PORTION OF SW 1/4 OF THE NW 1/4 OF SEC. 33, T. 24N., R. 5 E., W.M.

LAWRENCE PARK SEWER & WATER

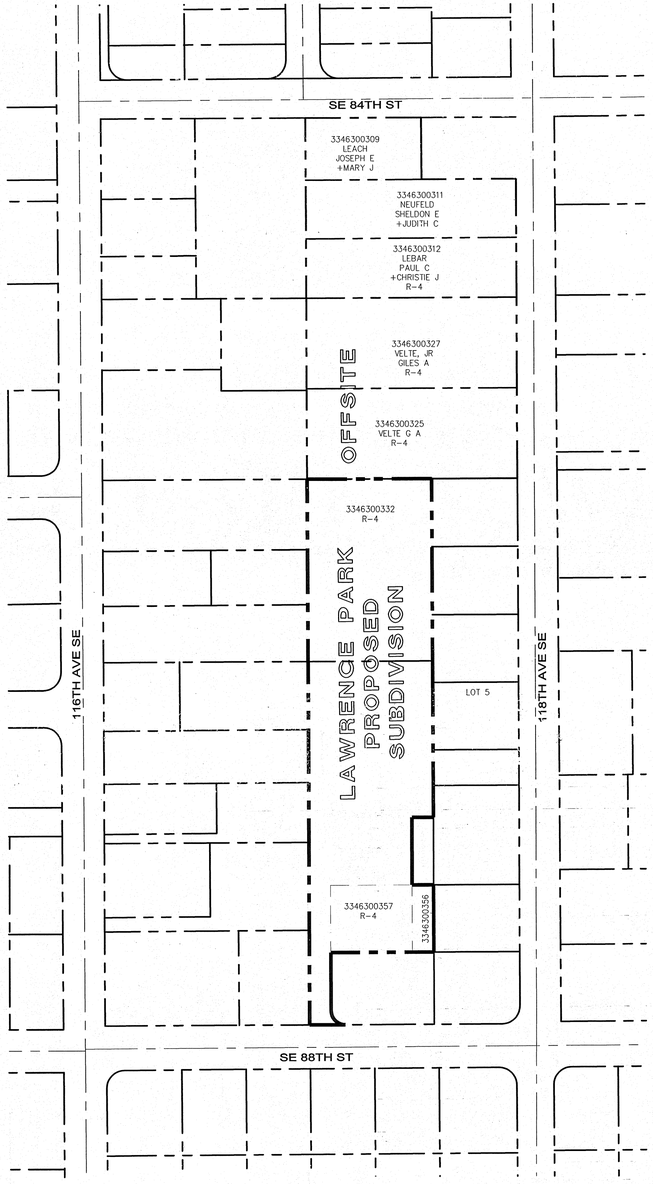
(PROJECT NO. 12041)

(PARCEL NO. 3346300-0309, -0311, -0312, -0327, -0325, -0332, -0357, -0356)

SHEET INDEX

LEGEND

PROPOSED:		EXISTING:
	BOUNDARY / R.O.W. LINE	
	CENTERLINE	
	LOT LINE	
	EASEMENT LINE	
FF= 308.0	FINISHED FLOOR ELEVATION	FF= 308.0
310	EXISTING GROUND CONTOUR	310
310	FINISHED GROUND CONTOUR	310
	CATCHBASIN (TYPE I) W/ ST LINE	
	CATCHBASIN (TYPE II) W/ ST LINE	
	CATCHBASIN (SOLID LID) W/ ST LINE	
	STORM DRAIN CULVERT	
	YARD DRAIN WITH TIGHT LINE	
	WATER BEND WITH CONC. BLOCKIING	
	FIRE HYDRANT ASSEMBLY	
	FIRE DEPARTMENT CONNECT	
	POST INCICATOR VALVE	
	WATER VALVE	
	PRESSURE REDUCING VALVE	
	DOMESTIC WATER METER	
	SANITARY SEWER MANHOLE W/ SS MAIN	
	6" INLINE SEWER CLEANOUT	
	6" BUILDING SEWER CLEANOUT	
	BACK WATER VALVE	
	ROCKERY RETAINING WALL	
	CONCRETE RETAINING WALL	
	KEYSTONE RETAINING WALL	
	SILT FENCE	
	V-DITCH	
	ROCK CHECK DAMS	
	SEDIMENT TRAP	
	STREET LIGHT ASSEMBLY	
	ASPHALT PAVEMENT	
	CEMENT CONCRETE	



ONSITE:

BASIS OF BEARING

THE MONUMENTED CENTERLINE OF 116TH AVE SE AT BEARING OF S00°10'00"E

BENCH MARK :

VERTICAL DATUM : CITY OF RENTON – NAVD88

CITY OF RENTON No. 1893 CONCRETE MONUMENT WITH BRASS DISK, SET 1.5' BELOW THE TOP OF AN IRON MONUMENT CASE AT THE INTERSECTION OF SE 80TH STREET AND 116TH AVENUE SE SET IN THE CENTER OF THE INTERSECTION.

ELEVATION = 321.279 FEET

OFFSITE:

BASIS OF BEARING

THE MONUMENTED CENTERLINE OF 116TH AVE SE AT BEARING OF N01°32'50"E. HORIZONTAL DATUM: NAD 83(2011) WASHINGTON NORTH ZONE.

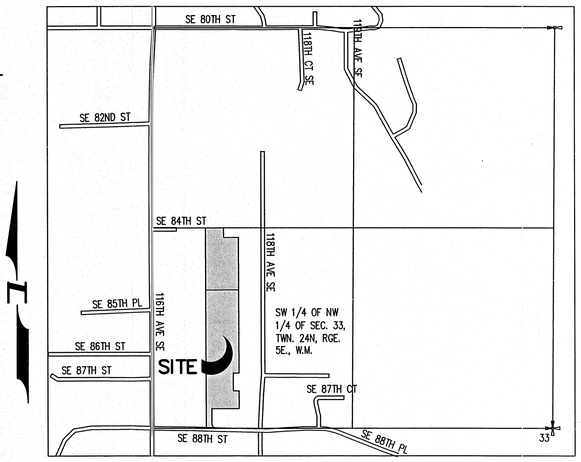
BENCH MARK:

VERTICAL DATUM: NAVD '88

ORIGINATING BENCHMARK:
CITY OF BELLEVUE MONUMENT NO. 0189, AS PUBLISHED IN CITY OF BELLEVUE SURVEY STATION DATA CARD.
ELEVATION: 326.70

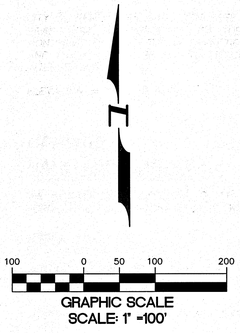
TEMPORARY BENCHMARKS:
TBM 'A' CHISELED 'X' ON NE BONNET BOLT OF FIRE HYDRANT ANT NE QUADRANT OF INTERSECTION OF SE 84TH ST AND 117TH AVE SE.
ELEVATION: 325.68'

TBM 'B' TOP OF 1/4" COPPER TUBE IN CONCRETE MONUMENT AT ± SOUTHWEST CORNER OF THE NORTH HALF OF LOT 4, C.D. HILLMAN'S LAKE WASHINGTON GARDEN OF EDEN ADDITION TO SEATTLE DIVISION NO. 8.
ELEVATION: 320.97'



VICINITY MAP

N.T.S.



OWNER/DEVELOPER :

CITY OF NEWCASTLE

CIVIL ENGINEER :

PACIFIC ENGINEERING DESIGN, LLC
15445 53RD AVE S.
SEATTLE, WA 98055
PHONE: (206) 431-7970
FAX: (206) 388-1648

SURVEYOR :

ONSITE SURVEY:
BAIMA & HOLMBERG INC.
ENGINEERS & SURVEYORS
100 FRONT STREET SOUTH
ISSAQUAH, WA 98027
PHONE: (425) 392-0250
FAX: (425) 391-3055

OFFSITE SURVEY:
AXIS SURVEY & MAPPING
13005 NE 126TH PL
KIRKLAND, WA 98034
PHONE: (425) 823-5700

NOTE:

1. *LOCATION OF EXISTING UTILITIES SHOWN ARE APPROXIMATE AND MAY NOT BE ACCURATE OR ALL INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY LOCATION OF UTILITIES PRIOR TO PROCEEDING WITH CONSTRUCTION.*
2. *YOU MUST CALL 1-800-424-5555 NOT LESS THAN 48 HOURS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED. FAILURE TO DO SO COULD MEAN BEARING SUBSTANTIAL REPAIR COSTS. (UP TO THREE TIMES THE COST OF REPAIRS TO THE SERVICE).*

PROJECT DATA:

PROPERTY ADDRESS:	SE 88TH ST. AND 116TH AVE. SE NEWCASTLE, WA 98059
EXISTING SITE ZONING:	R-4, CITY OF NEWCASTLE
TOTAL SITE AREA:	3.40 AC
PROPOSED LAND USE:	SINGLE FAMILY DETACHED
PROPERTY PARCEL NO.:	3346300-0309, -0311, -0312, -0325, -0327

Notice Required

Contractor shall notify operators who maintain underground utility lines in the area of proposed excavation or blasting at least two business days, but not more than ten working days prior to commencement of excavation or demolition in accordance with RCW Title 19. Names and telephone numbers of the operators of underground utility lines in this project appear below. These numbers shall also be used to serve in an emergency conditions as required.

	Phone
COAL CREEK UTILITY DISTRICT — Sanitary Sewer and Water	(425) 235-9200 (ROBERT RUSSELL)
CENTURY LINK — Telephone	(877) 348-9007 (TECHNICAL SUPPORT)
PUGET SOUND ENERGY — Gas Company & Power Company	(253) 395-6918 (KAREN FERGUSON)
COMCAST — Cable Company	(253) 288-7531 (JIM NIES)
BELLEVUE FIRE DEPARTMENT — Fire Department	(425) 452-6892 (TRAVIS ALLEN)
RENTON SCHOOL DISTRICT — School District	(425) 204-2300 (RICK STRACKE)
Call Before You Dig	DIAL-A-DIG 1-800-424-5555

Approved By:
Coal Creek Utility District
Date _____

CALL BEFORE YOU DIG
Call: TOLL FREE
1-811

REGISTERED PROFESSIONAL ENGINEER — EXPIRES 10/5/13

PLOT DATE & TIME
FILE NAME (UPDATED BY)
CROSS LINE

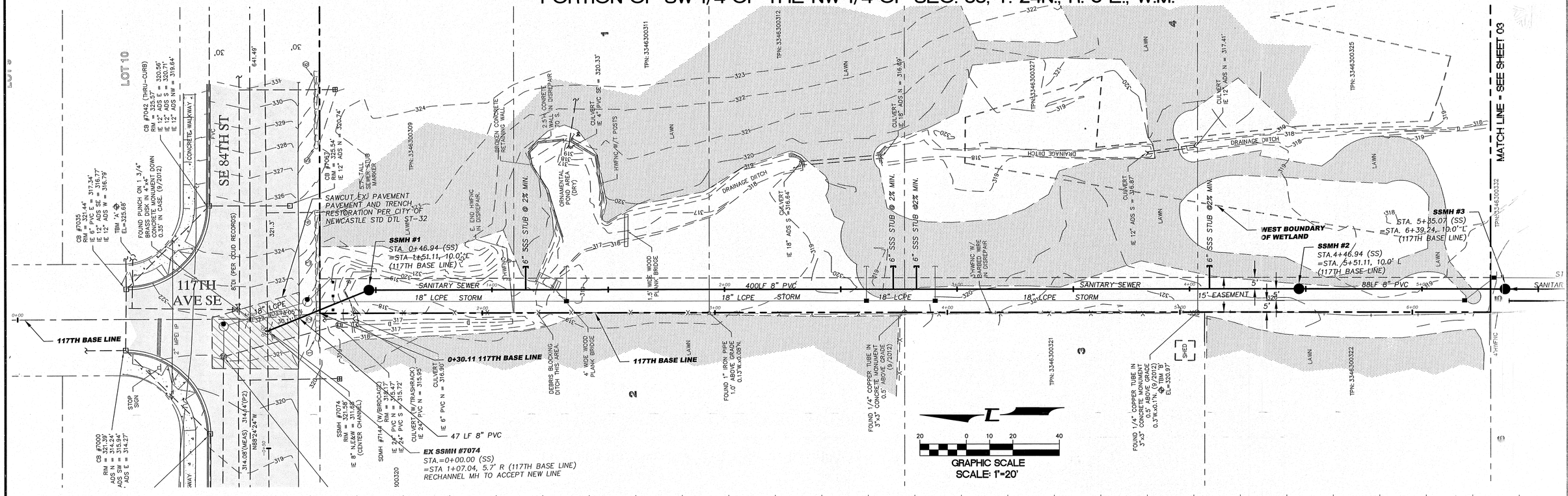
DESIGNED					
DRAWN	JINGSONG				
CHECKED	JINGSONG				
SYM	REVISION	DATE	BY	APP'D	
	REVISED PER DISTRICT COMMENTS				
	REVISED PER DISTRICT COMMENTS				

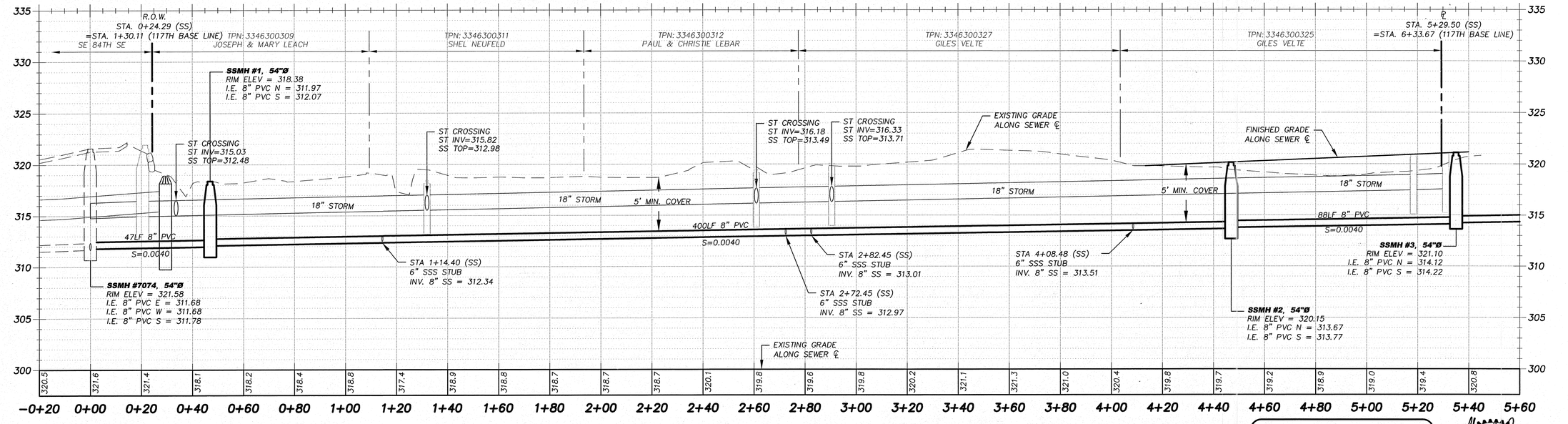
Pacific Engineering Design, LLC
15445 53RD AVE. S. SEATTLE, WA 98188
PHONE: (206) 431-7970 FAX: (206) 388-1648 WEB SITE: PACENG.COM
Civil Engineering and Planning Consultants

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

REFERENCE INFORMATION	DATE	LAWRENCE PARK SEWER AND WATER	JOB NUMBER
FIELD BOOK:	MAR 03, 2013	COVER SHEET	DWG NO. 12041SS-1-2.DWG
SURV. CPU FILE:	SCALE NOTED		SHEET 01 OF 09
DATUM: NAVD88			

PORTION OF SW 1/4 OF THE NW 1/4 OF SEC. 33, T. 24N., R. 5 E., W.M.





