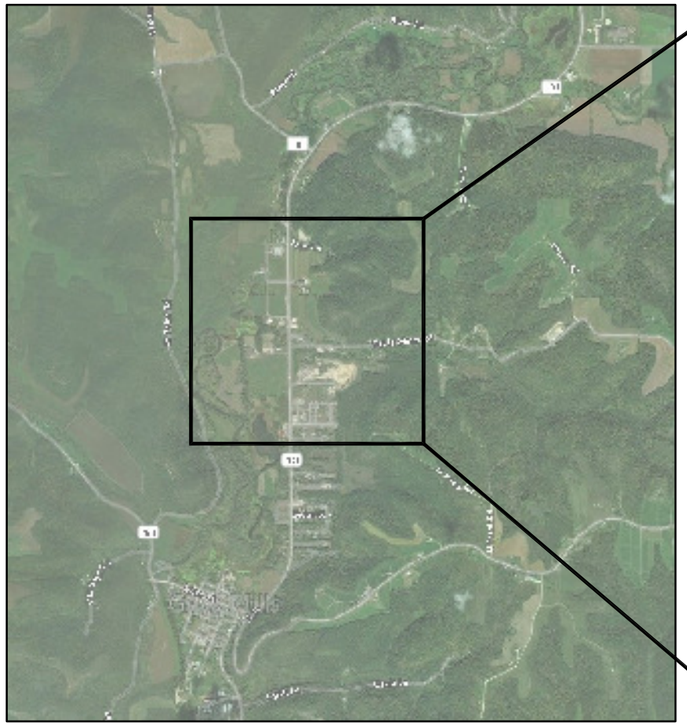
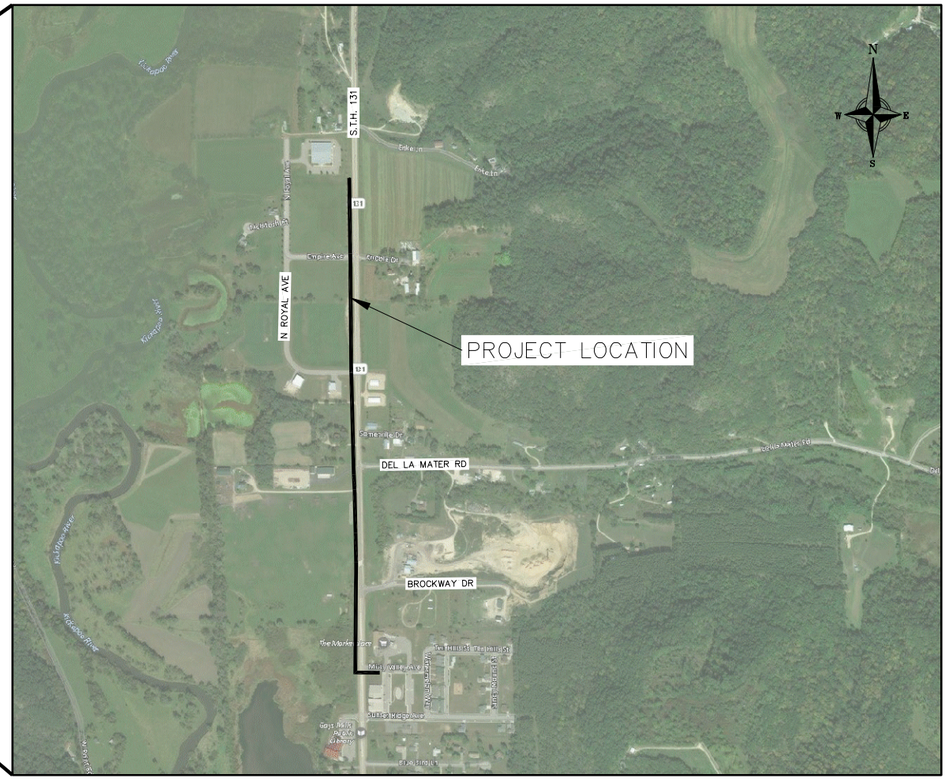
2020 TID NO. 1 INFRASTRUCTURE

TRAIL IMPROVEMENTS

GAYS MILLS, WISCONSIN



LOCATION MAP
VILLAGE OF GAYS MILLS



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www.DiggersHotline.com

THE LOCATION OF EXISTING UTILITIES, BOTH UNDERGROUND AND OVERHEAD ARE APPROXIMATE ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE EXACT LOCATION OF ALL EXISTING UTILITIES WHETHER SHOWN ON THESE PLANS OR NOT, BEFORE COMMENCING WORK, AND SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.

CALL DIGGER'S HOTLINE
1-800-242-8511

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	GENERAL NOTES
3	OVERALL SHEET INDEX
3A–12	PLAN & PROFILE
13–22	CROSS SECTIONS
23–25	DETAILS
26–28	CURB RAMP DETAILS
29	TRAFFIC CONTROL PLAN
31–43	WISDOT DETAILS

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REVISIONS
NO. DATE REMARKS

REVISIONS
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TITLE SHEET
2018 TID NO. 1 INFRASTRUCTURE
TRAIL IMPROVEMENTS
GAYS MILLS, WISCONSIN

SCALE
AS SHOWN

DATE
MAY 2020

DRAFTER
PJUN

CHECKED
THAL

PROJECT NO.
180089

SHEET
1 OF 29

DWG. NO.

08 Jun 2020 - 1:55p R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gay Mills Title_General Notes.dwg by: thal

EROSION CONTROL MEASURES

1. EROSION CONTROL SHALL BE IN ACCORDANCE WITH THE CITY OF VIROQUA EROSION CONTROL ORDINANCE AND CHAPTER NR 216 OF THE WISCONSIN ADMINISTRATIVE CODE.

2. CONSTRUCT AND MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES IN ACCORDANCE WITH WISCONSIN DNR TECHNICAL STANDARDS (http://dnr.wi.gov/runoff/stormwater/techstds.htm) AND WISCONSIN CONSTRUCTION SITE BEST MANAGEMENT PRACTICE HANDBOOK.

3. INSTALL SEDIMENT CONTROL PRACTICES (TRACKING PAD, PERIMETER SILT FENCE, SEDIMENT BASINS, ETC.) PRIOR TO INITIATING OTHER LAND DISTURBING CONSTRUCTION ACTIVITIES.

4. THE CONTRACTOR IS REQUIRED TO MAKE EROSION CONTROL INSPECTIONS AT THE END OF EACH WEEK AND WHEN 0.5 INCHES OF RAIN FALLS WITHIN 24 HOURS. INSPECTION REPORTS SHALL BE PREPARED AND FILED AS REQUIRED BY THE DNR AND CITY. ALL MAINTENANCE WILL FOLLOW AN INSPECTION WITHIN 24 HOURS.

5. EROSION CONTROL IS THE RESPONSIBILITY OF THE CONTRACTOR UNTIL ACCEPTANCE OF THIS PROJECT. EROSION CONTROL MEASURES AS SHOWN SHALL BE THE MINIMUM PRECAUTIONS THAT WILL BE ALLOWED. ADDITIONAL EROSION CONTROL MEASURES, AS REQUESTED IN WRITING BY THE STATE OR LOCAL INSPECTORS, OR THE ENGINEER, SHALL BE INSTALLED WITHIN 24 HOURS.

6. A 3" CLEAR STONE TRACKING PAD SHALL BE INSTALLED AT THE END OF ROAD CONSTRUCTION LIMITS TO PREVENT SEDIMENT FROM BEING TRACKED ONTO THE ADJACENT PAVED PUBLIC ROADWAY. SEDIMENT TRACKING PAD SHALL CONFORM TO WisDNR TECHNICAL STANDARD 1057. SEDIMENT REACHING THE PUBLIC ROAD SHALL BE REMOVED BY STREET CLEANING (NOT HYDRAULIC FLUSHING) BEFORE THE END OF EACH WORK DAY.

7. CHANNELIZED RUNOFF: FROM ADJACENT AREAS PASSING THROUGH THE SITE SHALL BE DIVERTED AROUND DISTURBED AREAS.

8. STABILIZED DISTURBED GROUND: ANY SOIL OR DIRT PILES WHICH WILL REMAIN IN EXISTENCE FOR MORE THAN 7-CONSECUTIVE DAYS, WHETHER TO BE WORKED DURING THAT PERIOD OR NOT, SHALL NOT BE LOCATED WITHIN 25-FEET OF ANY ROADWAY, PARKING LOT, PAVED AREA, OR DRAINAGE STRUCTURE OR CHANNEL (UNLESS INTENDED TO BE USED AS PART OF THE EROSION CONTROL MEASURES). TEMPORARY STABILIZATION AND CONTROL MEASURES (SEEDING, MULCHING, TARPING, EROSION MATTING, BARRIER FENCING, ETC.) ARE REQUIRED FOR THE PROTECTION OF DISTURBED AREAS AND SOIL PILES, WHICH WILL REMAIN UN-WORKED FOR A PERIOD OF MORE THAN 14-CONSECUTIVE CALENDAR DAYS. THESE MEASURES SHALL REMAIN IN PLACE UNTIL SITE HAS STABILIZED.

9. SITE DE-WATERING: WATER PUMPED FROM THE SITE SHALL BE TREATED BY TEMPORARY SEDIMENTATION BASINS OR OTHER APPROPRIATE CONTROL MEASURES. SEDIMENTATION BASINS SHALL HAVE A DEPTH OF AT LEAST 3 FEET, BE SURROUNDED BY SNOWFENCE OR EQUIVALENT BARRIER AND HAVE SUFFICIENT SURFACE AREA TO PROVIDE A SURFACE SETTLING RATE OF NO MORE THAN 750 GALLONS PER SQUARE FOOT PER DAY AT THE HIGHEST DEWATERING PUMPING RATE. WATER MAY NOT BE DISCHARGED IN A MANNER THAT CAUSES EROSION OF THE SITE, A NEIGHBORING SITE, OR THE BED OR BANKS OF THE RECEIVING WATER. POLYMERS MAY BE USED AS DIRECTED BY DNR TECHNICAL STANDARD 1061 (DE-WATERING).

10. WASHED STONE WEEPERS OR TEMPORARY EARTH BERMS SHALL BE BUILT PER PLAN BY CONTRACTOR TO TRAP SEDIMENT OR SLOW THE VELOCITY OF STORM WATER.

11. SEE DETAIL SHEETS FOR RIP-RAP SIZING. IN NO CASE WILL RIP-RAP BE SMALLER THAN 3" TO 6".

12. INLET FILTERS ARE TO BE PLACED IN STORMWATER INLET STRUCTURES AS SOON AS THEY ARE INSTALLED. ALL PROJECT AREA STORM INLETS NEED WISCONSIN D.O.T. TYPE D INLET PROTECTION. THE FILTERS SHALL BE MAINTAINED UNTIL THE CITY HAS ACCEPTED THE BINDER COURSE OF ASPHALT.

13. RESTORATION (SEED, FERTILIZE AND MULCH) SHALL BE PER SPECIFICATIONS ON THIS SHEET (NOTE: ADD SEEDING RATE STANDARD OF DETAIL BLOCK TO PLAN) UNLESS SPECIAL RESTORATION IS CALLED FOR ON THE LANDSCAPE PLAN OR THE DETENTION BASIN DETAIL SHEET.

14. TERRACES SHALL BE RESTORED WITH 6" TOPSOIL, PERMANENT SEED, FERTILIZER AND MULCH. LOTS SHALL BE RESTORED WITH 6" TOPSOIL, TEMPORARY SEED, FERTILIZER AND MULCH.

15. SEED, FERTILIZER AND MULCH SHALL BE APPLIED WITHIN 7 DAYS AFTER FINAL GRADE HAS BEEN ESTABLISHED. IF DISTURBED AREAS WILL NOT BE RESTORED IMMEDIATELY AFTER ROUGH GRADING, TEMPORARY SEED SHALL BE PLACED.

16. FOR THE FIRST SIX WEEKS AFTER RESTORATION (E.G. SEED & MULCH, EROSION MAT, SOD) OF A DISTURBED AREA, INCLUDE SUMMER WATERING PROVISIONS OF ALL NEWLY SEEDED AND MULCHED AREAS WHENEVER 7 DAYS ELAPSE WITHOUT A RAIN EVENT.

17. EROSION MAT (TYPE I CLASS A PER WISCONSIN D.O.T. P.A.L.) SHALL BE INSTALLED ON ALL SLOPES 3:1 OR GREATER BUT LESS THAN 1:1.

18. SILT FENCE OR EROSION MAT SHALL BE INSTALLED ALONG THE CONTOURS AT 100 FOOT INTERVALS DOWN THE SLOPE ON THE DISTURBED SLOPES STEEPER THAN 5% AND MORE THAN 100 FEET LONG THAT SHEET FLOW TO THE ROADWAY UNLESS SOIL STABILIZERS ARE USED.

19. SILT FENCE TO BE USED ACROSS AREAS OF THE LOT THAT SLOPE TOWARDS A PUBLIC STREET OR WATERWAY. SEE DETAILS.

20. SEDIMENT SHALL BE CLEANED FROM CURB AND GUTTER AFTER EACH RAINFALL AND PRIOR TO PROJECT ACCEPTANCE.

21. ACCUMULATED CONSTRUCTION SEDIMENT SHALL BE REMOVED FROM ALL PERMANENT BASINS TO THE ELEVATION SHOWN ON THE GRADING PLAN FOLLOWING THE STABILIZATION OF DRAINAGE AREAS.

22. ALL CONSTRUCTION ENTRANCES SHALL HAVE TEMPORARY ROAD CLOSED SIGNS THAT WILL BE IN PLACE WHEN THE ENTRANCE IS NOT IN USE AND AT THE END OF EACH DAY.

23. THE CITY AND/OR ENGINEER MAY REQUIRE ADDITIONAL EROSION CONTROL MEASURES AT ANY TIME DURING CONSTRUCTION.

AGENCIES

EMERGENCY – FIRE, RESCUE, AMBULANCE, POLICE
DIAL 911

GAYS MLLS FIRE DEPARTMENT
KEVIN OPPRICHT
GAYS MILLS, WI 54631
(608) 735-4424 NON-EMERGENCY

UNITED STATES POST OFFICE
225 ORIN STREET
GAYS MILLS, WI 54631
(608) 735-4450

CRAWFORD COUNTY – HIGHWAY DEPARTMENT
21515 STH 27
SENECA, WI 54654
(608) 421-8875

CRAWFORD COUNTY – SHERIFF'S DEPARTMENT
224 N. BEAUMONT ROAD
PRAIRIE DU CHIEN, WI 53821
(608) 326-0241 NON-EMERGENCY

WIDOT
MARK GOGGIN
3550 MORMAN COULEE ROAD
LACROSSE, WI 54601-6767
(608) 789-5955

OWNER

VILLAGE OF GAYS MILLS -VILLAGE HALL
16381 STH 131, SUITE #1
GAYS MILLS, WI 54631
ATTN: DAWN McCANN, VILLAGE CLERK
(608) 735-4341

ENGINEER

VIERBICHER ASSOCIATES INC
400 VIKING DRIVE
REEDSBURG, WI 53959
ATTN: CRAIG MATHEWS
(608) 524-6468

UTILITIES

VILLAGE OF GAYS MILLS -SEWER & WATER
16381 STH 131, SUITE #1
GAYS MILLS, WI 54631
ATTN: JIM CHELLEVOLD, DPW
(608) 735-4341

MEDIACOM LLC WISCONSIN – TELEPHONE
115 S MARQUETTE RD
PRAIRIE DU CHIEN, WI 53821
ATTN: TIM ORCUTT
(608) 326-0478
(515) 249-5848

ALLIANT ENERGY – ELECTRIC
761 ENTERPRISE DRIVE
PLATTEVILLE, WI 53818
ATTN: JERRY NICHOLSON
(608) 342-4113
(608) 558-7777 CELL

RICHLAND-GRANT TELEPHONE – TELEPHONE
PO BOX 67
BLUE RIVER, WI 53518
ATTN: JOHN BARTZ
(608) 537-2461

MADISON GAS & ELECTRIC – GAS
PO BOX 109
526 E. DECKER
VIROQUA, WI 54665
ATTN: MARK OLSON
(608) 637-3139

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GENERAL NOTES

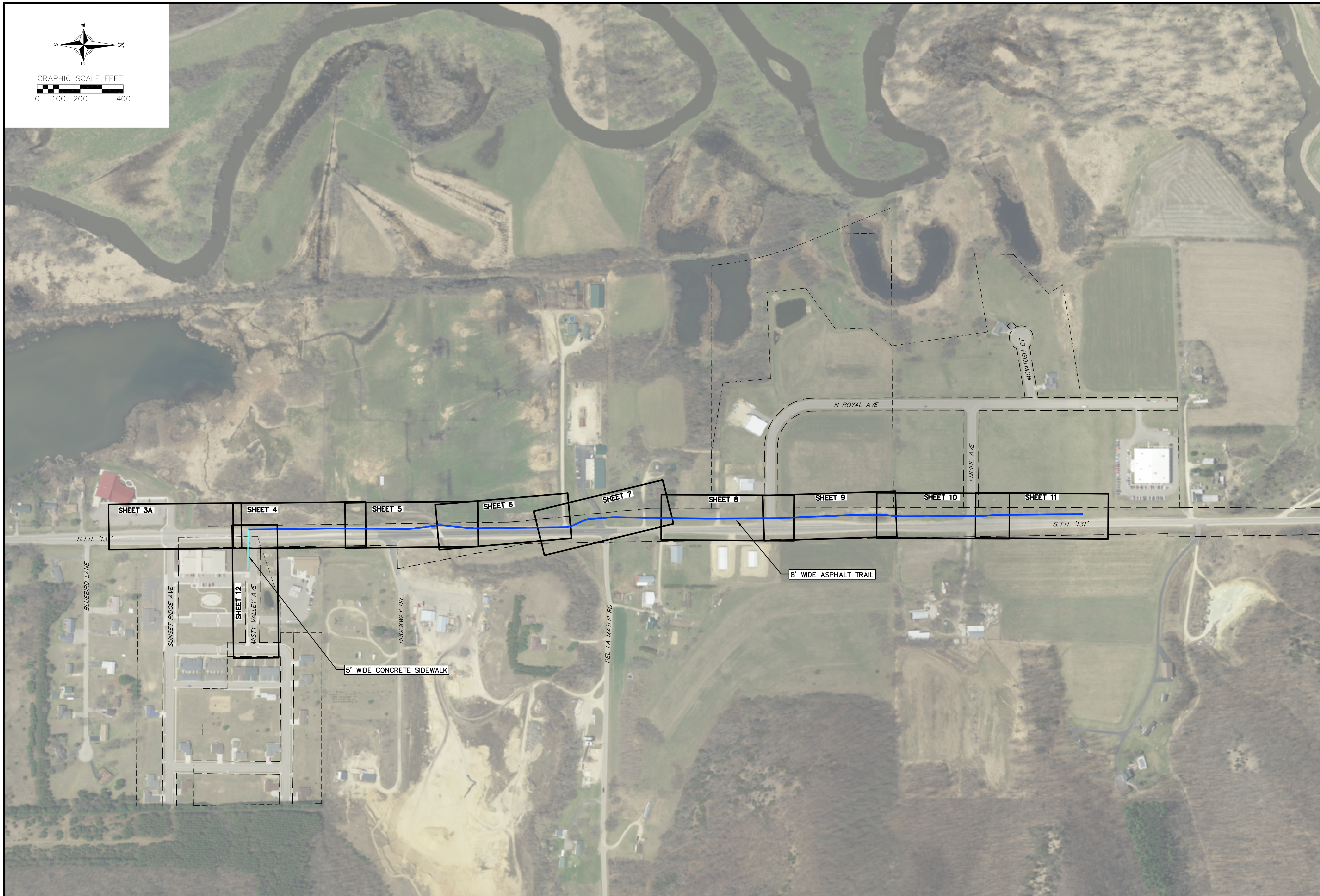
2018 TID NO. 1 INFRASTRUCTURE
TRAIL IMPROVEMENTS
GAYS MILLS, WISCONSIN

REVISIONS		
NO.	DATE	REMARKS

REVISIONS		
NO.	DATE	REMARKS

SCALE: AS SHOWN
DATE: JULY 2018
DRAFTER: PJUN
CHECKED: MMUC
PROJECT NO.: 180089
SHEET: 2 OF 25
DWG. NO.:

12 Nov 2019 - 8:23a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gay Mills Title_General Notes.dwg by: lgre



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OVERALL SHEET INDEX

2018 TID NO. 1 INFRASTRUCTURE
TRAIL IMPROVEMENTS
GAYS MILLS, WISCONSIN

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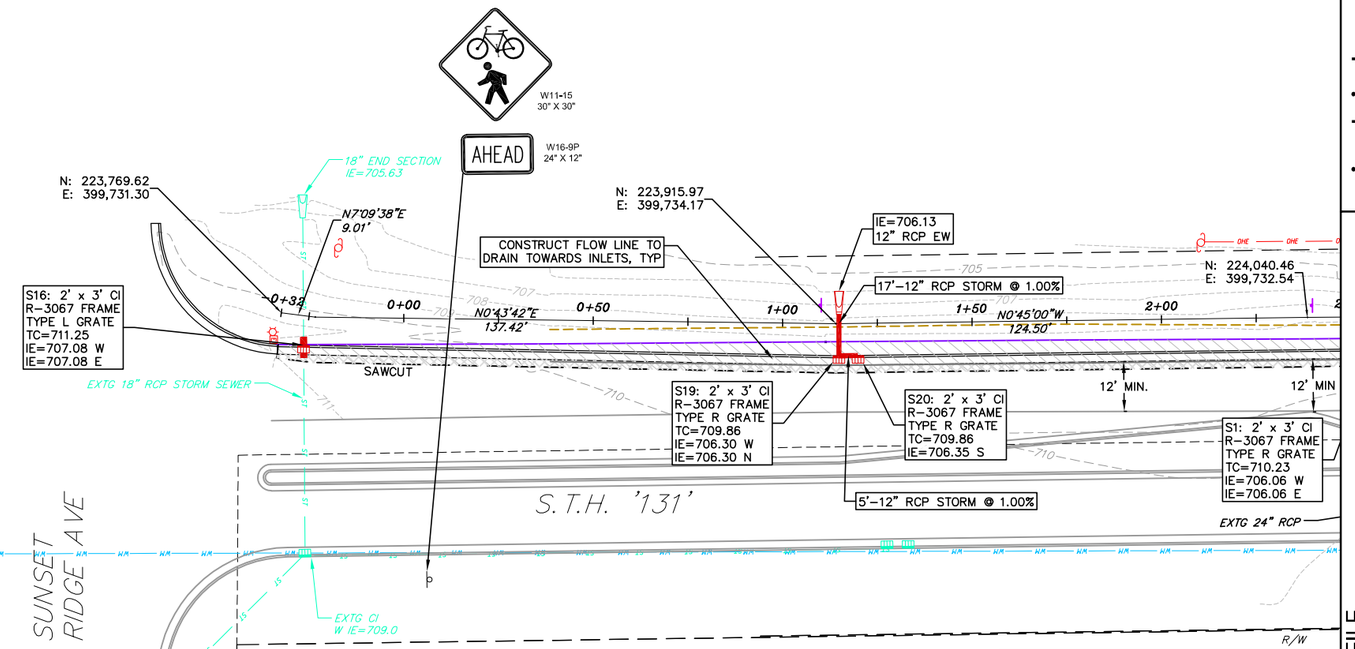
NO.	DATE	REMARKS

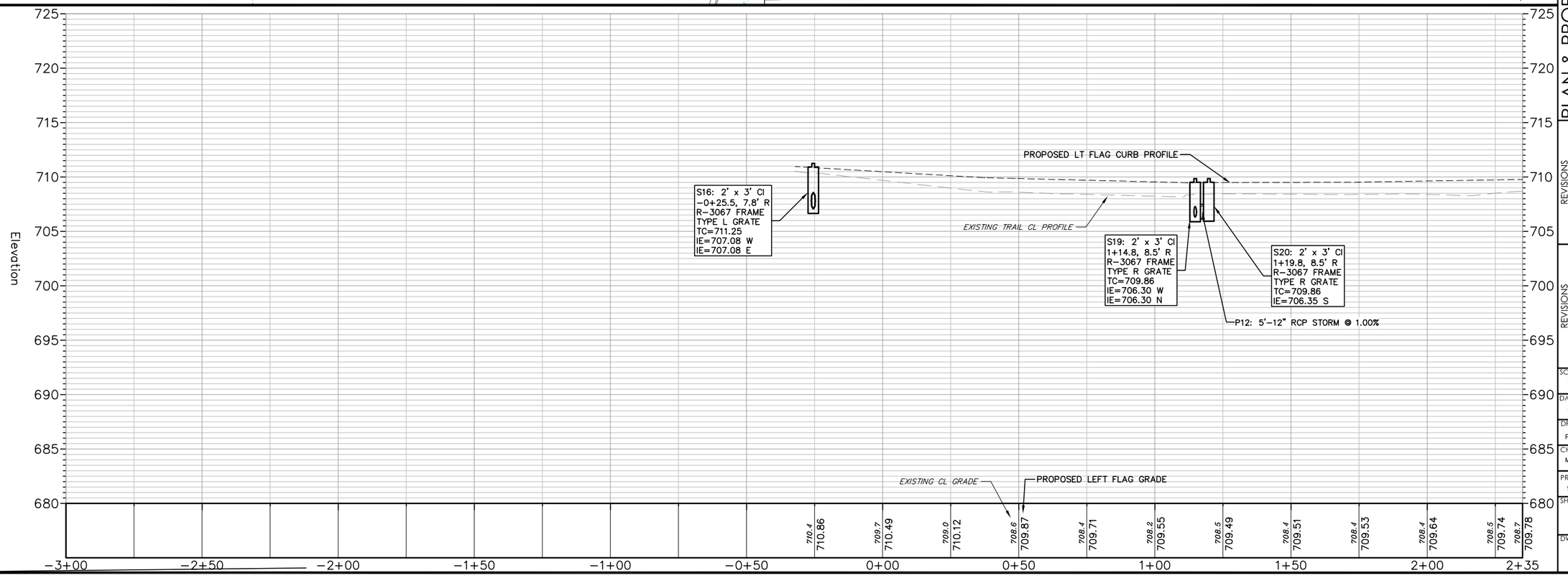
SCALE AS SHOWN
DATE JULY 2018
DRAFTER PJUN
CHECKED MMUC
PROJECT NO. 180089
SHEET 3 OF 25
DWG. NO.

15 Aug 2019 - 9:16a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gay Mills Title_General Notes.dwg by: pjun

GRAPHIC SCALE FEET
0 10 20 40

LEGEND
- NEW ASPHALT TRAIL (2.5")
- NEW CONCRETE (5")
- REMOVE ASPHALT
- REPLACE ASPHALT (4" HMA)
- PROPOSED CURB
- EXISTING CURB
- SLOPE INTERCEPT





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PLAN & PROFILE

2018 TID NO. 1 INFRASTRUCTURE
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GAYS MILLS, WISCONSIN

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DATE
JULY 2018

DRAFTER
PJUN

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PROJECT NO.
180089

SHEET
3A OF 29

DWG. NO.

28 May 2020 - 9:30a C:\Users\lhall\Documents\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: lhall

LEGEND

- NEW ASPHALT TRAIL (2.5")
- NEW CONCRETE (5")
- REMOVE ASPHALT
- REPLACE ASPHALT (4" HMA)
- PROPOSED CURB
- EXISTING CURB
- SLOPE INTERCEPT

W11-15 30" X 30"

AHEAD W16-9P 24" X 12"

GRAPHIC SCALE FEET 0 10 20 40

N: 224,040.46
E: 399,732.54

RELOCATE STREET LIGHT

CONSTRUCT FLOW LINE TO DRAIN TOWARDS INLETS, TYP

IE=706.94
4+50.0, 12.2 L
12" RCP EW

21'-12" RCP STORM @ 1.06%

CONSTRUCT FLOW LINE TO DRAIN TOWARDS INLETS, TYP

48" POLY-COATED CHAIN LINK FENCE

IE=706.99
6+50.0, 11.8 L
12" RCP EW

N: 224,455.81
E: 399,727.11

100+00.00

N0°45'00"W
415.39'

12' MIN

8'

SAWCUT

20'-12" RCP STORM @ 1.00%

S.T.H. '131'

DOUBLE SIDED RRFB
SEE DETAILS
STA 2+64, 3.5' RT

CROSSWALK
6" EPOXY

CONCRETE APRON &
ADA ACCESIBLE RAMPS
SEE DETAILS

S1: 2' x 3' CI
R-3067 FRAME
TYPE R GRATE
TC=710.23
IE=706.06 W
IE=706.06 E

S5: 2' x 3' CI
R-3067 FRAME
TYPE R GRATE
TC=710.16
IE=707.16 W

S7: 2' x 3' CI
R-3067 FRAME
TYPE R GRATE
TC=710.19
IE=707.19 W

EXTG 24" RCP

REMOVE AND REPLACE CURB
AS REQUIRED FOR ADA RAMPS

100+78.53

SAWCUT

101+00.38

DOUBLE SIDED RRFB
SEE DETAILS
STA 100+84, 5' RT

5' CONCRETE SIDEWALK

MISTY VALLEY AVE

R/W

PVI STA = 2+61.56
ELEV = 709.85

PVI STA = 4+02.94
ELEV = 709.85

PVI STA = 5+49.98
ELEV = 709.60

PVI STA = 6+96.59
ELEV = 709.85

PROPOSED TRAIL CL PROFILE

EXISTING TRAIL CL PROFILE

PROPOSED LT FLAG CURB PROFILE

0.00%

-0.17%

0.17%

0.60%

S1: 2' x 3' CI
2+56.4, 8.5' R
R-3067 FRAME
TYPE R GRATE
TC=710.23
IE=706.06 W
IE=706.06 E

S5: 2' x 3' CI
4+50.0, 8.5' R
R-3067 FRAME
TYPE R GRATE
TC=710.16
IE=707.16 W

S7: 2' x 3' CI
6+50.0, 8.5' R
R-3067 FRAME
TYPE R GRATE
TC=710.19
IE=707.19 W

EXISTING CL GRADE

PROPOSED CL GRADE

2+25	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50	7+00	7+50	8+00
708.5	708.6	708.8 709.85	708.9 709.85	708.9 709.85	708.7 709.85	708.5 709.85	708.4 709.85	708.3 709.81	708.4 709.77	708.4 709.73	708.3 709.68	708.2 709.64
708.3 709.60	708.4 709.64	708.5 709.69	708.6 709.73	708.6 709.77	708.7 709.81	708.8 709.87	709.0 710.02	709.2 710.17	709.3 710.32	709.4 710.47		

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PLAN & PROFILE

2018 TID NO. 1 INFRASTRUCTURE
TRAIL IMPROVEMENTS
GAYS MILLS, WISCONSIN

REVISIONS

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SCALE: AS SHOWN
DATE: JULY 2018
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PROJECT NO.: 180089
SHEET: 4 OF 29
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28 May 2020 - 9:37a C:\Users\fhall\Documents\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: fhall

HYDRAULIC DATA
(FROM B-12-79 – UPSTREAM BRIDGE)

100 YEAR FREQUENCY
Q_{100} = 800 CFS
VEL. = 9.1 FPS
HW_{100} = ELEV 710.6
WATERWAY AREA = 88 SF
DRAINAGE AREA = 2.2 SQ MI
SCOUR CRITICAL CODE = 8
ROAD OVERTOPPING FREQUENCY = NA

50' CLEAR SPAN BRIDGE
HYDRAULIC OPENING = 156 SF
WATERWAY AREA = 139 SF

S8: 2' x 3' CI
12+90.1, 12.5' R
R-3067 FRAME
TYPE L GRATE
TC=712.58
IE=709.08 W

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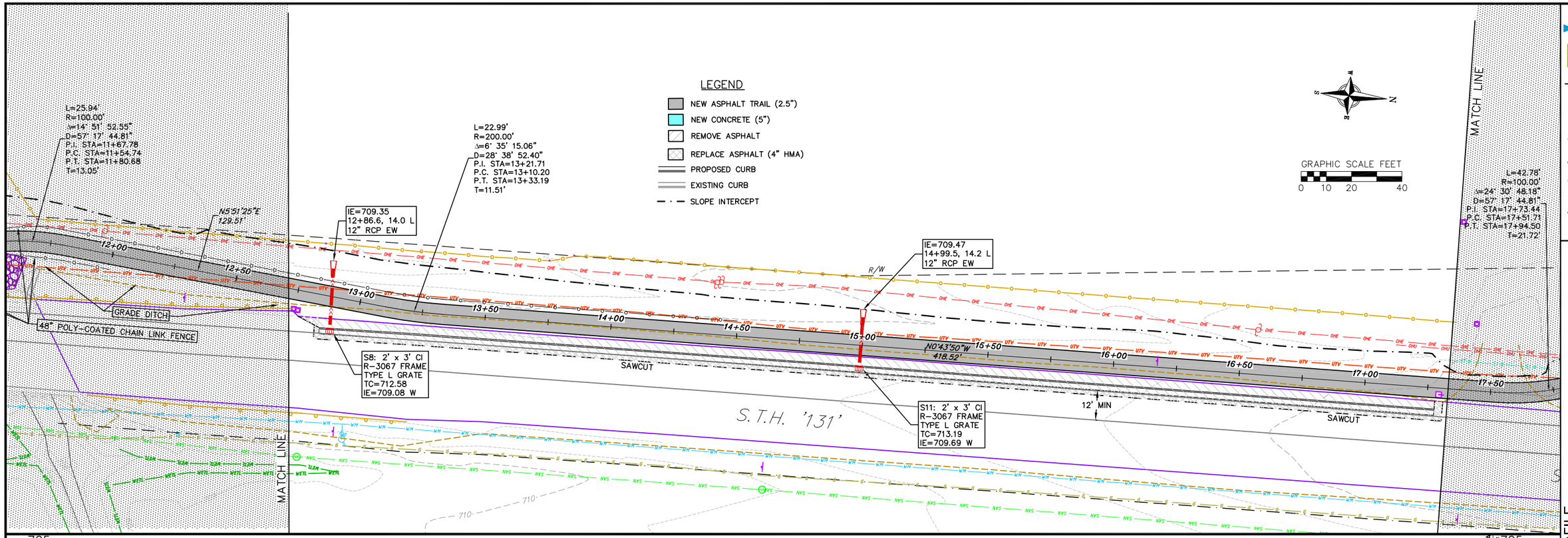
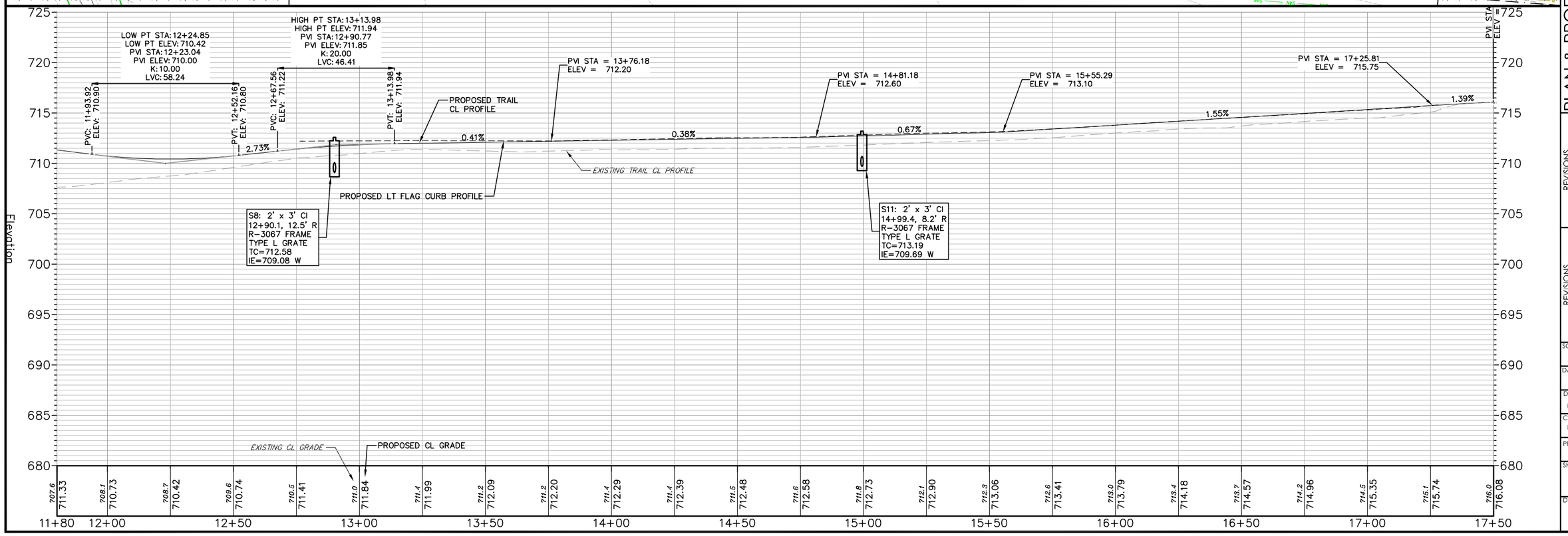
12 Nov 2019 - 8:29a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: igre





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180089

SHEET
6 OF 25

DWG. NO.

