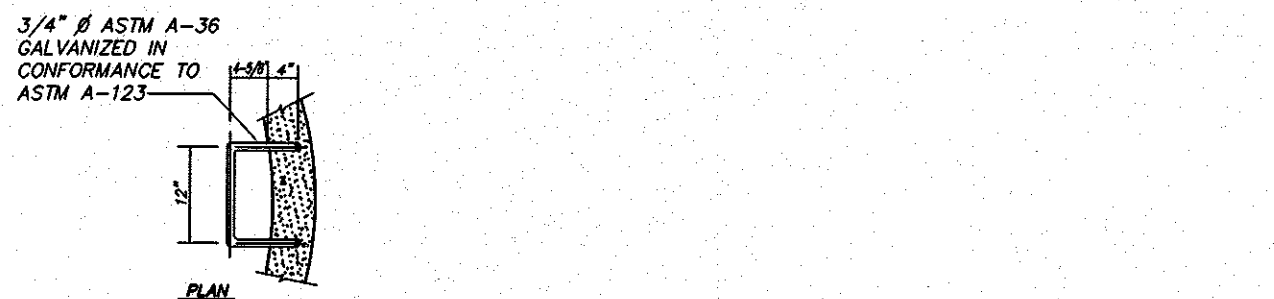
- NOTES:**
1. WHERE DIRECTED BY THE ENGINEER, GRANULAR TRENCH FOUNDATION STABILIZATION SHALL BE PLACED PRIOR TO PLACEMENT OF THE BEDDING. SIZE AND DEPTH ARE DEPENDENT ON SOIL CONDITIONS.
 2. BEDDING AND BACKFILL MATERIALS IN THE PIPE ZONE SHALL BE COMPACTED AS SPECIFIED PRIOR TO BACKFILLING THE REMAINDER OF THE TRENCH.
 3. FOR ROCK AND OTHER INCOMPRESSIBLE MATERIALS, THE TRENCH SHALL BE OVEREXCAVATED A MINIMUM OF 6" AND REFILLED WITH GRANULAR MATERIALS AS DIRECTED BY THE ENGINEER.
 4. BACK FILL AND COMPACTION ABOVE THE PIPE ZONE SHALL BE AS SHOWN IN TYPICAL TRENCH SECTIONS.
 5. INSTALLATION SHALL CONFORM TO UNIBELL PLASTIC PIPE ASSN. STANDARD SPEC. UNI-B-5 (LATEST EDITION) EXCEPT AS NOTED.
 6. FINAL INSTALLATION TO BE TESTED PER SECTION 7-17.3(4)H OF THE STANDARD SPECIFICATIONS
 7. ALTERNATIVE PRE-COVER MATERIALS ARE ALLOWABLE FROM PIPE CENTERLINE TO ONE FOOT ABOVE THE TOP OF PIPE. ALTERNATE PRE-COVER MATERIALS MUST BE PREAPPROVED BY THE INSPECTOR AND CITY ENGINEER, AND MAY BE SAND, CRUSHER SCREENINGS, GRAVEL, OR OTHER CLEAN GRANULAR MATERIAL CONTAINING NO ROCK LARGER THAN 1-1/4" IN LENGTH.

FLEXIBLE PIPE BEDDING DETAIL

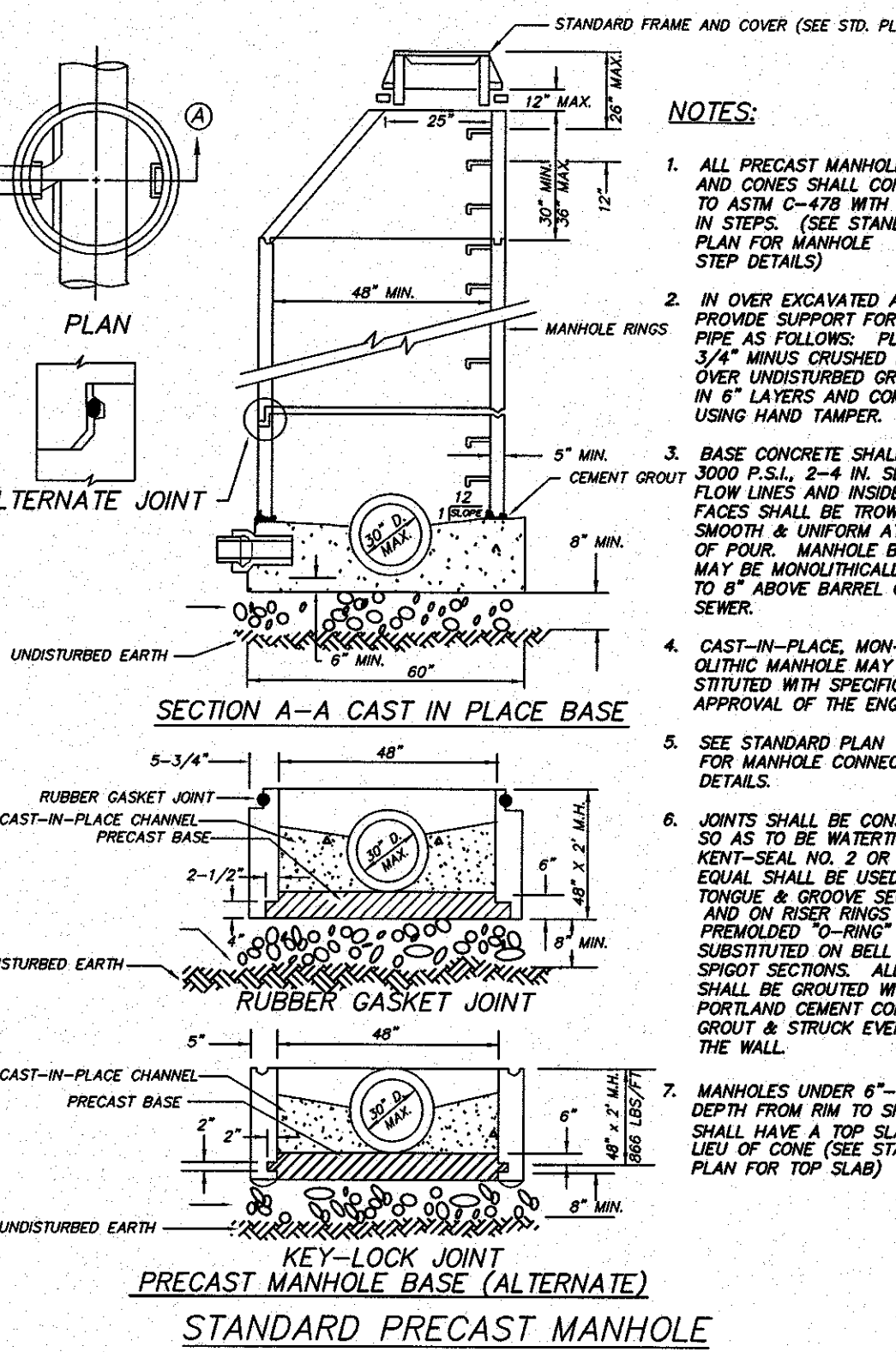


- NOTES:**
1. CONSTRUCTION SHALL CONFORM TO STD. PRECAST MANHOLE PLAN IF NOT OTHERWISE SHOWN.
 2. ALL PRECAST SECTIONS SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-476. ALL Poured IN PLACE CONCRETE SHALL HAVE A 28 DAY STRENGTH OF 3000 P.S.I. & 2" TO 4" SLUMP.
 3. ALL REINFORCING SHALL BE GRADE 40 STEEL.
 4. MANHOLES UNDER 6'-0" IN DEPTH FROM RIM TO SHELF SHALL HAVE UNIT "MH" TOP SLAB IN LIEU OF CONE AS SHOWN ON STD. PLAN S-2.1. UNIT "CB" TOP SLAB SHALL BE USED WHERE "TYPE 2" CATCH BASIN IS SPECIFIED. STANDARD RISER UNITS AND FRAME AND GRATE FOR CATCH BASIN SHALL BE USED IN CONJUNCTION WITH TYPE "CB" TOP SLAB.

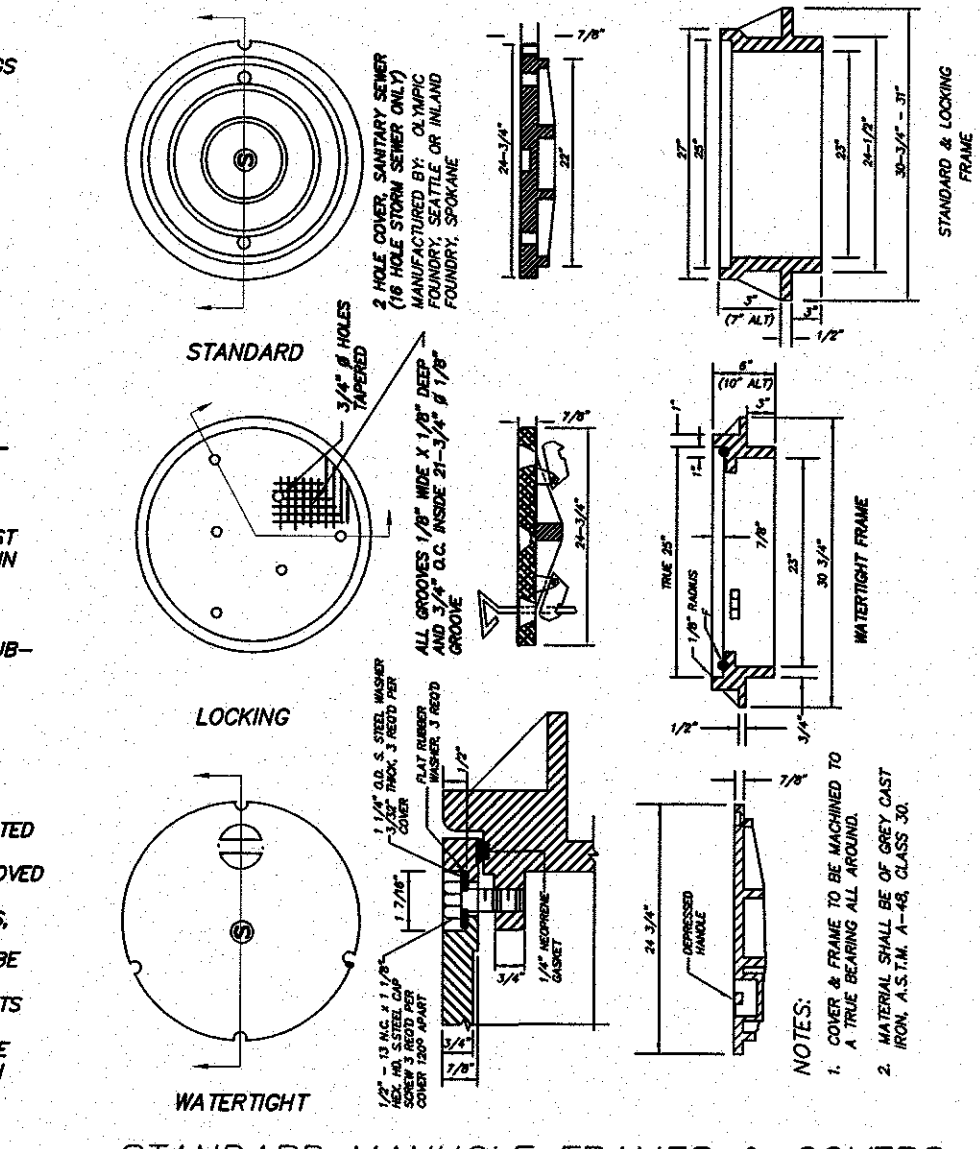
TOP SLAB FOR STANDARD PRECAST MANHOLE



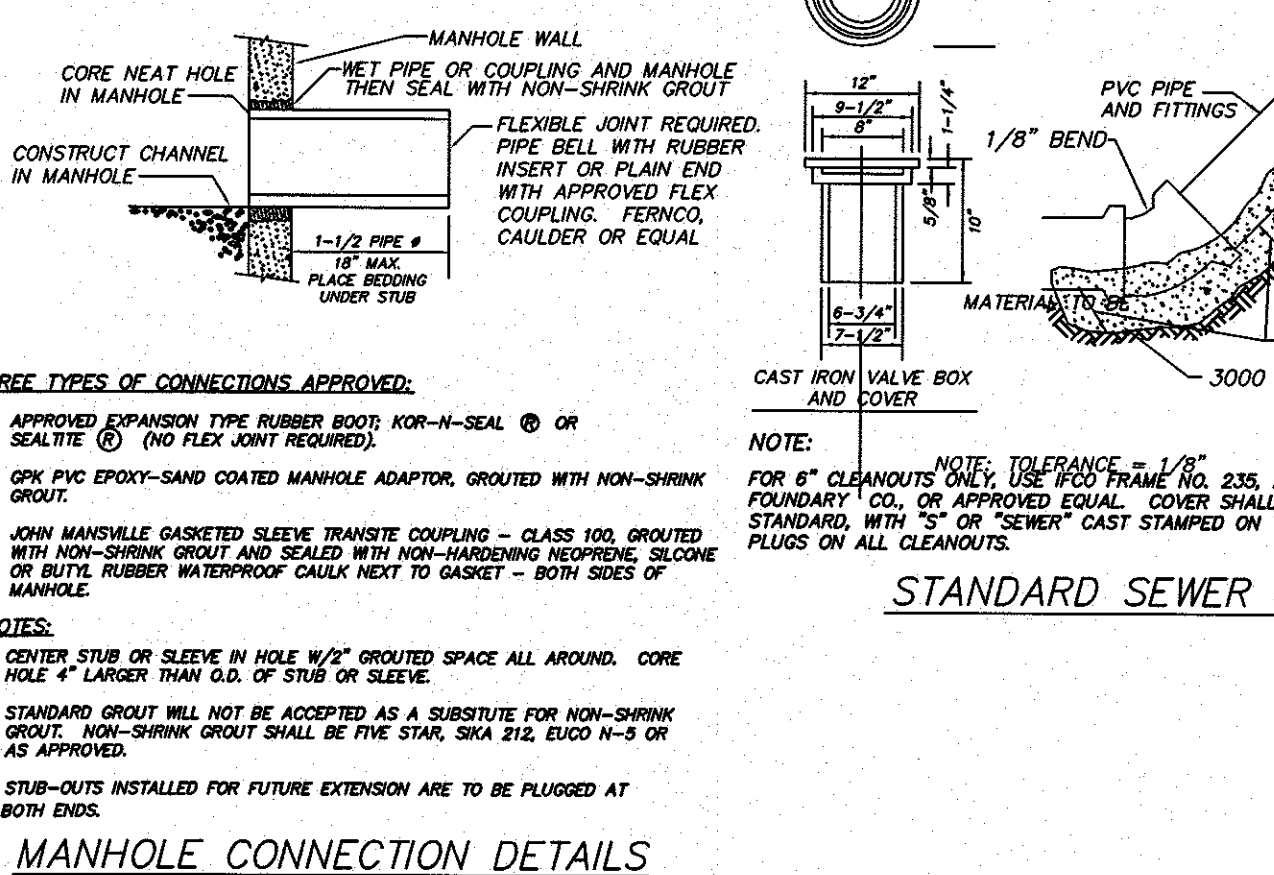
MANHOLE CONNECTION DETAILS



STANDARD PRECAST MANHOLE



STANDARD MANHOLE FRAMES & COVERS



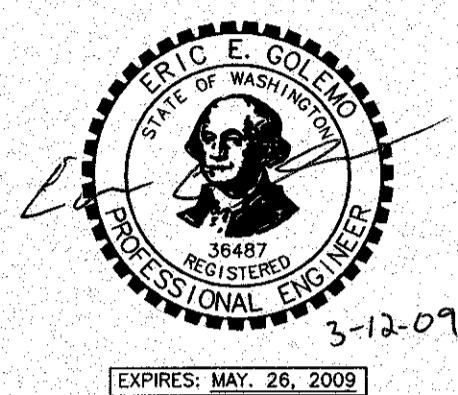
MANHOLE CONNECTION DETAILS

DATE PLOTTED: May 18, 2007 - 5:16 PM SCA DRAWING FILE: W:\DWG\0536 - Highland Terrace 4-Final\0536-COVER-DETAILS.dwg