Approved By:
Coal Creek Utility District
Date _____

CALL BEFORE YOU DIG
Call: TOLL FREE
1-811

DESIGNED					
DRAWN	JINGSONG				
CHECKED	JINGSONG				
SYM	REVISION	DATE	BY	APP'D	
	REVISED PER DISTRICT COMMENTS				
	REVISED PER DISTRICT COMMENTS				

PLOT DATE & TIME
FILE NAME (UPDATED BY)
CROSS TONE

Pacific Engineering Design, LLC
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6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

REFERENCE INFORMATION
FIELD BOOK:
SURV. CPU FILE:
DATUM: NAVD88

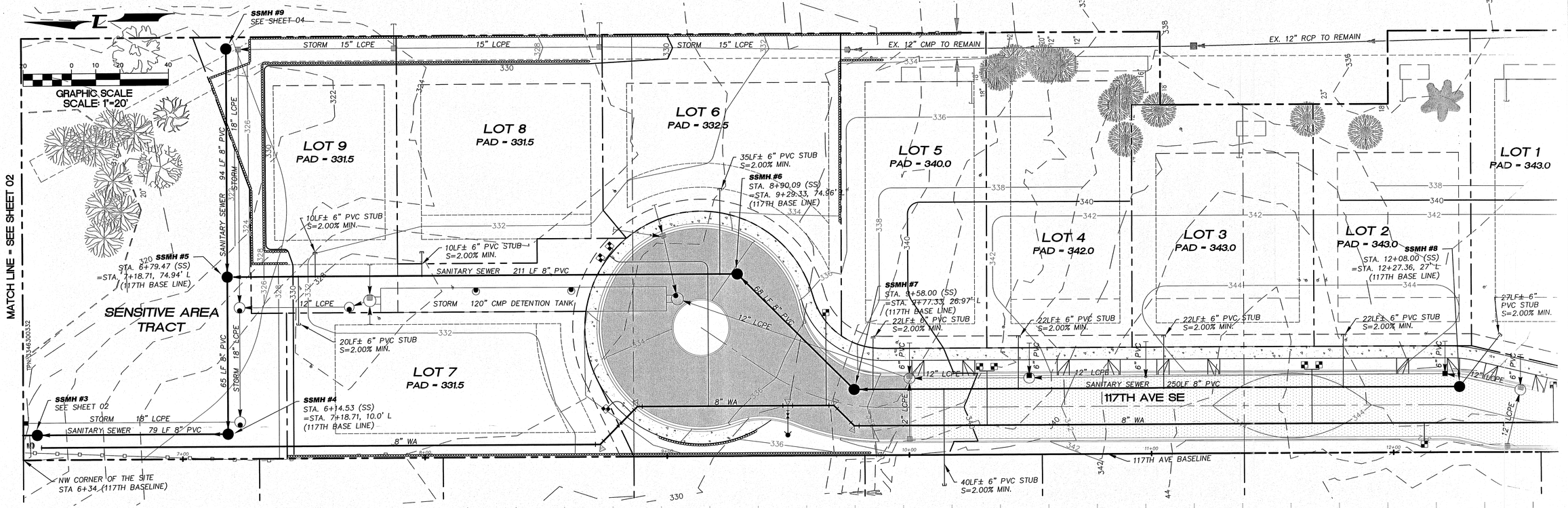
DATE: MAR 03, 2013
SCALE: NOTED

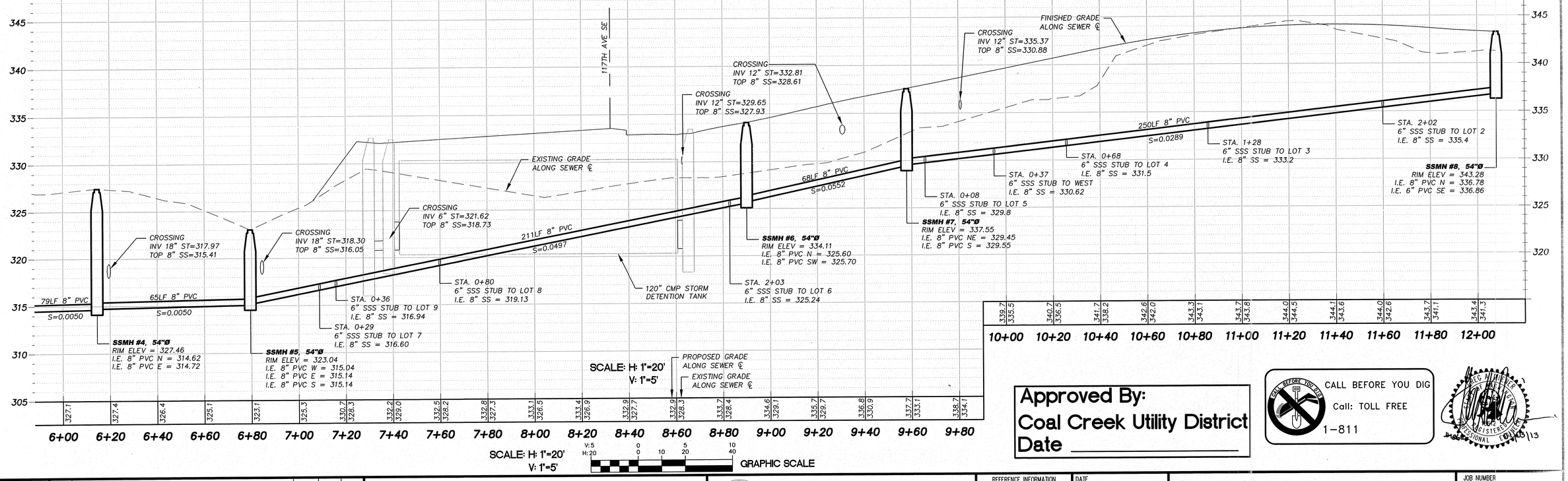
LAWRENCE PARK SEWER AND WATER

SANITARY SEWER PLAN AND PROFILE (1)

JOB NUMBER
DWG NO. 12041SS-1-2.DWG
SHEET 02 OF 09

PORTION OF SW 1/4 OF THE NW 1/4 OF SEC. 33, T. 24N., R. 5 E., W.M.





Approved By:
Coal Creek Utility District
Date _____

CALL BEFORE YOU DIG
Call: TOLL FREE
1-811

DESIGNED		REVISED PER DISTRICT COMMENTS			
DRAWN	JINGSONG	REVISED PER DISTRICT COMMENTS			
CHECKED	JINGSONG				
		SYM	REVISION	DATE	BY	APP'D

PLOT DATE & TIME
FILE NAME (UPRATED BY)

Pacific Engineering Design, LLC
15445 53RD AVE. S. SEATTLE, WA 98188
PHONE: (206) 431-7970 FAX: (206) 388-1648 WEB SITE: PACENG.COM
Civil Engineering and Planning Consultants

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

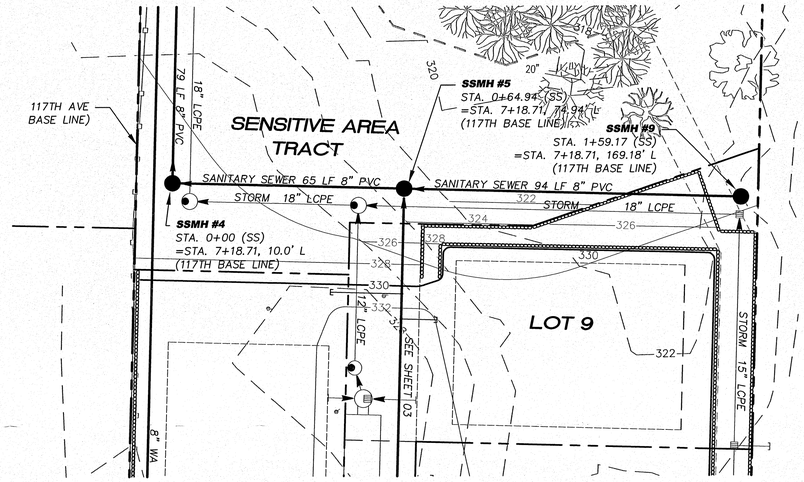
REFERENCE INFORMATION	
FIELD BOOK:	
SURV. CPU FILE:	
DATUM: NAVD88	

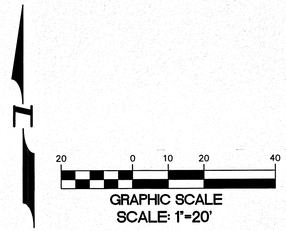
DATE: MAR 03, 2013
SCALE: NOTED

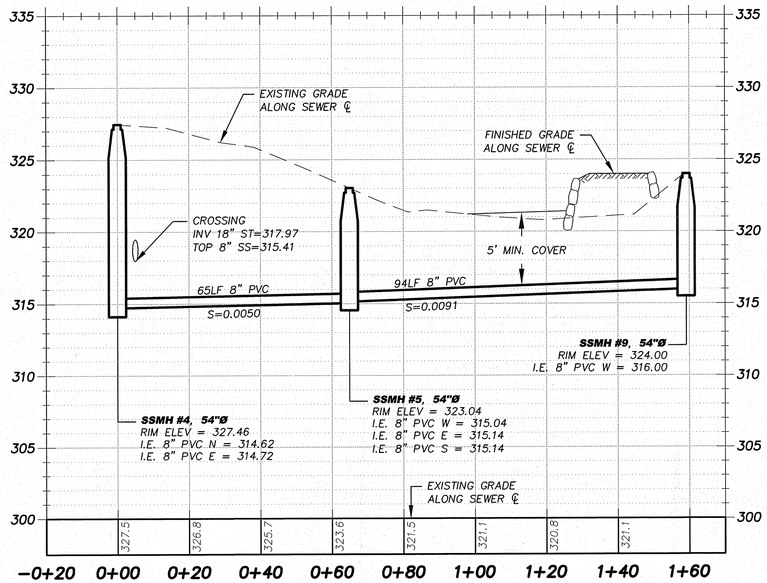
LAWRENCE PARK SEWER AND WATER
SANITARY SEWER PLAN AND PROFILE (2)

JOB NUMBER
DWG NO. 12041SS-1-2.DWG
SHEET 03 OF 09

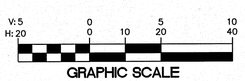
PORTION OF SW 1/4 OF THE NW 1/4 OF SEC. 33, T. 24N., R. 5 E., W.M.







SCALE: H: 1"=20'
V: 1"=5'



Approved By:
Coal Creek Utility District
Date _____

CALL BEFORE YOU DIG
Call: TOLL FREE
1-811

REG. NO. 16652 REGISTERED PROFESSIONAL ENGINEER 5/13

SYM	REVISION	DATE	BY	APP'D
	REVISED PER DISTRICT COMMENTS			
	REVISED PER DISTRICT COMMENTS			

DESIGNED
DRAWN JINGSONG
CHECKED JINGSONG

PLOT DATE & TIME
FILE NAME (UPDATED BY)
LOGIN NAME

Pacific Engineering Design, LLC
15445 53RD AVE. S. SEATTLE, WA 98188
PHONE: (206) 431-7970 FAX: (206) 388-1648 WEB SITE: PACENG.COM
Civil Engineering and Planning Consultants

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

REFERENCE INFORMATION
FIELD BOOK:
SURV. CPU FILE:
DATUM: NAVD88

DATE: MAR 03, 2013
SCALE: NOTED

LAWRENCE PARK SEWER AND WATER
SANITARY SEWER PLAN AND PROFILE (3)

JOB NUMBER
DWG NO. 12041SS-1-2.DWG
SHEET 04 OF 09

PART TWO – MATERIALS

2-1 GENERAL

All materials and equipment shall be new and workmanship and materials shall be good quality. All material incorporated into the work shall conform to the provisions of this part. All references to Specifications shall be of the latest edition.

2-2 MATERIAL LISTS AND SPECIFICATIONS

The Developer or his Contractor shall deliver to the Engineer a material list not less than ten (10) days before commencement of construction. The list shall contain the manufacturer and model number, if applicable, of the material and equipment to be installed as a part of the work so that the Engineer may determine whether such materials conform to the Plans and Specifications. No materials that are not included in the material list shall be installed as a part of the work. The manufacturer's technical specifications for pipe, appurtenances and equipment to be incorporated into the work shall be submitted to the Engineer at least ten (10) days prior to commencement of construction with the materials listed.

2-3 GUARANTEE BY MANUFACTURER

If requested by the District or by the Engineer, a written guarantee made by the manufacturer of any materials to be incorporated into the work shall be furnished, guaranteeing to the District that such materials shall conform to these Specifications and any specifications otherwise applying to the work.

2-4 SEWER PIPE AND APPURTENANCES, NON-PRESSURE

Non-pressure sewer pipe shall be PVC pipe conforming to ASTM D-3034 for depths of cover between 5 feet to 12 feet; and Ductile Iron pipe, class 50, cement lined conforming to AWWA Standard C-151 and C-104 for depths of cover less than 5 feet or exceeding 12 feet and for slopes less than 1% and and over 15%. Pipes installed at slopes 15% or greater shall incorporate "Field Lok" gaskets for the entire run.

