WEATHERLY DRIVE RECONSTRUCTION PROJECT

CITY OF OAK CREEK, WISCONSIN

OAK CREEK PROJECT NUMBER 14034

STATE OF WISCONSIN
GARY E. RAASCH
E-18894
BROOKFIELD, WI.
PROFESSIONAL ENGINEER
6/4/14

OWNER:
CITY OF OAK CREEK
8640 S. HOWELL AVENUE
OAK CREEK, WI. 53154

VICINITY MAP

CITY OF OAK CREEK
MILWAUKEE COUNTY, WISCONSIN

0' 1000' 2000' 3000'

LEGEND

- △ BENCHMARK
- SECTION CORNER
- FLAGPOLE
- MAILBOX
- SIGN
- BILLBOARD
- [B] CONTROL BOX
- TRAFFIC SIGNAL
- RAILROAD CROSSING SIGNAL
- [C] CABLE PEDESTAL
- POWER POLE
- GUY POLE
- GUY WIRE
- LIGHT POLE
- (E) ELECTRIC MANHOLE
- [E] ELECTRIC PEDESTAL
- [X] ELECTRIC METER
- (T) TELEPHONE MANHOLE
- [T] TELEPHONE PEDESTAL
- GAS VALVE
- GAS METER
- (ST) STORM MANHOLE
- ROUND INLET
- SQUARE INLET
- STORM SEWER END SECTION
- (S) SANITARY MANHOLE
- SANITARY CLEANOUT OR SEPTIC VENT
- SANITARY INTERCEPTOR MANHOLE
- MISCELLANEOUS MANHOLE
- WATER VALVE
- HYDRANT
- (C) WATER SERVICE CURB STOP
- (W) WATER MANHOLE
- WELL
- WATER SURFACE
- WETLANDS FLAG
- MARSH
- CONIFEROUS TREE
- DECIDUOUS TREE
- SHRUB

- —EDGE OF TREES
- S —SANITARY SEWER
- STO—STORM SEWER
- W —WATER MAIN
- G —MARKED GAS MAIN
- E —MARKED ELECTRIC
- OHW—OVERHEAD WIRES
- B —BUREAU ELEC. SERV.
- T —MARKED TELEPHONE
- TV—MARKED CABLE TV LINE
- FO—MARKED FIBER OPTIC

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

COVER SHEET

APPROVED BY
UTILITY ENGINEER — DATE
APPROVED BY
Michael C. Simons — 9/17/14
CITY ENGINEER — DATE

SCALE	SHEET
PLAN HOR. 1" = 1000'	1
PROFILE HOR. ____ VER. ____	OF 28

FILE NO: 14034-1B-2511

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ESTIMATE OF QUANTITIES

Description	Quantity	Unit
Inlet Protection	4	EA
Tracking Pad	2,000	S.F.
Silt Fence	1,500	L.F.
Ditch Checks	1	EA
Clearing & Grubbing	1	L.S.
Common Excavation	5,400	C.Y.
Imported Fill	4,800	C.Y.
Sanitary Manhole Adjustment	4	EA
MMSD Manhole Adjustment	1	EA
Storm Sewer Removal	60	L.F.
Storm Inlet 24"x30"	4	EA
Storm Sewer 12-inch RCP CL V	35	L.F.
Storm Sewer 18-inch RCP CL III	48	L.F.
Storm Sewer 21-inch RCP CL III	9	L.F.
Storm Sewer 24-inch RCP CL III	153	L.F.
Flared End Section 18-inch	1	EA
Flared End Section 24-inch	1	EA
Saw Cut Pavement	100	L.F.
Crushed Aggregate Base Course 1-1/4"	1,569	TON
5" Concrete Sidewalk	4,846	S.F.
Detectable Warning Fields	40	S.F.
31" Mountable Type "C" Concrete Curb and Gutter	1,860	L.F.
2.5" HMA 12.5mm E-1 (PG 64-22)	354	TON
3.5" HMA 19mm E-1 (PG 58-28)	518	TON
3" HMA 9.5mm E-0.3 Asphalt Path	48	TON
Heavy Rip Rap	51	C.Y.
Coffer Dam	4	EA
Turbidity Barrier	600	S.F.
Sodding	900	S.Y.
Temporary seeding	6,000	S.Y.
4" Topsoil, Seed, & Fertilizer	15,400	S.Y.
Erosion Mat Class 1, Type B	8,700	S.Y.
Mulching	6,700	S.Y.
Conspan Structure with Wingwalls	1	L.S.
8' Wide x 5' High Precast Box Culverts with End Sections	172	L.F.
Railing	324	L.F.
Remove Existing Street Light	2	EA
Street Light	8	EA
Lighting Cable-In-Duct	870	L.F.
Traffic Control	1	L.S.

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6–4–14	R.M.M.	6–4–14	G.E.R.	6–4–14

CONTACT LIST &
ESTIMATE OF QUANTITIES

APPROVED BY
UTILITY ENGINEER DATE
APPROVED BY
Michael C. Sanders 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR. N.T.S.	2
PROFILE HOR. ____ VER. ____	OF 28

FILE NO: 14034–2B–2517

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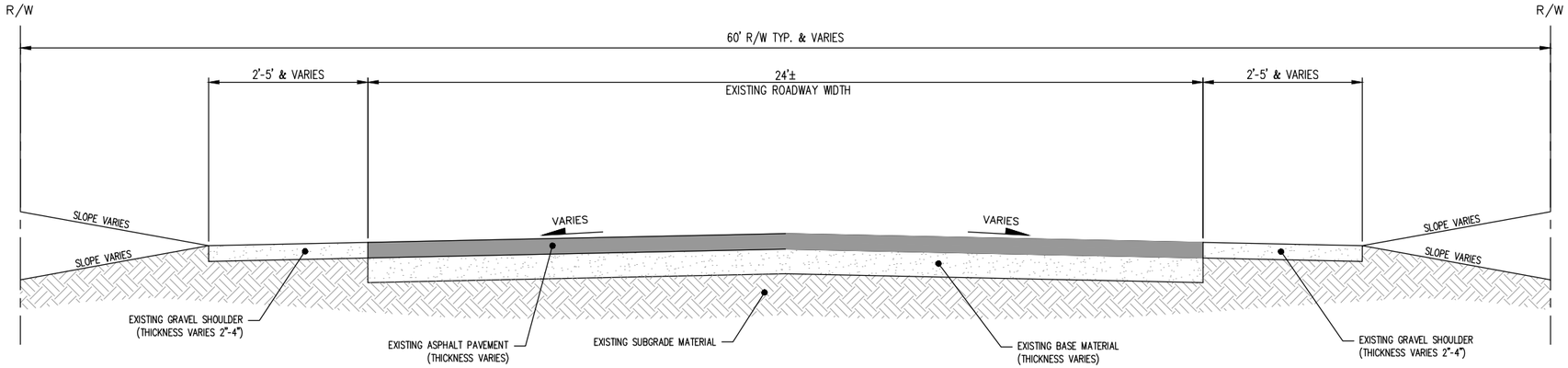
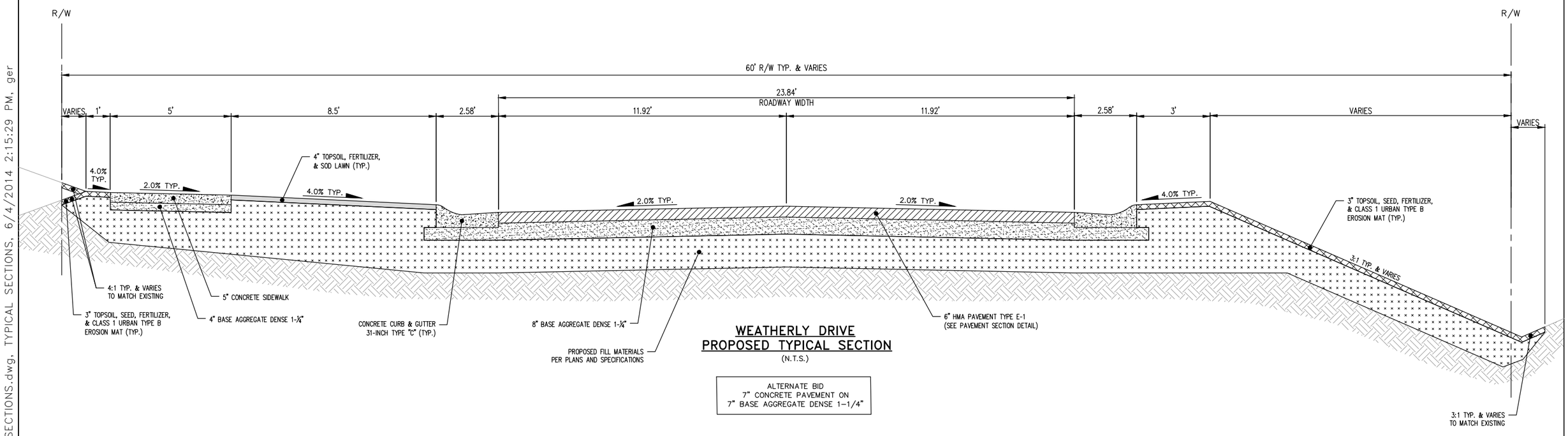


WEATHERLY DRIVE
EXISTING TYPICAL SECTION
(N.T.S.)



WEATHERLY DRIVE
PROPOSED TYPICAL SECTION
(N.T.S.)

ALTERNATE BID
7" CONCRETE PAVEMENT ON
7" BASE AGGREGATE DENSE 1-1/4"

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

TYPICAL SECTIONS

APPROVED BY
UTILITY ENGINEER — DATE
APPROVED BY
CITY ENGINEER — DATE 9/17/14

SCALE	SHEET
PLAN HOR. N.T.S.	3
PROFILE HOR. / VER.	OF 28

FILE NO: 14034-1D-2774

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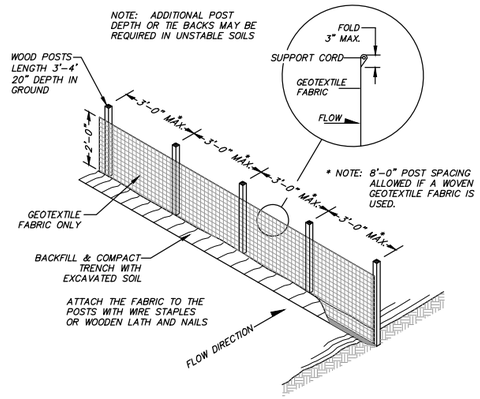
NOTES:

1. SILT FENCE INSTALLATION AND MATERIALS SHALL CONFORM TO WDNR CONSERVATION STANDARD 1056
2. SILT FENCE SHALL BE PLACED ON THE CONTOUR AND NOT PERPENDICULAR TO THE CONTOUR. THE ENDS SHALL BE EXTENDED UPSLOPE TO PREVENT WATER FROM FLOWING AROUND THE ENDS OF THE FENCE.
3. WHEN SILT FENCE IS INSTALLED ON A SLOPE, THE PARALLEL SPACING SHALL NOT EXCEED THE REQUIREMENTS IN THE TABLE BELOW:

SLOPE	FENCE SPACING
< 2%	100 FEET
2 TO 5%	75 FEET
5 TO 10%	50 FEET
10 TO 33%	25 FEET
> 33%	20 FEET

4. INSTALLED SILT FENCES SHALL BE MINIMUM 14 INCHES HIGH AND A MAXIMUM OF 28 INCHES IN HEIGHT MEASURED FROM THE INSTALLED GROUND ELEVATION.
5. A MINIMUM OF 20 INCHES OT THE POST SHALL EXTEND INTO THE GROUND AFTER INSTALLATION.
6. SILT FENCE SHALL BE ANCHORED BY SPREADING AT LEAST 8 INCHES OF THE FABRIC IN A 4-INCH TRENCH WIDE BY 6-INCH DEEP TRENCH, OR 6-INCH V-TRENCH ON THE UPSLOPE SIDE OF THE FENCE. TRENCH SHALL BE BACKFILLED AND COMPACTED. TRENCHES SHALL NOT BE EXCAVATED WIDER THAN NECESSARY FOR PROPER INSTALLATION.
7. 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.
8. SILT FENCE SHALL AT A MINIMUM BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EACH PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
9. DAMAGED OR DECOMPOSED FENCES, UNDERCUTTING, OR FLOW CHANNELS AROUND THE END OF BARRIERS SHALL BE REPAIRED OR CORRECTED.
10. SEDIMENT SHALL BE PROPERLY DISPOSED OF ONCE THE DEPOSITS REACH ONE HALF THE HEIGHT OF THE FENCE.
11. SILT FENCES SHALL BE REMOVED ONCE THE DISTURBED AREA IS PERMANENTLY STABILIZED AND IS NO LONGER SUSCEPTIBLE TO EROSION.



SILT FENCE DETAIL

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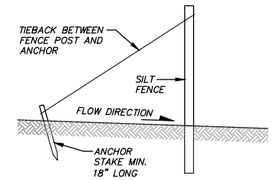
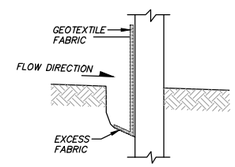
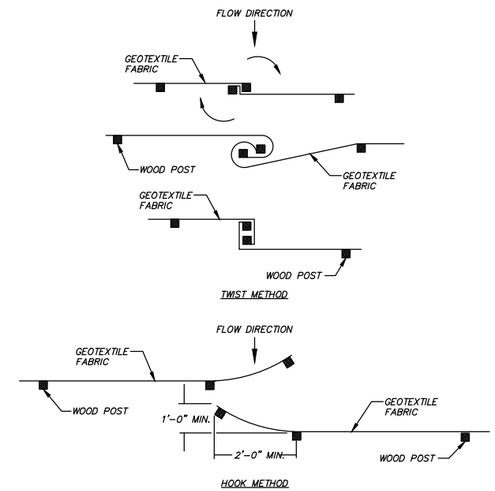


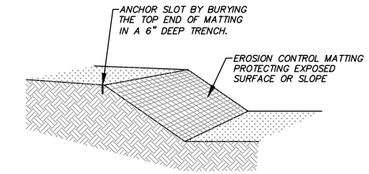
SILT FENCE TIE BACK
(WHEN ADDITIONAL SUPPORT IS REQUIRED)



TRENCH DETAIL



JOINING TWO LENGTHS OF SILT FENCE



NOTES:

1. PRIOR TO THE INSTALLATION OF ANY EROSION CONTROL MATTING, ALL ROCKS, DIRT CLODS, STUMPS, ROOTS, TRASH AND ANY OTHER OBSTRUCTIONS WHICH WOULD PREVENT THE MAT FROM LAYING IN DIRECT CONTACT WITH THE SOIL SHALL BE REMOVED.
2. EROSION CONTROL MATTING SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 628 OF THE WISCONSIN DOT STANDARD SPECIFICATIONS, DNR TECHNICAL STANDARD 1052 (NON CHANNEL APPLICATIONS), DNR TECHNICAL STANDARD 1053 (CHANNEL APPLICATIONS), AND LATEST MANUFACTURER SPECIFICATIONS, ESPECIALLY NOTING REQUIRED STAPLE PATTERNS AND ANCHOR TRENCH REQUIREMENTS.
3. INSTALLATION PROCEDURES MUST INSURE THAT THE MAT WILL REMAIN IN CONTACT WITH THE SOIL.
4. THE MATTING SHALL BE ANCHORED ALONG ITS ENTIRE PERIMETER WITH A 6"x6" ANCHOR TRENCH. AFTER MATTING IS LAID IN TRENCH, THE TRENCH SHALL BE BACKFILLED AND COMPACTED WITH SOIL OR GRAVEL.
5. THE MATTING SHALL BE ANCHORED TO THE GROUND USING 10 GAUGE WIRE STAPLES, 6" IN LENGTH BY 1" WIDE WITH A COVERAGE NOT LESS THAN 1 STAPLE PER EVERY 4 SQUARE FEET OF MATTING.
6. TEMPORARY EROSION CONTROL MATTING SHALL BE CLASS I, TYPE B.
7. MATTED AREAS MUST BE INSPECTED ON A WEEKLY BASIS, AND AFTER EACH SIGNIFICANT RAINFALL. BARE SPOTS, MISSING OR LOOSENED MATTING MUST BE IMMEDIATELY REPLACED AND/OR RE-ANCHORED.

EROSION CONTROL MATTING DETAIL

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.

INSTALLATION NOTES

TYPE 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.

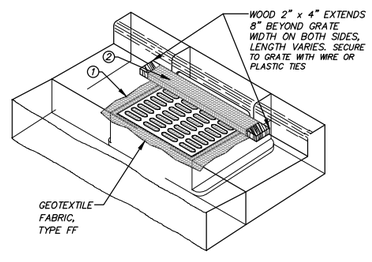
MAINTENANCE

REMOVE INLET PROTECTION DEVICES ONCE THE CONTRIBUTING DRAINAGE AREA IS STABILIZED WITH APPROPRIATE VEGETATION OR IMPERVIOUS AREA.

INLET PROTECTION SHALL BE, AT A MINIMUM, INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.

SEDIMENT DEPOSITS SHALL BE REMOVED AND THE INLET PROTECTION DEVICE RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED BETWEEN 1/3 TO 1/2 THE DESIGN DEPTH OF THE DEVICE, OR WHEN THE DEVICE IS NO LONGER FUNCTIONING AS DESIGNED. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.

WHEN REMOVING OR MAINTAINING INLET PROTECTION, DUE CARE SHALL BE TAKEN TO ENSURE SEDIMENT DOES NOT FALL INTO THE INLET AND IMPEDE THE INTENDED FUNCTION OF THE DEVICE. ANY MATERIAL FALLING INTO THE INLET SHALL BE REMOVED IMMEDIATELY.

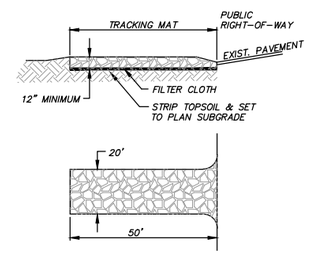


INLET PROTECTION, TYPE C
(WITH CURB BOX)

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.

INLET PROTECTION TYPE "C" DETAIL

(N.T.S.)



CONSIDERATIONS:

1. VEHICLES TRAVELING ACROSS THE TRACKING PAD SHOULD MAINTAIN A SLOW CONSTANT SPEED.
2. THE BEST APPROACH TO PREVENTING OFF-SITE TRACKING IS TO RESTRICT VEHICLES TO STABILIZED AREAS.
3. ANY SEDIMENT TRACKED ONTO A PUBLIC OR PRIVATE ROAD SHOULD BE REMOVED BY STREET CLEANING, NOT FLUSHING, BEFORE THE END OF EACH WORKING DAY.

NOTES:

A. TRACKING PAD:

1. TRACKING PAD TO CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1057.
2. THE TRACKING PAD SHALL BE INSTALLED PRIOR TO ANY TRAFFIC LEAVING THE SITE.
3. THE AGGREGATE FOR TRACKING PADS SHALL BE 3"- 6" CLEAR OR WASHED STONE. ALL MATERIAL SHALL BE RETAINED ON A 3-INCH SIEVE.
4. THE AGGREGATE SHALL BE PLACED IN A LAYER AT LEAST 12 INCHES THICK. ON SITES WITH A HIGH WATER TABLE, OR WHERE SATURATED CONDITIONS ARE EXPECTED DURING THE LIFE OF THE PRACTICE, STONE TRACKING PADS SHALL BE UNDERLAIN WITH A WISDOT TYPE R GEOTEXTILE FABRIC TO PREVENT MIGRATION OF UNDERLYING SOIL INTO THE STONE.
5. THE TRACKING PAD SHALL BE THE FULL WIDTH OF THE EGRESS POINT. THE TRACKING PAD SHALL BE A MINIMUM OF 50 FEET LONG.
6. SURFACE WATER MUST BE PREVENTED FROM PASSING THROUGH THE TRACKING PAD. FLOWS SHALL BE DIVERTED AWAY FROM TRACKING PADS OR CONVEYED UNDER AND AROUND THEM BY USING A VARIETY OF PRACTICES, SUCH AS CULVERTS, WATER BARS, OR OTHER SIMILAR PRACTICES.

B. MAINTENANCE

1. ROCKS LODGED BETWEEN THE TIRES IF DUAL WHEEL VEHICLES SHALL BE REMOVED PRIOR TO LEAVING THE CONSTRUCTION SITE.
2. TRACKING PADS AND TIRE WASHING STATIONS SHALL, AT AT MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
3. THE TRACKING PAD PERFORMANCE SHALL BE MAINTAINED BY SCRAPING OR TOP-DRESSING WITH ADDITIONAL AGGREGATE.
4. A MINIMUM 12-INCH THICK PAD SHALL BE MAINTAINED.

STONE TRACKING PAD DETAIL

(N.T.S.)

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

CONSTRUCTION DETAILS

APPROVED BY — UTILITY ENGINEER — DATE

APPROVED BY — CITY ENGINEER — DATE 9/17/14

SCALE	SHEET
PLAN HOR. N.T.S.	4
PROFILE HOR. ____ VER. ____	OF 28

FILE NO: 14034-2D-2775

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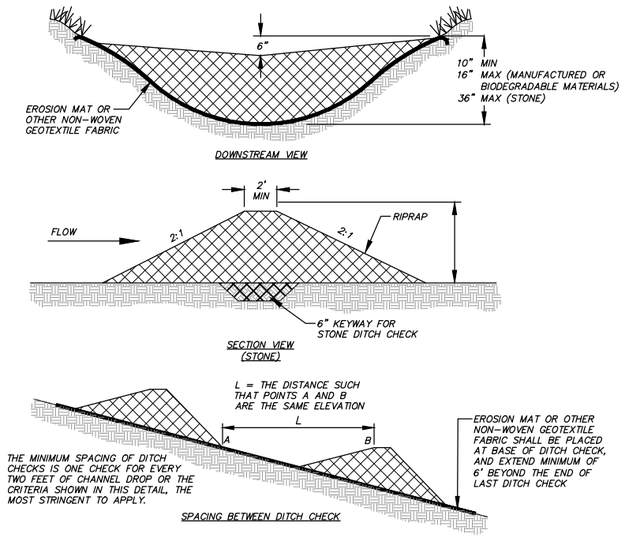


NOTES:

1. DITCH CHECKS SHALL CONFORM TO WDNR CONSERVATION PRACTICE STANDARD 1062.
2. STONE SHALL BE WELL-GRADED ANGULAR STONE WITH A D_{50} OF 3 INCHES OR GREATER (SOMETIMES REFERRED TO AS BREAKER RUN OR SHOT ROCK).
3. DITCH CHECK MAY ALSO BE CONSTRUCTED OF MANUFACTURED PRODUCTS LISTED IN WSDOT'S PAL (PRODUCT ACCEPTABILITY LIST) WITH THE ENGINEER'S APPROVAL.
4. DITCH CHECK SHALL, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD.
5. UNLESS INCORPORATED INTO A PERMANENT STORMWATER MANAGEMENT SYSTEM, DITCH CHECKS SHALL BE REMOVED ONCE THE FINAL GRADING AND CHANNEL STABILIZATION IS APPLIED.
6. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH ONE-HALF THE HEIGHT OF THE BARRIER. REMOVAL OF SEDIMENT MAY REQUIRE REPLACEMENT OF STONE. MAINTENANCE SHALL BE COMPLETED AS SOON AS POSSIBLE WITH CONSIDERATION TO SITE CONDITIONS.

DITCH CHECK

NOT TO SCALE

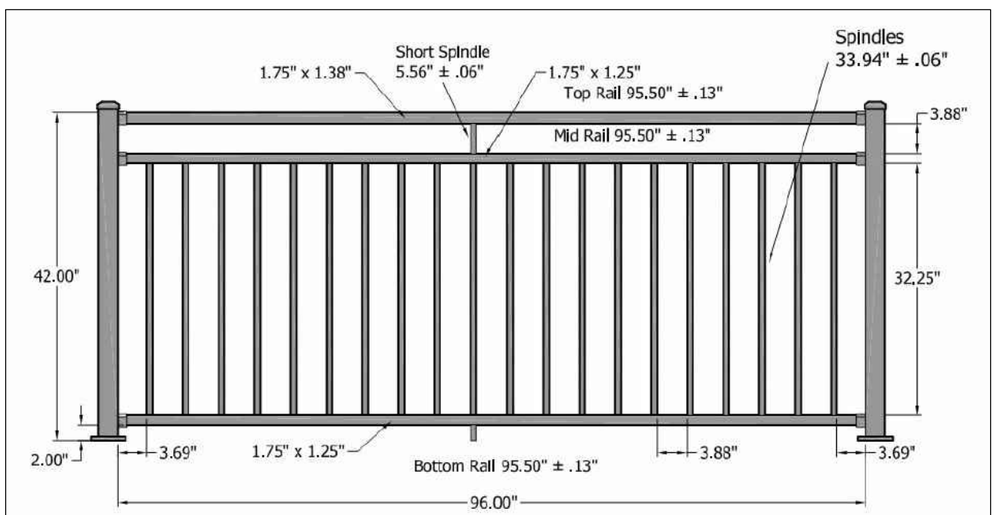


Figure 2
***Westbury® Riviera Series* Style C30 Aluminum Railing System**

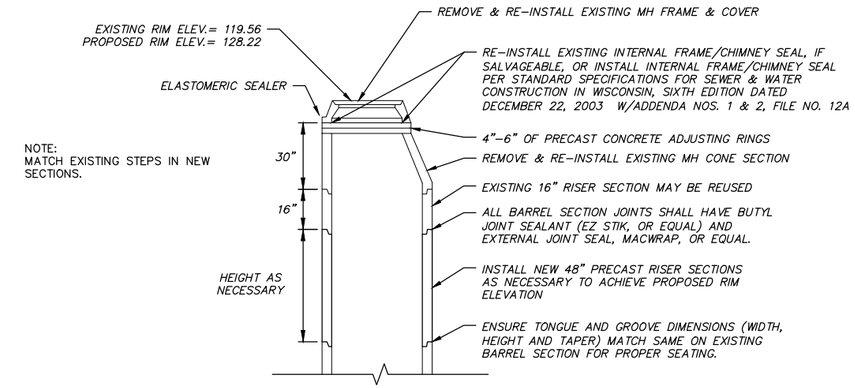
NOTES:

RAILINGS ON CONSPAN HEADWALLS, WINGWALLS, AND BOX CULVERT END SECTIONS SHALL BE WESTBURY RIVIERA SERIES STYLE C30 ALUMINUM RAILING (AS SHOWN), BLACK COLOR, MANUFACTURED BY DIGGER SPECIALTIES, INC., OR EQUAL.

