

THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING. ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO STANTEC WITHOUT DELAY. THIS DRAWING IS THE PROPERTY OF STANTEC AND IS TO BE USED FOR THE PROJECT AND PURPOSES ONLY. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY STANTEC IS FORBIDDEN.

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	BENCH
	BENCH MARK
	CATCH BASIN
	CULVERT END
	ELECTRIC MANHOLE
	FLARED END SECTION
	GAS METER
	GAS VALVE
	GAS VENT
	GUY POLE
	GUY WIRE
	HYDRANT
	LIGHT POLE
	MAIL BOX
	MONITORING WELL
	MONUMENT - SET
	ORDINARY HIGH WATER MARK
	POST
	POWER METER
	POWER POLE
	RAILROAD SIGNAL
	SANITARY MANHOLE
	SIGN (NON-TRAFFIC)
	SPRINKLER HEAD
	STORM MANHOLE
	TELEPHONE MANHOLE
	TELEPHONE PEDESTAL
	TRAFFIC SIGN
	TRAFFIC SIGNAL
	TRANSFORMER - POWER
	TREE - DECIDUOUS
	UNKNOWN MANHOLE
	WATER VALVE
	WATER WELL



12075 N. Corporate Parkway, Suite 200
 Mequon, WI 53092
 www.stantec.com

**PRELIMINARY
 FOR DISCUSSION
 ONLY**

LEGEND

UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE
 June 8, 2018

NO	REVISION	DATE

SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

SHEET NUMBER
G-2

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General Notes

- Existing utilities shown are indicated in accordance with available records. Other utilities may also be present. The Contractor shall be responsible for obtaining exact locations and elevations of all utilities from the owners of the respective utilities. All utility owners shall be notified by the Contractor a minimum of five (5) working days prior to excavation.
- All utility elevations are shown as invert elevations unless otherwise noted.
- Invert elevations are at the centerline of the structure unless otherwise noted.
- Limits of construction area shall be fenced prior to commencement of work.
- Demolition of the One-Hour Martinizing building shall be completed by others.
- Construction site access and haul routes shall be limited to Wall Street and Elm Grove Road.
- Construction sequence: Construct new channel from downstream end to approximately STN 0+75, including new culvert at Wall Street. Construct plunge pool and channel section immediately downstream of Watertown Plank Road. Complete connection to new channel, and transfer stream flow to new channel. Construct new parking lot storm sewers. Complete demolition of existing parking lot Underwood Creek culvert. Complete construction of stone weir at downstream end of project.

Survey Control and Alignment Data

- All coordinates are based on Wisconsin State Plane Coordinate System South Zone NAD27, and all bearings and distances shown are ground NGVD29.



POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	NOTE
1	387042.2113	2511666.679	798.116	NW CORNER 25-7-20	FOR HORIZ. CALIBRATION ONLY
2	387037.5609	2514301.393	762.384	N 1/4 CORNER 25-7-20	FOR HORIZ AND VERT CALIBRATION
4	384390.4762	2516995.462	726.217	E 1/4 CORNER 25-7-20	FOR HORIZ. CALIBRATION ONLY

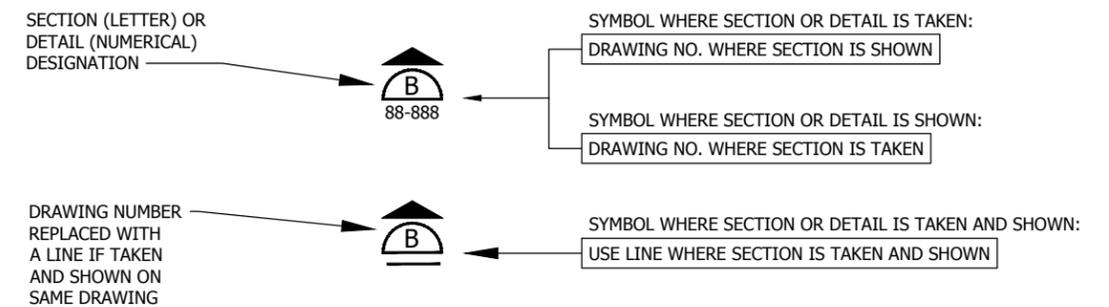
WSPCS, SOUTH ZONE, NAD 1927 NGVD 1929
 MULTIPLY NORTHING AND EASTING BY .99991135 TO RETURN TO GRID COORDINATES

SECTION AND DETAIL TITLES

SECTION B
 1/4" = 1' - 0" 88-888

DETAIL 1
 1/4" = 1' - 0" 88-888

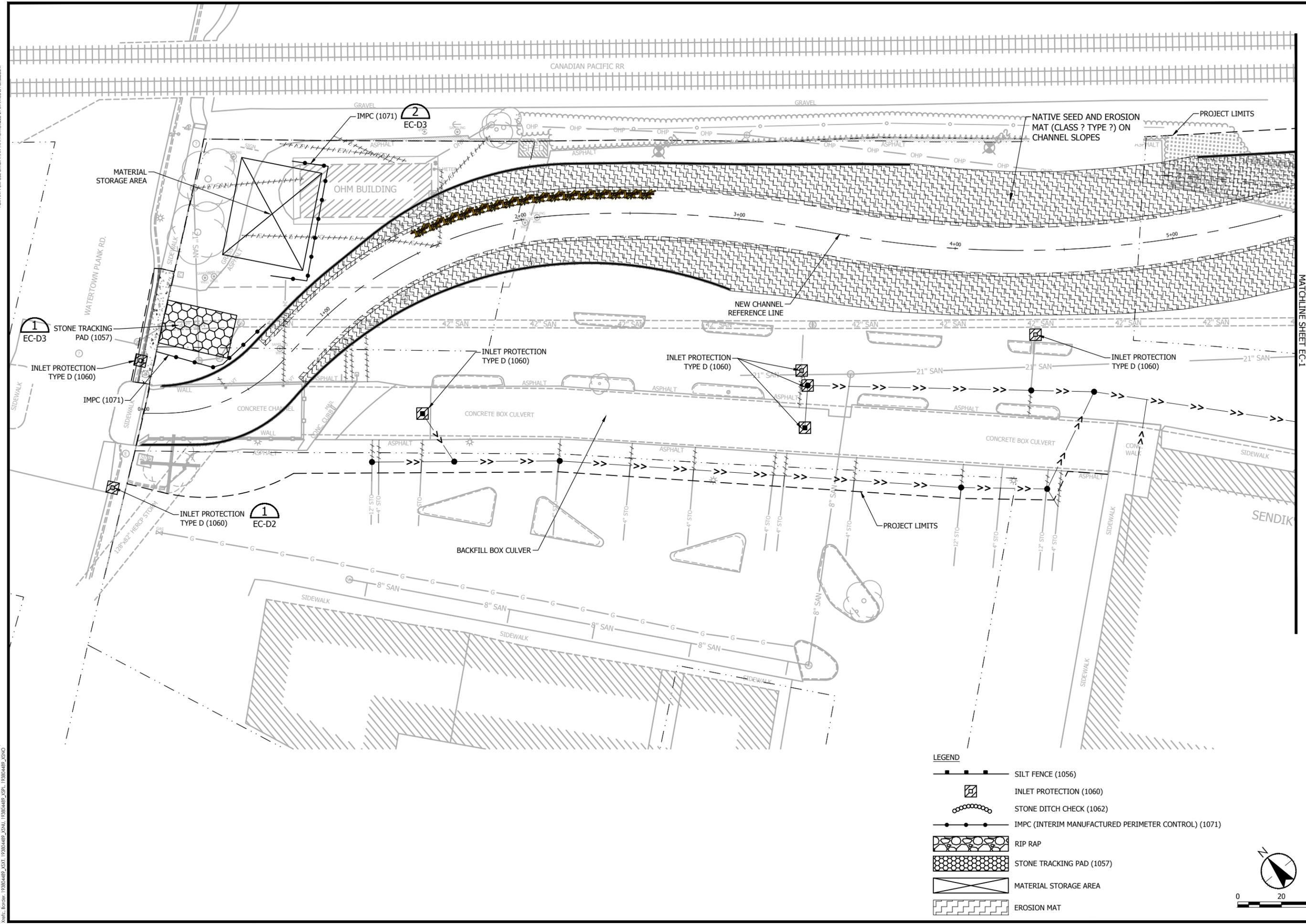
SECTION AND DETAIL REFERENCE (WHERE TAKEN AND SHOWN)



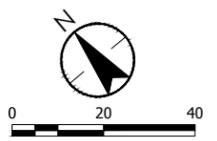
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- LEGEND**
- SILT FENCE (1056)
 - INLET PROTECTION (1060)
 - STONE DITCH CHECK (1062)
 - IMPC (INTERIM MANUFACTURED PERIMETER CONTROL) (1071)
 - RIP RAP
 - STONE TRACKING PAD (1057)
 - MATERIAL STORAGE AREA
 - EROSION MAT



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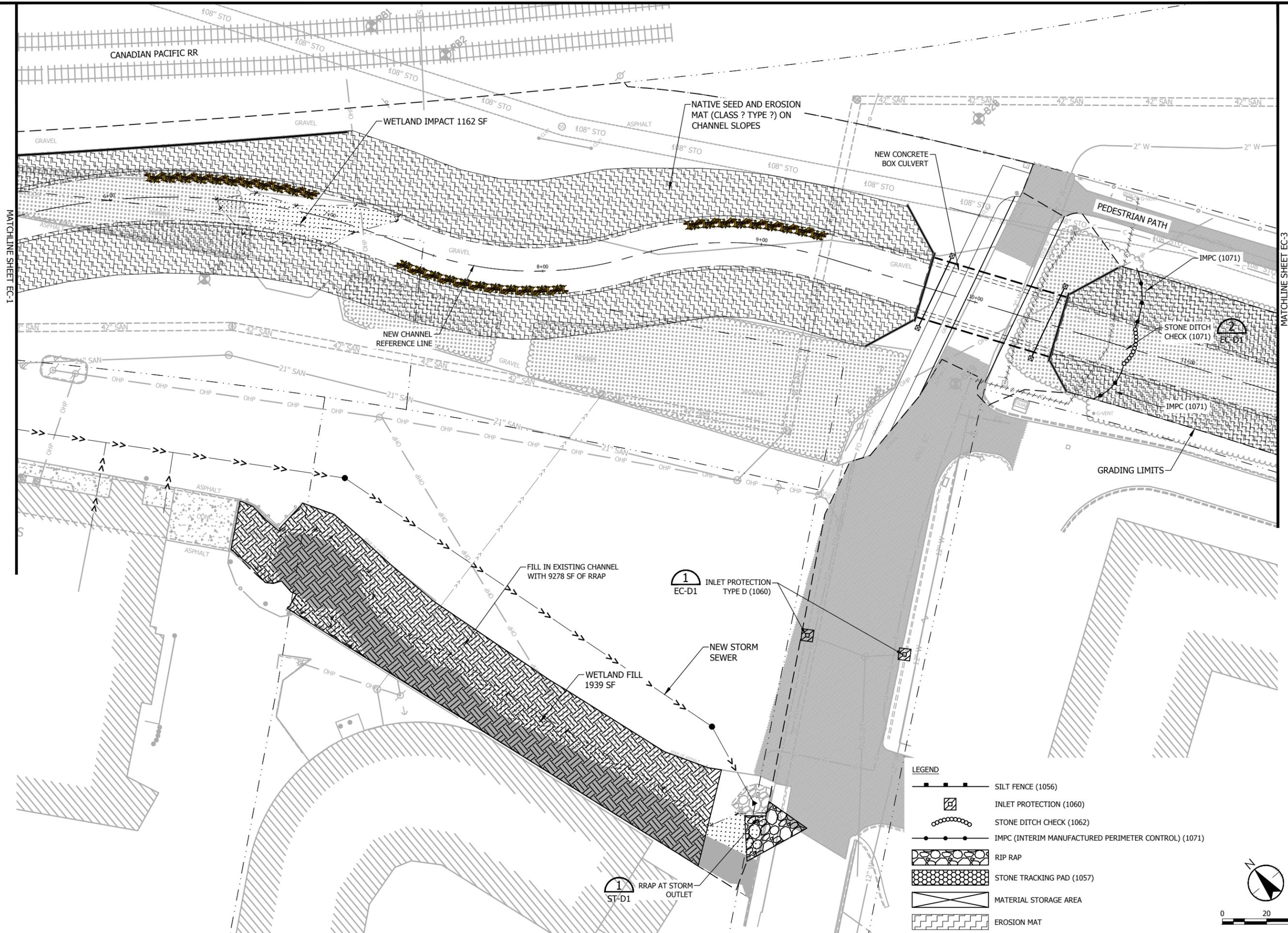
**PRELIMINARY
FOR DISCUSSION
ONLY**

SUGGESTED EROSION CONTROL PLAN
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE	
June 8, 2018	
NO. REVISION	DATE
SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489
SHEET NUMBER	EC-1

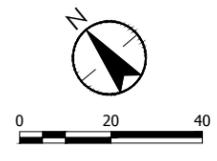
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LEGEND

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- RIP RAP
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- EROSION MAT



MATCHLINE SHEET EC-1

MATCHLINE SHEET EC-3

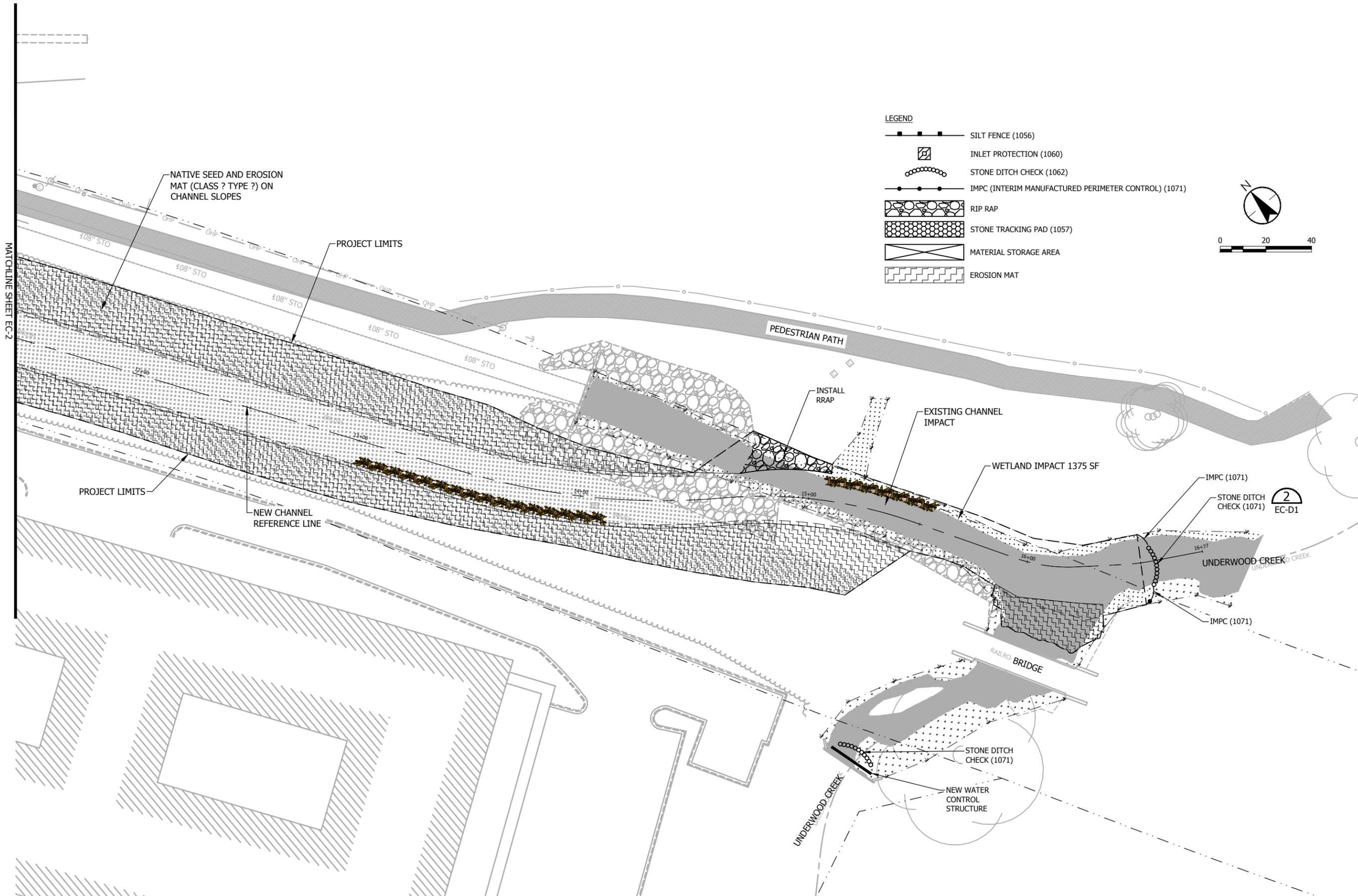
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 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

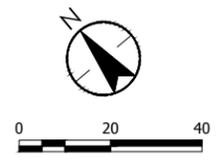
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SHEET NUMBER	EC-2

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- LEGEND**
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MATCHLINE SHEET EC-2

**PRELIMINARY
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SUGGESTED EROSION CONTROL PLAN
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

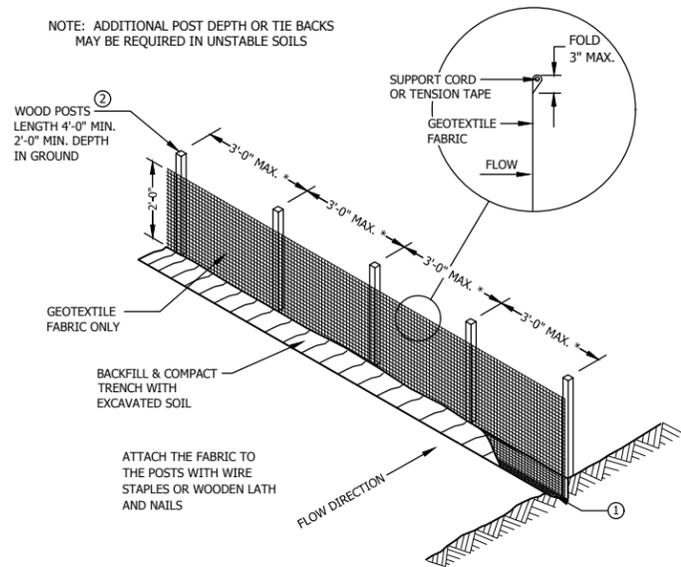
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SHEET NUMBER	EC-3	

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GENERAL NOTES

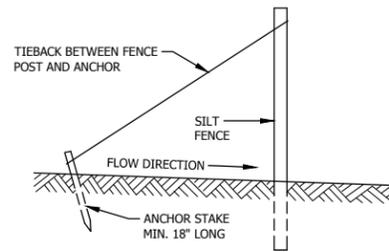
- ① TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL
- ② WOOD POSTS SHALL BE MINIMUM SIZE OF 1 1/8" X 1 1/8" OF OAK OR HICKORY.
- ③ CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS: A) TWIST METHOD -- OVERLAP THE END POSTS AND TWIST, OR ROTATE AT LEAST 180 DEGREES, B) HOOK METHOD -- HOOK THE END OF EACH SILT FENCE LENGTH.

NOTE: ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS

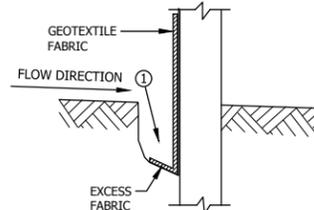


SILT FENCE

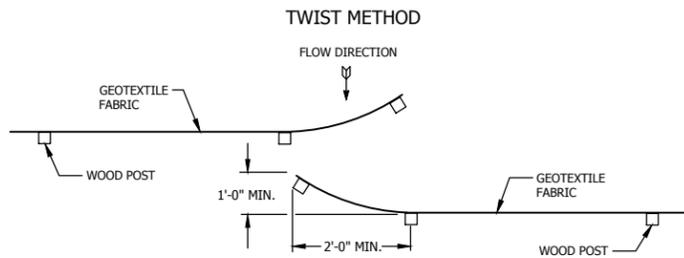
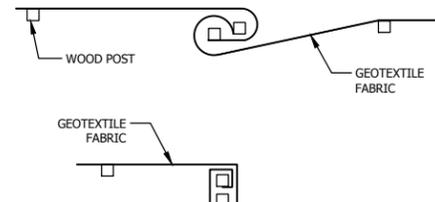
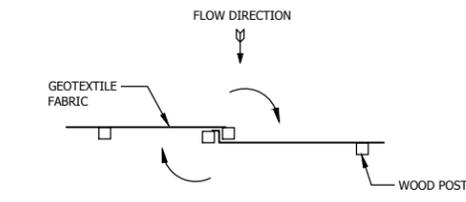
*NOTE: 8'-0" POST SPACING ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED.



