

CITY OF BELLINGHAM, PUBLIC WORKS DEPARTMENT  
SQUALICUM CREEK RE-ROUTE PROJECT  
PHASES I and II  
Bellingham, Washington



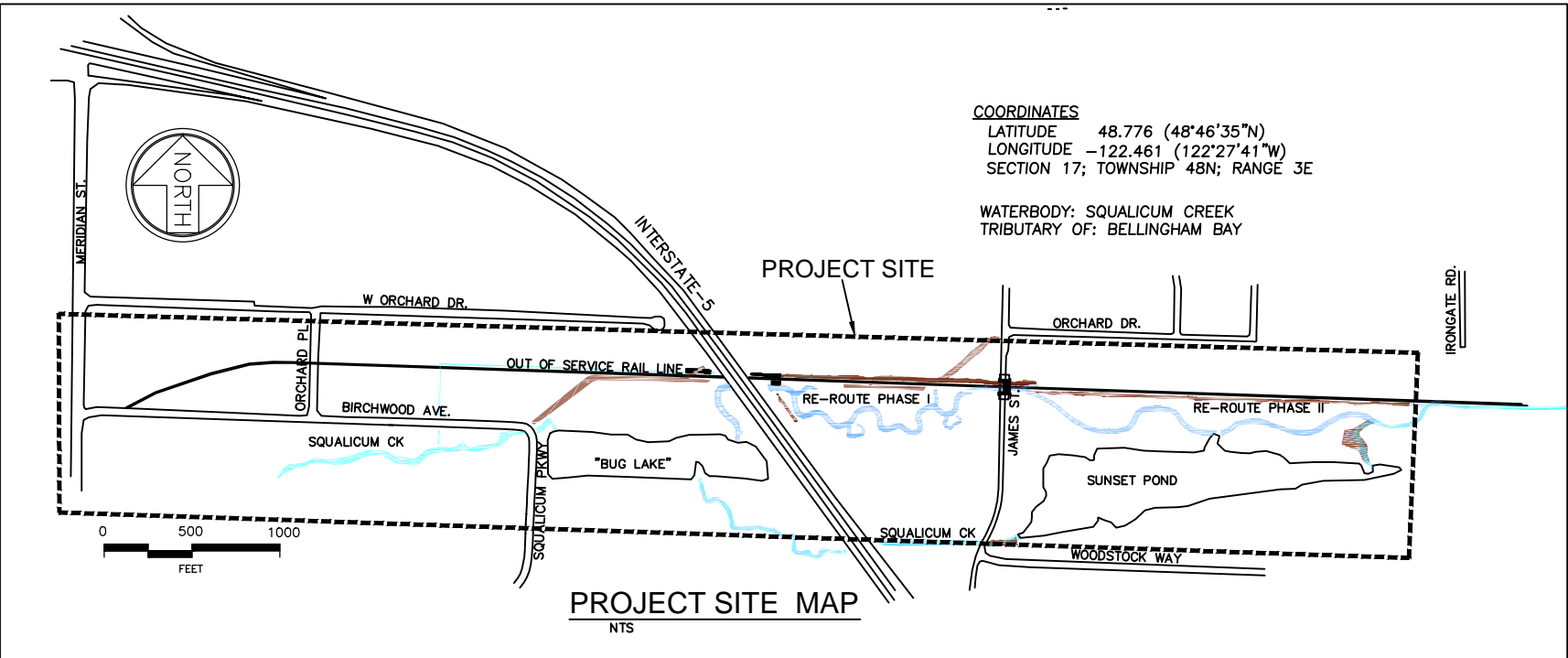
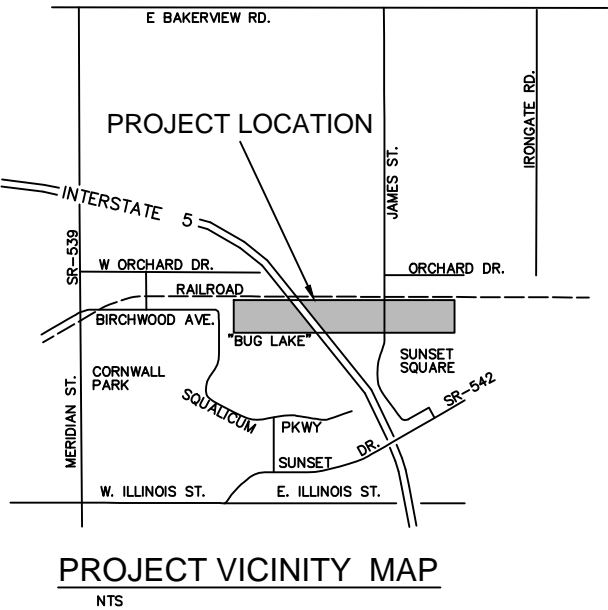
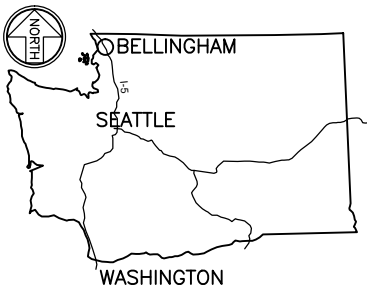
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4				PROJECT ENGINEER MRM		DIR. PUBLIC WORKS TC		CITY OF BELLINGHAM, WASHINGTON		SCALE		DATUM		Job. No. ---		SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT		SHEET	
3				DESIGNED/DRAWN MRM		CITY ENGINEER RAR		PUBLIC WORKS DEPARTMENT		Horiz. ---		NAD83/91		Date 04/30/15		COVER SHEET		1	
2				INSPECTOR -		OPER. ENGINEER		ENGINEERING DIVISION		Vert. ---		NAVD88		Field Bk. -				OF	
1																		44	
Date	No	Revision		By				CONTACT PERSON:											



THE CONTRACTOR SHALL ATTEND PRECONSTRUCTION CONFERENCES WITH THE CITY OF BELLINGHAM PRIOR TO BEGINNING CONSTRUCTION.

ALL WORK SHALL CONFORM TO THE CURRENT EDITIONS OF STANDARD PLANS AND SPECIFICATIONS OF THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT), AND CITY OF BELLINGHAM STANDARDS UNLESS INDICATED OTHERWISE BY THE CONTRACT DOCUMENTS. IN CASE OF A CONFLICT BETWEEN THE REGULATORY STANDARDS OR SPECIFICATIONS, THE MORE STRINGENT WILL PREVAIL.

IN-WATER WORK PERIODS

IN-WATER WORK SHALL OCCUR DURING THE PERMITTED WORK PERIOD STATED IN THE HYDRAULIC PROJECT APPROVAL AND NATIONWIDE PERMIT: JULY 1 THROUGH OCTOBER 15, 2015. SEE APPENDIX IN SPECIFICATIONS DOCUMENT.

EXISTING DATA

ELEVATIONS ARE RELATIVE TO CITY OF BELLINGHAM DATUM (NAVD88).

UTILITIES

UNDERGROUND UTILITIES ARE KNOWN TO EXIST IN THE AREA OF CONSTRUCTION. THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT ALL UTILITY OWNERS FOR LOCATIONS AND TO FIELD VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION. THE ONE-CALL NUMBER FOR UNDERGROUND UTILITIES IS 1-800-424-5555.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE INTEGRITY OF ALL EXISTING UTILITIES THROUGHOUT CONSTRUCTION.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROMPTLY NOTIFY THE CITY OF ANY CONFLICT WITH EXISTING UTILITIES.

ALL EXISTING FACILITIES, LANDSCAPE IMPROVEMENTS, AND UTILITIES NOT SPECIFICALLY IDENTIFIED FOR REMOVAL SHALL BE PROTECTED THROUGHOUT CONSTRUCTION OR RESTORED AT COMPLETION OF THE WORK.

SOILS

SURFACE AND SUBSURFACE CONDITIONS WERE EXPLORED AND SAMPLED BY GEO-ENGINEERS, INC.. RESULTS INCLUDING SOIL CHARACTERIZATION AND GROUNDWATER LEVELS, SOIL REPORTS ARE ATTACHED TO THE PROJECT SPECIFICATIONS.

CONSTRUCTION ACCESS/TRAFFIC CONTROL

THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN TO THE CITY FOR REVIEW. CONSTRUCTION SHALL NOT COMMENCE UNTIL APPROVAL. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR IMPLEMENTING REQUIRED TRAFFIC CONTROL AS REVIEWED AND APPROVED BY OWNER'S REPRESENTATIVE.

THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING ALL REQUIRED TRAFFIC CONTROL INCLUDING, BUT NOT LIMITED TO, SIGNAGE AND FLAGGERS.

ALL EQUIPMENT, MATERIALS AND PERSONNEL SHALL REMAIN WITHIN THE LIMITS OF DISTURBANCE.

THE CONTRACTOR SHALL KEEP THE WORK AREAS IN A CLEAN AND NEAT CONDITION FREE OF DEBRIS AND LITTER FOR THE DURATION OF THE PROJECT.

ALL EFFECTED AREAS INCLUDING ROADS AND ACCESS ROUTES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER.

ALL DISTURBED AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER AT NO COST TO THE OWNER.

CONSTRUCTION STAKING

CONTRACTOR SHALL PROVIDE STAKING OF PROJECT LIMITS, CHANNEL CENTERLINE, EXTENTS OF FILL AREAS.

CONTRACTOR SHALL MEET WITH THE OWNER'S REPRESENTATIVE TO DEFINE AND MARK LIMITS OF DISTURBANCE PRIOR TO MOBILIZATION OF EQUIPMENT OR MATERIALS ONTO THE SITE.

THE CONTRACTOR SHALL REPLACE DAMAGED OR DESTROYED CONSTRUCTION STAKES AT NO COST TO THE OWNER.

EARTHWORK VOLUMES ARE THE DIFFERENCE BETWEEN DESIGN GROUND AND SURVEYED GROUND. LOCATION, ALIGNMENT, SIZE, AND ELEVATION OF LOGS AND LOGS WITH ROOT WADS ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS, AND MATERIAL SIZE.

ANY EXCESS MATERIALS SHALL BE STOCKPILED NEATLY WITHIN THE LIMITS OF DISTURBANCE OR OTHER APPROVED STOCKPILE AREA. THE MATERIAL SHALL BE REMOVED FROM THE SITE PRIOR TO THE COMPLETION OF WORK.

CONSTRUCTION DEWATERING

CONTRACTOR SHALL PERFORM CONSTRUCTION DEWATERING IN SUCH A MANNER AS TO PREVENT THE RELEASE OF SEDIMENT-LADEN WATER TO SURFACE WATERS. SEDIMENT LADEN WATER MAY BE ALLOWED TO SHEET FLOW THROUGH NON-WETLAND FORESTED AREAS BEFORE INFILTRATING INTO THE GROUND. THIS METHOD IS TYPICALLY USED WHERE THE THREAT TO FISH HABITATS IS SMALL, USUALLY AWAY FROM STREAMS. IN MORE SENSITIVE ENVIRONMENTS, A 'DIRT-BAG' OR SEDIMENT RETENTION STRUCTURE SHALL BE REQUIRED.

THE CONTRACTOR IS ADVISED THAT THE PROJECT AREA DRAINS TO A SALMON BEARING STREAM AND/OR STATE WATERS AND THAT THE CONTRACTOR IS RESPONSIBLE TO PROTECT THE RECEIVING WATERS FROM DELETERIOUS EFFECTS OF CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE EROSION CONTROL MEASURES SHOWN OR DESCRIBED IN THE CONTRACT DOCUMENTS AND ANY ADDITIONAL MEASURES THAT MAY BE REQUIRED BY THE CONTRACTORS MEANS AND METHODS OF CONSTRUCTION AS NEEDED TO CONTROL EROSION AND SEDIMENT AT THE CONSTRUCTION SITE AND TO PREVENT VIOLATION OF SURFACE WATER QUALITY, GROUND WATER QUALITY, OR SEDIMENT MANAGEMENT STANDARDS.



VEHICLE OPERATIONS AND STAGING

VEHICLE CLEANING, MAINTENANCE, REFUELING, AND FUEL STORAGE SHALL OCCUR IN DESIGNATED STAGING AREAS THAT ARE 100 FEET OR MORE FROM ANY STREAM, WATER BODY OR WETLAND.

THE CONTRACTOR SHALL DIAPER ALL STATIONARY POWER EQUIPMENT (I.E. GENERATORS, PUMPS, CRANES) OPERATED WITHIN 100 FEET OF ANY STREAM, WATER BODY OR WETLAND TO PREVENT LEAKS, UNLESS SUITABLE CONTAINMENT IS PROVIDED TO PREVENT POTENTIAL SPILLS FROM ENTERING ANY STREAM OR WATER BODY.

THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SPILL CONTAINMENT AND CONTROL PLAN WITH NOTIFICATION PROCEDURES. SPECIFIC CLEANUP AND DISPOSAL INSTRUCTIONS FOR DIFFERENT PRODUCTS. THE CONTRACTOR SHALL STAGE QUICK RESPONSE CONTAINMENT AND CLEANUP MEASURES ON THE SITE, ALONG WITH PERSONEL TRAINED IN PROPOSED METHODS FOR DISPOSAL OF SPILLED MATERIALS AND SPILL CONTAINMENT.

CONTRACTOR SHALL INSPECT ALL VEHICLES OPERATED WITHIN 150 FEET OF ANY STREAM, WATER BODY OR WETLAND DAILY FOR FLUID LEAKS BEFORE LEAVING THE VEHICLE STAGING AREA. REPAIR ANY LEAKS DETECTED IN THE VEHICLE STAGING AREA BEFORE THE VEHICLE RESUMES OPERATION. DOCUMENT INSPECTIONS IN A RECORD THAT IS AVAILABLE FOR REVIEW UPON REQUEST.

BEFORE OPERATIONS BEGIN AND AS OFTEN AS NECESSARY DURING OPERATION, PRESSURE WASH ALL EQUIPMENT THAT WILL BE USED BELOW BANKFULL ELEVATION UNTIL ALL VISIBLE EXTERNAL OIL, GREASE, MUD, AND OTHER VISIBLE CONTAMINANTS ARE REMOVED.

WHEN TRUCKING SATURATED SOILS FROM THE SITE, WATERTIGHT TRUCKS MUST BE USED, OR LOADS SHALL BE DRAINED ON-SITE SO THAT WATER SEEPING FROM THE SOIL CANNOT DRAIN FROM THE VEHICLE. ALL VEHICLES LEAVING THE SITE SHALL HAVE TIRES CLEANED AT A TRUCK WASHING STATION.

STABILIZED CONSTRUCTION ENTRANCE (EXIT) AND TIRE WASH SHALL BE INSTALLED AT EACH LOCATION WHERE HIGHWAY HAULERS WILL LEAVE THE SITE ONTO PAVED ROADS.

EROSION CONTROL PUBLIC RIGHTS OF WAY ARE TO BE KEPT IN A CLEAN AND SERVICEABLE CONDITION AT ALL TIMES. IN THE EVENT MATERIALS ARE INADVERTENTLY DEPOSITED ON ROADWAYS IT SHALL BE REMOVED PROMPTLY. MATERIALS SHALL BE SWEEP AND REMOVED PRIOR TO ANY STREET FLUSHING. PUBLIC AND PRIVATE DRAINAGE AND WATER WAYS ARE TO BE PROTECTED FROM POLLUTION.

CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING AND MAINTAINING ALL NECESSARY EROSION CONTROL FACILITIES TO COMPLY WITH APPLICABLE EROSION CONTROL REGULATIONS.

THE CONTRACTOR SHALL ENSURE THAT MATERIALS FOR EMERGENCY EROSION CONTROL ARE ONSITE, INCLUDING BUT NOT LIMITED TO: SEDIMENT CONTROL MATERIALS (I.E. SILT FENCE, STRAW BALES, STRAW WATTLES, DIRT BAGS); AN OIL-ABSORBING, FLOATING BOOM WHENEVER FLOWING SURFACE WATER IS PRESENT.

THE CONTRACTOR SHALL SHALL IMPEMENT MEASURES TO CONTROL AND MINIMIZE WIND-BLOWN DUST FROM THE SITE.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR PROVIDING EROSION, SEDIMENT, AND POLLUTION CONTROL MEASURES TO COMPLY WITH ALL APPLICABLE REGULATIONS. NOTICE TO PROCEED WILL NOT BE ISSUED UNTIL THE CONTRACTOR OBTAINS AN APPROVED ESC PLAN.

THE CONTRACTOR SHALL SUBMIT NAME, ADDRESS AND 24-HOUR PHONE NUMBER OF PERSON RESPONSIBLE FOR EROSION PREVENTION AND SEDIMENT CONTROL MEASURES, AND SPILL CONTAINMENT.

THE IMPLEMENTATION OF EROSION, SEDIMENT, AND POLLUTION CONTROL MEASURES AND THE CONSTRUCTION, MAINTENANCE, REPLACEMENT, AND UPGRADING OF THESE FACILITIES IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ALL CONSTRUCTION IS COMPLETED AND APPROVED, AND VEGETATION IS ESTABLISHED.

THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THIS PLAN WILL BE FLAGGED IN THE FIELD PRIOR TO CONSTRUCTION BY THE OWNER'S REPRESENTATIVE. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE FLAGGED CLEARING LIMITS SHALL BE PERMITTED. THE FLAGGING SHALL BE MAINTAINED BY THE CONTRACTOR FOR THE DURATION OF CONSTRUCTION.

EROSION, SEDIMENT, AND POLLUTION CONTROL MEASURES MUST BE IMPLEMENTED PRIOR TO ANY GROUND DISTURBING ACTIVITY ON THE PROJECT SITE, AND IN SUCH A MANNER AS TO ENSURE THAT SEDIMENT AND SEDIMENT LADEN WATER DO NOT LEAVE THE PROJECT SITE, ENTER THE DRAINAGE SYSTEM OR ROADWAYS, OR VIOLATE APPLICABLE WATER STANDARDS.

DURING THE CONSTRUCTION PERIOD, EROSION, SEDIMENT, AND POLLUTION CONTROL MEASURES SHALL BE UPGRADED AS NEEDED FOR STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN WATER DO NOT LEAVE THE SITE.

DURING CONSTRUCTION, THE CONTRACTOR SHALL MONITOR INSTREAM TURBIDITY AND INSPECT ALL EROSION CONTROLS DAILY DURING THE RAINY SEASON AND WEEKLY DURING THE DRY SEASON, OR MORE OFTEN AS NECESSARY, TO ENSURE THE EROSION CONTROLS ARE WORKING ADEQUATELY. IF MONITORING OR INSPECTION SHOWS THAT THE EROSION CONTROLS ARE INEFFECTIVE, MOBILIZE WORK CREWS IMMEDIATELY TO MAKE REPAIRS, INSTALL REPLACEMENTS, OR INSTALL ADDITIONAL CONTROLS AS NECESSARY. THE CONTRACTOR SHALL REMOVE SEDIMENT FROM EROSION CONTROLS ONCE IT HAS REACHED 1/3 OF THE EXPOSED HEIGHT OF THE CONTROL.

A STABILIZED TEMPORARY CONSTRUCTION EXIT IS REQUIRED AT THE EACH CONSTRUCTION ACCESS POINT FROM THE STREET. THE FACILITY SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES MAY BE REQUIRED TO ENSURE THAT STREETS ARE KEPT CLEAN FOR THE DURATION OF THE PROJECT.

FROM MAY 1 – SEPT 30 NO SUBSTANTIALLY UNWORKED SOILS SHALL REMAIN EXPOSED FOR MORE THAN SEVEN DAYS AT A TIME.

CAUTION!!!  
OVERHEAD AND UNDERGROUND  
UTILITIES ARE KNOWN TO  
EXIST IN AREA. NOT ALL ARE  
SHOWN IN PLANS.

CALL UULC BEFORE YOU DIG.  
2 BUSINESS DAYS ADVANCE NOTICE.  
(800) 424-5555

IN-CHANNEL WORK

THE MAJORITY OF THE WORK WILL OCCUR OUTSIDE OF THE ACTIVE WATERWAY. THEREFORE, CREEK DIVERSION AND DEWATERING SHALL OCCUR FOR THE PERIOD OF IN-CHANNEL WORK ONLY. IN-CHANNEL WORK INCLUDES DIVERTING SQUALICUM CREEK FROM SUNSET POND TO THE RE-ROUTE CHANNEL, OPENING THE RE-ROUTE CHANNEL TO BUG LAKE, DEWATERING TRIB W, DIVERTING TRIB W TO THE RE-ROUTE CHANNEL, PLUGGING TRIB W, AND PLUGGING EXISTING INLET AND OUTLET OF SUNSET POND.

IN-CHANNEL WORK SHALL BE ISOLATED BY TEMPORARY DAMS INSTALLED UPSTREAM AND DOWNSTREAM OF WORK AREAS.

DEWATERING OF IN-CHANNEL WORK AREAS SHALL OCCUR CONCURRENT WITH FISH RESCUE. CONTRACTOR SHALL COORDINATE WITH THE CITY TO SCHEDULE WASHINGTON CONSERVATION CORP (WCC) FOR FISH RESCUE (MON – THUR). CONTRACTOR SHALL PROVIDE WCC AMPLE TIME TO SCHEDULE FISH RESCUE. IF DIVERSION FAILS DUE TO CONTRACTOR NEGLIGENCE, FISH RESCUE SHALL BE REPEATED BY WCC CREWS AT CONTRACTOR'S EXPENSE.

IF ADDITIONAL PUMPING IS REQUIRED TO DEWATER DURING CONSTRUCTION, PUMPED DISCHARGE SHALL RELEASE SEDIMENT-LADEN WATER IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OR INCREASE TURBIDITY OF SURFACE WATERS. (SEE CONTROL DEWATERING).

PUMPS SHALL CONFORM TO LOCAL CODES FOR NOISE STANDARDS. PUMPS SHALL RUN 24 HRS PER DAY UNTIL CONSTRUCTION IS COMPLETED. CONTRACTOR SHALL PROVIDE BACK UP PUMPS. PUMP INTAKE SCREENS SHALL MEET NMFS CRITERIA. SEE <http://swr.nmfs.noaa.gov/hcd/pumpcrit.htm>

TRIB W DIVERSION SHALL HAVE FLOW CAPACITY OF 1 CFS (450 GPM) OR GREATER.

FISH RESCUE

FISH BARRIERS SHALL BE PROVIDED AND INSTALLED UPSTREAM AND DOWNSTREAM OF THE PROJECT WHERE DESIGNATED IN THE PLANS.

CONTRACTOR SHALL PROVIDE PUMPS FOR FISH RESCUE AND DEWATERING.

INITIAL CHANNEL DEWATERING SHALL OCCUR SLOWLY BY INCREMENTALLY REDUCING STREAM FLOWS OVER A PERIOD OF 30 MINUTES TO ALLOW TIME FOR FISH TO VOLITIONALLY MOVE DOWNSTREAM OR FIND RESIDUAL POOLS WITHOUT RISK OF SUDDEN STRANDING.

RESIDUAL POOLS WITHIN THE DEWATERED CONSTRUCTION SITE SHALL BE PUMPED DRY USING SCREENED PUMP INTAKES. RESIDUAL DEWATERING PUMP INTAKES SHALL ADHERE TO NMFS SCREENING CRITERIA. NATIONAL MARINE FISHERIES SERVICE JUVENILE FISH SCREEN CRITERIA (REVISED FEBRUARY 16, 1995) AND ADDENDUM: JUVENILE FISH SCREEN CRITERIA FOR PUMP INTAKES (MAY 9, 1996). SEE <http://swr.nmfs.noaa.gov/hcd/pumpcrit.htm>

FISH REMOVAL TO BE PERFORMED BY WASHINGTON CONSERVATION CORPS CREWS AND COORDINATED THROUGH THE CITY.

ABBREVIATIONS

APPROX: APPROXIMATE	LWD: LARGE WOODY DEBRIS
CFS: CUBIC FEET PER SECOND	OHW: ORDINARY HIGH WATER
GPM: GALLONS PER MINUTE	WS: WATER SURFACE
LBS: POUNDS	RR: RAILROAD
MIN: MINIMUM	NB: NORTHBOUND
MAX: MAXIMUM	SB: SOUTHBOUND
FT: FEET	CNG: CASCADE NATURAL GAS
LF: LINEAR FEET	HVF: HIGH VISIBILITY FENCE
SF: SQUARE FEET	TESC: TEMPORARY EROSION AND SEDIMENT CONTROL
SY: SQAURE YARDS	SWPPP: STORMWATER POLLUTION PREVENION PLAN
CY: CUBIC YARDS	COB: CITY OF BELLINGHAM
AC: ACRES	WCC WASHINGTON CONSERVATION CORPS
OC: ON CENTER	WSDOT: WASHINGTON STATE DEPARTMENT OF TRANSPORTATION
PLS: PURE LIVE SEED	B2B: BAY TO BAKER
CL: CENTERLINE	PSE: Pacific Surveying & Engineering
XS: CROSS SECTION	TYP: TYPICAL
AVE: AVERAGE OR AVENUE	EL: ELEVATION
ST: STREET	IE: INVERT ELEVATION
NTS: NOT TO SCALE	REINF: REINFORCED
CS: CONTROL SUVERY	CONC: CONCRETE
CSRPC: CONTROL SURVEY RED PLASTIC CAP	EXIST: EXISTING
DISC: SURFACE MONUMENT DISC	
CSHT: CHECK SHOT	
LT: LEFT	
RT: RIGHT	
N: NORTHING	
E: EASTING	
PI: POINT OF INTERSECTION	
PVI: POINT OF VERTICAL INTERSECTION	
PC: POINT OF CURVATURE	
PT: POINT OF TANGENCY	
SSMH: SANITARY SEWER MANHOLE	
TRIB: TRIBUTARY	



<div><div></div><div>4</div><div>3</div><div>2</div><div>1</div><div>Date</div><div>No</div><div>Revision</div><div>By</div></div>	<div>PROJECT ENGINEER</div> <div>DESIGNED/DRAWN</div> <div>INSPECTOR</div> <div>MRM</div> <div>MRM</div> <div>—</div>	<div>DIR. PUBLIC WORKS</div> <div>CITY ENGINEER</div> <div>OPER. ENGINEER</div> <div>TC</div> <div>RAR</div> <div></div>	<div>CITY OF BELLINGHAM, WASHINGTON</div> <div>PUBLIC WORKS DEPARTMENT</div> <div>ENGINEERING DIVISION</div>	<div>SCALE</div> <div>Horiz.</div> <div>Vert.</div> <div></div> <div></div> <div></div>	<div>DATUM</div> <div>NAD83/91</div> <div>NAVD88</div>	<div>Job. No.</div> <div>Date</div> <div>Field Bk.</div> <div>---</div> <div>04/30/15</div> <div>—</div>	<div>SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT</div> <div>GENERAL NOTES</div>	<div>SHEET</div> <div>2</div> <div>OF</div> <div>44</div>
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CONTACT PERSON: ENGINEER , PROJECT ENGINEER AT 778-7900



ELEMENT 1 – MARK CLEARING LIMITS

PRIOR TO BEGINNING LAND DISTURBING ACTIVITIES, INCLUDING CLEARING AND GRADING, ALL CLEARING LIMITS, SENSITIVE AREAS AND THEIR BUFFERS, AND TREES THAT ARE TO BE PRESERVED WITHIN THE CONSTRUCTION AREA SHOULD BE CLEARLY MARKED, BOTH IN THE FIELD AND ON THE PLANS, TO PREVENT DAMAGE AND OFFSITE IMPACTS. PLASTIC, METAL, OR STAKE WIRE FENCE MAY BE USED TO MARK THE CLEARING LIMITS.

SUGGESTED BMP'S/BMP'S TO BE USED:

- CLEARING LIMITS ARE WITHIN THE DEVELOPED ROAD PRISM AND INDICATED ON THE CONSTRUCTION SITE PLANS. LIMITS WILL BE MARKED IN THE FIELD BY THE CONTRACTOR.
- BMP C103: HIGH VISIBILITY PLASTIC OR METAL FENCE.

ELEMENT 2 – ESTABLISH CONSTRUCTION ACCESS

(A) CONSTRUCTION VEHICLE ACCESS AND EXIT SHALL BE LIMITED TO ONE ROUTE IF POSSIBLE.

(B) ACCESS POINTS SHALL BE STABILIZED WITH QUARRY SPALL OR CRUSHED ROCK TO MINIMIZE THE TRACKING OF SEDIMENT ONTO PUBLIC ROADS.

(C) WHEEL WASH OR TIRE BATHS SHOULD BE LOCATED ON-SITE, IF APPLICABLE.

(D) PUBLIC ROADS SHALL AT A MINIMUM BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR PICKUP SWEEPING AND SHALL BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING WILL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.

(E) STREET WASH WASTEWATER SHALL BE CONTROLLED BY PUMPING BACK ON-SITE, OR OTHERWISE BE PREVENTED FROM DISCHARGING INTO SYSTEMS TRIBUTARY TO STATE SURFACE WATERS.

SUGGESTED BMP'S/BMP'S TO BE USED:

- BMP C106: WHEEL WASH
- BMP C107: CONSTRUCTION ROAD/PARKING AREA STABILIZATION

ELEMENT 3 – CONTROL FLOW RATES

(A) PROPERTIES AND WATERWAYS DOWNSTREAM FROM DEVELOPMENT SITES SHALL BE PROTECTED FROM EROSION DUE TO INCREASES IN THE VOLUME, VELOCITY, AND PEAK FLOW RATE OF STORMWATER RUNOFF FROM THE PROJECT SITE. PROPERTIES SUBJECT TO MINIMUM REQUIREMENT # 5 AND/OR #7 SHALL IMPLEMENT CONTROLS AS EARLY IN THE DEVELOPMENT AS IS PRACTICABLE TO MITIGATE FOR FLOW RATES.

(B) DOWNSTREAM ANALYSIS IS NECESSARY IF CHANGES IN FLOWS COULD IMPAIR OR ALTER CONVEYANCE SYSTEMS, STREAM BANKS, BED SEDIMENT OR AQUATIC HABITAT. SEE THE ECOLOGY MANUAL FOR OFFSITE ANALYSIS GUIDANCE.

(C) WHERE NECESSARY TO COMPLY WITH MINIMUM REQUIREMENT #7, STORMWATER RETENTION/DETENTION FACILITIES SHALL BE CONSTRUCTED AS ONE OF THE FIRST STEPS IN GRADING. DETENTION FACILITIES SHALL BE FUNCTIONAL PRIOR TO CONSTRUCTION OF SITE IMPROVEMENTS (E.G. IMPERVIOUS SURFACES).

(D.) IF PERMANENT INFILTRATION PONDS ARE USED FOR FLOW CONTROL DURING CONSTRUCTION, THESE FACILITIES SHOULD BE PROTECTED FROM SILTATION DURING THE CONSTRUCTION PHASE.

SUGGESTED BMP'S/BMP'S TO BE USED:

- FLOW RATES WILL CHANGE AS THE PURPOSE OF THIS PROJECT IS TO REROUTE SQUALICUM CREEK TO A NEW CHANNEL. RUNOFF FROM ALL NEW PERVIOUS AREAS HAVE BEEN INCLUDED WITH THE CAPACITY MODELING OF THE NEW CREEK CHANNEL.

ELEMENT 4 – INSTALL SEDIMENT CONTROLS

(A) THE DUFF LAYER, NATIVE TOPSOIL, AND NATURAL VEGETATION SHALL BE RETAINED IN AN UNDISTURBED STATE TO THE MAXIMUM EXTENT PRACTICABLE.

(B) PRIOR TO LEAVING A CONSTRUCTION SITE, OR PRIOR TO DISCHARGE TO AN INFILTRATION FACILITY, STORMWATER RUNOFF FROM DISTURBED AREAS SHALL PASS THROUGH A SEDIMENT POND OR OTHER APPROPRIATE SEDIMENT REMOVAL BMP UP TO AND INCLUDING FLOCCULATION TREATMENT. RUNOFF FROM FULLY STABILIZED AREAS MAY BE DISCHARGED WITHOUT A SEDIMENT REMOVAL BMP, BUT MUST MEET THE FLOW CONTROL PERFORMANCE STANDARD OF ELEMENT 3 ABOVE. FULL STABILIZATION MEANS THE USE OF ROLLED EROSION PRODUCTS, A BONDED FIBER MATRIX PRODUCT, OR VEGETATIVE COVER IN A MANNER THAT WILL FULLY PREVENT SOIL EROSION. SEDIMENT PONDS, VEGETATED BUFFER STRIPS, SEDIMENT BARRIERS OR FILTERS, DIKES, AND OTHER BMPS INTENDED TO TRAP SEDIMENT ON-SITE SHALL BE CONSTRUCTED AS ONE OF THE FIRST STEPS IN GRADING. THESE BMPS SHALL BE FUNCTIONAL BEFORE OTHER LAND DISTURBING ACTIVITIES TAKE PLACE.

(C) EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS SHALL BE SEEDED AND MULCHED ACCORDING TO THE TIMING INDICATED IN ELEMENT 5 BELOW.

SUGGESTED BMP'S/BMP'S TO BE USED:

- BMP C235: STRAW WATTLES
- BMP T6.10: PRESETTLING BASIN

ELEMENT 5 – STABILIZE SOILS

(A) ALL EXPOSED AND UNWORKED SOILS SHALL BE STABILIZED BY APPLICATION OF EFFECTIVE BMPS THAT PROTECT THE SOIL FROM THE EROSIIVE FORCES OF RAINDROP IMPACT AND FLOWING WATER, AND WIND EROSION.

(B) FROM OCTOBER 1 THROUGH APRIL 30 OF EACH YEAR, NO SOILS SHALL REMAIN EXPOSED AND UNWORKED FOR MORE THAN 2 DAYS. FROM MAY 1 TO SEPTEMBER 30 OF EACH YEAR, NO SOILS SHALL REMAIN EXPOSED AND UNWORKED FOR MORE THAN 7 DAYS. THIS CONDITION APPLIES TO ALL SOILS ON SITE, WHETHER AT FINAL GRADE OR NOT.

(C) APPLICABLE PRACTICES INCLUDE, BUT ARE NOT LIMITED TO, TEMPORARY AND PERMANENT SEEDING, SODDING, MULCHING, PLASTIC COVERING, SOIL APPLICATION OF POLYACRYLAMIDE (PAM), EARLY APPLICATION OF GRAVEL BASE ON AREAS TO BE PAVED, AND DUST CONTROL.

(D) SOIL STABILIZATION MEASURES SELECTED SHOULD BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS, ESTIMATED DURATION OF USE, AND POTENTIAL WATER QUALITY IMPACTS THAT STABILIZATION AGENTS MAY HAVE ON DOWNSTREAM WATERS OR GROUND WATER.

(E) SOIL STOCKPILES MUST BE STABILIZED AND PROTECTED WITH SEDIMENT TRAPPING MEASURES.

(F) WORK ON LINEAR CONSTRUCTION SITES AND ACTIVITIES, INCLUDING RIGHT-OF-WAY AND EASEMENT CLEARING, SHALL NOT EXCEED THE CAPABILITY OF THE INDIVIDUAL CONTRACTOR FOR HIS PORTION OF THE PROJECT TO INSTALL THE AGGREGATE AND SOIL MATERIALS AND CREEK CHANNEL, AND TO RE-STABILIZE THE DISTURBED SOILS, MEETING THE TIMING CONDITIONS LISTED ABOVE.

(G) IN ADDITION, AT THE DISCRETION OF THE PUBLIC WORKS DIRECTOR THOSE SITES UNABLE TO MAINTAIN THE QUALITY OF THEIR STORMWATER DISCHARGE MAY BE REQUIRED TO PROVIDE SOIL STABILIZATION TO ALL EXPOSED SOIL AREAS REGARDLESS OF THE WORKING STATUS OF THE AREA. UPON WRITTEN NOTIFICATION, THE PROPERTY OWNER SHALL PROVIDE FULL STABILIZATION OF ALL EXPOSED SOIL AREAS WITHIN 24 HOURS.

(J) REVEGETATION WILL BE ACCOMPLISHED BY THE CITY FOLLOWING CONSTRUCTION. WASHINGTON CONSERVATION CORPS CREWS WILL PERFORM THE PLANTING. ALL SIDESLOPES OF THE NEW CREEK CHANNEL TO BE COVERED IN EROSION CONTROL MAT AS DETAILED IN THE PROJECT DRAWINGS, AND UPLANDS SEEDED AND MULCHED AS SHOWN.

SUGGESTED BMP'S/BMP'S TO BE USED:

- BMP C120: TEMPORARY AND PERMANENT SEEDING
- BMP C124: SODDING
- BMP C140: DUST CONTROL
- BMP T.5.13: POST-CONSTRUCTION SOIL QUALITY AND DEPTH

ELEMENT 6 – PROTECT SLOPES

(A) CUT AND FILL SLOPES SHALL BE DESIGNED AND CONSTRUCTED IN A MANNER THAT WILL MINIMIZE EROSION.

(B) CONSIDER SOIL TYPE AND ITS POTENTIAL FOR EROSION.

(C) REDUCE SLOPE RUNOFF VELOCITIES BY REDUCING THE CONTINUOUS LENGTH OF SLOPE WITH TERRACING AND DIVERSIONS, REDUCE SLOPE STEEPNESS, AND ROUGHEN SLOPE SURFACE.

(D) DIVERT UPSLOPE DRAINAGE AND RUN-ON WATERS FROM OFF-SITE WITH INTERCEPTORS AT TOP OF SLOPE. OFF-SITE STORMWATER SHOULD BE HANDLED SEPARATELY FROM STORMWATER GENERATED ON THE SITE. DIVERSION OF OFF-SITE STORMWATER AROUND THE SITE MAY BE A VIABLE OPTION. DIVERTED FLOWS SHALL BE REDIRECTED TO THE NATURAL DRAINAGE LOCATION AT OR BEFORE THE PROPERTY BOUNDARY.

(E) CONTAIN DOWN SLOPE COLLECTED FLOWS IN PIPES, SLOPE DRAINS, OR PROTECTED CHANNELS.

(F) PROVIDE DRAINAGE TO REMOVE GROUND WATER INTERSECTING THE SLOPE SURFACE OF EXPOSED SOIL AREAS.

(G) EXCAVATED MATERIAL SHALL BE PLACED ON THE UPHILL SIDE OF TRENCHES, CONSISTENT WITH SAFETY AND SPACE CONSIDERATIONS.