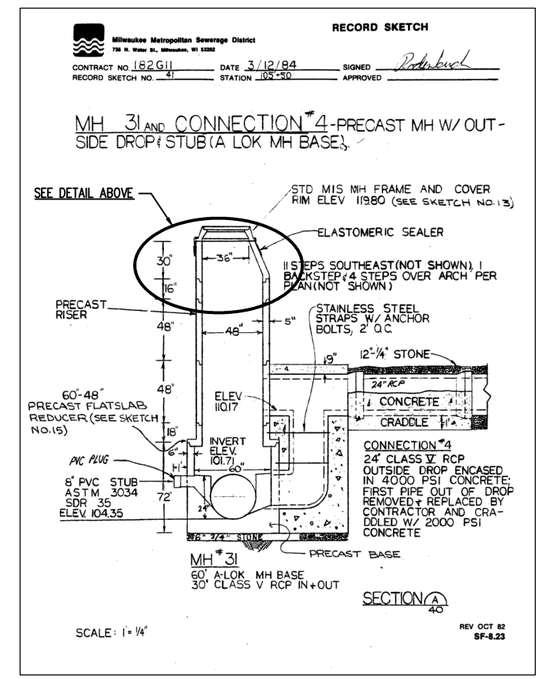
SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BEFORE RAILINGS ARE FABRICATED.

RAILINGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

RAILING DETAIL



NOTE:
MATCH EXISTING STEPS IN NEW SECTIONS.



MMSD MANHOLE ADJUSTMENT DETAIL

NOT TO SCALE

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SAN.		CITY OF OAK CREEK, WISCONSIN			APPROVED BY
STM. G.E.R.					UTILITY ENGINEER DATE
W.M.		DESIGNED BY / DATE	DRAWN BY / DATE	CHECKED BY / DATE	APPROVED BY
GAS		G.E.R. 6-4-14	R.M.M. 6-4-14	G.E.R. 6-4-14	Michael C. Simons 9/17/14
ELEC.					CITY ENGINEER DATE
TELE.		CONSTRUCTION DETAILS			SCALE / SHEET
IVM.					PLAN HOR. N.T.S. / 5
TS.					PROFILE HOR. / OF
PP.					VER. / 28
CATV.					
	REVISION BY				FILE NO: 14034-3D-2776

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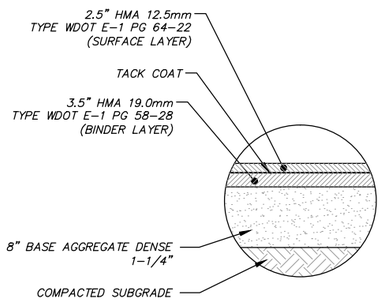
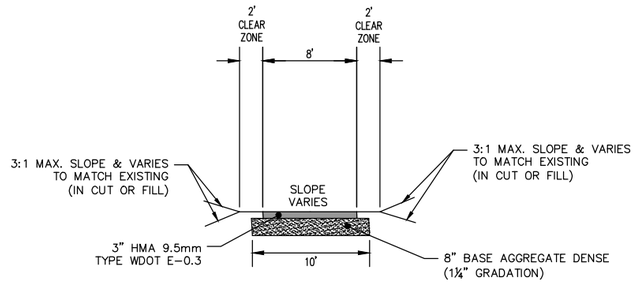


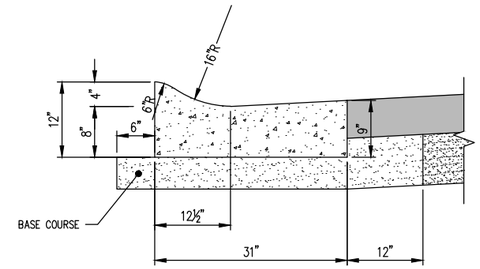
BITUMINOUS CONCRETE PAVEMENT DETAIL

(N.T.S.)



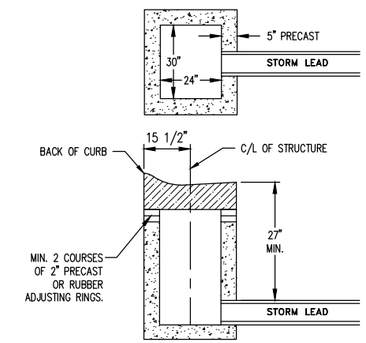
8' WIDE ASPHALT PATH DETAIL

(N.T.S.)



31" MOUNTABLE TYPE "C" CONCRETE CURB & GUTTER DETAIL

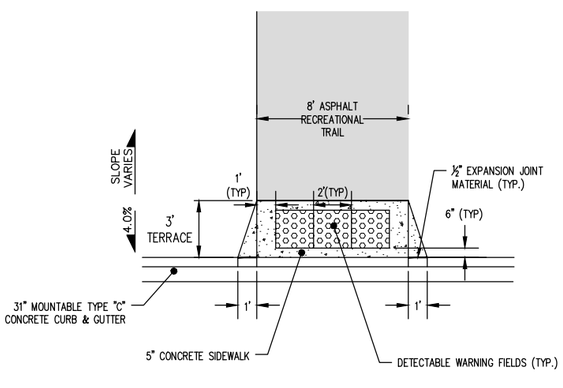
(N.T.S.)



GRATE & FRAME – NEENAH
CASTING NO. R-3501-R

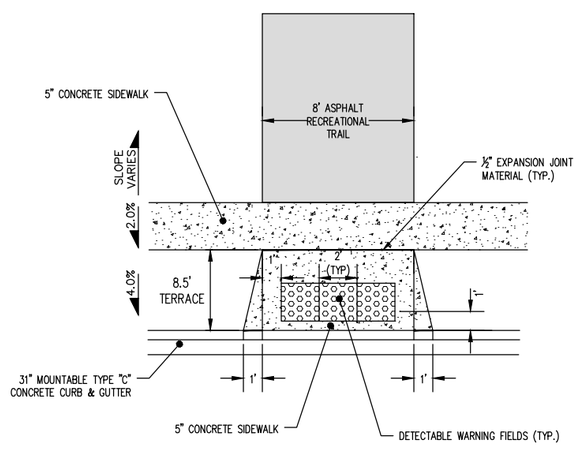
STORM INLET DETAIL

(N.T.S.)



CURB RAMP TYPE 7B DETAIL
(SOUTH SIDE WEATHERLY DRIVE)
(STATION 6+62 RT)

(N.T.S.)

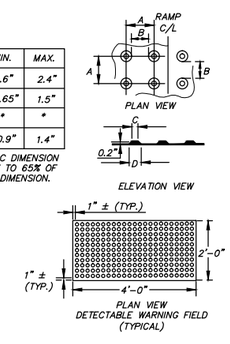


CURB RAMP TYPE 7B DETAIL
(NORTH SIDE WEATHERLY DRIVE)
(STATION 6+62 LT)

(N.T.S.)

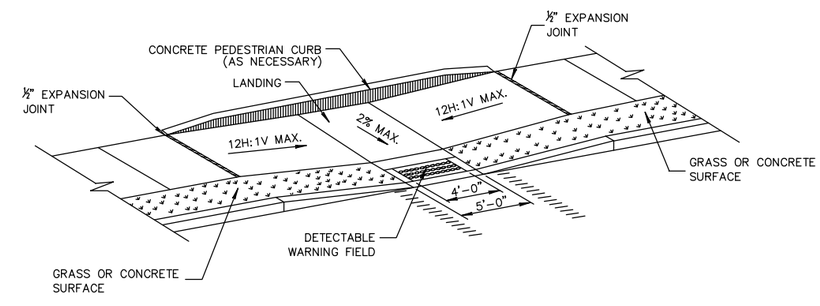
	MIN.	MAX.
A	1.6"	2.4"
B	0.65"	1.5"
C	*	*
D	0.9"	1.4"

* THE C DIMENSION IS 50% TO 65% OF THE D DIMENSION.



DETECTABLE WARNING FIELD DETAIL

(N.T.S.)



CURB RAMP TYPE 7B DETAIL
(STATION 1+36)

(N.T.S.)

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CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

CONSTRUCTION DETAILS

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR. N.T.S.	6
PROFILE HOR. ____ VER. ____	OF 28

FILE NO: 14034-4D-2777

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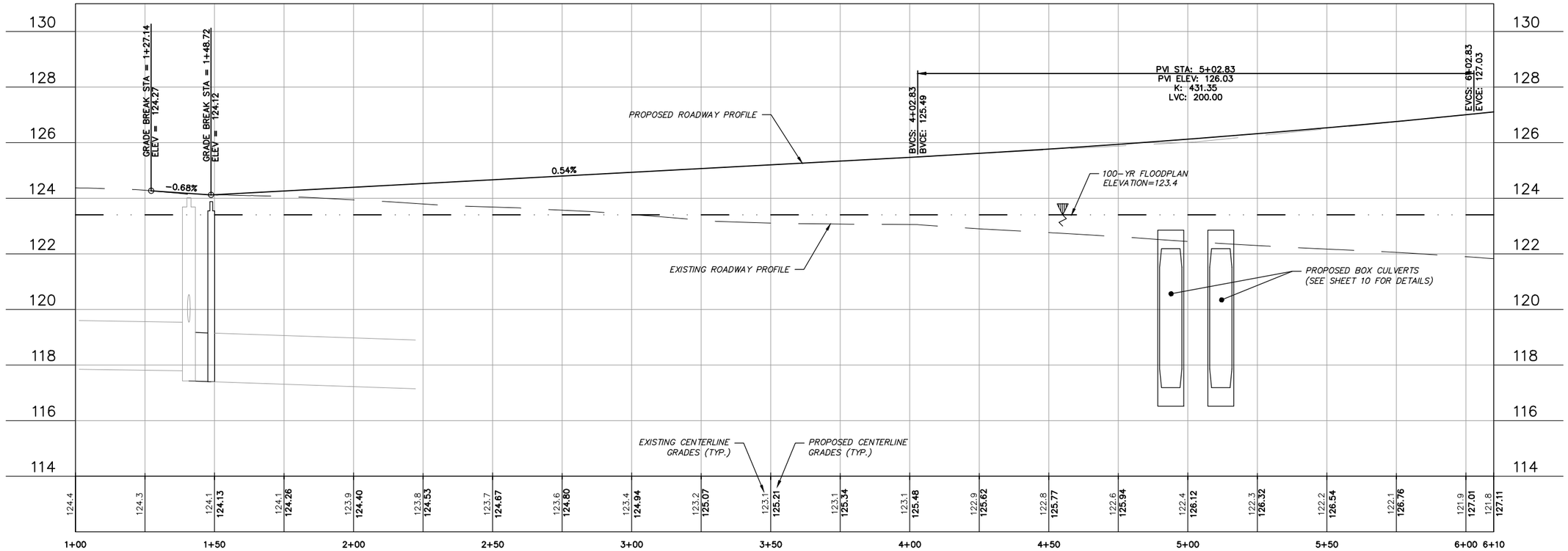
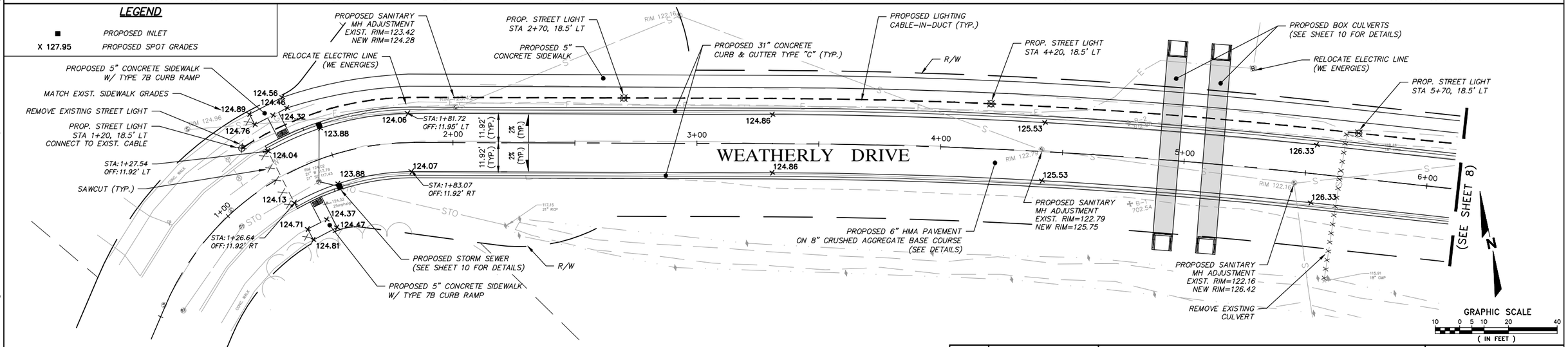


LEGEND

■ PROPOSED INLET

X 127.95 PROPOSED SPOT GRADES



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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE PLAN & PROFILE

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE		SHEET
PLAN HOR.	1"=20'	7
PROFILE HOR.	1"=20'	OF
VER.	1"=2'	28

FILE NO: 14034-5D-2778

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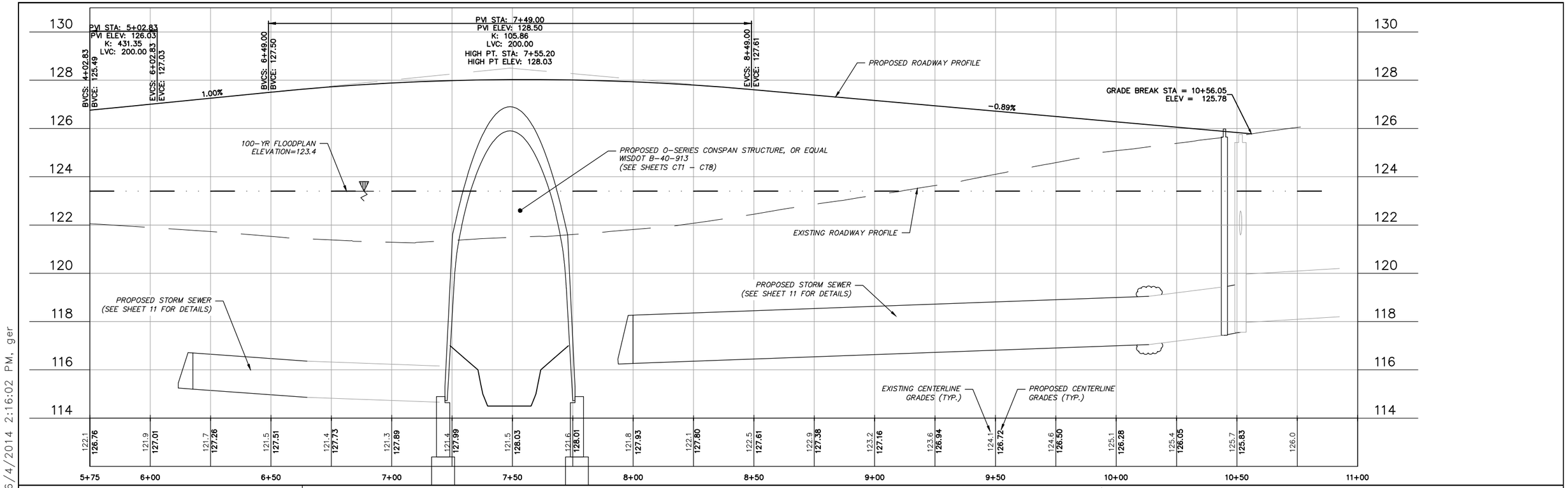
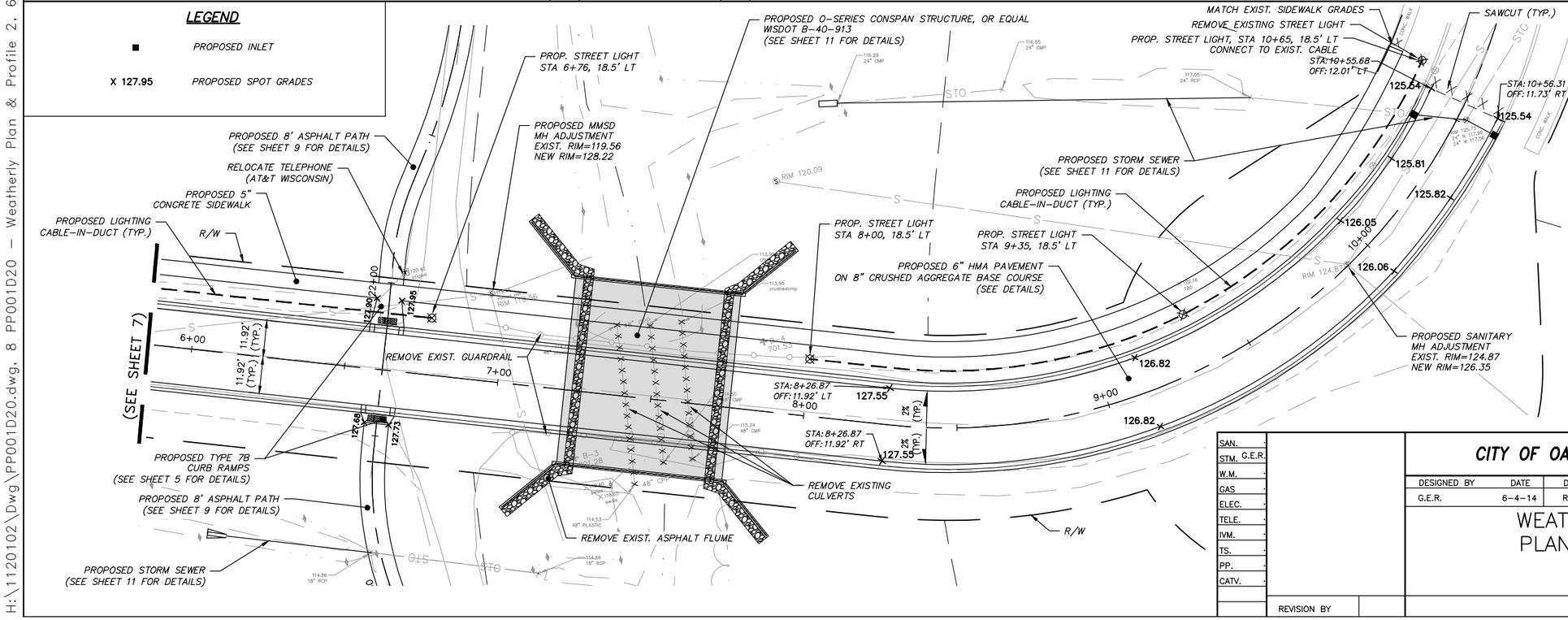


LEGEND

■ PROPOSED INLET

X 127.95 PROPOSED SPOT GRADES



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(IN FEET)

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IVM.	
TS.	
PP.	
CATV.	

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CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE PLAN & PROFILE

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR. 1"=20'	8
PROFILE HOR. 1"=20' VER. 1"=2'	OF 28

FILE NO: 14034-6D-2779

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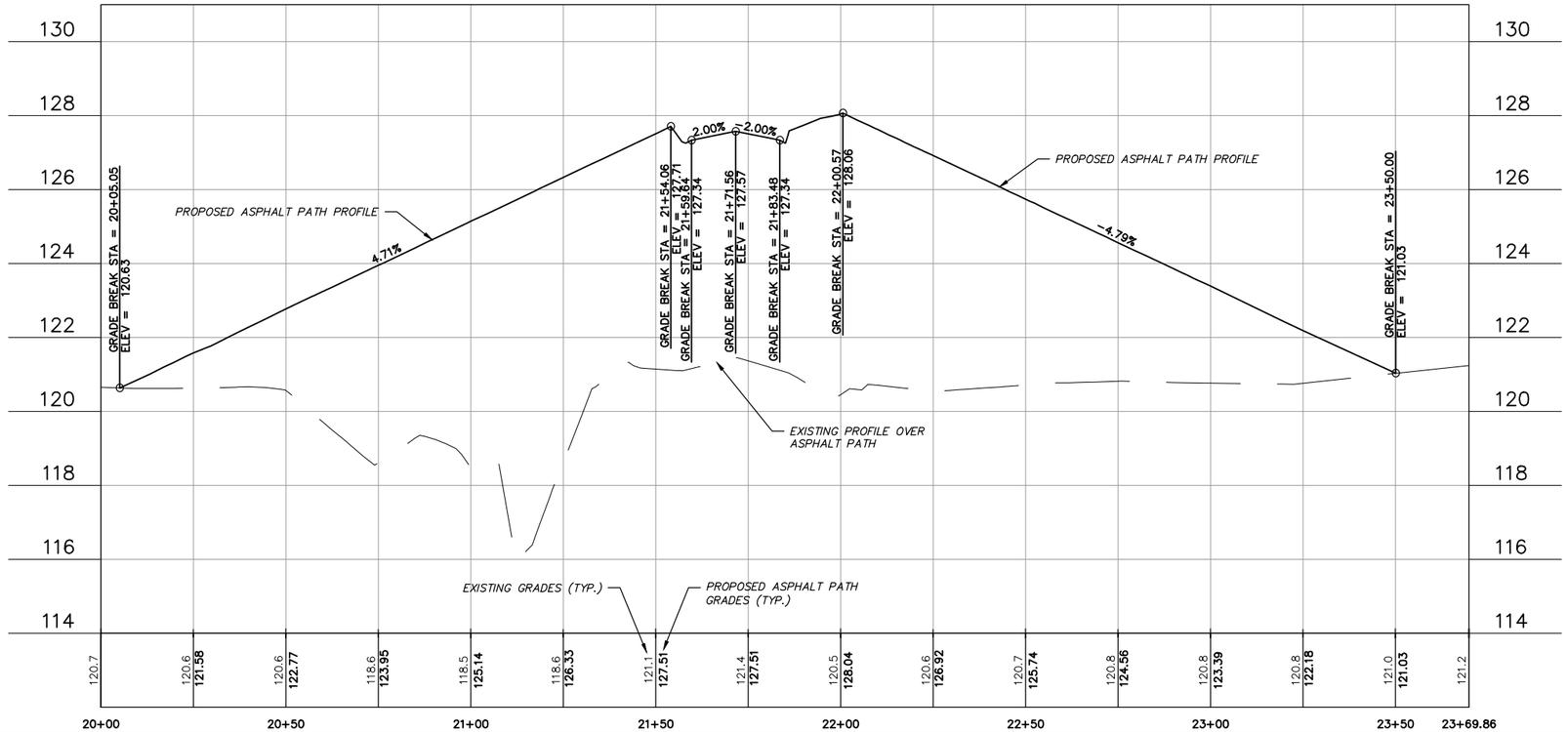
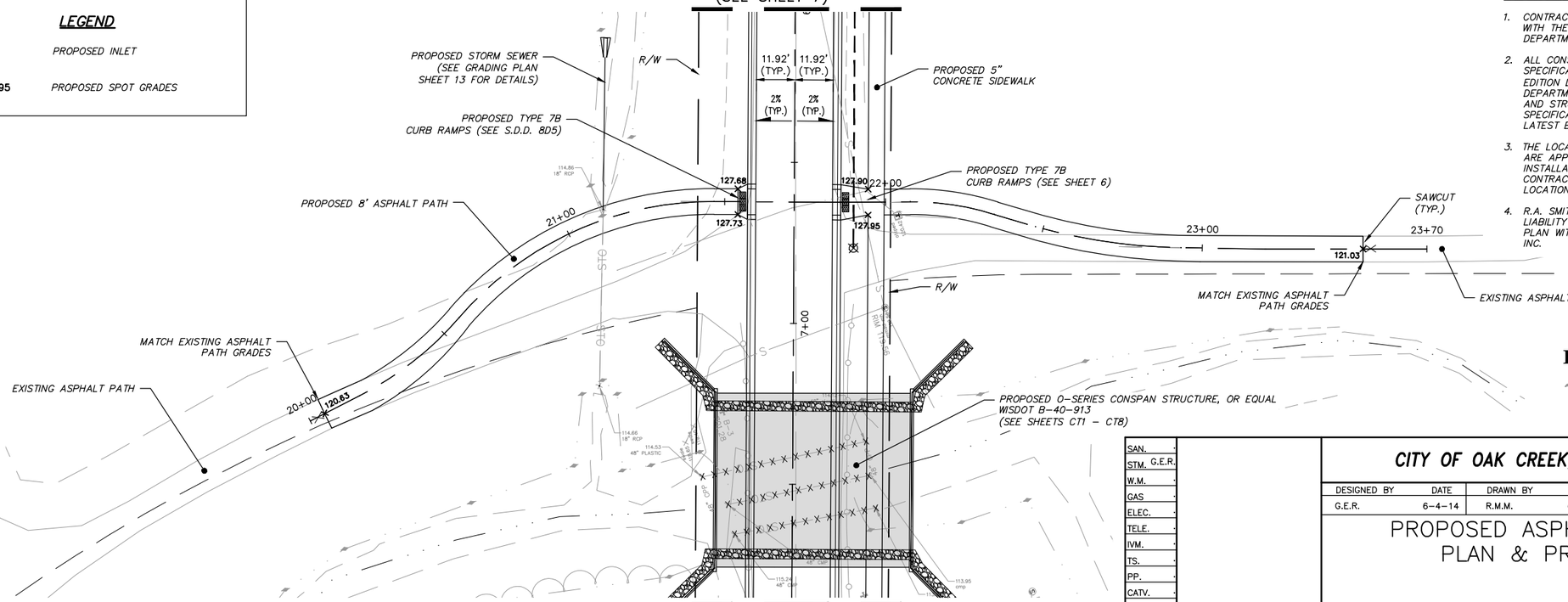


(SEE SHEET 7)

LEGEND

■ PROPOSED INLET

X 127.95 PROPOSED SPOT GRADES



(SEE SHEET 8)

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GRAPHIC SCALE
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CATV.	

REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

PROPOSED ASPHALT PATH PLAN & PROFILE

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE		SHEET
PLAN HOR.	1"=20'	9
PROFILE HOR.	1"=20'	OF
VER.	1"=2'	28

FILE NO: 14034-7D-2780

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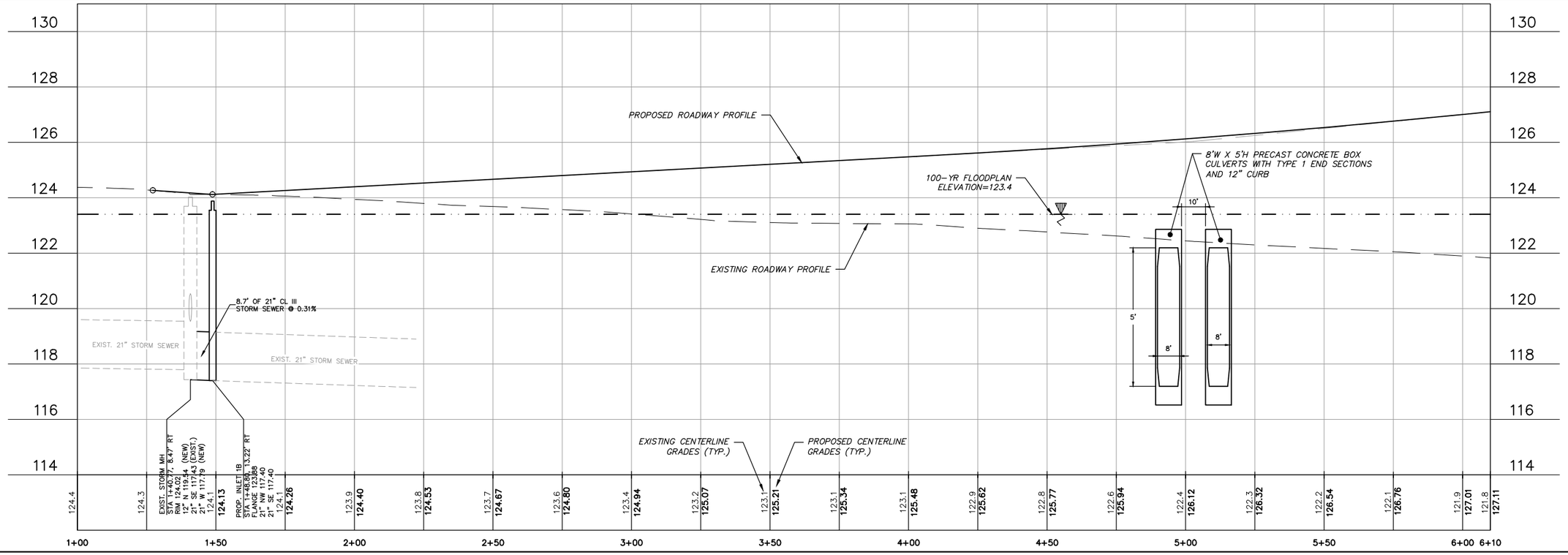
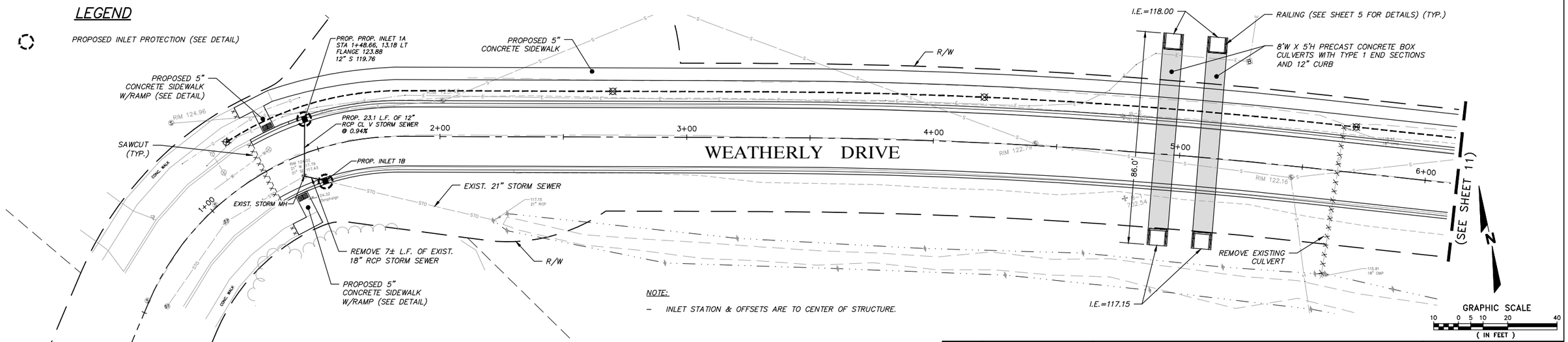


LEGEND

PROPOSED INLET PROTECTION (SEE DETAIL)



NOTE:

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CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE STORM SEWER PLAN & PROFILE

APPROVED BY
UTILITY ENGINEER DATE
APPROVED BY
CITY ENGINEER DATE 9/17/14

SCALE		SHEET
PLAN HOR.	1"=20'	10
PROFILE HOR.	1"=20'	OF
VER.	1"=2'	28

FILE NO: 14034-3B-2518

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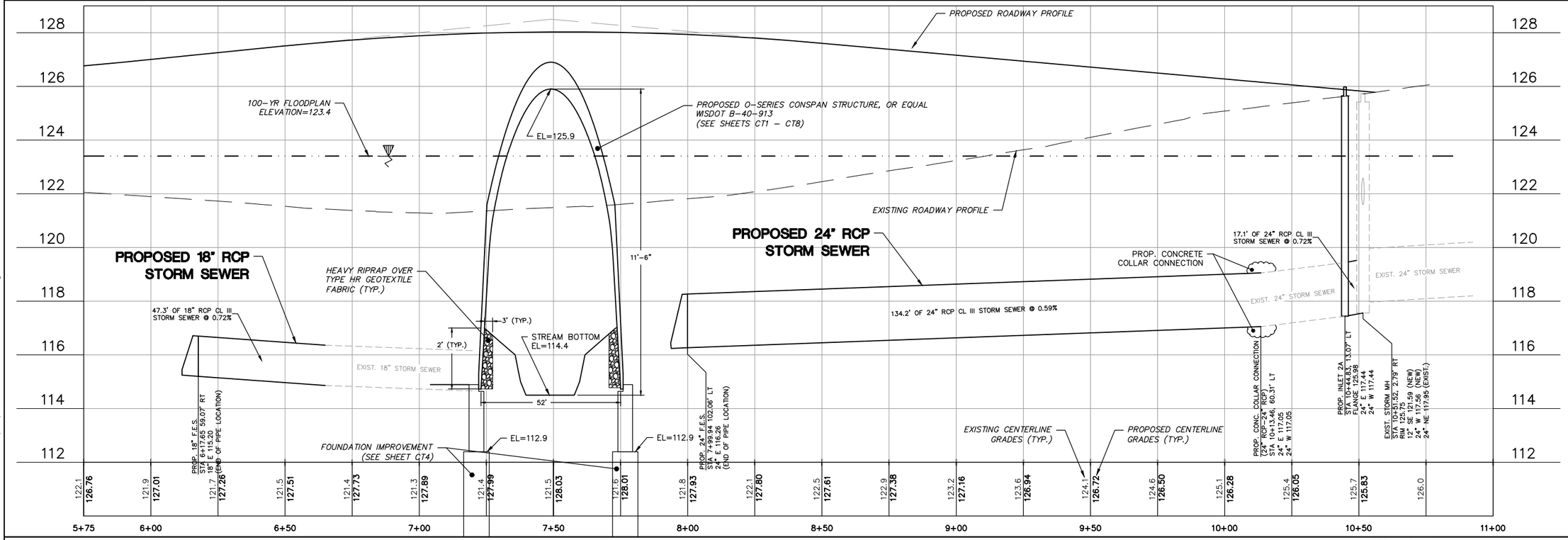
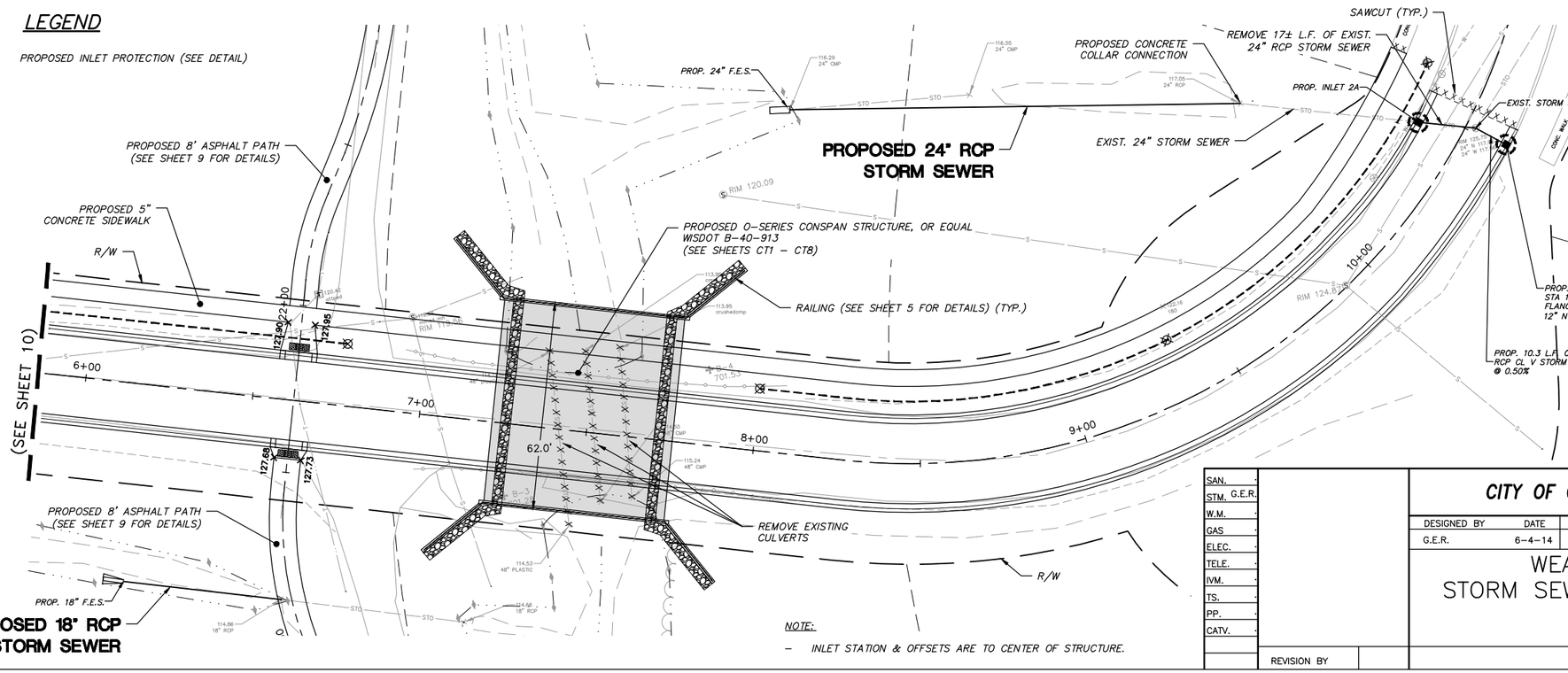


LEGEND

PROPOSED INLET PROTECTION (SEE DETAIL)



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N

GRAPHIC SCALE
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(IN FEET)

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE STORM SEWER PLAN & PROFILE

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE		SHEET
PLAN HOR.	1"=20'	11
PROFILE HOR.	1"=20'	OF
VER.	1"=2'	28

FILE NO: 14034-4B-2519

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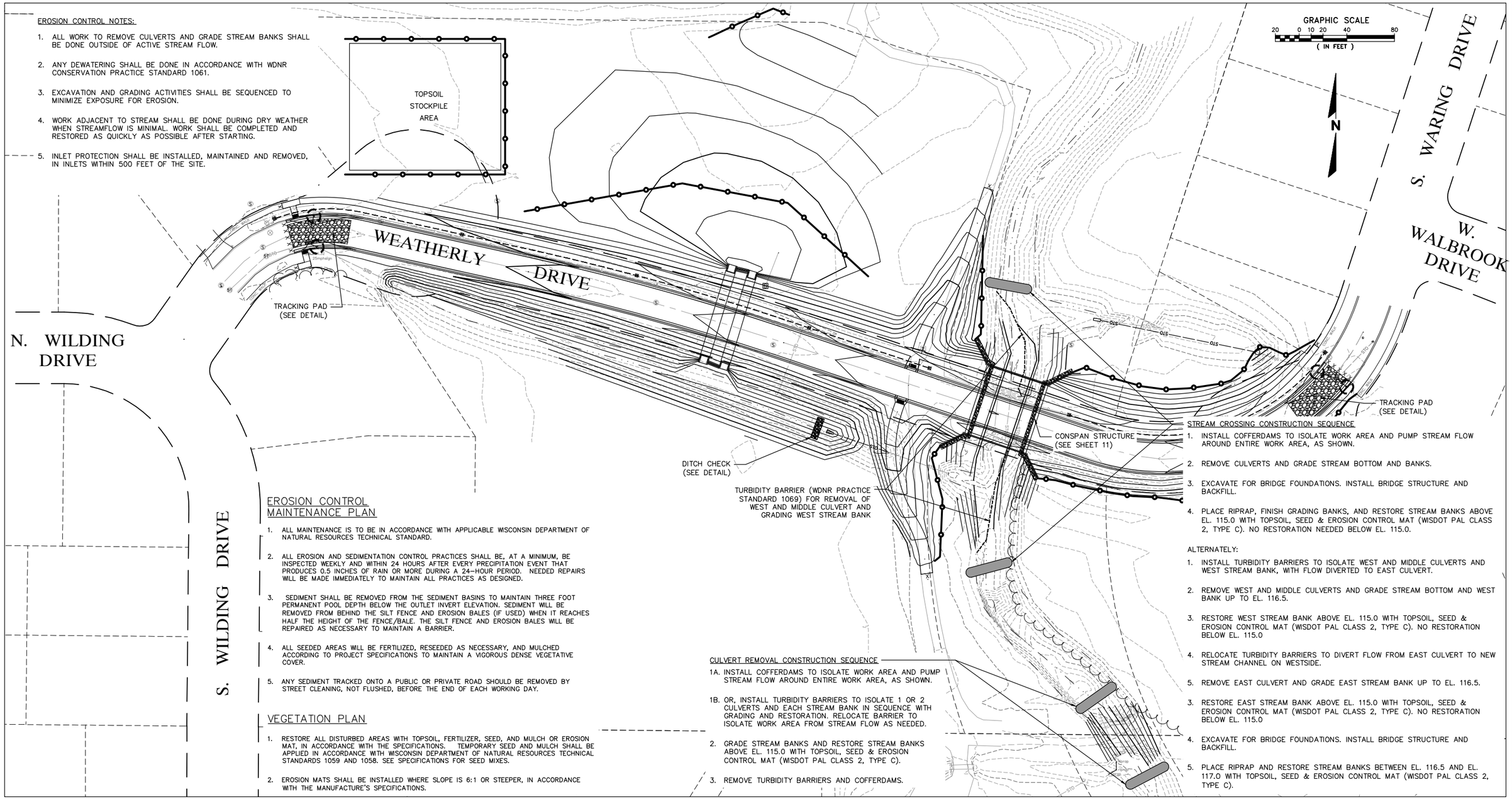
EROSION CONTROL NOTES:

1. ALL WORK TO REMOVE CULVERTS AND GRADE STREAM BANKS SHALL BE DONE OUTSIDE OF ACTIVE STREAM FLOW.
2. ANY DEWATERING SHALL BE DONE IN ACCORDANCE WITH WDNR CONSERVATION PRACTICE STANDARD 1061.
3. EXCAVATION AND GRADING ACTIVITIES SHALL BE SEQUENCED TO MINIMIZE EXPOSURE FOR EROSION.
4. WORK ADJACENT TO STREAM SHALL BE DONE DURING DRY WEATHER WHEN STREAMFLOW IS MINIMAL. WORK SHALL BE COMPLETED AND RESTORED AS QUICKLY AS POSSIBLE AFTER STARTING.
5. INLET PROTECTION SHALL BE INSTALLED, MAINTAINED AND REMOVED, IN INLETS WITHIN 500 FEET OF THE SITE.



EROSION CONTROL MAINTENANCE PLAN

1. ALL MAINTENANCE IS TO BE IN ACCORDANCE WITH APPLICABLE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARD.
2. ALL EROSION AND SEDIMENTATION CONTROL PRACTICES SHALL BE, AT A MINIMUM, BE INSPECTED WEEKLY AND WITHIN 24 HOURS AFTER EVERY PRECIPITATION EVENT THAT PRODUCES 0.5 INCHES OF RAIN OR MORE DURING A 24-HOUR PERIOD. NEEDED REPAIRS WILL BE MADE IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.
3. SEDIMENT SHALL BE REMOVED FROM THE SEDIMENT BASINS TO MAINTAIN THREE FOOT PERMANENT POOL DEPTH BELOW THE OUTLET INVERT ELEVATION. SEDIMENT WILL BE REMOVED FROM BEHIND THE SILT FENCE AND EROSION BALES (IF USED) WHEN IT REACHES HALF THE HEIGHT OF THE FENCE/BALE. THE SILT FENCE AND EROSION BALES WILL BE REPAIRED AS NECESSARY TO MAINTAIN A BARRIER.
4. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED ACCORDING TO PROJECT SPECIFICATIONS TO MAINTAIN A VIGOROUS DENSE VEGETATIVE COVER.
5. ANY SEDIMENT TRACKED ONTO A PUBLIC OR PRIVATE ROAD SHOULD BE REMOVED BY STREET CLEANING, NOT FLUSHED, BEFORE THE END OF EACH WORKING DAY.

VEGETATION PLAN

1. RESTORE ALL DISTURBED AREAS WITH TOPSOIL, FERTILIZER, SEED, AND MULCH OR EROSION MAT, IN ACCORDANCE WITH THE SPECIFICATIONS. TEMPORARY SEED AND MULCH SHALL BE APPLIED IN ACCORDANCE WITH WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS 1059 AND 1058. SEE SPECIFICATIONS FOR SEED MIXES.
2. EROSION MATS SHALL BE INSTALLED WHERE SLOPE IS 6:1 OR STEEPER, IN ACCORDANCE WITH THE MANUFACTURE'S SPECIFICATIONS.

CULVERT REMOVAL CONSTRUCTION SEQUENCE

1A. INSTALL COFFERDAMS TO ISOLATE WORK AREA AND PUMP STREAM FLOW AROUND ENTIRE WORK AREA, AS SHOWN.

1B. OR, INSTALL TURBIDITY BARRIERS TO ISOLATE 1 OR 2 CULVERTS AND EACH STREAM BANK IN SEQUENCE WITH GRADING AND RESTORATION. RELOCATE BARRIER TO ISOLATE WORK AREA FROM STREAM FLOW AS NEEDED.

2. GRADE STREAM BANKS AND RESTORE STREAM BANKS ABOVE EL. 115.0 WITH TOPSOIL, SEED & EROSION CONTROL MAT (WISDOT PAL CLASS 2, TYPE C).
3. REMOVE TURBIDITY BARRIERS AND COFFERDAMS.

STREAM CROSSING CONSTRUCTION SEQUENCE

1. INSTALL COFFERDAMS TO ISOLATE WORK AREA AND PUMP STREAM FLOW AROUND ENTIRE WORK AREA, AS SHOWN.
2. REMOVE CULVERTS AND GRADE STREAM BOTTOM AND BANKS.
3. EXCAVATE FOR BRIDGE FOUNDATIONS. INSTALL BRIDGE STRUCTURE AND BACKFILL.
4. PLACE RIPRAP, FINISH GRADING BANKS, AND RESTORE STREAM BANKS ABOVE EL. 115.0 WITH TOPSOIL, SEED & EROSION CONTROL MAT (WISDOT PAL CLASS 2, TYPE C). NO RESTORATION NEEDED BELOW EL. 115.0.

ALTERNATELY:

1. INSTALL TURBIDITY BARRIERS TO ISOLATE WEST AND MIDDLE CULVERTS AND WEST STREAM BANK, WITH FLOW DIVERTED TO EAST CULVERT.
2. REMOVE WEST AND MIDDLE CULVERTS AND GRADE STREAM BOTTOM AND WEST BANK UP TO EL. 116.5.
3. RESTORE WEST STREAM BANK ABOVE EL. 115.0 WITH TOPSOIL, SEED & EROSION CONTROL MAT (WISDOT PAL CLASS 2, TYPE C). NO RESTORATION BELOW EL. 115.0
4. RELOCATE TURBIDITY BARRIERS TO DIVERT FLOW FROM EAST CULVERT TO NEW STREAM CHANNEL ON WESTSIDE.
5. REMOVE EAST CULVERT AND GRADE EAST STREAM BANK UP TO EL. 116.5.
3. RESTORE EAST STREAM BANK ABOVE EL. 115.0 WITH TOPSOIL, SEED & EROSION CONTROL MAT (WISDOT PAL CLASS 2, TYPE C). NO RESTORATION BELOW EL. 115.0
4. EXCAVATE FOR BRIDGE FOUNDATIONS. INSTALL BRIDGE STRUCTURE AND BACKFILL.
5. PLACE RIPRAP AND RESTORE STREAM BANKS BETWEEN EL. 116.5 AND EL. 117.0 WITH TOPSOIL, SEED & EROSION CONTROL MAT (WISDOT PAL CLASS 2, TYPE C).

LEGEND

- PROPOSED INLET PROTECTION (SEE DETAIL)
- PROPOSED SILT FENCE (SEE DETAIL)
- PROPOSED TRACKING PAD (SEE DETAIL)

GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE EROSION CONTROL FACILITIES IN ACCORDANCE WITH THE MUNICIPALITY EROSION CONTROL ORDINANCE AND THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN, SIXTH EDITION DATED: DECEMBER 22, 2003, w/ ADDENDA NOS. 1 & 2, WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, 2013 EDITION WITH SUPPLEMENTAL SPECIFICATIONS, LATEST EDITION, AND THE WISCONSIN ADMINISTRATIVE CODE, LATEST EDITION.
3. THE LOCATIONS OF EXISTING UTILITY INSTALLATIONS AS SHOWN ON THIS PLAN ARE APPROXIMATE. THERE MAY BE OTHER UNDERGROUND UTILITY INSTALLATIONS WITHIN THE PROJECT AREA THAT ARE NOT SHOWN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE EXISTENCE AND LOCATION OF ALL UNDERGROUND UTILITIES.
4. R.A. SMITH NATIONAL, INC. ASSUMES NO RESPONSIBILITY FOR DAMAGES, LIABILITY OR COSTS RESULTING FROM CHANGES OR ALTERATIONS MADE TO THIS PLAN WITHOUT THE EXPRESSED WRITTEN CONSENT OF R.A. SMITH NATIONAL, INC.