SILT FENCE TIE BACK
(WHEN ADDITIONAL SUPPORT REQUIRED)



TRENCH DETAIL

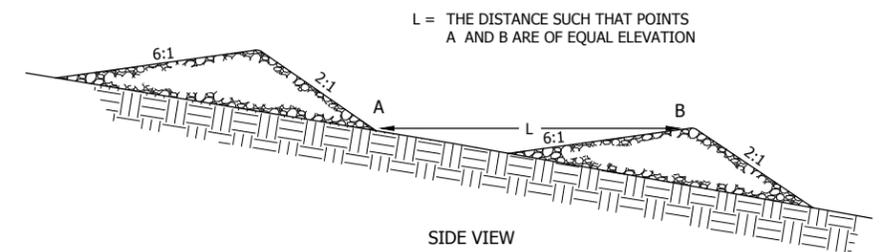
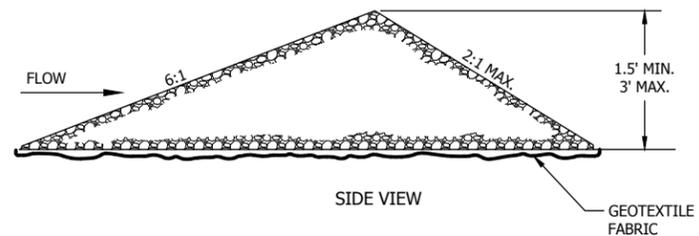
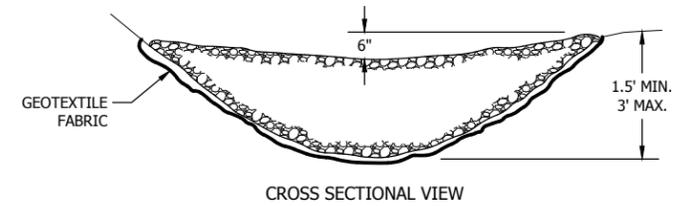


HOOK METHOD
JOINING TWO LENGTH OF SILT FENCE

SILT FENCE DETAIL

NTS

1
EC-1



STONE DITCH CHECK DETAIL

NTS

2
EC-1
EC-2
EC-3

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DATE OF ISSUANCE
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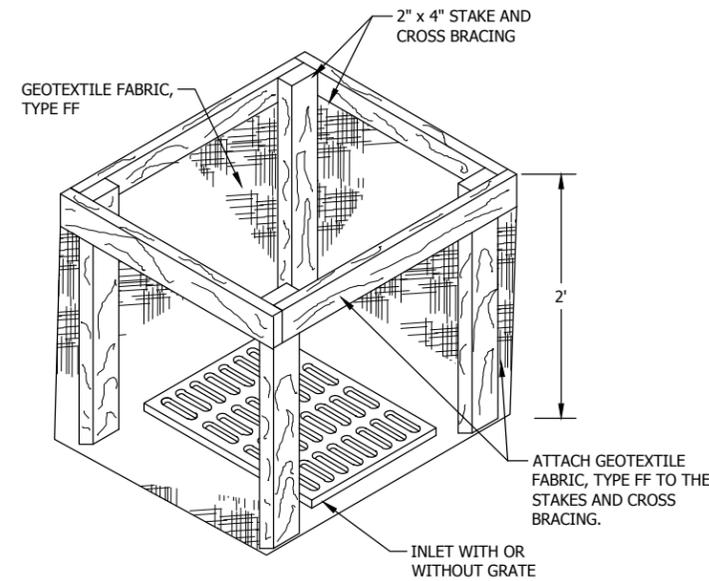
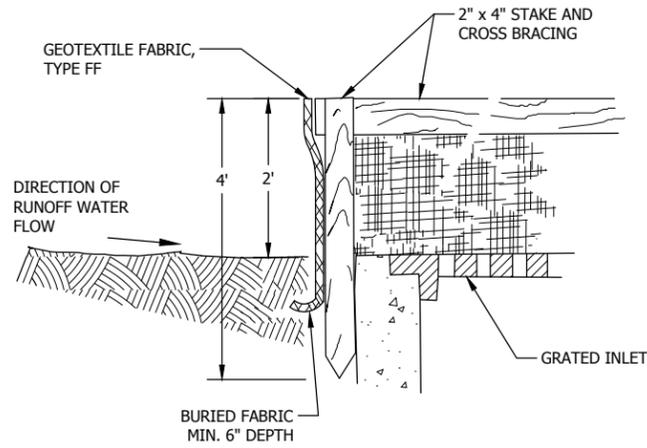
NO. REVISION DATE

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DESIGNED ####
CHECKED ####
APPROVED ####
PROJ. NO. 193804489

SHEET NUMBER
EC-D1

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INLET PROTECTION, TYPE A

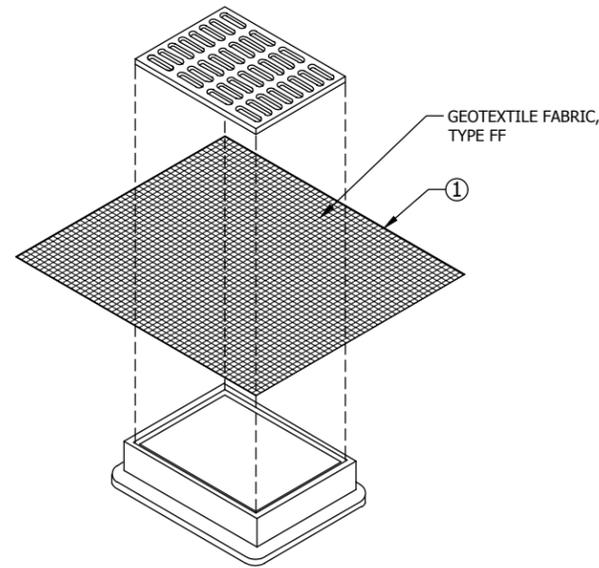
GENERAL NOTES

INLET PROTECTION DEVICES SHALL BE MAINTAINED OR REPLACED AT THE DIRECTION OF THE ENGINEER.

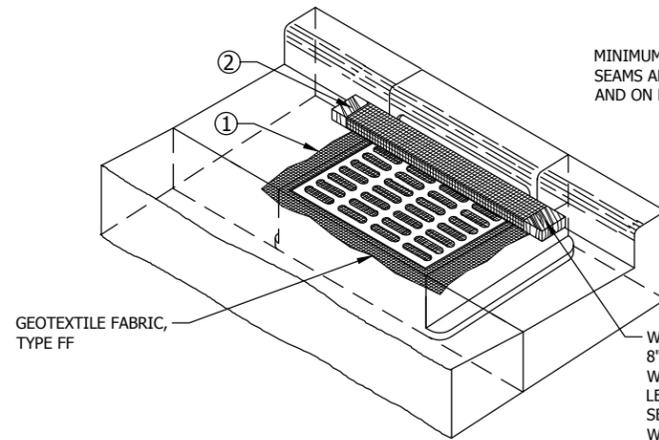
MANUFACTURED ALTERNATIVES APPROVED AND LISTED ON THE DEPARTMENT'S EROSION CONTROL PRODUCT ACCEPTABILITY LIST MAY BE SUBSTITUTED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, CARE SHALL BE TAKEN SO THAT THE SEDIMENT TRAPPED ON THE GEOTEXTILE FABRIC DOES NOT FALL INTO THE INLET. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

- ① FINISHED SIZE, INCLUDING FLAP POCKETS WHERE REQUIRED, SHALL EXTEND A MINIMUM OF 10" AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ② FOR INLET PROTECTION, TYPE C (WITH CURB BOX), AN ADDITIONAL 18" OF FABRIC IS WRAPPED AROUND THE WOOD AND SECURED WITH STAPLES. THE WOOD SHALL NOT BLOCK THE ENTIRE HEIGHT OF THE CURB BOX OPENING.
- ③ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2X4.



**INLET PROTECTION, TYPE B
 (WITHOUT CURB BOX)**
 (CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX)



INLET PROTECTION, TYPE C (WITH CURB BOX)

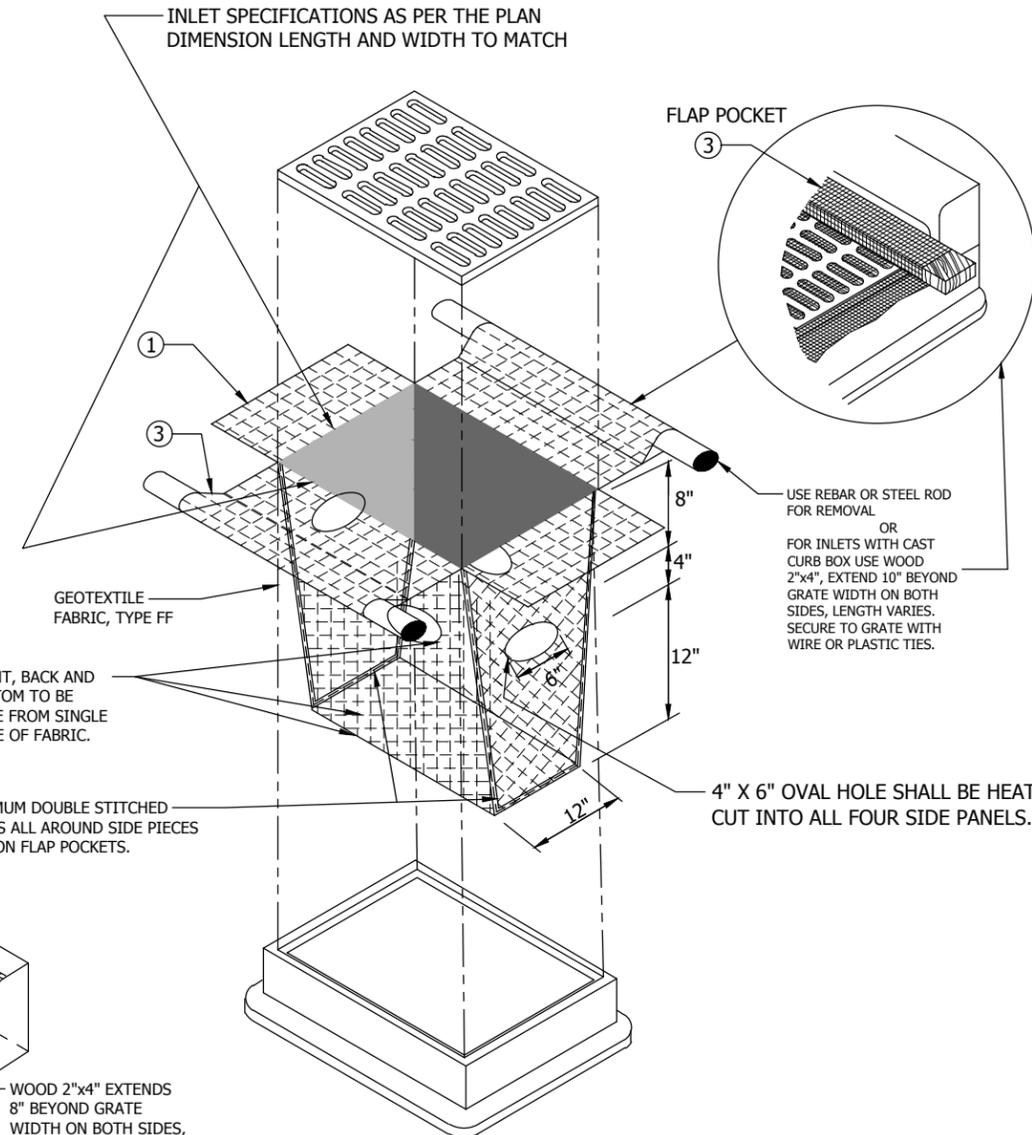
INSTALLATION NOTES

TYPE B & C
 TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.
 THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

TYPE D
 DO NOT INSTALL INLET PROTECTION TYPE D IN INLETS SHALLOWER THAN 30", MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE.

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE.

THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE, BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES, OF 3". WHERE NECESSARY THE CONTRACTOR SHALL CINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3" CLEARANCE. THE TIES SHALL BE PLACED AT A MAXIMUM OF 4" FROM THE BOTTOM OF THE BAG.



INLET PROTECTION, TYPE D
 (CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX AS PER NOTE ②)

INLET PROTECTION DETAILS

NTS

1
 EC-1
 EC-2
 EC-3

DATE OF ISSUANCE
 June 8, 2018

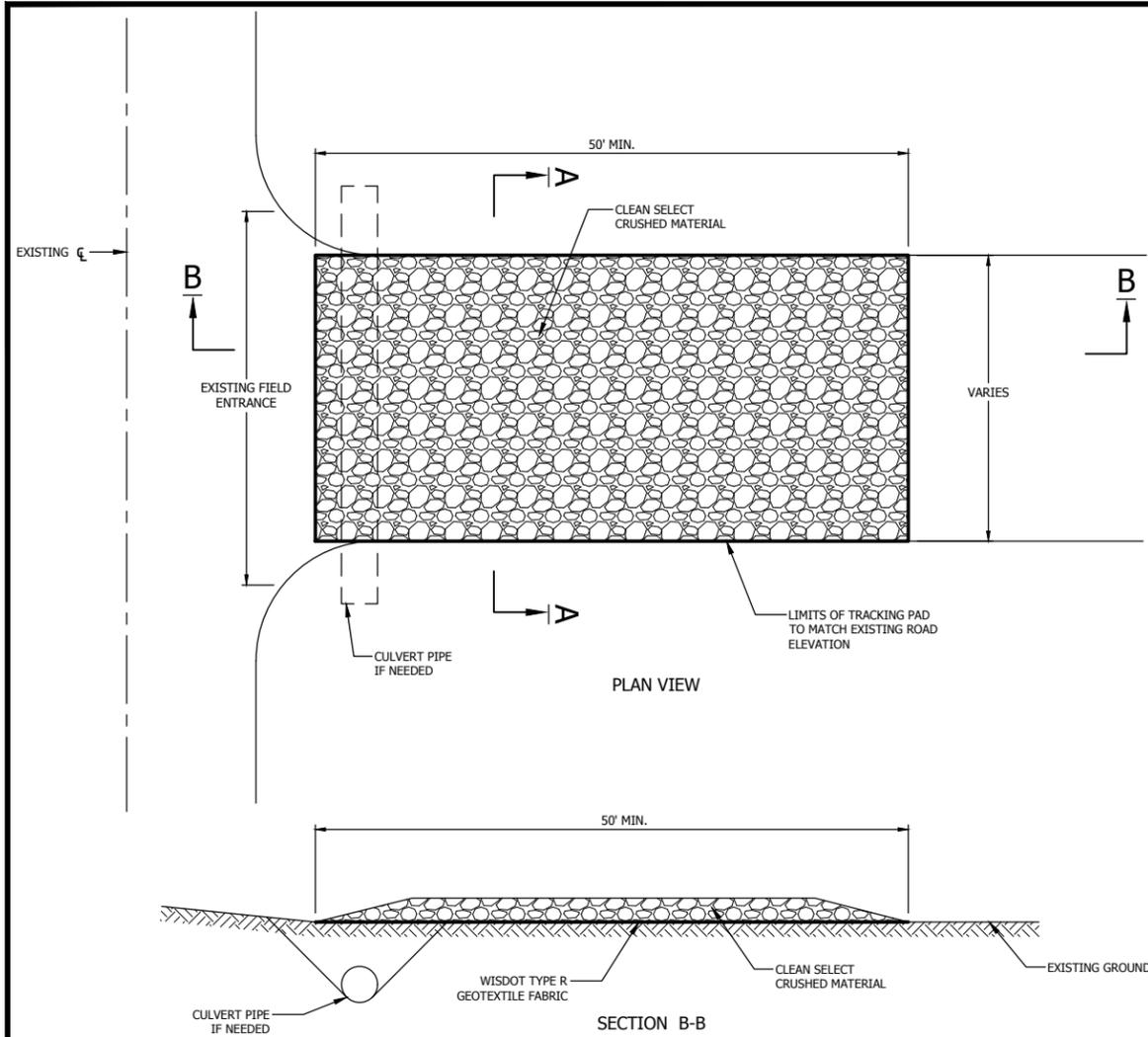
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 PROJ. NO. 193804489

SHEET NUMBER
EC-D2

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GENERAL NOTES

DETAILS OF CONSTRUCTION MATERIAL AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS.

TRACKING PAD SHALL BE INSPECTED DAILY. DEFICIENT AREAS SHALL BE REPAIRED OR REPLACED IMMEDIATELY.

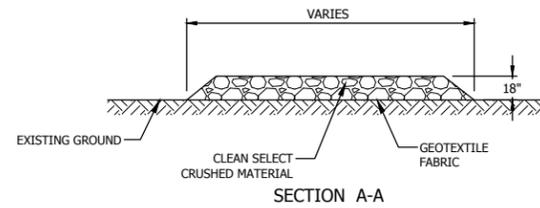
TRACKING PAD TO BE REMOVED AFTER CONSTRUCTION IS COMPLETE.

TRACKING PAD SHALL BE FULL WIDTH OF THE EGRESS POINT.

SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY, AROUND OR CONVEYED UNDER THE TRACKING PAD.

CULVERT PIPE OR OTHER BMP USED TO DIVERT WATER AWAY, AROUND OR UNDER THE TRACKING PAD SHALL BE DESIGNED TO CONVEY THE 2 YEAR - 24 HOUR EVENT.

THE COST OF ADDITIONAL BMP TO DIVERT WATER ARE INCIDENTAL TO THE TRACKING PAD BIT ITEM.



STONE TRACKING PAD DETAIL

NTS

1
EC-1

IMPC DETAIL

NTS

2
EC-1



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TRACKING PAD DETAIL
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE
 June 8, 2018

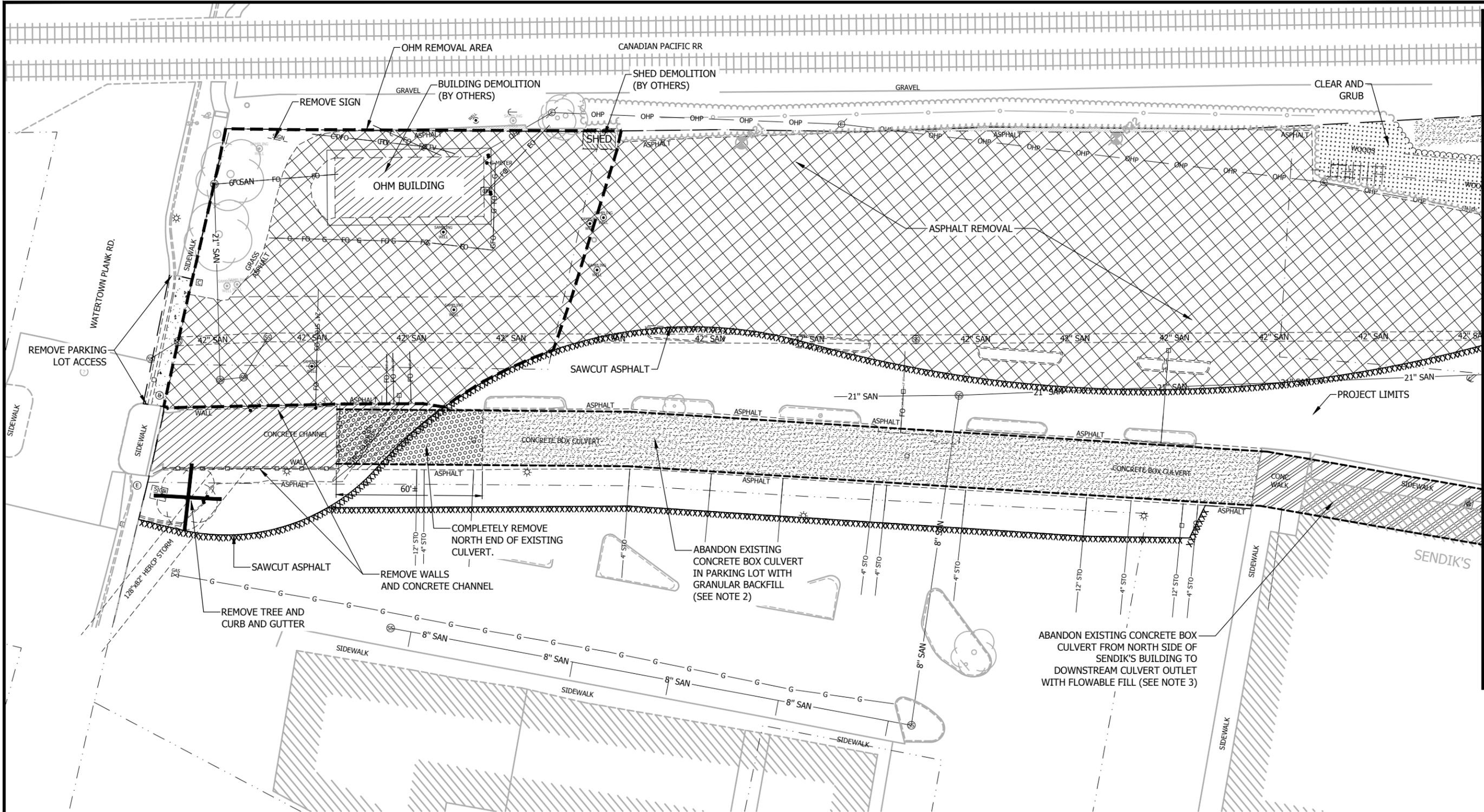
NO	REVISION	DATE

SURVEY JSH
 DRAWN ####
 DESIGNED ####
 CHECKED ####
 APPROVED ####
 PROJ. NO. 193804489

SHEET NUMBER
EC-D3

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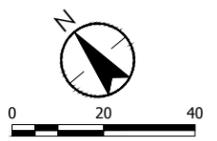
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- NOTES**
- DEMOLITION OF ONE HOUR MARTINIZING (OHM) BUILDING, INCLUDING BUILDING, SHED, UTILITIES, AND MONITORING WELLS, TO BE COMPLETED BY OTHERS.
 - CULVERT ABANDONMENT WITH GRANULAR BACKFILL: REMOVE TOP DECK OF CULVERT TO APPROXIMATELY THREE FEET BELOW GRADE; PLACE GRANULAR BACKFILL TO SUBGRADE AND COMPACT TO 90% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T 180.
 - CULVERT ABANDONMENT WITH FLOWABLE FILL: VERIFY WITH BUILDING OWNER THAT ALL PRIVATE PLUMBING UTILITIES THAT MAY BE AFFECTED BY THE ABANDONMENT HAVE BEEN ADDRESSED. BLOCK ENDS OF CULVERT SEGMENT TO BE ABANDONED BY FILLING WITH FLOWABLE FILL. FILL CULVERT PER SPECIFICATION.

