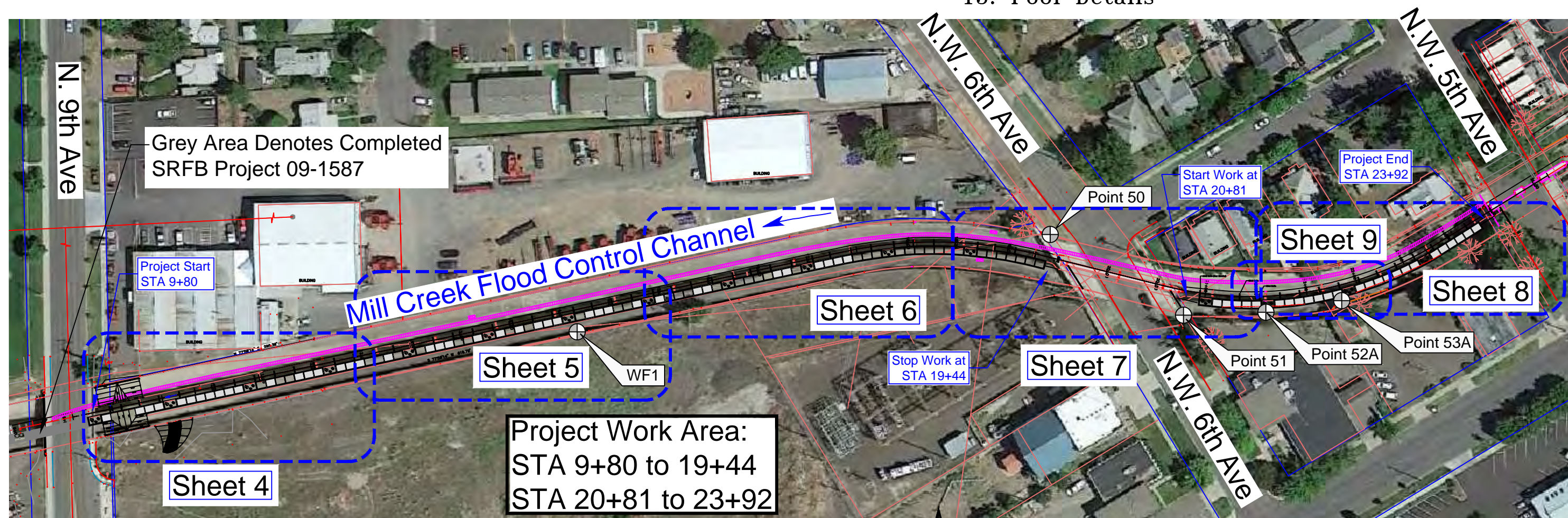


# CONSTRUCTION DOCUMENT FOR: Mill Creek Fish Passage N 9th Avenue Extension

PROJECT NUMBER 13-1387

## DRAWING INDEX:

1. Cover Sheet
2. Legend And Notes
3. Site, Access and Dewatering Plan
4. Site Plan - Enlarged View 9+80 to 12+50
5. Site Plan - Enlarged View 12+50 to 15+50
6. Site Plan - Enlarged View 15+50 to 18+50
7. Site Plan - Enlarged View 18+50 to 21+50
8. Site Plan - Enlarged View 21+50 to 24+00
9. Site Plan - Enlarged View 21+50 to 22+50
10. Site Plan - Transitions to Bridges
11. Sections
12. Ford Details
13. Roughness Panels
14. Roughness Panels
15. Pool Details



### OVERALL MAP

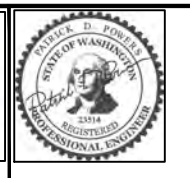
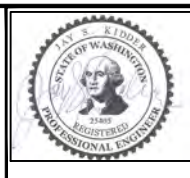
SCALE: 1"=50'



⊕ Project Benchmarks



Mill Creek Fish Passage  
N. 9th Avenue Extension



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

SCALE VERIFICATION: 0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

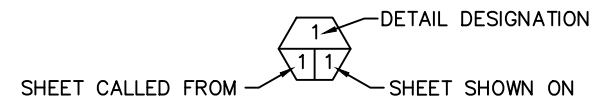
DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

Cover Sheet

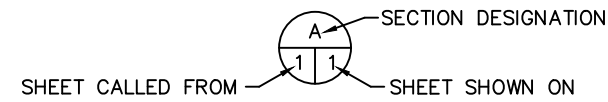
1 SHEET OF 15



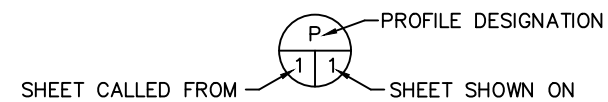
## SHEET SYMBOLS



DETAIL CALLOUT



SECTION CALLOUT



PROFILE CALLOUT

References to Right and Left as viewed downstream

### Survey Notes:

BEARINGS ARE BASED ON THE WASHINGTON COORDINATE SYSTEM SOUTH ZONE. THE CONVERGENCE ANGLE IS 01°33'40".

THE COMBINED GROUND TO GRID SCALE FACTOR IS 0.999914555. DISTANCES SHOWN ARE GROUND DISTANCES

THE VERTICAL DATUM IS NAVD 88 ORTHOMETRIC HEIGHTS DETERMINED BY GPS OBSERVATIONS WHILE CONNECTED TO THE WASHINGTON STATE REFERENCE NETWORK SOUTHEAST WASHINGTON.

1. THE DEED BOUNDARIES SHOWN ARE BASED ON THE CURRENT CONVEYANCE DEED OF RECORD FOR EACH PROPERTY AND MAY NOT REFLECT ACTUAL OCCUPATION OR OWNERSHIP WHICH WOULD BE REVEALED BY A COMPREHENSIVE BOUNDARY SURVEY OF EACH INDIVIDUAL PROPERTY

2. THE CURRENT CONVEYANCE DOCUMENTS DO NOT SPECIFY AN EASEMENT OR RIGHT OF WAY FOR THE CHANNEL. HOWEVER, CORPS OF ENGINEERS DESIGN DRAWINGS IMPLY THAT ONE EXISTS.

3. COORDINATES SHOWN ARE BASED ON THE WASHINGTON COORDINATE SYSTEM SOUTH ZONE, U.S. SURVEY FEET.

4. CENTERLINE STATIONING SHOWN IS PER ARMY CORPS OF ENGINEERS PLANS FOR MILL CREEK CHANNEL IMPROVEMENTS DATED MAY 25, 1945

- " - INCHES  
' - FEET  
APPROX. - APPROXIMATELY  
B&B - BALLED AND BURLAPPED  
BM - BENCH MARK  
C - CENTERLINE  
CAL. - CALIPER  
CFS - CUBIC FEET PER SECOND  
CLR. - CLEARANCE  
CMP. - CORRUGATED METAL PIPE  
CONC. - CONCRETE  
DIA. - DIAMETER  
ELEV. - ELEVATION  
EQ. - EQUAL  
FTG. - FOOTING  
HDPE - HIGH DENSITY POLYETHYLENE  
HT. - HEIGHT  
GAL. - GALLON  
I.D. - INSIDE DIAMETER  
I.E. - INVERT ELEVATION  
LBS. - POUNDS  
LWD - LARGE WOODY DEBRIS  
MAX. - MAXIMUM  
MFG. - MANUFACTURER'S  
MHW - MEAN HIGH WATER  
MHHW - MEAN HIGHER HIGH WATER  
MIN. - MINIMUM  
MISC. - MISCELLANEOUS

## ABBREVIATIONS

- MISC. - MISCELLANEOUS  
MPH - MILES PER HOUR  
O.C. - ON CENTER  
O.D. - OUTSIDE DIAMETER  
OHW - ORDINARY HIGH WATER  
PK - PARKER-KALON  
R.O.W. - RIGHT OF WAY  
REQ'D - REQUIRED  
SEC. - SECTION  
S.F. - SQUARE FEET  
SHT. - SHEET  
SPEC'S. - PROJECT SPECIFICATIONS  
STA. - STATION  
SS - STAINLESS STEEL  
TEMP. - TEMPORARY  
TYP. - TYPICAL  
W.S. - WATER SURFACE  
WSDOT - WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
WSEL - WATER SURFACE ELEVATION

Materials List		
Concrete Slab Cutting (ft)	2591	ft
Concrete Removal (cu yds)	279	cu yds
Excavation/Disposal	599	cu yds
Gravel Backfill	110	cu yds
CIP Concrete	253	cu yds
Curbs	132	
Baffles	15	
Resting Pools	106	
Habitat Boulders	48	ea.
Ford		
Concrete Cutting	240	ft
Concrete Removal	45	cu yds
Excavation and Disposal	110	cu yds
Gravel Backfill	16	cu yds
CIP Concrete	53	cu yds

## LEGEND

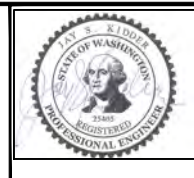
- PROPERTY LINE  
--- RIGHT OF WAY LINE  
--- CENTERLINE  
--- EXISTING FENCE  
--- BUILDING LINE  
--- INDEX CONTOUR LINE  
--- OHE --- OVERHEAD POWER  
--- UGE --- UNDERGROUND POWER
- EXISTING CALLOUT  
NEW CALLOUT  
Existing Concrete  
Proposed Concrete  
FILL  
ROCK/GRAVEL  
UNDISTURBED GRADE  
WETLAND DELINEATION  
DEMO  
ELEVATION MARKER  
TREE TO BE REMOVED  
TREE TO REMAIN
- FOUND SURVEY MONUMENT  
SET CONTROL POINT  
POWER POLE  
MANHOLE  
UTILITY CABINET  
LIGHT POST  
TREE  
WATER VALVE  
OWNERSHIP REFERENCE  
SURVEY POINT  
PROJECT BENCH MARK  
BORING LOCATIONS  
SANDBAGS  
NOTE CALLOUT  
STATION CALLOUT  
PHOTO CALLOUT
- MAPLE 36"  
BM1  
B-1  
1  
2+00  
1

### CONTROL POINT TABLE (See Sheet 1 for Location)

POINT	ELEVATION	NORTHING	EASTING	DESCRIPTION
50	938.22	274750.13	2187073.52	SCRIBED "X" IN WALK ON WEST SIDE OF 6TH ST BRIDGE DECK
51	939.44	274670.58	2187205.17	SCRIBED "X" IN WALK ON EAST SIDE OF 6TH ST BRIDGE DECK
52A	928.54	274673.18	2187286.38	Nail with Washer in Channel 3.3' Out From Wall
53A	929.36	274681.99	2187361.31	Nail with Washer 3.5' Out From Wall
WF1	922.53	274654.04	2186607.22	Nail in Channel
BM1	921.71	274549.67	2185892.67	Brass Cap Top Right Concrete Wall STA 7+43
BM2	921.66	274497.19	2185890.80	Brass Cap Top Left Concrete Wall STA 7+30



