

# WHATCOM COUNTY GENERAL NOTES

- ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT WSDOT/APWA STANDARD SPECIFICATIONS, WHATCOM 1. COUNTY DEVELOPMENT STANDARDS (WCDS), AND SHALL BE SUBJECT TO APPROVAL BY WHATCOM COUNTY PUBLIC WORKS DEPARTMENT - ENGINEERING DIVISION - PUBLIC WORKS ENGINEERING SERVICES (PWES).
- 2. DEVELOPER/CONTRACTOR/CONSULTING ENGINEER SHALL SCHEDULE A PRE-CONSTRUCTION CONFERENCE WITH THE PUBLIC WORKS ENGINEERING SERVICES PROJECT MANAGER A MINIMUM OF 3 WORKING DAYS PRIOR TO BEGINNING ANY WORK.
- NORMAL WORKING HOURS ARE 8:00 AM. TO 6:00 PM., MONDAY THROUGH FRIDAY. WORK DURING HOLIDAYS, WEEKENDS, 3. AND OUTSIDE THE NORMAL WORK HOURS REQUIRES PRIOR ARRANGEMENTS AND APPROVAL.
- 4. SIGHT DISTANCE REQUIRED AT ALL INTERSECTIONS PER WCDS CHAPTER 5.
- 5. A REVOCABLE ENCROACHMENT PERMIT SHALL BE OBTAINED PRIOR TO COMMENCING ANY WORK WITHIN COUNTY MAINTAINED ROAD RIGHTS-OF-WAY.
- THE CONTRACTOR SHALL CONTACT UTILITY LOCATION SERVICE 48 HOURS PRIOR TO STARTING WORK AT (800)424-5555 6. OR 811.
- 7. A COPY OF THE COUNTY-APPROVED DRAWINGS MUST BE ON THE JOB SITE WHENEVER WORK IS IN PROCESS.
- WHATCOM COUNTY RESERVES THE RIGHT TO INSPECT ALL WORK. THE CONTRACTOR SHALL CALL THE CONSULTING 8. ENGINEER AND THE PUBLIC WORKS ENGINEERING SERVICES PROJECT MANAGER AT (360)778-6220 AT LEAST 24 HOURS IN ADVANCE OF THE FOLLOWING WORK ITEMS: A. PLACEMENT OF TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES.
- B. PLACEMENT OF WATER, SANITARY SEWER, AND STORM DRAINAGE LINES AND BACKFILLING OF THESE LINES WITHIN COUNTY MAINTAINED ROAD RIGHTS-OF-WAY.
- C. PLACEMENT OF UNDERGROUND UTILITIES AND BACKFILLING WITHIN COUNTY MAINTAINED ROAD RIGHTS-OF-WAY.
- D. ROADWAY GRADING AT THE COMPLETION OF THE SUBGRADE, BALLAST, AND OF CRUSHED SURFACING.
- E. POURING OF CURB/GUTTER AND SIDEWALK. F. ASPHALT PAVING, AT THE BEGINNING OF PAVING.
- G. PRIOR TO PAVEMENT MARKING.
- H. OVERALL INSPECTION OF FINISHED SHOULDERS, DITCHES, PERMANENT SEEDING, ROAD SIGNAGE, MONUMENT PLACEMENT, CLEANING OF DRAINAGE SYSTEM AND CONSTRUCTION DEBRIS.
- I. ALL WORK REQUIRED TO RELEASE OF ANY POSTED SECURITY.
- 9. ALL TESTING REQUIRED FOR THE WORK SHALL BE THE RESPONSIBILITY OF THE OWNER AND SHALL BE IN CONFORMANCE WITH WCDS WITH RESPECT TO THE CONSULTING ENGINEER.
- 10. THE CONTRACTOR SHALL RIP RAP ALL CULVERT INLETS AND OUTLETS.
- 11. THE CONTRACTOR SHALL RESTORE ALL PRIVATE AND PUBLIC PROPERTY DISTURBED BY THE WORK IMMEDIATELY AFTER CONSTRUCTION. THE CONTRACTOR SHALL NOT LEAVE ANY PART OF THE ROAD USED BY OTHERS UN-PASSABLE WITHOUT NOTIFICATIONS AND AGREEMENT OF OTHER USERS.
- 12. ALL CUT AND FILL SLOPES SHALL BE MULCHED AND SEEDED FOR EROSION CONTROL. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SLOPE EROSION UNTIL VEGETATION IS FIRMLY ESTABLISHED.
- 13. CONTRACTOR SHALL SWEEP AND REMOVE ALL DEBRIS TRACKED ONTO EXISTING ROADS DURING ALL PHASES OF CONSTRUCTION.
- 14. ANY TREE, WHERE 1/3 OF THE ROOT SYSTEM IS DAMAGED BY WORK, SHALL BE REMOVED.
- 15. THE CONTRACTOR SHALL INFORM THE CONSULTING ENGINEER AND OBTAIN APPROVAL FROM WHATCOM COUNTY ENGINEERING DIVISION OF ANY PROPOSED CHANGES IN PLANS PRIOR TO IMPLEMENTATION OF THE CHANGE. THE CONTRACTOR SHALL KEEP RECORDS OF DEVIATIONS AND FORWARD TO THE ENGINEER OF RECORD AND WHATCOM COUNTY ENGINEERING DIVISION.
- 16. TRAFFIC CONTROL IS TO BE MAINTAINED IN ACCORDANCE WITH WSDOT/APWA STANDARD SPECIFICATIONS.
- 17. THE DEVELOPER/CONTRACTOR SHALL POST A WARRANTY SECURITY AS REQUIRED BY THE WHATCOM COUNTY DEVELOPMENT STANDARDS.
- 18. AN ENGINEER SHALL PROVIDE RECORD DRAWINGS PER WCDS 507.D.

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	DESCRIPTION	FOR :	SURVEY ABBRI	EVIATIONS SEE TO	POGRAPH	IIC SURVEY PAGE 2	<b>07</b>
1 COVER SHE 2 TOPOGRAPH		1'/1" AC	ONE FOOT/ONE INC ACRE	н	No./# 0.C.	NUMBER ON CENTER	
- 101 0010 %	IIC SURVEY PAGE 1 IIC SURVEY PAGE 2	AF# APPROX	AUDITORS FILE NUM APPROXIMATE	IBER	PC PCL	POINT OF CURVATURE PARCEL	M P A DESIGN
	IIC SURVEY PAGE 3	ASB/AB	AS-BUILT ASPHALT		PERF	PERFORATED POINT OF INTERSECTION	
5 OVERALL SI		ASPH BLDG	BUILDING		PIV POB	POST INDICATOR VALVE	
6 OVERALL SI	TE PLAN 30 SCALE-2	BMP BNDRY	BEST MANAGEMENT BOUNDARY		PP	POINT OF BEGINNING POWER POLE	
7 OVERALL SI	TE PLAN 30 SCALE-1	BVCS BVCE	BEGINNING OF VERT	TICAL CURVE STATION	PROP K	PROPERTY LENGTH OF VERTICAL CURVE PER	
8 OVERALL SI	TE PLAN – 100 SCALE	C CC	COMPACT PARKING CURB CUT	STALL	PT/POT	PERCENT GRADE DIFFERENCE POINT OF TANGENCY	
9 PLAN & PR	ROFILE STORM 2	CB CL	CATCH BASIN CENTERLINE		PÝC PVI	POLYVINYL CHLORIDE POINT OF VERTICAL INFLECTION	
	ROFILE – A1B-A1B'	CMP CNTRL	CORRUGATED METAL CONTROL	l PIPE	PWR	POWER RADIUS	2426
	ROFILE – A2–A2' & A3–A3'	CO	CLEANOUT		R/C RCP	REBAR WITH CAP REINFORCED CONCRETE PIPE	
	ROFILE – A4–A4' & A5–A5' ROFILE WATER–1	CPP CONC	CORRUGATED POLYE	ETHYLENE PIPE	RET	RETAINING	
	ROFILE WATER-2	CSTC	CRUSHED SURFACIN	IG TOP COURSE	RIM R/W	RIM RIGHT-OF-WAY (R.O.W.)	N CAR
	ROFILE WATER-3	CULV Ø	CULVERT DIAMETER		RPP S	REDUCED PRESSÙRE PRINCIPAL SOUTH	TAN IN GOOD
16 PLAN & PR	ROFILE WATER-4	DEMO DI	DEMOLITION DUCTILE IRON		SAN SCH	SANITARY SCHEDULE	
17 PROPOSED STRUCTURES	STORM BLDG 1 & CONTROL	DWGS	DRAWINGS EAST		SD SDCB	STORM DRAIN STORM DRAIN CATCH BASIN	
	ROFILE RAIL TO CONN PT	EA EL/ELEV	EACH ELEVATION		SDCO SDMH	STORM DRAIN CLEANOUT STORM DRAIN MAN HOLE	A starter
	EROSION & SEDIMENT CONTROL	ENC EP/EOP	REVOCABLE ENCROA		SERV STND/STD	SERVICE	SIGHT SI SIGHT
	R POLUTION PROTECTION PLAN	ESMT EVCS	EASEMENT END OF VERTICAL C		SSC0	STANDARD SANITARY SEWER SANITARY SEWER CLEANOUT	STONAL BNG
21 STORM DRA	IN DETAILS-1	EVCE	END OF VERTICAL C	CURVE ELEVATION	SSMH	SANITARY SEWER MANHOLE	10-23-20
	IN DETAILS-2	EX/EXIST FDC	EXISTING FIRE DEPARTMENT (		ST TBM	STREET TEMPORARY BENCH MARK	
	IN DETAILS-3	FFE/FF FG	FINISH FLOOR ELEV	AΠON	TC TEL/TELE	TOP OF CURB TELEPHONE	
24 WATER DETA		FH FND	FIRE HYDRANT FOUND		TESC	TEMPORARY EROSION & SEDIMENTATION CONTROL	
25 WATER DETA		GND GUTT	GROUND GUTTER		TP TS	TOP OF PAVEMENT TOP OF SIDEWALK	
26 STORM & 27 BASIN MAP	WATERMAIN STRUCTURES & PIPES	HP INV	HIGH POINT		TW TYP	TOP OF SIDE WALK TOP OF WALL TYPICAL	
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			$\backslash$			$\backslash$	YCLING SHEET 10-23-202
AE 2	SEE TOPOGRAPH	IC SURVEY	PAGE 2	SEETOP	OGRAPHI	C SURVEY PAGE 2	
	HORIZONTAL DATUM:			1. THIS TOPOGRAPHIC	C SURVEY WAS	PERFORMED FOR A.B.C.	
	WASHINGTON STATE PLANE, NORT	H ZONE NAD83/9	98	RECYCLING REALTY CO	ORP. IN APRIL (	DF 2021.	
ERLINE	BASIS OF COORDINATES: COORDI			2. BASIS OF BEARINGS	S IS NAD83/98	PER TIES TO CITY OF BELLINGHAM	
,	LOCAL GROUND VALUES, BASED U			CONTROL NETWORK,	PER THAT REC	ORD OF SURVEY RECORDED	RECY VER SI SET (10- MARINE
	NAD83/98 POSITION FOR THE BRAS	S DISK MONUME	ENT AT THE	UNDER WHATCOM CO	OUNTY AFN 20	71002449.	
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)GE	FOLLOWING PUBLISHED POSITION:					MENTS WERE COLLECTED USING	
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	EASTING = 1,234,329.448	USFT		SURVEY-GRADE GPS F	RECEIVER OPER	ATING IN NETWORKED RTK	
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ER LINE N EWER R OPTIC/COMM ERLINE RUB LINE RNER ARK T T ETION BOX JUNCTION BOX	BELLINGHAM CONTROL POINTS #29         DISK MONUMENT AT THE INTERSED         LOCUST AVENUE AND THE NORTH         THE DERIVED INVERSE BETWEEN S/         #2995 IS NORTH 48° 45' 36" WEST,         THE PUBLISHED POSITION FOR MO         NORTHING =       651,342.168         EASTING =       1,231,722.071         VERTICAL DATUM:         NAVD88         BASIS OF ELEVATIONS:       ELEVATION         UPON HOLDING THE PUBLISHED EL         BELLINGHAM BENCHMARK #5848,         AT THE TOP OF THE HEADWALL AT         ELDRIDGE AVENUE BRIDGE OVER LI         MONUMENT HAS THE FOLLOWING	CTION OF THE CEI MARGIN OF MAR AID MONUMENTS AT A DISTANCE ON NUMENT <u>#2995</u> USFT USFT USFT BEING A BRASS D THE NORTHWEST TTLE SQUALICUM PUBLISHED NAVI	ALUES, BASED TY OF DISK MONUMENT T END OF THE A CREEK. SAID	5. LOCATIONS OF UNI ACCORDING TO SURF CANNOT GUARANTEE AND THE EXTANT UTI 6. BARGAIN & SALE I CONTAINS USE RES RELEASE NOT DISCI NCS-1028029.	DERGROUND L ACE MARKS PR THE CORRESP LITIES. DEED NO. 202 TRICTIONS AN LOSED PER TI	TILITIES DEPICTED HEREON ARE OVIDED BY OTHERS. WILSON ONDENCE BETWEEN THE MARKS 1-0404007: THIS DOCUMENT ND AN ENVIRONMENTAL TLE COMMITMENT NO.	
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ER LINE N EWER R OPTIC/COMM ERLINE IRUB LINE RNER ARK T E CTION BOX JUNCTION BOX /E :R NT	BELLINGHAM CONTROL POINTS #29         DISK MONUMENT AT THE INTERSED         LOCUST AVENUE AND THE NORTH         THE DERIVED INVERSE BETWEEN S/         #2995 IS NORTH 48° 45' 36" WEST,         THE PUBLISHED POSITION FOR MO         NORTHING =       651,342.168         EASTING =       1,231,722.071         VERTICAL DATUM:         NAVD88         BASIS OF ELEVATIONS:       ELEVATION         UPON HOLDING THE PUBLISHED EL         BELLINGHAM BENCHMARK #5848,         AT THE TOP OF THE HEADWALL AT         ELDRIDGE AVENUE BRIDGE OVER LI         MONUMENT HAS THE FOLLOWING	CTION OF THE CEI MARGIN OF MAR AID MONUMENTS AT A DISTANCE ONUMENT #2995 USFT USFT USFT IS ARE NAVD88 V EVATION FOR CIT BEING A BRASS D THE NORTHWEST TTLE SQUALICUN PUBLISHED NAVI	ALUES, BASED TY OF DISK MONUMENT T END OF THE A CREEK. SAID D88 ELEVATION:	5. LOCATIONS OF UNI ACCORDING TO SURF CANNOT GUARANTEE AND THE EXTANT UTI 6. BARGAIN & SALE I CONTAINS USE RES RELEASE NOT DISCI NCS-1028029.	DERGROUND L ACE MARKS PR THE CORRESP LITIES. DEED NO. 202 TRICTIONS AN LOSED PER TI	TILITIES DEPICTED HEREON ARE OVIDED BY OTHERS. WILSON ONDENCE BETWEEN THE MARKS 1-0404007: THIS DOCUMENT ND AN ENVIRONMENTAL TLE COMMITMENT NO.	Image: Second state   Image: Second state <tr< th=""></tr<>
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ER LINE N EWER A OPTIC/COMM ERLINE RUB LINE RNER LT ERUNCTION BOX JUNCTION BOX /E ER NT	BELLINGHAM CONTROL POINTS #29         DISK MONUMENT AT THE INTERSED         LOCUST AVENUE AND THE NORTH         THE DERIVED INVERSE BETWEEN S/         #2995 IS NORTH 48° 45' 36" WEST,         THE PUBLISHED POSITION FOR MO         NORTHING =       651,342.168         EASTING =       1,231,722.071         VERTICAL DATUM:         NAVD88         BASIS OF ELEVATIONS:       ELEVATION         UPON HOLDING THE PUBLISHED EL         BELLINGHAM BENCHMARK #5848,         AT THE TOP OF THE HEADWALL AT         ELDRIDGE AVENUE BRIDGE OVER LI         MONUMENT HAS THE FOLLOWING	CTION OF THE CEI MARGIN OF MAR AID MONUMENTS AT A DISTANCE ONUMENT #2995 USFT USFT USFT IS ARE NAVD88 V EVATION FOR CIT BEING A BRASS D THE NORTHWEST TTLE SQUALICUN PUBLISHED NAVI	ALUES, BASED TY OF DISK MONUMENT T END OF THE A CREEK. SAID D88 ELEVATION:	5. LOCATIONS OF UNI ACCORDING TO SURF CANNOT GUARANTEE AND THE EXTANT UTI 6. BARGAIN & SALE I CONTAINS USE RES RELEASE NOT DISCI NCS-1028029.	DERGROUND L ACE MARKS PR THE CORRESP LITIES. DEED NO. 202 TRICTIONS AN LOSED PER TI	TILITIES DEPICTED HEREON ARE OVIDED BY OTHERS. WILSON ONDENCE BETWEEN THE MARKS 1-0404007: THIS DOCUMENT ND AN ENVIRONMENTAL TLE COMMITMENT NO.	Image: Signed part
ER LINE N EWER R OPTIC/COMM ERLINE RUB LINE RNER ARK ARK JUNCTION BOX JUNCTION BOX ZE CTION BOX JUNCTION BOX A KE RNER	BELLINGHAM CONTROL POINTS #29         DISK MONUMENT AT THE INTERSED         LOCUST AVENUE AND THE NORTH         THE DERIVED INVERSE BETWEEN S/         #2995 IS NORTH 48° 45' 36" WEST,         THE PUBLISHED POSITION FOR MO         NORTHING =       651,342.168         EASTING =       1,231,722.071         VERTICAL DATUM:         NAVD88         BASIS OF ELEVATIONS:       ELEVATION         UPON HOLDING THE PUBLISHED EL         BELLINGHAM BENCHMARK #5848,         AT THE TOP OF THE HEADWALL AT         ELDRIDGE AVENUE BRIDGE OVER LI         MONUMENT HAS THE FOLLOWING	CTION OF THE CEI MARGIN OF MAR AID MONUMENTS AT A DISTANCE ON NUMENT #2995 USFT USFT USFT USFT IS ARE NAVD88 V EVATION FOR CIT BEING A BRASS D THE NORTHWEST TTLE SQUALICUM PUBLISHED NAVI	ALUES, BASED TY OF DISK MONUMENT T END OF THE A CREEK. SAID D88 ELEVATION:	5. LOCATIONS OF UNI ACCORDING TO SURF CANNOT GUARANTEE AND THE EXTANT UTI 6. BARGAIN & SALE I CONTAINS USE RES RELEASE NOT DISCI NCS-1028029.	DERGROUND L ACE MARKS PR THE CORRESP LITIES. DEED NO. 202 TRICTIONS AN LOSED PER TI	TILITIES DEPICTED HEREON ARE OVIDED BY OTHERS. WILSON ONDENCE BETWEEN THE MARKS 1-0404007: THIS DOCUMENT ND AN ENVIRONMENTAL TLE COMMITMENT NO.	Image: Sige       Image: Sige
ER LINE N EWER R OPTIC/COMM ERLINE IRUB LINE	BELLINGHAM CONTROL POINTS #20 DISK MONUMENT AT THE INTERSEC LOCUST AVENUE AND THE NORTH THE DERIVED INVERSE BETWEEN SA #2995 IS NORTH 48° 45' 36" WEST, THE PUBLISHED POSITION FOR MO NORTHING = 651,342.168 EASTING = 1,231,722.071 VERTICAL DATUM: NAVD88 BASIS OF ELEVATIONS: ELEVATION UPON HOLDING THE PUBLISHED EL BELLINGHAM BENCHMARK #5848, AT THE TOP OF THE HEADWALL AT ELDRIDGE AVENUE BRIDGE OVER LI MONUMENT HAS THE FOLLOWING ELEVATION = 67.42 FEET	CTION OF THE CEI MARGIN OF MAR AID MONUMENTS AT A DISTANCE ON NUMENT #2995 USFT USFT USFT USFT IS ARE NAVD88 V EVATION FOR CIT BEING A BRASS D THE NORTHWEST TTLE SQUALICUM PUBLISHED NAVI	ALUES, BASED TY OF DISK MONUMENT T END OF THE A CREEK. SAID D88 ELEVATION: TODATUM SECTION 23	5. LOCATIONS OF UNI ACCORDING TO SURF CANNOT GUARANTEE AND THE EXTANT UTI 6. BARGAIN & SALE I CONTAINS USE RES RELEASE NOT DISCINCS-1028029.	DERGROUND L ACE MARKS PR THE CORRESP LITIES. DEED NO. 202 TRICTIONS AN LOSED PER TI	TILITIES DEPICTED HEREON ARE OVIDED BY OTHERS. WILSON ONDENCE BETWEEN THE MARKS 1-0404007: THIS DOCUMENT ND AN ENVIRONMENTAL TLE COMMITMENT NO.	Image: Signed part
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ER LINE N EWER R OPTIC/COMM ERLINE RUB LINE RNER ARK ARK ARK JUNCTION BOX JUNCTION BOX ZE R NT N CATCH BASIN EWER MANHOLE TREE	BELLINGHAM CONTROL POINTS #20 DISK MONUMENT AT THE INTERSEC LOCUST AVENUE AND THE NORTH THE DERIVED INVERSE BETWEEN SA #2995 IS NORTH 48° 45' 36" WEST, THE PUBLISHED POSITION FOR MO NORTHING = 651,342.168 EASTING = 1,231,722.071 VERTICAL DATUM: NAVD88 BASIS OF ELEVATIONS: ELEVATION UPON HOLDING THE PUBLISHED EL BELLINGHAM BENCHMARK #5848, AT THE TOP OF THE HEADWALL AT ELDRIDGE AVENUE BRIDGE OVER LI MONUMENT HAS THE FOLLOWING ELEVATION = 67.42 FEET	CTION OF THE CEI MARGIN OF MAR AID MONUMENTS AT A DISTANCE ON NUMENT #2995 USFT USFT USFT USFT IS ARE NAVD88 V EVATION FOR CIT BEING A BRASS D THE NORTHWEST TTLE SQUALICUM PUBLISHED NAVI	ALUES, BASED TY OF DISK MONUMENT T END OF THE A CREEK. SAID D88 ELEVATION: TODATUM SECTION 23	5. LOCATIONS OF UNI ACCORDING TO SURF CANNOT GUARANTEE AND THE EXTANT UTI 6. BARGAIN & SALE I CONTAINS USE RES RELEASE NOT DISCINCS-1028029.	DERGROUND L ACE MARKS PR THE CORRESP LITIES. DEED NO. 202 TRICTIONS AN LOSED PER TI	TILITIES DEPICTED HEREON ARE OVIDED BY OTHERS. WILSON ONDENCE BETWEEN THE MARKS 1-0404007: THIS DOCUMENT ND AN ENVIRONMENTAL TLE COMMITMENT NO.	Image: Signed part

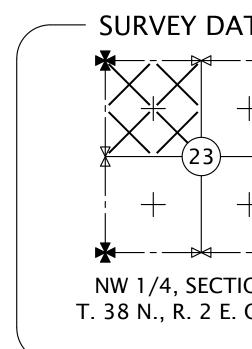
# PLANS LEGEND

EXISTING WETLANDS		PHIC SURVEY PAGE 2 CALE MAY VARY
PROPOSED STORM PIPE		
		= RIGHT-OF-WAY
PROPOSED WATER EASEMENT		= RIGHT-OF-WAY CENTERLINE
PROPOSED WATER LINE		= PROPERTY BOUNDARY
POND BOTTOM ELEVATION 74.0'		= EASEMENT
POND FILL TO DAYLIGHT		= EXISTING GRAVEL EDGE
PROPOSED PARKING		= EXISTING ASPHALT EDGE
		= EXISTING CONCRETE EDGE
PROPOSED GRAVEL	7//////////////////////////////////////	= EXISTING BUILDING
EXISTING PROPERTY LINE	 	= EXISTING BUILDING OVERHANG
EXISTING RIGHT OF WAGE	 x	= EXISTING COLVERT
		= EXISTING PLACE
EXISTING RIGHT OF WAY		
	D D D D	
	ss	
EXISTING RAILROAD		= EXISTING BURIED FIBER OPTIC/COMM
	GG	
EXISTING ASPHALT	ww	
		= EXISTING DITCH CENTERLINE
EXISTING WATER LINE	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	= EXISTING TREE OR SHRUB LINE
EXISTING CURB	•	= FOUND PROPERTY CORNER
EXISTING STORM LINE	۲	= FOUND BRASS DISK
EXISTING EASEMENT	<del>\$</del>	= TEMPORARY BENCH MARK
	Δ	= TRAVERSE POINT
PROPOSED BUILDINGS	Ρ	= EXISTING POWER VAULT
	-0-	= EXISTING UTILITY POLE
	$\boxtimes$	= EXISTING POWER JUNCTION BOX
PROPOSED CONCRETE	$\boxtimes$	= EXISTING TELE/COMM JUNCTION BOX
	$\bowtie$	= EXISTING WATER VALVE
Q Delineated Extent Fill	Ħ	= EXISTING WATER METER
	-0-	= EXISTING FIRE HYDRANT
ROPOSED VEGETATION PLANTINGS	Д.	= EXISTING SIGN
	0	= EXISTING BOULDER
		= EXISTING STORM DRAIN CATCH BASIN
0' & 100' SETBACKS	0	= EXISTING SANITARY SEWER MANHOLE
	Ř	= EXISTING CONIFEROUS TREE
ELANE	· _	

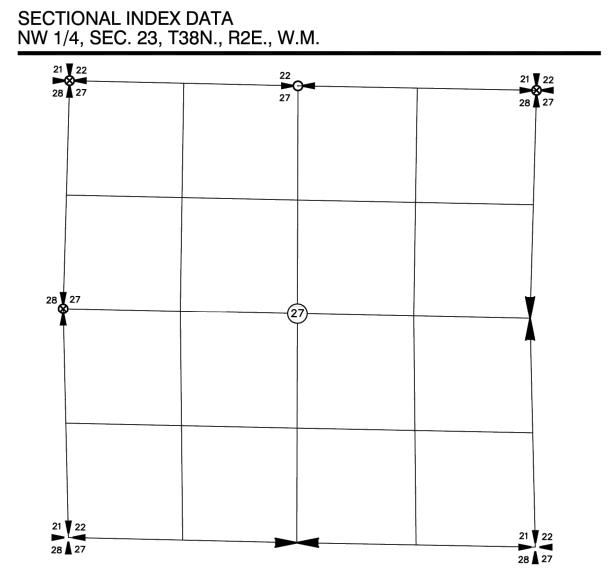
SURVEY LEGEND

NORTHING =	649,056.361	USFT
EASTING =	1,234,329.448	USFT

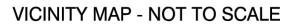
NORTHING =	651,342.168	USFT
FASTING =	1 231 722 071	LISET

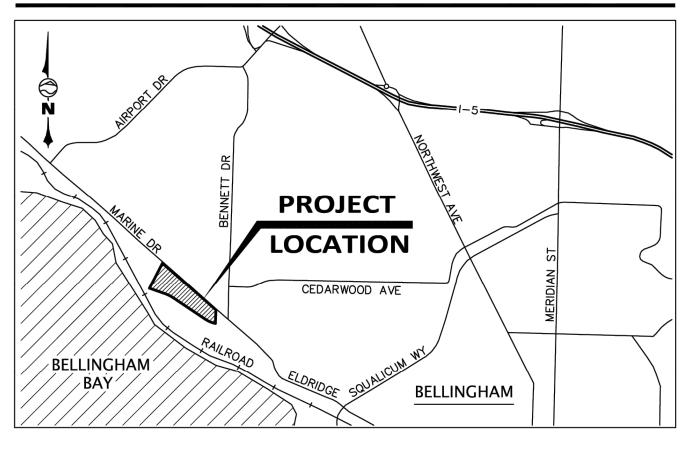


AQ Wetland Delineation Buffers



XX QTR - XX QTR, SEC. XX, TWNSHP XX NORTH, R XX EAST, W.M. XX QTR - XX QTR, SEC. XX, TWNSHP XX NORTH, R XX EAST, W.M. XX QTR - XX QTR, SEC. XX, TWNSHP XX NORTH, R XX EAST, W.M.





# INDEX TO DRAWINGS

SHEET 1	W.A.C. 332-130 COMPLIANCE SHEET
SHEET 2	TOPOGRAPHIC SURVEY

SHEET 3 TOPOGRAPHIC SURVEY

# SURVEYOR'S CERTIFICATE

I HEREBY CERTIFY THAT I AM A LICENSED LAND SURVEYOR IN THE STATE OF WASHINGTON, THAT THIS MAP IS BASED ON AN ACTUAL FIELD SURVEY DONE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT ALL DATA SHOWN HEREON ACTUALLY EXISTS IN THE LOCATIONS SHOWN AT THE TIME OF THIS SURVEY. THIS TOPOGRAPHIC MAP WAS DONE AT THE REQUEST OF ABC RECYCLING IN 2021.

JOHN THOMAS BREWSTER, P.L.S. NO. 44335

DATE

5-7-2021

DESCRIBED AS FOLLOWS:

LEGAL DESCRIPTION

COMMENCING AT THE BRASS SURFACE MONUMENT MARKING THE INTERSECTION OF LOCUST AVENUE WITH THE NORTH MARGIN OF MARINE DRIVE, SAID MONUMENT BEING THAT CADASTRAL SURVEY MONUMENT DESIGNATED NO. 2995, PER THAT RECORD OF SURVEY OF THE CITY OF BELLINGHAM 2005 HORIZONTAL CONTROL NETWORK, PER THE MAP THEREOF RECORDED UNDER WHATCOM COUNTY AUDITOR'S FILE NO. 2071002449; THENCE SOUTH 48°45'40" EAST, NOMINALLY ALONG SAID NORTH MARGIN OF MARINE DRIVE, 3467.57 FEET, TO THE BRASS-DISK MONUMENT MARKING THE INTERSECTION OF THE CENTERLINE OF WEST ILLINOIS STREET WITH THE NORTH MARGIN OF MARINE DRIVE, SAID MONUMENT BEING THAT CITY OF BELLINGHAM CADASTRAL SURVEY MONUMENT DESIGNATED NO. 2998, PER THE AFOREMENTIONED CONTROL NETWORK RECORD OF SURVEY; THENCE NORTH 48°44'10" WEST, ALONG SAID NORTH MARGIN AS CALCULATED IN RELIANCE UPON THAT CITY OF BELLINGHAM RECORD OF SURVEY OF MARINE DRIVE SEWER AND IMPROVEMENTS RECORDED AS RS-3308 IN THE RECORDS OF THE CITY OF BELLINGHAM, DATED MARCH 15, 2012, A DISTANCE OF 926.92 FEET; THENCE NORTH 48°44'11" WEST, CONTINUING ALONG THE NORTH MARGIN OF MARINE DRIVE PER SAID CITY OF BELLINGHAM RECORD OF SURVEY, 408.32 FEET: THENCE NORTH 48°46'35" WEST. CONTINUING ALONG THE NORTH MARGIN OF MARINE DRIVE PER SAID CITY OF BELLINGHAM RECORD OF SURVEY, 25.45 FEET, TO A POINT AT THE INTERSECTION OF SAME WITH THE EAST BOUNDARY OF THE COMPTON DONATION LAND CLAIM, AND THE HERE COINCIDENT WEST BOUNDARY OF THE ELDRIDGE DONATION LAND CLAIM. PER SAID SURVEY;

THENCE SOUTH 01°47'30" WEST, ALONG SAID COINCIDENT COMPTON DONATION LAND CLAIM AND ELDRIDGE DONATION LAND CLAIM BOUNDARY. 77.70 FEET. TO A POINT AT THE INTERSECTION OF SAME WITH THE SOUTH MARGIN OF MARINE DRIVE, SAID POINT BEING THE NORTH-MOST CORNER COMMON TO THE PARCEL ORIGINALLY CONVEYED ACCORDING TO STATUTORY WARRANTY DEED NO. 148000 AND TO THE PARCEL CONVEYED ACCORDING TO THAT QUIT CLAIM DEED RECORDED UNDER WHATCOM COUNTY AUDITOR'S FILE NO. 2111103174, SAID POINT BEING THE **TRUE POINT OF** BEGINNING:

THENCE SOUTH 01°47'30" WEST, CONTINUING ALONG SAID COINCIDENT COMPTON DONATION LAND CLAIM AND ELDRIDGE DONATION LAND CLAIM BOUNDARY, 336.98 FEET, TO A POINT AT THE INTERSECTION OF SAME WITH AN OFFSET LINE PARALLEL AND/OR CONCENTRIC WITH, THE CENTERLINE OF AN EXTANT BURLINGTON-NORTHERN SANTA-FE (BNSF) SPUR-LINE RAILROAD TRACK, AS CONSTRUCTED, AND SAID POINT OF INTERSECTION BEING AT THE BEGINNING OF A NON-TANGENT CURVE, CONCAVE TO THE NORTH, HAVING A RADIUS OF 700.00 FEET, AND FROM SAID POINT OF INTERSECTION THE CURVE'S INITIAL RADIAL BEARS NORTH 10°41'48" EAST;

THENCE SOUTH AND WEST, ALONG SAID OFFSET LINE AND NON-TANGENT CURVE, THROUGH A CENTRAL ANGLE OF 22°59'14", AN ARC LENGTH OF 280.84, TO A POINT ON SAID OFFSET LINE FROM WHICH THE CURVE'S CLOSING RADIAL BEARS NORTH 33°41'02" EAST: THENCE NORTH 56°18'58" WEST, ALONG SAID OFFSET LINE, 972.62 FEET, TO A POINT AT THE BEGINNING OF A NONTANGENT CURVE, CONCAVE TO THE SOUTH, HAVING A RADIUS OF 810.00 FEET, AND FROM SAID POINT OF BEGINNING THE CURVE'S INITIAL RADIAL BEARS SOUTH 33°42'04" WEST;

THENCE WEST AND SOUTH, ALONG SAID OFFSET LINE AND NON-TANGENT CURVE, THROUGH A CENTRAL ANGLE OF 14°23'56", AN ARC LENGTH OF 203.56 FEET, TO A POINT FROM WHICH THE CURVE'S CLOSING RADIAL BEARS SOUTH 19°18'07" WEST;

THENCE NORTH 70°42'09" WEST, ALONG SAID OFFSET LINE, 431.39 FEET, TO A POINT AT THE INTERSECTION OF SAME WITH THE BOUNDARY LINE COMMON TO THAT PORTION OF THE COMPTON DONATION LAND CLAIM ORIGINALLY CONVEYED AS THE RICKERSON AND BOOKER TRACT, PER WHATCOM COUNTY AUDITOR'S FILE NO. 56428, AND TO THAT PORTION OF SAID DONATION LAND CLAIM ORIGINALLY CONVEYED AS THE CHAMPION MCDONALD TRACT (JULY 20, 1909), AND SAID POINT OF INTERSECTION BEARS SOUTH 05°14'11" WEST, 928.84 FEET DISTANT, FROM THE CITY OF BELLINGHAM CADASTRAL CONTROL MONUMENT NO. 2995;

THENCE NORTH 27°16'09" EAST, ALONG SAID COMMON BOUNDARY, 712.59 FEET, TO A POINT AT THE INTERSECTION OF SAME WITH THE SOUTH MARGIN OF MARINE DRIVE;

THENCE SOUTH 48°46'35" EAST ALONG SAID SOUTH MARGIN, 1782.27 FEET, TO A POINT AT THE INTERSECTION OF SAME WITH THE BOUNDARY COMMON TO THE COMPTON DONATION LAND CLAIM AND THE ELDRIDGE DONATION LAND CLAIM, SAID POINT BEING THE **TRUE POINT OF** BEGINNING AND TERMINUS OF THIS DESCRIBED ADJUSTED PARCEL OF LAND.