(H) CHECK DAMS SHALL BE PLACED AT REGULAR INTERVALS WITHIN TRENCHES THAT ARE CUT DOWN A SLOPE.

(I) STABILIZE SOILS ON SLOPES, AS SPECIFIED IN ELEMENT #5.

(J) REVEGETATION WILL BE ACCOMPLISHED BY THE CITY FOLLOWING CONSTRUCTION. WASHINGTON CONSERVATION CORPS CREWS WILL PERFORM THE PLANTING. ALL SIDESLOPES OF THE NEW CREEK CHANNEL TO BE COVERED IN EROSION CONTROL MAT AS DETAILED IN THE PROJECT DRAWINGS, AND UPLANDS SEEDED AND MULCHED AS SHOWN.

SUGGESTED BMP'S/BMP'S TO BE USED:

- BMP C123: PLASTIC COVERING
- BMP C130: SURFACE ROUGHENING

ELEMENT 7: PROTECT DRAIN INLETS

(A) ALL STORM DRAIN INLETS MADE OPERABLE DURING CONSTRUCTION, AND NEAR CONSTRUCTION ENTRANCES SHALL BE PROTECTED SO THAT STORMWATER RUNOFF SHALL NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR TREATED TO REMOVE SEDIMENT.

(B) ALL APPROACH ROADS SHALL BE KEPT CLEAN, AND ALL SEDIMENT AND STREET WASH WATER SHALL NOT BE ALLOWED TO ENTER STORM DRAINS WITHOUT PRIOR AND ADEQUATE TREATMENT UNLESS TREATMENT IS PROVIDED BEFORE THE STORM DRAIN DISCHARGES TO WATERS OF THE STATE.

SUGGESTED BMP'S/BMP'S TO BE USED:

- BMP C220: STORM DRAIN INLET PROTECTION

ELEMENT 8: STABILIZE CHANNELS AND OUTLETS

(A) ALL TEMPORARY ON-SITE CONVEYANCE CHANNELS SHALL BE DESIGNED, CONSTRUCTED AND STABILIZED TO PREVENT EROSION FROM THE EXPECTED VELOCITY OF FLOW FROM A 2 YEAR, 24-HOUR FREQUENCY STORM FOR THE DEVELOPED CONDITION.

(B) STABILIZATION, INCLUDING ARMORING MATERIAL, ADEQUATE TO PREVENT EROSION OF OUTLETS, ADJACENT STREAM BANKS, SLOPES AND DOWNSTREAM REACHES SHALL BE PROVIDED AT THE OUTLETS OF ALL CONVEYANCE SYSTEMS.

SUGGESTED BMP'S/BMP'S TO BE USED:

- BMP C209: OUTLET PROTECTION

ELEMENT 9: CONTROL POLLUTANTS

(A) ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS, THAT OCCUR ON-SITE DURING CONSTRUCTION SHALL BE HANDLED AND DISPOSED OF IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER.

(B) COVER, CONTAINMENT, AND PROTECTION FROM VANDALISM SHALL BE PROVIDED FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND NON-INERT WASTES PRESENT ON THE SITE (SEE CHAPTER 173-304 WAC, AS CURRENTLY ENACTED OR HEREAFTER MODIFIED, FOR THE DEFINITION OF INERT WASTE, WHICH IS INCORPORATED HEREIN BY THIS REFERENCE).

(C) MAINTENANCE AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES INVOLVING OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, SOLVENT AND DE-GREASING CLEANING OPERATIONS, FUEL TANK DRAIN DOWN AND REMOVAL, AND OTHER ACTIVITIES WHICH MAY RESULT IN DISCHARGE OR SPILLAGE OF POLLUTANTS TO THE GROUND OR INTO STORMWATER RUNOFF MUST BE CONDUCTED USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS. CONTAMINATED SURFACES SHALL BE CLEANED IMMEDIATELY FOLLOWING ANY DISCHARGE OR SPILL INCIDENT. EMERGENCY REPAIRS MAY BE PERFORMED ON-SITE USING TEMPORARY PLASTIC PLACED BENEATH AND, IF RAINING, OVER THE VEHICLE.

(D) WHEEL WASH, OR TIRE BATH WASTEWATER, SHALL BE DISCHARGED TO A SEPARATE ON-SITE TREATMENT SYSTEM OR TO THE SANITARY SEWER.

(E) APPLICATION OF AGRICULTURAL CHEMICALS, INCLUDING FERTILIZERS AND PESTICIDES, SHALL BE CONDUCTED IN A MANNER AND AT APPLICATION RATES THAT WILL NOT RESULT IN LOSS OF CHEMICAL TO STORMWATER RUNOFF. MANUFACTURERS' RECOMMENDATIONS SHALL BE FOLLOWED FOR APPLICATION RATES AND PROCEDURES.

(F) MANAGEMENT OF PH-MODIFYING SOURCES SHALL PREVENT CONTAMINATION OF RUNOFF AND STORMWATER COLLECTED ON THE SITE. THESE SOURCES INCLUDE, BUT ARE NOT LIMITED TO, BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHING AND CURING WATERS, WASTE STREAMS GENERATED FROM CONCRETE GRINDING AND SAWING, EXPOSED AGGREGATE PROCESSES, AND CONCRETE PUMPING AND MIXER WASHOUT WATERS.

ELEMENT 10: CONTROL DE-WATERING

(A) ALL TRENCH DE-WATERING WATER, WHICH HAS SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE, SHALL BE DISCHARGED INTO A CONTROLLED CONVEYANCE SYSTEM, PRIOR TO DISCHARGE TO A SEDIMENT TRAP OR SEDIMENT POND. CHANNELS MUST BE STABILIZED, AS SPECIFIED IN ELEMENT #8.

(B) CLEAN, NON-TURBID DE-WATERING WATER, SUCH AS WELL-POINT GROUND WATER, CAN BE DISCHARGED TO SYSTEMS TRIBUTARY TO STATE SURFACE WATERS, AS SPECIFIED IN ELEMENT #8, PROVIDED THE DE-WATERING FLOW DOES NOT CAUSE EROSION OR FLOODING OF THE RECEIVING WATERS. THESE CLEAN WATERS SHOULD NOT BE ROUTED THROUGH SEDIMENT PONDS WITH STORMWATER.

(C) HIGHLY TURBID OR OTHERWISE CONTAMINATED DEWATERING WATER, SUCH AS FROM CONSTRUCTION EQUIPMENT OPERATION, CLAMSHELL DIGGING, CONCRETE TREMIE POUR, OR WORK INSIDE A COFFERDAM, SHALL BE HANDLED SEPARATELY FROM STORMWATER AT THE SITE.

(D) OTHER DISPOSAL OPTIONS, DEPENDING ON SITE CONSTRAINTS, MAY INCLUDE, BY WAY OF EXAMPLE: 1) INFILTRATION, 2) TRANSPORT OFF-SITE IN VEHICLE, SUCH AS A VACUUM FLUSH TRUCK, FOR LEGAL DISPOSAL IN A MANNER THAT DOES NOT POLLUTE STATE WATERS, 3) ON-SITE TREATMENT USING CHEMICAL TREATMENT OR OTHER SUITABLE TREATMENT TECHNOLOGIES.

SUGGESTED BMP'S/BMP'S TO BE USED:

ELEMENT 11: MAINTAIN BMPS

(A) ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPS SHALL BE MAINTAINED AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. ALL MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH BMPS.

(B) SEDIMENT CONTROL BMPS SHALL BE INSPECTED WEEKLY OR AFTER A RUNOFF-PRODUCING STORM EVENT DURING THE DRY SEASON AND DAILY DURING THE WET SEASON. ALL PROJECTS THAT DISTURB AN AREA GREATER THAN ONE ACRE SHALL HAVE A CERTIFIED EROSION CONTROL LEAD AVAILABLE TO THE SITE. THIS EROSION CONTROL LEAD SHALL BE RESPONSIBLE TO PROVIDE OVERVIEW OF ONGOING DAY TO DAY EROSION CONTROL REQUIREMENTS. THE EROSION CONTROL LEAD SHALL (WITHIN 24 HOURS) REPORT TO THE CITY AND DEPARTMENT OF ECOLOGY ANY SITE DISCHARGES THAT EXCEED STATE WATER QUALITY STANDARDS THAT HAVE OR ARE LIKELY TO HAVE ENTERED WATERS OF THE STATE.

(C) ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS SHALL BE REMOVED WITHIN 30 DAYS AFTER FINAL SITE STABILIZATION IS ACHIEVED OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED. TRAPPED SEDIMENT SHALL BE REMOVED OR STABILIZED ON SITE. DISTURBED SOIL AREAS RESULTING FROM REMOVAL OF BMPS OR VEGETATION SHALL BE PERMANENTLY STABILIZED.

ELEMENT 12: MANAGE THE PROJECT

(A) PHASING OF CONSTRUCTION – DEVELOPMENT PROJECTS SHALL BE PHASED WHERE FEASIBLE IN ORDER TO PREVENT, TO THE MAXIMUM EXTENT PRACTICABLE, THE TRANSPORT OF SEDIMENT FROM THE DEVELOPMENT SITE DURING CONSTRUCTION. REVEGETATION OF EXPOSED AREAS AND MAINTENANCE OF THAT VEGETATION SHALL BE AN INTEGRAL PART OF THE CLEARING ACTIVITIES FOR ANY PHASE.

(B) WHEN ESTABLISHING THESE PERMITTED CLEARING AND GRADING AREAS, CONSIDERATION SHOULD BE GIVEN TO MINIMIZING REMOVAL OF EXISTING TREES AND MINIMIZING DISTURBANCE/COMPACTION OF NATIVE SOILS EXCEPT AS NEEDED FOR BUILDING PURPOSES. PERMITTED CLEARING AND GRADING AREAS AND ANY OTHER AREAS REQUIRED TO PRESERVE CRITICAL OR SENSITIVE AREAS, BUFFERS, NATIVE GROWTH PROTECTION EASEMENTS, OR TREE RETENTION AREAS, SHALL BE DELINEATED ON THE SITE PLANS AND THE DEVELOPMENT SITE.

(C) COORDINATION WITH UTILITIES AND OTHER CONTRACTORS – THE PRIMARY PROJECT PROPONENT SHALL EVALUATE, WITH INPUT FROM UTILITIES AND OTHER CONTRACTORS, THE STORMWATER MANAGEMENT REQUIREMENTS FOR THE ENTIRE PROJECT, INCLUDING THE UTILITIES, WHEN PREPARING THE CONSTRUCTION SWPPP.

(D) INSPECTION AND MONITORING – ALL BMPS SHALL BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION.

(E) FOR ANY PROJECT DISTURBING MORE THAN ONE ACRE, A CERTIFIED PROFESSIONAL IN EROSION AND SEDIMENT CONTROL SHALL BE IDENTIFIED IN THE CONSTRUCTION SWPPP AND SHALL BE ON-SITE OR ON-CALL AT ALL TIMES. CERTIFICATION MAY BE THROUGH THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION/ASSOCIATED GENERAL CONTRACTORS (WSDOT/AGC) CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL CERTIFICATION PROGRAM OR ANY EQUIVALENT LOCAL OR NATIONAL CERTIFICATION AND/OR TRAINING PROGRAM, IN THE CITY'S DISCRETION.

(F) WHENEVER INSPECTION AND/OR MONITORING REVEALS THAT THE BMPS IDENTIFIED IN THE CONSTRUCTION SWPPP ARE INADEQUATE, DUE TO THE ACTUAL DISCHARGE OF OR POTENTIAL TO DISCHARGE A SIGNIFICANT AMOUNT OF ANY POLLUTANT, THE SWPPP SHALL BE MODIFIED, AS APPROPRIATE, IN A TIMELY MANNER.

(G) MAINTENANCE OF THE CONSTRUCTION SWPPP – THE CONSTRUCTION SWPPP SHALL BE RETAINED ON-SITE. THE CONSTRUCTION SWPPP SHALL BE MODIFIED WHENEVER THERE IS A SIGNIFICANT CHANGE IN THE DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF ANY BMP.

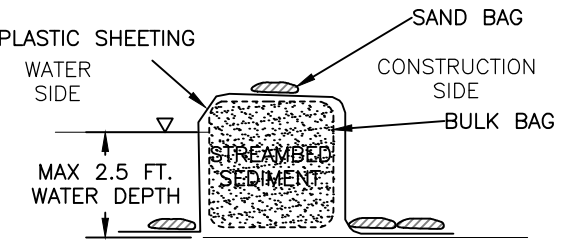


	4			PROJECT ENGINEER	MRM	DIR. PUBLIC WORKS	TC	CITY OF BELLINGHAM, WASHINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	SCALE Horiz. _____ Vert. _____	DATUM NAD83/91 NAVD88	Job. No. _____ Date 04/30/15 Field Bk. _____	SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP)	SHEET 3 OF 44
	3			DESIGNED/DRAWN	MRM	CITY ENGINEER	RAR						
	2			INSPECTOR	—	OPER. ENGINEER							
Date	1	Revision	By										

CONTACT PERSON: ENGINEER , PROJECT ENGINEER AT 778-7900



SEE CONSTRUCTION SEQUENCE SHEETS 7-8 AND SHEETS 2-34 FOR APPROXIMATE LOCATIONS OF SEDIMENT AND WATER CONTROLS.



### TEMPORARY COFFERDAM

(WATER DEPTH LESS THAN 2.5')  
NO SCALE

#### BULK BAG GENERAL NOTES:

BULK BAG COFFERDAM SHALL BE CONSTRUCTED OF SEVERAL UNITS OF BULK BAGS FILLED WITH "STREAMBED SEDIMENT" (SEE TABLE), AND ABUTTED SIDE BY SIDE TO CREATE A ROW THAT ISOLATES THE CONSTRUCTION SITE FROM THE WATERWAY. IF WATER DEPTH EXCEEDS 85% OF THE BULK BAG HEIGHT, AN ADDITIONAL TOP ROW OF BULK BAGS SHALL BE INSTALLED, SUPPORTED BY TWO BOTTOM ROWS OF BULK BAGS. BULK BAG COFFERDAM SHALL BE SEALED BY COVERING THE COFFERDAM WITH PLASTIC SHEETING HELD IN PLACE BY STANDARD SANDBAGS PLACED IN ROWS ON TOP OF COFFERDAM, AND AT TOE OF COFFERDAM. THE PLASTIC SHEETING SHALL BE DRAPED ALONG THE CHANNEL BOTTOM ON THE WORK AREA SIDE OF THE COFFERDAM WITH OUTWARD EDGE OF SHEETING MINIMUM 3- FEET FROM TOE OF COFFERDAM. THE DRAPED PORTION OF PLASTIC SHEETING SHALL BE PINNED TO THE CHANNEL BED BY MINIMUM TWO ROWS OF STANDARD SANDBAGS. THE OUTWARD EDGE OF PLASTIC SHEETING SHALL BE KEYED INTO THE CHANNEL BED MINIMUM 1-FT. KEYING IN THE OUTWARD EDGE OF PLASTIC SHEETING SHALL OCCUR AFTER THE COFFERDAM IS CLOSED TO PREVENT TURBIDITY RELEASE TO THE WATERWAY.

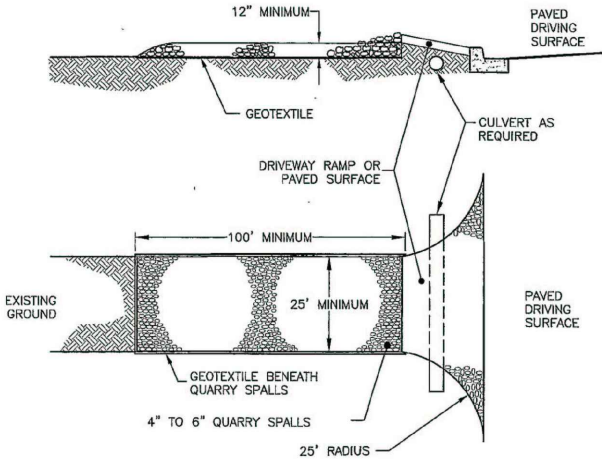
IF POSSIBLE, THE COFFERDAM SHALL BE EXTENDED ONTO A GRAVEL BAR AND OUT OF THE WATER. IF THE END MUST BE TERMINATED AT THE RIVERBANK, THE COFFERDAM SHALL BE TIGHTLY SEALED TO THE GROUND BY PLASTIC SHEETING AND STANDARD SANDBAGS. MULTIPLE LAYERS OF SHEETING AND SANDBAGS MAY BE REQUIRED TO FORM A WATERTIGHT SEAL.

BULK BAGS SHALL BE WATERPROOF CUBE-SHAPED POLYPROPYLENE WOVEN FABRIC BAGS WITH FULLY OPEN TOP, FLAT BOTTOM, FOUR LOOPS, MINIMUM 2-TON WEIGHT CAPACITY, MINIMUM 5:1 SAFETY FACTOR.

PLASTIC SHEETING SHALL BE MINIMUM 6-MIL THICKNESS. PLASTIC SHEETING SHALL COVER THE ENTIRE LENGTH OF COFFERDAM WITHOUT SEAMS.

BULK BAG COFFERDAM SHALL BE COMPLETELY REMOVED AFTER CONSTRUCTION IS COMPLETED AND TURBIDITY HAS BEEN REMOVED.

ALTERNATE COFFERDAM MATERIALS AND CONFIGURATIONS MAY BE ALLOWED BUT SHALL NOT BE IMPLEMENTED WITHOUT REVIEW AND APPROVAL BY THE OWNER. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS AND/OR VENDOR CUT SHEETS FOR SUBSTITUTIONS.



#### NOTES:

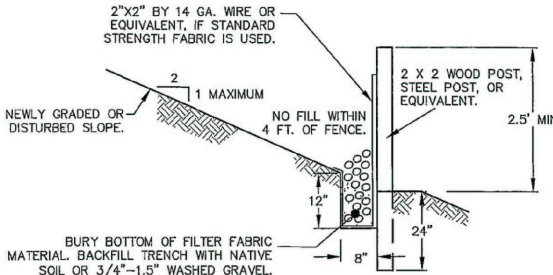
1. PAD SHALL BE REMOVED AND REPLACED WHEN SOIL IS EVIDENT ON THE SURFACE OF THE PAD OR AS DIRECTED BY THE CITY.
2. PAD SHALL BE INSTALLED IN PLANTING STRIP AS APPROPRIATE.
3. PAD THICKNESS SHALL BE INCREASED IF SOIL CONDITIONS DICTATE OR PER THE DIRECTION OF THE CITY.
4. MINIMUM DIMENSIONS MAY BE MODIFIED AS REQUIRED BY SITE CONDITIONS UPON APPROVAL OF THE CITY.

APPROVED  
*Peggy L. Smith*  
City Engineer

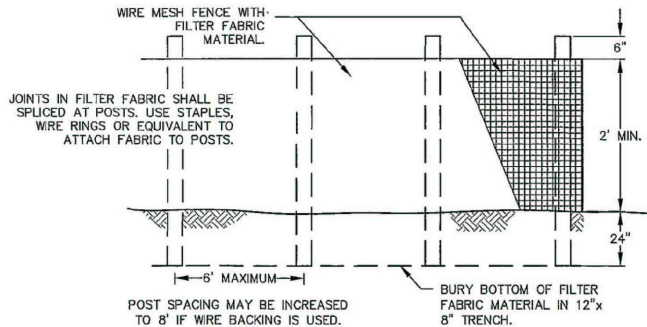
11/29/14  
Date

CITY OF BELLINGHAM  
TEMPORARY CONSTRUCTION  
EXIT-PLAT/COMMERCIAL

DRAWING  
EC-600



#### TYPICAL CROSS SECTION



#### ELEVATION

#### NOTES:

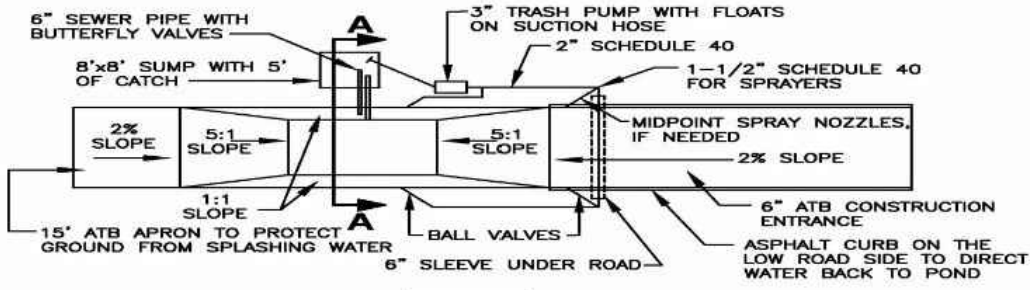
1. FENCE SHALL NOT BE INSTALLED ON SLOPES STEEPER THAN 2:1.
2. JOINTS IN FILTER FABRIC SHALL BE OVERLAPPED 6 INCHES AT POST.
3. USE STAPLES, WIRE RINGS, OR EQUIVALENT TO ATTACH FABRIC TO WIRE FENCE.
4. REMOVE SEDIMENT WHEN IT REACHES 1/3 FENCE HEIGHT.

APPROVED  
*Peggy L. Smith*  
City Engineer

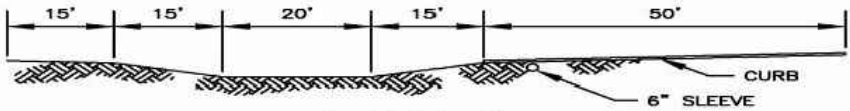
11/29/14  
Date

CITY OF BELLINGHAM  
REINFORCED SILT FENCE

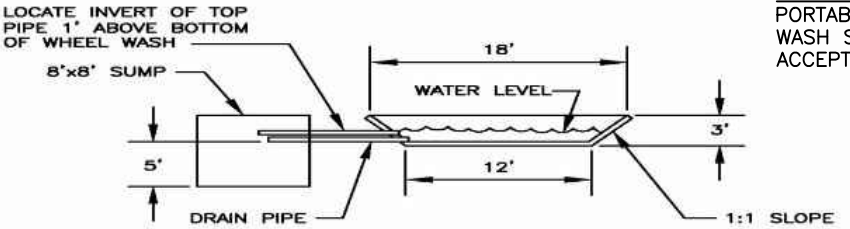
DRAWING  
EC-615



#### PLAN VIEW



#### ELEVATION VIEW



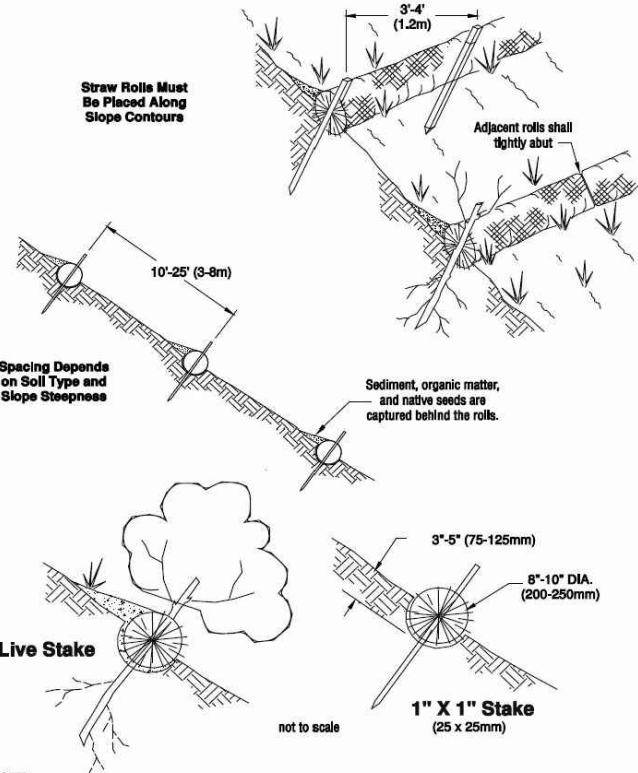
#### SECTION A-A

#### NOTES:

1. BUILD 8'x8' SUMP TO ACCOMMODATE CLEANING BY TRACKHOE.

TIRE WASH NOTE:  
PORTABLE WHEEL  
WASH STATION IS  
ACCEPTABLE.

Figure 4.1.2 – Wheel Wash



NOTE:  
1. Straw roll installation requires the placement and secure staking of the roll in a trench, 3\"/>

Figure 4.2.14 – Wattles

#### STREAM CROSSINGS FOR ACCESS:

INSTALL CULVERTS IN TRIBUTARY W WHERE ACCESS ROUTES CROSS THE CREEK.

ACCESS FROM IRONGATE RD. AND FROM JAMES ST WILL EACH REQUIRE A CULVERT.

EACH CULVERT SHALL CONVEY 24 CFS (10% CHANCE OF OCCURRENCE).

FILL PLACED OVER THE CULVERT TO PROVIDE ACCESS ROAD SHALL BE GRANULAR MATERIAL.

REMOVE CULVERTS AND FILL MATERIAL AS SOON AS THEY ARE NO LONGER NEEDED FOR HEAVY EQUIPMENT ACCESS OR EGRESS.

	4		
	3		
	2		
	1		
Date	No	Revision	By

PROJECT ENGINEER	MRM
DESIGNED/DRAWN	MRM
INSPECTOR	-

DIR. PUBLIC WORKS	TC
CITY ENGINEER	RAR
OPER. ENGINEER	

CITY OF BELLINGHAM, WASHINGTON  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE	
Horiz.	
Vert.	

DATUM	
NAD83/91	
NAVD88	

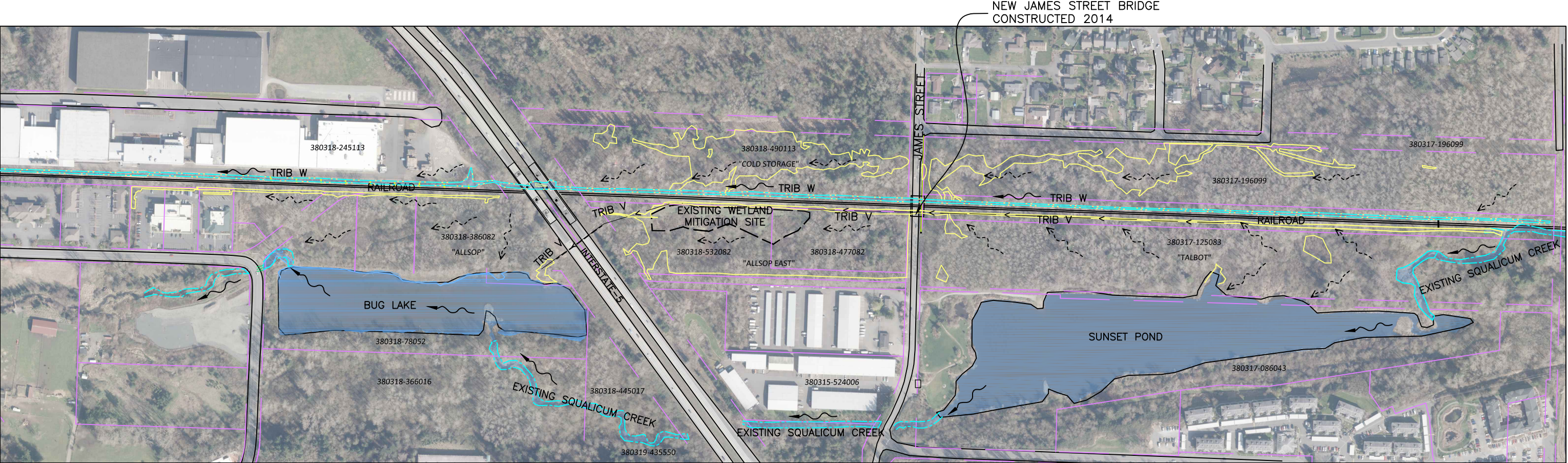
Job. No.	---
Date	04/30/15
Field Bk.	-

SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
SWPPP DETAILS

SHEET	4	OF	44
-------	---	----	----

CONTACT PERSON: ENGINEER . PROJECT ENGINEER AT 778-7900





**EXISTING STREAMS**  
THE EXISTING SQUALICUM CREEK BEGINS AT THE NORTHEAST CORNER OF SUNSET POND, FLOWING THROUGH THE POND, EXITING THE POND AT THE SOUTHWEST CORNER, CONTINUING THROUGH A CULVERT UNDER JAMES STREET AND WESTWARD IN A DITCHED CHANNEL TO TWIN CULVERTS UNDER INTERSTATE 5. IT CONTINUES NORTHWEST TO THE SOUTH SIDE OF BUG LAKE.

TRIB W FLOWS IN A DITCH ALONG THE NORTH SIDE OF THE OLD RAILROAD.

TRIB V IS A STORMWATER DITCH ALONG THE SOUTH SIDE OF THE RAILROAD.

WETLANDS AND WETLAND MITIGATION AREAS ARE WITHIN AND ADJACENT TO THE PROJECT SITE.

A NEW BRIDGE HAS BEEN CONSTRUCTED AT THE JAMES STREET CROSSING OF TRIBUTARIES W AND V. SCOUR PROTECTION STONE HAS BEEN INSTALLED UNDER THE BRIDGE ALONG THE FOOTINGS AND ACROSS THE CHANNELS.

**STORMWATER RUNOFF**  
EXISTING STORMWATER RUNOFF GENERALLY FLOWS WESTWARD, OR TOWARD DITCHES ADJACENT TO THE RAILROAD. RUNOFF FROM DEVELOPED AREAS FLOWS TOWARD CATCH BASINS AND DITCHES THAT CONVEY FLOW AWAY FROM THE RE-ROUTE CHANNEL SITE.

**EXISTING VEGETATION**  
VEGETATION IS RIPARIAN FOREST. COTTONWOOD AND ALDER TREES, WITH THICK UNDERSTORY SHRUBS, PREDOMINANTLY ROSE, DOGWOOD, AND SNOWBERRY, MIXED WITH HIMALAYAN BLACKBERRY.

**PLAN VIEW  
EXISTING CONDITIONS**

**PLAN LEGEND**

---> STORMWATER RUNOFF  
---<--- STORMWATER DITCH

--- STREAM



EXISTING WETLAND

380318-366016 PARCEL LINE AND NUMBER



0 200 400  
FEET  
PLAN SCALE

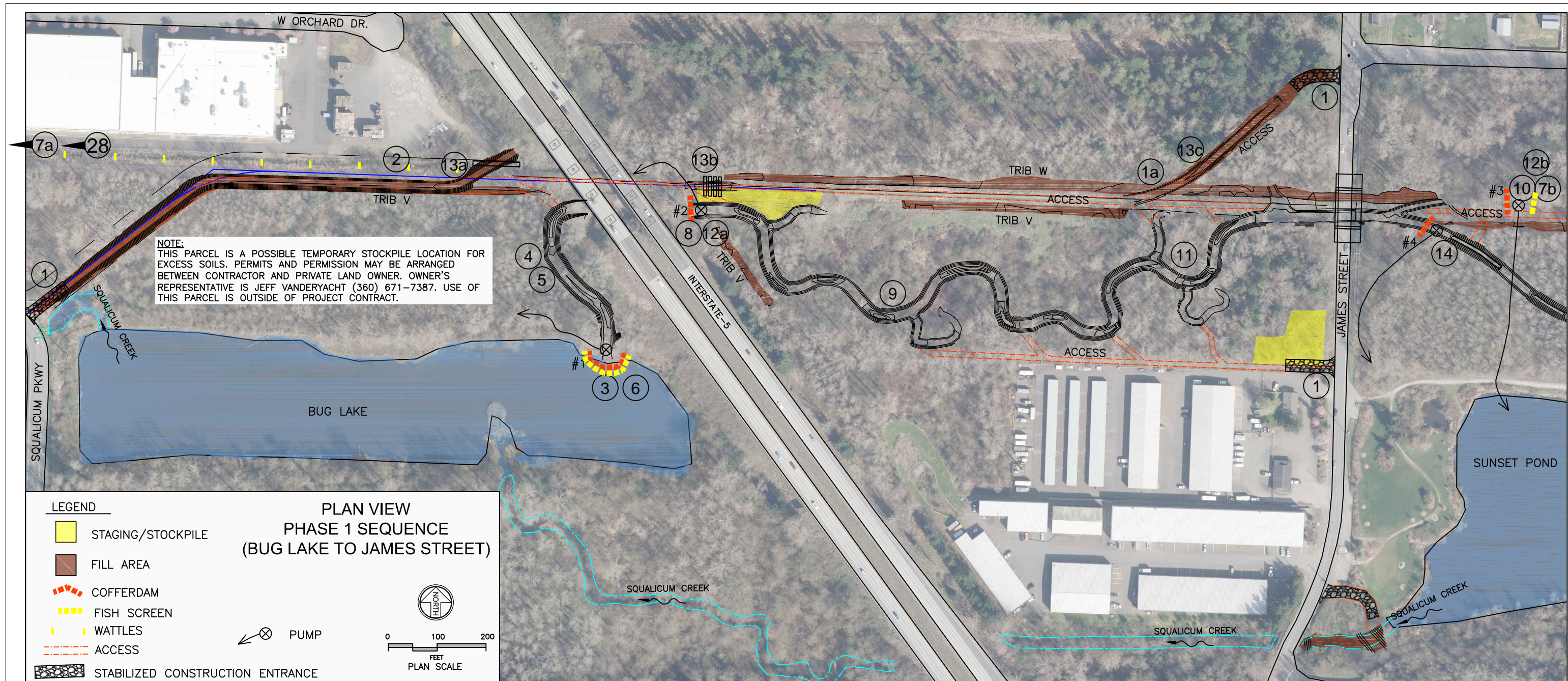


4 3 2 1			PROJECT ENGINEER <u>MRM</u> DESIGNED/DRAWN <u>MRM</u> INSPECTOR <u>---</u>			DIR. PUBLIC WORKS <u>TC</u> CITY ENGINEER <u>RAR</u> OPER. ENGINEER <u>---</u>			CITY OF BELLINGHAM, WASHINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION			SCALE Horiz. <u>---</u> Vert. <u>---</u>			DATUM NAD83/91 NAVD88			Job. No. <u>---</u> Date <u>04/30/15</u> Field Bk. <u>---</u>			SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT EXISTING CONDITIONS			SHEET 5 OF 44		
Date			No			Revision			By			CONTACT PERSON:			ENGINEER			PROJECT ENGINEER AT 778-7900								









- 1 ESTABLISH TEMPORARY ACCESS. INSTALL STABILIZED CONSTRUCTION ENTRANCES. INSTALL ANY TEMPORARY CULVERTS NEEDED TO CROSS TRIB W.
- 2 INSTALL 20 WATTLES IN TRIB W, ONE EVERY 100'.
- 3 INSTALL FISH SCREEN AND TEMPORARY COFFERDAM #1 WHERE RE-ROUTE CHANNEL OUTLETS TO BUG LAKE. DEFISH IMPOUNDED AREA. CONSTRUCT A SUMP AND INSTALL PUMP. PUMP WILL COLLECT SEDIMENT LADEN WATER DEVELOPED DURING CONSTRUCTION AND PUMP TO INFILTRATION AREA. INSTALL BMP'S AS NEEDED TO PREVENT TURBIDITY FROM ENTERING BUG LAKE.
- 4 CLEAR AND GRUB 1-5 TO BUG LAKE.
- 5 CONSTRUCT CHANNEL FROM BUG LAKE TO I-5. APPLY FILL TO DESIGNATED TRIB V AREA. EXCESS FILL TO BE DISPOSED OF OFF SITE.
- 6 REMOVE PUMP AND COFFERDAM #1. FISH SCREEN REMAINS.
- 7 INSTALL FISH SCREENS IN TRIB W; ONE AT CONFLUENCE WITH SQUALICUM CREEK (7a), ONE 400' UPSTREAM OF JAMES STREET (7b). THE OWNER, WITH CONTRACTOR COORDINATION AND ASSISTANCE, WILL RESCUE FISH IN THIS TRIB W EXCLUSION AREA.
- 8 INSTALL TEMPORARY COFFERDAM #2 IN UPSTREAM END OF I-5 CULVERT. CONSTRUCT A SUMP IN THE CHANNEL AND INSTALL PUMP. PUMP WILL COLLECT SEDIMENT LADEN WATER DEVELOPED DURING CONSTRUCTION. PUMP TO TRIB W.
- 9 CONTINUE CONSTRUCTION OF CHANNEL FROM I-5 TO APPROXIMATELY HALF WAY TO JAMES ST. APPLY FILL TO DESIGNATED TRIB V AREAS.

- 10 EXCESS FILL TO BE HAULED OFF SITE.
- 11 INSTALL COFFERDAM #3 IN TRIB W. PUMP TO DIVERT CLEAN WATER TO SUNSET POND.
- 12 CONTINUE CHANNEL CONSTRUCTION TO JAMES STREET. CONSTRUCT CHANNEL UNDER JAMES ST. CONNECT TRIB W TO RE-ROUTE CHANNEL. APPLY FILL TO DESIGNATED TRIB W AREA. EXCESS FILL TO BE HAULED OFF SITE. DO NOT REMOVE EXISTING SCOUR PROTECTION STONE UNDER JAMES STREET BRIDGE.
- 13 REMOVE COFFERDAM #2 AND PUMP. REMOVE COFFERDAM #3 AND PUMP. TRIB W WILL FLOW INTO NEW RE-ROUTE CH
- 14 INSTALL BERMS AND FLOOD CULVERTS.

INSTALL COFFERDAM #4 AND PUMP CONSTRUCTION WATER TO INFILTRATION AREAS.  
(CONTINUED ON PHASE 2 SEQUENCE)

NOTES:  
SQUALICUM CREEK WILL FLOW IN ITS EXISTING CHANNEL FOR THE ENTIRETY OF PHASE I CONSTRUCTION.

GROUNDWATER WILL BE ENCOUNTERED. PUMPING WILL BE REQUIRED TO REMOVE CONSTRUCTION WATER FROM THE WORK AREA AND DISCHARGE IT TO INFILTRATION AREAS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT NO TURBIDITY ENTERS THE WATERWAY. ADDITIONAL CONTROLS MAY BE REQUIRED AT THE CONTRACTOR'S EXPENSE.