L=42.78'
R=100.00'
Δ=24° 30' 48.18"
D=57° 17' 44.81"
P.I. STA=17+73.44
P.C. STA=17+51.71
P.T. STA=17+94.50
T=21.72'

IE=714.10
18+49.9, 13.1 L
12" RCP EW

26'-12" RCP STORM @ 2.28%

L=35.99'
R=100.00'
Δ=20° 37' 21.86"
D=57° 17' 44.81"
P.I. STA=18+58.03
P.C. STA=18+39.84
P.T. STA=18+75.83
T=18.19'

MATCH EXISTING, SAWCUT EDGE

IE=716.20
19+60.7, 14.1 L
12" RCP EW

27'-12" RCP STORM @ 4.89%

L=47.59'
R=500.00'
Δ=5° 27' 12.94"
D=11° 27' 32.96"
P.I. STA=19+79.91
P.C. STA=19+56.10
P.T. STA=20+03.69
T=23.81'

SAWCUT

N25°14'38"W
45.34'

IE=714.70
18+50.1, 13.2 R
12" RCP EW

S.T.H. '131'

N4°37'16"W
80.27'

IE=717.50
19+65.5, 12.1 R
12" RCP EW

R/W

8' WIDE PAVED TRAIL w/
1' WIDE GRAVEL SHOULDERS

N0°49'57"E
409.31'

DEL LA MATER RD

LEGEND

- NEW ASPHALT TRAIL (2.5")
- NEW CONCRETE (5")
- REMOVE ASPHALT
- REPLACE ASPHALT (4" HMA)
- PROPOSED CURB
- EXISTING CURB
- SLOPE INTERCEPT

GRAPHIC SCALE FEET
0 10 20 40

PVI STA = 17+25.81
ELEV = 715.75

PVI STA = 17+49.84
ELEV = 716.08

PVI STA = 17+96.54
ELEV = 716.00

PVI STA = 18+25.74
ELEV = 716.27

PVI STA = 18+75.98
ELEV = 716.84

PVI STA = 18+99.40
ELEV = 717.42

PVI STA = 19+60.06
ELEV = 718.15

PVI STA = 19+79.58
ELEV = 718.29

PVI STA = 19+99.80
ELEV = 718.50

PVI STA = 21+24.68
ELEV = 726.47

PVI STA = 21+45.11
ELEV = 726.11

PVI STA = 21+86.32
ELEV = 727.71

1.39% −0.18% 0.91% −0.95% 1.30% 2.46% 1.20% 0.72% 1.03% 6.38% −1.78% 3.88%

PROPOSED LT FLAG CURB PROFILE
PROPOSED TRAIL CL PROFILE
EXISTING TRAIL CL PROFILE
GRADE DITCH TO MATCH NEW CULVERT
GRADE DITCH TO MATCH NEW CULVERT
EXISTING CL GRADE
PROPOSED CL GRADE

713.7	714.2	714.5	715.1	716.0	715.2	714.3	714.5	714.6	714.7	716.0	717.2	716.7	717.2	717.8	719.0	720.2	721.2	722.9	726.5	726.2	727.2	727.8	728.3
714.57	714.96	715.35	715.74	716.08	716.04	716.03	716.26	716.50	716.83	717.43	717.73	718.03	718.26	718.51	720.11	721.70	723.30	724.89	726.46	726.30	727.27	727.97	728.46

16+50 17+00 17+50 18+00 18+50 19+00 19+50 20+00 20+50 21+00 21+50 22+00 22+25

740 735 730 725 720 715 710 705 700 695

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7 OF 25

DWG. NO.

21 May 2020 - 8:58a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: lhal

GRAPHIC SCALE FEET
0 10 20 40

LEGEND
- NEW ASPHALT TRAIL (2.5")
- NEW CONCRETE (5")
- REMOVE ASPHALT
- REPLACE ASPHALT (4" HMA)
- PROPOSED CURB
- EXISTING CURB
- SLOPE INTERCEPT

R/W

L=15.09'
R=1000.00'
Δ=0° 51' 52.97"
D=5° 43' 46.48"
P.I. STA=24+20.55
P.C. STA=24+13.00
P.T. STA=24+28.09
T=7.55'

8' WIDE PAVED TRAIL w/ 1' WIDE GRAVEL SHOULDERS

NO MOTOR VEHICLES

REPLACE CURB FOR CURB OPENINGS AS REQ'D

STOP

STOP BAR

N: 226,513.16
E: 399,681.11

N. ROYAL AVE

R/W

MATCH LINE

22+50 23+00 23+50 24+00 24+50 25+00 25+50 26+00 26+50 27+00 27+50 28+00

N01°01'56"W
292.32'

8'

SAWCUT

CROSSWALK 6" EPOXY

NO MOTOR VEHICLES

S.T.H. '131'

ADJUST EXTG SAN MANHOLE RIM
EXTG: 733.60'
PROPOSED: 734.38'

STOP AHEAD

STOP

RELOCATE EXTG SIGN

CONCRETE APRON & HANDICAP RAMP ON BOTH SIDES

MATCH LINE

R/W

PVI STA = 23+25.23
ELEV = 730.40

PVI STA = 24+08.99
ELEV = 732.55

PVI STA = 24+64.60
ELEV = 735.33

PVI STA = 25+03.87
ELEV = 734.28

PVI STA = 25+41.55
ELEV = 735.29

PVI STA = 26+64.04
ELEV = 741.41

PVI STA = 27+20.41
ELEV = 743.06

PVI STA = 27+63.68
ELEV = 743.79

PVI STA = 28+03.55
ELEV = 743.13

PROPOSED TRAIL CL PROFILE

EXISTING TRAIL CL PROFILE

1.94% 2.57% 5.00% 0.77% −4.69% 2.67% 5.00% 2.92% 1.67% −1.64%

EXISTING CL GRADE

PROPOSED CL GRADE

728.3	728.8	729.3	729.8	730.5	731.2	731.5	732.2	732.8	733.3	735.5	734.2	734.7	735.1	735.6	736.1	737.2	739.7	741.6	742.4	743.1	743.4	743.6	743.2
728.46	728.94	729.43	729.91	730.40	731.04	731.68	732.32	733.35	734.60	735.41	734.46	734.85	735.71	736.96	738.21	739.46	740.71	741.74	742.47	743.14	743.56	743.60	743.21

22+25 22+50 23+00 23+50 24+00 24+50 25+00 25+50 26+00 26+50 27+00 27+50 28+00 28+10

755 750 745 740 735 730 725 720 715 710

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2018 TID NO. 1 INFRASTRUCTURE
TRAIL IMPROVEMENTS
GAYS MILLS, WISCONSIN

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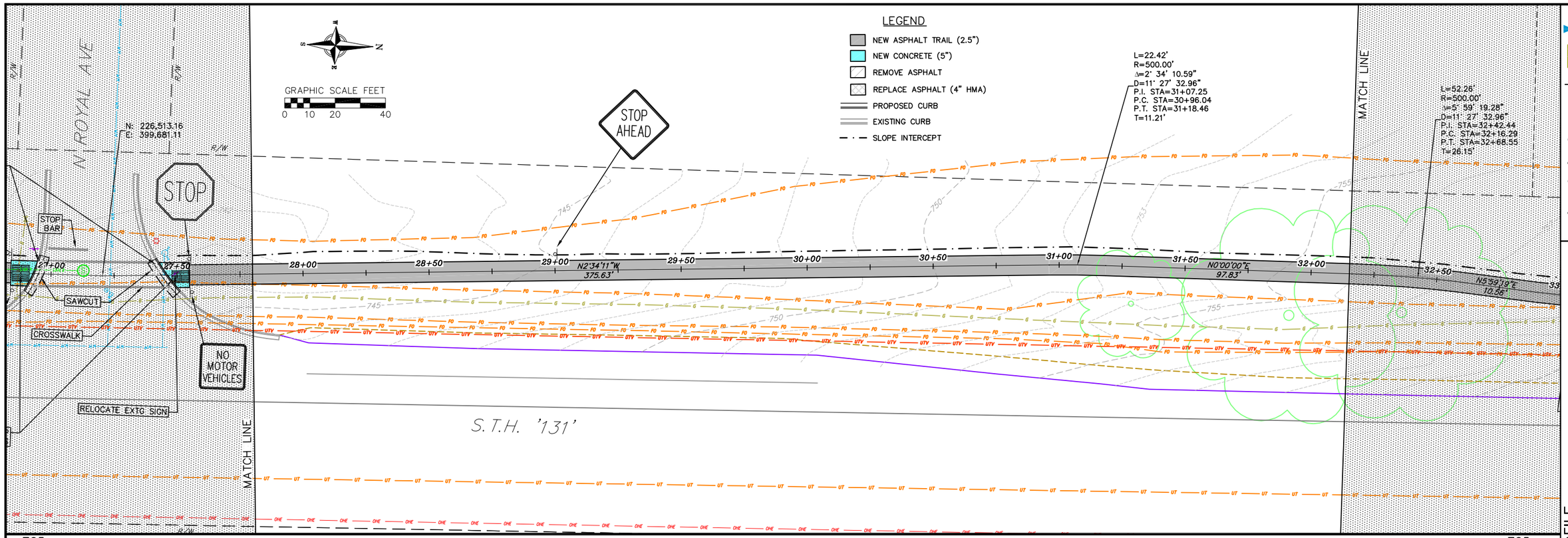
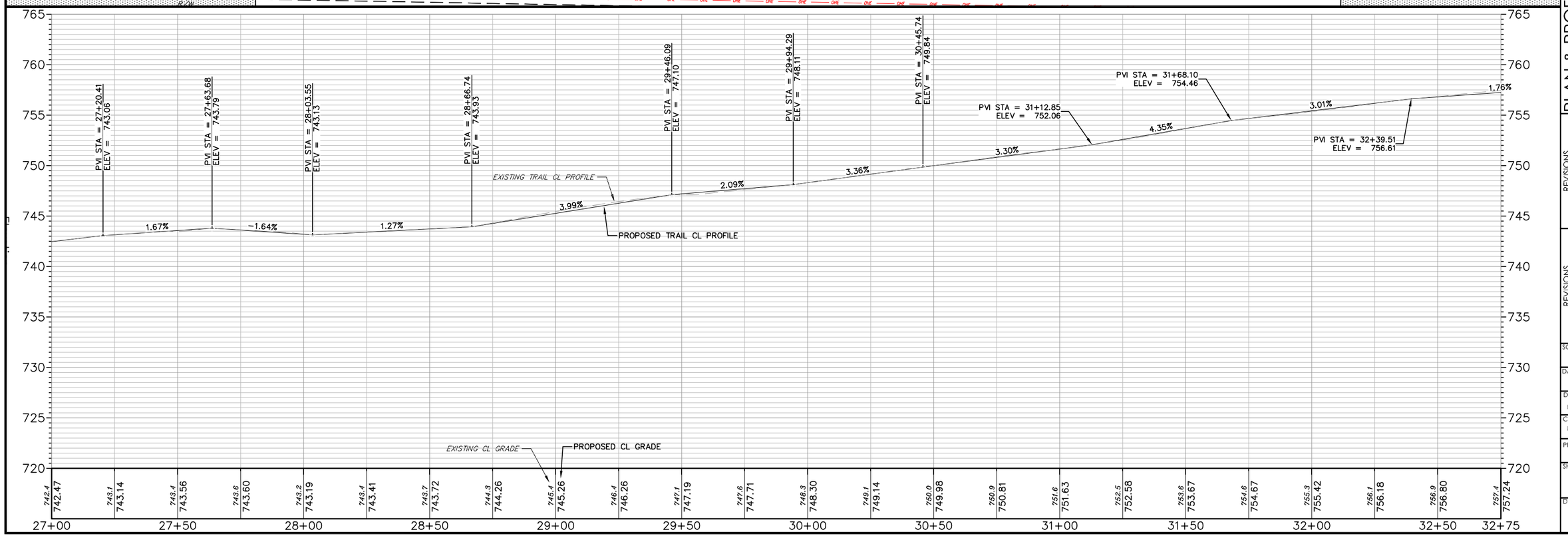
27 May 2020 - 10:54a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: thal





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16 Aug 2019 - 8:57a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Bosse Engineering-west.dwg by: pjun

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27 May 2020 - 11:08a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: lhal

LEGEND

- NEW ASPHALT TRAIL (2.5")
- NEW CONCRETE (5")
- REMOVE ASPHALT
- PROPOSED CURB
- EXISTING CURB
- SLOPE INTERCEPT

GRAPHIC SCALE FEET
0 10 20 40

TRAIL ENDS
500 FT
CUSTOM 12" X 6"
STOP
STOP AHEAD
CURB REQ'D
NO MOTOR VEHICLES
NDICAP SIDES
R/W

37+00 N5°45'15"W 15.67' 37+50 38+00 38+50 39+00 39+50 N0°38'59"W 400.00" 40+00 40+50 41+00 41+50 42+00 N78°49'15"W 43.90' 42+50

L=29.05'
R=300.00'
Δ=5° 32' 52.73"
D=19° 05' 54.94"
P.I. STA=37+10.09
P.C. STA=36+95.56
P.T. STA=37+24.60
T=14.54'

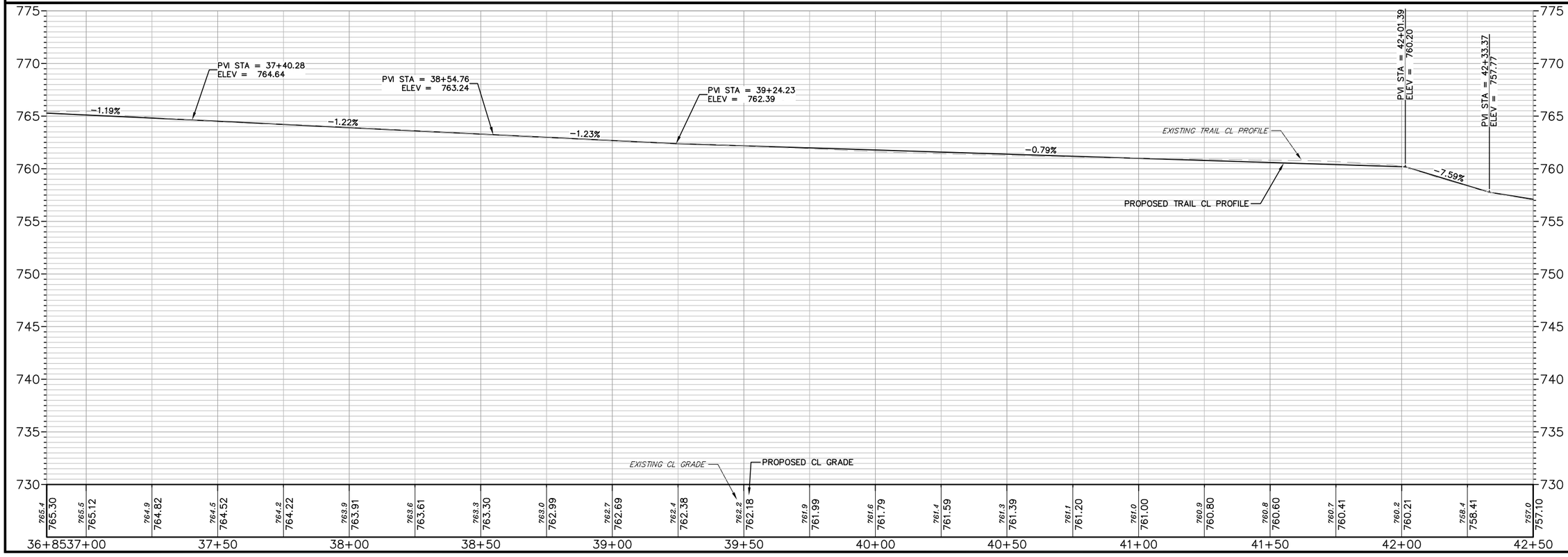
L=26.73'
R=300.00'
Δ=5° 06' 16.28"
D=19° 05' 54.94"
P.I. STA=37+53.65
P.C. STA=37+40.28
P.T. STA=37+67.00
T=13.37'

L=40.93'
R=30.00'
Δ=78° 10' 16.50"
D=190° 59' 09.35"
P.I. STA=41+91.37
P.C. STA=41+67.00
P.T. STA=42+07.93
T=24.37'

764 763 762 761 758

S.T.H. '131'

TRAIL ENDS



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27 May 2020 - 11:13a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: thol

N
W E
S

GRAPHIC SCALE FEET
0 10 20 40

S.T.H. '131'

MISTY VALLEY AVE

R/W

CONCRETE APRON & ADA ACCESIBLE RAMPS SEE RAMP DETAILS

CROSSWALK

100+00 100+50 101+00 101+50 102+00 102+50 103+00 103+10

100+78.53 101+00.38 103+09.84

S1: 2' x 3' CI R-3067 FRAME TYPE R GRATE TC=710.23 IE=706.06 W IE=706.06 E

N: 224,040.46
E: 399,732.54

REMOVE AND REPLACE CURB AS REQUIRED FOR ADA RAMPS

6' CONCRETE SIDEWALK

MATCH EXISTING SIDEWALK

LEGEND
- NEW ASPHALT TRAIL (2.5")
- NEW CONCRETE (5")
- REMOVE ASPHALT
- REPLACE ASPHALT (4" HMA)
- PROPOSED CURB
- EXISTING CURB
- SLOPE INTERCEPT

Elevation

PVI STA = 100+17.90
ELEV = 709.85

PVI STA = 100+50.04
ELEV = 710.32

PVI STA = 100+77.86
ELEV = 709.77

PVI STA = 101+41.51
ELEV = 713.28

PVI STA = 102+16.39
ELEV = 718.38

0.52% 1.98% -1.97% 5.52% 6.81%

MATCH EXISTING SIDEWALK

EXISTING GL GRADE

PROPOSED CL GRADE

709.89 710.3 710.32 709.8 709.83 711.9 710.99 712.6 712.37 713.8 713.86 715.5 715.57 717.2 717.27 719.0 720.8 722.6 724.5

99+00 99+50 100+00 100+50 101+00 101+50 102+00 102+50 103+00 103+50 104+00 104+50 104+75

735 730 725 720 715 710 705 700 695 690

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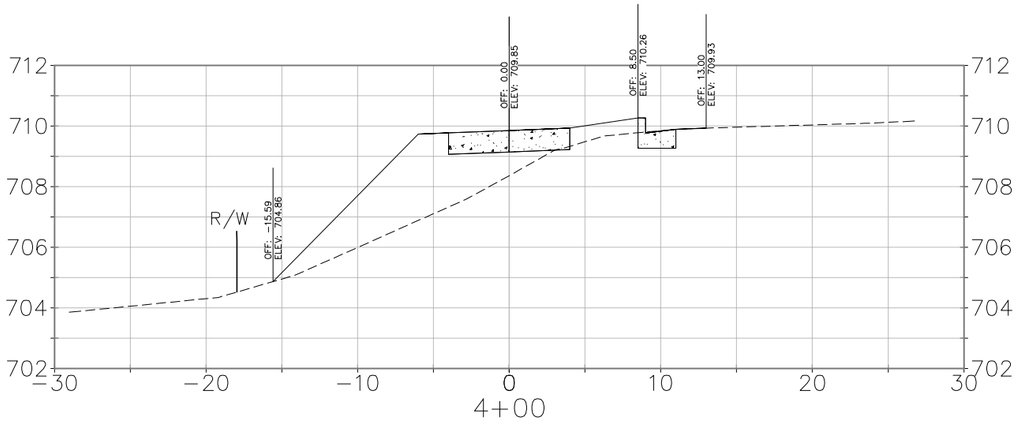
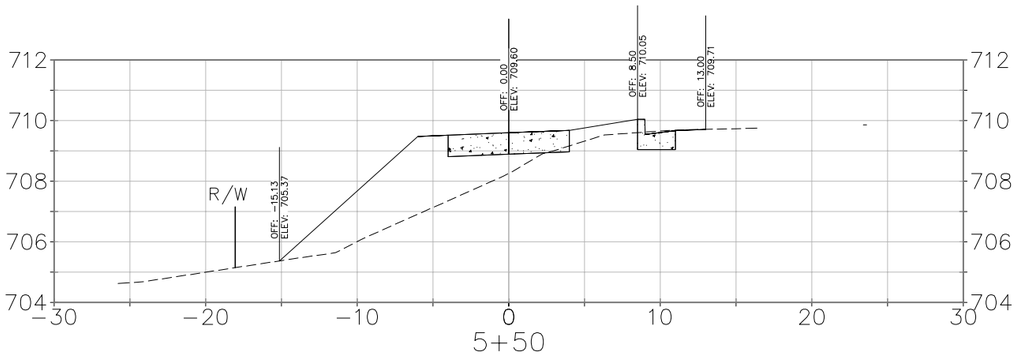
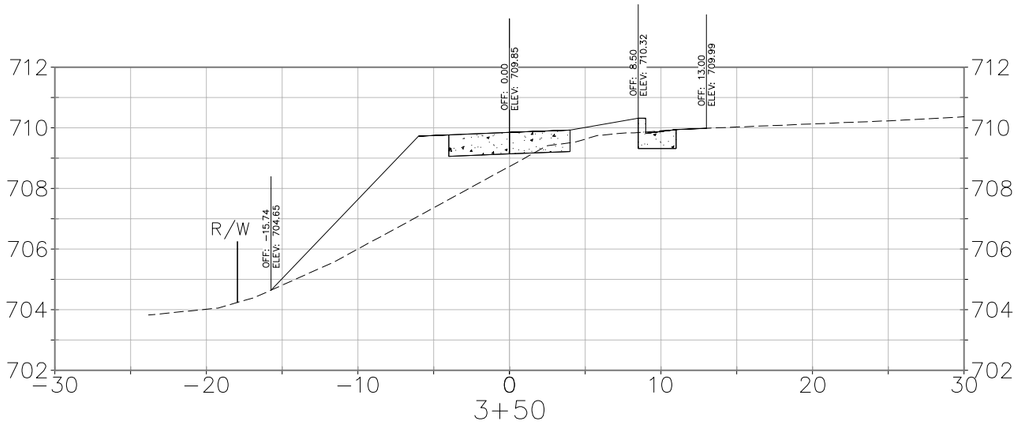
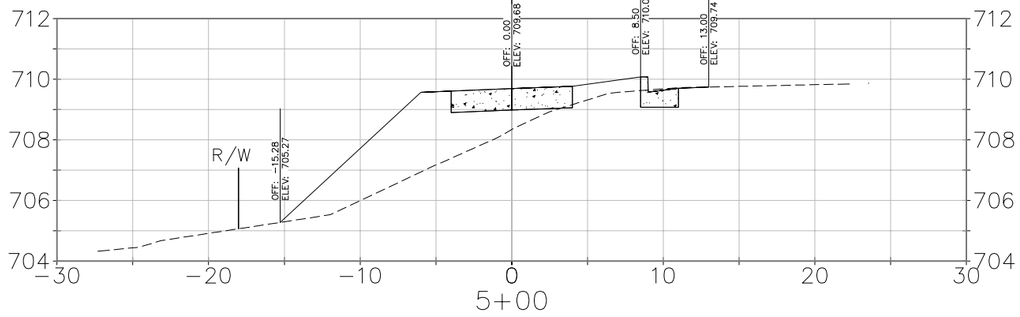
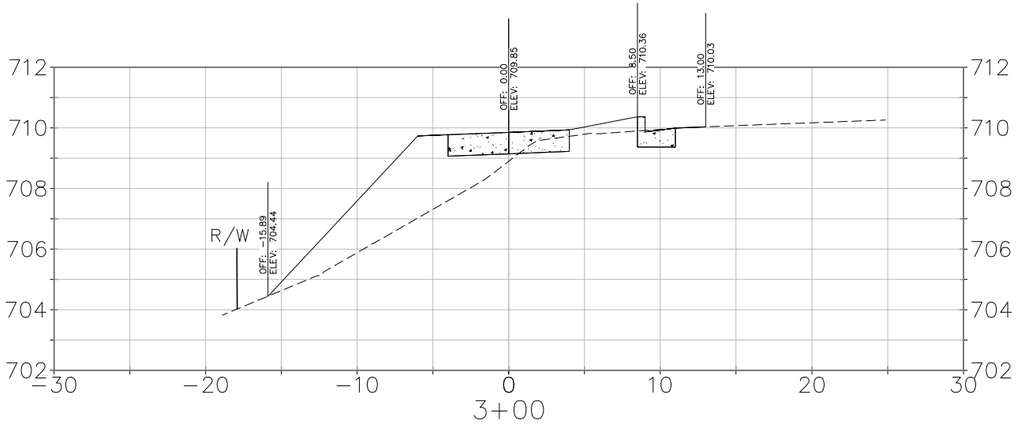
27 May 2020 - 11:50a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: thal

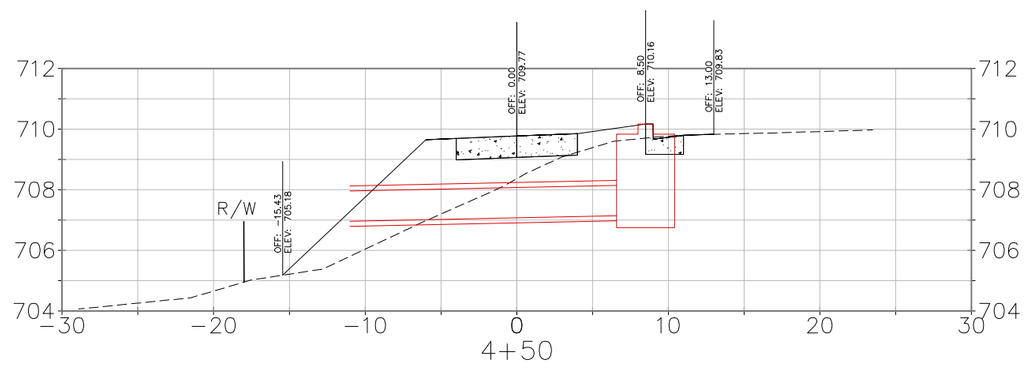












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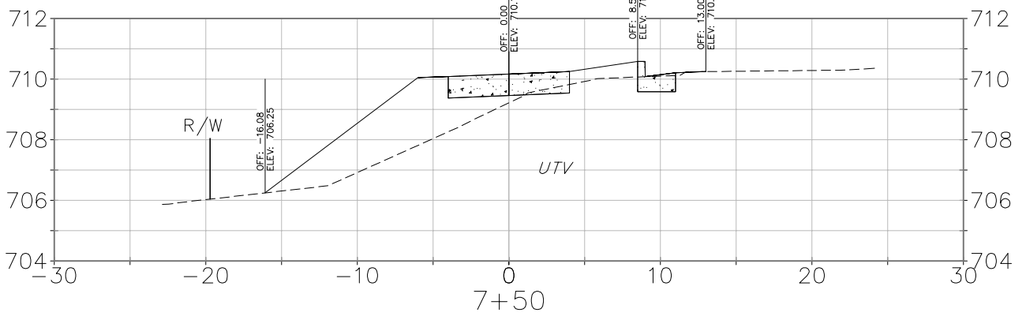
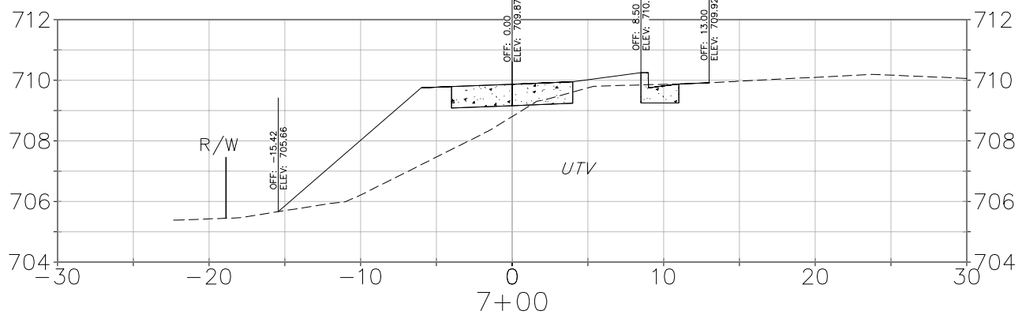
16 Aug 2019 - 9:14a C:\Users\pjun\appdata\local\temp\AcPublish_4624\2018 Gays Mills Trails Base Engineering-west.dwg by: pjun



7+50



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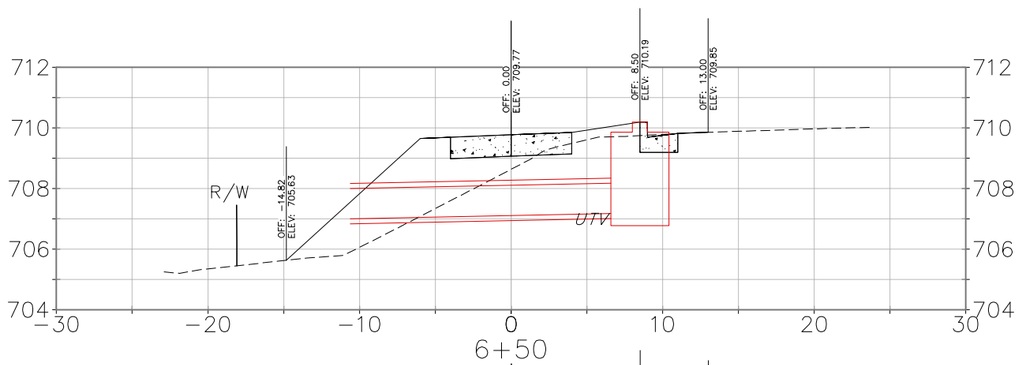

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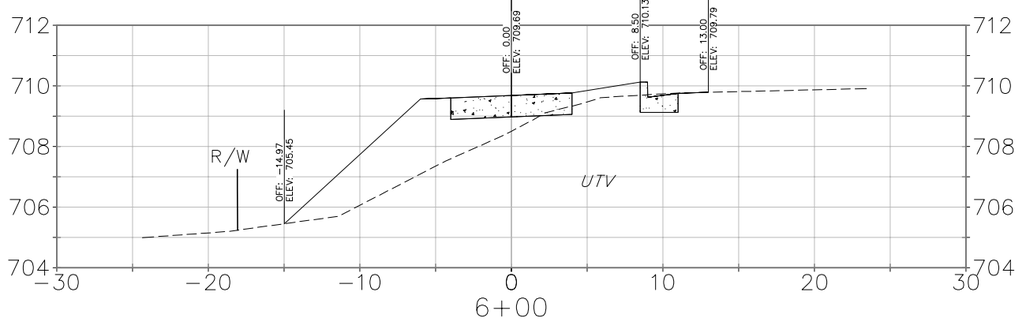

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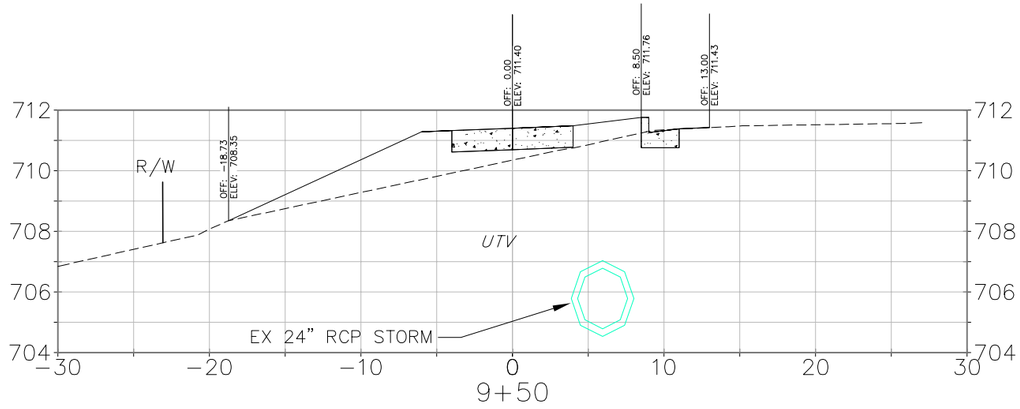
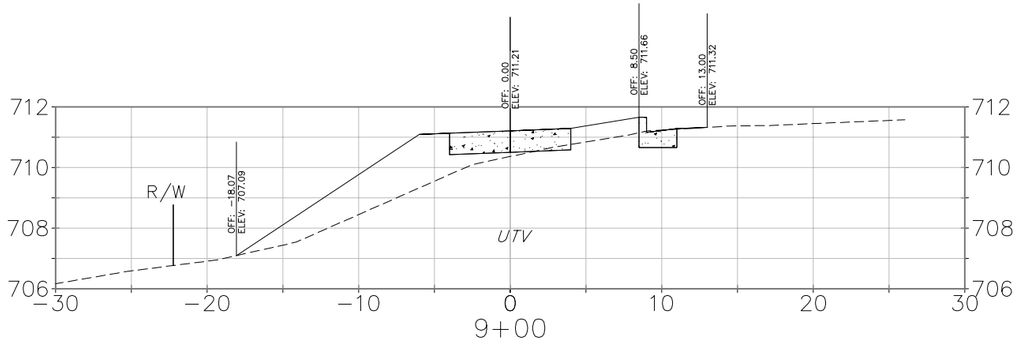


9+50



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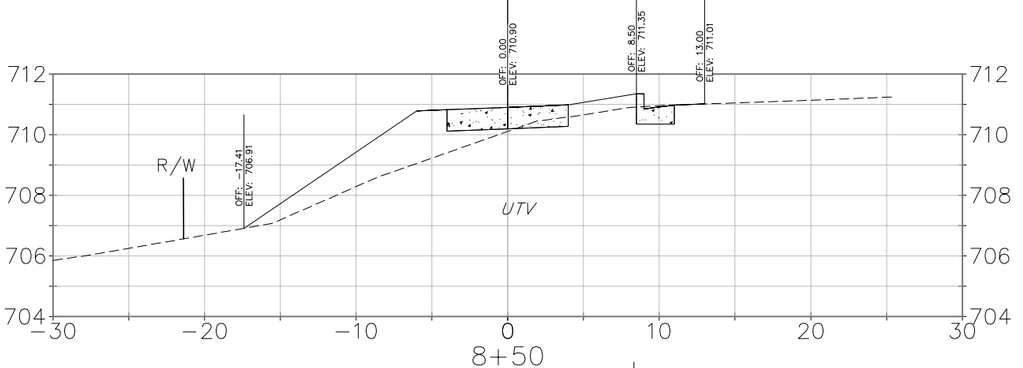

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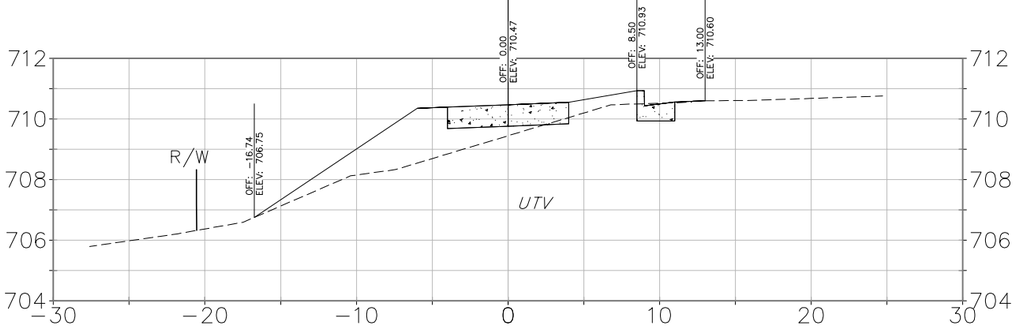