PVC sewer pipe is defined as flexible conduit. Joints shall conform to ASTM D-3212 using a restrained rubber gasket conforming to ASTM F-477. Fittings shall be injection molded tees or factory solvent welded saddle tees. Saddles fastened to pipe with external bands are not acceptable on any new system.

Ductile Iron pipe is defined as rigid conduit. Mechanical or push-on joints shall conform to AWWA Standard C-110.

2-5 SEWER PIPE AND APPURTENANCES – PRESSURE

Unless otherwise specified, pressure pipe shall be constructed of:

(a) Ductile Iron pipe conforming to AWWA C-151 with a manufacturer's thin cement lining conforming to AWWA C-104 (except as to thickness) and with the type of joint, class, thickness, designation and markings as specified.

(b) Cast Iron fittings shall be rubber-gasket and shall conform to AWWA C-110 and C-111. Valves shall conform to AWWA Specifications C-500.

2-6 MANHOLES – 54" STANDARD

(a) Manhole Frames and Covers

Cast Iron frames and covers shall conform to the Olympic Foundry Company No. MH30A, or equivalent. Castings shall conform to the requirements of ASTM A48, class 30 and shall be free of porosity, shrink cavities, cold shuts, or cracks or any surface defects which would impair service ability. Repair of defects by welding, or by the use of "smooth-on" or similar material will not be permitted. Cover to be non-skid type surface and shall have the word "SEWER" in large raised letters.

A bituminous coating shall be applied to all surfaces. The finished coating shall be continuous, smooth, neither brittle when cold nor sticky when exposed to the sun, and shall be strongly adherent to the casting. The District shall have the right to require inspection and approval of all castings prior to painting. Manhole rings and covers shall be machine finished or ground on seating surfaces to assure non-rocking fit in any position, and interchangeability. At the request of the District, there shall be made available at the foundry standard rings and standard covers for use by inspectors in testing fit and seating.

Manholes located outside public rights-of-way shall be equipped with a locking device of such design that the cover may be readily released from the ring. All movable parts shall be made of non-corrosive metals otherwise arranged to avoid possible binding. At the request of the District, there shall be made available at the foundry a testing device suitable for proving the capacity of the of the assembly to resist an uplift pressure on the lid equal to a 20-foot head. The locking frame and cover shall be Metro standard frame and cover with 3-screw-type locking lids.

All manhole frames and covers shall be identified by the name or symbol of the manufacturer. This identification shall be in a plainly visible location when the frames and covers are installed. In addition to the manufacturer's identification, the material shall be identified by the following "NOD" or "DUC" for nodular or ductile iron respectively. The manufacturer's identification and the material identification shall be adjacent to each other and shall be minimum 1/2-inch letters, recessed to be flush with the adjacent surfaces.

(b) Precast Manhole Components

Precast manhole components shall conform to ASTM C-478 except as modified herein. Base section openings to receive pipe shall be circular, tapered inward, and held to the minimum size practical to accomodate the pipe to be inserted to effectively seal the joint. Pipe to manhole connections shall be made with a rubber boot installed in a pre-cored opening.

All Manholes shall have all interior surfaces, including channeling, coated (sealed) with a high solids urethane coating, Wasser MC-AROSHIELD or approved equal. Color of coating shall be white.

Precast manhole elements shall be provided with steps and/or ladders such that the completed manhole will contain a continuous vertical ladder with rungs equally spaced at 12 inches apart plus or minus 3/4 inch. The lowest rung shall be not more than 16 inches above the shelf, and the uppermost rung shall be not more than 18 inches below the street surface.

Joints between precast manhole elements shall be rubber gasketed similarly to pipe joints and shall conform to ASTM C-433. Shop drawings of the joint design shall be submitted to the Engineer for approval, prior to manufacture. Completed joints shall show no visible leakage and shall conform to the dimensional requirements of ASTM C-478.

Standard flat slab covers for shallow manholes shall be a minimum of 8 inches thick and shall conform to the outer dimension of the standard sections upon which they are to be placed. The 24-inch diameter opening shall be eccentrically located as shown on the Standard Plans to provide at least 6 inches minimum radial distance from the edge of the 24-inch opening to the inside face of the standard section below. Reinforcing shall be as shown on the Standard Plans. Reduction to 24 inches shall be made by means of of a flat slab, for shallow manholes, or an eccentric precast cone for standard manholes.

(c) Deformed Bar Steps

Galvanized deformed bar steps shall be 1-inch-diameter deformed bar conforming to ASTM A-615, Grade 40 or Grade 60, hot bent and galvanized after bending. For Bending, the temperature shall be at least 1,600 degrees F. Galvanizing shall conform to ASTM A-123. Step dimensions and pattern shall conform to the Standard Plans.

Polypropylene coated steps shall conform to ASTM C-478 with deformed bar conforming to ASTM A-615. Steps shall be Lane model P-14936 or approved equal.

(d) Ladders

Precast manhole base sections more than three feet in height shall be provided with a ladder as detailed on the Standard Plans. Ladders shall be galvanized steel or polypropylene coated.

2-7 IMPORTED BACKFILL MATERIAL

Imported backfill material shall be free from wood, bark, roots or other extraneous material and shall meet the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
2-1/2" Square Opening	100
1/4" Sieve	25 Min.
No. 200	10 Max.
Sand Equivalent	35 Min.

PEA GRAVEL WILL NOT BE ALLOWED AS BACKFILL MATERIAL.

2-8 TRENCH FOUNDATION MATERIAL

Over-excavated material shall be replaced with trench foundation material conforming to one of the following gradations as specified:

U.S. Standard Sieve Size	Class "A" Min.	Class "A" Max.	Class "B" Min.	Class "B" Max.
2-1/2" square opening	98%	100%	95%	100%
2" square opening	92	100	75	100
1-1/2" square opening	72	87	30	60
1-1/4" square opening	58	75	0	15
3/4" square opening	27	47	0	1
3/8" square opening	3	14	0	0
No. 4 sieve	0	1	0	0

2-9 BEDDING MATERIAL

Bedding material shall be well-graded, clean, granular material, commonly known as pea gravel and shall meet the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
Pea Gravel:	
3/8" square opening	100
#8 sieve	0-5

2-10 ASPHALTIC CONCRETE

Asphalt concrete pavement shall conform to the technical requirements for Class B Asphalt in the latest edition of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction.

2-11 TOP COURSE AND KEYSTONE MATERIAL

For use in the restoration of excavated areas, Top Course and Keystone material shall be manufactured from ledge or talus rock, be free from wood, roots, bark and other extraneous material and shall conform to the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
5/8" square opening	100
1/4" square opening	55-75
U.S. No. 40 sieve	8-24
U.S. No. 200 sieve	10 Max.
Sand Equivalent	40 Min.

2-12 BASE COURSE MATERIAL

Base course material shall conform to the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
1-1/2" square opening	100
5/8" square opening	50-80
1/4" square opening	30-50
U.S. No. 40 sieve	3-18
U.S. No. 200 sieve	7.5 Max.
Sand Equivalent	40 Min.

2-13 CONCRETE BEDDING AND BLOCKING

Bedding and blocking concrete shall be Portland cement concrete containing four sacks of cement per cubic yard and maximum aggregate size of 1-1/2 inches. Maximum slump shall be 3-1/2 inches.

PART THREE – CONSTRUCTION

3-1 GENERAL

Except as otherwise noted herein, all work shall be accomplished as recommended in the latest revision of AWWA and APWA Specifications and according to the recommendations of the manufacturer of the material and equipment concerned. All specified depths shall be compacted depths.

In roadway areas, all asphalt and concrete pavement shall be saw cut. When trenching operations cut through concrete pavement, the pavement shall be removed to a width of 18 inches greater than the top width of the trench. The concrete shall be saw cut on a straight line and shall be beveled so that the cut will be approximately 1 inch wider at the top than at the bottom. Asphalt paving shall be saw cut ahead of the backhoe to prevent excessive tearing up of the surfacing and to eliminate ragged edges.

3-2 TRENCH EXCAVATION

Trenches shall be excavated to the line and grade designated by the District. Unless otherwise specified, trench sides shall be excavated vertically. Trench widths shall be adequate for proper working space and placement of bedding material under and around the pipe. The trench width, from the bottom of the trench to 4" above the crown of the pipe, shall not exceed 40 inches for 15-inch diameter and smaller pipe, or 1.5 times the inside diameter of 18-inch or larger pipe, plus 18 inches. If these widths are exceeded, a stronger grade of pipe and/or a higher classification and amount of bedding material shall be furnished, as directed by the District.

Excavation for manholes or other structures shall be sufficient to provide a minimum of 18 inches between the structure and the sides of the excavation, enough to allow for proper compaction of the surrounding backfill.

All material excavated from trenches and piled next to the trench, shall be placed and maintained so that the top of the material is at least 2 feet from the edge of the trench. Excavated material shall be located so that free access is provided to all fire hydrants, water valves, meters and other utilities, and clearance shall be left to enable free flow of storm water in all gutters, conduits and natural water courses.

3-3 TIMBERING AND SHEETING

The developer shall provide and install timbering and sheeting as necessary to protect workers, the work, existing buildings, utilities and other properties, and shall meet all OSHA and WISHA requirements.

3-4 JACKED OR BORED CROSSING

All work shall be done in conformance with the requirements of the agency in control of the facility being bored or jacked. See Roadway and Railway Crossings for further details.

3-5 ROADWAY AND RAILWAY CROSSINGS

Any method may be used for roadway or railway crossings that provides for satisfactory results and is acceptable to both the District and the governmental or private agency having control of the road or track, provided that the road or track shall be restored to its original condition after the crossing is completed. If tunneling or jacking is elected or required for crossings, steel, cast iron or concrete pipe casing shall be placed and the sewer pipe laid within the casing. For District Standards for boring or tunneling see "Water or Sewer Casing Detail" on seperate sheet.

3-6 TRENCH FOUNDATION

If, in the judgement of the District, the native trench bottoms will provide a firm base for the subsequent placement of bedding, pipe and backfill, such native trench bottom may be used if the bottom is leveled and smoothed so that the entire length of pipe will rest on a well-compacted base. Trench bottoms shall be over-excavated as necessary to remove all unstable soil and eliminate "boiling" or "quick" conditions to such a depth as to provide a firm base. Over-excavated materials shall be replaced with trench foundation material as specified in Section 2-8. Foundation material shall be placed when ordered by the District.

3-7 BEDDING MATERIAL PLACEMENT

All flexible pipe shall be placed in bedding material of the type specified in Section 2-9 (a). The bedding shall be placed from a minimum of 4 inches below the pipe barrell to 4 inches above the pipe as shown on the Standard Detail herein. Bedding material shall be worked by hand under, around and over the pipe to the depths required for the full width of the trench.

All rigid pipe shall be placed in bedding material of the type specified in Section 2-9 (a) or (b). The bedding shall be placed from a minimum of 4 inches below the pipe barrel to the spring line of the pipe as shown on the Standard Detail. Bedding shall be placed in more than one lift. The first lift, to provide at least 4-inch thickness under any portion of the pipe, shall be placed before the pipe is installed and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6-inch thickness shall be placed as shown on the Standard Detail and individually compacted to a minimum of 90 percent of maximum density. Shoring to be removed, or moveable trench shields or boxes, shall be located at least 2-1/2 pipe diameters away from flexible pipe if the bottom of the shoring, shield or box extends below the top of the pipe, unless a satisfactory means of reconsolidating the bedding or side support material disturbed by shoring removal can be demonstrated.

In solid rock excavation, all ledge rock, boulders or stones shall be removed to provide a minimum clearance of 8 inches under the pipe. All material thus removed shall be replaced with bedding material.

3-8 GRADE LINES

The Contractor shall maintain the correct grades between manholes and shall check all intermediate grade stakes by means of a taut grade wire between at least three intermediate grade stakes. In the event that the grade stakes do not line up, the work shall be stopped until the situation is corrected. All bench marks, reference points and stakes shall be preserved. In case of destruction of any of them, the resulting expense of restoration shall be borne by the Developer. Construction staking shall consist of grade stakes at 10 foot offsets. Stakes at each manhole and intermediate grade stakes shall be offset 10 feet and located at 50 foot stations between manholes. Laser beam equipment for grade and alignment control is an acceptable alternative.

3-9 PIPELAYING

Each pipe shall be laid with bells upgrade and the invert of the pipe to the alignment and grade shown on the Plans. Concentric joints shall be closed and a smooth invert provided. Open ends of pipes or fittings shall be temporarily blocked or covered when laying is not in progress.

Adjustment to the line and grade shall be done by scraping away or filling and tamping bedding material under the body of the pipe. No wedging or blocking of the pipe for adjustment to line and grade may be done.

The pipe shall be lowered into the trench by means of ropes, trolley, crane or any other suitable means, shall not be dropped or handled roughly, and shall be checked for cracks and defects before installation. Any cracked or defective pipe shall not be installed.

Tees, wyes and standing services shall be installed as shown in the Standard Details herein and at such locations as shown on the Plans, or as otherwise directed by the District. They shall not be covered until the District has completed inspection and recorded their exact location.

Variance from established line and grade shall not be greater than 1/32nd of an inch per inch of pipe diameter, but shall not exceed 1/2 inch or result in a level or reverse sloping invert.

3-10 PIPE JOINTS

No joints shall be covered until examined and approved by the District. Only pipelayers experienced with the type of gasket being used in the work shall be allowed to lay pipe. On the request of the District, proof of such experience shall be furnished before laying may begin.

Joint material shall be installed according to the manufacturer's recommendations. After the gasket has been affixed, the pipe shall be handled to avoid bumping the gasket, knocking out of position or loading it with dirt or other foreign material. Any gasket so disturbed shall be removed, replaced, cleaned and relubricated before the joint is made. The pipe shall be properly aligned before the joint is forced home. During insertion of the tounge or spigot, the pipe shall be partially supported by hand, sling or crane as required to minimize lateral pressure on the gasket and to maintain concentricity until the gasket is properly positioned. Pipe deflection and straightening shall be avoided once the joint is home, to prevent creep of the joint.

Sufficient pressure shall be applied in making the joint to assure that the joint is home, as defined in the pipe manufacturer's standard instructions for installation. Sufficient restraint shall be applied to the line to assure the joints, once home, are held so by tamping fill under and alongside the pipe or other appropriate means. At the end of the day's work, the last pipe laid shall be blocked in such a manner as may be required to prevent creep during downtime.