	4		
	3		
	2		
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Date	No	Revision	By

PROJECT ENGINEER MRM  
DESIGNED/DRAWN MRM  
INSPECTOR -

DIR. PUBLIC WORKS TC  
CITY ENGINEER RAR  
OPER. ENGINEER -

CITY OF BELLINGHAM, WASHINGTON  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

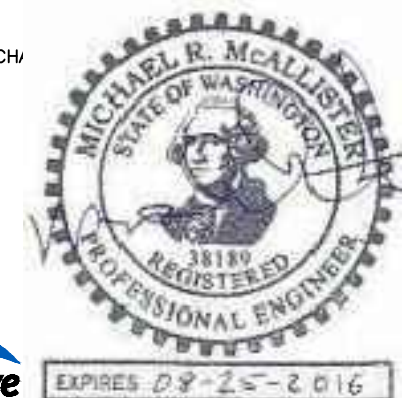
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NAD83/91  
NAVD88

Job. No. ---  
Date 04/30/15  
Field Bk. -

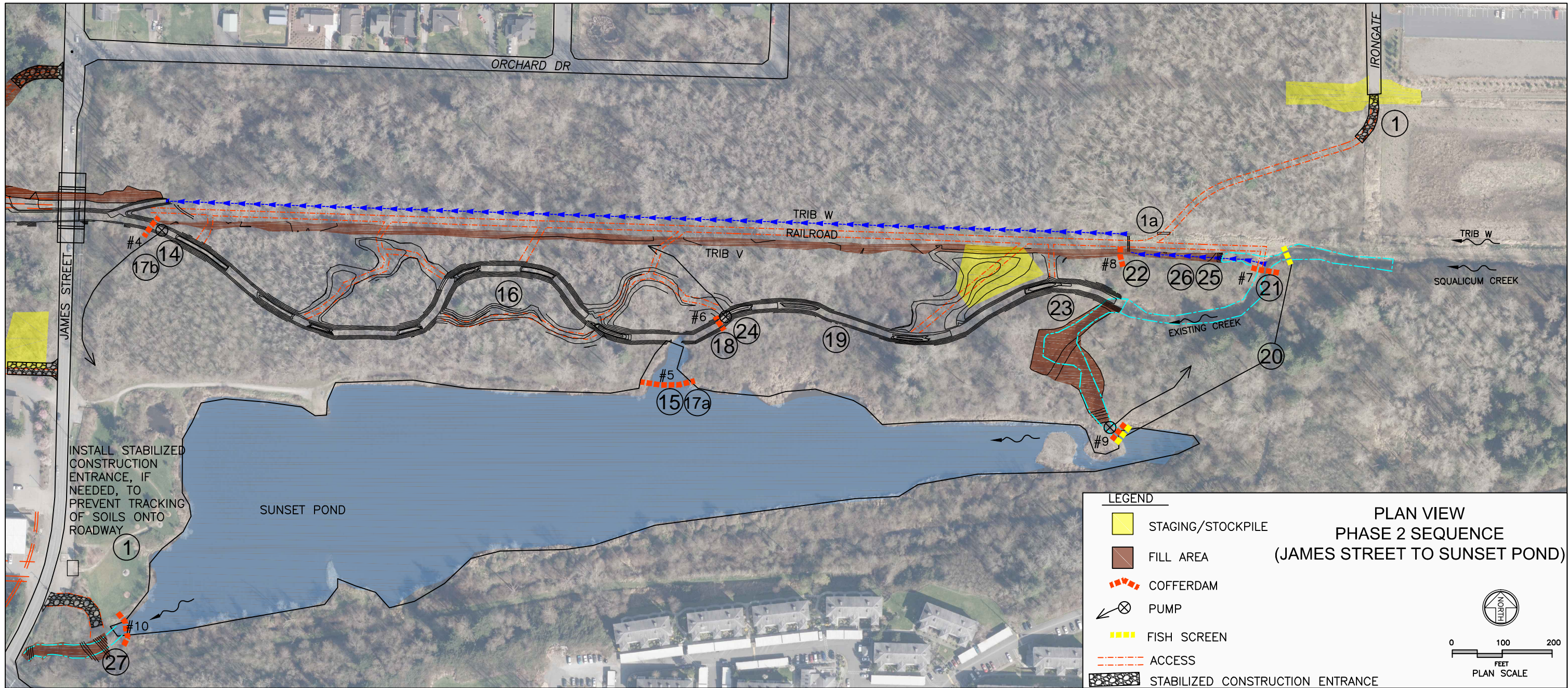
SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
CONSTRUCTION SEQUENCE I  
BUG LAKE TO JAMES STREET

SHEET  
7 OF  
44



CONTACT PERSON: ENGINEER . PROJECT ENGINEER AT 778-7900





- 14 FROM PHASE 1 SEQUENCE – INSTALL COFFERDAM #4. CONSTRUCT A SUMP AND INSTALL PUMP. PUMP CONSTRUCTION WATER TO INFILTRATION AREAS DURING CONTINUED UPSTREAM CHANNEL CONSTRUCTION.
- 15 INSTALL COFFERDAM #5 AT SUNSET POND CONNECTION.
- 16 CONSTRUCT CHANNEL UP TO POND CONNECTION.
- 17 REMOVE COFFERDAM #4 AND PUMP. REMOVE COFFERDAM #5.
- 18 INSTALL COFFERDAM #6 AND PUMP. PUMP CONSTRUCTION WATER TO INFILTRATION AREA.
- 19 CONTINUE UPSTREAM CHANNEL CONSTRUCTION WHILE SQUALICUM CREEK FLOWS TO SUNSET POND IN ITS EXISTING ALIGNMENT. LEAVE 20 FEET OF GROUND AS A TEMPORARY BERM BETWEEN UPSTREAM END NEW CHANNEL AND EXISTING CREEK. APPLY FILL TO DESIGNATED TRIB V AREA. EXCESS FILL TO BE HAULED OFF SITE.
- 20 INSTALL FISH SCREEN IN SQUALICUM CREEK AND SUNSET POND. RESCUE FISH FROM THE EXCLUSION AREA.
- 21 INSTALL COFFERDAM (#7) TO DIVERT SQUALICUM CREEK TO TRIB V (CONCURRENT WITH NEXT STEP).
- 22 INSTALL COFFERDAM (#8) TO DIVERT TRIB V THROUGH EXISTING CULVERT TO TRIB W.

- 23 CONNECT NEW CHANNEL TO SQUALICUM CREEK BY REMOVING TEMPORARY BERM (STEP 19) AND CONTINUING UPSTREAM CHANNEL CONSTRUCTION. INSTALL COFFERDAM #9 AND FILL EXISTING CREEK BETWEEN UPSTREAM END OF NEW CHANNEL AND SUNSET POND. PUMP RESIDUAL WATER TO INFILTRATION AREA.
- 24 REMOVE COFFERDAM #6 AND PUMP.
- 25 PERFORM FLOW RAMPING BY GRADUALLY REMOVING DIVERSION DAMS TO TRIB V AND TRIB W (#7 AND #8). REMOVE FISH SCREENS.
- 26 FILL REMAINDER OF TRIBUTARY V.
- 27 INSTALL COFFERDAM #10 AT SUNSET POND OUTLET CHANNEL. PUMP RESIDUAL WATER. RESCUE FISH IN EXISTING CHANNEL BETWEEN SUNSET POND AND BUG LAKE. FILL EXISTING CHANNEL BETWEEN SUNSET POND AND JAMES STREET. REMOVE COFFERDAM #10. REMOVE ALL FISH SCREENS.
- 28 INSTALL STREAMBED SEDIMENT IN TRIB W AT DESIGNATED AREAS WEST OF 1–5 (SEE PHASE 1 SEQUENCE SHEET).

NOTES:  
SQUALICUM CREEK WILL FLOW IN ITS EXISTING CHANNEL DURING PHASE II CONSTRUCTION UNTIL THE FINAL CONNECTION AND PERMANENT DIVERSION TO THE NEW CHANNEL.

Date 1 No Revision By		PROJECT ENGINEER MRM DESIGNED/DRAWN MRM INSPECTOR	DIR. PUBLIC WORKS TC CITY ENGINEER RAR OPER. ENGINEER	CITY OF BELLINGHAM, WASHINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION		SCALE Horiz. _____ Vert. _____	DATUM NAD83/91 NAVD88	Job. No. --- Date 04/30/15 Field Bk. -	SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT CONSTRUCTION SEQUENCE II JAMES STREET TO SUNSET POND	SHEET 8 OF 44
CONTACT PERSON: ENGINEER PROJECT ENGINEER AT 778-7900										

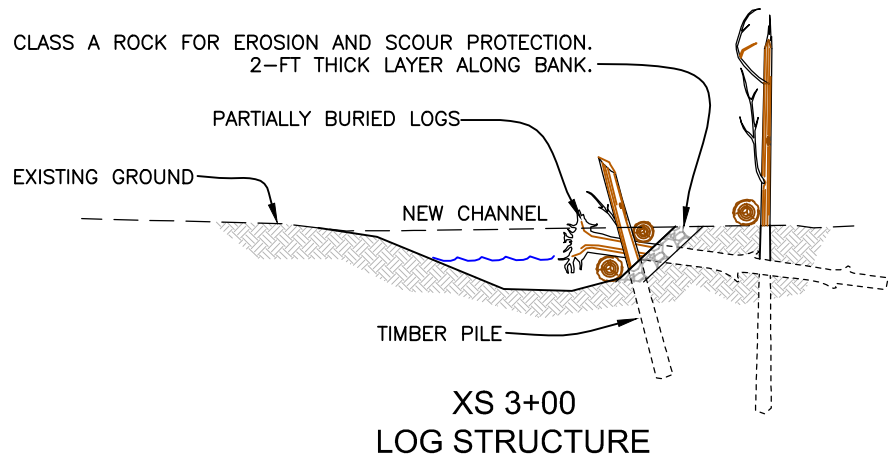
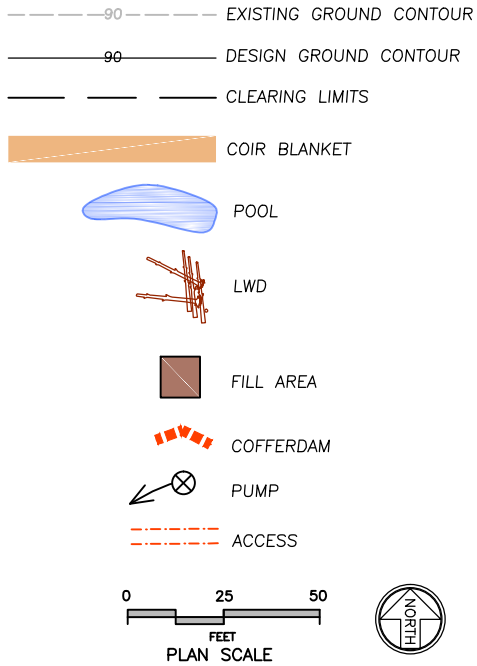




**CAUTION!!!**  
OVERHEAD AND UNDERGROUND UTILITIES ARE KNOWN TO EXIST IN AREA. NOT ALL ARE SHOWN IN PLANS.

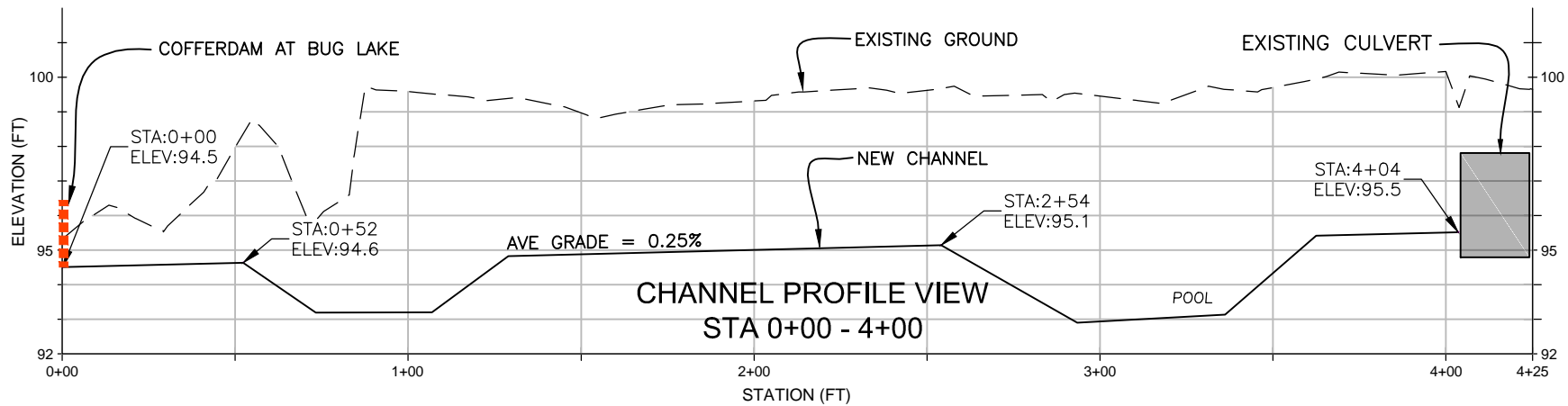
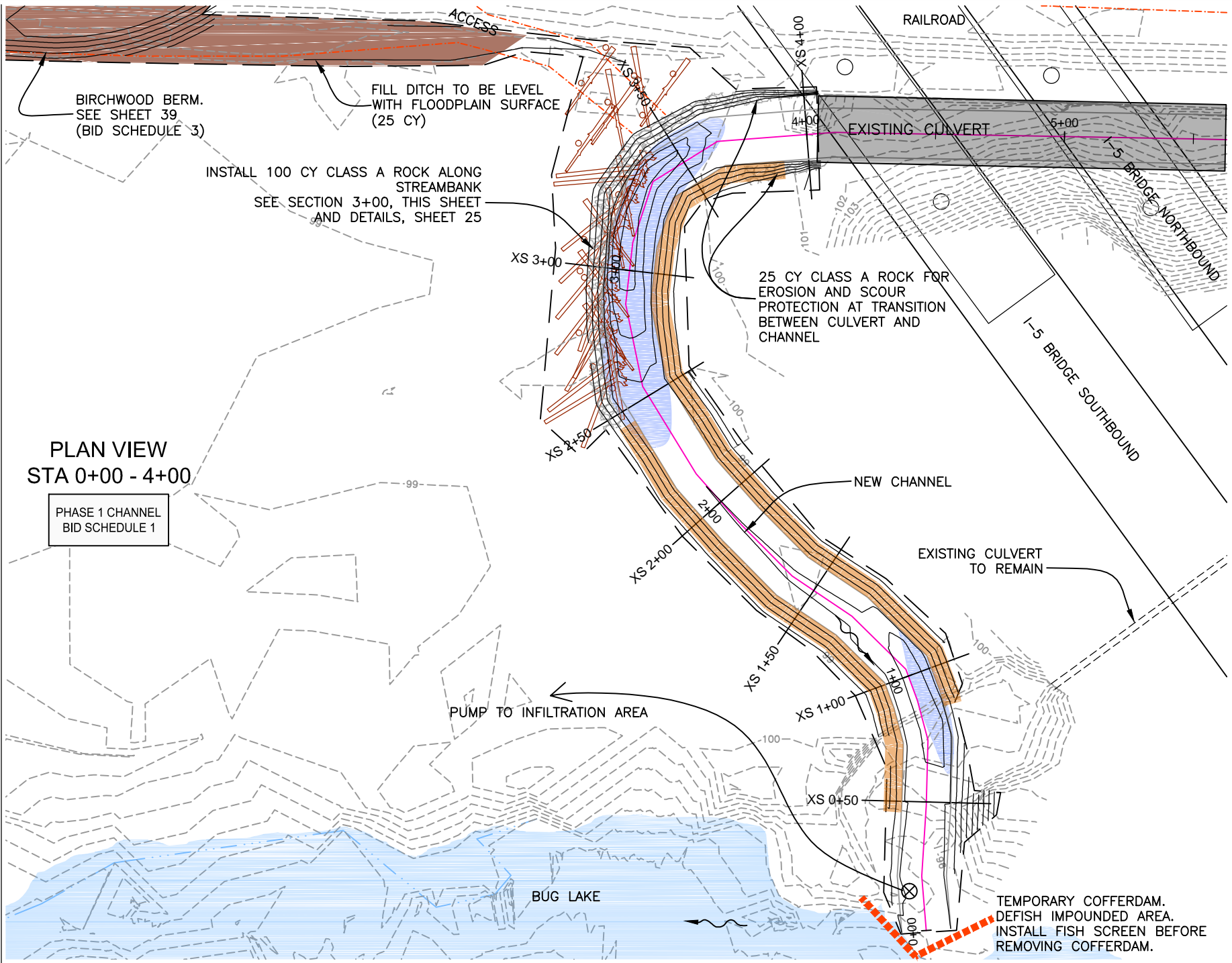
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2 BUSINESS DAYS ADVANCE NOTICE.  
(800) 424-5555

**PLAN LEGEND**



**NOTES:**

1. APPLY SEEDING TO STREAMBANKS BEFORE INSTALLING EROSION CONTROL BLANKET.
2. APPLY 8' WIDE EROSION CONTROL BLANKET TO CONSTRUCTED STREAM BANKS (NOT REQUIRED AT LOG STRUCTURE AREAS).
3. APPLY WOOD MULCH 4" DEEP TO CONSTRUCTED SURFACES THAT ARE OUTSIDE OF EROSION CONTROL BLANKET.



**CITY OF BELLINGHAM, WASHINGTON**  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

**SCALE**  
Horiz. \_\_\_\_\_  
Vert. \_\_\_\_\_

**DATUM**  
NAD83/91  
NAVD88

Job. No. \_\_\_\_\_  
Date 04/30/15  
Field Bk. \_\_\_\_\_

**SQUALIUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
PHASE I GRADING PLAN  
BUG LAKE TO I-5**

**SHEET  
9  
OF  
44**

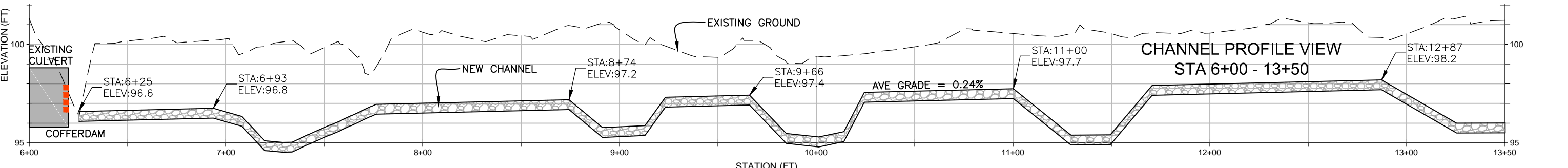
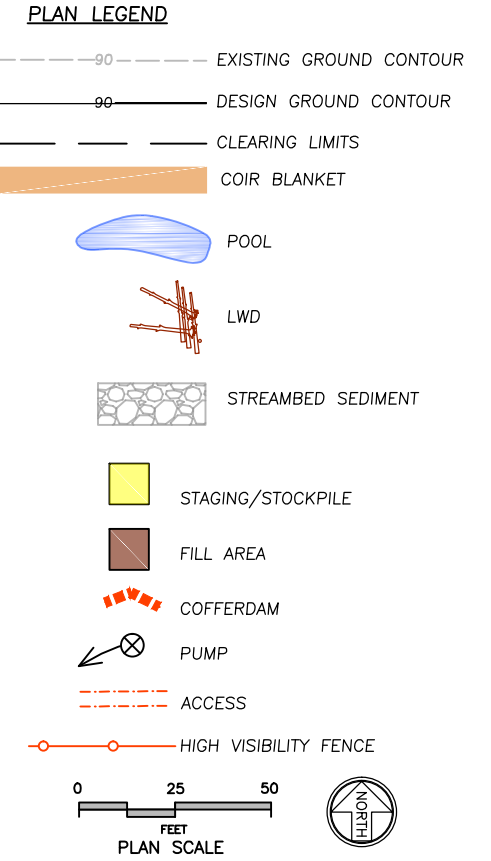
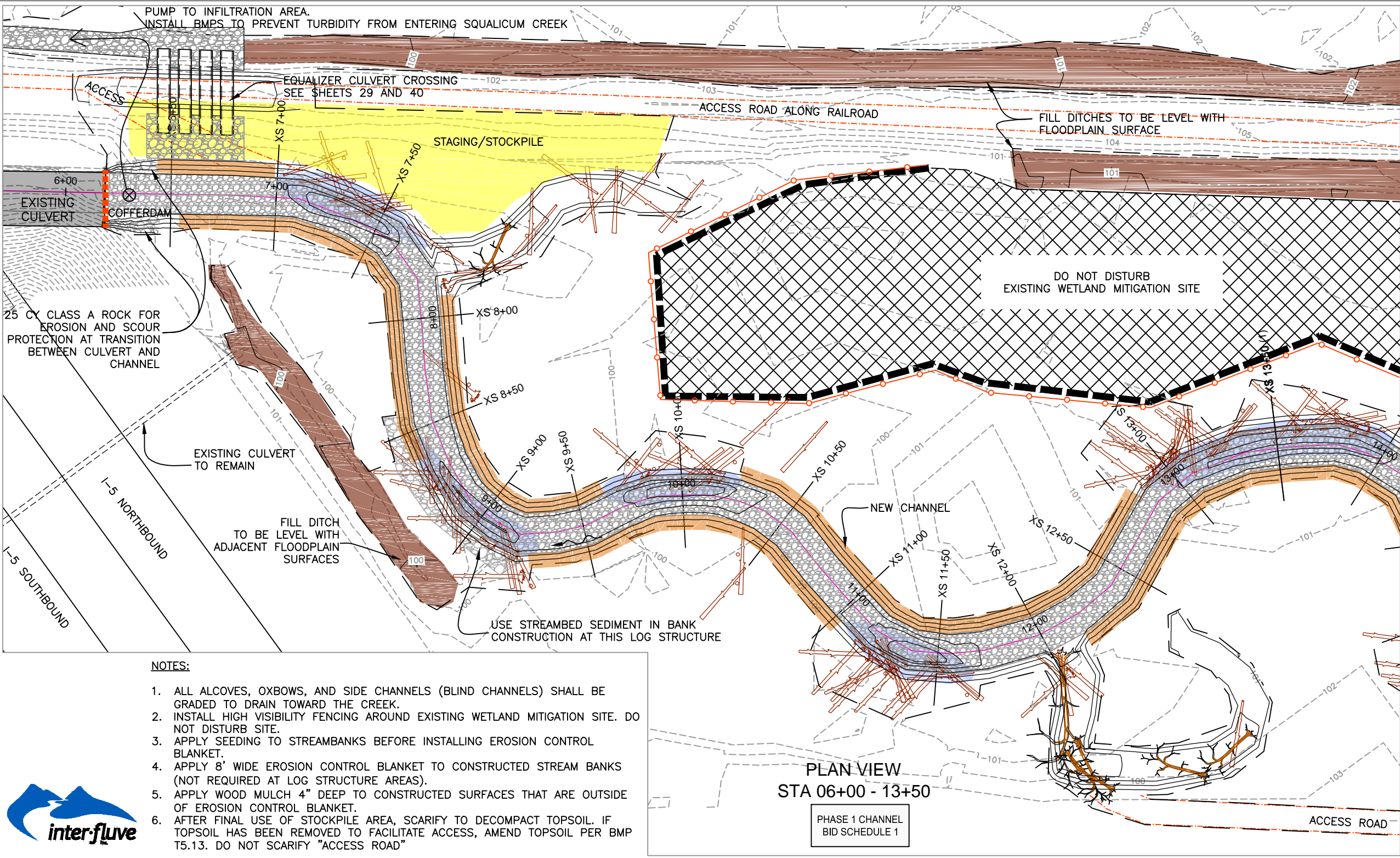
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Date	No	Revision	By

PROJECT ENGINEER MRM  
DESIGNED/DRAWN MRM  
INSPECTOR -

DIR. PUBLIC WORKS TC  
CITY ENGINEER RAR  
OPER. ENGINEER \_\_\_\_\_

CONTACT PERSON: \_\_\_\_\_ ENGINEER \_\_\_\_\_ PROJECT ENGINEER AT 778-7900

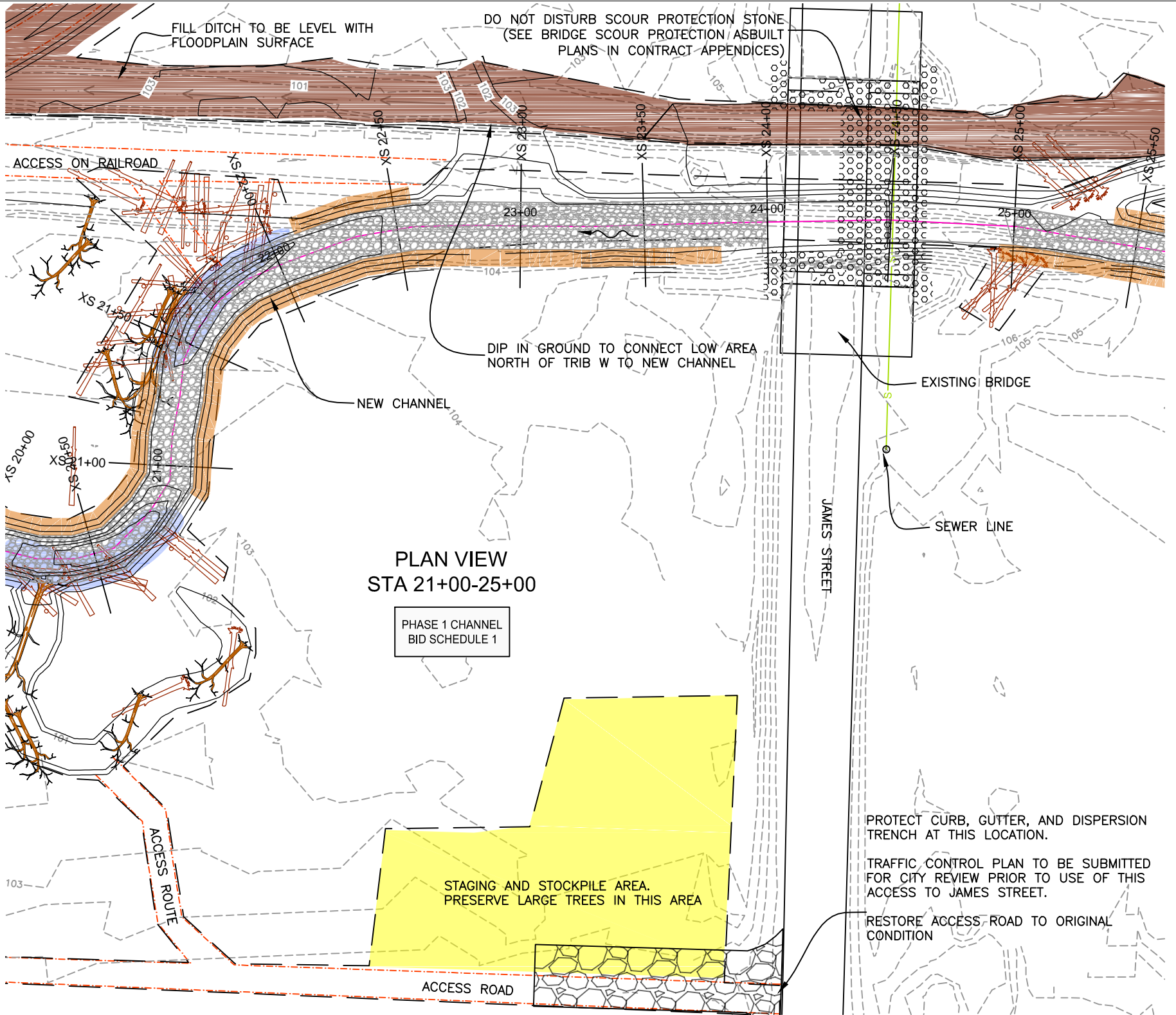








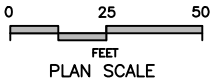




PLAN LEGEND

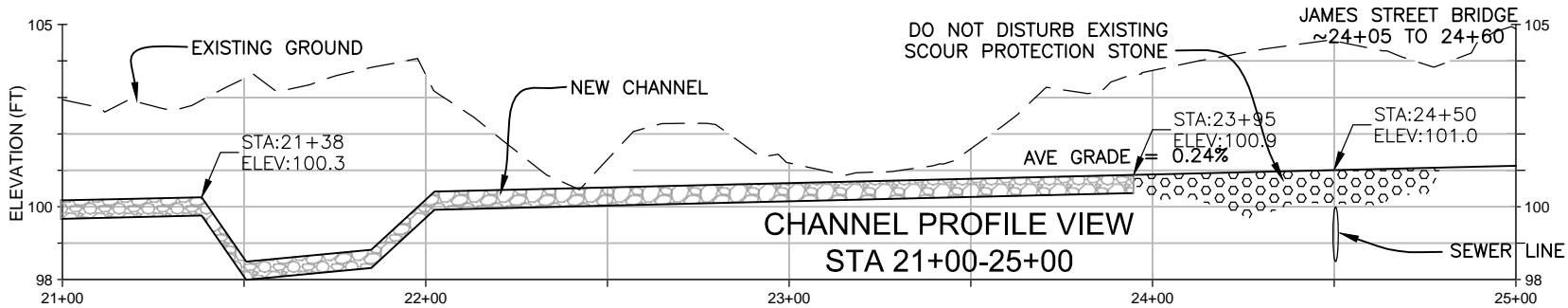
- EXISTING GROUND CONTOUR
- DESIGN GROUND CONTOUR
- CLEARING LIMITS
- COIR BLANKET
- POOL
- LWD
- STREAMBED SEDIMENT
- PROTECT EXISTING SCOUR PROTECTION STONE
- STAGING/STOCKPILE
- FILL AREA
- ACCESS

CAUTION!!!  
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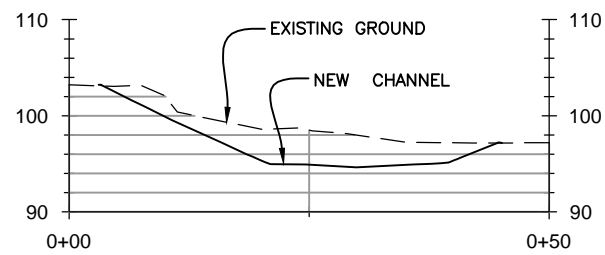
NOTES:

1. PROTECT SCOUR PROTECTION STONE THAT HAS BEEN INSTALLED UNDER/NEAR JAMES STREET BRIDGE. SEE SCOUR PROTECTION PLANS IN THE "RELATED INFORMATION" APPENDIX FOR DETAILS AND ADDITIONAL INFORMATION.
2. ALL ALCOVES, OXBOWS, AND SIDE CHANNELS (BLIND CHANNELS) SHALL BE GRADED TO DRAIN TOWARD THE CREEK.
3. APPLY TRANSITION ZONE SEEDING TO STREAMBANKS BEFORE INSTALLING EROSION CONTROL BLANKET.
4. APPLY 8' WIDE EROSION CONTROL BLANKET TO CONSTRUCTED STREAM BANKS (NOT REQUIRED AT LOG STRUCTURE AREAS).
5. APPLY WOOD MULCH 4" DEEP TO CONSTRUCTED SURFACES THAT ARE LANDWARD OF EROSION CONTROL BLANKET.
6. AFTER FINAL USE OF ACCESS ROUTES AND STOCKPILE AREAS, SCARIFY TO DECOMPACT TOPSOIL. IF TOPSOIL HAS BEEN REMOVED TO FACILITATE ACCESS, AMEND TOPSOIL PER BMP T5.13. DO NOT SCARIFY "ACCESS ROAD".

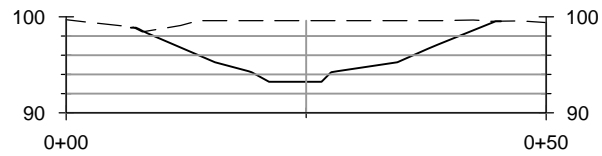




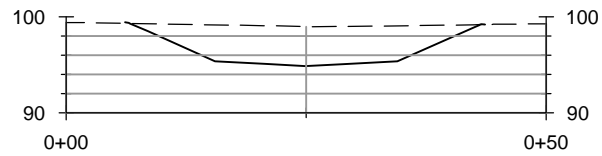
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LOOKING DOWNSTREAM



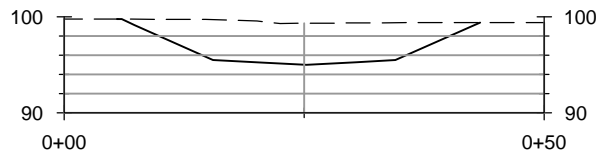
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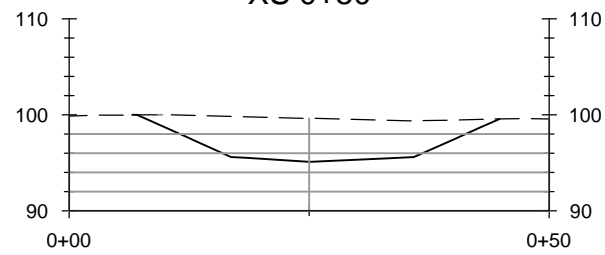
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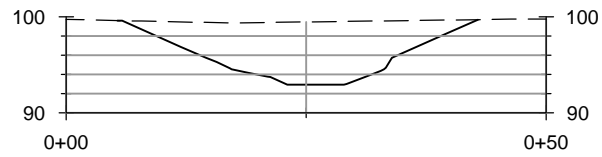
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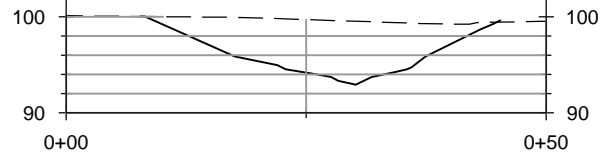
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XS 2+50



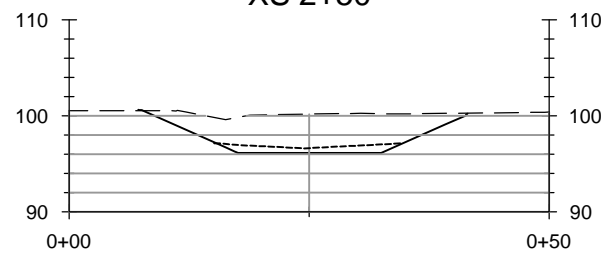
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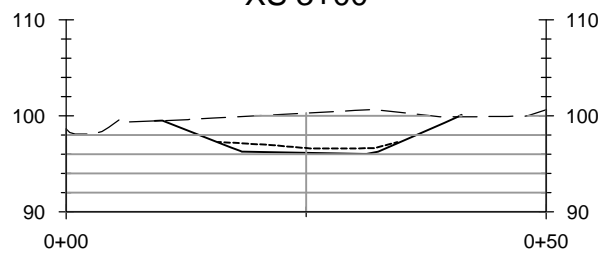
XS 3+50