8+00

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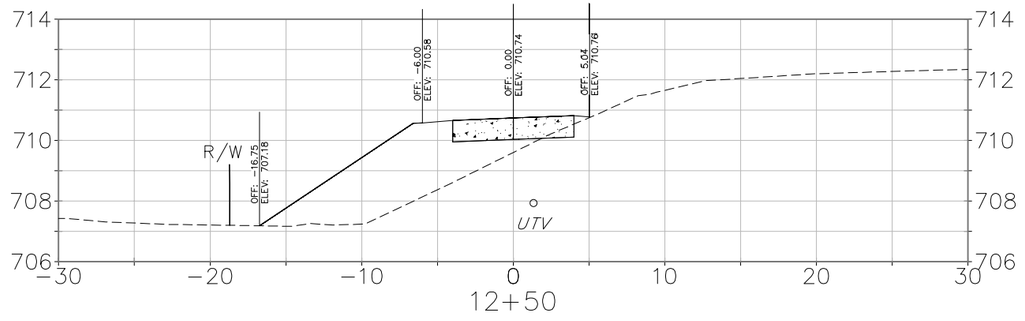
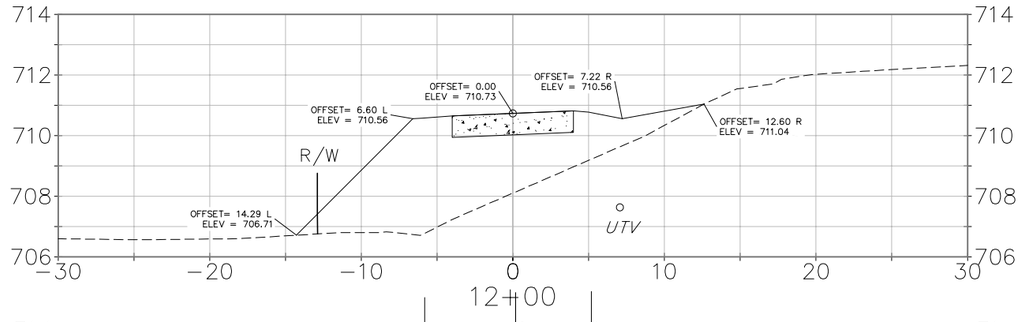
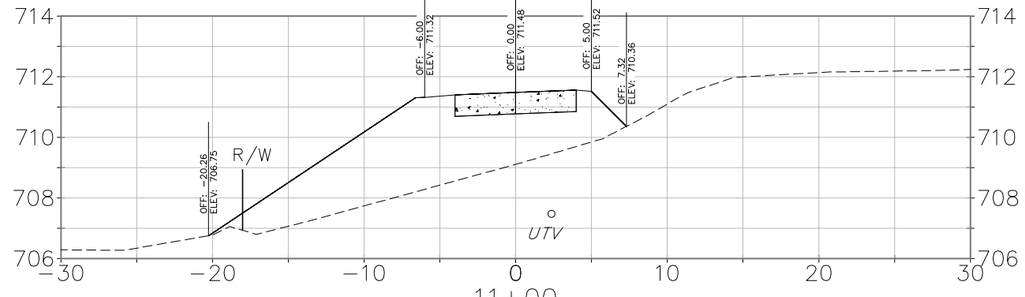
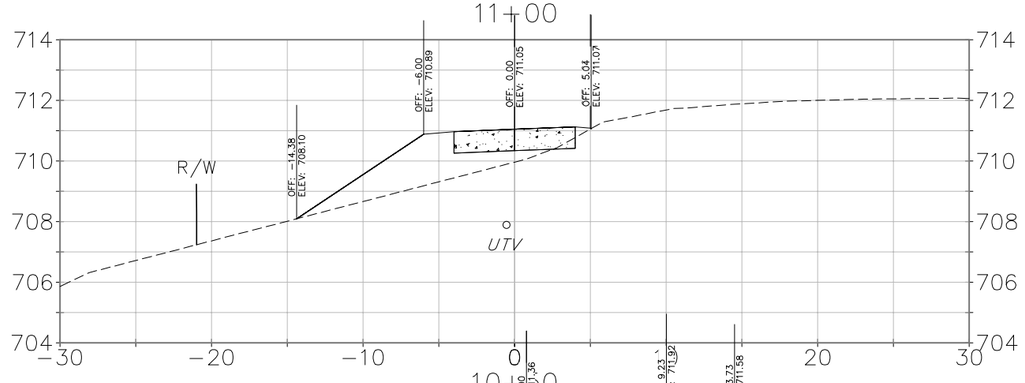
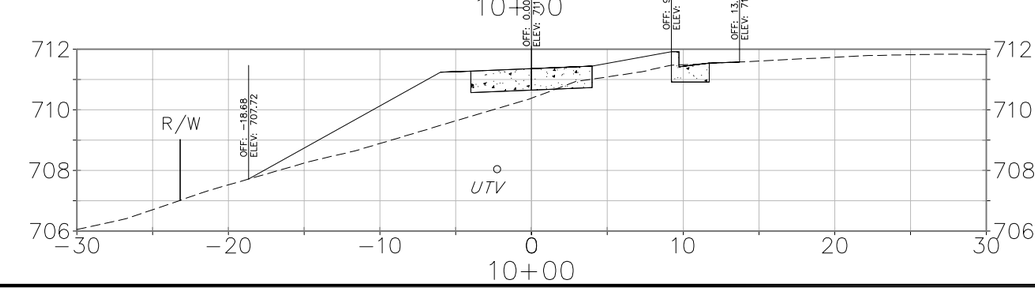
21 May 2020 - 8:33a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gays Mills Trails Base Engineering-west.dwg by: thal

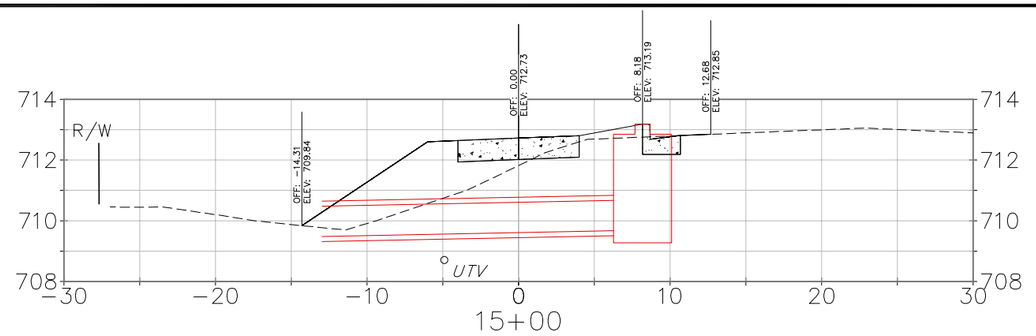


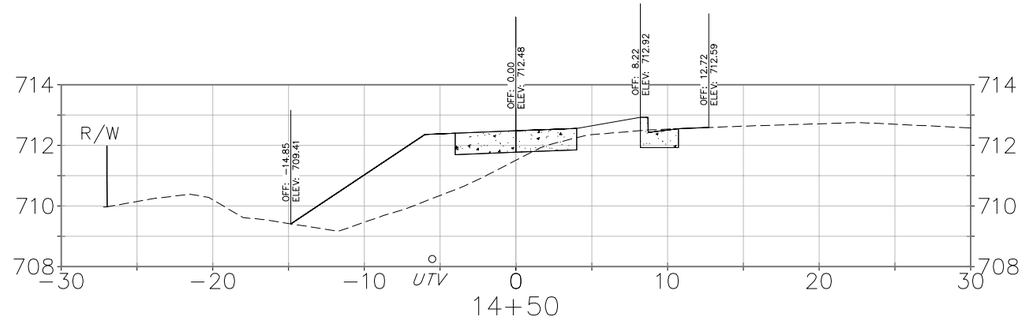


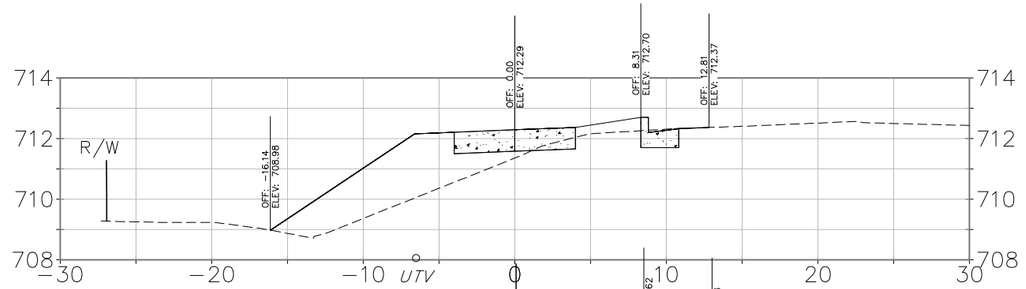


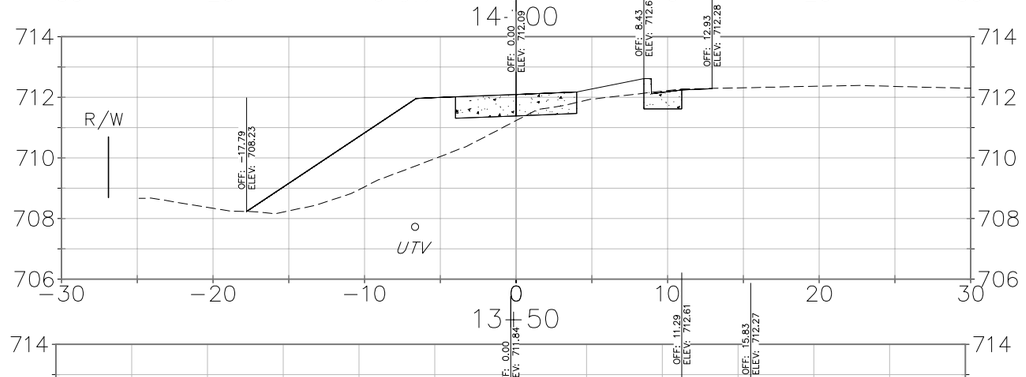


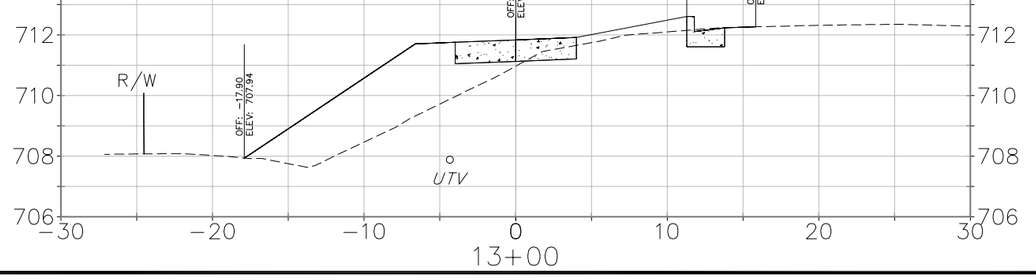












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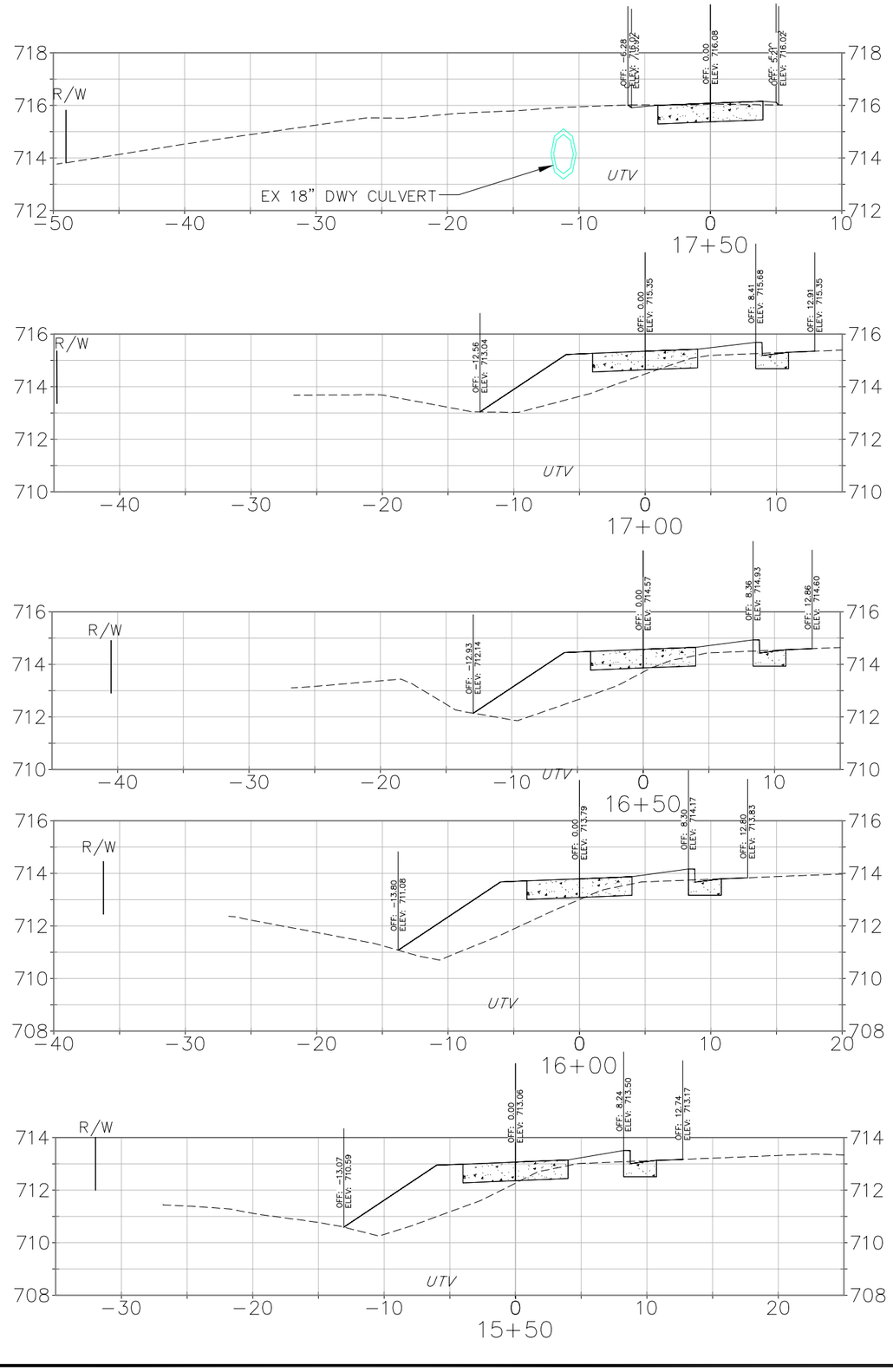
16 Aug 2019 - 9:14a C:\Users\pjun\appdata\local\temp\AcPublish_462A\2018 Gays Mills Trails Base Engineering-west.dwg by: pjun



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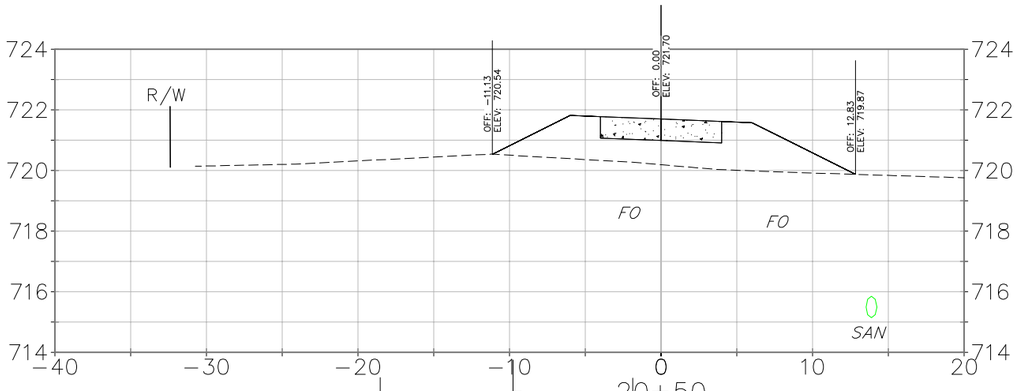

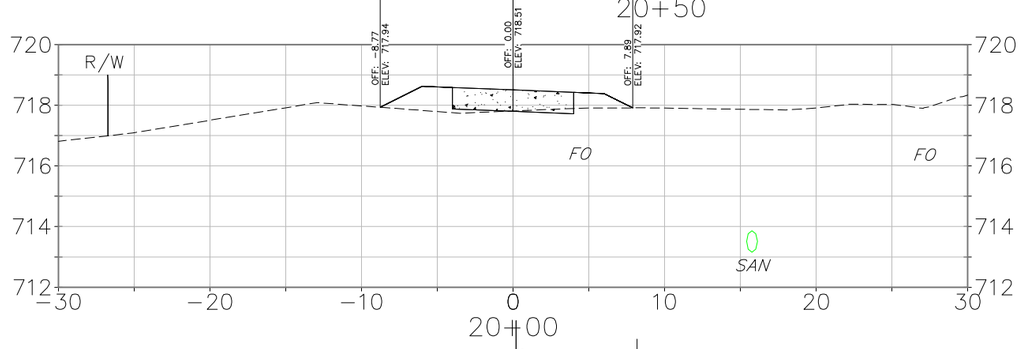

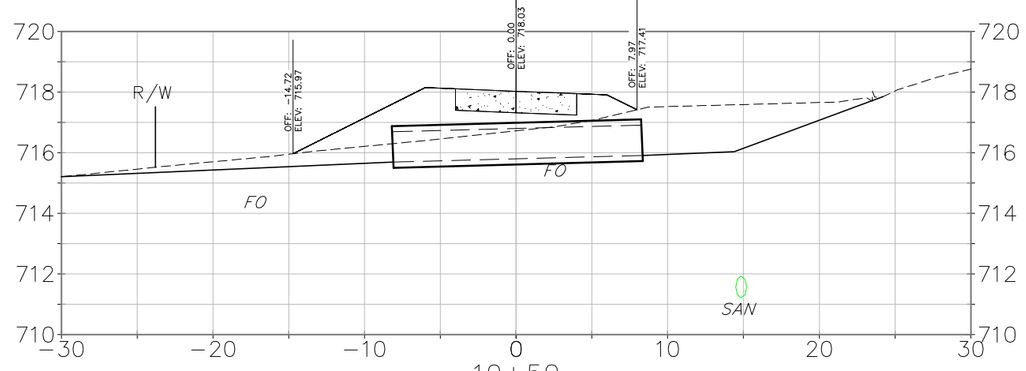

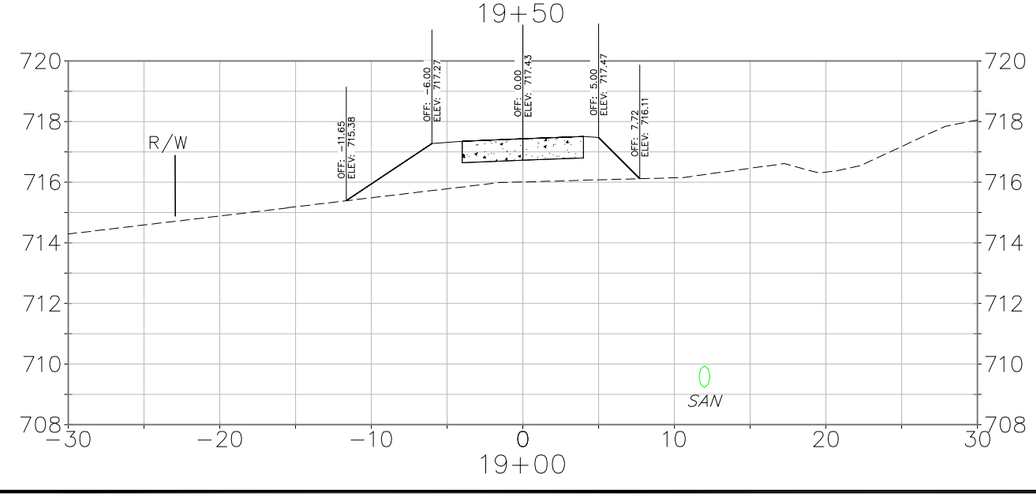

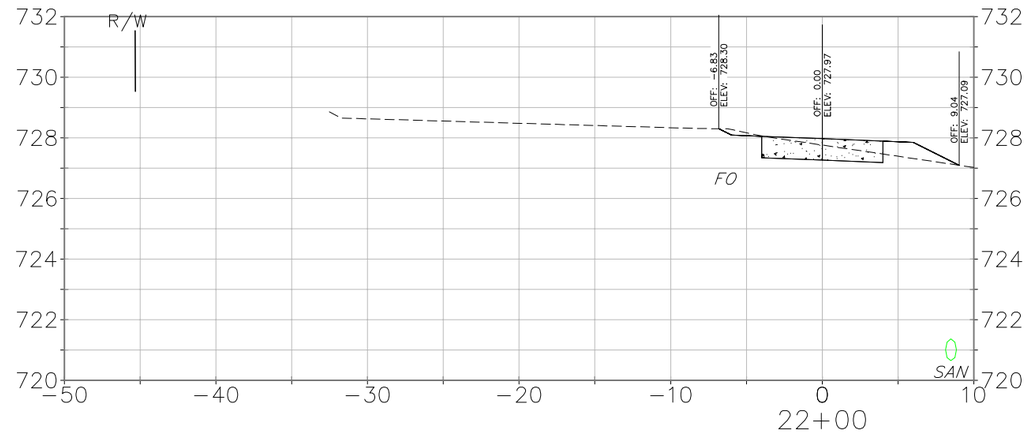

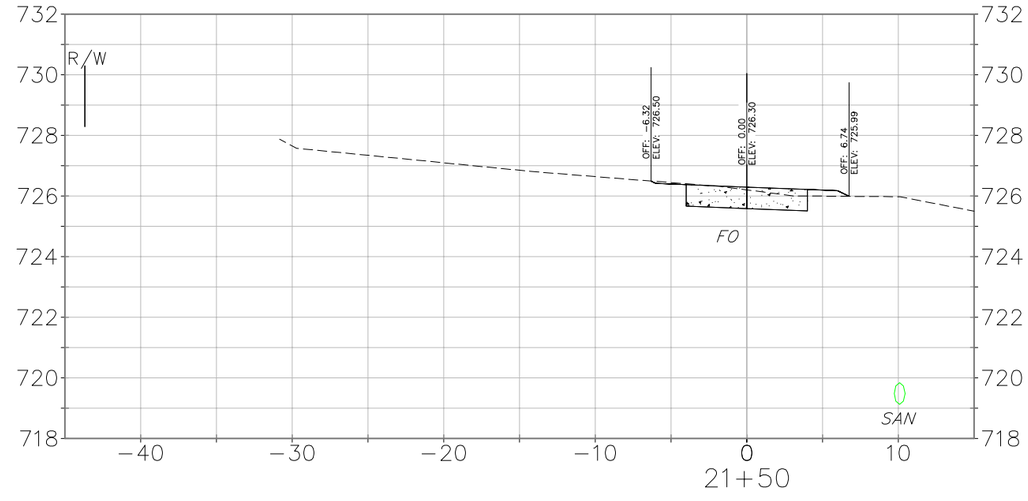

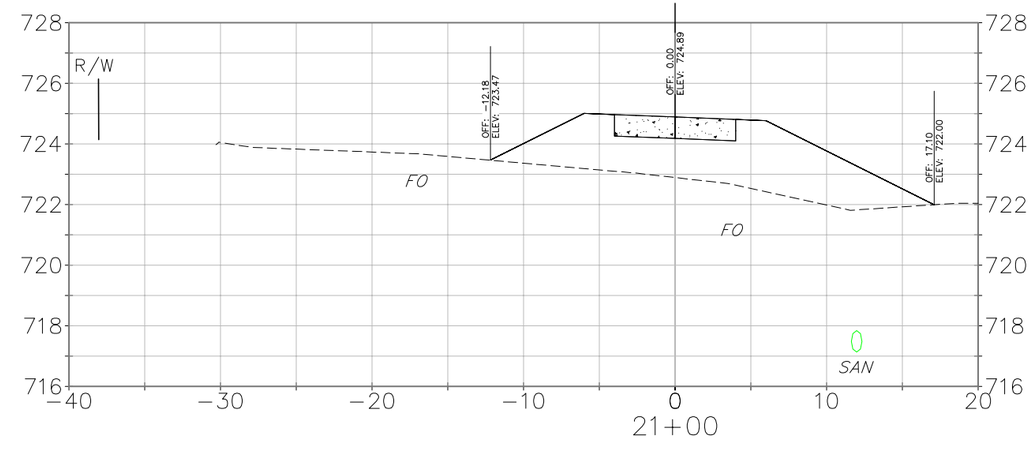

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REVISIONS

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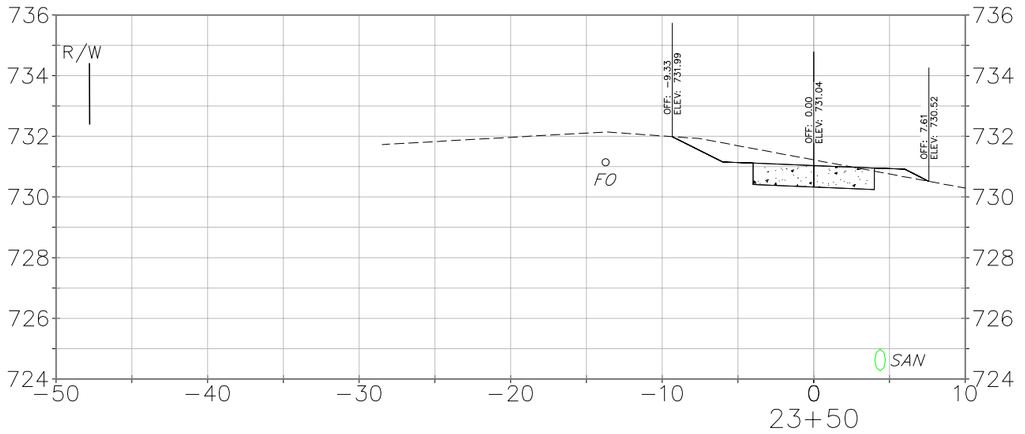

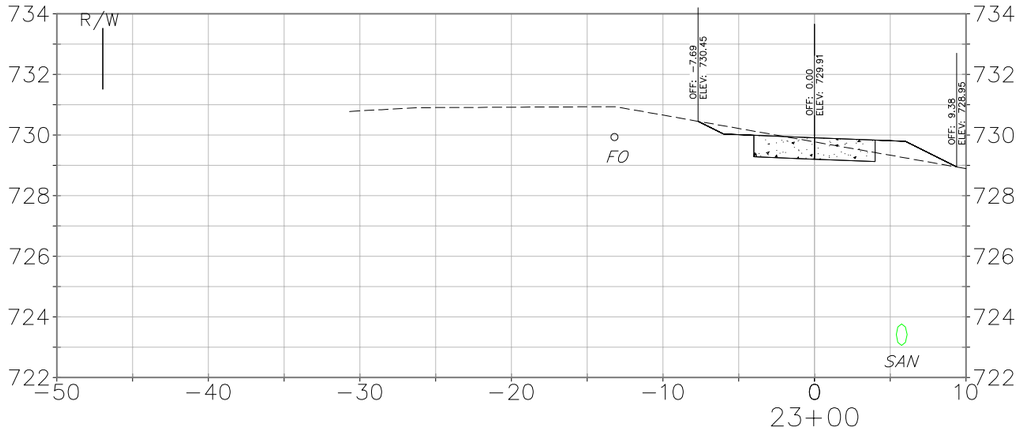

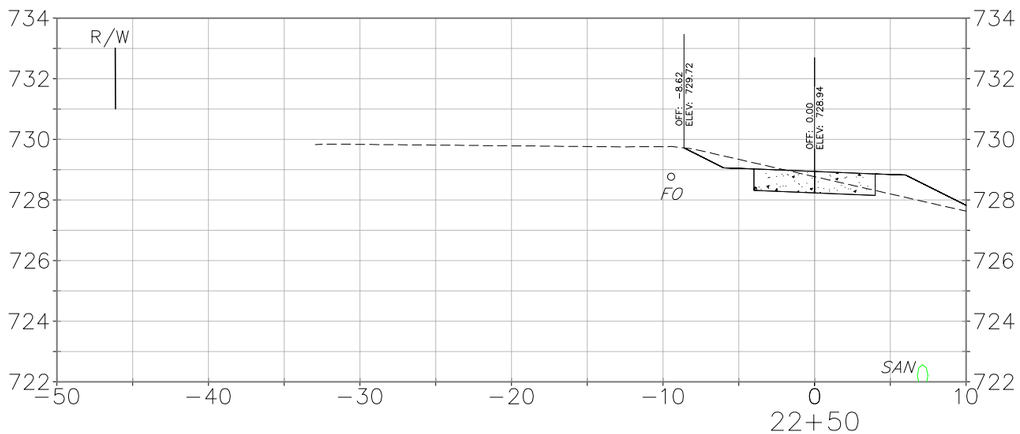

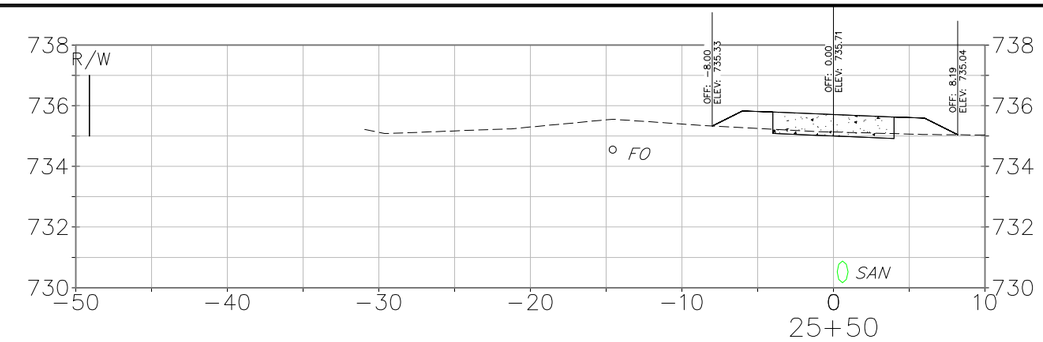

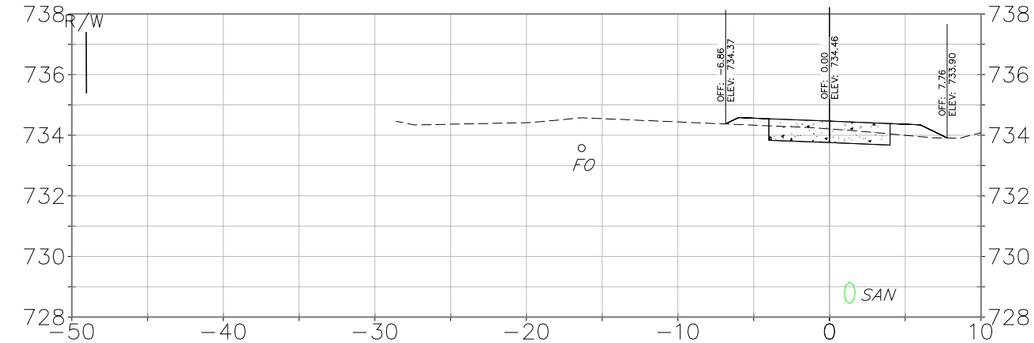

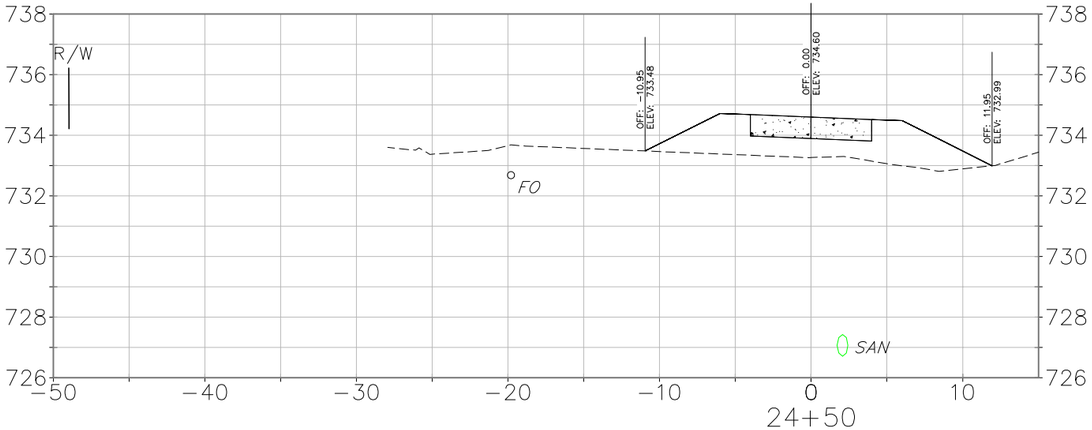

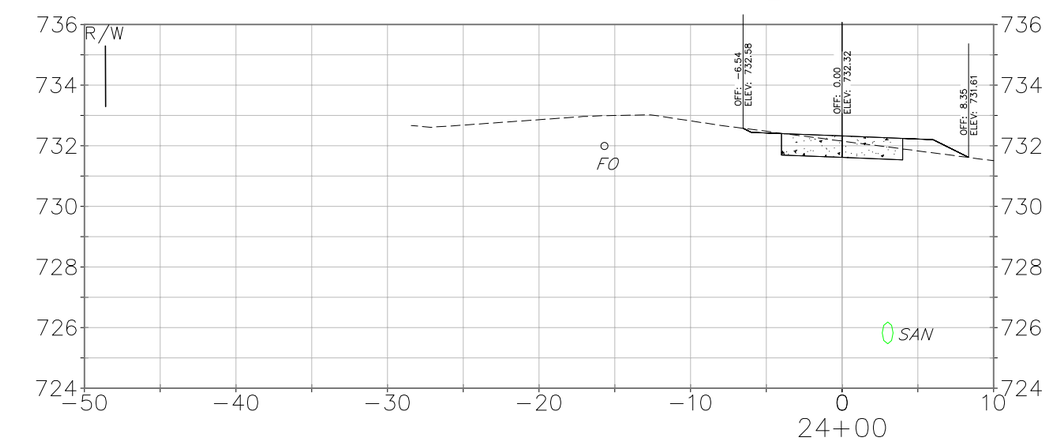

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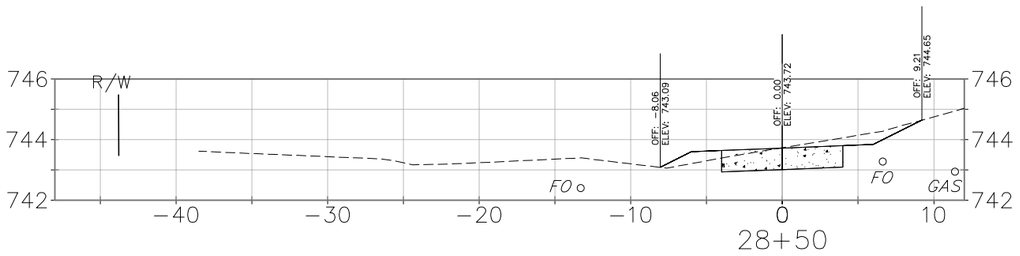