3-11 MANHOLES

Precast manhole base sections shall be placed on a well-compacted bedding course of bedding material. The depth of the bedding shall not be less than 4 inches thick, extending a minimum of 12 inches beyond the outside perimeter of the base section. The balance of any remaining excavated area shall be filled with imported backfill material and well tamped to the level of the top of the bedding before the manhole is set in place. The bedding shall be well tamped and made smooth and level to assure uniform contact support to the precast elements.

All lift holes and the inside and outside face of rubber gasketed joints between precast sections shall be thoroughly wetted, pointed, then filled with mortar, and smoothed both inside and out. Precast sections shall be placed and aligned to provide vertical sides and vertical alignment of ladder rungs. The completed manhole shall be rigid, true to dimension and watertight.

Manholes set in paved streets or other paved areas shall be set to the finished grade of the paving. When required, the manhole frame shall be tilted to conform to the grade of the paved surface. Manholes not set in paved areas shall be set at a finished grade slightly higher than that of the surrounding terrain to prevent surface water infiltration into the system. Manholes set in unpaved areas shall have an asphalt pad, 2" thick and 6' in diameter placed around the manhole casting. Manholes at the end of a line with no inflow, shall have sloped floors to drain to the outflow. If there is inflow, a channel shall be provided. Unless needed to clear a paved road, stub-outs and channels intended to facilitate future hookup shall be omitted.

Manhole channels shall be made to conform to the sewer grade and shall be brought together with well-rounded junctions. Channel sides shall be carried vertically to the crown elevation of the various pipes. The concrete shelf shall be smoothly finished with slopes to drain. Channels shall not narrow down to less than the inside diameter of the pipe.

All pipe openings, when practical, shall be cored before setting the manhole. Pipe connections shall be made by use of a rubber boot connector, Kor-N-Seal or equal.

3-12 BACKFILLING

No backfilling shall be performed until after the District has inspected the installation of the pipe and bedding and approved backfilling.

The initial backfill shall be hand placed select material spread evenly over the bedding material and compacted by hand to an elevation of 6 inches above the crown of the pipe for Ductile Iron pipe and 10 inches above the crown of the pipe for PVC. This shall be done in such a manner that subsequent backfilling will not disturb the pipe in any way. Subsequent lifts of not more than 2-foot thickness shall be placed as shown on the Standard Details and individually compacted to a minimum of 90 percent maximum density. Subsequent backfilling shall be performed by pushing material from the end of the trench along and directly over the pipe so that the material will be applied in a rolling slope, rather than by side filling. Backfilling from the sides of the trench will not be done until the District has determined that material has been carefully placed over the pipe to a sufficient depth.

In areas such as existing paving, or in areas to be paved, where the District determines that minor settlement would be detrimental and the native excavated material is not suitable for compaction as backfill, the trench shall be backfilled with imported backfill material as specified in Section 2-7.

3-13 COMPACTION OF BACKFILL

Compaction of backfill and backfill procedures in public rights-of-way shall, at the minimum, conform to the requirements of the governmental agency having jurisdiction thereof.

Backfilling shall be compacted to 95 percent of maximum theoretical density in all areas where paving will be placed over the backfill or in shoulder areas and to 90 percent of maximum theoretical density in all other areas. Measurement of compaction density shall be by the modified AASHTO method.

Compaction of backfill shall be achieved by power operated tampers, roller vibration equipment or other mechanical means. Water settling will not be acceptable as a means of compaction. If excavated material has a California Bearing Ratio for compacted and soaked sample of less than 7, or for any other reason cannot be compacted as specified, such excavated material shall be replaced with imported backfill material. No backfill shall be placed without immediate compaction according to these specifications.

The District will require that the services of an independent testing laboratory or county testing laboratory be employed to perform in-place density tests to ascertain whether the specified density can be or has been obtained. The costs of these tests shall be borne by the Developer.

Regardless of the approval of the District as to the manner of compaction or testing, the Developer shall repair any settlement of trenches and excavations that may occur within two years after completion and formal acceptance of the work by the District.

3-14 CLEANING AND FLUSHING

Prior to pipe testing, all pipes shall be cleaned as provided in this section. An inflatable ball of a size that will inflate to fit snugly into the pipe shall be furnished by the Contractor and placed in the last manhole on the pipe to be cleaned. The ball may be used with a tag line or a rope may be fastened to the ball to locate and control its position at all times. Water shall be introduced behind the ball and the ball shall pass through the pipe with only the force of the water impelling it. All debris flushed ahead of the ball shall be removed at the first manhole where presence of the debris is noted. In the event that cemented or wedged debris or damaged pipe shall stop the ball, the obstruction shall be removed.

3-15 TESTING OF NON-PRESSURE SEWER PIPE – DEFLECTION TESTING FOR FLEXIBLE SEWER PIPE

All non-pressure sewer pipe shall be air tested. The procedures set forth in this section shall be employed in conducting the testing. All facilities and personnel for conducting the testing under the observation of the District shall be furnished by the Developer. All equipment and personnel to conduct the test shall be subject to the approval of the District. Although air testing may be performed for the convenience of the Contractor before backfilling, no pipe shall be accepted until air tests have been performed after backfilling and compacting.

All wyes, tees and ends of side sewer stubs shall be plugged with flexible joint caps, or an alternate acceptable to the District, and securely fastened to withstand the internal test pressure. Such plugs or caps shall be readily removable and their removal shall provide a socket suitable for making a flexible-jointed lateral connection or extension. No double plugs shall be used.

Immediately following the pipe cleaning, and manhole channeling the pipe installed shall be tested with low pressure air. Air shall be slowly supplied to the plugged pipe installation until the internal air pressure reaches 4.0 pounds per square inch greater than the average back pressure of any ground water that may submerge the pipe. At least two minutes shall be allowed for temperature stabilization before future procedure. A pressure gauge with a maximum of 30 p.s.i. shall be used for testing.

The pipe shall be acceptable if the time required in seconds for the pressure to decrease from 3.5 to 3.0 psi greater than the average back pressure is equal to or greater than the listed values for corresponding sizes of pipe shown on the air test graph located elsewhere in Part Four. Hazards created by use of air pressure for testing pipe shall be guarded against, and all plugs shall be securely blocked to prevent blowouts. A supply air regulator shall be installed on the air supply to the sewer that will allow only a maximum of 6 psig in the line to be tested and all pressure shall be relieved from the sewer line before removal of test plugs.

When required by the Engineer, all sanitary sewers constructed of flexible pipe shall be deflection tested not less than 30 days after the trench backfill and compaction has been completed. The test shall be conducted by pulling a solid pointed mandrel with a diameter equal to 95 percent of the pipe diameter through the completed pipeline. Testing shall be conducted on a manhole-to-manhole basis and shall be done after the line has been completely flushed out with water. The Contractor will be required, at his expense, to locate and repair any sections failing to passs the test and to retest the section

3-16 MANHOLE ACCEPTANCE TESTS

All manholes shall be subject to an acceptance test at the request of the Owner. Manholes shall be tested by an approved vacuum test.

Water testing of the manholes shall not be allowed.

The vacuum test shall be performed prior to the installation of the manhole channeling.

All lift holes shall be plugged and seams sealed. All pipes entering the manhole shall be temporarily plugged, taking care to securely brace the pipes and plugs to prevent them from being drawn into the manhole.

The test head shall be placed at the top of the manhole in accordance to the manufacturer's recommendations. A vacuum of 10 inches of mercury shall be drawn on the manhole, the valve on the vacuum line of the test head closed, and the vacuum pump shut off. The time shall be measured for the vacuum to drop to 9 inches of mercury. The manhole shall pass if the time it takes the mercury to drop from 10 inches of mercury to 9 inches of mercury meets or exceeds the values indicated in Table 1 below.

TABLE 1

Depth (feet)	Manhole Diameter (inches) 48	54	60	66	72
	Time (seconds)				
8	20	45	26	29	30
10	25	45	33	36	00
12	30	45	39	43	00
14	35	45	45	51	00
16	40	60	52	58	120
18	45	60	59	65	120
20	50	60	65	72	120

3-17 TESTING OF PRESSURE SEWER PIPE

All force mains shall be tested at a minimum pressure of at least 50 percent above the design operating pressure for at least 30 minutes. Leakage shall not exceed the amount given by the following formula:

$$L = \frac{ND\sqrt{P}}{1850}$$

Where: L = allowable leakage in gallons per hour
N = the number of pipe joints
D = the pipe diameter in inches
P = the test pressure in psi

3-18 6-INCH SIDE SEWER FROM MAIN TO PROPERTY LINE

The material and strength class of side sewer pipe shall be the same as the sewer pipe to which it connects and these specifications shall be applicable to side sewer work. The slope of side sewers shall not exceed 2-foot vertical to 1-foot horizontal and grade shall not be less than 2 percent. Side sewers shall have minimum 48" cover. When change in slope exceeds 2 inches per foot standard wye bends shall be used. All side sewers shall be plugged and the plugs blocked.

The ends of all side sewers at the property lines shall be marked with a 2" x 4" board, the bottom of which shall be located at the invert of the end of the side sewer and the top of which shall be painted green and extended 4 feet above the ground with the length of the board and labeled "SEWER" in 2" high white stenciled letters. The entire length of the board shall be wrapped with a heavy gauge wire which is attached to the spigot end of the pipe.

3-19 CONNECTION TO THE EXISTING SYSTEM

No connections shall be made to the existing sewer system without the presence of the District. Written application for connection shall be made to the District for connection, and the connection shall be made at a time agreed upon with the District.

Connections to existing manholes shall be made as follows: If the manhole is "live," manhole channel shall be tightly covered, prior to breaking into the manhole wall, to prevent debris from entering the sewer line. Immediately after the connection is made, the new pipe shall be plugged. The plug shall not be removed without permission of the District. If the existing mannhole is not "live," a plug shall be installed in the downstream or discharge pipe of the existing manhole in addition to the above.

Connections of new mains to existing sewer lines shall be made as follows: A new manhole shall be placed over the existing line. The manhole shall be precast 54-inch diameter except that the base slab shall be cast in place. The new connection shall be plugged and blocked and the existing sewer pipe shall not be opened without the permission of the District.

Connections of side sewers to an existing sewer line shall be made as follows, or as directed by the District Engineer.

A) For ductile iron pipe, the connection shall be made with a stainless steel, or stainless steel with ductile iron flange, tapping tee, Romac model "SST" or equal. A FL by MJ adapter is required.

B) For PVC or AC pipe, the connection shall be made with a sewer saddle, Romac style "CB" or equal.

The existing sewer pipe shall be cut or drilled to give a smooth symmetrical opening of the proper size. Each connection shall be bedded with a 4-inch thick concrete pad in place to the lower quadrant of the pipe barrel. Unsuitable foundation material shall be overexcavated and replaced with bedding material.

3-20 TRAFFIC CONTROL

All traffic control shall be per the Manual of Uniform Traffic Control Devices, and/or agency of jurisdiction. During construction, traffic shall not be delayed for more than 5 minutes unless previously approved by the District and the agency of jurisdiction.

3-21 T.V. INSPECTION

Prior to acceptance, all pipe shall be flushed at the contractors expense and T.V. inspected by the District at contractors expense. Contractor shall notify the District 48 hours prior to the need for flushing and T.V. inspection. All manholes must be channeled, the sewer system completed and the roadway subbase (ATB or 2" class B asphalt) installed before the T.V. inspection. Sewer dye, Norlab or approved equal, shall be introduced into the system prior to the T.V. inspection, if required. The T.V. camera must be pulled through the pipe without use of a hydraulic flushing nozzle. VHS video tape of this inspection shall be submitted to the District along with a completed certified report by the Contractor. Video must start at the downstream manhole and proceed upstream against the flow. All defects revealed by the T.V. inspection shall be repaired by the Contractor to the District's satisfaction. Any pipe or sanitary manhole channel with a sag that creates a standing water depth of 1/4-inch may be rejected by the District (No sag of 1/2-inch or greater will be accepted.) Depending on the severity and extent of the defects, the District may require that the entire pipe run be relayed.

3-22 SIDE SEWERS

A side sewer permit will be required from the District before installation of side sewers. Commercial waste discharge from fixtures and equipment that may contain grease, including but not limited to, scullery sinks, pot and pan sinks, dishwashers, soup kettles, and floor drains located in areas where grease containing materials may exist, will require a grease interceptor prior to entering the sanitary sewer system. Commercial establishments that may discharge oil into the sanitary sewer system will require an oil separator prior to entering the sewer system.

3-23 STREAMGUARD CATCH BASIN INSERTS

All catch basins located along project shall have a streamguard sediment catch basin insert model 9226 as manufactured by Ultra-Drain Guard, model 3003 as manufactured by Foss Environmental or approved equal installed. Inserts are to be cleaned and replaced by Contractor per manufacturer's recommendations or by District direction.

CALL BEFORE YOU DIG
Call: TOLL FREE
1-811

FILE NAME (UPDATED BY) | PLOT DATE & TIME

SYM	REVISION	DATE	BY	APP'D
	REVISED PER DISTRICT COMMENTS			
	REVISED PER DISTRICT COMMENTS			

DESIGNED
DRAWN JINGSONG
CHECKED JINGSONG

Pacific Engineering Design, LLC
15445 53RD AVE. S. SEATTLE, WA 98188
PHONE: (206) 431-7970 FAX: (206)
388-1648 WEB SITE: PACENG.COM
Civil Engineering and Planning Consultants

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

REFERENCE INFORMATION
FIELD BOOK:
SURV. CPU FILE:
DATUM: NAVD88

DATE MAR 03, 2013
SCALE NOTED

LAWRENCE PARK SEWER AND WATER
SEWER STANDARD NOTES

JOB NUMBER
DWG NO. 12041STDSS-3.DWG
SHEET 5 OF 9

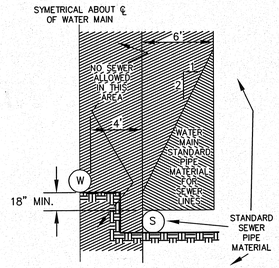


Table 1

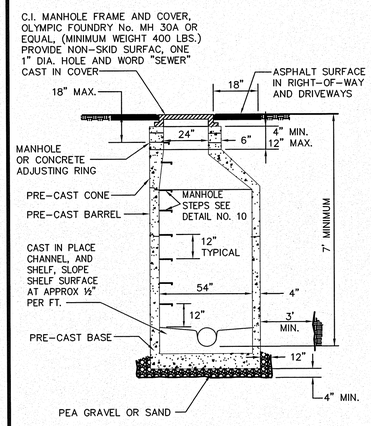
WATER MAIN STANDARD PIPE MATERIAL

TYPE OF PIPE	AWWA (ASTM) STANDARD PIPE	JOINT	FITTINGS
Ductile Iron	C 151 & C104	C 111	C 153

NOTE:

For perpendicular construction, maintain 18" separation or construct waterline passing over sewer line and use water main standards setforth above for the sewer with minimum 18 feet length centered over crossing.