PROJECT NO.		DATE	
STANDARD SANITARY SEWER DETAILS		DRAWING NO.	
CLARK PUBLIC UTILITIES		SHEET NO.	
JOB NUMBER 0536		SHEET 16 of 18	

CAD FILE: SEWER1.DWG

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'

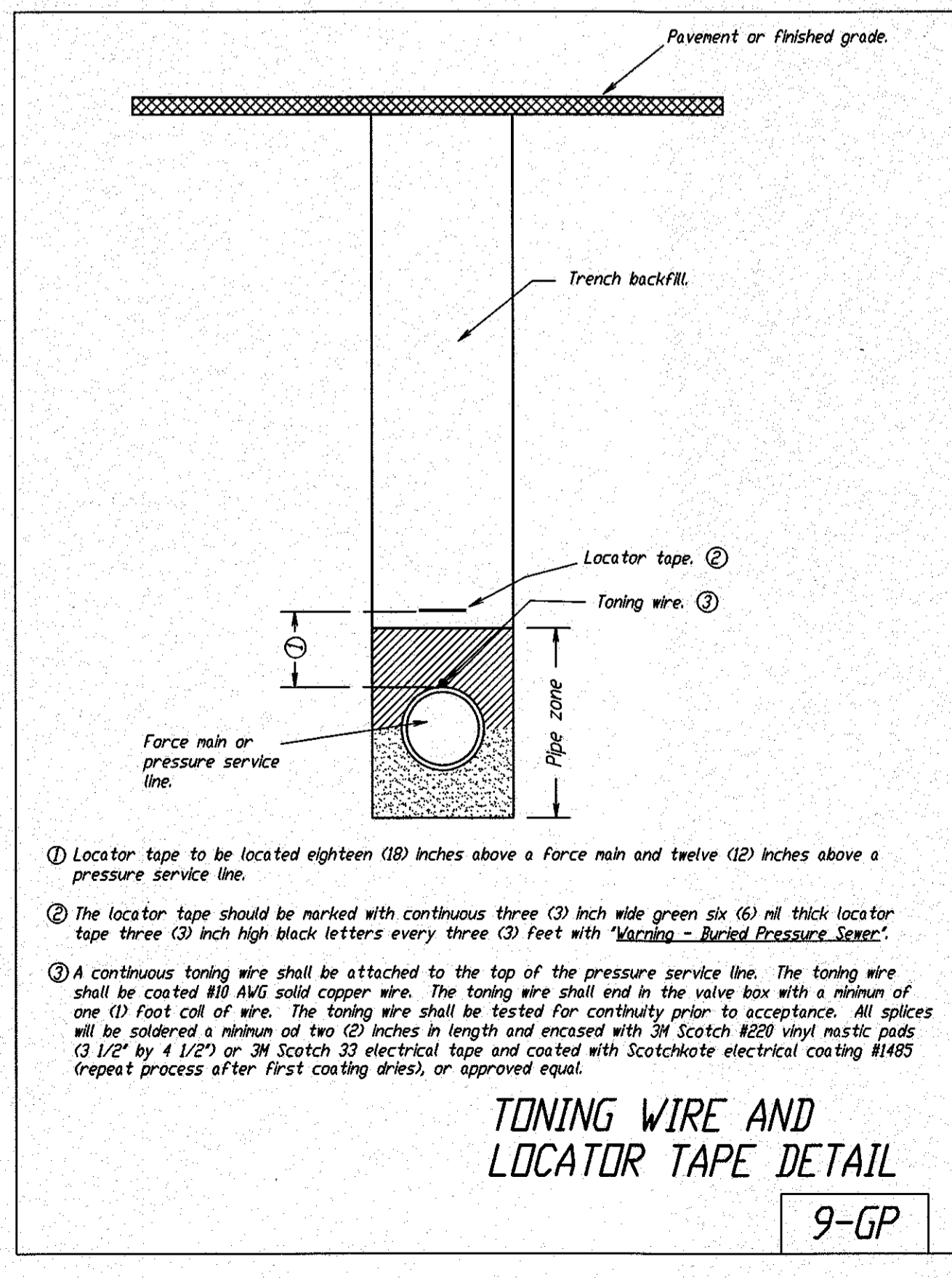
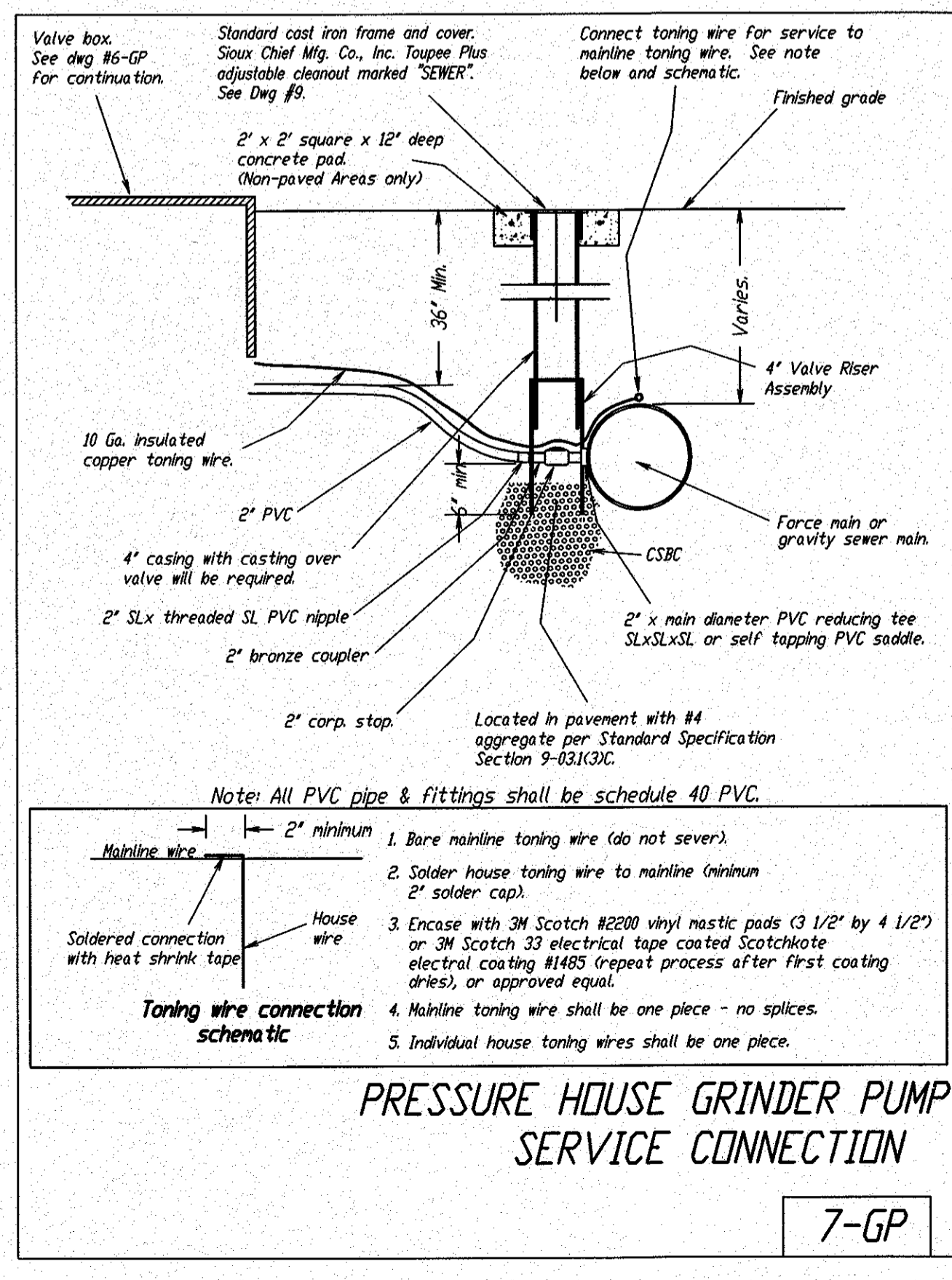
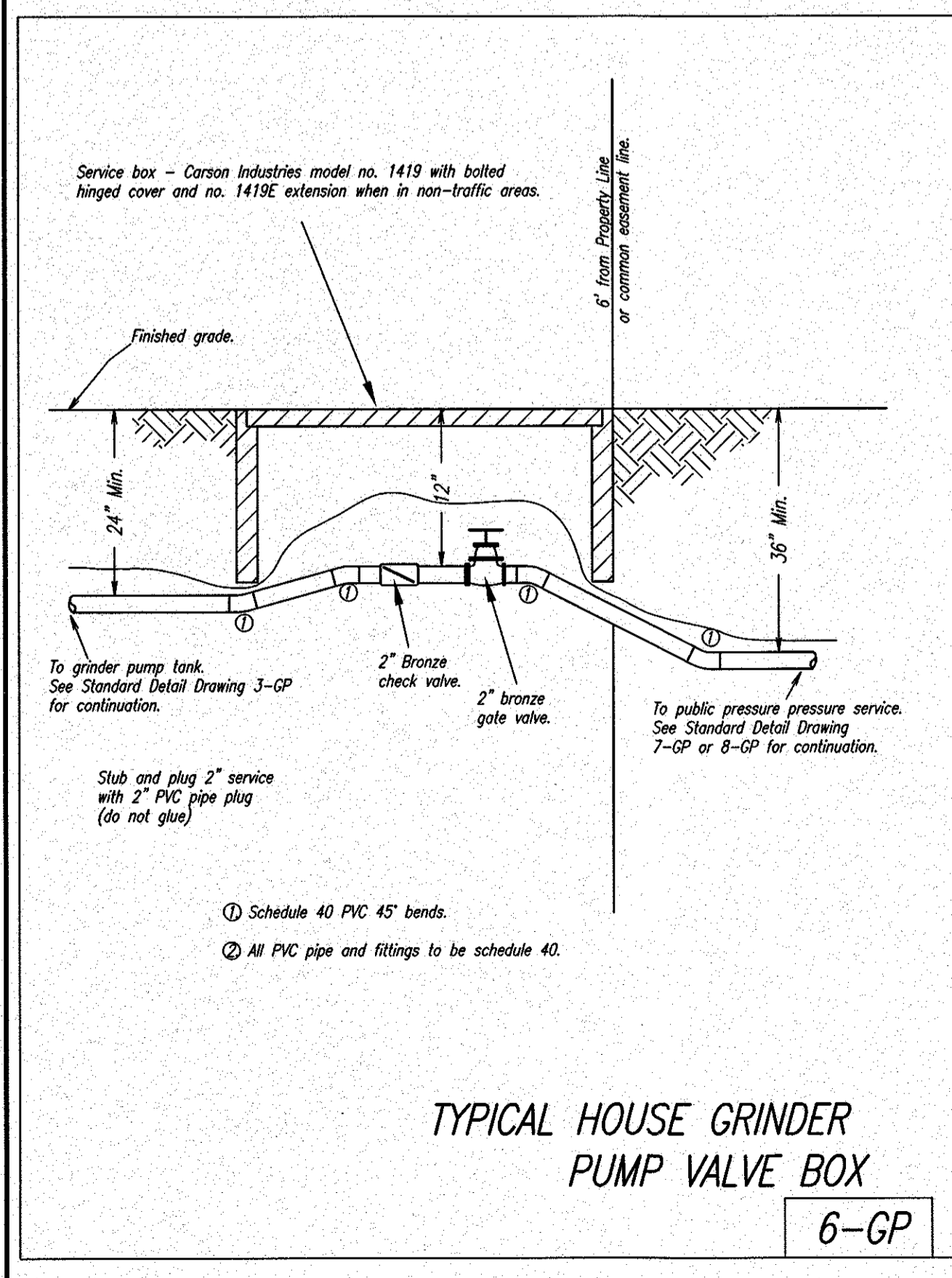
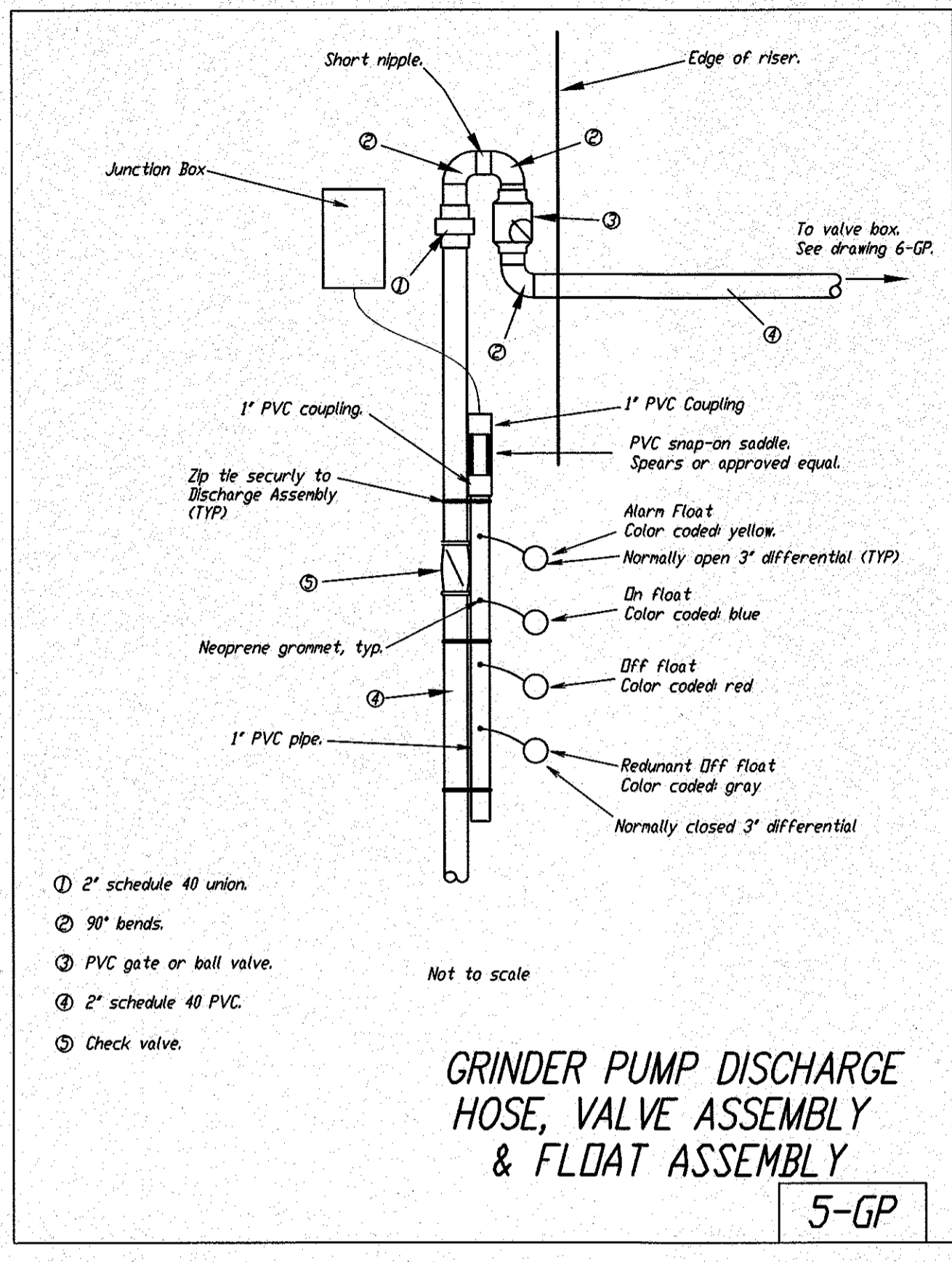
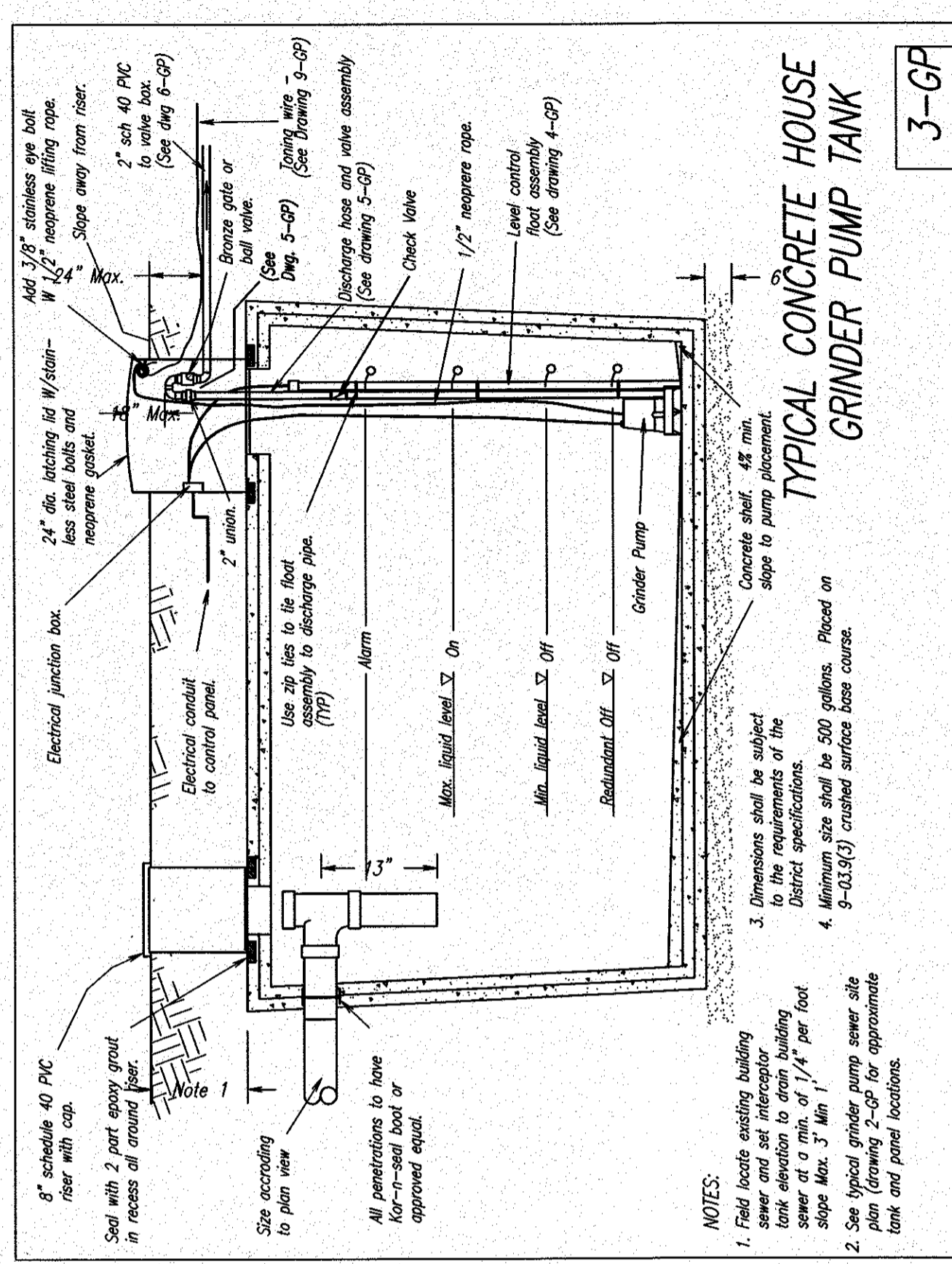
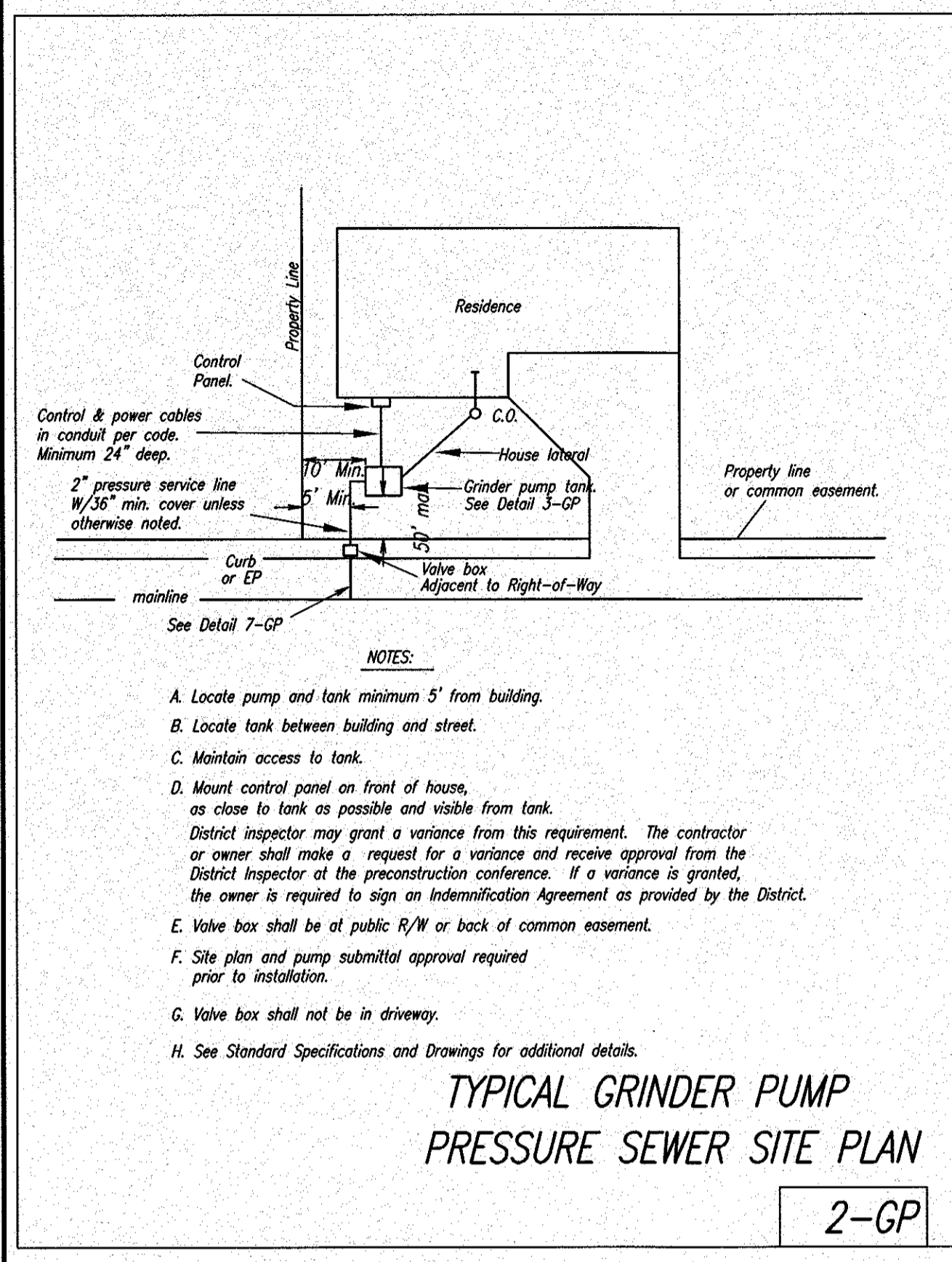


