

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
HAM-75-3.84
LIGHTING, S&PM, ITS
(BU-19)

HAMILTON COUNTY
CITY OF CINCINNATI

PROJECT DESCRIPTION

THIS IS PHASE 5A OF THE HAMILTON 75 CORRIDOR PROJECTS (MCE). THE PROJECT ADDS A LANE TO IR 75 SB, PROVIDES 4-LANE CONTINUITY NB, AND RECONFIGURES IR 74 EB RAMP TO IR 75. THE PROJECT ALSO INCLUDES SURFACE COURSE AND ADDITIONAL PAVEMENT WORK TO THE SOUTH AND IMPROVEMENTS TO RAMP A AT THE HOPPLE ST INTERCHANGE.

BUILDABLE UNIT 19 DESCRIPTION

THIS BU INCLUDES ALL OF THE PROPOSED PAVEMENT MARKINGS AND SIGNAGE, LIGHTING & ITS PLANS.

LIMITED ACCESS

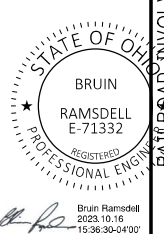
THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE OHIO REVISED CODE.

2016 SPECIFICATIONS

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO, DEPARTMENT OF TRANSPORTATION, INCLUDING SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PLANS AND CHANGES LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING TO TRAFFIC OF THE HIGHWAY AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THE PLANS AND ESTIMATES.

The DBT confirms that the record drawings have been updated to incorporate all red-lined changes and have been approved by the appropriate parties. These updated drawings represent the final and accurate record of the buildable unit's design and construction.

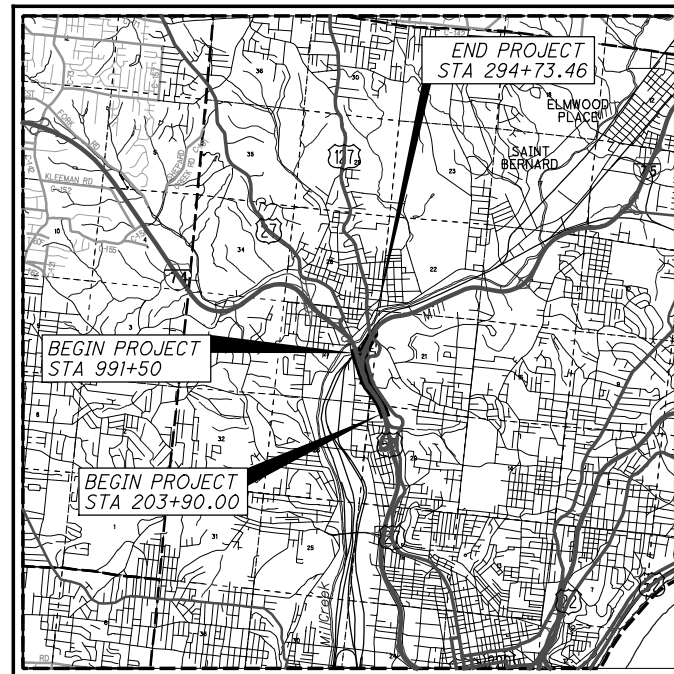


The following sheets have been updated:
5-18, 22, 25-27, 43, 46-47, 49-50, 53-54, 57-58, 73, 84-87, 90, 93, 102-103.

UNDERGROUND UTILITIES
CONTACT BOTH SERVICES TWO WORKING DAYS BEFORE YOU DIG.

OHIO Utilities Protection SERVICE
Call Before You Dig
1-800-362-2764
(Non-members must be called directly)

OIL & GAS PRODUCERS UNDERGROUND PROTECTION SERVICE
1-800-925-0988



LOCATION MAP

LATITUDE: 39° 09' 03" LONGITUDE: -84° 32' 24"



PORTION TO BE IMPROVED	-----
INTERSTATE HIGHWAY	=====
FEDERAL ROUTES	===== =====
STATE ROUTES	=====
COUNTY & TOWNSHIP ROADS	-----
OTHER ROADS	-----

