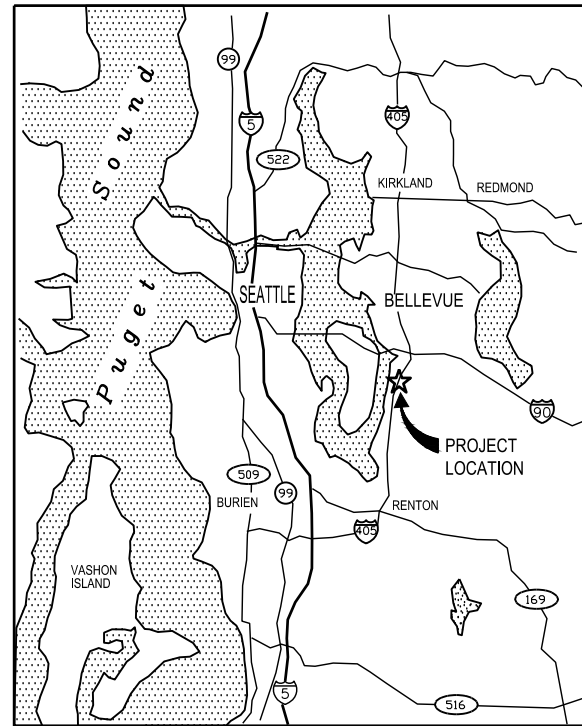


CITY OF BELLEVUE

UTILITIES DEPARTMENT

LOWER COAL CREEK FLOOD HAZARD REDUCTION PROJECT C.I.P. # X-XX and X-XX



VICINITY MAP

MAYOR

JOHN STOKES

DEPUTY MAYOR

JOHN CHELMINIAK

CITY MANAGER

BRAD MIYAKE

DIRECTOR OF UTILITIES DEPARTMENT

NAV OTAL

CITY COUNCIL

CONRAD LEE

JENNIFER ROBERTSON

LYNNE ROBINSON

VANDANA SLATTER

KEVIN WALLACE

SHEET INDEX

SHEET

NO. SHEET TITLE

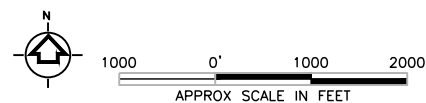
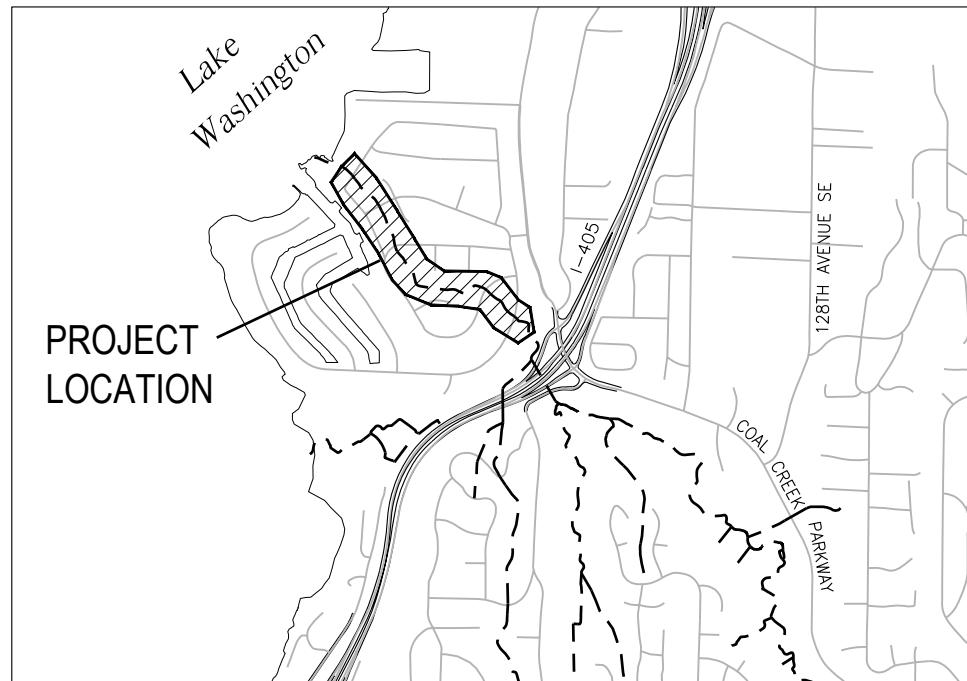
- * 1 TITLE SHEET / SHEET INDEX
- * 2 LEGEND, ABBREVIATIONS AND SYMBOLS
- * 3 SURVEY CONTROL AND NOTES
- * 4 KEY MAP AND SITE INDEX
- * 5 CASCADE KEY CREEK AND ROAD PLAN
- * 6 CASCADE KEY CREEK AND ROAD PROFILE
- * 7 CASCADE KEY HABITAT FEATURES PLAN AND CROSS SECTIONS
- 8 NOT USED
- * 9 CASCADE KEY MISCELLANEOUS DETAILS
- 10 CASCADE KEY EROSION CONTROL
- * 11 CASCADE KEY TRAFFIC CONTROL
- * 12 UPPER SKAGIT KEY CREEK AND ROAD PLAN
- * 13 UPPER SKAGIT KEY CREEK AND ROAD PROFILE
- * 14 UPPER SKAGIT KEY HABITAT FEATURES PLAN AND CROSS SECTIONS
- 15 NOT USED
- * 16 UPPER SKAGIT KEY MISCELLANEOUS DETAILS
- 17 UPPER SKAGIT KEY EROSION CONTROL
- * 18 UPPER SKAGIT KEY TRAFFIC CONTROL
- * 19 GLACIER KEY CREEK AND ROAD PLAN
- * 20 GLACIER KEY CREEK AND ROAD PROFILE
- 21 NOT USED
- 22 NOT USED
- * 23 GLACIER KEY MISCELLANEOUS DETAILS
- 24 GLACIER KEY EROSION CONTROL
- * 25 GLACIER KEY TRAFFIC CONTROL

SHEET

NO. SHEET TITLE

- * 26 NEWPORT KEY CREEK AND ROAD PLAN
- * 27 NEWPORT KEY CREEK AND ROAD PROFILE
- 28 NOT USED
- * 29 NEWPORT KEY HABITAT FEATURES PLAN AND CROSS SECTIONS
- * 30 NEWPORT KEY MISCELLANEOUS DETAILS
- 31 NEWPORT KEY EROSION CONTROL
- * 32 NEWPORT KEY TRAFFIC CONTROL
- * 33 LOWER SKAGIT KEY CREEK AND ROAD PLAN
- * 34 LOWER SKAGIT KEY CREEK AND ROAD PROFILE
- 35 NOT USED
- 36 NOT USED
- * 37 LOWER SKAGIT KEY MISCELLANEOUS DETAILS
- 38 LOWER SKAGIT KEY EROSION CONTROL
- * 39 LOWER SKAGIT KEY TRAFFIC CONTROL
- * 40 HABITAT DETAILS 1
- * 41 HABITAT DETAILS 2

* = INCLUDED IN 30% SUBMITTAL



LOCATION MAP

CALL TWO
BUSINESS DAYS
BEFORE YOU DIG
1-800-424-5555

30% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

TP
DESIGNED BY DATE
BT
DRAWN BY DATE
JS
CHECKED BY DATE



City of
Bellevue
UTILITIES

TITLE SHEET / SHEET INDEX

SUBMITTAL SHT 1 OF 41

Path: P:\134271 lower cool creek ph 2 early action\CAD\sheet\leg\culvert construction documents\2 ABBREVIATIONS-LEGEND-SYMBOLS.dwg Plot date: Oct 10, 2016-12:15:17pm CAD User: MADINE.STOCK
Ref filename: 1 Border 1

WATER SYMBOLS

SYMBOL	EXIST.	PROP.	DESCRIPTION (ABBR)
			CAP/PLUG
			COUPLING (CPL)
			GUARD POST (GP)
			REDUCER (RED)
			THRUST BLOCK (TB)
			WATER METER (WM)
			FIRE HYDRANTS:
			2-NOZZLE (FH)
			3-NOZZLE (FH)
			JOINTS:
			FLANGE/BLIND FL (FL)/(BL FL)
			MECHANICAL (MJ)
			PUSH-ON/HUB
			THREAD (THD)
			VALVES:
			AIR RELIEF (AIR)
			BLOW-OFF (BO)
			BUTTERFLY (BF)
			CHECK (CK)
			GATE/GENERAL (WV)
			PLUG VALVE (PV)

GAS/POWER/TELEPHONE SYMBOLS

SYMBOL	EXIST.	PROP.	DESCRIPTION (ABBR)
			GAS METER (GM)
			GAS VALVE (GV)
			PAD MOUNTED TRANSFORMER (P TRAN)
			POWER VAULT (POW V)
			TRANSMISSION TOWER (TRANS TWR)
			UTILITY POLE (PP, TP)
			UTILITY POLE ANCHOR
			TELEPHONE RISER (TEL R)
			TELEPHONE VAULT (TEL V)

SURVEY SYMBOLS

SYMBOL	THEOR./EXIST.	FOUND/PROP.	DESCRIPTION (ABBR)
			ANGLE POINT (AP)
			BENCH MARK (BM)
			BLOCK CORNER (BC)
			IRON PIPE (IP)
			MONUMENT (IN CASE) (MIC)
			MONUMENT (SURFACE) (MON)
			OWNERSHIP TIE (OT)
			SECTION DATA:
			SECTION CENTER
			SECTION CORNER
			QUARTER CORNER
			SIXTEENTH CORNER
			CLOSING CORNER
			MEANDER CORNER (MC)
			WITNESS CORNER (WC)
			SOIL BORING (SB)
			SPOT ELEVATION (SE)
			TAX LOT / PARCEL NUMBER

SIGNALIZATION SYMBOLS

SYMBOL	EXIST.	PROP.	DESCRIPTION (ABBR)
			AERIAL DISCONNECT
			AERIAL TERMINAL COMPARTMENT
			DETECTORS:
			DIPOLE DETECTOR
			QUADRAPOLE DETECTOR
			PEDESTRIAN DETECTOR
			EMERGENCY VEHICLE INDICATOR LIGHTS:
			INDICATOR LIGHTS
			OPTICOM SENSOR
			OPTICOM SENSOR W/ INDICATOR LIGHTS
			FLASHING WARNING SYSTEM
			JUNCTION BOX (TYPE I, II, III) (JB)
			PEDESTRIAN PUSHBUTTON (PB)
			POST W/ PUSHBUTTON
			PEDESTRIAN SIGNAL HEAD
			POLE NOTE
			R/R CROSSING GATE
			R/R CROSSING SIGNAL
			SIGNAL CONTROLLER
			SIGNAL LOAD CENTER
			STREET LIGHT ASSEMBLY
			TRAFFIC SIGNS:
			BRIDGE
			CANTILEVERED
			SINGLE POST
			DOUBLE POST
			TRAFFIC SIGNAL POLE
			TRAFFIC SIGNAL POLE W/ LUMINAIRE
			TRAFFIC SIGNAL SUPPORT POLE
			VEHICLE SIGNAL HEAD
			VEHICLE SIGNAL HEAD W/ARROW INDICATOR
			WIRE NOTE

SANITARY/STORM SEWER SYMBOLS

SYMBOL	EXIST.	PROP.	DESCRIPTION (ABBR)
			SAN. SEWER CLEAN OUT (CO)
			SAN. SEWER MANHOLE (SSMH)
			STORM DRAIN CATCH BASIN (CB)
			STORM DRAIN CULVERT (CULV)
			STORM DRAIN MANHOLE (SDMH)

SURFACE FEATURES/LANDSCAPING

SYMBOL	EXIST.	PROP.	DESCRIPTION
			BUS STOP
			EMBANKMENT
			MAIL BOX
			RIP RAP
			ROCKERY
			SHRUB
			SIGN
			TREE (Conifer)
			TREE (Deciduous)
			YARD LIGHT

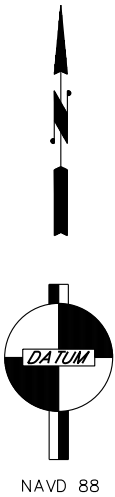
CHANNELIZATION SYMBOLS

SYMBOL	EXIST.	PROP.	DESCRIPTION
			BIKE PATH
			HANDICAP SYMBOL
			H.O.V. LANE SYMBOL
			ONLY
			RAILROAD CROSSING
			SCHOOL
			STOP
			LANE CONTROL ARROWS:
			STRAIGHT ARROW
			LT-RT-STR-ARROW
			LEFT-RIGHT ARROW
			2-WAY LEFT TURN
			LEFT TURN ARROW
			RIGHT TURN ARROW
			LEFT-STRAIGHT ARROW
			RIGHT-STRAIGHT ARROW
			RAISED MARKERS:
			LANE MARKERS TYPE I
			LANE MARKERS TYPE II

LINE TYPES

LINE TYPE	DESCRIPTION
	SURFACE FEATURES:
	BUILDING LINE (EXISTING)
	BUILDING LINE (PROPOSED)
	CREEK/DITCH CENTERLINE (EXIST.)
	CREEK/DITCH CENTERLINE (PROP.)
	CURB/PAVEMENT/SIDEWALK (EX)
	CURB/PAVEMENT/SIDEWALK (PROP)
	FENCE (EXISTING)
	FENCE (PROPOSED)
	GUARDRAIL (EXISTING)
	GUARDRAIL (PROPOSED)
	LAKE/POND
	MARSH/SWAMP PERIMETER
	RAILROAD
	RETAINING WALL (EXISTING)
	RETAINING WALL (PROPOSED)
	RIVERBANK/ShORELINE
	SURVEY:
	CENTERLINE (EXISTING)
	CENTERLINE (PROPOSED)
	CONTOUR (DEPRESSION)
	CONTOUR (EXISTING)
	CONTOUR (INDEX)
	CONTOUR (PROPOSED)
	DONATION LAND CLAIM (EXIST.)
	DONATION LAND CLAIM (PROP.)
	EASEMENT (PERMANENT)
	EASEMENT (TEMPORARY)
	MEANDER LINE
	PROPERTY LINE (EXISTING)
	PROPERTY LINE (PROPOSED)
	RANGE/TOWNSHIP LINE
	RESERVATION/PARK/FOREST (EX)
	RESERVATION/PARK/FOREST (PRO)
	RIGHT-OF-WAY (EXISTING)
	RIGHT-OF-WAY (PROPOSED)
	RIGHT-OF-WAY (LIMITED ACCESS)
	SECTION LINE
	QUARTER SECTION LINE
	SIXTEENTH SECTION LINE
	STATE/COUNTY/CORPORATE LIMIT
	STATE/COUNTY/CORPORATE LIMIT
	UTILITIES (EXISTING):
	CABLE TELEVISION (AERIAL)
	CABLE TELEVISION (BURIED)
	FORCE MAIN
	GAS
	OIL
	POWER (AERIAL)
	POWER (BURIED)
	SANITARY SEWER
	STEAM
	STORM DRAINAGE
	TELEPHONE (AERIAL)
	TELEPHONE (BURIED)
	UTILITY SERVICE LINE (GENERAL)
	WATER
	UTILITIES (PROPOSED):
	MAIN LINE (LIST TYPE, SIZE, ETC.)
	SERVICE (LIST TYPE, SIZE, ETC.)

* COLOR DEPENDS ON TYPE OF UTILITY (E.G. POWER, WATER, ETC.)
*** INSERT ELEVATION AT 6" INTERVALS (TEXT 0.1" HIGH)



NAVD 88

SHEET REFERENCE

SECTIONS ARE CROSS REFERENCED IN THE FOLLOWING MANNER:

SECTION CUT ON SHEET 5:

ON SHEET 4 THIS SECTION IS DEFINED AS:

SECTION

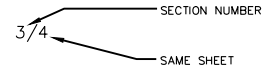
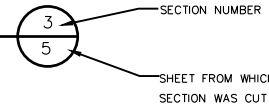
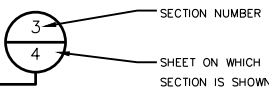
3/4"= 1'-0"

ANY ADDITIONAL SHEET(S) FROM WHICH THE SECTION WAS CUT

SECTION OR DETAIL CUT AND SHOWN ON THE SAME SHEET:

SECTION NUMBER

SAME SHEET, OPTIONAL



NO	DATE	BY	APPR	REVISIONS



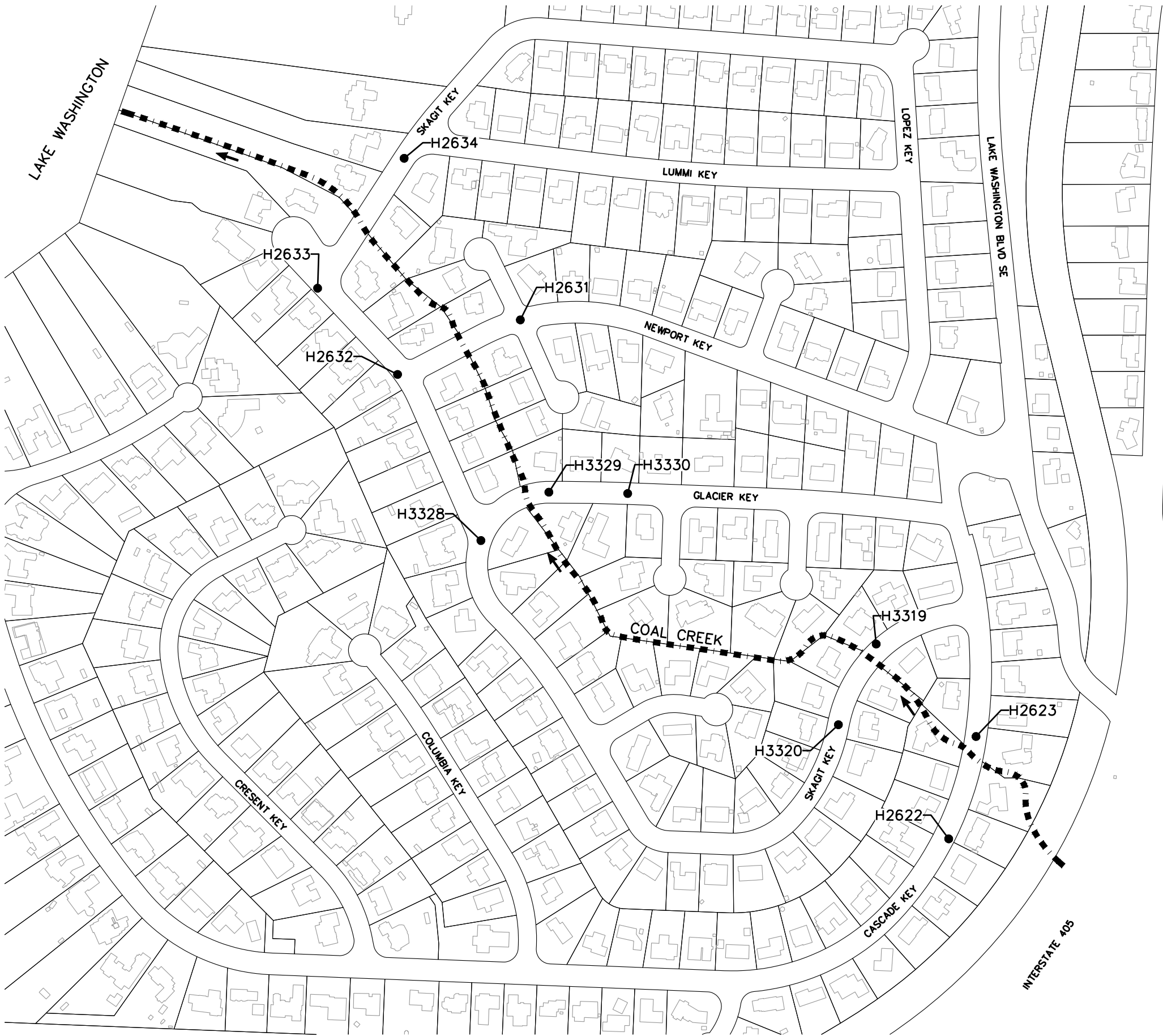
Approved By	
DESIGN MANAGER	DATE
PROJECT MANAGER	DATE



30% SUBMITTAL

LEGEND, ABBREVIATIONS AND SYMBOLS	
SHT	2 OF 41

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Ref filename: I:\Border [C:\AP-SITE-SKAGIT KEY-LOWER [C:\AP-SITE-SKAGIT KEY-UPPER [C:\AP-SITE-CASCADE KEY [C:\AP-SITE-GLACIER KEY]



CITY OF BELLEVUE CONTROL POINTS				
ID	DESCRIPTION	NORTHING	EASTING	ELEVATION*
H3330	MONUMENT	211164.71	1306566.34	
H3329	MONUMENT	211168.28	1306348.89	
H3328	MONUMENT	211034.83	1306161.35	29.713
H2634	MONUMENT	212089.66	1305949.47	22.620
H2633	MONUMENT	211731.15	1305710.73	
H2632	MONUMENT	211493.19	1305931.36	
H2631	MONUMENT	211643.78	1306270.10	25.547
H2623	MONUMENT	210494.05	1307527.55	43.856
H2622	NAIL	210211.61	1307452.15	
H3320	MONUMENT	210526.50	1307147.76	39.631
H3319	MONUMENT	210749.16	1307252.13	

*HORIZONTAL CONTROL POINT ONLY IF NO ELEVATION LISTED.