PRESSURE SANITARY DETAILS

HIGHLAND TERRACE SUBDIVISION

LA CENTER

NOTE AS AN ALTERNATIVE TO THESE DETAILS, A PROPRIETARY SYSTEM SUCH AS THE "ENVIRONMENT ONE" OR "BARNES" SYSTEMS, MAY BE USED UPON APPROVAL.



DATE PLOTTED: Feb. 25, 2009 - 4:19 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE\4-FINAL\0536-COVER-DETAILS.DWG

REVISIONS	
DESIGNED BY:	JDR
DRAWN BY:	JDR
CHECKED BY:	EEG
SCALE:	1" = 50'
JOB NUMBER	SHEET
0536	17 of 18



EXPIRES: MAY 26, 2009

STANDARD WATER DETAILS - CPU

**HIGHLAND TERRACE
SUBDIVISION**

WA

LA CENTER

REVISIONS

DESIGNED BY: JDR
DRAWN BY: JDR
CHECKED BY: EEG
SCALE: 1" = 50'

JOB NUMBER: 0536
SHEET: 18 of 18

GENERAL NOTES:

- ALL CONSTRUCTION MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE CLARK COUNTY PUBLIC UTILITIES (CPU) WATER CONSTRUCTION SPECIFICATIONS, STANDARD DETAILS AND THE 2002 EDITION OF THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT).
- A CPU WATER UTILITY INSPECTOR SHALL BE AT THE JOB SITE DURING CONSTRUCTION OF ALL WATER FACILITIES. CONTACT 360-992-8019 TWO WORKING DAYS PRIOR TO COMMENCING WORK.
- WORK WITHIN COUNTY RIGHT-OF-WAY SHALL CONFORM WITH CLARK COUNTY PUBLIC WORKS UTILITY PERMIT REQUIREMENTS AND DETAILS. WORK WITHIN STATE RIGHT-OF-WAY SHALL CONFORM TO WSDOT UTILITY PERMIT REQUIREMENTS AND DETAILS.
- WATER MAIN PIPE 12" OR SMALLER SHALL BE PVC, C-900, PC150 OR PC200 AS SPECIFIED ON THE PLANS; OR DUCTILE IRON PIPE, PC350 GAUGED PIPE.
- VALVE SHALL BE 2" SQUARE OPERATING NUT OR AS SPECIFIED ON PLANS.
- INSTALL WATER MAIN WITH 3.0 FEET OF MINIMUM COVER UNLESS OTHERWISE NOTED. DEPTH MAY INCREASE AT UTILITY AND CULVERT CROSSINGS. REFER TO NOTE 13.
- THE LOCATION OF THE UTILITIES SHALL BE VERIFIED IN ADVANCE TO ALLOW FOR ALIGNMENT ADJUSTMENTS. CALL UTILITY LOCATES TWO (2) WORKING DAYS PRIOR TO CONSTRUCTION (1-800-553-4344).
- A TAPPING COMPANY APPROVED BY CLARK PUBLIC UTILITIES SHALL BE USED TO MAKE ALL TAPS.
- LOCATE WIRE SHALL BE NON-COATED, NO. 14 GA. SOFT DRAWN SOLID COPPER.
- DRY CALCIUM HYPO CHLORIDE IN TABLET FORM, FAST DISSOLVING, WITH 65% MIN. AVAILABILITY SHALL BE USED TO COLORIZE ALL NEW MAINS. THE DOSAGE RATE SHALL BE A MINIMUM OF 25mg/L. THE NUMBER OF 5-g TABLETS TO BE APPLIED PER 20 FOOT LENGTH OF PIPE SHALL BE AS FOLLOWS:

PIPE SIZE	NUMBER OF TABLETS
4"	1
6"	1
8"	2
10"	3
12"	4

- ACTUAL ROAD ALIGNMENTS MAY VARY FROM RIGHT-OF-WAY INDICATED. THE CONTRACTOR SHALL VERIFY THE PROPOSED PIPE ALIGNMENT AND REPORT ANY DIFFERENCES TO THE CPU INSPECTOR. ALL ALIGNMENT CHANGES MUST BE APPROVED BY THE CPU INSPECTOR PRIOR TO INSTALLATION.
- DRIVEWAYS DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION. REFER TO PLAN FOR APPROXIMATE LOCATIONS AND TYPES.
- CONTRACTOR SHALL VERIFY EXISTING UTILITY CULVERTS, CONDUITS AND LINE LOCATION PRIOR TO CONSTRUCTION. DUE TO FIELD CONDITIONS, THE CONTRACTOR SHALL FIELD ADJUST THE VERTICAL AND HORIZONTAL ALIGNMENT OF THE WATER MAIN TO CLEAR THE UTILITY IN CONFLICT AND PROVIDE THE MIN. 3.0 FEET OF COVER AS APPROVED BY THE CPU INSPECTOR. ALL UTILITIES WHICH ARE DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR IN ACCORDANCE WITH THE SPECIFICATIONS.
- FENCES DISTURBED BY CONSTRUCTION SHALL BE RESTORED BY THE CONTRACTOR TO "LIKE" OR BETTER CONDITION.
- CONTRACTOR SHALL VERIFY EXISTING SIGN AND MAILBOX LOCATIONS PRIOR TO CONSTRUCTION. SIGNS & MAILBOXES THAT ARE DISTURBED BY CONSTRUCTION SHALL BE RELOCATED BACK FROM EDGE OF PAVEMENT, 1.0 FEET CLEAR OF WATER MAIN. ANY SIGNS OR MAILBOXES DAMAGED SHALL BE REPAIRED OR REPLACED AS PER THE SPECIFICATIONS.
- WHENEVER A PIPE IS CUT AND NOT RECONNECTED, THE CUT ENDS SHALL BE CAPPED OR PLUGGED, AS DIRECTED BY THE CPU INSPECTOR.
- ALL WATER SERVICES, BLOW-OFF ASSEMBLIES, AIR RELEASE VALVES, FIRE HYDRANT ASSEMBLIES, VALVE BOXES AND THRUST BLOCKING SHALL BE INSTALLED PER THE STANDARD SPECIFICATIONS AND DETAILS.
- THE LOCATIONS OF ALL EXISTING UTILITIES ARE FOR INFORMATIONAL PURPOSES ONLY. MANY LOCATIONS ARE PER SCHEMATIC RECORD DRAWINGS. THE CURRENT AND EXACT LOCATIONS OF FACILITIES MUST BE RECORDED PRIOR TO CONSTRUCTION. THE CONTRACTOR PERFORMING THE WORK SHALL COMPLY WITH THE PROVISIONS OF FACILITIES AT LEAST 48 BUSINESS DAY HOURS PRIOR TO EXCAVATION. CALL 1-800-553-4344 FOR UTILITY LOCATE SERVICE.
- WATER MAINS BEING INSTALLED NEAR TELEPHONE/CABLE COMMUNICATIONS SHALL HAVE A MINIMUM 12" HORIZONTAL AND 6" VERTICAL CLEARANCE.
- WATER MAINS BEING INSTALLED NEAR UNDERGROUND POWERLINES SHALL HAVE A MINIMUM 12" HORIZONTAL AND 6" VERTICAL CLEARANCE.
- REQUIRED SEPARATION BETWEEN WATER LINES AND SANITARY SEWER LINES SHALL BE AS FOLLOWS:

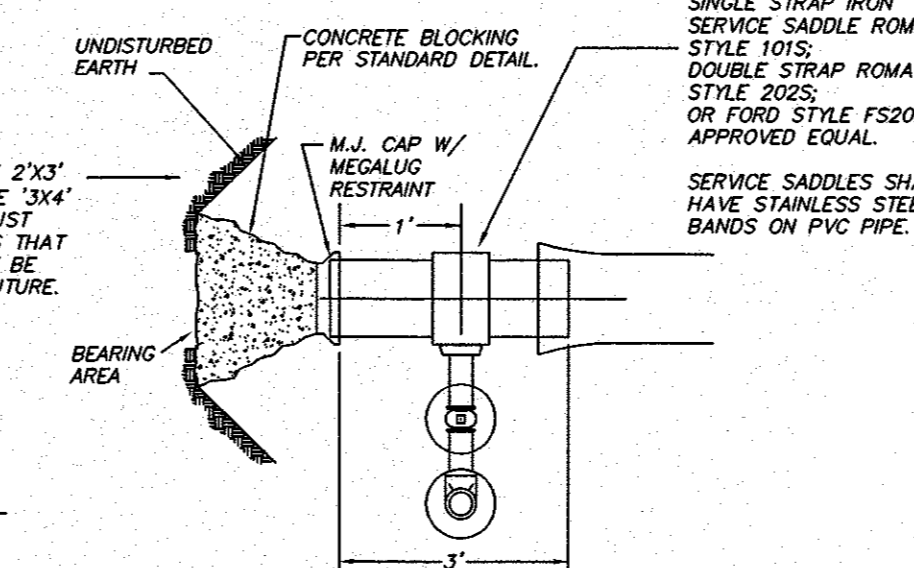
- HORIZONTAL SEPARATIONS (PARALLEL)**
A MINIMUM SEPARATION OF TEN (10) FEET (MEASURED EDGE TO EDGE) BETWEEN SANITARY SEWER LINES AND WATER LINES SHALL BE MAINTAINED WHENEVER POSSIBLE. WHEN CONDITIONS PREVENT THE MINIMUM TEN (10) FOOT HORIZONTAL SEPARATION THE ENGINEER SHALL BE NOTIFIED.
- VERTICAL SEPARATIONS (PERPENDICULAR)**
WATER LINES CROSSING SANITARY SEWER LINES SHALL BE LAID ABOVE THE SEWER LINES TO PROVIDE A SEPARATION OF AT LEAST 18" BETWEEN THE INVERT OF THE WATER PIPE AND THE CROWN OF THE SANITARY SEWER PIPE. A LENGTH OF WATER PIPE SHALL BE CENTERED AT THE POINT OF CROSSING AND SHALL BE THE LONGEST STANDARD LENGTH AVAILABLE FROM THE MANUFACTURER.

EROSION CONTROL NOTES:

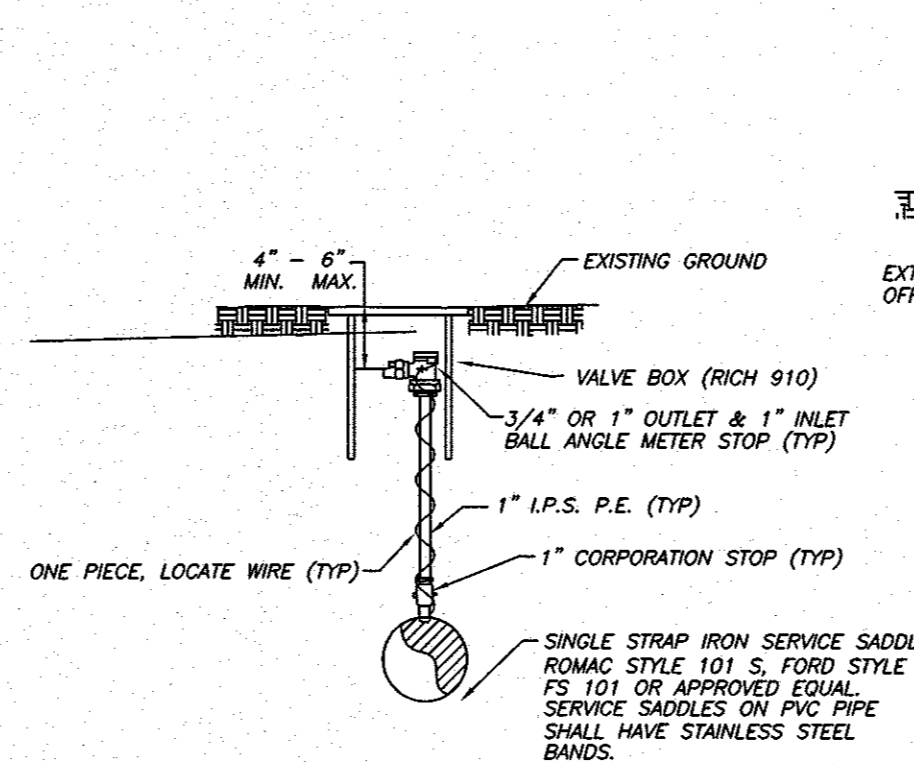
- CONSTRUCTION EROSION CONTROL SHALL BE AS REQUIRED AND CONFORMING WITH THE CLARK COUNTY DRAINAGE AND EROSION CONTROL ORDINANCE. REFER TO THE CLARK COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD EROSION CONTROL DETAILS.
- ALL EXPOSED SOILS SHALL BE STABILIZED, IN A TIMELY MANNER, BY THE APPLICATION OF BEST MANAGEMENT PRACTICES, INCLUDING BUT NOT LIMITED TO SOIL SEED, OR OTHER VEGETATION, PLASTIC COVERINGS, MULCHING, OR APPLICATION OF CRUSHED AGGREGATE ON THOSE AREAS TO BE PAVED.
- WHEN EXCAVATION OCCURS IN ROADSIDE DITCHES, EXCAVATE AND KEY INTO DITCH ONE BIOFILTER BAG CHECK DAM PER 100' OF DITCH, OR WHERE NOTED ON THE PLANS. REMOVE SILT WHEN IT IS EVEN WITH THE TOP OF THE CHECK DAM. REPLACE OR ADD BIOFILTER BAGS AS NECESSARY TO PROPERLY FILTER THE STORM WATER.
- INSTALL BIOFILTER BAGS (POLYESTER FABRIC PILLOW (ASTM-D191 OR EQUAL) FILLED W/ 15-18 LBS. OF WOOD CHIPS) AT EACH INLET. REMOVE SILT AND ADD BIOFILTER BAGS AS NECESSARY TO PROPERLY FILTER STORM WATER.
- IF SEDIMENT IS TRANSPORTED ONTO THE ROAD SURFACE, THE ROADS SHALL BE CLEANED THOROUGHLY AT THE END OF THE WORKDAY OR MORE IF NECESSARY. SIGNIFICANT SOIL DEPOSITS SHALL BE REMOVED FROM THE ROAD BY SHOVELING OR SWEEPING.
- THE LENGTH OF THE TRENCH OPEN AT ONE TIME SHALL BE MINIMIZED AND WHERE CONSISTENT WITH SAFETY AND SPACE CONSIDERATION, EXCAVATED MATERIALS SHALL BE PLACED ON THE UPHILL SIDE OF THE TRENCH.

SERVICE SADDLES:

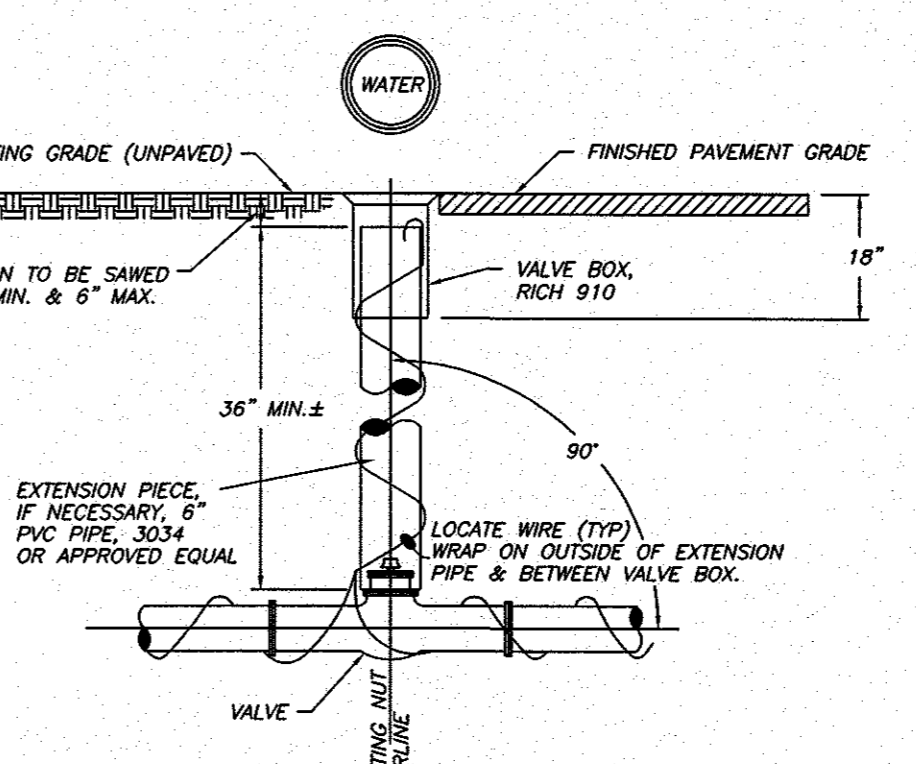
- PROVIDE IRON SERVICE SADDLES WITH NEOPRENE GASKETS CEMENTED IN PLACE AND I.P.S. TAP AS SPECIFIED ON THE CONTRACT DRAWINGS. SADDLES SHALL BE SPECIFICALLY DESIGNED FOR THE TYPE OF PIPE TO WHICH THEY ARE BEING INSTALLED. SERVICE SADDLES ON PVC PIPE SHALL HAVE STAINLESS STEEL BANDS.
- SADDLES FOR 1" AND 2" SERVICE LINES ON WATER MAINS 8" AND SMALLER SHALL BE "ROMAC 101S" OR APPROVED EQUAL.
 - SADDLES FOR 1" AND 2" SERVICE LINES ON WATER MAINS 10" AND LARGER SHALL BE "ROMAC 202S" OR APPROVED EQUAL.