REMOVALS LEGEND

	ABANDON/REMOVE UTILITY
	SAWCUT ASPHALT
	PROJECT LIMITS
	ABANDON WELL
	ABANDON MONITORING WELL
	ASPHALT REMOVAL
	BUILDING REMOVAL
	CONCRETE REMOVAL
	CLEAR AND GRUBBING



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DEMOLITION AND REMOVALS PLAN

UNDERWOOD CREEK DAYLIGHTING
VILLAGE OF ELM GROVE
WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE
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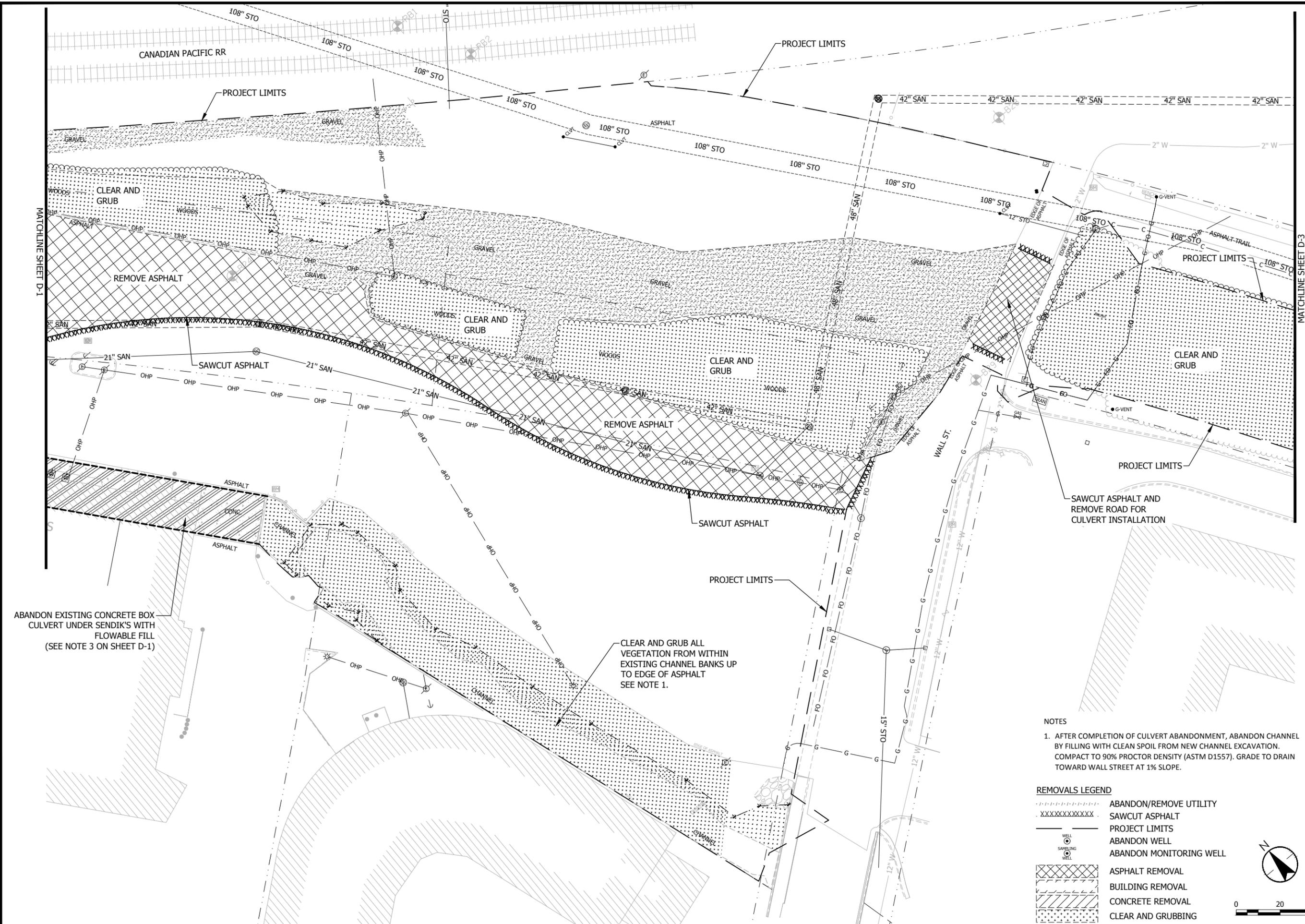
SHEET NUMBER

D-1

MATCHLINE SHEET D-2

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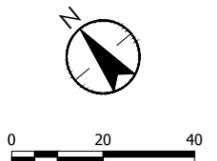
ABANDON EXISTING CONCRETE BOX CULVERT UNDER SENDIK'S WITH FLOWABLE FILL (SEE NOTE 3 ON SHEET D-1)

CLEAR AND GRUB ALL VEGETATION FROM WITHIN EXISTING CHANNEL BANKS UP TO EDGE OF ASPHALT SEE NOTE 1.

- NOTES**
- AFTER COMPLETION OF CULVERT ABANDONMENT, ABANDON CHANNEL BY FILLING WITH CLEAN SPOIL FROM NEW CHANNEL EXCAVATION. COMPACT TO 90% PROCTOR DENSITY (ASTM D1557). GRADE TO DRAIN TOWARD WALL STREET AT 1% SLOPE.

REMOVALS LEGEND

-----	ABANDON/REMOVE UTILITY
XXXXXXXXXX	SAWCUT ASPHALT
-----	PROJECT LIMITS
○	ABANDON WELL
○	ABANDON MONITORING WELL
XXXXXX	ASPHALT REMOVAL
XXXXXX	BUILDING REMOVAL
XXXXXX	CONCRETE REMOVAL
XXXXXX	CLEAR AND GRUBBING



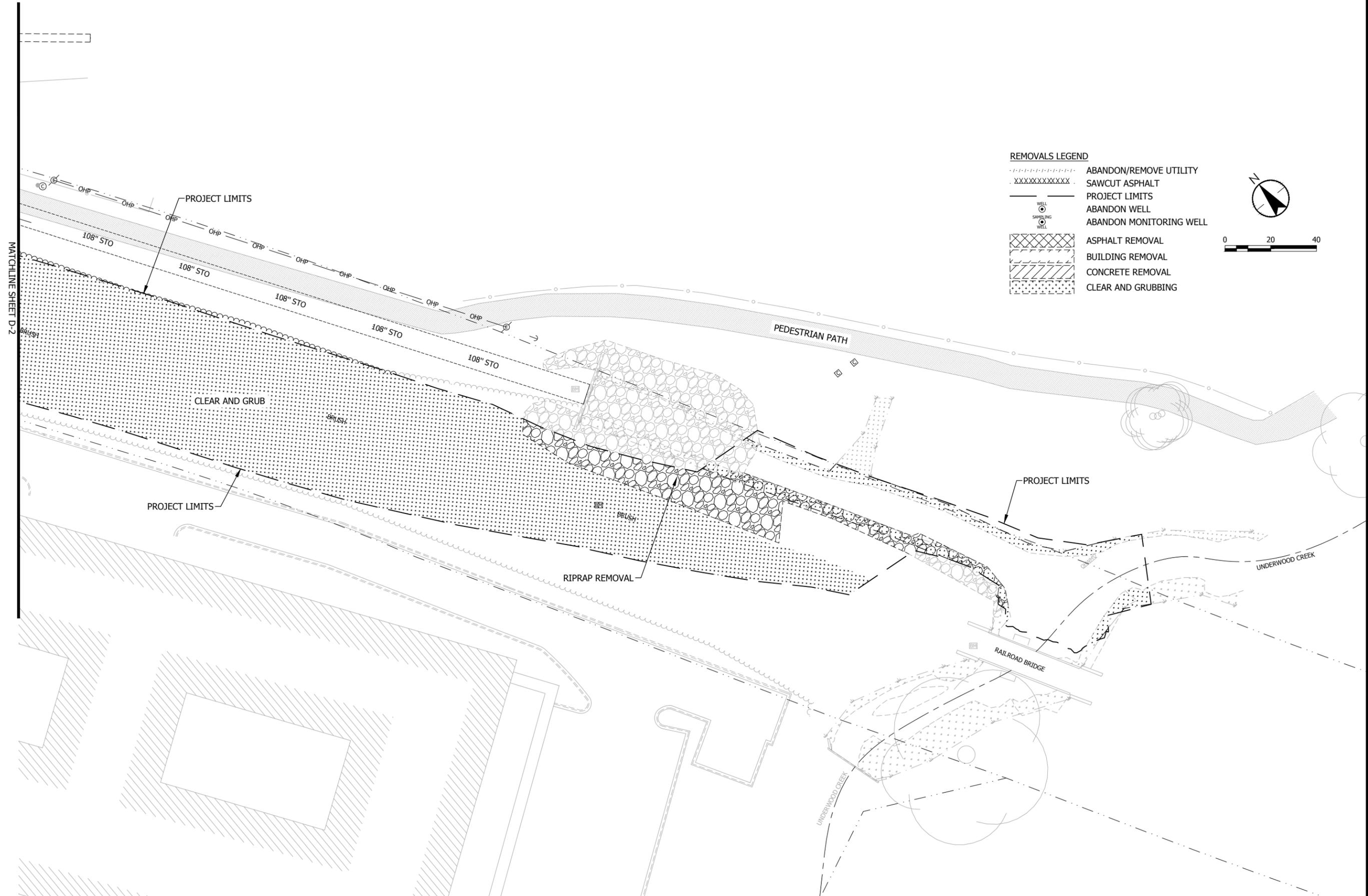
**PRELIMINARY
 FOR DISCUSSION
 ONLY**

DEMOLITION AND REMOVALS PLAN
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE	June 8, 2018
NO/REVISION	DATE
SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489
SHEET NUMBER	D-2

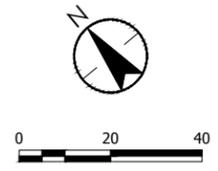
THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING. ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO STANTEC WITHOUT DELAY. REPRODUCTION OR USE FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY STANTEC IS FORBIDDEN.

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REMOVALS LEGEND

- ABANDON/REMOVE UTILITY
- XXXXXXXXXX SAWCUT ASPHALT
- PROJECT LIMITS
- ABANDON WELL
- SAMPLING WELL
- ASPHALT REMOVAL
- BUILDING REMOVAL
- CONCRETE REMOVAL
- CLEAR AND GRUBBING



**PRELIMINARY
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ONLY**

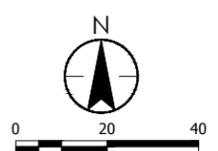
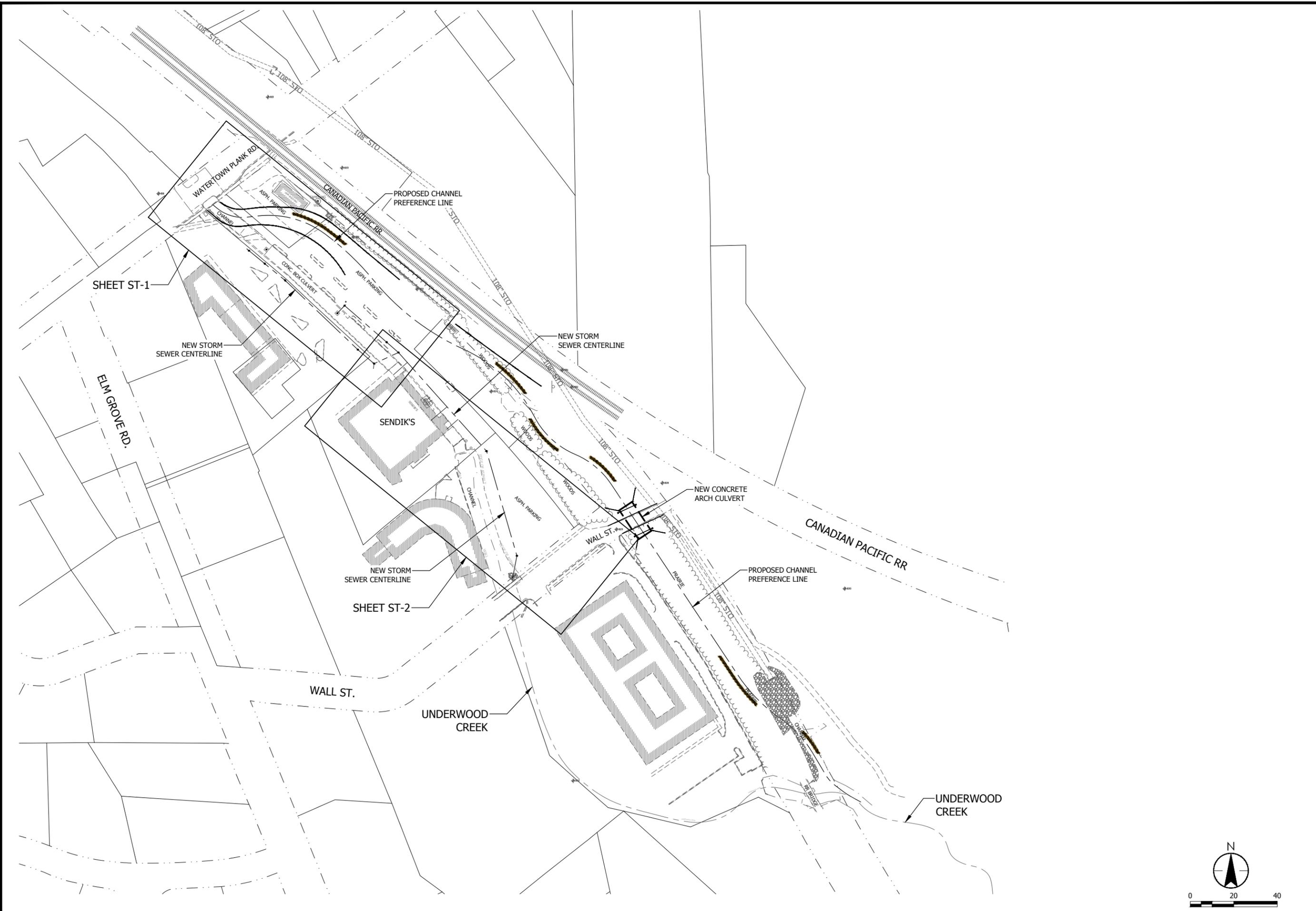
DEMOLITION AND REMOVALS PLAN
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE	
June 8, 2018	
NO.	REVISION DATE
SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

SHEET NUMBER
D-3

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**PRELIMINARY
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STORM SEWER SHEET INDEX
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

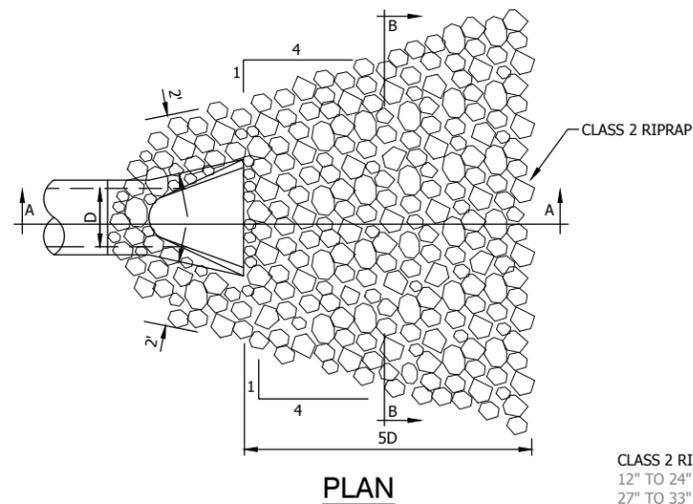
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SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489
SHEET NUMBER	
ST-0	

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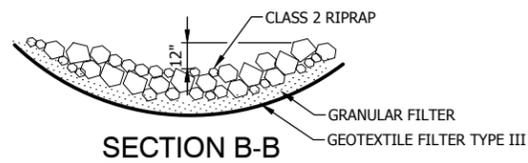
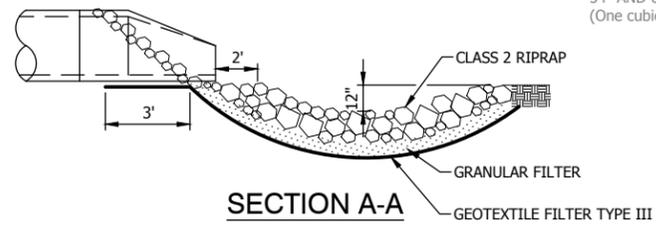
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STORM OUTFALL RIPRAP DETAIL

NTS



CLASS 2 RIPRAP REQUIREMENTS
 12" TO 24" 4 cubic yards
 27" TO 33" 8 cubic yards
 36" TO 48" 12 cubic yards
 54" AND UP 16 cubic yards
 (One cubic yard is approximately 2,800 lbs.)

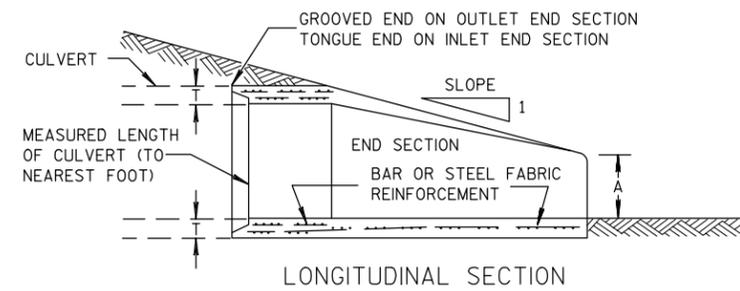
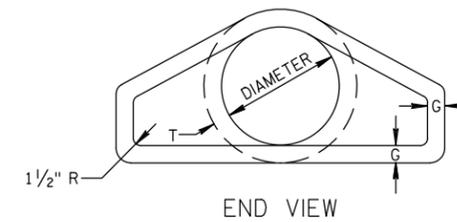
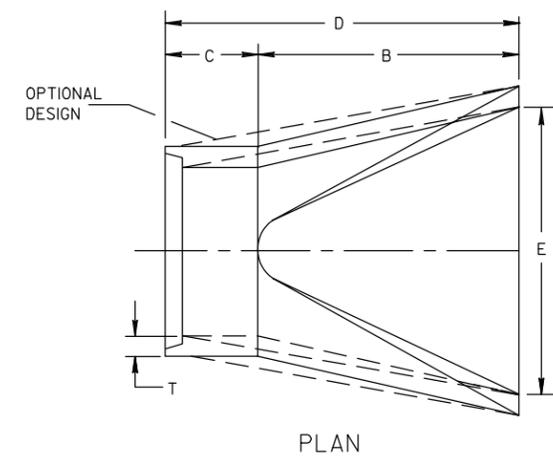


1

EC-2
ST-2

PIPE DIA. (IN.)	DIMENSIONS (Inches)							APPROX. SLOPE
	T	A	B	C	D	E	G	
12	2	4	24	48 1/8	72 7/8	24	2	3 to 1
15	2 1/4	6	27	46	73	30	2 1/4	3 to 1
18	2 1/2	9	27	46	73	36	2 1/2	3 to 1
21	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	3 to 1
24	3	9 1/2	43 1/2	30	73 1/2	48	3	3 to 1
27	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	3 to 1
30	3 1/2	12	54	19 3/4	73 1/2	60	3 1/2	3 to 1
36	4	15	63	34 3/4	97 3/4	72	4	3 to 1
42	4 1/2	21	63	35	98	78	4 1/2	3 to 1
48	5	24	72	26	98	84	5	3 to 1
54	5 1/2	27	65	* 33 1/4 - 35	* 98 1/4 - 100	90	5 1/2	2 2/5 to 1
60	6	* 30 - 35	60	39	99	96	5	2 to 1
66	6 1/2	* 24 - 30	* 72 - 78	* 21 - 27	99	102	5 1/2	2 to 1
72	7	* 24 - 36	78	21	99	108	6	2 to 1
78	7 1/2	* 24 - 36	78	21	99	114	6 1/2	2 to 1
84	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2 to 1
90	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	1 1/2 to 1

* MINIMUM
 ** MAXIMUM



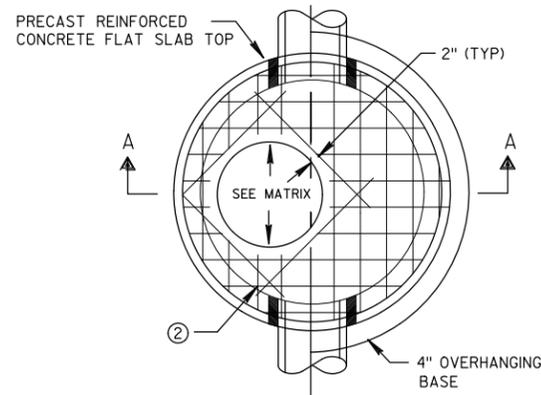
CONCRETE ENDWALL DETAIL

NTS

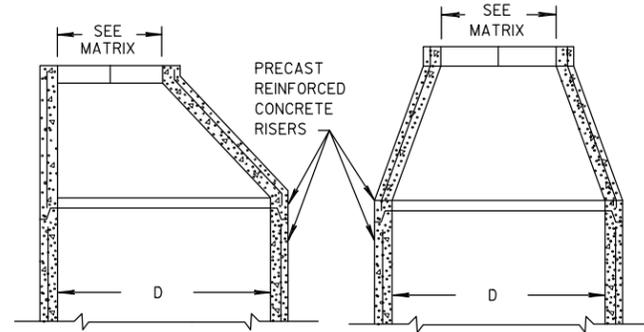
2

EC-2
ST-2

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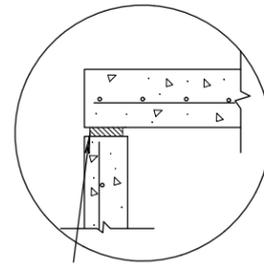