HORIZONTAL DATUM:
WASHINGTON STATE PLANE COORDINATES, NORTH
ZONE (BASED UPON NAD 83/11)

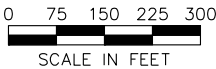
VERTICAL DATUM:
NAVD 88

CONTROL METHOD:
HORIZONTAL AND VERTICAL CONTROL COORDINATES
WERE DERIVED USING TRIGONOMETRIC TRAVERSE
METHODS USING A LEICA TPS-1201 TOTAL STATION
TIED TO CITY OF BELLEVUE CONTROL POINTS.

FIELD SURVEY PERFORMED OCTOBER AND NOVEMBER
2015 BY TETRA TECH.



NAVD 88



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NO	DATE	BY	APPR	REVISIONS





TETRA TECH
www.tetratech.com
1420 Fifth Avenue, Suite 550
Seattle, Washington 98101
Phone: 206-728-9655 Fax: 206-883-9301

Approved By

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PROJECT MANAGER _____ DATE _____

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DESIGNED BY _____ DATE _____

BT
DRAWN BY _____ DATE _____

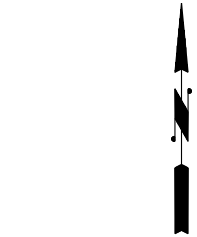
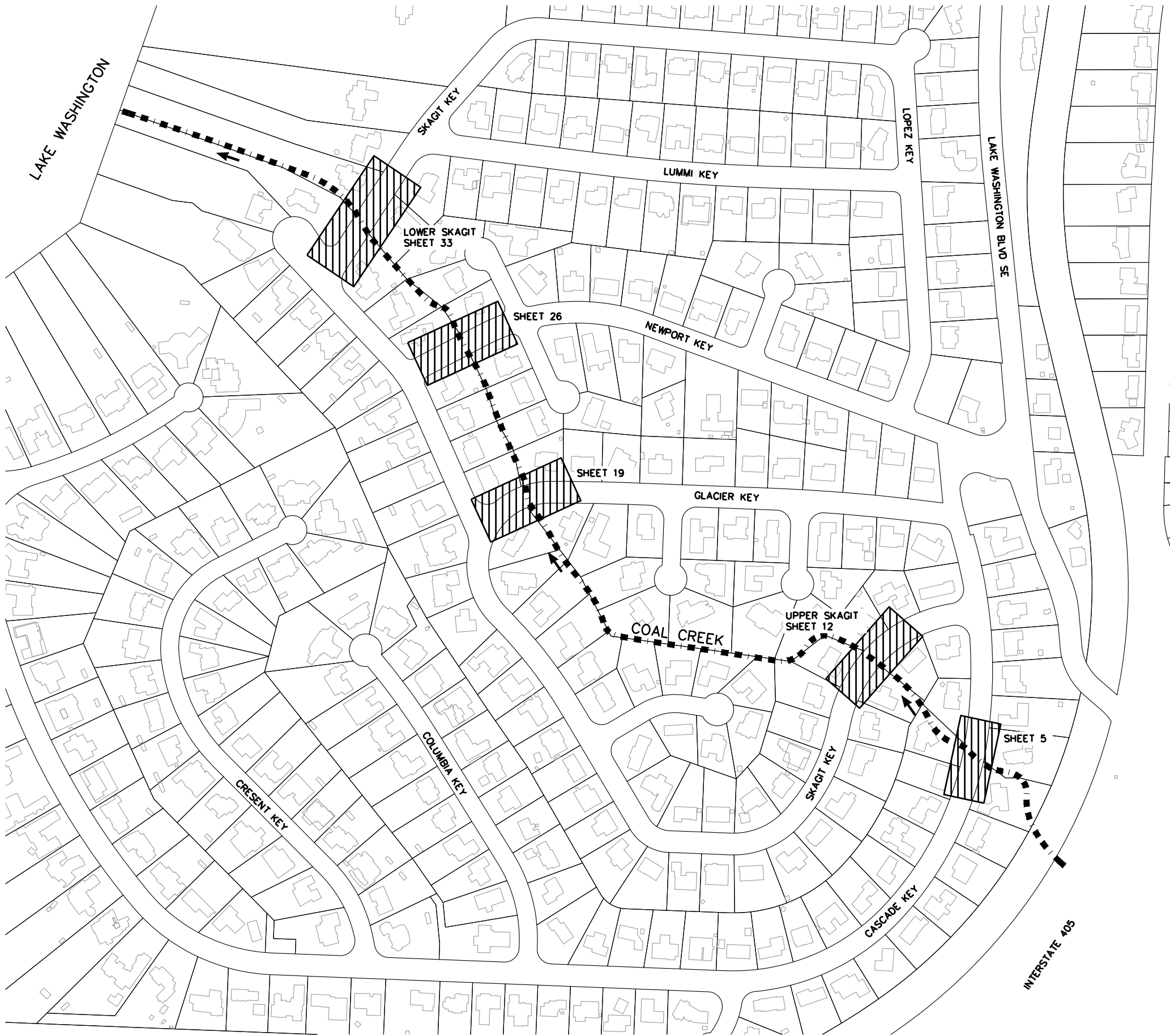
JS
CHECKED BY _____ DATE _____



**City of
Bellevue**
UTILITIES

**SURVEY CONTROL
AND NOTES**

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0 75 150 225 300
SCALE IN FEET

30% SUBMITTAL

KEY MAP
AND SITE INDEX

SHT 4 OF 41

NO	DATE	BY	APPR	REVISIONS



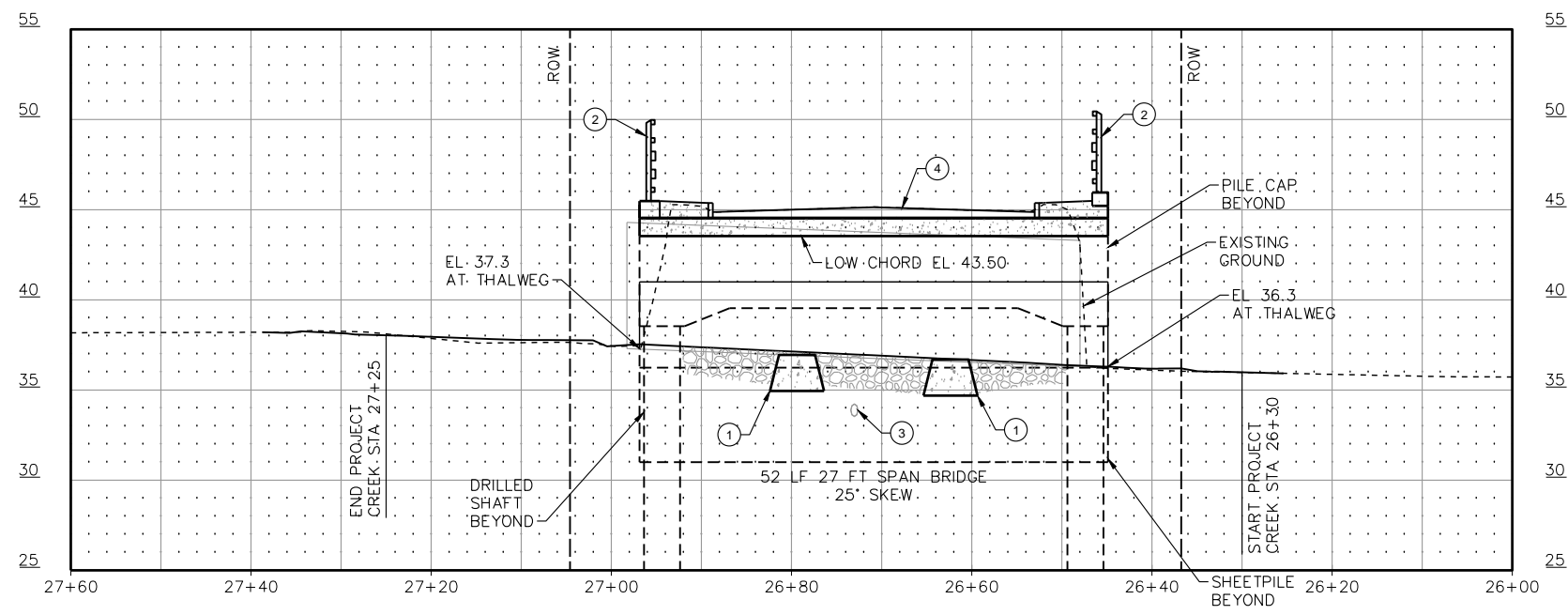
Approved By

DESIGN MANAGER _____ DATE _____
PROJECT MANAGER _____ DATE _____

TP DESIGNED BY _____ DATE _____
BT DRAWN BY _____ DATE _____
JS CHECKED BY _____ DATE _____

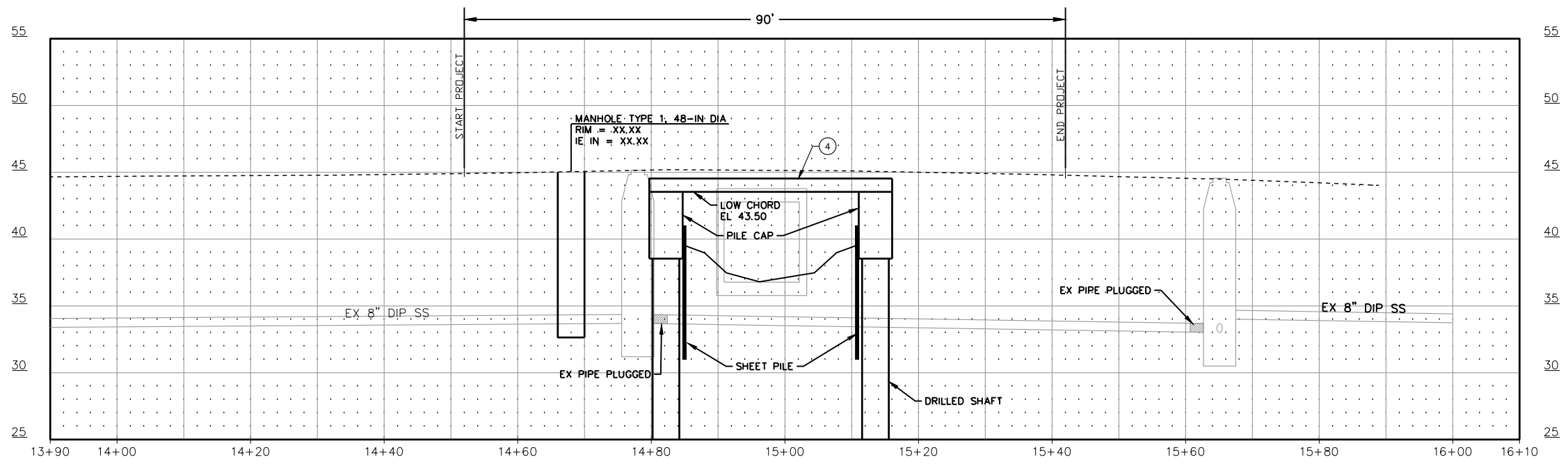


City of
Bellevue
UTILITIES

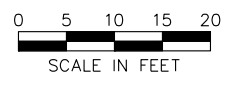


CREEK PROFILE AT CASCADE KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'

- CONSTRUCTION NOTES:
- 1 COARSE SEDIMENT BAND, SEE SHEET 41.
 - 2 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 13.
 - 3 ABANDONED 8" DIP SEWER. REMOVE IF IN CONFLICT WITH CONSTRUCTION.
 - 4 SEE SHEET 13 FOR TYPICAL ROAD SECTION.



ROAD PROFILE CASCADE KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



Path: P:\134271 Lower Cascade Key Ph. 2 Early Action\CAD\SheetFiles\Cover Construction Documents\6 CASCADE KEY CREEK AND ROAD PROFILE.dwg Plot date: Oct 11, 2016-01:36:52pm CAD User: MADINE STOCK
Net filename: [Border] C:\P\134271-CASCADE KEY\1 C-SP-ALOK-PROP

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www.tetrattech.com
1420 Fifth Avenue, Suite 550
Seattle, Washington 98101
Phone: 206-728-9655 Fax: 206-883-9301

Approved By

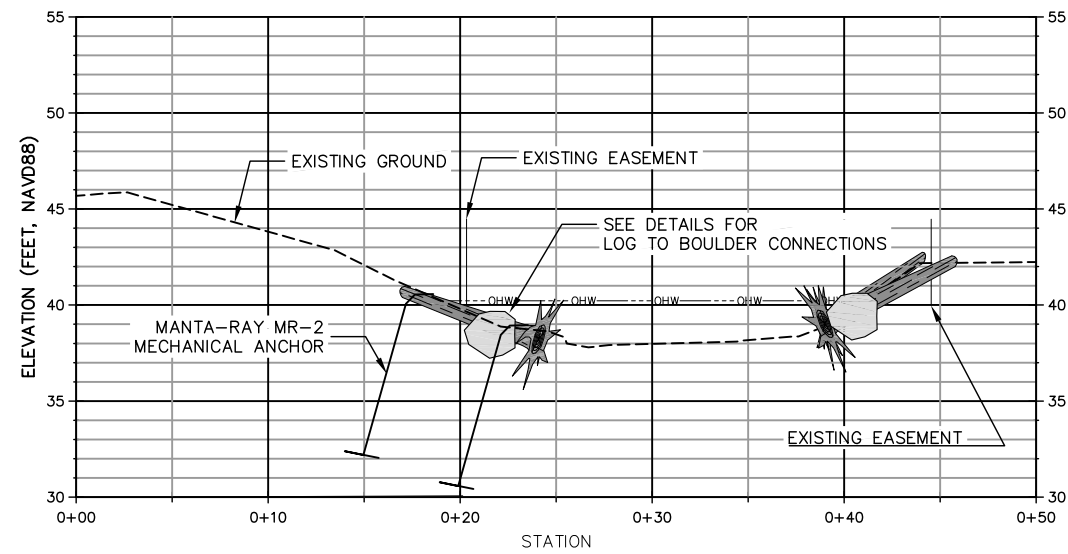
DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

TP	DESIGNED BY	DATE
BT	DRAWN BY	DATE
JS	CHECKED BY	DATE

**City of Bellevue**
UTILITIES

CASCADE KEY
CREEK AND ROAD PROFILE

SHT 6 OF 41



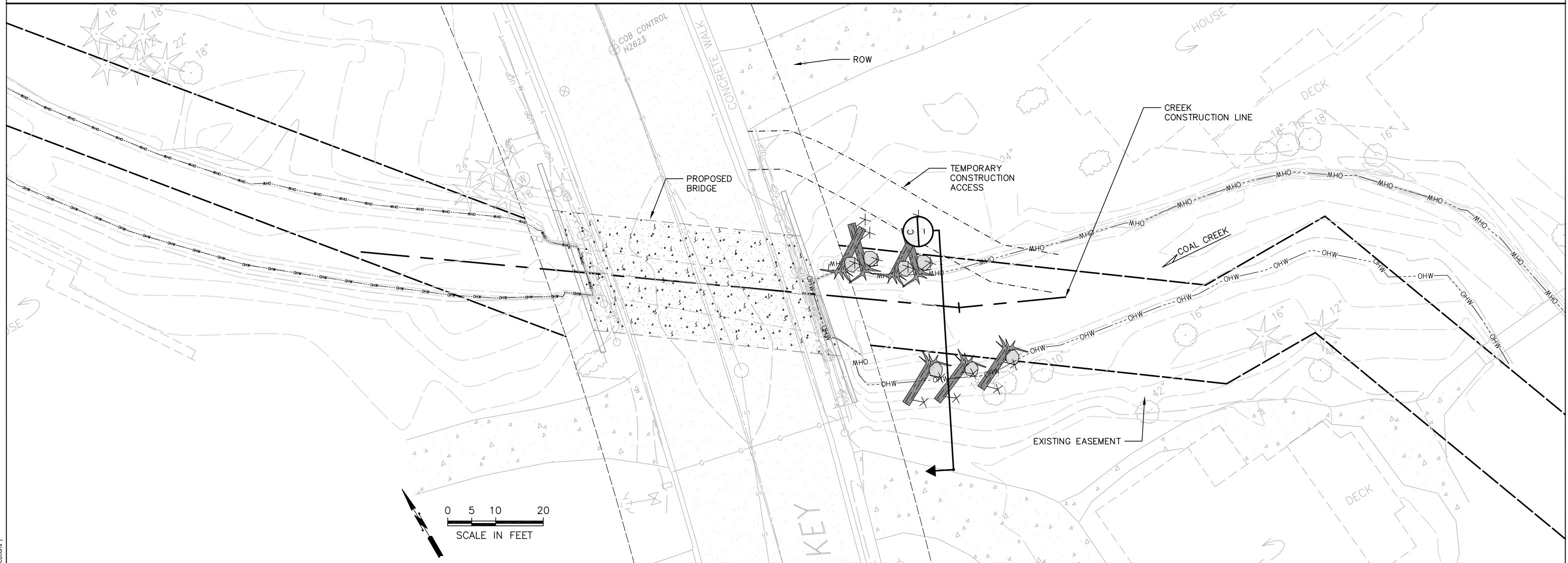
SECTION

1"= 10'-0"

0 2.5 5 10
SCALE IN FEET



SEE SHEET 2 FOR
ABBREVIATIONS AND SYMBOLS.



0 5 10 20
SCALE IN FEET

NO	DATE	BY	APPR	REVISIONS

nhc
northwest hydraulic consultants

16300 Christensen Rd. Suite 350
Tukwila WA 98188
Phone: 206-241-6000
Fax: 206-439-2420



TETRA TECH

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Seattle, Washington 98101
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Approved By

DESIGN MANAGER DATE

PROJECT MANAGER DATE

J BROWN 5/6/2016
DESIGNED BY DATE
M OHR 5/6/2016
DRAWN BY DATE
E ROWLAND 5/6/2016
CHECKED BY DATE



**City of
Bellevue**
UTILITIES

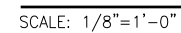
**CASCADE KEY
PLAN AND CROSS SECTION VIEWS**

30% SUBMITTAL

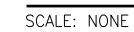
SHT 7 OF 41



SCALE: 1/8"=1'-0"



- ① PILE CAP BEAM DETAILS, SEE X/Y.
- ② ROAD SECTION, SEE X/Y.
- ③ FABRICATE WINGWALLS AND/OR ADJUST WINGWALL FOOTING GRADE TO ELIMINATE SPACE BETWEEN PRECAST WINGWALL AND CULVERT.



SCALE: 1/4" = 1'-0"



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



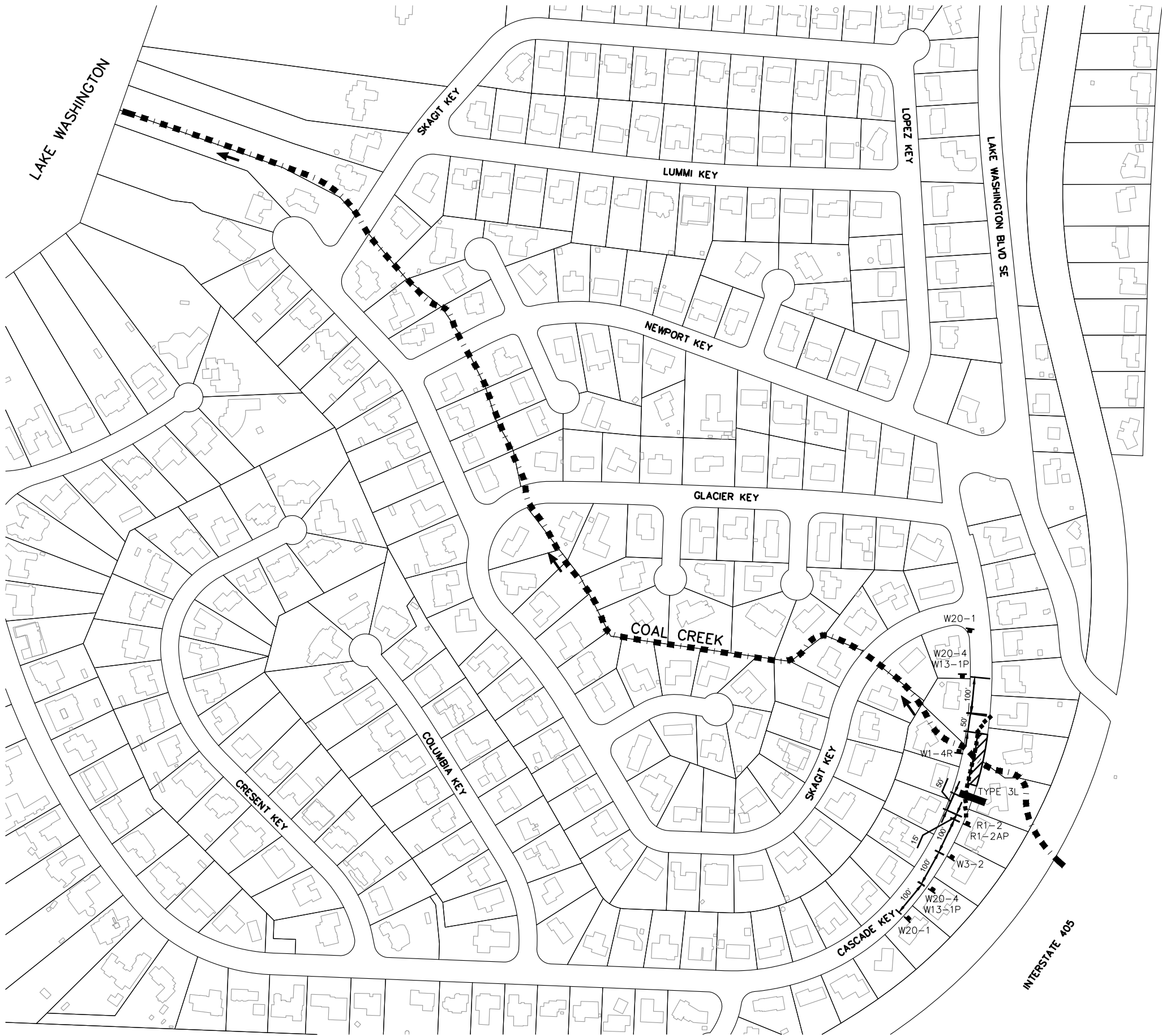
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TP	
DESIGNED BY	DATE
BT	
DRAWN BY	DATE
JS	
CHECKED BY	DATE



CASCADE KEY
MISCELLANEOUS DETAILS

Path: P:\134271 lower coal creek ph 2 early action\CAD sheets\files\culvert construction documents\11 CASCADE TRAFFIC CONTROL.dwg Plot date: Oct 10, 2016 - 12:20:44pm CAD User: MADINE STOCK.
Ref filename: [Border] [C-AP-SITE-SKAGIT KEY-LOWER] [C-AP-SITE-SKAGIT KEY] [C-AP-SITE-NEWPORT KEY] [C-AP-SITE-CASCADE KEY] [C-AP-SITE-GLACIER KEY]



LEGEND

WORK SPACE

CHANNELIZATION DEVICE

TYPE 3L BARRICADE

TYPE 3R BARRICADE

TEMPORARY TRAFFIC CONTROL ZONE SIGN

L

R

R1-2

R1-2AP

W3-2

W20-4

W13-1P

W20-1

W1-4R

D3-1

YIELD

TO ONCOMING TRAFFIC

ONE LANE ROAD AHEAD

5 M.P.H.

ROAD WORK AHEAD

CASCADE KEY

NOTE

TRAFFIC CONTROL DEPICTED HEREIN IS WHEN THE EASTERN HALF OF THE BRIDGE IS UNDER CONSTRUCTION. THE TRAFFIC CONTROL SIGNAGE IS MIRRORED WHEN THE WESTERN HALF OF THE BRIDGE IS CONSTRUCTED.