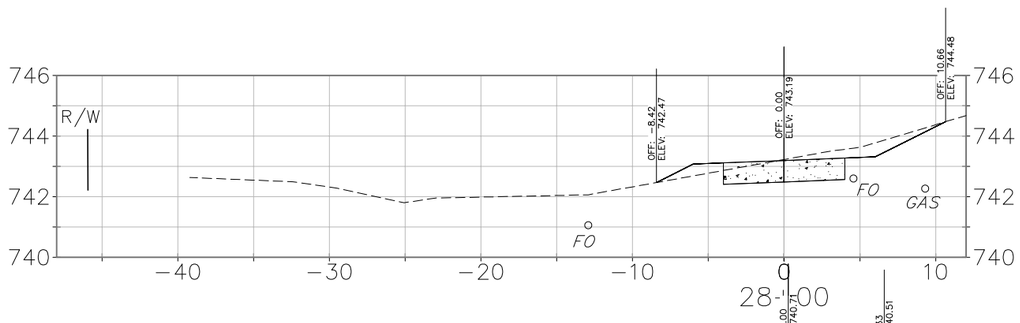

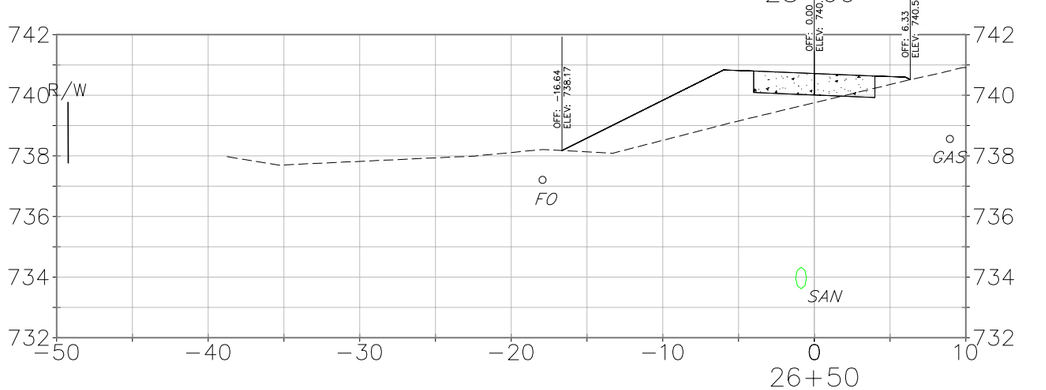

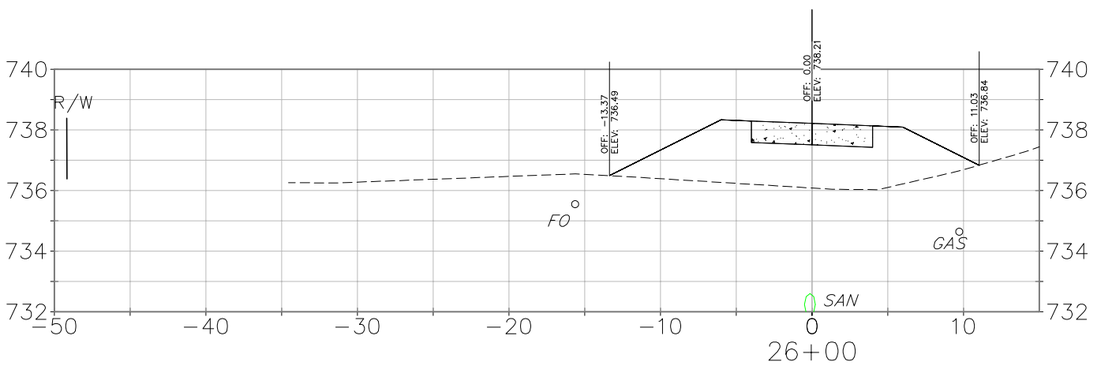

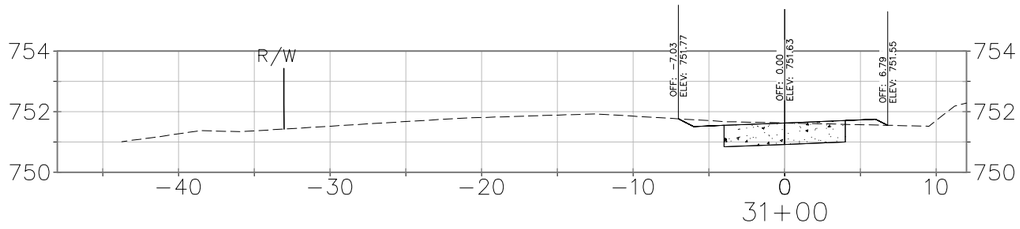

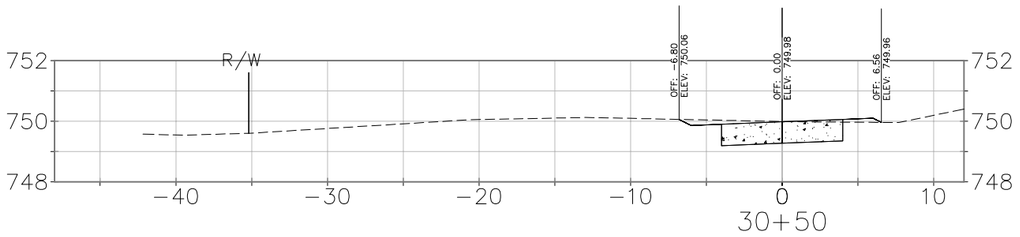

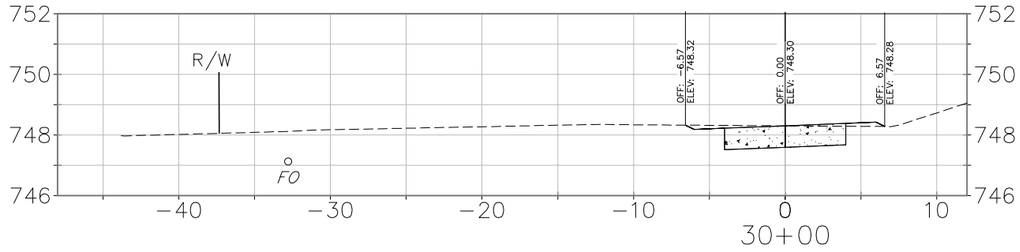

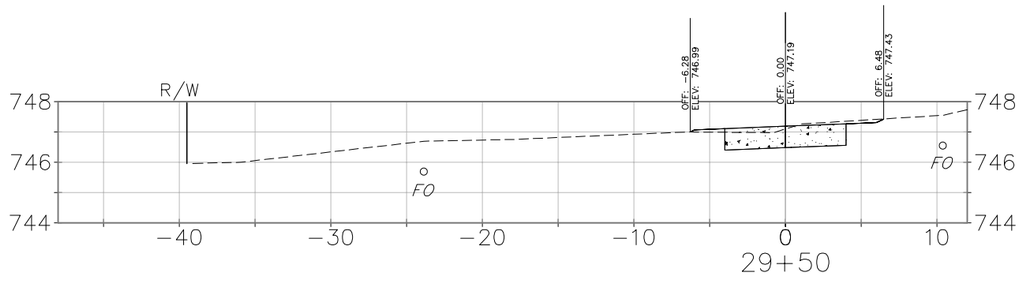

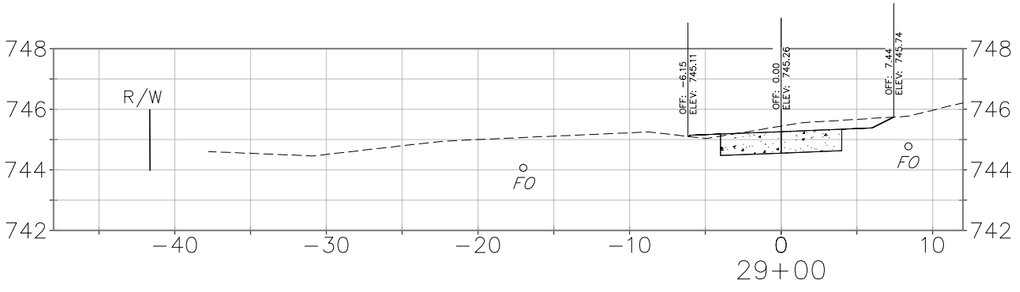

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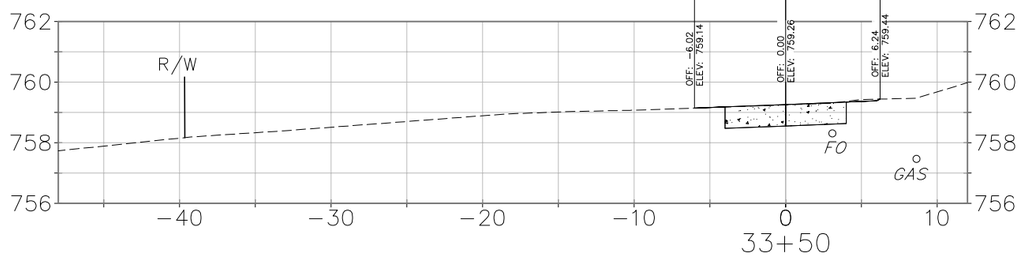

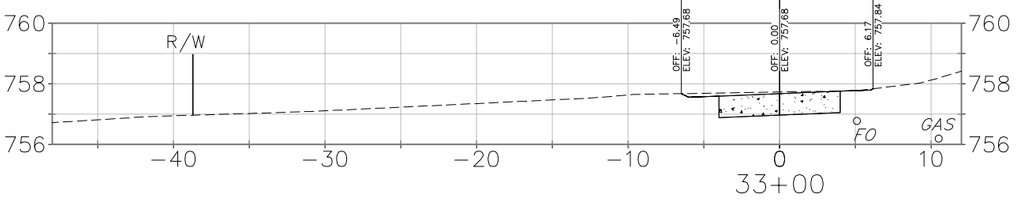

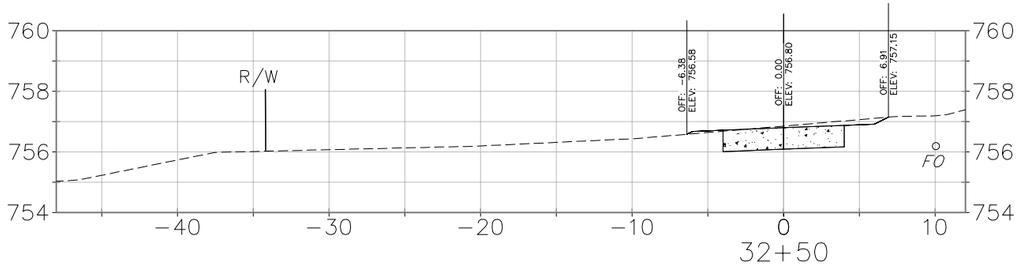

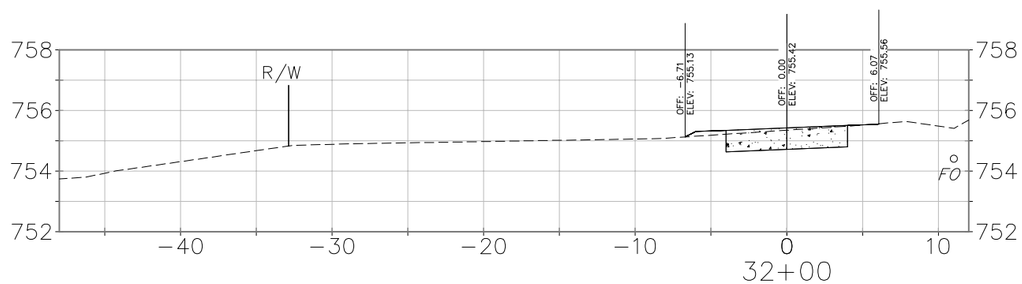

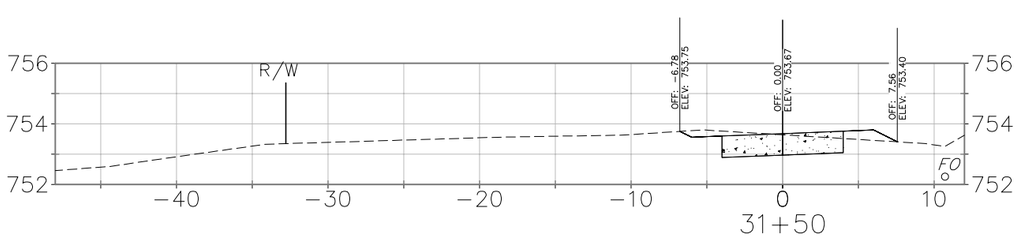

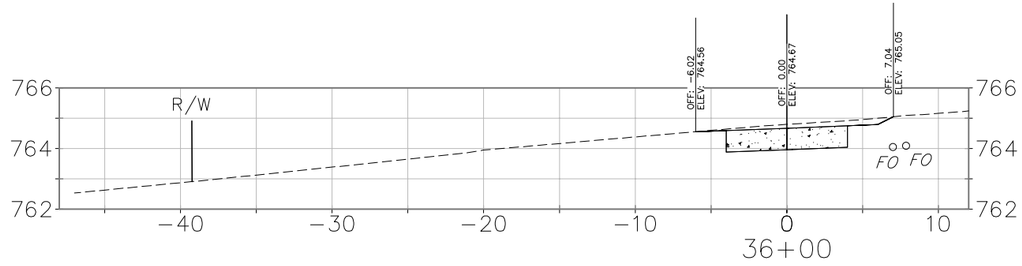

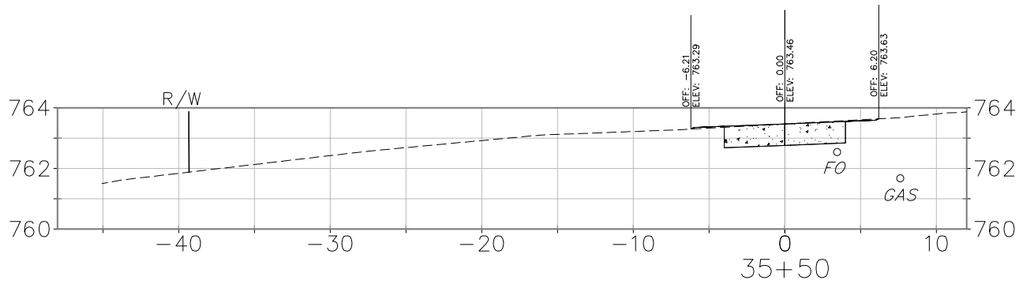

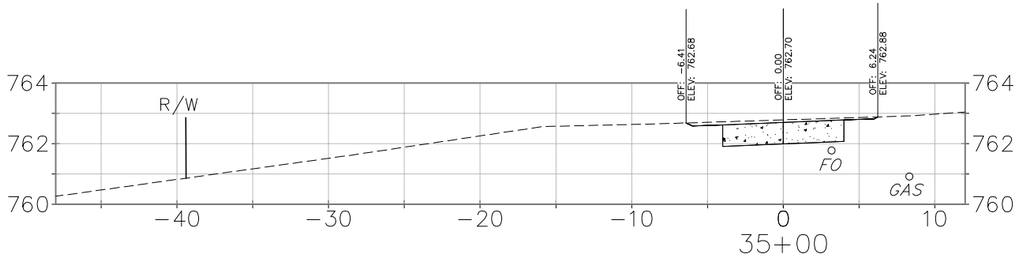

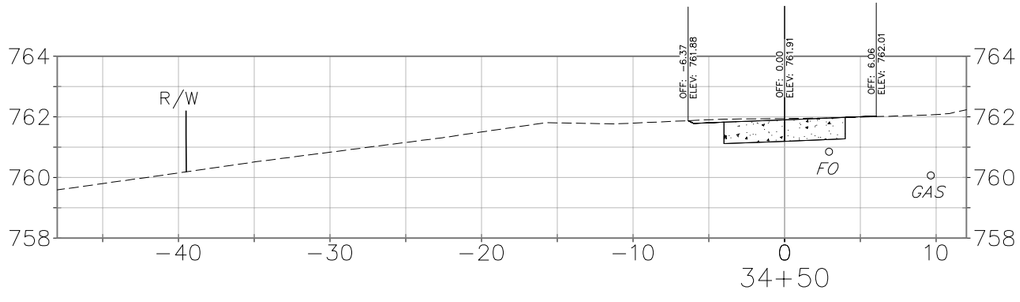

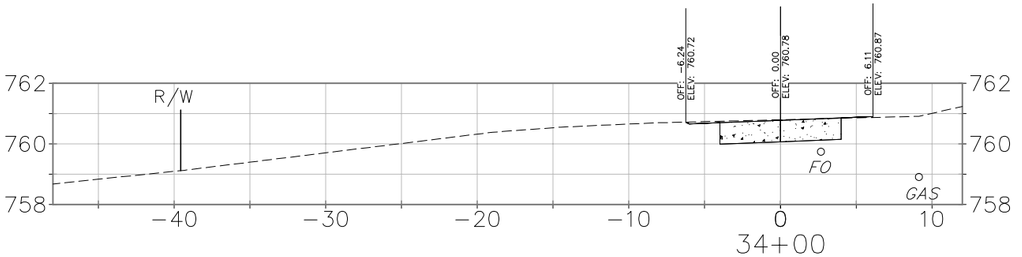

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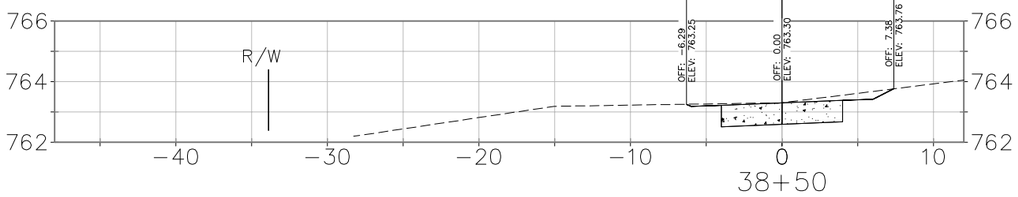

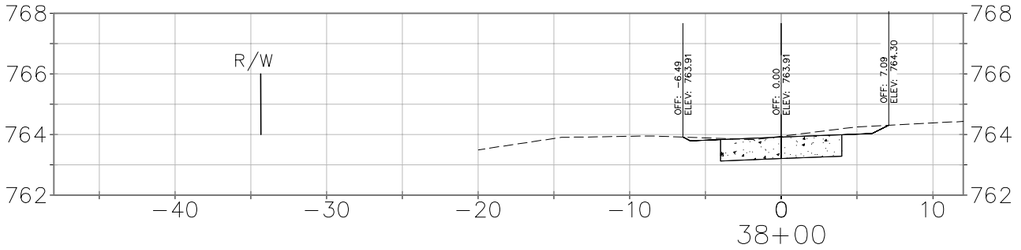

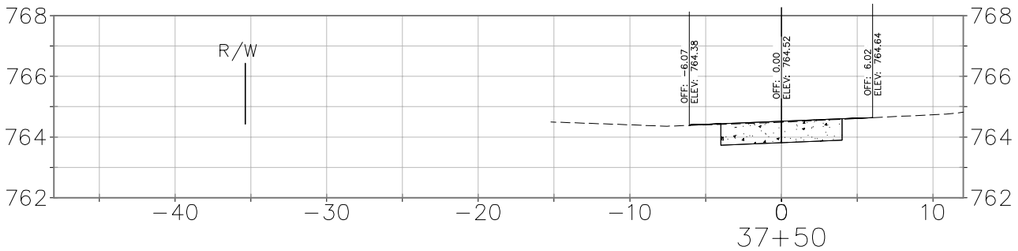

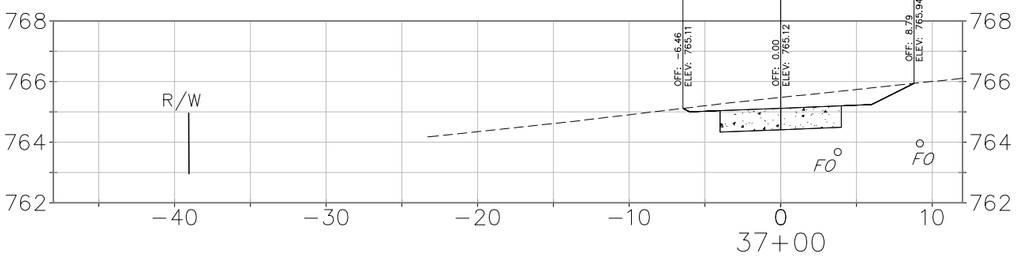

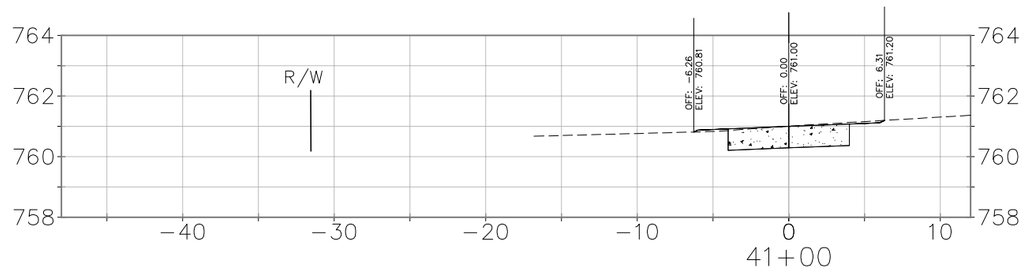

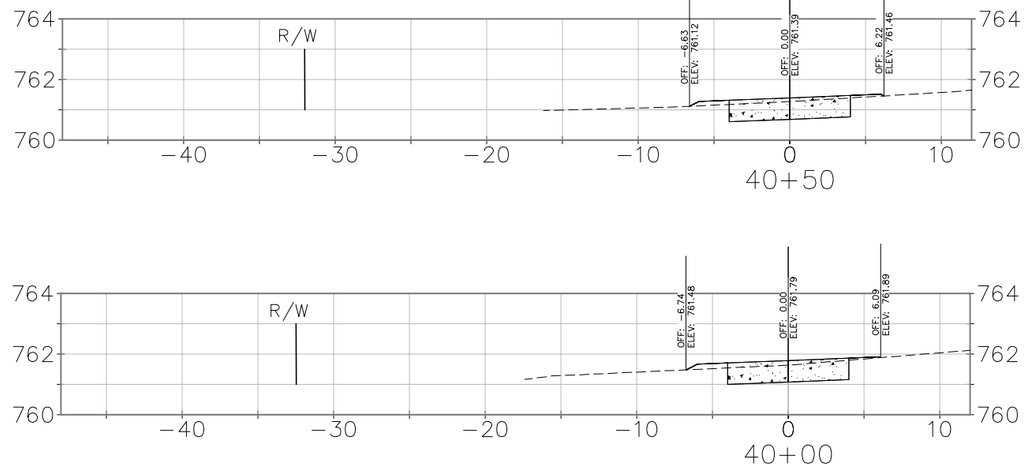

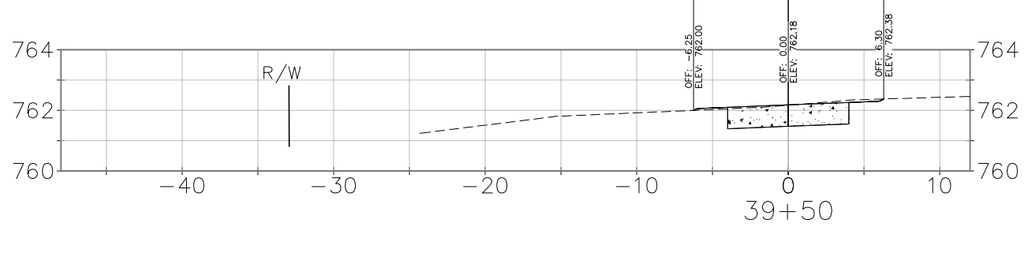

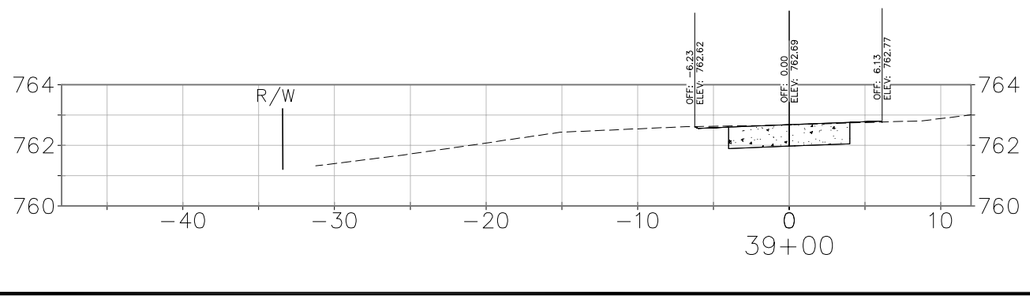

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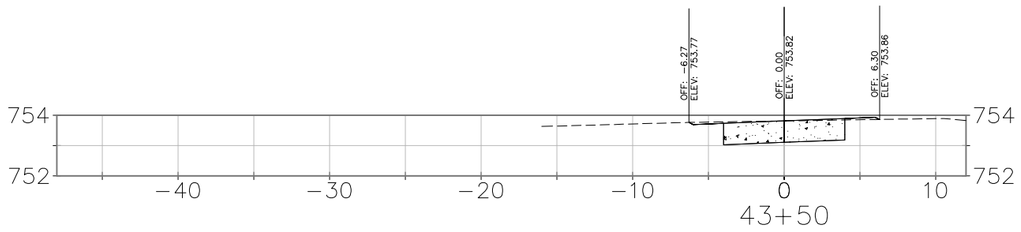

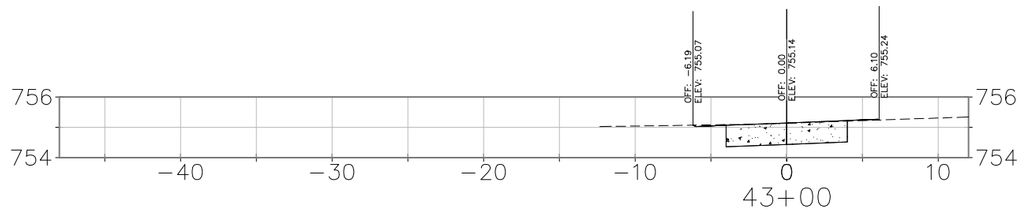

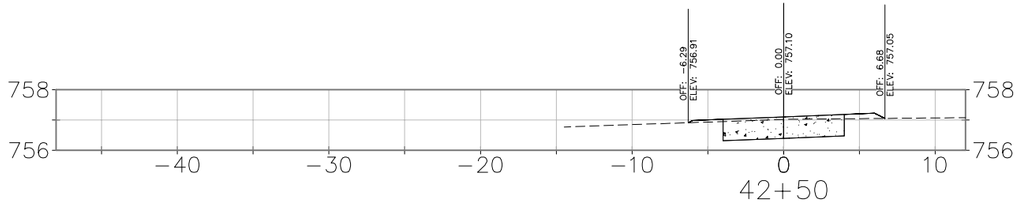

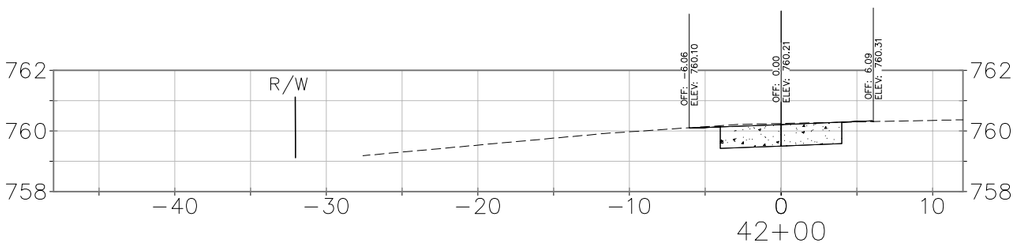

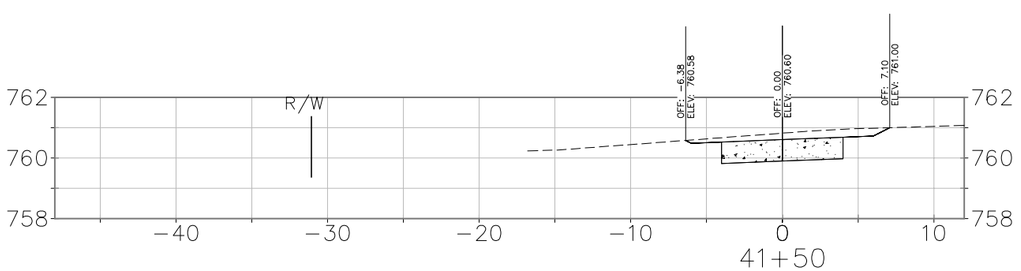

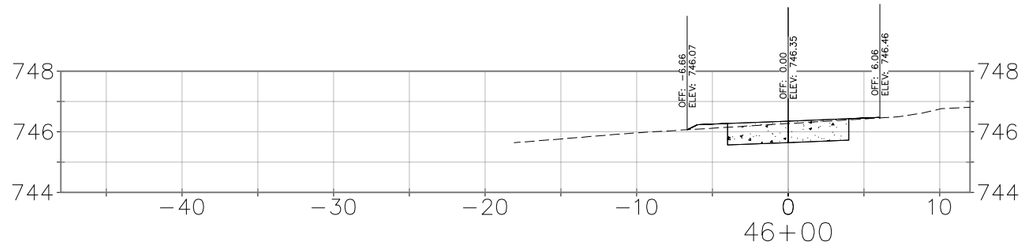

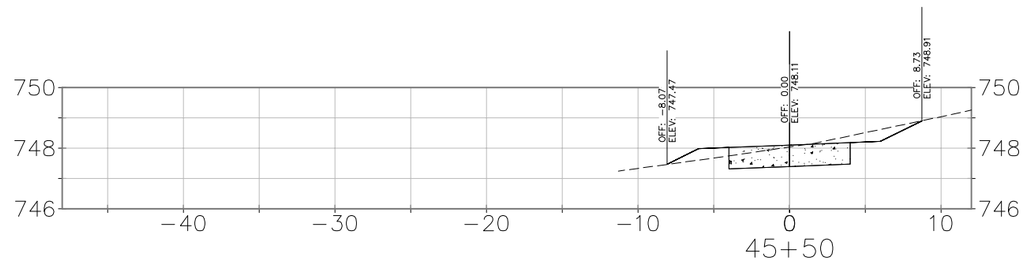

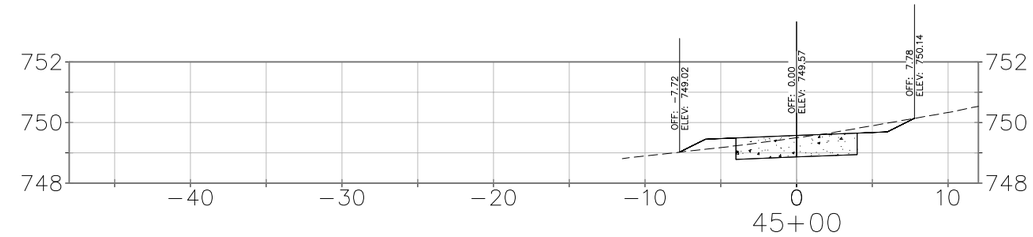

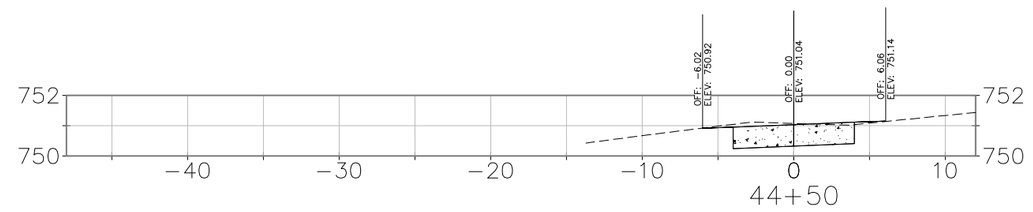

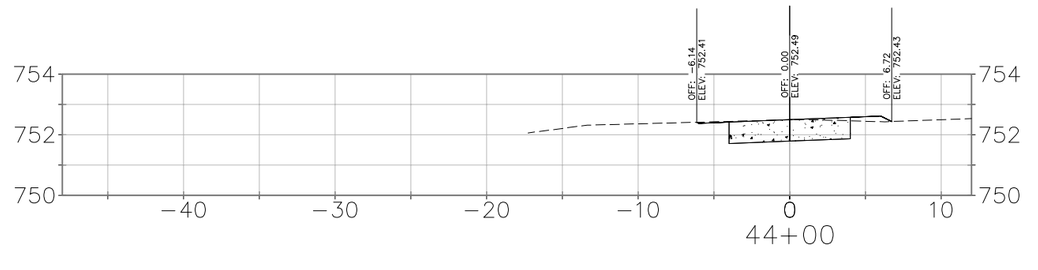

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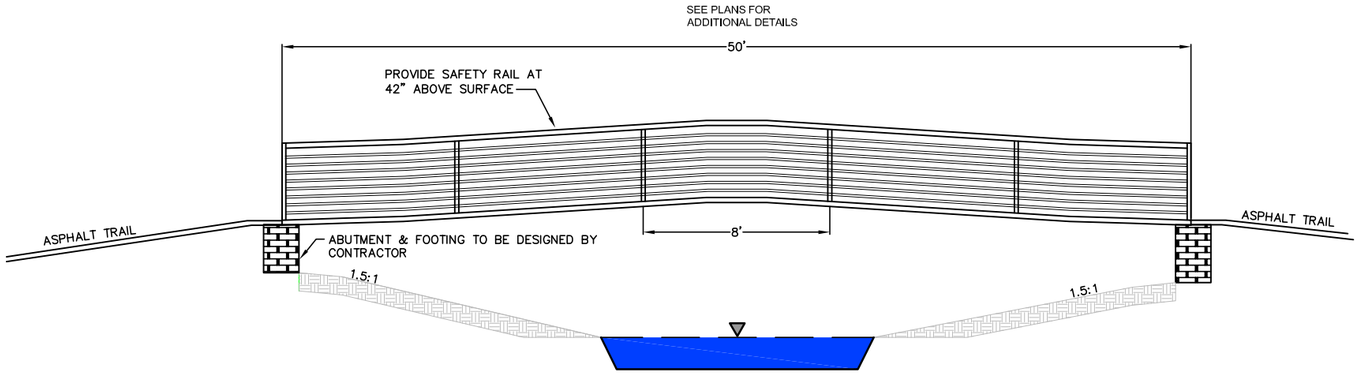
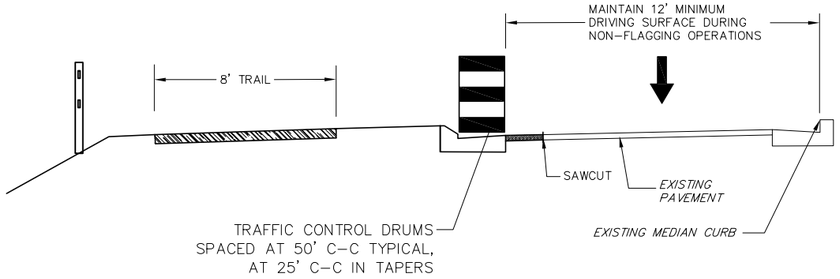


TEMPORARY EROSION CONTROL MEASURES WILL INCLUDE STRAW BALES AND SILT FENCE INSTALLED PRIOR TO CONSTRUCTION.
PERMANENT EROSION CONTROL MEASURES WILL INCLUDE EROSION MAT AND/OR HEAVY RIP RAP AS DEEMED NECESSARY BY THE OWNER AND/OR ENGINEER.