PLAN VIEW CIRCULAR OPENING

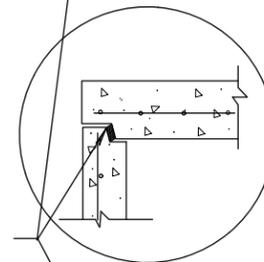


OPTIONAL PRECAST REINFORCED CONCRETE ECCENTRIC TOP

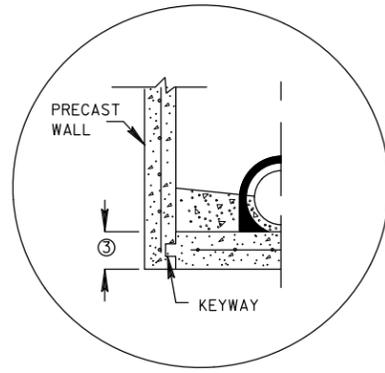
OPTIONAL PRECAST REINFORCED CONCRETE CONCENTRIC TOP



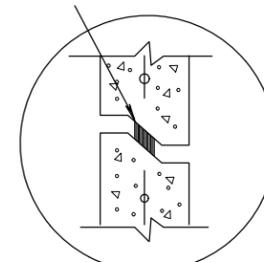
TOP WITH PLAIN END JOINT



TOP WITH TONGUE AND GROOVE JOINT



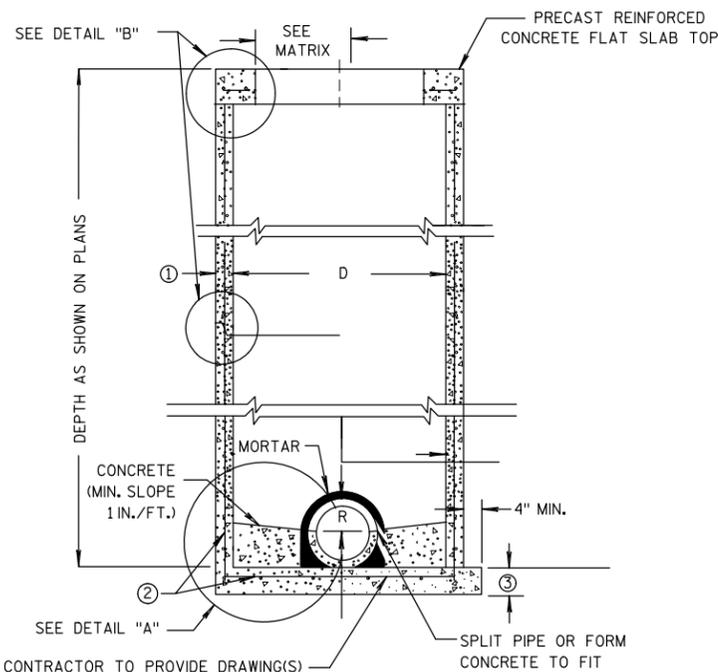
PRECAST REINFORCED CONCRETE WITH INTEGRAL BASE OPTION



RISER WITH TONGUE AND GROOVE JOINT

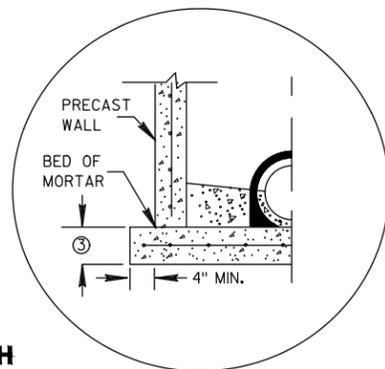
DETAIL "B"

JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C990 (TYP)



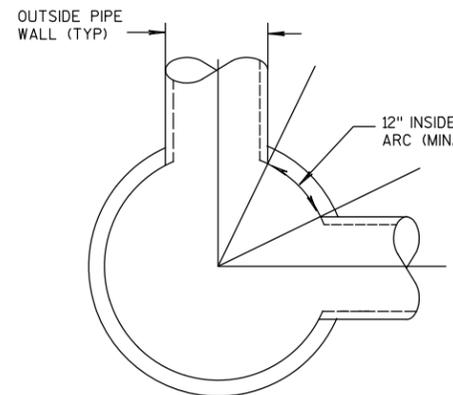
CONTRACTOR TO PROVIDE DRAWING(S) STAMPED BY A PROFESSIONAL ENGINEER FOR STEEL REINFORCING DESIGN FOR CAST-IN-PLACE STRUCTURES

PRECAST REINFORCED CONCRETE BLOCK WITH CONCRETE WITH MONOLITHIC BASE CAST-IN-PLACE OR PRECAST REINFORCED CONCRETE BASE



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

DETAIL "A"



DETAIL "C"

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS AND THE APPLICABLE SPECIAL PROVISIONS. UNLESS OTHERWISE AUTHORIZED IN WRITING BY THE ENGINEER, THE CONTRACTOR SHALL NOT ORDER AND DELIVER PRECAST MANHOLE UNITS REQUIRED FOR THE PROJECT UNTIL A LIST OF SIZES IS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR PROPOSED ALTERNATE DESIGNS FOR UNDERGROUND DRAINAGE STRUCTURES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PROVIDING THAT SUCH ALTERNATE DESIGNS MAKE PROVISION FOR EQUIVALENT CAPACITY AND STRENGTH.

ALL DRAINAGE STRUCTURES ARE DESIGNATED ON THE PLANS AS "MANHOLES 3X3-L", "CATCH BASINS 4-B", "INLETS 2X3-H", ETC. THE FIRST NUMBERS DESIGNATE THE SIZE OF THE STRUCTURE, AND THE FOLLOWING LETTER DESIGNATES THE TYPE OF COVER TO BE USED TO COMPRISE THE COMPLETE UNIT.

BASES SHALL BE PLACED ON A BED OF MATERIAL AT LEAST 6 INCHES IN DEPTH, WHICH MEETS THE REQUIREMENTS OF FOUNDATION BACKFILL. THIS BEDDING SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT FOR THE ENTIRE AREA OF THE BASE.

PRECAST REINFORCED CONE TOPS (ECCENTRIC OR CONCENTRIC) OR PRECAST REINFORCED FLAT SLAB TOPS MAY BE USED ON CONCRETE BLOCK STRUCTURES.

ECCENTRIC CONE TOPS MAY BE USED ON ALL STRUCTURES, AND CONCENTRIC CONE TOPS SHALL BE USED ONLY ON STRUCTURES 5 FEET OR LESS IN DEPTH, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

STEPS MEETING AASHTO M199 AND THE FOLLOWING REQUIREMENTS SHALL BE INSTALLED IN ALL STRUCTURES OVER 5 FEET IN DEPTH: 16 INCH C-C MAXIMUM SPACING; PROJECT A MINIMUM CLEAR DISTANCE OF 4 INCHES FROM THE WALL AT THE POINT OF EMBEDMENT; MINIMUM LENGTH OF 10 INCHES; MINIMUM WALL EMBEDMENT OF 3 INCHES. FERROUS METAL STEPS NOT PAINTED OR TREATED TO RESIST CORROSION SHALL HAVE A MINIMUM CROSS SECTIONAL DIMENSION OF 1 INCH.

STEPS OF APPROVED POLYPROPYLENE PLASTIC COATED REINFORCEMENT BAR ARE ACCEPTABLE. REINFORCING BAR MUST BE A MINIMUM OF 1/2" AND MEET THE REQUIREMENTS OF ASTM A615.

CERTIFICATION SHALL BE PROVIDED THAT INSTALLED STEPS WHEN TESTED IN ACCORDANCE WITH SECTION 10 OF AASHTO T280 CAN WITHSTAND A VERTICAL LOAD OF 800 LBS. AND A HORIZONTAL LOAD OF 400 LBS.

ALL BAR STEEL REINFORCEMENT SHALL BE EMBEDDED 2 INCHES CLEAR UNLESS OTHERWISE SHOWN OR NOTED. CONCRETE BLOCK WILL NOT BE PERMITTED FOR STRUCTURES GREATER THAN 4 FEET IN DIAMETER.

PRECAST REINFORCED RISERS SHALL HAVE A TONGUE AND GROOVE JOINT WITH TONGUE UP OR DOWN.

ALL PRECAST MANHOLE UNITS SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF AASHTO DESIGNATION M 199.

4" OVERHANGING BASES ARE REQUIRED FOR ALL CONCRETE BLOCK INSTALLATIONS. 4" OVERHANG IS REQUIRED WHEN SEPARATE PRECAST BASE IS PROVIDED. OVERHANG IS NOT REQUIRED ON PRECAST STRUCTURES WITH AN INTEGRAL OR MONOLITHIC BASE.

FOR ADDITIONAL CONFIGURATIONS, MAINTAIN A MINIMUM OF 12 INCHES AS MEASURED FROM THE INSIDE OF THE STRUCTURE WALL BETWEEN THE OUTSIDE PIPE WALLS OF ADJACENT PIPES. SEE DETAIL "C".

- ① MINIMUM WALL THICKNESS SHALL BE 4 INCHES FOR 3-FT, 5 INCHES FOR 4-FT, 6 INCHES FOR 5-FT, 7 INCHES FOR 6-FT, 8 INCHES FOR 7-FT AND 9 INCHES FOR 8-FT DIAMETER PRECAST MANHOLES.
- ② FOR PRECAST MANHOLES PROVIDE REINFORCING STEEL IN ACCORDANCE TO AASHTO M199.
- ③ PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER OF 48" AND LESS SHALL HAVE A MINIMUM THICKNESS OF 6". PRECAST FLAT SLAB TOPS AND BASES WITH A DIAMETER LARGER THAN 48" SHALL HAVE A MINIMUM THICKNESS OF 8".

MANHOLE COVER OPENING MATRIX

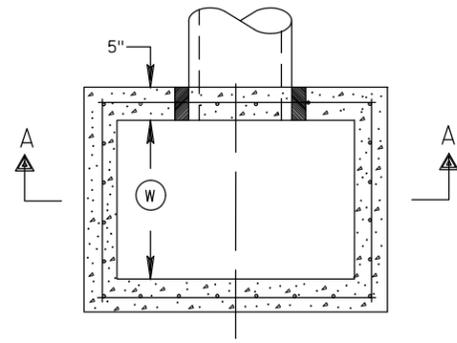
MANHOLE COVER TYPE	C	ALL J'S	K	L	M
OPENING SIZE (FT)					
2 DIA.	X	X		X	
3 DIA.			X		X

PIPE MATRIX

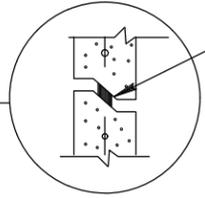
MANHOLE SIZE	MAXIMUM INSIDE PIPE DIAMETER FOR TWO PIPES	
	180° SEPARATION (IN)	90° SEPARATION (IN)
3-FT	15	12
4-FT	24	18
5-FT	36	24
6-FT	42	36
7-FT	48	36
8-FT	60	42

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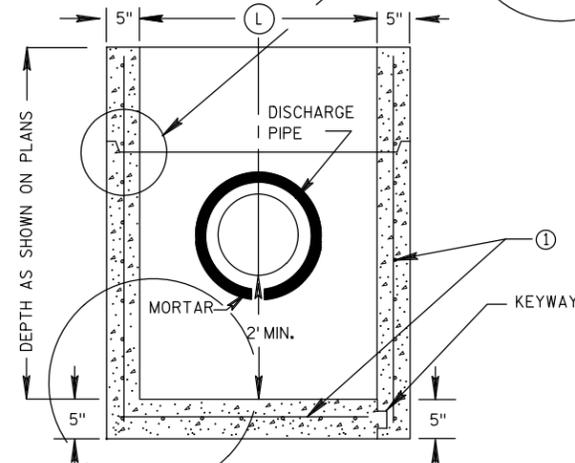
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PLAN VIEW

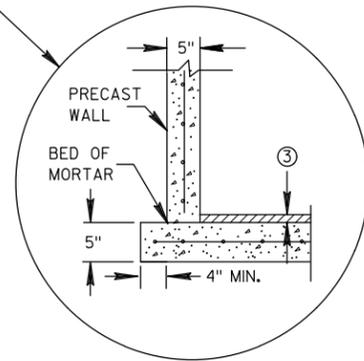


RISER JOINTS TO BE SEALED WITH A BUTYL RUBBER SEAL PER SEALANT MANUFACTURERS RECOMMENDATIONS CONFORMING TO ASTM C 990 (TYP)



PRECAST REINFORCED CONCRETE WITH MONOLITHIC BASE **PRECAST REINFORCED CONCRETE WITH INTEGRAL BASE**

SECTION A-A



SEPARATE PRECAST REINFORCED CONCRETE BASE OPTION

2'X3' CATCH BASIN DETAIL

NTS

1
EC-2
ST-2

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STORM SEWER DETAILS
UNDERWOOD CREEK DAYLIGHTING
VILLAGE OF ELM GROVE
WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE
June 8, 2018

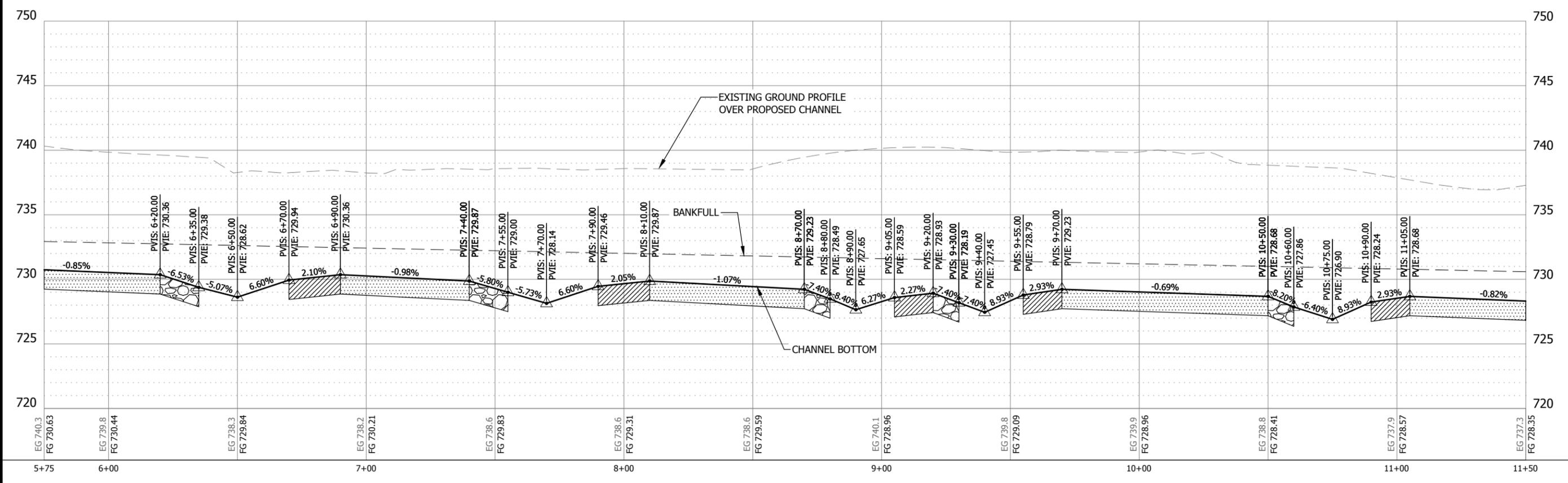
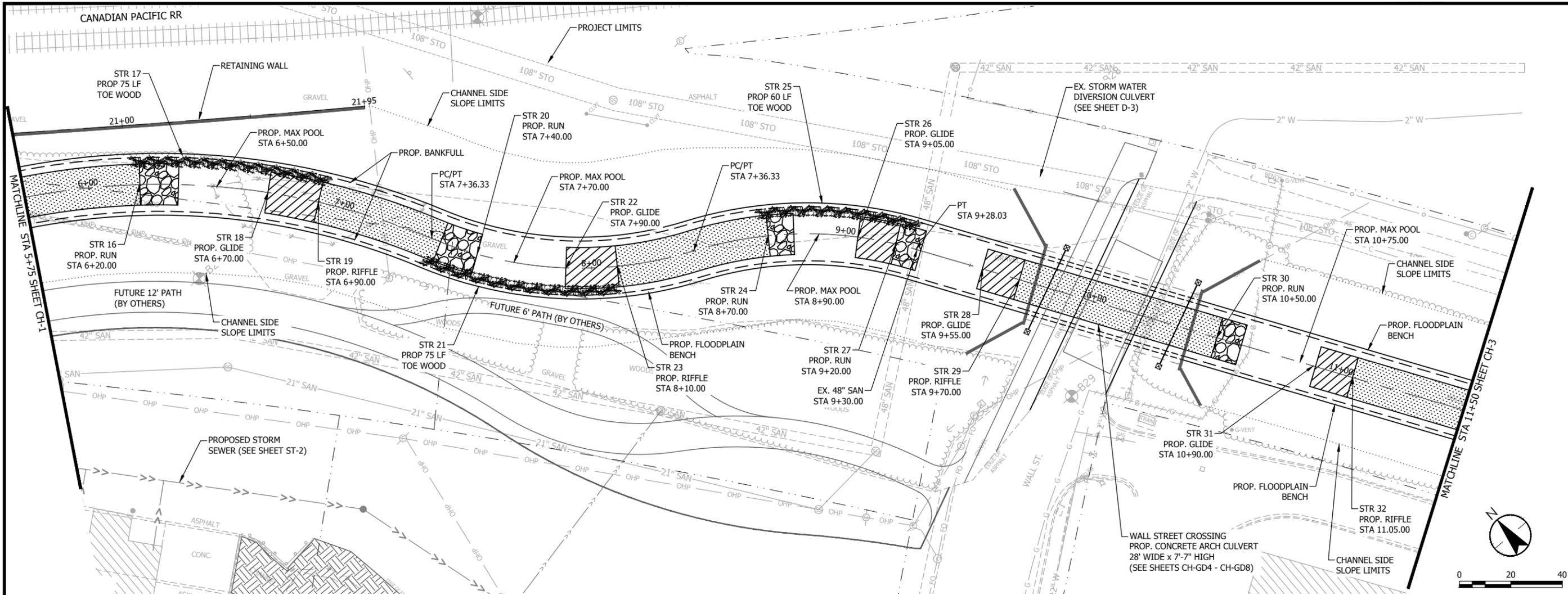
NO	REVISION	DATE

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DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

SHEET NUMBER
ST-D3

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**PRELIMINARY
 FOR DISCUSSION
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CHANNEL PLAN & PROFILE
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE	June 8, 2018
NO. REVISION	DATE
SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RIK
APPROVED	JG
PROJ. NO.	193804489
SHEET NUMBER	CH-2