0 75 150 225 300

SCALE IN FEET

NAV 88

NO	DATE	BY	APPR	REVISIONS

TETRA TECH

www.tetrattech.com

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Seattle, Washington 98101

Phone: 206-728-9655 Fax: 206-883-9301

Approved By

DESIGN MANAGER

PROJECT MANAGER

DATE

DATE

TP DESIGNED BY

BT

DRAWN BY

JS

CHECKED BY

DATE

DATE

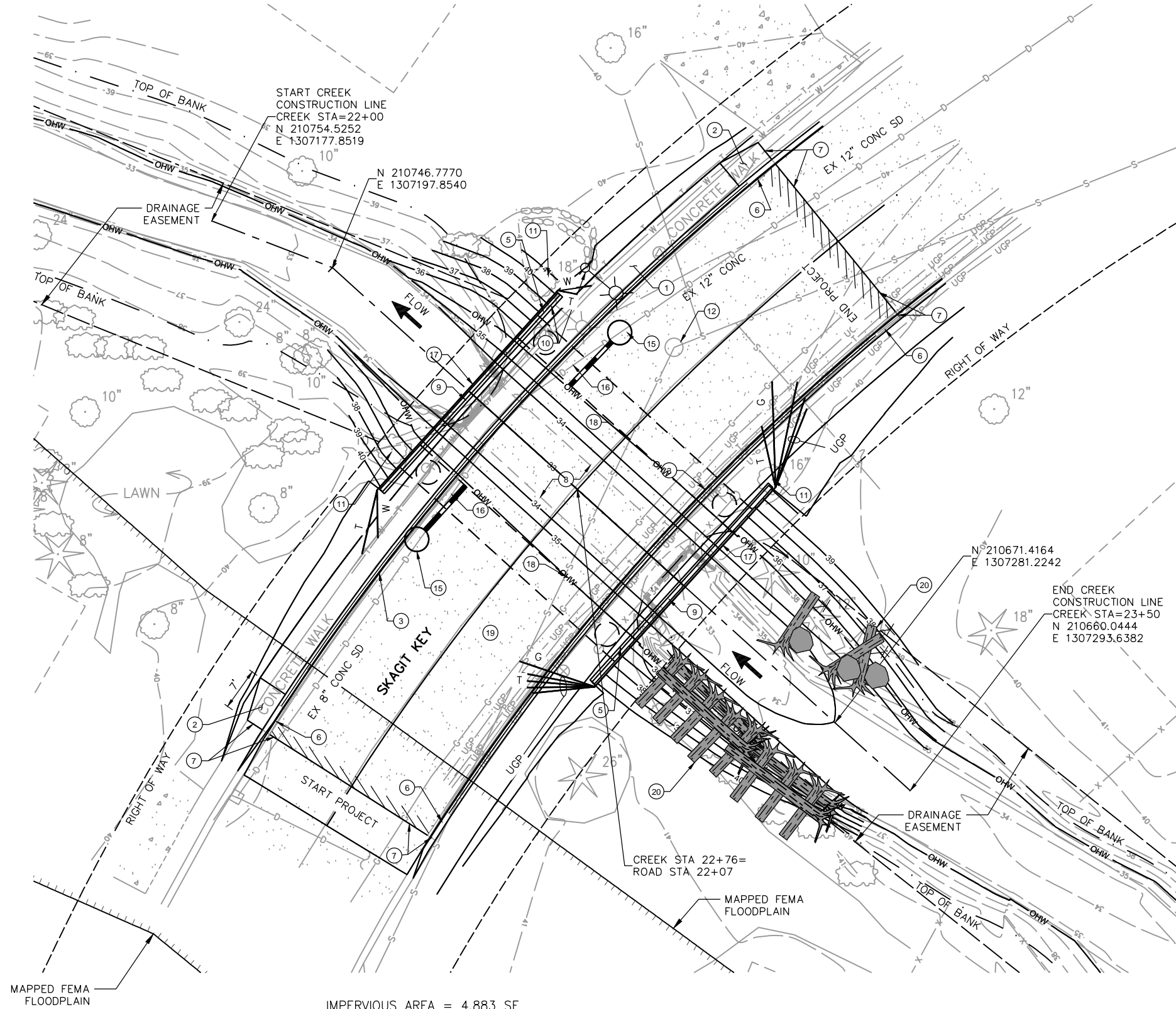
DATE

DATE

CASCADE KEY TRAFFIC CONTROL

SHT 11 OF 41

Path: P:\134271 Lower Coal Creek Ph. 2 Early Action\CAD\SheetFiles\Upper Construction Documents\12 UPPER SKAGIT KEY CREEK AND ROAD PLAN.dwg Plot date: Oct 17, 2016 - 01:01:30pm CAD User: NADINE STOCK
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IMPERVIOUS AREA = 4,883 SF

CONSTRUCTION NOTES:

- 1 CEMENT CONCRETE SIDEWALK, SEE X/Y.
- 2 TAPER CEMENT CONCRETE SIDEWALK TO MATCH EXISTING, TYP.
- 3 TRAFFIC CURB AND GUTTER, SEE X/Y.
- 4 PRESERVE EXISTING SANITARY SEWER.
- 5 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 13.
- 6 TRANSITION ROLLED TO TRAFFIC CURB AND GUTTER, SEE X/Y.
- 7 SAWCUT SIDEWALK, CURB, GUTTER, AND ROAD.
- 8 REMOVE EXISTING CULVERT, WINGWALLS AND HEADWALLS.
- 9 SEE X/Y FOR HEADWALL AND WINGWALL DETAILS.
- 10 RELOCATE LIGHTPOLE.
- 11 REMOVE EXISTING TREE.
- 12 ADJUST MANHOLE TO GRADE.
- 13 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE EX SEWER. CONTRACTOR SHALL POTHOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING.
- 14 APPROXIMATE POSITION OF CATCHBASIN. EXISTING STORM DRAIN POSITION IS UNKNOWN PRIOR TO POTHOLE CONFIRMATION.
- 15 CONNECT TO DRAINAGE STRUCTURE.
- 16 REMOVE AND DISPOSE OF EXISTING STORM DRAIN IN CONFLICT WITH CONSTRUCTION.
- 17 RELOCATED UTILITIES MOUNTED ON HEADWALL, SEE X/Y.
- 18 PROVIDE BLOCKOUT TO PROVIDE PASSAGE OF EX 8" CONC SEWER. BLOCKOUT SHALL BE SIZED TO PROVIDE 6 INCHES CLEARANCE ON ALL SIDES OF THE SEWER.
- 19 SEE TYPICAL ROAD SECTION SHEET 13.
- 20 SEE SHEET 14.



NAVD 88



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UPPER SKAGIT KEY
CREEK AND ROAD PLAN

SHT 12 OF 41

NO	DATE	BY	APPR	REVISIONS



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DESIGN MANAGER _____ DATE _____
PROJECT MANAGER _____ DATE _____

TP DESIGNED BY _____ DATE _____
BT DRAWN BY _____ DATE _____
JS CHECKED BY _____ DATE _____

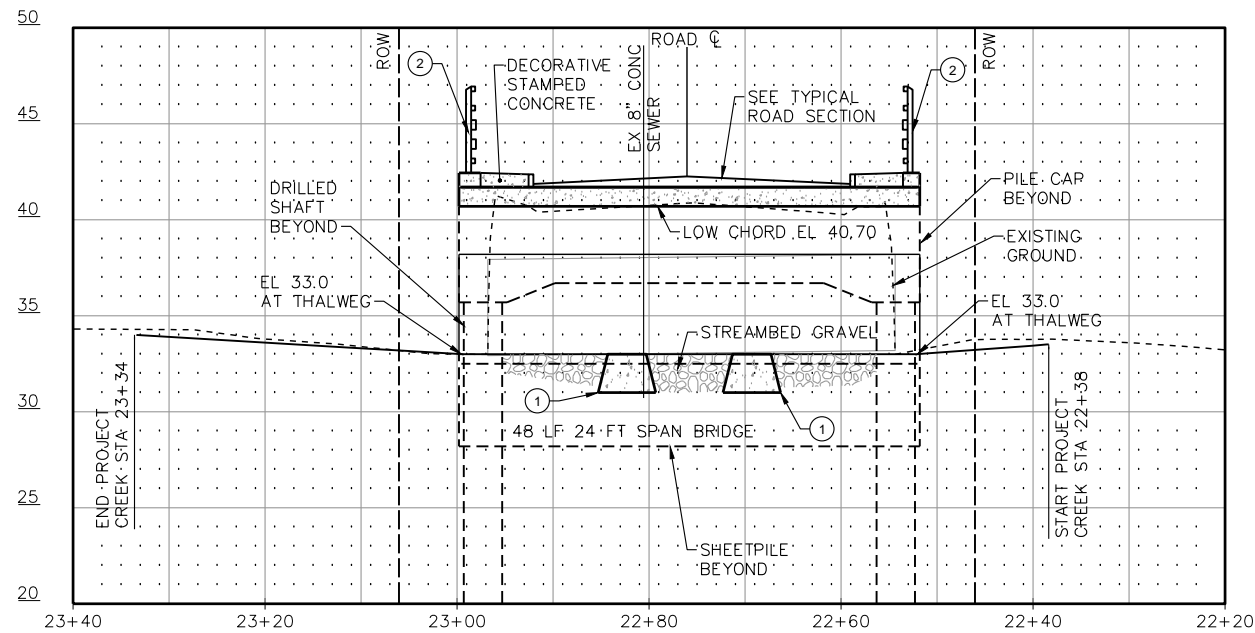


City of
Bellevue
UTILITIES

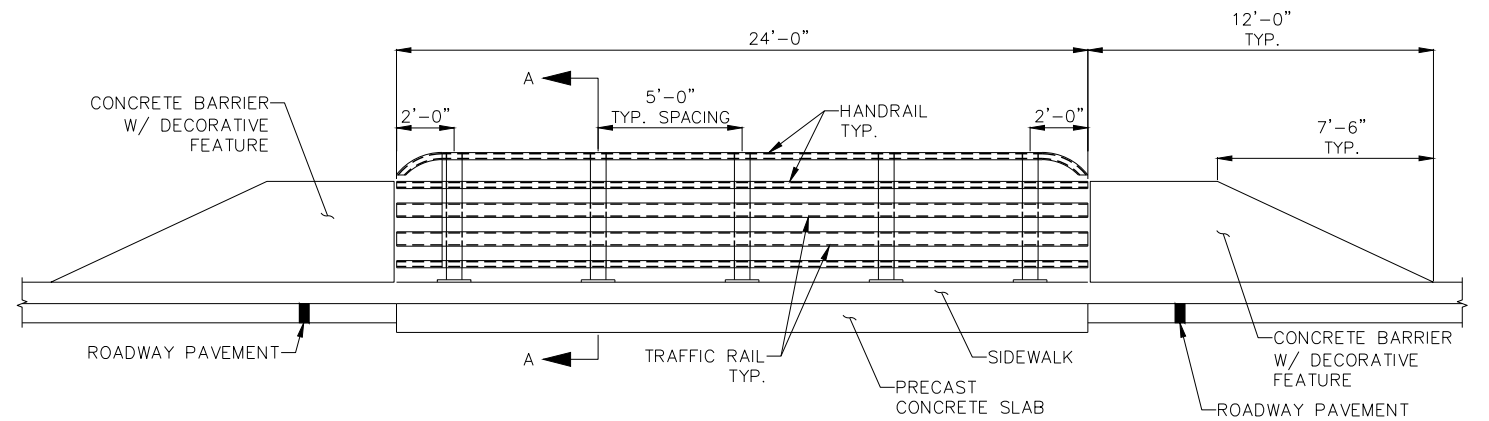
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Net Name: Border C-3P-SITE-UPPER SKAGIT KEY C-3P-BR00 RAIL



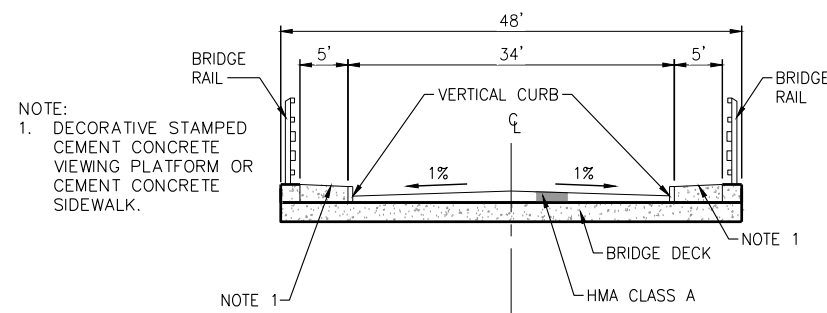
NAVD 88



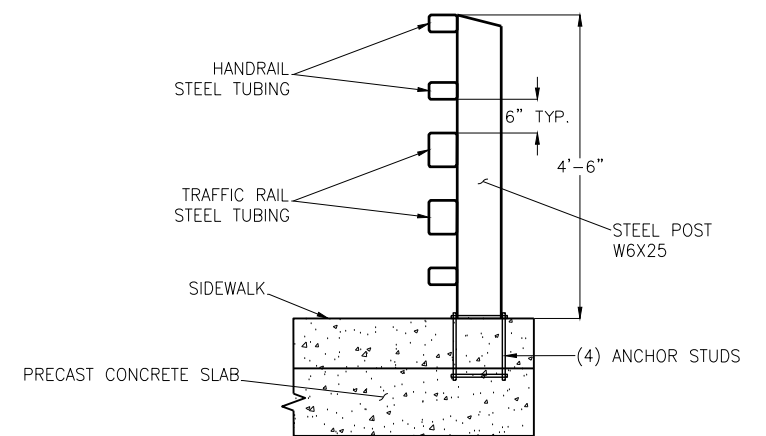
CREEK PROFILE AT UPPER SKAGIT KEY
SCALE: HORIZ: 1" = 10' VERT: 1" = 5'



BRIDGE RAIL ELEVATION
SCALE: NTS

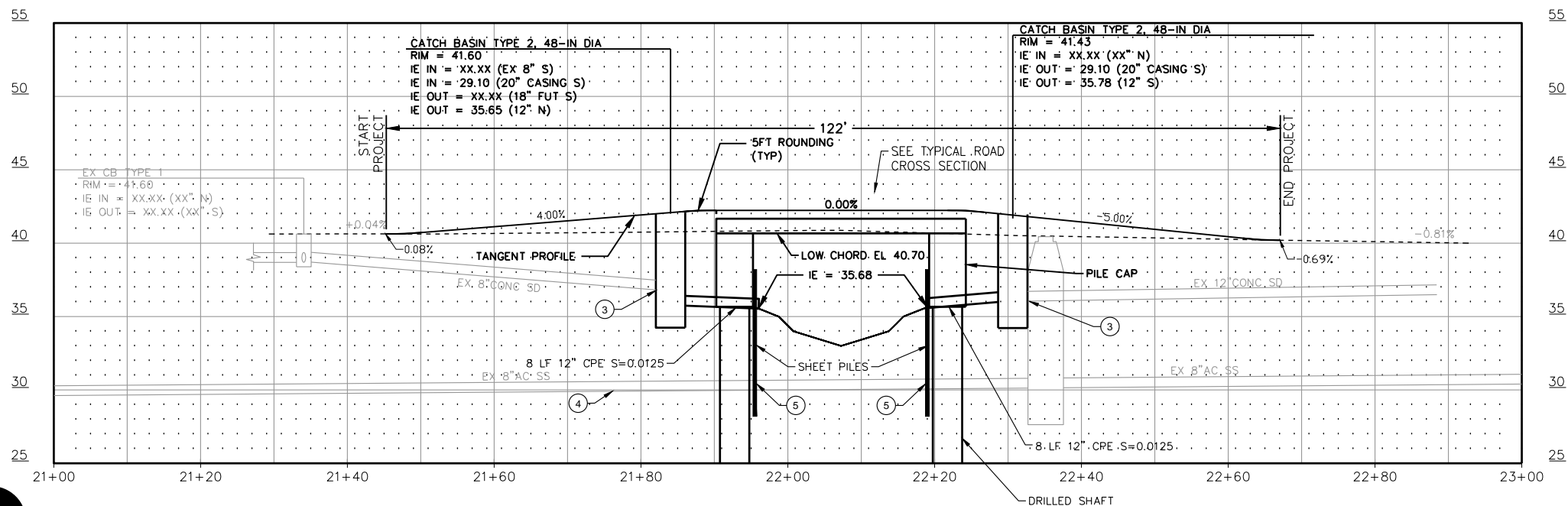


TYPICAL ROAD CROSS SECTION
1" = 10'



BRIDGE RAIL NOTE: STEEL POST AND ALL STEEL TUBING PAINTED GREEN.

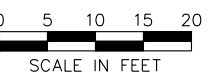
BRIDGE RAIL SECTION A-A
SCALE: NTS



ROAD PROFILE SKAGIT KEY-UPPER
SCALE: HORIZ: 1" = 10' VERT: 1" = 5'

CONSTRUCTION NOTES:

- 1 COARSE SEDIMENT BAND, SEE SHEET 41.
- 2 BRIDGE RAIL WITH MIN. TL-1 RATING.
- 3 CONNECT TO DRAINAGE STRUCTURE.
- 4 PRESERVE EXISTING SANITARY SEWER.
- 5 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE EX SEWER. CONTRACTOR SHALL POT HOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING.



30% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

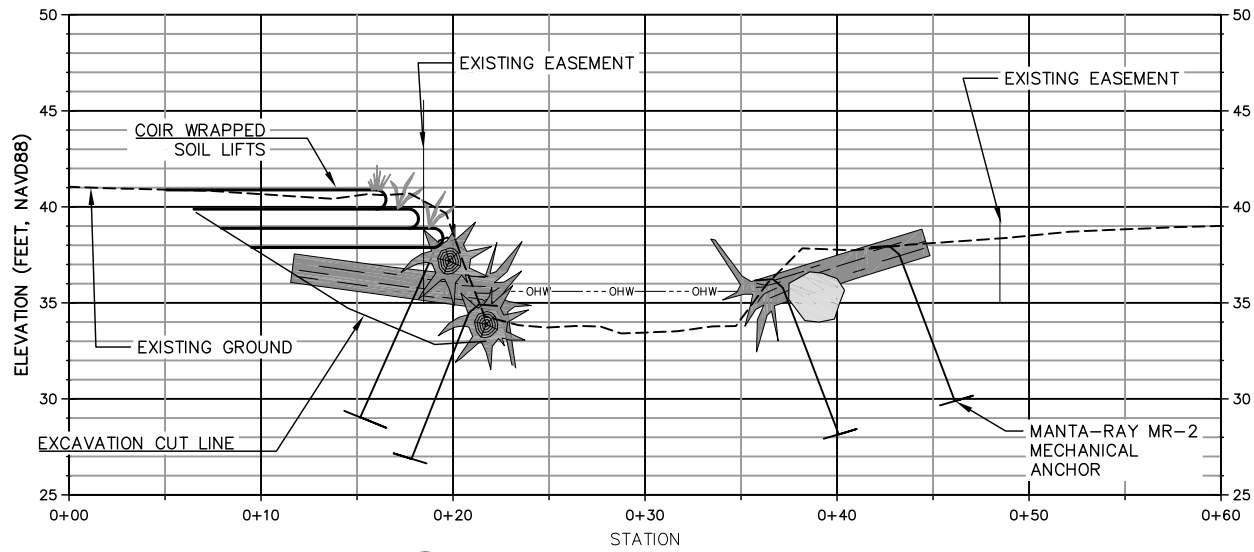
TP
DESIGNED BY DATE
BT
DRAWN BY DATE
JS
CHECKED BY DATE



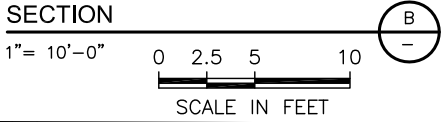
**City of
Bellevue**
UTILITIES

**UPPER SKAGIT KEY
CREEK AND ROAD PROFILE**

SHT 13 OF 41



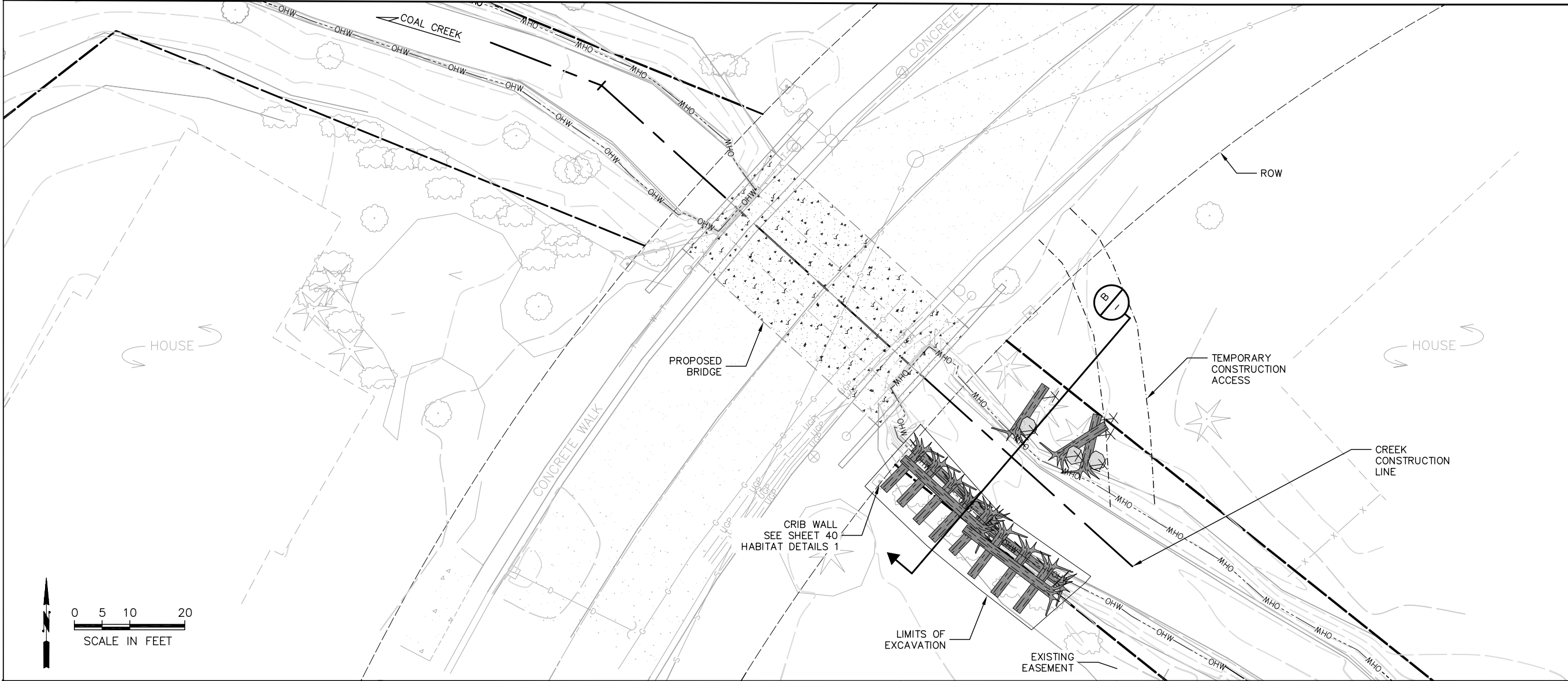
SEE SHEET 2 FOR
ABBREVIATIONS AND SYMBOLS.



COIR WRAPPED SOIL LIFTS

Above OHW			Below OHW			Total Net
Cut	Fill	Net	Cut	Fill	Net	Cut
30.0yd ³	0.08yd ³	29.9yd ³ cut	1.85yd ³	0yd ³	1.85yd ³ cut	31.77yd ³

EXCAVATION



NO	DATE	BY	APPR	REVISIONS

nhc
northwest hydraulic consultants

16300 Christensen Rd. Suite 350
Tukwila WA 98188
Phone: 206-241-6000
Fax: 206-439-2420

TETRA TECH
www.tetratech.com
1420 Fifth Avenue, Suite 600
Seattle, Washington 98101
Phone: 206-883-9300 Fax: 206-883-9301

Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

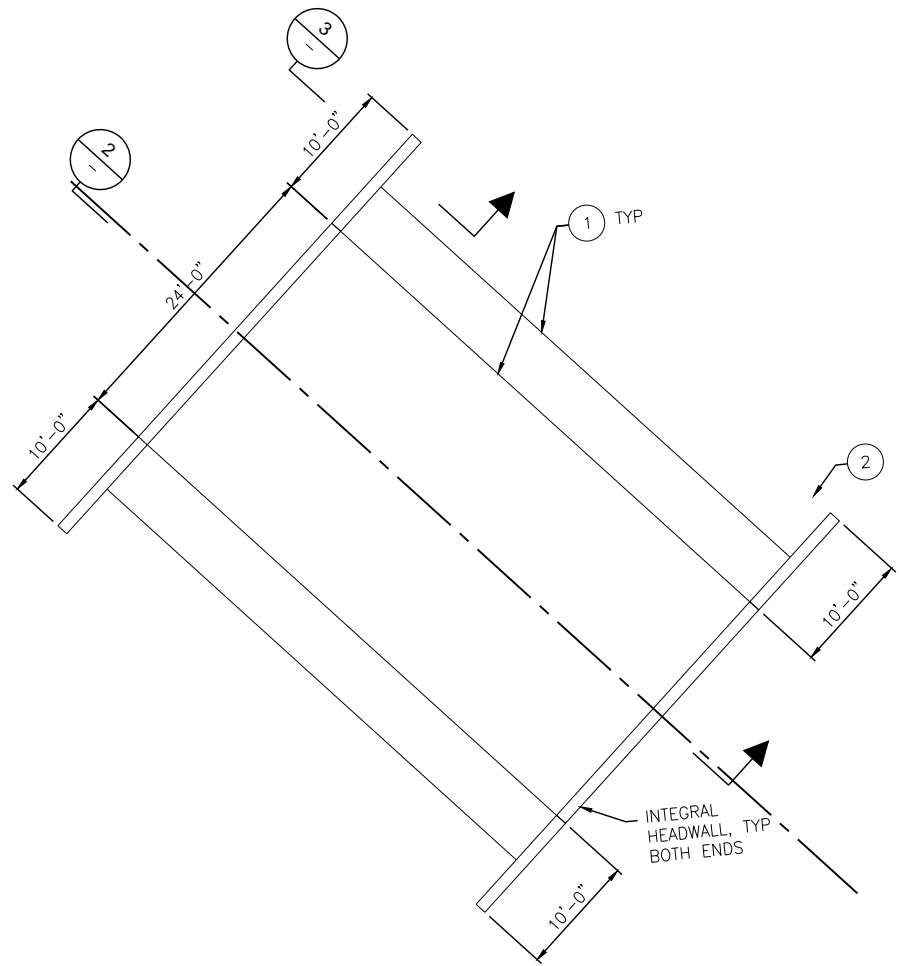
J BROWN 5/6/2016
DESIGNED BY DATE
M OHR 5/6/2016
DRAWN BY DATE
E ROWLAND 5/6/2016
CHECKED BY DATE



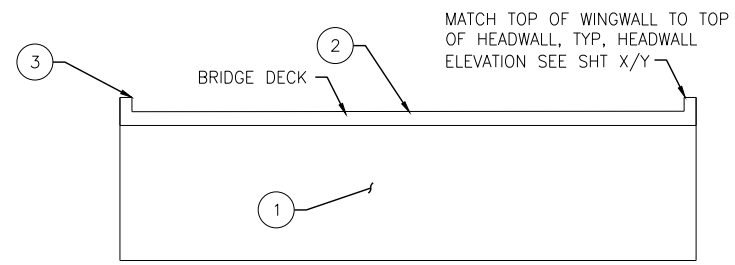
City of Bellevue
UTILITIES

**UPPER SKAGIT KEY
PLAN AND CROSS SECTION VIEWS**

30% SUBMITTAL SHT 14 OF 41



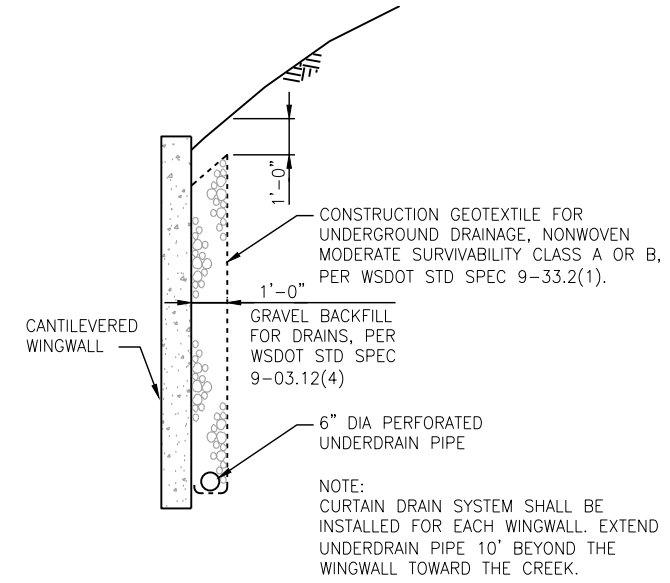
WINGWALL PLAN LAYOUT
SCALE: 1/8"=1'-0"



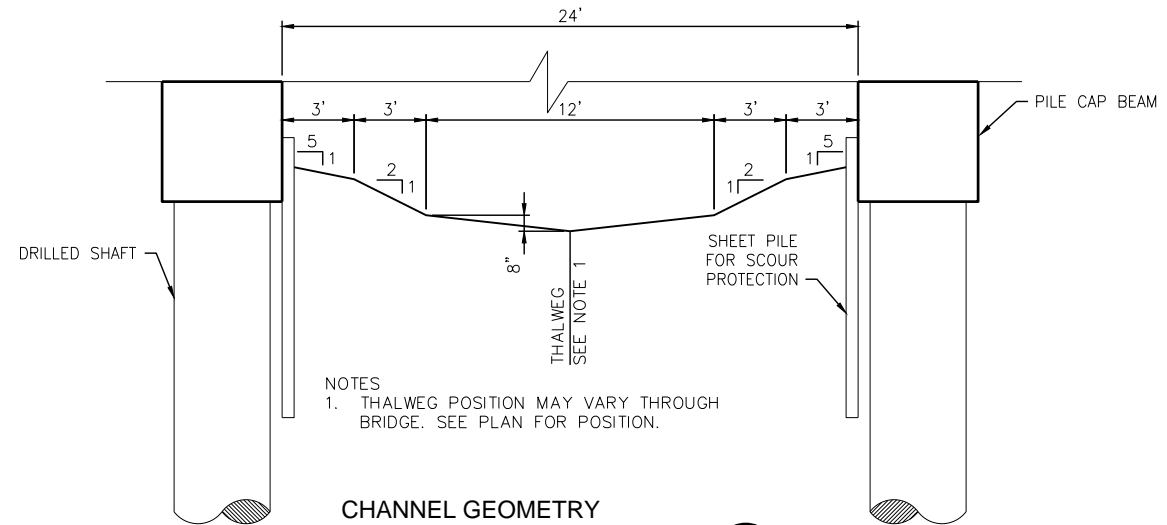
SECTION
SCALE: 1/8"=1'-0"

CONSTRUCTION NOTES

- 1 PILE CAP BEAM DETAILS, SEE X/Y.
- 2 ROAD SECTION, SEE X/Y.
- 3 FABRICATE WINGWALLS AND/OR ADJUST WINGWALL FOOTING GRADE TO ELIMINATE SPACE BETWEEN PRECAST WINGWALL AND CULVERT.



SECTION
SCALE: NONE



CHANNEL GEOMETRY WITHIN BRIDGE
SCALE: 1/4" = 1'-0"



30% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



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DESIGN MANAGER DATE
PROJECT MANAGER DATE

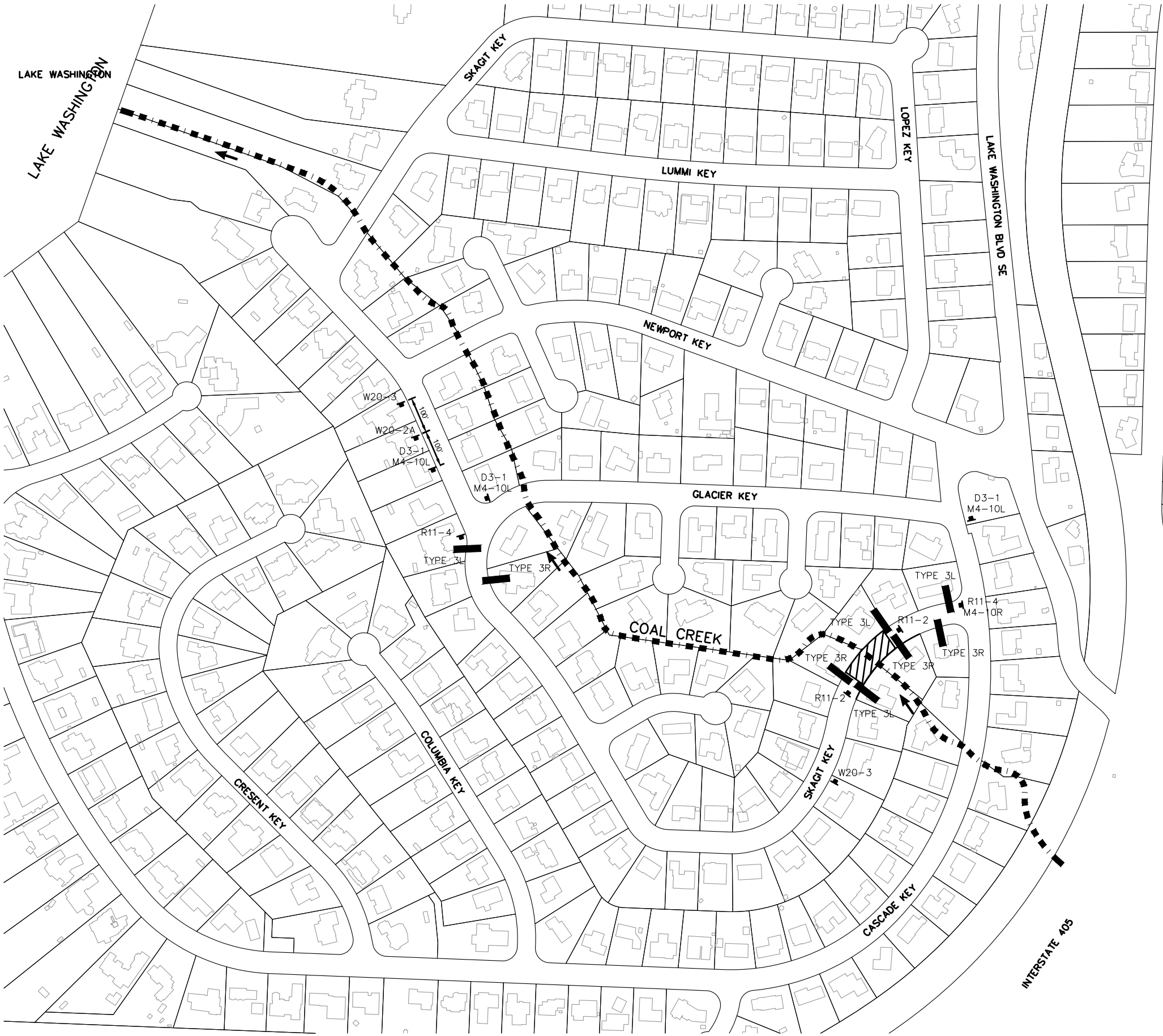
TP DESIGNED BY DATE
BT DRAWN BY DATE
JS CHECKED BY DATE



City of
Bellevue
UTILITIES

UPPER SKAGIT KEY
MISCELLANEOUS DETAILS

Path: P:\134271 lower coal creek ph 2 early action\CAD sheets\traffic control construction documents\18 UPPER SKAGIT KEY TRAFFIC CONTROL.dwg Plot date: Oct 10, 2016 12:25:18pm CAD User: NADINE STOCK
Ref Name: Border C:\P-SITE-SKAGIT KEY-LOWER C:\P-SITE-SKAGIT KEY-UPPER C:\P-SITE-NEWPORT KEY C:\P-SITE-OS-PAVEMENT C:\P-SITE-GLACIER KEY



LEGEND

TYPE 3L BARRICADE

L

TYPE 3R BARRICADE

R

TEMPORARY TRAFFIC CONTROL ZONE SIGN

WORK SPACE

R11-2

ROAD CLOSED

R11-4

ROAD CLOSED TO THRU TRAFFIC

M4-10L

DETOUR

M4-10R

DETOUR

W20-2A

DETOUR AHEAD

W20-3

ROAD CLOSED AHEAD

M4-8A

END DETOUR

D3-1

SKAGIT KEY

NAV 88

0 75 150 225 300

SCALE IN FEET

30% SUBMITTAL

UPPER SKAGIT KEY TRAFFIC CONTROL

SHT 18 OF 41

NO	DATE	BY	APPR	REVISIONS



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Phone: 206-728-9655 Fax: 206-883-9301

Approved By

DESIGN MANAGER

DATE

PROJECT MANAGER

DATE

TP DESIGNED BY

DATE

BT DRAWN BY

DATE

JS CHECKED BY

DATE



- 1 CEMENT CONCRETE SIDEWALK, SEE X/Y.
- 2 TAPER CEMENT CONCRETE SIDEWALK TO MATCH EXISTING, TYP.
- 3 TRAFFIC CURB AND GUTTER, SEE X/Y.
- 4 ADJUST MANHOLE TO GRADE.
- 5 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 12.
- 6 PROTECT TREE FROM DAMAGE.
- 7 SAWCUT SIDEWALK, CURB, AND GUTTER.
- 8 SHAPE CULVERT GRAVEL INFILL TO PROVIDE UNOBSTRUCTED DISCHARGE FROM STORM DRAIN.
- 9 REMOVE EXISTING CULVERT, WINGWALLS AND HEADWALLS.
- 10 SEE X/Y FOR HEADWALL AND WINGWALL DETAILS.
- 11 REMOVE EX ROCK WALL
- 12 REMOVE EX TREE.
- 13 ABANDON IN PLACE EX SD.
- 14 ALLOW DRIVEWAY ACCESS DURING CONSTRUCTION.
- 15 CEMENT CONCRETE DRIVEWAY ENTRANCE TYPE-----, SEE X/Y.
- 16 MATCH EXISTING DRIVEWAY WIDTH.
- 17 TRANSITION ROLLED TO TRAFFIC CURB AND GUTTER, SEE X/Y.
- 18 RELOCATED UTILITIES MOUNTED TO HEADWALL, SEE X/Y.
- 19 SEE SHEET 13 FOR TYPICAL ROAD SECTION.