DESIGN DESIGNATION

CURRENT ADT (2010)	149,400	152,100	75,000	88,300	25,300	25,300
DESIGN YEAR ADT (2030)	174,300	179,200	89,300	102,000	29,800	29,800
DESIGN HOURLY VOLUME (2030)	14,640	15,050	8,040	9,180	4,100	4,380
DIRECTIONAL DISTRIBUTION	0.54	0.70	0.72	0.73	1.00	1.00
TRUCKS (24 HOUR B&C)	0.16	0.13	0.15	0.13	0.03	0.08
DESIGN SPEED	60 MPH	60 MPH	60 MPH	60 MPH	50 MPH	50 MPH
LEGAL SPEED	55 MPH	55 MPH	55 MPH	55 MPH	50 MPH	50 MPH
DESIGN FUNCTIONAL CLASSIFICATION:	03 URBAN INTERSTATE	03 URBAN INTERSTATE	03 URBAN INTERSTATE	03 URBAN INTERSTATE	03 URBAN INTERSTATE	03 URBAN INTERSTATE

NHS PROJECT ----- YES

DESIGN EXCEPTIONS

DESIGN FEATURE	APPROVAL DATES	SHEET NUMBERS
STOP. SIGHT DIST. - SB IR 75 (CURVE 6)	4/6/18	SEE BU-14
SHOULDER WIDTH - IR 74-1892R BRIDGE	4/10/18	SEE BU-14
SHOULDER WIDTH - RAMP P 1908S BRIDGE	12/12/18	SEE BU-14
CURVE RADIUS - RAMP P 1908S BRIDGE	12/12/18	SEE BU-14
STOP. SIGHT DIST. - RAMP P 1908S BRIDGE	12/12/18	SEE BU-14
S.E. RATE - IR 74 EB CURVE 13, 1908R BRIDGE	4/26/18	SEE BU-14

SHOP DRAWING INDEX OF SHEETS:

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IP CCTV CAMERAS	274-301

PLAN PREPARED BY:
AMERICAN STRUCTUREPOINT INC.
2550 CORPORATE EXCHANGE DR. STE 300
COLUMBUS, OH 43231
TEL 614.901.2235 FAX 614.901.2236
www.structurepoint.com

ENGINEERS SEAL:

SIGNED: *Bruce Fraser*
DATE: 05/21/2019

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SUPPLEMENTAL SPECIFICATIONS

800-2016	1/19/18	814	7/15/16	866	4/21/17	914	7/15/16
804	1/15/16	821	4/20/12	867	4/15/16	921	4/20/12
806	3/2/15	832	1/17/14	902	12/31/12	939	7/17/15
808	10/16/15	839	7/17/15	904	7/15/16		
809	1/19/18	840	4/15/16	908	10/20/17		