# Mill Creek Fish Passage N. 9th Avenue Extension



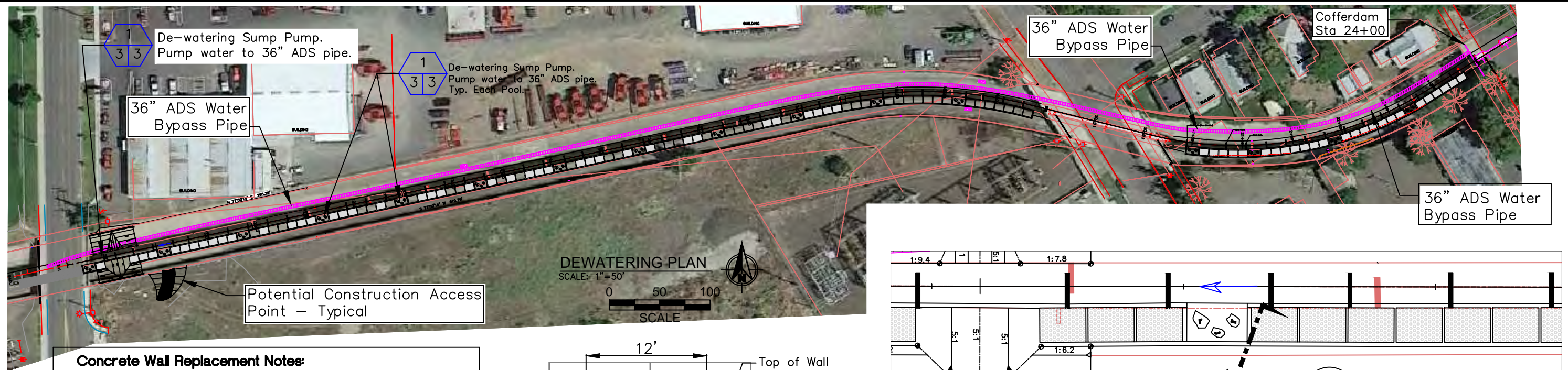
REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

SCALE VERIFICATION: 1" = 100'

DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

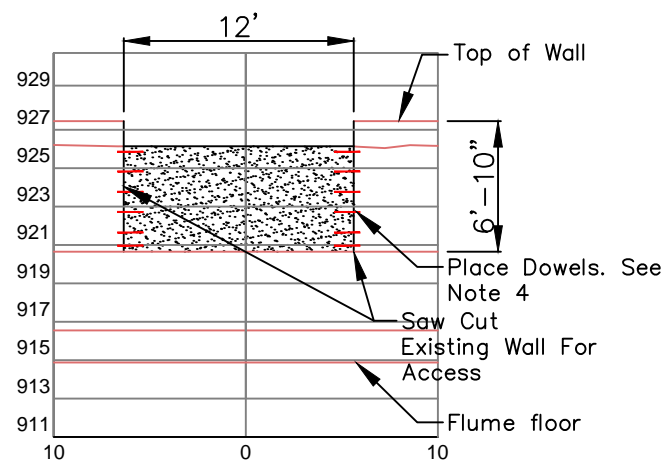
## Legend and notes



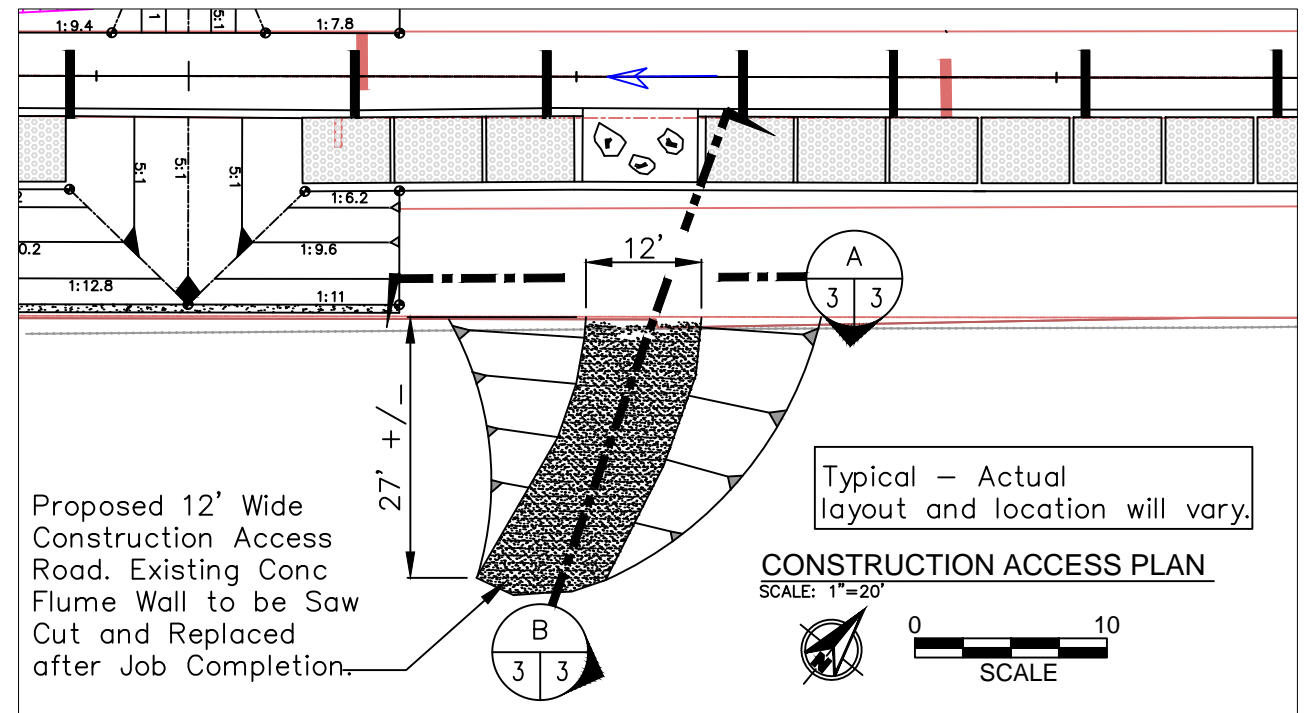


**Concrete Wall Replacement Notes:**

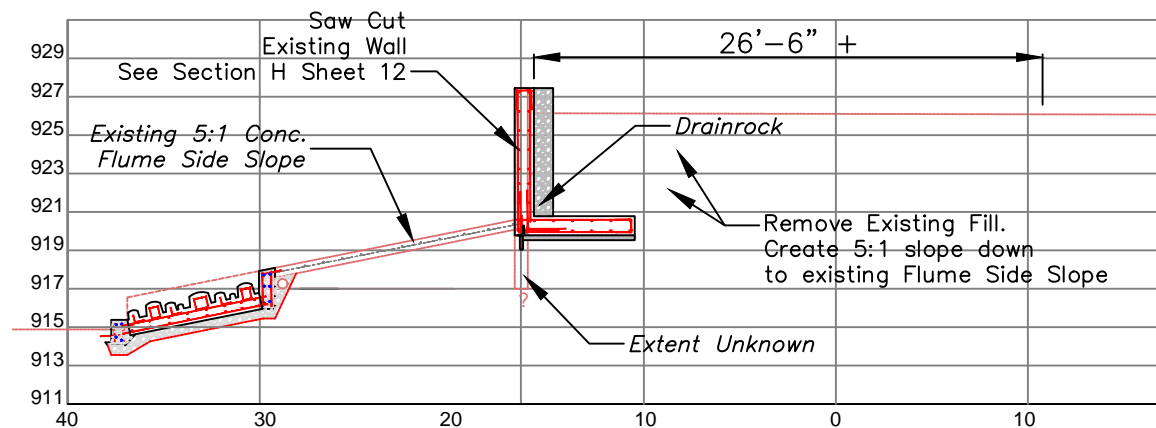
1. Sawcut Existing Concrete wall. Remove fill from behind for access. When replacing if concrete is competent as determined by engineer, rotary drill and epoxy 4" min embedment #5 rebar to tie into new wall at new rebar locations.
2. No drilling shall be allowed until approved by the engineer.
3. All saw cut concrete edges to new concrete placement contacts shall be coated with concrete bonding agent prior to placement of new concrete.
4. All dowels shall be epoxy anchored rebar with a minimum embedment of 4" into existing concrete wall.
5. All rebar shall be #5 bars.
6. Epoxy Shall be Hilti HIT HY 150 or Simpson SET XP or Equal.
7. Final design of replacement retaining wall will be determined upon inspection of existing wall steel and concrete condition but should follow this detail unless field inspection determines different arrangement.
8. Provide 2' thick layer of free draining 3/4" drain rock on backfilled side full height of retaining wall.
9. All vertical edges shall receive 3/4" chamfer strip and top edges may be hand troweled 3/4" radius.
10. Provide PVC water stop at all exist to new wall contacts



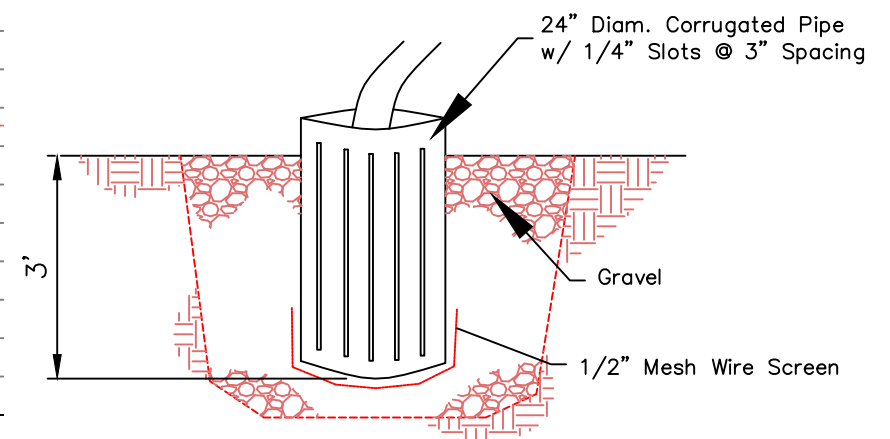
**ACCESS SECTION**  
SCALE: 1"=5'



**CONSTRUCTION ACCESS PLAN**  
SCALE: 1"=20'



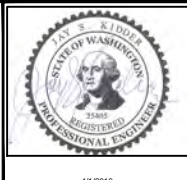
**CONSTRUCTION ACCESS SECTION**  
SCALE: 1"=5'