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IVM.	
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PP.	
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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE EROSION CONTROL PLAN

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Sinnen 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR. 1"=40'	12
PROFILE HOR. ____	OF
VER. ____	28

FILE NO: 14034-5B-2520

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GRADING NOTES:

1. CONTRACTOR SHALL SEQUENCE GRADING ACTIVITIES TO MINIMIZE EROSION POTENTIAL.
2. CLEARED BRUSH AND TREES SHALL BE REMOVED FROM SITE AND DISPOSED OF PROPERLY.
3. ALL STUMPS SHALL BE GRUBBED AT LEAST 6" BELOW FINAL GRADE.
4. ALL DISTURBED AREAS TO BE RESTORED WITH 4" MIN. TOPSOIL, SEED (WDOT MIX NO. 10), FERTILIZER & MULCH OR MULCH BLANKET.
5. EROSION CONTROL MAT (WDOT PAL: CLASS I, TYPE B) SHALL BE USED ON AREAS WITH SLOPES STEEPER THAN 6:1.
6. CONTRACTOR SHALL PROVIDE EROSION CONTROL FACILITIES IN ACCORDANCE WITH THE CITY OF OAK CREEK EROSION CONTROL ORDINANCE, THE WISCONSIN DNR STORMWATER CONSTRUCTION TECHNICAL STANDARDS, PERMIT CONDITIONS, AND THESE DOCUMENTS. THE MOST STRINGENT TO APPLY.
7. CONTRACTOR SHALL ASSUME SOLE RESPONSIBILITY FOR THE COMPUTATIONS OF ALL GRADING QUANTITIES AND FOR THE ACTUAL LAND BALANCE, INCLUDING UTILITY TRENCH SPOIL. CONTRACTOR SHALL IMPORT OR EXPORT MATERIAL AS NECESSARY TO COMPLETE THE PROJECT.

GENERAL NOTES:

1. CONTRACTOR SHALL PROVIDE EROSION CONTROL FACILITIES IN ACCORDANCE WITH THE MUNICIPALITY EROSION CONTROL ORDINANCE AND THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES TECHNICAL STANDARDS.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN, SIXTH EDITION DATED: DECEMBER 22, 2003, w/ ADDENDA NOS. 1 & 2, WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION, 2013 EDITION WITH SUPPLEMENTAL SPECIFICATIONS, LATEST EDITION, AND THE WISCONSIN ADMINISTRATIVE CODE, LATEST EDITION.
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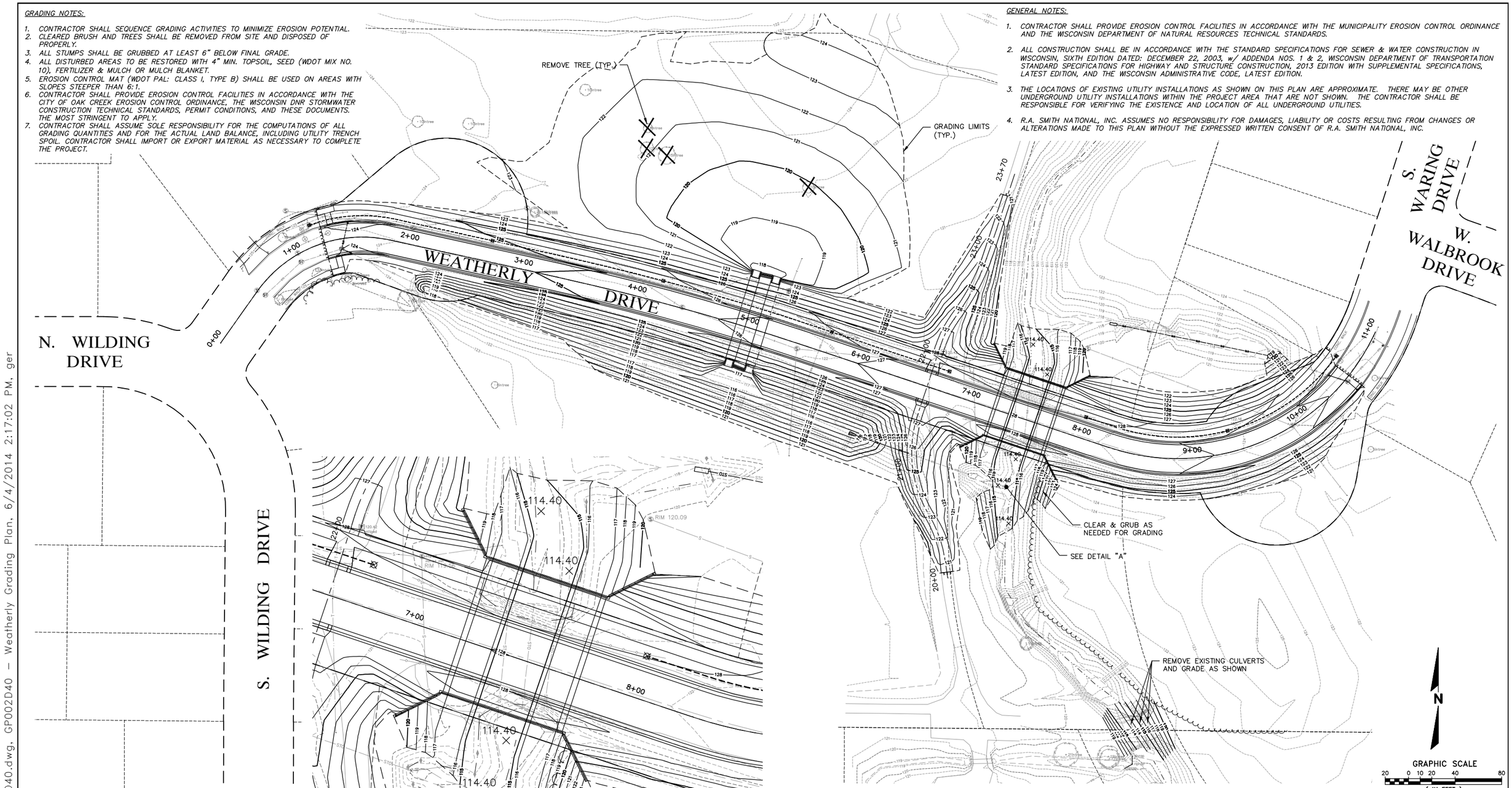

DETAIL "A"
SCALE = 1"=20'

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REVISION BY	

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE
GRADING PLAN

APPROVED BY
UTILITY ENGINEER DATE
APPROVED BY
Michael C Simons 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR. 1"=40'	13
PROFILE HOR.	OF
VER.	28

FILE NO: 14034-6B-2521

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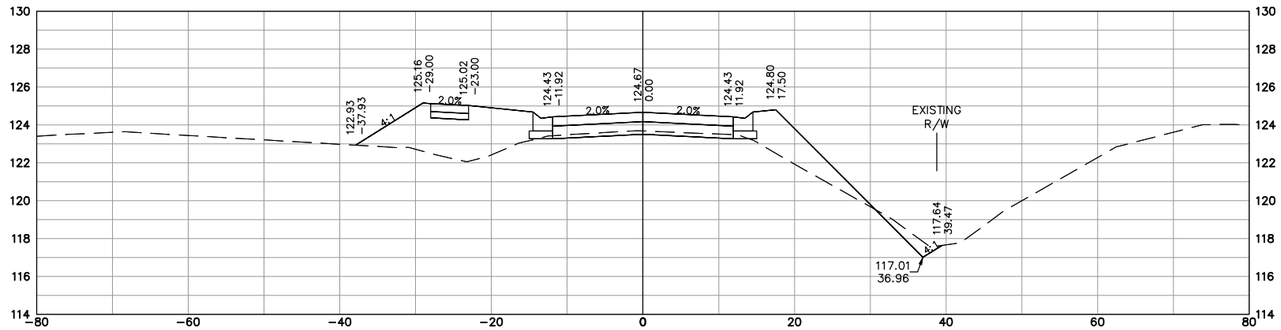

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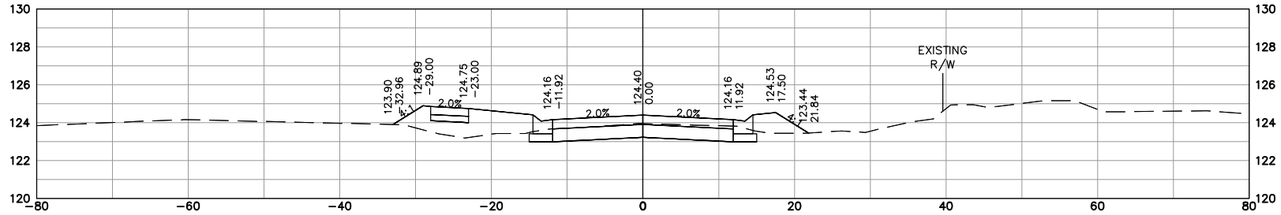

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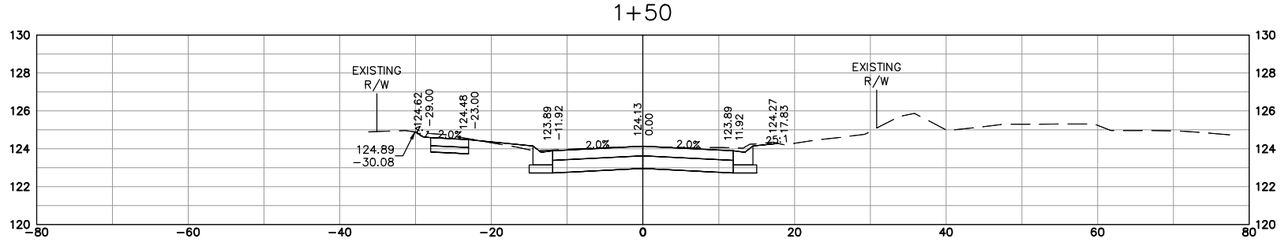

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE
CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR.	14
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO: 14034-8D-2781

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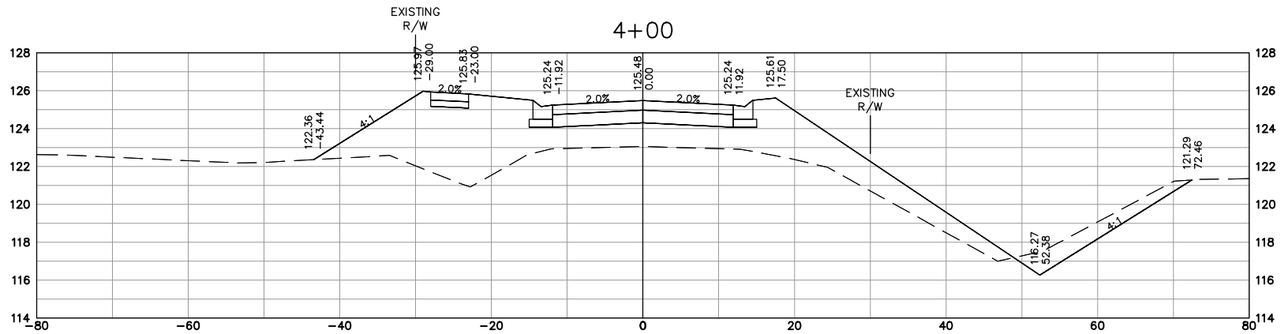

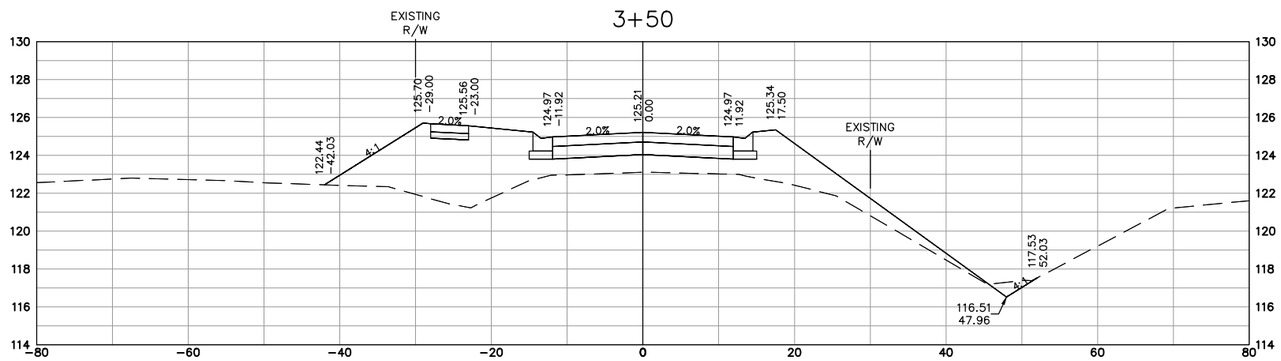

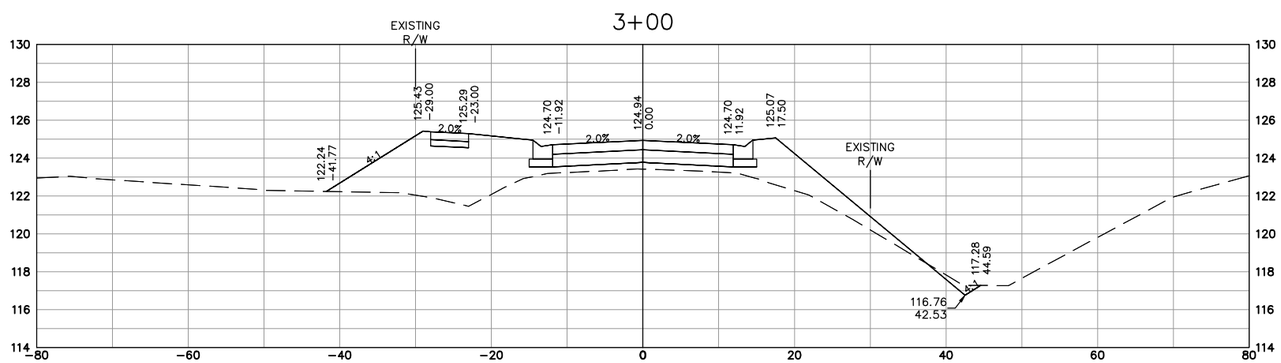

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DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER DATE
APPROVED BY
CITY ENGINEER DATE 9/17/14

SCALE	SHEET
PLAN HOR.	15
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO: 14034-9D-2782

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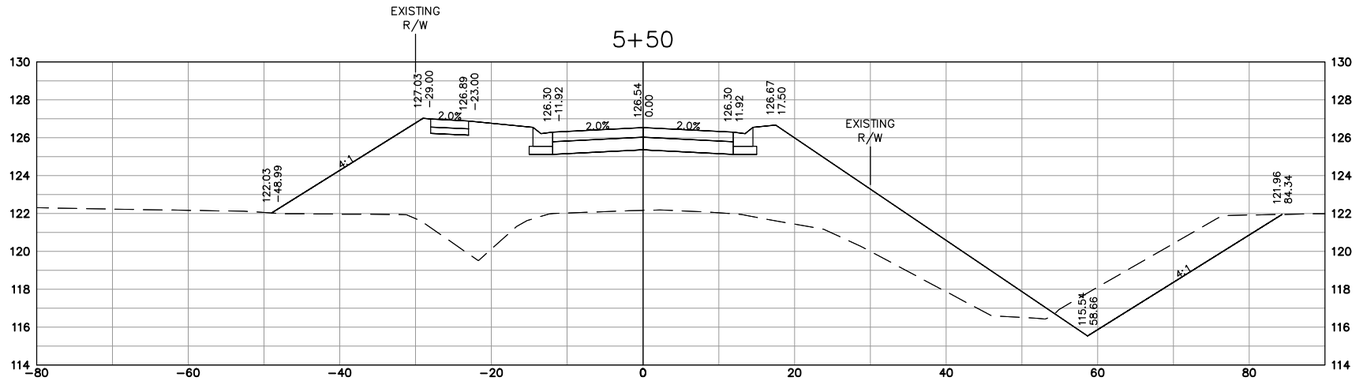

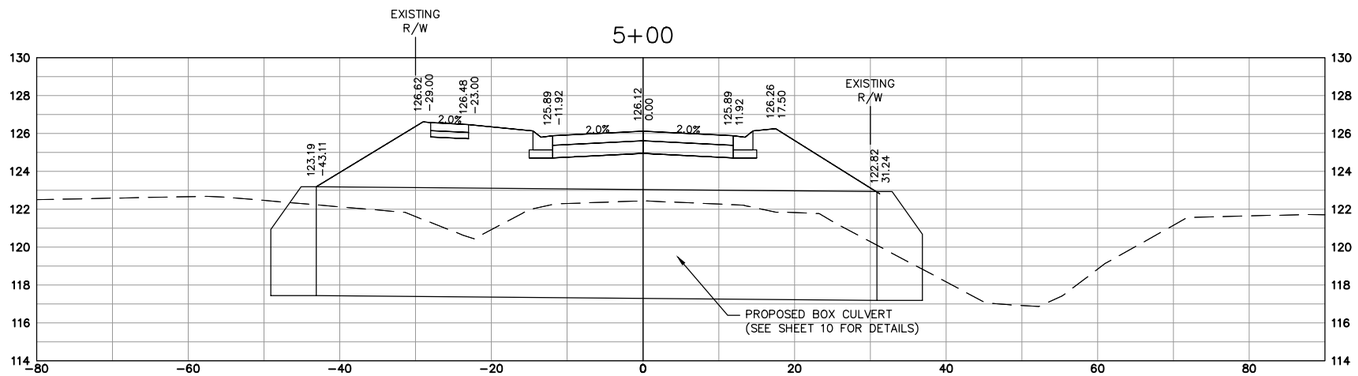

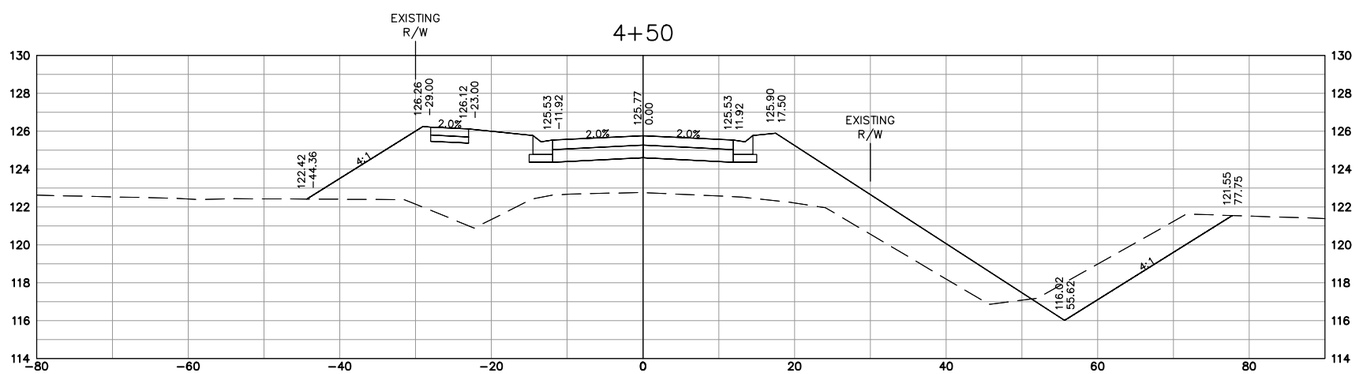

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CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER DATE
APPROVED BY
CITY ENGINEER DATE 9/17/14

SCALE	SHEET
PLAN HOR.	16
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO:14034-10D-2783

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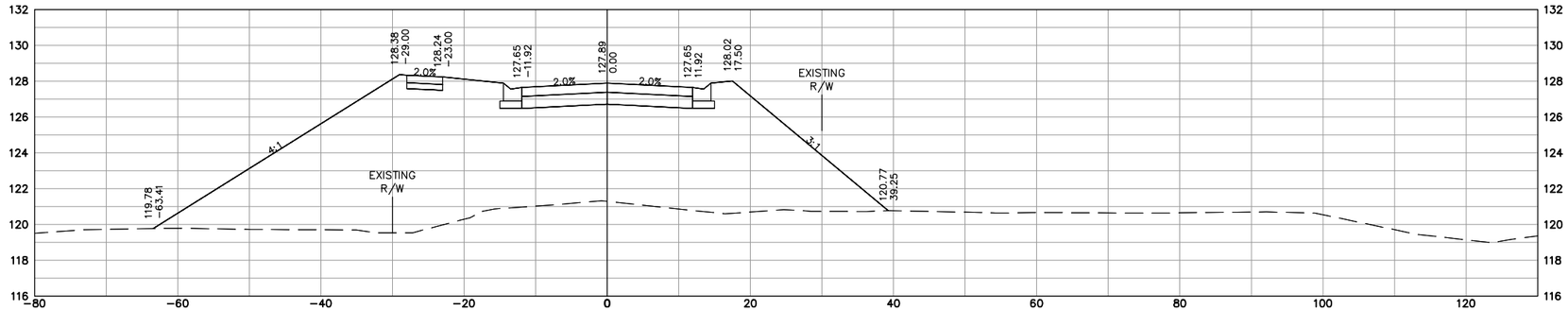

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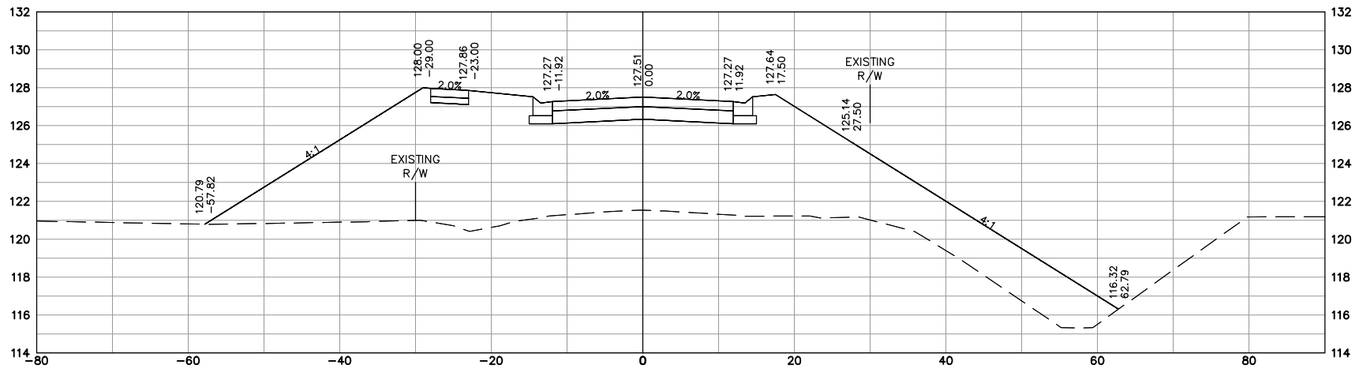

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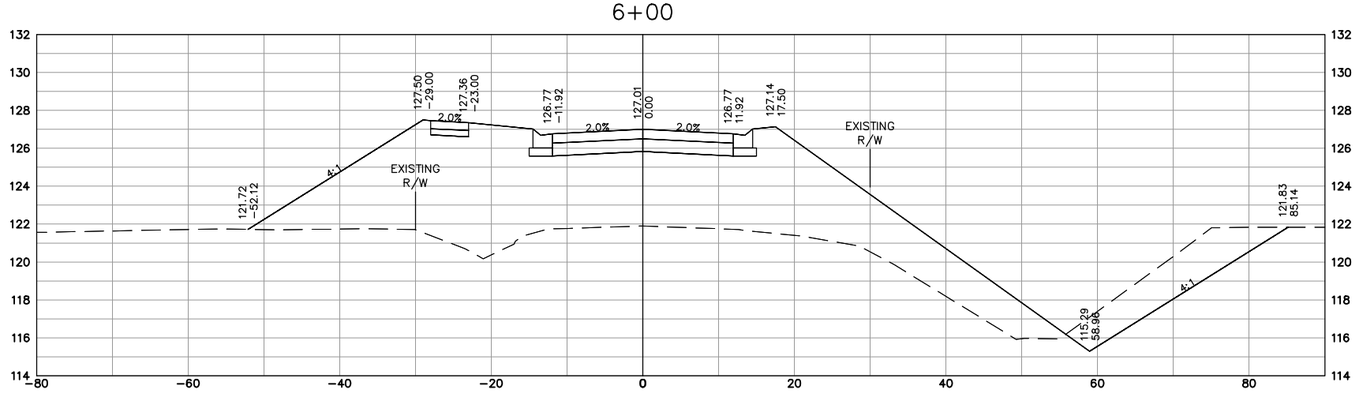

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE
CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER — DATE

APPROVED BY
Michael C. Simons — 9/17/14
CITY ENGINEER — DATE

SCALE	SHEET
PLAN HOR.	17
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO:14034-11D-2784