STANDARD CONSTRUCTION DRAWINGS

BP-1.1	7/28/00	MH-1.1	1/15/16	RM-1.1	7/18/14	HL-10.11	1/19/18	MT-95.30	7/21/17	TC-7.65	1/15/16	ITS-10.10	7/17/15
BP-2.1	7/17/15	MH-1.2	1/15/16	RM-4.1	7/21/17	HL-10.12	1/20/17	MT-95.31	7/21/17	TC-9.10	1/19/18	ITS-10.11	1/19/18
BP-2.2	7/18/08			RM-4.3	7/18/14	HL-10.13	1/20/17	MT-95.32	7/21/17	TC-9.30	1/19/18	ITS-13.10	7/17/15
BP-2.3	7/18/14	DM-1.1	7/21/17	RM-4.4	7/21/17	HL-10.15	7/17/15	MT-95.40	1/20/17	TC-12.30	1/19/18	ITS-14.10	7/17/15
BP-2.4	7/19/13	DM-1.2	1/18/13	RM-4.5	7/21/17	HL-10.31	1/19/18	MT-95.45	7/21/17	TC-15.115	10/18/13	ITS-14.11	7/17/15
BP-3.1	7/18/14	DM-1.3	7/18/14	RM-4.6	7/19/13	HL-20.11	4/21/17	MT-95.50	7/21/17	TC-16.21	1/19/18	ITS-15.10	7/17/15
BP-6.1	7/19/13	DM-2.1	1/18/13			HL-20.13	1/19/18	MT-95.73	1/19/18	TC-21.10	7/21/17	ITS-15.11	7/17/15
BP-8.1	7/18/08	DM-4.1	1/15/16	A-1-69	7/19/02	HL-20.21	1/19/18	MT-98.10	1/20/17	TC-21.20	1/19/18	ITS-50.10	1/19/18
		DM-4.2	7/20/12	AS-1-15	7/17/15	HL-20.24	1/19/18	MT-98.11	1/20/17	TC-21.50	7/15/16	ITS-50.11	1/15/16
CB-1.1	1/15/16	DM-4.3	1/15/16	AS-2-15	1/19/18	HL-30.11	1/19/18	MT-98.20	7/18/14	TC-22.10	10/18/13	ITS-50.12	1/19/18
CB-1.2	1/15/16	DM-4.4	1/15/16	EXJ-4-87	1/19/18	HL-30.21	1/17/14	MT-98.21	7/18/14	TC-22.20	1/17/14	ITS-60.10	7/15/16
CB-1.3	1/15/16			GSD-1-96	7/19/02	HL-30.22	1/17/14	MT-98.29	1/20/17	TC-41.30	10/18/13		
CB-2.1	1/15/16	MGS-1.1	1/19/18	PCB-91	1/18/13	HL-30.31	1/17/14	MT-98.30	7/21/17	TC-42.10	10/18/13		
CB-2.2	1/15/16	MGS-2.1	1/19/18	PSID-1-13	7/15/16	HL-30.32	1/17/14	MT-99.30	1/19/18	TC-42.20	10/18/13		
CB-2.3	1/15/16	MGS-3.1	1/19/18	RB-1-55	7/19/13	HL-30.33	1/17/14	MT-99.60	7/15/16	TC-52.10	10/18/13		
CB-3.1	1/15/16	MGS-3.2	1/18/13	SBR-1-13	1/14/14	HL-30.41	1/19/18	MT-101.70	1/17/14	TC-52.20	1/19/18		
CB-3.3	1/15/16	MGS-4.2	7/19/13	SBR-2-13	1/14/14	HL-40.10	1/20/17	MT-101.75	7/15/16	TC-61.30	1/20/17		
		MGS-4.3	1/18/13	SICD-1-96	7/18/14	HL-40.20	1/20/17	MT-101.80	1/16/18	TC-65.10	1/17/14		
I-2.1	1/15/16	MGS-5.2	7/15/16	SICD-2-14	7/18/14	HL-50.11	1/16/15	MT-101.90	7/21/17	TC-65.11	7/21/17		
I-2.2	1/15/16	MGS-5.3	7/15/16	VPF-1-90	1/19/18	HL-50.21	1/19/18	MT-102.10	1/20/17	TC-71.10	1/19/18		
I-2.3	1/15/16	MGS-6.1	1/19/18			HL-60.12	7/15/16	MT-102.20	7/18/14	TC-72.20	7/15/16		
I-2.4	1/15/16					HL-60.21	1/16/15	MT-103.10	1/19/18	TC-73.20	7/21/17		
						HL-60.31	7/21/17	MT-104.10	10/16/15				
								MT-105.10	7/19/13				