**SUMP PUMP DETAIL**  
NOT TO SCALE  
Locate at Resting Pools



**Mill Creek Fish Passage  
N. 9th Avenue Extension**



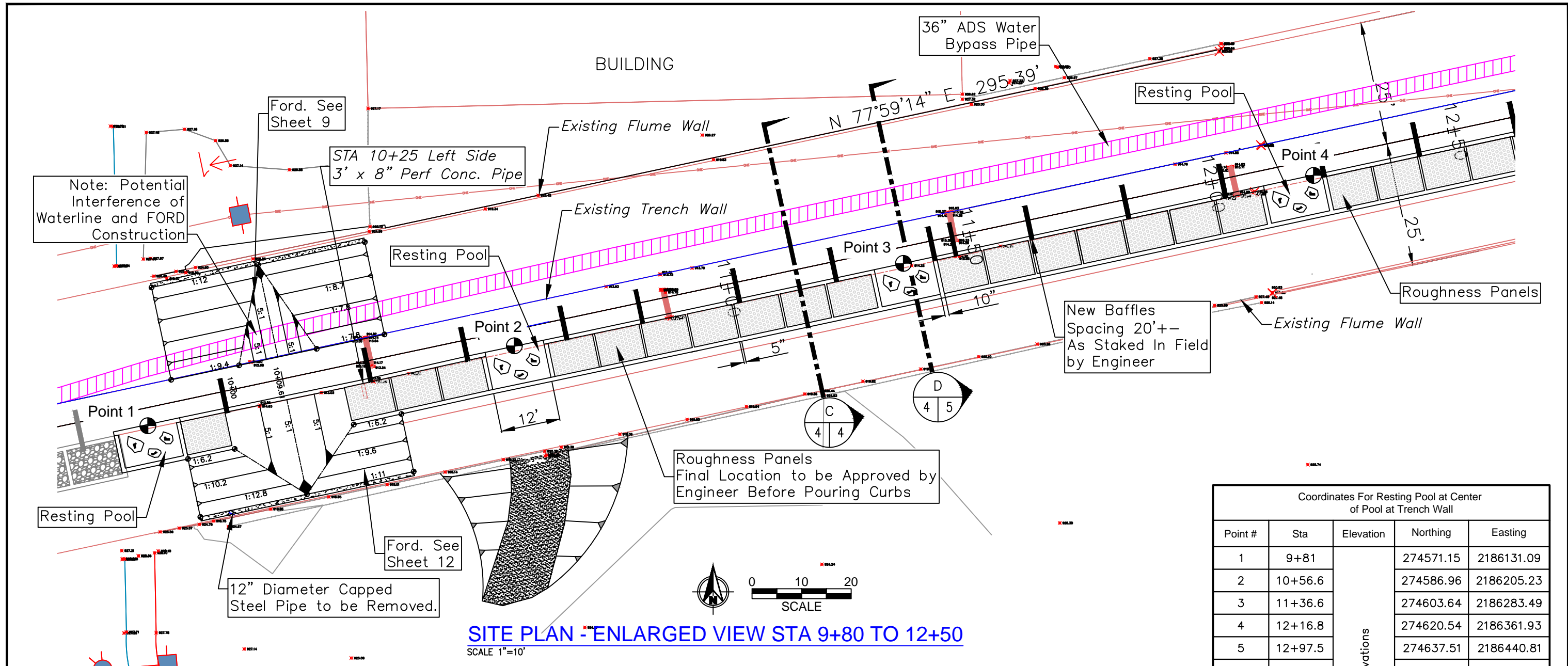
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REV	DATE	BY	APP'D	DESCRIPTION	

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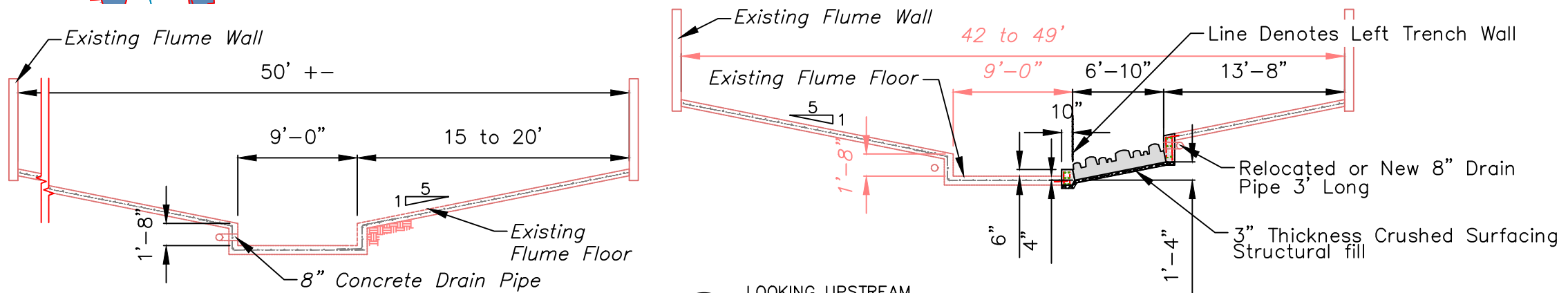
DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

**Site, Access and  
Dewatering Plan**





**SITE PLAN - ENLARGED VIEW STA 9+80 TO 12+50**  
SCALE: 1"=10'



**CONC. FLUME TYPICAL SECTION**  
SCALE: 1"=5' LOOKING UPSTREAM (EXISTING CONDITIONS)

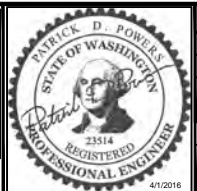
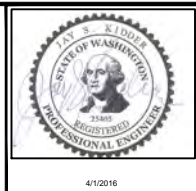
LOOKING UPSTREAM  
**CONC. FLUME TYPICAL SECTION - STA 11+18**  
SCALE: 1"=5'

Coordinates For Resting Pool at Center of Pool at Trench Wall				
Point #	Sta	Elevation	Northing	Easting
1	9+81		274571.15	2186131.09
2	10+56.6		274586.96	2186205.23
3	11+36.6		274603.64	2186283.49
4	12+16.8		274620.54	2186361.93
5	12+97.5		274637.51	2186440.81
6	13+78		274654.31	2186519.42
7	14+58		274671.18	2186597.87
8	15+38.8		274688.09	2186676.72
9	16+19		274704.91	2186755.03
10	16+99		274721.65	2186833.38
11	17+80.9		274736.03	2186913.53
12	18+63.7		274737.09	2186995.44
13	21+01		274687.90	2187227.23
14	21+61		274685.66	2187287.96
15	22+40.8		274698.45	2187367.07
16	23+19.7		274728.37	2187440.70

Match Existing Trench Elevations



**Mill Creek Fish Passage  
N. 9th Avenue Extension**

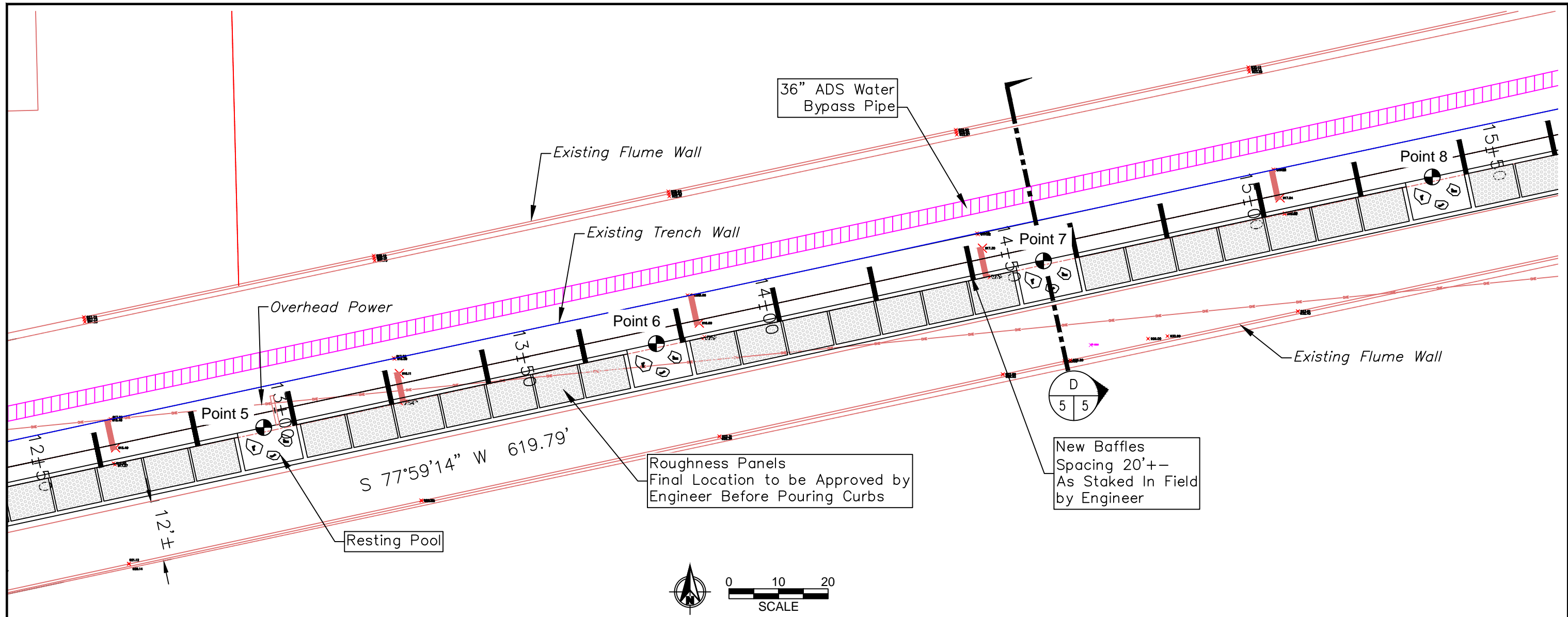


REVISIONS					
REV	DATE	BY	APPD	DESCRIPTION	

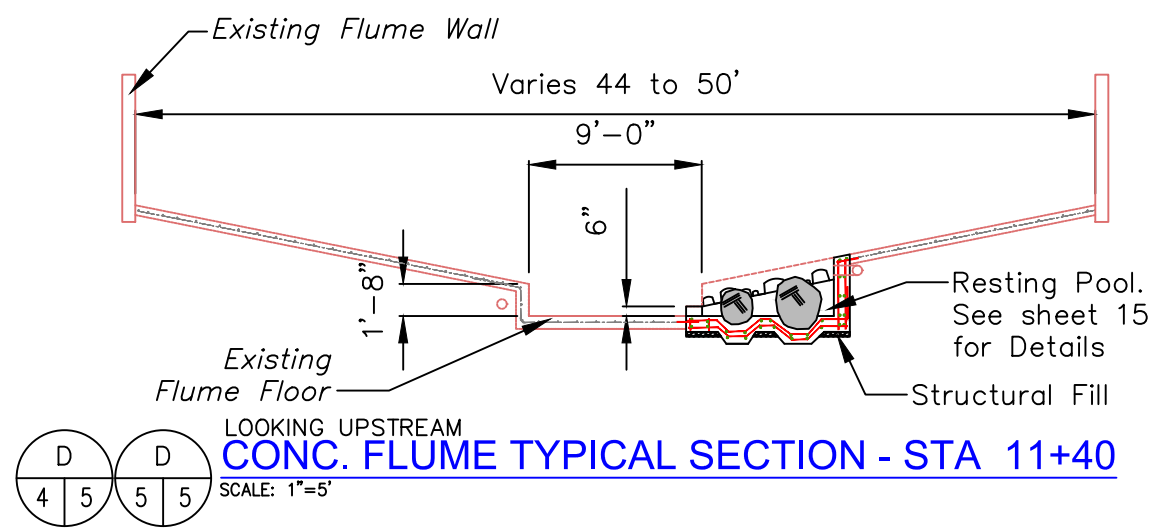
SCALE VERIFICATION: 0 1'

DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

**Site Plan - Enlarged View  
9+80 to 12+50**



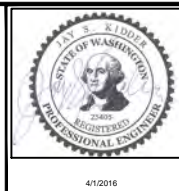
**SITE PLAN - ENLARGED VIEW STA 12+50 to 15+50**  
SCALE 1"=10'



**CONC. FLUME TYPICAL SECTION - STA 11+40**  
LOOKING UPSTREAM  
SCALE: 1"=5'



**Mill Creek Fish Passage  
N. 9th Avenue Extension**



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

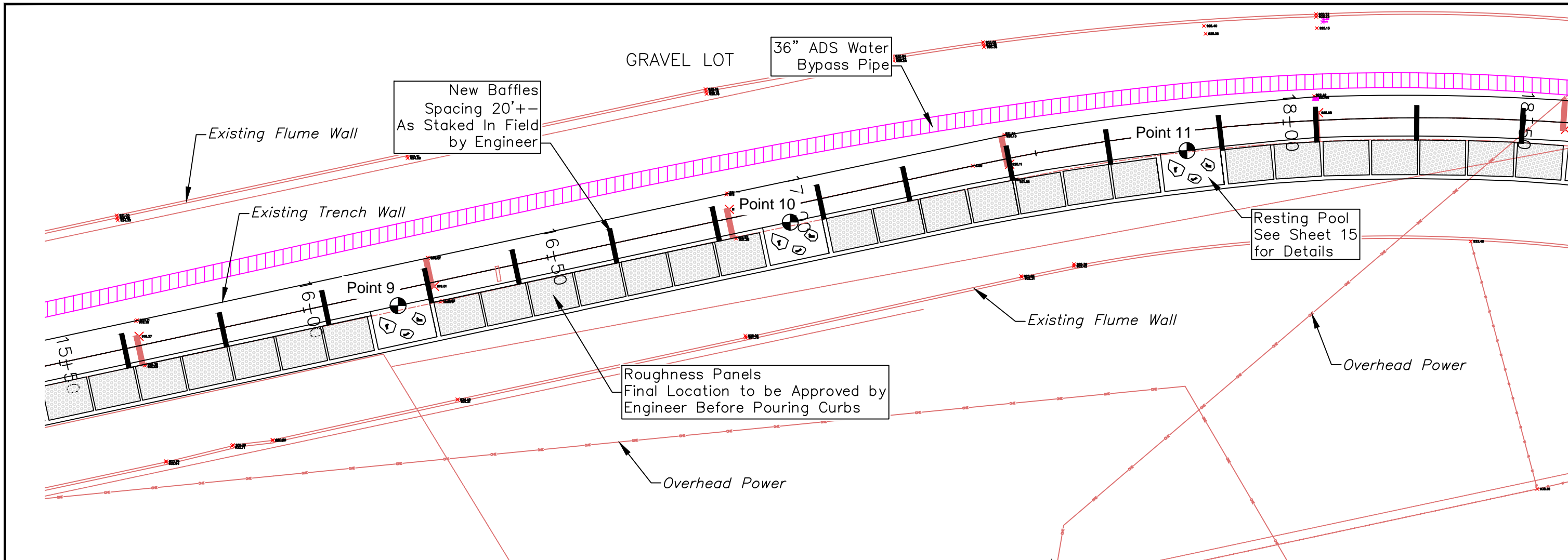
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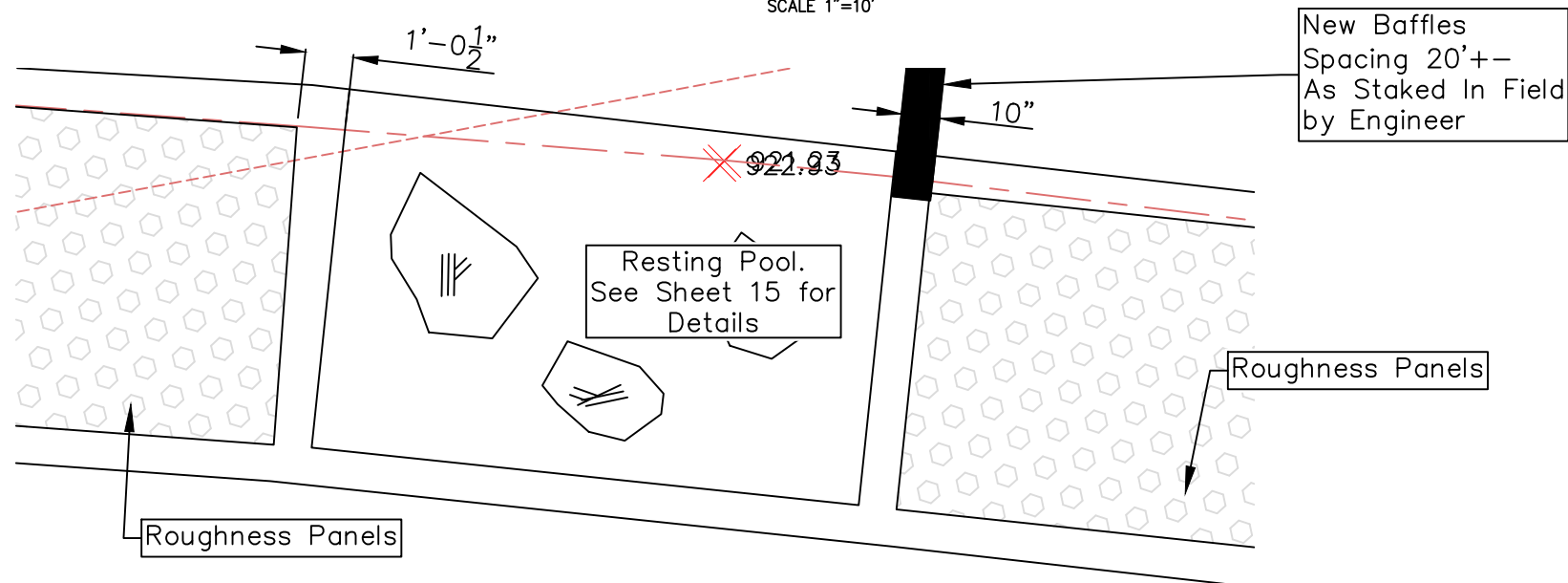
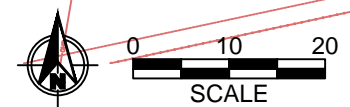
DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

**Site Plan - Enlarged View  
12+50 to 15+50**





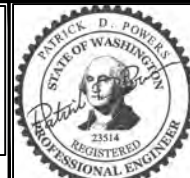
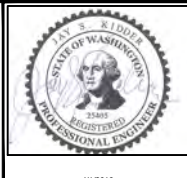
**SITE PLAN - ENLARGED VIEW STA 15+50 to 18+50**  
SCALE 1"=10'



**PANEL PLACEMENT - ENLARGED VIEW**  
SCALE 1"=2'



Mill Creek Fish Passage  
N. 9th Avenue Extension



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

SCALE VERIFICATION

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

0 1"