**City of
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UTILITIES

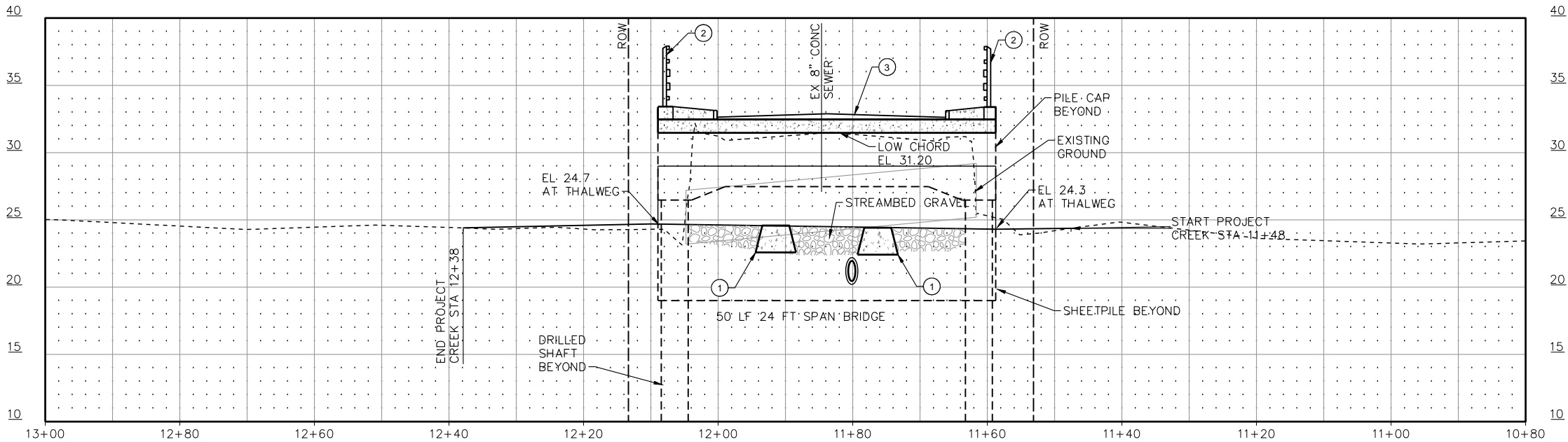
SHT 19 OF 41

CONSTRUCTION NOTES:

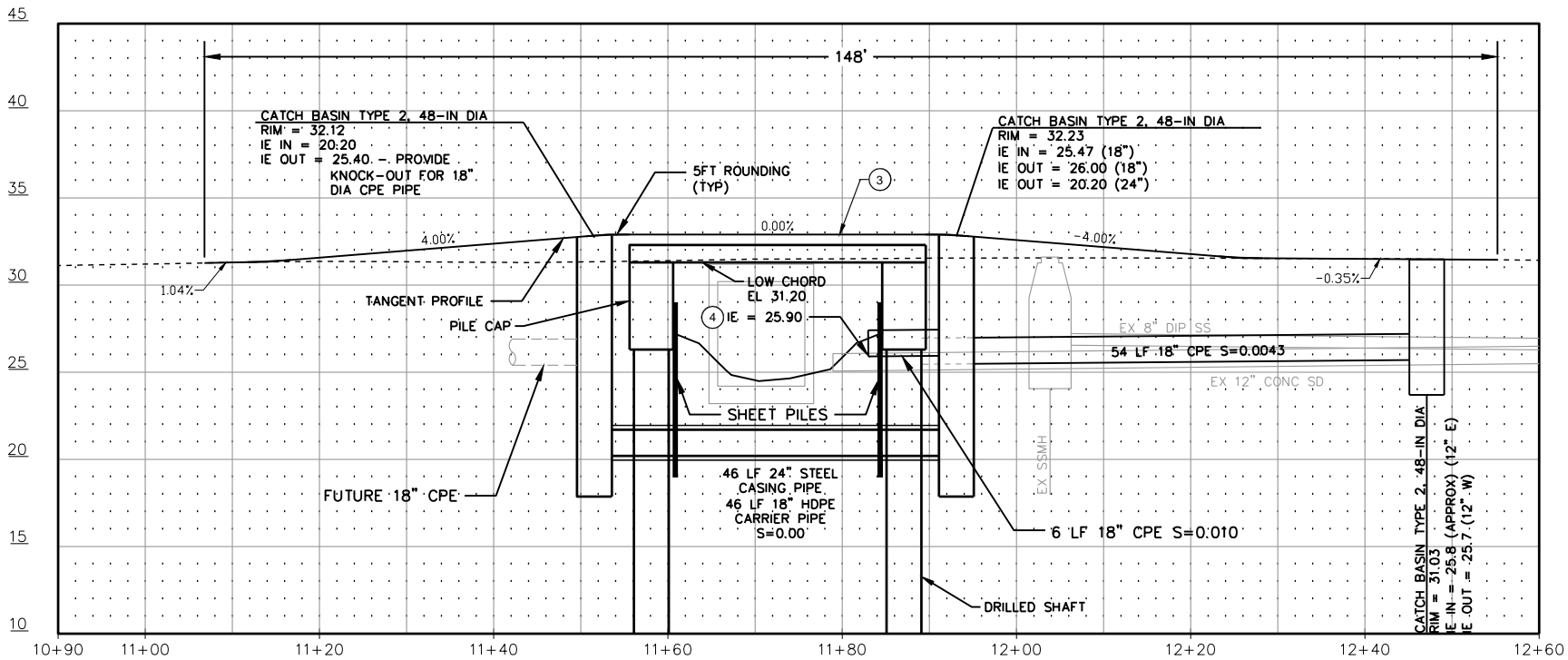
- 1 COARSE SEDIMENT BAND, SEE SHEET 41.
- 2 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 12.
- 3 SEE SHEET 13 FOR TYPICAL ROAD CROSS SECTION
- 4 SHAPE CULVERT GRAVEL INFILL TO PROVIDE UNOBSTRUCTED DISCHARGE FROM STORM DRAIN.

NOTE:

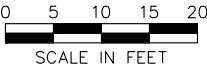
SEE SHEET 19 FOR UTILITY AND ROAD RELATED IMPROVEMENTS.



CREEK PROFILE AT GLACIER KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



ROAD PROFILE GLACIER KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



30% SUBMITTAL

GLACIER KEY
CREEK AND ROAD PROFILE

SHT 20 OF 41

NO	DATE	BY	APPR	REVISIONS



Approved By

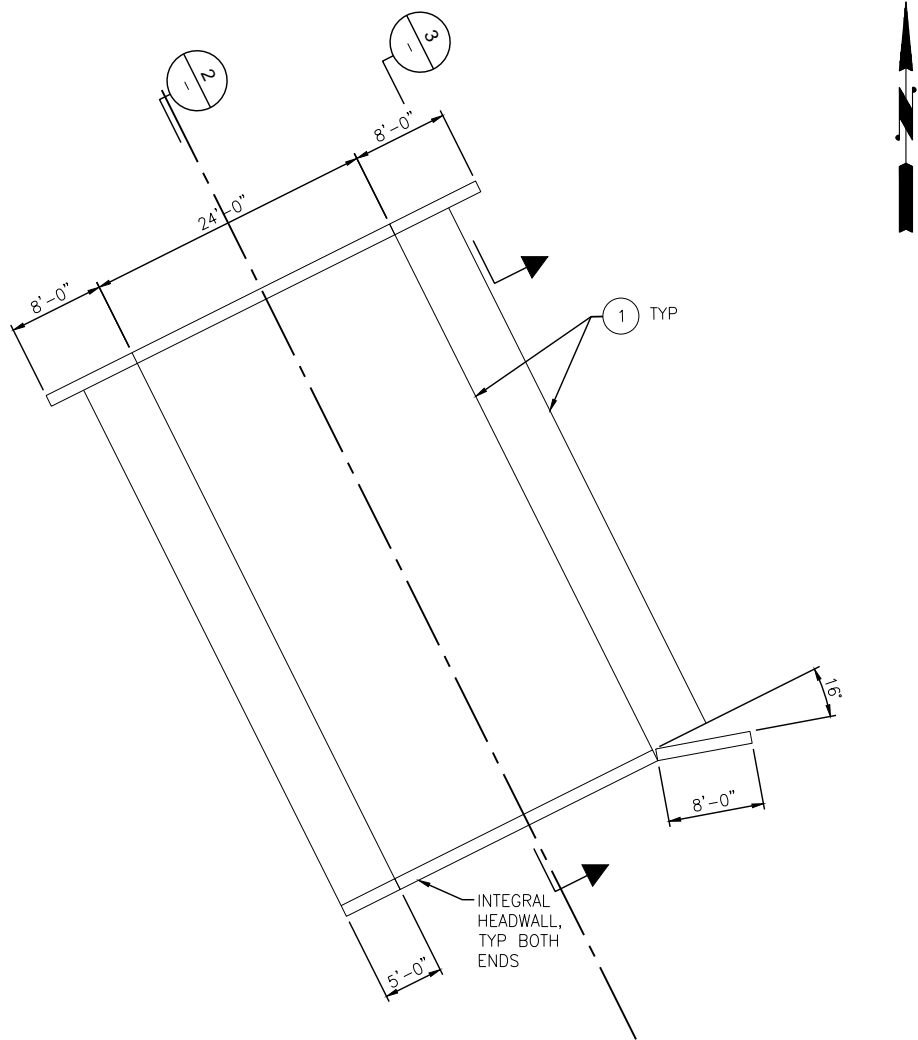
DESIGN MANAGER DATE
PROJECT MANAGER DATE

TP
DESIGNED BY DATE
BT
DRAWN BY DATE
JS
CHECKED BY DATE

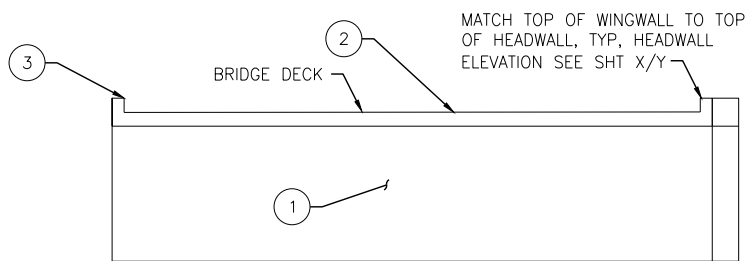


City of
Bellevue
UTILITIES

Path: P:\134271 lower cool creek ph 2 early action\CAD\sheet\p\culvert construction documents\23 GLACIER KEY MISCELLANEOUS DETAILS.dwg Plot date: Oct 10, 2016-12:28:22pm CAD User: MADINE STOCK
Ref Name: Border C-SP-SITE-GLACIER KEY C-SP-WINGWALL DETAILS



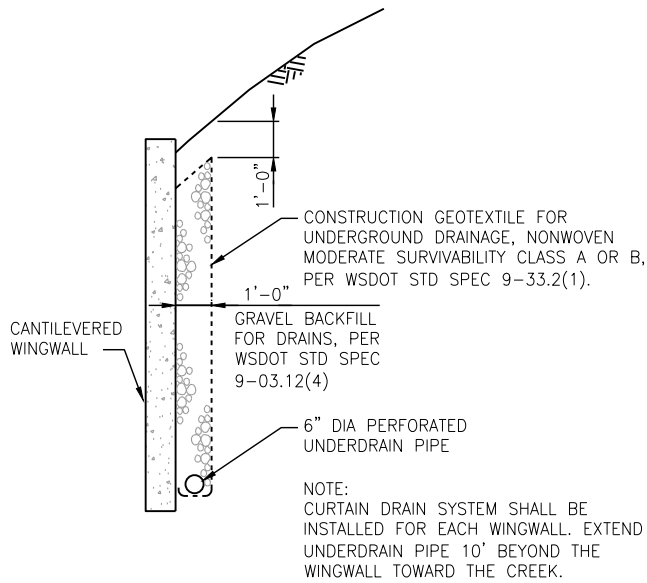
WINGWALL PLAN LAYOUT
SCALE: 1/8"=1'-0"



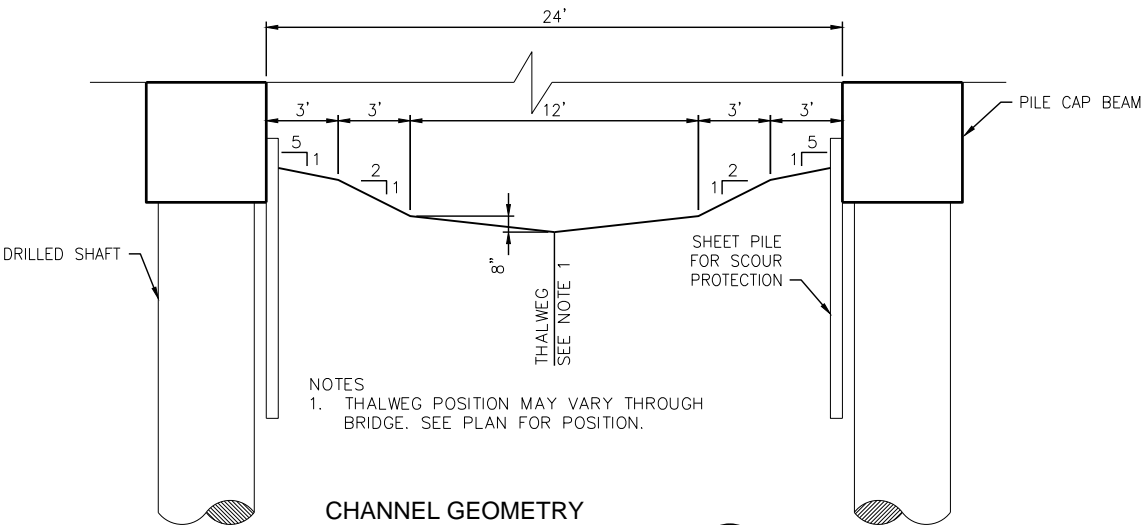
SECTION
SCALE: 1/8"=1'-0"

CONSTRUCTION NOTES

- 1 PILE CAP BEAM DETAILS, SEE X/Y.
- 2 ROAD SECTION, SEE X/Y.
- 3 FABRICATE WINGWALLS AND/OR ADJUST WINGWALL FOOTING GRADE TO ELIMINATE SPACE BETWEEN PRECAST WINGWALL AND CULVERT.



SECTION
SCALE: NONE



CHANNEL GEOMETRY WITHIN BRIDGE
SCALE: 1/4" = 1'-0"



30% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



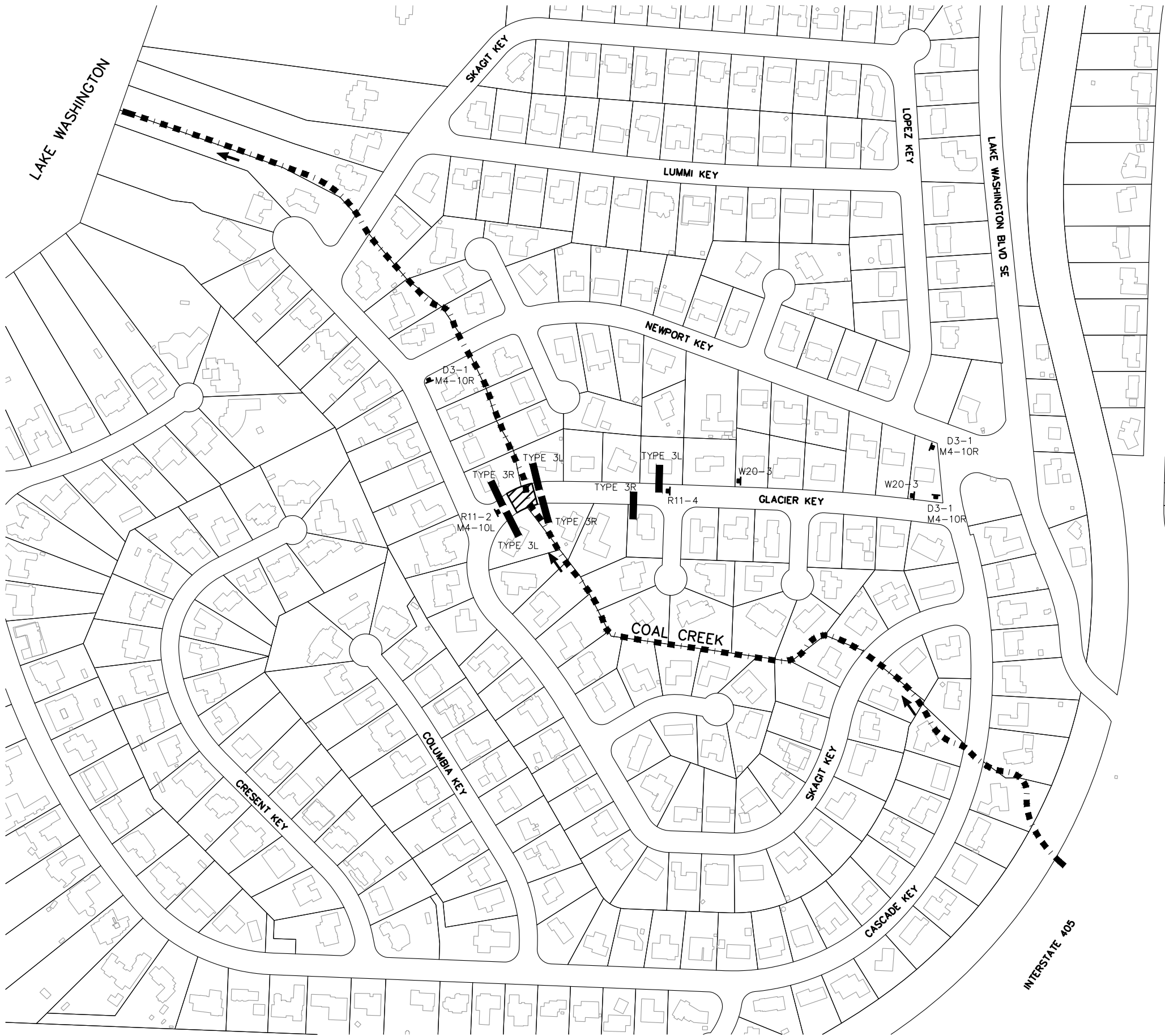
Approved By	
DESIGN MANAGER	DATE
PROJECT MANAGER	DATE



City of
Bellevue
UTILITIES

GLACIER KEY MISCELLANEOUS DETAILS	
SHT	23 OF 41

Path: P:\134271 lower coal creek ph 2 early action\CAD sheets\glacier key traffic control.dwg Plot date: Oct 10, 2016 12:41:16pm CAD User: NADINE STOCK
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LEGEND

TYPE 3L
BARRICADE

L

TYPE 3R
BARRICADE

R

TEMPORARY
TRAFFIC CONTROL
ZONE SIGN

▲

WORK SPACE



R11-2



R11-4



M4-10L



M4-10R



W20-2A



W20-3



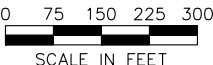
M4-8a



D3-1



NAVD 88



SCALE IN FEET

30% SUBMITTAL

GLACIER KEY
TRAFFIC CONTROL

SHT 25 OF 41

NO	DATE	BY	APPR	REVISIONS





TETRA TECH
www.tetrattech.com
1420 Fifth Avenue, Suite 550
Seattle, Washington 98101
Phone: 206-728-9655 Fax: 206-883-9301

Approved By

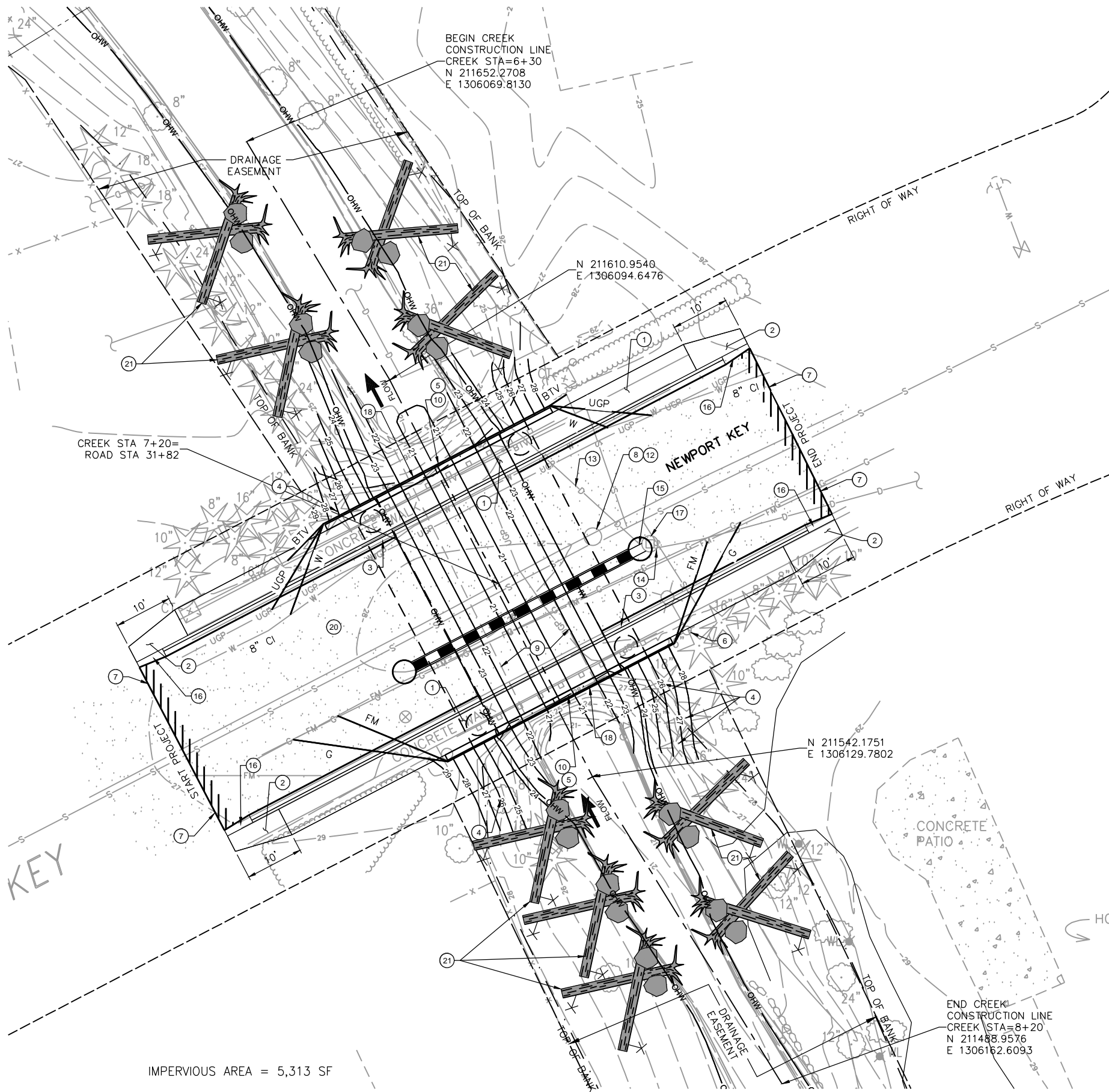
DESIGN MANAGER _____ DATE _____
PROJECT MANAGER _____ DATE _____

TP DESIGNED BY _____ DATE _____
BT DRAWN BY _____ DATE _____
JS CHECKED BY _____ DATE _____



**City of
Bellevue**
UTILITIES

Path: P:\134271 Lower Coo Creek Ph. 2 Early Action\CAD\SheetFiles\Culvert Construction Documents\26 NEWPORT KEY CREEK AND ROAD PLAN.dwg Plot date: Oct 17, 2016-01:03:26pm CAD User: MADINE,STOCK
Net filename: [Border] C:\P\134271-NEWPORT KEY\1 C-SP-SITE-NEWPORT KEY\1 C-SP-CONTOURS-NEWPORT KEY\1 C-SP-LOOS\1 C-SP-OHW\1 C-SP-FEMA



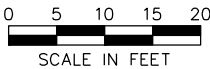
IMPERVIOUS AREA = 5,313 SF

CONSTRUCTION NOTES:

- 1 CEMENT CONCRETE SIDEWALK, SEE X/Y.
- 2 TAPER CEMENT CONCRETE SIDEWALK TO MATCH EXISTING, TYP.
- 3 TRAFFIC CURB AND GUTTER, SEE X/Y.
- 4 REMOVE EXISTING TREE.
- 5 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 12.
- 6 SUPPORT LIGHT POLE DURING CONSTRUCTION.
- 7 SAWCUT SIDEWALK, CURB, GUTTER, AND PAVEMENT.
- 8 PRESERVE EXISTING SANITARY MANHOLE.
- 9 REMOVE EXISTING CULVERT, WINGWALLS AND HEADWALLS.
- 10 SEE X/Y FOR HEADWALL AND WINGWALL DETAILS.
- 11 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE EXISTING SEWER. CONTRACTOR SHALL POTHOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING.
- 12 ADJUST MANHOLE TO GRADE.
- 13 ABANDON IN PLACE EXISTING STORM.
- 14 CONNECT TO DRAINAGE STRUCTURE.
- 15 PLUG EXISTING STORM.
- 16 TRANSITION ROLLED TO TRAFFIC CURB AND GUTTER, SEE X/Y.
- 17 REMOVE EXISTING CATCH BASIN.
- 18 RELOCATED UTILITIES MOUNTED ON HEADWALL, SEE X/Y.
- 19 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE STORM DRAIN CASING PIPE.
- 20 SEE SHEET 13 FOR TYPICAL ROAD CROSS SECTION.
- 21 SEE SHEET 29.