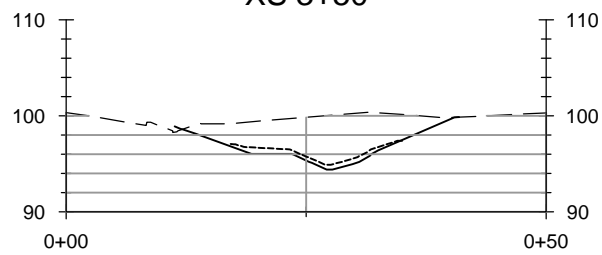
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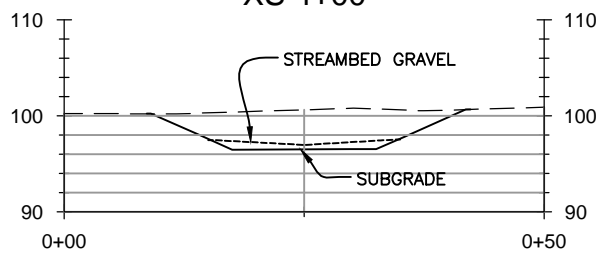
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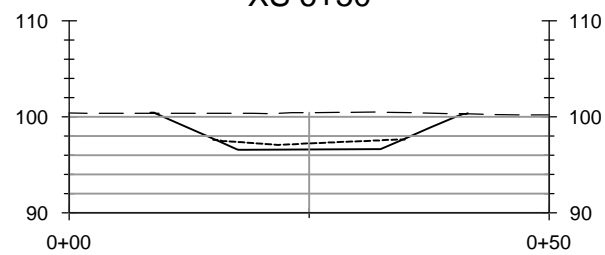
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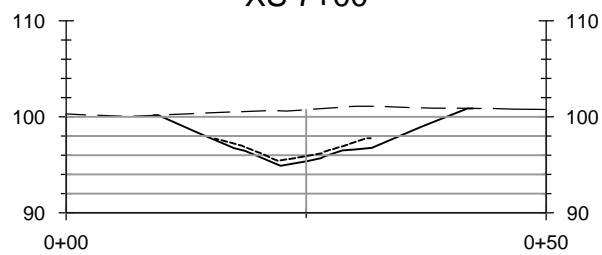
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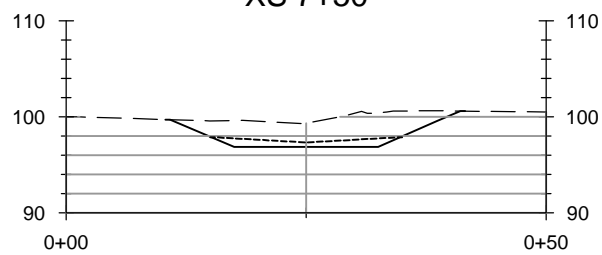
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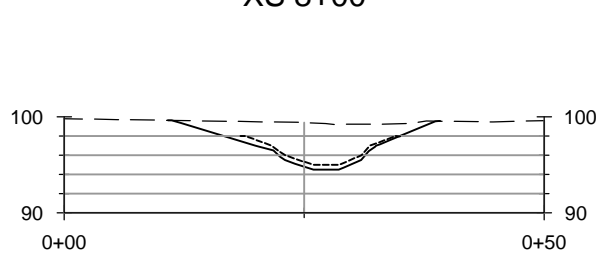
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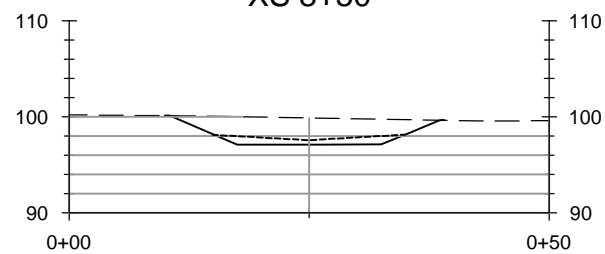
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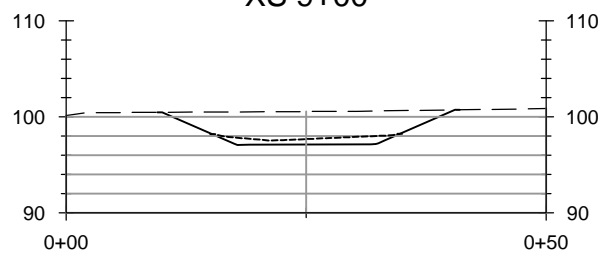
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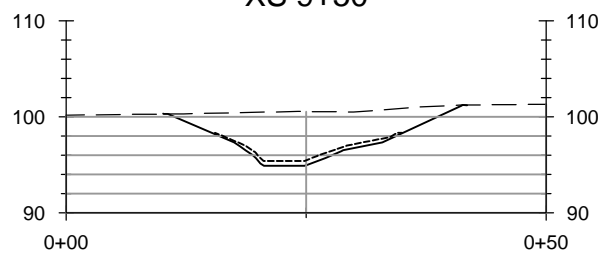
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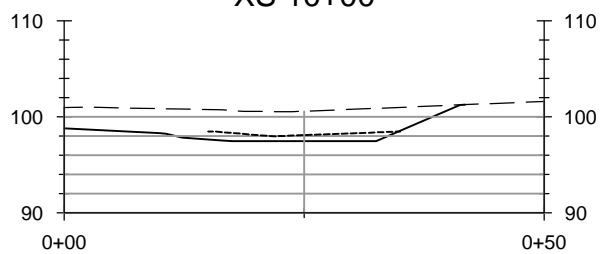
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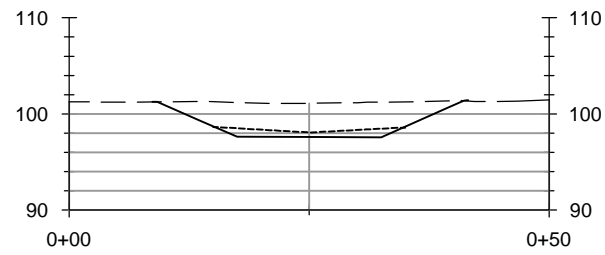
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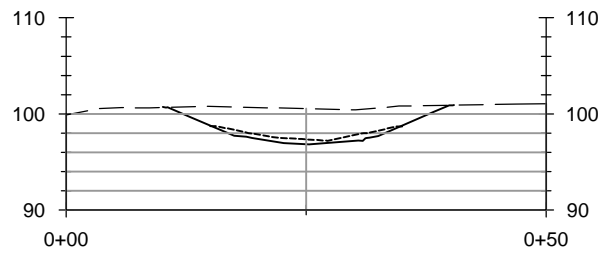
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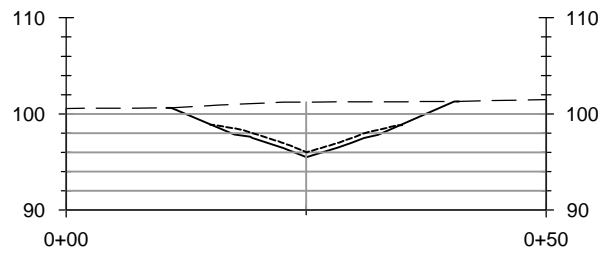
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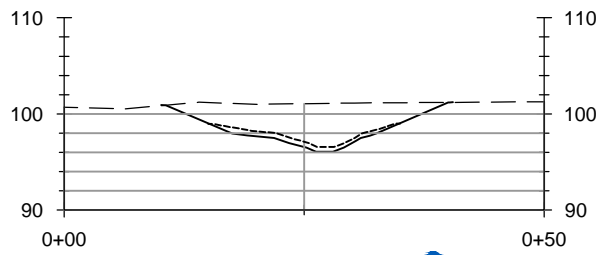
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XS 13+00



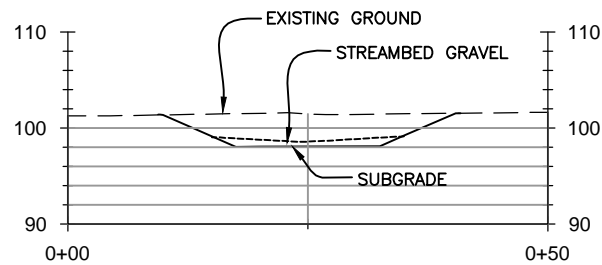
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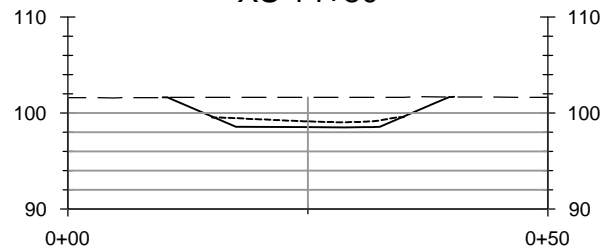
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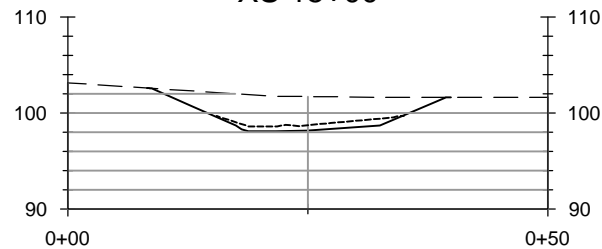




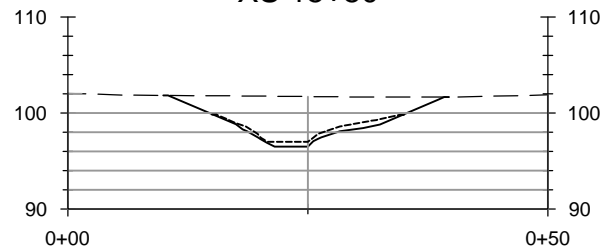
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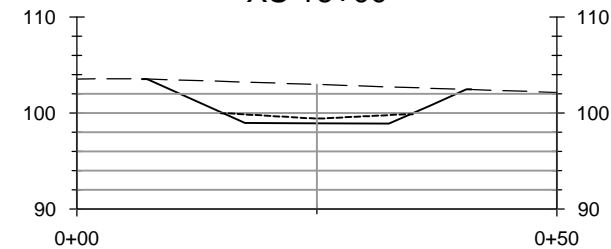
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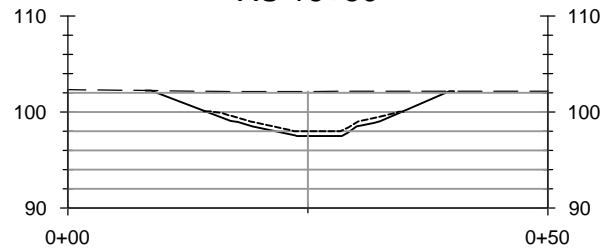
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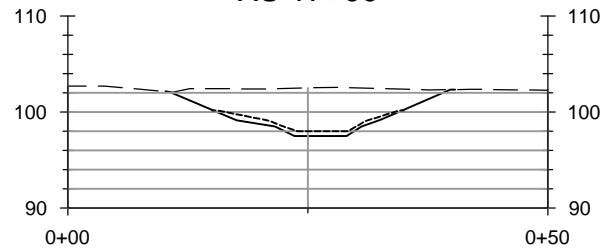
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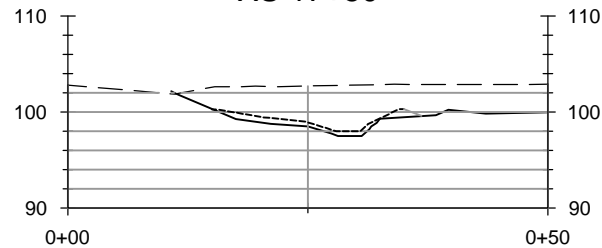
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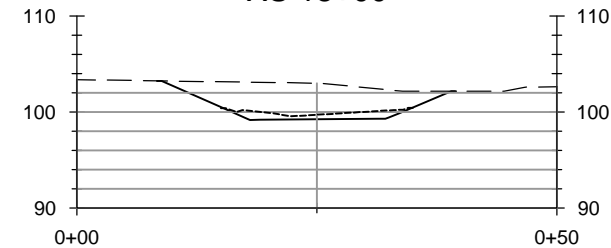
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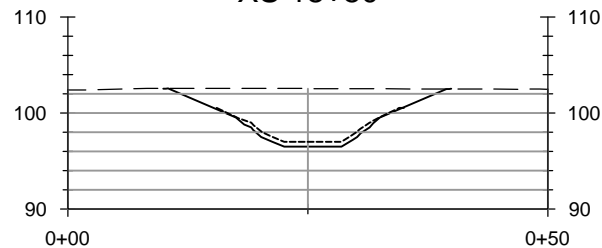
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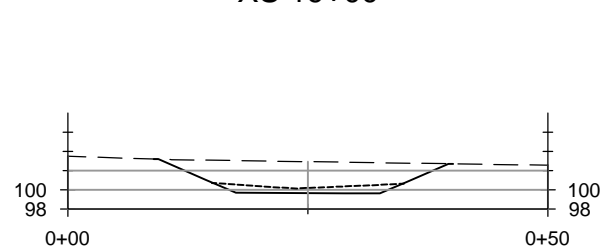
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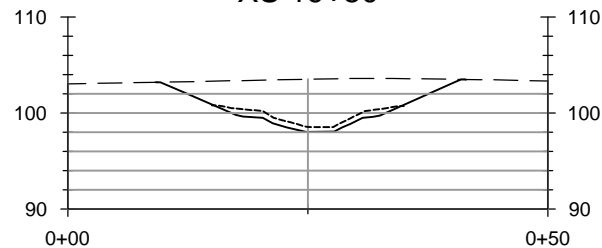
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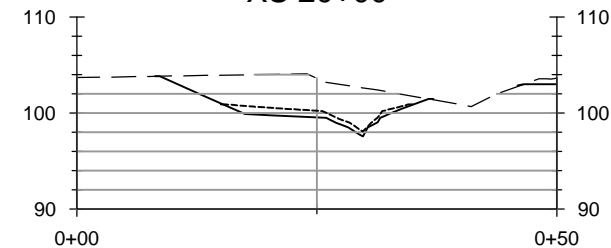
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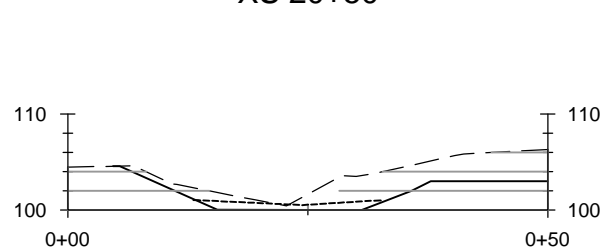
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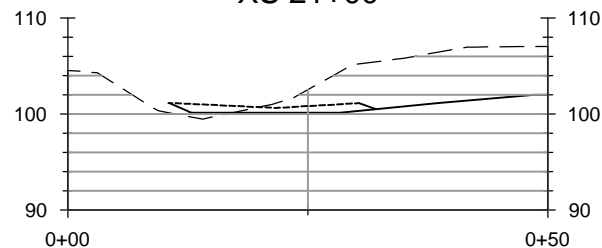
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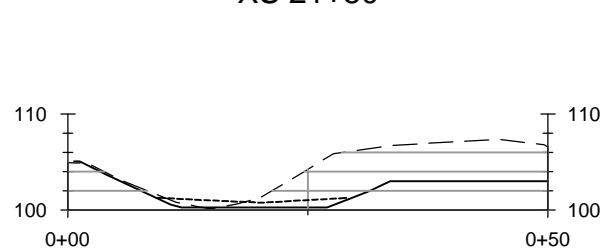
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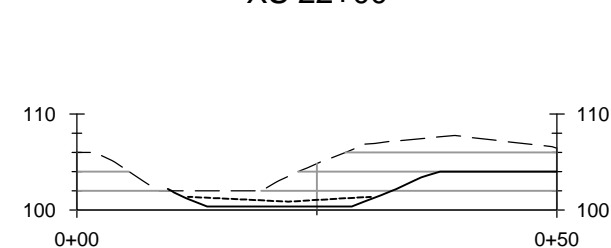
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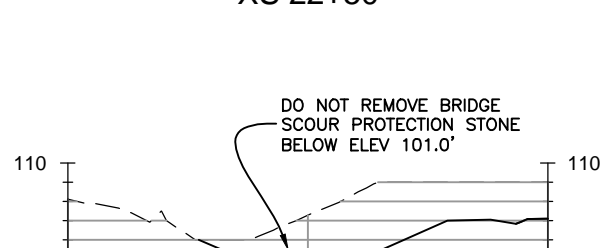
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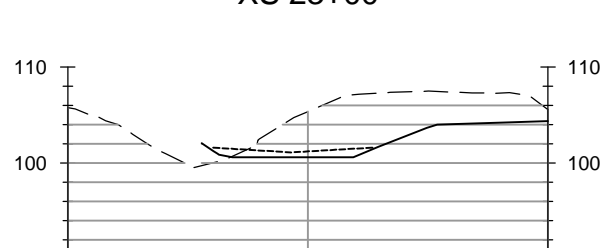
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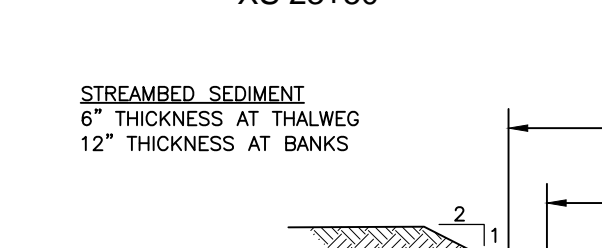
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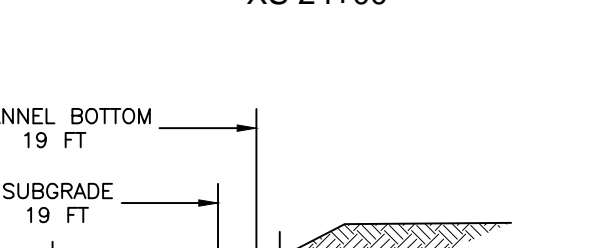
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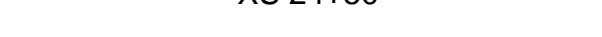
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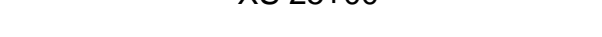
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XS 25+00

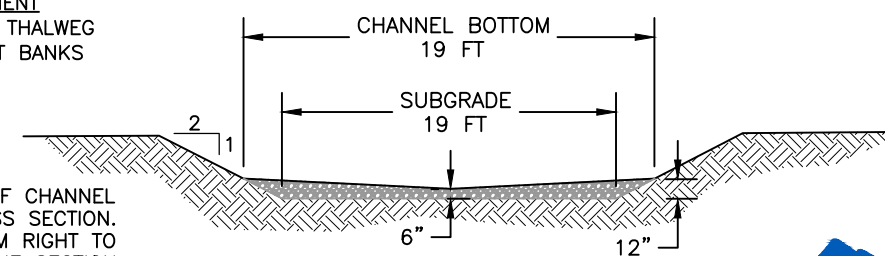


SECTION VIEWS ARE  
LOOKING DOWNSTREAM

DO NOT REMOVE BRIDGE  
SCOUR PROTECTION STONE  
BELOW ELEV 101.0'

STREAMBED SEDIMENT  
6" THICKNESS AT THALWEG  
12" THICKNESS AT BANKS

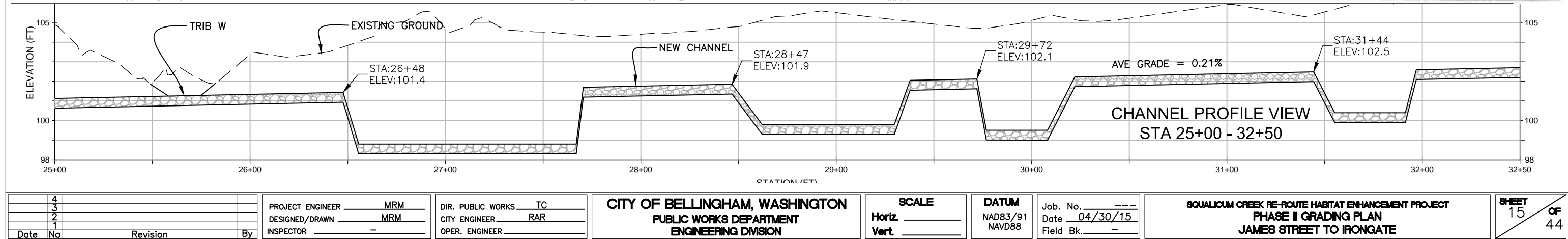
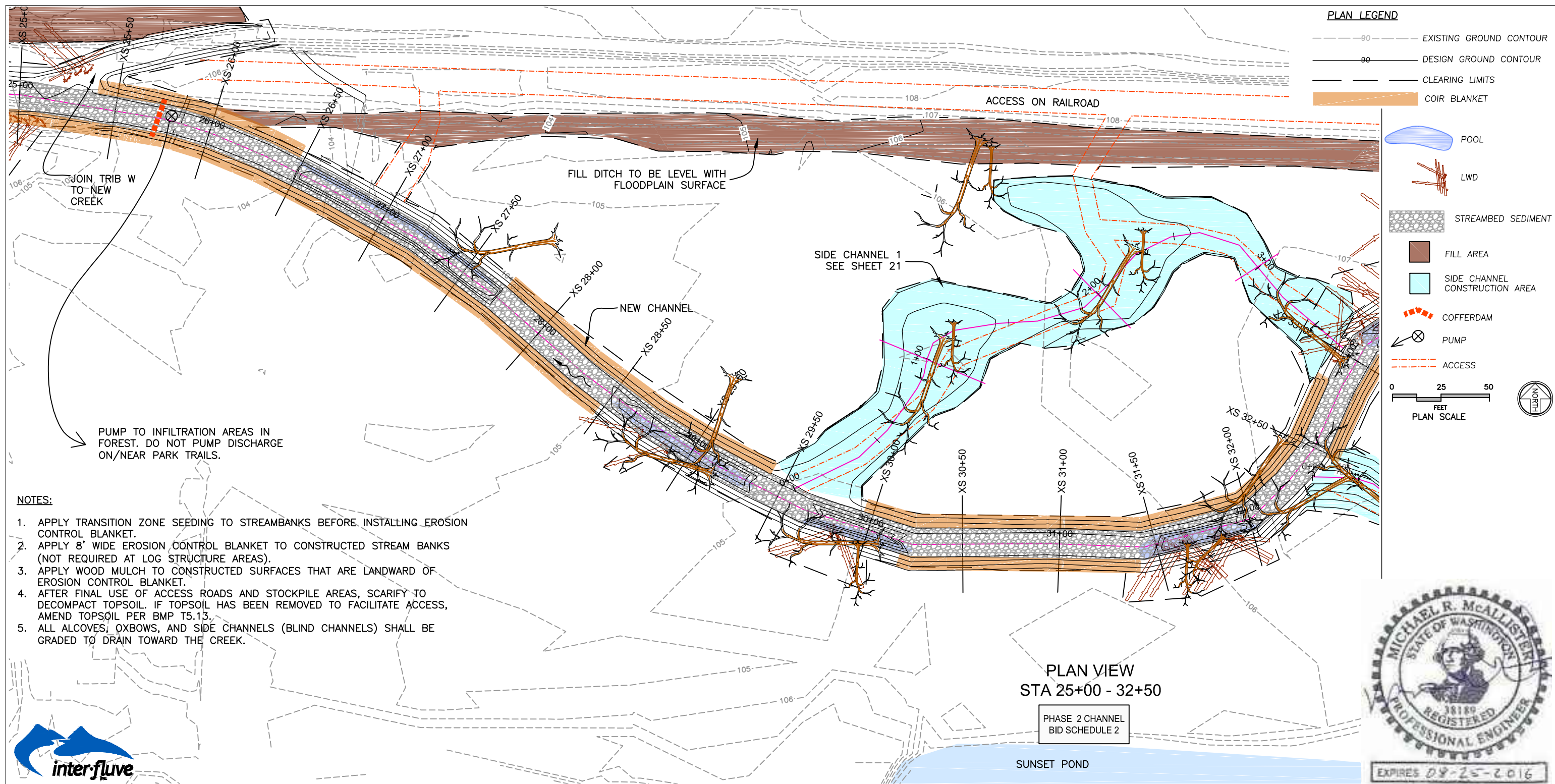
THALWEG OF CHANNEL  
IS LOWEST PORTION OF CROSS SECTION.  
ITS POSITION VARIES FROM RIGHT TO  
LEFT DEPENDING ON WHERE THE SECTION  
OCCURS ALONG THE CHANNEL ALIGNMENT.



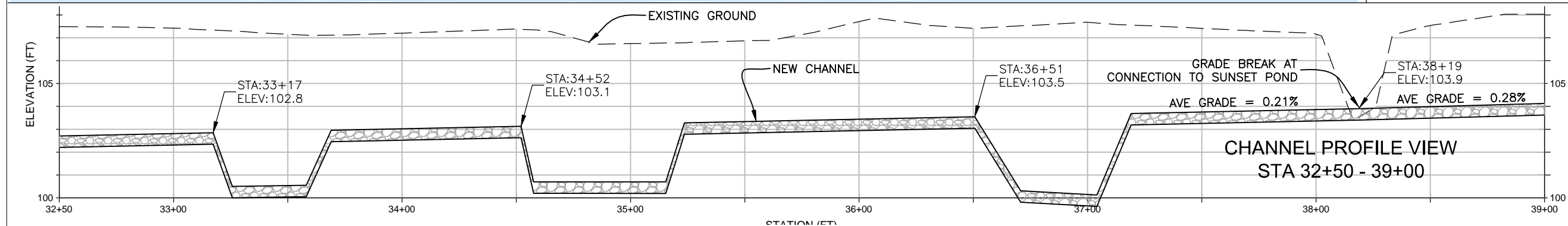
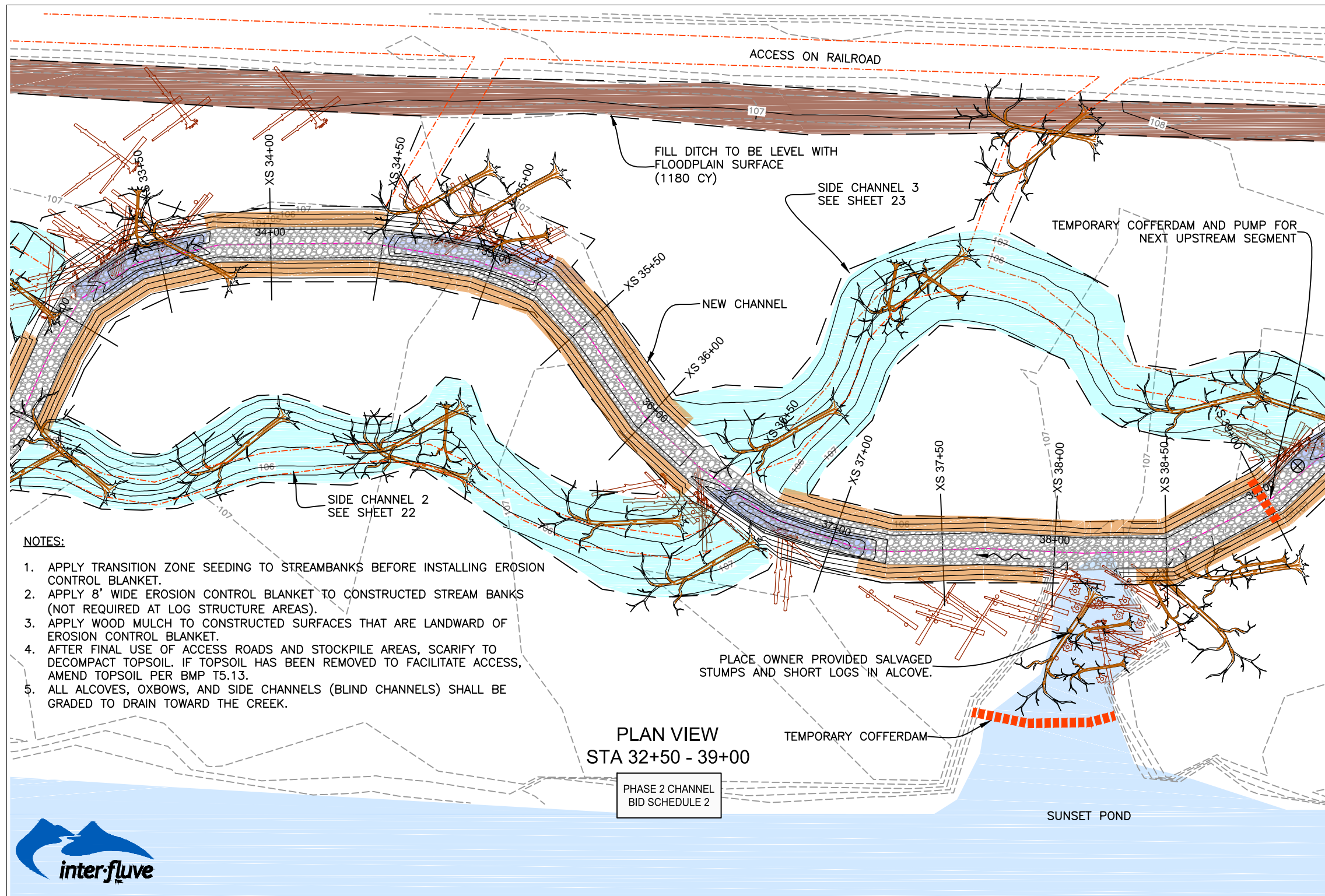
SECTION VIEW  
TYPICAL PHASE I CHANNEL DIMENSIONS



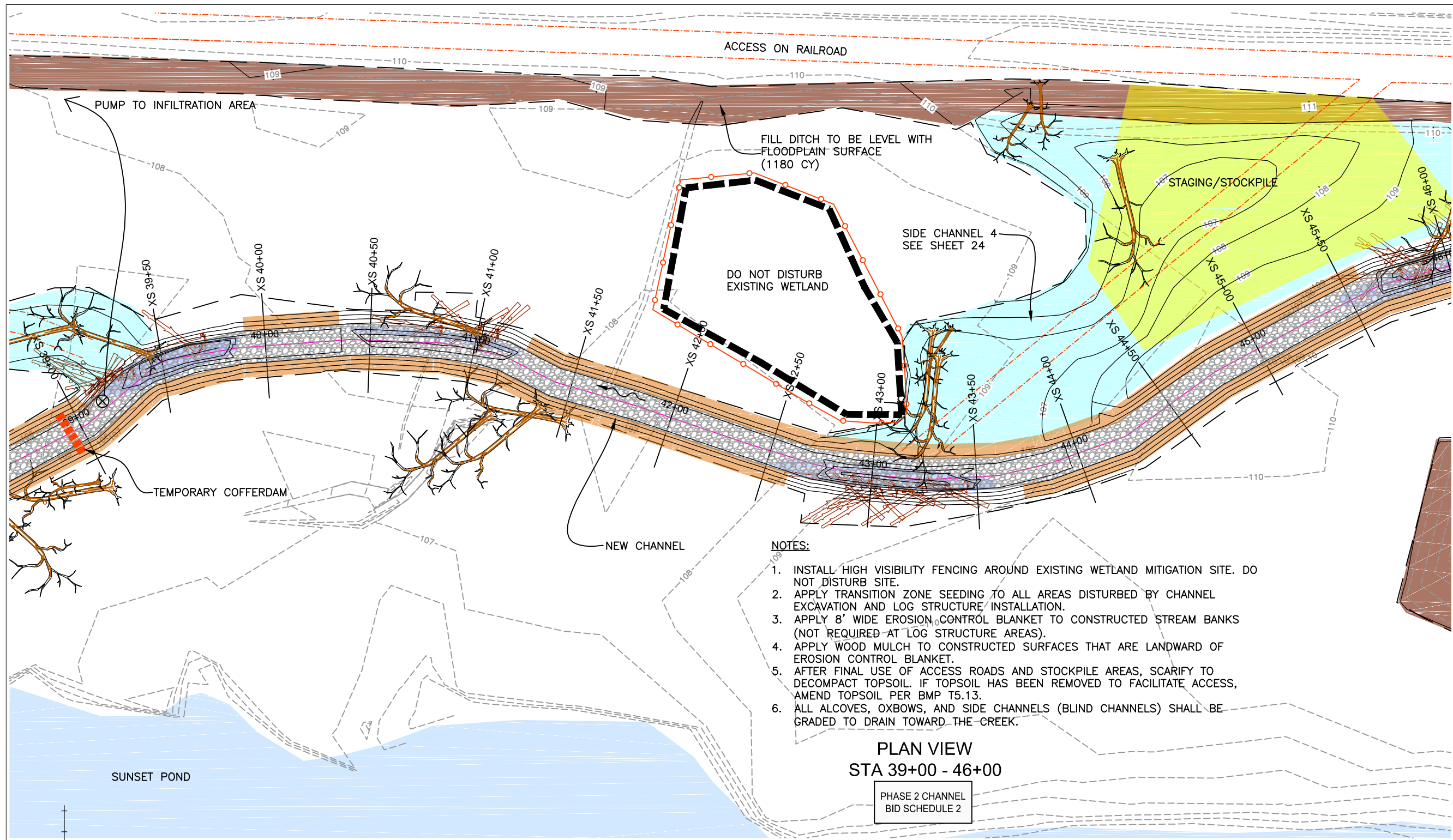












**PLAN LEGEND**

- EXISTING GROUND CONTOUR
- DESIGN GROUND CONTOUR
- CLEARING LIMITS
- COIR BLANKET
- POOL
- LWD
- STREAMBED SEDIMENT
- STAGING/STOCKPILE
- FILL AREA
- SIDE CHANNEL CONSTRUCTION AREA
- COFFERDAM
- PUMP
- ACCESS
- HIGH VISIBILITY FENCE

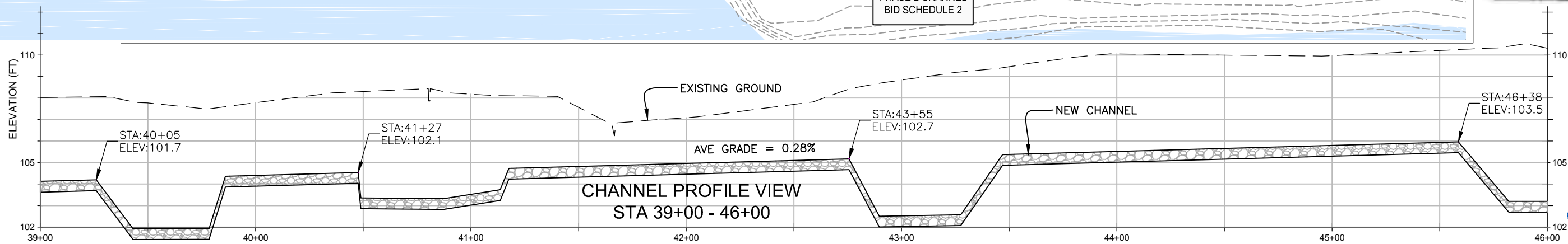
0 25 50  
FEET  
PLAN SCALE

NORTH

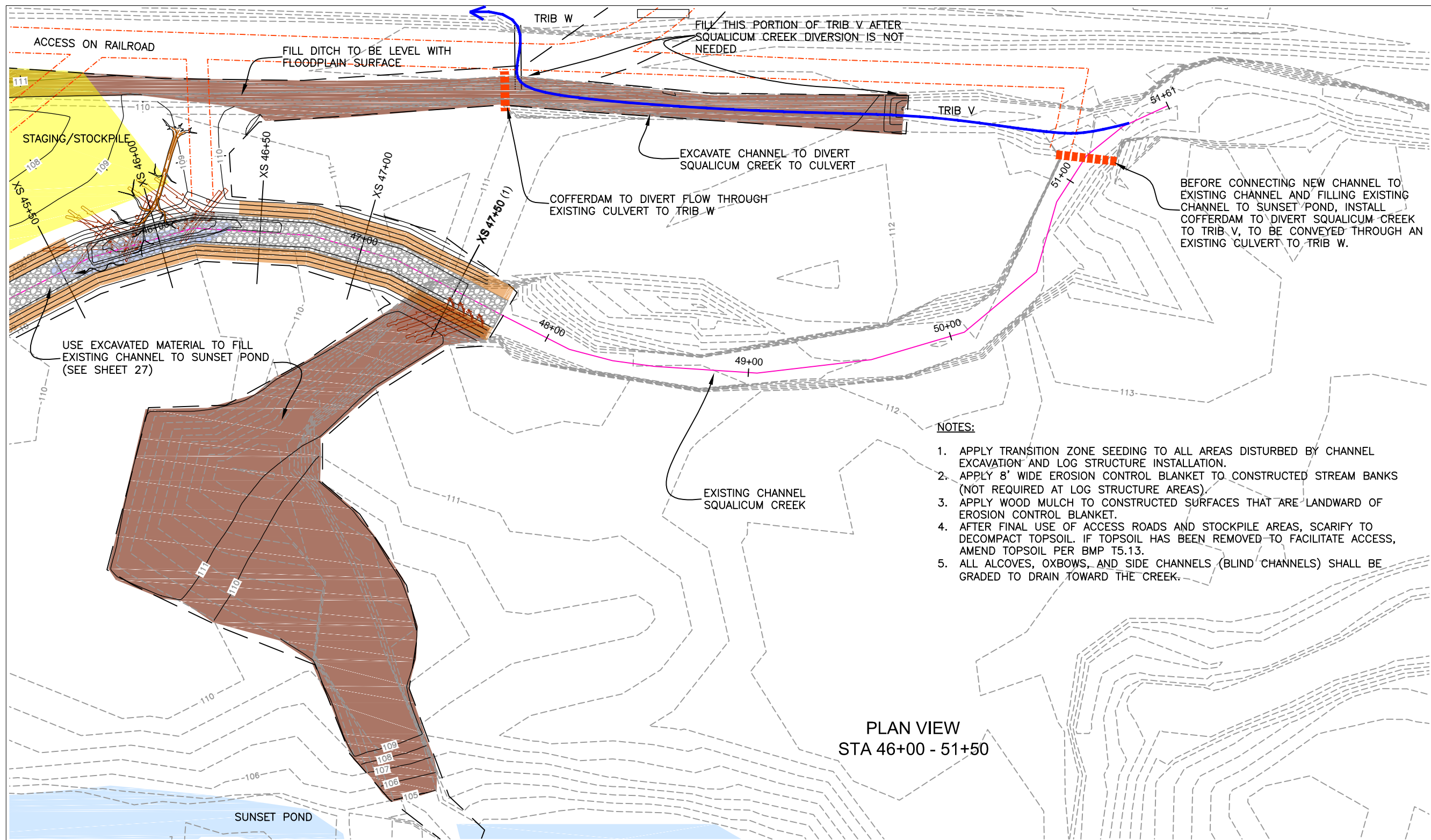
- NOTES:**
1. INSTALL HIGH VISIBILITY FENCING AROUND EXISTING WETLAND MITIGATION SITE. DO NOT DISTURB SITE.
  2. APPLY TRANSITION ZONE SEEDING TO ALL AREAS DISTURBED BY CHANNEL EXCAVATION AND LOG STRUCTURE INSTALLATION.
  3. APPLY 8' WIDE EROSION CONTROL BLANKET TO CONSTRUCTED STREAM BANKS (NOT REQUIRED AT LOG STRUCTURE AREAS).
  4. APPLY WOOD MULCH TO CONSTRUCTED SURFACES THAT ARE LANDWARD OF EROSION CONTROL BLANKET.
  5. AFTER FINAL USE OF ACCESS ROADS AND STOCKPILE AREAS, SCARIFY TO DECOMPACT TOPSOIL. IF TOPSOIL HAS BEEN REMOVED TO FACILITATE ACCESS, AMEND TOPSOIL PER BMP T5.13.
  6. ALL ALCOVES, OXBOWS, AND SIDE CHANNELS (BLIND CHANNELS) SHALL BE GRADED TO DRAIN TOWARD THE CREEK.

**PLAN VIEW**  
STA 39+00 - 46+00

PHASE 2 CHANNEL  
BID SCHEDULE 2







**PLAN LEGEND**

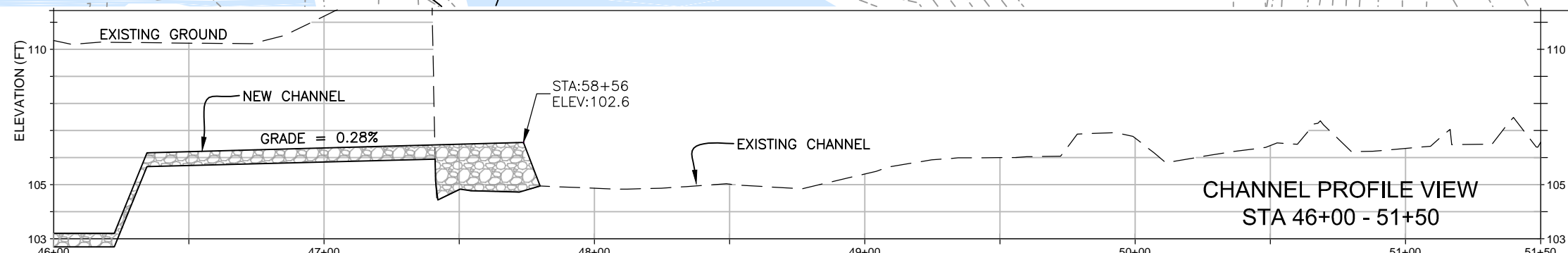
- EXISTING GROUND CONTOUR (dashed line)
- DESIGN GROUND CONTOUR (solid line)
- CLEARING LIMITS (dashed line)
- COIR BLANKET (orange hatched area)
- POOL (blue area)
- LWD (red hatched area)
- STREAMBED SEDIMENT (grey stippled area)
- STAGING/STOCKPILE (yellow area)
- FILL AREA (brown area)
- COFFERDAM (red dashed line)
- ACCESS (dashed line)

0 25 50  
FEET  
PLAN SCALE

NORTH

- NOTES:**
1. APPLY TRANSITION ZONE SEEDING TO ALL AREAS DISTURBED BY CHANNEL EXCAVATION AND LOG STRUCTURE INSTALLATION.
  2. APPLY 8' WIDE EROSION CONTROL BLANKET TO CONSTRUCTED STREAM BANKS (NOT REQUIRED AT LOG STRUCTURE AREAS).
  3. APPLY WOOD MULCH TO CONSTRUCTED SURFACES THAT ARE LANDWARD OF EROSION CONTROL BLANKET.
  4. AFTER FINAL USE OF ACCESS ROADS AND STOCKPILE AREAS, SCARIFY TO DECOMPACT TOPSOIL. IF TOPSOIL HAS BEEN REMOVED TO FACILITATE ACCESS, AMEND TOPSOIL PER BMP T5.13.
  5. ALL ALCOVES, OXBOWS, AND SIDE CHANNELS (BLIND CHANNELS) SHALL BE GRADED TO DRAIN TOWARD THE CREEK.