DETAIL NO. 1
PARALLEL CONSTRUCTION

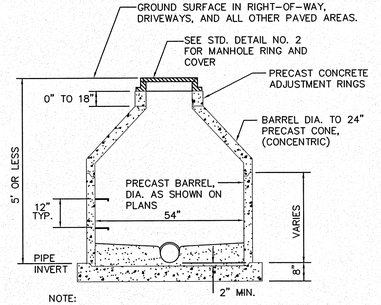


TYPICAL FOR 54" MANHOLE

NOTES:

1. Details shown are typical for all manholes unless otherwise noted.
2. A 2 inch thick, 6 foot diameter asphalt pad is to be placed around the rim of manholes in unpaved areas.
3. Manholes with depths of 20 feet and greater need to be 72" diameter with a safety platform. Ask for detail.
4. Provide a minimum three foot clearance from outside face of manhole to excavation in order to use a hoepac during compaction.
5. All Manholes shall have all interior surfaces, including channeling, coated (sealed) with a high solids urethane coating, Wasser MC-AROSHIELD or approved equal. Color of coating shall be white.

DETAIL NO. 2
STANDARD MANHOLE

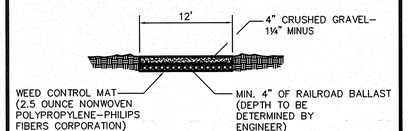


NOTE:

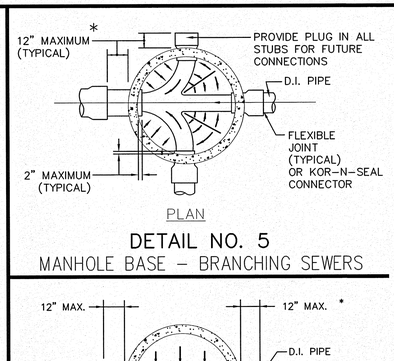
1. Manholes over 5 feet in depth from rim to invert shall have an eccentric cone and conform to standard detail no. 2.

TYPICAL FOR 54" MANHOLE

DETAIL NO. 3
SHALLOW MANHOLE

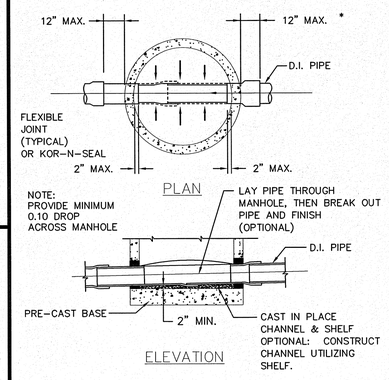


DETAIL NO. 15
ACCESS ROAD



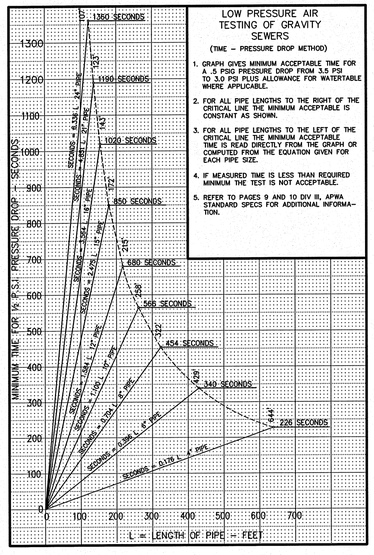
PLAN

DETAIL NO. 5
MANHOLE BASE - BRANCHING SEWERS

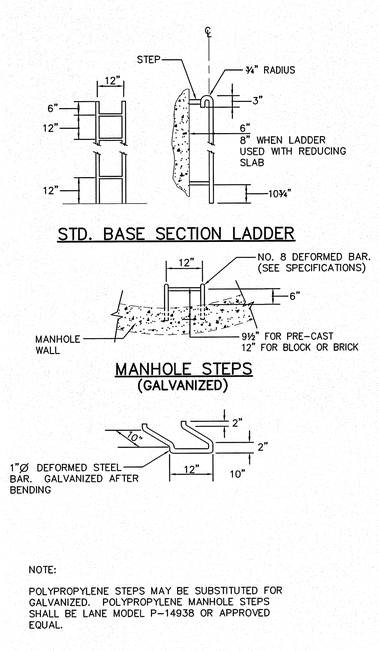


DETAIL NO. 6
MANHOLE BASE STRAIGHT THROUGH FLOW

* FOR PVC PIPE, JOINTS SHALL BE PLACED A MIN. OF 10 FEET FROM THE MANHOLE WALL.



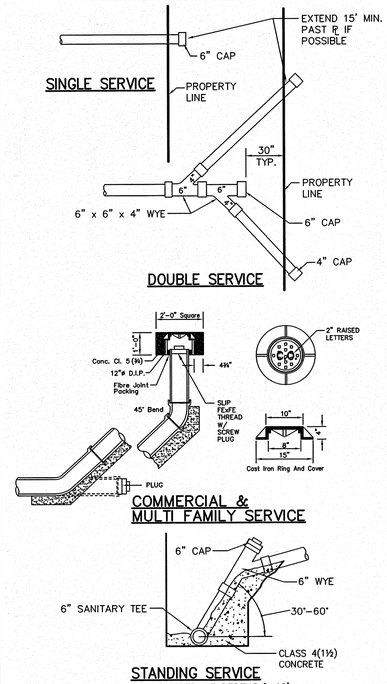
DETAIL NO. 14
LOW PRESSURE AIR TESTING OF GRAVITY SEWERS



NOTE:

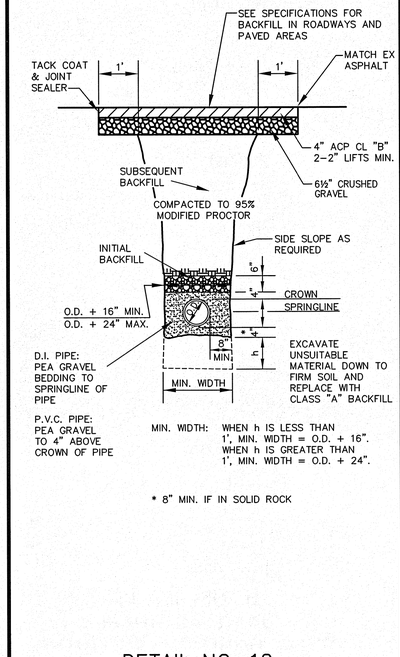
POLYPROPYLENE STEPS MAY BE SUBSTITUTED FOR GALVANIZED. POLYPROPYLENE MANHOLE STEPS SHALL BE LANE MODEL P-14938 OR APPROVED EQUAL.

DETAIL NO. 10
MANHOLE STEP DETAILS



STANDING SERVICE
MAY BE REQUIRED AT DEPTHS > 12'

DETAIL NO. 11
SIDE SEWER DETAILS



* 8" MIN. IF IN SOLID ROCK

DETAIL NO. 12
TRENCH CROSS SECTION FOR P.V.C. OR D.I. PIPE

PLOT DATE & TIME

FILE NAME (UPDATED BY)

DESIGNED					
DRAWN	JINGSONG				
CHECKED	JINGSONG				
SYM	REVISION	DATE	BY	APP'D	
	REVISED PER DISTRICT COMMENTS				
	REVISED PER DISTRICT COMMENTS				

Pacific Engineering Design, LLC
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Civil Engineering and Planning Consultants

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

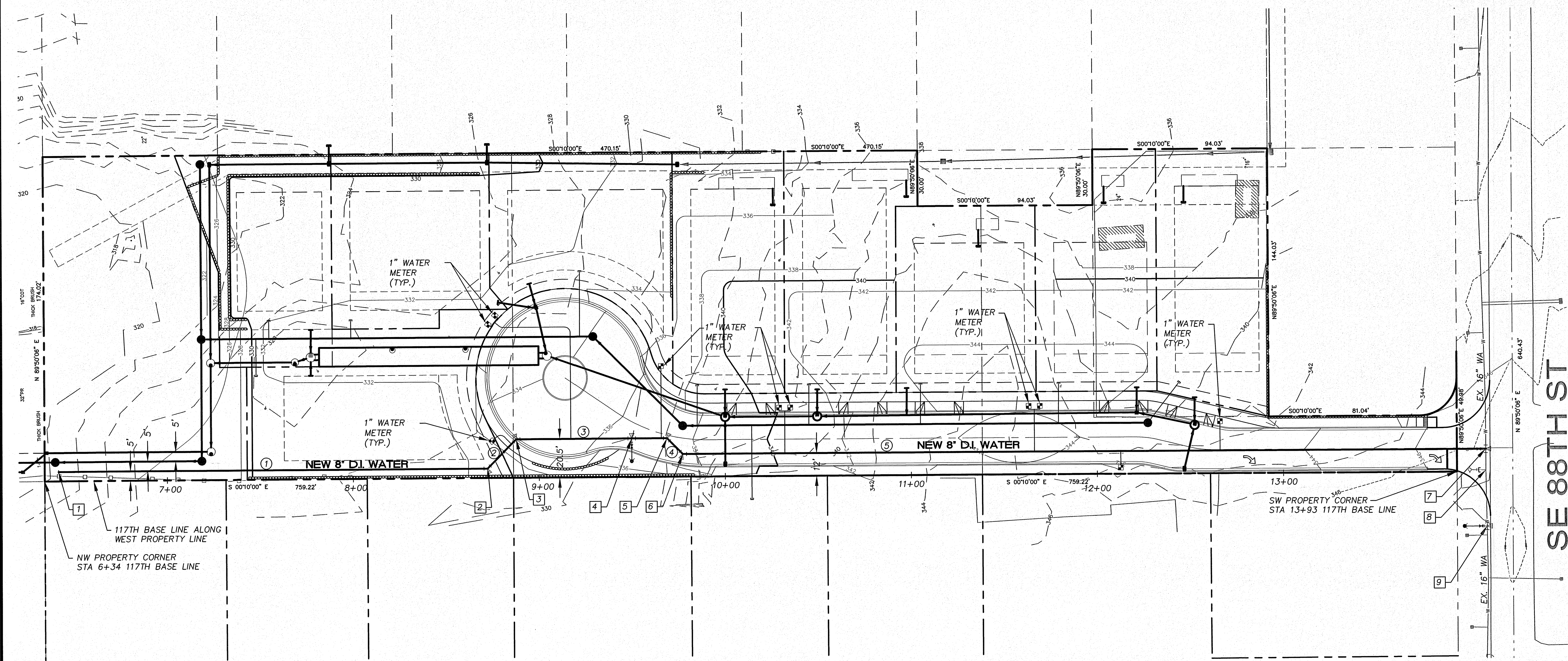
REFERENCE INFORMATION	
FIELD BOOK:	
SURV. CPU FILE:	
DATUM: NAVD88	

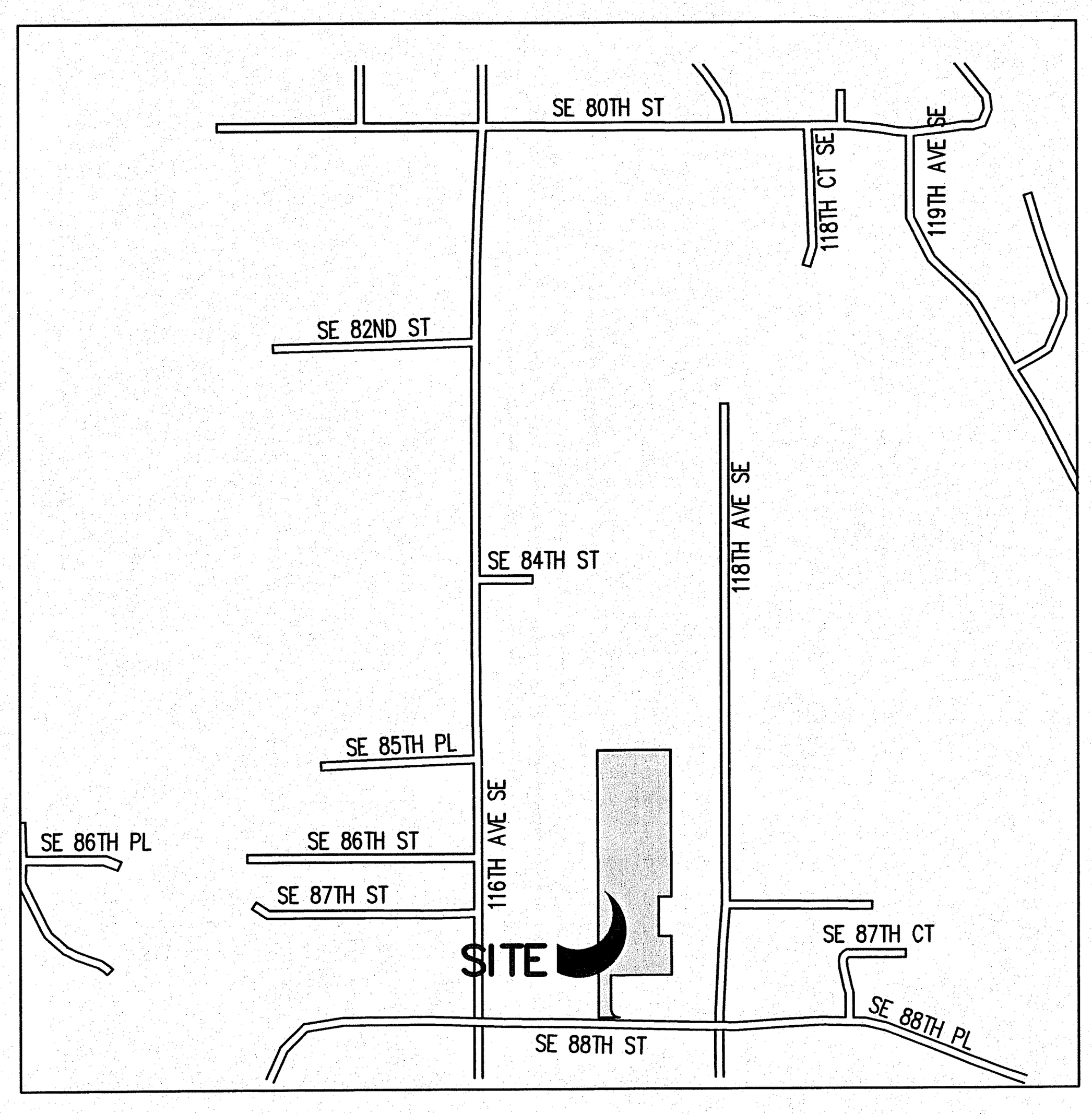
DATE: MAR 03, 2013
SCALE: NOTED

LAWRENCE PARK SEWER AND WATER
SEWER STANDARD DETAILS

JOB NUMBER
DWG NO. 12041SSDT-4.DWG
SHEET 6 OF 9

PORTION OF SW 1/4 OF THE NW 1/4 OF SEC. 33, T. 24N., R. 5 E., W.M.