SITUATE IN WHATCOM COUNTY, WASHINGTON.

# SURVEYOR'S NOTES

1. THIS TOPOGRAPHIC SURVEY WAS PERFORMED FOR A.B.C. RECYCLING REALTY CORP. IN APRIL OF 2021.

2. BASIS OF BEARINGS IS NAD83/98 PER TIES TO CITY OF BELLINGHAM CONTROL NETWORK, PER THAT RECORD OF SURVEY RECORDED UNDER WHATCOM COUNTY AFN 2071002449.

3. MONUMENTATION SHOWN HEREON WAS RECOVERED DURING THE COURSE OF THIS SURVEY, UNLESS OTHERWISE NOTED.

4. ANGULAR AND LINEAR MEASUREMENTS WERE COLLECTED USING A COMBINATION OF GPS AND CONVENTIONAL METHODOLOGIES. PRIMARY CONTROL WAS COLLECTED USING A TRIMBLE R10 SURVEY-GRADE GPS RECEIVER OPERATING IN NETWORKED RTK MODE. FROM GPS CONTROL, A TRIMBLE S-6 ROBOTIC TOTAL STATION WAS USED TO TIE SECONDARY CONTROL POINTS AND COLLECT TOPOGRAPHIC DATA. ORTHO-RECTIFIED PHOTOGRAPHY CAPTURED WITH AN UNMANNED AERIAL VEHICLE WAS USED TO DELINEATE CERTAIN FEATURES, INCLUDING THE EXTENTS OF STOCKPILES ON-SITE.

5. LOCATIONS OF UNDERGROUND UTILITIES DEPICTED HEREON ARE ACCORDING TO SURFACE MARKS PROVIDED BY OTHERS. WILSON CANNOT GUARANTEE THE CORRESPONDENCE BETWEEN THE MARKS AND THE EXTANT UTILITIES.

6. BARGAIN & SALE DEED NO. 2021-0404007: THIS DOCUMENT CONTAINS USE RESTRICTIONS AND AN ENVIRONMENTAL RELEASE NOT DISCLOSED PER TITLE COMMITMENT NO. NCS-1028029.



# ABC RECYCLING

# MARINE DRIVE PLANT W.A.C. 332–130 COMPLIANCE SHEET

A TRACT OF LAND LYING WITHIN THE COMPTON DONATION LAND CLAIM, SECTION 23, TOWNSHIP 38 NORTH, RANGE 2 EAST OF WILLAMETTE MERIDIAN IN WHATCOM COUNTY, STATE OF WASHINGTON.

1	Call 811 two business days before you dig

# CONTROL NOTES

**HORIZONTAL DATUM:** WASHINGTON STATE PLANE, NORTH ZONE NAD83/98

BASIS OF COORDINATES: COORDINATION AND MENSURATION ARE LOCAL GROUND VALUES, BASED UPON HOLDING THE PUBLISHED NAD83/98 POSITION FOR THE BRASS DISK MONUMENT AT THE INTERSECTION OF THE CENTERLINE OF TIMPSON WAY AND THE NORTH MARGIN OF MARINE DRIVE, PUBLISHED AS CITY OF BELLINGHAM CONTROL POINT #2998. SAID MONUMENT HAS THE FOLLOWING PUBLISHED POSITION:

NORTHING =	649,056.361	USFT
EASTING =	1,234,329.448	USFT

BASIS OF BEARINGS: BEARINGS ARE NAD83/98, BASED UPON HOLDING THE PUBLISHED POSITIONS MONUMENTED BY CITY OF BELLINGHAM CONTROL POINTS #2998 AND #2995, BEING A BRASS DISK MONUMENT AT THE INTERSECTION OF THE CENTERLINE OF LOCUST AVENUE AND THE NORTH MARGIN OF MARINE DRIVE.

THE DERIVED INVERSE BETWEEN SAID MONUMENTS #2998 AND #2995 IS NORTH 48° 45' 36" WEST, AT A DISTANCE OF 3,467.47 USFT. THE PUBLISHED POSITION FOR MONUMENT #2995 IS:

NORTHING =	651,342.168	USFT
EASTING =	1,231,722.071	USFT

VERTICAL DATUM: NAVD88

BASIS OF ELEVATIONS: ELEVATIONS ARE NAVD88 VALUES, BASED UPON HOLDING THE PUBLISHED ELEVATION FOR CITY OF BELLINGHAM BENCHMARK #5848, BEING A BRASS DISK MONUMENT AT THE TOP OF THE HEADWALL AT THE NORTHWEST END OF THE ELDRIDGE AVENUE BRIDGE OVER LITTLE SQUALICUM CREEK. SAID MONUMENT HAS THE FOLLOWING PUBLISHED NAVD88 ELEVATION: ELEVATION = 67.42 FEET

# W.A.C. 332-130-145 REQUIRED DATA

- 1.E: THIS SURVEY WAS PREPARED UNDER THE DIRECT SUPERVISION OF:
  - J. THOMAS BREWSTER, WA PLS #44335 SURVEY MANAGER / PRINCIPAL WILSON ENGINEERING LLC 805 DUPONT STREET, SUITE 7 BELLINGHAM, WA 98225 360-733-6100 (EXT. 231) tbrewster@wilsonengineering.com
- 2.A: BASIS OF ELEVATIONS: ELEVATION VALUES AND CONTOURS DEPICTED ON THIS SURVEY ARE BASED UPON HOLDING AS FIXED THE NAVD88 DATUM, PER WSDOT BENCHMARK BM 29020-22. AS PUBLISHED BY THE WSDOT SURVEY MONUMENT ON-LINE DATABASE.
- 2.B: PURPOSE OF SURVEY: WILSON ENGINEERING PERFORMED THIS SURVEY DURING APRIL OF 2021, AT THE REQUEST OF ALPINE ENGINEERING AND ABC RECYCLING PURSUANT TO SITE IMPROVEMNT DESIGN. THIS SURVEY WAS PREPARED WITHOUT THE BENEFIT OF A TITLE REPORT, AND THE DEPICTED PARCEL BOUNDARIES SHOULD NOT BE CONSIDERED TO BE COMPREHENSIVE.
- 2.C: SOURCE OF CONTOURS: THE CONTOURS DEPICTED ON THIS SURVEY WERE DERIVED BASED ON DIRECT FIELD OBSERVATIONS.
- 2.D: CONTOUR INTERVAL LABELING: MAJOR CONTOURS AT 5-FOOT INTERVALS HAVE BEEN EXPLICITLY LABELED.
- 2.E: DESCRIPTION OF BENCHMARKS SET PURSUANT TO THIS SURVEY: REFER TO THE ACCOMPANYING "CONTROL TABLE" FOR COORDINATES, ELEVATION, AND DESCRIPTION OF ON-SITE CONTROL SET PURSUANT TO THIS SURVEY.
- 2.F: ELEVATION AND/OR CONTOUR ACCURACY: IF CONTOURS HAVE BEEN DEPICTED ON THE FACE OF THIS SURVEY, IT IS ANTICIPATED THAT 90% OF ANY MEASURED ELEVATION VALUE, IF OBSERVED RELATIVE TO THE CONTROL POINTS SPECIFICALLY ENUMERATED IN THE ACCOMPANYING CONTROL TABLE, WILL BE, IN FACT, WITHIN ONE-HALF OF THE MINOR-CONTOUR INTERVAL DEPICTED HEREON. SPECIFIC ELEVATIONS DEPICTED HEREON, IF ANY, ARE EXPECTED TO BE WITHIN ONE INTEGRAL VALUE OF THE FINAL DEPICTED SIGNIFICANT FIGURE. THAT IS, 90% OF ELEVATIONS EXPRESSED TO THE TENTH-FOOT, SHOULD BE WITHIN 0.1 FEET OF THAT VALUE, IF OBSERVED RELATIVE TO THE SURVEY CONTROL SPECIFICALLY ENUMERATED IN THE ACCOMPANYING CONTROL TABLE. IF OFF-SITE CONTROL IS EMPLOYED, EVEN CONTROL PURPORTING TO BE ON THE SAME DATUM OR BASED ON THE SAME OFF-SITE BENCHMARK, THEN NO ABSOLUTE STATEMENT REGARDING THE ACCURACY OF THE DEPICTED POINTS CAN BE MADE, AND VALUES SO OBSERVED ARE OUTSIDE OF THIS SURVEY'S AUTHORITY OR INTEREST.
- 2.G: SOURCE OF CONTROLLING BOUNDARY INFORMATION: THE OWNERSHIP BOUNDARIES DEPICTED ON THIS SURVEY ARE BASED UPON SOME, OR ALL, OF THE DOCUMENTS ENUMERATED IN THE ACCOMPANYING "REFERENCE DOCUMENTS" AS THEREIN CHARACTERIZED. BEARINGS HAVE BEEN TRANSLATED AND/OR ROTATED FROM THE RECORD VALUES TO FIT MONUMENTATION FOUND DURING THE COURSE OF THIS SURVEY.
- 3.A: SOURCE OF DEPICTED UTILITY INFORMATION: UTILITY LINES DEPICTED ON THIS SURVEY ARE BASED UPON PAINT MARKS SET BY UTILITY-LOCATE PROFESSIONALS DISPATCHED BY THE WASHINGTON "ONE-CALL" UTILITY LOCATE CENTER.
- 3.B: ACCURACY OF DEPICTED UTILITY INFORMATION: WILSON ENGINEERING DOES NOT PROVIDE FOR-HIRE UTILITY LOCATION AND/OR MARKING SERVICES, AND CAN NOT INDEPENDENTLY ASCERTAIN THE ACCURACY OF ANY DEPICTED UTILITY THAT WAS NOT DIRECTLY OBSERVED IN THE COURSE OF THIS SURVEY.
- 3.C: STATEMENT OF LIMITATIONS REGARDING UTILITY-DEPICTION ACCURACY: ALPINE ENGINEERING AND ABC RECYCLING HAVE BEEN NOTIFIED THAT WILSON CAN NOT, AND DOES NOT, GUARANTEE THE ACCURACY, AT ANY LEVEL, OF DEPICTED UTILITIES BASED ON THIRD-PARTY PAINT MARKS OR RECORD INFORMATION

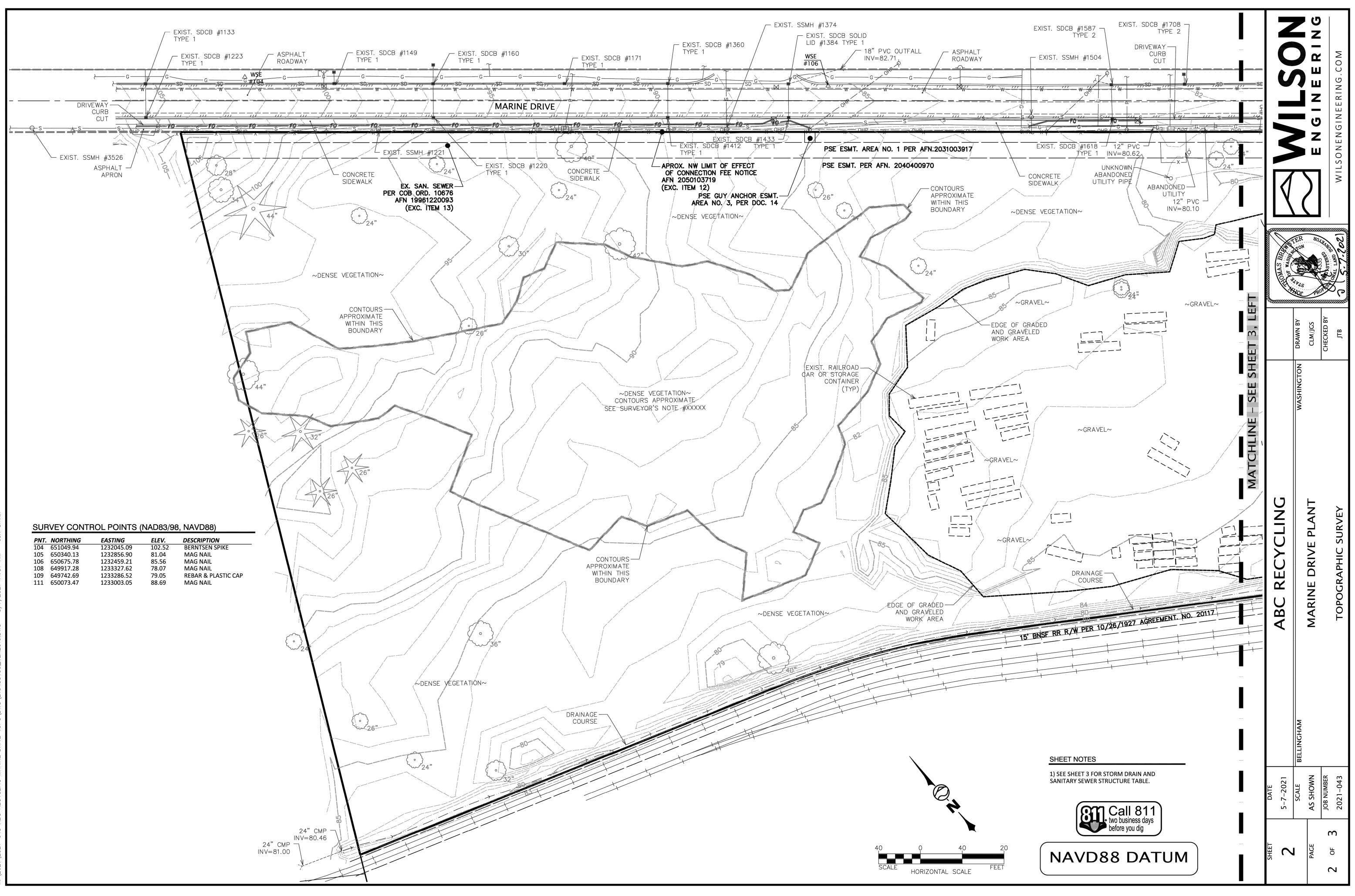
## ABBREVIATIONS USED

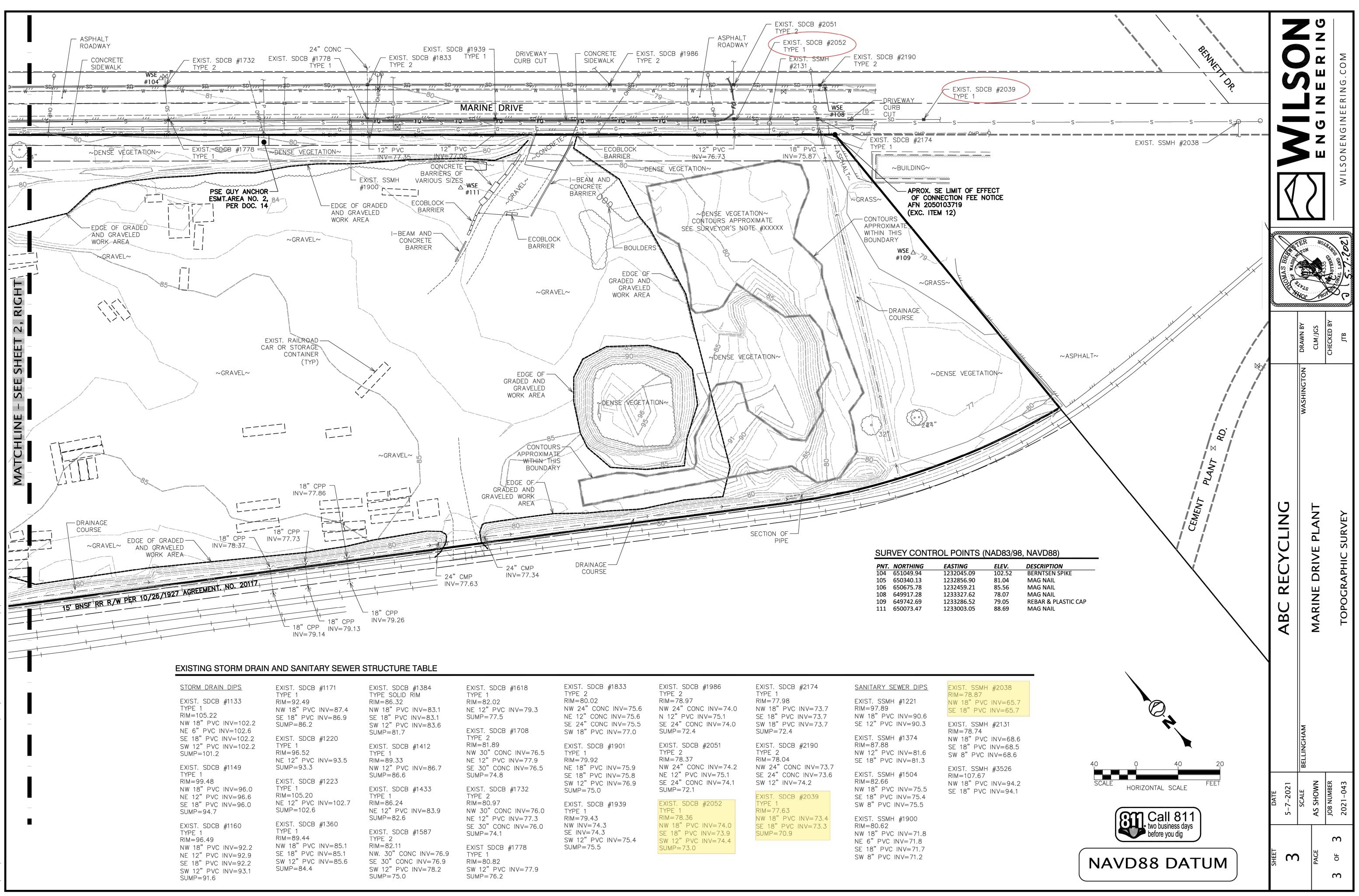
AFN = AUDITOR'S FILE NUMBER ASM = ALUMINUM SURFACE MONUMENT	
CONC = CONCRETE	. –
CPP = CORRUGATED POLYETHYLENE PIF	Έ
DLC = DONATION LAND CLAIM	
E = EAST	
ELEV = ELEVATION	
FND = FOUND	
INT = INTERSECTION	
INV = INVERT	
L = LENGTH	
MON = MONUMENT	
N = NORTH	
NE = NORTHEAST	
NW = NORTHWEST	
R = RADIUS	
R/W = RIGHT - OF - WAY	
S = SOUTH	
SE = SOUTHEAST	
SW = SOUTHWEST	
TYP = TYPICAL	
W = WEST	
WAC = WASHINGTON CODE	
WSE = WILSON SURVEY/ENGINEERING	

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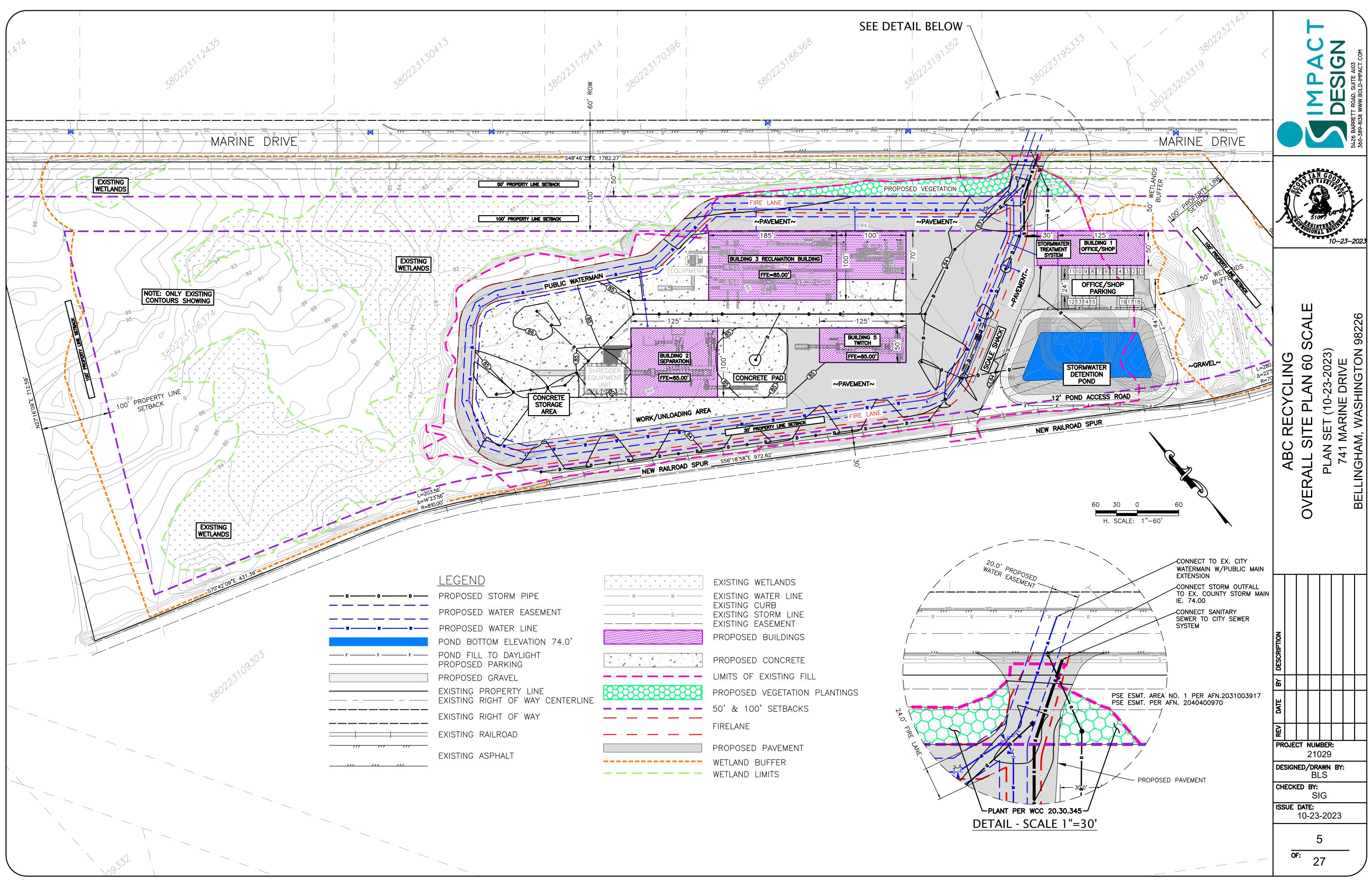
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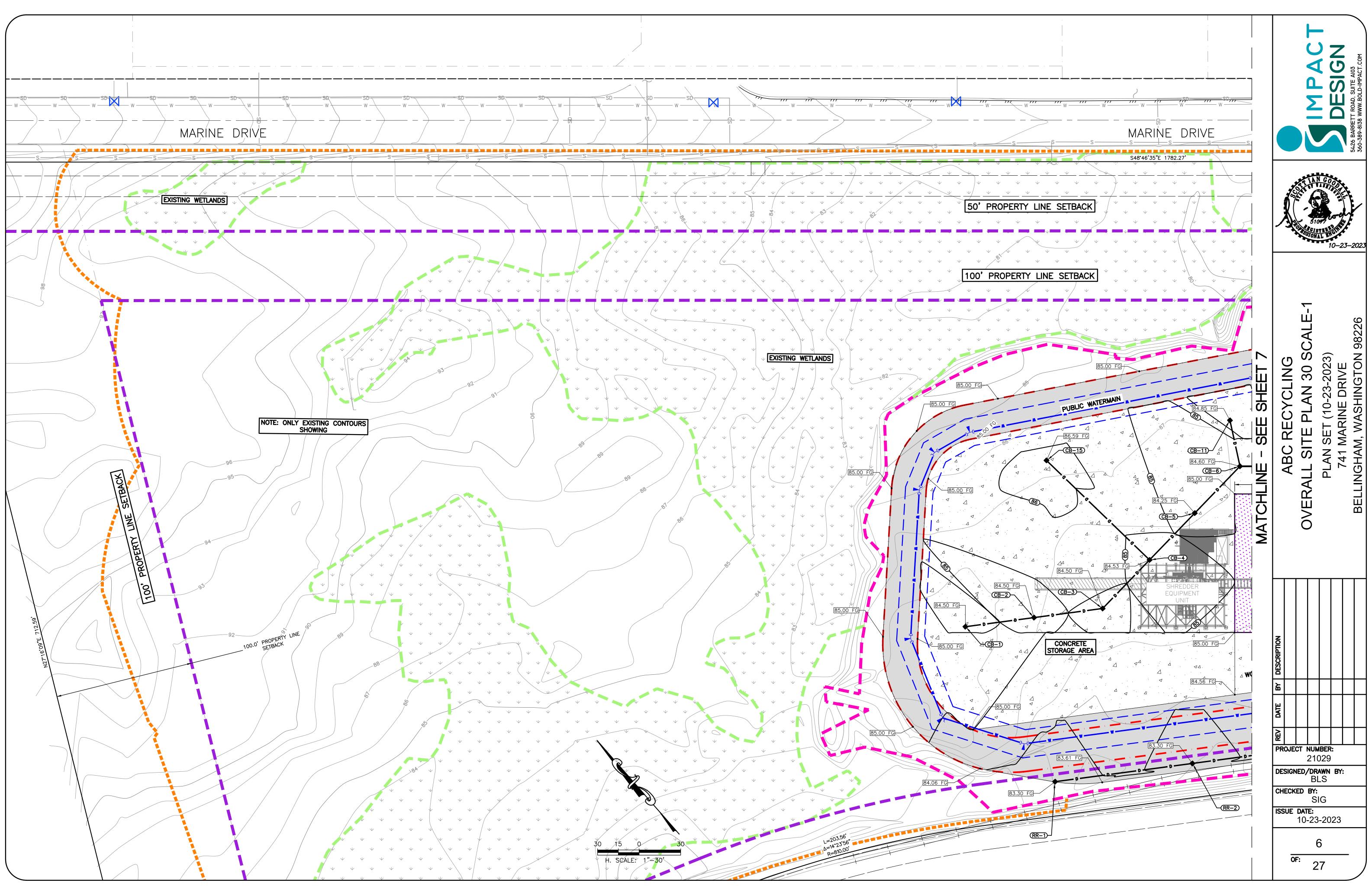
LEGEND - SIZE & SCA	LE MAY VARY					
	<ul> <li>RIGHT-OF-WAY CENTERLINE</li> <li>PROPERTY BOUNDARY</li> <li>EASEMENT</li> <li>EXISTING GRAVEL EDGE</li> <li>EXISTING ASPHALT EDGE</li> <li>EXISTING CONCRETE EDGE</li> <li>EXISTING BUILDING</li> <li>EXISTING BUILDING OVERHANG</li> <li>EXISTING CULVERT</li> <li>EXISTING FENCE</li> <li>EXISTING BURIED POWER LINE</li> <li>EXISTING AERIAL POWER LINE</li> <li>EXISTING STORM DRAIN</li> <li>EXISTING SANITARY SEWER</li> <li>EXISTING BURIED FIBER OPTIC/COMM</li> <li>EXISTING GAS LINE</li> </ul>		ABC RECYCLING	BELLINGHAM	MARINE DRIVE PLANT	W.A.C. 332.130.145 COMPLIANCE EXHIBIT
⊞ -\$- - - С	<ul> <li>= EXISTING WATER METER</li> <li>= EXISTING FIRE HYDRANT</li> <li>= EXISTING SIGN</li> <li>= EXISTING BOULDER</li> </ul>	DATE	5-7-21	SCALE	AS SHOWN	JOB NUMBER 2021-043
□ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	<ul> <li>= EXISTING STORM DRAIN CATCH BASIN</li> <li>= EXISTING SANITARY SEWER MANHOLE</li> <li>= EXISTING 2" (ETC) CONIFEROUS TREE</li> <li>= EXISTING 2" (ETC) DECIDUOUS TREE</li> </ul>	SHEET		-	PAGE	1 of 3

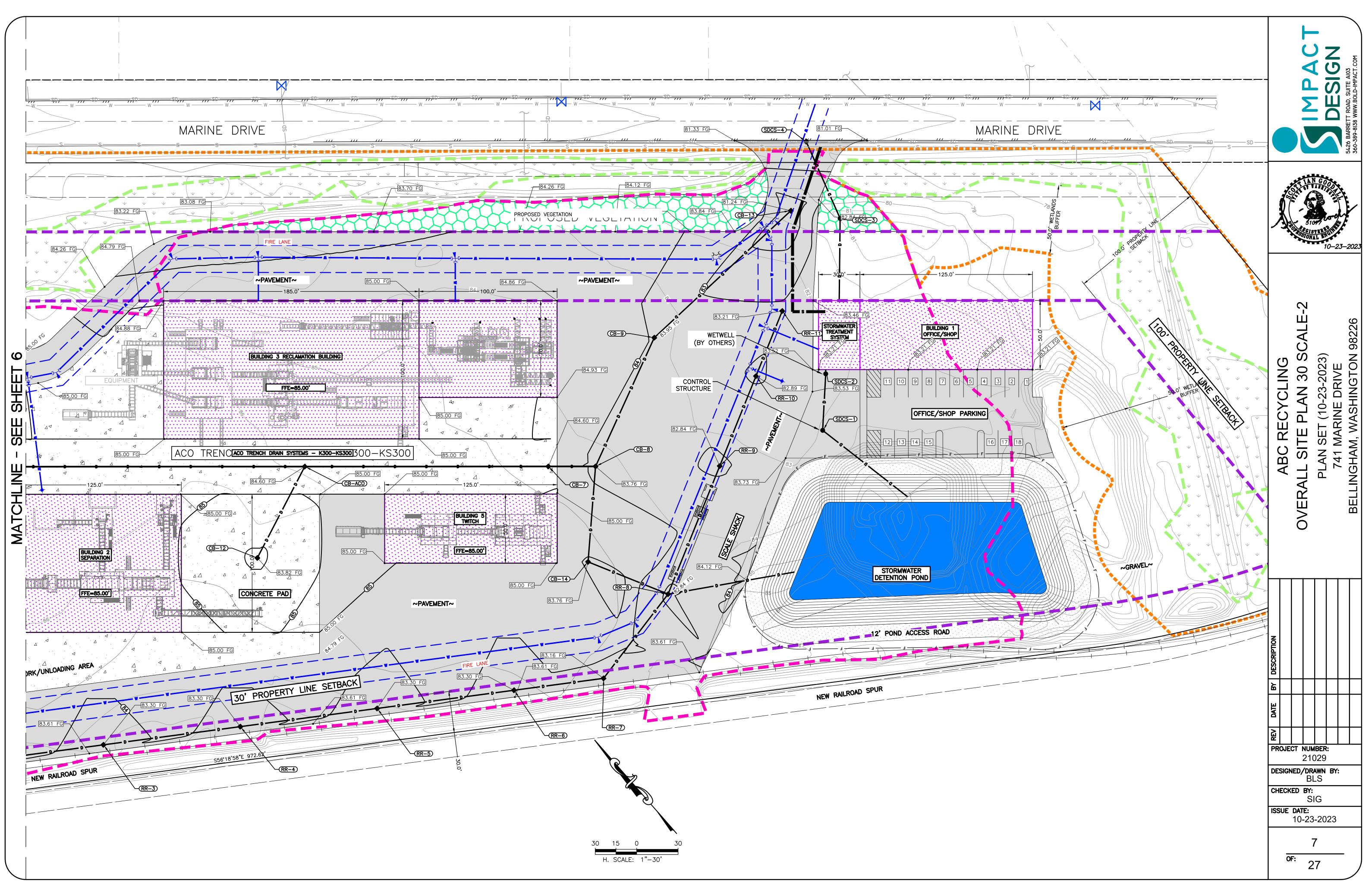




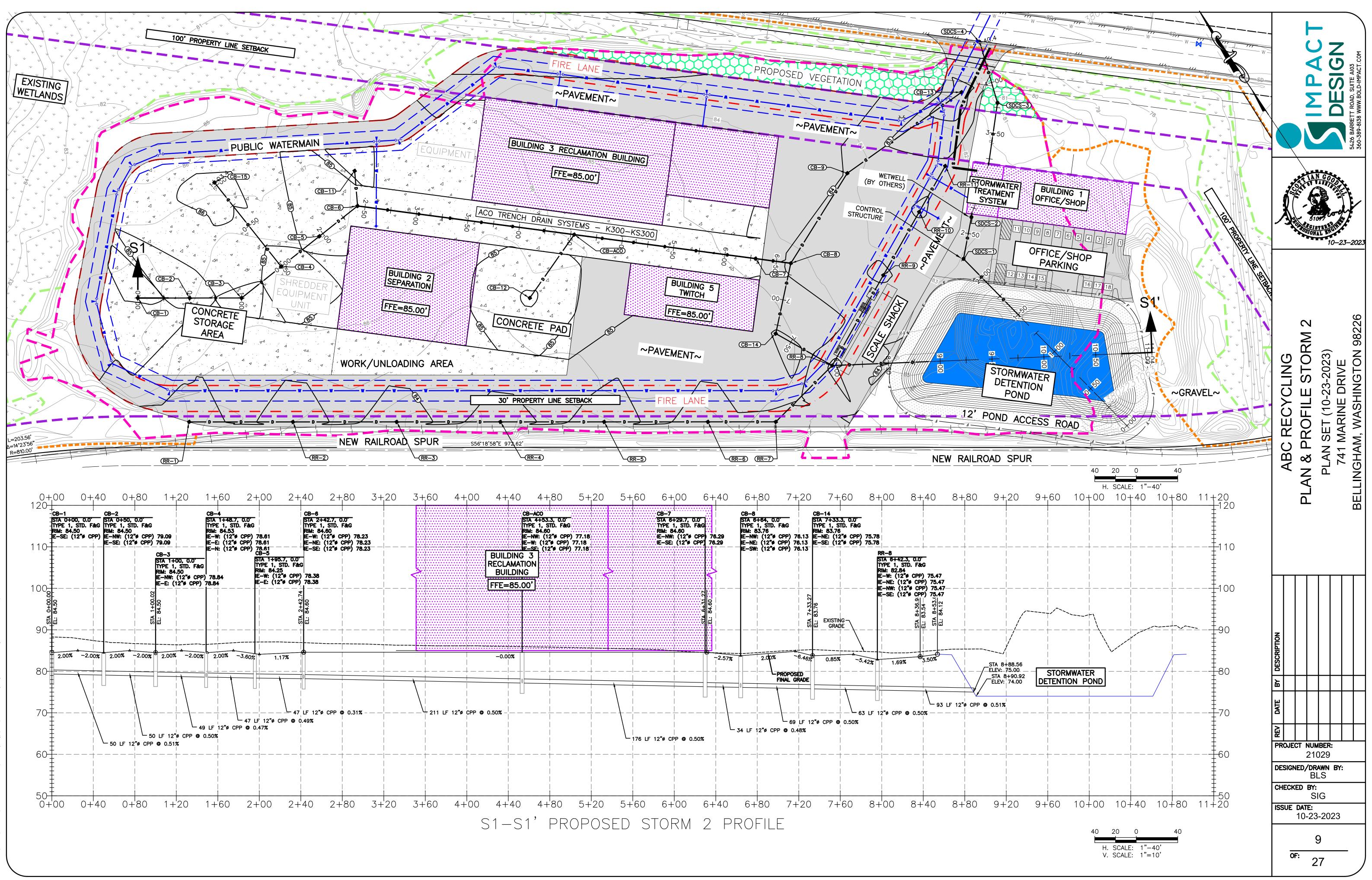
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108	649917.28	1233327.62	78.07	
109	649742.69	1233286.52	79.05	
111	650073.47	1233003.05	88.69	