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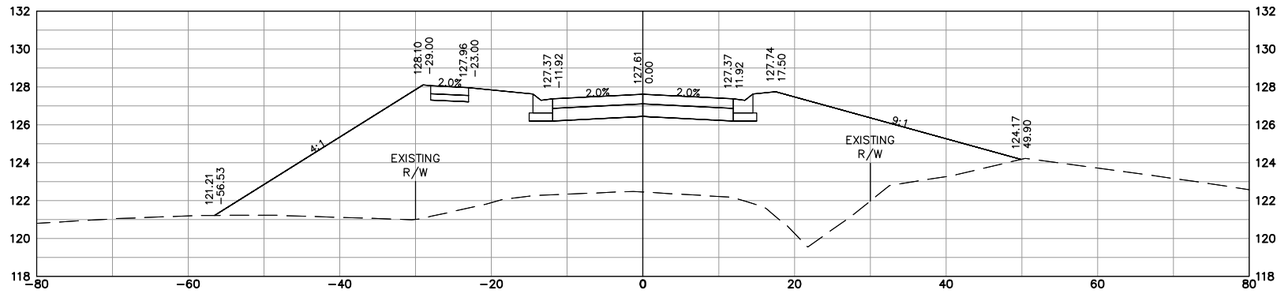

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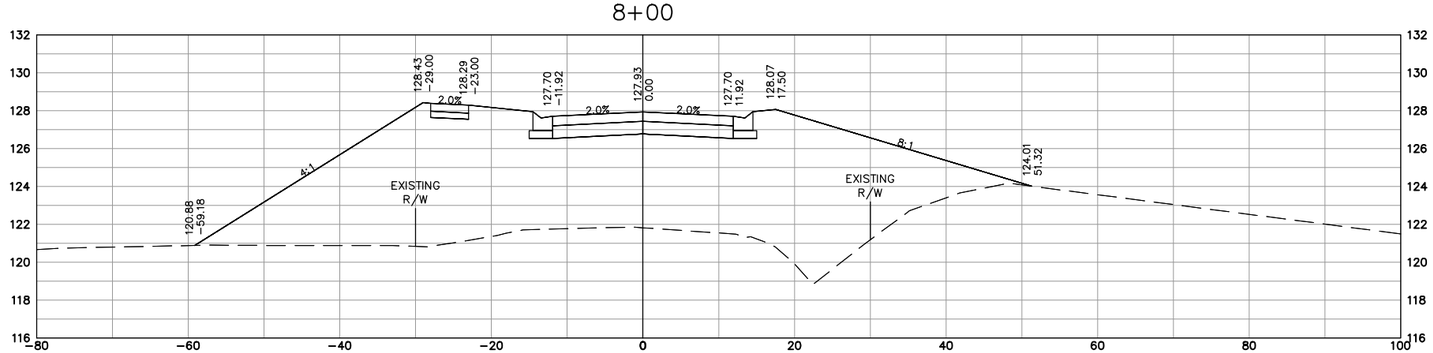

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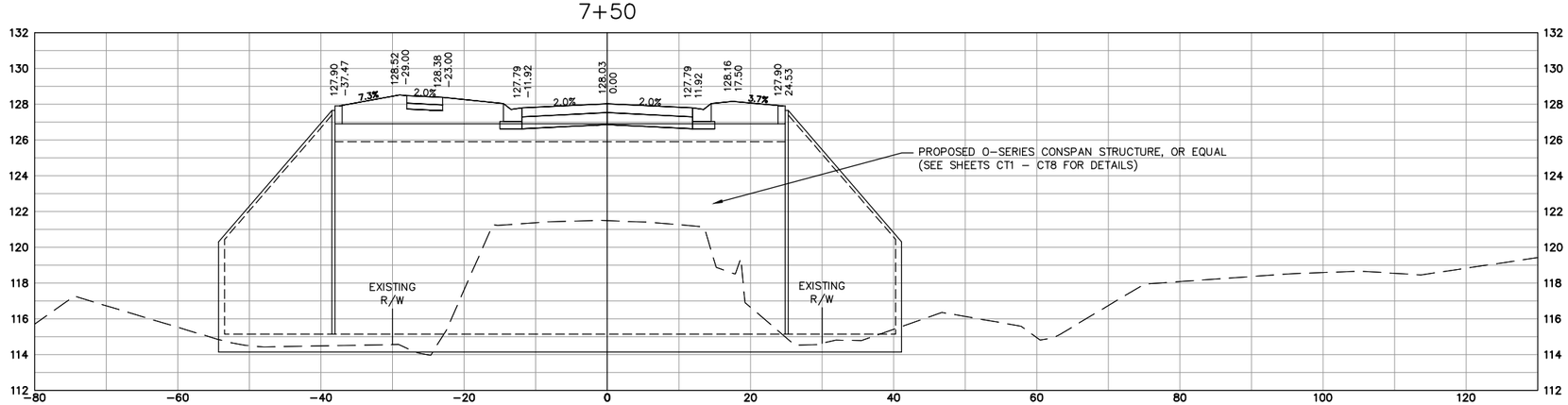

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REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE
CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR.	18
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO:14034-12D-2785

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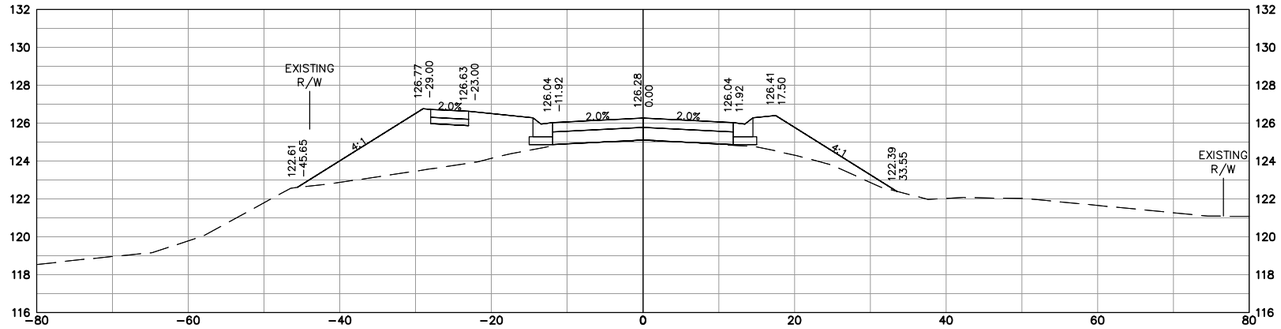

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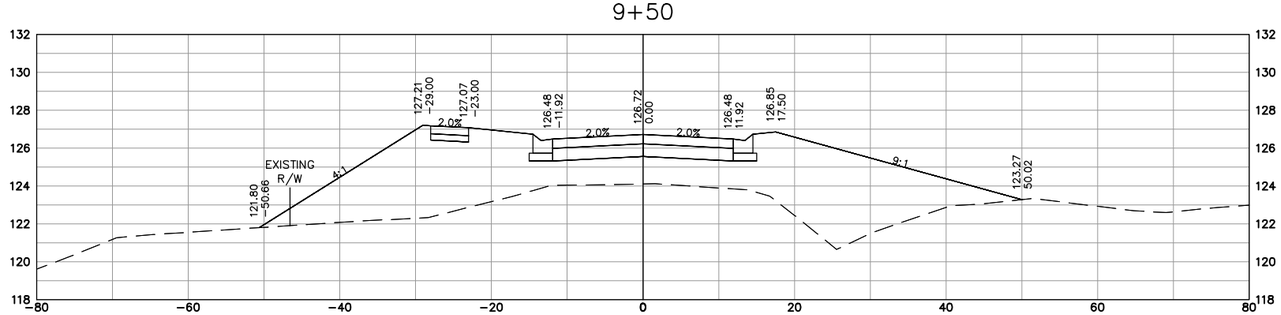

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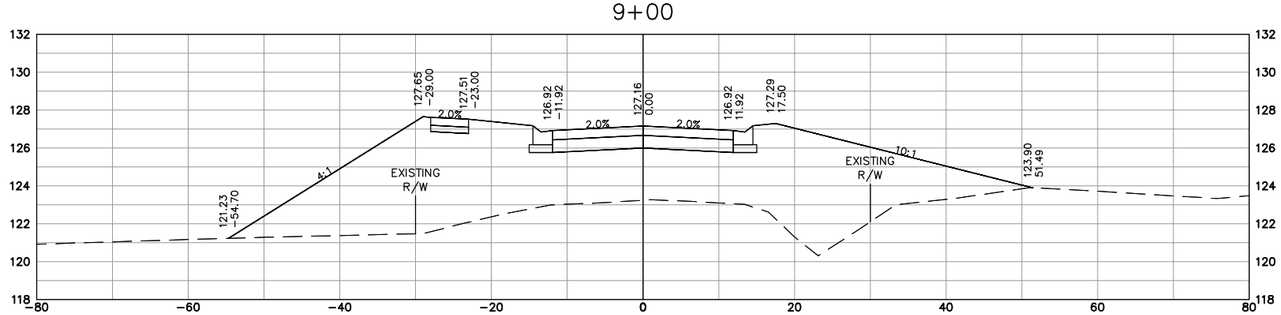

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262-781-1000 Fax 262-781-8466
www.rasmithnational.com

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STM.	G.E.R.
W.M.	
GAS	
ELEC.	
TELE.	
IVM.	
TS.	
PP.	
CATV.	

REVISION BY

CITY OF OAK CREEK, WISCONSIN

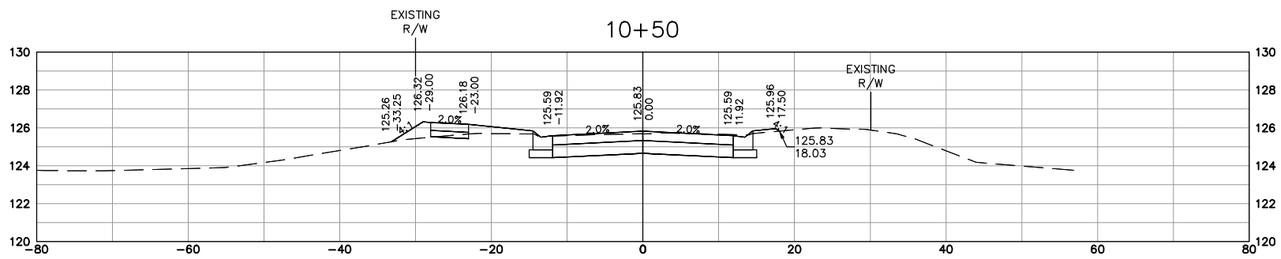
DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER DATE
APPROVED BY
CITY ENGINEER DATE 9/17/14

SCALE	SHEET
PLAN HOR.	19
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO:14034-13D-2786



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CATV.	

REVISION BY

CITY OF OAK CREEK, WISCONSIN

DESIGNED BY	DATE	DRAWN BY	DATE	CHECKED BY	DATE
G.E.R.	6-4-14	R.M.M.	6-4-14	G.E.R.	6-4-14

WEATHERLY DRIVE
CROSS SECTIONS

APPROVED BY
UTILITY ENGINEER DATE

APPROVED BY
Michael C. Simons 9/17/14
CITY ENGINEER DATE

SCALE	SHEET
PLAN HOR.	20
PROFILE HOR. 1"=10' VER. 1"=4'	OF 28

FILE NO:14034-14D-2787

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OAK CREEK ENGINEERING DIVISION
SHOP DRAWING REVIEW

☒ APPROVED PJB 9/11/14
☐ APPROVED AS NOTED
☐ NOT APPROVED
☐ REVISE & RESUBMIT

WEATHERLY DRIVE

OAK CREEK, WISCONSIN

NOTES

GENERAL NOTES:

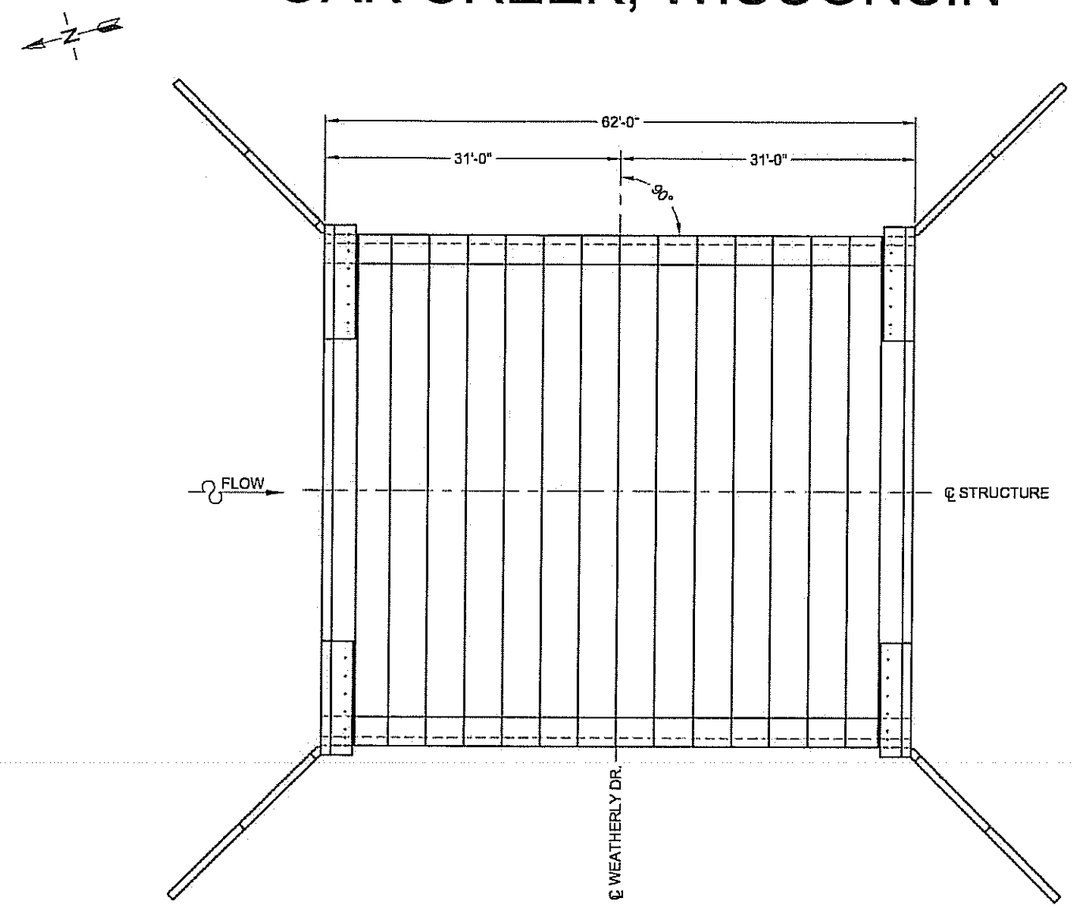
1. THIS BRIDGE HAS BEEN DESIGNED FOR GENERAL SITE CONDITIONS. THE PROJECT ENGINEER SHALL BE RESPONSIBLE FOR THE STRUCTURE'S SUITABILITY TO THE EXISTING SITE CONDITIONS AND FOR THE HYDRAULIC EVALUATION – INCLUDING SCOUR AND CONFIRMATION OF SOIL CONDITIONS.
2. PRIOR TO CONSTRUCTION, CONTRACTOR MUST VERIFY ALL ELEVATIONS SHOWN THROUGH THE ENGINEER.
3. ONLY CONTECH ENGINEERED SOLUTIONS LLC, THE CON/SPAN® APPROVED PRECASTER IN WISCONSIN MAY PROVIDE THE STRUCTURE DESIGNED IN ACCORDANCE WITH THESE PLANS.
4. THE USE OF ANOTHER PRECAST STRUCTURE WITH THE DESIGN ASSUMPTIONS USED FOR THE CON/SPAN® STRUCTURE MAY LEAD TO SERIOUS DESIGN ERRORS. USE OF ANY OTHER PRECAST STRUCTURE WITH THIS DESIGN AND DRAWINGS VOIDS ANY CERTIFICATION OF THIS DESIGN AND WARRANTY. CONTECH ENGINEERED SOLUTIONS, LLC ASSUMES NO LIABILITY FOR DESIGN OF ANY ALTERNATE OR SIMILAR TYPE STRUCTURES.
5. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT DRAWINGS AND CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF WISCONSIN, EMPLOYED BY THE PRECAST CONCRETE BRIDGE SUPPLIER, ARE SUBMITTED TO THE ENGINEER 2 WEEKS PRIOR TO THE BID DATE FOR REVIEW AND APPROVAL.
6. ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE ALTERNATE DESIGN DOES NOT REDUCE THE HYDRAULIC OPENING OF THE STRUCTURE AS SHOWN ON THE DRAWINGS. AT A MINIMUM THE ALTERNATE STRUCTURE MUST PROVIDE THE SAME OR LARGER SPAN AND RISE AS THE STRUCTURE SHOWN ON THE DRAWINGS.
7. THE PRECAST ARCH SUPPLIER MUST ATTEND THE PRE-BID MEETING, IF ONE IS HELD.
8. SUPPLIER OF PROPOSED ALTERNATES TO A CON/SPAN® BRIDGE SYSTEM MUST SUBMIT AT LEAST TWO (2) INDEPENDENTLY VERIFIED FULL SCALE LOAD TESTS THAT CONFIRM THE PROPOSED DESIGN METHODOLOGY OF THE THREE SIDED/ARCH STRUCTURE(S). THE PROPOSED ALTERNATE, UPON SATISFACTORY CONFIRMATION OF DESIGN METHODOLOGY, MAY BE CONSIDERED AN ACCEPTABLE ALTERNATE.
9. PROPOSED ALTERNATE STRUCTURES MAY BE CONSIDERED, PROVIDED THAT THE PRECAST CONCRETE BRIDGE STRUCTURES ARE PROVIDED BY A SUPPLIER THAT HAS A MINIMUM OF TWO (2) REGISTERED PROFESSIONAL ENGINEERS ON STAFF THAT ARE DEDICATED TO THE DESIGN OF THESE TYPES OF STRUCTURES. SUPPLIER MUST PROVIDE THESE NAMES, P.E. LICENSE NUMBERS AND DATES OF HIRE AT TIME OF ALTERNATE SUBMITTAL.

DESIGN DATA

DESIGN LOADING:
BRIDGE UNITS: HL-93
HEADWALLS: EARTH PRESSURE ONLY
WINGWALLS: EARTH PRESSURE ONLY
DESIGN FILL HEIGHT: 1'-0" MIN. TO 1'-6" MAX.
FROM TOP OF CROWN TO TOP OF PAVEMENT.
DESIGN METHOD: LOAD RESISTANCE FACTOR DESIGN PER AASHTO LRFD SPECIFICATION
GROSS ALLOWABLE SOIL BEARING PRESSURE: 6250 PSF * + 4'-0" OVERBURDEN
*FOUNDATION EXCAVATION AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH THE GILES ENGINEERS REPORT 1G-1203019 DATED: 11/14/2012
*FOUNDATION SUBGRADE IMPROVEMENT SHALL BE IN ACCORDANCE WITH THE CBC ENGINEERS REPORT 16055D-12-14-05 DATED: 02/04/2014

MATERIALS

PRECAST UNITS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH CON/SPAN® SPECIFICATIONS. CONCRETE FOR FOOTINGS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI. REINFORCING STEEL FOR FOOTINGS SHALL CONFORM TO ASTM A615 OR A996-GRADE 60.



LOCATION PLAN

NOT TO SCALE

9/2/14
WISCONSIN
PHILIP A. CREAMER
38832
WEST CHESTER, OHIO
PROFESSIONAL ENGINEER

14034-7B-2522

MARK	DATE	REVISION DESCRIPTION	BY
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CONTRACT DRAWING

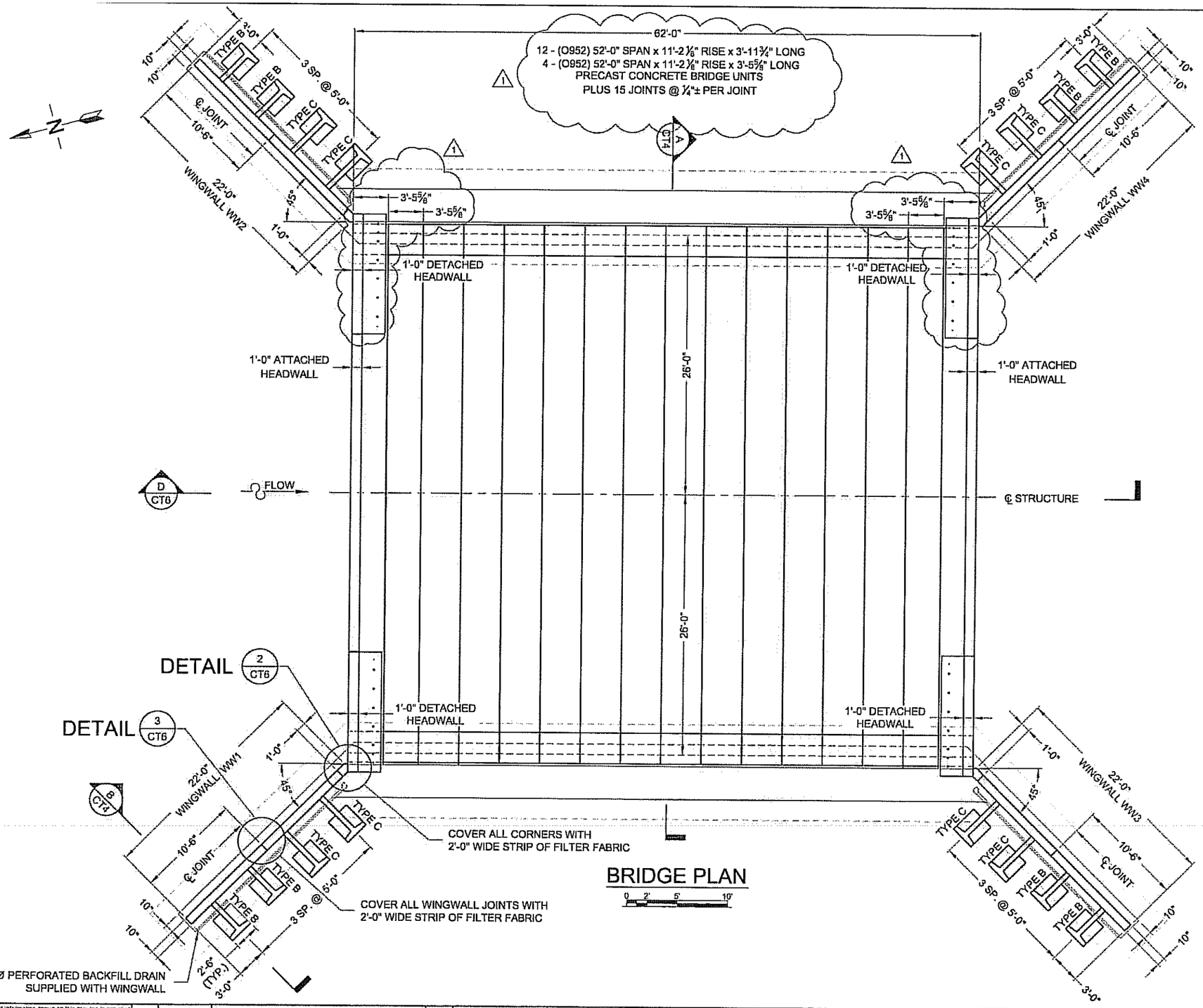
WEATHERLY DRIVE
OAK CREEK, WISCONSIN

PROJECT No.:	SEQ. No.:	DATE:
475964	010	2/12/2014
DESIGNED: DM		DRAWN: JA
CHECKED: JDR		APPROVED: PAC
SHEET NO.: CT1 OF CT8		

V:\AD CONTECH-CPI COM\ROOT\MERLIN\PROJECT\ACTIVE\475964\475964\475964-10-CON_SPAN\DRAWINGS\CONTRACT\PRE-475964-010-CD-CON-9.DWG 9/2/2014 2:10 PM

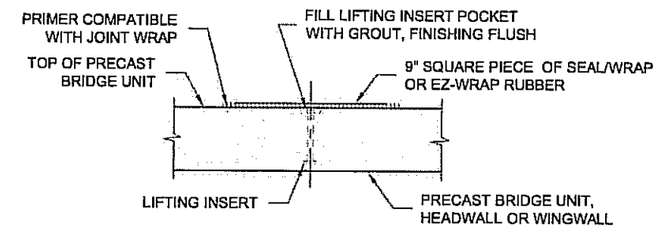
OAK CREEK ENGINEERING DIVISION
SHOP DRAWING REVIEW

- [x] APPROVED 9/11/14
- [ ] APPROVED AS NOTED
- [ ] NOT APPROVED
- [ ] REVISE & RESUBMIT



BRIDGE PLAN

0 2' 5' 10'