NAVD 88



SCALE IN FEET

30% SUBMITTAL

NO	DATE	BY	APPR	REVISIONS



Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

TP
DESIGNED BY DATE
BT
DRAWN BY DATE
JS
CHECKED BY DATE

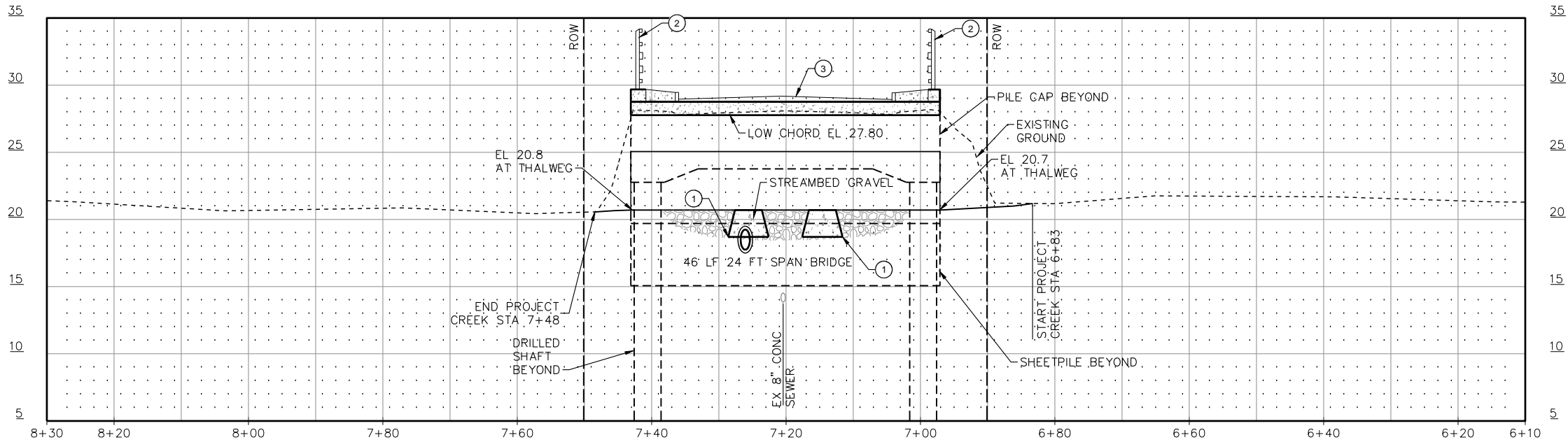


City of
Bellevue
UTILITIES

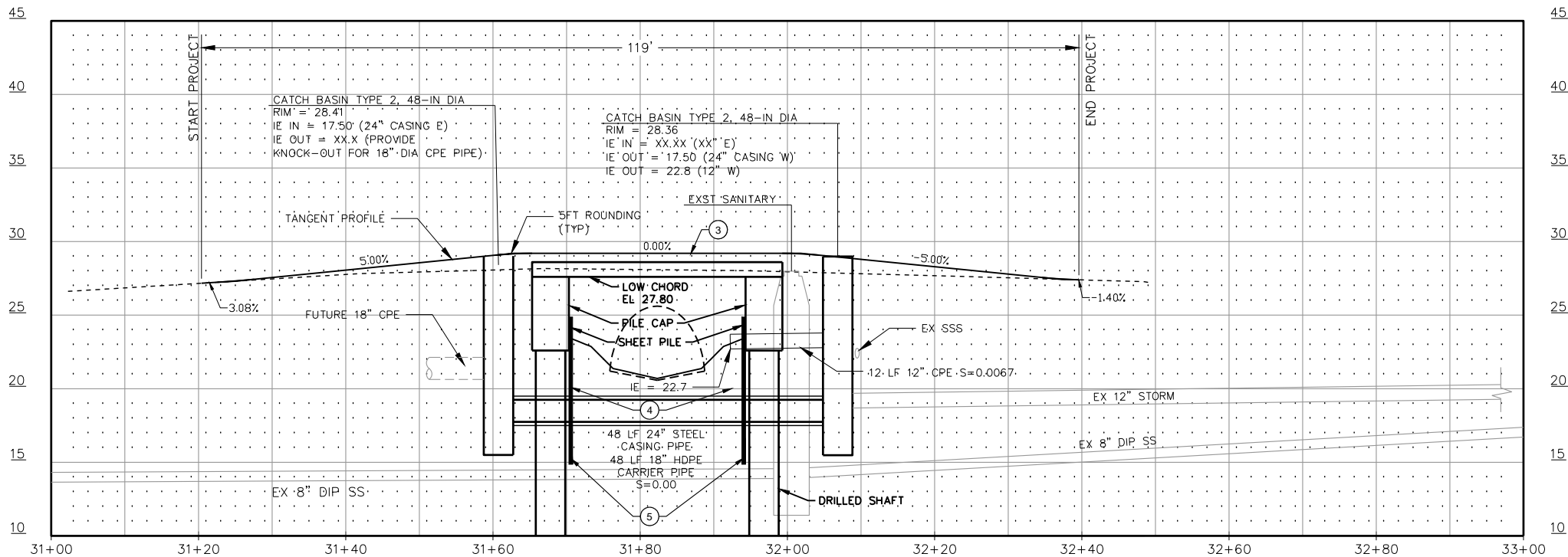
NEWPORT KEY
CREEK AND ROAD PLAN

SHT 26 OF 41

Path: P:\134271 Lower Coo Creek Ph. 2 Early Action\CAD\SheetFiles\Curv Construction Documents\27 NEWPORT KEY CREEK AND ROAD PROFILE.dwg Plot date: Oct 11, 2016-01:52:57pm CAD User: NADINE STOCK
Net Name: Border C:\P-SITE-NEWPORT KEY\1 C-S-P-ALOK-PROP



CREEK PROFILE AT NEWPORT KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



ROAD PROFILE NEWPORT KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'

CONSTRUCTION NOTES:

- 1 COARSE SEDIMENT BAND, SEE SHEET 41.
- 2 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 12.
- 3 SEE SHEET 13 FOR TYPICAL ROAD CROSS SECTION.
- 4 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE STORM DRAIN CASING PIPE.
- 5 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE EXISTING SEWER. CONTRACTOR SHALL POTHOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING

NOTE:

SEE SHEET 26 FOR UTILITY AND ROAD RELATED IMPROVEMENTS.



NAVD 88



30% SUBMITTAL

NEWPORT KEY
CREEK AND ROAD PROFILE

SHT 27 OF 41

NO	DATE	BY	APPR	REVISIONS



TETRA TECH
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Phone: 206-728-9655 Fax: 206-883-9301

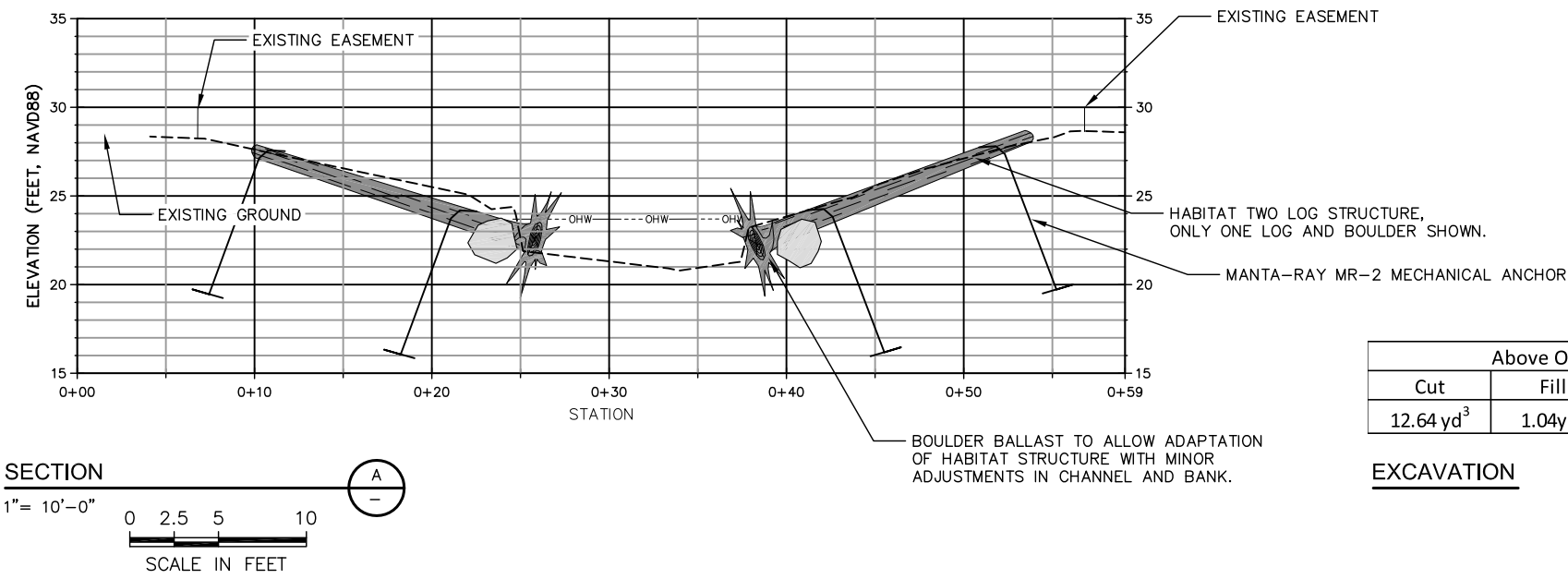
Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

TP
DESIGNED BY DATE
BT
DRAWN BY DATE
JS
CHECKED BY DATE



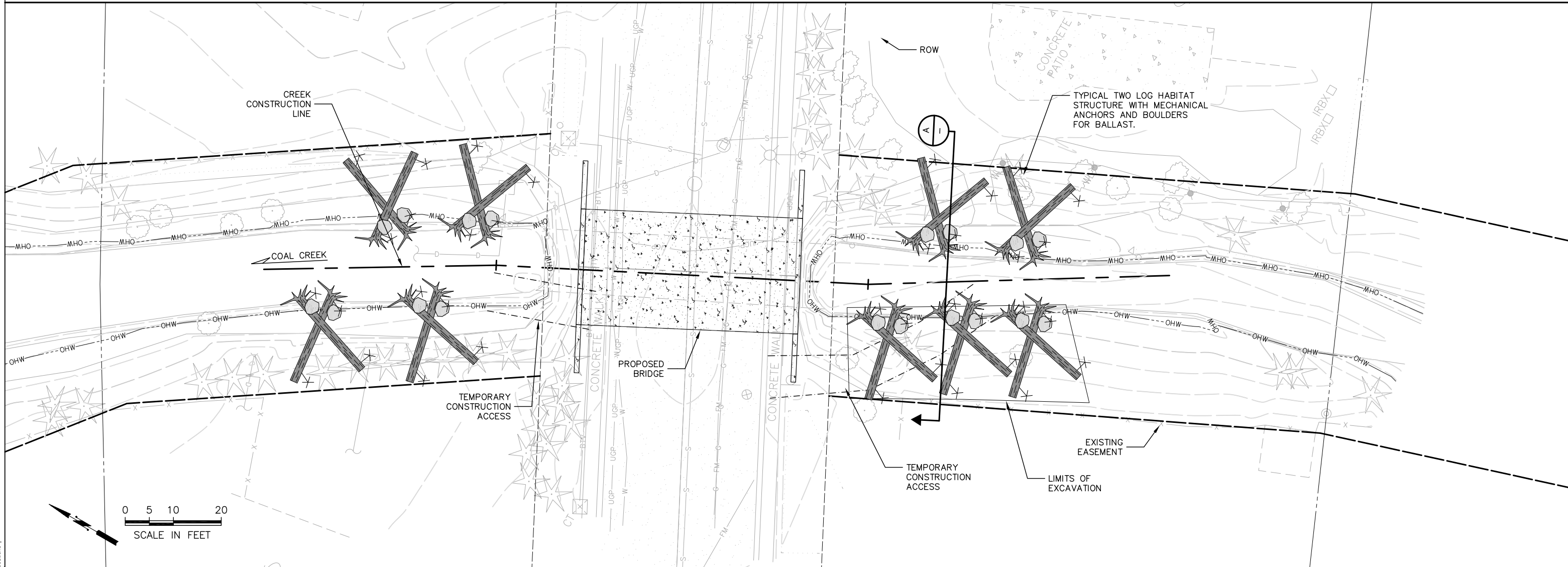
**City of
Bellevue**
UTILITIES



Above OHW			Below OHW			Total Net
Cut	Fill	Net	Cut	Fill	Net	Cut
12.64 yd ³	1.04yd ³	11.6yd ³ cut	3.25yd ³	0yd ³	3.25yd ³ cut	14.85yd ³

EXCAVATION

SEE SHEET 2 FOR ABBREVIATIONS AND SYMBOLS.



NO	DATE	BY	APPR	REVISIONS

nhc
northwest hydraulic consultants

16300 Christensen Rd. Suite 350
Tukwila WA 98188
Phone: 206-241-6000
Fax: 206-439-2420



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1420 Fifth Avenue, Suite 600
Seattle, Washington 98101
Phone: 206-883-9300 Fax: 206-883-9301

Approved By

DESIGN MANAGER	DATE
PROJECT MANAGER	DATE

J BROWN	5/6/2016
DESIGNED BY	DATE
M OHRT	5/6/2016
DRAWN BY	DATE
E ROWLAND	5/6/2016
CHECKED BY	DATE



City of Bellevue
UTILITIES

**NEWPORT KEY
PLAN AND CROSS SECTION VIEWS**

Path: C:\Users\jbrunton\Documents\Projects\2000044 Lower Coal Creek\AC_2000044\Log_Placement_30%_DRAFT6.dwg Plot date: Oct 14, 2016 03:29:52pm CAD User: dflinton
Net File Name: [Container Locations]

3

BRIDGE DECK

2

1

MATCH TOP OF WINGWALL TO TOP OF HEADWALL, TYP. HEADWALL ELEVATION SEE SHT X/Y

24'

12'

3'

3'

3'

3'

5'

1'

2'

1'

8"

THALWEG
SEE NOTE 1

NOTES
1. THALWEG POSITION MAY VARY THROUGH
BRIDGE. SEE PLAN FOR POSITION.

DRILLED SHAFT

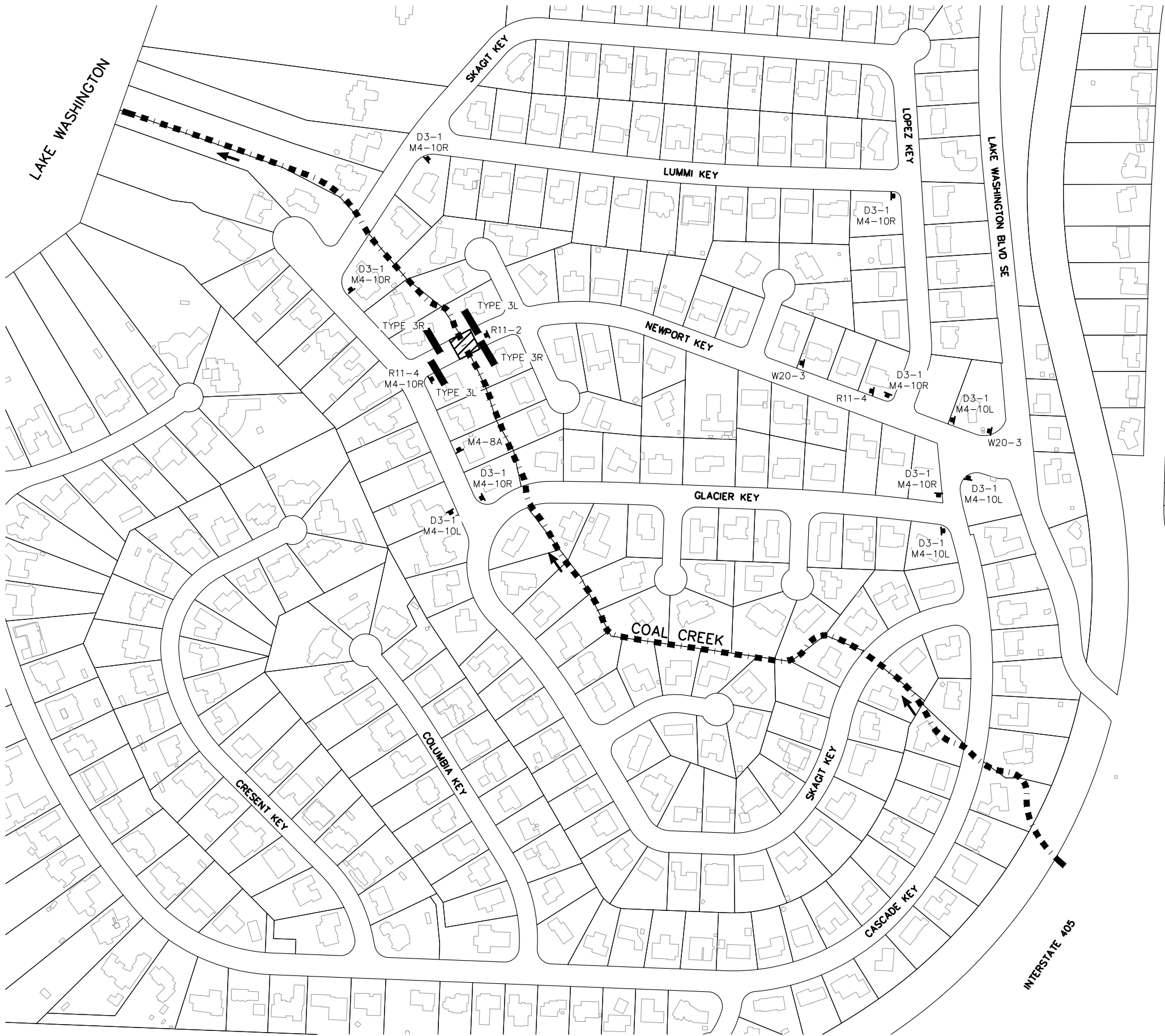
SHEET PILE
FOR SCOUR
PROTECTION

PILE CAP BEAM

CHANNEL GEOMETRY

SHT 30 OF 41

Path: P:\134271 lower coal creek ph 2 early action\CAD sheets\traffic control construction documents\32 NEWPORT KEY TRAFFIC CONTROL.dwg Plot date: Oct 10, 2018-12:45:46pm CAD User: MONE STOCK
Ref Name: [Border] [C-AP-SITE-SKAGIT KEY-LOWER] [C-AP-SITE-SKAGIT KEY-UPPER] [C-AP-SITE-NEWPORT KEY] [C-AP-SITE-GLACIER KEY] [C-AP-SITE-GLACIER KEY]



LEGEND

TYPE 3L BARRICADE

TYPE 3R BARRICADE

TEMPORARY TRAFFIC CONTROL ZONE SIGN

WORK SPACE

R11-2

R11-4

M4-10L

M4-10R

W20-2A

W20-3

M4-8A

D3-1

L

R

ROAD CLOSED

ROAD CLOSED TO THRU TRAFFIC

← DETOUR

DETOUR →

DETOUR AHEAD

ROAD CLOSED AHEAD

END DETOUR

NEWPORT KEY

NAVOD 88

0 75 150 225 300

SCALE IN FEET

30% SUBMITTAL

NEWPORT KEY TRAFFIC CONTROL

SHT 32 OF 41

NO	DATE	BY	APPR	REVISIONS



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Phone: 206-728-9655 Fax: 206-883-9301

Approved By

DESIGN MANAGER

PROJECT MANAGER

DATE

DATE

TP DESIGNED BY

B.T.