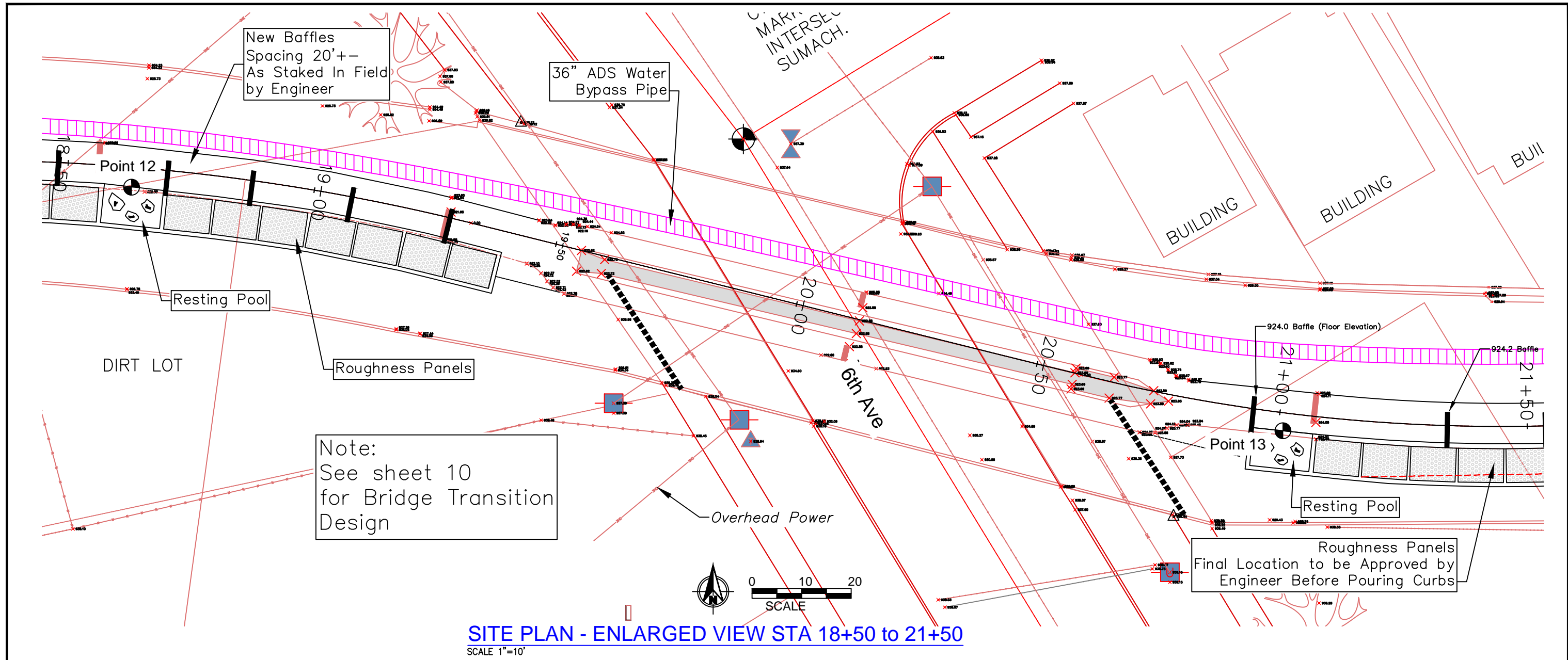
DESIGNED BY:  
WATERFALL ENGINEERING

CHINOOK ENGINEERING

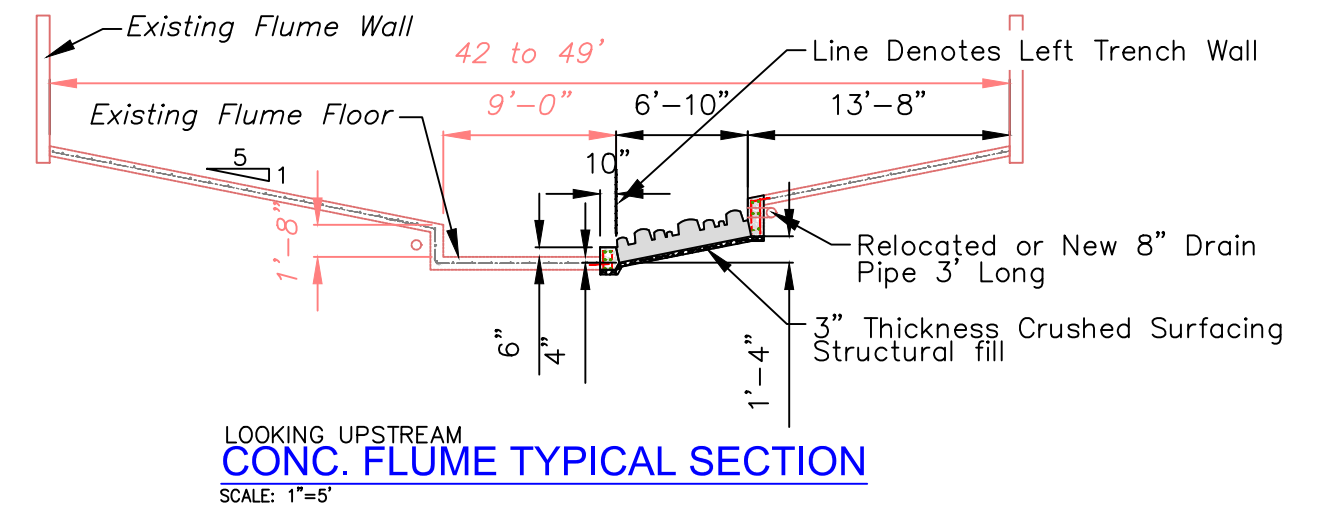
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN

DATE:  
4/4/2016

**Site Plan - Enlarged View**  
**15+50 to 18+50**



**SITE PLAN - ENLARGED VIEW STA 18+50 to 21+50**  
SCALE 1"=10'



**Mill Creek Fish Passage  
N. 9th Avenue Extension**



REVISIONS					
REV	DATE	BY	APP'D	DESCRIPTION	

SCALE VERIFICATION: 0 1"

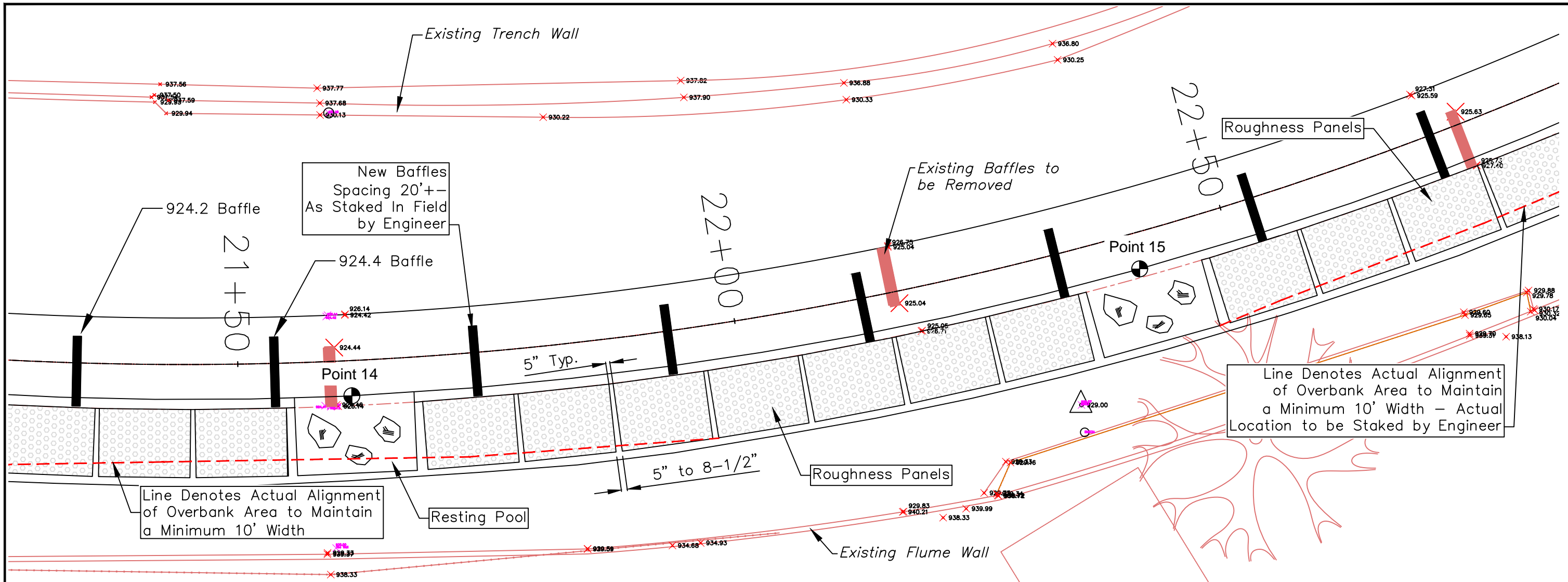
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

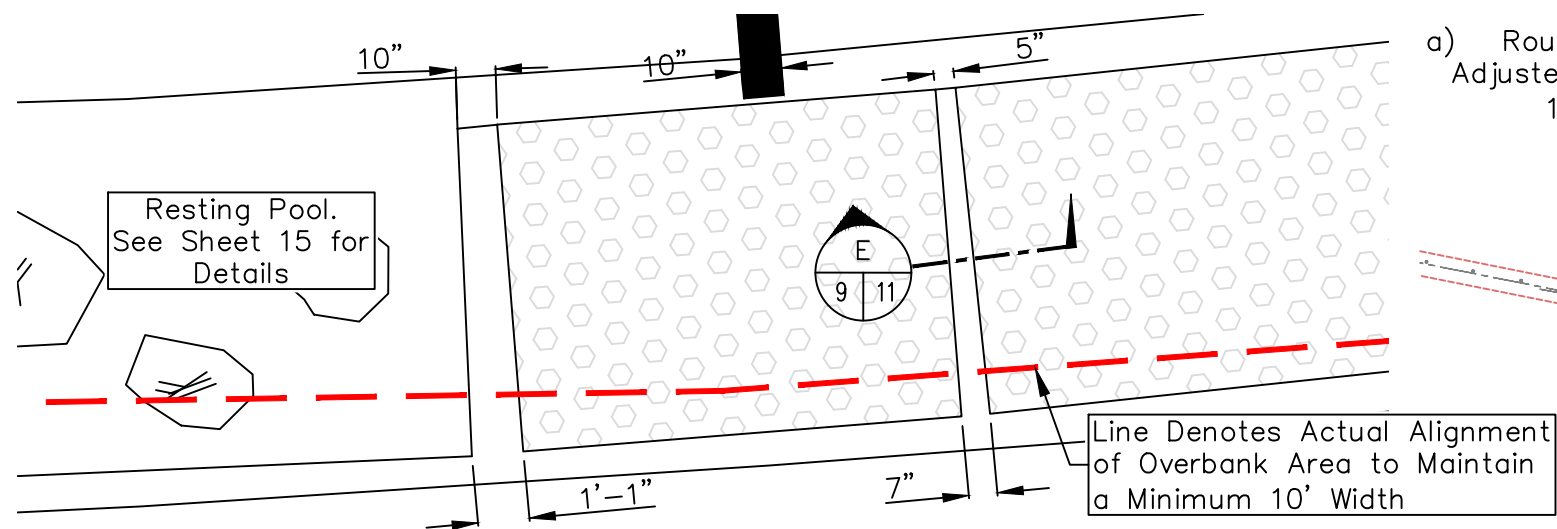
**Site Plan - Enlarged View  
18+50 to 21+50**



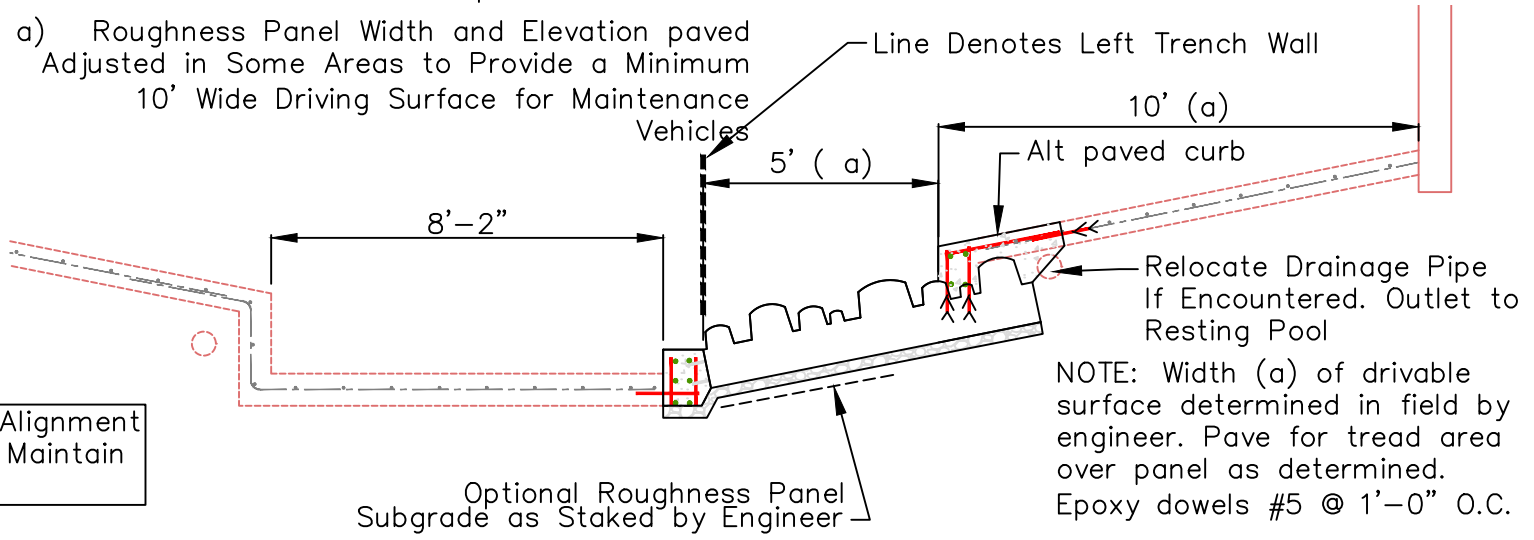




**SITE PLAN - ENLARGED VIEW STA 21+50 TO 22+50**  
SCALE 1"=5'



**PANEL PLACEMENT - ENLARGED VIEW**  
SCALE 1"=2'



**Optional Roughness Panel Subgrade as Staked by Engineer STA 21+45 Typical Section (View Upstream)**  
SCALE 1"=2'



Mill Creek Fish Passage  
N. 9th Avenue Extension



REVISIONS				
REV	DATE	BY	APP'D	DESCRIPTION

SCALE VERIFICATION: 0 1'