LIFTING INSERTS

TYPICAL LIFT POINT SEALING DETAIL

NOT TO SCALE

9/2/14

WISCONSIN PHILIP A. CREAMER # 39532 WEST CHESTER, OHIO PROFESSIONAL ENGINEER

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14034-8B-2523

WEATHERLY DRIVE

OAK CREEK, WISCONSIN

PROJECT No: 475964	SEQ. No: 010	DATE: 2/12/2014
DESIGNED: DM		DRAWN: JA
CHECKED: JDR		APPROVED: PAC
SHEET NO: CT2 OF CT8		

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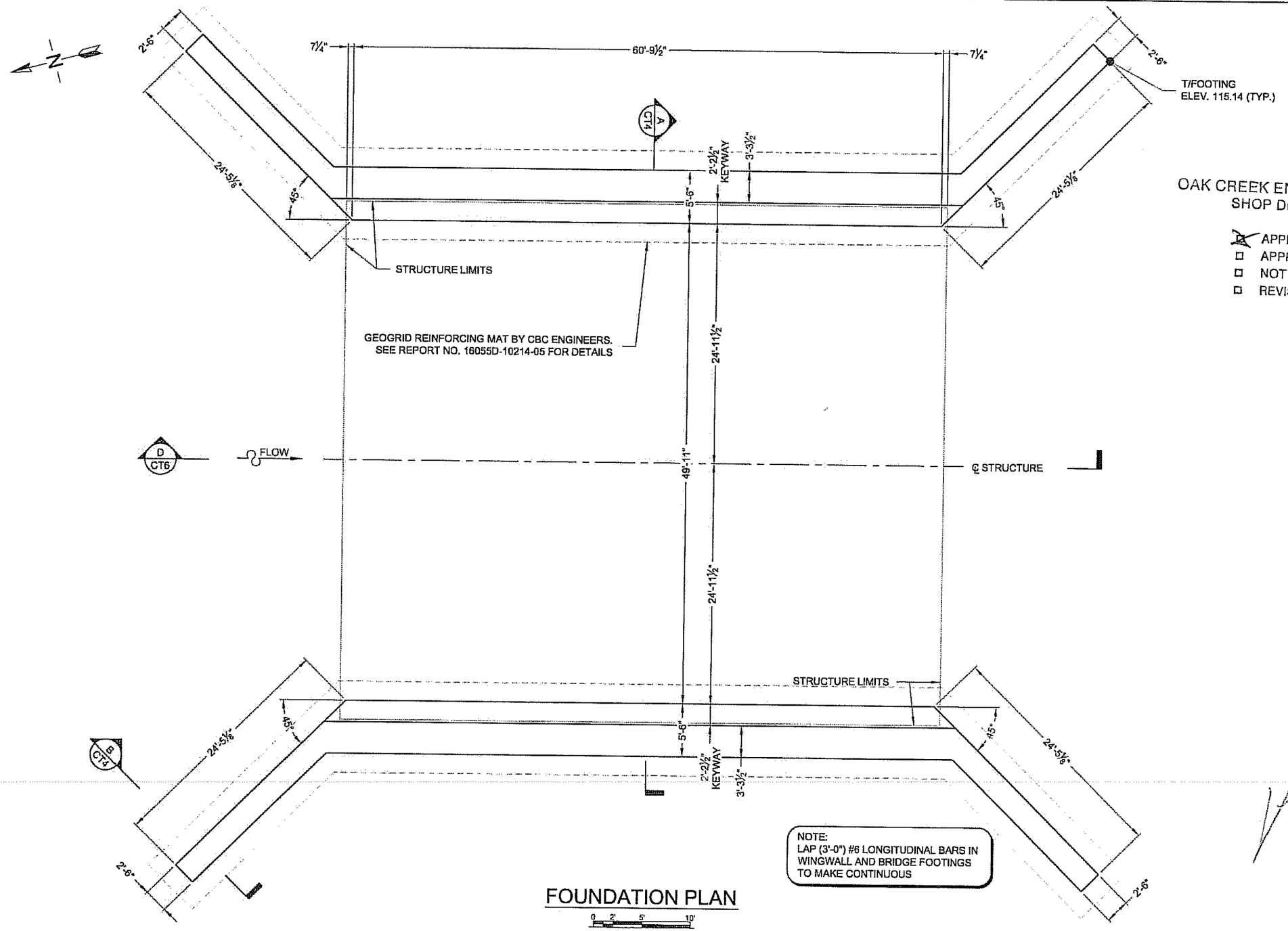

OAK CREEK ENGINEERING DIVISION
SHOP DRAWING REVIEW

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☐ APPROVED AS NOTED
☐ NOT APPROVED
☐ REVISE & RESUBMIT

NOTE:
LAP (3'-0") #6 LONGITUDINAL BARS IN WINGWALL AND BRIDGE FOOTINGS TO MAKE CONTINUOUS

FOUNDATION PLAN

0 2' 5' 10'

9/2/14

WISCONSIN
PHILIP A. CREAMER
30832
WEST CHESTER, OHIO
PROFESSIONAL ENGINEER

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WEATHERLY DRIVE

OAK CREEK, WISCONSIN

PROJECT No.:	SEQ. No.:	DATE:
475984	010	2/12/2014
DESIGNED: DM		DRAWN: JA
CHECKED: JDR		APPROVED: PAC
SHEET NO.: CT3 OF CT8		

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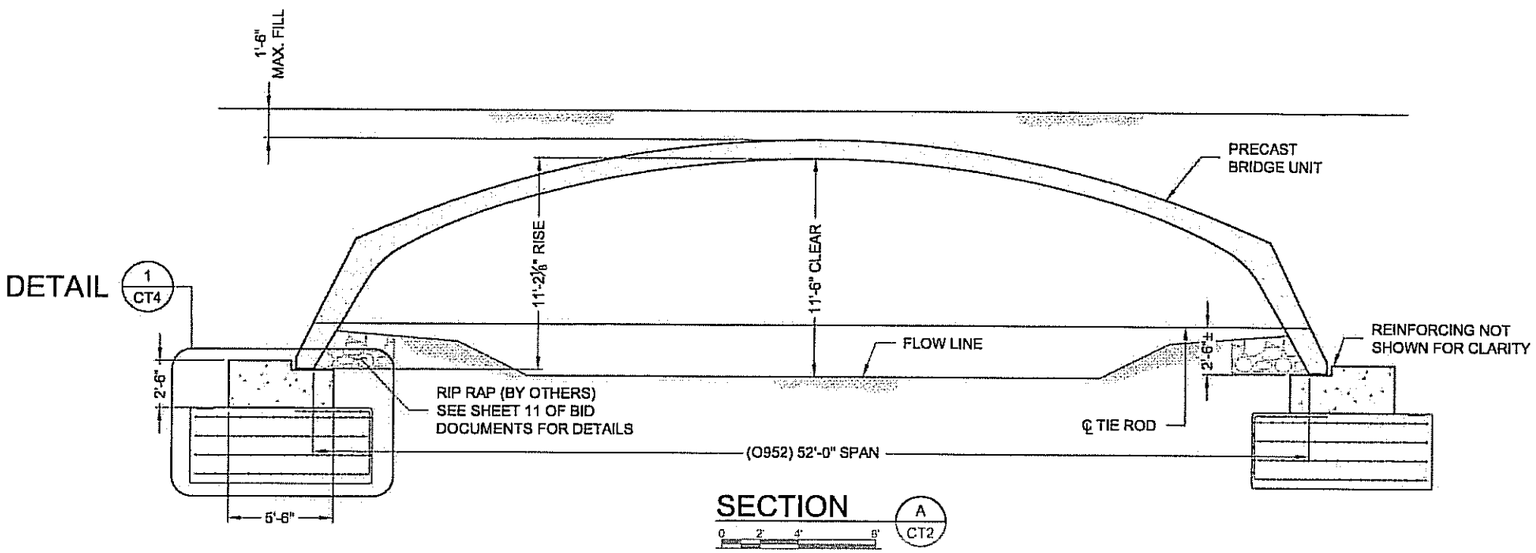
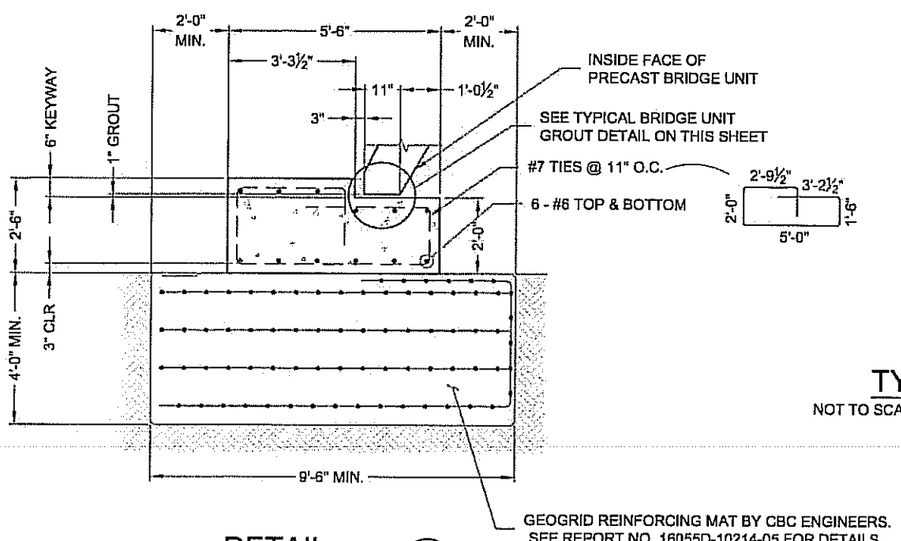
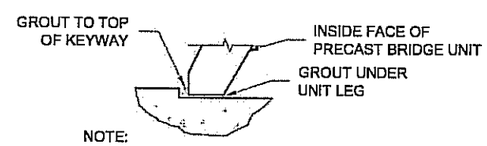


DETAIL 1 / CT4

SECTION A / CT2



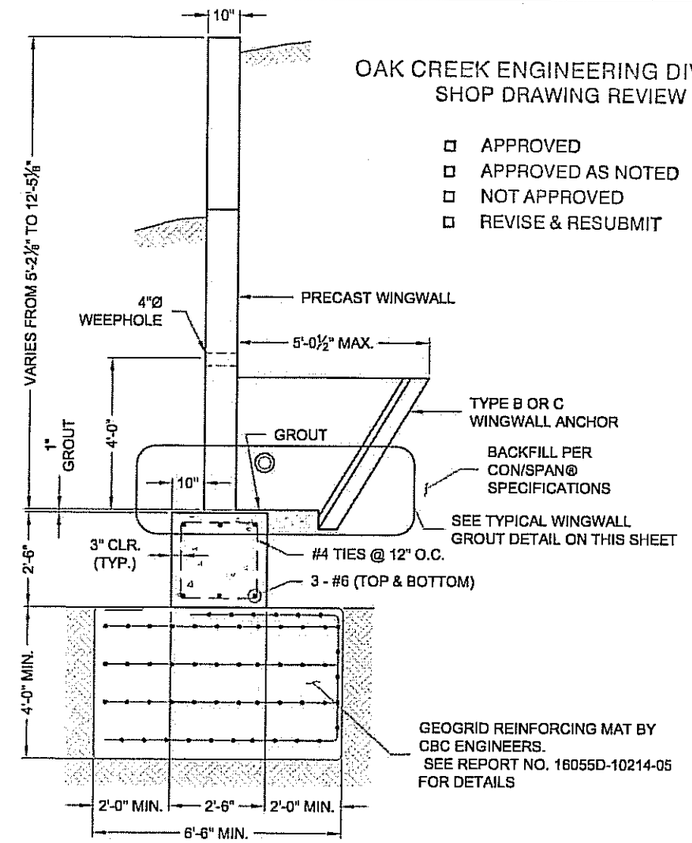
DETAIL 1 / CT4



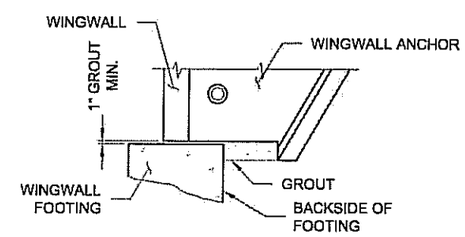
NOTE:
FILL ENTIRE KEYWAY INCLUDING NOMINAL 1" VOID BETWEEN BOTTOM OF KEYWAY AND BOTTOM OF PRECAST BRIDGE UNIT LEG WITH GROUT.

TYPICAL BRIDGE UNIT GROUT DETAIL

NOT TO SCALE



SECTION B / CT2



NOTES:
- MINIMUM 1" GROUT UNDER WINGWALL LEG & ANCHOR STEM.
- AREA BETWEEN WINGWALL FOOTING AND WINGWALL ANCHOR SHALL BE GROUTED SOLID BEFORE BACKFILL.
- FORM BACKSIDE OF FOOTING TO DIMENSIONS SHOWN ON FOUNDATION PLAN.

TYPICAL WINGWALL GROUT DETAIL

NOT TO SCALE

OAK CREEK ENGINEERING DIVISION
SHOP DRAWING REVIEW

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- ☐ REVISE & RESUBMIT

9/2/14

WISCONSIN PHILIP A. CREAMER # 39832 WEST CHESTER, OHIO PROFESSIONAL ENGINEER

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WEATHERLY DRIVE

OAK CREEK, WISCONSIN

PROJECT No.:	SEQ. No.:	DATE:
475964	010	2/12/2014
DESIGNED: DM		DRAWN: JA
CHECKED: JDR		APPROVED: PAC
SHEET NO.: CT4 OF CT8		

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OAK CREEK ENGINEERING DIVISION
SHOP DRAWING REVIEW

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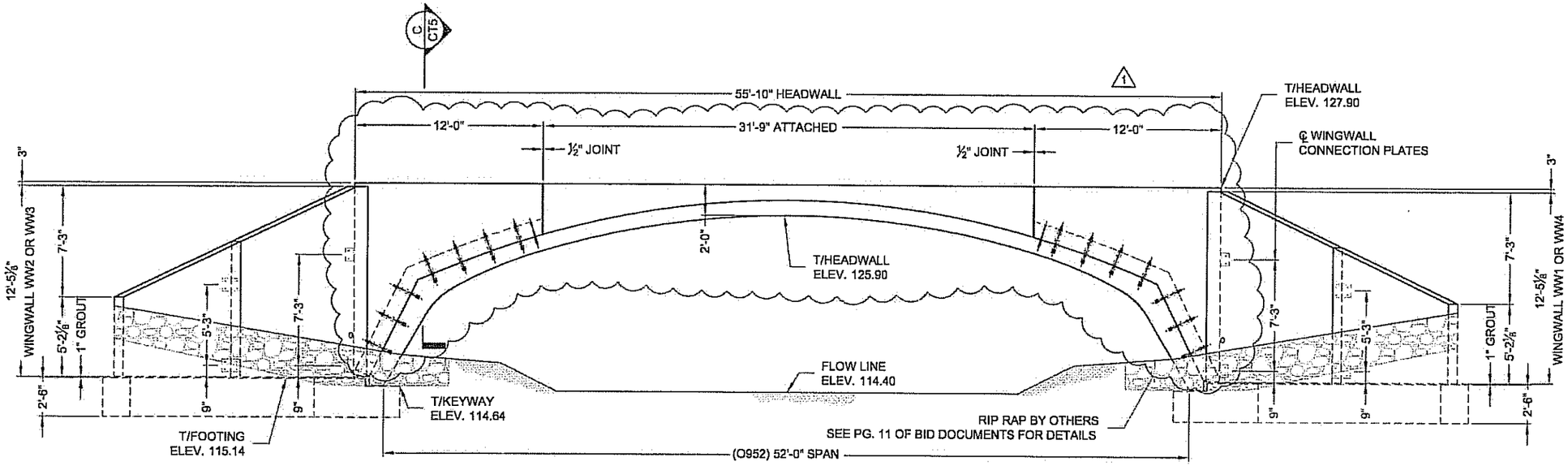
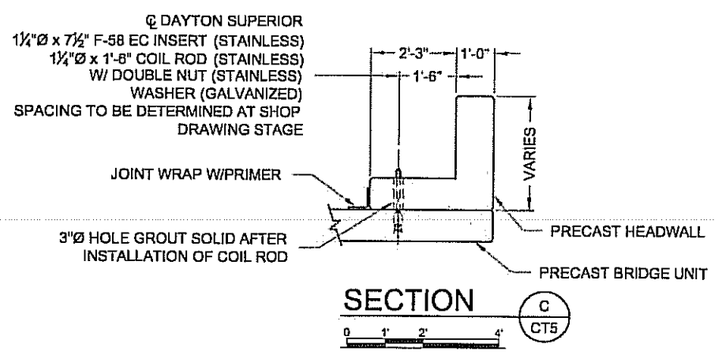
☐ NOT APPROVED
☐ REVISE & RESUBMIT



TYPICAL END ELEVATION

0 2' 4' 8'



SECTION C CT5

0 1' 2' 4'

9/2/14

WISCONSIN
PHILIP A. CREAMER
39832
WEST CHESTER, OHIO
PROFESSIONAL ENGINEER

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CONTRACT DRAWING

14034-11B-2526

WEATHERLY DRIVE

OAK CREEK, WISCONSIN

PROJECT No: 475964	SEQ. No: 010	DATE: 2/12/2014
DESIGNED: DM		DRAWN: JA
CHECKED: JDR		APPROVED: PAC
SHEET NO.: CT5 OF CT8		

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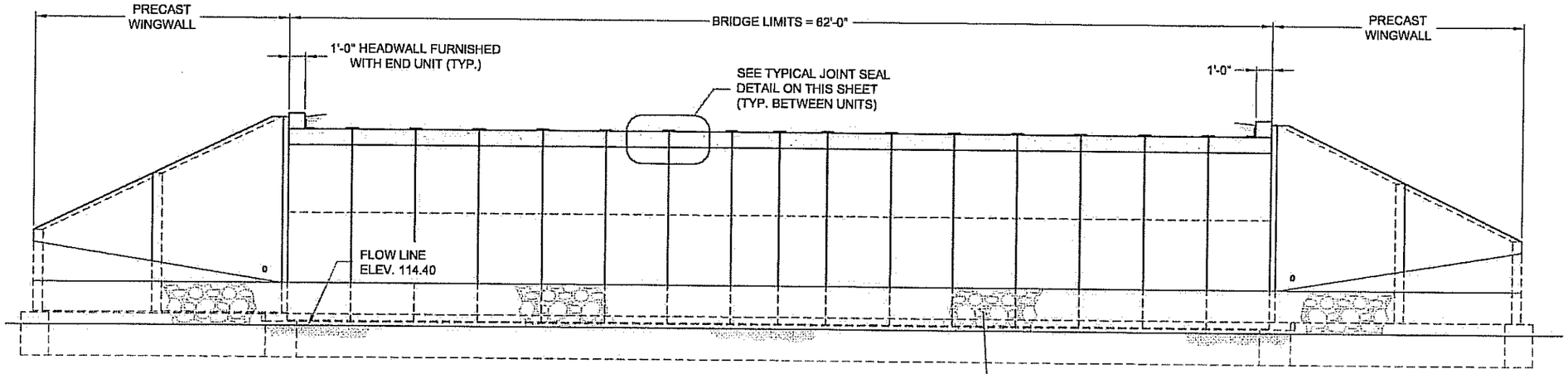
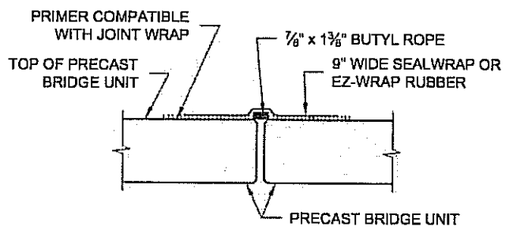


SECTION D / CT2

0 2' 4' 8'



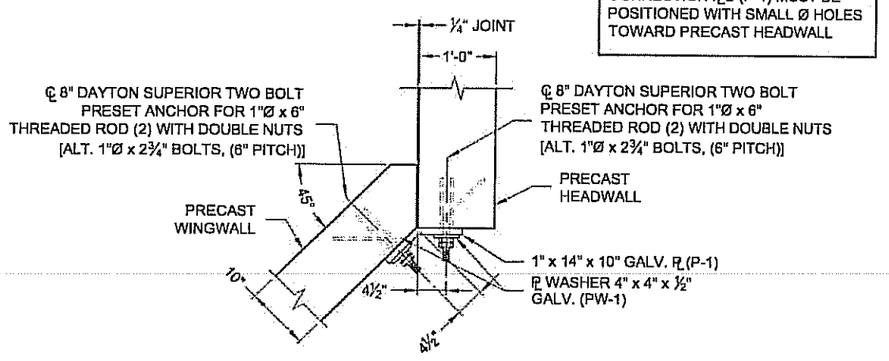
TYPICAL JOINT SEAL DETAIL

NOT TO SCALE

OAK CREEK ENGINEERING DIVISION
SHOP DRAWING REVIEW

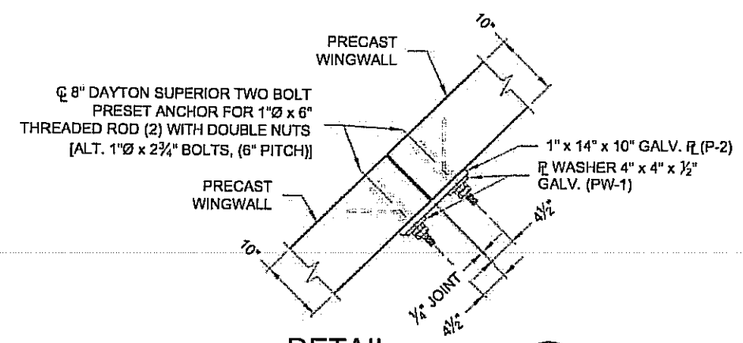
- [x] APPROVED PAB 9/11/14
- [ ] APPROVED AS NOTED
- [ ] NOT APPROVED
- [ ] REVISE & RESUBMIT

NOTE:
CONNECTION PL'S (P-1) MUST BE POSITIONED WITH SMALL Ø HOLES TOWARD PRECAST HEADWALL



DETAIL 2 / CT2

0 1' 2'



DETAIL 3 / CT2

0 1' 2'

9/2/14

WISCONSIN
PHILIP A. CREAMER
39832
WEST CHESTER, OHIO
PROFESSIONAL ENGINEER

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14034-12B-2527

WEATHERLY DRIVE

OAK CREEK, WISCONSIN

PROJECT No.: 475964	SEQ. No.: 010	DATE: 2/12/2014
DESIGNED: DM	DRAWN: JA	
CHECKED: JDR	APPROVED: PAC	
SHEET NO.: CT6 OF CT8		

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® O-SERIES BRIDGE SYSTEMS

1. DESCRIPTION
   1.1. TYPE - THIS WORK SHALL CONSIST OF FURNISHING AND CONSTRUCTING A CON/SPAN® O-SERIES BRIDGE SYSTEM IN ACCORDANCE WITH THESE SPECIFICATIONS AND IN REASONABLY CLOSE CONFORMITY WITH THE LINES, GRADES, DESIGN AND DIMENSIONS SHOWN ON THE PLANS OR AS ESTABLISHED BY THE ENGINEER. IN SITUATIONS WHERE TWO OR MORE SPECIFICATIONS APPLY TO THIS WORK, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.
   1.2. DESIGNATION - PRECAST REINFORCED CONCRETE CON/SPAN® O-SERIES BRIDGE UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY SPAN AND RISE. PRECAST REINFORCED CONCRETE WINGWALLS AND HEADWALLS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT, AND DEFLECTION ANGLE. PRECAST REINFORCED CONCRETE EXPRESS™ FOUNDATION UNITS MANUFACTURED IN ACCORDANCE WITH THIS SPECIFICATION SHALL BE DESIGNATED BY LENGTH, HEIGHT AND WIDTH.

2. DESIGN
   2.1. SPECIFICATIONS - THE PRECAST ELEMENTS ARE DESIGNED IN ACCORDANCE WITH THE "AASHTO LRFD BRIDGE SPECIFICATION" 6TH EDITION, ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, 2012. A MINIMUM OF ONE FOOT OF COVER ABOVE THE CROWN OF THE BRIDGE UNITS IS REQUIRED IN THE INSTALLED CONDITION. (UNLESS NOTED OTHERWISE ON THE SHOP DRAWINGS AND DESIGNED ACCORDINGLY.)