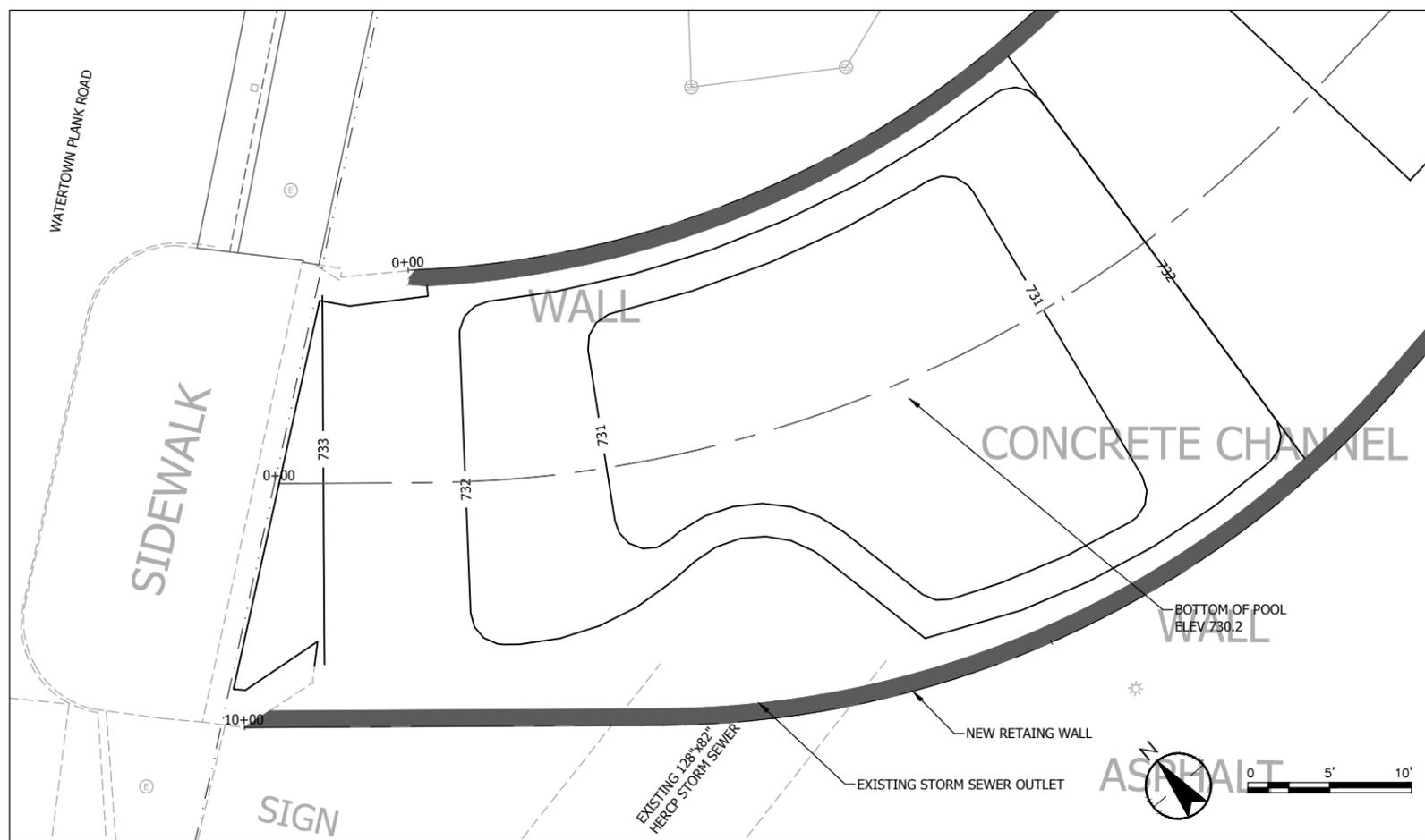
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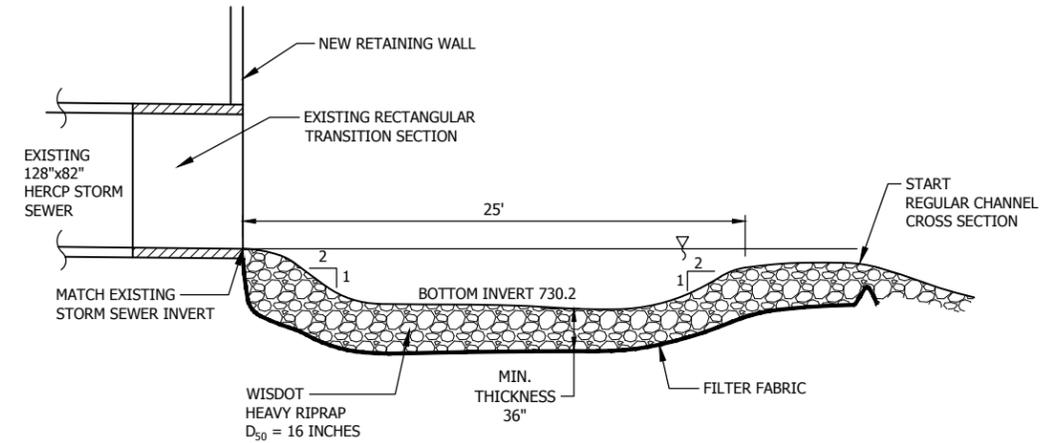
STR #	STRUCTURE POINT DESCRIPTION	UPSTREAM STATION (FT)	UPSTREAM ELEVATION (FT)	DOWNSTREAM STATION (FT)	DOWNSTREAM ELEVATION (FT)	LENGTH (FT)	PLAN SHEET	PROFILE SHEET	DETAIL SHEET	PIPE INVERT (FT)	PIPE DIAMETER (FT)	TOP OF PIPE (FT)	PIPE COVER (FT)	CULVERT HEIGHT (FT)	CULVERT CREST ELEVATION (FT)	CULVERT WIDTH (FT)	CULVERT LENGTH (FT)	FOOTING INVERT ELEVATION (FT)
1	CHANNEL INVERT WATERTOWN PLANK ROAD	0+00	732.96				CH-1	CH-1										
	PC	0+8.77					CH-1											
	MAX POOL	0+35.00	731.12				CH-1	CH-1										
	PT	0+69.43					CH-1											
2	GLIDE	0+70.00	732.58			15	CH-1	CH-1	CH-GD2									
3	RIFFLE	0+85.00	732.82			70	CH-1	CH-1	CH-GD2									
	PC	0+88.00					CH-1											
	SANITARY SEWER CROSSING	0+94.10	732.73				CH-1	CH-1		723.3 +/-	42	727.3 +/-	5.43					
4	RUN	1+55.00	732.12			10	CH-1	CH-1	CH-GD2									
5	TOE WOOD	1+55.00	734.63	2+60.00	734.21	105	CH-1	CH-1	CH-GD3									
	RUN END	1+65.00	731.39				CH-1	CH-1										
	MAX POOL	1+75.00	730.55				CH-1	CH-1										
6	GLIDE	1+90.00	731.49			15	CH-1	CH-1	CH-GD2									
7	RUN	2+05.00	731.83			15	CH-1	CH-1	CH-GD2									
	PT/PC	2+19.59					CH-1											
	RUN END	2+20.00	731.07				CH-1	CH-1										
	MAX POOL	2+30.00	730.33				CH-1	CH-1										
8	GLIDE	2+45.00	731.67			15	CH-1	CH-1	CH-GD2									
9	RIFFLE	2+60.00	732.11			75	CH-1	CH-1	CH-GD2									
10	RUN	3+35.00	731.50			15	CH-1	CH-1	CH-GD2									
	PT/PC	3+42.59					CH-1											
	RUN END	3+50.00	730.74				CH-1	CH-1										
	MAX POOL	3+70.00	729.76				CH-1	CH-1										
11	GLIDE	3+90.00	731.08			20	CH-1	CH-1	CH-GD2									
12	RIFFLE	4+10.00	731.50			80	CH-1	CH-1	CH-GD2									
13	RUN	4+90.00	730.91			15	CH-1	CH-1	CH-GD2									
	RUN END	5+05.00	730.21				CH-1	CH-1										
	MAX POOL	5+25.00	729.13				CH-1	CH-1										
14	GLIDE	5+40.00	730.57			15	CH-1	CH-1	CH-GD2									
	PT/PC	5+52.83					CH-1											
15	RIFFLE	5+55.00	730.91			65	CH-1	CH-1	CH-GD2									
16	RUN	6+20.00	730.36			15	CH-2	CH-2	CH-GD2									
17	TOE WOOD	6+20.00	732.75	6+90.00	732.46	75	CH-2	CH-2	CH-GD3									
	RUN END	6+35.00	729.38				CH-2	CH-2										
	MAX POOL	6+50.00	728.62				CH-2	CH-2										
18	GLIDE	6+70.00	729.94			20	CH-2	CH-2	CH-GD2									
19	RIFFLE	6+90.00	730.36			50	CH-2	CH-2	CH-GD2									
	PT/PC	7+36.33					CH-2											
20	RUN	7+40.00	729.87			15	CH-2	CH-2	CH-GD2									
21	TOE WOOD	7+40.00	732.26	8+10.00	731.93	75	CH-2	CH-2	CH-GD3									
	RUN END	7+55.00	729.00				CH-2	CH-2										
	MAX POOL	7+70.00	728.14				CH-2	CH-2										
22	GLIDE	7+90.00	729.46			20	CH-2	CH-2	CH-GD2									
23	RIFFLE	8+10.00	729.87			60	CH-2	CH-2	CH-GD2									
	PT/PC	8+40.35					CH-2											
24	RUN	8+70.00	729.23			10	CH-2	CH-2	CH-GD2									
25	TOE WOOD	8+70.00	731.73	9+28.00	731.50	60	CH-2	CH-2	CH-GD3									
	RUN END	8+80.00	728.49				CH-2	CH-2										
	MAX POOL	8+90.00	727.65				CH-2	CH-2										
26	GLIDE	9+05.00	728.59			15	CH-2	CH-2	CH-GD2									
27	RUN	9+20.00	728.93			10	CH-2	CH-2	CH-GD2									
	SANITARY SEWER CROSSING	9+21.00	728.85				CH-2	CH-2		720.75	48	725.75	3.10					
	PT	9+28.03					CH-2											
	RUN END	9+30.00	728.19				CH-2	CH-2										
	MAX POOL	9+40.00	727.45				CH-2	CH-2										
28	GLIDE	9+55.00	728.79			15	CH-2	CH-2	CH-GD2									
29	RIFFLE	9+70.00	729.23			80	CH-2	CH-2	CH-GD2									
	WALL STREET UPSTREAM	9+75.13	729.19				CH-2							8.50		28.50		
	WALL STREET DOWNSTREAM	10+40.00	728.75				CH-2							8.50		28.50		
30	RUN	10+50.00	728.68			10	CH-2	CH-2	CH-GD2									
	RUN END	10+60.00	727.86				CH-2	CH-2										
	MAX POOL	10+75.00	726.90				CH-2	CH-2										
31	GLIDE	10+90.00	728.24			15	CH-2	CH-2	CH-GD2									
32	RIFFLE	11+05.00	728.68			65	CH-2	CH-2	CH-GD2									
33	RUN	11+70.00	728.15			15	CH-3	CH-3	CH-GD2									
	RUN END	11+85.00	727.25				CH-3	CH-3										
	MAX POOL	12+00.00	726.39				CH-3	CH-3										
34	GLIDE	12+15.00	727.73			20	CH-3	CH-3	CH-GD2									
35	RIFFLE	12+35.00	728.15			70	CH-3	CH-3	CH-GD2									
36	RUN	13+05.00	727.44			10	CH-3	CH-3	CH-GD2									
37	TOE WOOD	13+05.00	727.44	14+10.00	727.44	105	CH-3	CH-3	CH-GD3									
	RUN END	13+15.00	726.63				CH-3	CH-3										
	MAX POOL	13+25.00	725.89				CH-3	CH-3										
38	GLIDE	13+40.00	726.72			15	CH-3	CH-3	CH-GD2									
	PC	13+47.93					CH-3											
39	RUN	13+55.00	727.16			10	CH-3	CH-3	CH-GD2									
	RUN END	13+65.00	726.52				CH-3	CH-3										
	MAX POOL	13+80.00	725.66				CH-3	CH-3										
40	GLIDE	13+95.00	727.00			15	CH-3	CH-3	CH-GD2									
41	RIFFLE	14+10.00	727.44			50	CH-3	CH-3	CH-GD2									
	PT/PC	14+61.75					CH-3											
42	RUN	14+60.00	726.88			15	CH-3	CH-3	CH-GD2									
	RUN END	14+75.00	726.08				CH-3	CH-3										
	MAX POOL	15+00.00	725.18				CH-3	CH-3										
43	TOE WOOD	15+10.00	725.18	15+57.00		50	CH-3	CH-3	CH-GD3									
	PT	15+47.37					CH-3											
44	GLIDE	15+27.00	726.47			20	CH-3	CH-3	CH-GD2									
45	RIFFLE	15+47.00	726.88			48	CH-3	CH-3	CH-GD2									
	PC	15+94.78																

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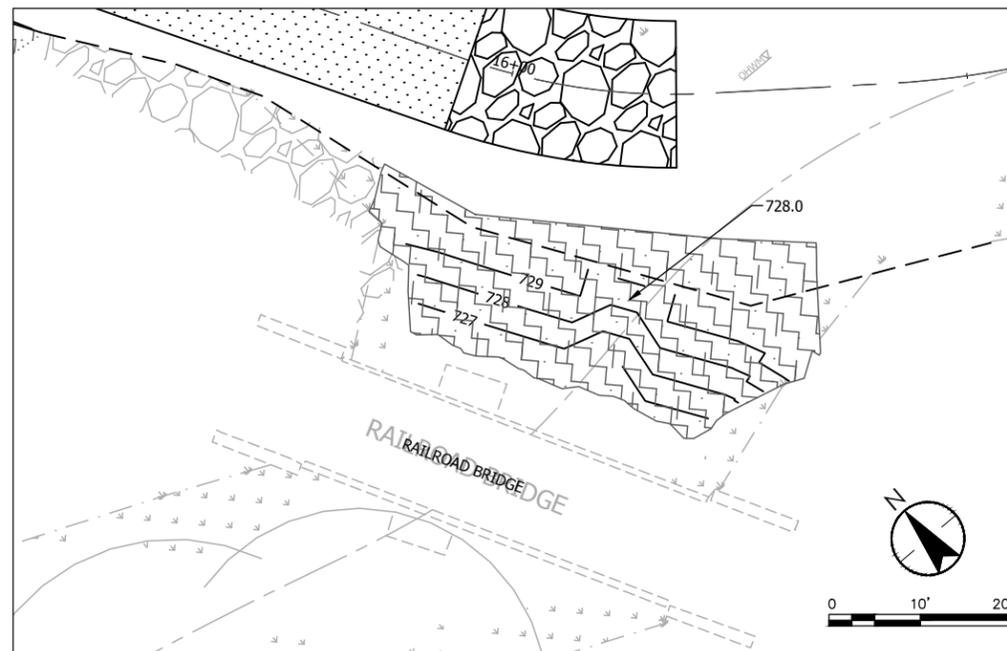
PLAN VIEW



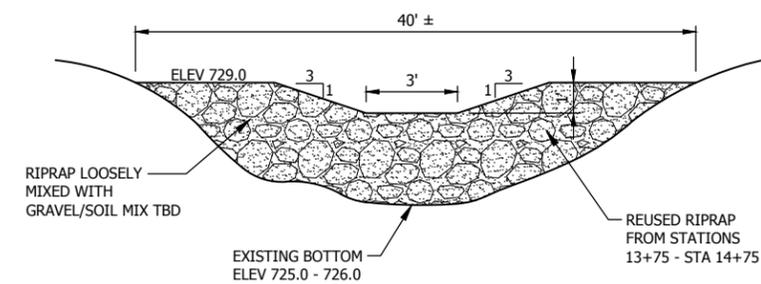
PROFILE VIEW

ENERGY DISSIPATION

1
CH-1



PLAN



ELEVATION

STONE WEIR

2
CH-3

DATE OF ISSUANCE
 June 8, 2018

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SURVEY JSH
 DRAWN AJR
 DESIGNED BG
 CHECKED RJK
 APPROVED JG

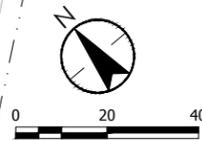
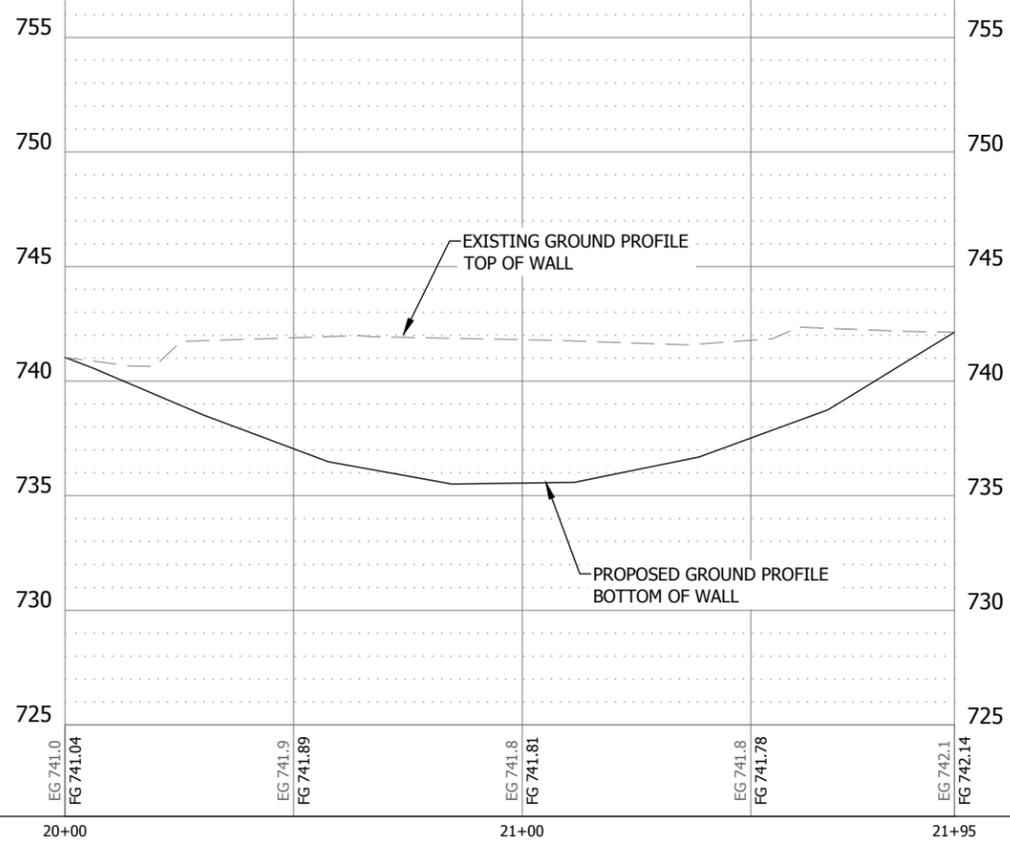
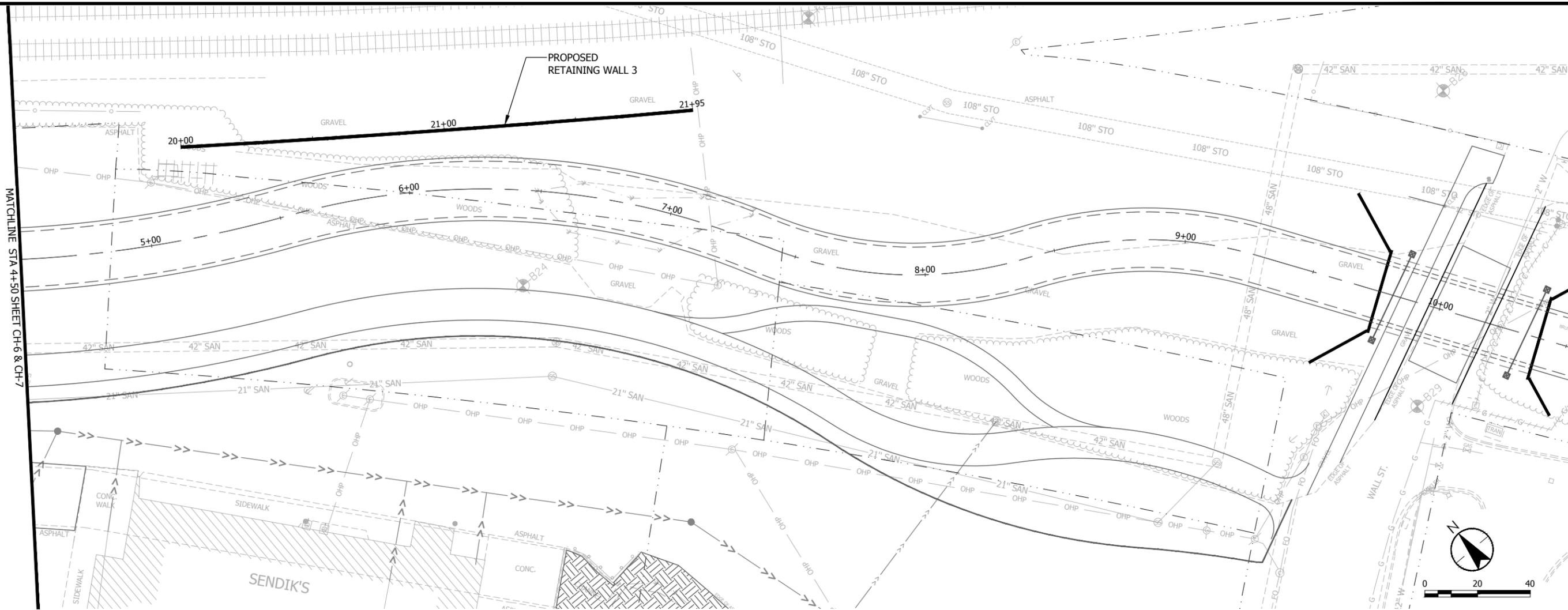
PROJ. NO. 193804489

SHEET NUMBER
CH-5

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MATCHLINE STA 4+50 SHEET CH-6 & CH-7



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 Mequon, WI 53092
 www.stantec.com

**PRELIMINARY
 FOR DISCUSSION
 ONLY**

RETAINING WALL 3 PROFILE
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

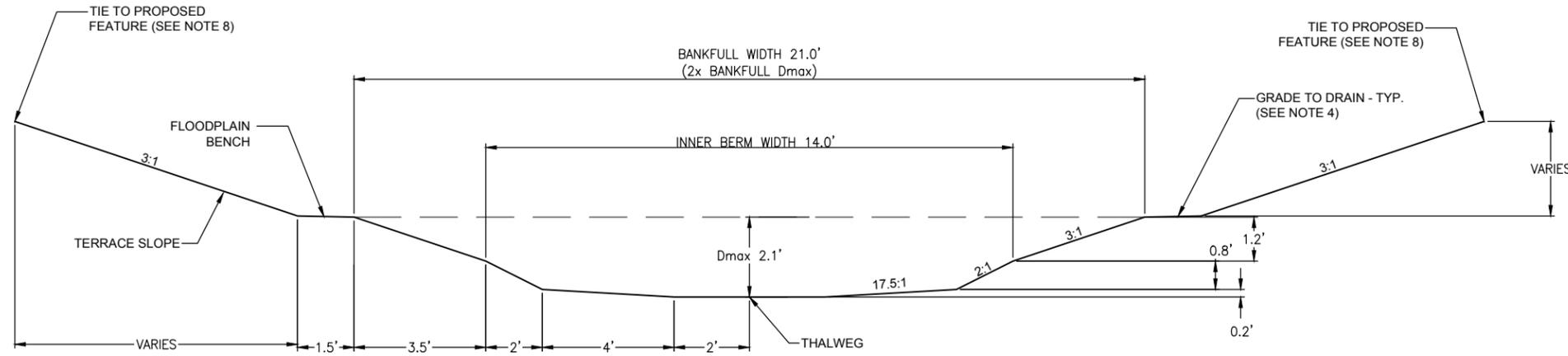
DATE OF ISSUANCE
 June 8, 2018

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DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

SHEET NUMBER
CH-8

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TYPICAL RIFFLE CROSS SECTION

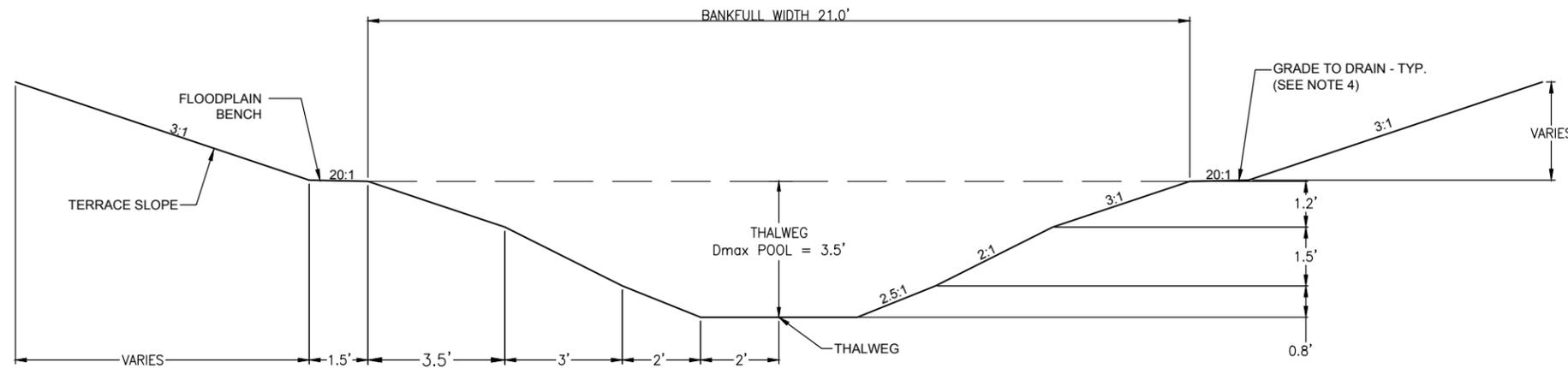
1" = 4'



CH-1
CH-2
CH-3

TYPICAL CROSS SECTION NOTES

1. TYPICAL SECTIONS ARE VIEWED FACING DOWNSTREAM AND APPLICATION OF THE POOL TYPICAL SECTION SHALL BE REVERSED AS NEEDED DEPENDING ON THE DIRECTIONS OF THE BEND IN THE STREAM.
2. TYPICAL SECTION VERTICAL CONTROL SHALL BE ABOUT THE THALWEG POINT PER PLAN AND PROFILE VIEWS.
3. ALL GRADING, EXCAVATION, AND FILL SHALL BE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
4. GRADING OF ALL AREAS OUTSIDE OF THE PROPOSED CHANNEL (INCLUDING FLOOD PRONE AREAS, TERRACE SLOPES AND WETLANDS) SHALL ALLOW FOR MINOR VARIATIONS IN ELEVATION. VARIATIONS OF UP TO 0.5' ARE ACCEPTABLE.
5. THE EXISTING STREAM CHANNEL SHALL BE PARTIALLY FILLED AS SHOWN ON GRADING PLAN.
6. REFER TO PROFILE SHEETS FOR SPECIFIC LOCATIONS OF TYPICAL SECTION APPLICATION.
7. TRANSITION BETWEEN RIFFLE AND POOL OR POOL AND RIFFLE TYPICAL CROSS SECTIONS SHALL BE EVENLY GRADED.
8. SLOPE TRANSITIONS BETWEEN TOP OF CHANNEL BANK, FLOODPLAIN BENCH, TERRACE SLOPE AND EXISTING SURROUNDING GROUND SHALL BE GRADED TO PROVIDE A SMOOTH AND ROUNDED TRANSITION. REFER TO PLANTING NOTES AND DETAILS FOR ADDITIONAL SLOPE TRANSITION GRADING/SURFACE PREPARATION.
9. IF SITE CONDITIONS (I.E. BEDROCK) DO NOT ALLOW FOR APPLICATION OF THE TYPICAL CROSS-SECTION AND/OR EVEN TRANSITION BETWEEN EXISTING AND PROPOSED BED/BANK FEATURES THEN THE PROPOSED GRADING SHALL BE ADJUSTED TO INCORPORATE THE NATURAL VARIATION. THE ENGINEER SHALL BE NOTIFIED OF ADVERSE SITE CONDITIONS AND DETERMINE THE APPROPRIATE MEANS OF INCORPORATION.