PLAN VIEW  
STA 46+00 - 51+50



CHANNEL PROFILE VIEW  
STA 46+00 - 51+50

4 3 2 1 Date No	Revision	By	PROJECT ENGINEER MRM DESIGNED/DRAWN MRM INSPECTOR	DIR. PUBLIC WORKS TC CITY ENGINEER RAR OPER. ENGINEER	CITY OF BELLINGHAM, WASHINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	SCALE Horiz. _____ Vert. _____	DATUM NAD83/91 NAVD88	Job. No. --- Date 04/30/15 Field Bk. -	SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT PHASE II GRADING PLAN JAMES STREET TO IRONGATE	SHEET 18 OF 44
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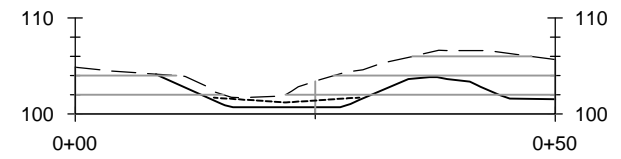
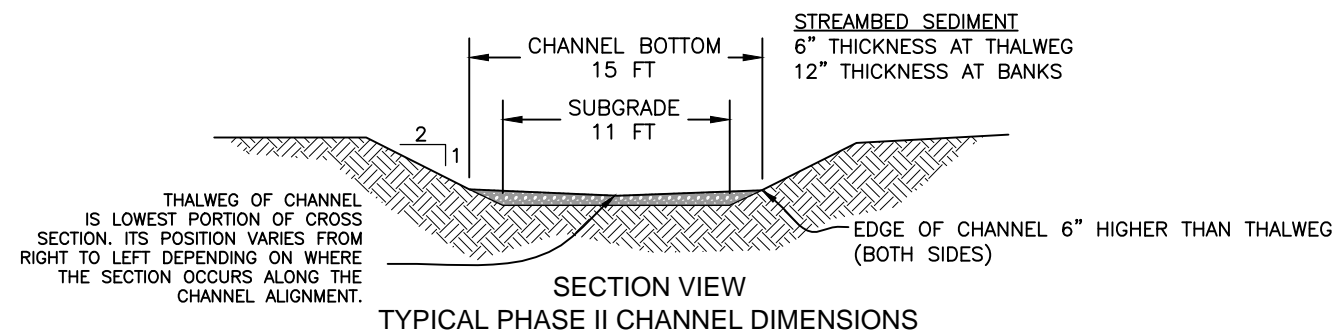
CONTACT PERSON: ENGINEER PROJECT ENGINEER AT 778-7900

inter-fluve

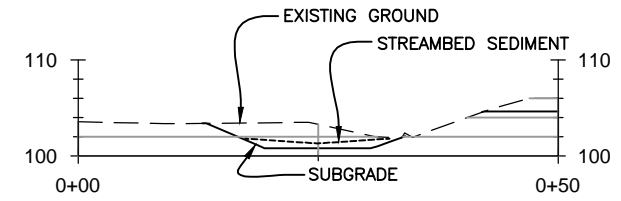
MICHAEL R. McALLISTER  
STATE OF WASHINGTON  
REGISTERED PROFESSIONAL ENGINEER  
38180  
EXPIRES 08-25-2016



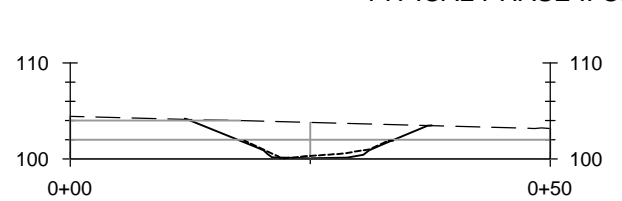
SECTION VIEWS ARE  
LOOKING DOWNSTREAM



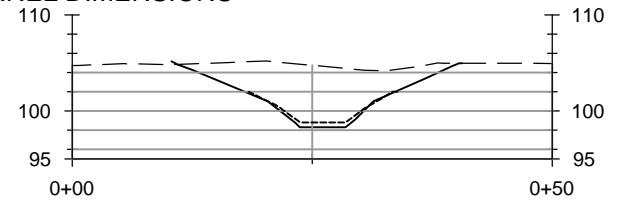
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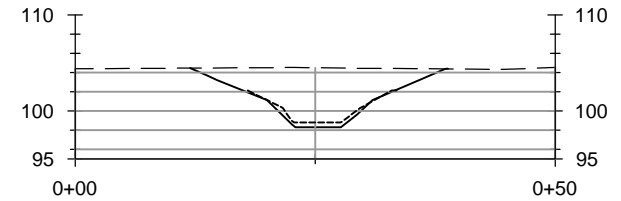
XS 26+00



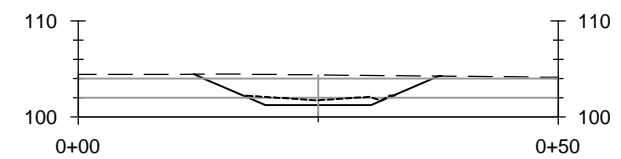
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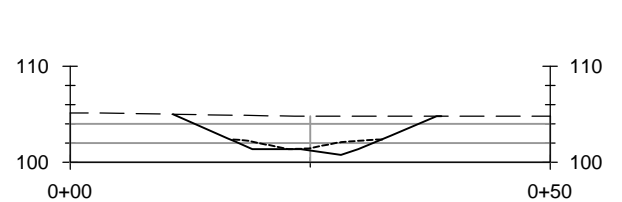
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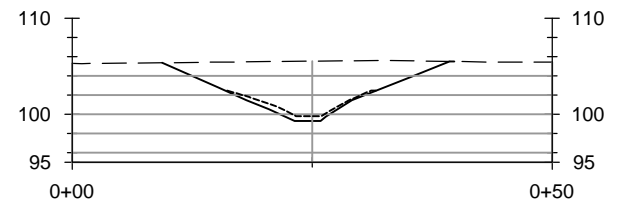
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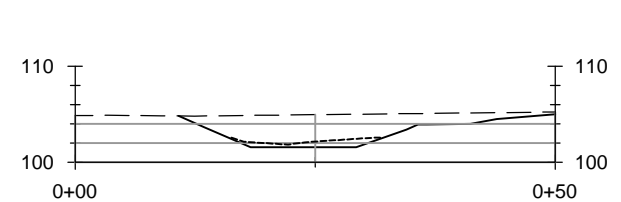
XS 28+00



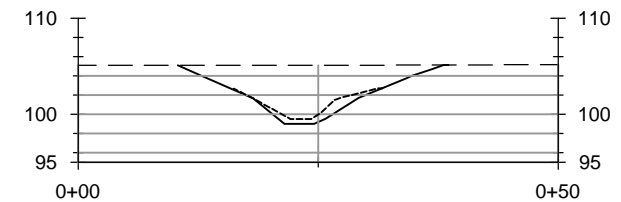
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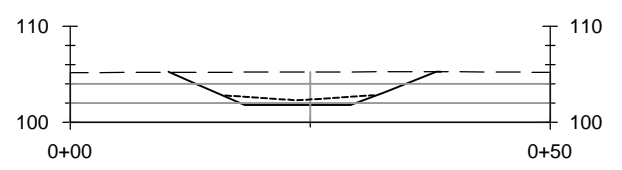
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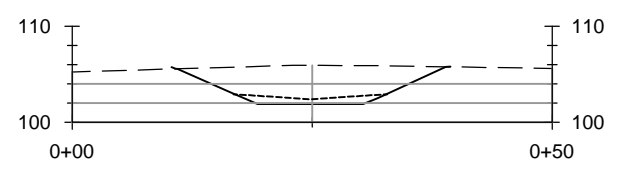
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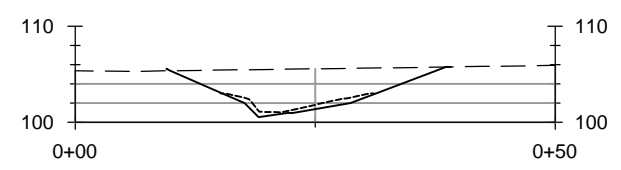
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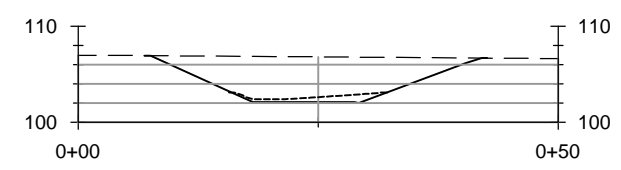
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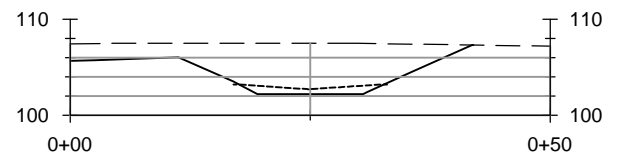
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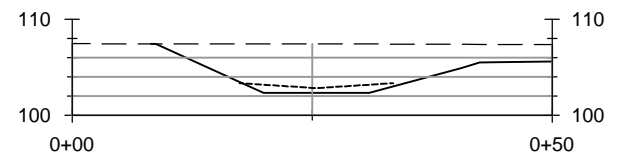
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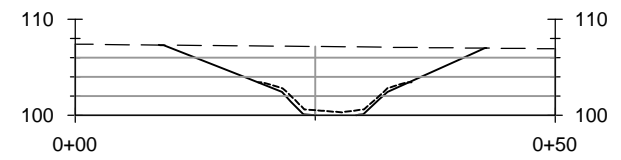
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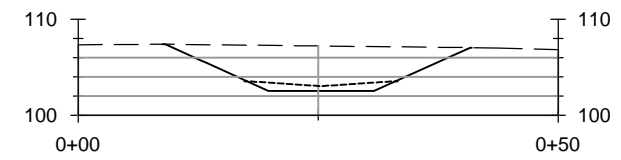
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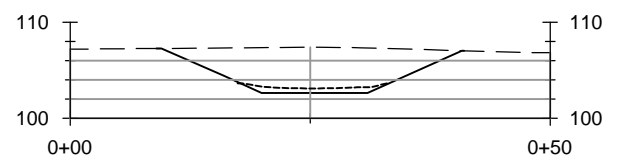
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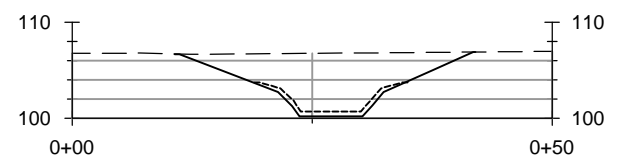
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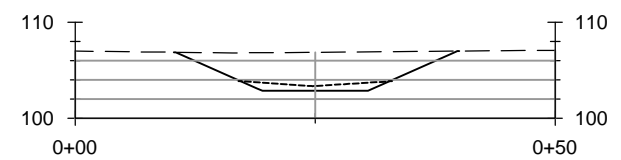
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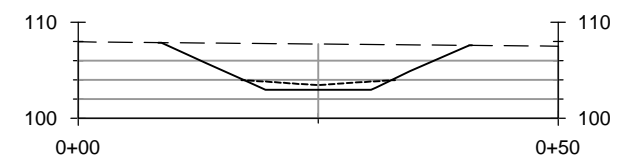
XS 34+50



XS 35+00



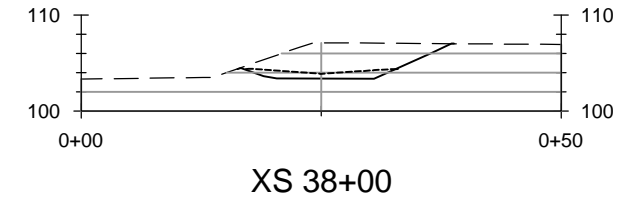
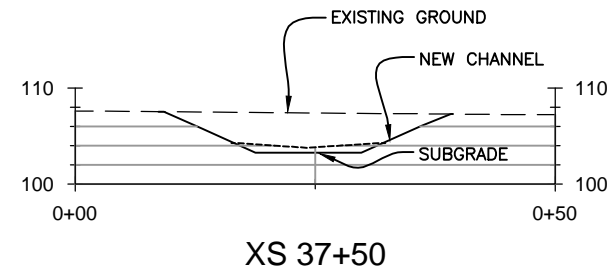
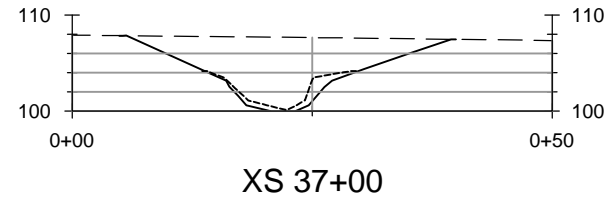
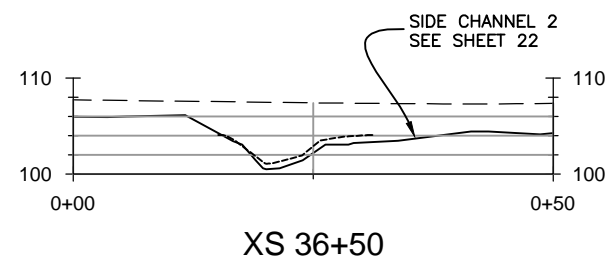
XS 35+50



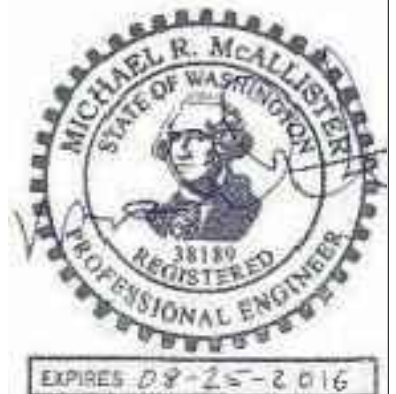
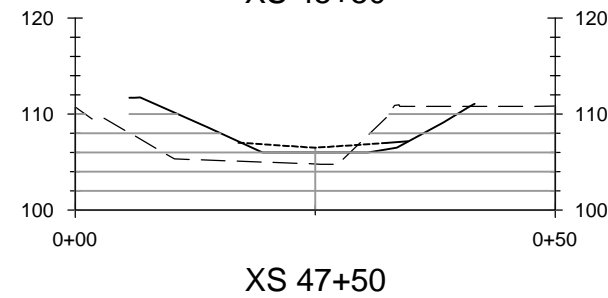
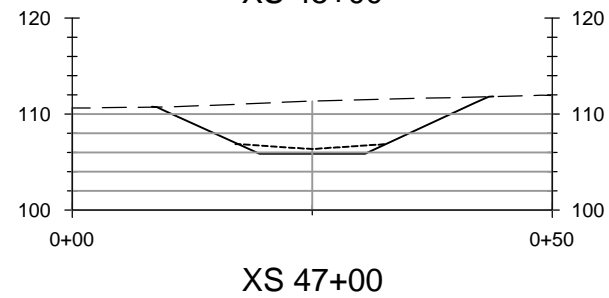
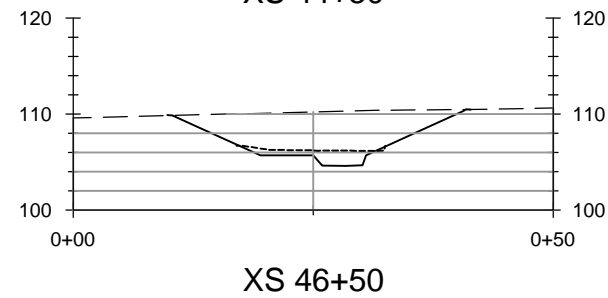
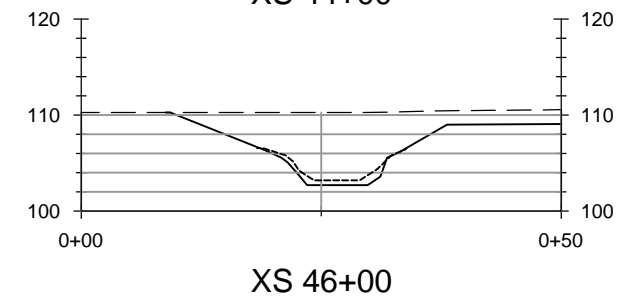
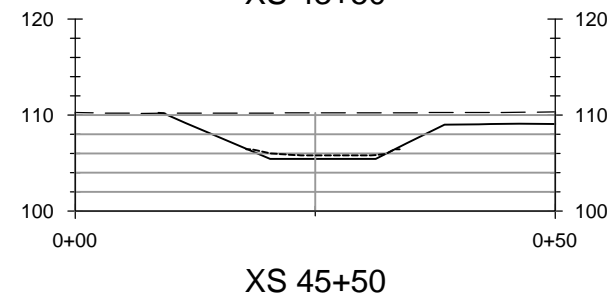
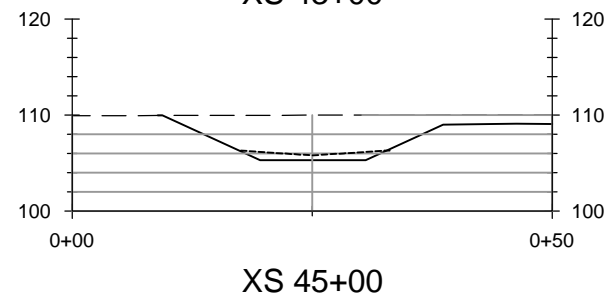
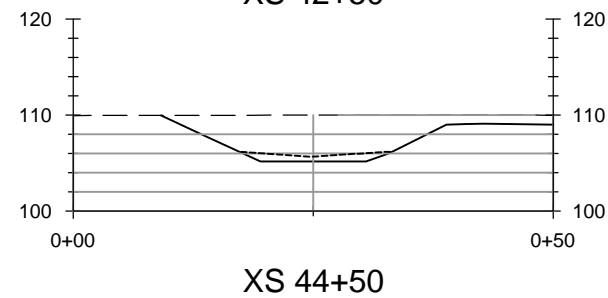
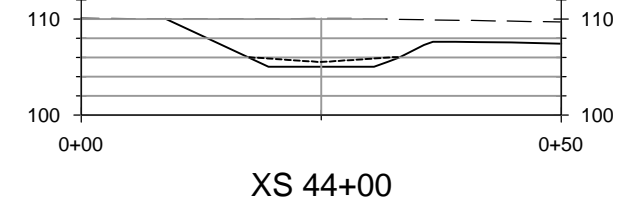
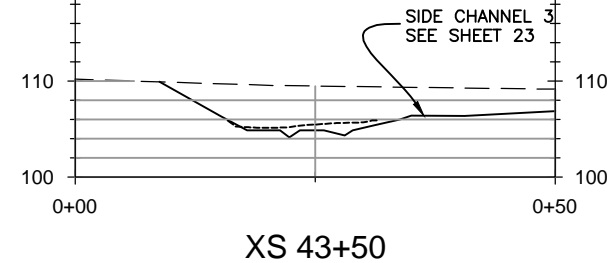
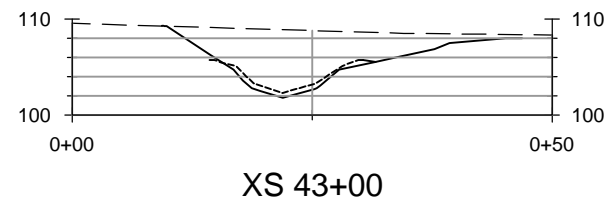
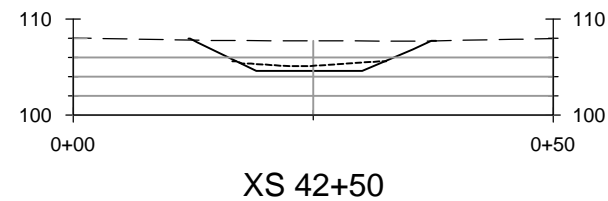
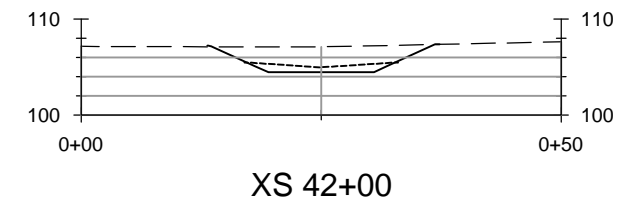
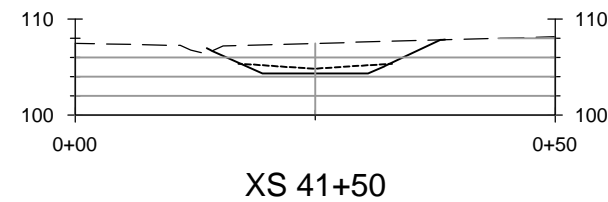
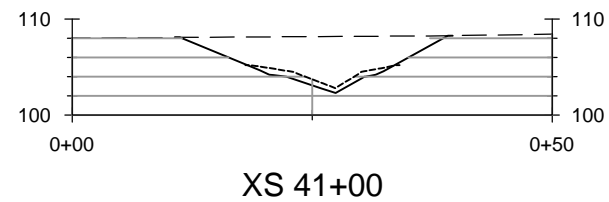
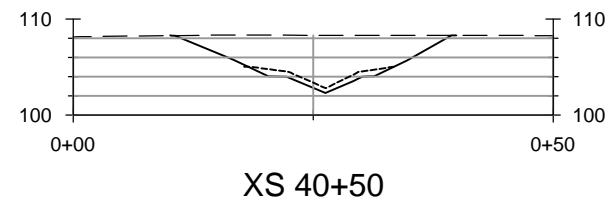
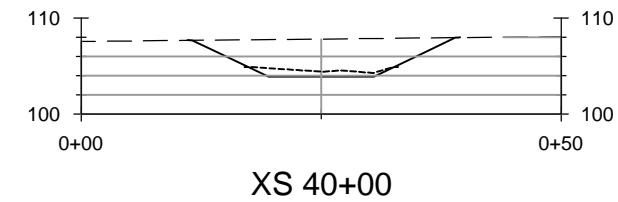
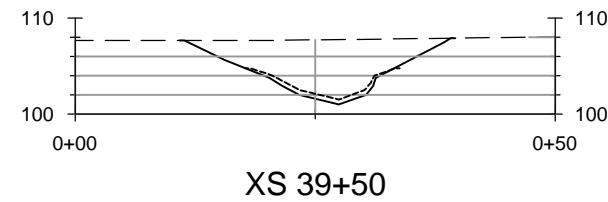
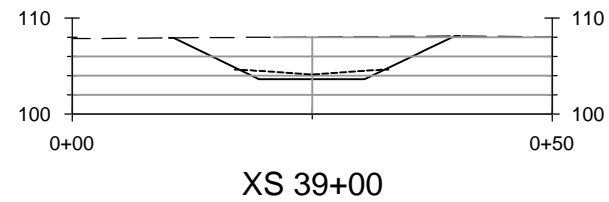
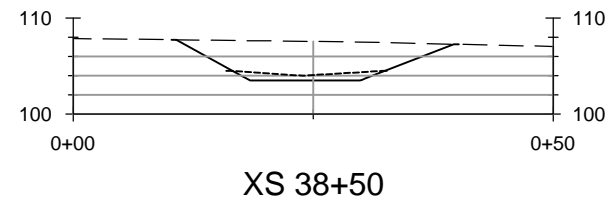
XS 36+00



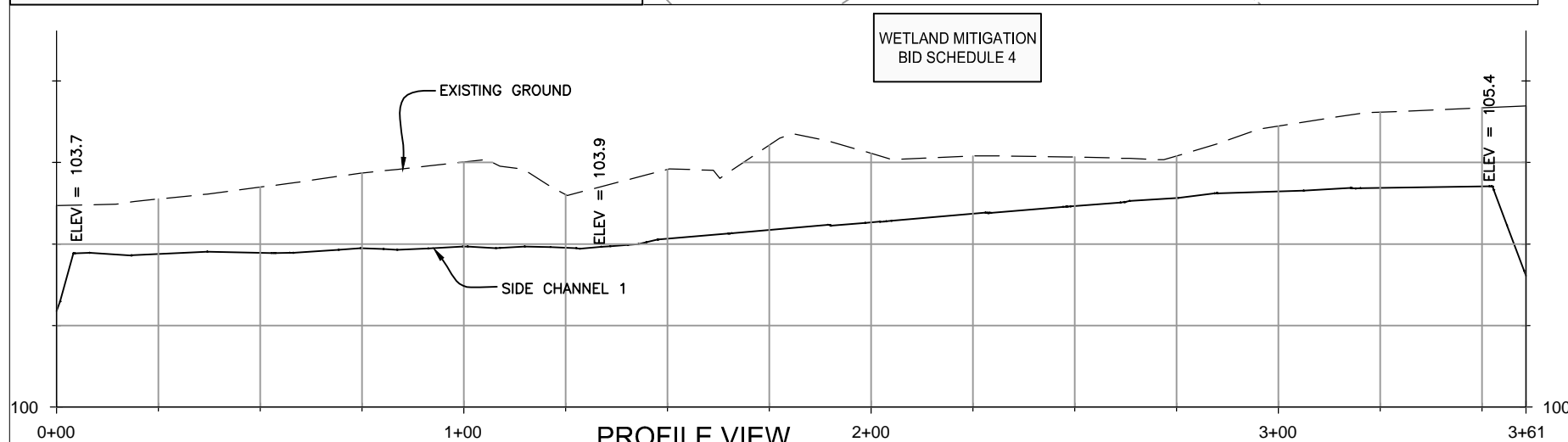
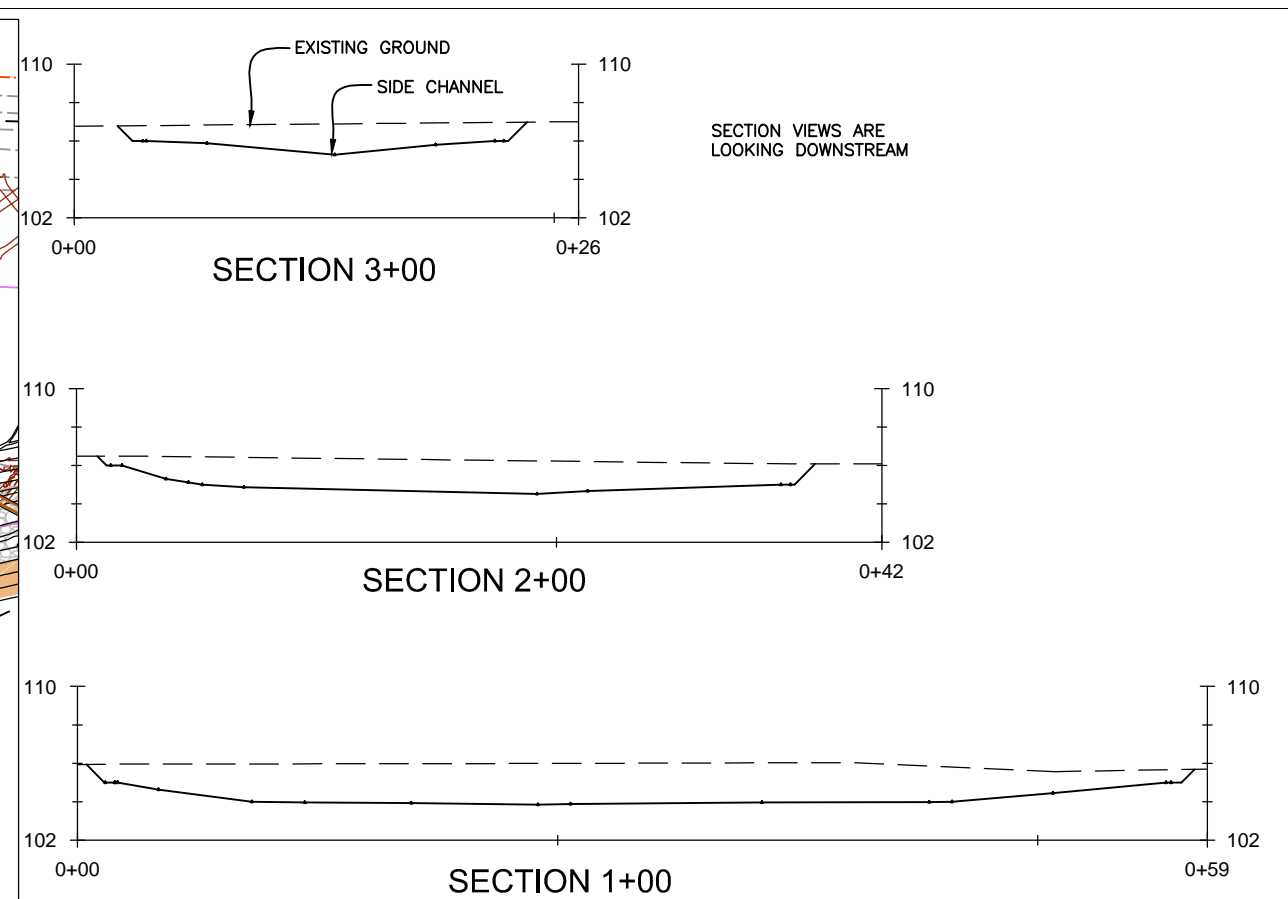
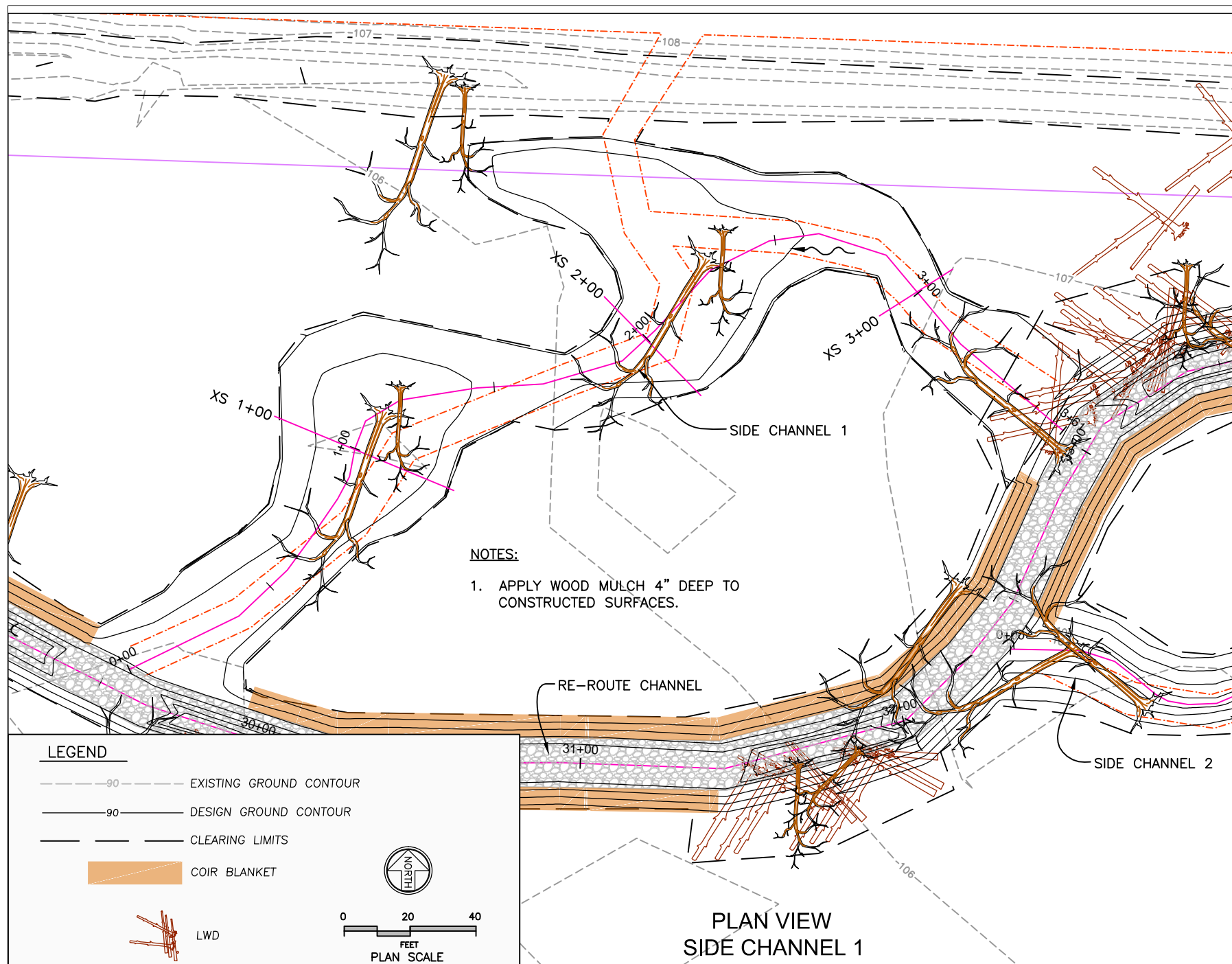