3. MATERIALS
   3.1. CONCRETE - THE CONCRETE FOR THE PRECAST ELEMENTS SHALL BE AIR-ENTRAINED WHEN INSTALLED IN AREAS SUBJECT TO FREEZE-THAW CONDITIONS, COMPOSED OF PORTLAND CEMENT, FINE AND COARSE AGGREGATES, ADMIXTURES AND WATER. AIR-ENTRAINED CONCRETE SHALL CONTAIN 6 ± 2 PERCENT AIR. THE AIR- ENTRAINING ADMIXTURE SHALL CONFORM TO AASHTO M154. THE MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE AS SHOWN ON THE SHOP DRAWINGS.
      3.1.1. PORTLAND CEMENT - SHALL CONFORM TO THE REQUIREMENTS OF ASTM SPECIFICATIONS C150-TYPE I, TYPE II, OR TYPE III CEMENT.
      3.1.2. COARSE AGGREGATE - SHALL CONSIST OF STONE HAVING A MAXIMUM SIZE OF 1 INCH. AGGREGATE SHALL MEET REQUIREMENTS FOR ASTM C33.
      3.1.3. WATER REDUCING ADMIXTURE - THE MANUFACTURER MAY SUBMIT, FOR APPROVAL BY THE ENGINEER, A WATER-REDUCING ADMIXTURE FOR THE PURPOSE OF INCREASING WORKABILITY AND REDUCING THE WATER REQUIREMENT FOR THE CONCRETE.
      3.1.4. CALCIUM CHLORIDE - THE ADDITION TO THE MIX OF CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE WILL NOT BE PERMITTED.
      3.1.5. MIXTURE - THE AGGREGATES, CEMENT AND WATER SHALL BE PROPORTIONED AND MIXED IN A BATCH MIXER TO PRODUCE A HOMOGENEOUS CONCRETE MEETING THE STRENGTH REQUIREMENTS OF THIS SPECIFICATION. THE PROPORTION OF PORTLAND CEMENT IN THE MIXTURE SHALL NOT BE LESS THAN 564 POUNDS (6 SACKS) PER CUBIC YARD OF CONCRETE.
   3.2. STEEL REINFORCEMENT
      3.2.1. THE MINIMUM STEEL YIELD STRENGTH SHALL BE 60,000 PSI, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS.
      3.2.2. ALL REINFORCING STEEL FOR THE PRECAST ELEMENTS SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH THE DETAILED SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER.
      3.2.3. REINFORCEMENT SHALL CONSIST OF WELDED WIRE FABRIC CONFORMING TO ASTM SPECIFICATION A 185 OR A 497, OR DEFORMED BILLET STEEL BARS CONFORMING TO ASTM SPECIFICATION A 615, GRADE 60. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY CONSIST OF WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS.
   3.3. STEEL HARDWARE
      3.3.1. BOLTS AND THREADED RODS FOR WINGWALL CONNECTIONS SHALL CONFORM TO ASTM A 307. NUTS SHALL CONFORM TO AASHTO M292 (ASTM A194) GRADE 2H. ALL BOLTS, THREADED RODS AND NUTS USED IN WINGWALL CONNECTIONS SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.2. STRUCTURAL STEEL FOR WINGWALL CONNECTION PLATES AND PLATE WASHERS SHALL CONFORM TO AASHTO M 270 (ASTM A 709) GRADE 36 AND SHALL BE HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.3. INSERTS FOR WINGWALLS SHALL BE 1" DIAMETER TWO-BOLT PRESET WINGWALL ANCHORS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700 AND SHALL BE MECHANICALLY ZINC COATED IN ACCORDANCE WITH ASTM B695 CLASS 50.
      3.3.4. FERRULE LOOP INSERTS SHALL BE F-64 FERRULE LOOP INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700.
      3.3.5. HOOK BOLTS USED IN ATTACHED HEADWALL CONNECTIONS SHALL BE ASTM A307.
      3.3.6. INSERTS FOR DETACHED HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL, EXPANDED COIL INSERTS AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, COIL RODS AND NUTS USED IN HEADWALL CONNECTIONS SHALL BE AISI TYPE 304 STAINLESS STEEL. WASHERS USED IN HEADWALL CONNECTIONS SHALL BE EITHER AISI TYPE 304 STAINLESS STEEL PLATE WASHERS OR AASHTO M270 (ASTM A709) GRADE 36 PLATE WASHERS HOT DIP GALVANIZED AS PER AASHTO M111 (ASTM A123).
      3.3.7. MECHANICAL SPLICES OF REINFORCING BARS SHALL BE MADE USING THE DOWEL BAR SPLICER SYSTEM AS MANUFACTURED BY DAYTON SUPERIOR CONCRETE ACCESSORIES, MIAMISBURG, OHIO, (800) 745-3700, AND SHALL CONSIST OF THE DOWEL BAR SPLICER (DB-SAE) AND DOWEL-IN (DI).

4. MANUFACTURE OF PRECAST ELEMENTS - SUBJECT TO THE PROVISIONS OF SECTION 5, BELOW, THE PRECAST ELEMENT DIMENSION AND REINFORCEMENT DETAILS SHALL BE AS PRESCRIBED IN THE PLAN AND SHOP DRAWINGS PROVIDED BY THE MANUFACTURER.
   4.1. FORMS - THE FORMS USED IN MANUFACTURE SHALL BE SUFFICIENTLY RIGID AND ACCURATE TO MAINTAIN THE REQUIRED PRECAST ELEMENT DIMENSIONS WITHIN THE PERMISSIBLE VARIATIONS GIVEN IN SECTION 5 OF THESE SPECIFICATIONS. ALL CASTING SURFACES SHALL BE OF A SMOOTH MATERIAL.
   4.2. PLACEMENT OF REINFORCEMENT
      4.2.1. PLACEMENT OF REINFORCEMENT IN PRECAST BRIDGE UNITS - THE COVER OF CONCRETE OVER THE OUTSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 2" MINIMUM. THE COVER OF CONCRETE OVER THE INSIDE CIRCUMFERENTIAL REINFORCEMENT SHALL BE 1½" MINIMUM, UNLESS OTHERWISE NOTED ON THE SHOP DRAWINGS. THE CLEAR DISTANCE OF THE END CIRCUMFERENTIAL WIRES SHALL NOT BE LESS THAN 1" NOR MORE THAN 2" FROM THE ENDS OF EACH SECTION. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING SINGLE OR MULTIPLE LAYERS OF WELDED WIRE FABRIC (NOT TO EXCEED 3 LAYERS), SUPPLEMENTED WITH A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS, WHEN NECESSARY. WELDED WIRE FABRIC SHALL BE COMPOSED OF CIRCUMFERENTIAL AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE BRIDGE UNIT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL DISTRIBUTION REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW. THE ENDS OF THE LONGITUDINAL DISTRIBUTION REINFORCEMENT SHALL BE NOT MORE THAN 3" AND NOT LESS THAN 1½" FROM THE ENDS OF THE BRIDGE UNIT.
      4.2.2. BENDING OF REINFORCEMENT FOR PRECAST BRIDGE UNITS - THE OUTSIDE AND INSIDE CIRCUMFERENTIAL REINFORCING STEEL FOR THE CORNERS OF THE BRIDGE SHALL BE BENT TO SUCH AN ANGLE THAT IS APPROXIMATELY EQUAL TO THE CONFIGURATION OF THE BRIDGE'S OUTSIDE CORNER.
      4.2.3. PLACEMENT OF REINFORCEMENT FOR PRECAST WINGWALLS AND HEADWALLS - THE COVER OF CONCRETE OVER THE LONGITUDINAL AND TRANSVERSE REINFORCEMENT SHALL BE 2" MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 1½" NOR MORE THAN 3". REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC, OR A SINGLE LAYER OF DEFORMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
      4.2.4. PLACEMENT OF REINFORCEMENT FOR PRECAST FOUNDATION UNITS - THE COVER OF CONCRETE OVER THE BOTTOM REINFORCEMENT SHALL BE 3 INCHES MINIMUM. THE COVER OF CONCRETE FOR ALL OTHER REINFORCEMENT SHALL BE 2 INCHES MINIMUM. THE CLEAR DISTANCE FROM THE END OF EACH PRECAST ELEMENT TO THE END OF REINFORCING STEEL SHALL NOT BE LESS THAN 2 INCHES NOR MORE THAN 3 INCHES. REINFORCEMENT SHALL BE ASSEMBLED UTILIZING A SINGLE LAYER OF WELDED WIRE FABRIC OR A SINGLE LAYER OF DEFOREMED BILLET-STEEL BARS. WELDED WIRE FABRIC SHALL BE COMPOSED OF TRANSVERSE AND LONGITUDINAL WIRES MEETING THE SPACING REQUIREMENTS OF 4.3, BELOW, AND SHALL CONTAIN SUFFICIENT LONGITUDINAL WIRES EXTENDING THROUGH THE ELEMENT TO MAINTAIN THE SHAPE AND POSITION OF THE REINFORCEMENT. LONGITUDINAL REINFORCEMENT MAY BE WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS AND SHALL MEET THE SPACING REQUIREMENTS OF 4.3, BELOW.
   4.3. LAPS, WELDS, SPACING
      4.3.1. LAPS, WELDS, AND SPACING FOR PRECAST BRIDGE UNITS - TENSION SPLICES IN THE CIRCUMFERENTIAL REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. THE OVERLAP OF WELDED WIRE FABRIC SHALL BE MEASURED BETWEEN THE OUTER-MOST LONGITUDINAL WIRES OF EACH FABRIC SHEET. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1 FOR SPLICES OTHER THAN TENSION SPLICES, THE OVERLAP SHALL BE A MINIMUM OF 1'-0" FOR WELDED WIRE FABRIC OR DEFORMED BILLET-STEEL BARS. THE SPACING CENTER TO CENTER OF THE CIRCUMFERENTIAL WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL DISTRIBUTION STEEL FOR EITHER LINE OF REINFORCING IN THE TOP SLAB SHALL BE NOT MORE THAN 1'-4".
      4.3.2. LAPS, WELDS, AND SPACING FOR PRECAST WINGWALLS, HEADWALLS AND FOUNDATIONS - SPLICES IN THE REINFORCEMENT SHALL BE MADE BY LAPPING. LAPS MAY BE TACK WELDED TOGETHER FOR ASSEMBLY PURPOSES. FOR SMOOTH WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.2 AND 5.11.6.2. FOR DEFORMED WELDED WIRE FABRIC, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.5.1 AND 5.11.6.1. FOR DEFORMED BILLET-STEEL BARS, THE OVERLAP SHALL MEET THE REQUIREMENTS OF AASHTO 5.11.2.1. THE SPACING CENTER-TO-CENTER OF THE WIRES IN A WIRE FABRIC SHEET SHALL BE NOT LESS THAN 2" NOR MORE THAN 8".
   4.4. CURING - THE PRECAST CONCRETE ELEMENTS SHALL BE CURED FOR A SUFFICIENT LENGTH OF TIME SO THAT THE CONCRETE WILL DEVELOP THE SPECIFIED COMPRESSIVE STRENGTH IN 28 DAYS OR LESS. ANY ONE OF THE FOLLOWING METHODS OF CURING OR COMBINATIONS THERE OF SHALL BE USED:
      4.4.1. STEAM CURING - THE PRECAST ELEMENTS MAY BE LOW-PRESSURE STEAM CURED BY A SYSTEM THAT WILL MAINTAIN A MOIST ATMOSPHERE.
      4.4.2. WATER CURING - THE PRECAST ELEMENTS MAY BE WATER CURED BY ANY METHOD THAT WILL KEEP THE SECTIONS MOIST.
      4.4.3. MEMBRANE CURING - A SEALING MEMBRANE CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION C309 MAY BE APPLIED AND SHALL BE LEFT INTACT UNTIL THE REQUIRED CONCRETE COMPRESSIVE STRENGTH IS ATTAINED. THE CONCRETE TEMPERATURE AT THE TIME OF APPLICATION SHALL BE WITHIN +/- 10 DEGREES F OF THE ATMOSPHERIC TEMPERATURE. ALL SURFACES SHALL BE KEPT MOIST PRIOR TO THE APPLICATION OF THE COMPOUNDS AND SHALL BE DAMP WHEN THE COMPOUND IS APPLIED.
   4.5. STORAGE, HANDLING & DELIVERY
      4.5.1. STORAGE - PRECAST CONCRETE BRIDGE ELEMENTS SHALL BE LIFTED AND STORED IN "AS-CAST" POSITION. PRECAST CONCRETE HEADWALL AND WINGWALL UNITS ARE CAST, STORED AND SHIPPED IN A FLAT POSITION. THE PRECAST ELEMENTS SHALL BE STORED IN SUCH A MANNER TO PREVENT CRACKING OR DAMAGE. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE. THE UNITS SHALL NOT BE MOVED UNTIL THE CONCRETE COMPRESSIVE STRENGTH HAS REACHED A MINIMUM OF 2500 PSI, AND THEY SHALL NOT BE STORED IN AN UPRIGHT POSITION.
      4.5.2. HANDLING - HANDLING DEVICES SHALL BE PERMITTED IN EACH PRECAST ELEMENT FOR THE PURPOSE OF HANDLING AND SETTING. SPREADER BEAMS MAY BE REQUIRED FOR THE LIFTING OF PRECAST CONCRETE BRIDGE ELEMENTS TO PRECLUDE DAMAGE FROM BENDING OR TORSION FORCES.
      4.5.3. DELIVERY - PRECAST CONCRETE ELEMENTS MUST NOT BE SHIPPED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED DESIGN COMPRESSIVE STRENGTH, OR AS DIRECTED BY THE DESIGN ENGINEER. PRECAST CONCRETE ELEMENTS MAY BE UNLOADED AND PLACED ON THE GROUND AT THE SITE UNTIL INSTALLED. STORE ELEMENTS USING TIMBER SUPPORTS AS APPROPRIATE.
   4.6. QUALITY ASSURANCE - THE PRECASTER SHALL DEMONSTRATE ADHERENCE TO THE STANDARDS SET FORTH IN THE NPCA QUALITY CONTROL MANUAL. THE PRECASTER SHALL MEET EITHER SECTION 4.6.1 OR 4.6.2
      4.6.1. CERTIFICATION - THE PRECASTER SHALL BE CERTIFIED BY THE PRECAST/PRESTRESSED CONCRETE INSTITUTE PLANT CERTIFICATION PROGRAM OR THE NATIONAL PRECAST CONCRETE ASSOCIATION'S PLANT CERTIFICATION PROGRAM PRIOR TO AND DURING PRODUCTION OF THE PRODUCTS COVERED BY THIS SPECIFICATION.
      4.6.2. QUALIFICATIONS, TESTING AND INSPECTION
         4.6.2.1. THE PRECASTER SHALL HAVE BEEN IN THE BUSINESS OF PRODUCING PRECAST CONCRETE PRODUCTS SIMILAR TO THOSE SPECIFIED FOR A MINIMUM OF THREE YEARS. HE SHALL MAINTAIN A PERMANENT QUALITY CONTROL DEPARTMENT OR RETAIN AN INDEPENDENT TESTING AGENCY ON A CONTINUING BASIS. THE AGENCY SHALL ISSUE A REPORT, CERTIFIED BY A LICENSED ENGINEER, DETAILING THE ABILITY OF THE PRECASTER TO PRODUCE QUALITY PRODUCTS CONSISTENT WITH INDUSTRY STANDARDS.
         4.6.2.2. THE PRECASTER SHALL SHOW THAT THE FOLLOWING TESTS ARE PERFORMED IN ACCORDANCE WITH THE ASTM STANDARDS INDICATED. TESTS SHALL BE PERFORMED AS INDICATED IN SECTION 6 OF THESE SPECIFICATIONS.
            4.6.2.2.1. AIR CONTENT: C231 OR C173
            4.6.2.2.2. COMPRESSIVE STRENGTH: C31,C39,C497
         4.6.2.3. THE PRECASTER SHALL PROVIDE DOCUMENTATION DEMONSTRATING COMPLIANCE WITH THIS SECTION TO CONTECH® ENGINEERED SOLUTIONS AT REGULAR INTERVALS OR UPON REQUEST.
         4.6.2.4. THE OWNER MAY PLACE AN INSPECTOR IN THE PLANT WHEN THE PRODUCTS COVERED BY THIS SPECIFICATION ARE BEING MANUFACTURED.
      4.6.3. DOCUMENTATION - THE PRECASTER SHALL SUBMIT PRECAST PRODUCTION REPORTS TO CONTECH® ENGINEERED SOLUTIONS AS REQUIRED.

5. PERMISSIBLE VARIATIONS
   5.1. BRIDGE UNITS
      5.1.1. INTERNAL DIMENSIONS - THE INTERNAL DIMENSION SHALL VARY NOT MORE THAN 1% FROM THE DESIGN DIMENSIONS NOR MORE THAN 1½" WHICHEVER IS LESS.
      5.1.2. SLAB AND WALL THICKNESS - THE SLAB AND WALL THICKNESS SHALL NOT BE LESS THAN THAT SHOWN IN THE DESIGN BY MORE THAN ¼". A THICKNESS MORE THAN THAT REQUIRED IN THE DESIGN SHALL NOT BE CAUSE FOR REJECTION.
      5.1.3. LENGTH OF OPPOSITE SURFACES - VARIATIONS IN LAYING LENGTHS OF TWO OPPOSITE SURFACES OF THE BRIDGE UNIT SHALL NOT BE MORE THAN ½" IN ANY SECTION, EXCEPT WHERE BEVELED ENDS FOR LAYING OF CURVES ARE SPECIFIED BY THE PURCHASER.
      5.1.4. LENGTH OF SECTION - THE UNDERRUN IN LENGTH OF A SECTION SHALL NOT BE MORE THAN ½" IN ANY BRIDGE UNIT.
      5.1.5. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½" FOR THE OUTSIDE CIRCUMFERENTIAL STEEL OR BE LESS THAN 1" FOR THE INSIDE CIRCUMFERENTIAL STEEL AS MEASURED TO THE EXTERNAL OR INTERNAL SURFACE OF THE BRIDGE. THESE TOLERANCES OR COVER REQUIREMENTS DO NOT APPLY TO MATING SURFACES OF THE JOINTS.
      5.1.6. AREA OF REINFORCEMENT - THE AREAS OF STEEL REINFORCEMENT SHALL BE THE DESIGN STEEL AREAS AS SHOWN IN THE MANUFACTURER'S SHOP DRAWINGS. STEEL AREAS GREATER THAN THOSE REQUIRED SHALL NOT BE CAUSE FOR REJECTION. THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCEMENT SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCEMENT.
   5.2. WINGWALLS & HEADWALLS
      5.2.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.2. LENGTH/HEIGHT OF WALL SECTIONS - THE LENGTH AND HEIGHT OF THE WALL SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.2.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.2.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.
   5.3. FOUNDATION UNITS
      5.3.1. WALL THICKNESS - THE WALL THICKNESS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.2. LENGTH/ HEIGHT/WIDTH OF FOUNDATION SECTIONS - THE LENGTH, HEIGHT AND WIDTH OF THE FOUNDATION UNITS SHALL NOT VARY FROM THAT SHOWN IN THE DESIGN BY MORE THAN ½".
      5.3.3. POSITION OF REINFORCEMENT - THE MAXIMUM VARIATION IN THE POSITION OF THE REINFORCEMENT SHALL BE ± ½". IN NO CASE SHALL THE COVER OVER THE REINFORCEMENT BE LESS THAN 1½".
      5.3.4. SIZE OF REINFORCEMENT - THE PERMISSIBLE VARIATION IN DIAMETER OF ANY REINFORCING SHALL CONFORM TO THE TOLERANCES PRESCRIBED IN THE ASTM SPECIFICATION FOR THAT TYPE OF REINFORCING. STEEL AREA GREATER THAN THAT REQUIRED SHALL NOT BE CAUSE FOR REJECTION.

6. TESTING/ INSPECTION
   6.1. TESTING
      6.1.1. TYPE OF TEST SPECIMEN - CONCRETE COMPRESSIVE STRENGTH SHALL BE DETERMINED FROM COMPRESSION TESTS MADE ON CYLINDERS OR CORES. FOR CYLINDER TESTING, A MINIMUM OF 4 CYLINDERS SHALL BE TAKEN FOR EACH BRIDGE ELEMENT, EACH ELEMENT SHALL BE CONSIDERED SEPARATELY FOR THE PURPOSE OF TESTING AND ACCEPTANCE.
      6.1.2. COMPRESSION TESTING - CYLINDERS SHALL BE MADE AND TESTED AS PRESCRIBED BY THE ASTM C39 SPECIFICATION. CYLINDERS SHALL BE CURED IN THE SAME ENVIRONMENT AS THE BRIDGE ELEMENTS. CORES SHALL BE OBTAINED AND TESTED FOR COMPRESSIVE STRENGTH IN ACCORDANCE WITH THE PROVISIONS OF THE ASTM C42 SPECIFICATION.
      6.1.3. ACCEPTABILITY OF CYLINDER TESTS - WHEN THE AVERAGE COMPRESSIVE STRENGTH OF ALL CYLINDERS TESTED IS EQUAL TO OR GREATER THAN THE DESIGN COMPRESSIVE STRENGTH, AND NOT MORE THAN 10% OF THE CYLINDERS TESTED HAVE A COMPRESSIVE STRENGTH LESS THAN THE DESIGN CONCRETE STRENGTH, AND NO CYLINDER TESTED HAS A COMPRESSIVE STRENGTH LESS THAN 80% OF THE DESIGN COMPRESSIVE STRENGTH, THEN THE ELEMENT SHALL BE ACCEPTED. WHEN THE COMPRESSIVE STRENGTH OF THE CYLINDERS TESTED DOES NOT CONFORM TO THESE ACCEPTANCE CRITERIA, THE ACCEPTABILITY OF THE ELEMENT MAY BE DETERMINED AS DESCRIBED IN SECTION 6.1.4, BELOW.
      6.1.4. ACCEPTABILITY OF CORE TESTS - THE COMPRESSIVE STRENGTH OF THE CONCRETE IN A BRIDGE ELEMENT IS ACCEPTABLE WHEN THE AVERAGE CORE TEST STRENGTH IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH. WHEN THE COMPRESSIVE STRENGTH OF A CORE TESTED IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN MAY BE RE-CORED. WHEN THE COMPRESSIVE STRENGTH OF THE RE-CORE IS EQUAL TO OR GREATER THAN THE DESIGN CONCRETE STRENGTH, THE COMPRESSIVE STRENGTH OF THE CONCRETE IN THAT BRIDGE ELEMENT IS ACCEPTABLE.
         6.1.4.1. WHEN THE COMPRESSIVE STRENGTH OF ANY RECORE IS LESS THAN THE DESIGN CONCRETE STRENGTH, THE PRECAST ELEMENT FROM WHICH THAT CORE WAS TAKEN SHALL BE REJECTED.
         6.1.4.2. PLUGGING CORE HOLES - THE CORE HOLES SHALL BE PLUGGED AND SEALED BY THE MANUFACTURER IN A MANNER SUCH THAT THE ELEMENTS WILL MEET ALL OF THE TEST REQUIREMENTS OF THIS SPECIFICATION. PRECAST ELEMENTS SO SEALED SHALL BE CONSIDERED SATISFACTORY FOR USE.
         6.1.4.3. TEST EQUIPMENT - EVERY MANUFACTURER FURNISHING PRECAST ELEMENTS UNDER THIS SPECIFICATION SHALL FURNISH ALL FACILITIES AND PERSONNEL NECESSARY TO CARRY OUT THE TEST REQUIRED.
   6.2. INSPECTION - THE QUALITY OF MATERIALS, THE PROCESS OF MANUFACTURE, AND THE FINISHED PRECAST ELEMENTS SHALL BE SUBJECT TO INSPECTION BY THE PURCHASER.

7. JOINTS
   THE BRIDGE UNITS SHALL BE PRODUCED WITH FLAT BUTT ENDS. THE ENDS OF THE BRIDGE UNITS SHALL BE SUCH THAT WHEN THE SECTIONS ARE LAID TOGETHER THEY WILL MAKE A CONTINUOUS LINE WITH A SMOOTH INTERIOR FREE OF APPRECIABLE IRREGULARITIES, ALL COMPATIBLE WITH THE PERMISSIBLE VARIATIONS IN SECTION 5, ABOVE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

8. WORKMANSHIP/ FINISH
   THE BRIDGE UNITS, WINGWALLS, HEADWALLS AND FOUNDATION UNITS SHALL BE SUBSTANTIALLY FREE OF FRACTURES. THE ENDS OF THE BRIDGE UNITS SHALL BE NORMAL TO THE WALLS AND CENTERLINE OF THE BRIDGE SECTION, WITHIN THE LIMITS OF THE VARIATIONS GIVEN IN SECTION 5, ABOVE, EXCEPT WHERE BEVELED ENDS ARE SPECIFIED. THE FACES OF THE WINGWALLS AND HEADWALLS SHALL BE PARALLEL TO EACH OTHER, WITHIN THE LIMITS OF VARIATIONS GIVEN IN SECTION 5, ABOVE. THE SURFACE OF THE PRECAST ELEMENTS SHALL BE A SMOOTH STEEL FORM OR TROWELED SURFACE. TRAPPED AIR POCKETS CAUSING SURFACE DEFECTS SHALL BE CONSIDERED AS PART OF A SMOOTH, STEEL FORM FINISH.

9. REPAIRS
   PRECAST ELEMENTS MAY BE REPAIRED, IF NECESSARY, BECAUSE OF IMPERFECTIONS IN MANUFACTURE OR HANDLING DAMAGE AND WILL BE ACCEPTABLE IF, IN THE OPINION OF THE PURCHASER, THE REPAIRS ARE SOUND, PROPERLY FINISHED AND CURED, AND THE REPAIRED SECTION CONFORMS TO THE REQUIREMENTS OF THIS SPECIFICATION.