TYPICAL POOL CROSS SECTION

1" = 4'



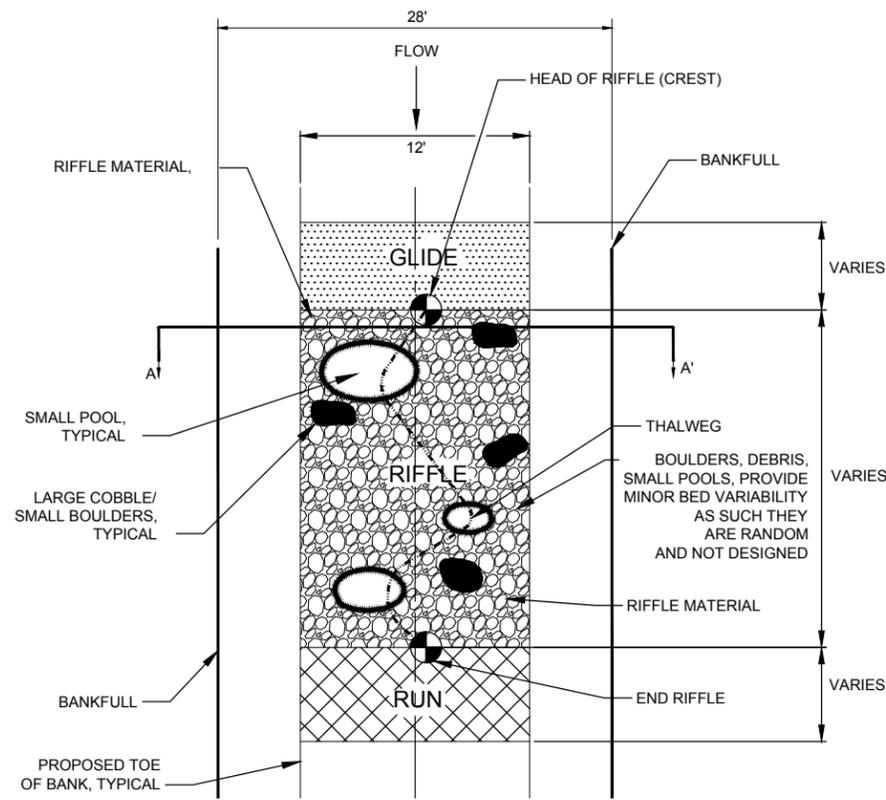
CH-1
CH-2
CH-3

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NO	REVISION	DATE

SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

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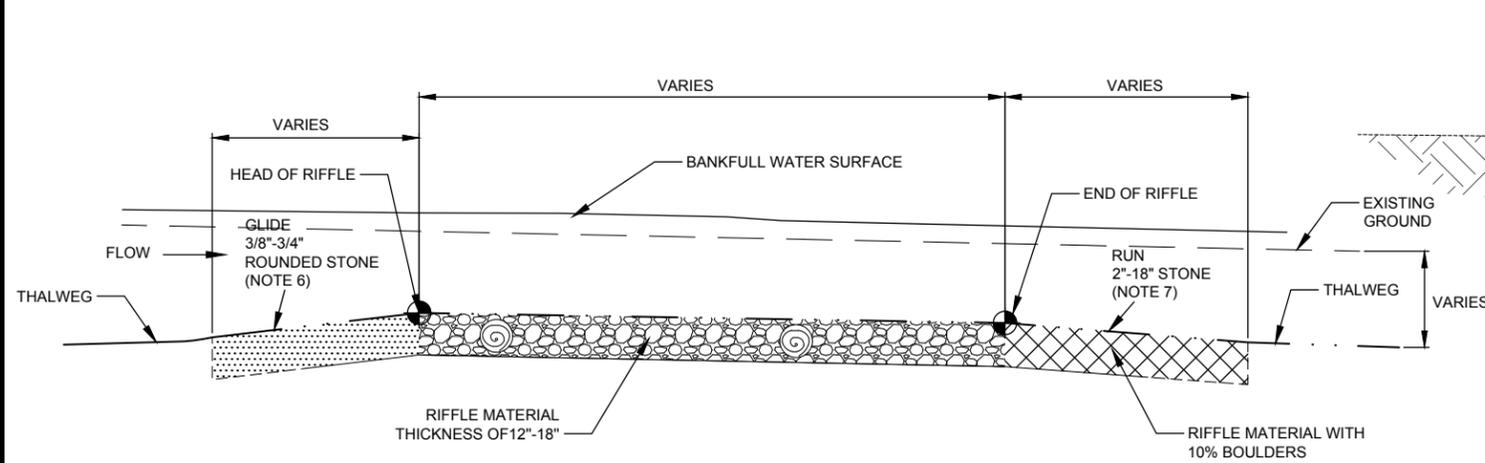


PLAN VIEW
NTS

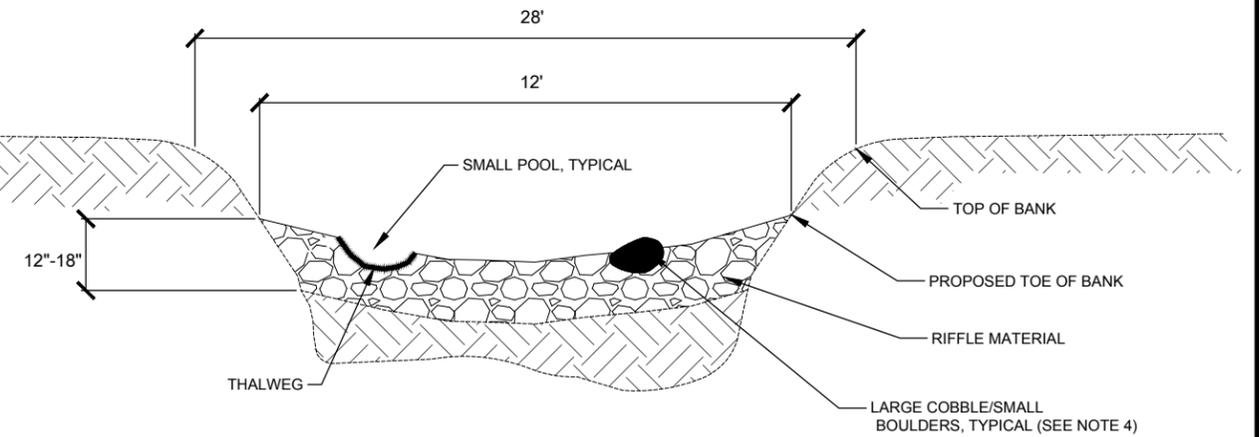
NOTES:

- VARIABLE CONSTRUCTED RIFFLES SHALL BE CONSTRUCTED IN NEWLY GRADED CHANNEL SECTIONS AND/OR IN EXISTING CHANNEL SECTIONS, AT THE LOCATIONS SHOWN ON THE PLANS, AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
- CONTROL POINTS AT THE BEGINNING AND END OF EACH RIFFILE ARE SHOWN ON THE CONTROL POINT DATA TABLES PLAN SHEETS AND ON PROFILE SHEETS. THE CONTROL POINTS INCLUDE BOTH HORIZONTAL (NORTHINGS AND EASTINGS) AND VERTICAL (ELEVATION) DATA. PROFILE CONTROL POINTS FOR THE UPSTREAM AND DOWNSTREAM TRANSITIONS ARE SHOWN ON PLAN AND PROFILE SHEETS.
- SUBPAVEMENT MATERIAL SHALL CONSIST OF ROUNDED GLACIAL GRAVEL, SANDS, AND FINES. THE ENGINEER SHALL MAKE FINAL DETERMINATION REGARDING WHETHER OR NOT SUBPAVEMENT SHALL BE USED, BASED ON SITE CONDITIONS OBSERVED DURING CONSTRUCTION. IF SUBPAVEMENT IS REQUIRED BY THE ENGINEER, THE SUBGRADE SHALL BE EXCAVATED, AS NEEDED, TO ALLOW FOR THE PLACEMENT OF A 10"-12" THICK LAYER OF SUBPAVEMENT MATERIAL BELOW THE PROPOSED RIFFILE MATERIAL.
- RIFFILE MATERIAL (PAVEMENT) SHALL BE COMPRISED OF ROUNDED GLACIAL MATERIAL AND WOOD. THE ROCK MATERIAL SHALL CONSIST OF A COMBINATION OF 25-35% SMALL BOULDERS/COBBLE (6"-12" DIA., D50 9", D84 11"), 35-45% COARSE GRAVEL (2"-4" DIA.) AND 25-35% GRAVEL, SAND AND FINES. BOULDERS (18"-24" DIA.) MAY BE ADDED TO THE RIFFILE MATERIAL NOT TO EXCEED 5% MAX. THE RIFFILE MATERIAL SHALL TRANSITION INTO THE PROPOSED BED AND BANKS UPSTREAM AND DOWNSTREAM OF THE STRUCTURE AND ALONG THE PROPOSED CHANNEL BANKS. ON-SITE BED MATERIAL (ROCK, COBBLE, AND GRAVEL) WITH A D50 AND D84 MEETING AND OR EXCEEDING THE SIZE SPECIFIED ABOVE MAY BE EXCAVATED, STOCKPILED, AND RE-USED FROM ABANDONED CHANNEL SECTIONS. OFF-SITE ROCK MATERIAL SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS ABOVE. RIFFILE MATERIAL SHALL BE PLACED IN A 12"-18" THICK LAYER ACROSS THE STREAM BED. THE CHANNEL BED SHALL BE OVER-EXCAVATED, AS NEEDED, TO ALLOW FOR FULL DEPTH PLACEMENT OF RIFFILE MATERIAL. IN ADDITION, LOGS AND WOODY DEBRIS AND BOULDERS, MEETING THE TECHNICAL SPECIFICATIONS, SHALL BE INCORPORATED INTO THE RIFFILE MATERIAL. LOGS AND WOODY DEBRIS SHALL HAVE A DIAMETER OF 8" - 15" AND A LENGTH OF 6' - 10', BOULDER DIMENSIONS SHALL BE A MINIMUM 2'- 3' LONG, 1.5' - 2' WIDE, AND 1' - 1.5' THICK.
- RIFFILE MATERIAL SHALL BE FINISH GRADED IN A MANNER TO CREATE A SMOOTH PROFILE, WITH NO ABRUPT "JUMP" (TRANSITION) BETWEEN THE UPSTREAM POOL-GLIDE AND THE RIFFILE, AND LIKEWISE NO ABRUPT "DROP" (TRANSITION) BETWEEN THE RIFFILE AND THE

- DOWNSTREAM RUN-POOL. THE FINISHED CROSS SECTION OF THE RIFFILE MATERIAL SHALL GENERALLY MATCH THE SHAPE AND DIMENSIONS SHOWN ON THE RIFFILE TYPICAL SECTION WITH SOME VARIABILITY OF THE THALWEG LOCATION AS A RESULT OF THE SMALL POOLS, LOGS, AND BOULDERS. TRANSITIONS SHALL MATCH THE PROFILE SHOWN ON THE PLANS.
- UPSTREAM OF THE BEGIN RIFFILE CONTROL POINT THE CONTRACTOR SHALL OVER-EXCAVATE THE PROPOSED/EXISTING STREAM BED, AS NEEDED, TO ALLOW FOR THE PLACEMENT OF AN 10" -12" THICK LAYER OF SPAWNING GRAVEL (3/8" TO 3/4" DIA. ROUND STONE).
- DOWNSTREAM OF THE END RIFFILE CONTROL POINT THE CONTRACTOR SHALL OVER-EXCAVATE THE PROPOSED/EXISTING STREAM BED TO ALLOW FOR THE PLACEMENT OF 12"-18" OF A COMBINATION OF ROUNDED GLACIAL MATERIAL CONSISTING OF 10-20% BOULDERS (18"-24" DIA.), 55-65% SMALL BOULDERS/COBBLE (6"-12" DIA., D50 9"), 20-30% COARSE GRAVEL (2"-4" DIA.) AND A MAXIMUM OF 5% FINE GRAVEL AND SAND.



PROFILE VIEW
NTS



SECTION A
NTS

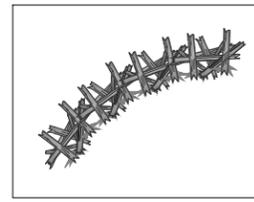
DETAIL - VARIABLE CONSTRUCTED RIFFILE
NTS

1
CH-1
CH-2
CH-3

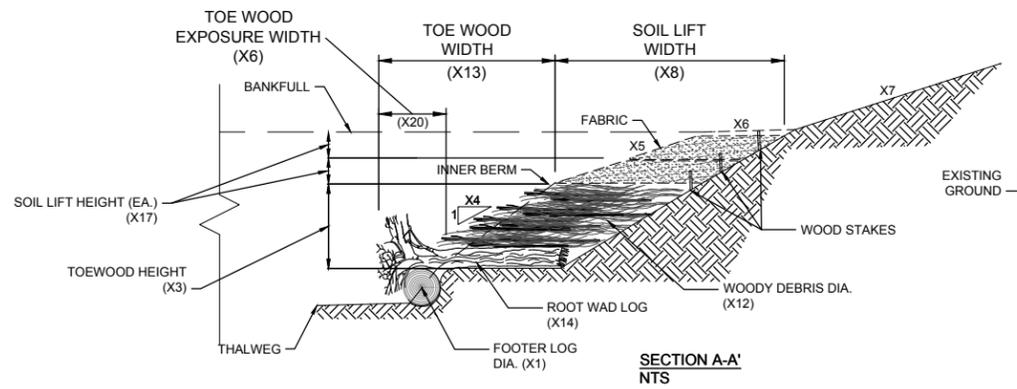
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DATE OF ISSUANCE	June 8, 2018
NO. REVISION	DATE
SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489
SHEET NUMBER	CH-GD2

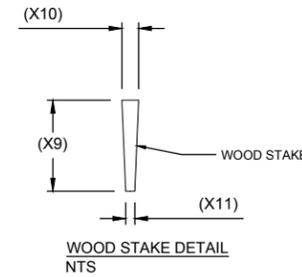
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PLAN - SYMBOL



SECTION A-A' NTS

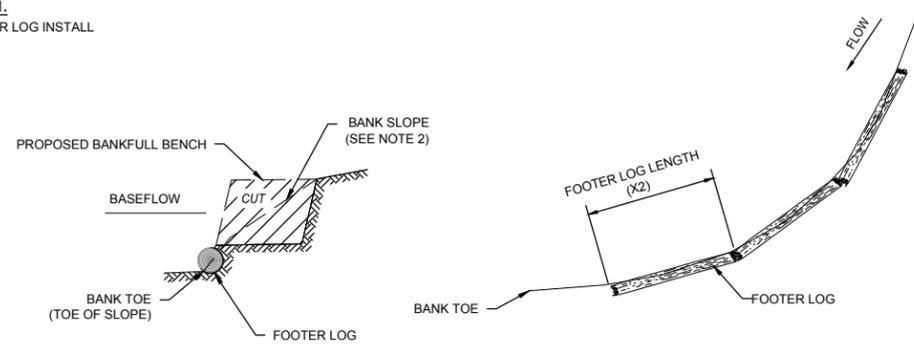


WOOD STAKE DETAIL NTS



PHOTO: KNOWLTON CREEK, DULUTH, MN (USACE)

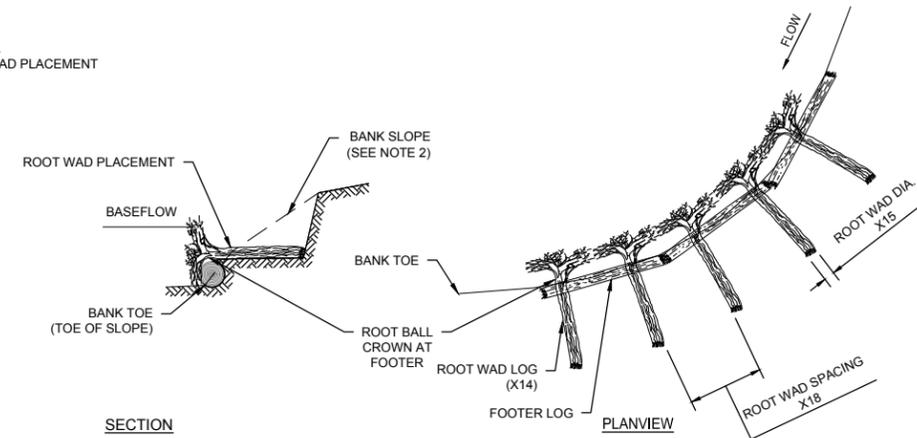
STEP 1. FOOTER LOG INSTALL



SECTION

PLANVIEW

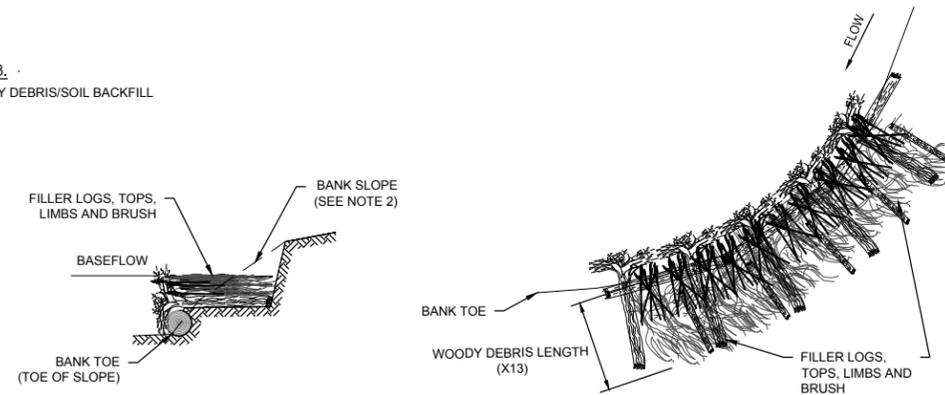
STEP 2. ROOT WAD PLACEMENT



SECTION

PLANVIEW

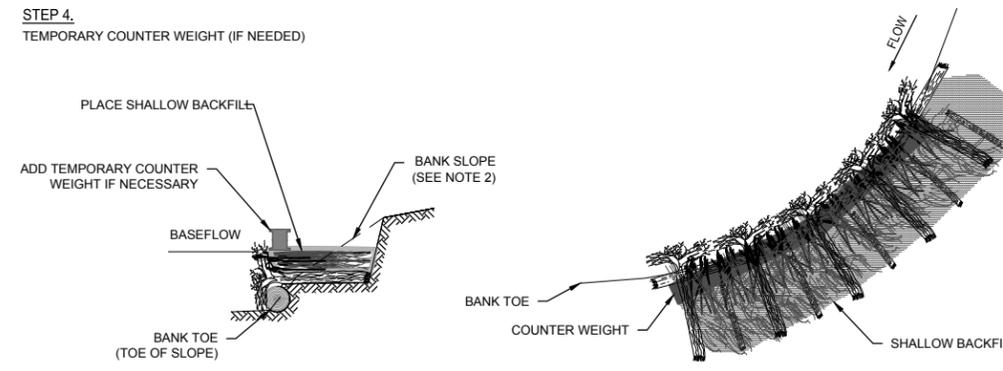
STEP 3. WOODY DEBRIS/SOIL BACKFILL



SECTION

PLANVIEW

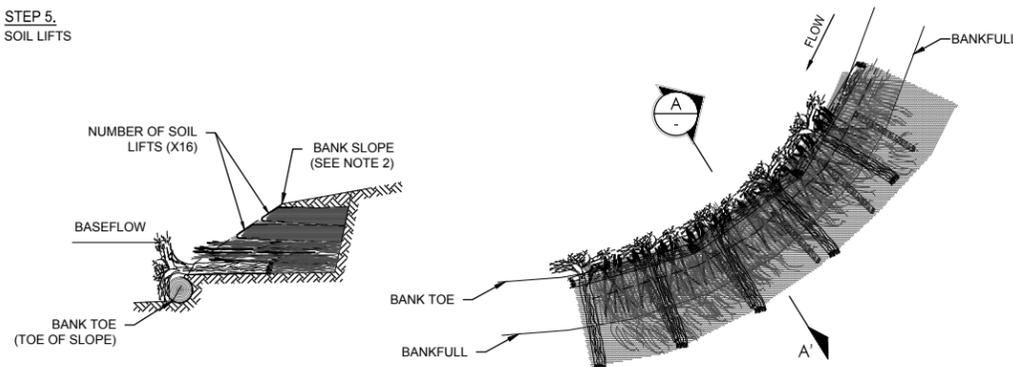
STEP 4. TEMPORARY COUNTER WEIGHT (IF NEEDED)