VICINITY MAP

N.T.S.

BASIS OF BEARING

THE MONUMENTED CENTERLINE OF 116TH AVE SE AT BEARING OF S00°10'00"E

BENCH MARK :

VERTICAL DATUM : CITY OF RENTON – NAVD88
CITY OF RENTON No. 1893 CONCRETE MONUMENT WITH BRASS DISK, SET 1.5' BELOW THE TOP OF AN IRON MONUMENT CASE AT THE INTERSECTION OF SE 80TH STREET AND 116TH AVENUE SE SET IN THE CENTER OF THE INTERSECTION.

ELEVATION = 321.279 FEET

PRESSURE ZONE

THE PROPOSED WATER MAIN IS IN THE PRESSURE ZONE OF 475'

GENERAL NOTES

1. MAXIMUM ALLOWABLE DEFLECTION ON EACH JOINT SHALL NOT EXCEED ONE-HALF THE MANUFACTURER'S RECOMMENDED PERMISSIBLE DEFLECTION.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH COAL CREEK UTILITY DISTRICT STANDARD SPECIFICATIONS AND THE CITY OF NEWCASTLE.
3. LOCATIONS OF THE EXISTING UTILITIES SHOWN ARE APPROXIMATE. EXISTING UTILITIES SHALL BE FIELD LOCATED BY REPRESENTATIVE UTILITY COMPANIES PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL FIELD VERIFY ALL CONNECTIONS TO EXISTING PIPES FOR PROPER FITTING AND DEPTH.
5. CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITIES 24 HOURS PRIOR TO CONSTRUCTION.
6. ALL ADAPTERS ARE TO BE DUCTILE IRON FITTINGS.
7. VALVE POST MARKERS ARE TO BE INSTALLED FOR VALVES LOCATED OUT OF ASPHALTED AREAS.
8. " FIELD LOK" GASKETS MAY BE REQUIRED BY DISTRICT ON STEEP SLOPES.

[1] STA 6+41.5, 5' LT.
1 – 2" BLOWOFF
1 – THRUST BLOCK

[2] STA 8+72.3, 5' LT.
1 – 8" 45° BEND (MJ)
1 – THRUST BLOCK

[3] STA 8+87.7, 20.5' LT.
1 – 8" 45° BEND (MJ)
1 – THRUST BLOCK

[4] STA 9+49.8, 20.5' LT.
1 – FIRE HYDRANT ASSEMBLY
PLUMPER PORT TO FACE STREET

[5] STA 9+68.8, 20.5' LT.
1 – 8" 45° BEND (MJ)
1 – THRUST BLOCK

[6] STA 9+77.2, 12' LT.
1 – 8" 45° BEND (MJ)
1 – THRUST BLOCK

[7] STA 14+08.8, 12' LT.
1 – 16"X8" TAPPING TEE (FL)
1 – 8" GATE VALVE (FLXMJ)
1 – THRUST BLOCK

[8] PLUG & BLOCK EXISTING VALVE
REMOVE EXISTING VALVE BOX AND FIRE HYDRANT
DELIVER EX. FIRE HYDRANT TO DISTRICT

[9] STA 14+06, 28' RT.
1 – 16"X6" TAPPING TEE (FL)
1 – 6" GATE VALVE (FLXMJ)
1 – FIRE HYDRANT ASSEMBLY
PLUMPER PORT TO FACE STREET

(1) 231 LF 8" D.I. PIPE CENTER TO CENTER [1] TO [2]
(2) 22 LF 8" D.I. PIPE CENTER TO CENTER [2] TO [3]
(3) 81 LF 8" D.I. PIPE CENTER TO CENTER [3] TO [5]
(4) 12 LF 8" D.I. PIPE CENTER TO CENTER [5] TO [6]
(5) 432 LF 8" D.I. PIPE CENTER TO CENTER [6] TO [7]

Approved By:
Coal Creek Utility District
Date ____________

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Pacific Engineering Design, LLC
15445 53RD AVE. S. SEATTLE, WA 98188
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Civil Engineering and Planning Consultants

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

REFERENCE INFORMATION
FIELD BOOK:
SURV. CPU FILE:
DATUM: NAVD88

DATE: MAR 03, 2013
SCALE: NOTED

LAWRENCE PARK SEWER AND WATER
WATER PLAN

JOB NUMBER
DWG NO. 12041WA01.DWG
SHEET 07 OF 09

FILE NAME (UPDATED BY) PLOT DATE & TIME

PART TWO – MATERIALS

NOTE: "Developer" in these specifications shall also signify "Contractor" for the purpose of District Financed Projects.

2-1 GENERAL

All materials and equipment shall be new and undamaged. Where possible, the same manufacturer of each item shall be used throughout the job.

2-2 MATERIAL LISTS AND SPECIFICATIONS

The Developer or his Contractor shall deliver to the Engineer a material list not less than ten (10) days before commencement of construction. The list shall contain the manufacturer and model number, if applicable, of the material and equipment to be installed as a part of the work so that the Engineer may determine whether such materials conform to the Plans and Specifications. Materials that are not included in the material list shall not be installed as a part of the work. The manufacturer's technical specifications for pipe, appurtenances and equipment to be incorporated into the work shall be submitted to the Engineer at least ten (10) days before commencement of construction with the materials listed.

2-3 GUARANTEE BY MANUFACTURER

If requested by the District or the Engineer, a written guarantee made by the manufacturer of any materials to be incorporated into the work shall be furnished, guaranteeing to the District that such materials shall conform to these Specifications and any specifications otherwise applying to the work.

2-4 DUCTILE IRON PIPE AND FITTINGS

(a) Ductile iron pipe shall conform to AWWA Standard C-151. Pipe shall be thickness class 52 or as indicated on the Drawings. Pipe and fittings shall have cement mortar lining conforming to AWWA Standard C-104. Joints shall be mechanical joint or push-on joint and shall conform to AWWA Standard C-111.

(b) Cast iron fittings shall conform to AWWA Standard C-110 or C-153. Mechanical or push-on joints shall conform to AWWA Standard C-111. Flanged joints shall conform to ASA Standard B-16.1, class 125. Flange gaskets shall be ring type, cloth insert rubber, 1/16-inch thick, equal to Rainbow or Durable Garlock.

2-5 COPPER PIPE AND FITTINGS

(a) Copper pipe shall conform to ASTM B 88, type K, annealed.

(b) Fittings shall be brass conforming to ASTM B 62 for compression style connections.

See Standard Details.

2-6 VALVES

(a) Gate valves shall be resilient seated, non-rising stem, conforming to AWWA Standard C-509. Valves shall be open by turning counterclockwise. Joints shall be as indicated on the Plans.

(b) Butterfly valves shall conform to AWWA Standard C-504 as supplemented herein. Valves shall be Class 150B with flanged, mechanical joint, or flanged x M.J. end connections. Valves in chambers shall be handwheel operated with integral position indicators. Buried valves shall have a stem extension with AWWA 2-inch operating nut and suitable valve box. Buried valves 14 inches or larger and other valves that may be designated "critical" shall be provided with a ground level position indicator and valve box adaptor. Rubber seats may be either body or disc-mounted. Valves using hardware to retain the seat shall positively secure all internal fasters with lockwires or equivalent means.

Manual operators shall be certified to withstand an input torque of 450 foot-pounds in either extreme position of travel. This torque shall be absorbed by individually adjustable travel stop mechanisms using the operator housing to limit travel. All valve operating nuts shall be brought to within three (3) feet of the finished grade.

2-7 FIRE HYDRANTS

Hydrants shall have a 5-1/4-inch main valve opening (MVO), 6-inch MJ connections, two 2-1/2-inch hose connections, ASA (National) standard thread and a 4-inch pumper connection with City of Seattle standard threads. They shall have 36 inches of ground cover unless otherwise required, and be flanged at the ground line. Hydrants shall be constructed that the direction of the pumper connection may be rotated to face the roadway. Hydrant shackles and straps shall be as shown on the Standard Details. Hydrants shall be Clow Medallion, Mueller, M & H, or Waterous Pacer model WB-67-250.

See Standard Details.

2-8 VALVE BOXES

Valve boxes in non-paved areas shall be cast iron, two-piece, suitable for installation required, equal to Rich Co. style 045 with drop in handle or approved equal. Valve boxes in paved areas shall be cast iron, two-piece, with standard style traffic lid. Locking lids of approved design shall be used where designated on plans.

2-9 CORPORATION STOP, SERVICE CLAMP, CURB STOP

See Service Connections in Standard Details.

2-10 TWO-INCH BLOW OFF

See Standard Details.

2-11 PRESSURE REDUCING STATION

See Construction Drawings and Detail Sheet.

2-12 AIR AND VACUUM RELEASE VALVES

See Standard Details.

2-13 DETECTOR CHECK VALVE

Detector check valves shall be U.L. approved, FEBCO Model 806 DDC or equal.

See Standard Details.

2-14 HYDRANT GUARD POSTS

Guard posts shall be precast concrete nine inches (9") in diameter by six feet (6') long constructed with concrete having minimum strength of 3,500 psi. Reinforcing shall consist of a minimum of four (4) #3 deformed steel bars. See Standard Detail #4 for placement.

2-15 VALVE MARKER POSTS

Valve marker posts shall be equal to Fog-Tite Meter Seal Company product 4" x 4" – 42" long.

See Standard Details.

2-16 CONCRETE BEDDING AND BLOCKING

Bedding and blocking concrete shall be Portland cement concrete containing four sacks of cement per cubic yard and a maximum aggregate size of 1-1/2 inches. Maximum slump shall be 3-1/2 inches.

2-17 BOLTS IN PIPING

Bolts shall be carbon steel, zinc or chromium plated, brass or stainless steel.

2-18 BEDDING MATERIALS

Bedding material shall be well-graded, clean, granular sand and shall meet the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
Sand:	
3/8" square opening	100
1/4" square opening	90–100
#10 sieve	40–75
#40 sieve	15–40
#200 sieve	0–15

2-19 TRENCH FOUNDATION MATERIAL

Over-excavated material shall be replaced with trench foundation material conforming to one of the following gradations as specified:

U.S. Standard Sieve Size	Class "A" Min.	Class "A" Max.	Class "B" Min.	Class "B" Max.
2-1/2" square opening	98%	100%	95%	100%
2" square opening	92	100	75	100
1-1/2" square opening	72	87	30	60
1-1/4" square opening	58	75	0	15
3/4" square opening	27	47	0	1
3/8" square opening	3	14	0	0
No. 4 sieve	0	1	0	0

2-20 ASPHALTIC CONCRETE

Asphalt concrete pavement shall conform to the technical requirements for Class B Asphalt in the latest edition of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction.

2-21 TOP COURSE AND KEYSTONE MATERIAL

For use in restoration of excavated areas, Top Course and Keystone material shall be manufactured from ledge or talus rock, be free from wood, roots, bark and other extraneous material and shall conform to the following requirements.

U.S. Standard Sieve Size	% Passing By Weight
5/8" square opening	100
1/4" square opening	55–75
U.S. No. 40 sieve	8–24
U.S. No. 200 sieve	10 Max.
Sand Equivalent	40 Min.

2-22 BASE COURSE MATERIAL

Base course material shall conform to the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
1-1/2" square opening	100
5/8" square opening	50–80
1/4" square opening	30–50
U.S. No. 40 sieve	3–18
U.S. No. 200 sieve	7.5 Max.
Sand Equivalent	40 Min.

2-23 IMPORTED BACKFILL MATERIAL

Imported backfill material shall be free from wood, bark, roots or other extraneous material and shall meet the following requirements:

U.S. Standard Sieve Size	% Passing By Weight
2-1/2" Square Opening	100
1/4" Sieve	25 Min.
No. 200	10 Max.
Sand Equivalent	35 Min.

PEA GRAVEL WILL NOT BE ALLOWED AS BACKFILL MATERIAL.

PART THREE – CONSTRUCTION

3-1 GENERAL

Except as otherwise noted herein, all work shall be accomplished as recommended in the latest revision of AWWA and APWA Specifications and according to the recommendations of the manufacturer of the material and equipment concerned.

In roadway areas, all asphalt and concrete pavement shall be saw cut and vacuumed. When trenching operations cut through concrete pavement, the pavement shall be removed to a width of 18 inches greater than the top width of the trench. The concrete shall be saw cut on a straight line and shall be beveled so that the cut will be approximately 1 inch wider at the top than at the bottom. Asphalt paving shall be saw cut ahead of the backhoe to prevent excessive tearing up of the surfacing and to eliminate ragged edges.

3-2 ALIGNMENT

Pipe shall be laid to the specified grade and alignment as staked in the field. Alignment deviation shall not exceed 0.5 feet. Replacement of stakes lost or destroyed shall be made at the Developer's expense and in accordance with Contract Plans, including modifications called for by the District.

3-3 TRENCH

Trenches shall be excavated to the line and grade designated by the District. Except for unusual circumstances where approved by the District, the trench sides shall be excavated vertical and the trench shall be excavated to only such widths as are necessary for adequate working space. The maximum trench width at the top of the pipe shall normally be the outside diameter of the pipe barrel plus 16 inches. The trench shall be kept free from water until joining material has set. Surface water shall be diverted so as to not enter the trench. The Developer shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out. Boulders, rocks, roots and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth of 6 inches below water main grade. Where material is removed form below a water main grade, the trench shall be backfilled to grade with material satisfactory to the District and thoroughly compacted. Trenching operations shall not proceed until pipe laying is ready to commence and not more than 300 feet of trench shall be opened in advance of pipe laying operations without written approval of the District. All work on County right-of-way shall be backfilled in its entirety each day.