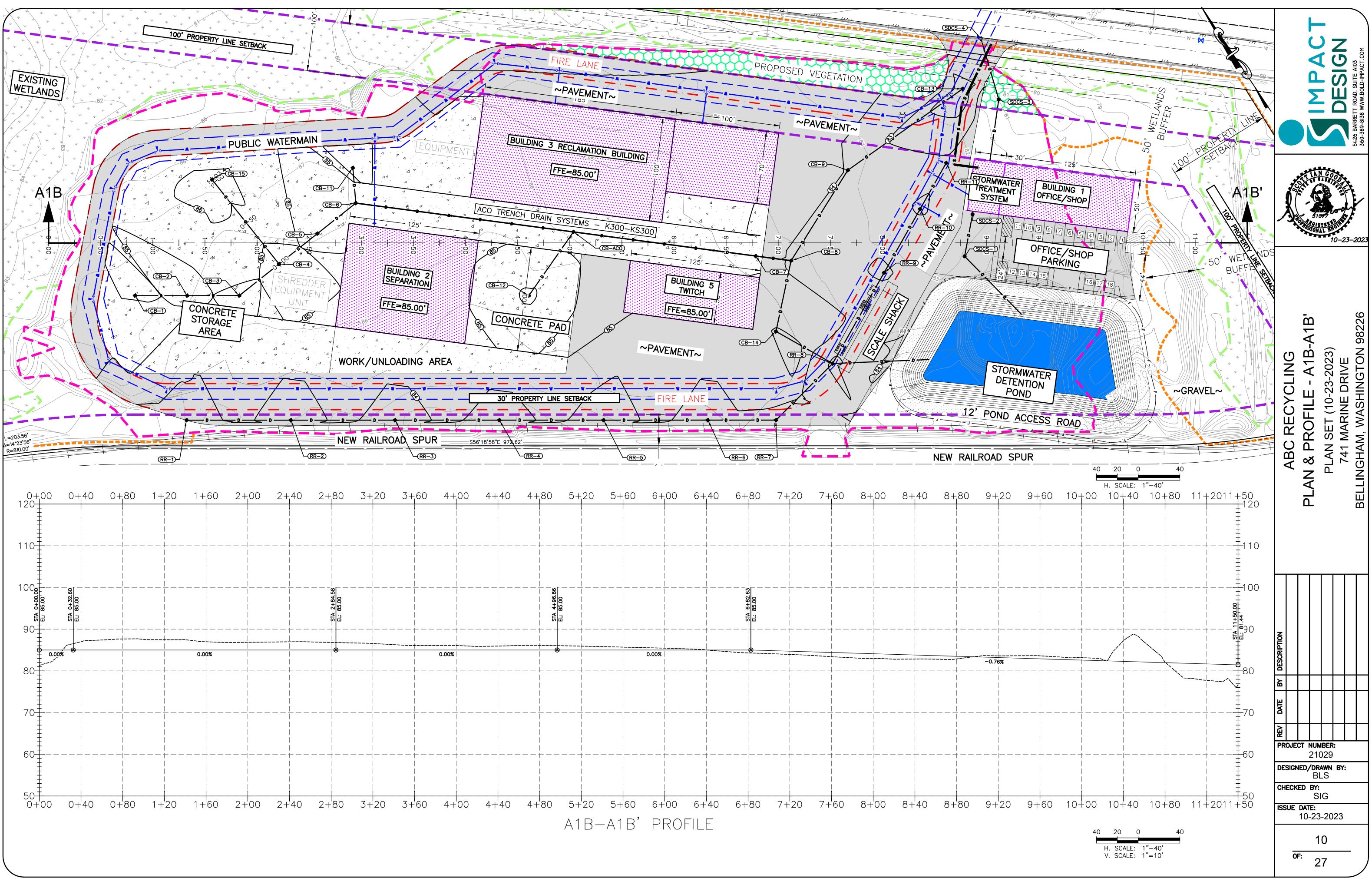


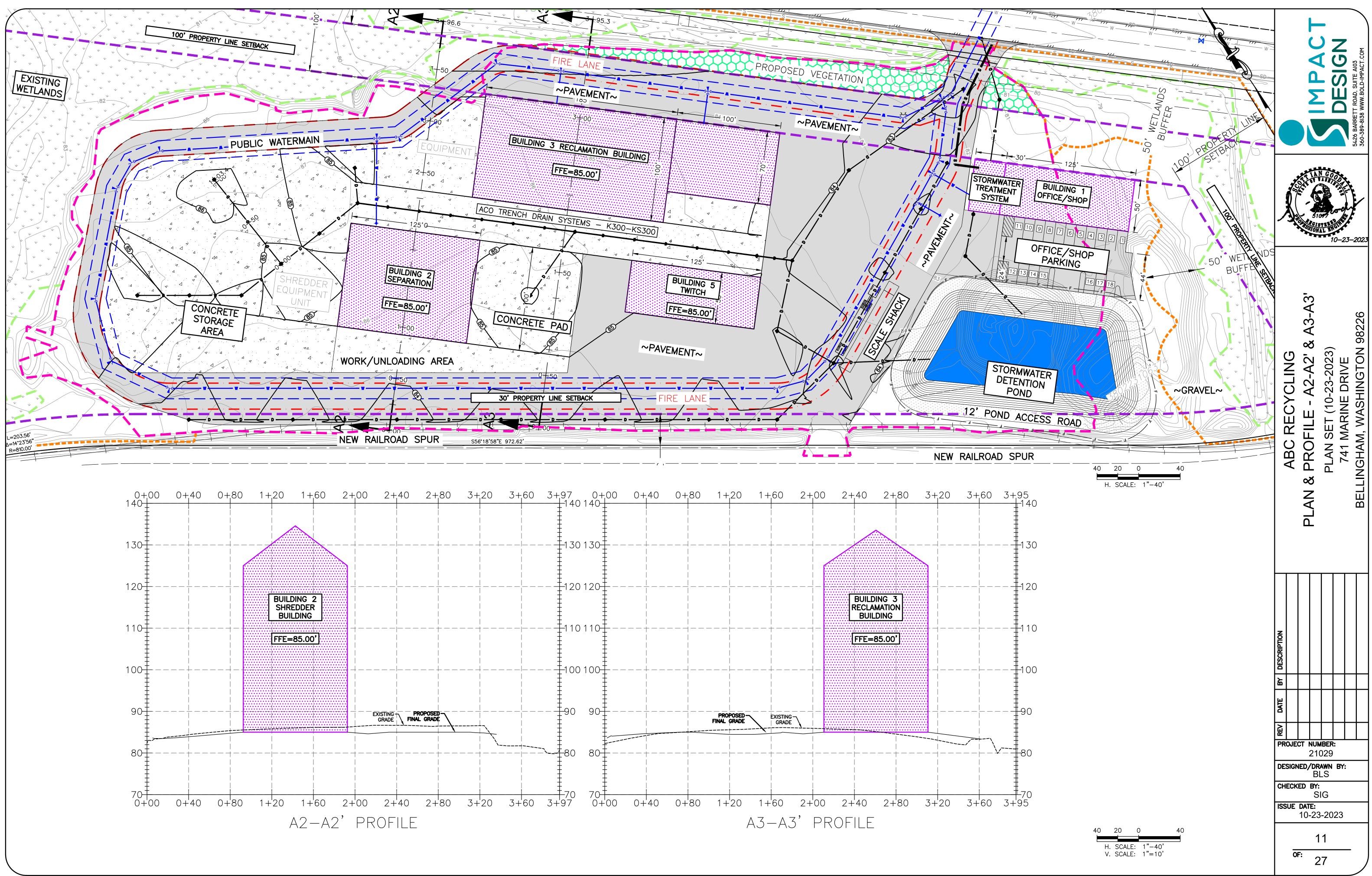


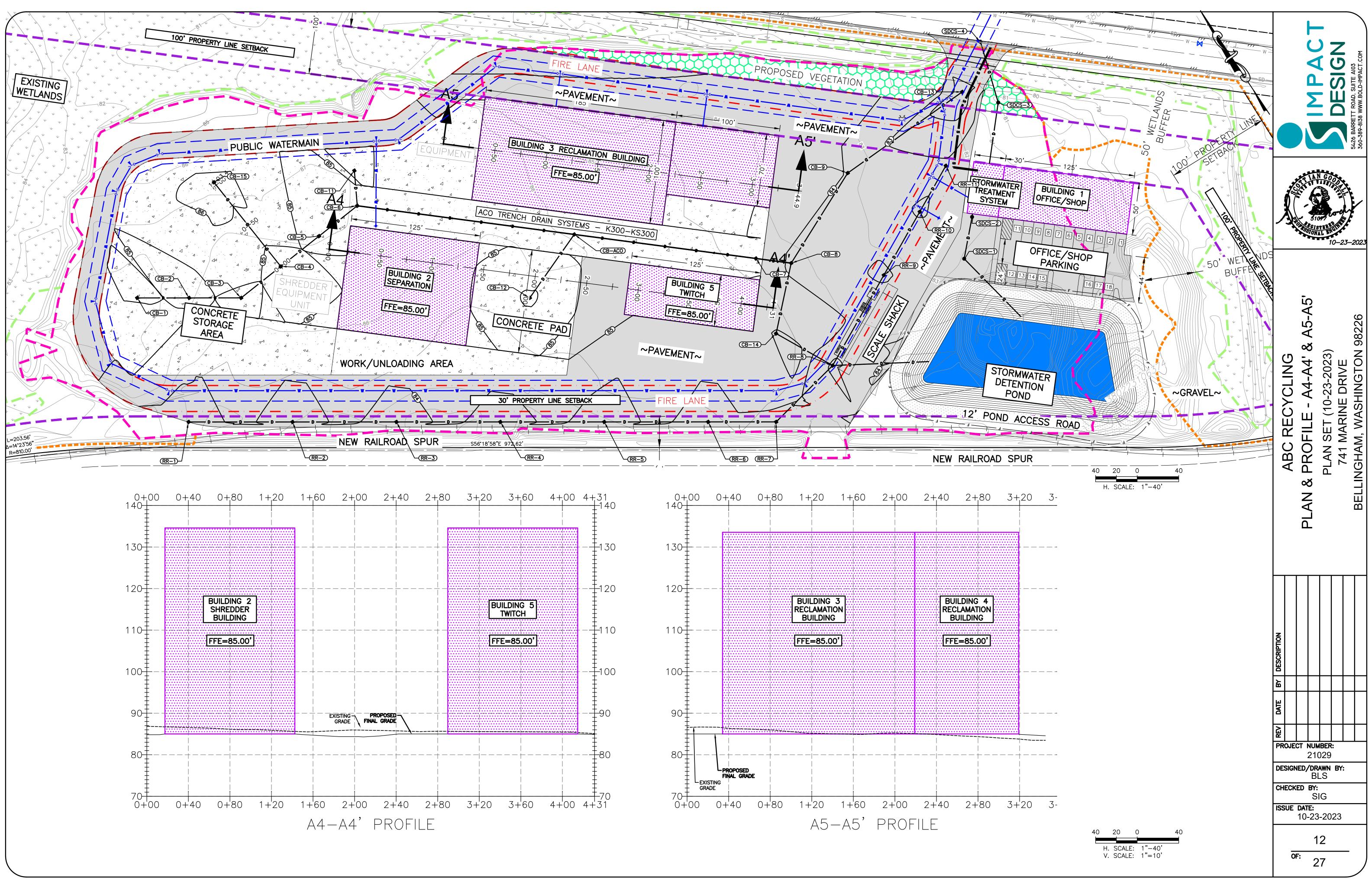


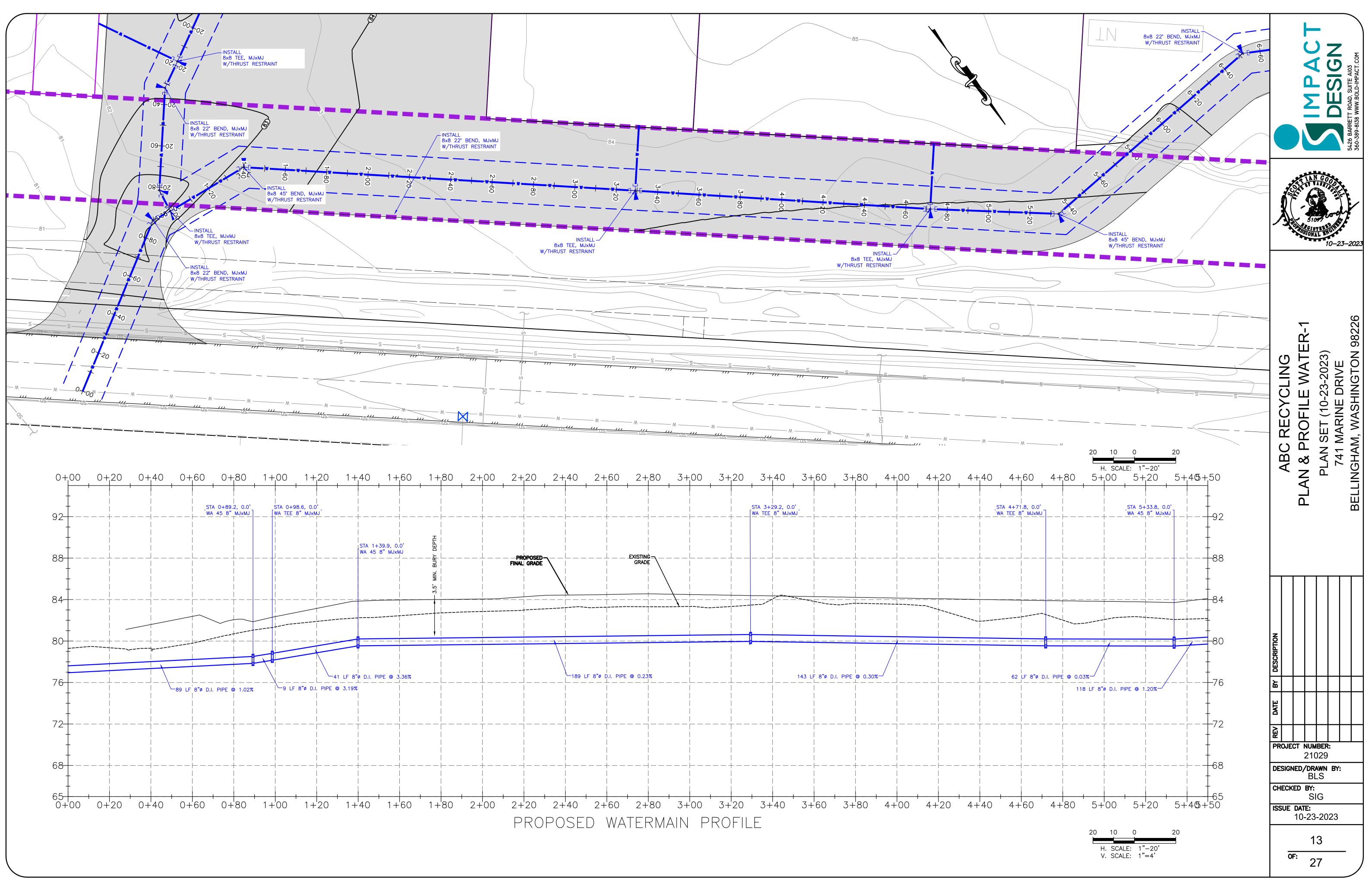


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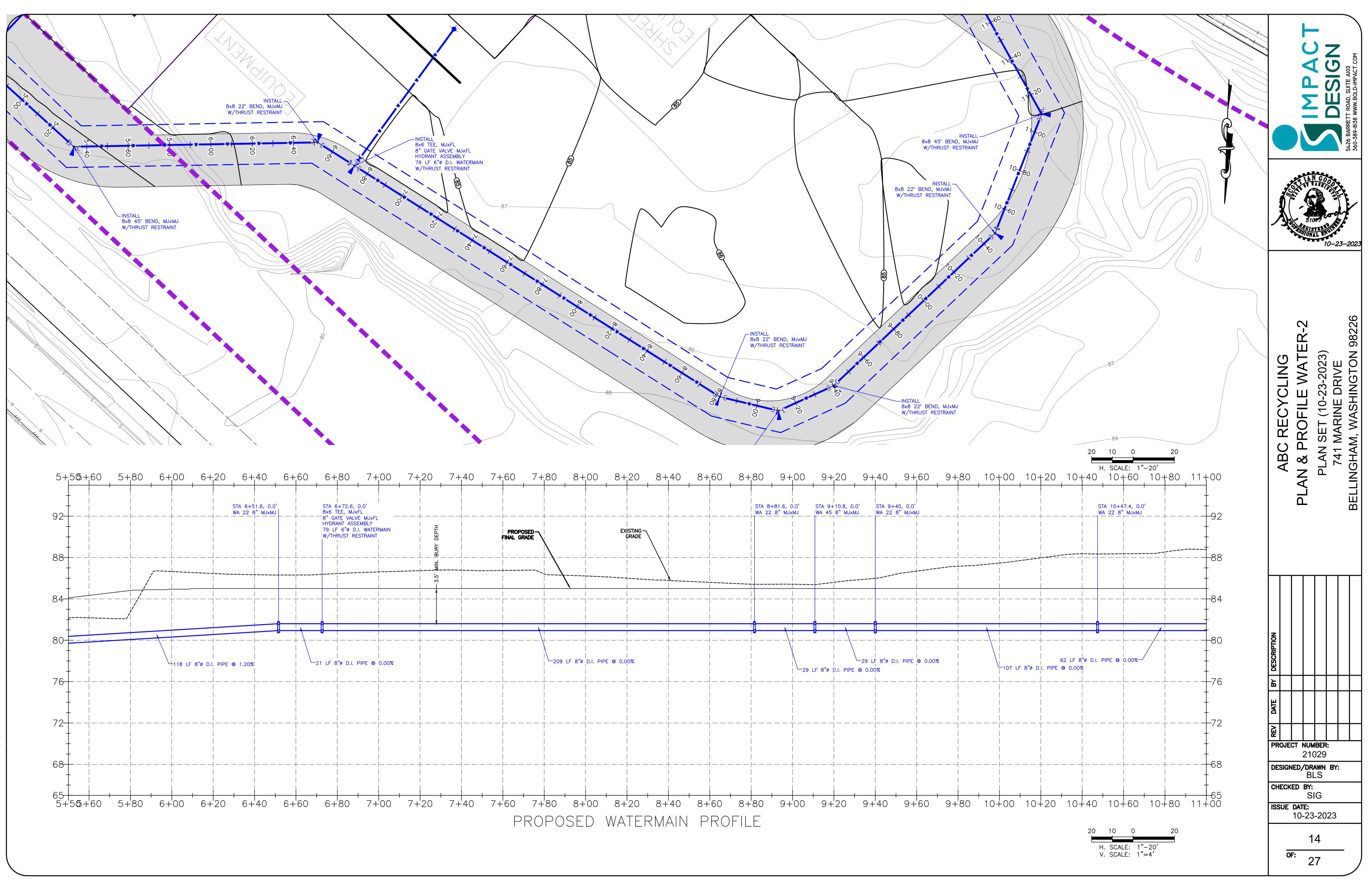


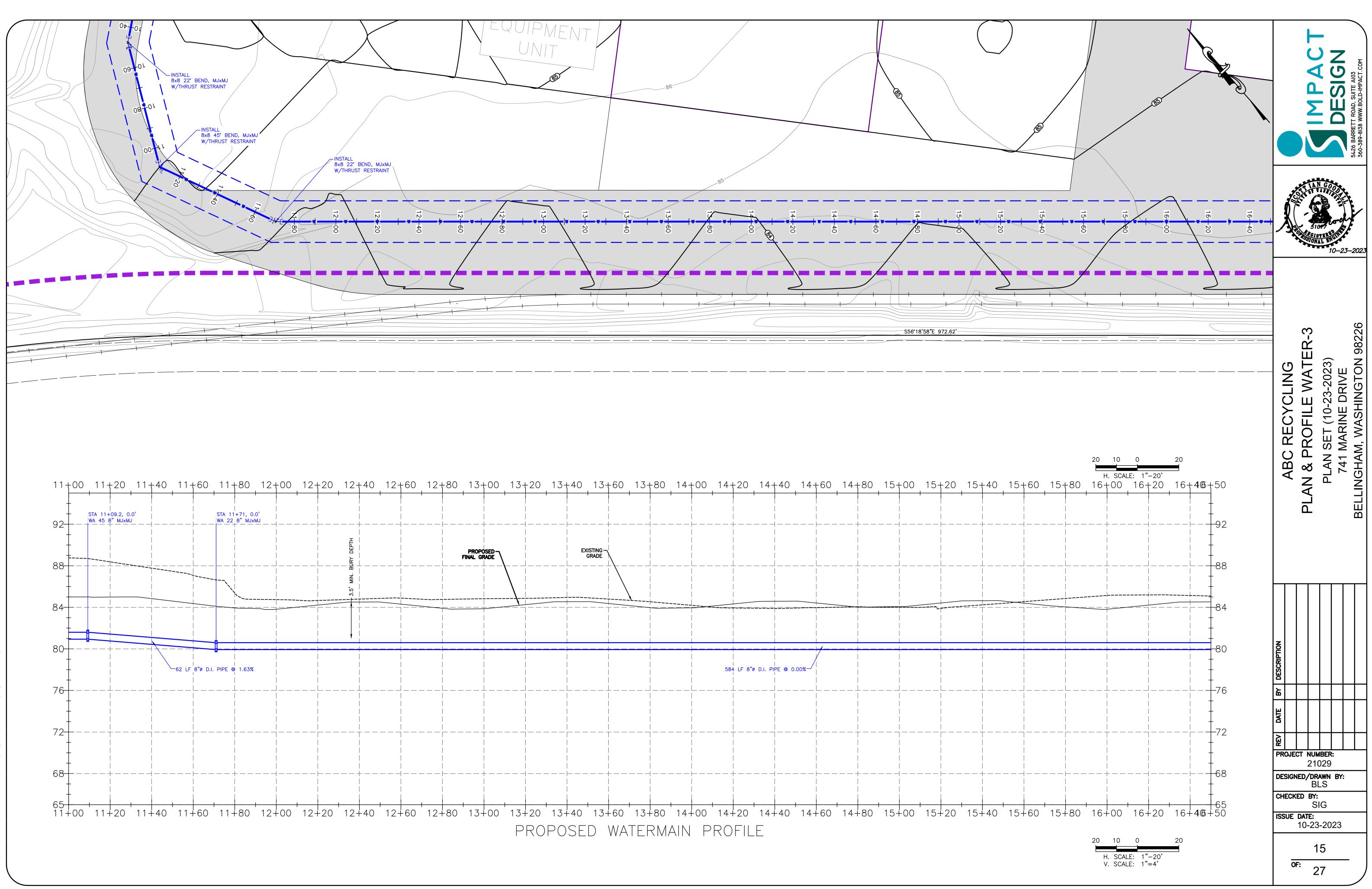




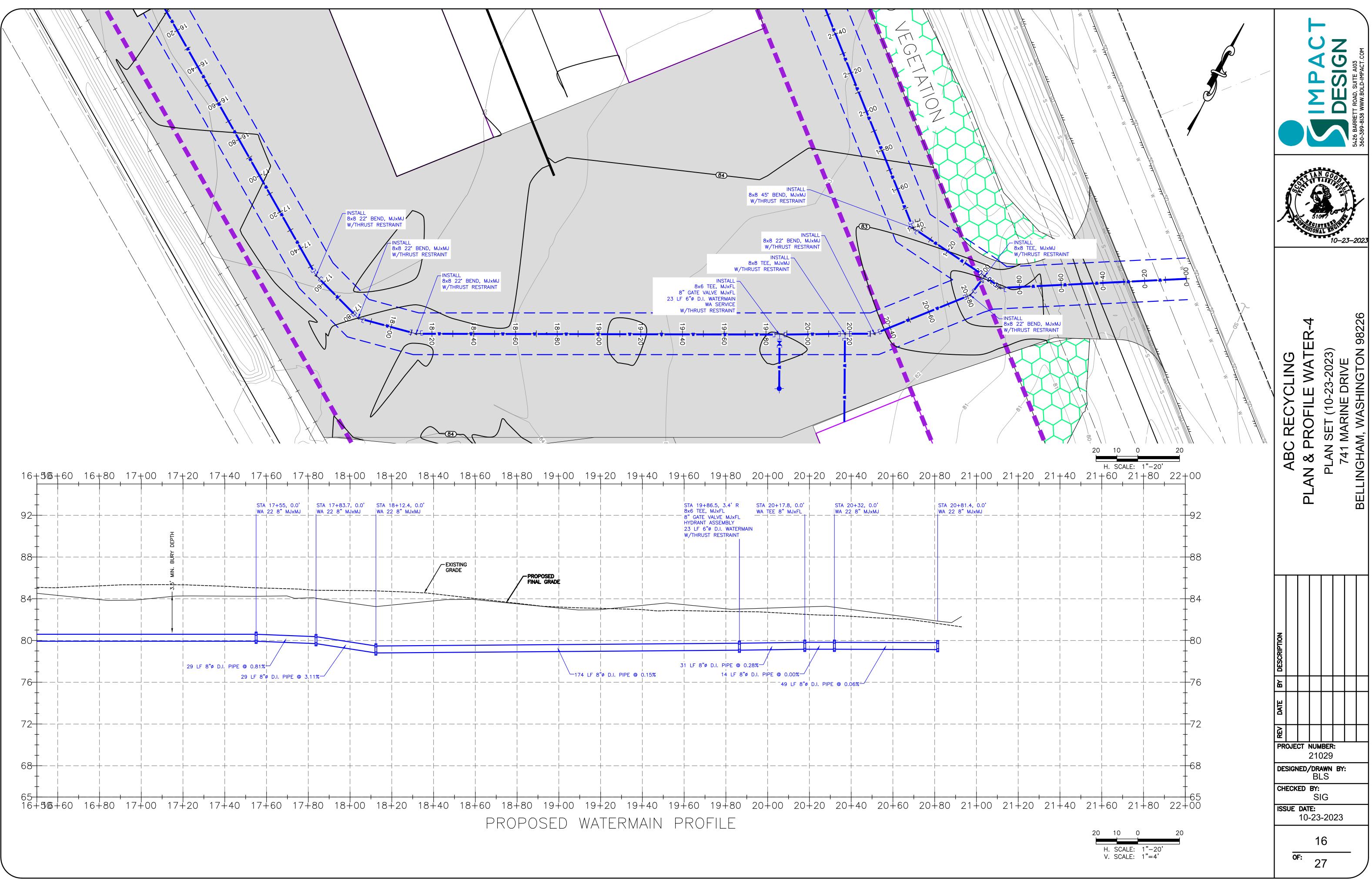


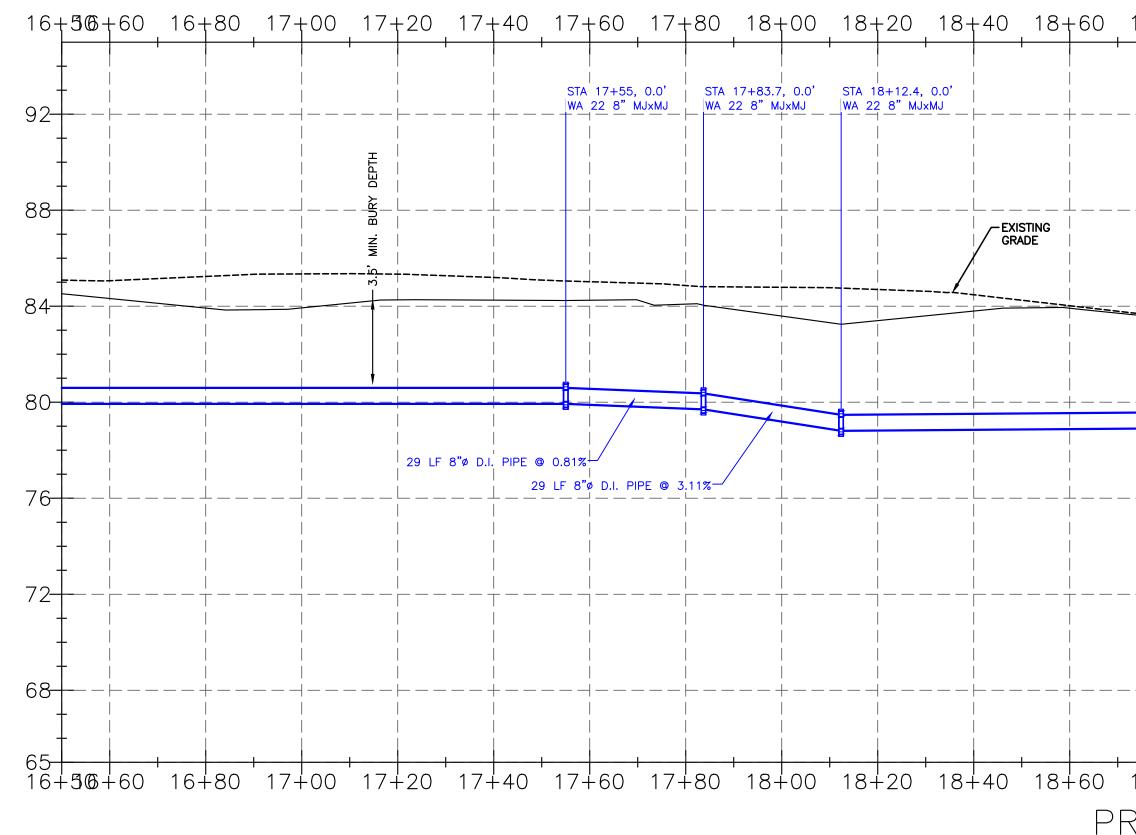
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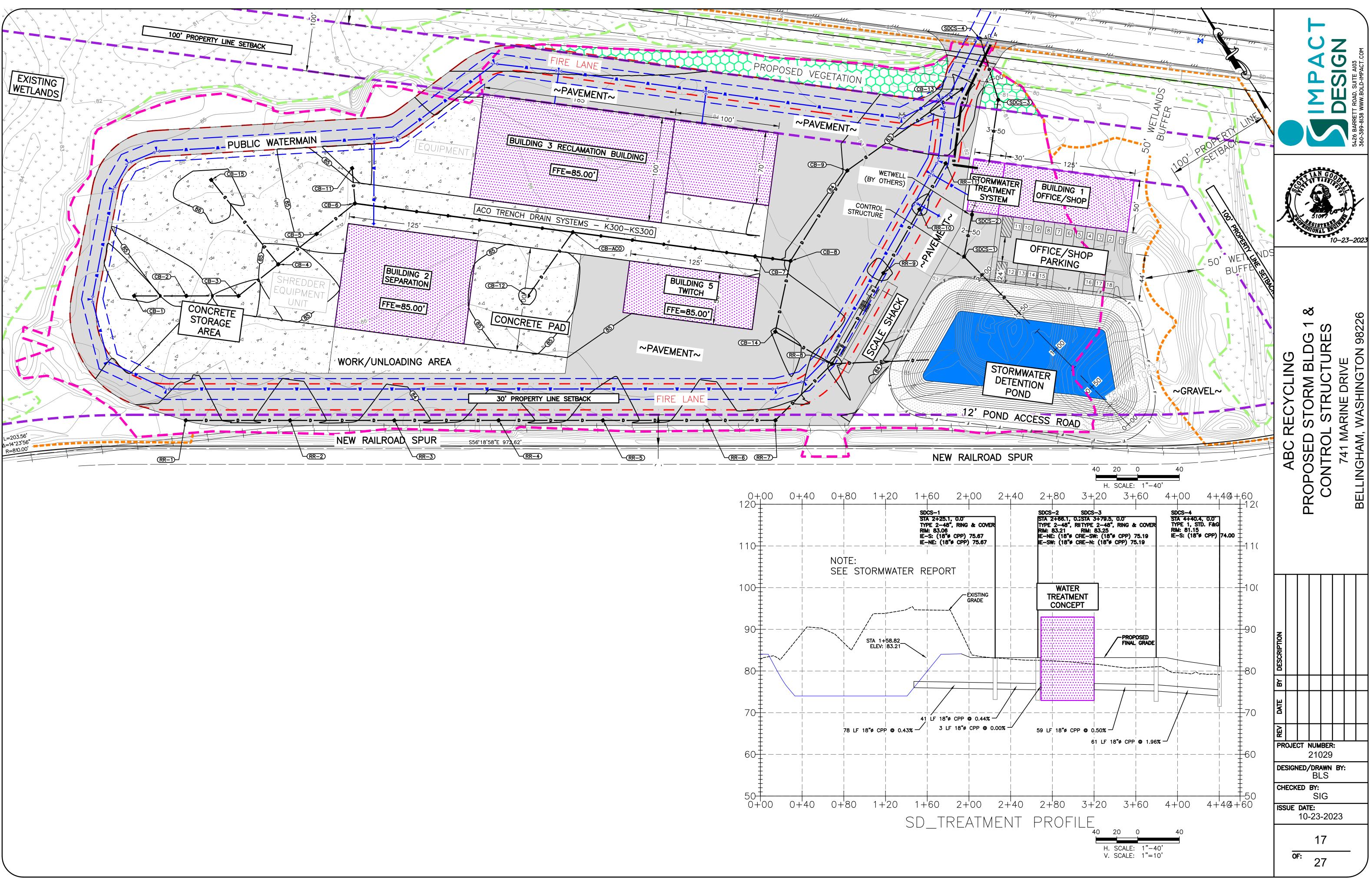