SECTION

PLANVIEW

STEP 5. SOIL LIFTS



SECTION

PLANVIEW

DETAIL - TOE WOOD

NTS

1 CH-1, CH-2, CH-3

TOE WOOD DIMENSIONS			
VARIABLE	REQUIRED	TYPICAL UNIT	DESCRIPTION
X1	4.0 - 10.0	IN	FOOTER LOG DIAMETER
X2	10.0 - 15.0	FT	FOOT LOG LENGTH
X3	1.5 - 2.0	FT	TOE WOOD HEIGHT
X4	2:1	RATIO	MATCH TYPICAL SECTION (SLOPE)
X17	6.0	IN	SOIL LIFT HEIGHT
X5	3:1	RATIO	MATCH TYPICAL SECTION (SLOPE)
X6	20:1	RATIO	MATCH TYPICAL SECTION (SLOPE)
X7	3:1	FT	MATCH TYPICAL SECTION (SLOPE)
X8	5.0 - 6.0	FT	SOIL LIFT WIDTH
X9	24.0	IN	WOOD STAKE LENGTH
X10	4.0	IN	WOOD STAKE WIDTH (TOP)
X11	0.5	IN	WOOD STAKE WIDTH (BOTTOM)
X12	0.5 - 3.0	IN	WOODY DEBRIS DIAMETER
X13	7.0 - 10.0	FT	WOODY DEBRIS LENGTH
X14	7.0 - 10.0	FT	ROOT WAD LENGTH (NOT INCLUDING ROOT BALL)
X15	3.0 - 10.0	IN	ROOT WAD DIAMETER (SEE NOTE 5)
X16	2	#	SOIL LIFTS
X19	3.0 - 4.0	IN	TOPSOIL DEPTH
X18	VARIES	FT	ROOT WAD SPACING (SEE NOTE 6)
X20	2.0	FT	EXPOSED WOODY DEBRIS DEPTH

TOE WOOD NOTES:

- DETAIL TYPICAL SECTIONS ARE VIEWED FACING DOWNSTREAM AND APPLICATION OF THE POOL TYPICAL SECTION SHALL BE REVERSED AS NEEDED DEPENDING ON THE STREAM REACH AND THE DIRECTION OF THE BEND IN THE STREAM.
- APPLICABLE REFERENCES:
 - CH-1 THRU CH-3 PLAN SHEETS
 - CH-GD1 TYPICAL POOL SECTIONS
- TOE WOOD WILL BE CONSTRUCTED IN NEWLY GRADED CHANNEL SECTIONS AND/OR EXISTING CHANNEL SECTIONS AT THE LOCATIONS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION.
- ROOT WAD SPACING VARIES BASED ON SIZE OF ROOT BALL (TYPICALLY 3.0' TO 6.0')
- TOP OF TOE WOOD 14.5 INCHES BELOW ADJACENT BANKFULL ELEVATION.
- BOTTOM ELEVATION OF FOOTER LOG VARIES BASED ON DIAMETER OF LOGS AND TOE WOOD HEIGHT (X3).

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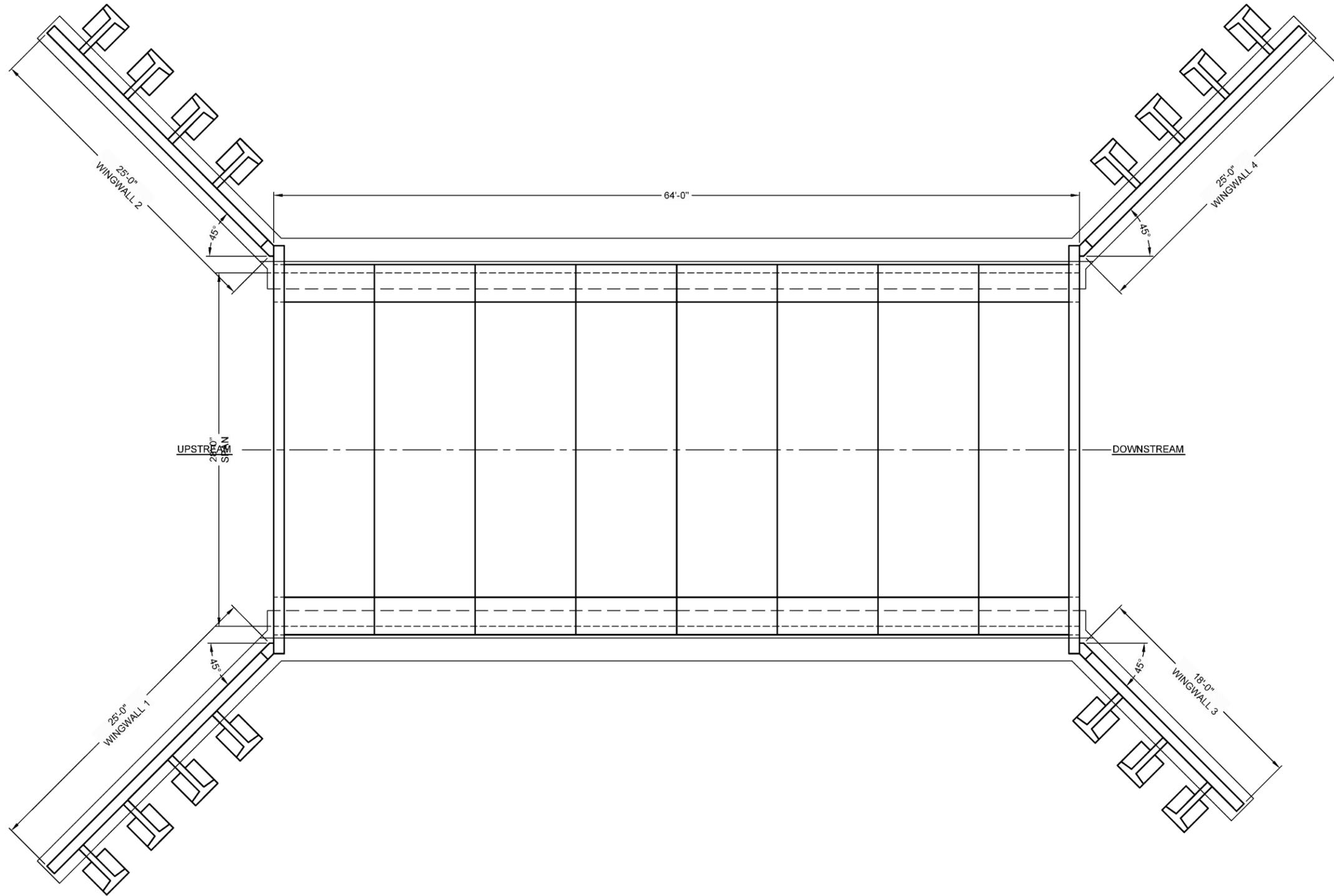
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SHEET NUMBER
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BRIDGE PLAN

DETAIL - CONCRETE ARCH CULVERT 1
 NTS CH-2

NOTES:

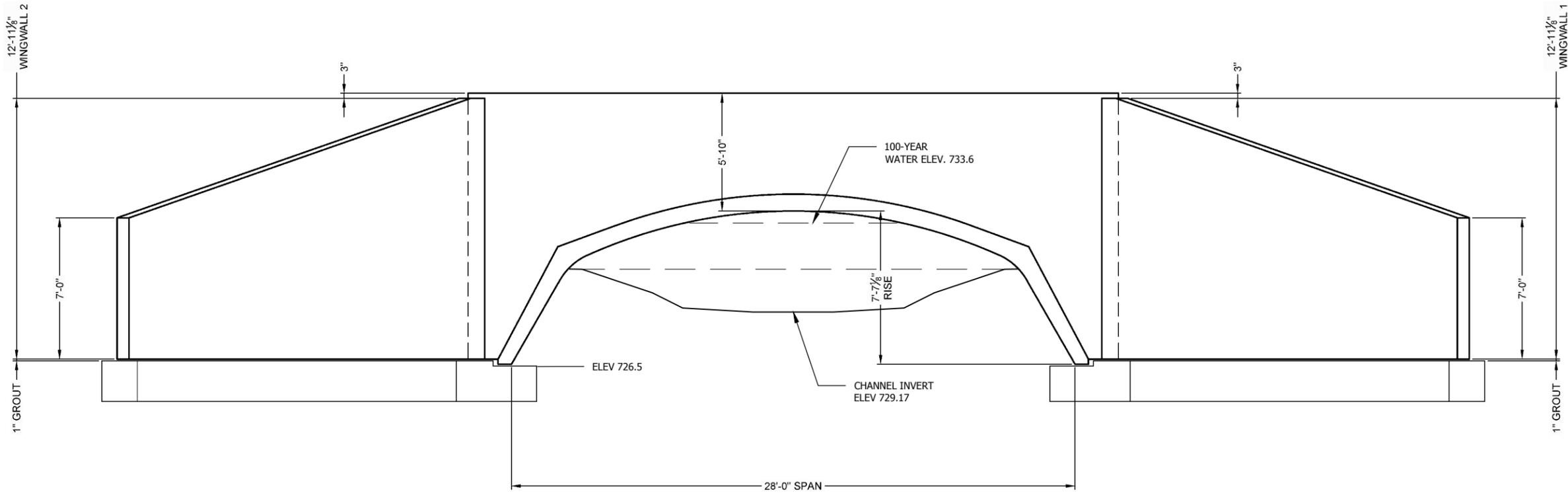
- CONTECH CON/SPAN O-SERIES O428 28'-0" X 7'-7 1/8" RISE 1 CELL - 64' LONG SHOWN FOR REFERENCE.
- ALTERNATE EQUIVALENT SINGLE CELL CULVERT CONFIGURATIONS WILL BE CONSIDERED IF PROPOSED.
- CONTRACTOR SHALL SUBMIT DETAILS OF PROPOSED CULVERT FOR CONSIDERATION.

DATE OF ISSUANCE	June 8, 2018
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NO	REVISION	DATE

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CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

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UPSTREAM END ELEVATION

DETAIL - CONCRETE ARCH CULVERT (UPSTREAM)

NTS

1
CH-2

NOTES:

- CONTECH CON/SPAN O-SERIES O428 28'-0" X 7'-7 1/8" RISE 1 CELL - 64' LONG SHOWN FOR REFERENCE.
- ALTERNATE EQUIVALENT SINGLE CELL CULVERT CONFIGURATIONS WILL BE CONSIDERED IF PROPOSED.
- CONTRACTOR SHALL SUBMIT DETAILS OF PROPOSED CULVERT FOR CONSIDERATION.

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User: bender, 193804489, 2018, 193804489, 2018, 193804489, 2018

DATE OF ISSUANCE	June 8, 2018
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NO	REVISION	DATE

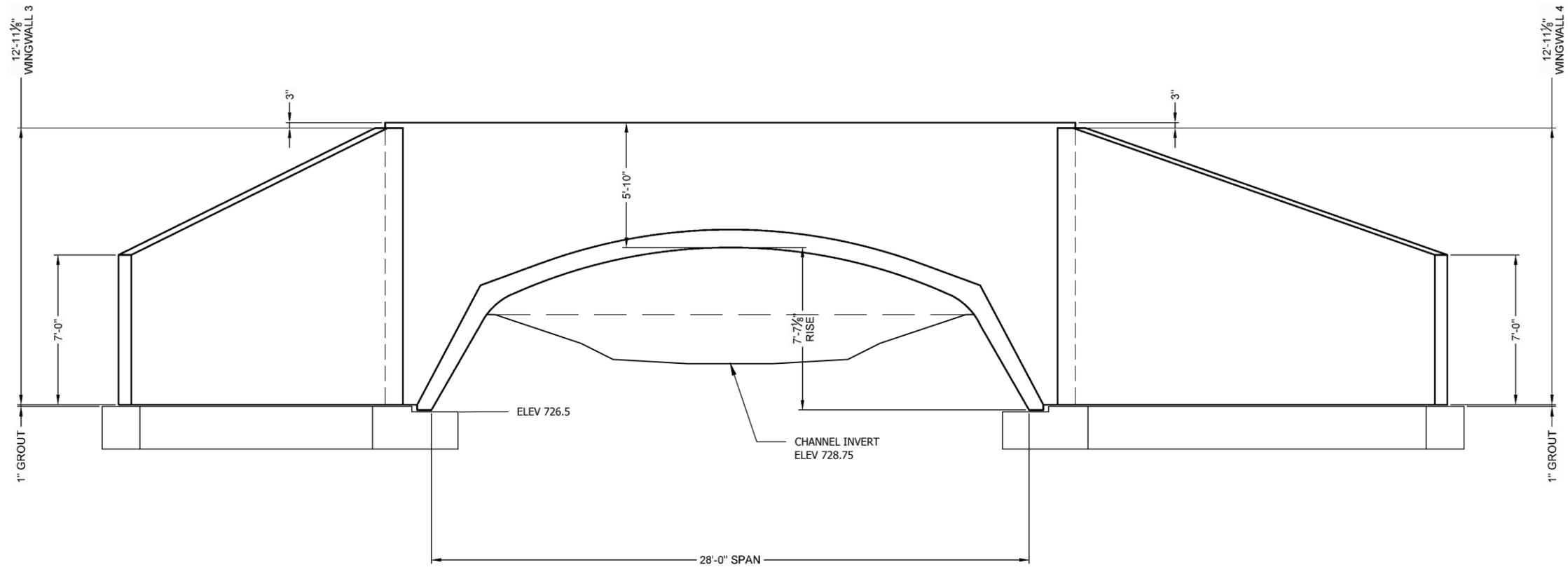
SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG

PROJ. NO. 193804489

SHEET NUMBER
CH-GD6

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CON/SPAN O-SERIES O428 28'-0" X 7'-7 1/8" RISE
 1 CELL - 64' LONG

DOWNSTREAM END ELEVATION

DETAIL - CONCRETE ARCH CULVERT (DOWNSTREAM)

NTS

1
 CH-2

NOTES:

- CONTECH CON/SPAN O-SERIES O428 28'-0" X 7'-7 1/8" RISE 1 CELL - 64' LONG SHOWN FOR REFERENCE.
- ALTERNATE EQUIVALENT SINGLE CELL CULVERT CONFIGURATIONS WILL BE CONSIDERED IF PROPOSED.
- CONTRACTOR SHALL SUBMIT DETAILS OF PROPOSED CULVERT FOR CONSIDERATION.



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CONCRETE ARCH CULVERT DETAIL
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE
 June 8, 2018

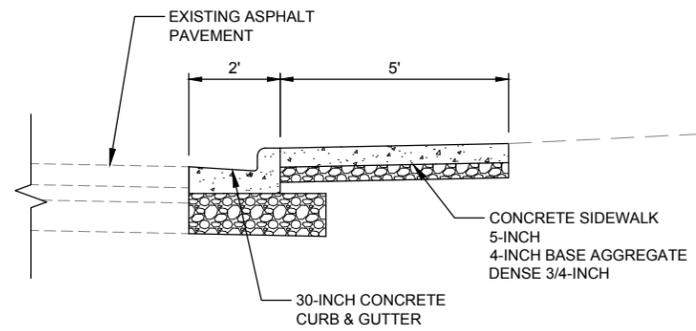
NO	REVISION	DATE

SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

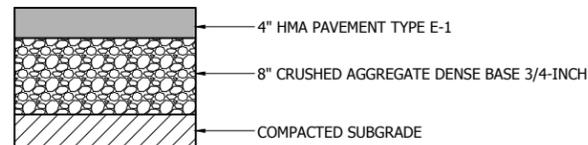
SHEET NUMBER
CH-GD7

THE CONTRACTOR SHALL VERIFY AND BE RESPONSIBLE FOR ALL DIMENSIONS. DO NOT SCALE THE DRAWING. ANY ERRORS OR OMISSIONS SHALL BE REPORTED TO STANTEC WITHOUT DELAY. STANTEC SHALL NOT BE RESPONSIBLE FOR ANY REVISIONS OR CHANGES MADE TO THIS DRAWING FOR ANY PURPOSE OTHER THAN THAT AUTHORIZED BY STANTEC IS FORBIDDEN.

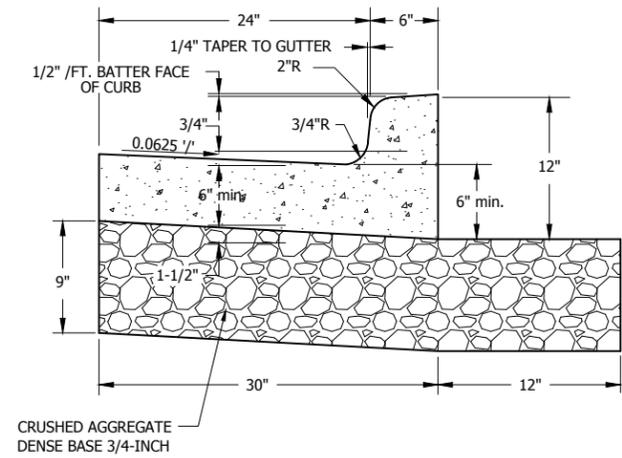
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 User: bender, 193804489, SSNO, 193804489, SSNT



DETAIL - CURB & SIDEWALK 1
 NTS R-1



DETAIL - PARKING ASPHALT SECTION 2
 NTS R-1

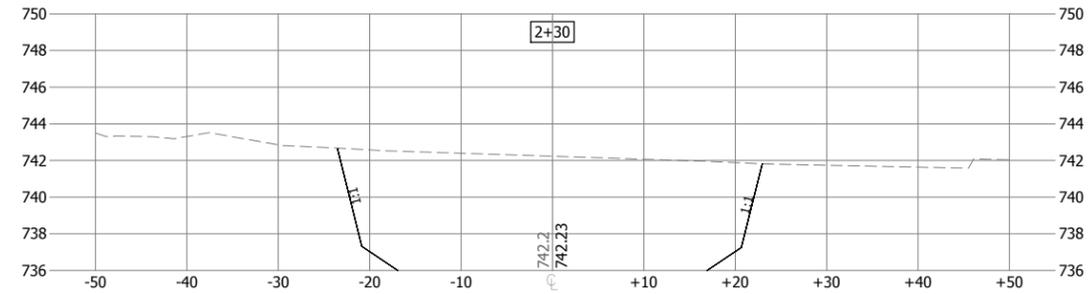
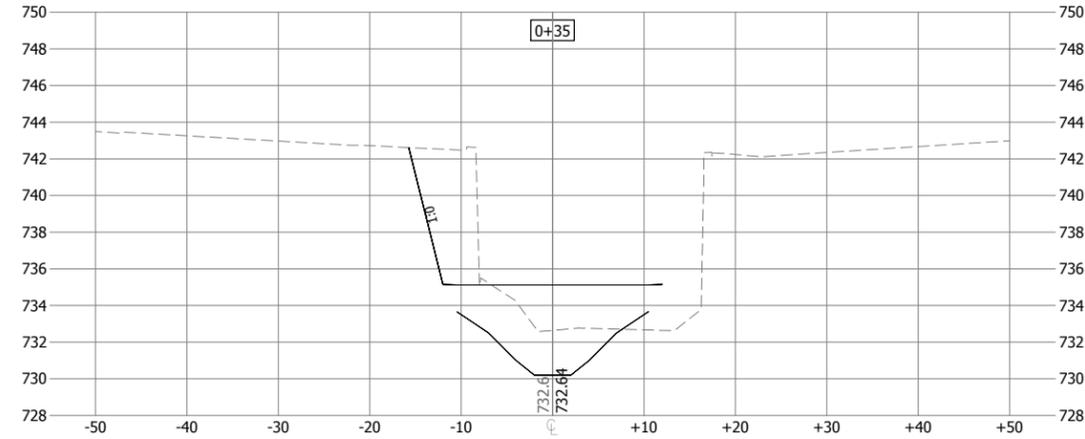
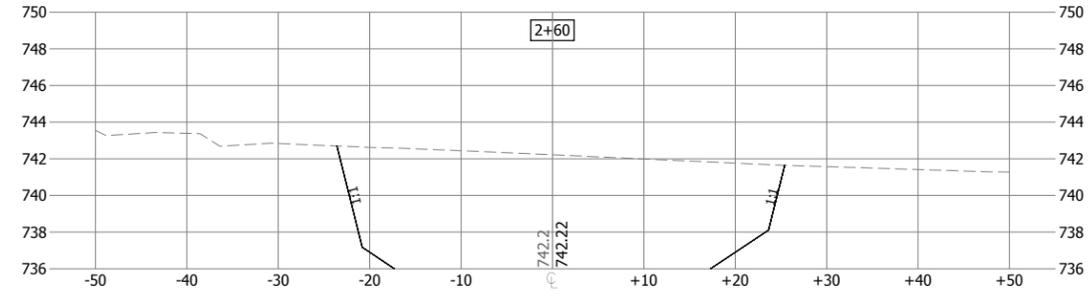
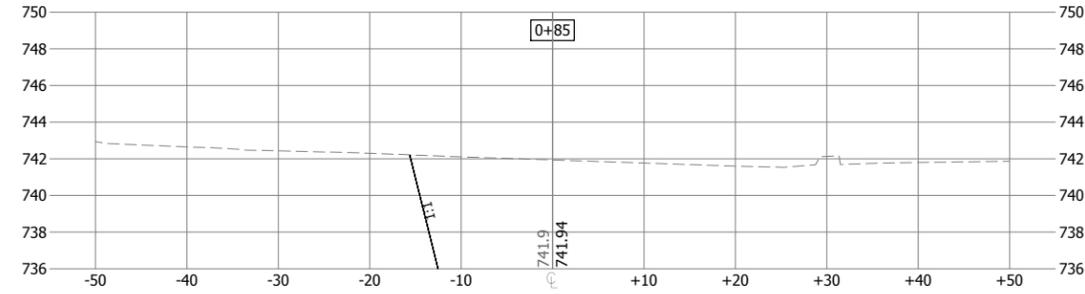
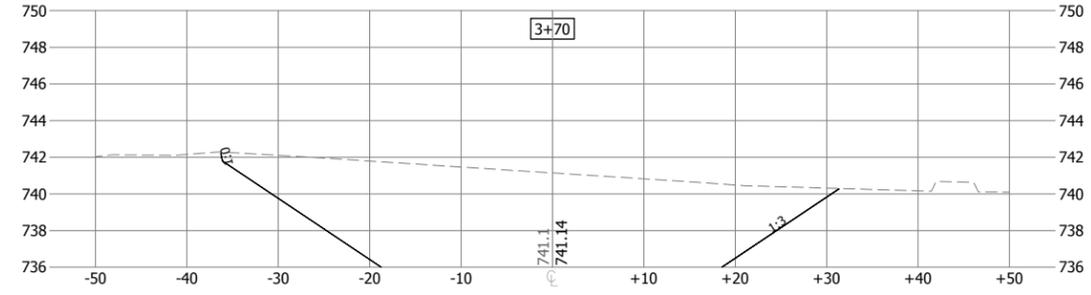
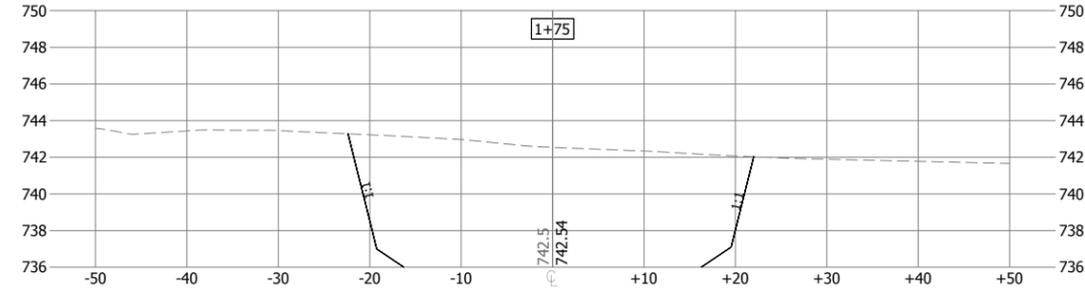