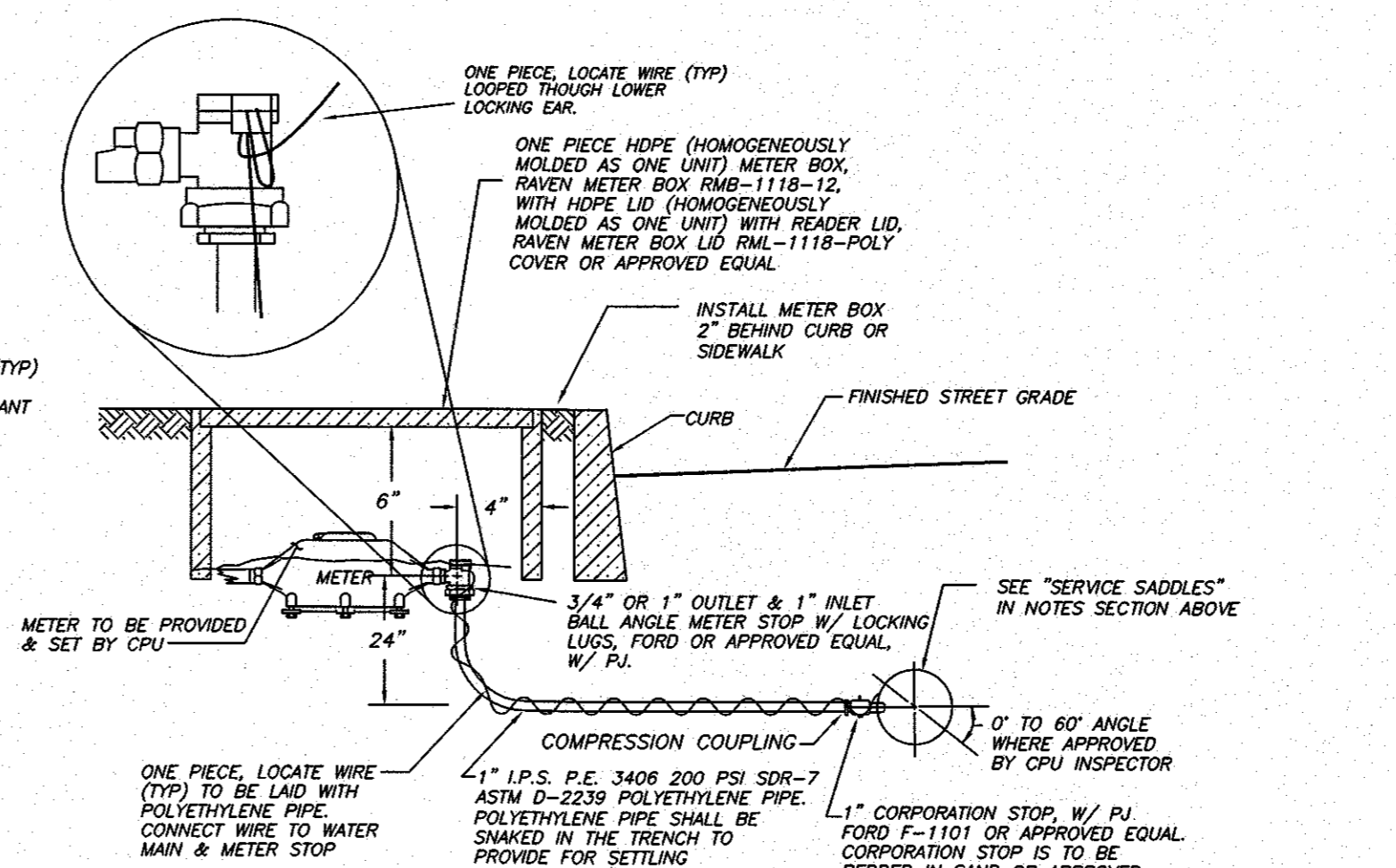
STANDARD BLOW-OFF ASSEMBLY (PERMANENT)



STANDARD MANUAL AIR RELEASE VALVE



STANDARD VALVE BOX ASSEMBLY

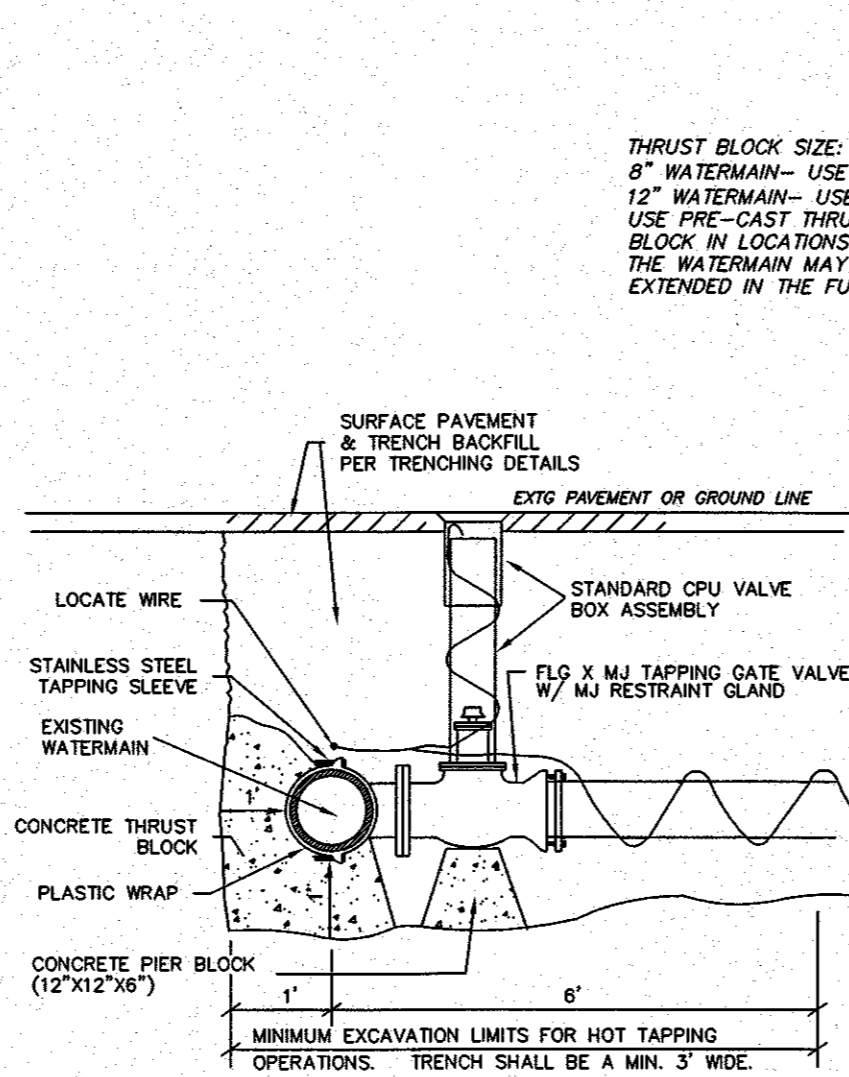


WATER SERVICE & MANUAL AIR RELEASE NOTES:

- NO CONNECTIONS WILL BE ALLOWED TO AN EXISTING SERVICE PRIOR TO AN APPROVED PURITY TEST. PURITY TEST SHALL PRECEDE PRESSURE TEST.
- STUB SERVICES SHALL BE PRESSURE TESTED WITH THE MAIN LINE AND BE CAPABLE OF WITHSTANDING THE MAINS TEST PRESSURE.
- ALL COMPRESSION FITTINGS TO HAVE STAINLESS STEEL INSERTS.

STANDARD 3/4" & 1" WATER SERVICE

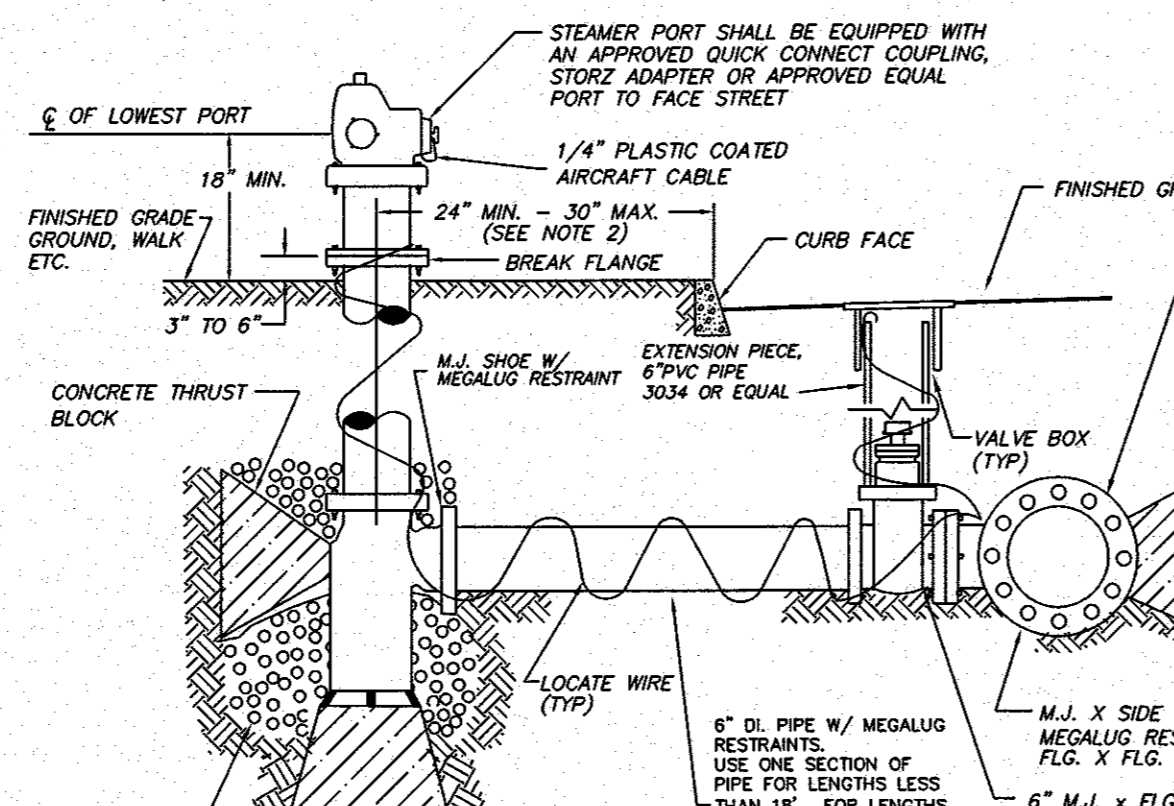
DETAIL SHEET INFO: JEFF SIMONS 360.992.8543



STANDARD HOT TAP

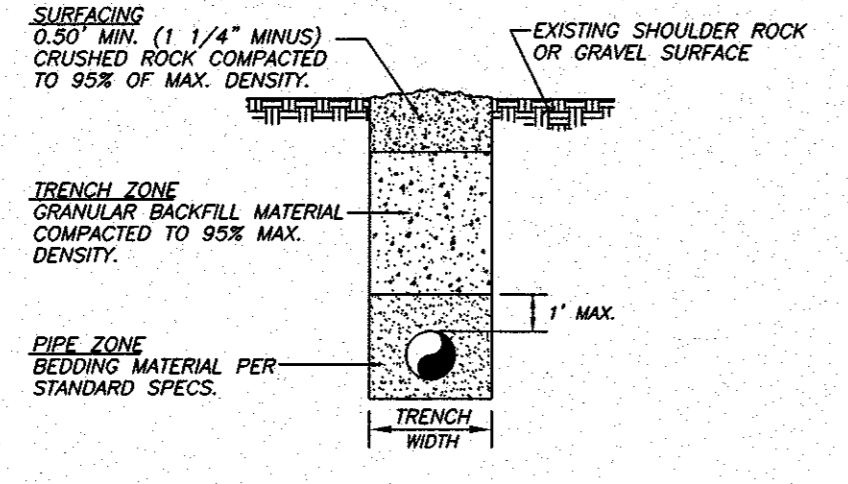
- NOTES**
- LAYOUT AND TAP LOCATION SHALL BE APPROVED BY THE CPU INSPECTOR PRIOR TO EXCAVATING. CONTACT THE CPU INSPECTOR 2 DAYS IN ADVANCE PRIOR TO SCHEDULING THE HOT TAP.
 - HOT TAPS MAY ONLY BE DONE BY A CPU APPROVED TAPPING CONTRACTOR.
 - THE CPU INSPECTOR SHALL BE AT THE WORKSITE DURING TAPPING OPERATIONS.
 - THRUST BLOCK SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL. USE PLASTIC OR OTHER PROTECTIVE MATERIAL BETWEEN PIPE/FITTINGS AND THRUST BLOCK.
 - TRENCH EXCAVATIONS OVER 4' WILL REQUIRE SHORING OR OTHER MEASURES CONSISTANT WITH APPLICABLE LOCAL, STATE OR FEDERAL SAFETY CODES.

STANDARD FIRE HYDRANT ASSEMBLY



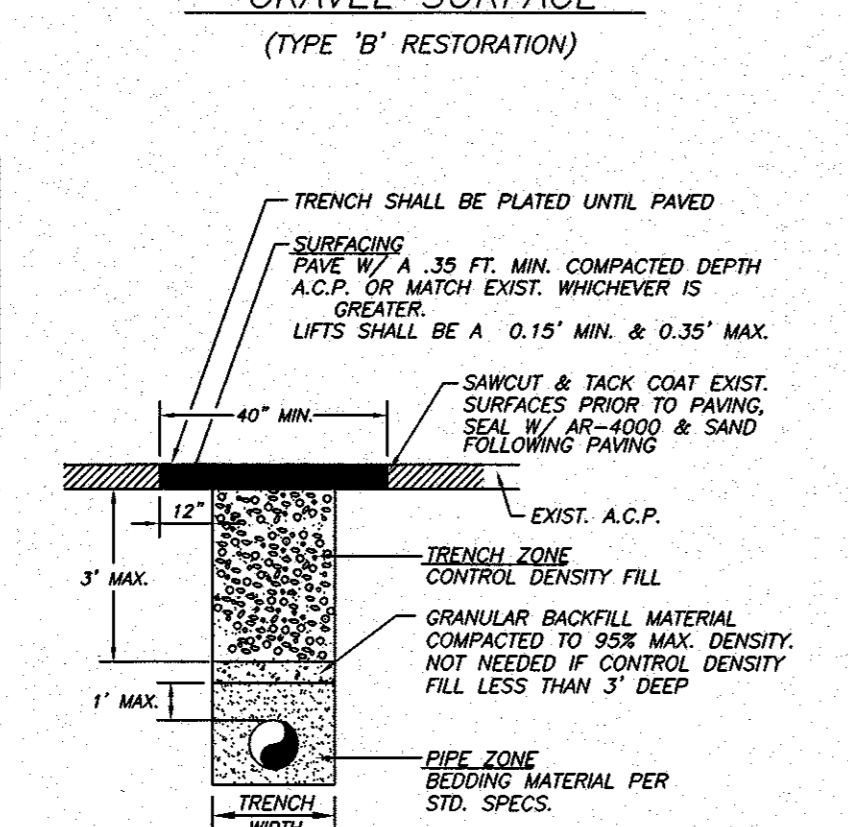
STANDARD FIRE HYDRANT ASSEMBLY

- FIRE HYDRANT NOTES:**
- FIRE HYDRANT INSTALLATIONS SHALL BE INSPECTED PRIOR TO BACKFILLING.
 - WHERE HYDRANTS ARE SET BEHIND SIDEWALK, DISTANCE FROM BACK OF SIDEWALK TO HYDRANT C/L SHALL BE 18" MIN., 24" MAX.
 - FIRE HYDRANTS SHALL BE SHOP PAINTED PRIOR TO INSTALLATION W/STANDARD A.W.W.A. Q353 B, YELLOW.