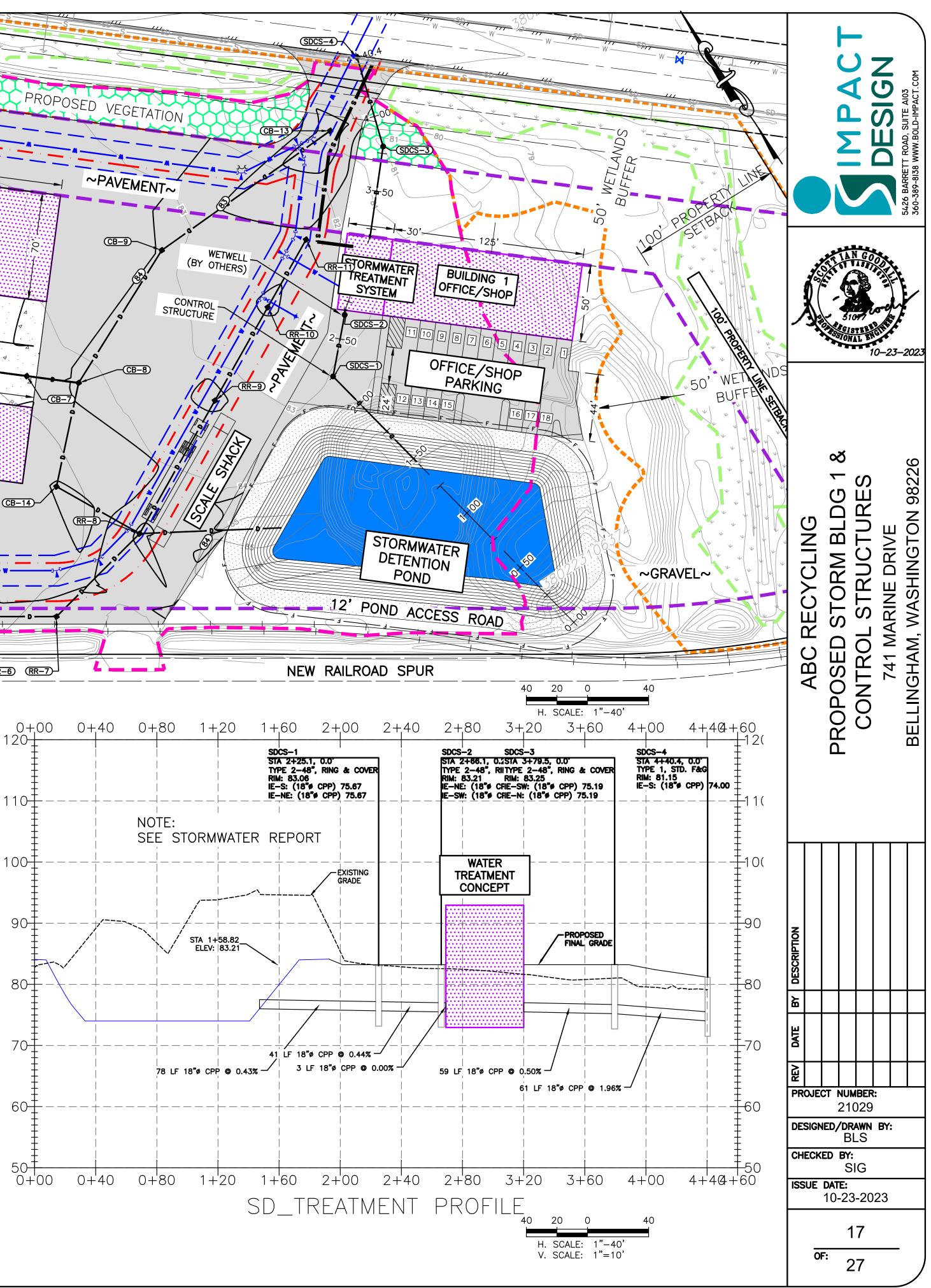


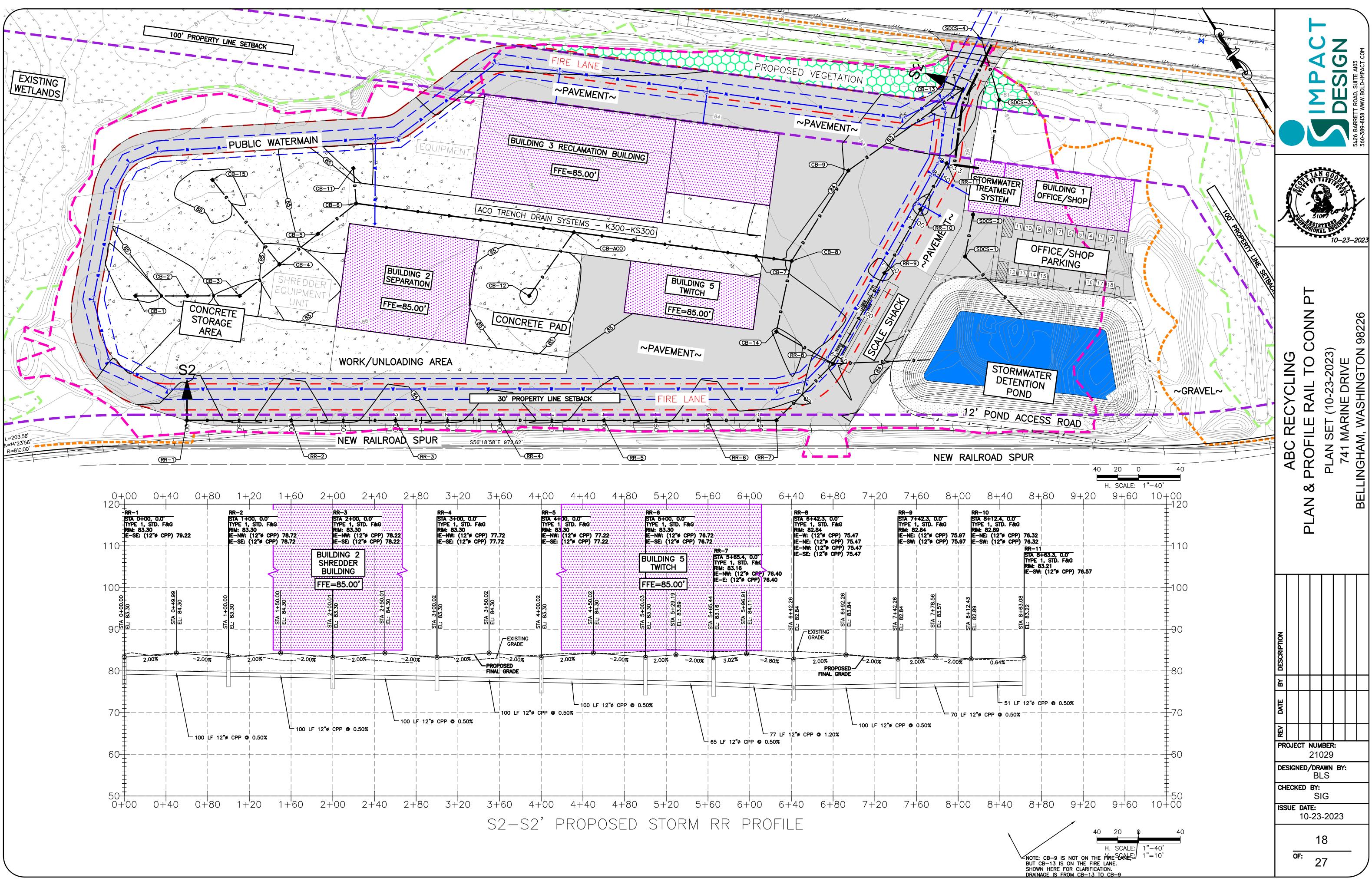


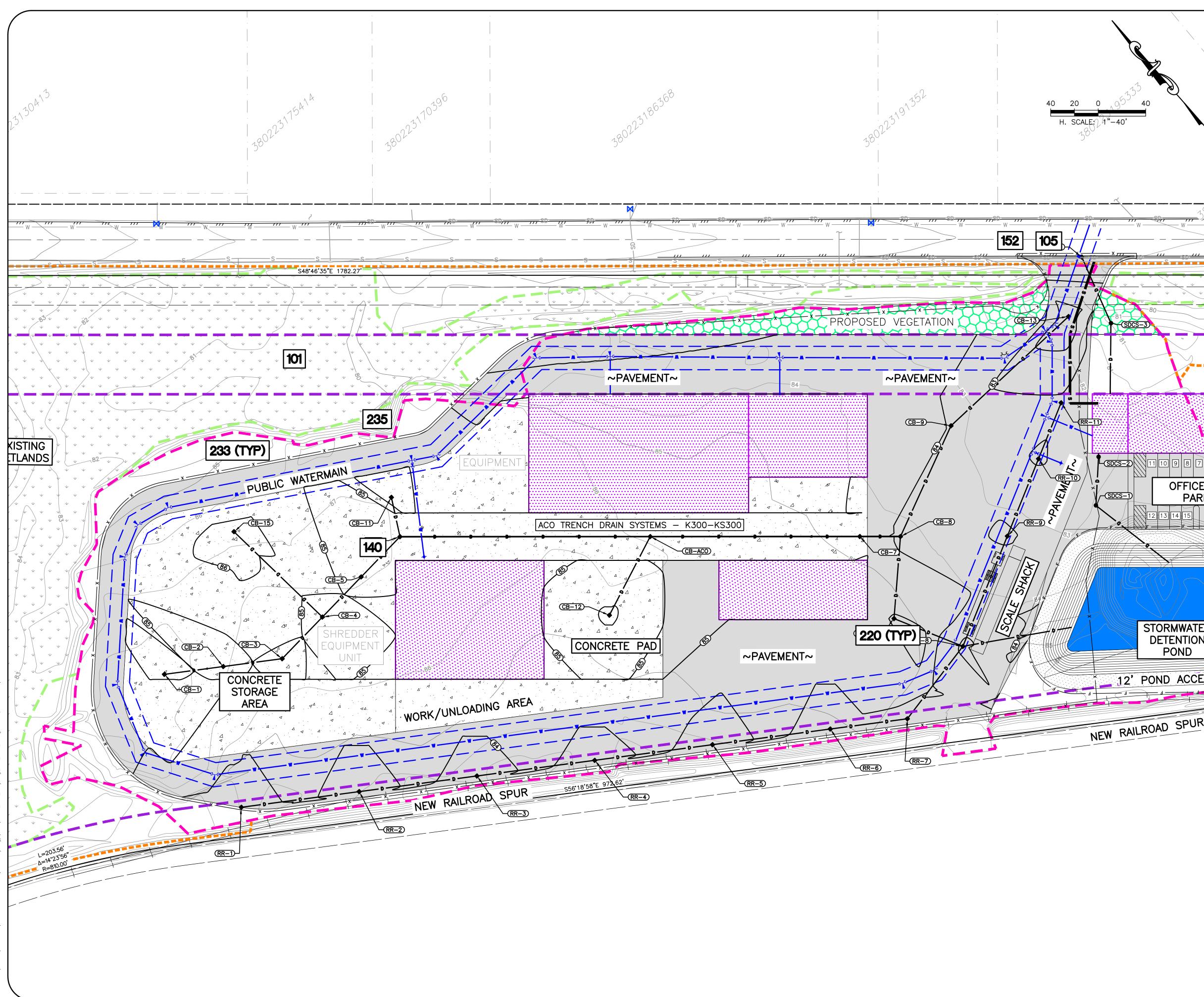


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	ACCESS	<u>#2 - ESTABLISH CONSTRUCTION</u> BMP C105 STABILIZED CONSTRUCTION ENTRANCE							5426 BARRET1 360-389-8138 \
	<b>105</b>	(ONLY INSTALLED IF NECESSARY)	$\vdash$						
		<u>#3 - CONTROL FLOW RATES</u> BMP C220		3	Solt.		GO		
		STORM DRAIN INLET PROTECTION			/5			2	
	<u>ELEMENI</u> CONTROLS	<u>#4 — INSTALL SEDIMENT</u> 2				510 510	TER	D ITT	, F
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	235	BMP 235 STRAW WATTLES							
	ELEMENT	<u>#5 – STABILIZE SOILS</u>				$\tilde{\boldsymbol{b}}$			
	120	BMP C120 TEMPORARY AND PERMANENT SEEDING							26
	121	BMP C121 MULCHING			Ż				98226
	140	BMP C140 DUST CONTROL		ŊZ			023)	` ⊥ >	TON
	ELEMENT	<u>#6 – PROTECT SLOPES</u>		CLING	L U U	いて	-23-2	741 MARINE DRIVE	WASHINGTON
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FICE/S	121	BMP C121 MULCHING		Ш Х		$\overline{\mathbf{D}}$	S П	MAI	N N
5		<u>#7 – PROTECT DRAIN INLETS</u>		ABC		)	<b>PLAN SET</b>	171	HA
	220	BMP C220 STORM DRAIN INLET PROTECTION	•	∢			Ч		NG (
	<u>ELEMENT</u> AND OUTL	<u>#8 – STABILIZE CHANNELS ETS</u>			>				BELLINGHAM,
	235	BMP 235 STRAW WATTLES			□ <	ξ			Ш
		<u>#9 – CONTROL POLLUTANTS</u>				5			
ATER TON	152	BMP C152 SAWCUTTING AND SURFACE POLLUTION PREVENTION				≥ L			
D	153	BMP C153 MATERIAL DELIVERY, STORAGE AND CONTAINMENT			┟╸				
CCESS	ELEMENT	<u>#10 – CONTROL DEWATERING</u>							
	236	BMP C236 VEGETATIVE FILTRATION							
PUR	ELEMENT	<u>#11 — MAINTAIN BMPs</u>	DESCRIPTION						
	160	BMP C160 CERTIFIED EROSION AND SEDIMENT CONTROL LEAD							
	ELEMENT	<u>#12 – MANAGE THE PROJECT</u>	₽ B	$\vdash$	-		$\left  - \right $		+
	160	BMP C160 CERTIFIED EROSION AND SEDIMENT CONTROL LEAD	DATE						
		<u>#13 – PROTECT LID BMPs</u> MPs PROPOSED	A B R	OJF	СТ	NUM	BER		
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B. RETAIN THE DUFF LAYER, NATIVE TOPSOIL, AND NATURAL VEGETATION IN AN UNDISTURBED STATE TO THE MAXIMUM DEGREE PRACTICABLE ADDITIONAL GUIDANCE FOR ELEMENT 1 • PLASTIC, METAL, FABRIC FENCE, OR OTHER PHYSICAL BARRIERS MAY BE USED TO MARK THE CLEARING LIMITS. NOTE THE DIFFERENCE BETWEEN THE PRACTICAL USE AND PROPER INSTALLATION OF BMP C233: SILT FENCE AND THE PROPER USE AND INSTALLATION OF BMP C103: HIGH-VISIBILITY FENCE. • IF IT IS NOT PRACTICAL TO RETAIN THE DUFF LAYER IN PLACE, THEN STOCKPILE IT ON SITE, COVER IT TO PREVENT EROSION, AND REPLACE IT IMMEDIATELY WHEN YOU FINISH DISTURBING THE SITE. UGGESTED BMPS FOR ELEMENT 1 BMP C101: PRESERVING NATURAL VEGETATION

A.BEFORE BEGINNING LAND DISTURBING ACTIVITIES, INCLUDING CLEARING AND GRADING, CLEARLY

MARK ALL CLEARING LIMITS, SENSITIVE AREAS AND THEIR BUFFERS, AND TREES THAT ARE TO BE

BMP C102: BUFFER ZONES

ELEMENT 1: PRESERVE VEGETATION / MARK CLEARING LIMITS

PRESERVED WITHIN THE CONSTRUCTION AREA.

### • BMP C103: HIGH-VISIBILITY FENCE BMP C233: SILT FENCE

## ELEMENT 2: ESTABLISH CONSTRUCTION ACCESS

- A.LIMIT CONSTRUCTION VEHICLE ACCESS AND EXIT TO ONE ROUTE, IF POSSIBLE.
- B. STABILIZE ACCESS POINTS WITH A PAD OF QUARRY SPALLS, CRUSHED ROCK, OR OTHER EQUIVALENT BMPS, TO MINIMIZE TRACKING OF SEDIMENT ONTO PUBLIC ROADS.
- C. LOCATE WHEEL WASH OR TIRE BATHS ON SITE, IF THE STABILIZED CONSTRUCTION ENTRANCE IS NOT EFFECTIVE IN PREVENTING TRACKING SEDIMENT ONTO ROADS
- D. IF SEDIMENT IS TRACKED OFF SITE, CLEAN THE AFFECTED ROADWAY(S) THOROUGHLY AT THE END OF EACH DAY, OR MORE FREQUENTLY AS NECESSARY (FOR EXAMPLE, DURING WET WEATHER). REMOVE SEDIMENT FROM ROADS BY SHOVELING, SWEEPING, OR PICKING UP AND TRANSPORTING THE SEDIMENT TO A CONTROLLED SEDIMENT DISPOSAL AREA.
- E. CONDUCT STREET WASHING ONLY AFTER SEDIMENT IS REMOVED IN ACCORDANCE WITH 2.D
- F. CONTROL STREET WASH WASTEWATER BY PUMPING BACK ON SITE, OR OTHERWISE PREVENT IT FROM DIS- CHARGING INTO SYSTEMS TRIBUTARY TO WATERS OF THE STATE.

ADDITIONAL GUIDANCE FOR ELEMENT 2

MINIMIZE CONSTRUCTION SITE ACCESS POINTS ALONG LINEAR PROJECTS, SUCH AS ROADWAYS. STREET WASHING MAY REQUIRE LOCAL JURISDICTION APPROVAL. SUGGESTED BMPS FOR ELEMENT 2

# BMP C105: STABILIZED CONSTRUCTION ACCESS

### BMP C106: WHEEL WASH

• BMP C107: CONSTRUCTION ROAD / PARKING AREA STABILIZATION

ELEMENT 3: CONTROL FLOW RATES

- A.PROTECT PROPERTIES AND WATERWAYS DOWNSTREAM OF DEVELOPMENT SITES FROM EROSION AND THE ASSOCIATED DISCHARGE OF TURBID WATERS DUE TO INCREASES IN THE VELOCITY AND PEAK VOLUMETRIC FLOW RATE OF STORMWATER RUNOFF FROM THE PROJECT SITE.
- B. WHERE NECESSARY TO COMPLY WITH 3.A (ABOVE), CONSTRUCT STORMWATER INFILTRATION OR DETENTION BMPS AS ONE OF THE FIRST STEPS IN GRADING. ASSURE THAT DETENTION BMPS
- FUNCTION PROPERLY BEFORE CONSTRUCTING SITE IMPROVEMENTS (E.G., IMPERVIOUS SURFACES) C. IF PERMANENT INFILTRATION BMPS ARE USED FOR TEMPORARY FLOW CONTROL DURING
- CONSTRUCTION, PROTECT THESE BMPS FROM SILTATION DURING THE CONSTRUCTION PHASE.

ADDITIONAL GUIDANCE FOR ELEMENT 3

- CONDUCT A DOWNSTREAM ANALYSIS IF CHANGES IN FLOWS COULD IMPAIR OR ALTER CONVEYANCE SYSTEMS, STREAMBANKS, BED SEDIMENT, OR AQUATIC HABITAT. SEE III-3.2 PREPARING A STORMWATER SITE PLAN FOR OFF-SITE ANALYSIS GUIDELINES.
- EVEN GENTLY SLOPED AREAS NEED FLOW CONTROLS SUCH AS BMP C235: WATTLES OR OTHER ENERGY DISSIPATION / FILTRATION STRUCTURES. PLACE DISSIPATION FACILITIES CLOSER TOGETHER ON STEEPER SLOPES. THESE METHODS PREVENT WATER FROM BUILDING HIGHER VELOCITIES AS IT FLOWS DOWNSTREAM WITHIN THE CONSTRUCTION SITE.
- CONTROL STRUCTURES DESIGNED FOR PERMANENT DETENTION BMPS ARE NOT APPROPRIATE FOR USE DURING CONSTRUCTION WITHOUT MODIFICATION. IF USED DURING CONSTRUCTION, MODIFY THE CONTROL STRUCTURE TO ALLOW FOR LONG-TERM STORAGE OF RUNOFF AND ENABLE SEDIMENT TO SETTLE. VERIFY THAT THE BMP IS SIZED APPROPRIATELY FOR THIS PURPOSE. RESTORE BMPS TO THEIR ORIGINAL DESIGN DIMENSIONS, REMOVE SEDIMENT, AND INSTALL A FINAL CONTROL STRUCTURE AT COMPLETION OF THE PROJECT
- EROSION HAS THE POTENTIAL TO OCCUR BECAUSE OF INCREASES IN THE VOLUME, VELOCITY, AND PEAK FLOW RATE OF STORMWATER RUNOFF FROM THE PROJECT SITE. THE LOCAL PERMITTING AGENCY MAY REQUIRE INFILTRATION OR DETENTION BMP DESIGNS THAT PROVIDE ADDITIONAL OR DIFFERENT STORMWATER FLOW CONTROL THAN THE DESIGNS DETAILED IN THIS MANUAL. THESE REQUIREMENTS MAY BE NECESSARY TO ADDRESS LOCAL CONDITIONS OR TO PROTECT PROPERTIES AND WATERWAYS DOWNSTREAM.
- ICITY OF WATER LEAVING THE SITE SHOULD NOT EXCEED 3 FEET/SECOND, IF THE DISCHARGE IS TO A STREAM OR DITCH. INSTALL VELOCITY DISSIPATION, SUCH AS BMP C207: CHECK DAMS OR BMP C202: RIPRAP CHANNEL LINING TO ENSURE REDUCTION OF THE FLOW VELOCITY TO A NON-EROSIVE LEVEL.
- IF THE DISCHARGE FROM A PROJECT SITE IS TO A MUNICIPAL STORM DRAINAGE SYSTEM, THE ALLOWABLE DIS- CHARGE RATE MAY BE LIMITED BY THE CAPACITY OF THE PUBLIC SYSTEM. IT MAY BE NECESSARY TO CLEAN THE MUNICIPAL STORM DRAINAGE SYSTEM PRIOR TO THE START OF THE DISCHARGE TO PREVENT SCOURING SOLIDS FROM THE DRAINAGE SYSTEM. OBTAIN PERMISSION FROM THE OWNER OF THE COLLECTION SYSTEM BEFORE DISCHARGING TO IT. ENSURE THAT NO DOWNSTREAM PIPES ARE SURCHARGED AS A RESULT OF INCREASED FLOWS FROM THE PROJECT SITE.
- IF THE DISCHARGE FROM A PROJECT SITE IS DIRECTLY TO A FLOW CONTROL EXEMPT RECEIVING WATER LISTED IN APPENDIX I-A: FLOW CONTROL EXEMPT RECEIVING WATERS OR TO AN INFILTRATION SYSTEM, THERE IS NO DISCHARGE FLOW LIMIT.

SUGGESTED BMPS FOR ELEMENT 3

- BMP C203: WATER BARS
- BMP C207: CHECK DAMS BMP C209: OUTLET PROTECTION

• BMP C235: WATTLES

## BMP C240: SEDIMENT TRAP

• BMP C241: SEDIMENT POND (TEMPORARY)

- ELEMENT 4: INSTALL SEDIMENT CONTROLS
- A. CONSTRUCT SEDIMENT CONTROL BMPS (SEDIMENT PONDS, TRAPS, FILTERS, ETC.) AS ONE OF THE FIRST STEPS IN GRADING. THESE BMPS MUST BE FUNCTIONAL BEFORE OTHER LAND DISTURBING ACTIVITIES TAKE PLACE.
- B. MINIMIZE SEDIMENT DISCHARGES FROM THE SITE. THE DESIGN, INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROLS MUST ADDRESS FACTORS SUCH AS THE AMOUNT, FREQUENCY, INTENSITY AND DURATION OF PRECIPITATION, THE NATURE OF RESULTING STORMWATER RUNOFF, AND SOIL CHARACTERISTICS, INCLUDING THE RANGE OF SOIL PARTICLE SIZES EXPECTED TO BE PRESENT ON THE SITE.
- C. DIRECT STORMWATER RUNOFF FROM DISTURBED AREAS THROUGH BMP C241: SEDIMENT POND (TEMPORARY) OR OTHER APPROPRIATE SEDIMENT REMOVAL BMP. BEFORE THE RUNOFF LEAVES A CONSTRUCTION SITE OR BEFORE DISCHARGE TO AN INFILTRATION FACILITY. RUNOFF FROM FULLY STABILIZED AREAS MAY BE DISCHARGED WITHOUT A SEDIMENT REMOVAL BMP, BUT MUST CONTROL FLOW RATES PER ELEMENT 3: CONTROL FLOW RATES.
- D. LOCATE BMPS INTENDED TO TRAP SEDIMENT ON SITE IN A MANNER TO AVOID INTERFERENCE WITH THE MOVEMENT OF JUVENILE SALMONIDS ATTEMPTING TO ENTER OFF-CHANNEL AREAS OR DRAINAGES.
- E. PROVIDE AND MAINTAIN NATURAL BUFFERS AROUND SURFACE WATERS, DIRECT STORMWATER TO VEGETATED AREAS TO INCREASE SEDIMENT REMOVAL AND MAXIMIZE STORMWATER INFILTRATION, UNLESS INFEASIBLE
- F. WHERE FEASIBLE, DESIGN OUTLET STRUCTURES THAT WITHDRAW IMPOUNDED STORMWATER FROM THE SURFACE TO AVOID DISCHARGING SEDIMENT THAT IS STILL SUSPENDED LOWER IN THE WATER COLUMN.

ADDITIONAL GUIDANCE FOR ELEMENT 4

 OUTLET STRUCTURES THAT WITHDRAW IMPOUNDED STORMWATER FROM THE SURFACE TO AVOID DISCHARGING SEDIMENT THAT IS STILL SUSPENDED LOWER IN THE WATER COLUMN ARE FOR THE CONSTRUCTION PERIOD ONLY. IF INSTALLING A FLOATING PUMP STRUCTURE, INCLUDE A STOPPER TO PREVENT THE PUMP BASKET FROM HITTING THE BOTTOM OF THE POND.

• IF A SEDIMENT TRAPPING BMP UTILIZES A CONTROL STRUCTURE THAT WILL ALSO BE USED IN A PERMANENT DETENTION BMP APPLICATION, THE CONTROL STRUCTURE CONSTRUCTION MUST BE

WHERE FEASIBLE, DIRECT STORMWATER TO VEGETATED AREAS TO INCREASE SEDIMENT REMOVAL AND

• SEED AND MULCH EARTHEN STRUCTURES SUCH AS DAMS, DIKES, AND DIVERSIONS ACCORDING TO THE

• THE LOCAL PERMITTING AUTHORITY MAY INSPECT AND APPROVE AREAS FULLY STABILIZED BY MEANS

• FULL STABILIZATION INCLUDES CONCRETE OR ASPHALT PAVING; QUARRY SPALLS USED AS DITCH

LINING; OR THE USE OF ROLLED EROSION PRODUCTS, A BONDED FIBER MATRIX PRODUCT, OR

VEGETATIVE COVER IN A MANNER THAT WILL FULLY PREVENT SOIL EROSION.

- INSTALL SEDIMENT CONTROLS IN A MANNER THAT PROTECTS THE SENSITIVE AREAS AND THEIR

- FINALIZED FOR THE PERMANENT BMP APPLICATION UPON PROJECT COMPLETION.
- BUFFERS MARKED IN ACCORDANCE WITH ELEMENT 1: PRESERVE VEGETATION / MARK CLEARING

- SUGGESTED BMPS FOR ELEMENT 4 BMP C231: BRUSH BARRIER BMP C232: GRAVEL FILTER BERM BMP C233: SILT FENCE

## BMP C234: VEGETATED STRIP

- BMP C235: WATT
- BMP C240: SEDIMENT TRAP

MAXIMIZE STORMWATER INFILTRATION

TIMING INDICATED IN ELEMENT 5: STABILIZE SOILS.

BMP C241: SEDIMENT POND (TEMPORARY)

OTHER THAN PAVEMENT OR QUARRY SPALLS.

- BMP C250: CONSTRUCTION STORMWATER CHEMICAL TREATMENT

## BMP C251: CONSTRUCTION STORMWATER FILTRATION

- ELEMENT 5: STABILIZE SOILS
- A. STABILIZE EXPOSED AND UNWORKED SOILS BY APPLICATION OF EFFECTIVE BMPS THAT PREVENT EROSION. APPLICABLE BMPS INCLUDE. BUT ARE NOT LIMITED TO: TEMPORARY AND PERMANENT SEEDING, SODDING, MULCHING, PLASTIC COVERING, EROSION CONTROL FABRICS AND MATTING, SOIL APPLICATION OF POLYACRYLAMIDE (PAM), THE EARLY APPLICATION OF GRAVEL BASE ON AREAS TO BE PAVED, AND DUST CONTROL.
- B. CONTROL STORMWATER VOLUME AND VELOCITY WITHIN THE SITE TO MINIMIZE SOIL EROSION. C. CONTROL STORMWATER DISCHARGES, INCLUDING BOTH PEAK FLOW RATES AND TOTAL
- STORMWATER VOLUME, TO MINIMIZE EROSION AT OUTLETS AND TO MINIMIZE DOWNSTREAM CHANNEL AND STREAM BANK EROSION
- D. SOILS MUST NOT REMAIN EXPOSED AND UNWORKED FOR MORE THAN THE TIME PERIODS SET FORTH **BELOW TO PREVENT EROSION:**
- a. DURING THE DRY SEASON (MAY 1 SEPTEMBER 30): 7 DAYS
- b. DURING THE WET SEASON (OCTOBER 1 APRIL 30): 2 DAYS
- E. STABILIZE SOILS AT THE END OF THE SHIFT BEFORE A HOLIDAY OR WEEKEND IF NEEDED BASED ON THE WEATHER FORECAST
- F. STABILIZE SOIL STOCKPILES FROM EROSION, PROTECT WITH SEDIMENT TRAPPING MEASURES, AND WHERE POSSIBLE, LOCATE AWAY FROM STORM DRAIN INLETS, WATERWAYS AND DRAINAGE CHANNELS.

SOIL STABILIZATION BMPS SHOULD BE APPROPRIATE FOR THE TIME OF YEAR, SITE CONDITIONS,

ESTIMATED DURATION OF USE, AND POTENTIAL WATER QUALITY IMPACTS THAT STABILIZATION

• ENSURE THAT GRAVEL BASE USED FOR STABILIZATION IS CLEAN AND DOES NOT CONTAIN FINES OR

A. DESIGN AND CONSTRUCT CUT-AND-FILL SLOPES IN A MANNER TO MINIMIZE EROSION. APPLICABLE

PRACTICES INCLUDE, BUT ARE NOT LIMITED TO, REDUCING CONTINUOUS LENGTH OF SLOPE WITH

TERRACING AND DIVERSIONS, REDUCING SLOPE STEEPNESS, AND ROUGHENING SLOPE SURFACES

B. DIVERT OFF-SITE STORMWATER (RUN-ON) OR GROUND WATER AWAY FROM SLOPES AND DISTURBED

C. AT THE TOP OF SLOPES, COLLECT DRAINAGE IN PIPE SLOPE DRAINS OR PROTECTED CHANNELS TO

10-MINUTE TIME STEP FROM A TYPE 1A, 10-YEAR, 24-HOUR FREQUENCY STORM.

APPROVED CONTINUOUS RUNOFF MODEL WITH A 15-MINUTE TIME STEP.

PREVENT EROSION. TEMPORARY PIPE SLOPE DRAINS MUST BE SIZED TO CONVEY THE FLOW RATE

a. SINGLE EVENT HYDROGRAPH METHOD: THE PEAK VOLUMETRIC FLOW RATE CALCULATED USING A

b. CONTINUOUS SIMULATION METHOD: THE 10-YEAR PEAK FLOW RATE, AS DETERMINED BY AN

D. THE HYDROLOGIC ANALYSIS MUST USE THE EXISTING LAND COVER CONDITION FOR PREDICTING

CONDITION, WHICHEVER WILL PRODUCE THE HIGHEST FLOW RATES. IF USING THE WESTERN

FLOW RATES FROM TRIBUTARY AREAS OUTSIDE THE PROJECT LIMITS. FOR TRIBUTARY AREAS ON THE

PROJECT SITE, THE ANALYSIS MUST USE THE TEMPORARY OR PERMANENT PROJECT LAND COVER

WASHINGTON HYDRO- LOGY MODEL (WWHM) TO PREDICT FLOWS, BARE SOIL AREAS SHOULD BE

E. PLACE EXCAVATED MATERIAL ON THE UPHILL SIDE OF TRENCHES, CONSISTENT WITH SAFETY AND

F. PLACE CHECK DAMS AT REGULAR INTERVALS WITHIN CONSTRUCTED CHANNELS THAT ARE CUT

BMP COMBINATIONS ARE THE MOST EFFECTIVE METHOD OF PROTECTING SLOPES WITH DISTURBED

SOILS. FOR EXAMPLE, USE BOTH BMP C121: MULCHING AND BMP C122: NETS AND BLANKETS IN

AREAS WITH INTERCEPTOR DIKES, PIPES AND/OR SWALES. OFF-SITE STORMWATER SHOULD BE MAN-

- G.MINIMIZE THE AMOUNT OF SOIL EXPOSED DURING CONSTRUCTION ACTIVITY.
- H. MINIMIZE THE DISTURBANCE OF STEEP SLOPES.
- I. MINIMIZE SOIL COMPACTION AND, UNLESS INFEASIBLE, PRESERVE TOPSOIL.