The depth of trenching for water mains shall be such as to give a minimum cover of 36 inches over the top of the pipe unless otherwise specified. Pipe cover shall be increased as required to provide minimum 6-inch clearance when crossing culverts or existing utilities, and due to localized breaks in grade. Where the profile of the pipeline and ground surface is shown on the Plans, the pipeline shall be laid to the elevation shown, regardless of depth. Excavation shall be to such depth that the minimum cover over the valve nuts shall be one foot. No valve shall be located in such a position as to be in any roadside ditch, drainage ditch or channel.

3-4 TRENCH FOUNDATION

If, in the judgement of the District, the native trench bottoms will provide a firm base for the subsequent placement of bedding, pipe and backfill, such native trench bottom may be used if the bottom is leveled and smoothed so that the entire length of pipe will rest on a well-compacted base. Trench bottoms shall be over-excavated as necessary to remove all unstable soil and eliminate "boiling" or "quick" conditions to such a depth as to provide a firm base. Over-excavated materials shall be replaced with trench foundation material as specified in Section 2-19. Foundation material shall be placed when ordered by the District.

3-5 TIMBERING AND SHEETING

The Developer shall provide and install timbering and sheeting as necessary to protect workers, the work, existing buildings, utilities and other properties, and shall meet all OSHA and WISHA requirements.

3-6 DUCTILE IRON

Pipe laying shall in general conform to AWWA Standard C-600 and the manufacturer's recommendations unless specifically contradicted by these Specifications. Special care shall be taken in handling pipe to avoid damaging ends, coatings and linings. Pipe shall be carried in slings and shall not be rolled or dragged.

The pipe shall be cleaned of all foreign material and examined for defects before lowering into the trench. Whenever the pipe laying is not in process, the last section of pipe shall be tightly capped or plugged. No pipe cutting will be allowed except by means of a cutter or other device approved by the District. The trench shall be overexcavated 4 inches and a sand bedding shall be placed and compacted under and around to the spring line of the pipe. After approval by the District, the backfilling shall then be completed in conformance with the section on backfilling of this Specification.

3-7 BEDDING MATERIAL PLACEMENT

All rigid pipe shall be placed in bedding material of the type specified in Section 2-18. The bedding shall be placed from a minimum of four (4) inches below the pipe barrel to the spring line of the pipe as shown on the Standard Details. Bedding material shall be worked and compacted by hand under, around and over the pipe to the depths required for the full width of the trench.

Bedding shall be placed in more than one lift. The first lift, to provide at least 4-inch thickness under any portion of the pipe, shall be placed before the pipe is installed and shall be spread smoothly so that the pipe is uniformly supported along the barrel. Subsequent lifts of not more than 6-inch thickness shall be placed as shown on the Standard Details and individually compacted to minimum 90 percent of maximum density.

3-8 BACKFILLING

No backfilling shall be performed until after the District has inspected the installation of the pipe and bedding and approved backfilling.

The initial backfill shall be hand placed select material spread evenly over the bedding material and compacted by hand up to an elevation of 12 inches above the top of the pipe. This shall be done in such a manner that subsequent backfilling will not disturb the pipe in any way. Subsequent lifts of not more than 12-inch thickness shall be placed as shown on the Standard Details and individually compacted to minimum 90 percent maximum density. Subsequent backfilling shall be performed by pushing material from the end of the trench along and directly over the pipe so that the material will be applied in the form of rolling slope, rather than by side filling. Backfilling from the sides of the trench will not be done until the District has determined that material has been carefully placed over the pipe to a sufficient depth.

In areas such as existing paving, or in areas to be paved or shoulder areas, where the District determines minor settlement would be detrimental and the native excavated material is not suitable for compaction as backfill, the trench shall be backfilled with imported backfill material as specified in Section 2-23.

3-9 COMPACTION OF BACKFILL

Compaction of backfill and backfill procedures in public rights-of-way shall, at the minimum, conform to the requirements of the governmental agency having jurisdiction thereof.

Backfilling shall be compacted to 95 percent of maximum theoretical density, from the pipe crown to the surface, in all areas where paving will be placed over the backfill and in shoulder areas and to 90 percent of maximum theoretical density in all other areas. Measurement of compaction density shall be by the modified AASHTO method.

Compaction of backfill shall be achieved by power operated tampers, or roller vibration equipment. Water settling will not be accepted as a means of compaction. If excavated material has a CaliforniaBearing Ratio for compacted and soaked sample of less than 7, or for any other reason in the judgement of the District cannot be compacted as specified, such excavated material shall be replaced with imported backfill material. No backfill shall be placed without immediate compaction according to these specifications.

The District will require that the services of an independent testing laboratory or County testing laboratory be employed to perform in-place density tests to ascertain whether the specified density can be or has been obtained, and the cost thereof shall be borne by the Developer.

Regardless of the approval of the District as to the manner of compaction or testing, the Developer shall repair any settlement of trenches and excavations that may occur within two years after compaction and formal acceptance of the work by the District.

3-10 POLYETHYLENE ENCASEMENT

Where the District determines that the pipe will be installed in corrosive soils, the Developer will protect the pipe with a polyethylene encasement as per ANSI/AWWA C105/A 21.5–82. No holes or repairs in the polyethylene encasement are allowed. Tapeing is required – poly wrap tape.

3-11 JACKED OR BORED CROSSING

All work shall be done in accordance with the requirements of the agency in control of the facility being bored or jacked. See highway crossings and railroad crossings (Section 3-12) for further details.

3-12 HIGHWAY CROSSINGS AND RAILROAD CROSSINGS

This item applies only to rigid surface pavements. The Developer may use any method that provides satisfactory results and is acceptable to the governmental agency having control of the road and to the District, provided that the Developer restores the roadway to its original condition. Normally, highway crossings require the placing of a steel casing by jacking or tunneling and laying the water mains within this casing. For steel casing specifications – see Plans. For District Standards for boring or tunneling see "Water or Sewer Casing Detail" on separate sheet.

3-13 FIRE HYDRANT INSTALLATION

Hydrant installation shall generally conform to AWWA Standard C-600 and the Standard Detail "Fire Hydrant Assembly". The concrete guard posts as shown on the Standard Detail Drawing shall be installed where required by the District. Shackle rods shall receive two coats of cold tar or asphalt prior to installation. Pumper nozzle shall face the road after installation is completed.

3-14 GATE VALVE INSTALLATION

Before installation, gate valves shall be cleaned of all foreign material as earlier specified for installation of pipe. Such blocking as the District may deem necessary shall be provided. The valve and valve box shall be set plumb with the valve box centered on the valve. The top of the valve box shall be set to the grade indicated by the District. If the valve nut is over 3 feet deep, operating nut extensions shall be used.

Valve markers shall be set where required by the District. The marker shall be set on a line through the valve at a right angle to the centerline of the road. The marker shall be generally set on the property line unless the District decides another location is safer or more conspicuous. Operating nut extensions shall be used if the nut is over 3 feet deep.

3-15 VALVE BOX INSTALLATION

Valve boxes shall be set flush in pavement. If placed in gravel areas, an asphalt pad 2 inches thick and three feet in diameter shall be placed around the box. The top of the valve box is to be set with the ears parallel to the water main.

3-16 CONCRETE BLOCKING

Concrete blocking shall be cast from 1:3:6 mix with a slump of not more than six inches (6"). Concrete blocking shall be cast-in-place, (not mixed in trench) and have a minimum of 1/4 square foot bearing against the fitting and bearing area against undisturbed soil as shown in the Standard Details. Additional bearing area may be required by the District. Blocking shall bear against fittings only and shall be clear of joints to permit taking up or dismantling joints. All hydrants, bends, tees, and valves shall be blocked. The Developer shall install blocking that is adequate to withstand full test pressure as well as operating pressures under all conditions of service. Vertical blocking, when required, shall conform to that shown in the Standard Details.

3-17 AIR AND VACUUM RELEASE VALVE INSTALLATION

See Plans. Location of the air release valves as shown on the Plans is approximate. The installation shall be set at the high point of the line.

3-18 HYDROSTATIC PRESSURE TEST

The hydrostatic pressure test shall be performed after the water system to be tested is initially filled, but before bacteriological sampling is conducted. Filling of mains from existing facilities shall be through an approved Reduced Pressure Backflow Device (RPBD) or Double Check Valve Assembly (DCVA).

Hydrostatic pressure tests shall be performed on all valved sections. The test shall be made at the low point of the section. Only District personnel shall operate valves. At no time shall the Developer's personnel operate valves during the testing procedures.

The Developer shall provide all necessary equipment, including temporary blowoff assemblies and provisions for temporary thrust restraint, and shall perform all work connected with the tests. The installation shall be tested at 250 psi. All mains, valves, hydrants, service fittings, and thrust blocks are to be tested at 250 psi. All service lines shall be tested from the main to the curb stop, in conjunction with the main at the pressure stated above. Containers used during testing must be clean of debris and disinfected. A 300 p.s.i. pressure gauge is to be used during test.

For approval, the pressure shall not drop more than 5 psi in 15 minutes. Any deffective joints, pipe or fittings shall be replaced at the Developer's expense and the test repeated until satisfactory. Maximum test L = 1000 Ft. A 300 psi guage shall be used.

3-19 STERILIZATION AND FLUSHING OF WATER MAIN

Sterilization of water lines shall conform to AWWA Standard C-601. Chlorination shall be by chloride-bearing compound placed in each pipe length or capsules secured to the top of the barrel of each pipe length. Chlorine residual shall not be less than 50 parts per million. Sterilization shall include all pipe mains, all pipe runs to hydrants and all service lines to the curb stop. Contact period shall be for a minimum of 24 hours during which time all valves shall be opened and closed. After the contact period, all mains, services and pipe runs to hydrants shall be thoroughly flushed and dechlorinated. A pressure test will be taken; then a water sample taken for testing and approval by the Washington State Department of Health. Flushing water drawn from pipe or hydrant shall pass through an approved RPBD or DCVA. No pressure testing is allowed during contact period.

The environment to which the chlorinated water is to be discharged shall be inspected and if there is any question that the chlorinated discharge will cause damage to the environment, a reducing agent shall be applied to the water to to be wasted to neutralize the chlorine residual remaining in the water. Disposal may be made to any available sanitary sewer provided the rate of disposal does not overload the sewer and the disposal is approved by the sewer agency having jurisdiction. Where necessary, federal, state and local regulatory agencies should be contacted to determine special provisions for the disposal of heavily chlorinated water.

Water required for flushing and testing due to non-passing purity tests, and to main breaks caused by the Developer, shall be paid for by the Developer at the existing Water District rates.

3-20 REPLACING ROAD SURFACING

The Developer shall restore all roadway and driveway surfaces excavated or disturbed to a condition acceptable the District and to the government agency having control of the road. Before replacing asphalt surfacing, the edges of the existing asphalt shall be trimmed, as necessary, to make a smooth joint. Where concrete must be broken out prior to trench excavation, the cut in the concrete shall be made by sawing square and straight with a concrete saw to a depth of not less than 1 inch.

3-21 SERVICE CONNECTION

(a) Ductile Iron Pipe: Connections into ductile iron pipe shall be by single strap saddles for 1-inch or smaller services and shall be made with double strap saddles for 1-1/2-inch and larger. Connections larger than 1-1/2-inch shall be made as required by the District. All saddles shall be epoxy coated and have stainless steel straps.

(b) Service saddles, corporation stops, tees, curb stops and reducers shall be as manufactured by Ford or equivalent.

(c) Taps to be made using tapping machine.

3-22 CONNECTION TO EXISTING PIPE LINES

No connections shall be made to the existing system until all hydrostatic and purity tests have been satisfactorily completed for the new sections of pipe. The two systems shall be completely isolated up to this point.

Where cut-ins are to be made in existing pipes, the work shall be conducted at such a time and in such a manner as to minimize the interruption of service. Necessary pipe, fittings and gate valves shall be assembled at the site ready for installation prior to shutting off water in the existing main. Once the water has been cut off, the work shall be prosecuted vigorously and shall not be halted until the line is restored to service. All fittings required for the connection shall be thoroughly swabbed with chlorine solution prior to connection Unless specifically provided for elsewhere in these Specifications, the Developer shall have the responsibility of giving at least 24 hours notice to the District of intention to disrupt service and shall give at least 24 hours notice to the affected water users.

Developer shall not operate any valves, including fire hydrant valves, in any part of the existing water system, except in the presence of the District. Developer shall notify the District 24 hours in advance of the need to operate valves.

3-23 WET TAPS

The material requirements for wet or "hot" taps of existing pipe lines shall be as follows:

TAPPING GATE VALVES

Valves shall be of the resilient-seated variety and shall meet or exceed the requirements of AWWA C509. Valves shall be coated internally and externally with fusion bonded epoxy coating meeting or exceeding AWWA C550. Double metal disc or solid metal wedge valve designs are not acceptable. All valves shall be new and of current manufacture, and shall display a current casting date.

For applications with working pressures exceeding 175 psi, a ductile iron valve rated for 250 psi or higher working pressure shall be used. The valve shall be U.S. Pipe Metroseal 250 or approved equal. For applications with working pressures below 175 psi, valves of the following manufacture, or an approved equal, are acceptable. Clow, M & H, Mueller, U.S. Pipe.

TAPPING SLEEVES

All tapping sleeves shall be rated by their manufacturer for a working pressure of at least 200 psi. Acceptable sleeve types are as follows:

"Mechanical Joint" Style: May be of either ductile or grey iron construction, although ductile iron is preferred. Acceptable for both size-on-size and non size-on-size applications on cast iron, ductile, iron, and AC mains through 12" on 12" only. All mechanical joint sleeves shall be new and of current manufacture, shall display a current casting date and be manufactured by Clow, Dresser, Mueller, Tyler, U.S. Pipe or approved equal.

"Stainless Steel" Style: The District prefers all stainless construction in this style. However, stainless sleeves with ductile iron (but not carbon steel) flanges are also acceptable. These sleeves are acceptable for all applications on ductile iron, cast iron and AC mains through 12" on 12" only. Stainless sleeves shall be manufactured by JCM or Romac or be an approved equal.

The District may at their option make all connections to existing mains and make all crossings of existing roadways at the expense of the Developer.

3-24 BACKFLOW PREVENTION DEVICES

Where the possibility of contamination of the water supply exists, the District will require certain services be equipped with a backflow prevention device. The only acceptable device is that which operates on the reduced pressure principle as indicated in the latest edition of the DOH approved list. The determination as to the need, size and location of a backflow device shall be determined solely by the District.