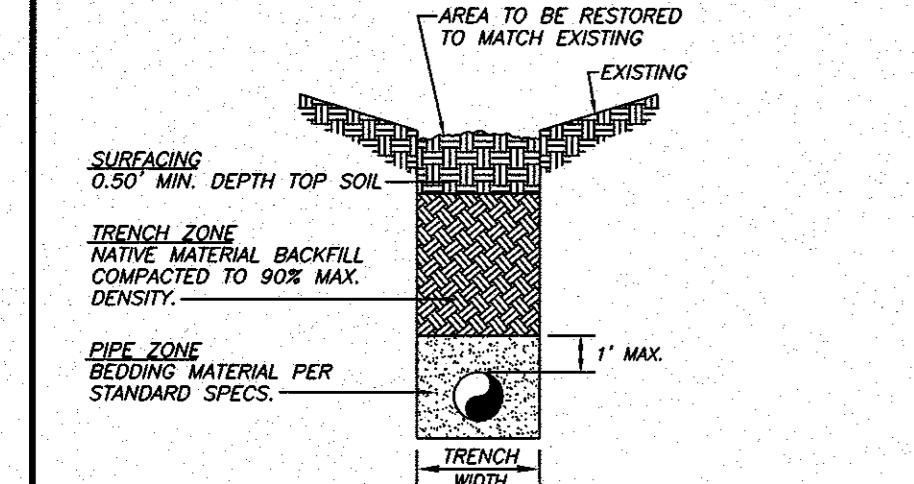
ROADWAY SHOULDERS, GRAVEL SURFACE

(TYPE 'B' RESTORATION)



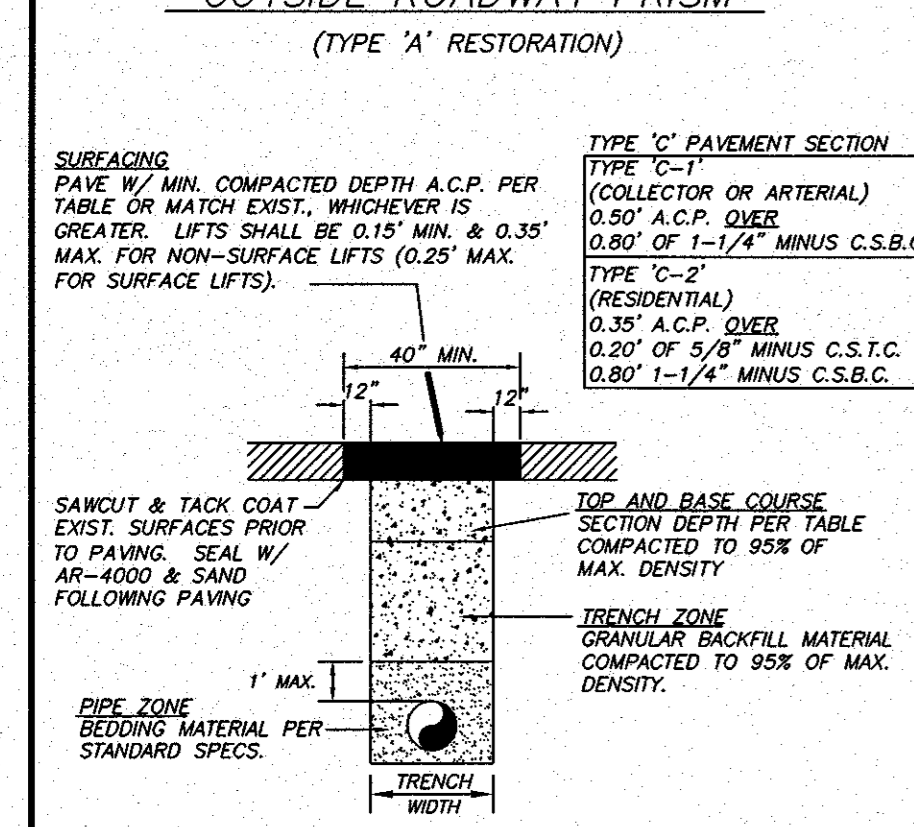
CONTROL DENSITY FILL - A.C.P.

(TYPE 'D' RESTORATION)



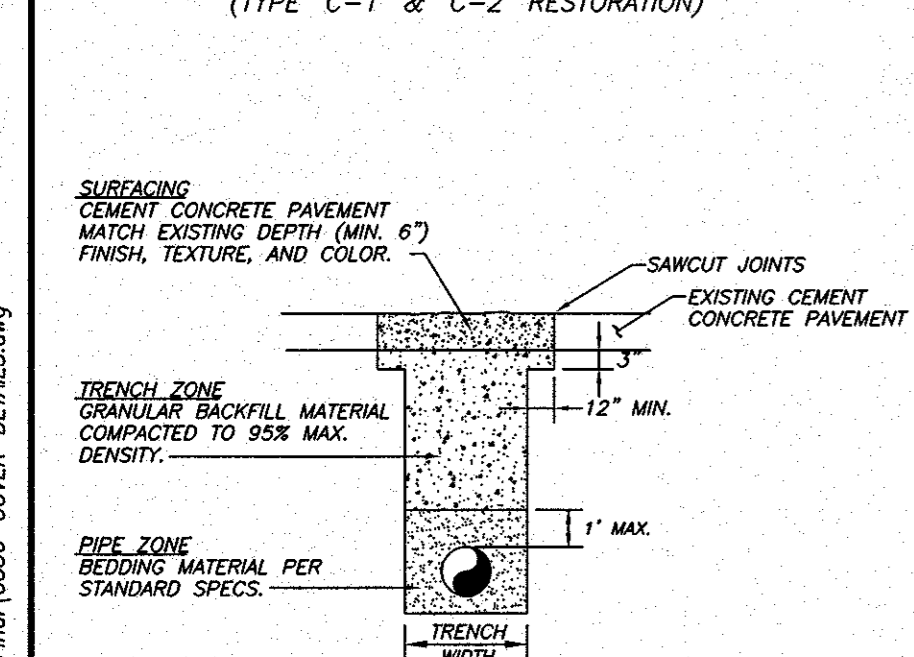
NATIVE BACKFILL

(TYPE 'A' RESTORATION)



ASPHALT CONCRETE PAVEMENT

(TYPE 'C-1' & 'C-2' RESTORATION)



CEMENT CONCRETE PAVEMENT

(TYPE 'E' RESTORATION)

PIPE SIZE	MIN. DEPTH (FT.)	MIN. WIDTH (FT.)	MIN. BEARING (PSI)	MIN. COMPRESSIVE STRENGTH (PSI)	MIN. CURING TIME (DAYS)	MIN. CURING TEMPERATURE (°F)
4"	12"	12"	1.2	1.5	1.5	1.5
6"	18"	18"	1.7	2.0	2.0	2.0
8"	24"	24"	2.4	3.0	3.0	3.0
10"	30"	30"	3.4	4.0	4.0	4.0
12"	36"	36"	4.4	5.0	5.0	5.0
16"	48"	48"	6.6	8.0	8.0	8.0
18"	54"	54"	8.8	10.0	10.0	10.0

THRUST BLOCK NOTES:

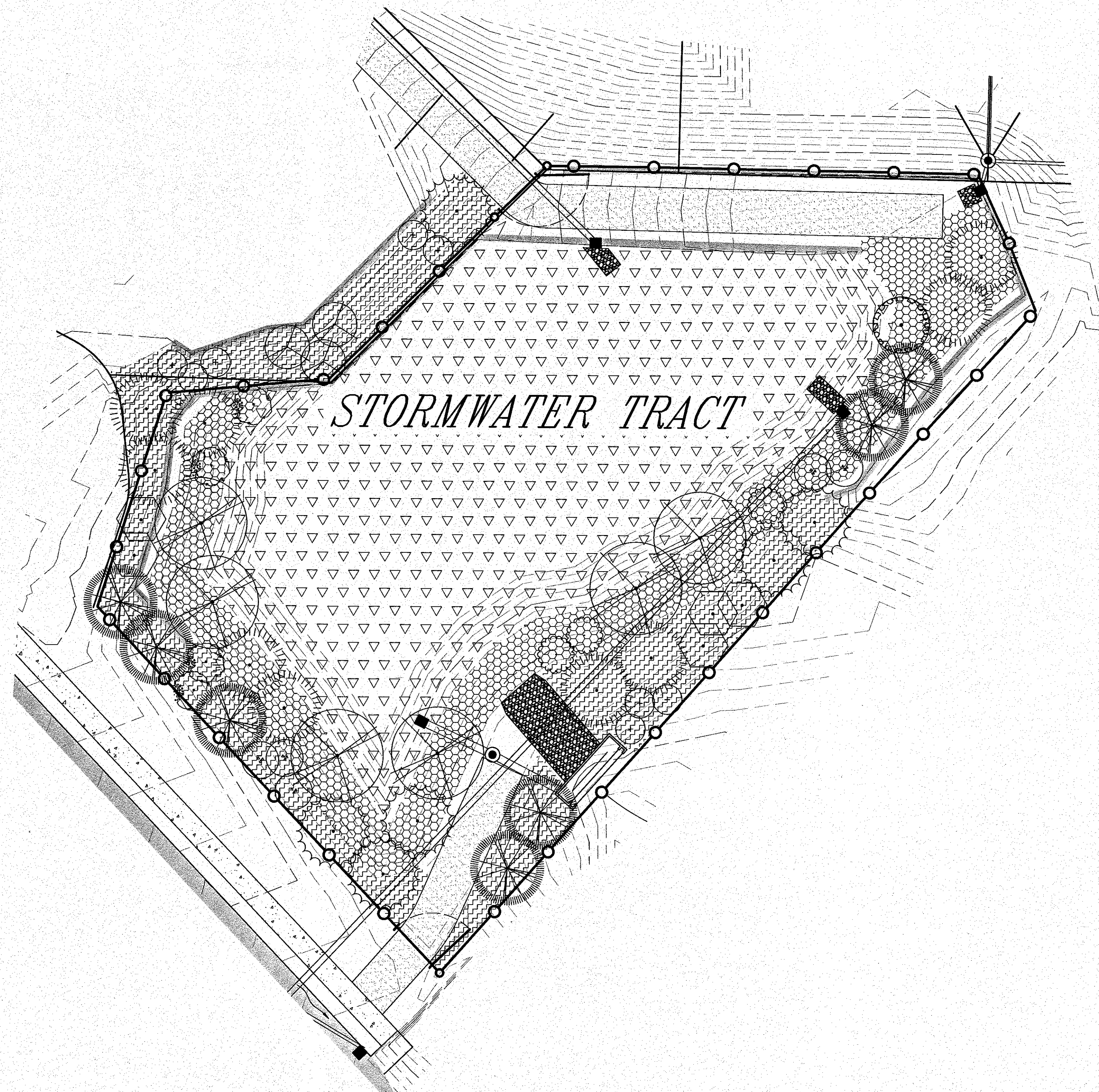
- POURED BLOCKING SHALL BE POURED IN PLACE WITHOUT DIRECT CONTACT TO THE PIPE OR FITTINGS. SOME PROTECTIVE MATERIAL SUCH AS PLASTIC SHALL BE PLACED BETWEEN THE CONCRETE AND PIPE OR FITTING.
- POURED BLOCKING SHALL BE POURED AGAINST FIRM UNDISTURBED SOIL.
- CONCRETE FOR ALL BLOCKING SHALL HAVE A 28-DAY MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI
- CONCRETE BLOCKING FOR VERTICAL BENDS SHALL BE PER APWA STD. PLAN NO. B-22.
- LAYOUT TO BE APPROVED BY THE CPU INSPECTOR PRIOR TO AND AFTER CONCRETE POUR.
- ALL PRE-CAST THRUST BLOCKS SHALL BE PLACED IN CENTER OF TEE OR BEND.