AGENTS MAY HAVE ON DOWNSTREAM WATERS OR GROUND WATER.

BMP C126: POLYACRYLAMIDE (PAM) FOR SOIL EROSION PROTECTION

AGED SEPARATELY FROM STORMWATER GENERATED ON SITE.

CALCULATED BY ONE OF THE FOLLOWING METHODS:

ADDITIONAL GUIDANCE FOR ELEMENT 5

BMP C120: TEMPORARY AND PERMANENT SEEDING

SEDIMENT.

SUGGESTED BMPS FOR ELEMENT 5

BMP C122: NETS AND BLANKETS

BMP C125: TOPSOILING / COMPOSTING

(FOR EXAMPLE, TRACK WALKING).

MODELED AS "LANDSCAPED" AREA.

CONSIDER SOIL TYPE AND ITS POTENTIAL FOR EROSION.

BMP C120: TEMPORARY AND PERMANENT SEEDING

STABILIZE SOILS ON SLOPES, AS SPECIFIED IN ELEMENT 5: STABILIZE SOILS.

SPACE CONSIDERATIONS

ADDITIONAL GUIDANCE FOR ELEMENT 6

SUGGESTED BMPS FOR ELEMENT 6

BMP C122: NETS AND BLANKETS

BMP C130: SURFACE ROUGHENING

BMP C201: GRASS-LINED CHANNELS

• BMP C204: PIPE SLOPE DRAINS

BMP C200: INTERCEPTOR DIKE AND SWALE

BMP C131: GRADIENT TERRACES

BMP C123: PLASTIC COVERING

BMP C121: MULCHING

BMP C124: SODDING

BMP C203: WATER BARS

DOWN A SLOPE.

COMBINATION.

BMP C130: SURFACE ROUGHENING

BMP C131: GRADIENT TERRACES

BMP C140: DUST CONTROL

ELEMENT 6: PROTECT SLOPES

BMP C123: PLASTIC COVERING

BMP C121: MULCHING

BMP C124: SODDING

### BMP C205: SUBSURFACE DRAINS

- BMP C206: LEVEL SPREADER
- BMP C207: CHECK DAMS

BMP C208: TRIANGULAR SILT DIKE (TSD)

- **ELEMENT 7: PROTECT DRAIN INLETS**
- A.PROTECT ALL STORM DRAIN INLETS MADE OPERABLE DURING CONSTRUCTION SO THAT STORMWATER RUNOFF DOES NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR TREATED TO REMOVE SEDIMENT
- B. CLEAN OR REMOVE AND REPLACE INLET PROTECTION DEVICES WHEN SEDIMENT HAS FILLED ONE-THIRD OF THE AVAILABLE STORAGE (UNLESS A DIFFERENT STANDARD IS SPECIFIED BY THE PRODUCT MANUFACTURER).

ADDITIONAL GUIDANCE FOR ELEMENT 7

- PROTECT ALL EXISTING STORM DRAIN INLETS SO THAT STORMWATER RUNOFF DOES NOT ENTER THE CONVEYANCE SYSTEM WITHOUT FIRST BEING FILTERED OR TREATED TO REMOVE SEDIMENT.
- KEEP ALL APPROACH ROADS CLEAN. DO NOT ALLOW SEDIMENT AND STREET WASH WATER TO ENTER STORM DRAINS WITHOUT PRIOR AND ADEQUATE TREATMENT (AS DEFINED ABOVE) UNLESS
- TREATMENT IS PROVIDED BEFORE THE STORM DRAIN DISCHARGES TO WATERS OF THE STATE. • INLETS SHOULD BE INSPECTED WEEKLY AT A MINIMUM AND DAILY DURING STORM EVENTS.

### SUGGESTED BMPS FOR ELEMENT 7

 BMP C220: INLET PROTECTION ELEMENT 8: STABILIZE CHANNELS AND OUTLETS

- A. DESIGN, CONSTRUCT, AND STABILIZE ALL ON-SITE CONVEYANCE CHANNELS TO PREVENT EROSION
- FROM THE FLOW RATE CALCULATED BY ONE OF THE FOLLOWING METHODS:
- a. SINGLE EVENT HYDROGRAPH METHOD: THE PEAK VOLUMETRIC FLOW RATE CALCULATED USING A 10-MINUTE TIME STEP FROM A TYPE 1A, 10-YEAR, 24-HOUR FREQUENCY STORM.
- b. CONTINUOUS SIMULATION METHOD: THE 10-YEAR PEAK FLOW RATE, AS DETERMINED BY AN
- APPROVED CONTINUOUS RUNOFF MODEL WITH A 15-MINUTE TIME STEP.

THE HYDROLOGIC ANALYSIS MUST USE THE EXISTING LAND COVER CONDITION FOR PREDICTING FLOW RATES FROM TRIBUTARY AREAS OUTSIDE THE PROJECT LIMITS. FOR TRIBUTARY AREAS ON THE PROJECT SITE, THE ANALYSIS MUST USE THE TEMPORARY OR PERMANENT PROJECT LAND COVER CONDITION, WHICHEVER WILL PRODUCE THE HIGHEST FLOW RATES. IF USING THE WESTERN WASHINGTON HYDRO LOGY MODEL (WWHM) TO PREDICT FLOWS, BARE SOIL AREAS SHOULD BE MODELED AS "LANDSCAPED"

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

ADDITIONAL GUIDANCE FOR ELEMENT 8

THE BEST METHOD FOR STABILIZING CHANNELS IS TO COMPLETELY LINE THE CHANNEL WITH BMP C122: NETS AND BLANKETS FIRST, THEN ADD BMP C207: CHECK DAMS AS NECESSARY TO FUNCTION AS AN ANCHOR AND TO SLOW THE FLOW OF WATER

SUGGESTED BMPS FOR ELEMENT 8

- BMP C122: NETS AND BLANKETS
- BMP C202: RIPRAP CHANNEL LINING
- BMP C207: CHECK DAMS
- BMP C209: OUTLET PROTECTION

ELEMENT 9: CONTROL POLLUTANTS

DESIGN, INSTALL, IMPLEMENT AND MAINTAIN EFFECTIVE POLLUTION PREVENTION MEASURES TO MINIMIZE THE DISCHARGE OF POLLUTANTS. THE PROJECT PROPONENT MUST:

- A. HANDLE AND DISPOSE OF ALL POLLUTANTS, INCLUDING WASTE MATERIALS AND DEMOLITION DEBRIS THAT OCCUR ON SITE IN A MANNER THAT DOES NOT CAUSE CONTAMINATION OF STORMWATER.
- B. PROVIDE COVER, CONTAINMENT, AND PROTECTION FROM VANDALISM FOR ALL CHEMICALS, LIQUID PRODUCTS, PETROLEUM PRODUCTS, AND OTHER MATERIALS THAT HAVE THE POTENTIAL TO POSE A THREAT TO HUMAN HEALTH OR THE ENVIRONMENT. ON-SITE FUELING TANKS MUST INCLUDE SECONDARY CONTAINMENT. SECONDARY CONTAINMENT MEANS PLACING TANKS OR CONTAINERS WITHIN AN IMPERVIOUS STRUCTURE CAPABLE OF CONTAINING 110% OF THE VOLUME CONTAINED IN THE LARGEST TANK WITHIN THE CONTAINMENT STRUCTURE. DOUBLE-WALLED TANKS DO NOT REQUIRE ADDITIONAL SECONDARY CONTAINMENT.
- C. CONDUCT MAINTENANCE, FUELING, AND REPAIR OF HEAVY EQUIPMENT AND VEHICLES USING SPILL PREVENTION AND CONTROL MEASURES. CLEAN CONTAMINATED SURFACES IMMEDIATELY FOLLOWING ANY SPILL INCIDENT.
- D. DISCHARGE WHEEL WASH OR TIRE BATH WASTEWATER TO A SEPARATE ON-SITE TREATMENT SYSTEM THAT PREVENTS DISCHARGE TO SURFACE WATER, OR TO THE SANITARY SEWER, WITH LOCAL SEWER DISTRICT APPROVAL
- E. APPLY FERTILIZERS AND PESTICIDES IN A MANNER AND AT APPLICATION RATES THAT WILL NOT RESULT IN LOSS OF CHEMICAL TO STORMWATER RUNOFF. FOLLOW MANUFACTURERS' LABEL REQUIREMENTS FOR APPLICATION RATES AND PROCEDURES.
- F. USE BMPS TO PREVENT CONTAMINATION OF STORMWATER RUNOFF BY PH-MODIFYING SOURCES THE SOURCES FOR THIS CONTAMINATION INCLUDE, BUT ARE NOT LIMITED TO: RECYCLED CONCRETE STOCKPILES, BULK CEMENT, CEMENT KILN DUST, FLY ASH, NEW CONCRETE WASHING AND CURING WATERS, WASTE STREAMS GENERATED FROM CONCRETE GRINDING AND SAWING, EXPOSED AGGREGATE PROCESSES, DEWATERING CONCRETE VAULTS, CONCRETE PUMPING AND MIXER WASHOUT WATERS.
- G. ADJUST THE PH OF STORMWATER IF NECESSARY TO PREVENT VIOLATIONS OF WATER QUALITY STANDARDS.
- H. ASSURE THAT WASHOUT OF CONCRETE TRUCKS IS PERFORMED OFF SITE OR IN DESIGNATED CONCRETE WASHOUT AREAS ONLY. DO NOT WASH OUT CONCRETE TRUCK DRUMS OR CONCRETE HANDLING EQUIPMENT ONTO THE GROUND, OR INTO STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS. WASHOUT OF SMALL CONCRETE HANDLING EQUIPMENT MAY BE DISPOSED OF IN A FORMED AREA AWAITING CONCRETE WHERE IT WILL NOT CONTAMINATE SURFACE OR GROUND WATER. DO NOT DUMP EXCESS CONCRETE ON SITE, EXCEPT IN DESIGNATED CONCRETE WASHOUT AREAS, CONCRETE SPILLAGE OR CONCRETE DISCHARGE DIRECTLY TO GROUND WATER OR SURFACE WATERS OF THE STATE IS PROHIBITED. DO NOT WASH OUT TO FORMED AREAS AWAITING INFILTRATION BMPS.
- I. OBTAIN WRITTEN APPROVAL FROM ECOLOGY BEFORE USING CHEMICAL TREATMENT OTHER THAN CO2, DRY ICE, OR FOOD GRADE VINEGAR TO ADJUST PH.
- J. UNCONTAMINATED WATER FROM WATER-ONLY BASED SHAFT DRILLING FOR CONSTRUCTION OF BUILDING, ROAD, AND BRIDGE FOUNDATIONS MAY BE INFILTRATED PROVIDED THE WASTEWATER IS MANAGED IN A WAY THAT PROHIBITS DISCHARGE TO SURFACE WATERS, PRIOR TO INFILTRATION. WATER FROM WATER-ONLY BASED SHAFT DRILLING THAT COMES INTO CONTACT WITH CURING CONCRETE MUST BE NEUTRALIZED UNTIL PH IS IN THE RANGE OF 6.5 TO 8.5 (SU).

ADDITIONAL GUIDANCE FOR ELEMENT 9

- WHEEL WASH AND/OR TIRE BATH WASTEWATER CAN BE COMBINED WITH WASTEWATER FROM CONCRETE WASHOUT AREAS IF THE WASTEWATERS WILL BE PROPERLY DISPOSED OF AT AN OFFSITE LOCATION OR TREATMENT FACILITY.
- DO NOT USE UPLAND LAND APPLICATIONS FOR DISCHARGING WASTEWATER FROM CONCRETE WASHOUT AREAS.
- WOODY DEBRIS MAY BE CHOPPED AND SPREAD ON SITE.
- CONDUCT OIL CHANGES, HYDRAULIC SYSTEM DRAIN DOWN, SOLVENT AND DEGREASING 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 USING SPILL PREVENTION MEASURES, SUCH AS DRIP PANS.
- CLEAN CONTAMINATED SURFACES 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

A STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

SUGGESTED BMPS FOR ELEMENT 9

## BMP C151: CONCRETE HANDLING

- BMP C152: SAWCUTTING AND SURFACING POLLUTION PREVENTION • BMP C153: MATERIAL DELIVERY, STORAGE, AND CONTAINMENT
- BMP C154: CONCRETE WASHOUT AREA
- BMP C250: CONSTRUCTION STORMWATER CHEMICAL TREATMENT
- BMP C251: CONSTRUCTION STORMWATER FILTRATION
- BMP C252: TREATING AND DISPOSING OF HIGH PH WATER
- ALSO SEE THE SOURCE CONTROL BMPS DETAILED IN VOLUME IV

ELEMENT 10: CONTROL DEWATERING

- A.DISCHARGE FOUNDATION, VAULT, AND TRENCH DEWATERING WATER, WHICH HAVE SIMILAR CHARACTERISTICS TO STORMWATER RUNOFF AT THE SITE. INTO A CONTROLLED CONVEYANCE SYSTEM BEFORE DISCHARGE TO BMP C240: SEDIMENT TRAP OR BMP C241: SEDIMENT POND (TEMPORARY)
- B. DISCHARGE CLEAN, NON-TURBID DEWATERING WATER, SUCH AS WELL-POINT GROUND WATER, TO SYSTEMS TRIBUTARY TO. OR DIRECTLY INTO SURFACE WATERS OF THE STATE. AS SPECIFIED IN ELEMENT 8: STABILIZE CHANNELS AND OUTLETS, PROVIDED THE DEWATERING FLOW DOES NOT CAUSE EROSION OR FLOODING OF RECEIVING WATERS. DO NOT ROUTE CLEAN DEWATERING WATER THROUGH STORMWATER SEDIMENT BMPS. NOTE THAT "SURFACE WATERS OF THE STATE" MAY EXIST ON A CONSTRUCTION SITE AS WELL AS OFF SITE; FOR EXAMPLE, A CREEK RUNNING THROUGH A SITE.
- C. HANDLE HIGHLY TURBID OR OTHERWISE CONTAMINATED DEWATERING WATER SEPARATELY FROM STORM- WATER.
- D. OTHER DEWATERING TREATMENT OR DISPOSAL OPTIONS MAY INCLUDE:
- a. INFILTRATION
- b. TRANSPORT OFF SITE IN A VEHICLE, SUCH AS A VACUUM FLUSH TRUCK, FOR LEGAL DISPOSAL IN A MANNER THAT DOES NOT POLLUTE STATE WATERS.
- c. ECOLOGY-APPROVED ON-SITE CHEMICAL TREATMENT OR OTHER SUITABLE TREATMENT TECHNOLOGIES
- d. SANITARY OR COMBINED SEWER DISCHARGE WITH LOCAL SEWER DISTRICT APPROVAL, IF THERE IS NO OTHER OPTION.
- e. USE OF A SEDIMENTATION BAG THAT DISCHARGES TO A DITCH OR SWALE FOR SMALL VOLUMES OF LOCALIZED DEWATERING.

### ADDITIONAL GUIDANCE FOR ELEMENT 10

- CHANNELS MUST BE STABILIZED, AS SPECIFIED IN ELEMENT 8: STABILIZE CHANNELS AND OUTLETS. CONSTRUCTION EQUIPMENT OPERATION, CLAMSHELL DIGGING, CONCRETE TREMIE POUR, OR WORK
- INSIDE A COFFERDAM CAN CREATE HIGHLY TURBID OR CONTAMINATED DEWATERING WATER. DISCHARGING SEDIMENT-LADEN (MUDDY) WATER INTO WATERS OF THE STATE LIKELY CONSTITUTES VIOLATION OF WATER QUALITY STANDARDS FOR TURBIDITY. THE EASIEST WAY TO AVOID DISCHARGING MUDDY WATER IS THROUGH INFILTRATION AND PRESERVING VEGETATION
- DEWATERING WATER FROM CONTAMINATED SITES MUST BE HANDLED SEPARATELY FROM STORMWATER. DIRECT CONTAMINATED STORMWATER TO A SANITARY SEWER WHERE ALLOWED BY THE LOCAL SEWER AUTHORITY, OR TO OTHER APPROVED TREATMENT.

SUGGESTED BMPS FOR ELEMENT 10

• BMP C203: WATER BARS

- BMP C236: VEGETATIVE FILTRATION
- **ELEMENT 11: MAINTAIN BMPS** A. MAINTAIN AND REPAIR ALL TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL BMPS AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION IN ACCORDANCE WITH BMP SPECIFICATIONS.
- B. REMOVE ALL TEMPORARY EROSION AND SEDIMENT CONTROL BMPS WITHIN 30 DAYS AFTER ACHIEVING FINAL SITE STABILIZATION OR AFTER THE TEMPORARY BMPS ARE NO LONGER NEEDED.
- ADDITIONAL GUIDANCE FOR ELEMENT 11
- SOME TEMPORARY EROSION AND SEDIMENT CONTROL BMPS ARE BIODEGRADABLE AND DESIGNED TO REMAIN IN PLACE FOLLOWING CONSTRUCTION. BMP C122: NETS AND BLANKETS IS AN EXAMPLE OF A BMP WITH BIODEGRADABLE OPTIONS.
- PROVIDE PROTECTION TO ALL BMPS INSTALLED FOR THE PERMANENT CONTROL OF STORMWATER FROM SEDIMENT AND COMPACTION. ALL BMPS THAT ARE TO REMAIN IN PLACE FOLLOWING COMPLETION OF CONSTRUCTION SHALL BE EXAMINED AND PLACED IN FULL OPERATING CONDITIONS. IF SEDIMENT ENTERS THE BMPS DURING CONSTRUCTION, IT SHALL BE REMOVED AND THE FACILITY SHALL BE RETURNED TO THE CONDITIONS SPECIFIED IN THE CONSTRUCTION DOCUMENTS.
- REMOVE OR STABILIZE TRAPPED SEDIMENT ON SITE. PERMANENTLY STABILIZE DISTURBED SOIL RESULTING FROM REMOVAL OF BMPS OR VEGETATION.
- SUGGESTED BMPS FOR ELEMENT 11
- BMP C150: MATERIALS ON HAND
- BMP C160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD
- ELEMENT 12: MANAGE THE PROJECT
- A.PHASE DEVELOPMENT PROJECTS TO THE MAXIMUM DEGREE PRACTICABLE AND TAKE INTO ACCOUNT SEASONAL WORK LIMITATIONS
- B. INSPECT, MAINTAIN AND REPAIR ALL BMPS AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. PROJECTS REGULATED UNDER THE CONSTRUCTION STORMWATER GENERAL PERMIT (CSWGP) MUST CONDUCT SITE INSPECTIONS AND MONITORING IN ACCORDANCE WITH SPECIAL CONDITION S4 OF THE CSWGP.
- C. MAINTAIN, UPDATE, AND IMPLEMENT THE CONSTRUCTION SWPPP.
- D. PROJECTS THAT DISTURB ONE OR MORE ACRES MUST HAVE SITE INSPECTIONS CONDUCTED BY A CERTIFIED FROSION AND SEDIMENT CONTROL LEAD (CESCI.), PROJECT SITES DISTURBING LESS THAN ONE ACRE MAY HAVE A CESCL OR A PERSON WITHOUT CESCL CERTIFICATION CONDUCT INSPECTIONS. BY THE INITIATION OF CONSTRUCTION, THE CONSTRUCTION SWPPP MUST IDENTIFY THE CESCL OR INSPECTOR, WHO MUST BE PRESENT ON SITE OR ON-CALL AT ALL TIMES.

### ADDITIONAL GUIDANCE FOR ELEMENT 12

THE PROJECT MANAGER MUST ENSURE THAT THE PROJECT IS BUILT IN SUCH A WAY TO COMPLY WITH ALL CONSTRUCTION SWPPP ELEMENTS, AS DETAILED IN THIS SECTION. CONSIDERATIONS FOR THE PROJECT MANAGER INCLUDE, BUT ARE NOT LIMITED TO:

- CONSTRUCTION PHASING
- SEASONAL WORK LIMITATIONS COORDINATION WITH UTILITIES AND OTHER CONTRACTORS
- INSPECTION
- MONITORING
- MAINTAINING AN UPDATED CONSTRUCTION SWPPP
- PHASING OF CONSTRUCTION

PHASE DEVELOPMENT PROJECTS WHERE FEASIBLE IN ORDER TO PREVENT SOIL EROSION AND TRANSPORTING OF SEDIMENT FROM THE SITE DURING CONSTRUCTION. REVEGETATE EXPOSED AREAS AND MAINTAIN THAT VEGETATION AS AN INTEGRAL PART OF THE CLEARING ACTIVITIES FOR ANY PHASE.

CLEARING AND GRADING ACTIVITIES FOR DEVELOPMENTS SHALL BE PERMITTED ONLY IF CONDUCTED USING AN APPROVED SITE DEVELOPMENT PLAN (E.G., SUBDIVISION APPROVAL) THAT ESTABLISHES PERMITTED AREAS OF CLEARING, GRADING, CUTTING, AND FILLING, MINIMIZE REMOVING TREES AND DISTURBING OR COMPACTING NATIVE SOILS WHEN ESTABLISHING PERMITTED CLEARING AND GRADING AREAS. SHOW ON THE SITE PLANS AND THE DEVELOPMENT SITE 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 AS MAY BE REQUIRED BY LOCAL JURISDICTIONS.

INSPECTION

ALL BMPS MUST BE INSPECTED, MAINTAINED, AND REPAIRED AS NEEDED TO ASSURE CONTINUED PERFORMANCE OF THEIR INTENDED FUNCTION. SITE INSPECTIONS MUST BE CONDUCTED BY A PERSON KNOWLEDGEABLE IN THE PRINCIPLES AND PRACTICES OF EROSION AND SEDIMENT CONTROL. THE PERSON MUST HAVE THE SKILLS TO 1) ASSESS THE SITE CONDITIONS AND CONSTRUCTION ACTIVITIES THAT COULD IMPACT THE QUALITY OF STORMWATER, AND 2) ASSESS THE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES USED TO CONTROL THE QUALITY OF STORMWATER DISCHARGES.

FOR CONSTRUCTION SITES ONE ACRE OR LARGER THAT DISCHARGE STORMWATER TO SURFACE WATERS OF THE STATE, A CESCL MUST BE IDENTIFIED IN THE CONSTRUCTION SWPPP: THIS PERSON MUST BE ON-SITE OR ON-CALL AT ALL TIMES. CERTIFICATION MUST BE OBTAINED THROUGH AN APPROVED TRAINING PROGRAM THAT MEETS THE EROSION AND SEDIMENT CONTROL TRAINING STANDARDS ESTABLISHED BY ECOLOGY. SEE BMP C160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD.

APPROPRIATE BMPS OR DESIGN CHANGES SHALL BE IMPLEMENTED AS SOON AS POSSIBLE 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 CESCL OR INSPECTOR MUST EXAMINE STORMWATER VISUALLY FOR THE PRESENCE OF SUSPENDED SEDIMENT, TURBIDITY, DISCOLORATION, AND OIL SHEEN. THEY MUST EVALUATE THE EFFECTIVENESS OF BMPS AND DETERMINE IF IT IS NECESSARY TO INSTALL, MAINTAIN, OR REPAIR BMPS TO IMPROVE THE QUALITY OF STORMWATER DISCHARGES.

BASED ON THE RESULTS OF THE INSPECTION, CONSTRUCTION SITE OPERATORS MUST CORRECT THE PROBLEMS IDENTIFIED BY: • REVIEWING THE CONSTRUCTION SWPPP FOR COMPLIANCE WITH THE 13 ELEMENTS AND MAKING

APPROPRIATE REVISIONS WITHIN 7 DAYS OF THE INSPECTION.

 IMMEDIATELY BEGINNING THE PROCESS OF FULLY IMPLEMENTING AND MAINTAINING APPROPRIATE SOURCE CONTROL AND/OR TREATMENT BMPS AS SOON AS POSSIBLE, ADDRESSING THE PROBLEMS NO LATER THAN WITHIN 10 DAYS OF THE INSPECTION. IF INSTALLATION OF NECESSARY TREATMENT BMPS IS NOT FEASIBLE WITHIN 10 DAYS, THE CONSTRUCTION SITE OPERATOR MAY REQUEST AN EXTENSION WITHIN THE INITIAL 10- DAY RESPONSE PERIOD.

 DOCUMENTING BMP IMPLEMENTATION AND MAINTENANCE IN THE SITE LOG BOOK (APPLIES ONLY TO SITES THAT HAVE COVERAGE UNDER THE CONSTRUCTION STORMWATER GENERAL PERMIT).

THE CESCL MUST INSPECT ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES, ALL BMPS, AND ALL STORMWATER DISCHARGE POINTS AT LEAST ONCE EVERY CALENDAR WEEK AND WITHIN 24 HOURS OF ANY DISCHARGE FROM THE SITE. (FOR PURPOSES OF THIS CONDITION, INDIVIDUAL DISCHARGE EVENTS THAT LAST MORE THAN ONE DAY DO NOT REQUIRE DAILY INSPECTIONS. FOR EXAMPLE, IF A STORMWATER POND DISCHARGES CONTINUOUSLY OVER THE COURSE OF A WEEK, ONLY ONE INSPECTION IS REQUIRED THAT WEEK.) THE CESCL OR INSPECTOR MAY REDUCE THE INSPECTION FREQUENCY FOR TEMPORARY STABILIZED, INACTIVE SITES TO ONCE EVERY CALENDAR MONTH

MAINTAINING AN UPDATED CONSTRUCTION SWPPP

CESCL CONTACT INFORMATION SHALL BE PROVIDED TO THE CITY OF FERNDALE AT OR BEFORE PRE-CONSTRUCION. THE CONSTRUCTION SWPPP WILL BE RETAINED ON-SITE AND WILL BE UPDATED ON A REGULAR BASIS. MODIFICATIONS TO THE CONSTRUCTION SWPPP WILL BE MADE WHENEVER THERE IS A SIGNIFICANT CHANGE IN THE DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE OF ANY BMP.

RETAIN THE CONSTRUCTION SWPPP ON-SITE OR WITHIN REASONABLE ACCESS TO THE SITE.

MODIFY THE CONSTRUCTION SWPPP WHENEVER THERE IS A CHANGE IN THE DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE AT THE CONSTRUCTION SITE THAT HAS, OR COULD HAVE, A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO WATERS OF THE STATE.

THE CONSTRUCTION SWPPP MUST BE MODIFIED IF, DURING INSPECTIONS OR INVESTIGATIONS CONDUCTED BY THE OWNER/OPERATOR, OR THE APPLICABLE LOCAL OR STATE REGULATORY AUTHORITY, IT IS DETERMINED THAT THE CONSTRUCTION SWPPP IS INEFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING POLLUTANTS IN STORMWATER DIS- CHARGES FROM THE SITE. MODIFY THE CONSTRUCTION SWPPP AS NECESSARY TO INCLUDE ADDITIONAL OR MODIFIED BMPS DESIGNED TO CORRECT PROBLEMS IDENTIFIED. COMPLETE REVISIONS TO THE CONSTRUCTION SWPPP WITHIN SEVEN (7) DAYS FOLLOWING THE INSPECTION.

- SUGGESTED BMPS FOR ELEMENT 12
- BMP C150: MATERIALS ON HAND
- BMP C160: CERTIFIED EROSION AND SEDIMENT CONTROL LEAD

BMP C162: SCHEDULING

ELEMENT 13: PROTECT LOW IMPACT DEVELOPMENT BMPS

THE PRIMARY PURPOSE OF ON-SITE STORMWATER MANAGEMENT IS TO REDUCE THE DISRUPTION OF THE NATURAL SITE HYDROLOGY THROUGH INFILTRATION. BMPS USED TO MEET I-3.4.5 MR5: ON-SITE STORMWATER MANAGEMENT (OFTEN CALLED LID BMPS) ARE PERMANENT FACILITIES.

- A.PROTECT ALL LID BMPS (INCLUDING, BUT NOT LIMITED TO BMP T7.30: BIORETENTION, BMP T5.14: RAIN GARDENS, AND BMP T5.15: PERMEABLE PAVEMENTS) FROM SEDIMENTATION THROUGH INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL BMPS ON PORTIONS OF THE SITE THAT DRAIN INTO THE LID BMPS. RESTORE THE BMPS TO THEIR FULLY FUNCTIONING CONDITION IF THEY ACCUMULATE SEDIMENT DURING CONSTRUCTION, RESTORING THE BMP MUST INCLUDE REMOVAL OF SEDIMENT AND ANY SEDIMENT-LADEN BIORETENTION/RAIN GARDEN SOILS, AND REPLACING THE REMOVED SOILS WITH SOILS MEETING THE DESIGN SPECIFICATION.
- B. MAINTAIN THE INFILTRATION CAPABILITIES OF LID BMPS BY PROTECTING AGAINST COMPACTION BY CONSTRUCTION EQUIPMENT AND FOOT TRAFFIC. PROTECT COMPLETED LAWN AND LANDSCAPED AREAS FROM COMPACTION DUE TO CONSTRUCTION EQUIPMENT.
- C. CONTROL EROSION AND AVOID INTRODUCING SEDIMENT FROM SURROUNDING LAND USES ONTO BMP T5.15: PERMEABLE PAVEMENTS. DO NOT ALLOW MUDDY CONSTRUCTION EQUIPMENT ON THE BASE MATERIAL OR PAVEMENT. DO NOT ALLOW SEDIMENT-LADEN RUNOFF ONTO PERMEABLE PAVEMENTS OR BASE MATERIALS.
- D.PERMEABLE PAVEMENT FOULED WITH SEDIMENTS OR NO LONGER PASSING AN INITIAL INFILTRATION TEST MUST BE CLEANED USING PROCEDURES IN ACCORDANCE WITH THIS MANUAL OR THE MANUFACTURER'S PROCEDURES

E. KEEP ALL HEAVY EQUIPMENT OFF EXISTING SOILS UNDER LID BMPS THAT HAVE BEEN EXCAVATED TO FINAL GRADE TO RETAIN THE INFILTRATION RATE OF THE SOILS. ADDITIONAL GUIDANCE FOR ELEMENT 13

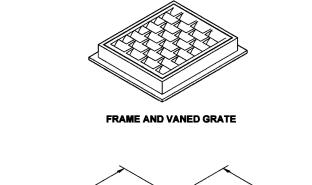
SEE CHAPTER 5: PRECISION SITE PREPARATION, CONSTRUCTION & INSPECTION OF LID FACILITIES IN THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND (HINMAN AND WULKAN, 2012) FOR MORE DETAIL ON PROTECTING LID INTEGRATED MANAGEMENT PRACTICES.

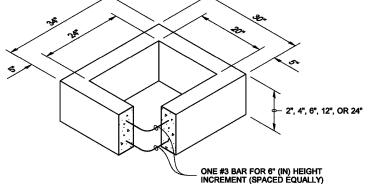
NOTE THAT THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND (HINMAN AND WULKAN, 2012) IS FOR ADDITIONAL INFORMATIONAL PURPOSES ONLY. YOU MUST FOLLOW THE GUIDANCE WITHIN THIS MANUAL IF THERE ARE ANY DISCREPANCIES BETWEEN THIS MANUAL AND THE LID TECHNICAL GUIDANCE MANUAL FOR PUGET SOUND

(HINMAN AND WULKAN, 2012).

- SUGGESTED BMPS FOR ELEMENT 13
- BMP C102: BUFFER ZONES
- BMP C103: HIGH-VISIBILITY FENCE
- BMP C200: INTERCEPTOR DIKE AND SWALE
- BMP C201: GRASS-LINED CHANNELS BMP C207: CHECK DAMS
- BMP C208: TRIANGULAR SILT DIKE (TSD)
- BMP C231: BRUSH BARRIER
- BMP C233: SILT FENCE
- BMP C234: VEGETATED STRIP

TATES! Ω Ζ Ο ()98 Ζ 0 Ο  $\sim$ Ζ  $\mathbf{\mathcal{L}}$ 0 7 0 Ο () $\overline{}$  $\Box$  $\bigcirc$ Ζ Ω (Г ≥ M r Ο S PROJECT NUMBER: 21029 DESIGNED/DRAWN BY: BLS CHECKED BY: SIG ISSUE DATE: 10-23-2023 20 27



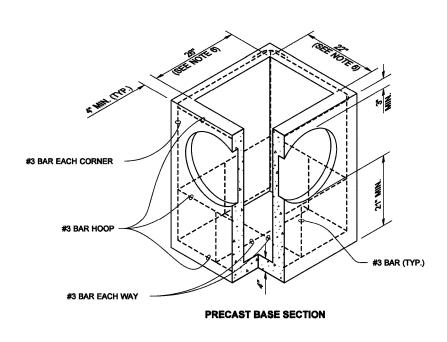


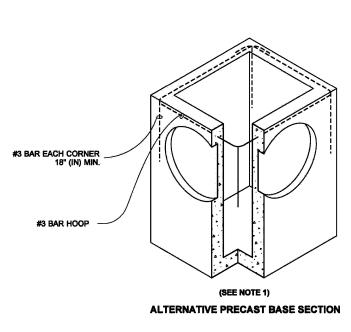
RECTANGULAR ADJUSTMENT SECTION

PIPE ALLOWANCES							
PIPE MATERIAL	MAXIMUM INSIDE DIAMETER (INCHES)						
REINFORCED OR PLAIN CONCRETE	12"						
ALL METAL PIPE	15"						
CPSSP <b>*</b> (STD. SPEC. SECT. 9-05.20)	12"						
SOLID WALL PVC (STD. SPEC. SECT. 9-05.12(1))	15"						
PROFILE WALL PVC (STD. SPEC. SECT. 9-05.12(2))	15"						
* CORRUGATED POLYETHYLE STORM SEWER PIPE	INE						

NOTES

- 1. As acceptable alternatives to the rebar shown in the PRECAST BASE SECTION, fibers (placed according to the Standard Specifications), or wire mesh having a minimum area of 0.12 square inches per foot shall be used with the minimum required rebar shown in the ALTERNATIVE PRECAST BASE SECTION. Wire mesh shall not be placed in the
- 2. The knockout diameter shall not be greater than 20" (in). Knockouts shall have a wall thickness of 2" (in) minimum to 2.5" (in) maximum. Provide a 1.5" (in) minimum gap between the knockout wall and the outside of the pipe. After the pipe is installed, fill the gap with joint mortar in accordance with **Standard Specification Section 9-04.3**.
- 3. The maximum depth from the finished grade to the lowest pipe invert shall be 5' (ft).
- The frame and grate may be installed with the flange down, or integrally cast into the adjustment section with flange up.
- 5. The Precast Base Section may have a rounded floor, and the walls may be sloped at a rate of 1 : 24 or steeper.
- 6. The opening shall be measured at the top of the Precast Base Section.
- 7. All pickup holes shall be grouted full after the basin has been placed.