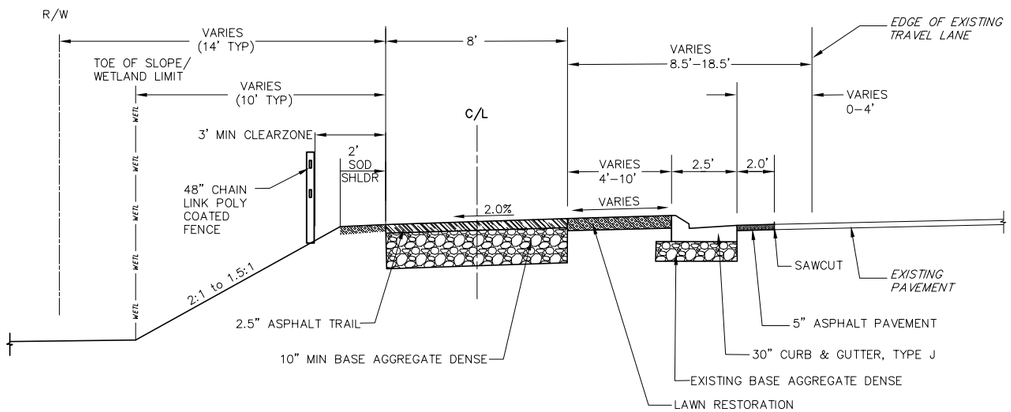
TYPICAL PREFABRICATED STEEL BRIDGE W/ TREATED WOOD DECK

NOT TO SCALE



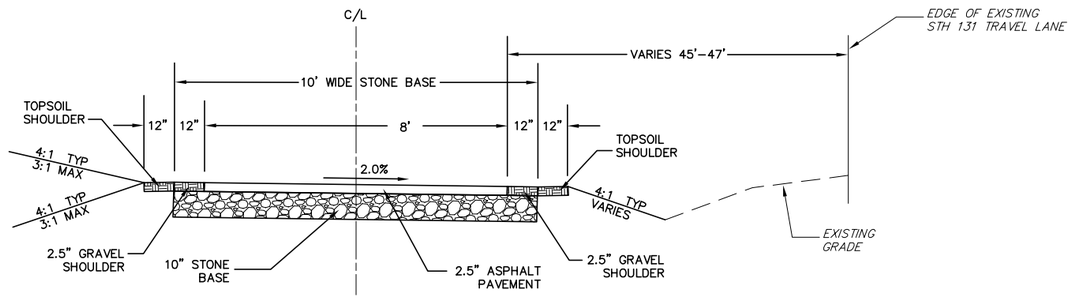
5/23 STH 131 TRAFFIC CONTROL

STA 0+00 – STA 17+50



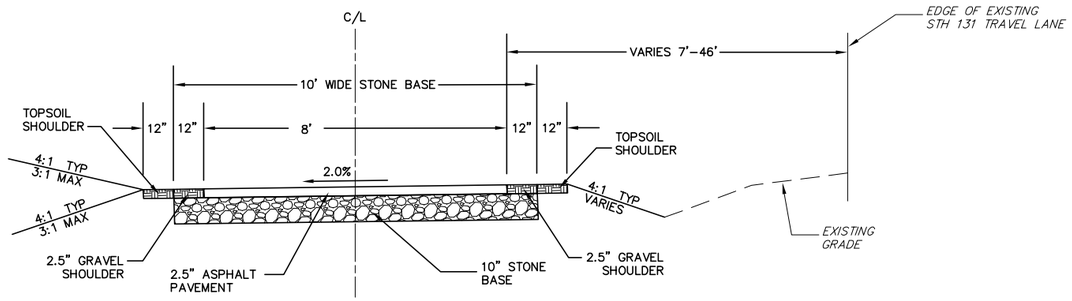
1/23 STH 131 TRAIL SECTION

STA 2+80 – STA 10+35 & STA 12+77 – 17+28



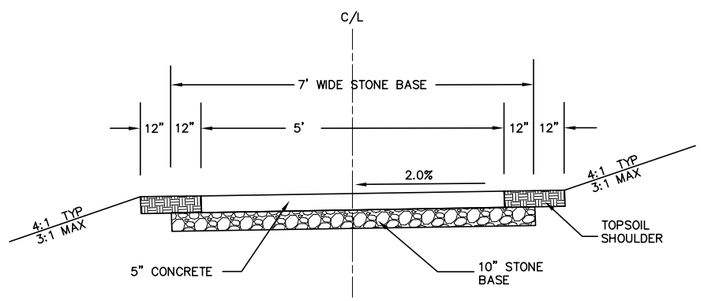
2/23 STH 131 TRAIL SECTION

STA 18+81 – 26+90



3/23 STH 131 TRAIL SECTION

STA 10+36 – 11+16, STA 11+57 – 12+76, STA 17+29 – 18+80, STA 27+55 – 41+67



4/23 TYPICAL CONCRETE SIDEWALK SECTION

STA: 100+50 TO STA: 102+53
(NOT TO SCALE)

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DETAILS
2018 TID NO. 1 INFRASTRUCTURE
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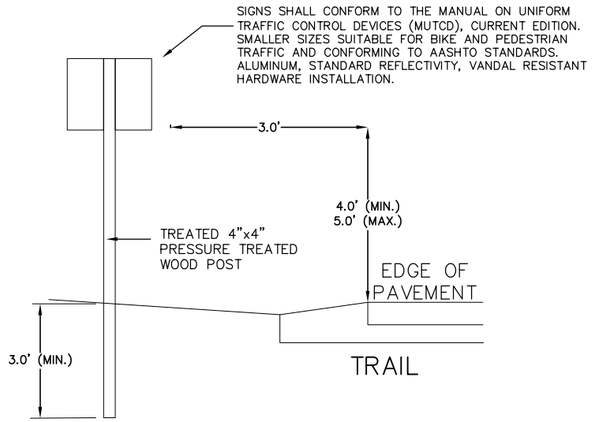
GAYS MILLS, WISCONSIN

REVISIONS			
NO.	DATE	REMARKS	

REVISIONS			
NO.	DATE	REMARKS	

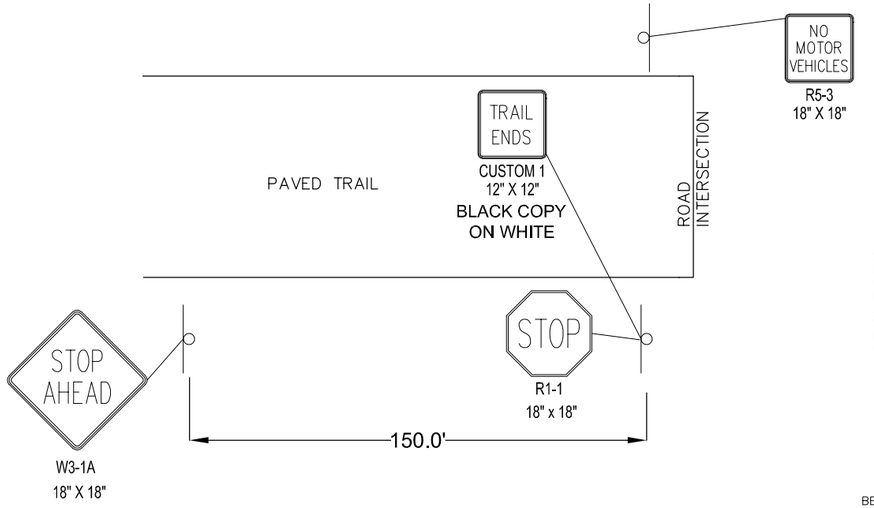
SCALE: AS SHOWN
DATE: JULY 2018
DRAFTER: PJUN
CHECKED: MMUC
PROJECT NO.: 180089
SHEET: 23 OF 25
DWG. NO.:

21 May 2020 - 9:59a R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gay Mills Details.dwg by: thal

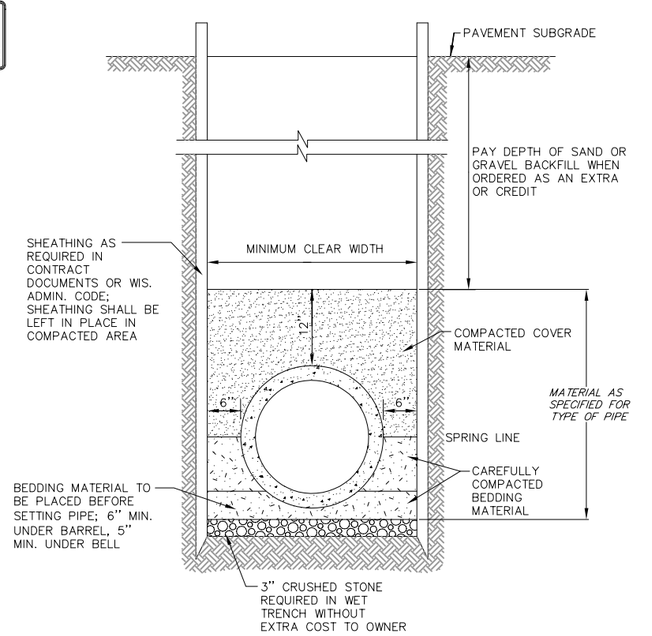


TYPICAL SIGN PLACEMENT

(NOT TO SCALE)

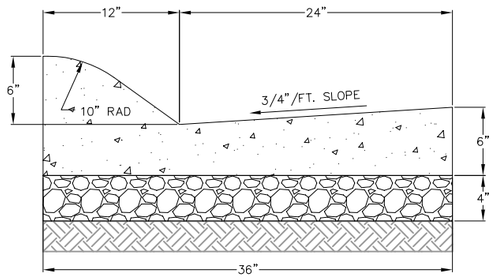


2/24 TYPICAL TRAIL SIGN LOCATIONS (SEE PLAN)
NOT TO SCALE



STORM SEWER (CLASS 'B' BEDDING):
BEDDING: CLASS 1: ⅜" TO 1½" CLEAR STONE
COVER: NATIVE OR GRANULAR BACKFILL AS REQ'D

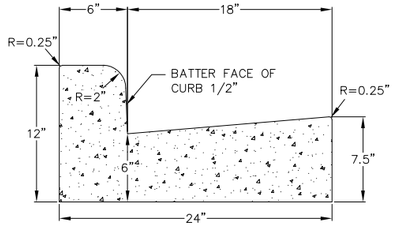
3/24 STANDARD TRENCH SECTION
NOT TO SCALE



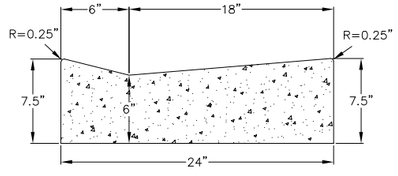
TIE BARS ARE REQUIRED FOR CURB & GUTTER TYPES A, G, AND K.

THE BOTTOM OF CURB AND GUTTER MAY BE CONSTRUCTED EITHER LEVEL OR PARALLEL TO THE SLOPE OF THE SUBGRADE OR BASE COURSE PROVIDED A 6" MINIMUM GUTTER THICKNESS IS MAINTAINED.

1/24 MOUNTABLE 36" CURB SECTION (TYPES A & D)
NOT TO SCALE

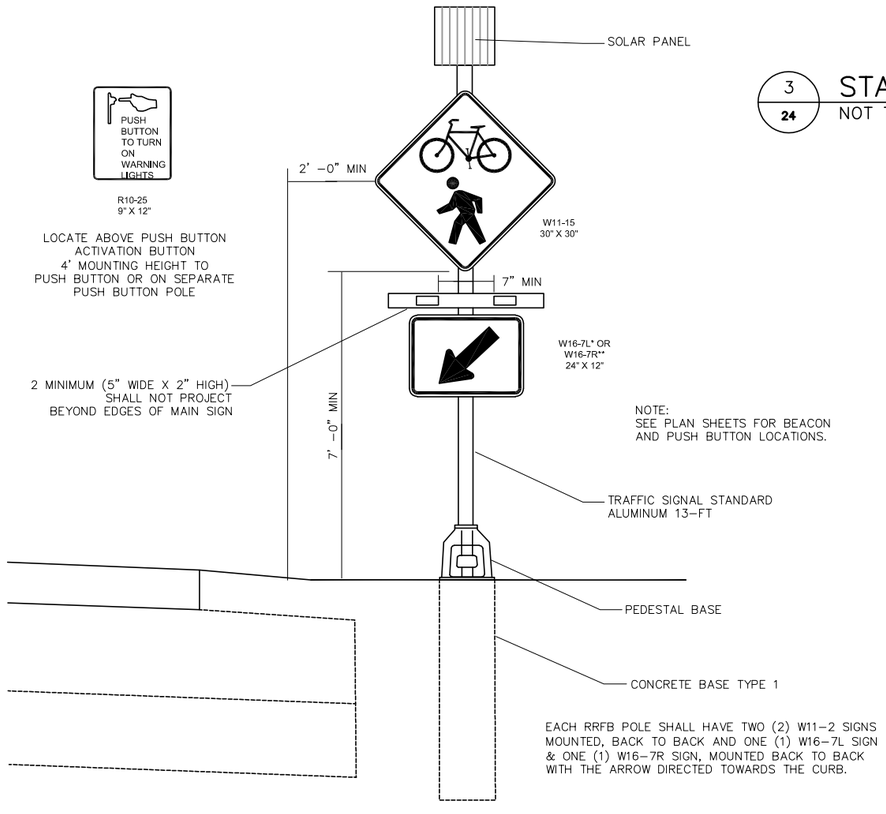


CURB AND GUTTER CROSS SECTION



DRIVEWAY AND HANDICAP RAMP GUTTER CROSS SECTION

4/24 24" CONCRETE CURB AND GUTTER
NOT TO SCALE



5/24 RECTANGULAR RAPID FLASHING BEACON DETAIL
NOT TO SCALE

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NO.	DATE	REMARKS

SCALE
AS SHOWN

DATE
JULY 2018

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180089

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24 OF 25

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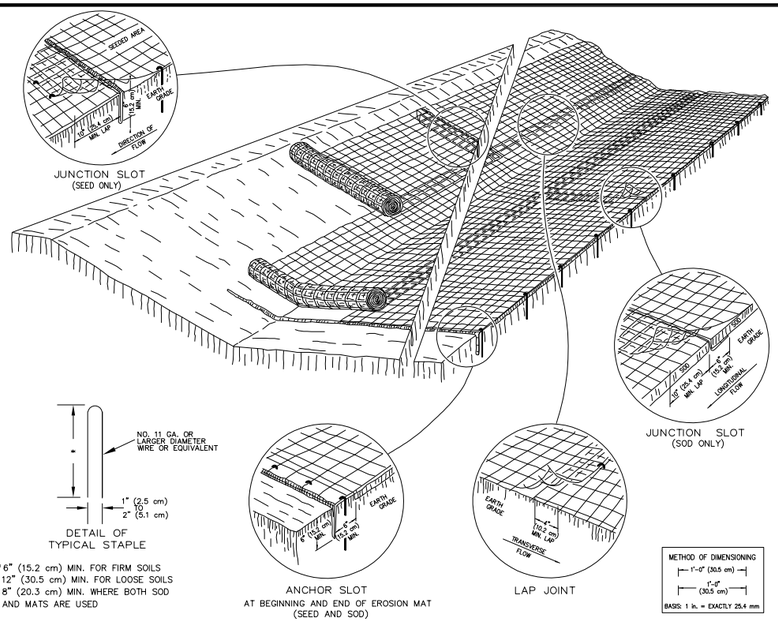
21 May 2020 - 3:34p R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gay Mills Details.dwg by: thal



* 6" (15.2 cm) MIN. FOR FIRM SOILS
12" (30.5 cm) MIN. FOR LOOSE SOILS
8" (20.3 cm) MIN. WHERE BOTH SOD AND MATS ARE USED

EROSION MAT
(NOT TO SCALE)

GENERAL NOTES

DETAILS OF CONSTRUCTION, MATERIALS AND WORKMANSHIP NOT SHOWN ON THIS DRAWING SHALL CONFIRM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS

VARIATIONS IN THE DIMENSIONS OR MATERIALS SHOWN HEREON SHALL BE PERTINENT IF THEY PROVIDE EQUIVALENT PROTECTION AND MATERIAL STRENGTH AND IF PRIOR APPROVAL OF THE ENGINEER IS OBTAINED

LAP JOINTS SHALL NOT BE PLACED IN THE BOTTOM OF V-SHAPED DITCHES.

JUNCTION SLOTS ON ADJACENT STRIPS OF MATTING SHALL BE STAGGERED A MINIMUM OF 4 FEET (1.219 m) APART.

EDGES OF THE EROSION MAT SHALL BE IMPRESSED IN THE SOIL.

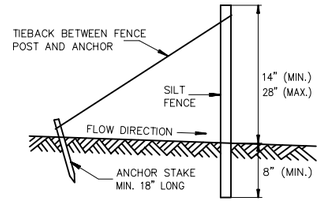
EROSION MAT WILL BE MEASURED AND PAID FOR IN ACCORD-ANCE WITH THE SPECIFICATIONS.

EROSION MAT OVER SOD

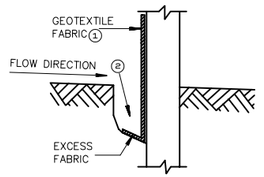
a. ONLY JUTE FABRIC WILL BE PERMITTED OVER SOD.
b. WOOD STAKES FOR SOD MAY BE OMITTED BY THE ENGINEER IF THE EXISTING SLOPE AND SOIL CONDITIONS SO WARRANT.
c. THE WIDTH OF THE EROSION MAT SHALL ALWAYS EQUAL THE SOD WIDTH.
d. SOD STRIPS MAY BE PLACED EITHER LONGITUDINALLY OR TRANSVERSELY TO THE FLOW LINE OF THE DITCH.

EROSION MAT OVER SEEDING

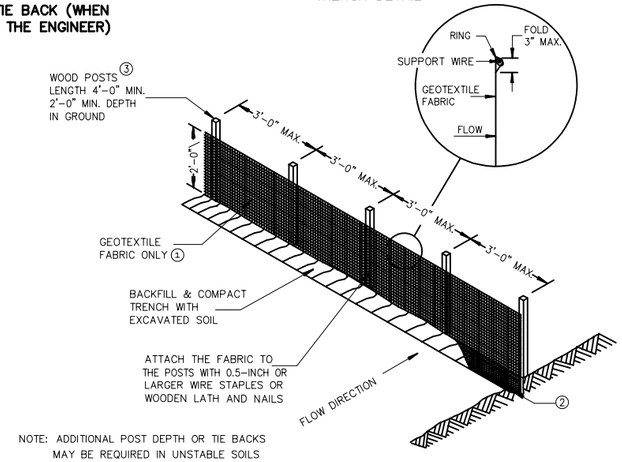
JUNCTION OR ANCHOR SLOTS SHALL BE AT MINIMUM INTERVALS OF 100 FEET (30.48 m) ON GRADES UP TO AND INCLUDING 3 PERCENT, AND 50 FEET (15.24 m) ON GRADES EXCEEDING 3 PERCENT.



SILT FENCE TIE BACK (WHEN REQUIRED BY THE ENGINEER)



TRENCH DETAIL



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

1. SILT FENCE SHALL BE INSPECTED WITHIN 24 HOURS AFTER EACH RAINFALL OR DAILY DURING PROLONGED RAINFALL. REPAIR OR REPLACEMENT SHALL BE DONE IMMEDIATELY IF FENCING IS TORN, SAGGING, OVERTOPPED, BLOWN OVER (LAYING DOWN), SHOWS A LACK OF MATERIAL INTEGRITY, OR IN ANY WAY IS NOT FUNCTIONING AS DESIGNED.

2. SEDIMENT DEPOSITS SHOULD BE REMOVED AFTER EACH STORM EVENT. SEDIMENT DEPOSITS SHALL BE REMOVED WHEN DEPOSITS REACH 0.5 THE HEIGHT OF THE FENCE.

GENERAL NOTES

DETAIL OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE SPECIFICATIONS.

WHEN POSSIBLE THE SILT FENCE SHOULD BE CONSTRUCTED IN AN ARC OR HORSESHOE SHAPE, WITH THE ENDS POINTING UPSLOPE TO MAXIMIZE BOTH STRENGTH AND EFFECTIVENESS.

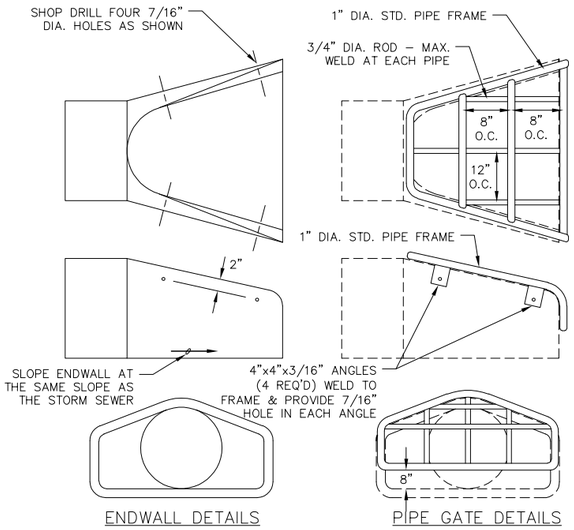
GEOTEXTILE FRABRIC SHALL CONFORM TO WDNR'S "WISCONSIN CONSTRUCTION SITE BEST MANAGEMENT PRACTICE HANDBOOK" REQUIREMENTS

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.

WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 1/8" x 1 1/8" OF OAK OR HICKORY.

HORIZONTAL BRACE WITH 2" x 4" WOODEN FRAME OR EQUIVALENT AT TOP OF POSTS AS DIRECTED BY THE ENGINEER.

3 SILT FENCE
25
NOT TO SCALE

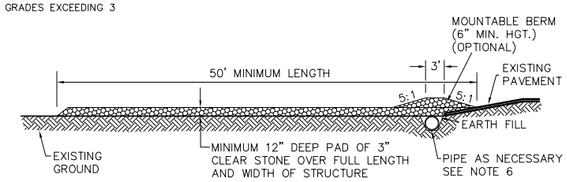


NOTES:
– THE CONTRACTOR SHALL BOLT THE PIPE GATE TO THE CONCRETE ENDWALL WITH FOUR 3/8"x6" MACHINE BOLTS WITH NUTS ON INSIDE WALL.

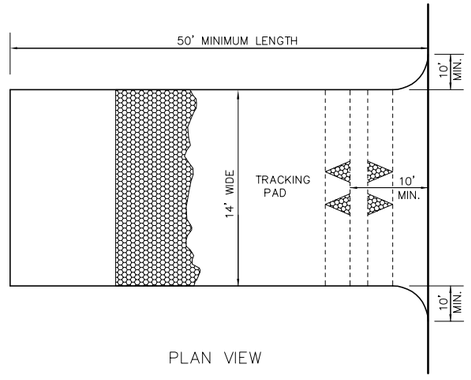
PAINTING SPECIFICATIONS:
– THE PIPE GATE SHALL RECEIVER THE FOLLOWING PREPARATION & PAINTING. THE FIRST COAT SHALL BE RUS-OLEUM X-60 RED BARE METAL PRIMER OR APPROVED EQUAL. THE SECOND COAT SHALL BE RUST-OLEUM 960 ZINC CHROMATE PRIMER OR APPROVED EQUAL. THE THIRD COAT SHALL BE RUS-OLEUM 1282 HIGH GLOSS METAL FINISH OR APPROVED EQUAL.

PREPARATION STEPS:
1. BARE METAL SURFACES – TREAT WITH THE THREE-COAT PAINTING SYSTEM LISTED AFTER A THOROUGH SCRAPING, WIRE BRUSHING & CLEANING.
2. EACH COAT OF PAINT SHALL BE APPLIED OVER THE ENTIRE GATE SURFACE.
3. ALLOW 24-48 HOURS DRYING TIME AT 60° OR ABOVE BETWEEN COATS.

1 STANDARD ENDWALL
25
NOT TO SCALE



PROFILE VIEW



PLAN VIEW

1) FOLLOW WISCONSIN DNR TECHNICAL STANDARD 1057 FOR FURTHER DETAILS AND INSTALLATION.

2) LENGTH – MINIMUM OF 50'.

3) WIDTH – 24' MINIMUM, SHOULD BE FLARED AT THE EXISTING ROAD TO PROVIDE A TURNING RADIUS.

4) ON SITES WITH A HIGH GROUND WATER TABLE OR WHERE SATURATED CONDITIONS EXIST, GEOTEXTILE FABRICSHALL BE PLACED OVER EXISTING GROUND PRIOR TO PLACING STONE. FABRIC SHALL BE WISDOT TYPE-HR GEOTEXTILE FABRIC.

5) STONE – CRUSHED 3" CLEAR STONE SHALL BE PLACED AT LEAST 12" DEEP OVER THE ENTIRE LENGTH AND WIDTH OF ENTRANCE.

6) SURFACE WATER – ALL SURFACE WATER FLOWING TO OR DIVERTED TOWARDS CONSTRUCTION ENTRANCES SHALL BE PIPED THROUGH THE ENTRANCE. MAINTAINING POSITIVE DRAINAGE. PIPE INSTALLED THROUGH THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE PROTECTED WITH A MOUNTABLE BERM WITH 5:1 SLOPES AND MINIMUM OF 6" STONE OVER THE PIPE. PIPE SHALL BE SIZED ACCORDING TO THE DRAINAGE REQUIREMENTS. WHEN THE ENTRANCE IS LOCATED AT A HIGH SPOT AND HAS NO DRAINAGE TO CONVEY A PIPE SHALL NOT BE NECESSARY. THE MINIMUM PIPE DIAMETER SHALL BE 6". CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF SAID PIPE.

7) LOCATION – A STABILIZED CONSTRUCTION ENTRANCE SHALL BE LOCATED WHERE CONSTRUCTION TRAFFIC ENTERS AND/OR LEAVES THE CONSTRUCTION SITE. VEHICLES LEAVING THE SITE MUST TRAVEL OVER THE ENTIRE LENGTH OF THE TRACKING PAD.

2 STONE TRACKING PAD
25
NOT TO SCALE

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DETAILS

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TRAIL IMPROVEMENTS
GAYS MILLS, WISCONSIN

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SCALE: AS SHOWN
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PROJECT NO.: 180089
SHEET: 25 OF 25
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MISTY VALLEY AVE

100+00

100+50

S. T.H. '131'

100+13.9, 9.7'L
EOP ELEV=709.81

100+21.9, 9.7'L
EOP ELEV=709.93

100+26.4, 9.2'L
TOC ELEV=710.32

100+21.9, 4.2'L
TOC ELEV=709.82

100+26.4, 4.2'L
TOC ELEV=709.87

100+13.9, 4.2'L
EOC ELEV=709.73

1.5%
1.5%
3.3%
1.0%
1.0%
8.0'

100+13.9, 3.8'R
EOC ELEV=709.73

100+21.9, 3.8'R
TOC ELEV=709.75

100+26.4, 3.8'R
TOC ELEV=709.85

100+26.4, 8.8'R
TOC ELEV=710.26

DOUBLE SIDED RRFB
SEE DETAILS

100+86.9, 7.6'L
TOC ELEV=710.20

100+85.5, 3.9'L
EOC ELEV=709.97

100+93.6, 3.0'L
EOC ELEV=710.10

101+00.4, 3.0'L
EOC ELEV=710.44

100+83.4, 3.9'L
TOC ELEV=709.83

6.0%
1.5%
5.0%
101+00
1.5%
1.5%
1.5%
1.5%
5.3%
1.2%
2.5%

100+78.7, 4.0'R
TOC ELEV=709.93

100+85.5, 3.9'R
EOC ELEV=710.10

100+94.0, 3.4'R
EOC ELEV=710.20

101+00.5, 3.0'R
EOC ELEV=710.53

6.8'

100+77.6, 8.8'R
TOC ELEV=710.40

N
W E
S

GRAPHIC SCALE FEET
0 2 4 8

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CURB RAMP DETAILS - MISTY VALLEY AVENUE

2018 TID NO. 1 INFRASTRUCTURE
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GAYS MILLS, WISCONSIN

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NO. DATE REMARKS

SCALE
AS SHOWN

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JULY 2018

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PJUN

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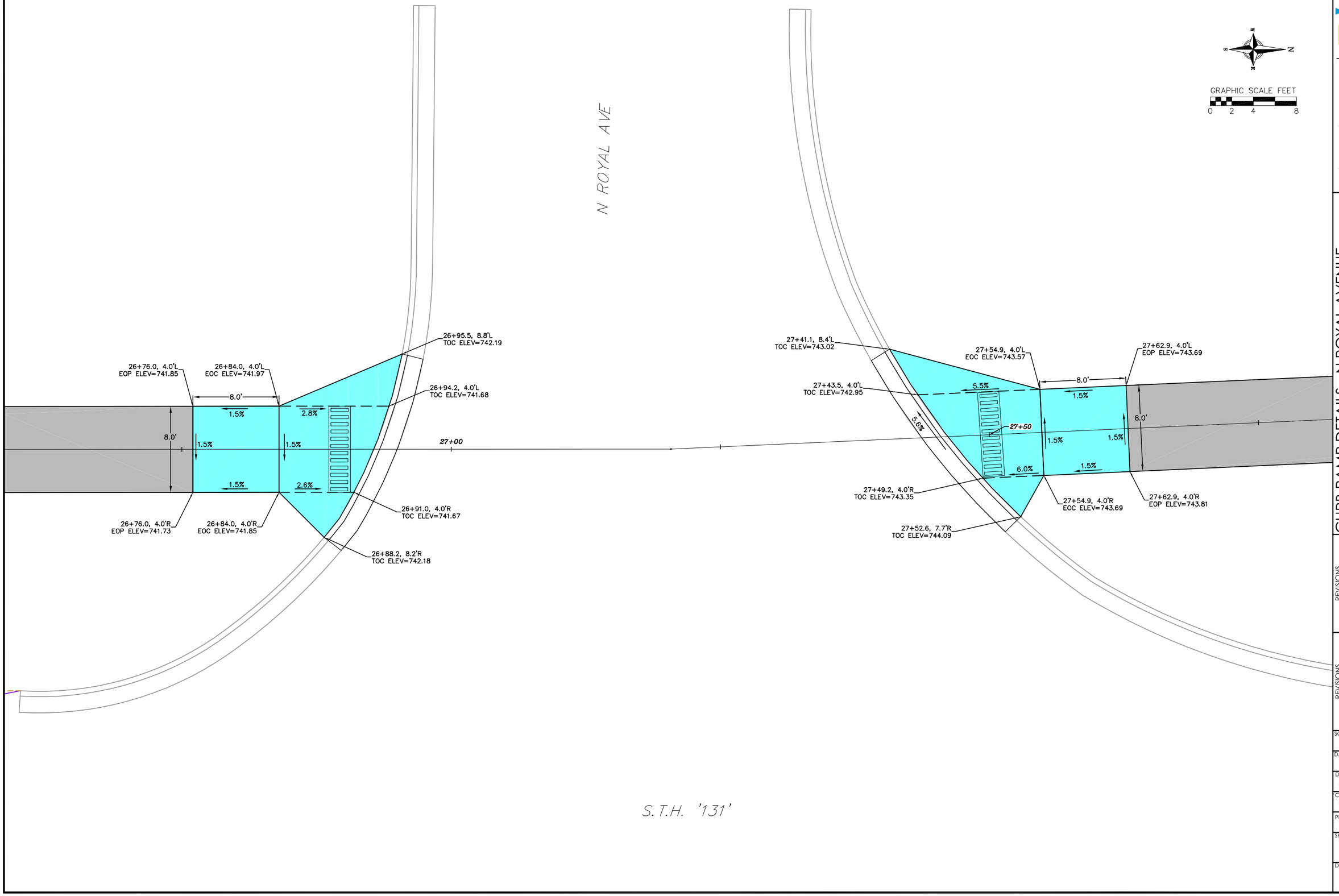
MMUC

PROJECT NO.
180089

SHEET
26 OF 29

DWG. NO.



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CURB RAMP DETAILS - N ROYAL AVENUE

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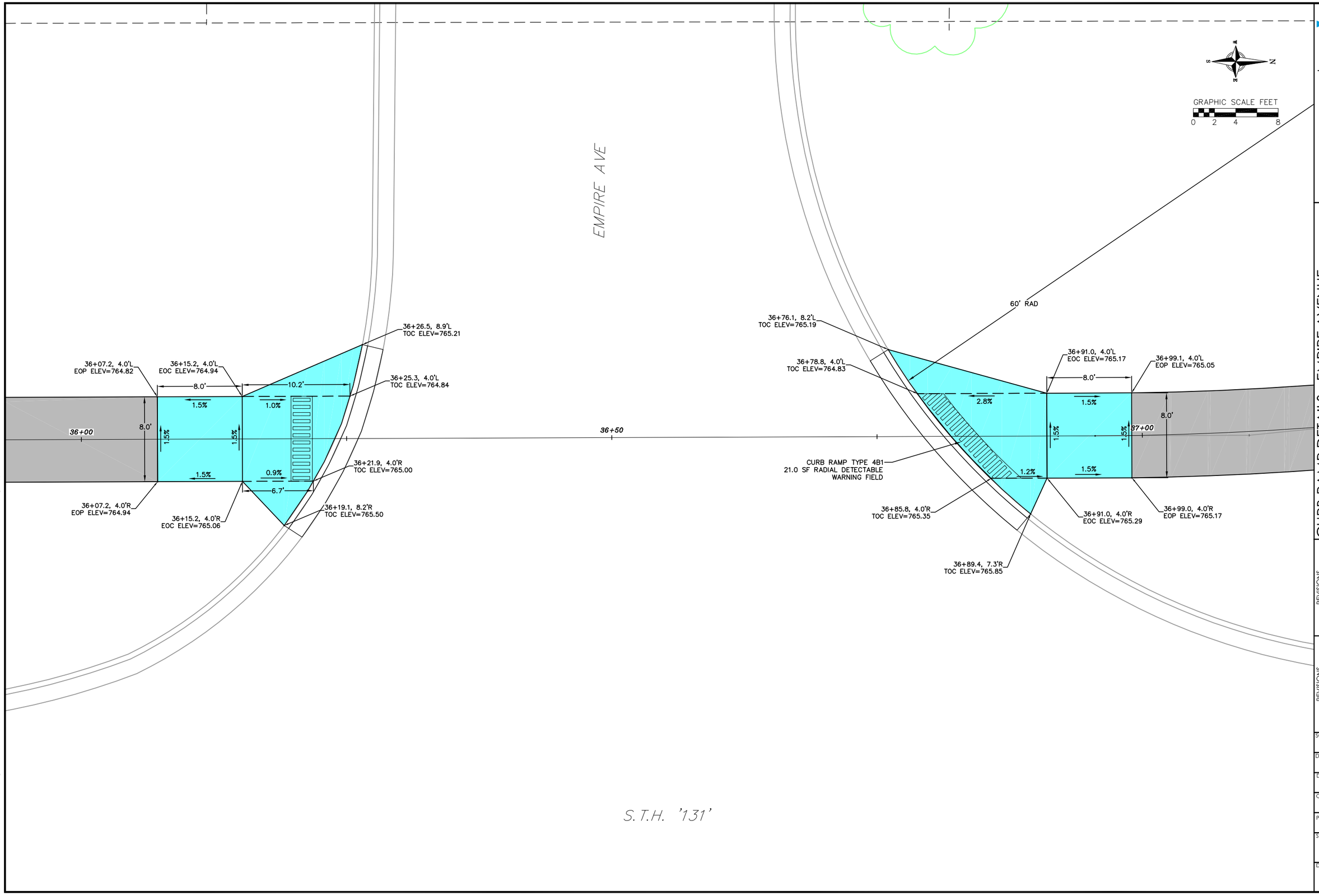
27 OF 29

DWG. NO.



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CURB RAMP DETAILS - EMPIRE AVENUE

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AS SHOWN

DATE
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PJUN

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MMUC

PROJECT NO.
180089

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28 OF 29

DWG. NO.

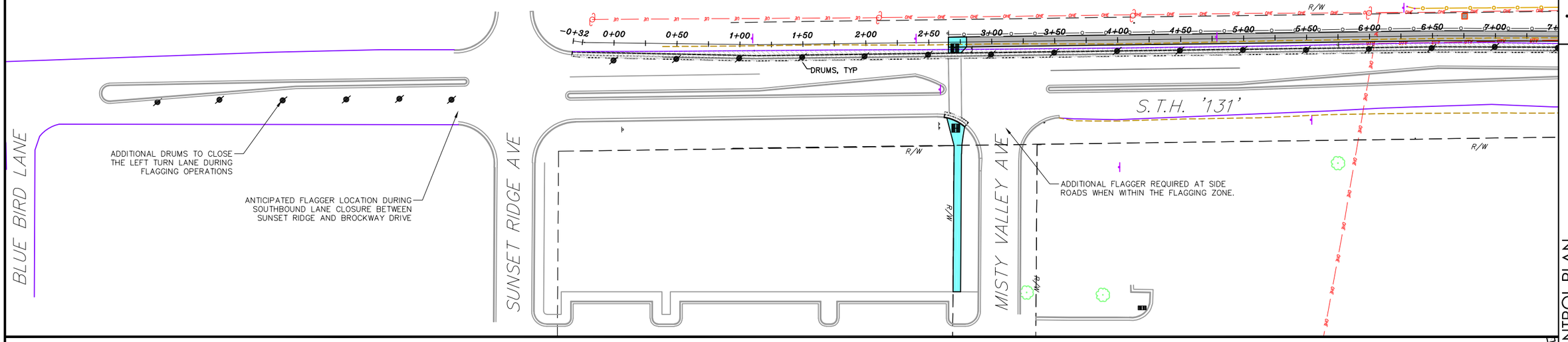
08 Jun 2020 - 1:43p R:\Gays Mills, Village of\180089 - Gays Mills TID No. 1 2018 Infrastructure\CADD\2018 Gay Mills Details - Crosswalks.dwg by: lhal

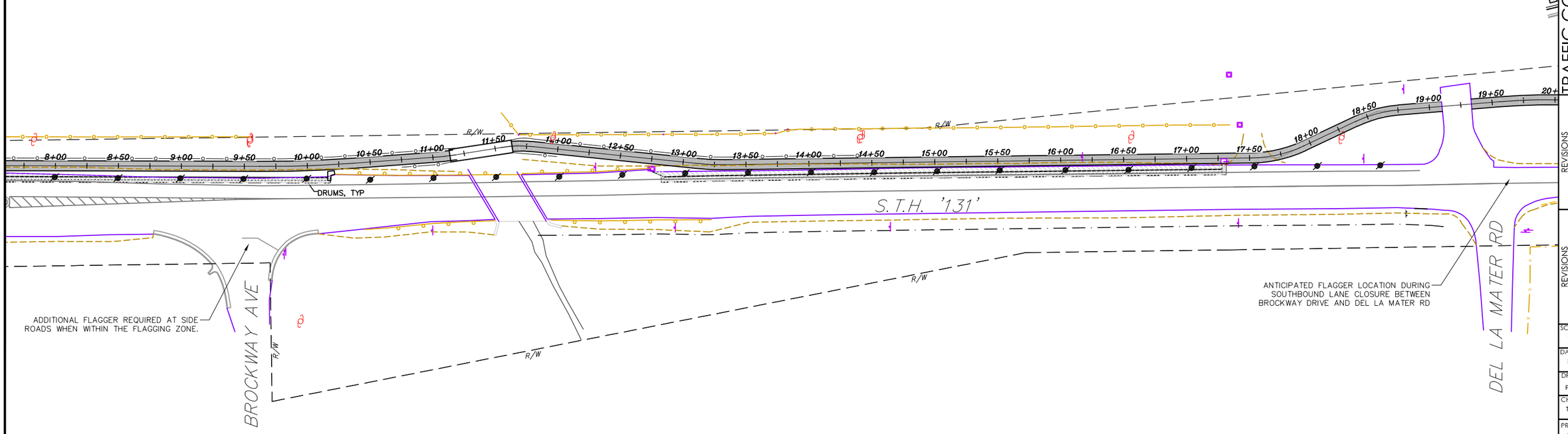
GRAPHIC SCALE FEET

0 10 20 40

TRAFFIC CONTROL NOTES

1. PLACE ADVANCED WARNING TRAFFIC CONTROL FOR PROJECT AS SHOWN ON SDD 15C04.
2. PLACE TRAFFIC CONTROL FOR WORK ON AND OFF SHOULDER AS SHOWN ON SDD 15D28.
3. PLACE TRAFFIC CONTROL FOR FLAGGING OPERATIONS AS SHOWN ON SDD 15C12 AND INCLUDE THE "BE PREPARED TO STOP" SIGNS.
4. ALL FLAGGERS SHALL BE WISDOT CERTIFIED.
5. PROVIDE ADDITIONAL FLAGGERS AT SIDE ROADS WHEN LOCATED WITHIN THE FLAGGING ZONE.