10. REJECTION
   THE PRECAST ELEMENTS SHALL BE SUBJECT TO REJECTION ON ACCOUNT OF ANY OF THE SPECIFICATION REQUIREMENTS. INDIVIDUAL PRECAST ELEMENTS MAY BE REJECTED BECAUSE OF ANY OF THE FOLLOWING:
   10.1. FRACTURES OR CRACKS PASSING THROUGH THE WALL, EXCEPT FOR A SINGLE END CRACK THAT DOES NOT EXCEED ONE HALF THE THICKNESS OF THE WALL.
   10.2. DEFECTS THAT INDICATE PROPORTIONING, MIXING, AND MOLDING NOT IN COMPLIANCE WITH SECTION 4 OF THESE SPECIFICATIONS.
   10.3. HONEYCOMBED OR OPEN TEXTURE.
   10.4. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.

9/11/14

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PROFESSIONAL ENGINEER

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CON/SPAN. O-SERIES.

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SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® O-SERIES BRIDGE SYSTEMS (CONT'D)

11. MARKING
EACH BRIDGE UNIT SHALL BE CLEARLY MARKED BY WATERPROOF PAINT. THE FOLLOWING SHALL BE SHOWN ON THE INSIDE OF THE VERTICAL LEG OF THE BRIDGE SECTION:
BRIDGE SPAN x BRIDGE RISE
DATE OF MANUFACTURE
NAME OR TRADEMARK OF THE MANUFACTURER

12. INSTALLATION PREPARATION
TO ENSURE CORRECT INSTALLATION OF THE PRECAST CONCRETE BRIDGE SYSTEM, CARE AND CAUTION MUST BE EXERCISED IN FORMING THE SUPPORT AREAS FOR BRIDGE UNITS, HEADWALL, AND WINGWALL ELEMENTS. EXERCISING SPECIAL CARE WILL FACILITATE THE RAPID INSTALLATION OF THE PRECAST COMPONENTS.

12.1. FOOTINGS
DO NOT OVER EXCAVATE FOUNDATIONS UNLESS DIRECTED BY SITE SOIL ENGINEER TO REMOVE UNSUITABLE SOIL.

THE SITE SOILS ENGINEER SHALL CERTIFY THAT THE BEARING CAPACITY MEETS OR EXCEEDS THE FOOTING DESIGN REQUIREMENTS, PRIOR TO THE CONTRACTOR POURING OF THE FOOTINGS.

THE BRIDGE UNITS AND WINGWALLS SHALL BE INSTALLED ON EITHER PRECAST OR CAST-IN-PLACE CONCRETE FOOTINGS. THE SIZE AND ELEVATION OF THE FOOTINGS SHALL BE AS DESIGNED BY THE ENGINEER. A KEYWAY SHALL BE FORMED IN THE TOP SURFACE OF THE BRIDGE FOOTING AS SPECIFIED ON THE PLANS. NO KEYWAY IS REQUIRED IN THE WINGWALL FOOTINGS, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

THE FOOTINGS SHALL BE GIVEN A SMOOTH FLOAT FINISH AND SHALL REACH A COMPRESSIVE STRENGTH OF 2,000 PSI BEFORE PLACEMENT OF THE BRIDGE AND WINGWALL ELEMENTS. BACKFILLING SHALL NOT BEGIN UNTIL THE FOOTING HAS REACHED THE FULL DESIGN COMPRESSIVE STRENGTH.

THE FOOTING SURFACE SHALL BE CONSTRUCTED IN ACCORDANCE WITH GRADES SHOWN ON THE PLANS. WHEN TESTED WITH A 10'-0" STRAIGHT EDGE, THE SURFACE SHALL NOT VARY MORE THAN ¼" IN 10'-0".

IF A PRECAST CONCRETE FOOTING IS USED, THE CONTRACTOR SHALL PREPARE A 4" THICK BASE LAYER OF COMPACTED GRANULAR MATERIAL THE FULL WIDTH OF THE FOOTING PRIOR TO PLACING THE PRECAST FOOTING.

THE FOUNDATIONS FOR PRECAST CONCRETE BRIDGE ELEMENTS AND WINGWALLS MUST BE CONNECTED BY REINFORCEMENT TO FORM ONE MONOLITHIC BODY. EXPANSION JOINTS SHALL NOT BE USED.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONSTRUCTION OF THE FOUNDATIONS PER THE PLANS AND SPECIFICATIONS.

13. INSTALLATION
13.1. GENERAL - THE INSTALLATION OF THE PRECAST CONCRETE ELEMENTS SHALL BE AS EXPLAINED IN THE PUBLICATION CON/SPAN BRIDGE SYSTEMS INSTALLATION HANDBOOK.
13.1.1. LIFTING - IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT A CRANE OF THE CORRECT LIFTING CAPACITY IS AVAILABLE TO HANDLE THE PRECAST CONCRETE UNITS. THIS CAN BE ACCOMPLISHED BY USING THE WEIGHTS GIVEN FOR THE PRECAST CONCRETE COMPONENTS AND BY DETERMINING THE LIFTING REACH FOR EACH CRANE UNIT. SITE CONDITIONS MUST BE CHECKED WELL IN ADVANCE OF SHIPPING TO ENSURE PROPER CRANE LOCATION AND TO AVOID ANY LIFTING RESTRICTIONS. THE LIFT ANCHORS OR HOLES PROVIDED IN EACH UNIT ARE THE ONLY MEANS TO BE USED TO LIFT THE ELEMENTS. THE PRECAST CONCRETE ELEMENTS MUST NOT BE SUPPORTED OR RAISED BY OTHER MEANS THAN THOSE GIVEN IN THE MANUALS AND DRAWINGS WITHOUT WRITTEN APPROVAL FROM CONTECH® ENGINEERED SOLUTIONS.
13.1.2. CONSTRUCTION EQUIPMENT WEIGHT RESTRICTIONS - IN NO CASE SHALL EQUIPMENT OPERATING IN EXCESS OF THE DESIGN LOAD (HL-93) BE PERMITTED OVER THE BRIDGE UNITS UNLESS APPROVED BY CONTECH® ENGINEERED SOLUTIONS.
13.1.2.1. IN THE IMMEDIATE AREA OF THE BRIDGE UNITS, THE FOLLOWING RESTRICTIONS FOR THE USE OF HEAVY CONSTRUCTION MACHINERY DURING BACKFILLING OPERATIONS APPLY:
- NO CONSTRUCTION EQUIPMENT SHALL CROSS THE BARE PRECAST CONCRETE BRIDGE UNIT.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 4" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 10 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED A MINIMUM OF 1'-0" OVER THE CROWN OF THE BRIDGE, CONSTRUCTION EQUIPMENT WITH A WEIGHT OF LESS THAN 30 TONS MAY CROSS THE BRIDGE.
- AFTER THE COMPACTED FILL LEVEL HAS REACHED THE DESIGN COVER, OR 2'-0" MINIMUM, OVER THE CROWN OF THE PRECAST CONCRETE BRIDGE, CONSTRUCTION EQUIPMENT WITHIN THE DESIGN LOAD LIMITS FOR THE ROAD MAY CROSS THE PRECAST CONCRETE BRIDGE.

13.2. LEVELING PAD/SHIMS - THE BRIDGE UNITS AND WINGWALLS SHALL BE SET ON HARDBOARD SHIMS CONFORMING TO ASTM D1037 OR PLASTIC SHIMS (DAYTON SUPERIOR P-60, P-61 OR APPROVED EQUAL) MEASURING 5" x 5", MINIMUM, UNLESS SHOWN OTHERWISE ON THE PLANS. A MINIMUM GAP OF ½" SHALL BE PROVIDED BETWEEN THE FOOTING AND THE BOTTOM OF THE BRIDGE'S VERTICAL LEGS OR THE BOTTOM OF THE WINGWALL. ALSO, A SUPPLY OF ⅛", ¼" AND ⅜" THICK HARDBOARD OR PLASTIC SHIMS FOR VARIOUS SHIMMING PURPOSES SHALL BE ON SITE.
13.3. PLACEMENT OF BRIDGE UNITS - THE BRIDGE UNITS SHALL BE PLACED AS SHOWN ON THE ENGINEER'S PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE. THE JOINT WIDTH BETWEEN ADJACENT PRECAST UNITS SHALL NOT EXCEED ¾".

13.4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STRUCTURE SPAN DURING ALL PHASES OF INSTALLATION. DUE TO THE ARCH SHAPE, BRIDGE ELEMENTS WILL TEND TO SPREAD UNDER SELF-WEIGHT. IT IS IMPERATIVE THAT ANY LATERAL SPREADING OF THE BRIDGE ELEMENTS BE AVOIDED DURING AND AFTER THEIR PLACEMENT. GENERALLY, HORIZONTAL CABLE TIES OR TIE RODS ARE SHIPPED IN THE LARGER BRIDGE ELEMENTS TO ASSIST IN PREVENTING THIS SPREADING. CABLE TIES/TIE RODS SHALL NOT BE REMOVED UNTILL BRIDGE UNITS ARE GROUTED AND GROUT HAS CURED. IT IS RECOMMENDED THAT TEMPORARY HARDWOOD BLOCKS BE USED IN CONJUNCTION WITH THE CABLE TIES/TIE RODS TO MAINTAIN SPAN. IF, HOWEVER, DUE TO SITE RESTRICTIONS, THESE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO PLACEMENT OF THE BRIDGE ELEMENTS, THE CONTRACTOR MUST NOTIFY CONTECH (MANUFACTURER) AND REQUEST A SUGGESTED INSTALLATION PROCEDURE.

IN ADDITION, IF THE CABLE TIES/TIE RODS MUST BE REMOVED PRIOR TO SETTING ARCH UNITS, THE FOLLOWING QUALITY CONTROL PROCEDURE MUST BE FOLLOWED:
1) FIND "MEASURED SPAN" UPON ARCH UNIT'S DELIVERY TO SITE, PRIOR TO LIFTING FROM TRUCK AND REMOVING CABLE TIES/TIE RODS. "MEASURED SPAN" SHALL BE THE AVERAGE OF (3) SPAN MEASUREMENTS ALONG THE LAY LENGTH OF THE ARCH UNIT.
2) AFTER SETTING OF BRIDGE UNIT ON THE FOUNDATION, VERIFY THE SPAN. THIS "INSTALLED SPAN MEASUREMENT" SHALL NOT EXCEED THE MAXIMUM OF:
A) THE NOMINAL SPAN +½" OR
B) THE "MEASURED SPAN"
IF THE "INSTALLED SPAN MEASUREMENT" EXCEEDS THIS AMOUNT, THE ARCH UNIT SHALL BE LIFTED AND RE-SET UNTIL THE "INSTALLED SPAN MEASUREMENT" MEETS THE LIMITS.

13.5. PLACEMENT OF WINGWALLS, HEADWALLS AND FOUNDATION UNITS - THE WINGWALLS, HEADWALLS AND FOUNDATIONS SHALL BE PLACED AS SHOWN ON THE PLAN DRAWINGS. SPECIAL CARE SHALL BE TAKEN IN SETTING THE ELEMENTS TO THE TRUE LINE AND GRADE.
13.6. WATERPROOFING/JOINT PROTECTION AND SUBSURFACE DRAINAGE
13.6.1. EXTERNAL PROTECTION OF JOINTS - THE BUTT JOINT MADE BY TWO ADJOINING BRIDGE UNITS SHALL BE COVERED WITH A ⅞" x 1⅜" PREFORMED BITUMINOUS JOINT SEALANT AND A MINIMUM OF A 9" WIDE JOINT WRAP. THE SURFACE SHALL BE FREE OF DIRT BEFORE APPLYING THE JOINT MATERIAL. A PRIMER COMPATIBLE WITH THE JOINT WRAP TO BE USED SHALL BE APPLIED FOR A MINIMUM WIDTH OF 9" ON EACH SIDE OF THE JOINT. THE EXTERNAL WRAP SHALL BE CS212 BY CONCRETE SEALANTS INC., EZ-WRAP RUBBER BY PRESS-SEAL GASKET CORPORATION, SEAL WRAP BY MAR MAC MANUFACTURING CO. INC. OR APPROVED EQUAL. THE JOINT SHALL BE COVERED CONTINUOUSLY FROM THE BOTTOM OF ONE BRIDGE SECTION LEG, ACROSS THE TOP OF THE BRIDGE AND TO THE OPPOSITE BRIDGE SECTION LEG. ANY LAPS THAT RESULT IN THE JOINT WRAP SHALL BE A MINIMUM OF 6" LONG WITH THE OVERLAP RUNNING DOWNHILL.
13.6.2. IN ADDITION TO THE JOINTS BETWEEN BRIDGE UNITS, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE HEADWALL SHALL ALSO BE SEALED AS DESCRIBED ABOVE. IF PRECAST WINGWALLS ARE USED, THE JOINT BETWEEN THE END BRIDGE UNIT AND THE WINGWALL SHALL BE SEALED WITH A 2'-0" STRIP OF FILTER FABRIC. ALSO, IF LIFT HOLES ARE FORMED IN THE BRIDGE UNITS, THEY SHALL BE PRIMED AND COVERED WITH A 9" x 9" SQUARE OF JOINT WRAP.
13.6.3. DURING THE BACKFILLING OPERATION, CARE SHALL BE TAKEN TO KEEP THE JOINT WRAP IN ITS PROPER LOCATION OVER THE JOINT.
13.6.4. SUBSOIL DRAINAGE SHALL BE AS DIRECTED BY THE ENGINEER.

13.7. GROUTING
13.7.1. GROUTING SHALL NOT BE PERFORMED WHEN TEMPERATURES ARE EXPECTED TO GO BELOW 35° FOR A PERIOD OF 72 HOURS. FILL THE BRIDGE-FOUNDATION KEYWAY WITH CEMENT GROUT (PORTLAND CEMENT AND WATER OR CEMENT MORTAR COMPOSED OF PORTLAND CEMENT, SAND AND WATER) WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 3000 PSI. VIBRATE AS REQUIRED TO ENSURE THAT THE ENTIRE KEY AROUND THE BRIDGE ELEMENT IS COMPLETELY FILLED. IF BRIDGE ELEMENTS HAVE BEEN SET WITH TEMPORARY TIES (CABLES, BARS, ETC.) GROUT MUST ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1500 PSI BEFORE TIES MAY BE REMOVED.
13.7.2. ALL GROUT SHALL HAVE A MAXIMUM AGGREGATE SIZE OF ¼".
13.7.3. LIFTING AND ERECTION ANCHOR RECESSES SHALL BE FILLED WITH GROUT.
13.7.4. AFTER GROUT HAS REACHED ITS DESIGN STRENGTH THE TEMPORARY HARDWOOD WEDGES SHALL BE REMOVED AND THEIR HOLES FILLED WITH GROUT.
13.8. BACKFILL
13.8.1. DO NOT PERFORM BACKFILLING DURING WET OR FREEZING WEATHER.
13.8.2. NO BACKFILL SHALL BE PLACED AGAINST ANY STRUCTURAL ELEMENTS UNTIL THEY HAVE BEEN APPROVED BY THE ENGINEER.
13.8.3. BACKFILL SHALL BE CONSIDERED AS ALL REPLACED EXCAVATION AND NEW EMBANKMENT ADJACENT TO THE PRECAST CONCRETE ELEMENTS. THE PROJECT CONSTRUCTION AND MATERIAL SPECIFICATIONS, WHICH INCLUDE THE SPECIFICATIONS FOR EXCAVATION FOR STRUCTURES AND ROADWAY EXCAVATION AND EMBANKMENT CONSTRUCTION, SHALL APPLY EXCEPT AS MODIFIED IN THIS SECTION.
13.8.4. BACKFILL ZONES:
- IN-SITU SOIL
- ZONE A: CONSTRUCTED EMBANKMENT OR OVERFILL.
- ZONE B: FILL THAT IS DIRECTLY ASSOCIATED WITH PRECAST CONCRETE BRIDGE INSTALLATION.
- ZONE C: ROAD STRUCTURE.
13.8.5. REQUIRED BACKFILL PROPERTIES
13.8.5.1. IN-SITU SOIL - NATURAL GROUND IS TO BE SUFFICIENTLY STABLE TO ALLOW EFFECTIVE SUPPORT TO THE PRECAST CONCRETE BRIDGE UNITS. AS A GUIDE, THE EXISTING NATURAL GROUND SHOULD BE OF SIMILAR QUALITY AND DENSITY TO ZONE B MATERIAL FOR MINIMUM LATERAL DIMENSION OF ONE BRIDGE SPAN OUTSIDE OF THE BRIDGE FOOTING.
13.8.5.2. ZONE A - ZONE A REQUIRES FILL MATERIAL WITH SPECIFICATIONS AND COMPACTING PROCEDURES EQUAL TO THAT FOR NORMAL ROAD EMBANKMENTS.
13.8.5.3. ZONE B - GENERALLY, SOILS SHALL BE REASONABLY FREE OF ORGANIC MATTER, AND, NEAR CONCRETE SURFACES, FREE OF STONES LARGER THAN 3" IN DIAMETER SEE CHARTS FOR DETAILED DESCRIPTIONS OF ACCEPTABLE SOILS.
13.8.5.4. ZONE C - ZONE C IS THE ROAD SECTION OF GRAVEL, ASPHALT OR CONCRETE BUILT IN COMPLIANCE WITH LOCAL ENGINEERING PRACTICES.
13.8.5.5. GEOTECHNICAL ENGINEER SHALL REVIEW GRADATIONS OF ALL INTERFACING MATERIALS AND, IF NECESSARY, RECOMMEND GEOTEXTILE FILTER FABRIC (PROVIDED BY CONTRACTOR)

13.8.6. PLACING AND COMPACTING BACKFILL
DUMPING FOR BACKFILLING IS NOT ALLOWED ANY NEARER THAN 3'-0" FROM THE BRIDGE LEG.

THE FILL MUST BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE MAXIMUM DIFFERENCE IN THE SURFACE LEVELS OF THE FILL ON OPPOSITE SIDES OF THE BRIDGE MUST NOT EXCEED 2'-0".

THE FILL BEHIND WINGWALLS MUST BE PLACED AT THE SAME TIME AS THAT OF THE BRIDGE FILL. IT MUST BE PLACED IN PROGRESSIVELY PLACED HORIZONTAL LAYERS NOT EXCEEDING 8" PER LAYER.

THE BACKFILL OF ZONE B SHALL BE COMPACTED TO A MINIMUM DENSITY OF 95% OF THE STANDARD PROCTOR, AS REQUIRED BY AASHTO T-99.

SOIL WITHIN 1'-0" OF CONCRETE SURFACES SHALL BE HAND-COMPACTED. ELSEWHERE, USE OF ROLLERS IS ACCEPTABLE. IF VIBRATING ROLLER-COMPACTORS ARE USED, THEY SHALL NOT BE STARTED OR STOPPED WITHIN ZONE B AND THE VIBRATION FREQUENCY SHOULD BE AT LEAST 30 REVOLUTIONS PER SECOND.

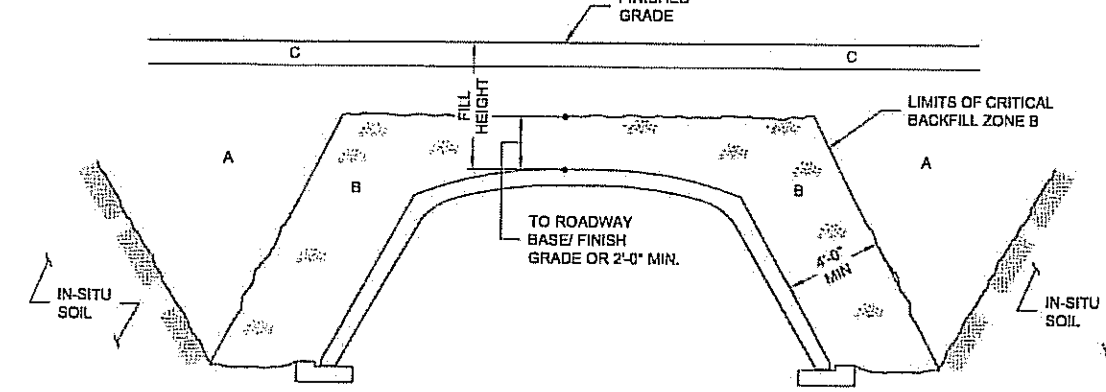
THE BACKFILL MATERIAL AND COMPACTING BEHIND WINGWALLS SHALL SATISFY THE CRITERIA FOR THE BRIDGE BACKFILL, ZONE B.

BACKFILL AGAINST A WATERPROOFED SURFACE SHALL BE PLACED CAREFULLY TO AVOID DAMAGE TO THE WATERPROOFING MATERIAL.
13.8.7. BRIDGE UNITS
FOR FILL HEIGHTS OVER 12 FEET (AS MEASURED FROM TOP CROWN OF BRIDGE TO FINISHED GRADE), NO BACKFILLING MAY BEGIN UNTIL A BACKFILL COMPACTION TESTING PLAN HAS BEEN COORDINATED WITH AND APPROVED BY CONTECH® ENGINEERED SOLUTIONS.
13.8.8. WINGWALLS
BACKFILL IN FRONT OF WINGWALLS SHALL BE CARRIED TO GROUND LINES SHOWN IN THE PLANS.
13.8.9. MONITORING
THE CONTRACTOR SHALL CHECK SETTLEMENTS AND HORIZONTAL DISPLACEMENT OF FOUNDATION TO ENSURE THAT THEY ARE WITHIN THE ALLOWABLE LIMIT PROVIDED BY THE ENGINEER. THESE MEASUREMENTS SHOULD GIVE AN INDICATION OF THE SETTLEMENTS AND DEFORMATIONS ALONG THE LENGTH OF THE FOUNDATIONS.

THE FIRST MEASUREMENT SHOULD TAKE PLACE AFTER THE ERECTION OF ALL PRECAST BRIDGE SYSTEM ELEMENTS, A SECOND AFTER COMPLETION OF BACKFILLING, AND A THIRD BEFORE OPENING OF THE BRIDGE TO TRAFFIC. FURTHER MEASUREMENTS MAY BE MADE ACCORDING TO LOCAL CONDITIONS.

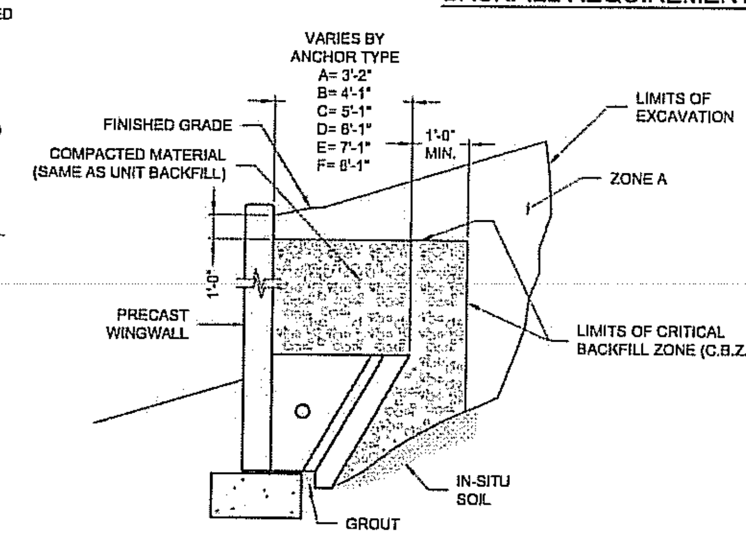
ACCEPTABLE SOILS FOR USE IN ZONE B BACKFILL

TYPICAL USCS MATERIALS	AASHTO GROUP	AASHTO SUBGROUP	PERCENT PASSING US SIEVE NO. #10	#40	#200	CHARACTER OF FRACTION PASSING NO. 40 SIEVE: LIQUID LIMIT	PLASTICITY INDEX	SOIL DESRIPTION
GW, GP, SP	A1	A-1a	50 MAX	30 MAX	15 MAX		6 MAX	LARGELY GRAVEL BUT CAN INCLUDE SAND AND FINES
GM, SW, SP, SM		A-1b		50 MAX	25 MAX		6 MAX	GRAVELLY SAND OR GRADED SAND, MAY INCLUDE FINES
GM, SM, ML, SP, GP	A2	A-2-4			35 MAX	40 MAX	10 MAX	SANDS, GRAVELS WITH LOW-PLASTICITY SILT FINES
SC, GC, GM		A-2-5			35 MAX	41 MIN	10 MAX	SANDS, GRAVELS WITH PLASTIC SILT FINES
SP, SM, SW	A3			51 MIN	10 MAX		NON-PLASTIC	FINE SANDS
ML, SM, SC	A4				36 MIN	40 MAX	10 MAX	LOW-COMPRESSIBILTY SILTS

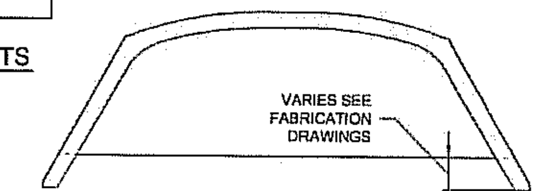


SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE ZONE B
≤ 24'-0"	≥ 12'-0"	A1, A3
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4
> 24'-0"	ALL	A1, A3

BACKFILL REQUIREMENTS



WALL BACKFILL REQUIREMENTS



TIE RODS

9/2/14

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