**CATCH BASIN TYPE 1** 



Julie Heilman 2020.09.01 07:52:50 -07'00' CATCH BASIN TYPE 1

STANDARD PLAN B-5.20-03 SHEET 1 OF 1 SHEET

APPROVED FOR PUBLICATION Roark, Steve Digitally signed by Roark, Steve Date: 2020.09.09 09:45:23 -07'00' STATE DESIGN ENGINEER Washington State Department of Transportation

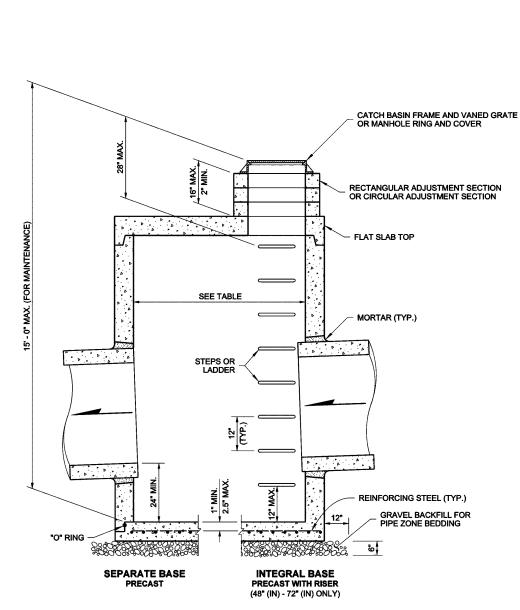
1. No steps are required when height is 4' or less.

The frame may be cast into the adjustment section.

2. The bottom of the precast catch basin may be sloped to facilitate cleaning.

3. The rectangular frame and grate may be installed with the flange up or down.





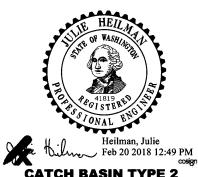
	CATCH	BASIN DI	MENSION	S
CATCH BASIN DIAMETER	MIN. WALL THICKNESS	MIN. BASE THICKNESS	MAXIMUM KNOCKOUT SIZE	MINIMUM DISTANCE BETWEEN KNOCKOUTS
48"	4"	6"	36"	8"
54"	4.5"	8"	42"	8"
60"	5"	8"	48"	8"
72"	6"	8"	60"	12"
84"	8"	12"	72"	12"
96"	8"	12"	84"	12"
120"	10"	12"	96"	12"
144"	12"	12"	108"	12"

PIPE ALLOWANCES											
САТСН	PIPE MATERIAL WITH MAXIMUM INSIDE DIAMETER										
BASIN	CONCRETE	ALL METAL	CPSSP ① PP ④	SOLID WALL PVC <sup>②</sup>	PROFILE WALL PVC <sup>3</sup>						
48"	24"	30"	24"	30"	30"						
54"	30"	36"	30"	36"	36"						
60"	36"	42"	36"	42"	42"						
72"	42"	54"	42"	48"	48"						
84"	54"	60"	54"	48"	48"						
96"	60"	72"	60"	48"	48"						
120"	66"	84"	60"	48"	48"						
144"	78"	96"	60"	48"	48"						

Corrugated Polyethylene Storm Sewer Pipe (See Standard Specification Section 9-05.20)

(2) (See Standard Specification Section 9-05.12(1)) ③ (See Standard Specification Section 9-05.12(2))

④ Polypropylene Pipe (See Standard Specification Section 9-05.24)

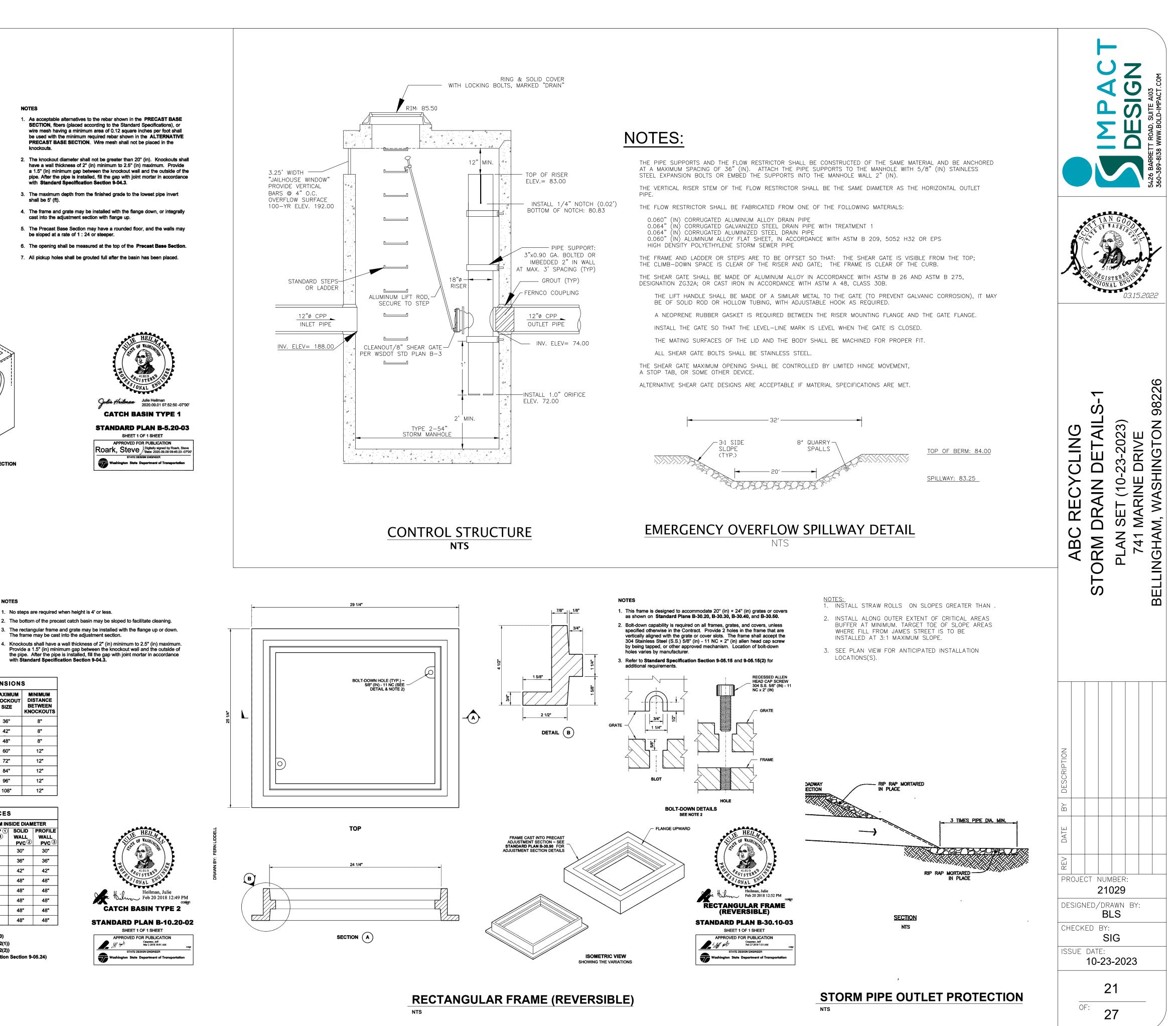


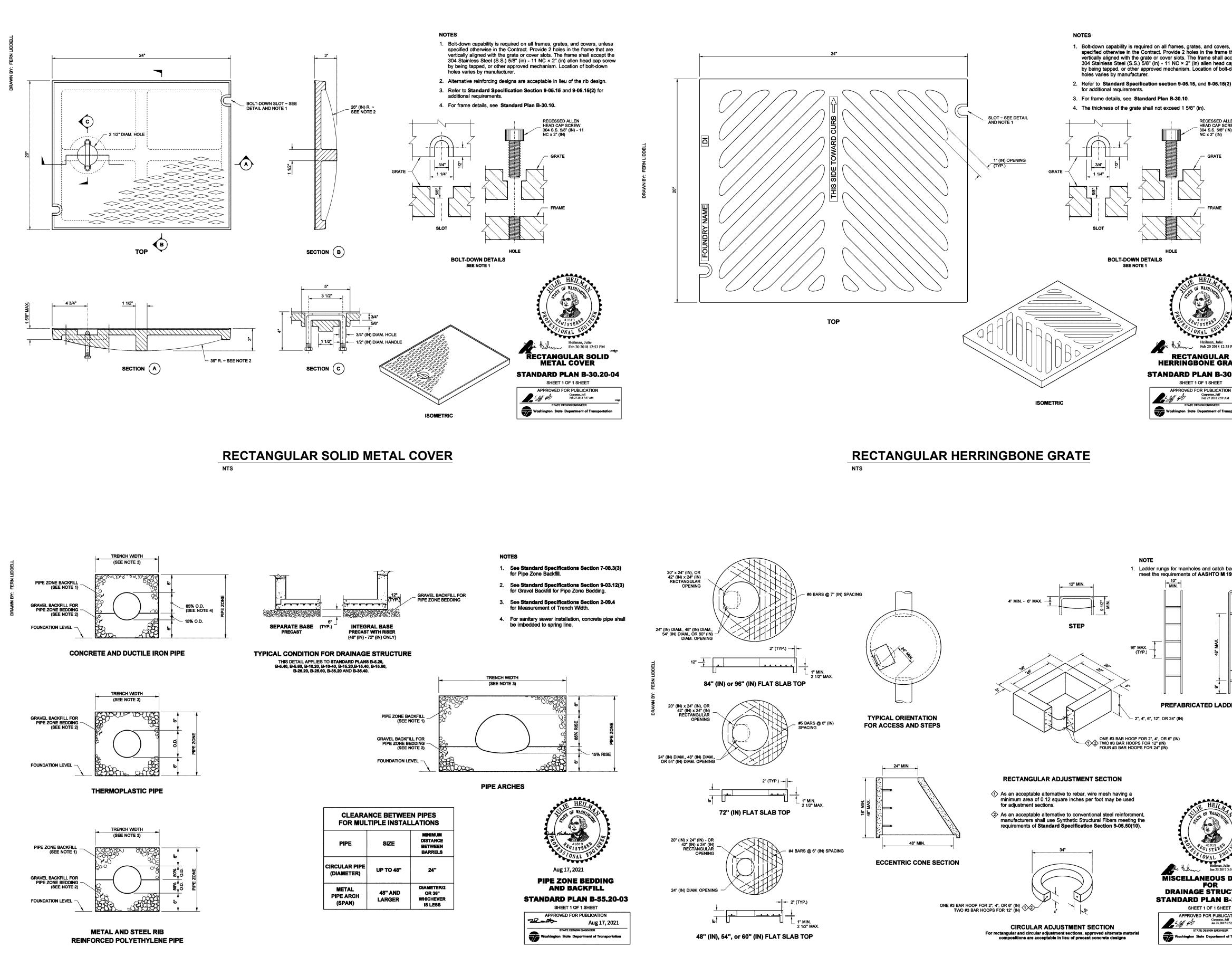
CATCH BASIN TYPE 2 STANDARD PLAN B-10.20-02 SHEET 1 OF 1 SHEET APPROVED FOR PUBLICATION H CopeR Mar 2 2018 10:01 AM STATE DESIGN ENGINEER Washington State Department of Transportation



# **CATCH BASIN TYPE 2** NTS







PIPE ZONE BEDDING AND BACKFILL

NTS

# MISCELLANEOUS DETAILS FOR DRAINAGE STRUCTURES

NTS

rs, unless e that are accept the cap screw It-down (2)	The second secon
LUEN GREW (IN) - 11	A REGISTERED OTHER BORNESSIONAL ENGINE 03.15.2022
s <sup>3</sup> FM <sub>α</sub> <b>R</b> <b>R</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b> <b>C</b>	ABC RECYCLING STORM DRAIN DETAILS-2 PLAN SET (10-23-2023) 741 MARINE DRIVE BELLINGHAM, WASHINGTON 98226
Image: state stat	NOLADYSE

# **GRATING PACIFIC** ACO DRAIN - KLASSIKDRAIN K300/KS300

Polymer Concrete Catch Bas	sins	K300 Catch Basins Parts	s Table			
Polymer concrete catch basins are used either as commonly as the outlet to a trench run. They pro		Part Description	Part K300	No. KS300	Volume Gallons*	Weight Ibs.
and allow easy access to the pipe system for ma		K3-903 in-line catch basin - 19.69"	94614	94615	30.4	88.0
In line Ture 002 and 004 actab begins some wid		K3-904 in-line catch basin - 19.69"	94635	94636	40.2	98.0
n-line Type 903 and 904 catch basins same wid rom trench run.	in and visually indistinguishable	Series 600 optional riser Foul air trap - fits both 902 & 600 basins	999		9.8	10.0 1.2
		* Volume is up to grate seat and without trash b		54		1.2
		K3-Type 904 12 in. <u>Wide</u> Catch Basin (with riser)				
3-Туре 903						1
2 in. Wide In-Line Catch Basin	-	to match/complement channel				
	with DrainLok™ or Quick QuickI ok™ grates require	e a removable QuickLok™		Pr		
all the second s		s to trash bucket and pipework.	1	Qu	iklok™ Loc	king Bar
	in galvanized or stainless	ncrete with integrally cast- steel frame. Guides aid el ends at #10. 20, 30 and 40				
Quiklok™ Locking Bar		in be connected by removing				}
	wall to required height. Bl	anking end rail supplied.			Ē	
		ish bucket designed to collect				
VIII	debris washed from trenc basin top to avoid creation outflow. K3-904 uses dee	n of a vacuum and reduction in				
	<b>Riser</b> - a plastic riser sup	plied with K3-904, designed		111	1	
		head with KS-304, designed	_			
Ministration of the second sec		ting to size at 2" intervals -				
	minimum 2" and maximu	m 12" height. Additional units		11/2	100 10 10 10 10 10 10 10 10 10 10 10 10	
11/1		of 2 is recommended to ensure				
	snake access is maintaine Contact Grating Pacific for	ed and for structural stability).		Y Y		
Res.	Base - polyethylene base 40 4", 6" and 8" cut-outs Cut-outs on end and side	s with wide range of Schedule for easy pipe connection. allow connection of ACO foul air			6	
		fic for non-polyethylene bases.	S	Foul Air	Trap	
	Pag	e 1 of 1		r our All	in all and all all all all all all all all all al	1

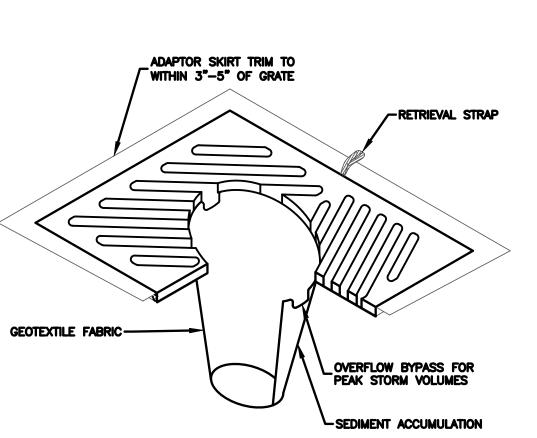
Page 1 of 1

ACO TRENCH DRAIN SYSTEMS - K300-KS300 CATCH BASINS AND GRATES

Page 1 of 2

Cocking mechanism Compared and the safe equal or less Compared and the safe equal	3330 - 2000	<b>GRATING P</b> ASSIKDRAIN K300		Locking mechanism Locking mechanism Key Compliant with Americans With Disabilities Act of 1990 Section 4.5.5 Heel safe equal or less than 0.25° (6.5mm) Bicycle Safe compliant to Australian Standard AS 3996 - 2006 Australian Standard AS Australian Standard AS
LOAD CLASS A - 3,500 LBS EN 1433 (58 PSI) PEDESTRIAN		D CLASS C - 56,000 LBS EN 1		
Description Part No. Length Slot Size in. Size i		Dent Lements Click	ntake Area q. in. Ibs. 🕞 🛃 📐	
LONGITUDINAL STAINLESS           Type 847D - stainless         142223         39.37"         0.81 x 0.24         263.2         28.6         DL         ✓ <td>51.3 51.3 Type 8810</td> <td></td> <td>54.6 47.0 QL 🗸 🗴</td> <td>x x 38.8</td>	51.3 51.3 Type 8810		54.6 47.0 QL 🗸 🗴	x x 38.8
*Grade 304 stainless steel LOAD CLASS B - 28,000 LBS EN 1433 (483 PSI) LIGHT DUTY PERFORATED SLOTTED STEEL		avg		
Type 811D - galvanized <b>138090</b> 39.37" 0.25 64.8 30.9 DL <b>v v v v</b>	22.6 MOSAIC	on to ASTM A 536-84 - minimum grade 64-45-12 IRON		ABJECON
Type 813D - galvanized       138091       19.69"       0.25 dia.       31.9       15.0       DL       ✓       ✓       ✓       ✓         Type 865D - stainless*       138092       39.37"       0.25 dia.       64.8       30.9       DL       ✓       ✓       ✓       ✓       ✓       ✓       ✓         Type 866D - stainless*       138093       19.69"       0.25 dia.       31.9       15.0       DL       ✓       ✓       ✓       ✓	22.6         29.6           29.6         29.6	9Q - iron <b>93958</b> 19.69" 0.30 x 0.98 avg	47.0 47.3 QL <b>~ ×</b>	× • 24.6
*Grade 304 stainless steel LOAD CLASS C - 56,000 LBS EN 1433 (967 PSI) COMMERCIAL VEHICLE		on to ASTM A 536-84 - minimum grade 64-45-12 D CLASS E - 135,000 LBS EN	1/122 /2 221 DSI\ INDUSTI	
MESH STEEL           Type 805D - galvanized         13819         19.69"         0.63 x 0.87         163.7         29.5         DL         X         X         X         ✓           Type 830D - stainless*         13849         19.69"         0.63 x 0.87         163.7         29.5         DL         X         X         X         ✓           *Grade 304 stainless steel         X         X         X         X         X         ✓		JDINAL IRON	61.8 52.9 QL V V	
SLOTTED IRON           Type 860D - iron         13870         19.69"         0.47 x 2.57 avg         88.1         38.0         DL         x         x         x         x	31.5	on to ASTM A 536-84 - minimum grade 64-45-12		
Ductile iron to ASTM A 536-84 - minimum grade 64-45-12 LONGITUDINAL IRON				
Type 876D - iron         99588         19.69"         1.97 x 0.24         64.3         35.8         DL         ✓         ✓         ✓           Ductile iron to ASTM A 536-84 - minimum grade 64-45-12             ✓	25.8 Type 8610	1Q - iron <b>10431</b> 19.69" 0.39 x 5.71	97.0 56.0 QL <b>x x</b>	× - 50.8
WAVE IRON		on to ASTM A 536-84 - minimum grade 64-45-12		
Type 880D - iron         99581         19.69"         0.2.9 avg         88.5         48.0         DL         ✓         ✓         ×         ✓           Ductile iron to ASTM A 536-84 - minimum grade 64-45-12	26.6 Quick	Lok <sup>™</sup> - Boltless Locking Sy	stem	
DrainLok <sup>™</sup> - Boltless & Barless Locking System 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	GRATE REMOVAL recesses, harmmer t o remove first grate, insert grate removal tool into slots into blace	FIT LOCKING BAR         K300 channels use plastic safety clip to to ap secure         Acking bar in s, rotate and use to tap secure         s, rotate and use to tap secure         e. Serrated	3       4         4       4         6       6         6       6         7       10         10       10         10       10         10       10         10       10         10       10         10       10         11       10         12       10         13       10         14       10         15       10         16       10         17       10         18       10         19       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10         10       10 <tr< td=""><td>tool into slots at end of at end of bar and lever grate, pull up sharply. back serrated end;</td></tr<>	tool into slots at end of at end of bar and lever grate, pull up sharply. back serrated end;
with recess in rail. at rel Page 1 of 2	t end of grate, pull up sharply. Remaining grates can be ends grip emoved by hand.	o in recess.	Page 2 of 2	Remaining grates can rotate bar free. be removed by hand.

Page 2 of 2



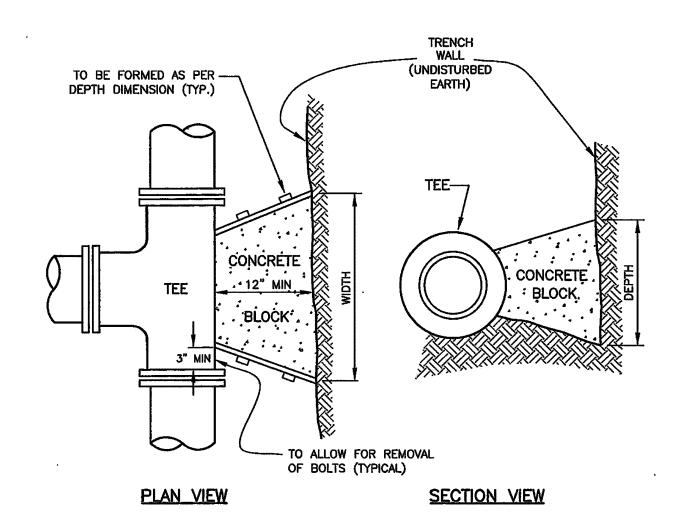
## NOTES:

- 1. CATCH BASIN INSERT SHALL BE INSTALLED PRIOR TO CLEARING AND GRADING ACTIVITY.
- 2. INSTALL UPON PLACEMENT OF A NEW CATCH BASIN.
- 3. SEDIMENT SHALL BE REMOVED FROM THE INSERT SOCK WHEN IT BECOMES HALF FULL.
- 4. SEDIMENT REMOVAL SHALL BE ACCOMPLISHED BY REMOVING THE INSERT, EMPTYING, AND RE-INSERTING INSERT SOCK INTO THE CATCH BASIN.

**INLET PROTECTION** 

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INSTALL 6" TERMINAL FLANGE $_{\lambda}$ 

FINISHED FLOOR SLAB 

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<b></b>	<u> </u>	

- ALL DIMENSIONS APPLY TO STABLE TRENCH WALLS. UNDER VARIABLE CONDITIONS, SIZE OF THRUST BLOCK SHALL BE DETERMINED BY THE CITY ENGINEER.
- WRAP ALL FITTINGS WITH VISQUINE MIN. 6" PAST FLANGES, PRIOR TO POURING CONCRETE THRUST BLOCK.

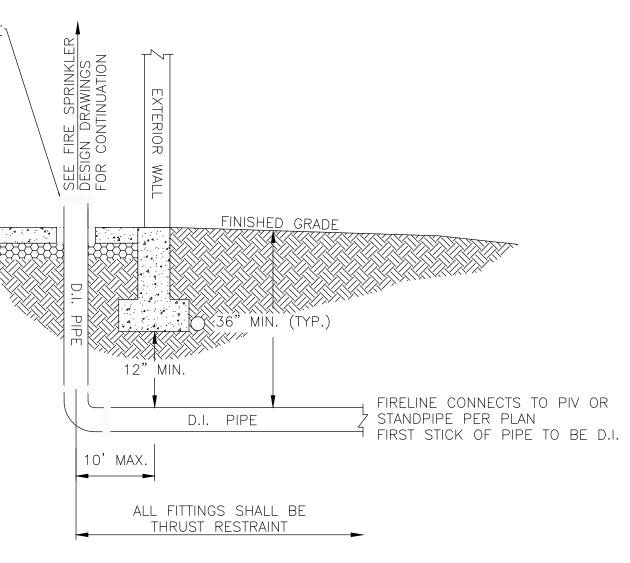
100 P.S.I. OPERATING PRESSURE										
SIZE	WIDTH	DEPTH -								
6"	1'-6"	1'-6"								
8"	2'-0"	2'-0"								
10"	2'-6"	2'-6"								
12*	3'-0"	3'—0"								
16"	4'-6"	3'6"								
20"	6'-0"	40"								
24*	7'-0"	5'0"								

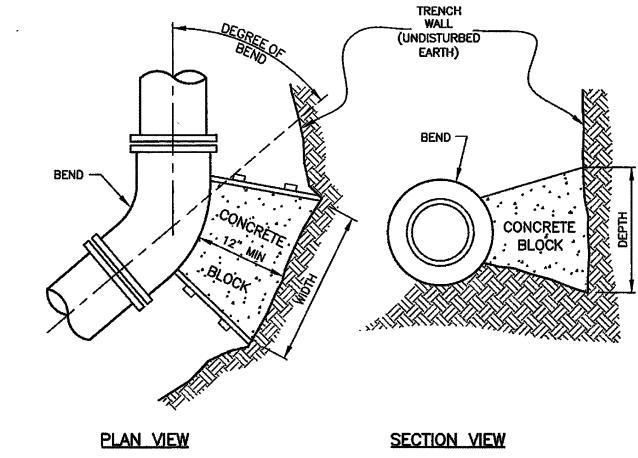
# THRUST BLOCK-TEE

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# NOTE • ALL DIMENSIONS APPLY TO STABLE TRENCH WALLS. UNDER VARIABLE CONDITIONS, SIZE OF THRUST BLOCK SHALL BE DETERMINED BY THE CITY ENGINEER. • WRAP ALL FITTINGS WITH VISQUINE MIN. 6" PAST FLANGES, PRIOR TO POURING CONCRETE THRUST BLOCK.

100 P.S.I. OPERATING PRESSURE

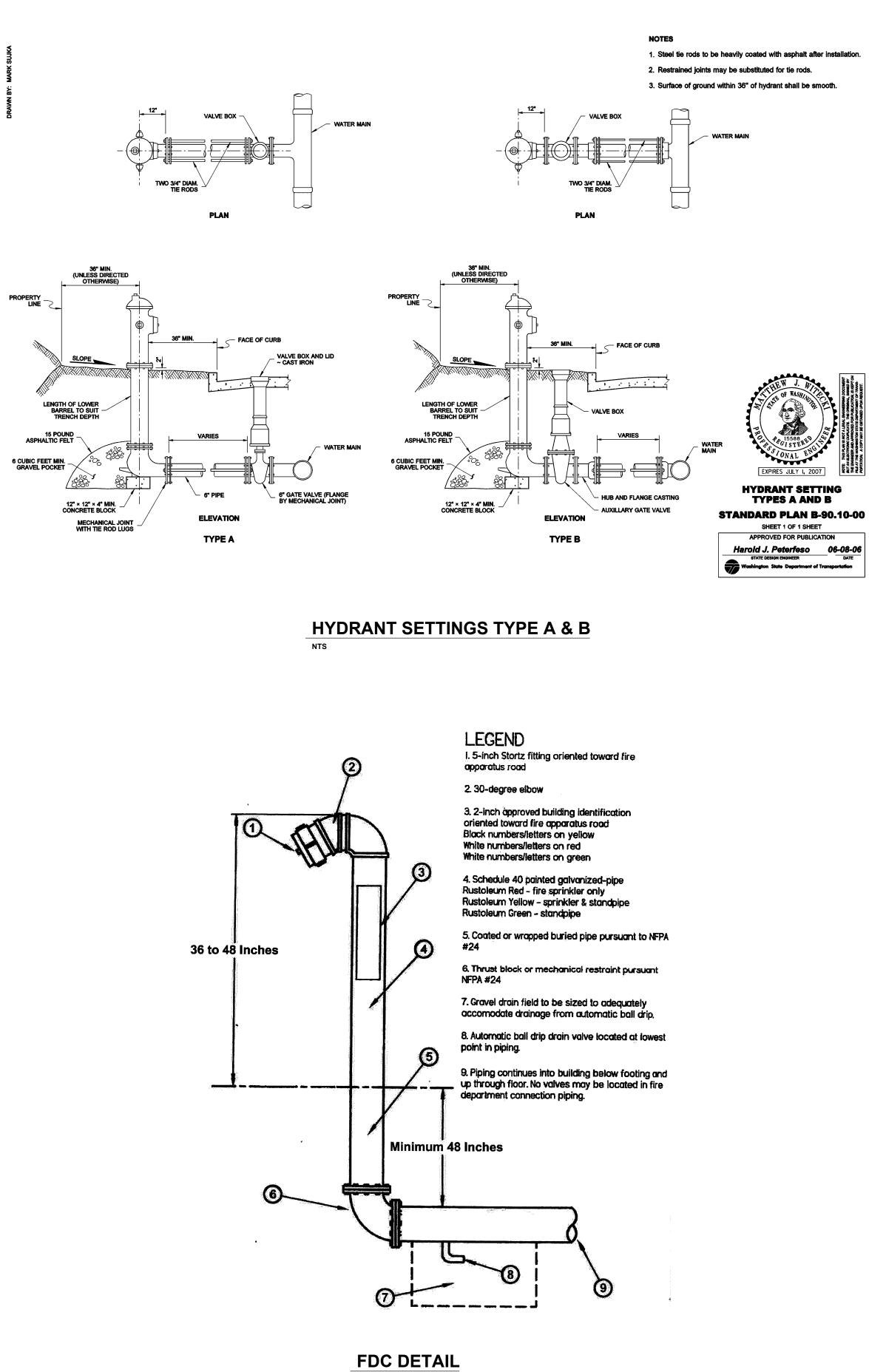
0.75	1	14.	22	21/2*	4	5*	90*		
SIZE	WIDTH	DEPTH	WIDTH	DEPTH	WIDTH	DEPTH	WIDTH	DEPTH	
6"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	1'-6"	2'-3"	1'-6"	
8"	1'3"	1'-3"	1'-3"	1'-3"	1'9"	1'-9"	3'-0"	2'-0"	
10"	1'-9"	1'-6"	1'-9"	1'-6"	2'3"	2'-3"	3'-6*	2'-6"	
12"	2'-0"	1'-9"	2'-0"	1'-9"	2'-9"	2'-6"	4'0"	3'-0"	
16 <b>"</b>	2'-9"	2'-3"	2'-9"	2'-3"	4'-0"	3'-0"	6'-3"	3'-6"	
20"	3'-6"	2'-9"	3'-6"	2'-9"	4'-6"	4'-0"	8'-6"	4'-0"	
24"	4'-6"	<sup>′</sup> 3'–0"	4'-6"	3'-0"	5'-6"	5'-0"	9'-9"	5'-0"	

# FIRE LINE BUILDING CONNECTION

THRUST BLOCK-ELBOW NTS

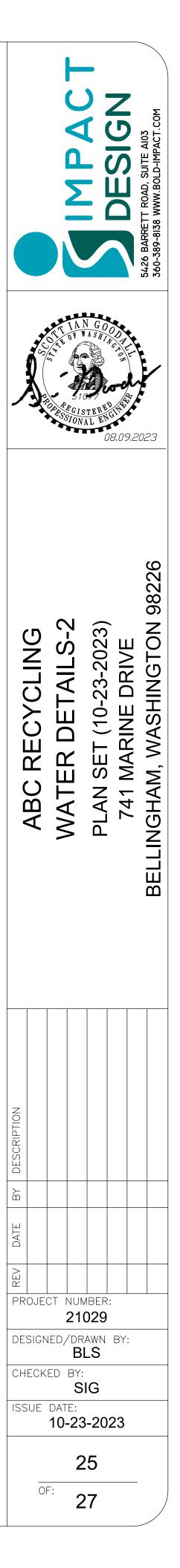
•

				5426 BARRETT ROAD, SUITE AI03 360-389-8138 WWW.BOLD-IMPACT.COM
	REAL OF STION	N GOO ASHING STEBENG AL ENG	0.09.20	023
ABC RECYCLING	WATER DETAILS-1	PLAN SET (10-23-2023)	741 MARINE DRIVE	<b>BELLINGHAM, WASHINGTON 98226</b>
DESCRIPTION B B DESIGN DESIGN CHECKI DESIGN	21 ED/DR B ED BY: S	LS IG		