STANDARD THRUST BLOCK

STANDARD FIRE HYDRANT ASSEMBLY

STANDARD 3/4" & 1" WATER SERVICE

DATE PLOTTED: May 18, 2007 - 5:17 PM SCA DRAWING FILE: W:\DWG\0536 - Highland Terrace 4-Final\0536-COVER-DETAILS.dwg



STORMWATER TRACT

PLANTING LEGEND

WETLAND TRACT BUFFER ENHANCEMENT AREA

TREES	SIZE	SPACING	QUANTITY
ABIES GRANDIS GRAND FIR	3' HGT.	AS SHOWN	6
BETULA Papyrifera PAPER BIRCH	18-36" BR	AS SHOWN	1
CORNUS NUTTALLI PACIFIC DOGWOOD	18-36" BR	AS SHOWN	8
CRATAEGUS DOUGLASII BLACK HAWTHORN	18-36" BR	AS SHOWN	5
MALUS FUSCA PACIFIC CRABAPPLE	18-36" BR	AS SHOWN	4
POPULUS BALSAMIFERA BLACK COTTONWOOD	18-36" BR	AS SHOWN	6
POPULUS TREMULOIDES QUAKING ASPEN	18-36" BR	AS SHOWN	3
PRUNUS EMARGINATA BITTER CHERRY	18-36" BR	AS SHOWN	5
RHAMNUS PURSHIANA CASCARA	18-36" BR	AS SHOWN	3
THUJA PLICATA WESTERN RED CEDAR	3' HGT.	AS SHOWN	9
PSEUDOTSUGA MENZIESII DOUGLAS FIR	3' HGT.	AS SHOWN	7

SHRUBS

- NATIVE SHRUBS, PERENNIALS, OR GROUNDCOVERS ADAPTED TO WET CONDITIONS, WHICH MIGHT INCLUDE. BUT ARE NOT LIMITED TO: ANDROMEDA POLIFOLIA, CORNUS SERICEA, KALIA MICROPHYLLA, LONICERA INVOLUCRATA, RIBES BRACTEOSUM, RIBES LACUSTRE, ROSA NUTKANA, ROSA PISOCARPA, RUBUS SPECTABILIS, SPIREA DOUGLASII, ANGELICA GENUFLEXA, ARUNCUS SYLVESTER, ANTHYRIUM FILIX-FEMINA, LYSICHTON AMERICANUM, MIMULUS GUTTATUS, PETASITES FRIGIDUS, SAGITTARIA LATIFOLIA, STACHYS COOLEYAE, CAREX VAR., SCIRPUS MICROCARPUS, TYPHA LATIFOLIA
- NATIVE SHRUBS, PERENNIALS, OR GROUNDCOVERS ADAPTED TO WET OR DRY CONDITIONS, WHICH MIGHT INCLUDE. BUT ARE NOT LIMITED TO: AMELANCHIER ALNIFOLIA, ANDROMEDA POLIFOLIA, CORYLUS CORNUTA, HOLODISCUS DISCOLOR, LONICERA INVOLUCRATA, MAHONIA AQUIFOLIUM, MYRICA GALE, OSMALIA CERASIFORMIS, PHILADELPHUS LEWISII, PHYSCARPUS CAPITATUS, RIBES BRACTEOSUM, RIBES LACUSTRE, EPILOBIUM AUGUSTIFOLIUM, OXALIS OREGANA, MAIANTHEMUM DILATATUM
- NATIVE SHRUBS, PERENNIALS, OR GROUNDCOVERS ADAPTED TO UPLAND CONDITIONS, WHICH MIGHT INCLUDE. BUT ARE NOT LIMITED TO: AMELANCHIER ALNIFOLIA, GAULTHERIA SHALLON, MAHONIA NERVOSA, RIBES SANGUINEUM, RUBUS PARVIFLORUS, SAMBUCUS CAERULEA, SAMBUCUS RACEMOSA, SYMPHOCARPUS ALBA, POLYSTICHUM MUNITUM, TRILLIUM OVATUM

LANDSCAPE NOTES

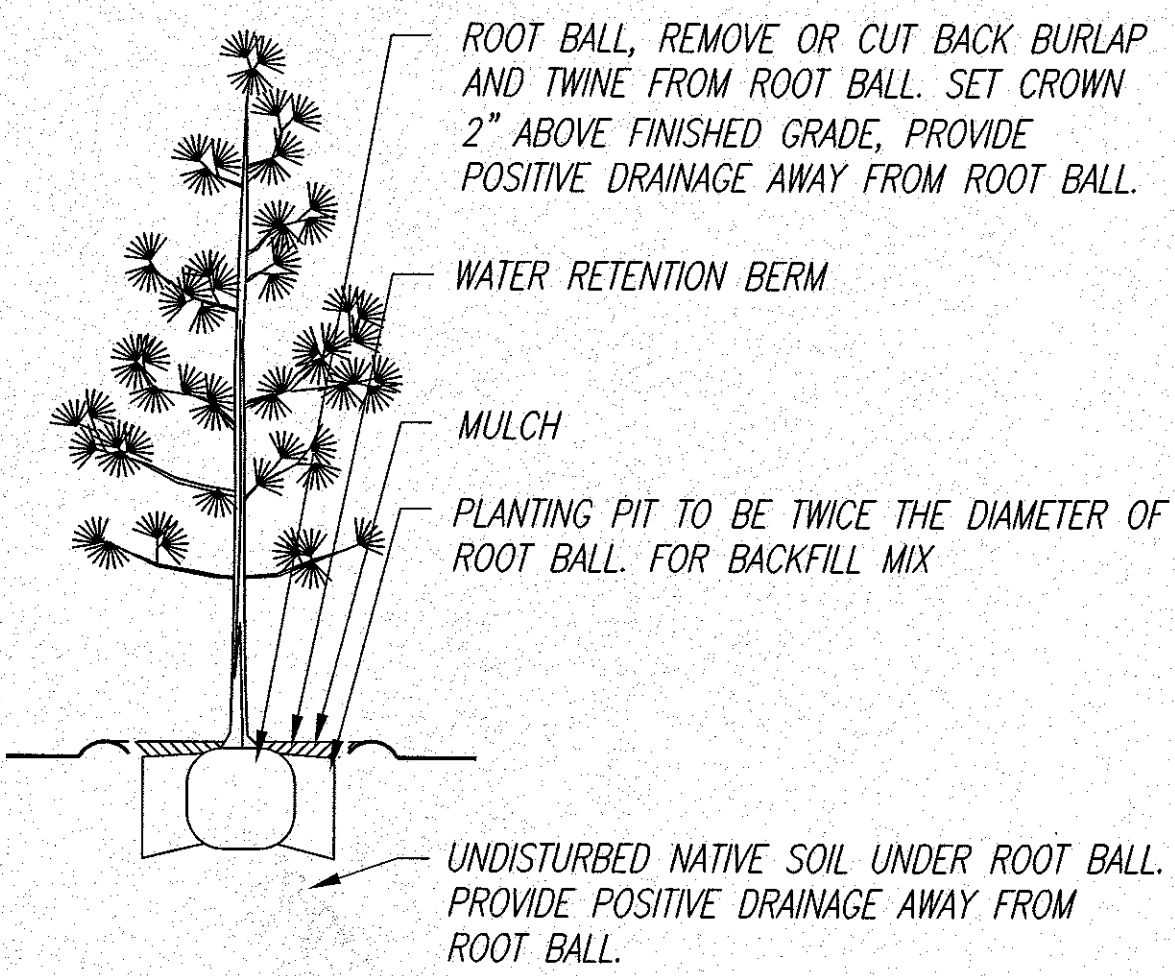
NATIVE TREES, SHRUBS, PERENNIALS, ETC... LISTED IN THE PLANTING LEGEND MAY NOT ALL BE AVAILABLE AND MAY BE SUBSTITUTED WITH AN EQUIVALENT SPECIES.

THE SHRUBS, GROUNDCOVERS, AND PERENNIALS ARE LISTED AS A POTENTIAL PLANT PALETTE ONLY. USE OF ALL PLANTS LISTED IS NOT EXPECTED. USE OF A VARIETY OF SOME THE PLANTS LISTED, AS AVAILABLE, IS RECOMMENDED.

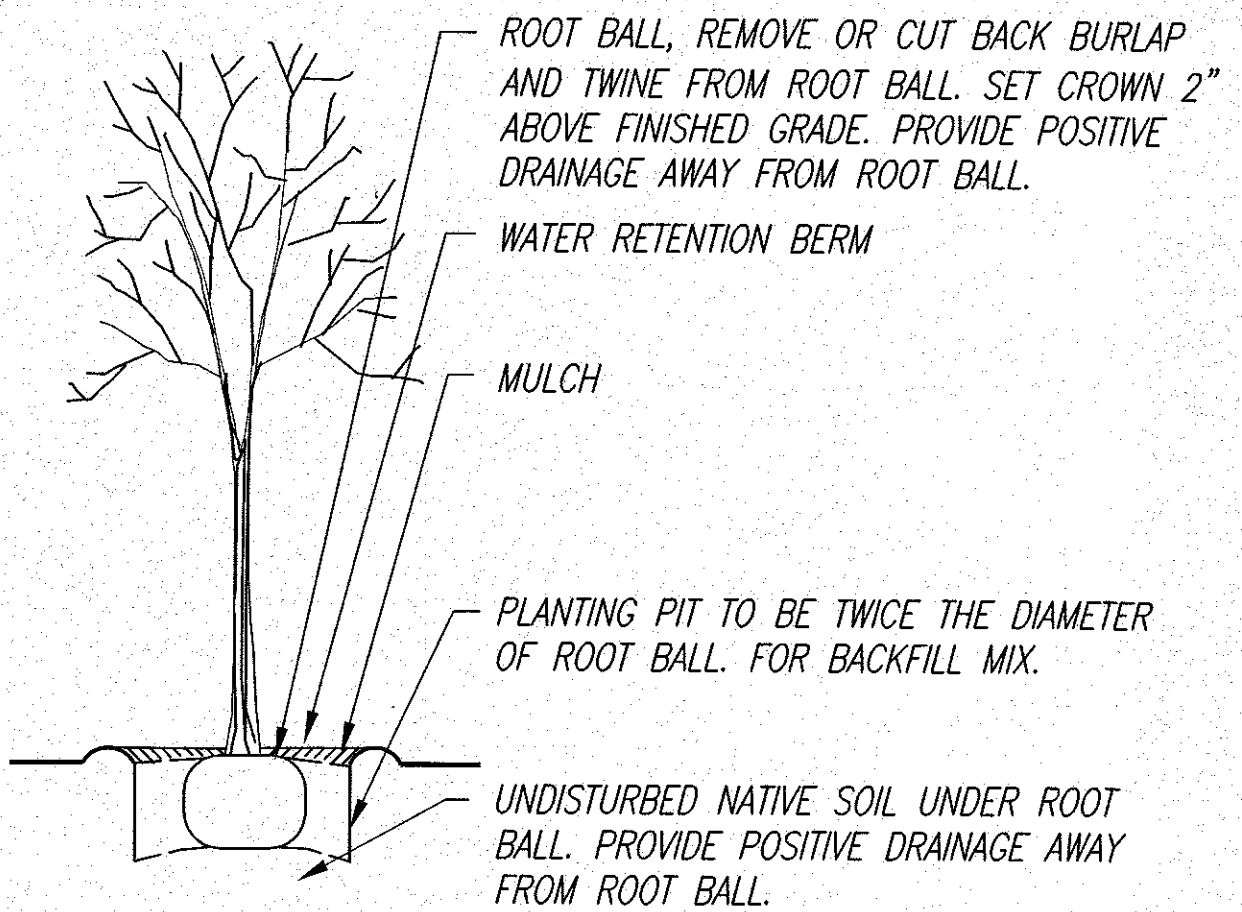
PLANTS MAY BE OBTAINED FROM SEED MIXES, CONTAINERS, B&B, OR BARE ROOT STOCK.

TREE LOCATIONS ARE SHOWN CONCEPTUALLY AND MAY BE MODIFIED AT THE TIME OF INSTALLATION.

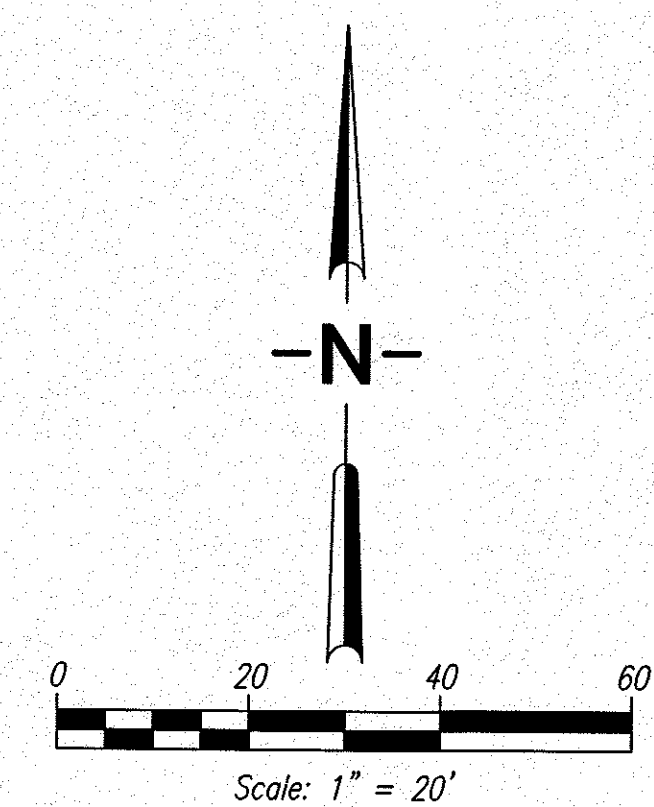
IF A DISCREPANCY IS FOUND BETWEEN THE PLANT LEGEND AND THE PLAN, THE PLAN SHALL PREVAIL.