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TRAFFIC CONTROL PLAN

2018 TID NO. 1 INFRASTRUCTURE
TRAIL IMPROVEMENTS
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NO.	DATE	REMARKS

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DRAFTER: PJUN
CHECKED: THAL
PROJECT NO.: 180089
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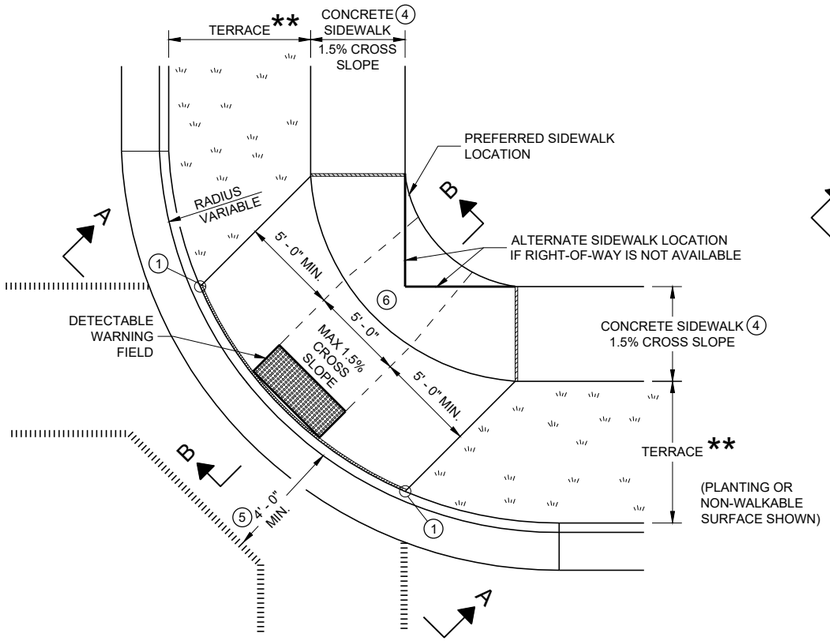
DWG. NO.:

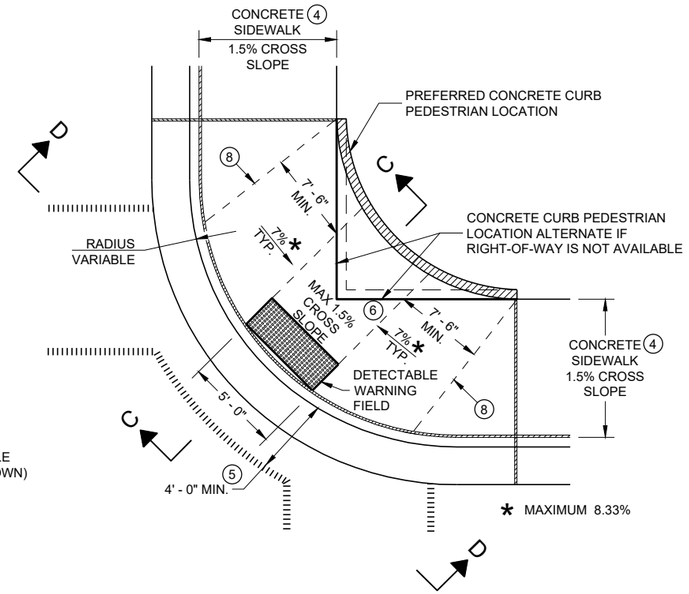
SDD 08D05-a: Curb Ramps Types 1 and 1-A



PLAN VIEW

CURB RAMP TYPE 1

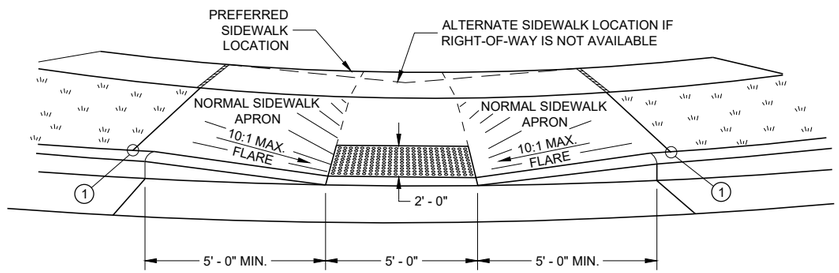
(CENTER OF CORNER RADIUS)



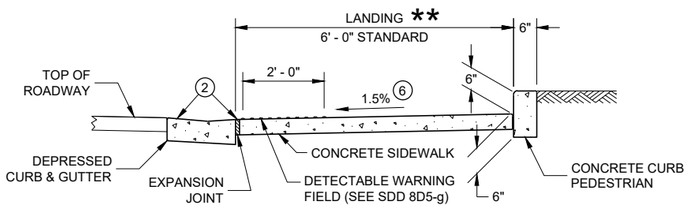
PLAN VIEW

CURB RAMP TYPE 1 - A

(NO TERRACE)

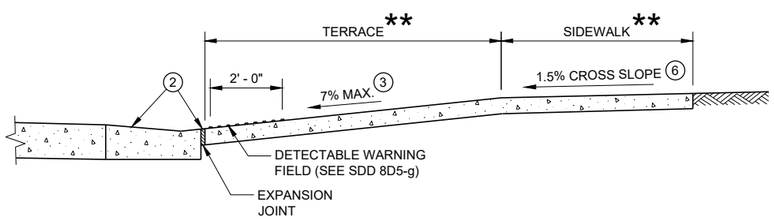


VIEW A - A FOR TYPE 1

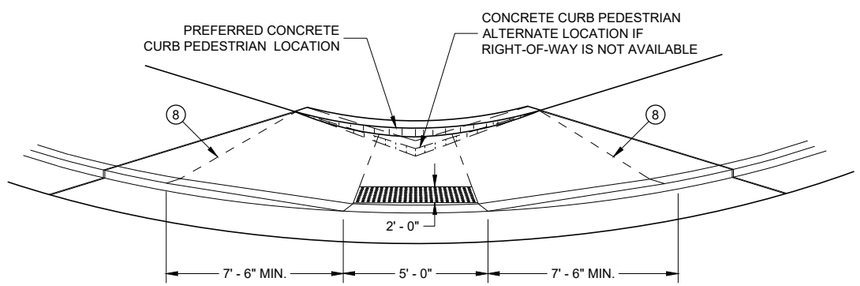


SECTION C - C FOR TYPE 1 - A

** WIDTH SHOWN ELSEWHERE IN THE PLANS



SECTION B - B FOR TYPE 1



VIEW D - D FOR TYPE 1 - A

GENERAL NOTES

AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

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.

WHEN NECESSARY, THE SIDEWALK ELEVATION MAY BE LOWERED TO MEET THE HIGH POINT ON THE RAMP.

TYPE 1 CURB RAMPS SHALL HAVE A NORMAL SIDEWALK APRON AND CURB ON BOTH SIDES OF RAMP.

DETECTABLE WARNING FILED SHALL BE MEASURED AND PAID BY THE SQUARE FOOT AS "CURB RAMP DETECTABLE WARNING FIELD". THE CONCRETE PEDESTRIAN CURB, IF NEEDED, SHALL BE MEASURED AND PAID BY THE LINEAR FOOT AS "CONCRETE CURB PEDESTRIAN". CONCRETE SIDEWALK IN THE CURB RAMP AREA SHALL BE MEASURED AND PAID BY THE SQUARE FOOT AS CONCRETE SIDEWALK, INCLUDING THE AREA UNDER THE DETECTABLE WARNING FIELD.

SELECT CURB RAMP DETECTABLE WARNING FIELD MATERIALS AND DEVICES FROM THE DEPARTMENT'S APPROVED MATERIALS LIST. THE COLOR OF THE DETECTABLE WARNING FIELD IS SPECIFIED ELSEWHERE AND IS INCIDENTAL TO THE BID ITEM OF "CURB RAMP DETECTABLE WARNING FIELD"

DETECTABLE WARNING FIELDS THAT ARE INSTALLED AS A GROUP OR SIDE BY SIDE, SHALL BE FROM THE SAME MANUFACTURER.

SURFACE TEXTURE OF THE RAMP SHALL BE OBTAINED BY COARSE BROOMING TRANSVERSE TO THE SLOPE OF THE RAMP.

(1) THIS POINT IS AN EXTENSION OF OUTSIDE EDGE OF APPROACHING SIDEWALK WHERE IT MEETS THE BACK OF CONCRETE CURB. POINT LOCATION MAY BE ADJUSTED TO ALIGN WITH BEGINNING OF FULL-HEIGHT CURB IF THIS DISTANCE IS SHORT.

(2) GRADE CHANGE BETWEEN GUTTER FLAG SLOPE AND THE CURB RAMP SLOPE SHALL NOT EXCEED 11%. MAXIMUM GUTTER FLAG SLOPE IS 4%. PROVIDE LONGITUDINAL DRAINAGE AROUND CURB AND AWAY FROM CURB RAMP. NO VERTICAL LIPS OR DISCONTINUITIES GREATER THAN ¼ - INCH ARE ALLOWED. SLOPE OF CURB HEAD OPENING SHALL MATCH THE RAMP SLOPE, MINIMALLY 1.5% AND NOT TO EXCEED 7%. WHEN ADJACENT TO 1.5% LANDING, CONSTRUCT CURB HEAD OPENING AT 1.5% IN THE DIRECTION OF PEDESTRIAN TRAVEL.

(3) MAXIMUM 8.33% CURB RAMP SLOPE IS ALLOWABLE WITH FLATTENED GUTTER FLAG SLOPE AND NOT TO EXCEED 11% GRADE CHANGE.

(4) ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

(5) PROVIDE A LEVEL LANDING IN THE STREET AND GUTTER AREA (2% MAXIMUM SLOPE IN ANY DIRECTION). WHEN THE GUTTER SLOPE EXCEEDS 2%, CONSTRUCT THE LEVEL LANDING IN THE STREET AREA.

(6) PROVIDE A LEVEL LANDING (MAXIMUM 2% SLOPE) IN ANY DIRECTION OF PEDESTRIAN TRAVEL. STANDARD LEVEL LANDING SIZE IS 5 FEET BY 5 FEET.

(8) PROVIDE GRADE BREAK PERPENDICULAR TO DIRECTION OF WHEELCHAIR TRAVEL.

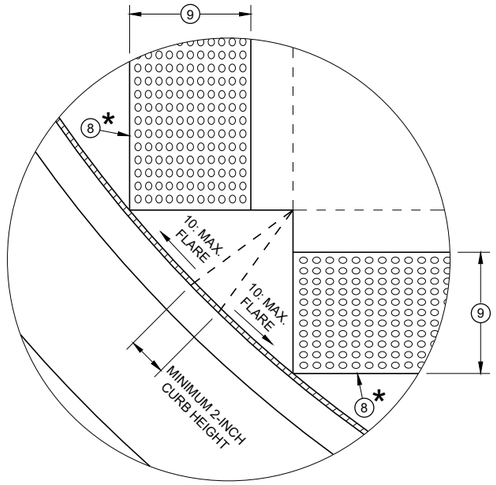
LEGEND

- ½" EXPANSION JOINT SIDEWALK
- CONTRACTION JOINT FIELD LOCATED
- PAVEMENT MARKING CROSSWALK (WHITE)

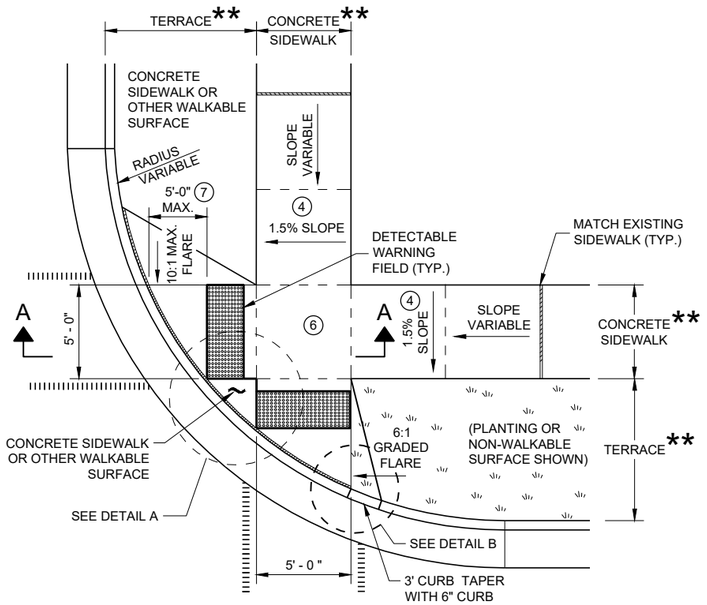
CURB RAMPS TYPE 1 AND 1-A

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

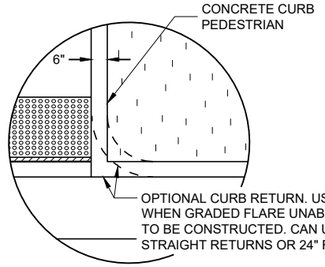
SDD 08D05-b Curb Ramps Types 2 and 3



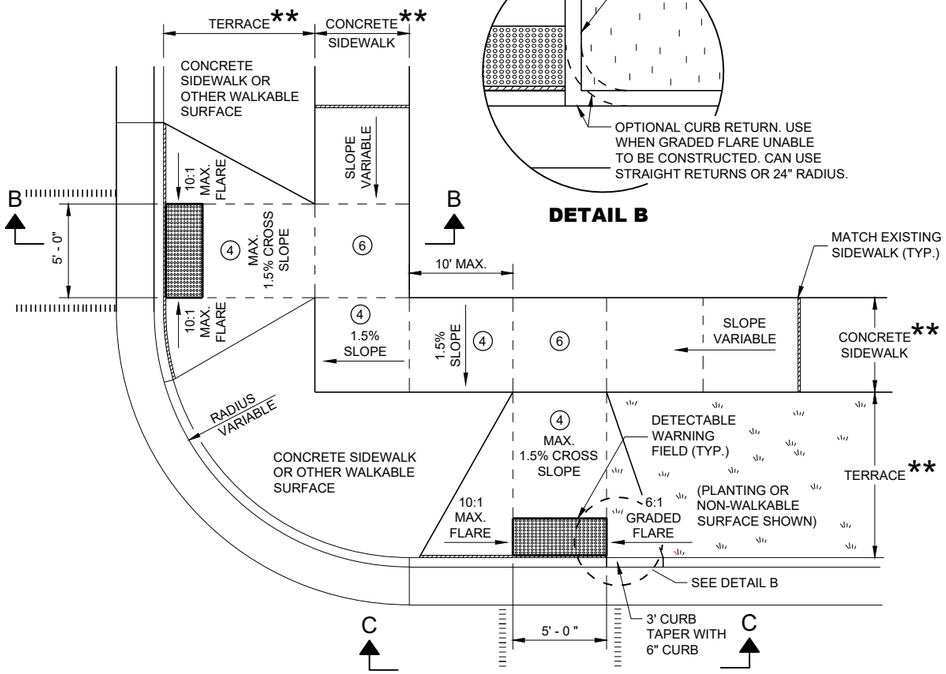
DETAIL A



PLAN VIEW
CURB RAMP TYPE 2
(CENTER OF CORNER RADIUS)



DETAIL B



PLAN VIEW
CURB RAMP TYPE 3
(OUTSIDE OF CROSSWALK AREA)

GENERAL NOTES

AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

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.

DETECTABLE WARNING FIELDS THAT ARE INSTALLED AS A GROUP OR SIDE BY SIDE SHALL BE FROM THE SAME MANUFACTURER.

(2) GRADE CHANGE BETWEEN GUTTER FLAG SLOPE AND THE CURB RAMP SLOPE SHALL NOT EXCEED 11%. MAXIMUM GUTTER FLAG SLOPE IS 4%. PROVIDE LONGITUDINAL DRAINAGE AROUND CURB AND AWAY FROM CURB RAMP. NO VERTICAL LIPS OR DISCONTINUITIES GREATER THAN ¼ - INCH ARE ALLOWED. SLOPE OF CURB HEAD OPENING SHALL MATCH THE RAMP SLOPE, MINIMALLY 1.5% AND NOT TO EXCEED 7%. WHEN ADJACENT TO 1.5% LANDING, CONSTRUCT CURB HEAD OPENING AT 1.5% IN THE DIRECTION OF PEDESTRIAN TRAVEL.

(3) AN 8.33% CURB RAMP SLOPE IS ALLOWABLE WITH FLATTENED GUTTER FLAG SLOPE (2.67% OR LESS) AND NOT TO EXCEED 11% GRADE CHANGE.

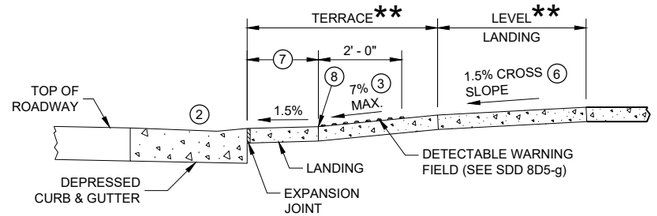
(4) ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

(6) PROVIDE A LEVEL LANDING (MAXIMUM 2% SLOPE) IN ANY DIRECTION OF PEDESTRIAN TRAVEL. STANDARD LEVEL LANDING SIZE IS 5 FEET X 5 FEET.

(7) WHEN GRADE BREAK DISTANCE EXCEEDS 5 FEET, USE RADIAL DETECTABLE WARNING FIELD PER SDD 8D5-f.

(8) PROVIDE GRADE BREAK PERPENDICULAR TO DIRECTION OF WHEELCHAIR TRAVEL.

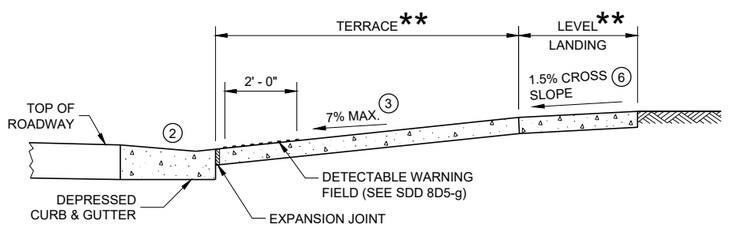
(9) WHEN DISTANCE IS LESS THAN 6' - 0", IT MAY BE DIFFICULT TO ACHIEVE A 7% SLOPE OR FLATTER ALONG THE RAMP. REDUCE CURB HEIGHT IN TRIANGLE AREA TO ACHIEVE 7% SLOPE OR FLATTER ON RAMP. CONSTRUCT 2-INCH MINIMUM CURB HEIGHT BETWEEN 10:1 FLARES.



SECTION A - A FOR TYPE 2

* MAXIMUM 2.0% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK

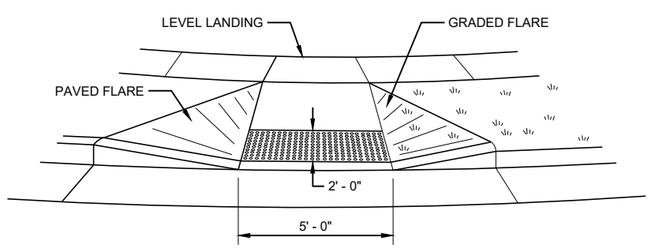
** WIDTH SHOWN ELSEWHERE IN THE PLANS



SECTION B - B FOR TYPE 3

LEGEND

- ½" EXPANSION JOINT SIDEWALK
- CONTRACTION JOINT SIDEWALK
- PAVEMENT MARKING CROSSWALK (WHITE)



VIEW C - C FOR TYPE 3

CURB RAMPS TYPE 2 AND 3

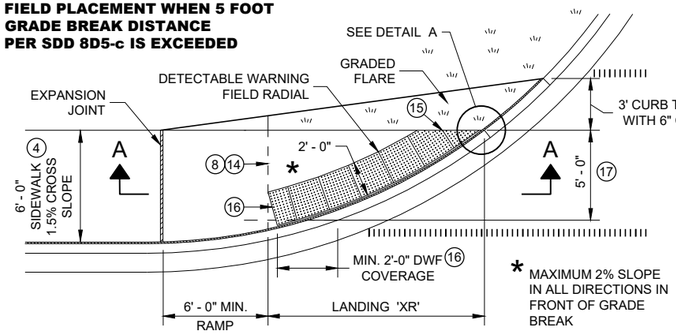
STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

6

SDD 08D05 - 20b

SDD 08D05-f Curb Ramps Radial Detectable Warning Field Applications

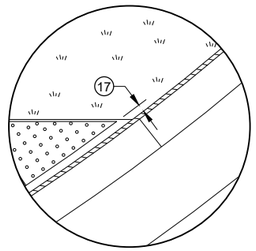
RADIAL DETECTABLE WARNING FIELD PLACEMENT WHEN 5 FOOT GRADE BREAK DISTANCE PER SDD 8D5-c IS EXCEEDED



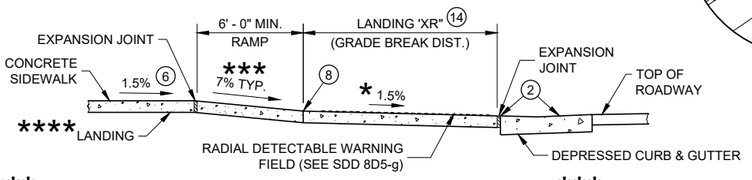
PLAN VIEW

CURB RAMP TYPE 4A1

(GRADE BREAK DISTANCE GREATER THAN 5 FEET)



DETAIL A



IF RAMP SLOPE IS LESS THAN 5.0%, THEN NO ADJACENT UPHILL LANDING IS REQUIRED

MAXIMUM 8.33%

SECTION A - A FOR TYPE 4A1

LEGEND

- ½" EXPANSION JOINT SIDEWALK
- CONTRACTION JOINT SIDEWALK
- PAVEMENT MARKING CROSSWALK (WHITE)

GENERAL NOTES

AVOID PLACING DRAINAGE STRUCTURES, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.

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.

DETECTABLE WARNING FIELDS THAT ARE INSTALLED AS A GROUP OR SIDE BY SIDE, SHALL BE FROM THE SAME MANUFACTURER.

APPLY RADIAL DETECTABLE WARNING PLACEMENT SIMILARLY FOR TYPE 4A AND 4A1 CURB RAMPS AND SIMILARLY FOR TYPE 4B AND 4B1 CURB RAMPS. TYPE 4A AND 4B CURB RAMPS ARE NOT SHOWN.

REFER TO SDD 8D5-g FOR ADDITIONAL RADIAL PLATE REQUIREMENTS.

FIELD CUTS AT INTERMEDIATE JOINTS WITHIN THE RADIAL DETECTABLE WARNING FILED ARE PROHIBITED.

DETERMINE FINAL RADIAL WARNING FIELD CONFIGURATION AD ITS INDIVIDUAL PLATE LOCATIONS. PERFORM PRE-LAYOUT PRIOR TO PLACEMENT IN PLASTIC CONCRETE. FOLLOW MANUFACTURER'S PRODUCT LIST AND INSTALLATION RECOMMENDATIONS.

(2) GRADE CHANGE BETWEEN GUTTER FLAG SLOPE AND THE CURB RAMP SLOPE SHALL NOT EXCEED 11%. MAXIMUM GUTTER FLAG SLOPE IS 4%. PROVIDE LONGITUDINAL DRAINAGE AROUND CURB AND AWAY FROM CURB RAMP. NO VERTICAL LIPS OR DISCONTINUITIES GREATER THAN ¼ - INCH ARE ALLOWED. SLOPE OF CURB HEAD OPENING SHALL MATCH THE RAMP SLOPE, MINIMALLY 1.5% AND NOT TO EXCEED 7%. WHEN ADJACENT TO 1.5% LANDING, CONSTRUCT CURB HEAD OPENING AT 1.5% IN THE DIRECTION OF PEDESTRIAN TRAVEL.

(3) AN 8.33% CURB RAMP SLOPE IS ALLOWABLE WITH FLATTENED GUTTER FLAG SLOPE AND NOT TO EXCEED 11% GRADE CHANGE.

(4) ±0.5% CONSTRUCTION TOLERANCE IN SIDEWALK CROSS SLOPE. THE SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2% WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

(6) PROVIDE A LEVEL LANDING (MAXIMUM 2% SLOPE) IN ANY DIRECTION OF PEDESTRIAN TRAVEL. STANDARD LANDING SIZE IS 5 FEET BY 5 FEET.

(8) PROVIDE GRADE BREAK PERPENDICULAR TO DIRECTION OF WHEELCHAIR TRAVEL.

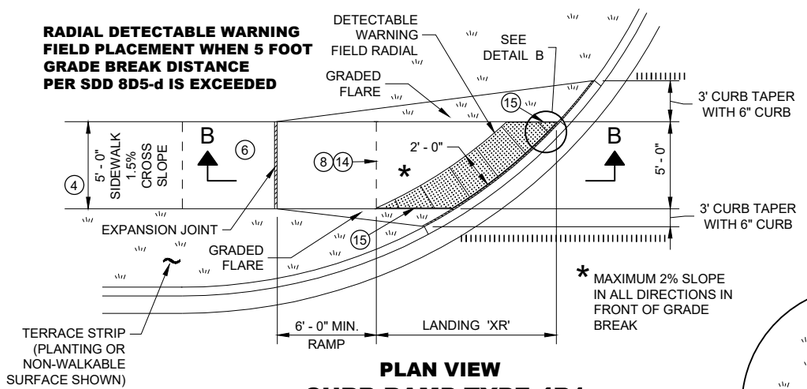
(14) CONSULT ENGINEER IF GRADE BREAK LOCATION (END OF LANDING DIMENSION "XR") REQUIRES FIELD ADJUSTMENT WHEN ESTABLISHING FINAL RADIAL DETECTABLE WARNING FIELD LOCATION.

(15) FIELD SAW CUTS ALONG RADIAL DETECTABLE WARNING PLATES WILL BE NECESSARY TO MATCH EACH CURB RAMP EDGE. AVOID CUTTING THROUGH DOMES WHENEVER POSSIBLE. MAKE FIELD CUTS TRUE TO LINE AND WITHIN ⅛" DEVIATION. SMOOTH EDGES OF FIELD CUT PLATES.

(16) USE 1' X 2" RECTANGULAR END PLATE AT END OF TYPE 4A1 RAMP AND PROVIDE MINIMUM 2' - 0" DETECTABLE WARNING FIELD COVERAGE (IN DIRECTION OF PEDESTRIAN TRAVEL) ALONG THE ENTIRE CURB RAMP WIDTH.

(17) A MAXIMUM 3 INCH CONCRETE BORDER WITH IS ALLOWABLE IN FROM OF RADIAL DETECTABLE WARNING FIELD FOR CONSTRUCTABILITY PURPOSES. CONCRETE BORDER WIDTH MAY VARY UP TO 1 INCH.

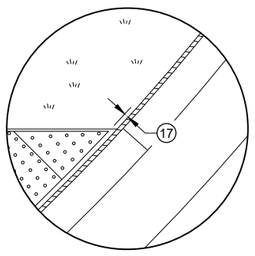
RADIAL DETECTABLE WARNING FIELD PLACEMENT WHEN 5 FOOT GRADE BREAK DISTANCE PER SDD 8D5-d IS EXCEEDED



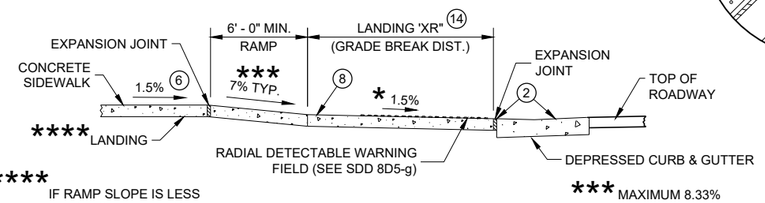
PLAN VIEW

CURB RAMP TYPE 4B1

(GRADE BREAK DISTANCE GREATER THAN 5 FEET)



DETAIL B

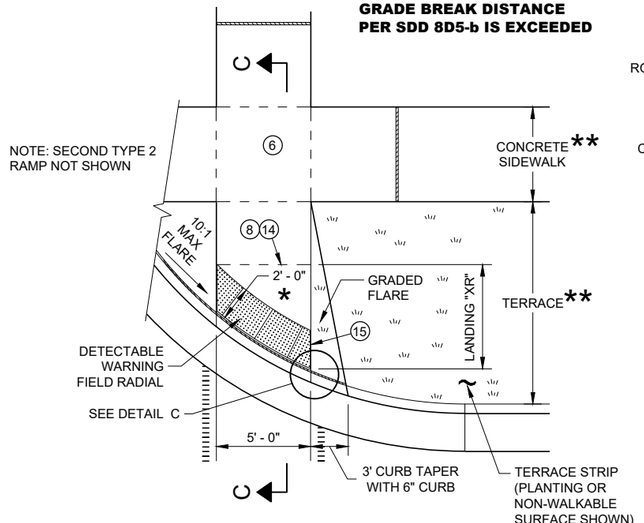


IF RAMP SLOPE IS LESS THAN 5.0%, THEN NO ADJACENT UPHILL LANDING IS REQUIRED

MAXIMUM 8.33%

SECTION B - B FOR TYPE 4B1

RADIAL DETECTABLE WARNING FIELD PLACEMENT WHEN 5 FOOT GRADE BREAK DISTANCE PER SDD 8D5-b IS EXCEEDED

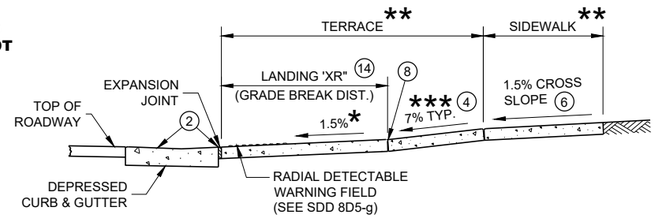


PLAN VIEW

CURB RAMP TYPE 2

(GRADE BREAK DISTANCE GREATER THAN 5 FEET)

(ON LINE WITH SIDEWALK)

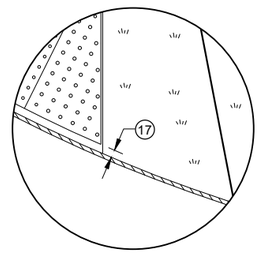


SECTION C - C FOR TYPE 2

MAXIMUM 2% SLOPE IN ALL DIRECTIONS IN FRONT OF GRADE BREAK

WIDTH SHOWN ELSEWHERE IN THE PLANS

MAXIMUM 8.33%



DETAIL C

CURB RAMPS
RADIAL DETECTABLE WARNING FIELD APPLICATIONS

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

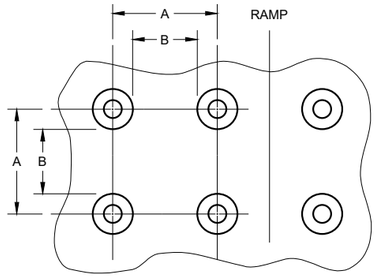
6

SDD 08D05 - 20f

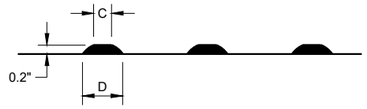
SDD 08D05-g: Curb Ramps Rectangular and Radial Detectable Warning Plates

	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.

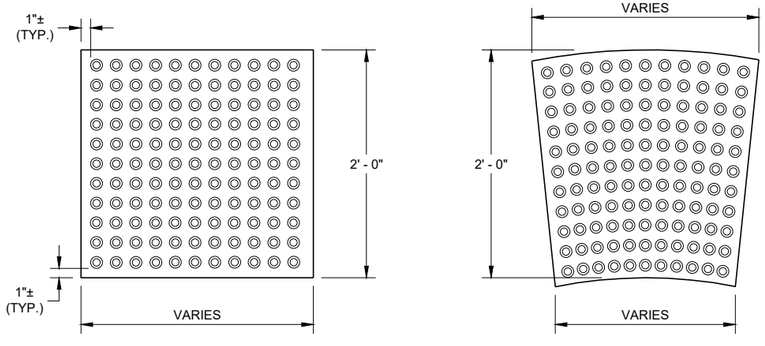


PLAN VIEW



ELEVATION VIEW

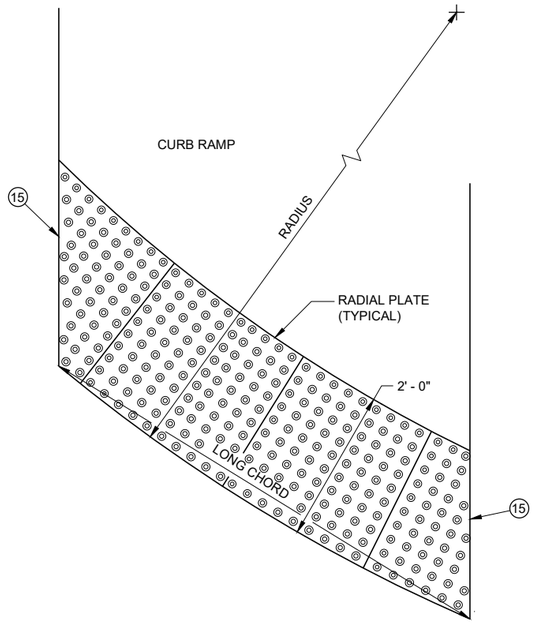
TRUNCATED DOMES
DETECTABLE WARNING PATTERN DETAIL



RECTANGULAR PLATES

RADIAL PLATES

PLAN VIEW
DETECTABLE WARNING FIELDS (TYPICAL)



PLAN VIEW
RADIAL DETECTABLE WARNING FIELD ATTRIBUTES

GENERAL NOTES

DETECTABLE WARNING FIELDS THAT ARE INSTALLED AT A CURB RAMP SHALL BE FROM THE SAME MANUFACTURER.

PLACE ALL DETECTABLE WARNING FIELD SYSTEMS IN ACCORDANCE TO THE MANUFACTURER'S RECOMMENDATION.

FIELD CUTS AT INTERMEDIATE JOINTS WITHIN THE RADIAL DETECTABLE WARNING FILED ARE PROHIBITED.

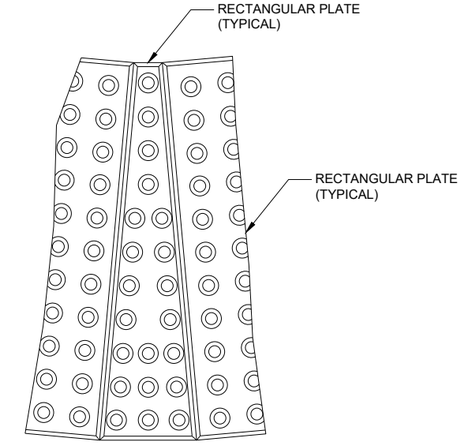
DETERMINE FINAL RADIAL WARNING FIELD CONFIGURATION AND ITS INDIVIDUAL PLATE LOCATIONS. PERFORM PRE-LAYOUT PRIOR TO PLACEMENT IN PLASTIC CONCRETE. FOLLOW MANUFACTURER'S PRODUCT LIST AND INSTALLATION RECOMMENDATIONS.

FOR RADIAL DETECTABLE WARNING FIELD APPLICATIONS WHERE STANDARD RADIAL PLATES ARE NOT AVAILABLE AT AN INTERSECTION CURB RADIUS, A COMBINATION OF SQUARE OR RECTANGULAR PLATES AND RADIAL PLATES MAY BE USED TO FORM RADIAL CONFIGURATION. RADIAL WEDGE PLATES IN COMBINATION WITH SQUARE PLATES ARE ALSO ACCEPTABLE. FOLLOW MANUFACTURER'S RECOMMENDATIONS.

REFER TO CONTRACT AND STANDARD SPECIFICATIONS FOR FIELD CUTTING REQUIREMENTS.