SECTION VIEWS ARE  
LOOKING DOWNSTREAM





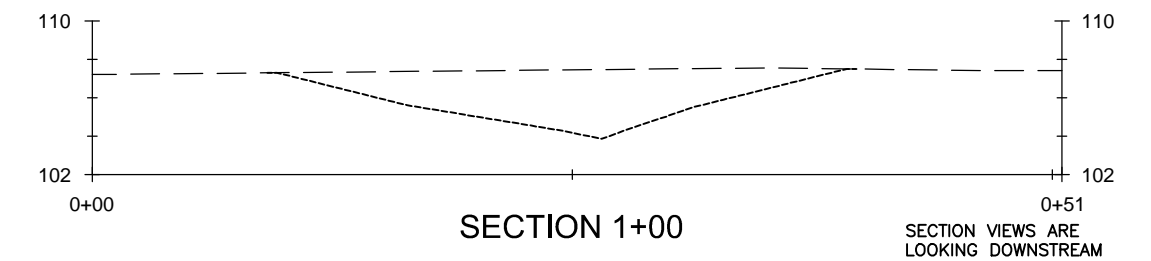
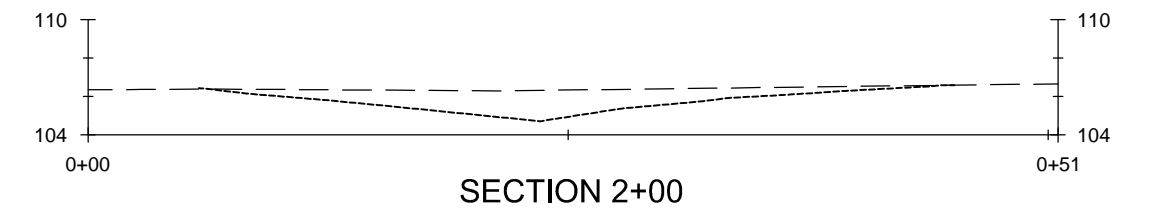
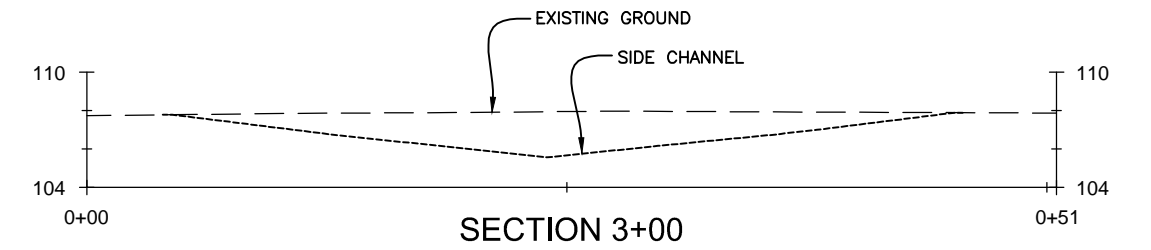
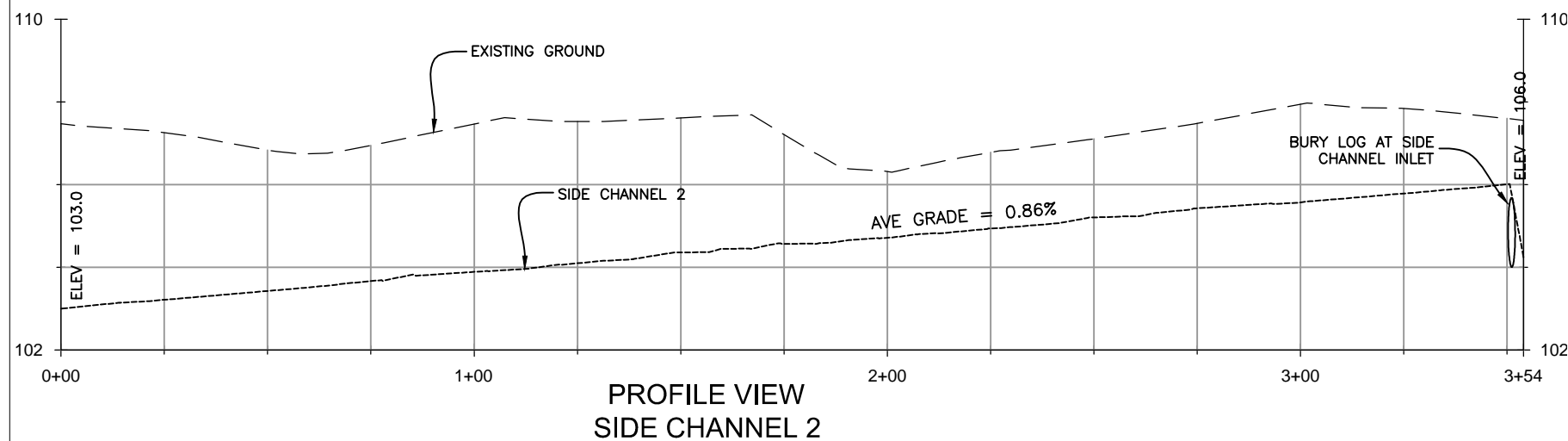
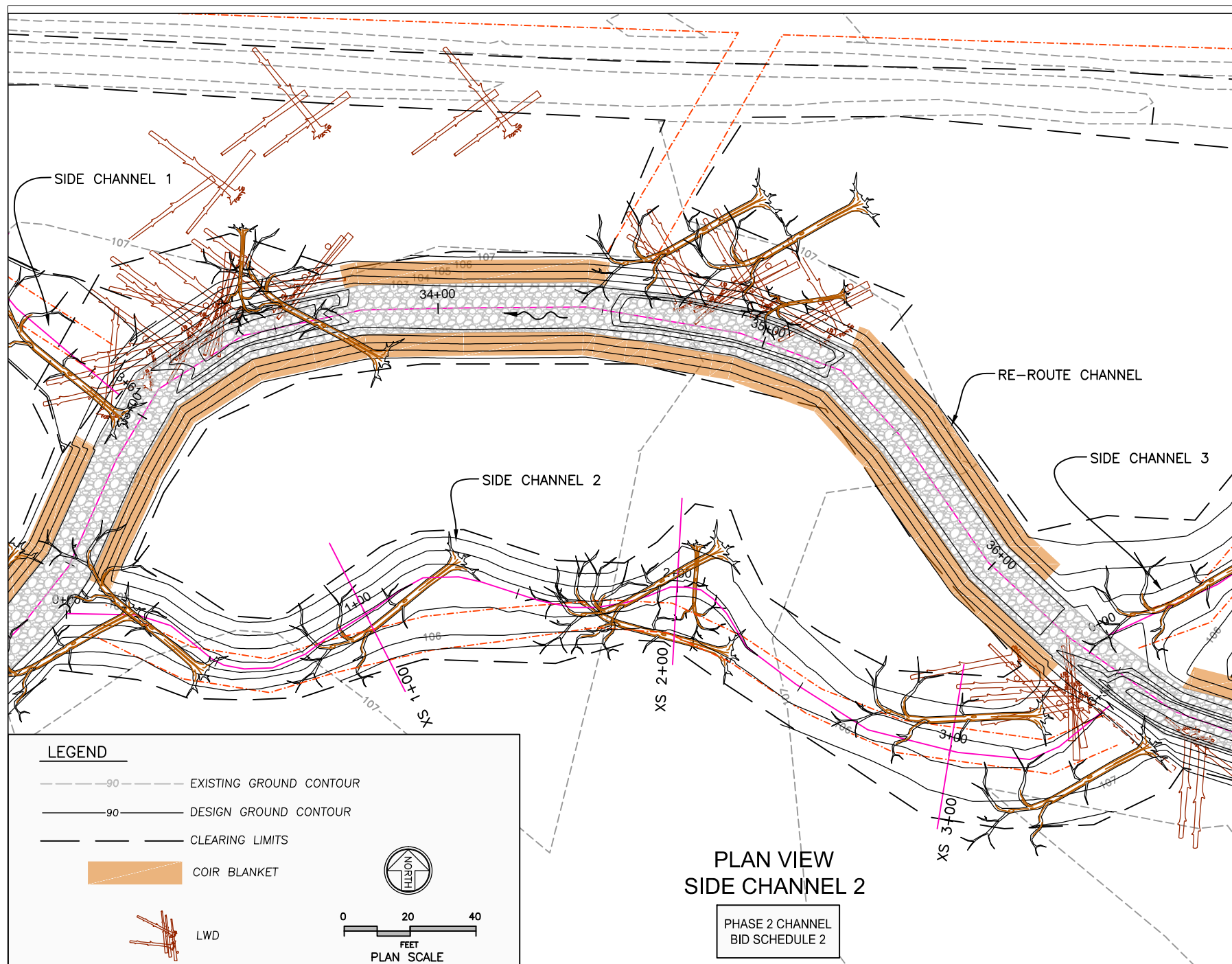


PROJECT ENGINEER DESIGNED/DRAWN INSPECTOR		CITY ENGINEER OPER. ENGINEER		CITY OF BELLINGHAM, WASHINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION		SCALE Horiz. _____ Vert. _____		DATUM NAD83/91 NAVD88		Job. No. _____ Date 04/30/15 Field Bk. _____		SQUALIUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT SIDE CHANNEL 1		SHEET 21 OF 44	
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CONTACT PERSON: ENGINEER, PROJECT ENGINEER AT 778-7900





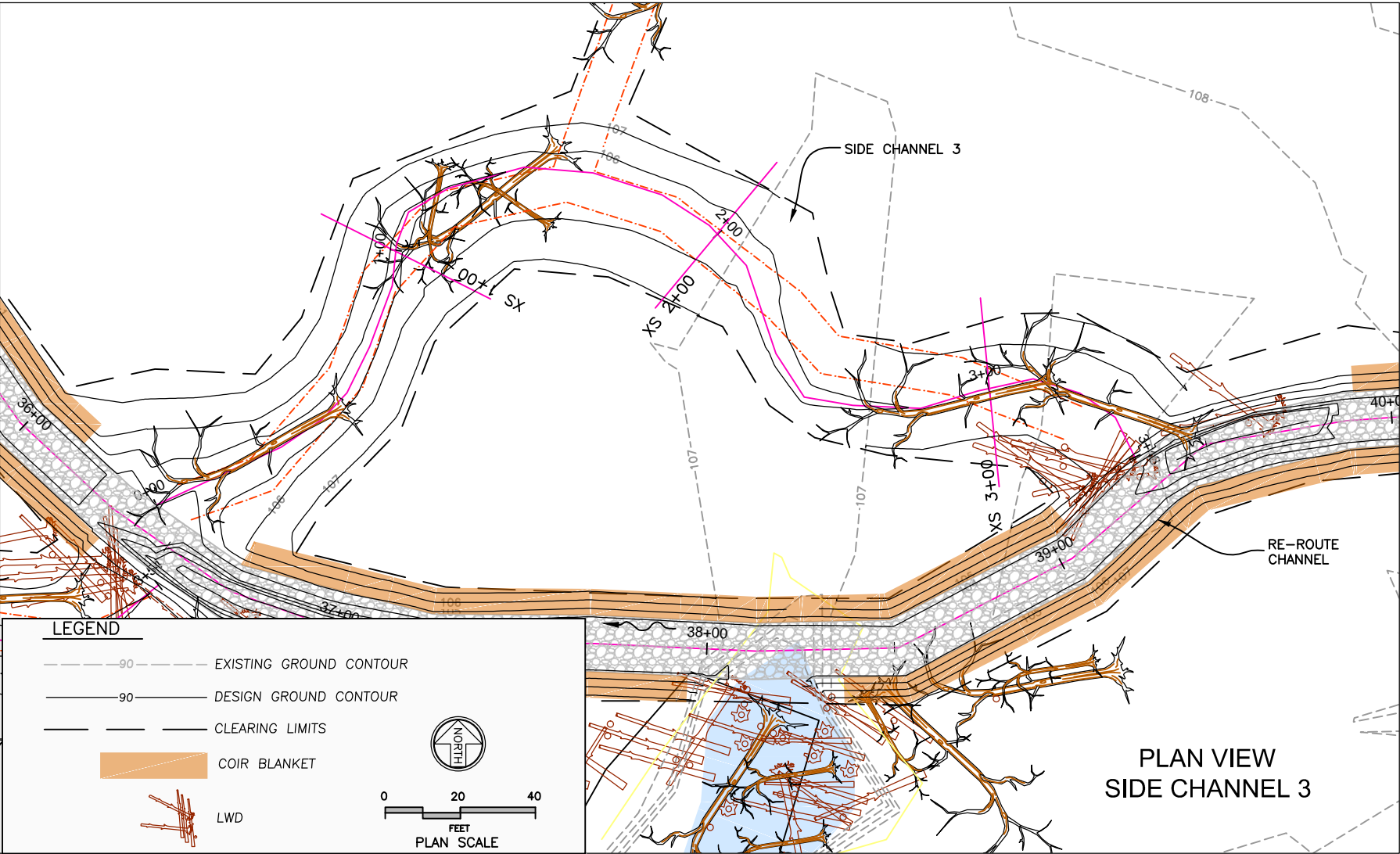


**NOTES:**

1. APPLY WOOD MULCH 4" DEEP TO CONSTRUCTED SURFACES (1,250 SY).
2. AFTER FINAL USE OF ACCESS ROADS AND STOCKPILE AREAS, SCARIFY TO DECOMPACT TOPSOIL. IF TOPSOIL HAS BEEN REMOVED TO FACILITATE ACCESS, AMEND TOPSOIL PER BMP T5.13.

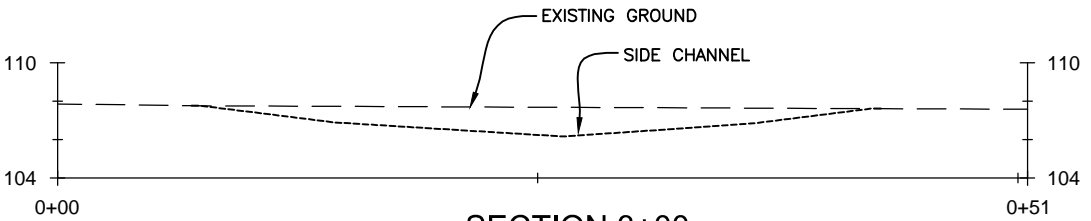




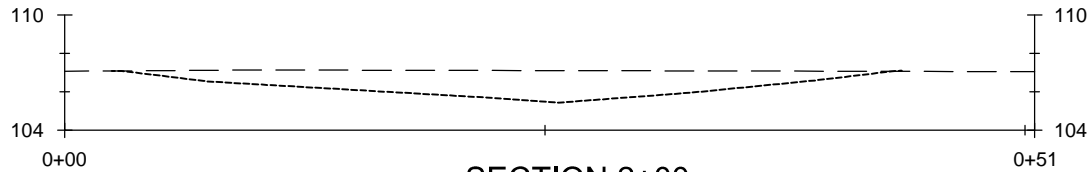


PLAN VIEW  
SIDE CHANNEL 3

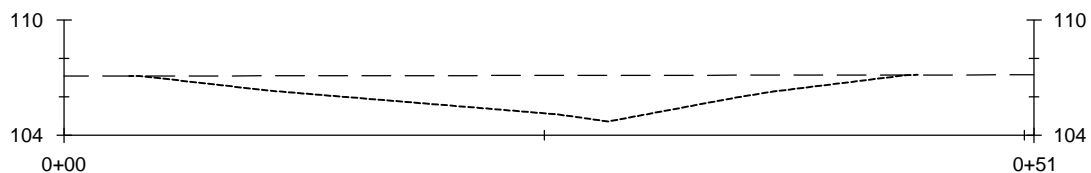
PHASE 2 CHANNEL  
BID SCHEDULE 2



SECTION 3+00



SECTION 2+00

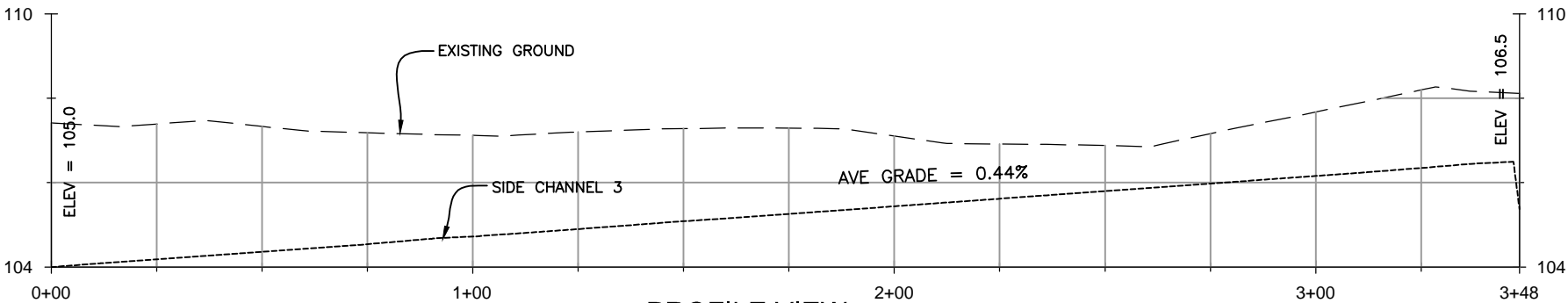


SECTION 1+00

SECTION VIEWS ARE  
LOOKING DOWNSTREAM

NOTES:

1. APPLY WOOD MULCH, 4" DEEP, TO CONSTRUCTED SURFACES (1,380 SY).
2. AFTER FINAL USE OF ACCESS ROADS AND STOCKPILE AREAS, SCARIFY TO DECOMPACT TOPSOIL. IF TOPSOIL HAS BEEN REMOVED TO FACILITATE ACCESS, AMEND TOPSOIL PER BMP T5.13.



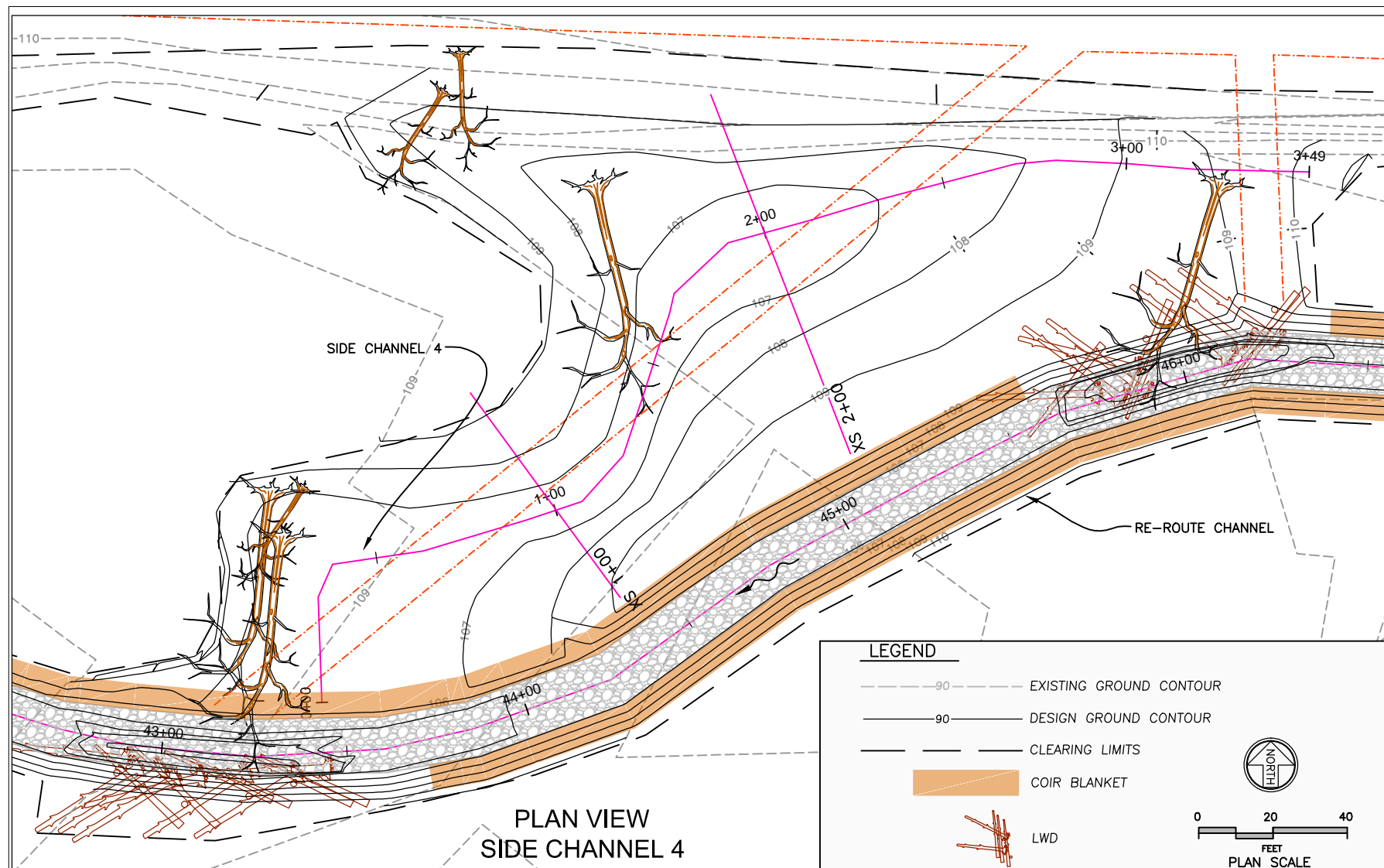
PROFILE VIEW  
SIDE CHANNEL 3



4 3 2 1			PROJECT ENGINEER <u>MRM</u>		DIR. PUBLIC WORKS <u>TC</u>		CITY OF BELLINGHAM, WASHINGTON		SCALE		DATUM		Job. No. <u>---</u>		SQUALIUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT		SHEET	
Date <u>No</u>			DESIGNED/DRAWN <u>MRM</u>		CITY ENGINEER <u>RAR</u>		PUBLIC WORKS DEPARTMENT		Horiz. <u>---</u>		NAD83/91		Date <u>04/30/15</u>		SIDE CHANNEL 3		23	
Revision			INSPECTOR <u>-</u>		OPER. ENGINEER <u>---</u>		ENGINEERING DIVISION		Vert. <u>---</u>		NAVD88		Field Bk. <u>-</u>				OF	
By																	44	

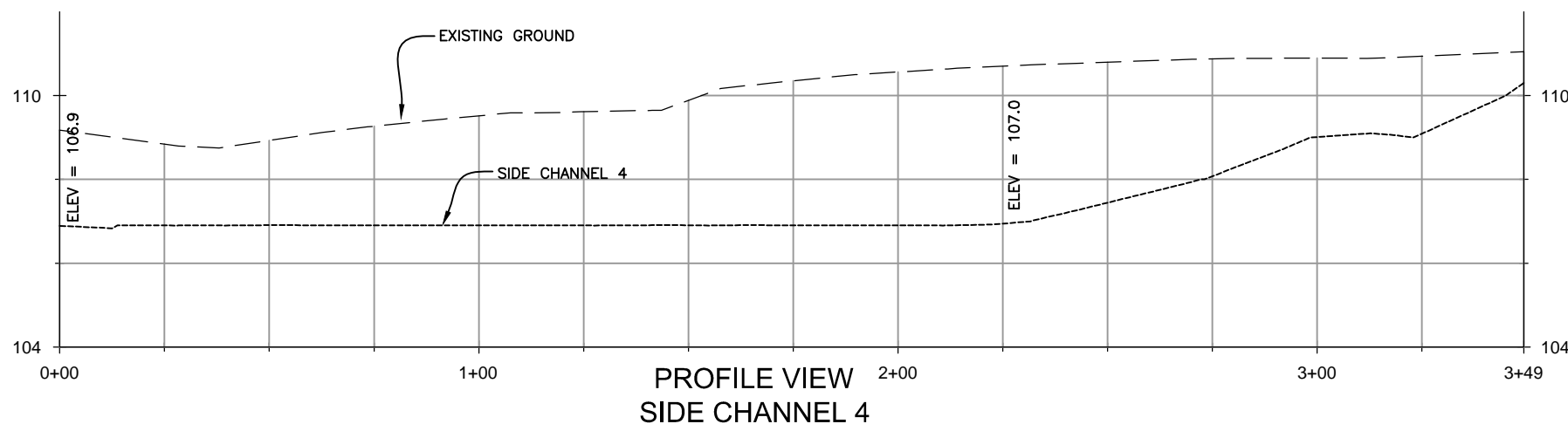
CONTACT PERSON: ENGINEER PROJECT ENGINEER AT 778-7900



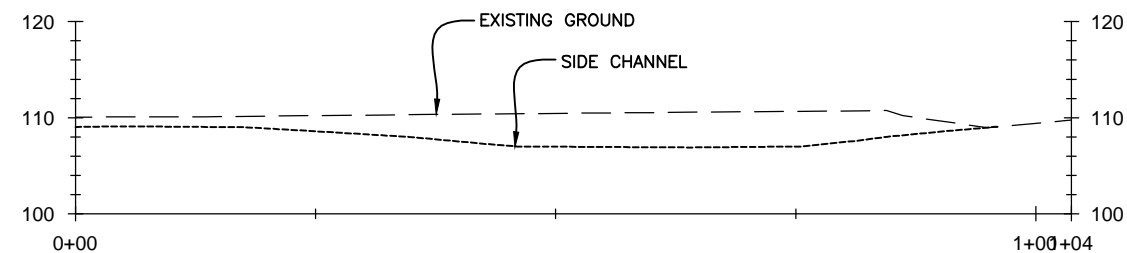


PLAN VIEW  
SIDE CHANNEL 4

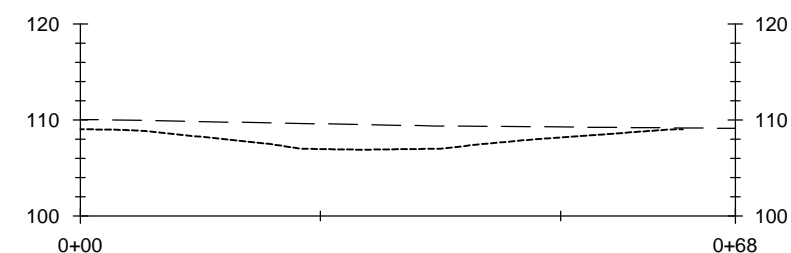
PHASE 2 CHANNEL  
BID SCHEDULE 2



PROFILE VIEW  
SIDE CHANNEL 4



SECTION 2+00



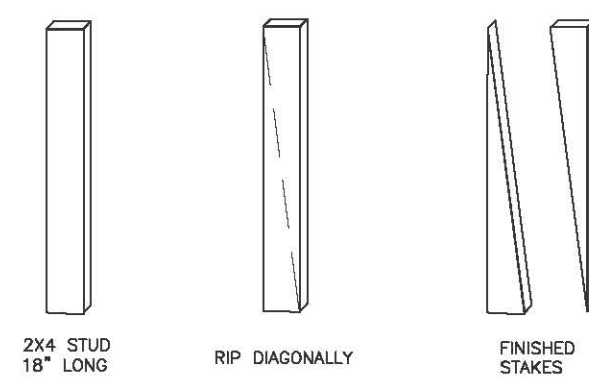
SECTION 1+00

NOTES:

1. APPLY WOOD MULCH, 4" DEEP, TO CONSTRUCTED SURFACES (2,780 SY).
2. AFTER FINAL USE OF ACCESS ROADS AND STOCKPILE AREAS, SCARIFY TO DECOMPACT TOPSOIL. IF TOPSOIL HAS BEEN REMOVED TO FACILITATE ACCESS, AMEND TOPSOIL PER BMP T5.13.

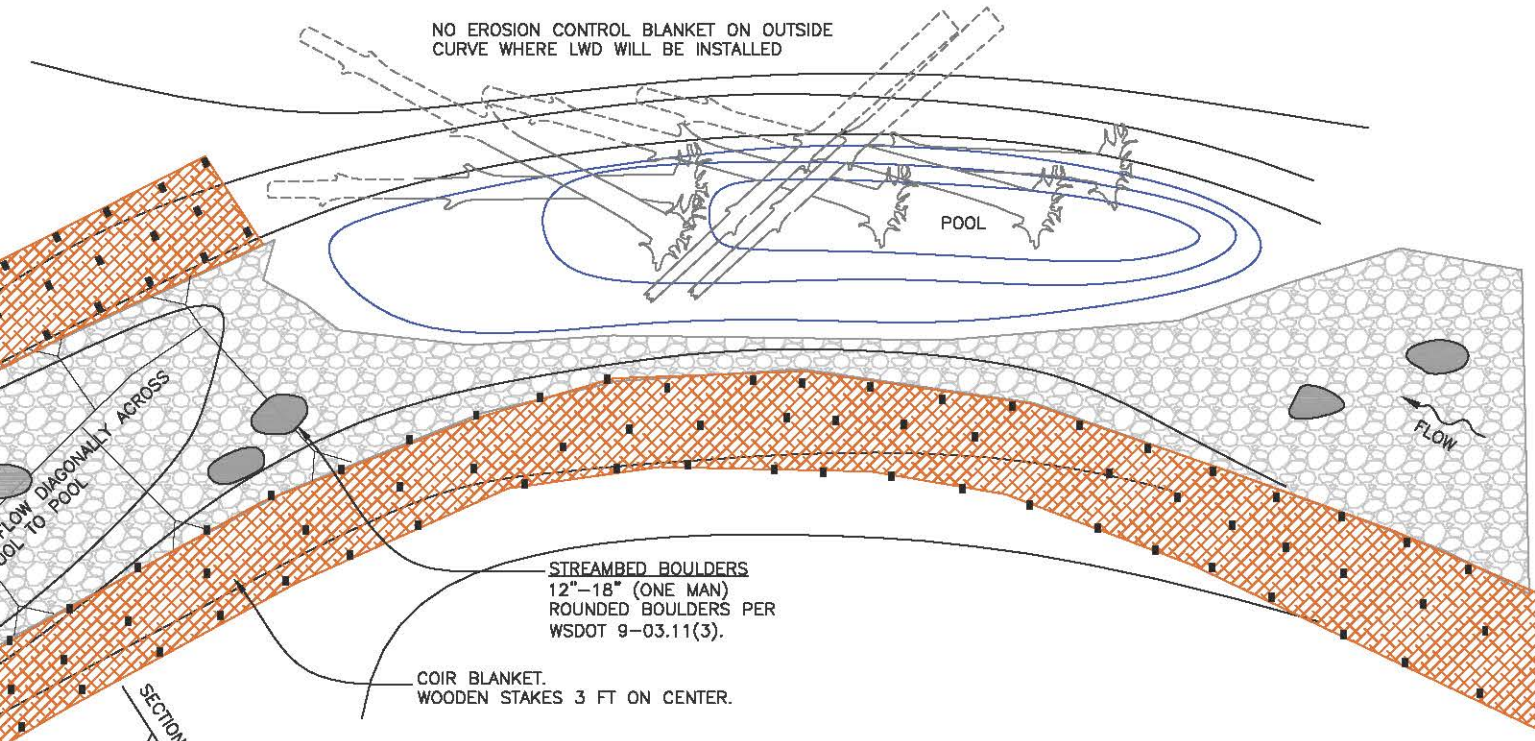




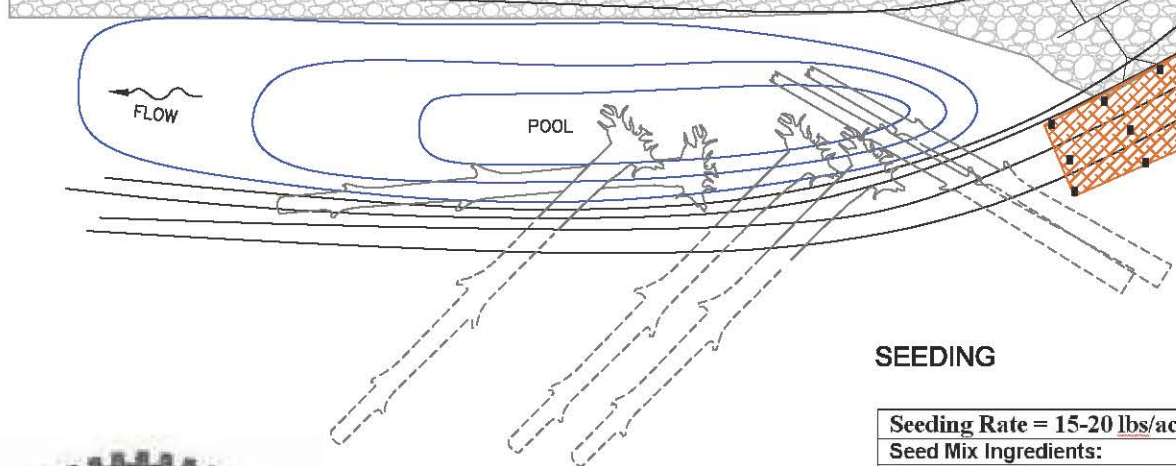


### WOODEN STAKE CONSTRUCTION

- LEGEND**
- STREAMBED SEDIMENT
  - COIR BLANKET AND WOODEN STAKES

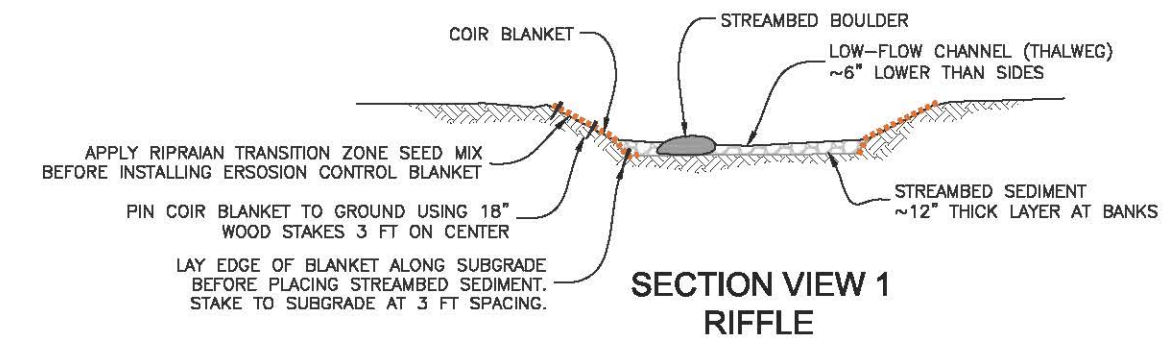


### PLAN VIEW STREAMBED SEDIMENT, BOULDERS, EC BLANKET

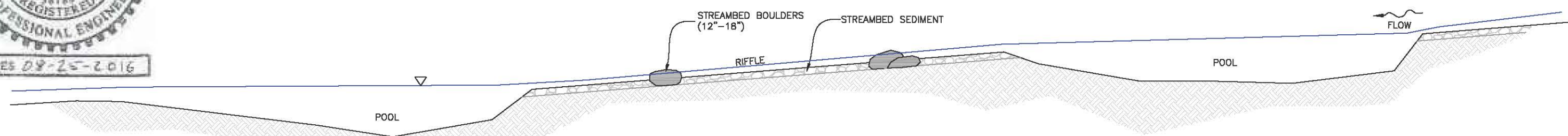
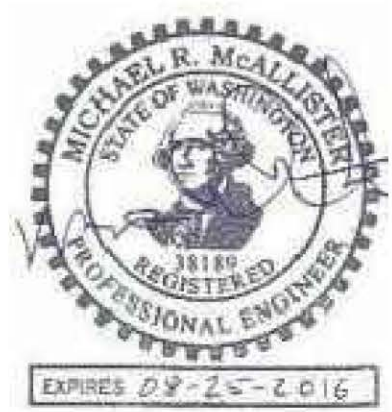


### SEEDING

Seeding Rate = 15-20 lbs/acre.	
Seed Mix Ingredients:	% by weight
Blue Wildrye ( <i>Elymus glaucus</i> )	40%
Red Fescue ( <i>Festuca rubra rubra</i> )	38%
Tufted hairgrass ( <i>Deschampsia cespitosa</i> )	12%
Western mannagrass ( <i>Glyceria occidentalis</i> )	2%
American sloughgrass ( <i>Beckmannia syzigachne</i> )	2%
Slough Sedge ( <i>Carex obnupta</i> )	6%



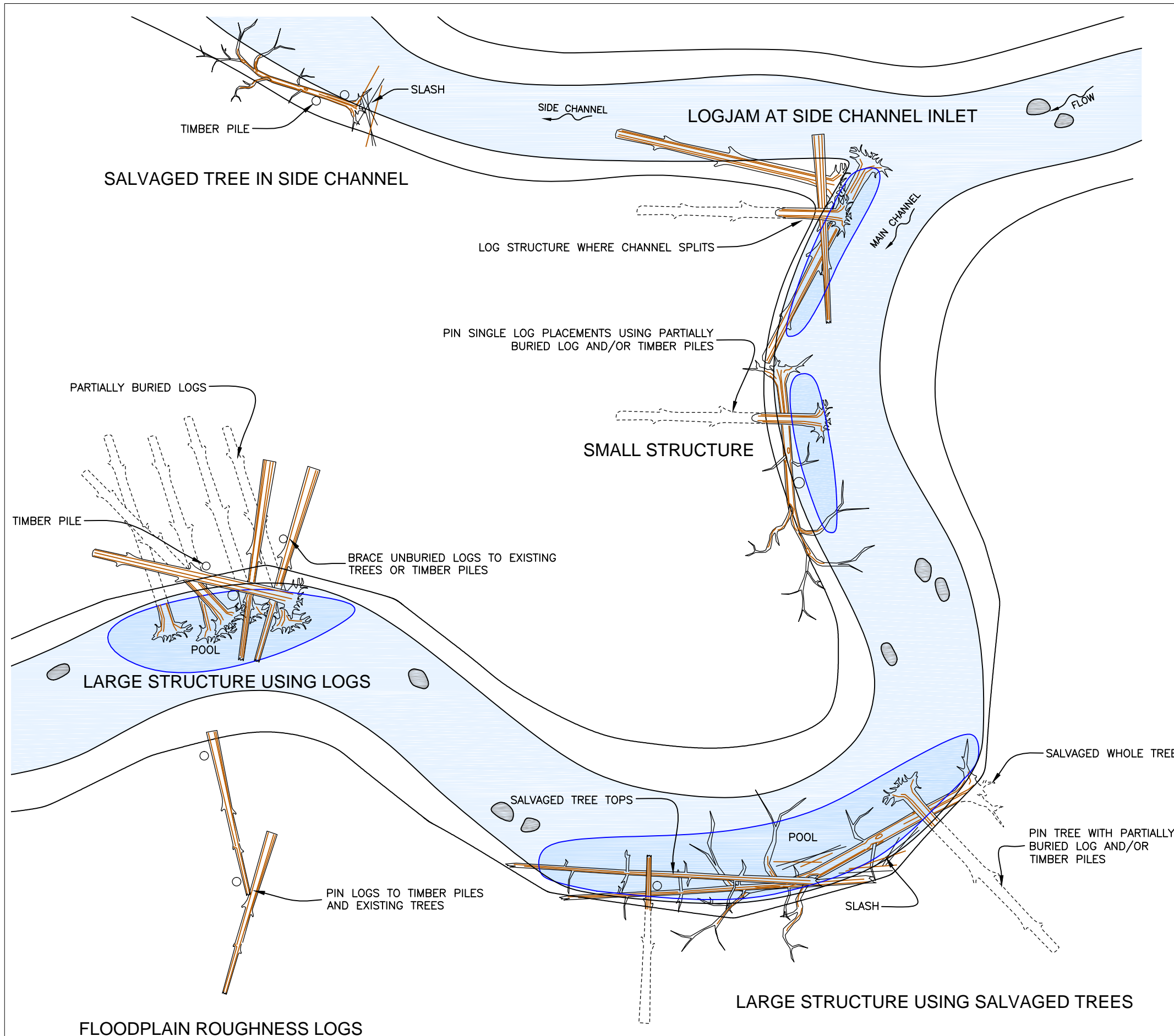
### SECTION VIEW 1 RIFFLE



### PROFILE VIEW POOL RIFFLE SEQUENCE







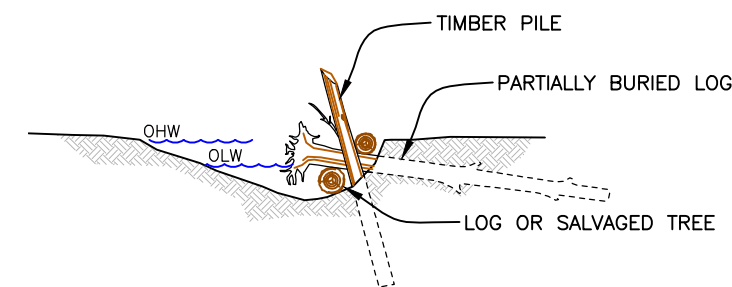
**LWD PLACEMENTS**  
LOG PLACEMENTS DEPICTED HERE ARE APPROXIMATE. ACTUAL QUANTITY, SIZES, LOCATIONS, AND ALIGNMENTS TO BE DETERMINED IN THE FIELD.

IN-CHANNEL LOGS WILL BE INSTALLED TO CREATE FISH HABITAT AND PROVIDE EROSION PROTECTION. LOGS ON THE FLOODPLAIN WILL PROVIDE WILDLIFE HABITAT AND EROSION PROTECTION.

IMPORTED LOGS SHALL BE CONIFER SPECIES.

TREES AND SHRUBS REMOVED DURING CLEARING AND GRUBBING SHALL BE SALVAGED AND USED IN LOG STRUCTURES.

TIMBER PILES SHALL BE EMBEDDED 6 FEET OR DEEPER INTO STREAMBED OR STREAMBANK.