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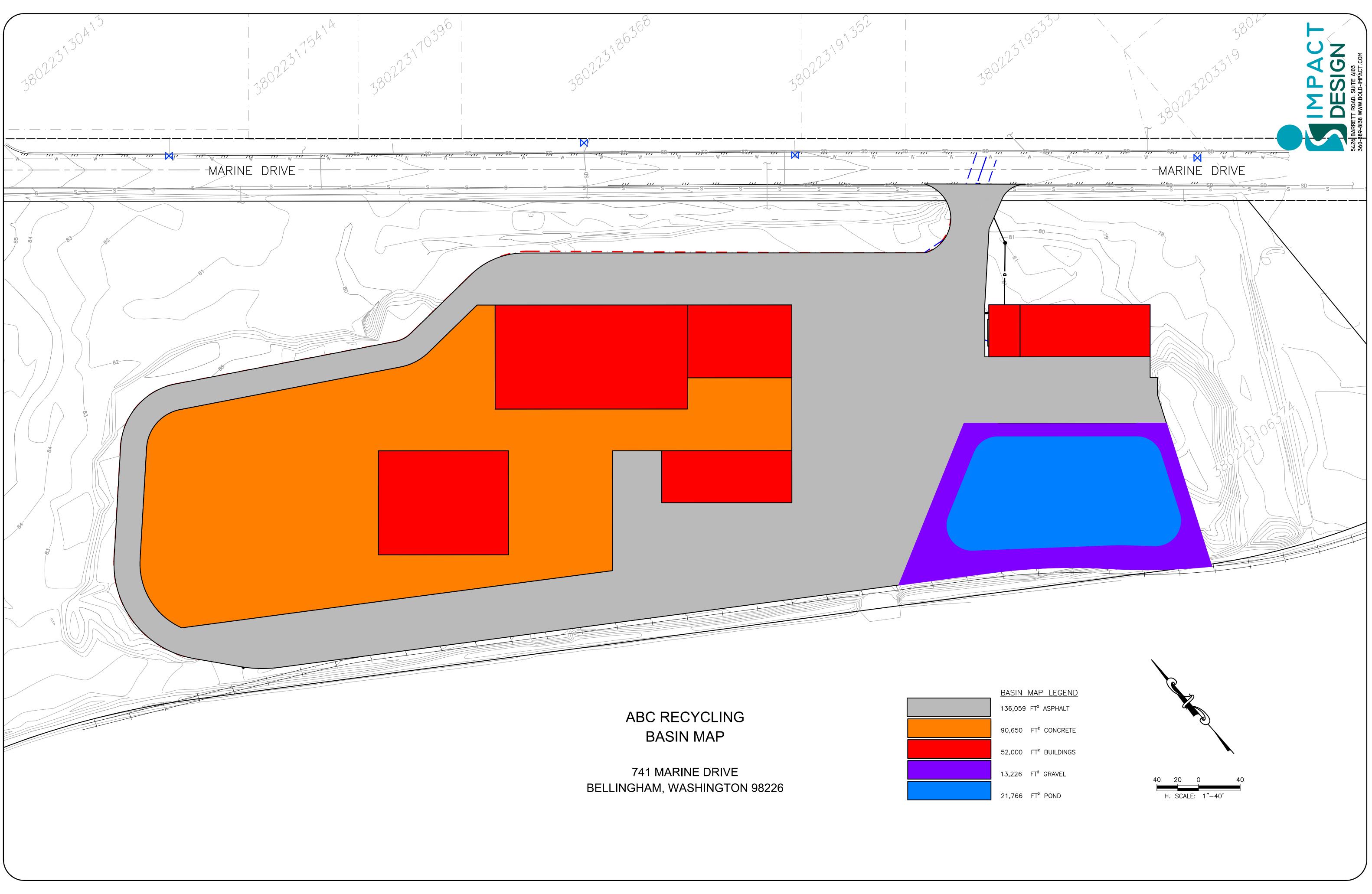
STRUCTURE NAME	ED STORM STRUCTURES
	RIM = 84.500
CB-1	SUMP = $77.347$ PIPE = CB-1_CB-2 INV OUT = $79.35$ 3D LENGTH = $47.48$
CB-2	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-3	$\begin{array}{rll} {\sf RIM} &=& 84.500 \\ {\sf SUMP} &=& 76.837 \\ {\sf PIPE} &=& {\sf CB-2\_CB-3} & {\sf INV} \ {\sf IN} &=& 78.84 \\ {\sf 3D} \ {\sf LENGTH} &=& 47.48 \\ {\sf PIPE} &=& {\sf CB-3\_CB-4} & {\sf INV} \ {\sf OUT} &=& 78.84 \\ {\sf 3D} \ {\sf LENGTH} &=& 46.71 \end{array}$
CB-4	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-5	$\begin{array}{l} \text{RIM} = 84.254 \\ \text{SUMP} = 76.378 \\ \text{PIPE} = \text{CB}-4\_\text{CB}-5 & \text{INV IN} = 78.38 \\ \text{3D LENGTH} = 45.00 \\ \text{PIPE} = \text{CB}-5\_\text{CB}-6 & \text{INV OUT} = 78.38 \\ \text{3D LENGTH} = 44.99 \end{array}$
CB-6	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-7	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-8	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-9	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-11	RIM = 84.847 SUMP = 76.400 PIPE = CB-6_CB-11 INV OUT = 78.40 3D LENGTH = 31.57
CB-12	RIM = 83.819 SUMP = 75.553 PIPE = CB ACO_CB-12 INV OUT = 77.55 3D LENGTH = 72.35
CB-13	RIM = 81.244 SUMP = 75.316 PIPE = CB-13_CB-9 INV OUT = 77.32 3D LENGTH = 133.05
CB-14	$\begin{array}{llllllllllllllllllllllllllllllllllll$
CB-15	$\begin{array}{rcl} \text{RIM} &=& 86.595 \\ \text{SUMP} &=& 77.127 \\ \text{PIPE} &=& \text{CB}-4\_\text{CB}-15 & \text{INV IN} &=& 79.13 \\ \text{3D} & \text{LENGTH} &=& 101.45 \end{array}$
CB-ACO	$\begin{array}{llllllllllllllllllllllllllllllllllll$
RR-1	$\begin{array}{rcl} \text{RIM} &= 83.304 \\ \text{SUMP} &= 77.223 \\ \text{PIPE} &= \text{RR}-1\_\text{RR}-2 & \text{INV} & \text{OUT} &= 79.22 \\ \text{3D} & \text{LENGTH} &= 97.47 \end{array}$
RR-2	$\begin{array}{l} \text{RIM} = 83.304 \\ \text{SUMP} = 76.722 \\ \text{PIPE} = \text{RR}-1\_\text{RR}-2  \text{INV}  \text{IN} = 78.72 \\ \text{3D}  \text{LENGTH} = 97.47 \\ \text{PIPE} = \text{RR}-2\_\text{RR}-3  \text{INV}  \text{OUT} = 78.72 \\ \text{3D}  \text{LENGTH} = 97.47 \end{array}$
RR-3	$\begin{array}{llllllllllllllllllllllllllllllllllll$
RR-4	$\begin{array}{llllllllllllllllllllllllllllllllllll$
RR–5	$\begin{array}{llllllllllllllllllllllllllllllllllll$

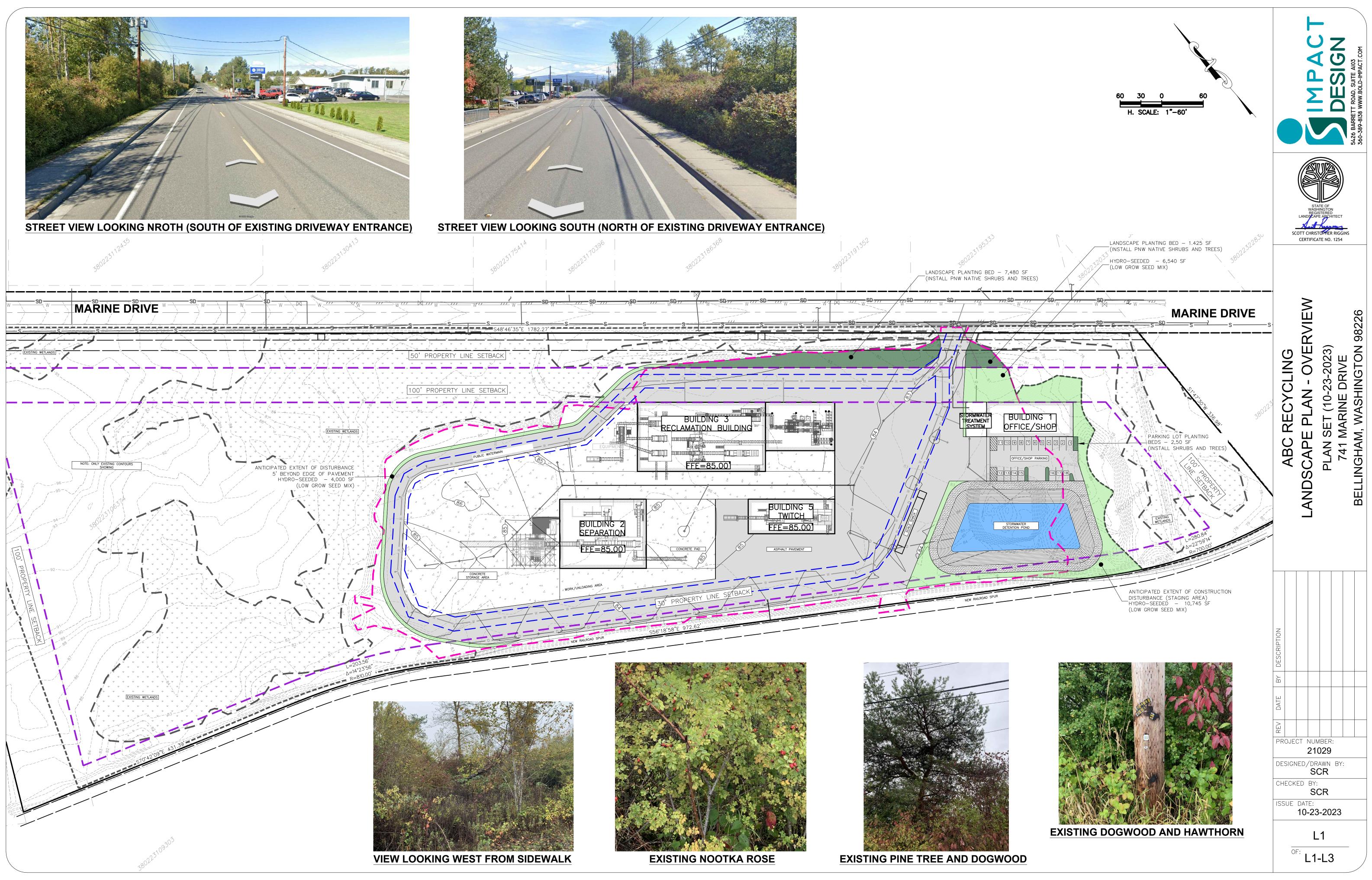
PR	OPOS	ED STORM STRUCTURES
STRUCTURE	NAME	STRUCTURE DETAILS
RR-6		$\begin{array}{rcl} \text{RIM} &=& 83.304 \\ \text{SUMP} &=& 74.722 \\ \text{PIPE} &=& \text{RR}-5\_\text{RR}-6 & \text{INV} \text{ IN} &=& 76.72 \\ \text{3D} & \text{LENGTH} &=& 97.47 \\ \text{PIPE} &=& \text{RR}-6\_\text{RR}-7 & \text{INV} \text{ OUT} &=& 76.72 \\ \text{3D} & \text{LENGTH} &=& 62.91 \end{array}$
RR-7		$\begin{array}{llllllllllllllllllllllllllllllllllll$
RR-8		$\begin{array}{l} \text{RIM} = 82.841 \\ \text{SUMP} = 73.469 \\ \text{PIPE} = \text{RR}-7\_\text{RR}-8 \\ \text{INV} \text{ IN} = 75.47 \\ \text{3D} \text{ LENGTH} = 74.79 \\ \text{PIPE} = \text{RR}-8\_\text{RR}-9 \\ \text{INV} \text{ IN} = 75.47 \\ \text{3D} \text{ LENGTH} = 97.69 \\ \text{PIPE} = \text{CB}-14\_\text{RR}-8 \\ \text{INV} \text{ IN} = 75.47 \\ \text{3D} \text{ LENGTH} = 60.19 \\ \text{PIPE} = \text{RR}-8\_\text{POND} \\ \text{INV} \text{ OUT} = 75.47 \\ \text{3D} \text{ LENGTH} = 91.57 \end{array}$
RR–9		$\begin{array}{rll} \text{RIM} &=& 82.841 \\ \text{SUMP} &=& 73.970 \\ \text{PIPE} &=& \text{RR}-9\_\text{RR}-10 & \text{INV} \text{ IN} &=& 75.97 \\ \text{3D} & \text{LENGTH} &=& 67.85 \\ \text{PIPE} &=& \text{RR}-8\_\text{RR}-9 & \text{INV} \text{ OUT} &=& 75.97 \\ \text{3D} & \text{LENGTH} &=& 97.69 \end{array}$
RR-10		$\begin{array}{llllllllllllllllllllllllllllllllllll$
RR-11		RIM = 83.214 SUMP = 74.574 PIPE = RR-10_RR-11 INV IN = 76.57 3D LENGTH = 48.56
SDCS-1		$\begin{array}{llllllllllllllllllllllllllllllllllll$
SDCS-2		$\begin{array}{llllllllllllllllllllllllllllllllllll$
SDCS-3		$\begin{array}{rcl} \text{RIM} &=& 83.255 \\ \text{SUMP} &=& 73.193 \\ \text{PIPE} &=& \text{TREATMENT\_SDCS-3} & \text{INV IN} &=& 75.19 \\ \text{3D} & \text{LENGTH} &=& 57.46 \\ \text{PIPE} &=& \text{SDCS-3\_SDCS-4} & \text{INV} & \text{OUT} &=& 75.19 \\ \text{3D} & \text{LENGTH} &=& 57.84 \end{array}$
SDCS-4		RIM = 81.148 SUMP = 72.000 PIPE = SDCS-3_SDCS-4 INV IN = 74.00 3D LENGTH = 57.84

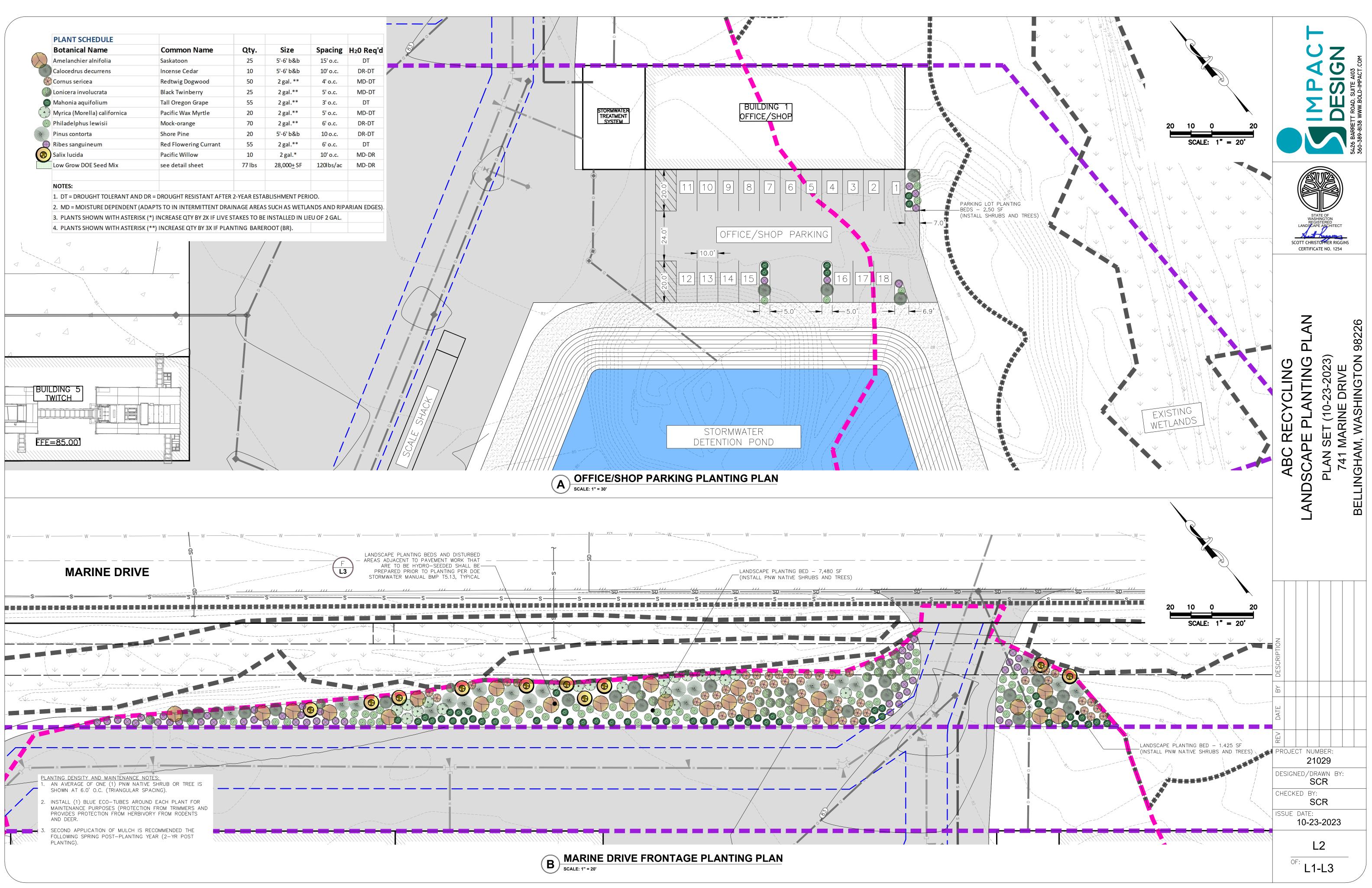
PROPOS	ED STORM	PIPES	
PIPE NAME	PIPE SIZE	Length	Slop
CB-1_CB-2	12"ø CPP, 12"	47.48	0.51
CB-2_CB-3	12"ø CPP, 12"	47.48	0.50
CB-3_CB-4	12"ø CPP, 12"	46.71	0.47
CB-4_CB-5	12"ø CPP, 12"	45.00	0.49
CB-4_CB-15	12"ø CPP, 12"	101.45	-0.5
CB-5_CB-6	12"ø CPP, 12"	44.99	0.31
CB-6_CB-11	12"ø CPP, 12"	31.57	0.50
CB-6_CB ACO	12"ø CPP, 12"	207.74	0.50
CB-7_CB-8	12"ø CPP, 12"	31.35	0.48
CB-8_CB-9	12"ø CPP, 12"	100.19	0.50
CB-8_CB-14	12"ø CPP, 12"	66.26	0.50
CB-13_CB-9	12"ø CPP, 12"	133.05	0.50
CB-14_RR-8	12"ø CPP, 12"	60.19	0.50
CB ACO_B-7	12"ø CPP, 12"	173.51	0.50
CB ACO_CB-12	12"ø CPP, 12"	72.35	0.50
POND_SDCS-1	18"ø CPP, 18"	75.96	0.43
RR-1_RR-2	12"ø CPP, 12"	97.47	0.50
RR-2_RR-3	12"ø CPP, 12"	97.47	0.50
RR-3_RR-4	12"ø CPP, 12"	97.47	0.50
RR-4_RR-5	12"ø CPP, 12"	97.47	0.50
RR-5_RR-6	12"ø CPP, 12"	97.47	0.50
RR-6_RR-7	12"ø CPP, 12"	62.91	0.50
RR-7_RR-8	12"ø CPP, 12"	74.79	1.20
RR-8_POND	12"ø CPP, 12"	91.57	0.51
RR-8_RR-9	12"ø CPP, 12"	97.69	0.50
RR-9_RR-10	12"ø CPP, 12"	67.85	0.50
RR-10_RR-11	12"ø CPP, 12"	48.56	-0.5
SDCS-1_SDCS-2	18"ø CPP, 18"	36.97	0.44
SDCS-2_TREATMENT	18"ø CPP, 18"	1.04	-0.00
SDCS-3_SDCS-4	18"ø CPP, 18"	57.84	1.96
TREATMENT_SDCS-3	18"ø CPP, 18"	57.46	0.50

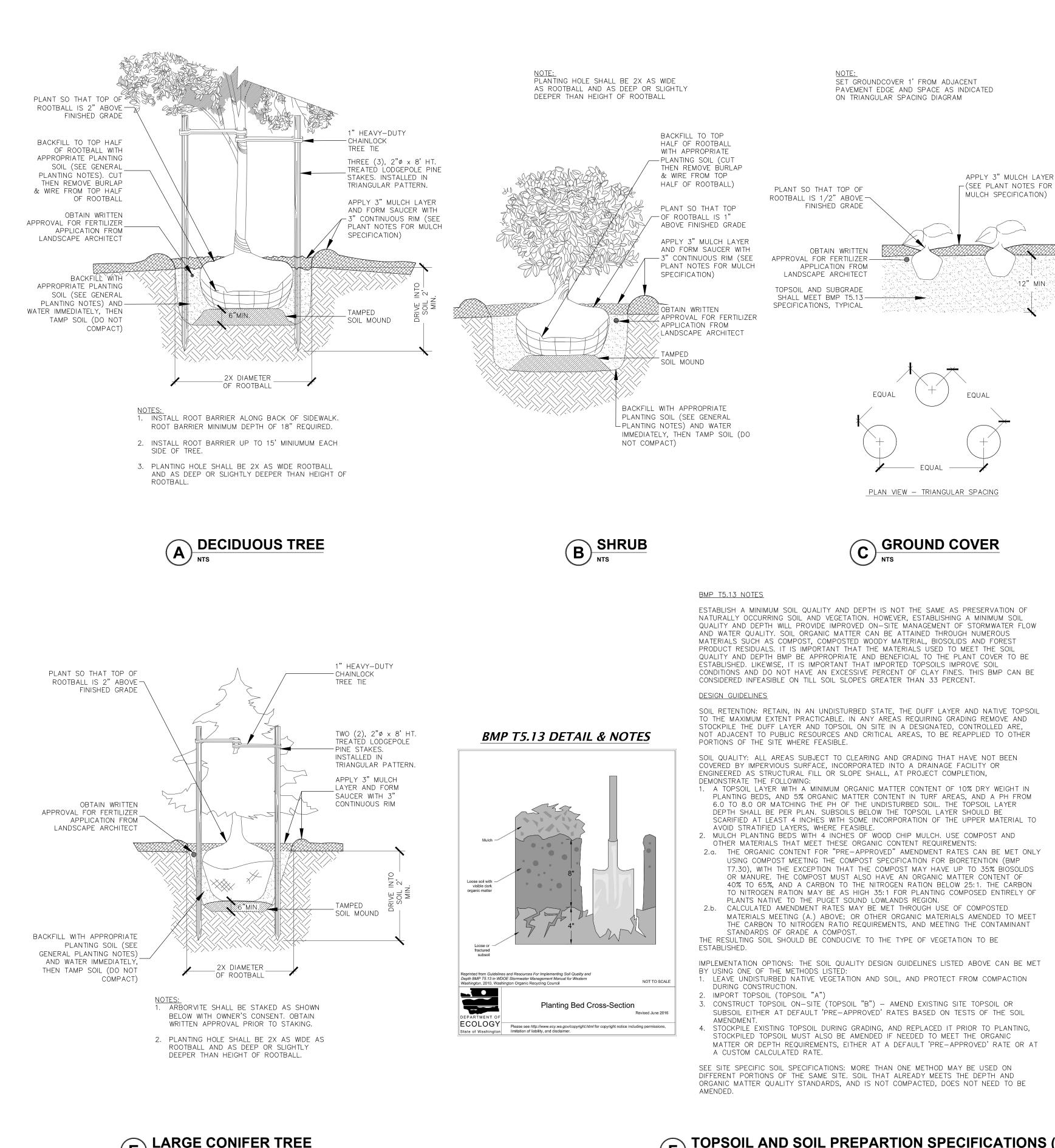
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recommended mixes for both temporary and permanent seeding.

- Apply these mixes, with the exception of the wet area seed mix, at a rate of 120 pounds per acre. This rate can be reduced if soil amendments or slow-release fertilizers are used. Apply the wet area seed mix at a rate of 60 pounds per acre.
- Consult the local suppliers or the local conservation district for their recommendations. The appropriate mix depends on a variety of factors, including location, exposure, soil type, slope, and expected foot traffic. Alternative seed mixes approved by the local authority may be used, depending on the soil type and hydrology of the area.

Common Name	Latin Name	% Weight	% Purity	% Germination
	Tempora	ry Erosion Control	Seed Mix	I
	A standard mix for an	eas requiring a tempo	rary vegetative cover.	
Chewings or annual blue grass	Festuca rubra var. commutata or Poa anna	40	98	90
Perennial rye	Lolium perenne	50	98	90
Redtop or colonial bentgrass	Agrostis alba or Agrostis tenuis	5	92	85
White dutch clover	Trifolium repens	5	98	90
	L	andscaping Seed M	ix	•
	A recomm	ended mix for landsca	aping seed.	
Perennial rye blend	Lolium perenne	70	98	90
Chewings and red fescue blend	Festuca rubra var. commutata or Fes- tuca rubra	30	98	90
	Low	-Growing Turf Seed	Mix	•
A turf seed mix for	dry situations where	there is no need for wa tenance.	atering. This mix requi	res very little main-
Dwarf tall fescue (several varieties)	Festuca arundin- acea var.	45	98	90
Dwarf perennial rye (Barclay)	Lolium perenne var. barclay	30	98	90
Red fescue	Festuca rubra	20	98	90
Colonial bentgrass	Agrostis tenuis	5	98	90
		Bioswale Seed Mix		
	A seed mix for bios	wales and other interr	nittently wet areas.	
Tall or meadow fes-	Festuca arundin-	75-80	98	90

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# D LOW-GROWING TURF SEED MIX - 2019 MANUAL

### SITE SPECIFIC SPECIFICATIONS

### TOPSOIL "A"/IMPORTED TOPSOIL:

IMPORTED TOPSOIL SHALL BE GARDEN MIX BY GREEN EARTH TECHNOLOGY, LLC (360.354.4936) OR APPROVED EQUAL. IMPORTED TOPSOIL SHALL BE FREE OF NOXIOUS WEED MATERIAL (SEEDS, RHIZOMES, AND/OR ROOTS). IMPORTED TOPSOIL SHALL BE FREE OF DELETERIOUS MATERIALS, ROCKS, AND DEBRIS WHICH WILL NOT PASS THROUGH THREE-QUARTER INCH 3/4" SCREEN. THE COMPONENTS OF THE SOIL MUST BE EVENLY DISTRIBUTED THROUGHOUT THE TOPSOIL MIX.

### TOPSOIL "B"/CONSTRUCTED TOPSOIL:

CONTRACTOR SHALL CONSTRUCT TOPSOIL B ON-SITE USING COMBINATION OF NATIVE TOPSOIL AND IMPORTED COMPOST. NATIVE TOPSOIL SHALL BE TAKEN FROM VEGETATED/LANDSCAPE AREAS WITHIN PROJECT WORK LIMITS. THE TOP TWELVE (12") OF THE SOIL COLUMN SHALL BE USED IN THE TOPSOIL B MIX AND STOCKPILED IN DESIGNATED AREA(S). STOCKPILED MATERIAL SHALL BE FREE OF NOXIOUS WEEDS. TOPSOIL B SHALL BE FREE OF NOXIOUS WEED MATERIAL (SEEDS, RHIZOMES, AND/OR ROOTS). TOPSOIL B SHALL BE FREE OF DELETERIOUS MATERIALS, ROCKS, AND DEBRIS WHICH WILL NOT PASS THROUGH 3/4" SCREEN. DESIGN INTENT IS TO INCLUDE ROCK OR ORGANIC MATERIAL IN THE TOPSOIL LAYER SO AS TO CREATE MACRO PORES AND ORGANIC MATTER RESERVES. NATIVE SOIL TO IMPORTED COMPOST RATIO SHALL BE THREE TO ONE (3 NATIVE SOIL : 1 COMPOST). THE COMPONENTS OF THE CONSTRUCTED TOPSOIL MUST BE EVENLY DISTRIBUTED THROUGHOUT THE TOPSOIL MIX.

### TOPSOIL "C"/AMENDED SOIL:

CONTRACTOR SHALL LOOSEN (DO NOT TILL) CLEARED LANDSCAPE AREAS WITH EXCAVATOR TEETH OR CLEARING/GRUB RACK ADAPTER FOR EXCAVATOR TO MEET 8" MINIMUM LOOSE DEPTH REQUIREMENT. TILLING DOES NOT MEET THE LOOSENING DEPTH REQUIREMENT. TILLING TO OCCURE AFTER A 2" LAYER OF "COMPOSTED MATERIALS" IN WAC 173-350-220 (INCLUDING CONTAMINANT LEVELS AND OTHER STANDARDS). THE COMPOST SHALL BE INCORPORATED INTO UPPER 4" OF DISTURBED SOIL. THE COMPOST SHALL BE FROM YARD TRIMMINGS OR SIMILAR ORGANIC MATTER COMPOSTED THROUGH AEROBIC DECOMPOSITION AS AVAILABLE AT GREEN EARTH TECHNOLOGY, LLC (360.354.4936) OR APPROVED EQUAL. IMPORTED COMPOST SHALL BE COMPOSTED IN ACCORDANCE WITH WAC 173-350-220 AND FREE OF NOXIOUS WEED MATERIAL. PROVIDE ONE-GALLON (1-GALLON) SAMPLE AND SOURCE FOR APPROVAL BY ARCHITECT PRIOR TO DELIVERY TO SITE.

GROWING MEDIUM/TOPSOIL A, B, AND C SHALL CONFORM TO THE FOLLOWING SOIL CHARACTERISTICS:

- SOIL QUALITY ALL AREAS SUBJECT TO CLEARING AND GRADING THAT HAVE NOT BEEN COVERED BY IMPERVIOUS SURFACE, INCORPORATED INTO A DRAINAGE FACILITY OR ENGINEERED AS STRUCTURAL FILL OR SLOPE SHALL, AT PROJECT COMPLETION, DEMONSTRATE:
- CONSTRUCTION MATERIAL(S) SHALL NOT BE PRESENT.
- SOIL MEDIA SHALL HAVE A SANDY-LOAM TO LOAM TEXTURE PER USDA TEXTURAL TRIANGLE. CLAY CONTENT SHALL NOT EXCEED 5%. TOPSOIL MIXTURE SHALL BE 60%-70% SANDY-LOAM (GRADATION PER ASTM D 422) AND 30%-40% COMPOST BY VOLUME (ORGANIC MATTER CONTENT OF 5%-10% BY WEIGHT). THE SOIL SHALL BE A UNIFORM MIX, FREE OF STONES, STUMPS, OR OTHER SIMILAR OBJECTS LARGER THAN TWO INCHES
- SUBSOILS BELOW THE TOPSOIL LAYER SHALL BE SCARIFIED TO 4" WITH SOME INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS. (THE INTENT IS TO PROVIDE A LOOSE PLANTING MEDIUM WITH TOTAL DEPTH OF LOOSENED SOIL THAT VARIES BASED ON THE SUBGRADE AND PREVIOUS LAND USE TYPE. SEE SOIL PREPARATION SPECIFICATIONS 32-9400 (UNLESS OTHERWISE NOTED ON THE LANDSCAPE PLANS).
- TOPSOIL AND LOOSENED SUBSOIL DEPTH OF 12" AS SHOWN IN IMAGE TO LEFT IS MINIMUM AND IS REQUIRED TO BE GREATER THAN 12" WHEN PREVIOUS/EXISTING SUBGRADE IS EITHER COMPACTED, GLACIAL TILL, CLAY, OR PURE GRAVEL OR PIT-RUN.
- COMPOST OR OTHER MATERIAL USED FOR SOIL AMENDMENTS (ORGANIC MATTER CONTENT) SHALL BE "COMPOSTED MATERIALS" IN WAC 173-350-220. THE COMPOST MUST ALSO HAVE ORGANIC MATTER CONTENT 35% TO 65% AND A CARBON TO NITROGEN RATIO BELOW 25:1 OR 35:1