DO NOT EMBED IN CONCRETE ANY FIELD-CUT PLATES WITH CUT EDGES SHORTER THAN 6 INCHES. CONSULT WITH MANUFACTURER FOR RE-DRILLING AND ANCHORING REQUIREMENTS OF FIELD-CUT PLATES.

(15) FIELD SAW CUTS ALONG RADIAL DETECTABLE WARNING PLATES WILL BE NECESSARY TO MATCH EACH CURB RAMP EDGE. AVOID CUTTING THROUGH DOMES WHENEVER POSSIBLE. MAKE FIELD CUTS TRUE TO LINE AND WITHIN ⅛" DEVIATION. SMOOTH EDGES OF FIELD CUT PLATES.



PLAN VIEW
RADIAL WEDGE PLATE CONNECTION DETAIL

CURB RAMPS
RECTANGULAR AND RADIAL
DETECTABLE WARNING PLATES

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

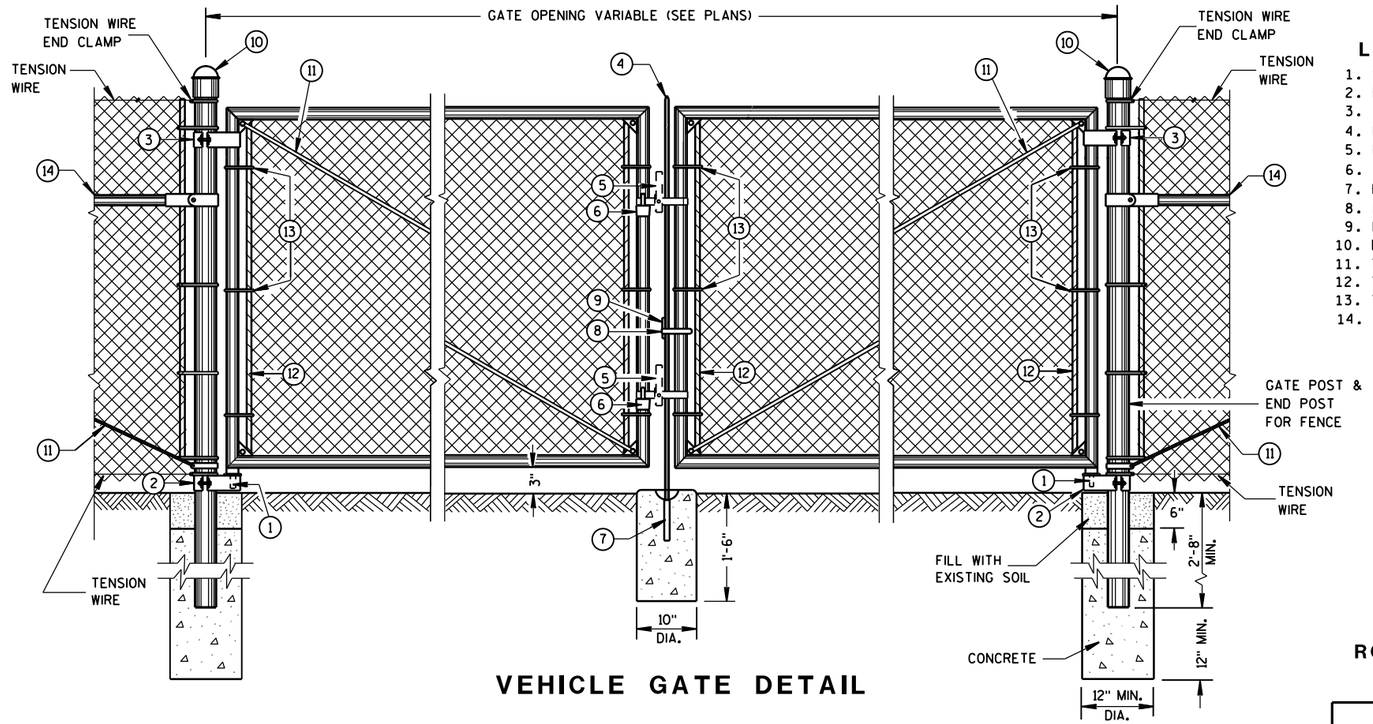
APPROVED
May 2019
DATE

/S/ Rodney Taylor
ROADWAY STANDARDS DEVELOPMENT
UNIT SUPERVISOR

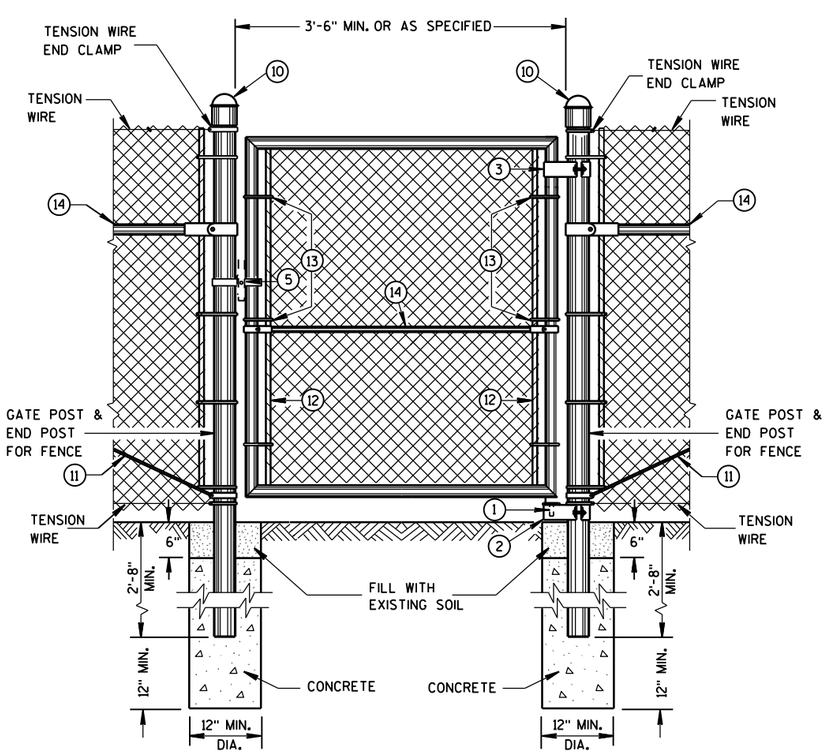
FHWA

6
SDD 08D05 - 20g

SDD 15b3-a Chain Link Fence



VEHICLE GATE DETAIL



PEDESTRIAN GATE DETAIL

LEGEND

1. STRAIGHT PLUG
2. BOTTOM HINGE
3. TOP HINGE
4. PLUNGER ROD
5. FULCRUM LATCH
6. FORK CATCH *
7. PLUNGER ROD CATCH
8. LOCK KEEPER GUIDE
9. LOCK KEEPER
10. DOME TOPS
11. TRUSS RODS
12. TENSION BAR
13. TENSION BANDS
14. BRACE RAIL

*NOT REQUIRED ON SINGLE SWING PEDESTRIAN GATE

GENERAL NOTES

FENCE POSTS INSTALLED ON CONCRETE WALLS SHALL BE ANCHORED INTO EMBEDDED METAL SLEEVES OR CORED HOLE BY FILLING THE ANNULAR SPACE WITH PEA GRAVEL FOLLOWED BY AN EPOXY RESIN ADHESIVE. THE EPOXY RESIN ADHESIVE SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M 235, CLASS A, B OR C.

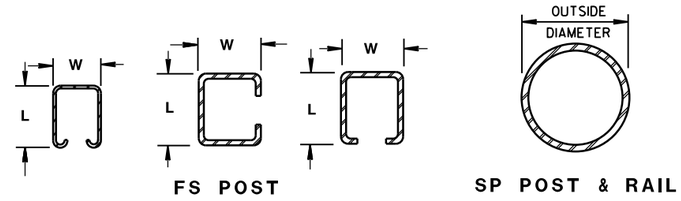
USE FENCE FABRIC KNUCKLED AT BOTH SELVAGES.

FOR LEAF GATES GREATER THAN 8 FEET WIDE, INSTALL INTERIOR VERTICAL BRACE RAIL AT 8 FOOT INTERVALS.

FOR FABRIC HEIGHTS GREATER THAN 8 FEET, INSTALL INTERIOR HORIZONTAL BRACE RAILS TO LEAF GATE.

MAXIMUM SAG FOR OUTER GATE MEMBER SHALL NOT EXCEED THE GREATER OF 1% OF THE LEAF GATE WIDTH OR 2 INCHES.

USE TYPE 2, CLASS 3, MARCELLED/CRIMPED, TENSION WIRE PER ASTM A 817.



CROSS SECTIONS OF POSTS AND RAILS

ROLLED-FORMED STEEL FENCE POST (2.0 OZ./SQ. FT. COATING)

POST TYPE	LENGTH (L) INCH	WIDTH (W) INCH	WEIGHT LBS/FT
FS1	1.625	1.25	1.35
FS2†	1.875	1.625	1.850
FS2	1.875	1.625	2.400
FS3	2.250	1.700	2.780

ROUND STEEL FENCE POST (1.8 OZ./SQ. FT. COATING)

POST TYPE	OUTSIDE DIMENSION INCH	WALL THICKNESS INCH	WEIGHT LBS/FT
SP1	1.660	0.140	2.270
SP2	1.900	0.145	2.720
SP3	2.375	0.154	3.650
SP4	2.875	0.203	5.800
SP5	4.000	0.226	9.120
SP6	6.625	0.280	18.990
SP7	8.625	0.322	28.580

REQUIRED FENCE POST SIZES

USE	FABRIC HEIGHTS FEET	POST TYPE
TERMINAL POSTS **	LESS THAN OR EQUAL TO 6 FT.	SP3
	GREATER THAN OR EQUAL TO 6 FT.	SP4
LINE POSTS	LESS THAN OR EQUAL TO 6 FT.	SP2
	LESS THAN OR EQUAL TO 8 FT.	SP3
	GREATER THAN OR EQUAL TO 8 FT.	SP4
	LESS THAN OR EQUAL TO 8 FT.	FS2 OR FS2†
	GREATER THAN OR EQUAL TO 8 FT.	FS3

REQUIRED POST SIZE FOR GATES

USE	LEAF WIDTHS FEET	POST TYPE
GATES	LESS THAN OR EQUAL TO 6 FT.	SP4
	LESS THAN OR EQUAL TO 13 FT.	SP5
	LESS THAN OR EQUAL TO 18 FT.	SP6
	LESS THAN OR EQUAL TO 23 FT.	SP7

BRACE RAIL TYPES

USE		TYPE
BRACE RAIL		SP1 OR FS1

** INCLUDES END, CORNER, ANGLE, INTERSECTION AND INTERMEDIATE BRACED POSTS

FENCE CHAIN LINK

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

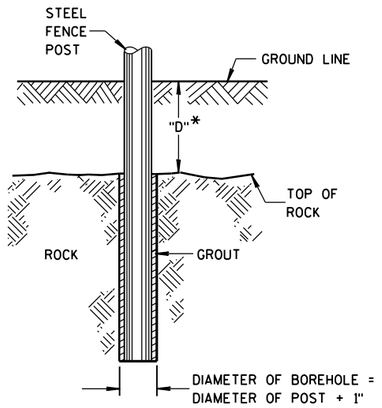
6

S.D.D. 15 B 3-15a

6

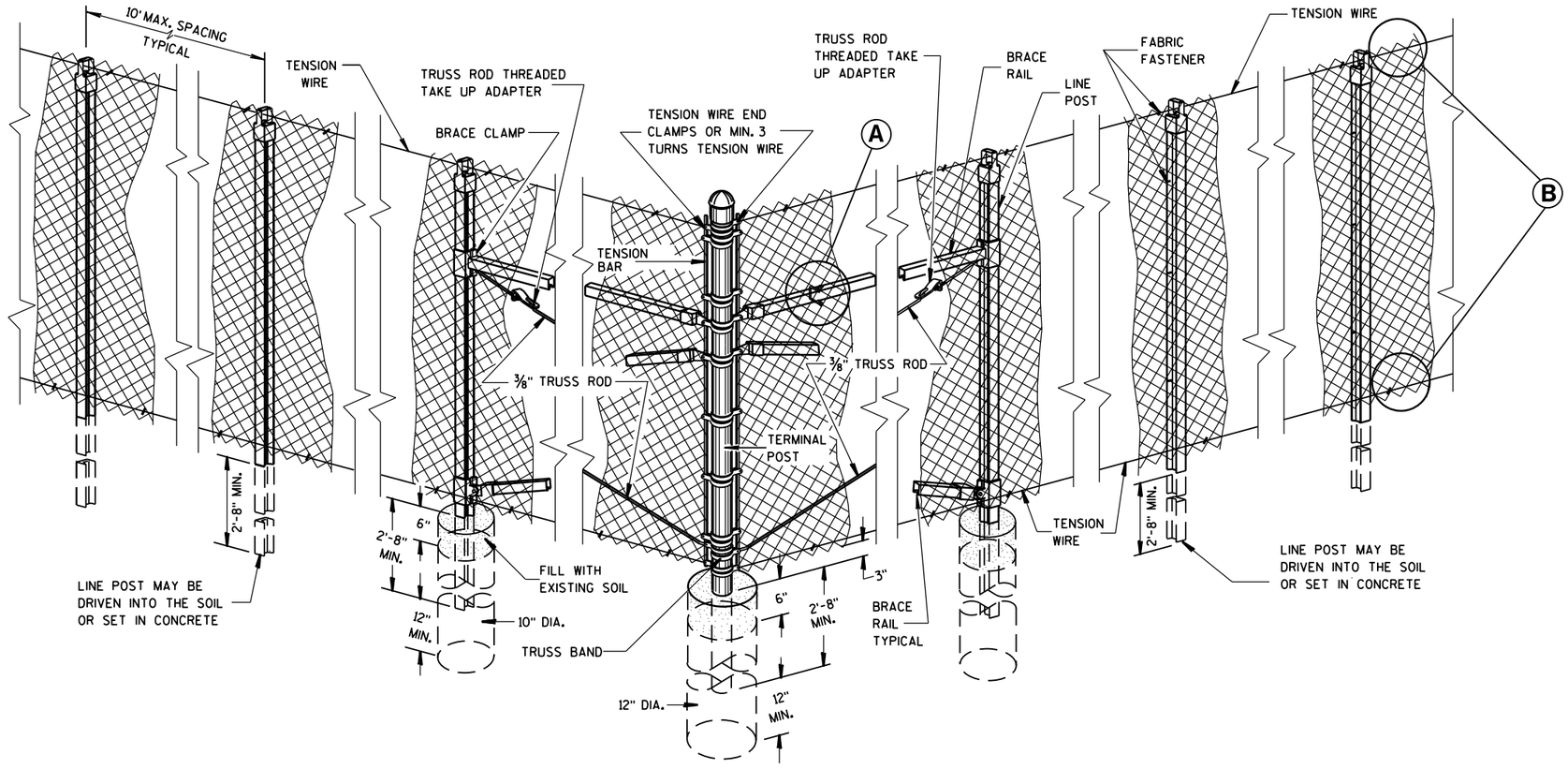
S.D.D. 15 B 3-15a

SDD 15b3-b Chain Link Fence

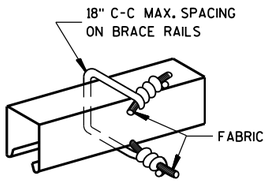


*IF "D" IS LESS THAN 2'-6", DRILL ROCK AND INSTALL GROUT

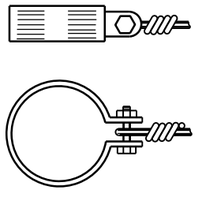
ROCK INSTALLATION OF LINE POST



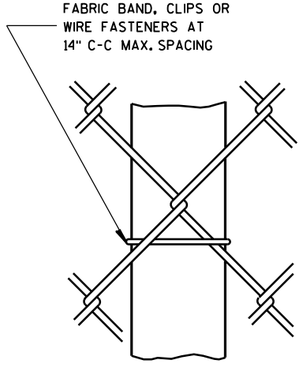
END, CORNER, ANGLE INTERSECTION & INTERMEDIATE BRACED POSTS



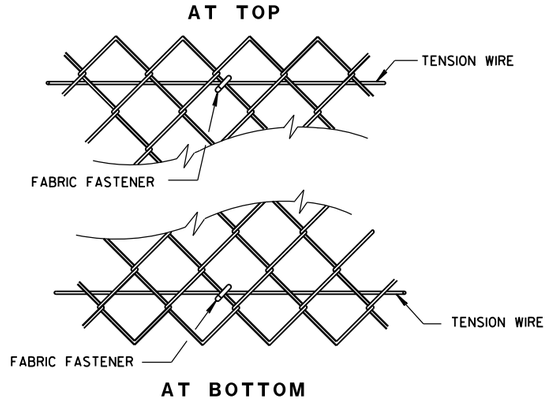
BRACE RAIL
FABRIC FASTENER
(A)



TENSION WIRE END CLAMP



LINE POST
FABRIC FASTENER



SELVAGES
(B)

FENCE CHAIN LINK

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
FEB. 2015
DATE
FHWA

/S/ Jerry H. Zogg
ROADWAY STANDARDS DEVELOPMENT ENGINEER

6

S.D.D. 15 B 3-15b

SDD 15C04 Traffic Control, Advance Warning Signs 45 MPH or Greater Undivided Road Open to Traffic

GENERAL NOTES

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS.

THE SPACING BETWEEN TRAFFIC CONTROL SIGNS SHOULD BE ADJUSTED TO NOT CONFLICT WITH AND SHOULD PROVIDE A MINIMUM OF 200 FEET (500 FEET DESIRABLE) CLEARANCE TO EXISTING SIGNS THAT WILL REMAIN IN PLACE.

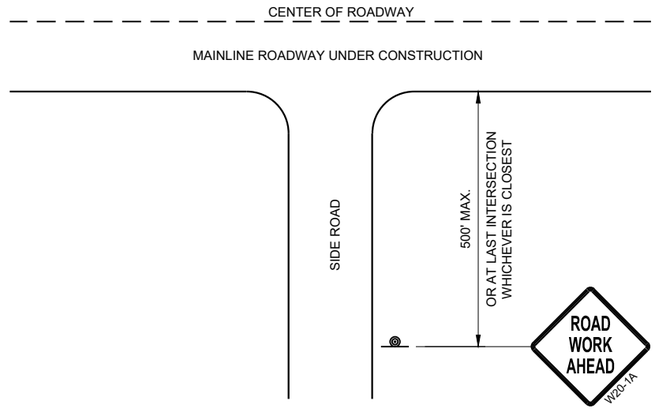
ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

SIGNS THAT WILL BE IN PLACE LESS THAN SEVEN CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

IF A "STOP" SIGN MUST BE REMOVED FOR A WORK OPERATION, A TEMPORARY "STOP" SIGN SHALL BE PLACED PRIOR TO THE SIGN REMOVAL, OR A FLAGGER SHALL BE PROVIDED UNTIL THE SIGN IS REESTABLISHED.

* OMIT G20-1 SIGNS IF LENGTH OF WORK AREA IS 2 MILES OR LESS

** PLACE AN ADDITIONAL W20-1A "ROAD WORK AHEAD" SIGN IF WORK AREA WITHIN THE PROJECT IS SEPARATED BY MORE THAN 2 MILES FROM PREVIOUS WORK AREA.



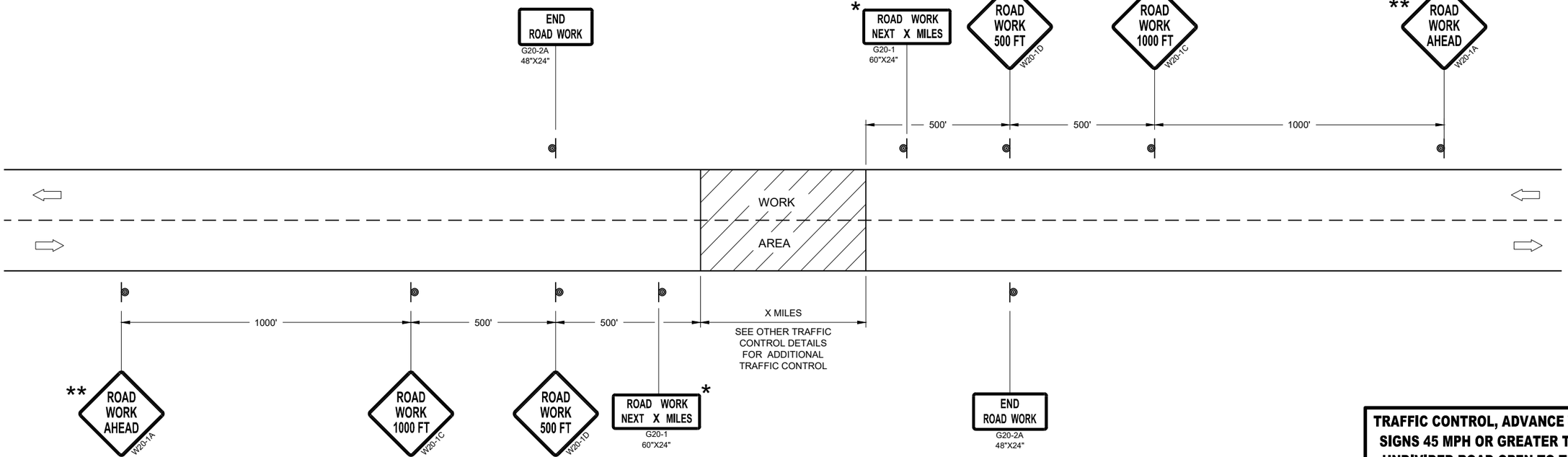
TYPICAL SIDE ROAD APPROACH WARNING SIGN DETAIL

LEGEND

SIGN ON PERMANENT SUPPORT

DIRECTION OF TRAFFIC

WORK AREA



TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45MPH OR GREATER

TRAFFIC CONTROL, ADVANCE WARNING SIGNS 45 MPH OR GREATER TWO-WAY UNDIVIDED ROAD OPEN TO TRAFFICE

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
July 2018
DATE

/S/ Andrew Heidtke
WORK ZONE ENGINEER

FHWA

6

SDD 15C04 - 05

6

SDD 15C04 - 05

SDD 15C12 Traffic Control for Lane Closure With Flagging Operation

LEGEND

- SIGN ON PORTABLE OR PERMANENT SUPPORT
- TEMPORARY PORTABLE RUMBLE STRIP ARRAY
- DIRECTION OF TRAFFIC
- WORK AREA
- FLAGGER, EQUIPPED WITH STOP/SLOW PADDLE FASTENED ON SUPPORT STAFF

GENERAL NOTES

DETAILS OF TRAFFIC CONTROL DEVICES AND INSTALLATION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE STANDARD SPECIFICATIONS, THE SPECIAL PROVISIONS, AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

ALL SIGNS ARE 48" X 48" UNLESS OTHERWISE NOTED.

"WO" SIGNS ARE THE SAME AS "W" SIGNS EXCEPT THE BACKGROUND IS ORANGE.

THE EXACT NUMBER, LOCATION AND SPACING OF ALL SIGNS, DEVICES, AND LOCATION OF ALL FLAGGERS SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

THE FIRST ADVANCE WARNING SIGN SHOULD TYPICALLY BE LOCATED IN ADVANCE OF THE ANTICIPATED TRAFFIC BACKUP OR QUEUE.

WHEN A SIDE ROAD OR RAMP INTERSECTS THE FACILITY ON WHICH THE WORK IS BEING PERFORMED, ADDITIONAL TRAFFIC CONTROLS SHALL BE PROVIDED AS SPECIFIED IN THE PLANS AND/OR THE SPECIAL PROVISIONS OR AS APPROVED BY THE ENGINEER.

FLAGGING

FLAGGERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES. THEY SHALL BE EQUIPPED WITH STOP/SLOW PADDLES FASTENED ON SUPPORT STAFFS. WHEN THE FLAGGING OPERATION IS NOT IN EFFECT REMOVE TEMPORARY PORTABLE RUMBLE STRIPS PRIOR TO COVERING OR REMOVING ALL ADVANCE SIGNING.

(1) FOR MOVING WORK OPERATIONS, POST ADDITIONAL W20-7A FLAGGER SIGNS AT APPROXIMATELY 3,500' INTERVALS IN THE MOVING WORK OPERATION OR AS APPROVED BY THE ENGINEER.

(2) SIGN NOT REQUIRED IF FLAGGING OPERATION OCCURS WITHIN A SIGNED ROAD WORK ZONE AREA.

WHEN THE DISTANCE BETWEEN FLAGGERS EXCEEDS 2 MILES, A PILOT CAR IS REQUIRED. WHEN CURVES REDUCE SIGHT DISTANCE BELOW 400', A PILOT CAR IS REQUIRED.

TEMPORARY PORTABLE RUMBLE STRIPS

UTILIZE TEMPORARY PORTABLE RUMBLE STRIPS ON ALL FLAGGING OPERATIONS.

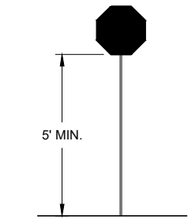
(3) EACH TEMPORARY PORTABLE RUMBLE STRIP ARRAY CONSISTS OF THREE RUMBLE STRIPS SPACED ACCORDING TO MANUFACTURER'S RECOMMENDATION, PLACED TRANSVERSE ACROSS THE LANE AT LOCATIONS SHOWN.

ONLY USE TEMPORARY PORTABLE RUMBLE STRIPS FOR THE APPROVED PRODUCTS LIST.

INSTALL TEMPORARY RUMBLE STRIPS PER MANUFACTURER'S RECOMMENDATIONS.

PLACE ADVANCE SIGNING PRIOR TO INSTALLING TEMPORARY RUMBLE STRIPS.

DO NOT INSTALL TEMPORARY PORTABLE RUMBLE STRIPS ON GRAVEL, MILLED SURFACES, OR ASPHALT THAT HAS BEEN PAVED LESS THAN 12 HOURS.



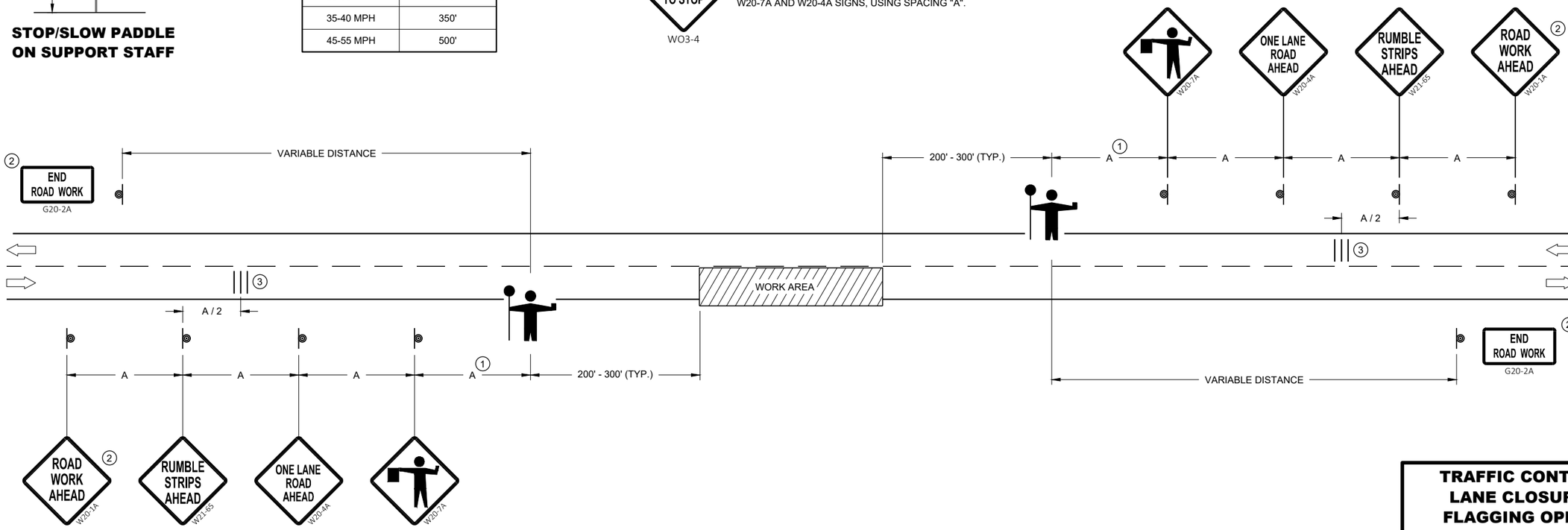
STOP/SLOW PADDLE ON SUPPORT STAFF

SIGN AND TEMPORARY RUMBLE STRIP ARRAY SPACING TABLE

SPEED LIMIT	SPACING "A"
25-30 MPH	200'
35-40 MPH	350'
45-55 MPH	500'

WO3-4

USE OF WO3-4 SIGN IS OPTIONAL. WHEN USED, THIS SIGN SHALL BE LOCATED BETWEEN THE W20-7A AND W20-4A SIGNS, USING SPACING "A".



TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

TRAFFIC CONTROL FOR LANE CLOSURE WITH FLAGGING OPERATION

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2019 — DATE
/S/ Andrew Heidtke — WORK ZONE ENGINEER

FHWA

6
SDD 15C12 - 07

SDD 15D28 Traffic Control, Work on Shoulder or Parking Lane, Undivided Roadway

LEGEND

- SIGN ON PERMANENT SUPPORT
- TRAFFIC CONTROL DRUM
- DIRECTION OF TRAFFIC
- WORK ZONE

GENERAL NOTES

ALL SIGNS ARE 48"X48" UNLESS OTHERWISE NOTED. IF NECESSARY DUE TO SPACE CONSTRAINTS IN URBAN AREAS, 36" X 36" SIGNS MAY BE USED IF APPROVED BY THE REGIONAL TRAFFIC UNIT.

"WO" SIGN IS THE SAME AS "W" SIGN EXCEPT THE BACKGROUND IS ORANGE.

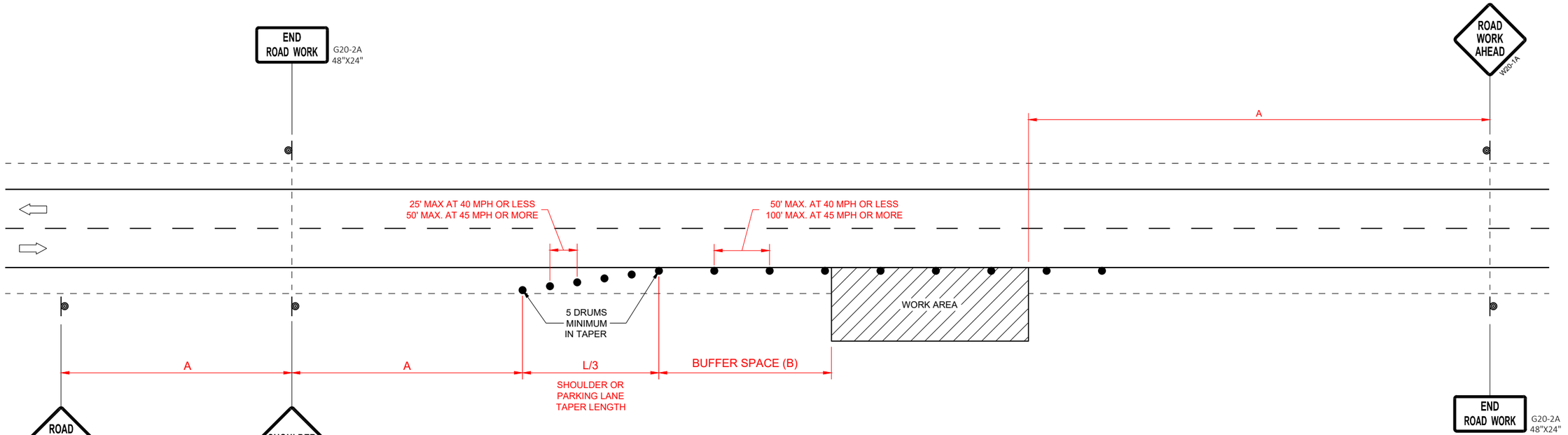
ANY SIGNS TEMPORARY OR EXISTING, WHICH CONFLICT WITH THE TRAFFIC CONTROL "IN USE" SHALL BE REMOVED OR COVERED AS NEEDED AND AS APPROVED BY THE ENGINEER.

THE EXACT NUMBER, LOCATION, AND SPACING OF ALL SIGNS AND DEVICES SHALL BE ADJUSTED TO FIT FIELD CONDITIONS AS APPROVED BY THE ENGINEER.

CHANNELIZING DEVICES PLACED ADJACENT TO WORK AREA SHALL BE PULLED BACK FROM THE TRAVEL LANE WHEN WORK IS NOT IN PROGRESS.

SIGNS THAT WILL BE IN PLACE LESS THAN 7 CONTINUOUS DAYS AND NIGHTS MAY BE MOUNTED ON PORTABLE SUPPORTS.

W20-1A AND G20-2A SIGNS ARE NOT REQUIRED IF THE WORK AREA IS WITHIN A LARGER WORK ZONE WHERE THESE SIGNS ARE ALREADY PRESENT. G20-2A SIGNS MAY ALSO BE OMITTED IF DURATION OF WORK IS LESS THAN 7 CONTINUOUS DAYS AND NIGHTS.



POSTED SPEED LIMIT PRIOR TO WORK STARTING (MPH)	ADVANCE WARNING SIGN SPACING (A) FEET	TAPER LENGTH (12 FT. LANE) (L) FEET	BUFFER SPACE (B) FEET
0-30	200'	200'	200'
35-40	350'	325'	305'
45	500'	600'	425'

TRAFFIC CONTROL, WORK ON SHOULDER OR PARKING LANE, UNDIVIDED ROADWAY

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED
May 2020
DATE

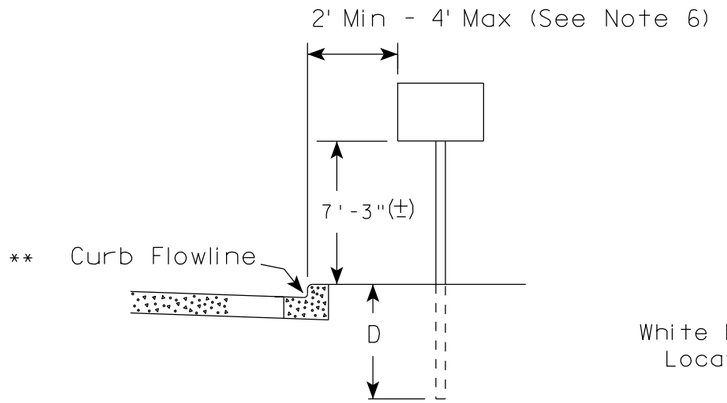
/S/ Andrew Heidtke
STATEWIDE WORK ZONE TRAFFIC SAFETY ENGINEER

FHWA

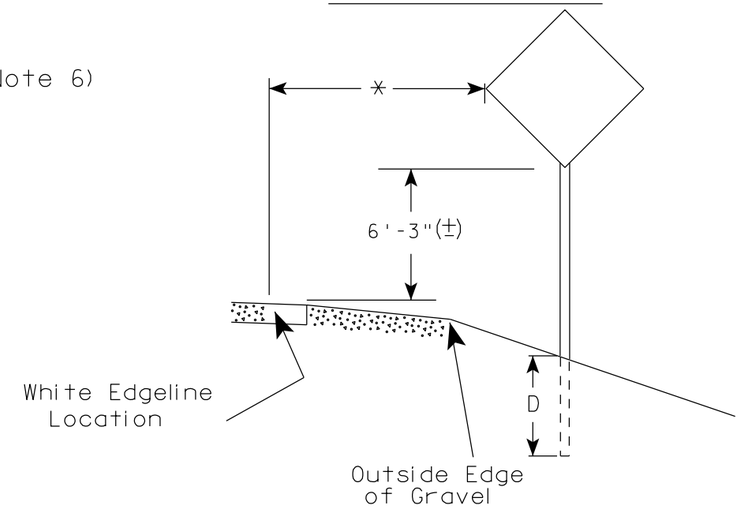
SDD 15D28 - 04

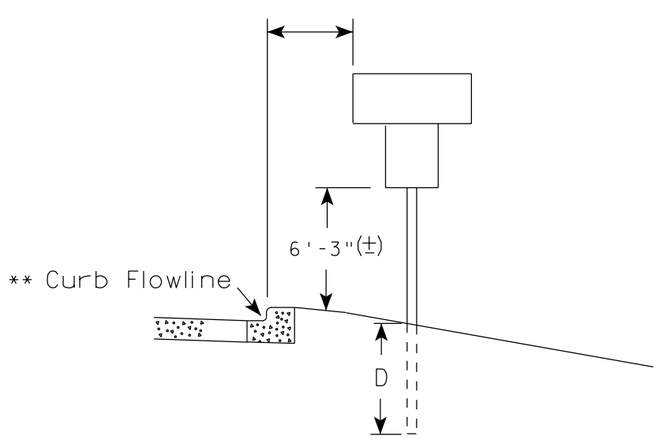
SDD 15D28 - 04

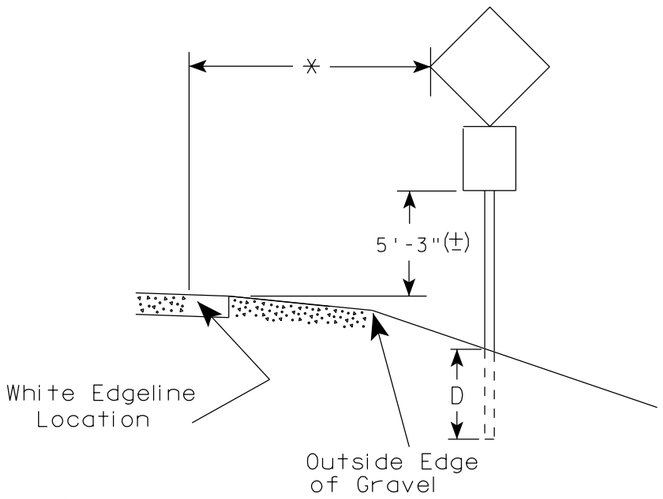
URBAN AREA



RURAL AREA (See Note 2)







** The existence of curb and gutter does not in itself mandate the vertical clearance illustrated. That height is typically measured where there is sidewalk adjacent to the roadway or parking is permitted. In the absence of sidewalk vertical clearance is measured from the top of the curb. Offset of signs is measured from the flow line.