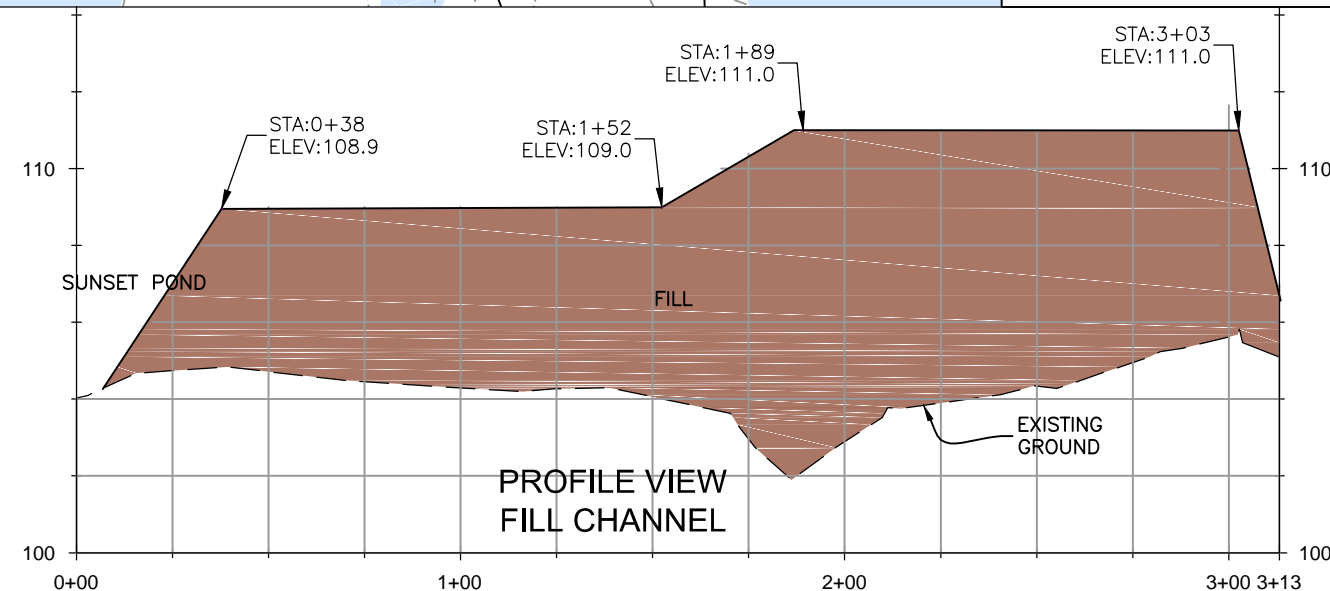
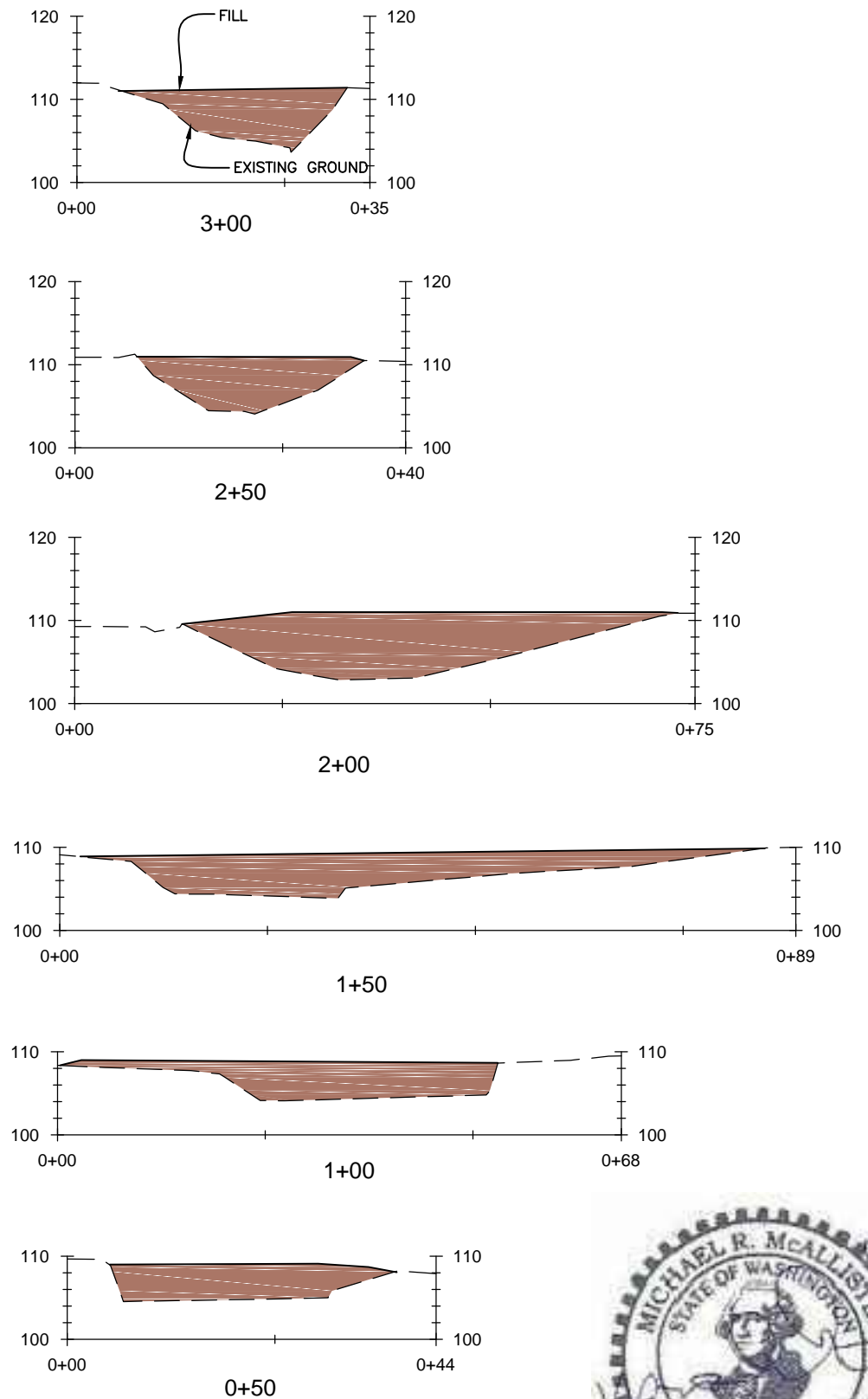
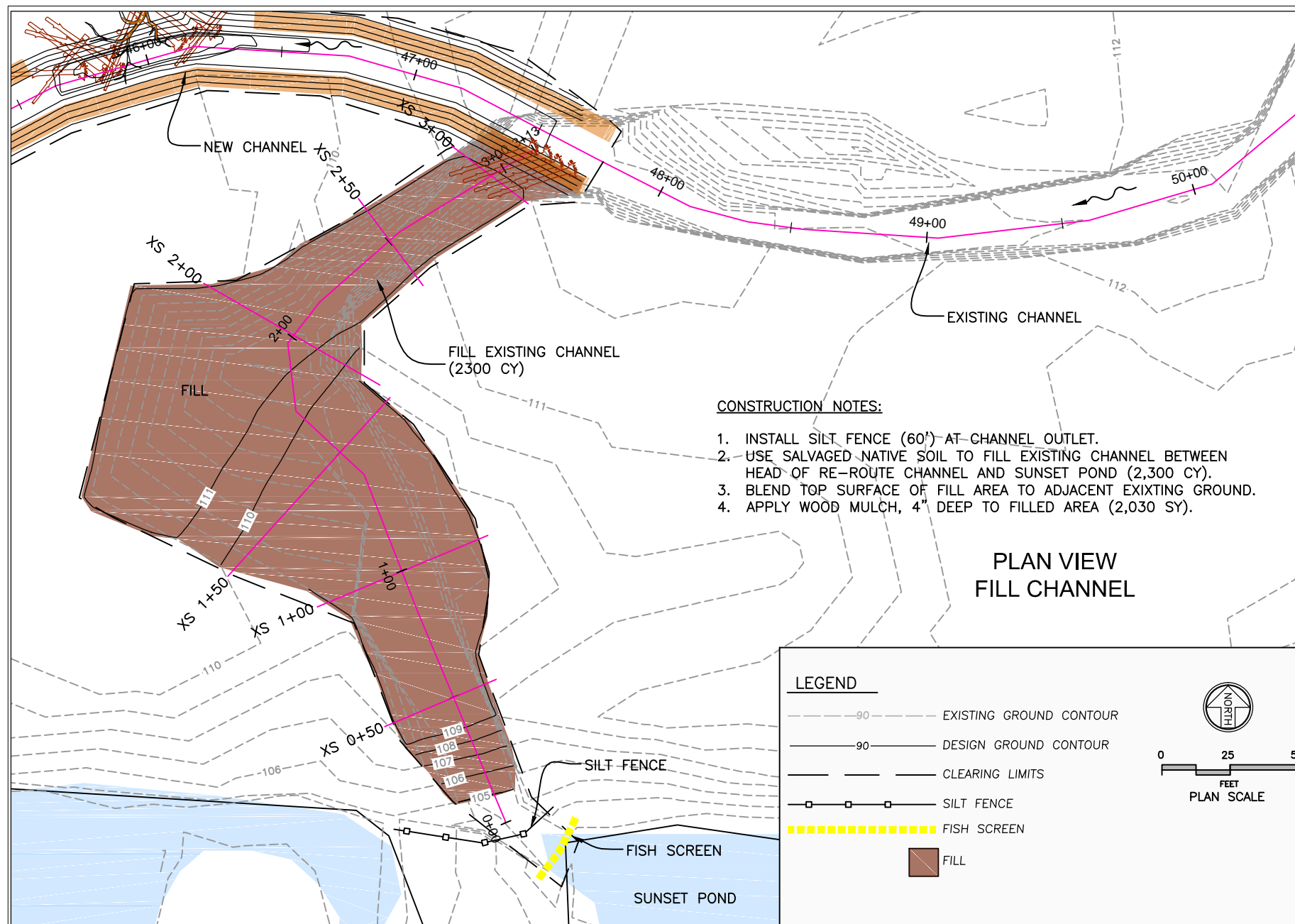
SECTION VIEW  
TYPICAL LOG STRUCTURE



	4			PROJECT ENGINEER	MRM	DIR. PUBLIC WORKS	TC	<b>CITY OF BELLINGHAM, WASHINGTON</b> <b>PUBLIC WORKS DEPARTMENT</b> <b>ENGINEERING DIVISION</b>	<b>SCALE</b> Horiz. _____ Vert. _____	<b>DATUM</b> NAD83/91 NAVD88	Job. No. _____ Date <u>04/30/15</u> Field Bk. _____	<b>SQUALIUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT</b> <b>TYPICAL LWD</b>	<b>SHEET</b> 26 <b>OF</b> 44
	3			DESIGNED/DRAWN	MRM	CITY ENGINEER	RAR						
	2			INSPECTOR	—	OPER. ENGINEER							
	1												
Date	No	Revision	By										

CONTACT PERSON: ENGINEER, PROJECT ENGINEER AT 778-7900









AT THREE LOCATIONS ALONG TRIB W, STREAMBED SEDIMENT SHALL BE PLACED IN EXISTING SCOUR POOLS TO REDUCE FISH STRANDING HAZARD.

FILL POOLS TO BE LEVEL WITH ADJACENT STREAMBED LEVEL.

STREAMBED SEDIMENT

STREAMBED SEDIMENT SHALL BE IMPORTED ROUNDED GRAVEL HAVING THE APPROXIMATE GRADATION OF WASHDOT STREAMBED SEDIMENT AS SPECIFIED IN SECTION 9-03.11(1) OF THE STANDARD SPECIFICATIONS, AND SUMMARIZED IN THE FOLLOWING TABLE:

Sieve Size	Percent Passing
2½"	99-100
2"	65-95
1"	50-85
No. 4	26-44
No. 40	16 max.
No. 200	5.0-9.0

All percentages are by weight.

PIT RUN HAVING SIMILAR CHARACTERISTICS MAY BE ACCEPTABLE, AS DETERMINED BY THE ENGINEER.

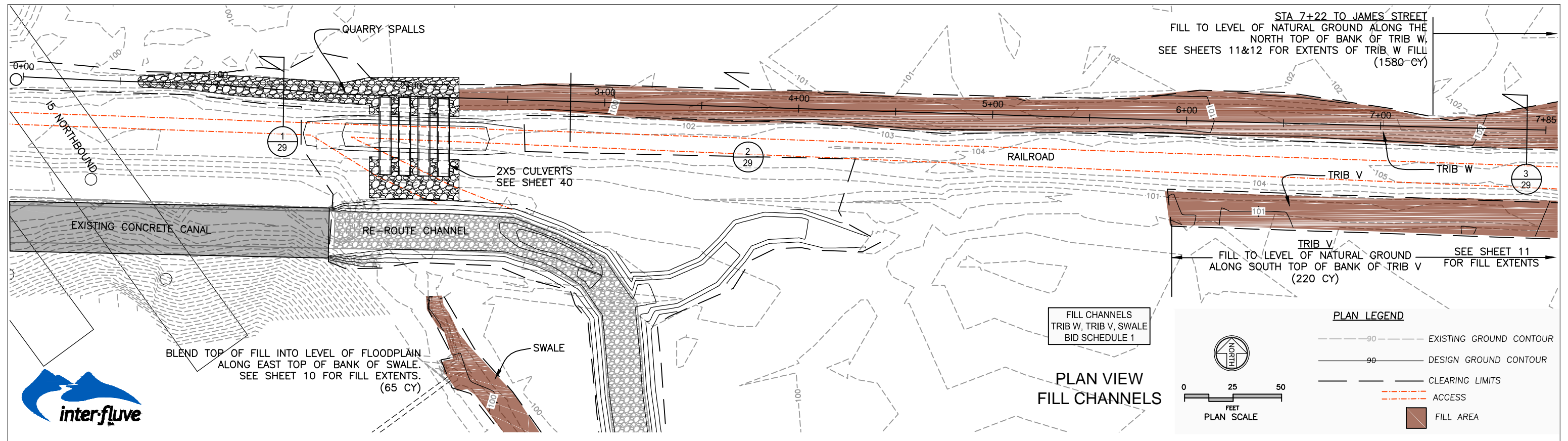
LEGEND



STREAMBED SEDIMENT

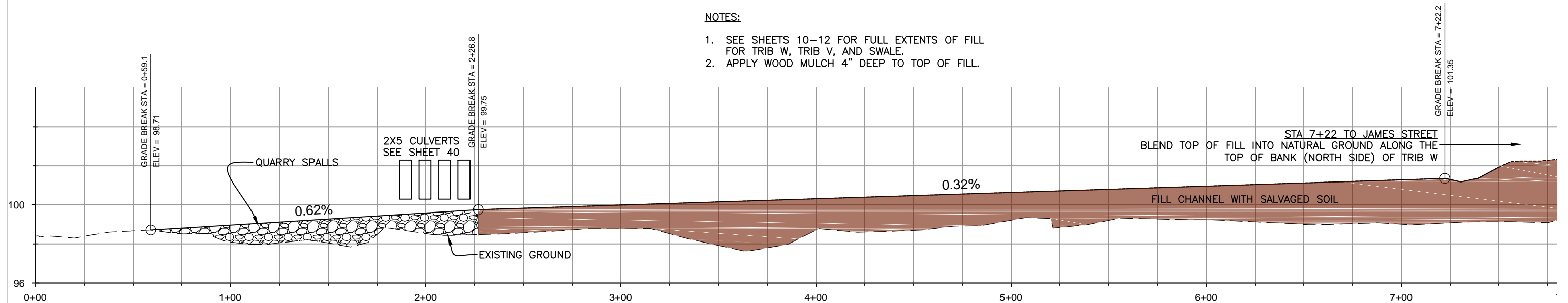




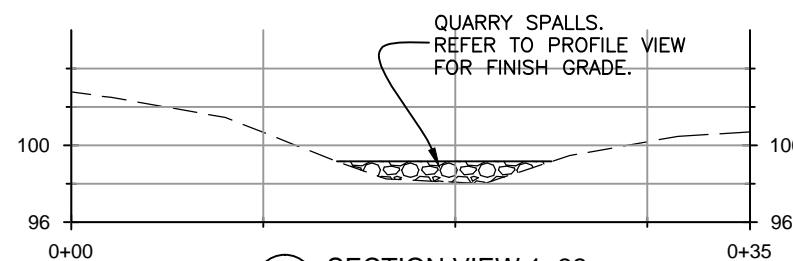


#### NOTES:

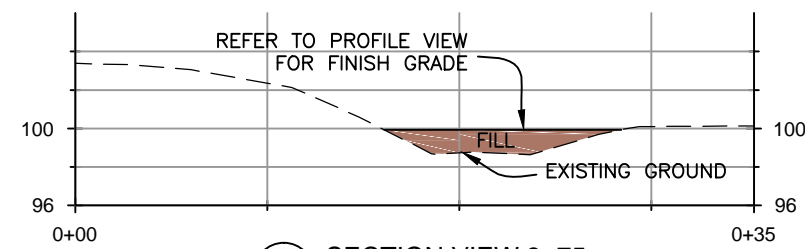
- SEE SHEETS 10-12 FOR FULL EXTENTS OF FILL FOR TRIB W, TRIB V, AND SWALE.
- APPLY WOOD MULCH 4" DEEP TO TOP OF FILL.



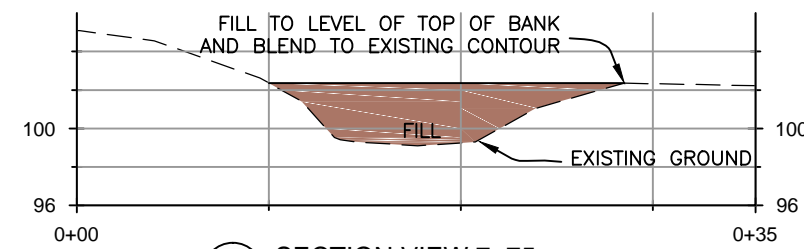
#### PROFILE VIEW TRIB W FILL



1  
29 SECTION VIEW 1+33  
QUARRY SPALLS



2  
29 SECTION VIEW 3+75  
TRIB W FILL



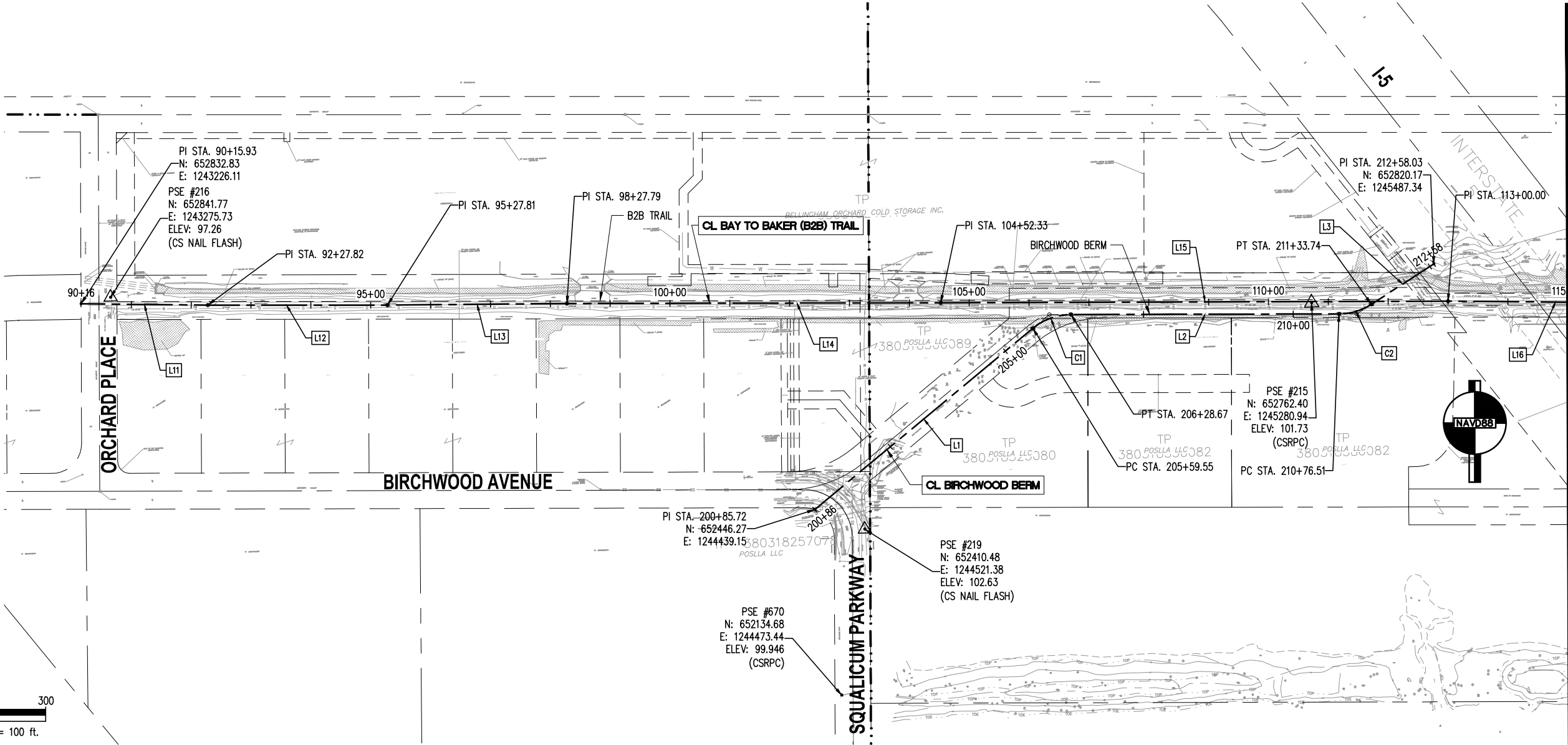
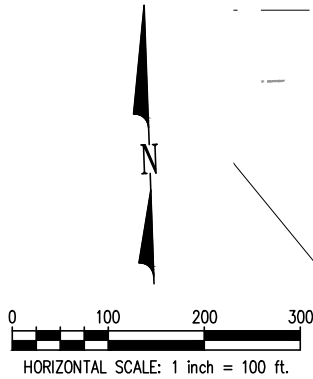
3  
29 SECTION VIEW 7+75  
FILL TRIB W



4		PROJECT ENGINEER	MRM	DIR. PUBLIC WORKS	TC	CITY OF BELLINGHAM, WASHINGTON PUBLIC WORKS DEPARTMENT ENGINEERING DIVISION	SCALE Horiz. _____ Vert. _____	DATUM NAD83/91 NAVD88	Job. No. --- Date 04/30/15 Field Bk. --	SQUALIUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT FILL CHANNELS	SHEET 29 OF 44
3		DESIGNED/DRAWN	MRM	CITY ENGINEER	RAR						
2		INSPECTOR	--	OPER. ENGINEER							
1											
Date	No	Revision	By			CONTACT PERSON:	ENGINEER	PROJECT ENGINEER AT 778-7900			



SECTION 18, T. 38 N., R. 3E., W. M.



MATCHLINE: STA 115+00.00  
SEE SHEET 31

BIRCHWOOD BERM ALIGNMENT LINE TABLE		
LINE #	DISTANCE	BEARING
L1	473.83'	N52°17'08"E
L2	447.83'	S88°06'36"E
L3	124.29'	N59°05'51"E

BIRCHWOOD BERM ALIGNMENT CURVE TABLE					
CURVE #	DELTA	RADIUS	LENGTH	PI NORTHING	PI EASTING
C1	39°36'16"	100.00'	69.12'	652758.16	1244842.47
C2	32°47'33"	100.00'	57.23'	652741.23	1245355.45

B2B TRAIL ALIGNMENT LINE TABLE									
LINE #	DISTANCE	BEARING	LINE #	DISTANCE	BEARING	LINE #	DISTANCE	BEARING	
L11	211.89'	S87°24'11"E	L20	252.18'	N48°33'21"E	L29	600.01'	S88°00'06"E	
L12	299.99'	S87°59'00"E	L21	54.51'	S88°45'35"E	L30	199.93'	S87°30'01"E	
L13	299.98'	S88°29'50"E	L22	3.00'	N1°14'25"E	L31	200.06'	S88°30'11"E	
L14	624.54'	S88°06'06"E	L23	43.71'	S88°45'35"E	L32	200.02'	S88°00'06"E	
L15	847.67'	S88°10'18"E	L24	47.14'	S56°58'17"E	L33	234.71'	S88°10'26"E	
L16	199.98'	S87°32'49"E	L25	211.41'	S27°59'24"E	L34	55.79'	N42°55'30"E	
L17	599.98'	S88°12'07"E	L26	96.60'	S28°21'33"E	L35	239.13'	N72°46'11"E	
L18	200.06'	S87°49'27"E	L27	91.58'	N85°56'00"E	L36	70.10'	N1°30'04"E	
L19	183.70'	S88°07'11"E	L28	201.21'	S88°21'33"E				

B2B TRAIL ALIGNMENT CURVE TABLE					
CURVE #	DELTA	RADIUS	LENGTH	PI NORTHING	PI EASTING
C11	43°19'28"	290.00'	219.28'	652712.28	1246807.02
C12	42°41'03"	66.00'	49.17'	652972.51	1247101.73
C13	28°58'52"	96.00'	48.56'	652933.60	1247286.09
C14	60°22'09"	90.00'	94.83'	652678.79	1247421.52
C15	5°42'27"	90.00'	8.97'	652674.40	1247574.89
C16	5°42'27"	90.00'	8.97'	652681.53	1247675.19
C17	48°54'04"	90.00'	76.81'	652625.01	1249355.56
C18	29°50'41"	200.00'	104.18'	652734.86	1249457.73
C19	71°16'07"	80.00'	99.51'	652838.47	1249791.81

WOODSTOCK PLUG ALIGNMENT LINE TABLE		
LINE #	DISTANCE	BEARING
L40	29.75'	N89°35'33"E
L41	50.89'	N89°36'05"E
L42	44.79'	N82°20'41"E
L43	47.43'	S82°33'14"E
L44	41.83'	N88°44'56"E
L45	54.20'	N48°21'21"E



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	4		
	3		
	2		
	1		
Date	No	Revision	By

PROJECT ENGINEER \_\_\_\_\_ CRN  
DESIGNED/DRAWN \_\_\_\_\_ TLW  
INSPECTOR \_\_\_\_\_

DIR. PUBLIC WORKS \_\_\_\_\_ TAC  
CITY ENGINEER \_\_\_\_\_ RAR  
OPER. ENGINEER \_\_\_\_\_

CITY OF BELLINGHAM, WASHINGTON  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE  
Horiz. 1"=100'  
Vert. \_\_\_\_\_

DATUM  
NAD 83/98  
NAVD 88

Job. No. 2013-0122  
Date 04/30/15  
Field Bk. \_\_\_\_\_

SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
JAMES STREET TO IRONGATE  
HORIZONTAL CONTROL PLAN 1

SHEET  
30 OF  
44

CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900

May 19, 2015 - 8:35am  
Xref Filename: \\22x34\_XTB\_BERM \\\\SCLC\_SV-10P0 \\\\LEMKUHL \\\\xSCLC\_SV-CMIL  
X: \\112501-112501\\112505 (Squalicum Creek Corridor)\\CADD\\Design\\BERM\\SCLC-HC.dwg



May 19, 2015 - 8:35am  
Xref Filename: \\22x34\_XTB\_BERM\\SQC\_SV-TOPO\\LEMMUHL\\XSQC\_SV-CMIL\\

tanw

X: 112501-112750\\112525 (Squalicum Creek Corridor)\\CADD\\Design\\BERM\\SQC-HC.dwg

MATCHLINE: STA 115+00.00  
SEE SHEET 30

SECTION 17-18, T. 38 N., R. 3E., W. M.

MATCHLINE: STA 147+00  
SEE BELOW

IRONGATE ROAD

JAMES STREET ROAD

EAST ORCHARD DRIVE

CL BAY TO BAKER (B2B) TRAIL

CL BAY TO BAKER (B2B) TRAIL

CL WOODSTOCK PLUG

INTERSTATE 5



0 100 200 300  
HORIZONTAL SCALE: 1 inch = 100 ft.

	4		
	3		
	2		
	1		
Date	No	Revision	By

PROJECT ENGINEER \_\_\_\_\_ CRN  
DESIGNED/DRAWN \_\_\_\_\_ TLW  
INSPECTOR \_\_\_\_\_

DIR. PUBLIC WORKS \_\_\_\_\_ TAC  
CITY ENGINEER \_\_\_\_\_ RAR  
OPER. ENGINEER \_\_\_\_\_

CITY OF BELLINGHAM, WASHINGTON  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE  
Horiz. 1"=100'  
Vert. \_\_\_\_\_

DATUM  
NAD 83/98  
NAVD 88

Job. No. 2013-0122  
Date 04/30/15  
Field Bk. \_\_\_\_\_

SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
JAMES STREET TO IRONGATE  
HORIZONTAL CONTROL PLAN 2

SHEET  
31 OF  
44

CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900



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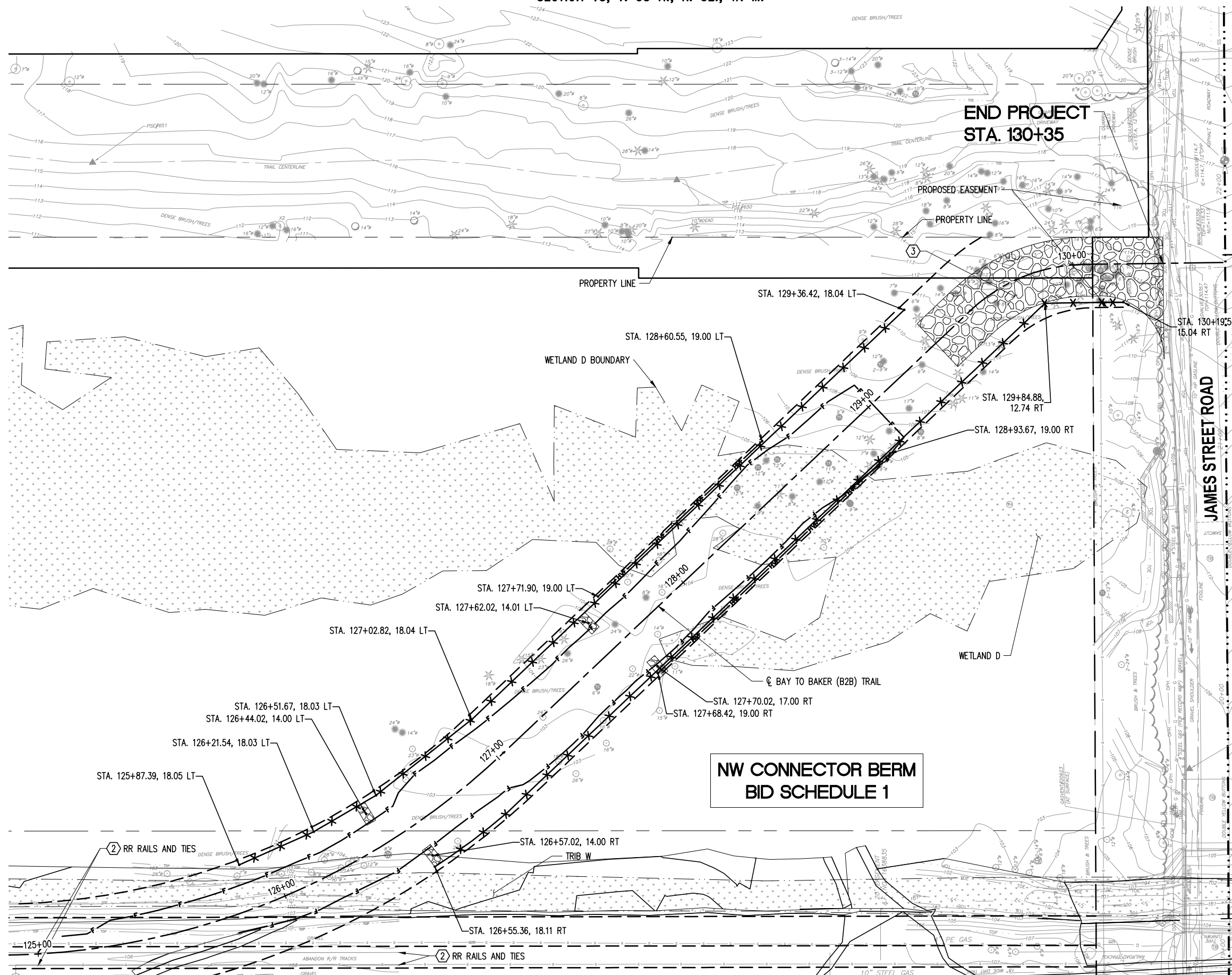


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CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900



## SECTION 18, T. 38 N., R. 3E., W. M.
















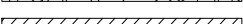
CONSTRUCTION NOTES:

- ① PROTECT IN PLACE.
- ② REMOVAL OF STRUCTURE AND OBSTRUCTION.
- ③ STABILIZED CONSTRUCTION ENTRANCE.
- ④ NOT USED.
- ⑤ WATTLE
- ⑥ ADJUST UTILITY TO GRADE

EROSION AND SEDIMENT CONTROL NOTES:

1. CLEARING AND GRUBBING LIMITS SHALL EXTEND 5-FEET BEYOND THE CUT/FILL LINES AND OTHER CONSTRUCTION LIMITS OR WITHIN ROW LINE. SILT FENCE SHALL BE INSTALLED AT LIMITS OF CLEARING AND GRUBBING OR AS NECESSARY.
2. CLEARING AND GRUBBING SHALL NOT EXTEND INTO SENSITIVE AREAS DELINEATED BY HIGH VISIBILITY FENCE.
3. SEE SHEET 2 FOR ADDITIONAL EROSION CONTROL NOTES.

LEGEND

	RIGHT OF WAY
	EASEMENT
	PROPERTY LINE
	ALIGNMENT CENTERLINE
	WETLAND BOUNDARY
	EXIST WETLAND
	EXIST TREES
	SILT FENCE, SEE DETAIL 1, SHEET 35
	HIGH VISIBILITY FENCE, SEE DETAIL 2, SHEET 35
	FILL LIMITS
	WATTLE, SEE DETAIL 4, SHEET 35
	CHECK DAM, SEE DETAIL 3, SHEET 35
	STABILIZED CONSTRUCTION ENTRANCE
	ROADWAY EXCAVATION INCL. HAUL

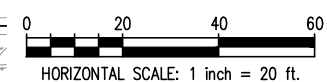
GENERAL NOTES:

1. SEE HORIZONTAL CONTROL PLAN SHEETS FOR CENTERLINE ALIGNMENT DATA.
2. LOCATION OF HVF IS GENERALIZED AND CAN BE FIELD ADJUSTED TO AVOID OBSTRUCTIONS.



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

Determina lo que esta **bajo tierra.**  
**Llama** antes de excavar.



HORIZONTAL SCALE: 1 inch = 20 ft.

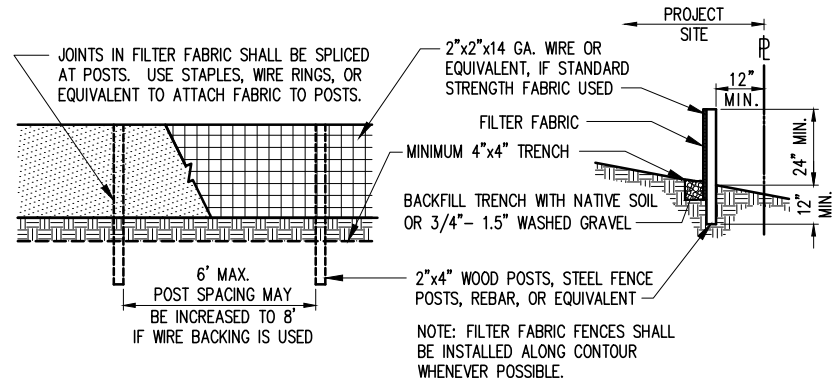
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	4			PROJECT ENGINEER _____ CRN	DIR. PUBLIC WORKS _____ TAC	<b>CITY OF BELLINGHAM, WASHINGTON</b> <b>PUBLIC WORKS DEPARTMENT</b> <b>ENGINEERING DIVISION</b>	<b>SCALE</b> Horiz. _____ 1"=20'	<b>DATUM</b> NAD 83/98	Job. No. <u>2013-0122</u>	<b>SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT</b> <b>JAMES STREET TO IRONGATE</b> <b>INTERIM BERM SITE PREP AND EROSION CONTROL PLAN 3</b>	<b>SHEET</b> 34 <b>OF</b> 44
	3			DESIGNED/DRAWN _____ TLW	CITY ENGINEER _____ RAR		Vert. _____	NAD 83/98	Date <u>04/30/15</u>		
	2			INSPECTOR _____	OPER. ENGINEER _____			NAVD 88	Field Bk. _____		
	1										
Date _____	No. _____	Revision _____	Rv _____								

CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900





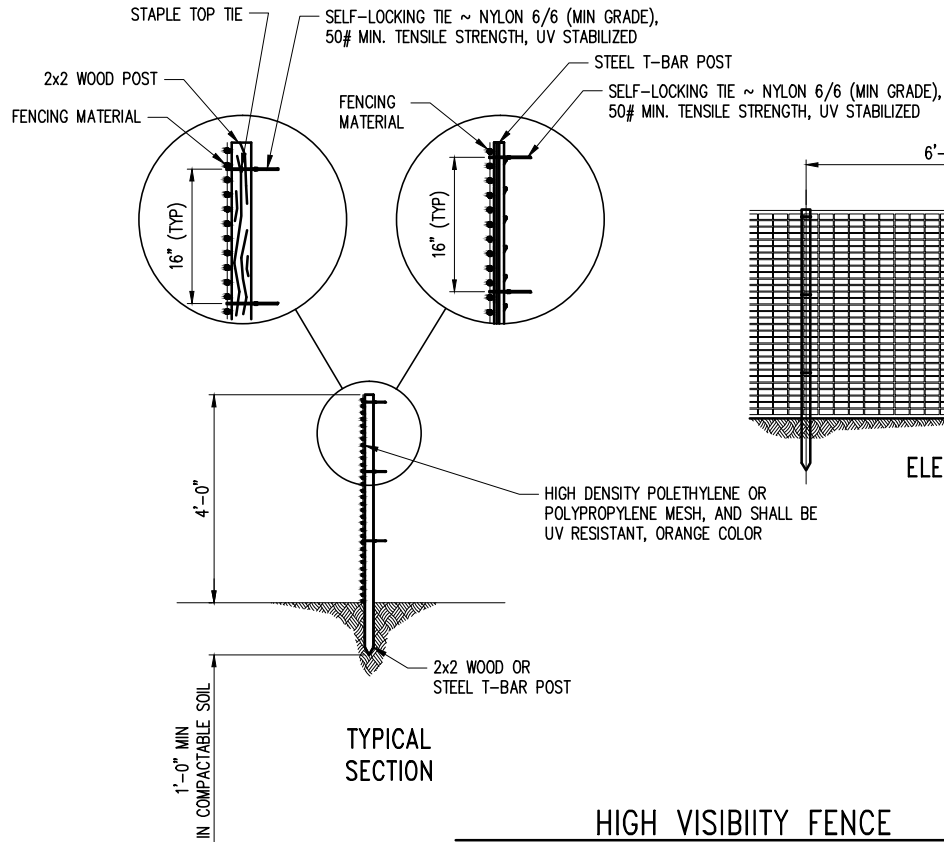
#### MAINTENANCE STANDARDS

1. ANY DAMAGE SHALL BE REPAIRED IMMEDIATELY.
2. IF CONCENTRATED FLOWS ARE EVIDENT UPHILL OF THE FENCE, THEY MUST BE INTERCEPTED AND CONVEYED TO A SEDIMENT TRAP OR POND.
3. IT IS IMPORTANT TO CHECK THE UPHILL SIDE OF THE FENCE FOR SIGNS OF THE FENCE CLOGGING AND ACTING AS A BARRIER TO FLOW AND THEN CAUSING CHANNELIZATION OF FLOWS PARALLEL TO THE FENCE. IF THIS OCCURS, REPLACE THE FENCE OR REMOVE THE TRAPPED SEDIMENT.
4. SEDIMENT MUST BE REMOVED WHEN THE SEDIMENT IS 6" HIGH.
5. IF THE FILTER FABRIC HAS DETERIORATED DUE TO ULTRAVIOLET BREAKDOWN, IT SHALL BE REPLACED.