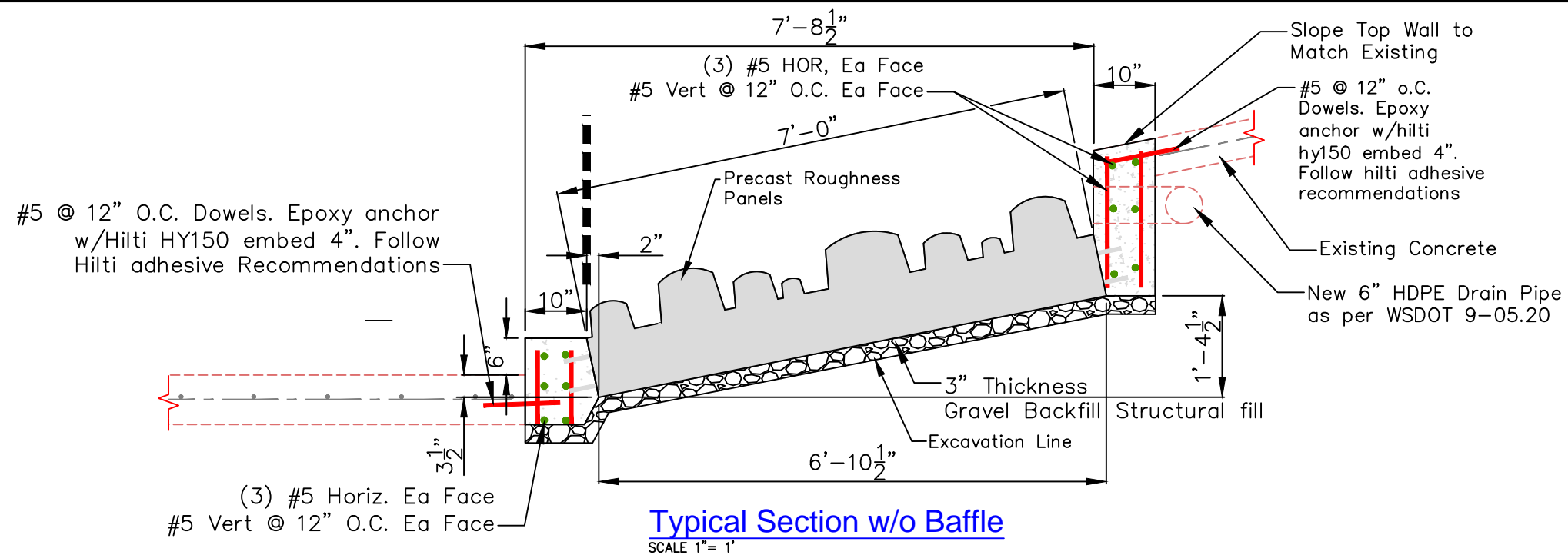
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

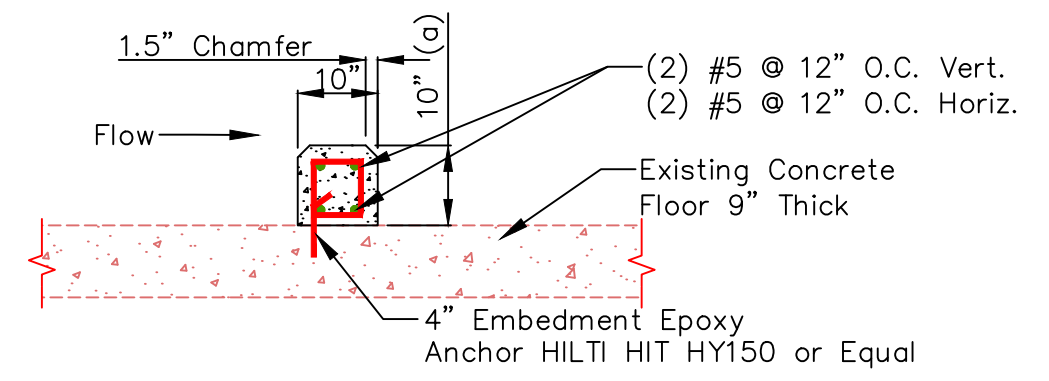
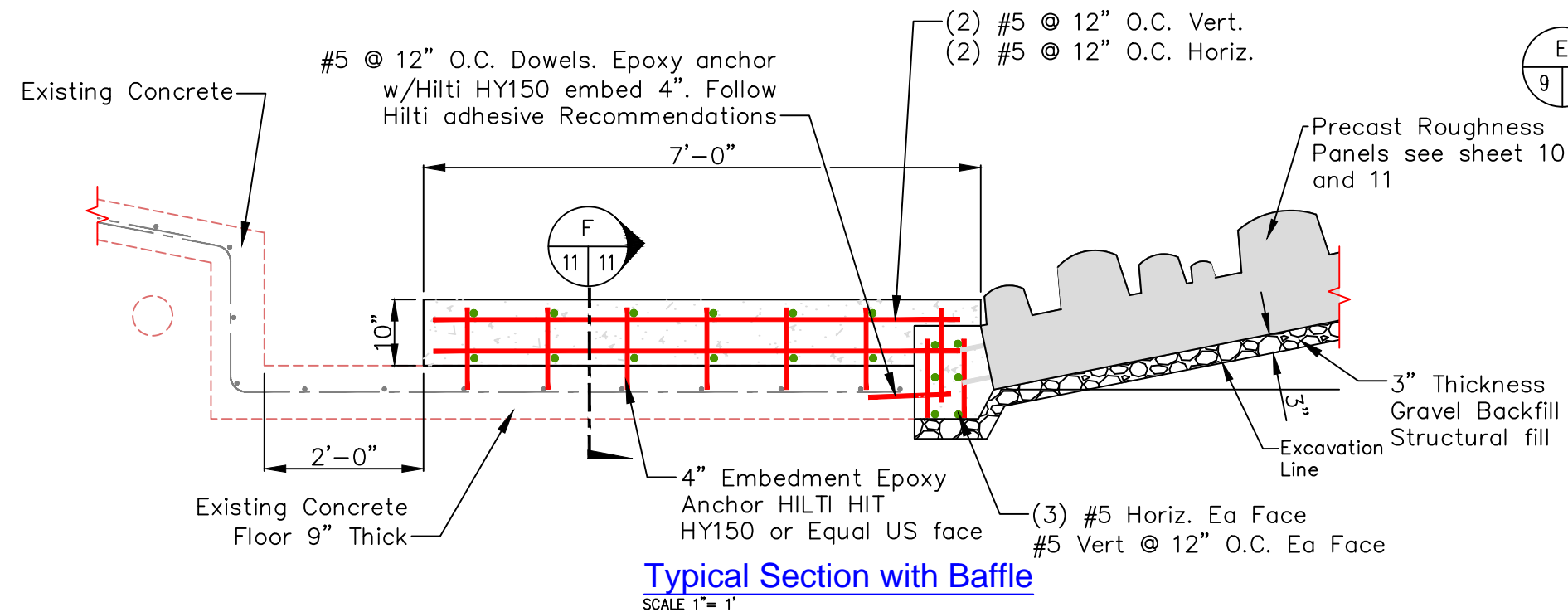
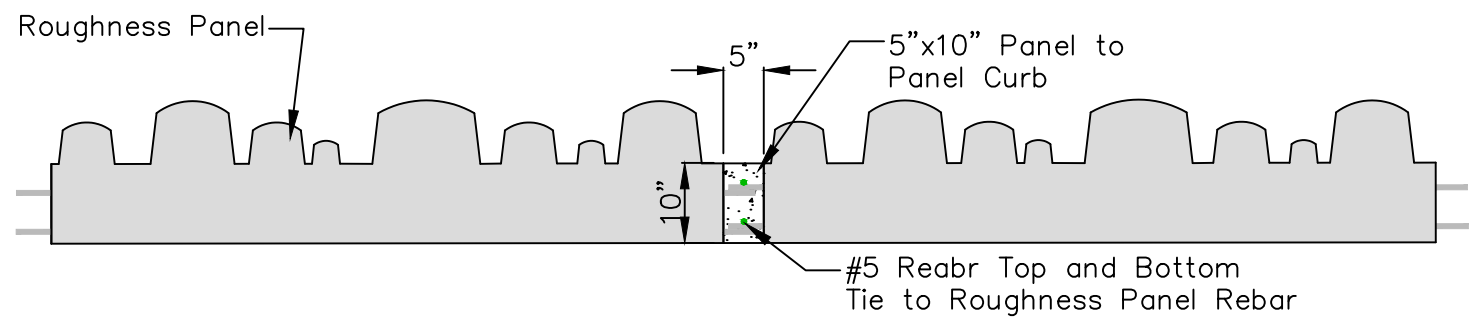
**Site Plan - Enlarged View**  
**21+50 to 22+50**







- Note:
1. All gravel backfill and new construction backfill shall be compacted as structural fill as per WSDOT 2-03.3(14)C Method C.
  2. All embankment compactions are called out as structural fill.
  3. See specifications for details of material and WSDOT M41-10
  4. Concrete Cover as Follows:  
Ground Contact 3"  
Walls and Curbs 2"



a) Baffle Height May Vary (-0.2') in Areas Where 10' Wide Driving Path is Needed



# Mill Creek Fish Passage N. 9th Avenue Extension



REVISIONS					
REV	DATE	BY	APP'D	DESCRIPTION	

SCALE VERIFICATION: 0 1'