* 6 feet from edge of a paved shoulder or 12 feet from the edge of pavement (edge line location) or 2 feet from outside edge of gravel, whichever is greater unless directed by project engineer.

POST EMBEDMENT DEPTH

Area of Sign Installation (Sq.Ft.)	D (Min)
20 or Less	4'
Greater than 20	5'

GENERAL NOTES

1. Signs wider than 4 feet or 20 sq.ft or larger, shall be mounted on multiple posts. Refer to plate A4-4.
2. If signs are mounted on barrier wall, see A4-10 sign plate.
3. For expressways and freeways, mounting height is 7'- 3" (±) or 6'-3" (±) depending upon existence of a sub-sign.
4. Minimum mounting height for J assemblies (A2-1S) is 7'-3" (±) or 6'-3" (±) per urban or rural detail respectively.
5. Minimum mounting height for signs mounted on traffic signal poles is 5'- 3" (±).
6. Offset distance shall be consistent with existing signs or consistent throughout length of project.
7. The (±) tolerance for mounting height is 3 inches.
8. Folding signs shall be mounted at a height of 5'-3" (±) or as directd by the Engineer.
9. The Double Arrow sign (W12-1) shall be mounted at a height of 2'-3" (±). The Chevron sign (W1-8), Roundabout Chevron panel (R6-4B), Enhanced Reference Markers, Clearance Markers (W5-52), Mile Markers (D10 series), In Road Object Markers (W5-54) & End of Road Markers (W5-56) shall be mounted at a height of 4'-3" (±).

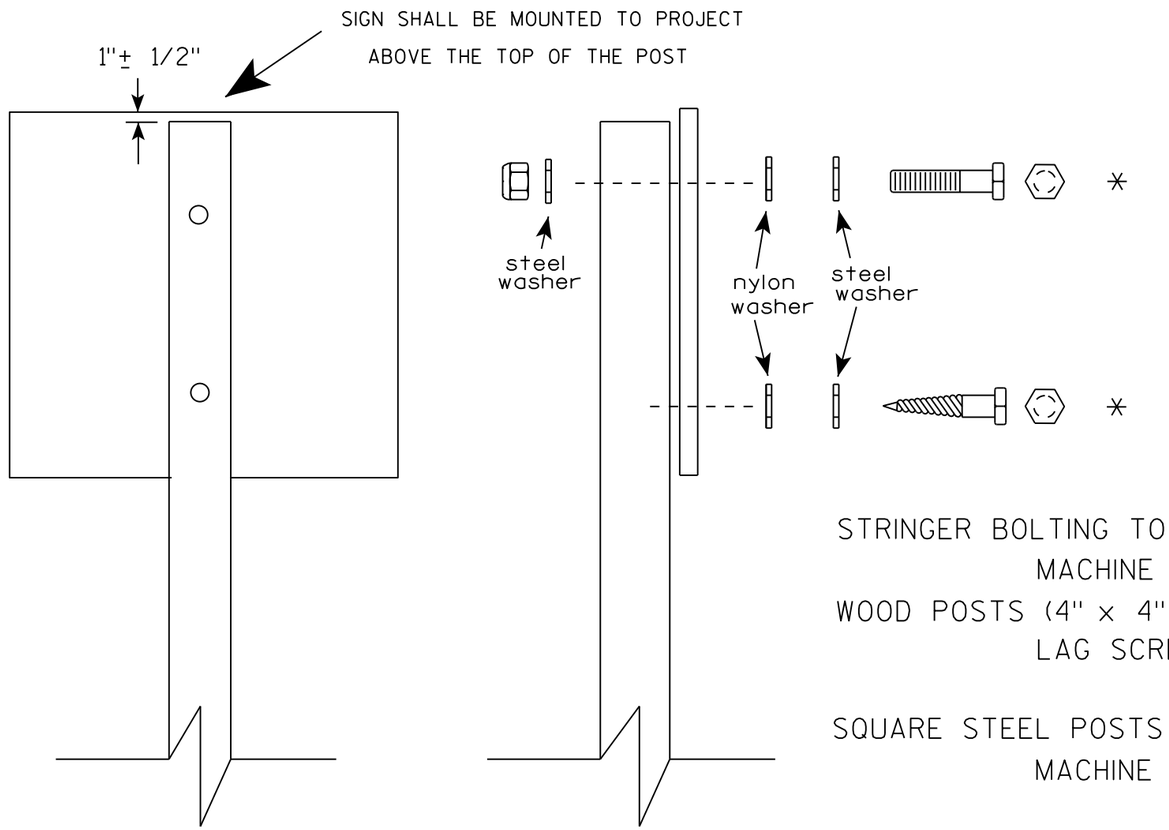
TYPICAL INSTALLATION OF PERMANENT TYPE II SIGNS ON SINGLE POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 7/23/15 PLATE NO. A4-3.20

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E



Nuts, bolts and lags used for mounting signs shall have hexagonal heads and shall be either :

a. Hot dip galvanized in accordance with ASTM Designation: A 153, Class D, or SC 3

b. Electro-galvanized in accordance with ASTM Designation : B 633, TYPE III, SC 3.

Threads on bolts and nuts shall be manufactured with sufficient allowance for the cadmium plate or galvanized coating to permit the nuts to run freely on the bolts.

STRINGER BOLTING TO ALUMINUM SIGNS (SEE SIGN PLATE A4-18)

MACHINE BOLTS - 5/16" X 1-3/4" Length w/ lock nuts

WOOD POSTS (4" x 4" or 4" x 6")

LAG SCREWS - 3/8" X 3" (NO STRINGERS ON BACK OF SIGN)

3/8" X 4" (STRINGERS ON BACK OF SIGN)

SQUARE STEEL POSTS (2" x 2")

MACHINE BOLTS - 3/8" X 3-1/4" Length w/ nuts (NO STRINGER ON BACK OF SIGN)

3/8" X 5" Length w/ nuts (STRINGERS ON BACK OF SIGN)

RIVETS - 9/32 " (6605-9-6) BULB-TITE, TRI-FOLD, ALUMINUM BODY/MANDREL O.D. FLANGE .720-.765 INCH, GRIP RANGE .042-.375 INCH

WASHERS (ALL POSTS) -

1-1/4" O.D. X 3/8" I.D. X 1/16" STEEL

1-1/4" O.D. X 3/8" I.D. X .080 NYLON

* Two different fastening systems are shown for illustration purposes. On any individual sign, either one or the other system shall be used. Actual number of fasteners per sign varies with the sign area, but normally there are two. For a single post installation, all signs greater than 9 sq. ft. require the use of 3 fasteners.

ATTACHMENT OF SIGNS TO POSTS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
For State Traffic Engineer

DATE 8/11/16 PLATE NO. A4-8.8

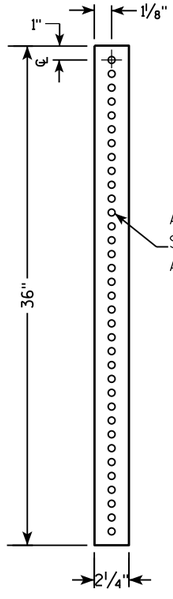
PROJECT NO:

SHEET NO: E

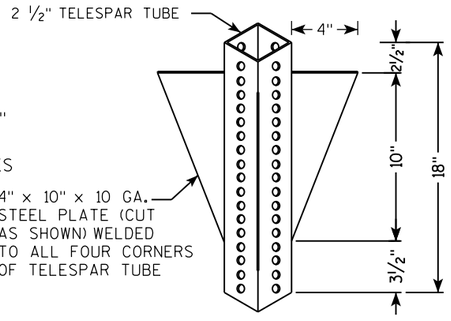
7

TELESCOPIC TUBING ANCHORS
TWO PIECE SYSTEM

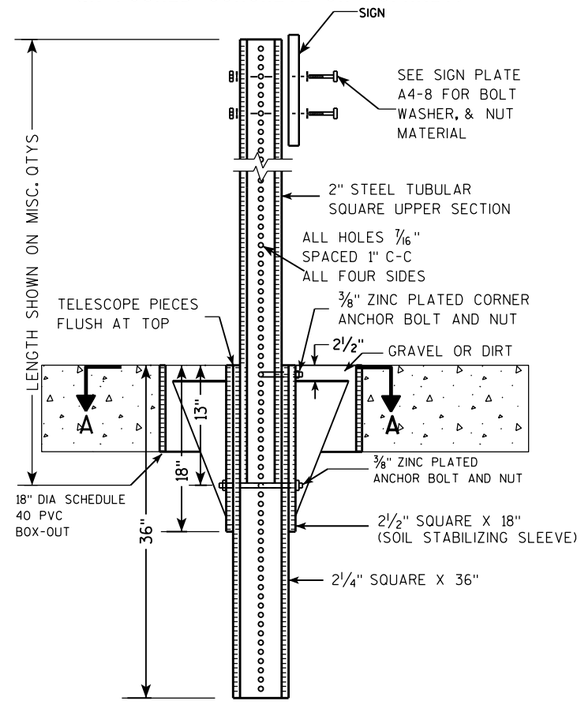
2 1/4 " SQUARE
12 GAUGE
PERFORATED
GALVANIZED FINISH



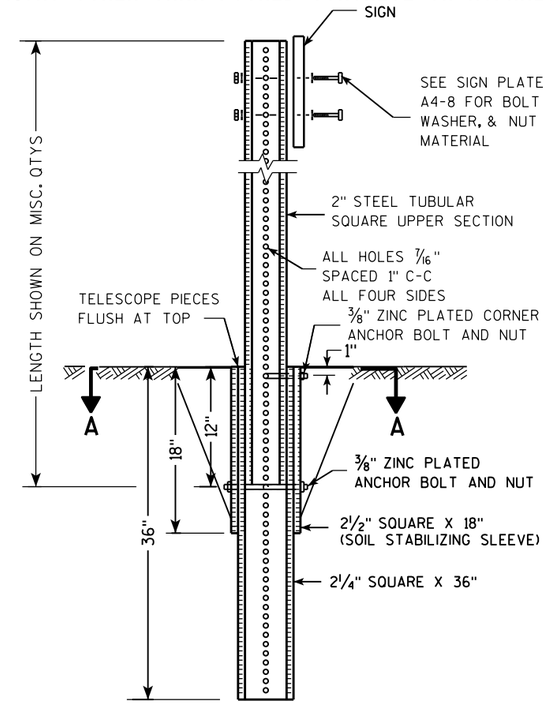
2 1/2 " SQUARE
12 GAUGE
OMNI-DIRECTIONAL
PERFORATED
SOIL STABILIZING SLEEVE
GALVANIZED FINISH

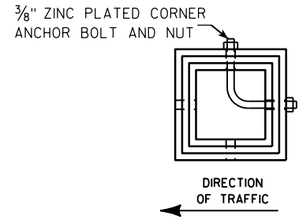


DETAIL OF TUBULAR STEEL SIGN POST
(IN POURED CONCRETE OR ASPHALT)



DETAIL OF TUBULAR STEEL SIGN POST
(IN LOCATIONS OTHER THAN POURED CONCRETE OR ASPHALT)





SECTION A-A

Area of Sign Installation (Sq. Ft.)	Number of Required Posts
9 or less	1
Greater than 9 less than or equal to 18	2
Greater than 18 less than or equal to 27	3

Signs wider than 3 feet or larger than 9 sq. ft shall be mounted on multiple posts (see above table).

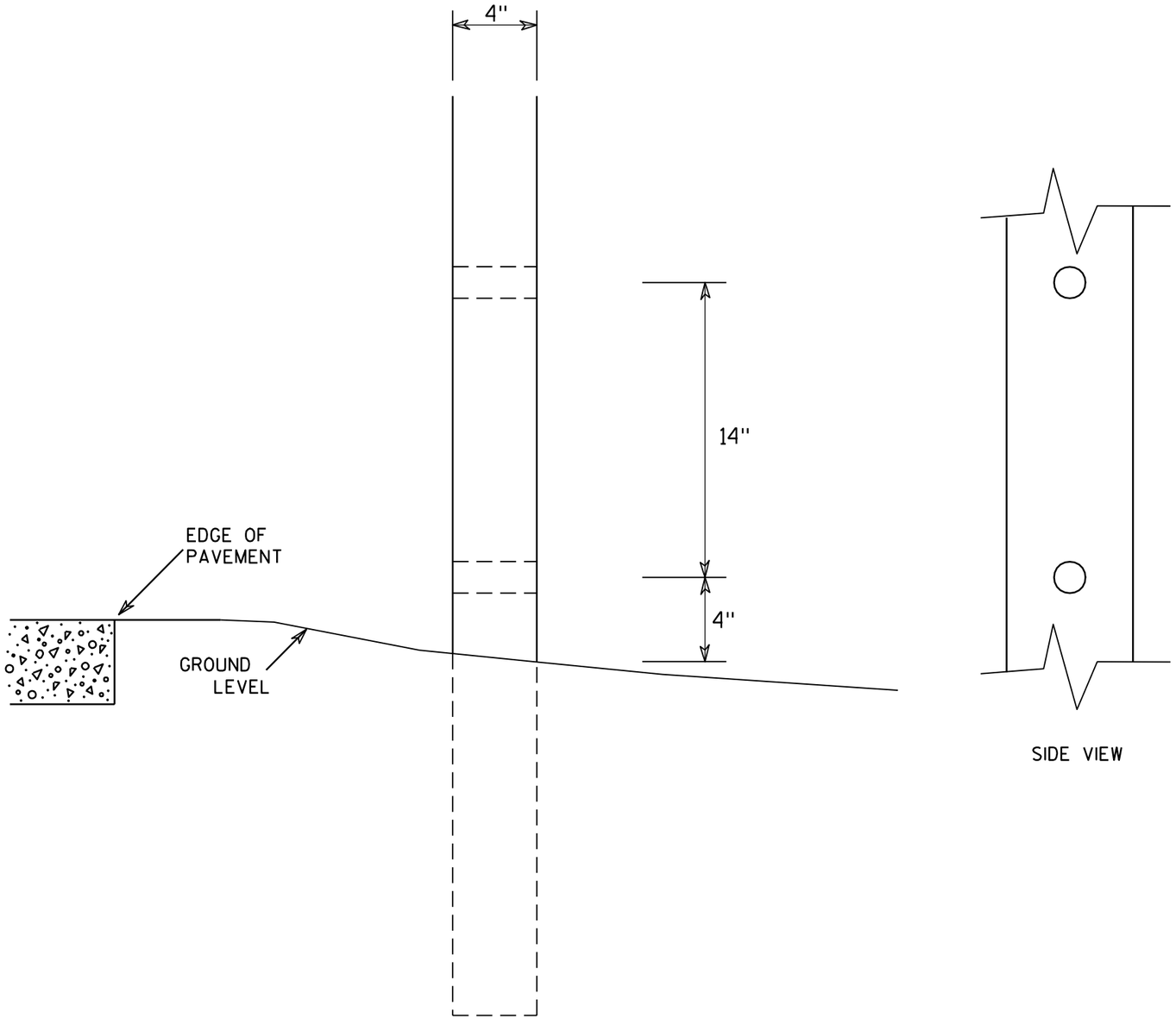
TUBULAR STEEL
SIGN POST
A4-9

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Matthew R Rauch
for State Traffic Engineer

DATE 2/05/15 PLATE NO. A4-9.9

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E



SIDE VIEW

GENERAL NOTES

1. All 4 x 6 Wood Posts shall be modified by having two 1½" diameter holes drilled perpendicular to the roadway centerline.

4 X 6 WOOD POST MODIFICATIONS

WISCONSIN DEPT OF TRANSPORTATION

APPROVED Chester J Spang for State Traffic Engineer

DATE 3/27/97 PLATE NO. A4-11.2

PROJECT NO:	HWY:	COUNTY:		SHEET NO:	E

Energy Balance Report

RECOMMENDED SYSTEM:

To meet the performance requirements at STH 131 and Misty Valley Road, Gays Mills, WI Carmanah recommends the R920-E system.

Key Parameters Considered:

- Maximum number of expected pedestrian activations (day and night, constant across months)
- The duration of the flashing signals following an activation
- Worst month** (month with least sunlight, coldest temp, and highest RRFB load over 24 hours)

***See glossary of terms on page 4 for clarification*

Recommended System:	**R920-E**
Location: STH 131 and Misty Valley Road, Gays Mills, WI	

System Configuration:	
Solar Panel (Watts)	12.8
Solar Panel Orientation	South
Battery Capacity (Amp-Hours)	14
Fixture Color and Type	Yellow Lightbar
Number of Fixtures	2
Per-Fixture Current	130mA
Number of Push Buttons	1
Flash Duration Setting (s)	7
Flash Pattern	RRFB WW+S
Push Button Model	Polara Bulldog
Passive Detection	No

Weather Data:	
Worst Month	December
Peak Sun Hours (during month)	2.90
Minimum Temperature	21.72°F / -5.71°C

Additional Notes:	
Adjusted Battery Capacity due to Cold Temperature	76%
Sunlight Available after Shading is Applied	70%

Performance Summary for Worst Month

Energy In (Watt-Hours)	**17.2**
Activations Per Day	**50.0**
Energy Out (Watt-Hours)	**2.72**
Autonomy (Days)	**42.5**
Array-to-load Ratio (ALR)	**6.3**
24-Hour Battery Usage - Depth of Cycle (%)	**0.9%**

See page 3 for in-depth system details

Minimum Recommended ALR	**1.2**
Maximum Daily Activations in Worst Month	**1779**

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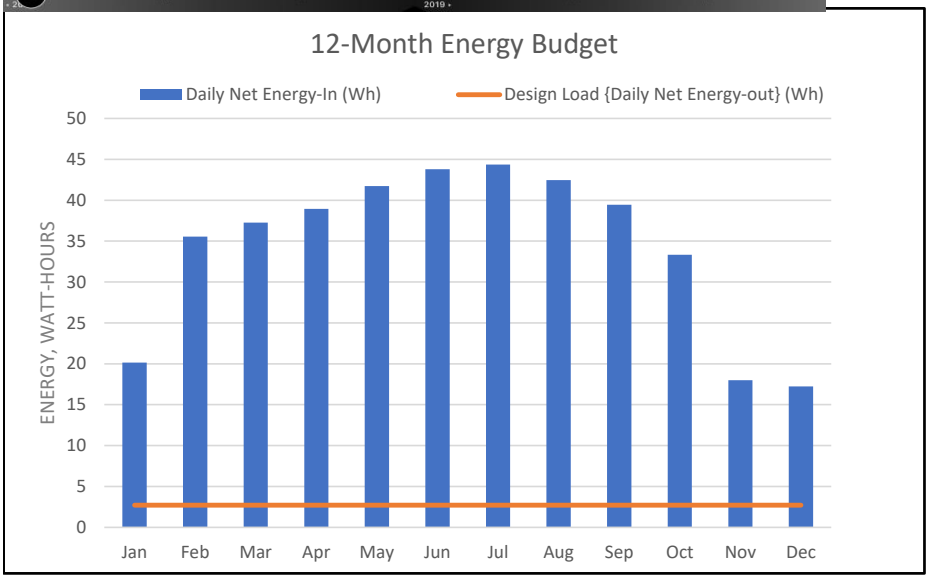
Energy Balance Report

Sun Path and Shading

The image on the left depicts the sun's path during the worst month*. Both the sun's path and shading affect the amount of available energy and determines the size and performance of the system.

Solid objects such as buildings block most light, while the effect of other objects – like trees, depending on their type and time of year– varies.

Location Shade De-rating: 30%

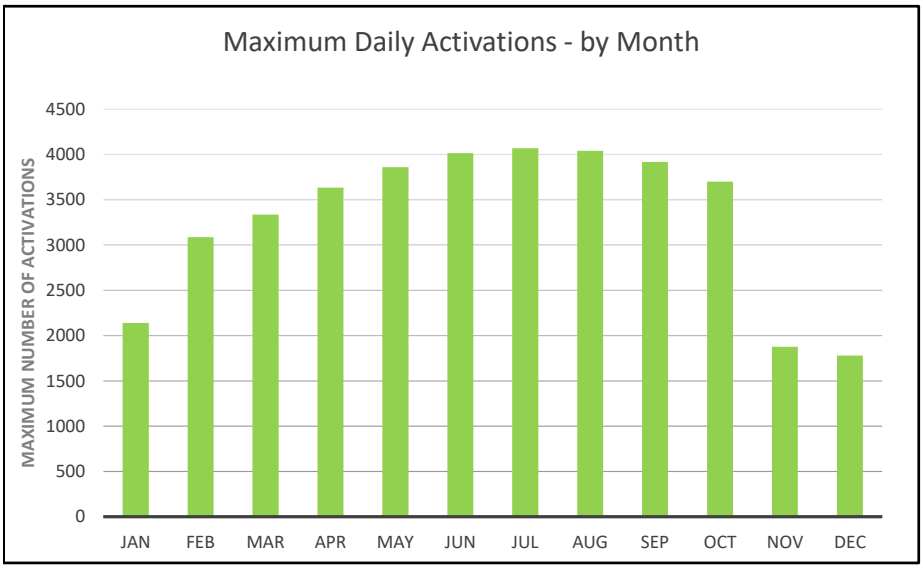


12-Month Energy Budget

Blue bars: Energy available to run the system and charge the batteries (energy-in*).

Red line: system load (energy-out*) due to pedestrian activations.

Minimum Array-to-Load Ratio:	6.3
System:	R920-E
Activations Per Day	50
Flash Duration Setting (s)	7



Maximum Daily System Activations

Green bars: Maximum number of daily activations the system can support per month.

The red line on the chart above shows the simulation "design load"

The maximum number activations will be capped when either the mininimum array-to-load ratio (ALR) or, the minimum allowable autonomy value has been reached. See Glossary Page 4.

carmanah®

Energy Balance Report

ENERGY-IN CALCULATION:

Rated Panel Wattage (W)	12.80	
Worst Month Peak Sun Hours (h)	2.90	Sun Hours at 45° tilt angle worst month = December
Effective Shading (%)	70%	100% is full sun. Based on worst month = December
Peak Sun Hours Adjusted for Shading (h)	2.03	
Solar Panel Energy Pre-Battery Charger (Wh)	26.01	
Solar Panel Charge Efficiency (%)	92%	Operating specification
Battery Charge Acceptance	72%	Value based on battery manufacturer's specifications
Energy Into the Battery (Watt-Hours)	**17.23**	

ENERGY-OUT CALCULATION:

Average Lightbar Power Day Operation (W)	1.58	Operating specification
Ambient Auto-Adjust Maximum (%)	100%	Operating specification
Night Dimming (%)	30%	User-adjustable setting
Percentage of Activations During Day (%)	100%	Input variable
Average Lightbar Power w/ Night Dim (W)	0.47	Calculated operating specification
Number of Lightbars	2	Input variable
LED Driver Efficiency (%)	95%	Lab-measured driver efficiency
Activations Every 24 Hours	**50.0**	Input variable per specification
Activation Time (Seconds)	7	Input variable per specification
Total Fixture Consumption (Wh)	0.323	Calculated operating specification
EMS Quiescent Current (Amps)	0.00796	Operating specification
24-hour Quiescent Energy Consumption (Wh)	2.29	24 hours x 12V battery voltage x sum of quiescent currents
Polara Bulldog Consumption (Wh)	0.10	
Passive Detection Consumption (Wh)	0.00	Includes Quiescent and Active Output with Button Press
Total 24-hour Energy Consumption (Wh)	**2.72**	Quiescent, Fixture(s) and Other loads

SYSTEM AUTONOMY:

Battery Capacity (Ah)	14	Operating specification - room temperature
Battery Low Voltage Disconnect (%)	10%	Operating specification
Battery Capacity (Wh)	151.2	Battery capacity (Ah) X 12 Volts X (1 - Battery LVD %)
Battery Capacity Temperature De-rate Amount	76%	Reduced capacity due to temperature effects
Temperature-Adjusted Battery Capacity (Wh)	115.5	Battery capacity X temperature de-rating factor
Total Daily Energy Consumption (Wh)	2.72	Restated from above
Autonomy (Days)	**42.5**	Adjusted battery capacity / daily energy consumption

ARRAY TO LOAD RATIO:

Energy Into the Battery (Wh)	17.23	Energy-in through the solar panel and EMS
Total Daily Energy Consumption (Wh)	2.72	Energy-out through the system
ALR (Energy In / Energy Out)	**6.3**	Recommended minimum = 1.2

DAILY DEPTH OF DISCHARGE:

Nominal Battery Capacity (Wh)	168	Battery capacity (Ah) x battery voltage (12V)
Daytime Energy drawn from Battery (Wh)	0.03	Energy-out through the system - daytime activations
Nighttime Energy drawn from Battery (Wh)	1.49	Energy-out through the system - nighttime activations
Total Energy Provided by Battery Only (Wh)	1.52	Total energy battery supplies system during a 24-hr cycle
24-Hour Battery Usage - Depth of Cycle %	**0.9%**	Daily Cyclical Battery Capacity Used

Glossary

12-Month Energy Budget: The amount of daily energy available during any month to run the system and charge the batteries plotted against the amount of daily energy used for a specified usage model - the "design load".

Hours per Day: The number of hours during the day that the beacons are flashing in response to a control signal from a time switch or other device.

Array-to-Load Ratio (ALR): Defined as the total system energy consumption (Energy-Out) divided into the net energy available to the system (Energy In) on a day during the worst month. It is an accepted industry practice to specify a minimum ALR of 1.2:1 in order to account for variability of sunlight energy over time. Providing a sufficient ALR will help ensure that the batteries will return to a full-state of charge at the end of each charging day.

Autonomy: The length of time (in days) that a system can function without sunlight (insolation). For autonomy calculations, net battery capacity is adjusted for the effect of temperature (during the worst month of sunlight) and low-voltage-disconnect (LVD) (see LVD definition below).

Battery Depth of Cycle/Depth of Discharge: The percentage of battery capacity used on a daily basis. This value considers times when sunlight can power LED fixtures directly, eliminating the need to draw from the battery. For lead-acid batteries, reducing the depth of discharge dramatically improves battery life. **Note:** For a system activated during the daytime only, the battery will power the system during dawn and dusk when insolation levels are lowest.

Daily Quiescent Energy: The passive energy drawn (measured in watt-hours) by a system when it is idle. This includes the power draw of the main circuit board (EMS), LED beacon loads, and a time switch (if present).

Energy-In: The total amount of useable energy collected by the solar panel during a 24-hour period. This value accounts for efficiencies between the solar panel and the battery, as well as shade de-rating. Efficiencies related to the charge controller and battery-charge acceptance are also factors.

Energy-Out: The total energy used by a system in a 24-hour period based on the stated number of activations per day. It includes Daily Quiescent Energy (see definition above)

Low-Voltage-Disconnect (LVD): The voltage at which the system will not flash when activated. LVD is a temporary state and is the result of too little sunlight or too many activations. LVD ensures that a minimal charge is retained in the battery to enable system recovery and to protect against permanent battery damage.

Location Shade De-Rating: Percentage of available sunlight blocked by buildings, trees and other objects. This factor is specific to the end user's site, which is why a system is always optimally sized when its exact final installation location is known or can be simulated.

Worst Month: The month with the least sunlight, coldest temperatures, and highest system load over 24 hours.

Energy Management System (EMS): The control module inside the Carmanah Solar Traffic Product responsible for all aspects of energy management and system control.

Maximum Power Point Tracking (MPPT): MPPT dynamically maximizes the amount of power the solar panel can produce by allowing the solar panel voltage to operate at its optimal point independentlof the battery voltage.

R920-E
RECTANGULAR RAPID FLASHING BEACON

carmanah® Traffic

MUTCD-compliant, pedestrian-activated warning beacon for uncontrolled marked crosswalks

- The R920-E is the benchmark for Rectangular Rapid Flashing Beacons (RRFBs)
- Ultra-efficient optics and Energy Management System (EMS)
- Compact design to simplify installation
- Proven technology platform
- Meets and exceeds MUTCD requirements, including IA-21

RRFBs have been found to provide vehicle yielding rates between 72 and 96 percent for crosswalk applications, including 4 lane roadways with average daily traffic (ADT) exceeding 12,000*.

Superior Design and Technology
The R920-E utilizes a self-contained solar engine integrating the Energy Management System (EMS) with an on-board user interface, housed in a compact enclosure together with the batteries and solar panel. MUTCD interim approval IA-21 flash pattern and multiple configurations enable the R920-E to handle all crosswalk applications.

Easy Installation
With its highly efficient and compact design, installation is quick and uncomplicated, dramatically reducing installation costs. Retrofitting can be done where existing sign bases are used to enhance existing marked crosswalks in minutes, and new installations can be completed without the cost of larger poles, new bases, and trenching.

Advanced User-Interface
The R920-E comes with an on-board user interface for quick configuration and status monitoring. It allows for simple in-the-field adjustment of flash pattern, duration, intensity, ambient auto adjust, night dimming, and many more. Settings are automatically sent wirelessly to all units in the system.

Reliable
Designed with Carmanah's industry-leading solar modeling tools to provide dependable year-after-year operation.

Trusted
With thousands of installations, Carmanah's beacons are the benchmark in traffic applications and other transportation applications worldwide.

WE SIMPLIFY PLANNING.
Contact us to get your Energy Balance Report and purchase specifications.

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REPRESENTED IN YOUR REGION BY:

* U.S. Department of Transportation Federal Highways Administration, Publication No. FHWA-HRT-10-043 - "Effects of Yellow Rectangular Rapid-Flashing Beacons on Yielding at Multilane Uncontrolled Crosswalks"

R920-E
RECTANGULAR RAPID FLASHING BEACON

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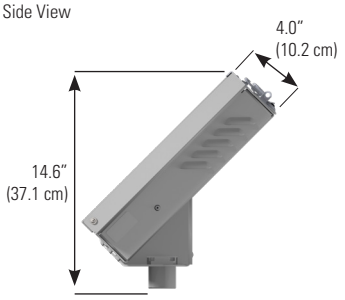
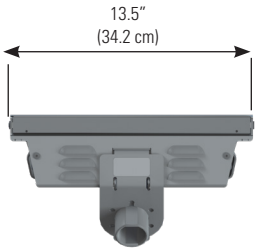
DIMENSIONS

Side View



Bottom View

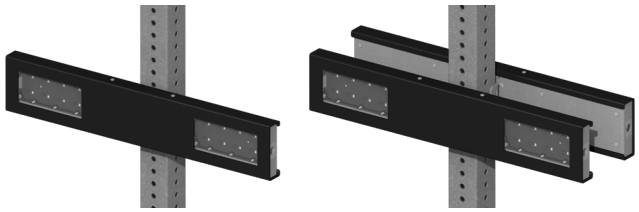


SOLAR ENGINE MOUNTING

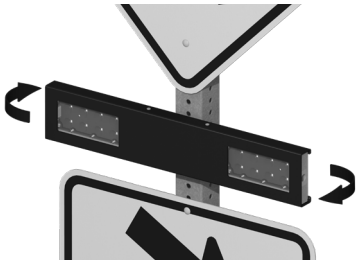
2.0"- 2.5" Perforated Square Pole Mount | 2.38" - 2.88" Diameter Round Pole Mount | 4.0" - 4.5" Diameter Round Pole Mount | Side Pole Mount

LIGHT BAR CONFIGURATION

Uni-directional Configuration | Bi-directional Configuration



IN-THE-FIELD AIMING



Rotate the light bar towards the incoming vehicle lane, independent of the wire hole location.

On-Board User Interface (OBUI)	Adjustable system settings with auto-scrolling LED display on our latest EMS
	System test, status, and fault detection: battery, solar, button, beacon, radio, day/night
	Flash patterns: RFB1 (WW+S), RFB2 (WSDOT), 0.5 sec. alternating (MUTCD), 0.5 sec. unison (MUTCD), 0.1 sec. unison, 0.25 sec. unison, 0.1 sec. x3 quick flashes unison, 0.1 sec. x3 quick flashes alternating
	Input: momentary for push button activation, normally open switch, normally closed switch
	Flash duration: 5 sec. to 1 hr.
	Intensity setting: 20 to 1400 mA for multiple RRFBs, circular beacons, or LED enhanced signs
	Nighttime dimming: 10 to 100% of daytime intensity
	Ambient Auto Adjust: increases intensity during bright daytime
	Automatic Light Control: reduces intensity if the battery is extremely low
	Temperature correction: yellow or red beacons
	Calendar: internal time clock function
	Radio settings: enable/disable, selectable channel from 1 to 14
	Output: enabled when beacons flashing daytime and nighttime, or nighttime only
	Activation counts and data reporting via OBUI or optional USB connection
Optical	MUTCD interim approval IA-21 and MUTCDC compliant
	Purpose-built light bar optics = maximum efficiency and no stray light Exceeds SAE J595 class 1 intensity by 2.5 to 3x when used as recommended Meets SAE J578 chromaticity
	3 in (76 mm) x 7 in (178 mm) clear, UV-rated polycarbonate lens with yellow LEDs
	High-power LEDs: +90% lumen maintenance (L90) based on IES LM-80
	Side-emitting pedestrian confirmation LEDs
	Independent, stainless steel mounting brackets make back-to-back installation simple and enable in-field aiming for maximum effectiveness
	Yellow, black, or green powder coated light bar covers
Connectivity	Encrypted, wireless radio with 2.4 GHz mesh technology
	Wireless update of settings from any unit to all systems on the same radio channel
	User-selectable multiple channels to group different beacons and ensure a robust wireless signal
	Communicates with all other Gen III radio-enabled systems including our R820-E, -F, and -G circular beacons
	Instantaneous wireless activation: <150 ms
	Wireless range: 1000 ft (305 m)
	Integrated, vandal-proof antenna
Energy Collection	13 W high-efficiency photovoltaic solar panel
	45 deg tilt for optimal energy collection
	Maximum Power Point Tracking with Temperature Compensation (MPPT-TC) battery charger for optimal energy collection in all solar and battery conditions
Energy Storage	12 V 14 Ahr. battery system
	Replaceable, recyclable, sealed, maintenance-free, best-in-class AGM batteries offer the widest temperature range and longest life
	Battery design life: +5 yrs.
	Tool-less battery change with quick connect terminals and strapping for easy installation
Solar Engine Construction	Weatherproof, gasketed enclosure with vents for ambient air transfer (NEMA 3R)
	Lockable, hinged lid for access to on-board user interface and batteries
	Corrosion-resistant aluminum with stainless steel hardware
	Raw aluminum finish or yellow, black, or green powder coated
	Prewired to minimize installation time
	High-efficiency optics and EMS = the most compact, lightweight system
	19 lb (8.6 kg) including batteries, excluding beacons and push button
Environmental	-40 to 165° F (-40 to 74° C) system operating temperature
	-40 to 140° F (-40 to 60° C) battery operating temperature
	150 mph (241 kph) wind speed as per AASHTO LTS-6
Activation	**Push button:** ADA-compliant, piezo-driven with visual LED and two-tone audible confirmation
Warranty	**5-year limited warranty**

Specifications subject to local environmental conditions, and may be subject to change.

All Carmanah products are manufactured in facilities that are certified to ISO quality standards.

US Patent No 6,573,659, Other patents pending.

Document: SPEC_TRA_R920-E_RevS