3-25 TRAFFIC CONTROL

All traffic control shall be according to the Manual of Uniform Traffic Control Devices and/or the agency with local jurisdiction. During construction, traffic shall not be delayed for more than 5 minutes unless previously approved by the District and the agency of jurisdiction.

3-26 ASBESTOS CEMENT PIPE

All pipe work and procedures are to be followed as set forth in WAC-296-62-077 thru 296-62-0776, including appendix A thru J.

3-27 NEW WATER SERVICE LINES

All new water service lines shall be marked with a 2" x 4" board which is to be located at meter box and the top of which shall be painted white and extended 4 feet above the ground labeled "WATER" in 2" high blue stenciled letters.

3-28 STREAMGUARD CATCH BASIN INSERTS

All catch basins located along project shall have a streamguard sediment catch basin insert model 9228 as manufactured by Ultra-Drain Guard, model 3003 as manufactured by Foss Environmental or approved equal installed. Inserts are to be cleaned and replaced by Contractor per manufacturer's recommendations or by District direction.

PLOT DATE & TIME

FILE NAME (UPDATED BY)

SYM	REVISION	DATE	BY	APP'D
	REVISED PER DISTRICT COMMENTS			
	REVISED PER DISTRICT COMMENTS			

DESIGNED

DRAWN JINGSONG

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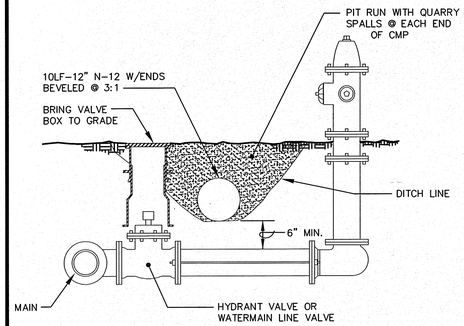
LAWRENCE PARK SEWER AND WATER

WATER STANDARD NOTES

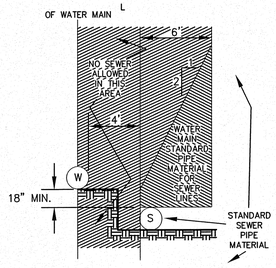
JOB NUMBER

DWG NO. 12041WA01.DWG

SHEET 08 OF 09



DETAIL NO. 2
INSTALLATION OF VALVES & HYDRANTS IN DITCHES



DETAIL NO. 7
FOR PARALLEL CONSTRUCTION

Table 1

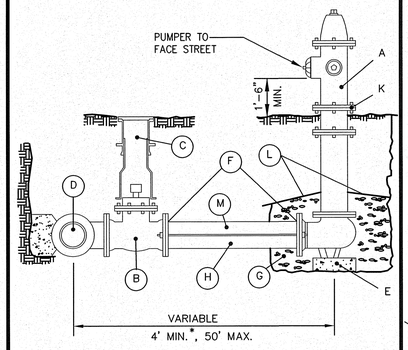
WATER MAIN STANDARD PIPE MATERIAL

TYPE OF PIPE	AWWA (ASTM) STANDARD PIPE	JOINT	FITTINGS
Ductile Iron	C 151 & C104	C 111	C 153

All water and sewer line separation shall meet DOE Standards.

For Perpendicular Construction

For perpendicular sewer line crossings, lay sewer below water lines and provide 18 inches of separation between inverts of water lines and crown of sewer pipes. If this is not possible, use material standards as set forth above for the sewer with minimum 18 feet length centered over crossing to maximize joint separation.

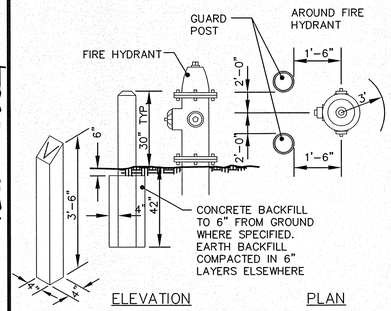


* Consult Engineer if less than 4 feet

Item	Quantity	Item Description
A	1	FIRE HYDRANT: 1–4" PUMPER–SEATTLE STANDARD THREAD 2–2½" HOSE NOZZLES–NATIONAL STD. THREAD MECHANICAL JOINT SHOE
B	1	AUXILIARY GATE VALVE: 6" – AWWA C509 RESILIENT SEAT, MJ x FL
C	1	VALVE BOX: CAST IRON SLIDE EXTENSION & BASE
D	1	TEE: 6" FLANGED OUTLET
E	1	CONCRETE BRICK: 8" x 16" x 4"
F	2	RESTRAINED JOINT GLAND: MEGA–LUG OR EQUAL
G	¼ CY	1½" WASHED ROCK
H	Var.	6" DUCTILE IRON PIPE: CEMENT LINED, CLASS 52
J		DELETED
K	1	HYDRANT EXTENSION, WHERE REQUIRED
L	1	PLASTIC SHEETING OVER WASHED ROCK.
M	Var.	FIELD LOCK GASKETS AT PIPE BELL'S

1. Hydrants shall be painted with two coats of Seymour/Krylon Paint Equipment No. 00481.
2. All hydrants shall be break–away type, per King County standards
3. Pumper Cap shall be located one foot minimum behind sidewalk.
4. Hydrant to be located five feet behind curb if no sidewalk is present.

DETAIL NO. 3
FIRE HYDRANT ASSEMBLY



VALVE MARKER POST

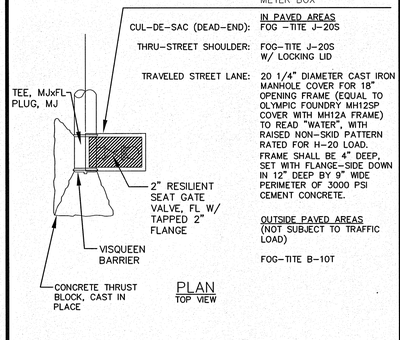
FIRE HYDRANT GUARD POST

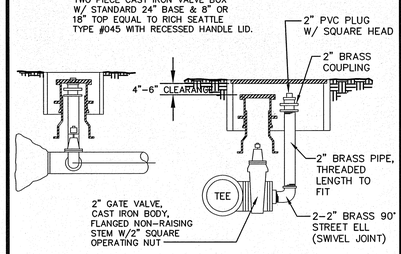
GUARD POST WILL NOT BE ALLOWED IN THE STREET CLEAR ZONE AS PER KING COUNTY REQUIREMENTS

Notes:

1. Guard post shall be 9" diameter x 6' long precast concrete posts as per technical specifications. Paint with two (2) coats of Seymour/Krylon Paint Equipment Yellow No. 00481.
2. Valve marker post as specified. Paint as specified for hydrant guard post. Paint distance from the valve marker to the valve on the post with black enamel paint, using 2" high numerals.

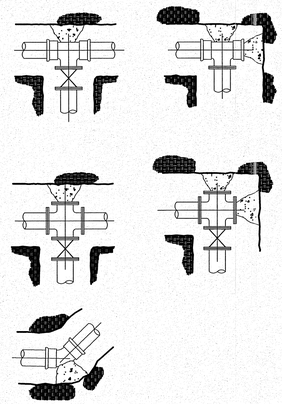
DETAIL NO. 4
GUARD AND MARKER POSTS



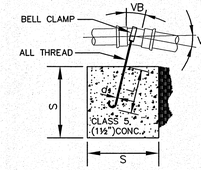


DETAIL NO. 5
2" BLOW OFF

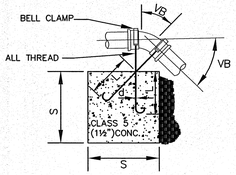
HORIZONTAL BLOCKING



TYPE "A" BLOCKING FOR 11¼°/22½° VERTICAL BENDS



TYPE "B" BLOCKING FOR 45° VERTICAL BENDS



PAINT SHACKLE RODS WITH 2 COATS OF COAL TAR OR ASPHALT PAINT

PIPE SIZE dia. in.	BEARING AREA of BLOCK sq. ft. TEES & BENDS	90° BEND	45° BEND	22½° BEND	11¼° BEND
6"	3	4	2	1.5	0.8
8"	5	7	4	2	1
10"	8	11.2	6	3	1.6
12"	13.0	18.0	10	5	3
16"	20	28.5	16	8	4

Notes:

1. All blocking shall be poured against firm undisturbed soil. blocking in organic soils or fill area to be designed by engineer.
2. Bearing area at fittings not given in bearing table shall be as directed by the Engineer.
3. When pouring against plugs and blind flanges, set steal meter box lid against fitting to keep concrete off bolts.
4. Layout to be approved by District prior to concrete pour.
5. For blocking scheme other than shown above, contact District Engineer for detail.

TYPE "A" BLOCKING FOR 11¼°/22½° VERTICAL BENDS

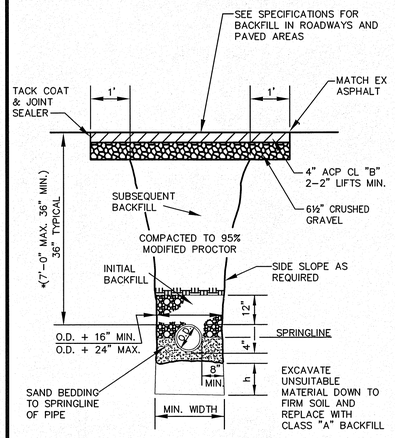
PIPE SIZE: Nom. diameter – inches	TEST PRESSURE psi	VERTICAL BEND	VB CONC. BLOCKING cu. ft.	S SIZE OF BLOCK feet	d DIAMETER OF SHACKLE RODS inches	L DEPTH OF RODS IN CONCRETE inches
4"	250	11¼°	8	2.0	5/8"	1.5
		22½°	11	2.2		2.0
6"	250	11¼°	11	2.2	5/8"	2.0
		22½°	25	2.9		
8"	250	11¼°	16	2.5	5/8"	2.0
		22½°	47	3.6		
12"	250	11¼°	54	3.8	5/8"	2.0
		22½°	120	5.0	3/4"	2.5
16"		11¼°	96	4.5	7/8"	3.0
		22½°	215	6.0	1–¼"	4.0

TYPE "B" BLOCKING FOR 45° VERTICAL BENDS

PIPE SIZE: Nom. diameter – inches	TEST PRESSURE psi	VERTICAL BEND	VB CONC. BLOCKING cu. ft.	S SIZE OF BLOCK feet	d DIAMETER OF SHACKLE RODS inches	L DEPTH OF RODS IN CONCRETE inches
4"	250	45°	30	3.1	5/8"	2.0
6"			68	4.1		
8"			123	5.0		
12"	250		294	6.6	3/4"	3.0
16"	*		*	*	*	*

* To be designed by Engineer

DETAIL NO. 6
CONCRETE BLOCKING

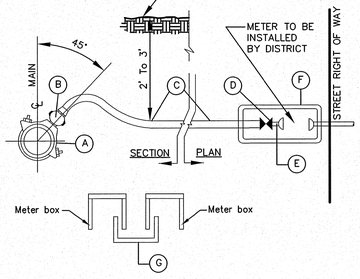


MIN. WIDTH: WHEN h IS LESS THAN 1', MIN. WIDTH = O.D. + 16". WHEN h IS GREATER THAN 1', MIN. WIDTH = O.D. + 24".

*NOTE:

Depths may increase as required. Additional fittings may be required to adjust grade to avoid conflicts.

DETAIL NO. 10
TRENCH CROSS SECTION FOR D.I. PIPE



TOP OF SETTER TO BE 6" FROM FINISHED GRADE

A. Service Clamp, Ford model FC 101 or FC 202, or Equal.

B. Corporation Stop, Ford or Equal. I.P. Threads.

C. Copper Tubing, ASTM B 88, Type K.

D. Curb Stop, Ford or Approved Equal. Curb Stops to be 18" Deep

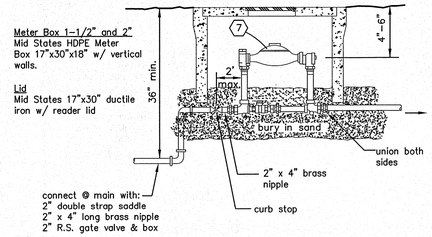
E. 1" Copper Setter with Locking Stop, C.T.S. Inlet and Horizontal Outlet, Angle Check Valve Outlet, 12" High per District Requirements. Ford No. VH 74–12W, or Equal. 1" x 4" brass nipple between curb stop and setter.

F. Meter Box Shall be Mid States HDPE 13" x 24" x 18" with Mid States 13" x 24" ductile iron lid with reader. Traffic Lid may be required.

G. 3/4" CTS 200 psi SDR 9 for Radio Read Conduit (Length as Required)

NOTES:

1. Single Service Lines are 1" Diameter.
2. Equal Materials Must be Approved by the District.
3. Copper Setter for Services with Multi–Residential Equivalents and Equivalents and all Commercial Services Shall Have a By–Pass with a Valve with Padlock Wings. Ford No. VFH66–12B or Equal.
4. No Meter Boxes in Sidewalks or Driveways.
5. After District Requirements Have Been Met, Meter(s) will be Installed Upon Completion of the Structure's Foundation and Roof.
6. Bedding Material Shall be used to Backfill Around Corp. Stop and Service Line.



1–1/2" & 2" METERS

DETAIL NO. 8
SERVICE CONNECTIONS

PLOT DATE & TIME

FILE NAME (UPDATED BY)

WORD VERSION

DESIGNED

DRAWN JINGSONG

CHECKED JINGSONG

SYM	REVISION	DATE	BY	APP'D
	REVISED PER DISTRICT COMMENTS			
	REVISED PER DISTRICT COMMENTS			

Pacific Engineering Design, LLC
15445 53RD AVE. S. SEATTLE, WA 98188
PHONE: (206) 431-7970 FAX: (206) 388-1648 WEB SITE: PACENG.COM
Civil Engineering and Planning Consultants

APPROVED COAL CREEK UTILITY DISTRICT

COAL CREEK UTILITY DISTRICT
6801 132ND PLACE S.E.
NEWCASTLE, WASHINGTON 98059

REFERENCE INFORMATION
FIELD BOOK:
SURV. CPU FILE:
DATUM: NAVD88

DATE MAR 03, 2013

SCALE NOTED

LAWRENCE PARK SEWER AND WATER

WATER STANDARD DETAILS

JOB NUMBER JOB NAME

DWG NO. 12041WA01.DWG

SHEET 09 OF 09