### SILT FENCE

NTS

1  
32-34



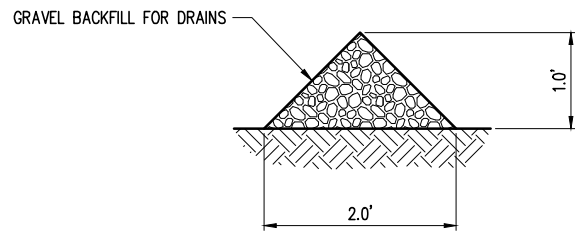
### HIGH VISIBILITY FENCE

NTS

2  
32-34

#### NOTES:

1. POST SHALL HAVE SUFFICIENT STRENGTH AND DURABILITY TO SUPPORT THE FENCE THROUGH THE LIFE OF THE PROJECT.



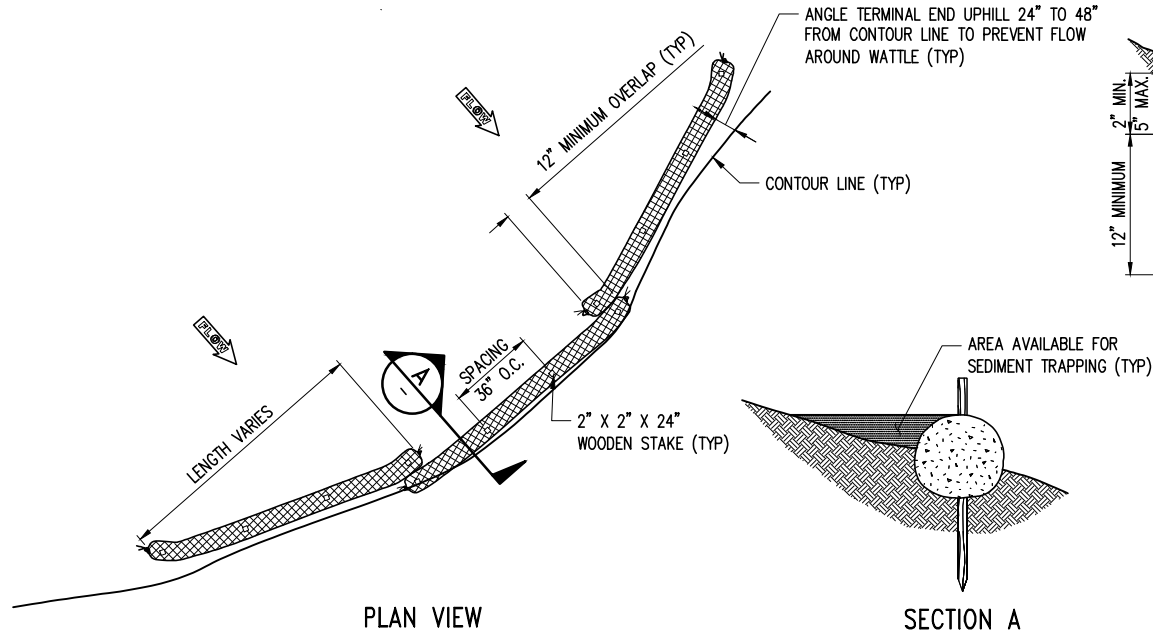
#### NOTES:

1. REGULAR INSPECTION IS REQUIRED. SEDIMENT SHALL BE REMOVED AND FILTER MATERIAL REPLACED AS NEEDED.

### CHECK DAM

NTS

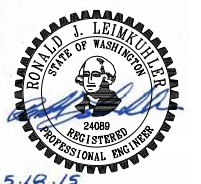
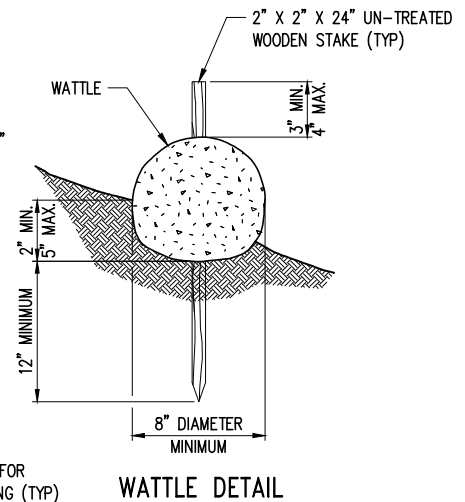
3  
32-34



### WATTLE

NTS

4  
32-34



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	4		
	3		
	2		
	1		
Date	No	Revision	By

PROJECT ENGINEER \_\_\_\_\_ CRN  
DESIGNED/DRAWN \_\_\_\_\_ TLW  
INSPECTOR \_\_\_\_\_

DIR. PUBLIC WORKS \_\_\_\_\_ TAC  
CITY ENGINEER \_\_\_\_\_ RAR  
OPER. ENGINEER \_\_\_\_\_

**CITY OF BELLINGHAM, WASHINGTON**  
**PUBLIC WORKS DEPARTMENT**  
**ENGINEERING DIVISION**

**SCALE**  
Horiz. \_\_\_\_\_ NTS  
Vert. \_\_\_\_\_

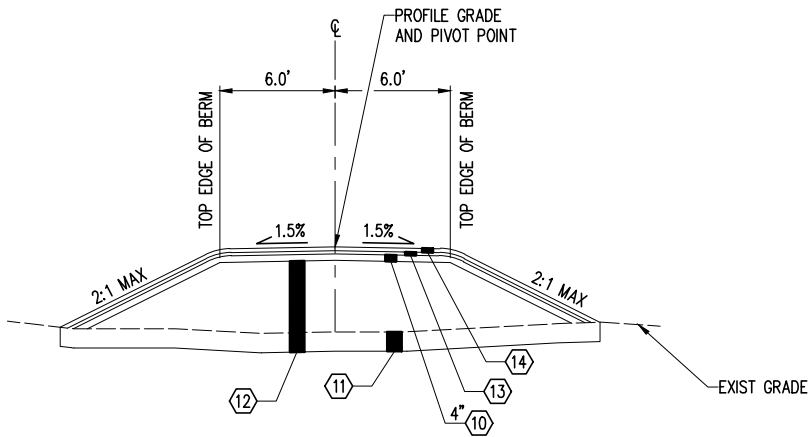
**DATUM**  
NAD 83/98  
NAVD 88

Job. No. 2013-0122  
Date 04/30/15  
Field Bk. \_\_\_\_\_

**SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT**  
**JAMES STREET TO IRONGATE**  
**INTERIM BERM DETAILS**

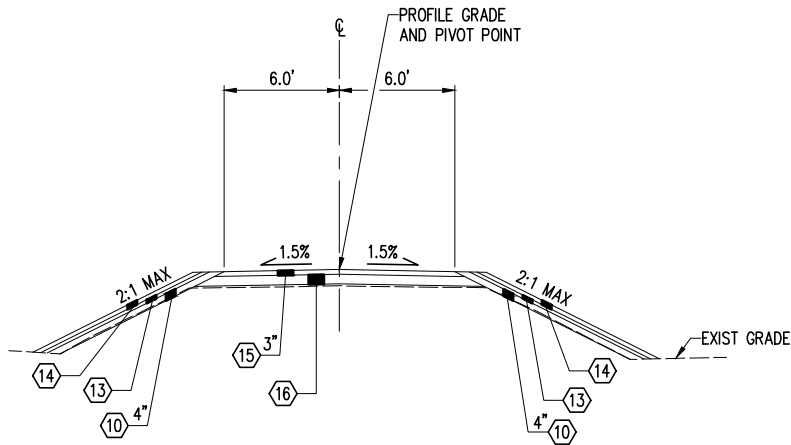
**SHEET**  
35 **OF**  
44





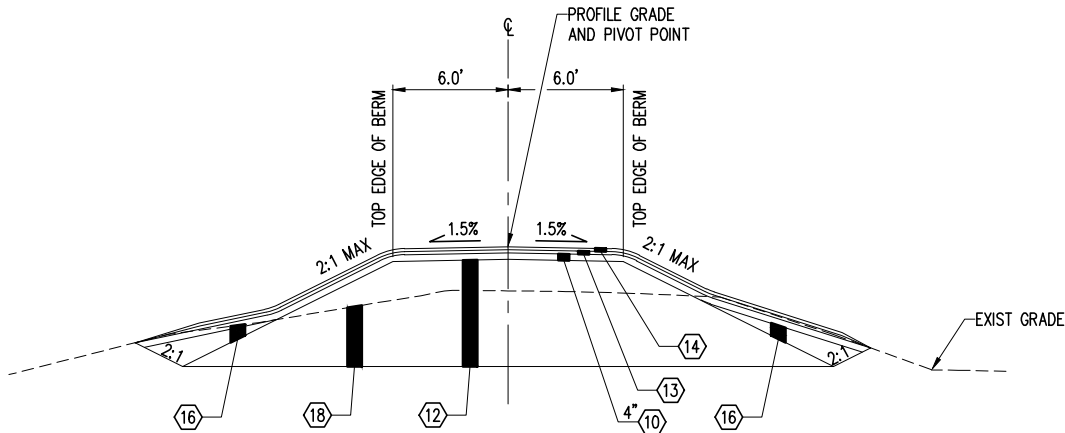
**BIRCHWOOD BERM**

NTS  
STA 201+49 TO STA 211+00  
STA 212+20 TO STA 212+49



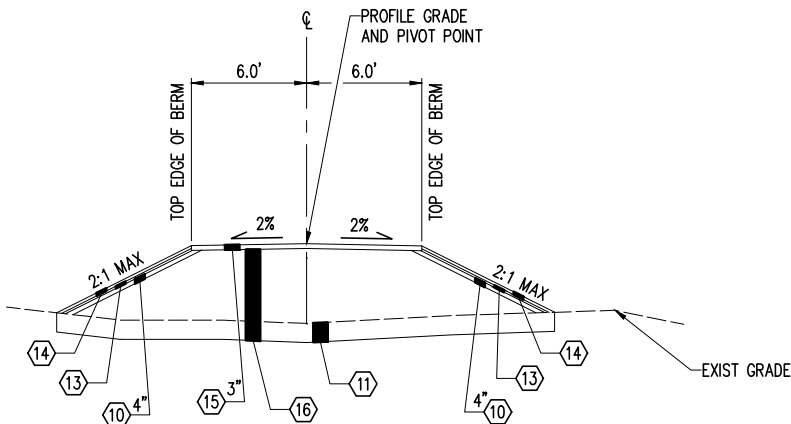
**EQUALIZER CULVERTS CROSSING**

NTS  
STA 116+12 TO STA 117+29



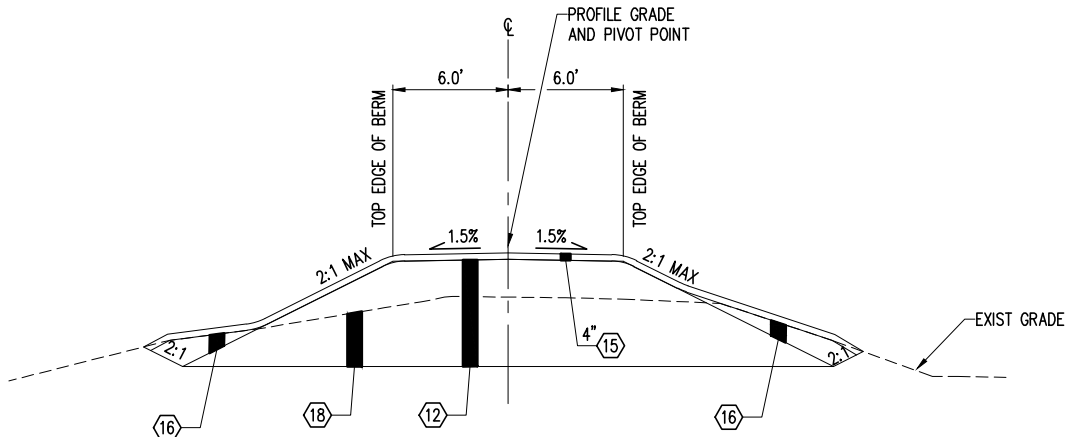
**BIRCHWOOD BERM**

NTS  
STA 211+00 TO STA 211+33  
STA 211+52 TO STA 212+20



**NORTHWEST CONNECTOR BERM**

NTS  
STA 125+52 TO STA 129+02



**BIRCHWOOD BERM**

NTS  
STA 211+33 TO STA 211+52

**NOTES:**

1. STRIPPING SHALL BE 24" DEEP FROM EXISTING GRADE AT WETLANDS, 15" AT EXISTING RAILROAD BERM, AND 15" AT ALL OTHER AREAS.

**CONSTRUCTION NOTES:**

- 10) TOPSOIL TYPE B
- 11) STRIPPING INCL. HAUL, SEE NOTE 1
- 12) COMMON BORROW-MODIFIED, FLOOD BERM, INCL. HAUL
- 13) SEEDING, FERTILIZING, AND MULCHING
- 14) BIODEGRADABLE EROSION CONTROL BLANKET
- 15) CRUSHED SURFACING BASE COURSE
- 16) GRAVEL BORROW, INCL. HAUL
- 17) NOT USED
- 18) ROADWAY EXCAVATION INCL. HAUL



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4			PROJECT ENGINEER _____ CRN			DIR. PUBLIC WORKS _____ TAC			CITY OF BELLINGHAM, WASHINGTON			SCALE			DATUM			Job. No. <u>2013-0122</u>			SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT			SHEET 36 OF 44	
3			DESIGNED/DRAWN _____ TLW			CITY ENGINEER _____ RAR			PUBLIC WORKS DEPARTMENT			Horiz. _____ NTS			NAD 83/98			Date <u>04/30/15</u>			JAMES STREET TO IRONGATE				
2			INSPECTOR _____			OPER. ENGINEER _____			ENGINEERING DIVISION			Vert. _____ NA			NAVD 88			Field Bk. _____			INTERIM BERM TYPICAL SECTIONS				
1																									
Date			No			Revision			By																

CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900

X:\112501-112750\112525 (Squalicum Creek Corridor)\CAD\Design\BERM\SOC-TS.dwg

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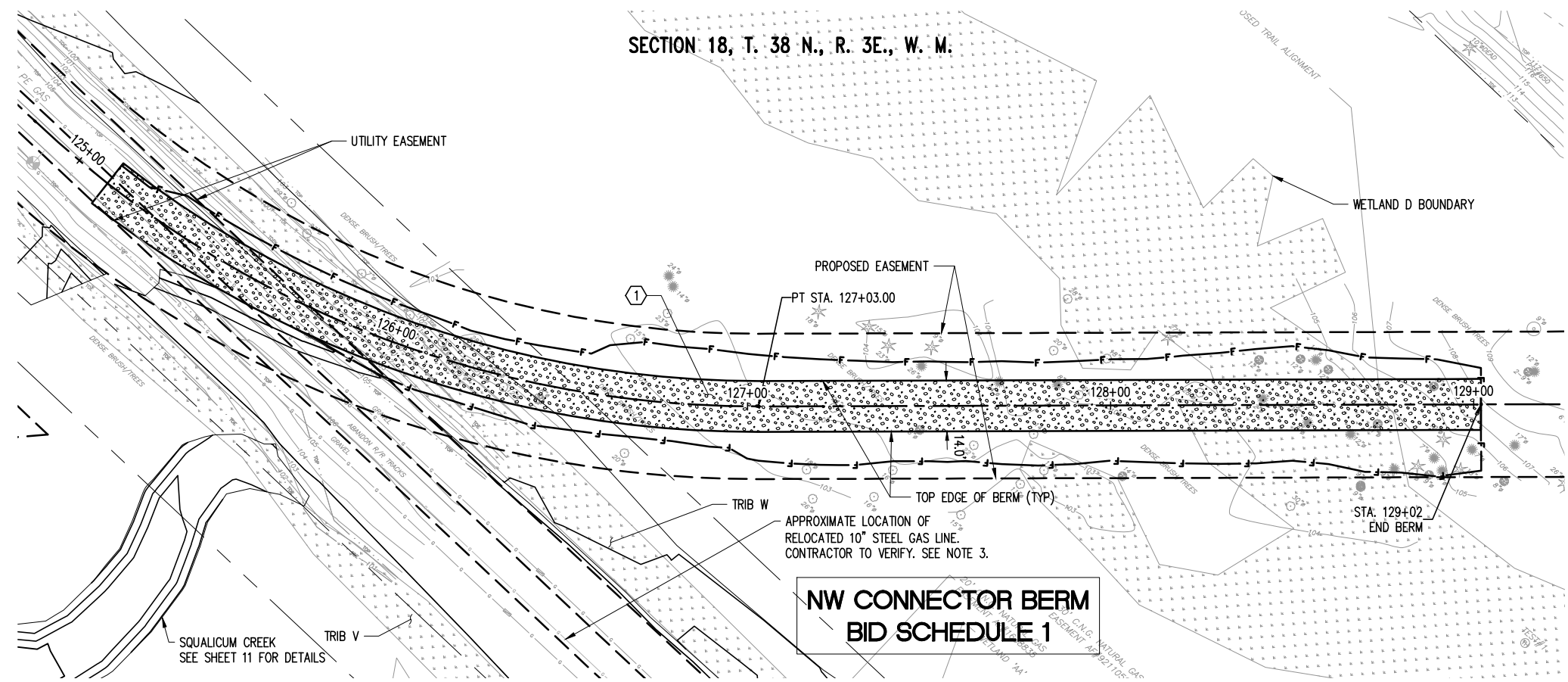


















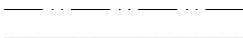

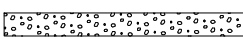
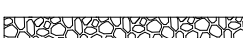
- CONSTRUCTION NOTES:

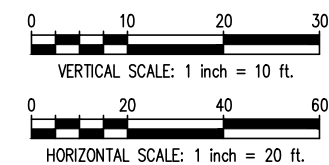
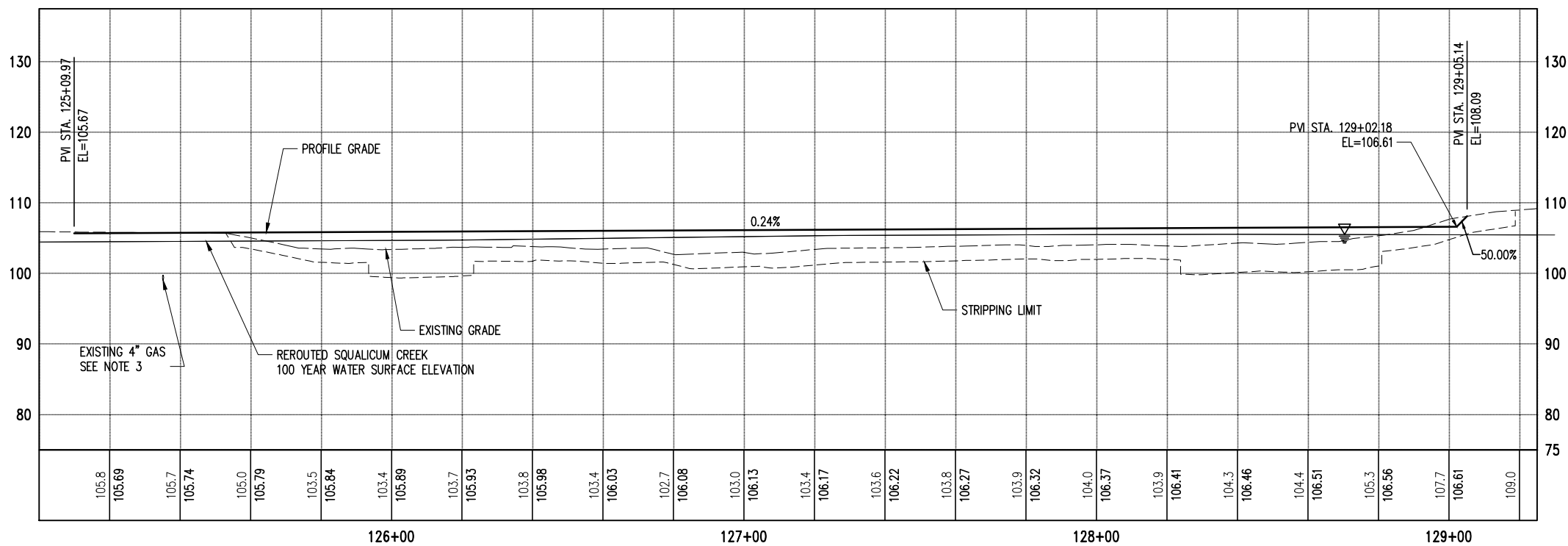
- ① TOP OF INTERIM BERM
- ② NOT USED
- ③ ECOLOGY BLOCK
- ④ CONSTRUCTION GEOTEXTILE FOR PERMANENT EROSION CONTROL
- ⑤ QUARRY SPALLS

- GENERAL NOTES:

1. FOR INTERIM BERM TYPICAL SECTIONS, SEE SHEET 36.
2. FOR CENTERLINE ALIGNMENT DATA, SEE SHEET 30.
3. CONTRACTOR TO LOCATE, POTHOLE, AND VERIFY DEPTHS OF EXISTING UTILITIES PRIOR TO EXCAVATION. DO NOT REMOVE. IF IN CONFLICT CONTACT GAS COMPANY. PROTECT IN PLACE.

- LEGEND:

- |   |                               |
|---|-------------------------------|
|    | RIGHT OF WAY                  |
|    | EASEMENT                      |
|    | PROPERTY LINE                 |
|    | ALIGNMENT CENTERLINE          |
|    | SECTION LINE                  |
|    | WETLAND BOUNDARY              |
|    | EXIST WETLAND                 |
|    | EXIST TREES                   |
|    | CRUSHED SURFACING BASE COURSE |
|  | QUARRY SPALLS                 |



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

Determina lo que esta **bajo tierra**.  
**Llama** antes de excavar.



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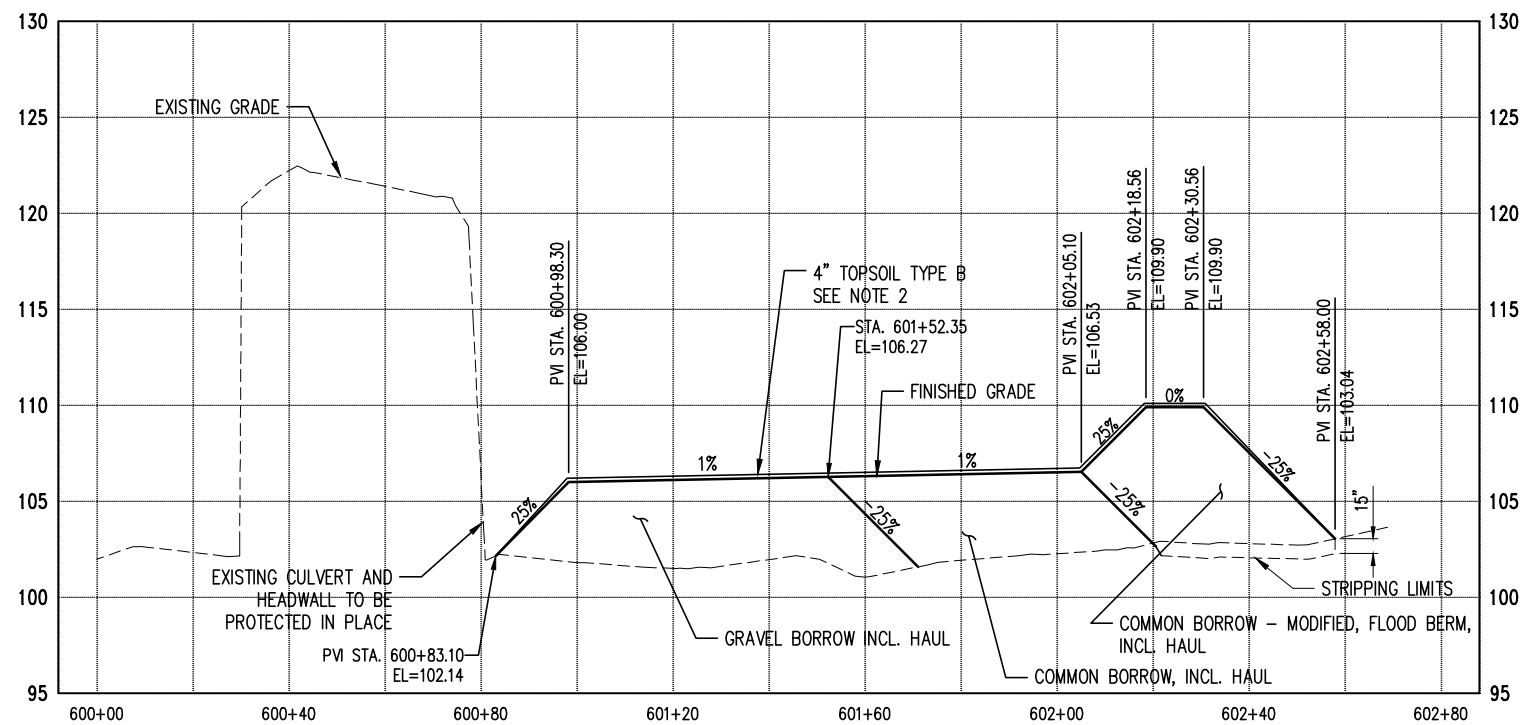
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	3			DESIGNED/DRAWN	TLW	CITY ENGINEER	RAR		Horiz.	1"=20'	NAD 83/98	Date			04/30/15
	2			INSPECTOR		OPER. ENGINEER	-		Vert.	1"=10'	NAVD 88	Field Bk.			
Date	No.	Revision	By												

CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900



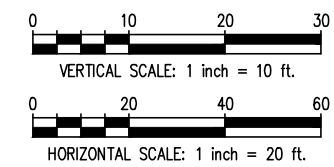






- NOTES:

1. SEE SHEET 42 FOR CREEK BACKFILL ALIGNMENT.
2. CONSTRUCT 4" OF TOP SOIL TYPE B ABOVE FINISHED PROFILE GRADE, THEN SEED, FERTILIZE, AND MULCH, AND INSTALL BIODEGRADABLE EROSION CONTROL BLANKET.



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	4		
	3		
	2		
	1		
Date	No	Revision	By

PROJECT ENGINEER \_\_\_\_\_ CRN  
DESIGNED/DRAWN \_\_\_\_\_ TLW  
INSPECTOR \_\_\_\_\_

DIR. PUBLIC WORKS \_\_\_\_\_ TAC  
CITY ENGINEER \_\_\_\_\_ RAR  
OPER. ENGINEER \_\_\_\_\_

**CITY OF BELLINGHAM, WASHINGTON**  
**PUBLIC WORKS DEPARTMENT**  
**ENGINEERING DIVISION**

SCALE	
Horiz.	1"=20'
Vert.	1"=10'

<b>DATUM</b>
NAD 83/98
NAVD 88

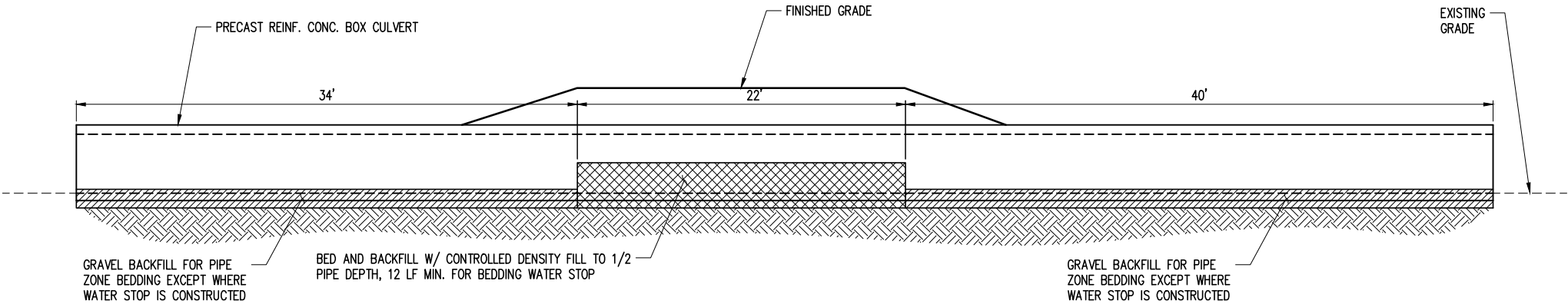
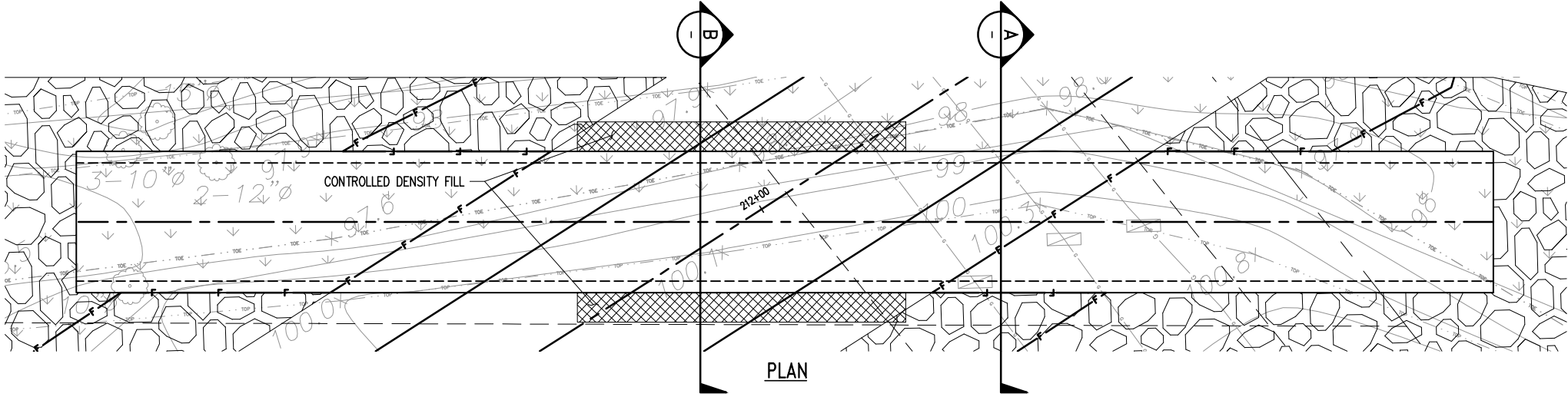
Job. No. 2013-0122  
Date 04/30/15  
Field Bk. \_\_\_\_\_

SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
JAMES STREET TO IRONGATE  
GRADING DETAIL AT WOODSTOCK INTERSECTION

SHEET  
43 OF  
44



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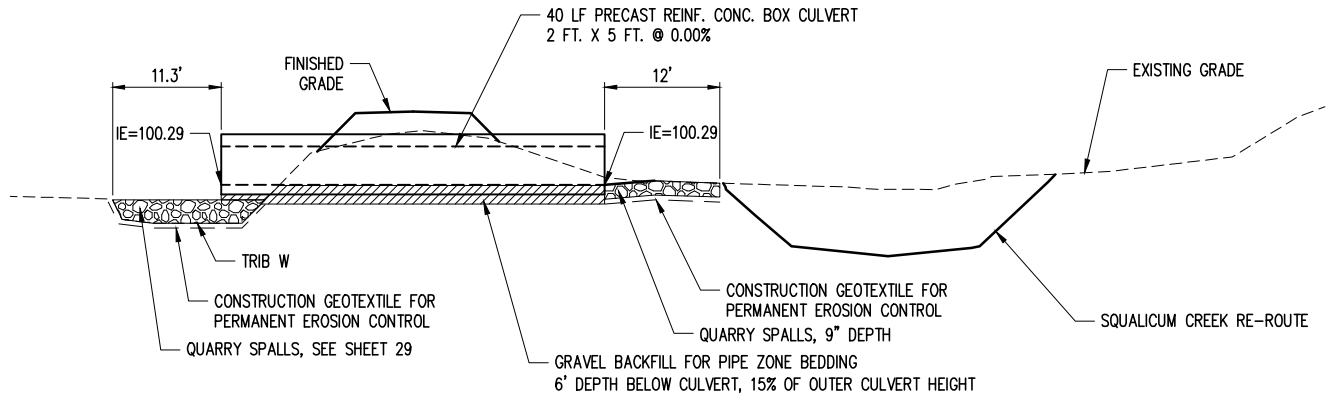


ELEVATION

PRECAST REINF. CONC. BOX CULVERT  
4 FT. X 8 FT.

1" = 5'

5  
39

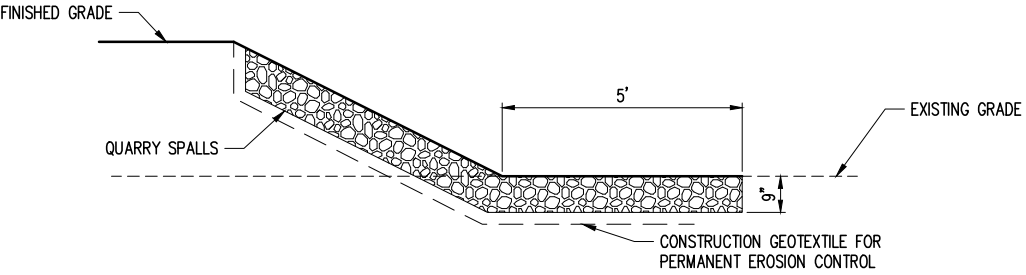


NOTE:  
1. BACKFILL WITH COMMON BORROW, INCL. HAUL.

EQUALIZER CULVERTS CROSSING PROFILE

NTS

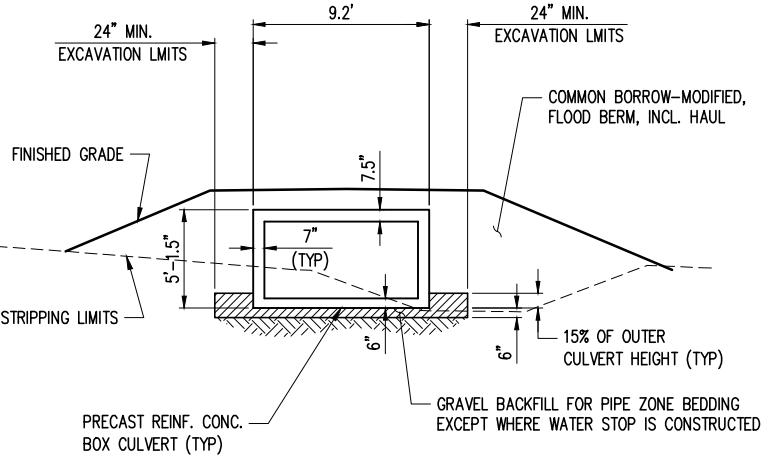
6  
40



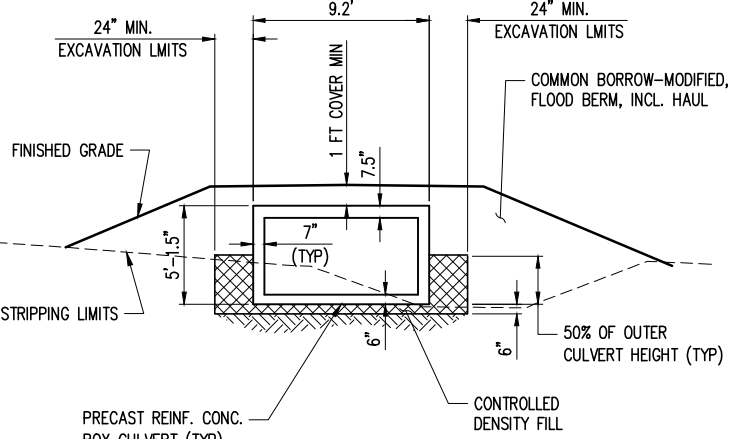
QUARRY SPALLS ON BIRCHWOOD LEVEE

NTS

7  
37



SECTION A



SECTION B



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4		
3		
2		
1		
Date	No.	Revision

PROJECT ENGINEER	CRN
DESIGNED/DRAWN	TLW
INSPECTOR	

DIR. PUBLIC WORKS	TAC
CITY ENGINEER	RAR
OPER. ENGINEER	

CITY OF BELLINGHAM, WASHINGTON  
PUBLIC WORKS DEPARTMENT  
ENGINEERING DIVISION

SCALE  
Horiz. AS NOTED  
Vert. NA

DATUM  
NAD 83/98  
NAVD 88

Job. No. 2013-0122  
Date 04/30/15  
Field Bk.

SQUALICUM CREEK RE-ROUTE HABITAT ENHANCEMENT PROJECT  
JAMES STREET TO IRONGATE  
CULVERT BERM DETAILS

SHEET  
44 OF  
44

CONTACT PERSON: Craig Mueller P.E., PROJECT ENGINEER AT 778-7900