Evergreen Tree Planting Detail

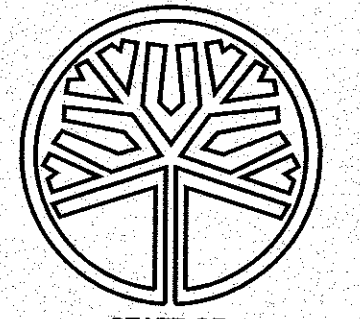


Deciduous Tree/Shrub Planting Detail



STURTEVANT, COLEMO,
& ASSOCIATES
CIVIL ENGINEERING ~ LAND PLANNING
DEVELOPMENT SERVICES

2005 BROADWAY
VANCOUVER, WA 98663
PHONE (360)993-0911
FAX (360)993-0912



STATE OF WASHINGTON
REGISTERED
LANDSCAPE ARCHITECT
3/3/09
JAMES A. CLARK
CERTIFICATE NO. 778
CLARB CERTIFIED
THE STANDARD OF QUALITY
FOR LANDSCAPE ARCHITECTS

HIGHLAND TERRACE SUBDIVISION

DETENTION POND LANDSCAPE PLAN

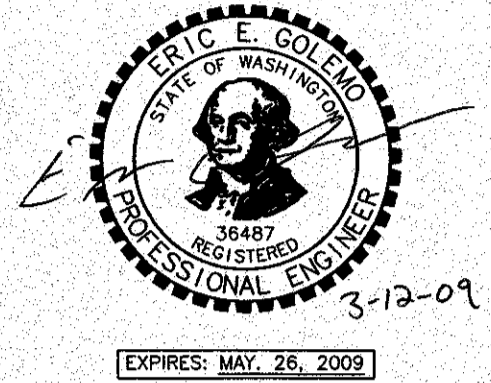
WASHINGTON
LA CENTER

REVISIONS

NO.	DESCRIPTION

DESIGNED BY: JAC
DRAWN BY: JAC
CHECKED BY: EEG
SCALE: 1" = 20'

JOB NUMBER SHEET
0536 LS1 of 1



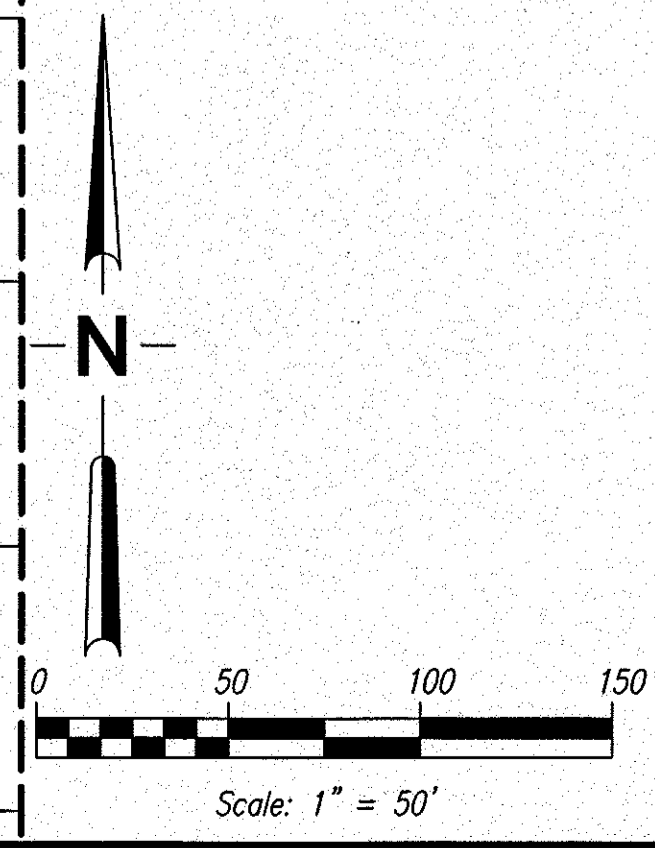
WA

HIGHLAND TERRACE
SUBDIVISION

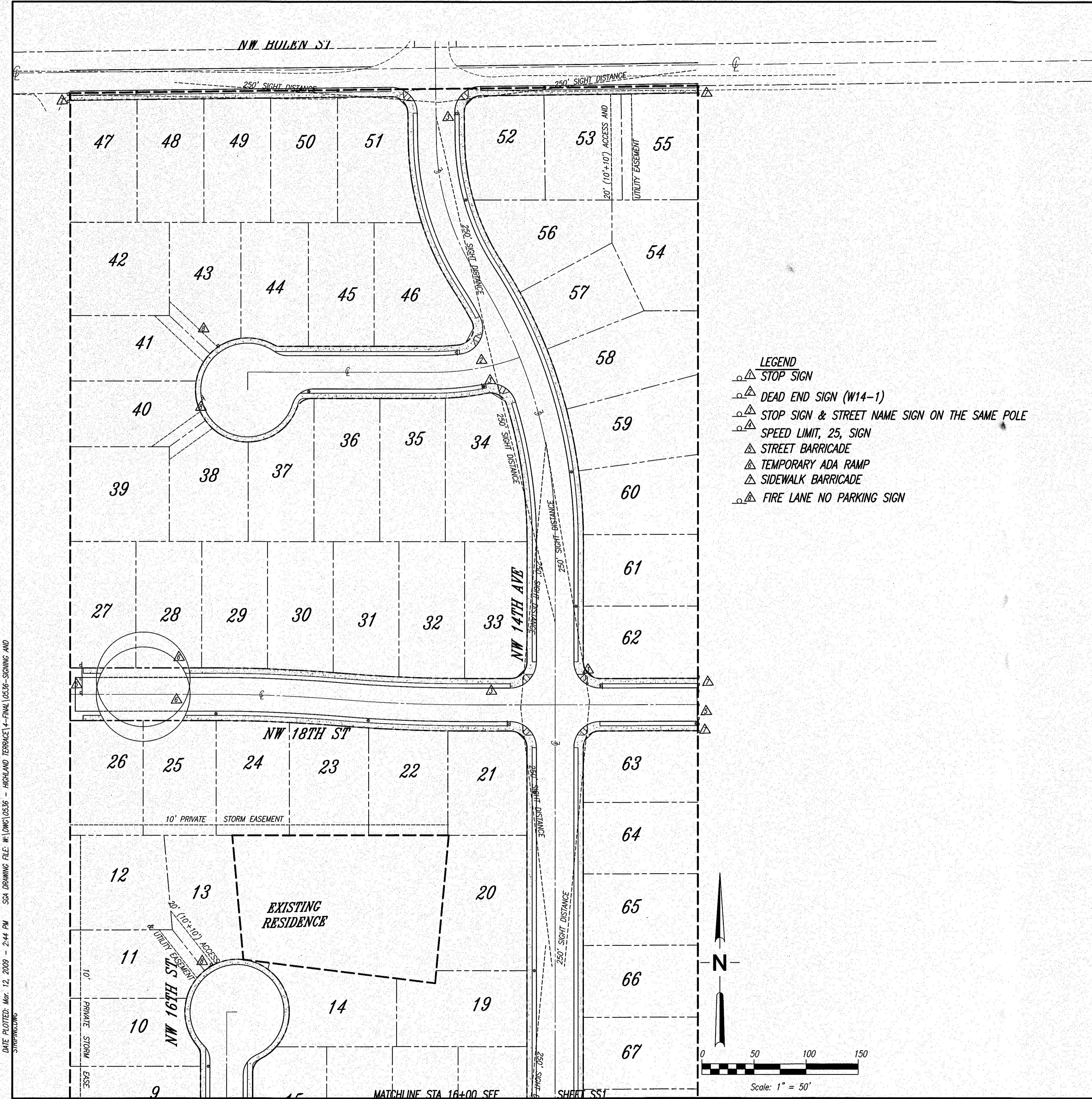
LA CENTER

SIGNING AND STRIPING-NORTH

- LEGEND**
- △ STOP SIGN
 - △ DEAD END SIGN (W14-1)
 - △ STOP SIGN & STREET NAME SIGN ON THE SAME POLE
 - △ SPEED LIMIT, 25, SIGN
 - △ STREET BARRICADE
 - △ TEMPORARY ADA RAMP
 - △ SIDEWALK BARRICADE
 - △ FIRE LANE NO PARKING SIGN



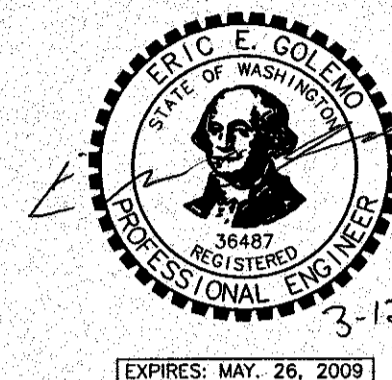
DATE PLOTTED: Mar. 12, 2009 - 2:44 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE\4-FINAL\0536-SIGNING AND STRIPING.DWG



REVISIONS

DESIGNED BY: JDR
DRAWN BY: JDR
CHECKED BY: EEG
SCALE: 1" = 50'

JOB NUMBER	SHEET
0536	SS2 of 2



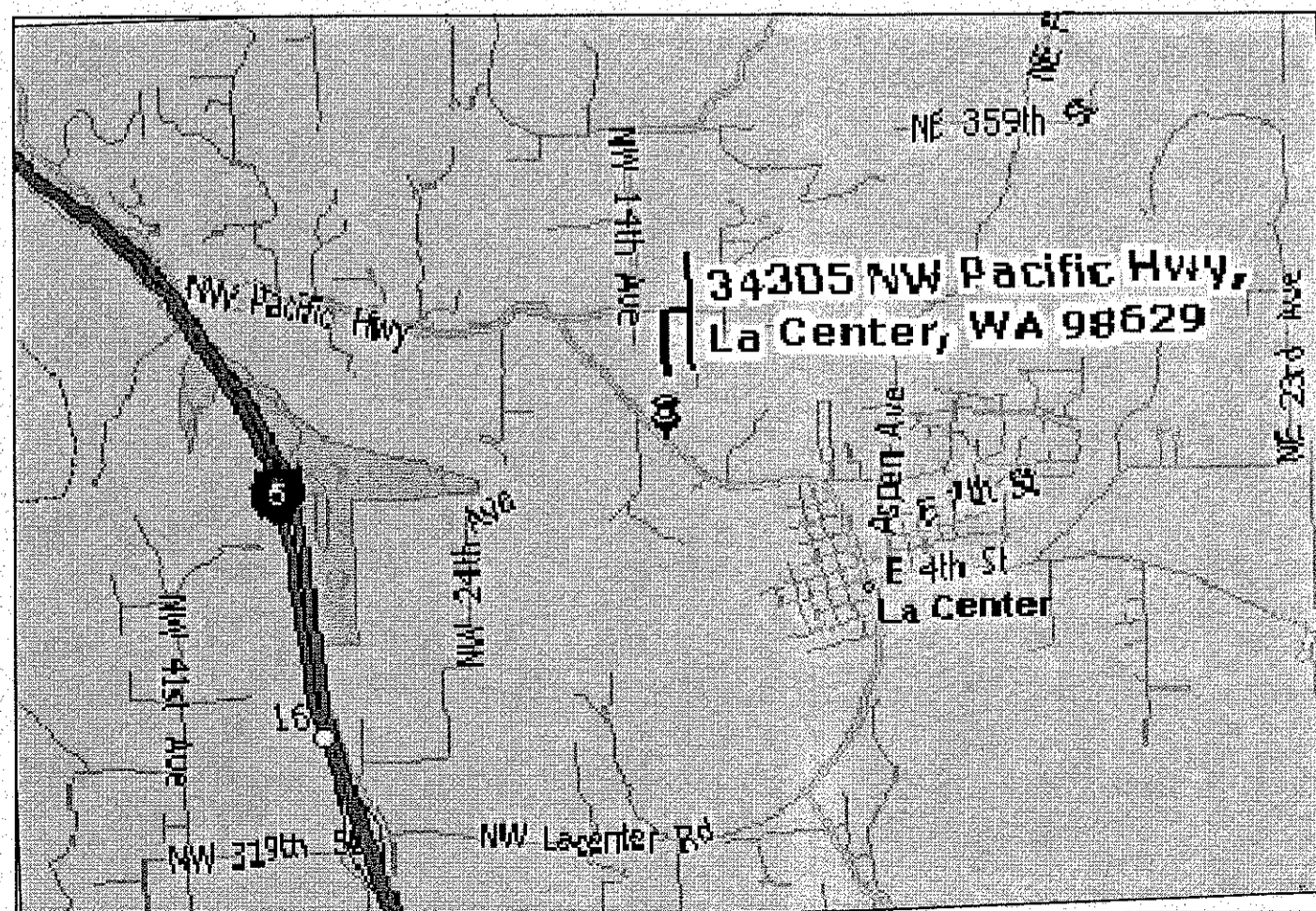
SIGNING & STRIPING PLAN APPROVAL	
All Construction to Conform to Clark County Standards	
Checked:	Reviewed:
RECOMMENDED for APPROVAL	
Clark County Traffic Engineering Staff	Date

- LEGEND**
- △ STOP SIGN
 - △ DEAD END SIGN (W14-1)
 - △ STOP SIGN & STREET NAME SIGN ON THE SAME POLE
 - △ SPEED LIMIT, 25, SIGN
 - △ STREET BARRICADE
 - △ TEMPORARY ADA RAMP
 - △ SIDEWALK BARRICADE
 - △ FIRE LANE NO PARKING SIGN

- NOTES:**
- THE STRIPING AND PAVEMENT MARKING REMOVAL PROCESS SHALL CONFORM TO WSDOT "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION" SECTION 8-22.3(6). THE COUNTY'S ACCEPTED PRACTICE OF REMOVAL OF EXISTING PAINTED PAVEMENT MARKING IS BY SHOT BLASTING. ALL OTHER MARKINGS ARE REMOVED BY GRINDING. THE CONTRACTOR SHALL HAVE A WRITTEN APPROVAL BY THE ENGINEER FOR ANY OTHER METHOD OF REMOVAL.
 - THE CONTRACTOR SHALL MAINTAIN EXISTING PERMANENT SIGNING IN ACCORDANCE WITH WSDOT "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION" SECTION 1-07.23(1).
 - FOR PRIVATE DEVELOPMENT PROJECTS ITEM 3 OF WSDOT STANDARD SPECIFICATION 1-07.23(1) SHALL BE MODIFIED TO REPLACE THE TERM "CONTRACTING AGENCY" WITH THE TERM "CONTRACTOR".
 - THE CONTRACTOR SHALL PROVIDE TEMPORARY PAVEMENT MARKINGS IN ACCORDANCE WITH WSDOT "STANDARD SPECIFICATION FOR ROAD, BRIDGE AND MUNICIPAL CONSTRUCTION" SECTION 8.23.
 - INSTALLATION OF ALL NEW AND FINAL RELOCATION OF EXISTING TRAFFIC CONTROL DEVICES, INCLUDING BARRICADES, WHERE APPLICABLE WILL BE PERFORMED BY CLARK COUNTY PUBLIC WORKS AFTER THE PLAT IS RECORDED. ACTUAL COST OF ALL WORK PERFORMED AND MATERIALS INSTALLED WILL BE REIMBURSED BY THE APPLICANT. THE CONTRACTOR SHALL MAINTAIN TEMPORARY SIGNS, STRIPING AND PAVEMENT MARKINGS UNTIL THE COUNTY PERFORMS SAID WORK.
 - ALL FLAG LOTS SHALL HAVE AN UNOBSTRUCTED ACCESS ROAD MARKED "FIRE LANE"

• STREET LIGHT

STREET LIGHT LOCATIONS SHOWN ARE PRELIMINARY. REFERENCE THE APPROVED ELECTRIC PLANS FOR FINAL LOCATIONS.



DATE PLOTTED: Mar. 12, 2009 - 2:46 PM SCA DRAWING FILE: W:\DWG\0536 - HIGHLAND TERRACE\4-FINAL\0536-SIGNING AND STRIPING.DWG

SIGNING AND STRIPING - SOUTH

HIGHLAND TERRACE SUBDIVISION

LA CENTER WA

REVISIONS

DESIGNED BY: JDR
 DRAWN BY: JDR
 CHECKED BY: EEG
 SCALE: 1" = 50'

JOB NUMBER: 0536 SHEET: SS1 of 2