DRAWN BY

J.S.

CHECKED BY

DATE

DATE

DATE



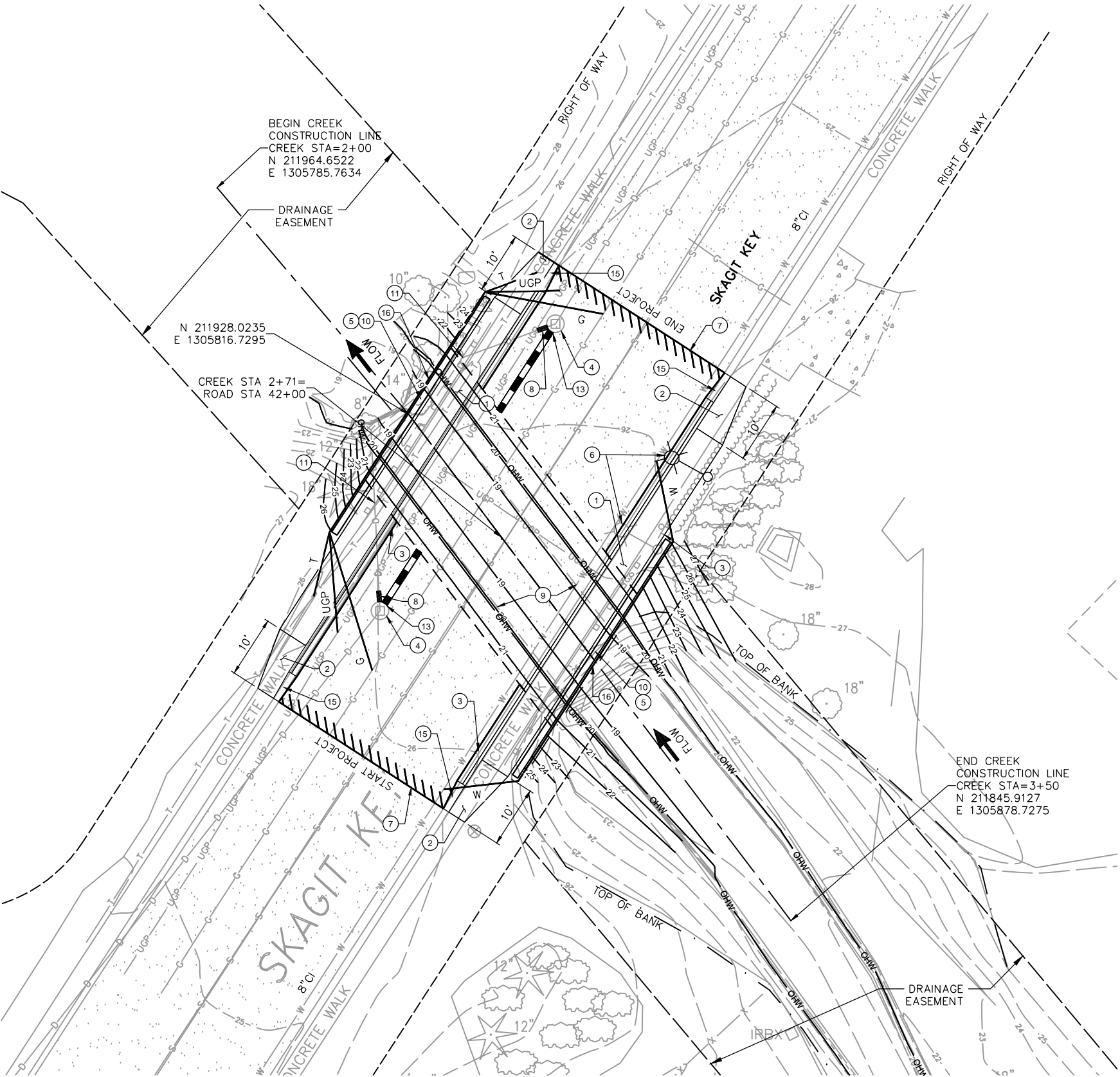
CONSTRUCTION NOTES:

- 1 CEMENT CONCRETE SIDEWALK, SEE X/Y.
2 TAPER CEMENT CONCRETE SIDEWALK TO MATCH EXISTING, TYP.
3 TRAFFIC CURB AND GUTTER, SEE X/Y.
4 ADJUST MANHOLE TO GRADE.
5 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 12.
6 RELOCATE LIGHT POLE.
7 SAWCUT SIDEWALK, CURB, AND GUTTER.
8 PLUG EXISTING STORM.
9 REMOVE EXISTING CULVERT, WINGWALLS AND HEADWALLS.
10 SEE X/Y FOR HEADWALL AND WINGWALL DETAILS.
11 REMOVE STORM DRAIN IN CONFLICT WITH CONSTRUCTION.
12 BURIED/PLUGGED EXISTING STORM DRAIN.
13 CONNECT TO DRAINAGE STRUCTURE.
14 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE EXISTING SEWER. CONTRACTOR SHALL POTHOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING.
15 TRANSITION ROLLED TO TRAFFIC CURB AND GUTTER, SEE X/Y.
16 RELOCATED EXISTING UTILITIES MOUNTED ON HEADWALL, SEE X/Y.
17 SEE SHEET 13 FOR TYPICAL ROAD CROSS SECTION.

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LOWER SKAGIT KEY
CREEK AND ROAD PLAN

SHT 33 OF 41



NAVD 88



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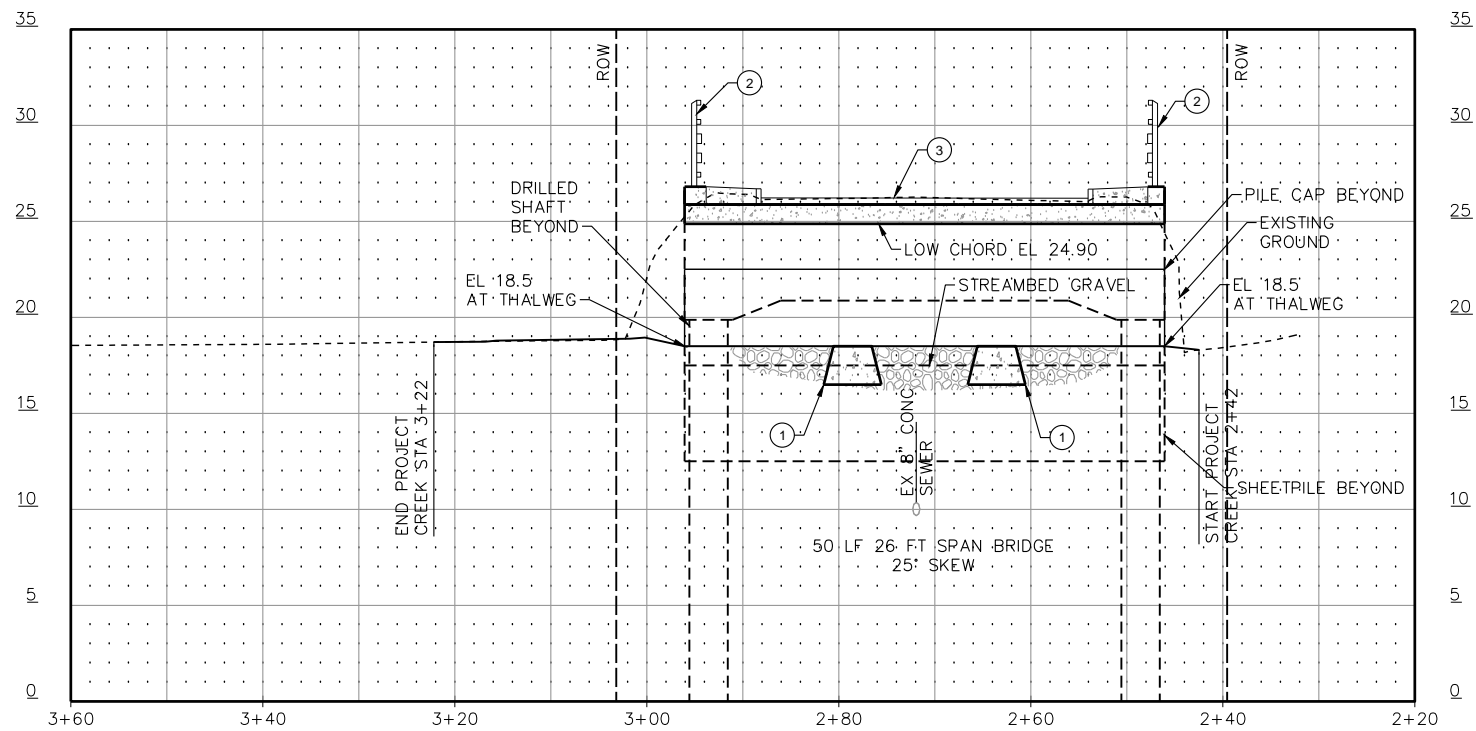
Approved By

DESIGN MANAGER DATE
PROJECT MANAGER DATE

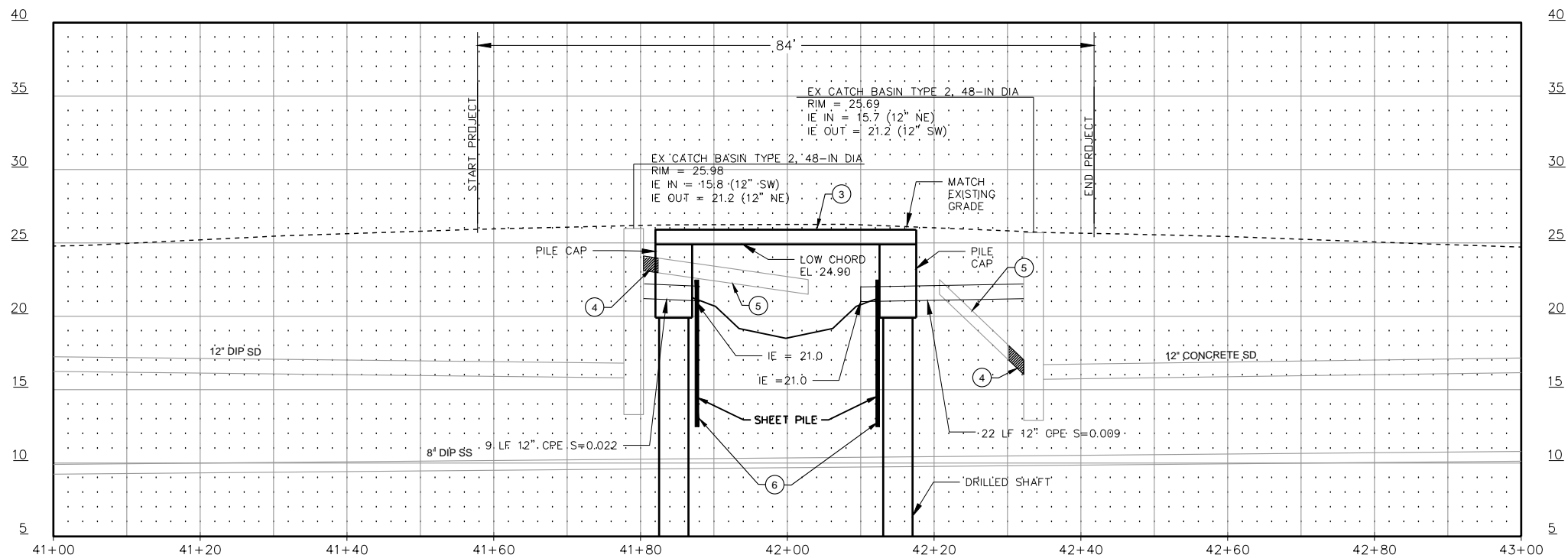
TP DESIGNED BY DATE
BT DRAWN BY DATE
JS CHECKED BY DATE



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UTILITIES



CREEK PROFILE AT LOWER SKAGIT KEY
SCALE: HORIZ: 1"= 10' VERT: 1"=5'



ROAD PROFILE SKAGIT KEY-LOWER
SCALE: HORIZ: 1"= 10' VERT: 1"=5'

CONSTRUCTION NOTES:

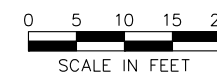
- 1 COARSE SEDIMENT BAND, SEE SHEET 41.
- 2 BRIDGE RAIL WITH MIN TL-1 RATING, SEE SHEET 12.
- 3 SEE SHEET 13 FOR TYPICAL ROAD CROSS SECTION.
- 4 PLUG EXISTING STORM DRAIN.
- 5 BURIED/PLUGGED EXISTING STORM DRAIN.
- 6 SHEET PILE SCOUR PROTECTION INSTALLED TO 6" ABOVE EXISTING SEWER. CONTRACTOR SHALL POT HOLE SEWER PRIOR TO SHEET PILE INSTALLATION TO ESTABLISH SHEET PILE LENGTH AT SEWER CROSSING.

NOTE:

SEE SHEET 33 FOR UTILITY AND ROAD RELATED IMPROVEMENTS.



NAVD 88



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LOWER SKAGIT KEY
CREEK AND ROAD PROFILE

SHT 34 OF 41

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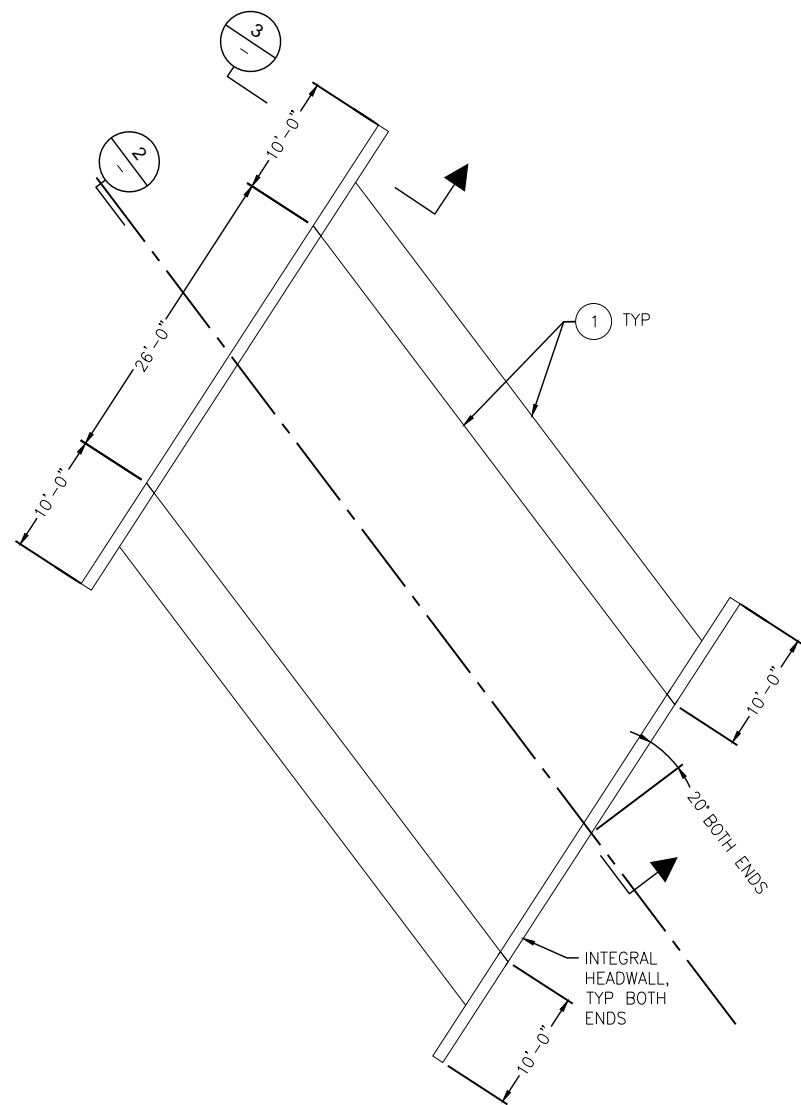
Approved By

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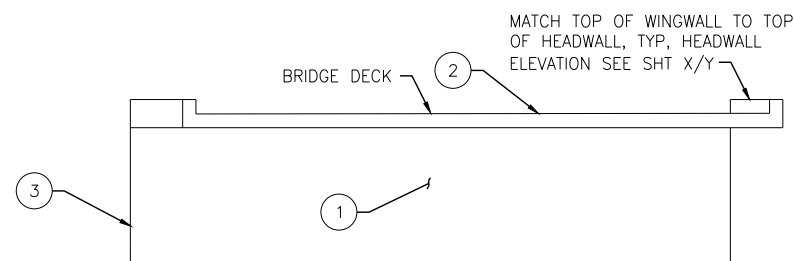
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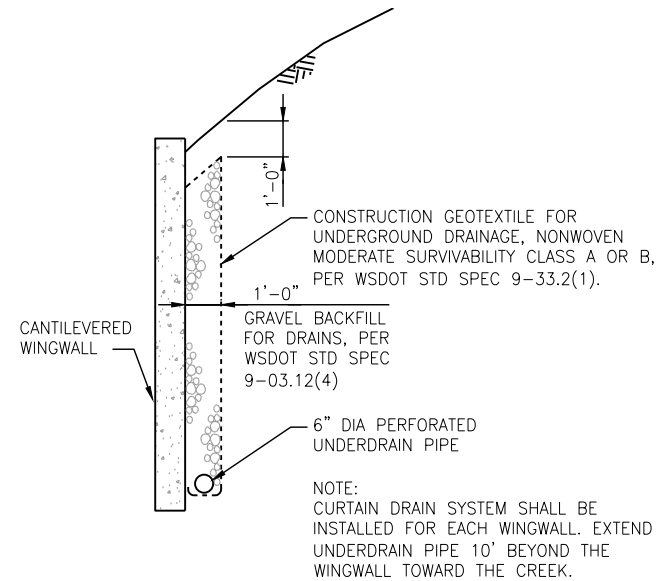
WINGWALL PLAN LAYOUT
SCALE: 1/8"=1'-0" 1/3



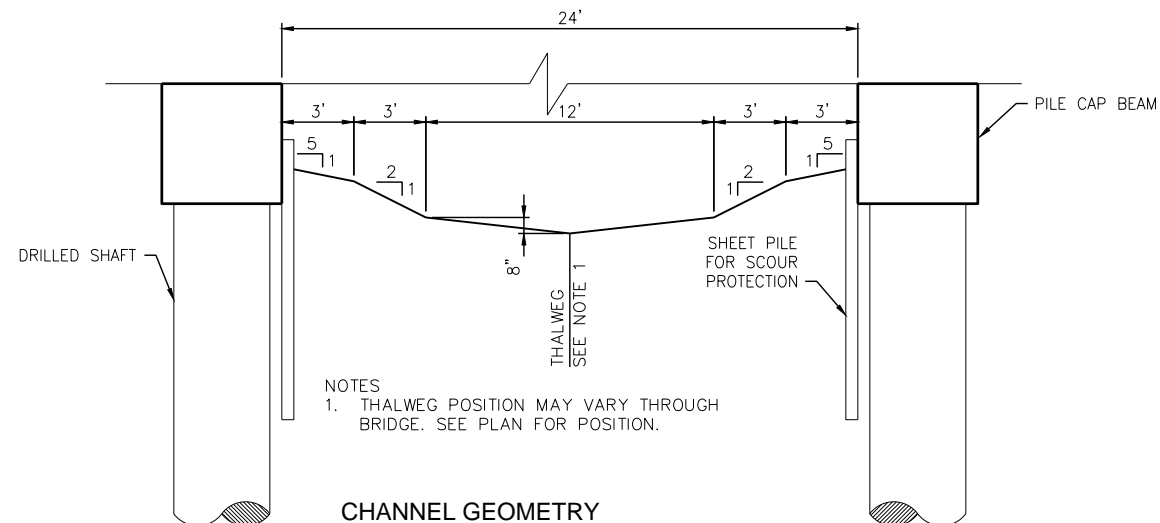
SECTION
SCALE: 1/8"=1'-0" 2/-

CONSTRUCTION NOTES

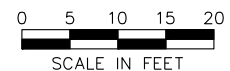
- 1 PILE CAP BEAM DETAILS, SEE X/Y.
- 2 ROAD SECTION, SEE X/Y.
- 3 FABRICATE WINGWALLS AND/OR ADJUST WINGWALL FOOTING GRADE TO ELIMINATE SPACE BETWEEN PRECAST WINGWALL AND CULVERT.