DETAIL - 30-INCH CURB & GUTTER 3
 NTS R-1

DATE OF ISSUANCE	
June 8, 2018	
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SURVEY	JSH
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PROJ. NO.	193804489

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CHANNEL CROSS SECTIONS
 UNDERWOOD CREEK DAYLIGHTING
 VILLAGE OF ELM GROVE
 WAUKESHA COUNTY, WISCONSIN

DATE OF ISSUANCE
 June 8, 2018

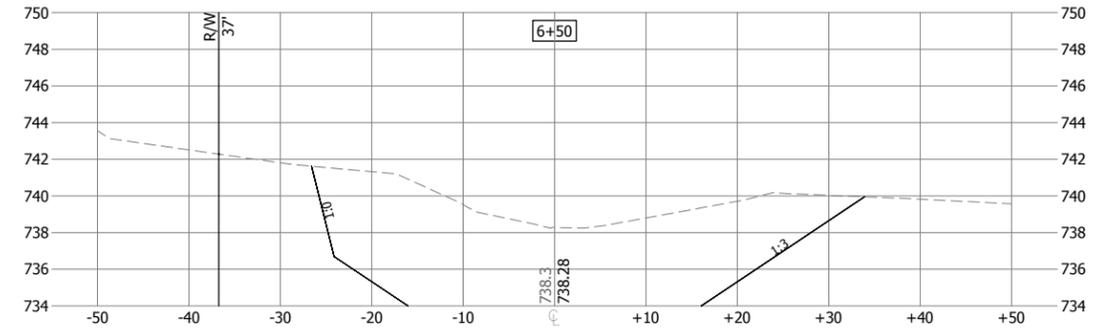
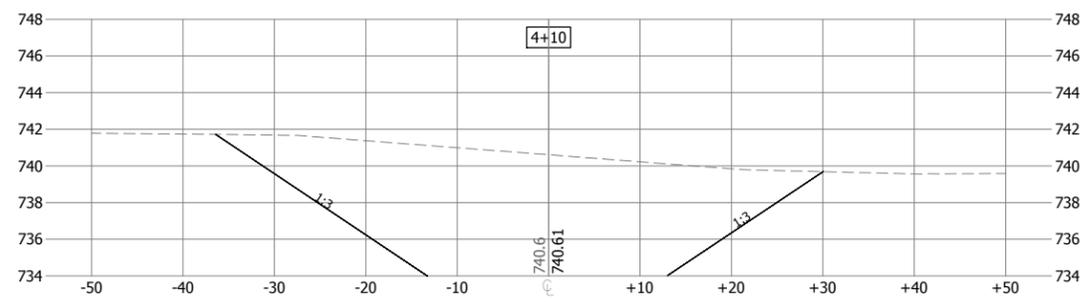
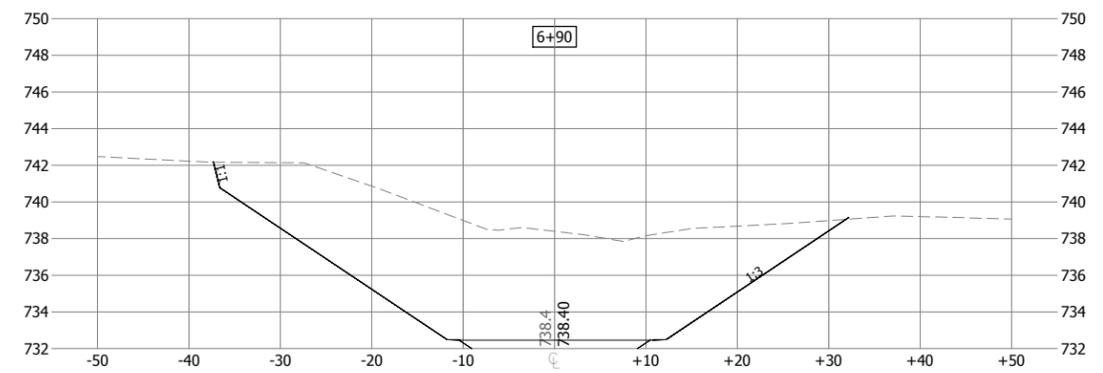
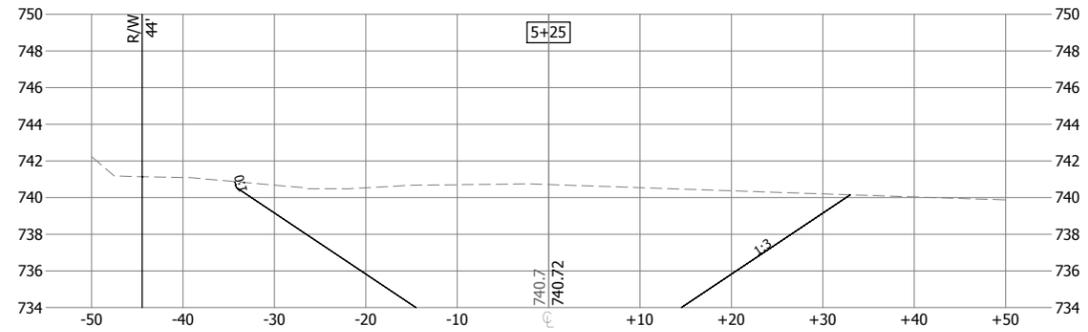
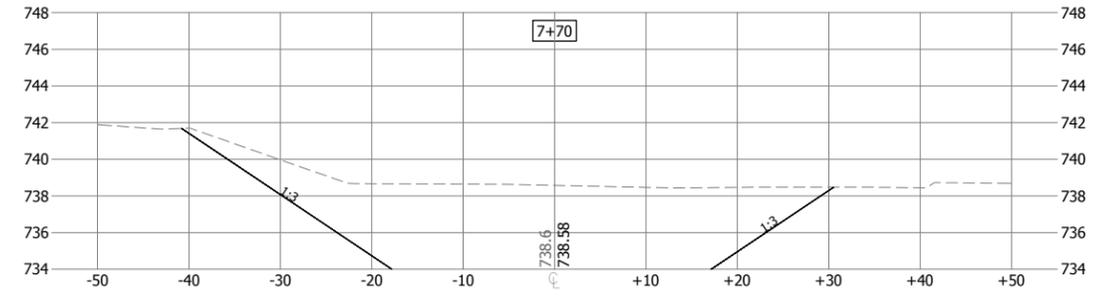
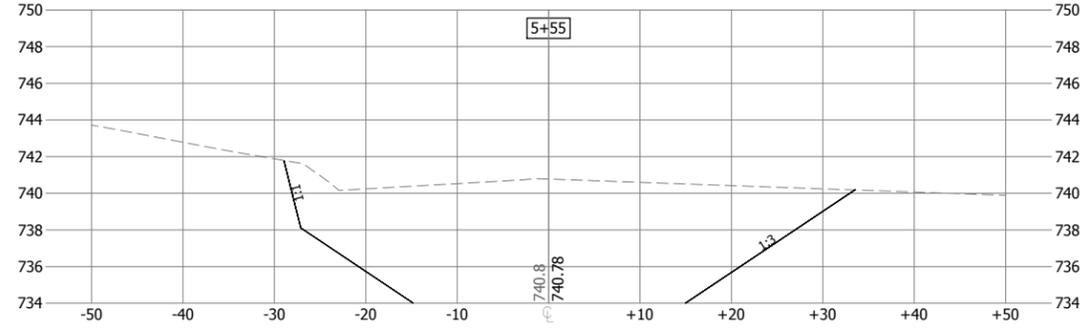
NO	REVISION	DATE

SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
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SHEET NUMBER
CH-CS1

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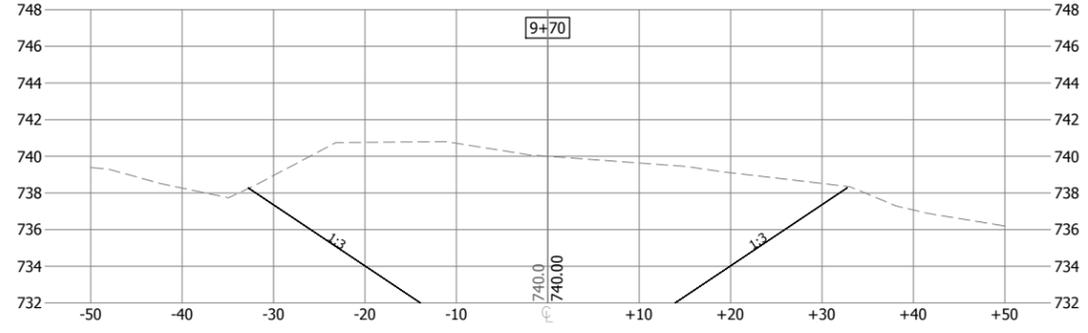
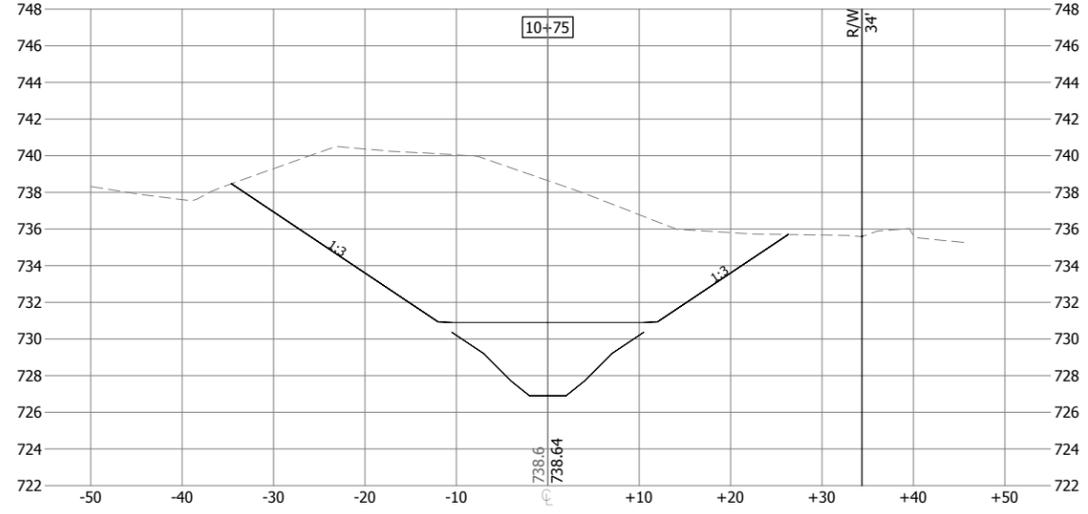
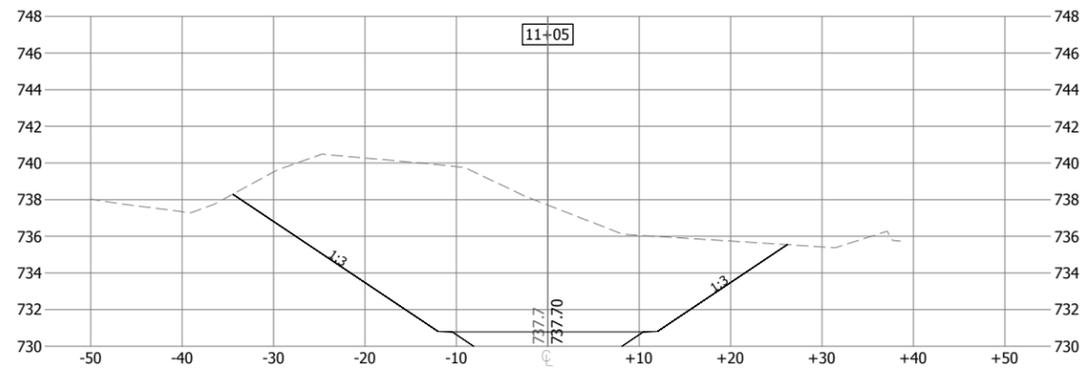
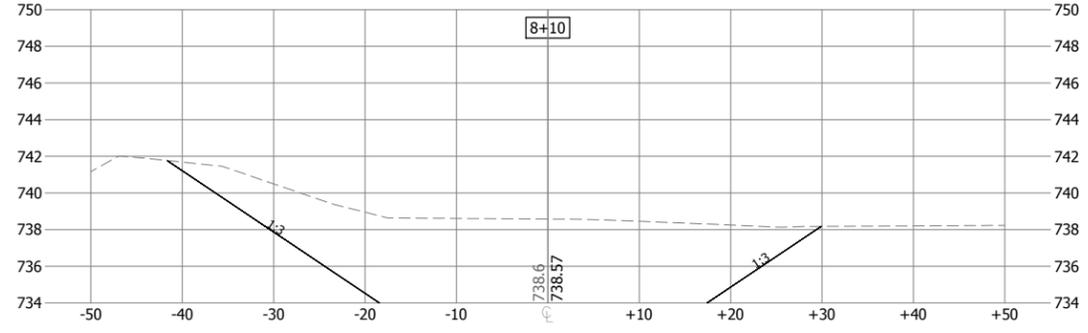
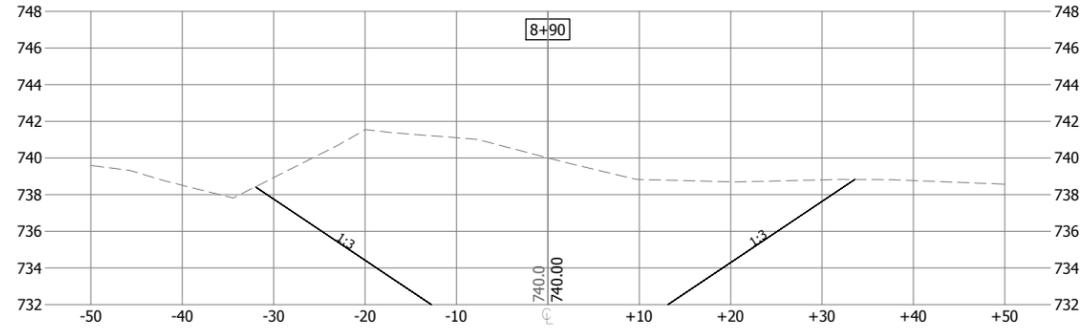
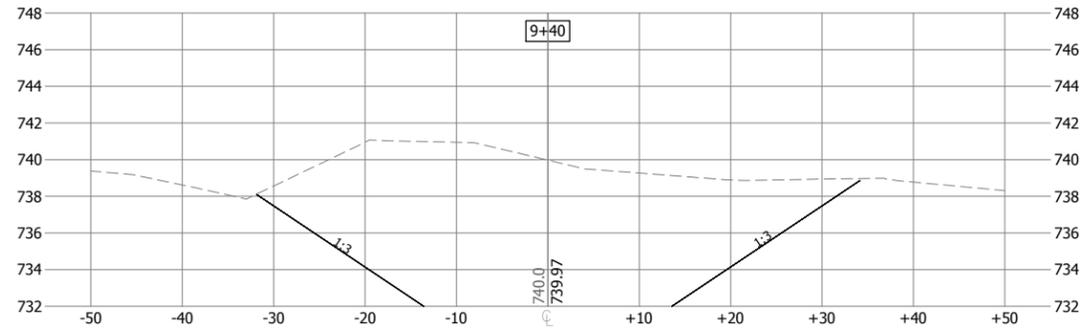
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 VILLAGE OF ELM GROVE
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DATE OF ISSUANCE	
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PROJ. NO.	193804489
SHEET NUMBER	
CH-CS2	

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DATE OF ISSUANCE
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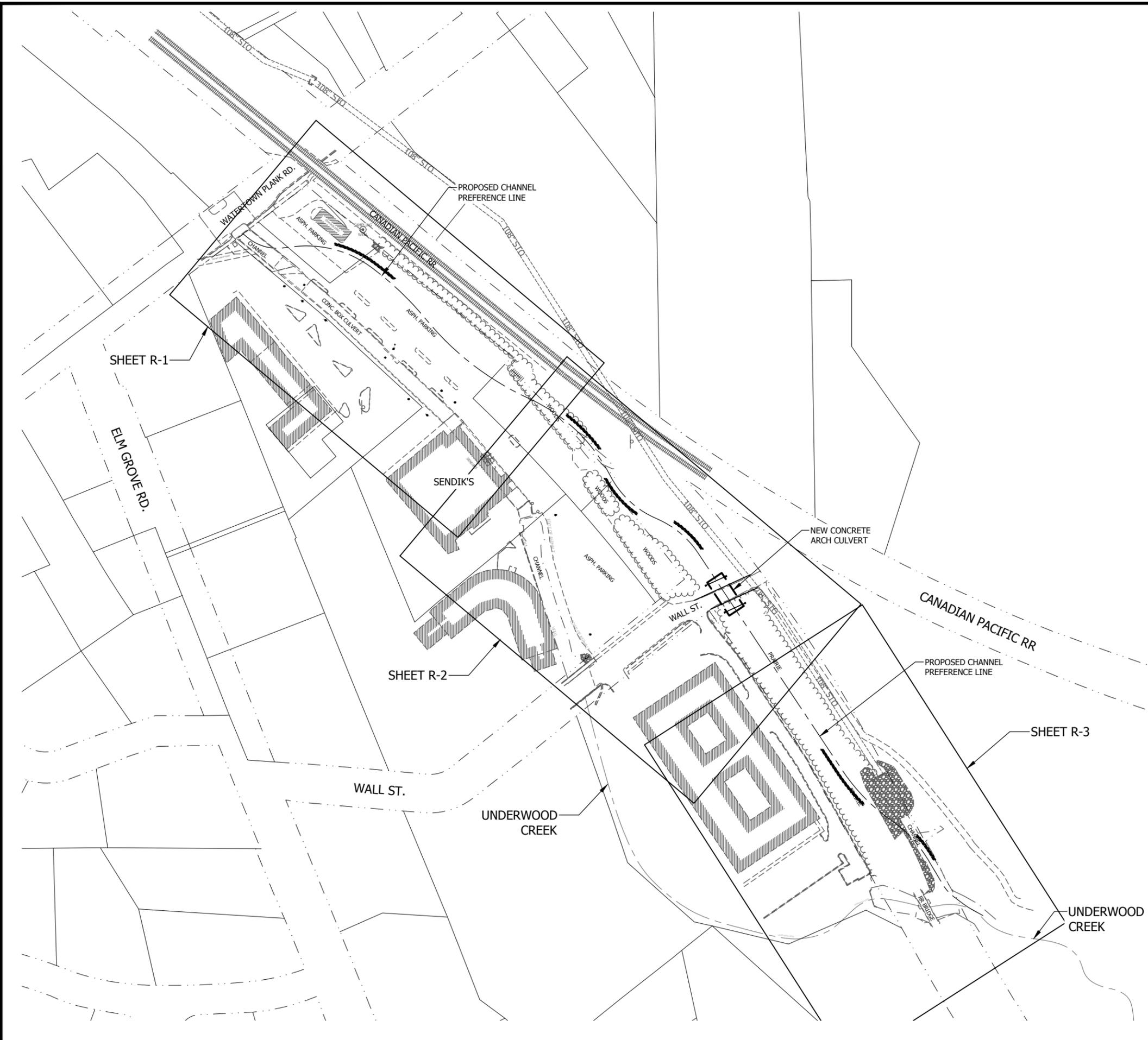
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SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

SHEET NUMBER
CH-CS3

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DATE OF ISSUANCE	
June 8, 2018	

NO	REVISION	DATE

SURVEY	JSH
DRAWN	AJR
DESIGNED	BG
CHECKED	RJK
APPROVED	JG
PROJ. NO.	193804489