# **TOPSOIL AND SOIL PREPARTION SPECIFICATIONS (DOE MANUAL BMP T5.13)**

- 1. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARITY WITH ALL UNDERGROUND UTILITIES, PIPES AND STRUCTURES. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO DAMAGE OF SAID UTILITIES. VERIFY ALL UTILITY LOCATIONS, PADS, AND APPURTENANCES PRIOR TO PLANTING ACTIVITY. DO NOT BLOCK ACCESS TO UTILITY STRUCTURES. IDENTIFY DISCREPANCIES IMMEDIATELY TO LANDSCAPE ARCHITECT.
- 2. ALL PLANT MATERIAL SHALL BE NURSERY GROWN (NOT FIELD COLLECTED), CONTAINERIZED OR BALLED AND BURLAPPED. PROVIDE ONLY SOUND, HEALTHY, VIGOROUS PLANTS, FREE OF DEFECTS, DISEASE, AND ALL FORMS OF INFESTATION. MEASUREMENTS, CALIPER, BRANCHING, GRADING QUALITY, BALLING AND BURLAPPING PLANT MATERIAL SHALL CONFORM TO MINIMUM STANDARDS OF ANSI Z60.0, LATEST EDITION.
- 3. ALL CONTAINER GROWN NURSERY STOCK SHALL BE HEALTHY, VIGOROUS, WELL-ROOTED. AND ESTABLISHED IN THE CONTAINER IN WHICH IT IS GROWN. CONTAINER GROWN NURSERY STOCK SHALL HAVE A WELL-ESTABLISHED ROOT SYSTEM REACHING THE SIDES OF THE CONTAINER TO MAINTAIN A FIRM BALL WHEN THE CONTAINER IS REMOVED, BUT SHALL NOT HAVE EXCESSIVE ROOT GROWTH ENCIRCLING THE INSIDE OF THE CONTAINER.
- 4. PLANTS SHALL NOT BE PRUNED PRIOR TO DELIVERY. PRUNE PLANTS ONLY AFTER PLANTING AND ACCORDING TO STANDARD HORTICULTURAL PRACTICE TO PRESERVE THE NATURAL CHARACTER OF THE TREE. REMOVE ALL DEAD WOOD, SUCKERS AND BROKEN OR BADLY BRUISED BRANCHES. USE ONLY CLEAN SHARP TOOLS.
- 5. PLANTS SHALL BE TRUE TO SPECIES AND VARIETY AND SHALL CONFORM TO SPECIFIED MEASUREMENTS, HOWEVER, LARGER PLANTS MAY BE USED IF APPROVED BY LANDSCAPE ARCHITECT. USE OF SUCH PLANTS SHALL NOT INCREASE CONTRACT PRICE. SPECIFIED HEIGHT AND AND SPREAD DIMENSIONS REFER TO MAIN BODY OF PLANT AND NOT BRANCH TIP TO TIP. CALIPER MEASUREMENT SHALL BE TAKEN AT A POINT ON THE TRUNK 6 INCHES ABOVE THE NATURAL GROUND LINE FOR TREES UNDER 4 INCHES IN CALIPER, AND AT A POINT 12 INCHES ABOVE THE GROUND FOR TREES 4 INCHES OR GREATER IN CALIPER. IF A RANGE OF SIZES IS GIVEN, NO PLANT SHALL BE LESS THAN THE MINIMUM SIZE AND NO LESS THAN 40% OF THE PLANTS SHALL BE AS LARGE AS THE MAXIMUM SIZE SPECIFIED.PRIOR TO INSTALLATION, ALL PLANT MATERIAL PROPOSED FOR USE ON THE PROJECT SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT AT THE TIME OF DELIVERY TO THE SITE FOR CONFORMANCE WITH THE REQUIREMENTS OF THE PLANT SCHEDULE, PLANT SPECIFICATIONS, AND STORAGE AND HANDLING REQUIREMENTS. CONTRACTOR IS TO PROVIDE A MINIMUM OF TWO WEEKS NOTICE PRIOR TO DELIVERY TO THE LANDSCAPE ARCHITECT.
- 6. MODIFICATIONS OF PLANTING BEDS AND PLACEMENT OF TREES, SHRUBS, GROUNDCOVERS, SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- 7. TREES SHALL BE PLACED FIRST, THEN SHRUBS, AND THEN GROUNDCOVERS. TREES SHALL BE STAKED OR GUYED PER DETAILS WITHIN 24 HOURS OF INSTALLATION. TREE TRUNKS SHALL BE LOCATED NO CLOSER THAN 5' FROM FENCE LINE, SHRUBS SHALL BE LOCATED SO THAT AT MATURITY THERE WILL BE A MINIMUM 3' CLEAR BETWEEN FENCE.
- 8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FINAL COMPLETE PLANT COUNTS TO COVER AREAS AT THE SPECIFIED SPACING.
- 9. DURING INSTALLATION, NOTIFY THE OWNER'S REPRESENTATIVE OF ANY CONDITIONS THAT MAY BE HARMFUL TO PLANT LIFE SUCH AS; POOR DRAINAGE, HAZARDOUS MATERIALS, ECT. MAKE RECOMMENDATIONS TO ADDRESS THE SPECIFIC SITUATION IMMEDIATELY TO THE OWNER'S REPRESENTATIVE.
- 10. TOPSOIL "A" (IMPORTED TOPSOIL) SHALL BE APPLIED IN LANDSCAPE AREAS WHERE TREES, SHRUBS, AND GROUND COVER ARE TO BE INSTALLED NEAR THE BUILDING. TOPSOIL "B" CAN BE USED IN LIEU OF TOPSOIL "A" (IMPORTED SOIL) IN AREAS THAT ARE DESIGNATED FOR LAWN/GRASS SEED MIX OR AREAS APPROVED BY LANDSCAPE ARCHITECT SUCH AS AROUND THE PERIMETER OF THE SITE. TOPSOIL "C"/AMENDED SOIL AREAS CONSIST OF LANDSCAPE/GRASS AREAS WHERE CONSTRUCTION ACTIVITIES CAUSED DISTURBANCE TO SOIL AND RESTORATION OF GRASS AND TOPSOIL IS REQUIRED.
- 11. MULCH SHALL BE MEDIUM TO COARSE PARTICLE SIZE, SHREDDED WOOD MULCH (ARBORIST MIX). MINIMUM DEPTH OF 3". SUBMITTAL OF PRODUCT TO BE REVIEWED AND APPROVED BY LANDSCAPE ARCHITECT.
- 12. FINISH GRADE (TOP OF MULCH) IN PLANTING BEDS AND FINISH GRADE OF TURF SHALL BE 1/2" BELOW FINISHED SURFACE OF ADJACENT WALK OR PAVED AREAS. LAWN/GRASS AREAS NEAR PAVED/HARD SURFACES SHALL BE AT 1/2" BELOW ADJACENT SURFACES.
- 13. THE CONTRACTOR SHALL BEGIN MAINTENANCE IMMEDIATELY FOLLOWING PLANT INSTALLATION. THE CONTRACTOR SHALL MAINTAIN THE PLANTED AREAS FOR 90 DAYS AFTER ACHIEVING COMPLETION OF PLANTING (LANDSCAPE SUBSTANTIAL COMPLETION WHICH IS NOT THE SAME AS ARCHITECTURAL SUBSTANTIAL COMPLETION).
- 14. PLANT ESTABLISHMENT/MAINTENANCE PROCEDURES SHALL INCLUDE WATERING, PROTECTION FROM INSECTS OR DISEASE, WEEDING, PRUNING, MOWING, AND OTHER ACTIVITIES AS MAY BE REQUIRED CONTRACTOR SHALL IMMEDIATELY REPLACE ANY PLANT MATERIALS THAT ARE NOT VIGOROUS OR TYPICAL OF SIZE AND SPECIES. TREE STAKES SHALL BE KEPT SECURE AT ALL TIMES. DEFECTIVE MATERIALS AS DETERMINED BY THE LANDSCAPE ARCHITECT SHALL BE REPLACED IMMEDIATELY WITH PLANT MATERIALS OF THE SAME SPECIES AT A SIZE TO MATCH EXISTING ADJACENT MATERIALS.
- 15. STANDARD COMMERCIAL GRADE FERTILIZERS AND HERBICIDES SHALL NOT BE APPLIED UNLESS THE CONTRACTOR HAS DEEMED IT NECESSARY TO PROMOTE HEALTHY AND SUSTAINABLE GROWTH. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FROM THE OWNER BEFORE APPLYING FERTILIZERS AND HERBICIDES.
- 16. PLANT ESTABLISHMENT WATERING SHALL BE ACHIEVED BY TEMPORARY IRRIGATION SYSTEM WITH POINT OF CONNECTION COMPONENTS AT PROPOSED HOSE BIBBS & YARD HYDRANT(S). THE TEMPORARY WATERING/IRRIGATION SYSTEM SHALL DELIVER UNIFORM DISTRIBUTION OF ADEQUATE WATER TO ESTABLISH ALL PLANTS AND SUSTAIN THEM DURING (2) DRY SEASONS (MAY 1ST THRU OCTOBER 15TH). TREES INSTALLED OUTSIDE THE EXTENT OF THE TEMPORARY IRRIGATION SYSTEM SHALL HAVE A MINIMUM OF ONE (1)-15 GALLON TREEGATOR OR SIMILAR SLOW RELEASE WATERING DEVICE ATTACHED TO EACH TRUNK FOR HAND AND/OR TRUCK WATERING. 10-GALLONS OF WATER PER 1-INCH CALIPER IS REQUIRED PER TREE PER WEEK (3" CALIPER TREE SHALL HAVE 2-BAG SLOW RELEASE SYSTEM INSTALLED).
- 17. ALL DISTURBED AREAS SHALL BE RE-VEGETATED AS GRASS/LAWN OR COMBINATION OF MULCH & PLANTS SPECIFIED IN PLANTING SCHEDULE. ALL GRASS/LAWN AREAS SHALL BE HYDRO-SEEDED.
- 18. HYDRO-SEEDED ONLY, HYDRO-SEED MIX APPLICATION SHALL TAKE PLACE PRIOR TO BEGINNING OF WET SEASON (LATE AUGUST TO MID-OCTOBER) AND SHALL BE WATERED AS NECESSARY. FENCE OR TAPE-OFF LAWN AREAS TO PREVENT FOOT TRAFFIC FROM ENTERING THE SEEDED AREAS. THE FENCE OR SIMILAR BARRIER SHALL BE REMOVED AFTER LAWN ESTABLISHMENT
- 19. SOD SHALL BE USED IN LIEU OF HYDRO-SEED MIX AS A LAST RESORT AND SHALL BE APPROVED SEED MIX OR SIMILAR AND OWNER APPROVAL REQUIRED PRIOR TO INSTALLATION.
- 20. AREAS OF DISTURBANCE, SUCH AS BARE SOIL &/OR AREAS IMPACTED BY VEHICULAR USE OF ANY KIND, OR STORAGE OF MATERIALS OUTSIDE OF THE CLEARING LIMITS SHOWN ON APPROVED CIVIL ENGINEERING PLANS SHALL RECEIVE FULL SUBGRADE PREPARATION, INCLUDING COMPOST AMENDMENTS IF NEEDED, IN ORDER TO RE-ESTABLISHED THE VEGETATION COVER TYPE PRIOR TO UNFORSEEN CONSTRUCTION IMPACTS

GENERAL LANDSCAPE NOTES

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ABC RECYCLING	LANDSCAPE DETAILS AND NOTES	PLAN SET (10-23-2023)	741 MAKINE UKIVE BELLINGHAM, WASHINGTON 98226
DESCRIPTION DESIGN DESIGN CHECK ISSUE	21 IED/DR ED BY: DATE: 10-23	CR	



# **Stormwater Management Report**

# **ABC Recycling**

October 21, 2023

3426 Barret Road, Suite A103 Ferndale, WA 98248

Scott Goodall, MS, PE Principal scott@bold-impact.com 360-389-8138







Prepared for: Andy Anthony Vice President 735 Cornwall Ave. Bellingham, WA 98225 360-622-1682

Let's Build Your Vision Together

# **Engineer's Declaration**

I, Scott Goodall, a Professional Engineer registered in the State of Washington as a Civil Engineer, do hereby declare that this stormwater site plan was prepared by, or under my personal supervision, and that this report was prepared in accordance with generally accepted engineering practices. I hereby affirm that, to the best of my knowledge, information and belief, this report was prepared in full compliance with the 2019 Washington State Department of Ecology Stormwater Management Manual for Western Washington (2019 DOE SWMM), City of Ferndale Development Standards, and all Technical Standards adopted thereunder.

Respectfully Sealed and Signed,



10-21-2023

Scott Goodall, MS, PE Impact Design LLC

Original document on-file at Impact Design, LLC

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# Appendix

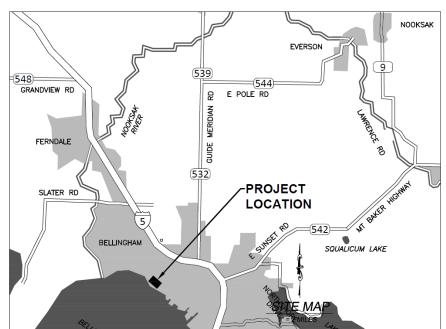
# **Stormwater Site Plan**

Section	Contents	
А	ABC Recycling Construction Plans	
В	Hydrologic and Hydraulic Analysis	
	Basin Maps	
	WWHM 2012 Modeling	
С	Conveyance Calculations	
D	Water Quality System Calculations	
Е	Geotechnical Information	
F	ABC Recycling Operations and Maintenance Manual	

# **ABC Recycling**

# **Project Location**

# Stormwater Site Plan Chapter 1



**Regional Vicinity Map** 



Local Vicinity Map

# **ABC Recycling** Project Description

# Stormwater Site Plan Chapter 2

**Existing Conditions:** The project is located in Whatcom County on the SW side of 741 Marine Drive just outside of the City limits of Bellingham, Washington. This places the site between 500-feet and 750-feet NE of Bellingham Bay, 2.5-street miles NW of the Whatcom County Court House, 1 street-mile NW of the active Bellingham waterfront, 3-street miles south of the Bellingham International Airport and 2.1-street miles SW of the "Northwest" (257) exit of Interstate 5 freeway. The site is bounded on all sides by active railway lines and shares a driveway with the (now abandoned) cement plant of Lehigh Concrete Company. The site is physically located at 48.76747420, -122.52265920.





# **Existing Conditions Site Photos (10/19/2023)**

The steepest slope of the property is approximately 5 percent at the northeast property boundary near the Marine Drive right-of-way. Shallow soils at the site consist of mostly uncontrolled fill overlying glacial outwash sand overlying glaciomarine drift clay.

**Proposed Conditions:** The facility will accept for purchase obsolete metal material, subject to an inbound Source Control Program, primarily post-consumer depolluted automobiles and kitchen appliances, with all fluids thereof previously removed, and process the metal material through the proposed metal shredder. Ferrous metal produced from the process would be delivered to the Port of Bellingham by truck or railcar and loaded on to ocean going vessels to its ultimate destination. Non-ferrous metal produced from the process would be delivered to the Port of Seattle by truck and loaded on to ocean going vessels to its ultimate destination. Non-ferrous metal produced for purchase on the secondary metal industries market, which reduces global mining and use of virgin materials. The project includes erection of various pre-manufactured steel buildings. Metal processing equipment of various designs will also be installed onsite, largely located inside buildings. A rail spur will be installed on the south side of the site; in addition, truck scales, concrete and asphalt paved areas for storage and movement of trucks and rolling stock will be installed. Here is a summary of the proposed buildings:

## • BUILDING 1 OFFICE/SHOP

- BUILDING 2 SEPARATION
- BUILDING 3 RECLAMATION

# • BUILDING 5 TWITCH

Basin Map Figure 1 shows the Post-Developed land use for the entire property. The pre-developed land use for the entire property for the purpose of stormwater modeling to size the pond is considered C, Forest, Flat per the 2019 WSDOE Manual. While the majority of the property is existing gravel fill, no existing stormwater management system is currently constructed for flow control or stormwater treatment.

WWHM2012 MODEL EXISTING CONDITION							
BASIN SURFACE	WWHM2012	AREA					
DASIN SURFACE	ELEMENT	SF	Acre				
Existing							
Condition	C, Forest, Flat	135,059	3.10				
TOTAL		135,059	7.18				
WWHM2012 MODEL PROPOSED CONDITION							
BASIN SURFACE	WWHM2012	AREA					
DASIN SURFACE	ELEMENT	SF	Acre				
Asphalt Surface	ROAD, FLAT	135,059	3.10				
Concrete Surface	SIDEWALK, FLAT	90,650	2.08				
Buildings	ROOFTOPS, FLAT	52,000	1.19				
Gravel	DRIVEWAY, FLAT	13,226	0.30				
Detention Pond	POND	21,766	0.51				
TOTAL		312,701	7.18				

ABC Recycling	Stormwater Site Plan
<b>Design Criteria and Assumptions</b>	Chapter 3

The following guidelines and design criteria were used to determine the project's stormwater requirements and design criteria.

#### **Development Standards:**

A. Whatcom County Code (WCC) Title 20.80.630

# B. Washington State Department of Ecology 2019 Stormwater Management Manual for Western Washington (WSDOE Manual)

**3.1 Governing Guidelines:** The land use intensity per "Land Use Intensity for Stormwater Management Table" in WCC 20.80.630 (1) (e) identifies this development as a High Land Use because it is an industrial use. This project is outside the NPDES Phase II Permit Area, the Lake Whatcom Watershed Overlay District, and the Stormwater Special District. Therefore, this project is subject to the WSDOE Manual requirements.

The 2019 Stormwater Management Manual for the Western Washington (DOE Manual) will be used to design the On-Site Stormwater Management BMP's, Stormwater Runoff Treatment and Flow Control measures for this project. This project disturbs more than one acre, so a General Construction NDPES permit will be required. This permit will be applied for prior to construction but is not necessary for vesting under a building permit application, as WSDOE is the governing body for this permit, not Whatcom County.

**3.2 Design Criteria:** The existing site does not consist of impervious surfaces covering more than 35% of the site; therefore, as specified by the DOE Manual, the proposed project meets the definition of new development. Because the area of new development is greater than 5,000 square feet, the project must meet all minimum requirements for stormwater management as specified in the DOE Manual. See Flowchart for the Determining Requirements for New Development on the next page of this report for this Minimum Requirements flow chart determination. All minimum requirements will apply to both new and replaced impervious surfaces.

In accordance with the requirements of the DOE Manual, the site's hydrologic analysis was performed using the Western Washington Hydrologic Model (WWHM), version 2012, a continuous simulation hydrologic model developed by the DOE.

#### **3.3 Design Assumptions:**

**On-Site Stormwater Management** – On-site stormwater management for hard surfaces will be required as is outlined in the DOE Manual, under minimum requirement #5. Due to the high groundwater table, no LID techniques will be employed on this project.

**Stormwater Treatment:** Stormwater treatment for new pollution hard generating surfaces will be required as is outlined in the DOE Manual, under minimum requirement #6. This will be met by using a Stormwater Treatment Wetland. See Minimum Requirement #6: Runoff Treatment of this report for further information.

**Stormwater Detention and Flow Control:** Stormwater detention and flow control for new hard surfaces will be required as outlined in the DOE Manual, under minimum requirement #7. This will be accomplished by using a stormwater treatment wetland. See the Minimum Requirement #7: Flow Control of this report for further information.

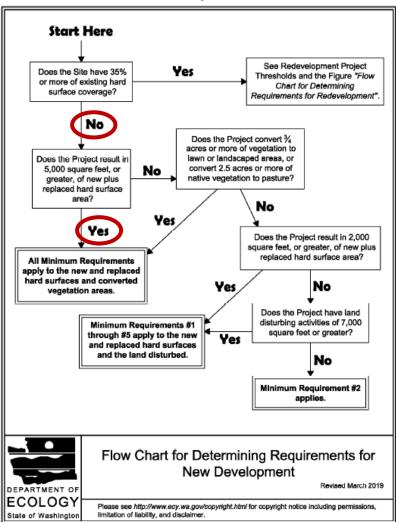


Figure I-3.1: Flow Chart for Determining Requirements for New Development

# **ABC Recycling**

# **Basin Analysis**

# <u>4.1 Soils:</u>

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey reports that the soil unit is Hydrologic Soil Group C: 172—Urban land-Whatcom-Labounty complex, 0 to 8 percent slopes. The Phase 2 Environmental Assessment Report (Anchor QEA August 2023) is attached. Here is an expert from their report:

# "2.1.1 Test Pits

Anchor QEA, with support from subcontractor Anderson Environmental Contracting, collected samples from TP-4 through TP-12 and TP-16 via excavator. Anchor QEA collected samples from TP-1 through TP-3, TP-13 through TP-15, and TP-17 via hand auger, as access was not able to be cleared for the excavator to enter the wooded portions of the site. Test pit sampling details are summarized in Table 1. Test pits were used for observation of soil conditions, and for collection of surficial and subsurface soil samples. Sample intervals were collected following the procedures in the SAP (Anchor QEA 2020b) and were based on visual observations of the soils and through discussions with ABC Recycling and the project team. Sample material from the selected sample interval(s) was characterized before placement in sample jars. Each test pit was filled in, compacted with the excavator bucket, and surface graded by the excavator to the extent practicable following sampling. Test pit logs are included in Appendix E.

# 3.1 Physical Features

The samples collected from the wooded area on the northern side of the Property were generally composed of moist, fine-grained soils, with the exception of TP-3 (Figure 1). Unique soil characteristics identified at TP-3 are detailed below.

- TP-3 was selected to document conditions in a mound of fill in the woods noted during the September 30 site walk. The mound was composed of fine, limestone-like material. Debris were present on the mound and within the surrounding area. The majority of samples collected from the yard were composed of dry, compacted gravel material that makes up the surface backfill of the yard. Native material was encountered in the yard between 4.5 and 5 feet bgs. Samples with unique soil characteristics are detailed below.
- TP-4 is along the northeastern edge of the yard and is the only location in the yard area to have native material at surface through to the depth of the bottom of the test pit (4 feet bgs). Material in this test pit contained brown grey fine-grained soil at the surface and contained more clayey soil with trace organics (wood pieces) towards the bottom of the test pit. Material from the surficial layer (0 to 0.5 feet bgs) was sampled and analyzed.
- TP-5 is located near the northwestern corner of the yard and was chosen for sampling based on observations of creosote-treated debris and creosote odor noted during the September 30 site walk. Surficial material from TP-5 (0 to 0.5 feet bgs) was sampled and analyzed.
- TP-6 is located near TP-4 on the northeastern side of the yard. This test pit was unique in that a slight metallic sheen was noted in the darkly colored fine-grained soil in the top 0 to

0.5 feet. Anthropogenic debris (e.g., hose, tarp, and fabric) was also observed compacted within the material along the test pit sidewall. The unique surficial layer was sampled and analyzed.

- *TP-7 is located on the northwestern side of the yard. Native material was encountered at 4.5 feet and the 4.5- to 5-foot interval was sampled and submitted for analysis.*
- TP-16 is a location added to the sampling scheme based on field observations. Surficial material was wet, and dark brown in color with coarse-grained soil, as opposed to the fine-grained soil found in surficial samples elsewhere around the yard. Native material was also encountered at this test pit starting at 5 feet bgs. The unique surficial layer and native layer were sampled and the native layer was analyzed.

Samples collected from the wooded area on the southern side of the Property typically consisted of dry to moist fine-grained soil underneath a surficial layer of leaves and organic matter. No test pits from this portion of the Property had significant variations, and there were no test pits with unique materials or debris observed.



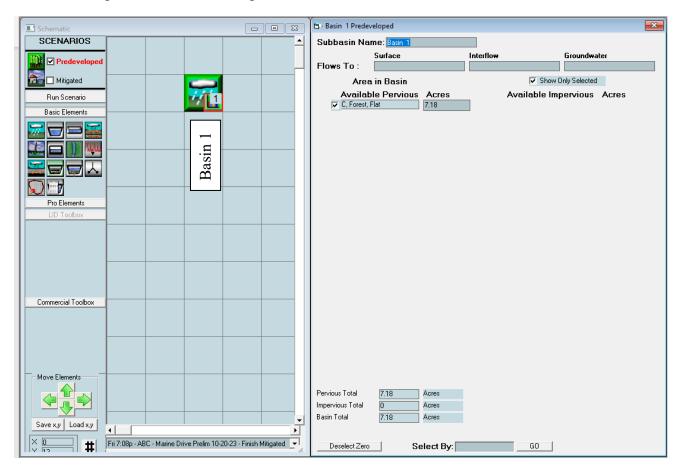
**4.2 Pre-Developed Conditions:** The site contains a gravel storage area with temporary storage onsite. Wetlands and forested conditions also exist on the site. The pre-developed land use in the WWHM2012 model is used as C, Forest, Flat.

**<u>4.3 Post-Developed Conditions:</u>** Appendix A of this report shows the proposed site development including the proposed buildings, hard surface replacement, expansion and other improvements.

Appendix B shows the post-developed basin map. The pre-developed and post-developed flow rates calculated by WWHM2012 are shown below:

Flow (cfs)	Predeveloped	Mitigated
2 Year	0.139	0.075
5 Year	0.210	0.113
10 Year	0.248	0.144
25 Year	0.288	0.192
50 Year	0.313	0.234
100 Year	0.334	0.282

See Predeveloped WWHM2012 setup is shown below:



Schematic					🛱 Basin 1 Mitigat	ed			×
SCENARIOS				<u> </u>	Subbasin Nan	ne: Basin 1	🗌 🗌 Desi	gnate as Bypass for POC:	
	-					Surface	Interflow		undwater
			_			Trapezoidal Pond 1	Trapezoidal		
🔂 🗹 Mitigated	_		1			in Basin		🔽 Show Only Se	
Run Scenario		111-	Basin		C, Forest, F	e Pervious Acres		Available Impervi ROADS/FLAT	ious Acres 3.1
Basic Elements			Ba					ROOF TOPS/FLAT	1.19
									.3
									2.08
							~	POND	.51
		AI1							
Pro Elements									
		Pond							
		l S l							
LID Toolbox	-								
		qa							
		Trapezoidal							
Commercial Toolbox		- S							
		ap							
		ΗĤ							
Move Elements									
					Pervious Total Impervious Total	0 Acres 7.18 Acres			
				<b></b>	Basin Total	7.18 Acres			
Save x,y Load x,y	•			ī					
	Sat 9:01a - ABC - Marine	Drive Prelim 7-21	-23 - Finish N	fitigated 🗾	Deselect Zero	Select B	y:	GO	

See Post-developed WWHM2012 setup is shown below:

WWHM 2012 Model Setup

The WWHM 2012 model was setup using one basin as shown above. A trapezoidal pond element was used to describe the stormwater treatment wetland. The WWHM2012 model is shown in Appendix B.

😰 Trapezoidal Pond 1 Mitigated						
Facility Name Trapezoidal Po	nd 1	Facility Type				
	Outlet 1	Outlet 2	Outlet 3			
Downstream Connections	0	0	0			
Precipitation Applied to Facility		Auto Pond	Quick Pond			
Evaporation Applied to Facility		Facility Dimen	sion Diagram			
Facility Dimensions		Outlet Structure I	Data			
Facility Bottom Elevation (ft)	0	Riser Height (ft)				
Bottom Length (ft)	100	Riser Diameter (in) 18				
Bottom Width (ft)	100	Riser Type Notched				
Effective Depth (ft)	10	Notch Type Rectangu	ar 🚽			
Left Side Slope (H/V)	3		73 ÷			
Bottom Side Slope (H/V)	3		235; ÷			
Right Side Slope (H/V)	3	1				
Top Side Slope (H/V)	3	Orifice Diamete	r Height			
Infiltration	NO 🕂	Number (in)	(ft) <sup>-</sup>			
		1 1.001 2 0 1 3 0 1 Pond Volume at Riser Hea Show Pond Table Initial				
Tide Gate Time Series Demand						
- Determine Outlet With Tide G	ate					
🗖 Use Tide Gate						
Tide Gate Elevation (ft)	0	Downstream Connection				
.,	0	Iterations				

# WWHM 2012 Model Setup

The WWHM 2012 model was setup using one basin as shown above. A trapezoidal pond element was used to describe the stormwater treatment wetland. The WWHM2012 model is shown in Appendix B.

#### 4.4 Downstream Analysis:



**Marine Drive Stormwater System** 

At 1,760 feet from the connection to the city storm drain line at the southeast corner of the property, Marine Dr. intersects Little Squalicum Creek. Following the flowpath of the city storm drain line, two 36" concrete pipes were observed to be discharging stormwater runoff into Little Squalicum Creek.

From the outfall at the intersection of Marine Dr. and Little Squalicum Creek stormwater runoff flows 700 feet to the Little Squalicum Estuary where it discharges into Bellingham Bay.

On October 4, 2023 a field investigation was conducted at the ABC Recycling site at 741 Marine Dr. to document the flowpath of stormwater leaving the property.

After inspecting the perimeter of the location, it was determined that stormwater runoff flows to the southeast corner of the property where it meets the City of Bellingham storm drain line. Two sewer-grade, green PVC culverts, 12" and 18" respectively, feed stormwater from the site to catch basins in the Marine Dr. right-of-way.

The city storm drain line uses 24" green PVC and 18" concrete pipe to move water in a southeasterly direction in the Marine Dr. right-of-way toward Little Squalicum Creek. The city storm drain network of catch basins and pipes were all observed to be functioning, including the connection of stormwater from the site to the city system.



**Marine Drive Outfall** 



**Marine Drive Open Channel** 



Little Squalicum Creek

**4.5 Emergency Overflow:** A gravity overflow system is in place for the stormwater treatment wetland. The gravity overflow pipe is an 18 inch CPP pipe laid at 0.5% slope. This pipe is capable of managing a flow of 8.6 cfs. The 100-year unmitigated flowrate of the site is 5.6 cfs as shown in the Unmitigated WWHM2012 model in Appendix B. Therefore, the pipe size is adequately. Calculations to confirm the 18-inch riser is capable of managing the 5.6 cfs 100-year unmitigated flowrate are also provided in Appendix B. The spillway calculations are also included for the 2.8 cfs flowrate.

**ABC Recycling** 

**Minimum Development Requirements** 

The following sections describe how the project meets the minimum requirements for stormwater management as specified in the DOE Manual.

**Stormwater Site Plan** 

Chapter 5

<u>Minimum Requirement #1: Preparation of a Stormwater Site Plan</u>: This project is required to prepare a Stormwater Site Plan, as defined by the DOE Manual

Stormwater Site Plans are prepared for local government review. Stormwater Site Plans shall use site-appropriate development principles, as required and encouraged by local development codes, to retain native vegetation and minimize impervious surfaces to the extent feasible. Stormwater Site Plans shall be prepared in accordance with the DOE Manual.

**Drainage Report:** A guiding document prepared with associated site testing, engineering analysis, site planning, supporting calculations, and supporting documentation defining a permanent stormwater control plan for the subject site.

**SWPPP Plan:** Construction Stormwater Pollution Prevention Plan consists of the preparation of a Temporary Erosion and Sediment Control Plan (TESC). Please see the attached project plans for the TESC plan. This is just an initial plan. The plan must be monitored and modified for field conditions by a Certified Erosion and Sedimentation Control Lead (CESCL) throughout the duration of the project construction phase.

**<u>SPCC Plan:</u>** A Spill Prevention, Control and Counter Measures Plan (SPCC) will be provided by the Contractor.

**Minimum Requirement #2: Construction Stormwater Pollution Prevention (SWPP)** This project is required to prepare SWPP Plan, as defined by thresholds in the DOE Manual.

A Stormwater Pollution Prevention Plan (SWPP Plan) has been prepared as part of the construction drawings for the proposed site improvements, which are included in Appendix A of this report. This plan provides erosion and sediment control information, locations where Best Management Practices (BMPs) shall be implemented, and requirements that the contractor must follow throughout construction. See the Construction Plans for a copy of the SWPP Site Plan, SWPP Notes, and BMP details.

During construction, the contractor shall maintain a copy of the SWPP Plan on site and shall update or modify the SWPP Plan as necessary for the current conditions of the site. The contractor's schedule and available crew, equipment, and materials will be determined prior to construction. Accordingly, some BMPs that have been specified may not be necessary, while other additional BMPs may be required.

Construction stormwater prevention is documented in the SWPP Plan that has been prepared for this project.

Element 1: Preserve Vegetation / Mark Clearing Limits

- A. Before beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.
- B. Retain the duff layer, native topsoil, and natural vegetation in an undisturbed state to the maximum degree practicable.

# Additional Guidance For Element 1

- Plastic, metal, fabric fence, or other physical barriers may be used to mark the clearing limits. Note the difference between the practical use and proper installation of BMP C233: silt fence and the proper use and installation of BMP C103: high-visibility fence.
- If it is not practical to retain the duff layer in place, then stockpile it on site, cover it to prevent erosion, and replace it immediately when you finish disturbing the site.

#### Suggested BMPs For Element 1

• BMP C233: Silt Fence

#### **Element 2: Establish Construction Access**

- A. Limit construction vehicle access and exit to one route, if possible.
- B. Stabilize access points with a pad of quarry spalls, crushed rock, or other equivalent BMPs, to minimize tracking of sediment onto public roads.
- C. Locate wheel wash or tire baths on site, if the stabilized construction entrance is not effective in preventing tracking sediment onto roads.
- D. If sediment is tracked off site, clean the affected roadway(s) thoroughly at the end of each day, or more frequently as necessary (for example, during wet weather). Remove sediment from roads by shoveling, sweeping, or picking up and transporting the sediment to a controlled sediment disposal area.
- E. Conduct street washing only after sediment is removed in accordance with 2.d (above).
- F. Control street wash wastewater by pumping back on site, or otherwise prevent it from discharging into systems tributary to waters of the state.

# Additional Guidance For Element 2

Minimize construction site access points along linear projects, such as roadways. Street washing may require local jurisdiction approval.

Suggested BMPs For Element 2

• BMP C105: Stabilized Construction Access

# **Element 3: Control Flow Rates**

A. Protect properties and waterways downstream of development sites from erosion and the associated discharge of turbid waters due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site.

- B. Where necessary to comply with 3.a (above), construct stormwater infiltration or detention BMPs as one of the first steps in grading. Assure that detention BMPs function properly before constructing site improvements (e.g., impervious surfaces).
- C. If permanent infiltration BMPs are used for temporary flow control during construction, protect these BMPs from siltation during the construction phase.

# Additional Guidance For Element 3

- Conduct a downstream analysis if changes in flows could impair or alter conveyance systems, streambanks, bed sediment, or aquatic habitat. See iii-3.2 preparing a stormwater site plan for off-site analysis guidelines.
- Even gently sloped areas need flow controls such as BMP C235: wattles or other energy dissipation / filtration structures. Place dissipation facilities closer together on steeper slopes. These methods prevent water from building higher velocities as it flows downstream within the construction site.
- Control structures designed for permanent detention BMPs are not appropriate for use during construction without modification. If used during construction, modify the control structure to allow for long-term storage of runoff and enable sediment to settle. Verify that the BMP is sized appropriately for this purpose. Restore BMPs to their original design dimensions, remove sediment, and install a final control structure at completion of the project.
- Erosion has the potential to occur because of increases in the volume, velocity, and peak flow rate of stormwater runoff from the project site. The local permitting agency may require infiltration or detention BMP designs that provide additional or different stormwater flow control than the designs detailed in this manual. These requirements may be necessary to address local conditions or to protect properties and waterways downstream.
- Velocity of water leaving the site should not exceed 3 feet/second, if the discharge is to a stream or ditch. Install velocity dissipation, such as BMP C207: check dams or BMP C202: riprap channel lining to ensure reduction of the flow velocity to a non-erosive level.
- If the discharge from a project site is to a municipal storm drainage system, the allowable discharge rate may be limited by the capacity of the public system. It may be necessary to clean the municipal storm drainage system prior to the start of the discharge to prevent scouring solids from the drainage system. Obtain permission from the owner of the collection system before discharging to it. Ensure that no downstream pipes are surcharged as a result of increased flows from the project site.
- If the discharge from a project site is directly to a flow control exempt receiving water listed in appendix I-A: Flow Control Exempt Receiving Waters or to an infiltration system, there is no discharge flow limit.

# Suggested BMPs For Element 3

• BMP C207: Check Dams

# **Element 4: Install Sediment Controls**

A. Construct sediment control BMPs (sediment ponds, traps, filters, etc.) As one of the first steps in grading. These BMPs must be functional before other land disturbing activities take place.

- B. Minimize sediment discharges from the site. The design, installation and maintenance of erosion and sediment controls must address factors such as the amount, frequency, intensity and duration of precipitation, the nature of resulting stormwater runoff, and soil characteristics, including the range of soil particle sizes expected to be present on the site.
- C. Direct stormwater runoff from disturbed areas through BMP C241: sediment pond (temporary) or other appropriate sediment removal BMP, before the runoff leaves a construction site or before discharge to an infiltration facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but must control flow rates per element 3: control flow rates.
- D. Locate BMPs intended to trap sediment on site in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.
- E. Provide and maintain natural buffers around surface waters, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration, unless infeasible.
- F. Where feasible, design outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column.

# Additional Guidance For Element 4

- Outlet structures that withdraw impounded stormwater from the surface to avoid discharging sediment that is still suspended lower in the water column are for the construction period only. If installing a floating pump structure, include a stopper to prevent the pump basket from hitting the bottom of the pond.
- If a sediment trapping BMP utilizes a control structure that will also be used in a permanent detention BMP application, the control structure construction must be finalized for the permanent BMP application upon project completion.
- Install sediment controls in a manner that protects the sensitive areas and their buffers marked in accordance with element 1: preserve vegetation / mark clearing limits.
- Where feasible, direct stormwater to vegetated areas to increase sediment removal and maximize stormwater infiltration.
- Seed and mulch earthen structures such as dams, dikes, and diversions according to the timing indicated in element 5: stabilize soils.
- Full stabilization includes concrete or asphalt paving; quarry spalls used as ditch lining; or the use of rolled erosion products, a bonded fiber matrix product, or vegetative cover in a manner that will fully prevent soil erosion.
- The local permitting authority may inspect and approve areas fully stabilized by means other than pavement or quarry spalls.

# Suggested BMPs For Element 4

• BMP C233: Silt Fence

# **Element 5: Stabilize Soils**

A. Stabilize exposed and unworked soils by application of effective BMPs that prevent erosion. Applicable BMPs include, but are not limited to: temporary and permanent seeding, sodding, mulching, plastic covering, erosion control fabrics and matting, soil application of