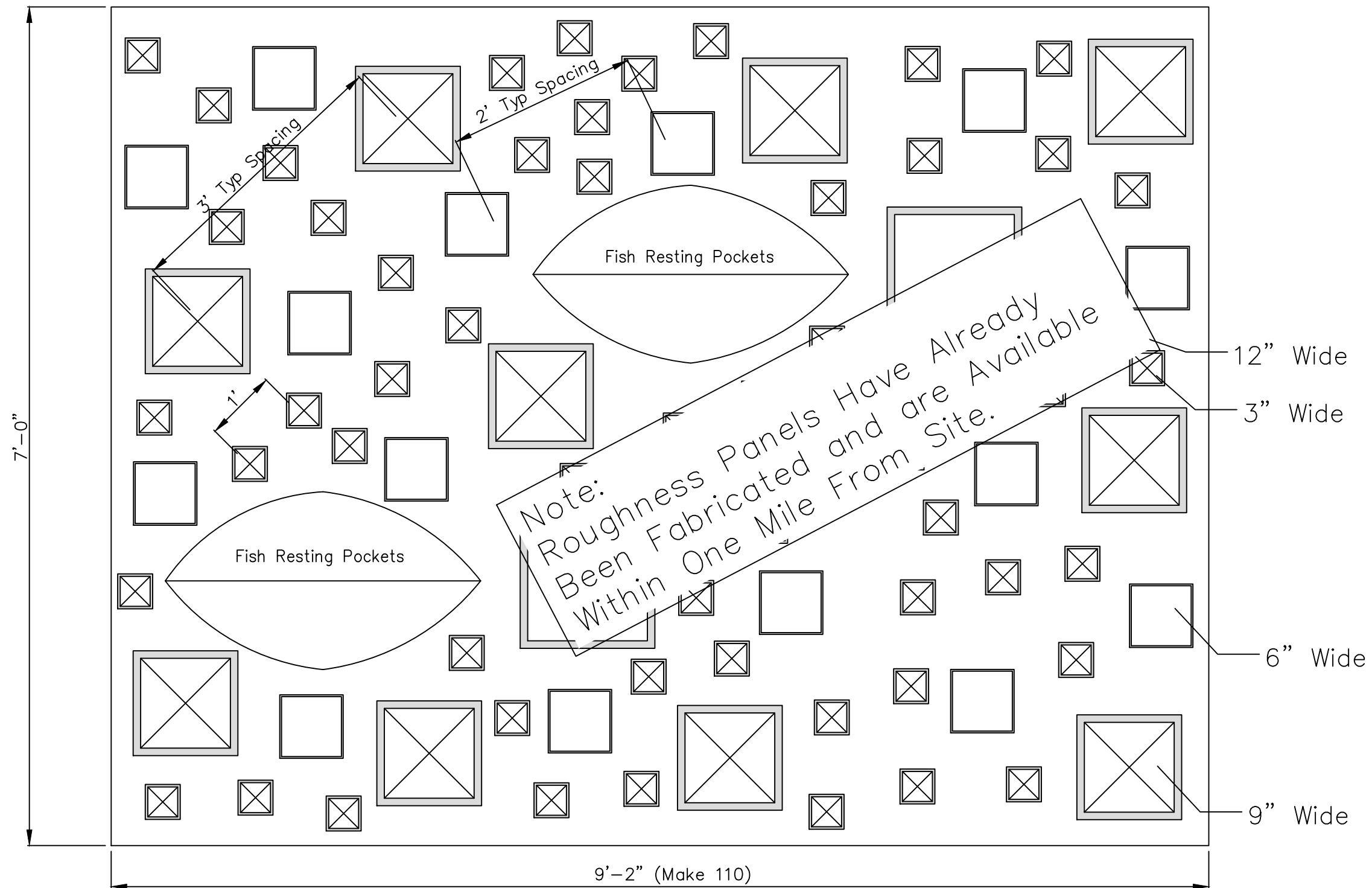
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

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WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016





← Flow Direction Trench Side



Roughness Panel Layout

Not to Scale



Mill Creek Fish Passage  
N. 9th Avenue Extension



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

SCALE VERIFICATION

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

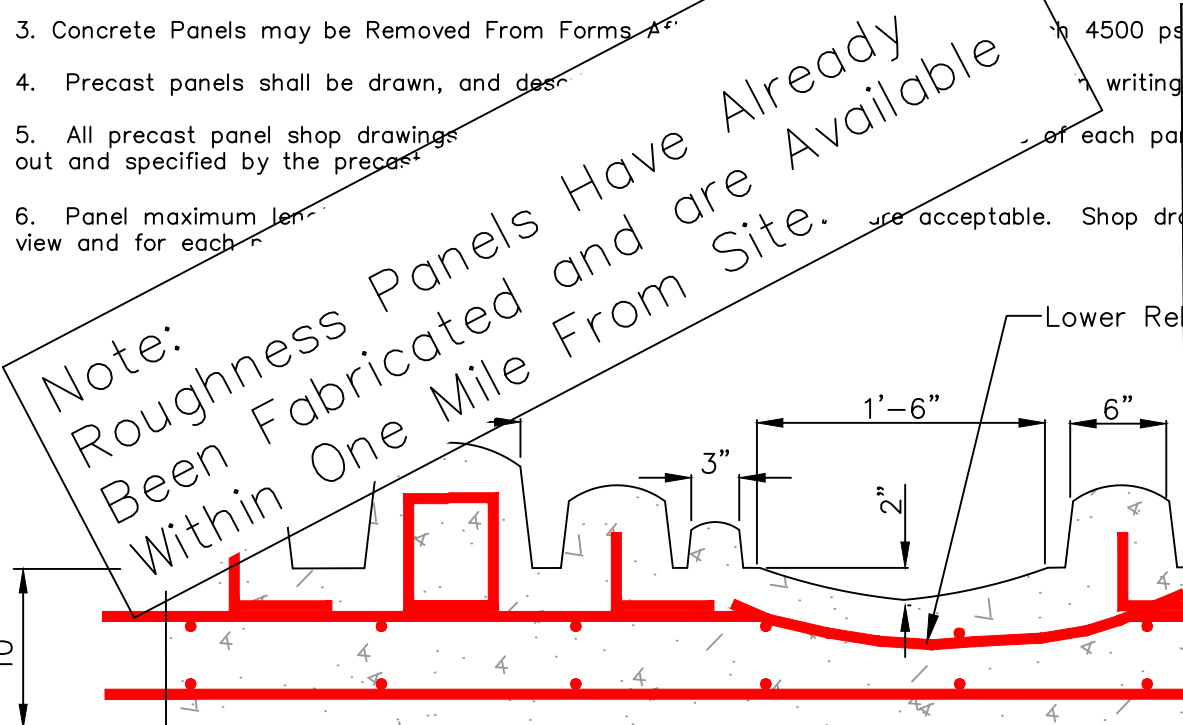
DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

**Roughness Panel**

**13** **15**  
SHEET OF

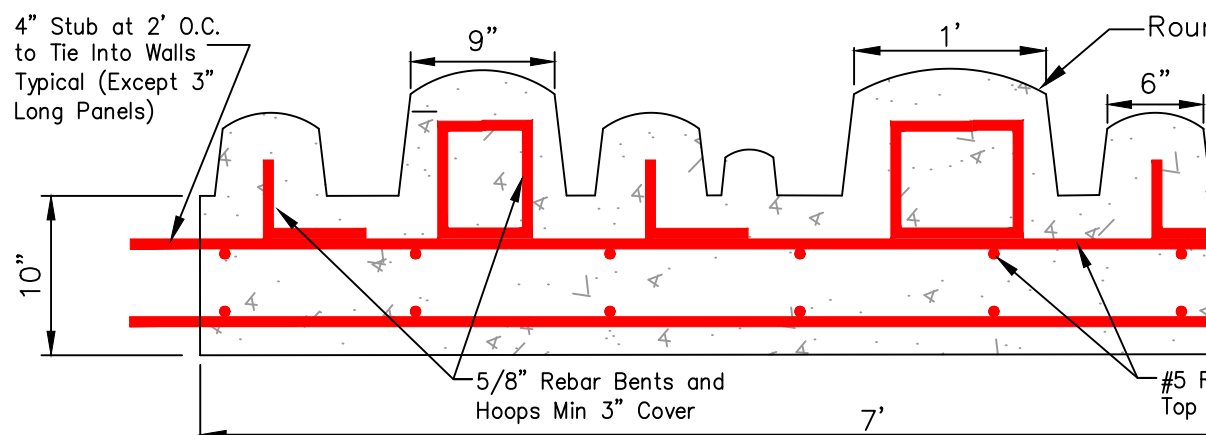
**Construction Notes:**

1. Layout of roughness elements shall be similar to plan view sketch with location of 12" largest elements and depressions and then proceed with 9", 6" etc on down at spacing shown. Final layout to be approved by Engineer.
2. The Roughness panels shall be precast concrete panels.
3. Concrete Panels may be Removed From Forms After 4500 psi strength is achieved.
4. Precast panels shall be drawn, and design shall be approved by Engineer.
5. All precast panel shop drawings shall be out and specified by the precast concrete manufacturer.
6. Panel maximum length shall be acceptable. Shop drawings shall be acceptable. Shop drawings shall be acceptable.



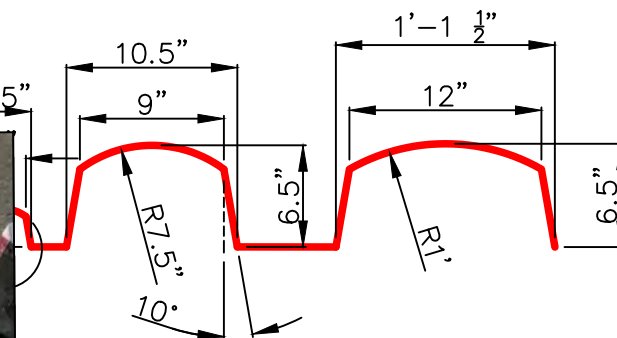
**Typical Section Showing 2" Depression**

Not To Scale



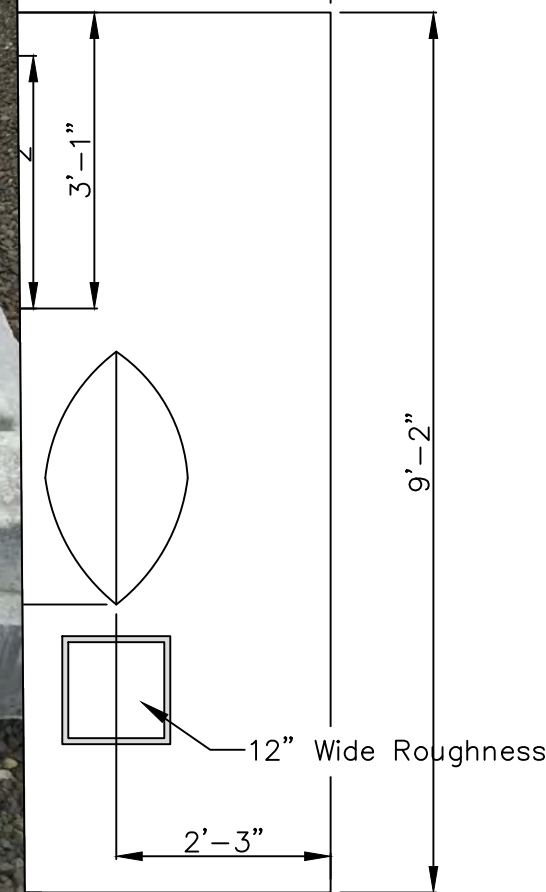
**Typical Section**

Not To Scale



**Roughness Detail**

Not To Scale

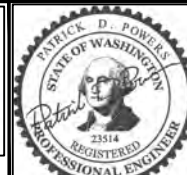


**Roughness Panel Plan - Layout For 12" Roughness**

Not to Scale



**Mill Creek Fish Passage  
N. 9th Avenue Extension**



REVISIONS				
REV	DATE	BY	APPD	DESCRIPTION

SCALE VERIFICATION: 0 1"

IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DESIGNED BY:  
WATERFALL ENGINEERING  
CHINOOK ENGINEERING  
DRAWN BY:  
DIMENSIONS DRAFTING & DESIGN  
DATE:  
4/4/2016

**Roughness Panels**

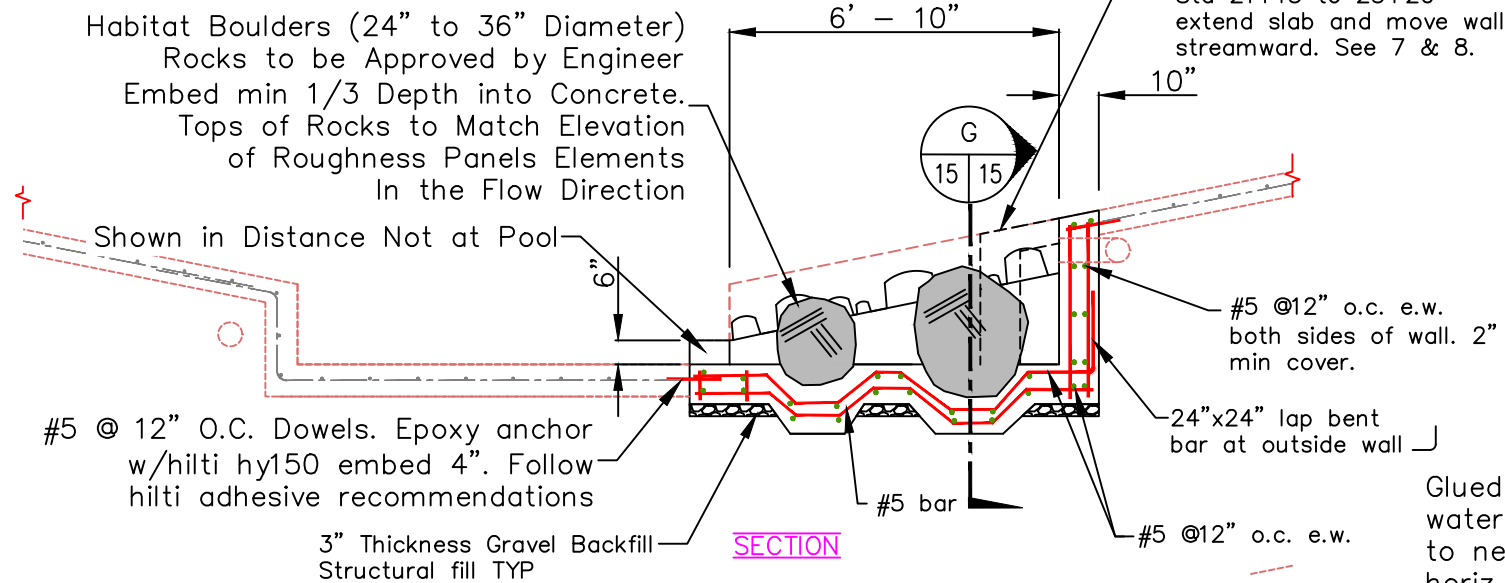


**Note:**

1. All saw cut concrete with exposed rebar shall be chipped back to expose 3" length of steel.
2. Steel rebar shall be cut off and the concrete cone shaped hole patched with Hilti Hit HY150 epoxy. minimize hole diameter to cut steel rebar.
3. Final epoxy cover over steel shall be 1 1/2" minimum
4. All saw cut concrete edges to new concrete placement contacts shall be provided with concrete bonding agent prior to placement of new concrete

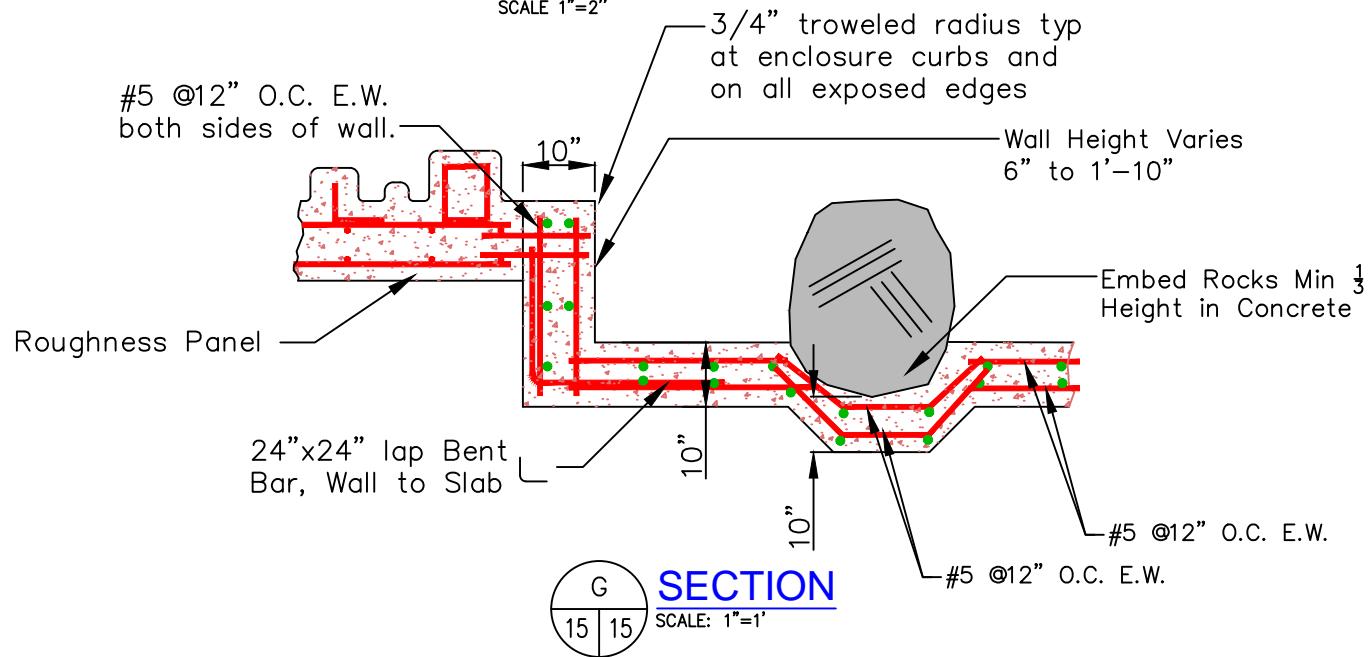
Top of Resting Pool Rocks to Match Average Height of Roughness Elements on Panels. Actual Rock Shape and Placement Shall be Approved by Engineer Prior to Delivery and Placement.

Alt wall location and slab reconstruction in widened drivable areas as determined by engineer Sta 21+15 to 23+20 extend slab and move wall streamward. See 7 & 8.



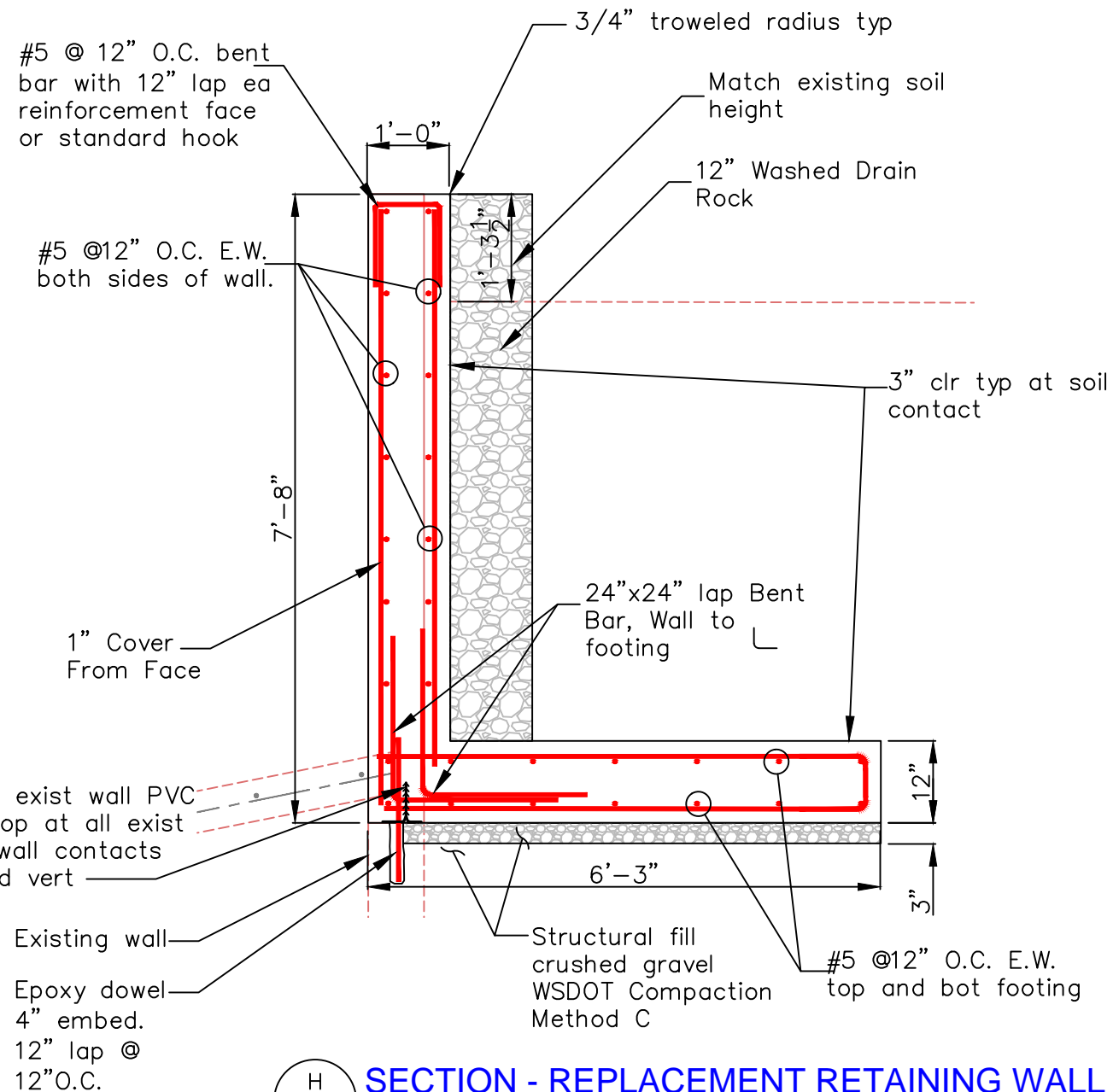
**RESTING POOL DETAILS**

SCALE 1"=2"



**SECTION G**

SCALE: 1"=1"



**SECTION H - REPLACEMENT RETAINING WALL**

SCALE: 1/2"=1"



**Mill Creek Fish Passage  
N. 9th Avenue Extension**



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**Pool Details**