SECTION
SCALE: NONE 3/-



CHANNEL GEOMETRY WITHIN BRIDGE
SCALE: 1/4" = 1'-0" 4/-



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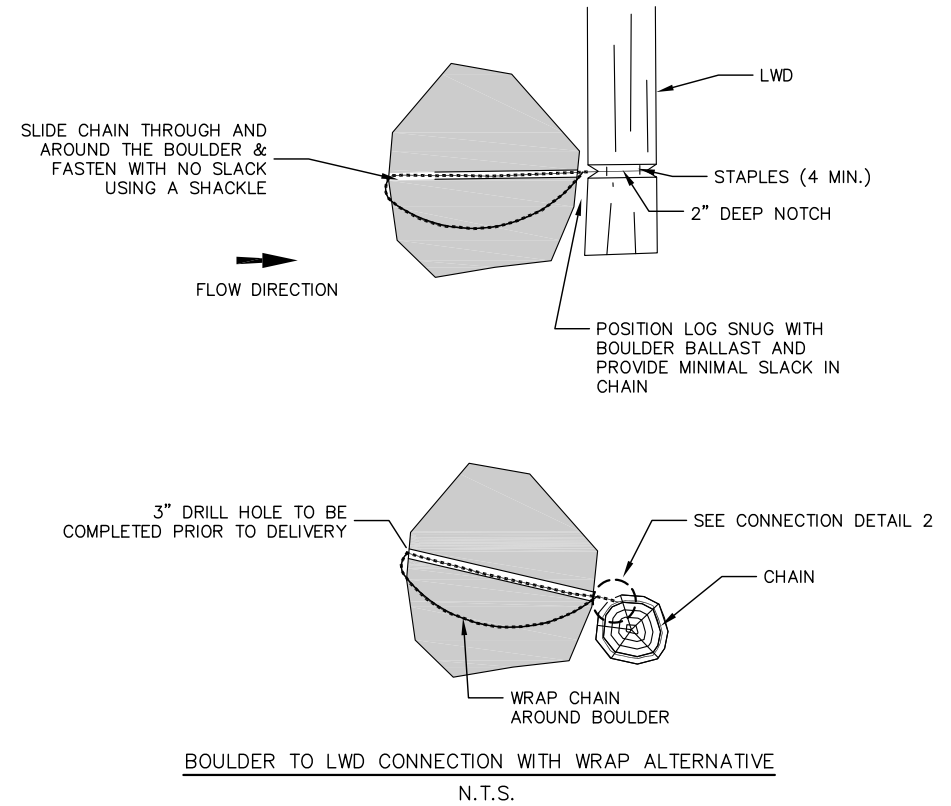
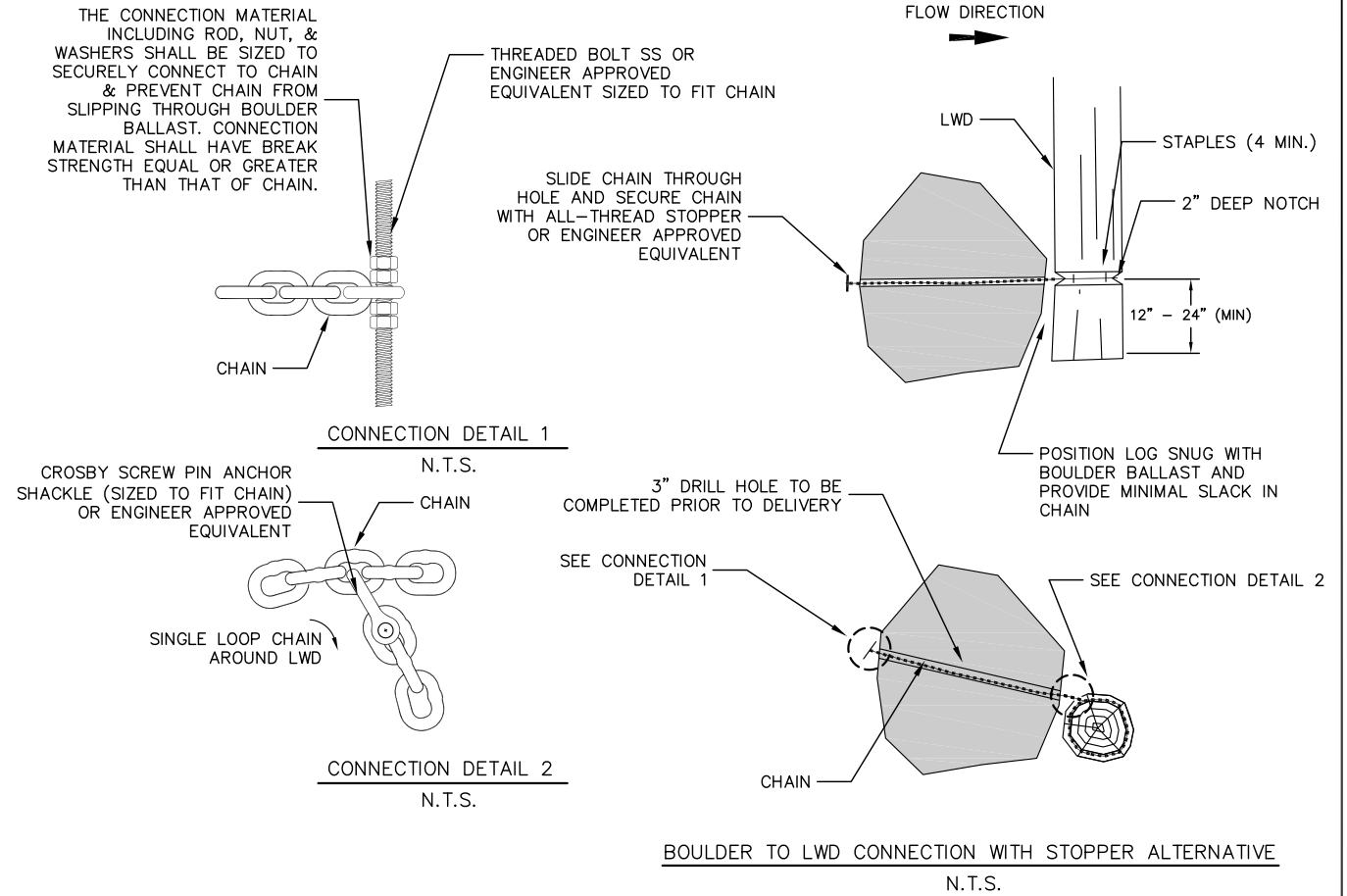
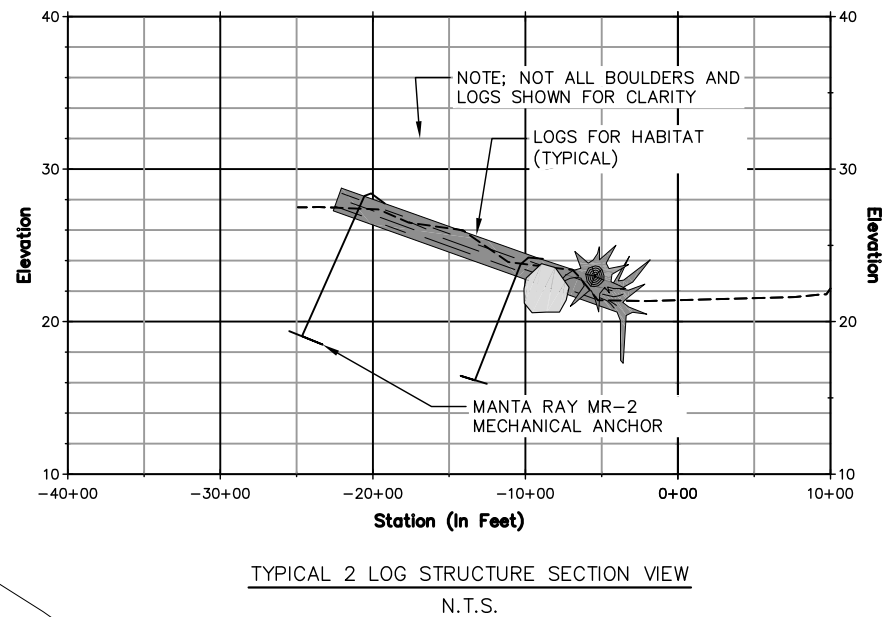
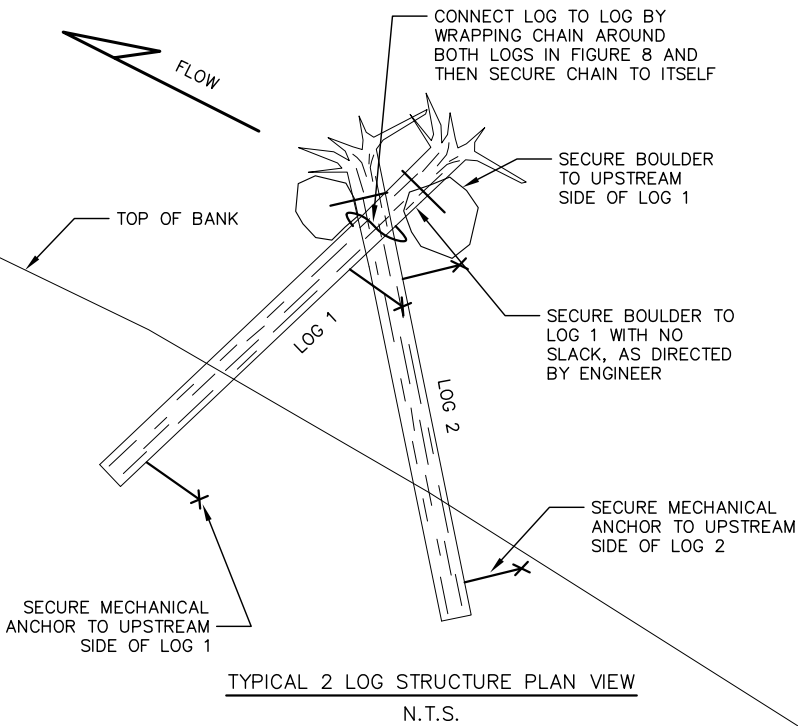
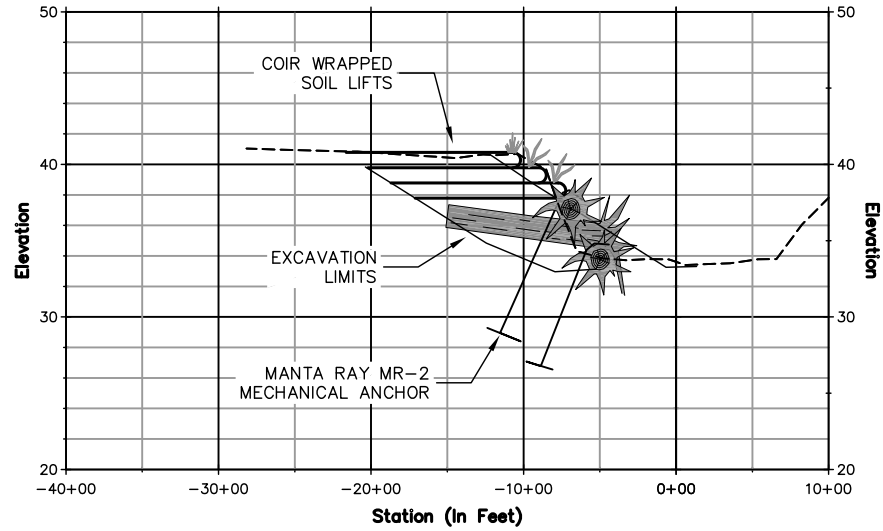
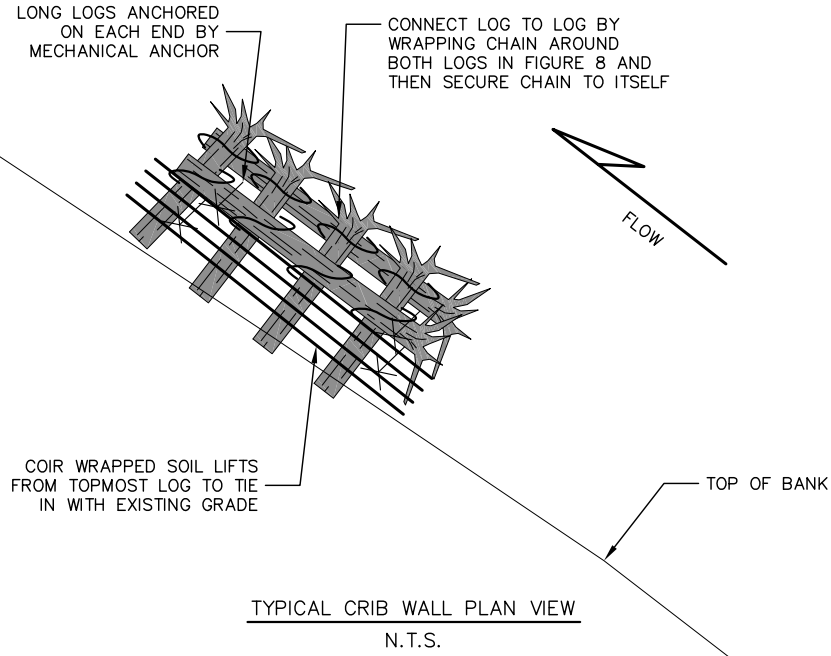
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LOWER SKAGIT KEY MISCELLANEOUS DETAILS	
SHT	37 OF 41



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DESIGN MANAGER DATE
PROJECT MANAGER DATE

J. BROWN 5/6/2016
DESIGNED BY DATE
M. OHRT 5/6/2016
DRAWN BY DATE
E. ROWLAND 5/6/2016
CHECKED BY DATE

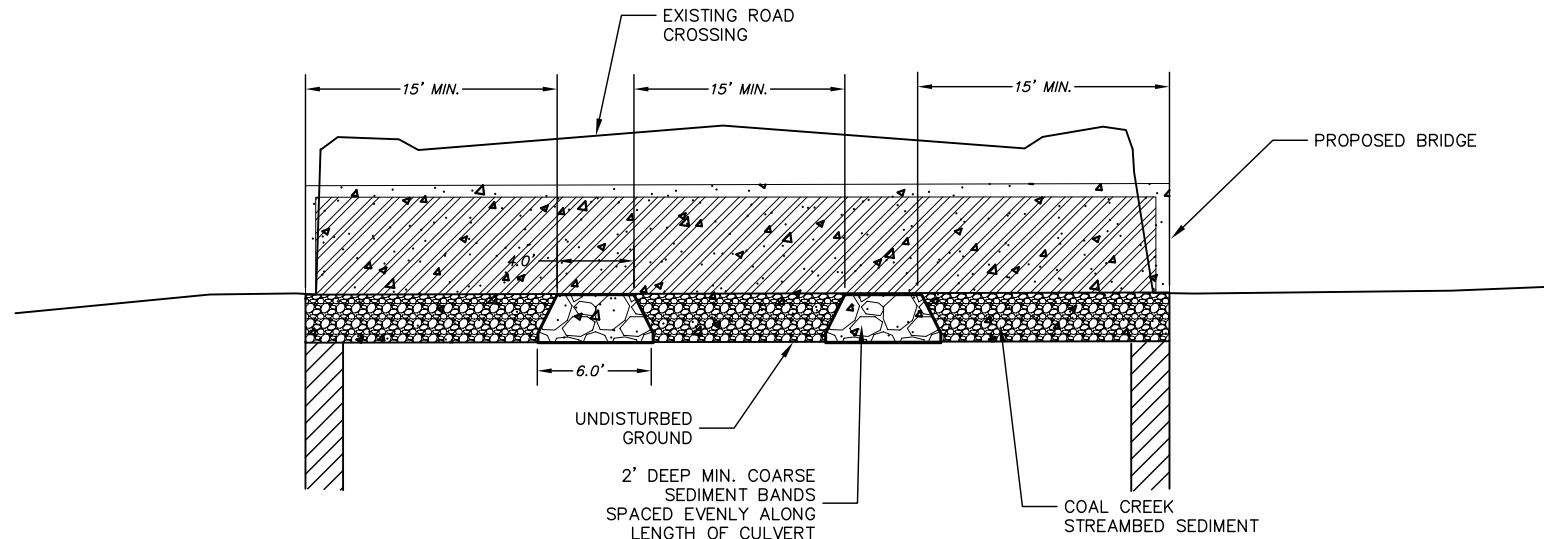


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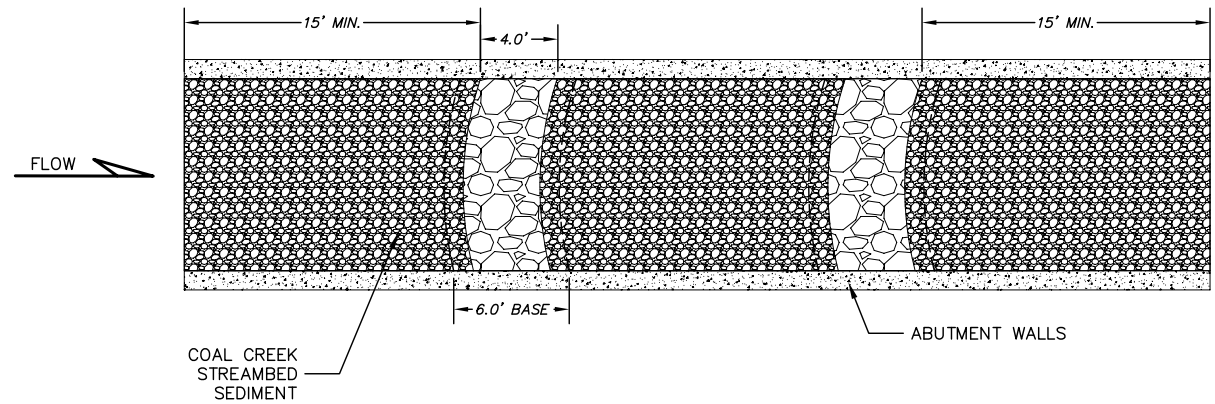
HABITAT DETAILS 1

30% SUBMITTAL

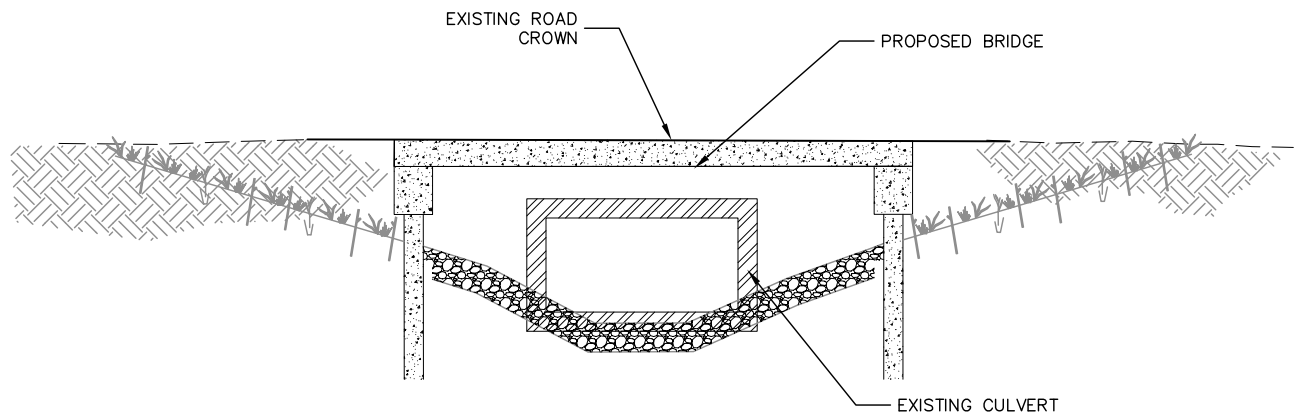
SHT 40 OF 41



TYPICAL COARSE ROCK BAND SECTION VIEW
N.T.S.



TYPICAL COARSE ROCK BAND PLAN VIEW
N.T.S.



TYPICAL COARSE ROCK BAND SECTION VIEW
N.T.S.

Construction Notes

1. Wood species shall be green (not stockpiled) Douglas Fir, Red Cedar, or Sitka Spruce unless otherwise specified. No dimensional beams or timbers, Red Alder, or other deciduous tree species shall be used.
2. The actual number and volume of ballast boulder required per site is dependent on the volume of LWD placed and anchoring system employed in the field.
3. LWD pieces: minimum diameter of 20 inches dbh (therefore 22" +/- 2" dbh), minimum rootwad diameter of 4 feet, and minimum 20 foot in length.
4. Each log shall be secured in place at both ends by anchoring to boulder ballasts, mechanical anchors, or buried 2/3 of stem length into competent material.
5. Boulders used for deadman ballast in channel shall be three man boulders, at least half buried, and secured to the logs with no slack in chain. All boulders shall be placed on the upstream side of the log they are secured to (unless instructed otherwise by engineer in field).
6. Mechanical anchors shall be Manta Ray MR-2 or equivalent, driven to and proof tested to manufacturer's specification.
7. Use minimum 1/2" long link deck-lashing chain or 3/8" grade 70 transport chain and shackles for securing logs to boulder ballast. Shackles should be stronger than chain. Equivalent chain and connection methods may be used if approved by the engineer.
8. Possible methods for securing chain to boulders are:
 - a. Drilling through boulder, threading chain through drilled hole, and securing chain on backside of boulder to prevent the chain from slipping through.
 - b. Drilling through boulder, threading chain through drilled hole, and securing chain to itself with an approved connection method.

Special Notes

1. The plan drawing shows the proposed location of the LWD structure. The final design may be modified to suit local conditions and available materials. Further, modifications to this design may be made in the field by the field engineer during construction.
2. Typical designs are meant as a guide only. Modification to suit site conditions will likely be required.
3. The ballast added to the structure is not intended to prevent log structures from shifting slightly during a large flow event, but rather to limit the distance they will move.
4. The stability of the log structure is derived from intertwining individual pieces. Normal high water events will likely result in some log shifting and settling of the structure as it adapts to the streambed and bank.

NO	DATE	BY	APPR	REVISIONS

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HABITAT DETAILS 2

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