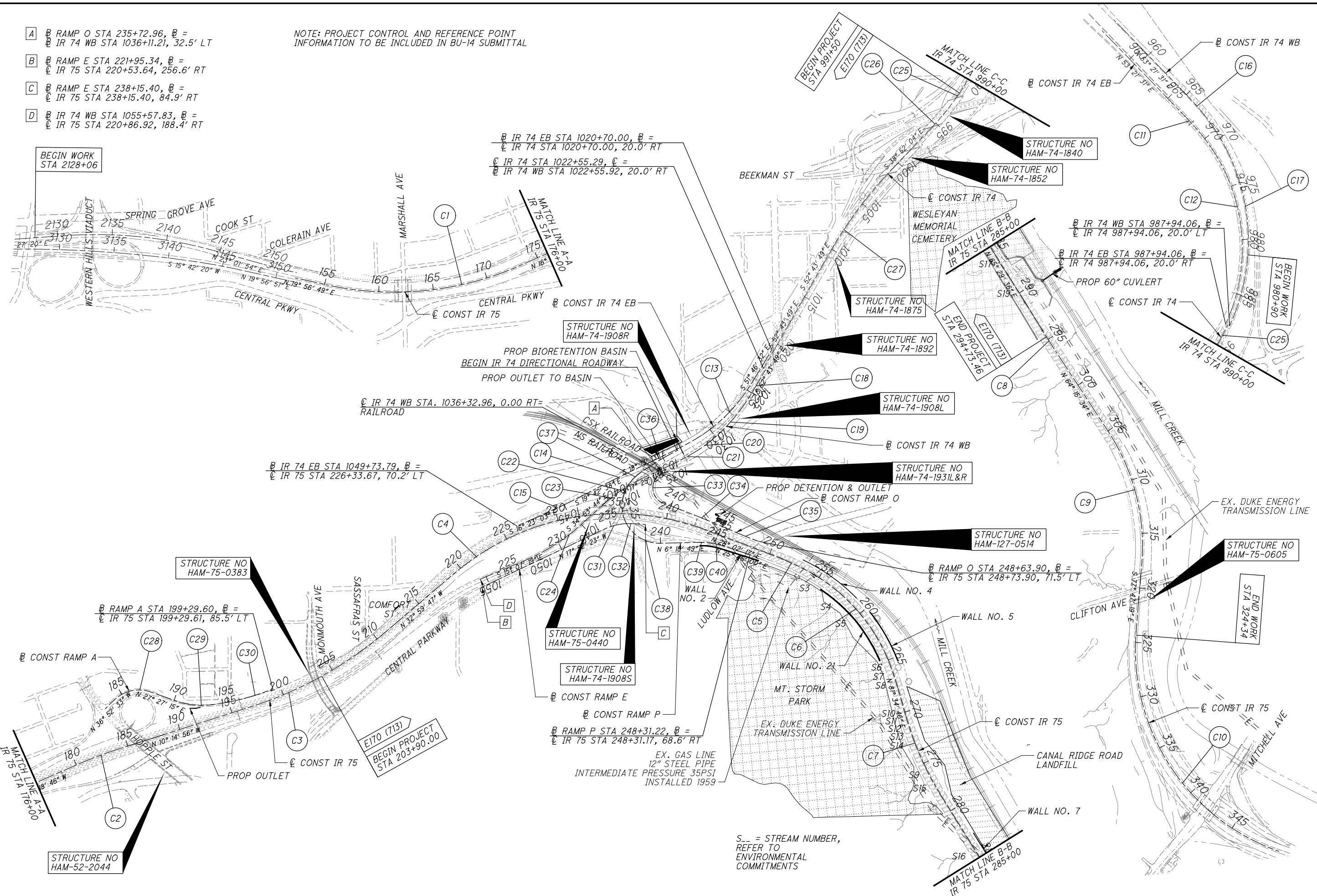
SPECIAL PROVISIONS

FEDERAL PROJECT NO. E170 (713)
PID NO. 104667
CONSTRUCTION PROJECT NO. 183000
CSXT (CSX OP # OH1179) NORFOLK SOUTHERN
HAM-75-3.84
1/106

schmeltzer 8:12:26 AM 6/11/2019 2017.01113.C.Design.104667.HAM-75-3.84.Design.Roadway.Sheets.BU-20.Sign & PM.104667.GT001.dgn

- A $\text{B RAMP O STA } 235+72.96, \text{B} =$
 $\text{C IR 74 WB STA } 1036+11.21, 32.5' \text{ LT}$
- B $\text{B RAMP E STA } 221+95.34, \text{B} =$
 $\text{C IR 75 STA } 220+53.64, 256.6' \text{ RT}$
- C $\text{B RAMP E STA } 238+15.40, \text{B} =$
 $\text{C IR 75 STA } 238+15.40, 84.9' \text{ RT}$
- D $\text{B IR 74 WB STA } 1055+57.83, \text{B} =$
 $\text{C IR 75 STA } 220+86.92, 188.4' \text{ RT}$

NOTE: PROJECT CONTROL AND REFERENCE POINT INFORMATION TO BE INCLUDED IN BU-14 SUBMITTAL



S... = STREAM NUMBER, REFER TO ENVIRONMENTAL COMMITMENTS



CALCULATED BY JS
CHECKED BY JS

SCHEMATIC PLAN

HAM-75-3.84

istuttler 10/13/2023 11:33:31 AM \\01.2017.01113.C.Design.104667_HAM-75-3.84.Design.Roadway.Sheets\BU-20_Sign & PM.104667_GBO01.dgn

IR 75

EX (C1) PI STA 164+50.15
 $\Delta = 36^\circ 15' 35''$ (LT)
 $Dc = 2^\circ 00' 00''$
 $R = 2,864.79'$
 $T = 938.01'$
 $L = 1,812.99'$
 $E = 149.66'$
 $C = 1,782.88'$
 C.B. = N $1^\circ 49' 02''$ E

EX (C2) PI STA 182+02.37
 $\Delta = 6^\circ 03' 50''$ (RT)
 $Dc = 1^\circ 20' 00''$
 $R = 4,297.18'$
 $T = 227.61'$
 $L = 454.79'$
 $E = 6.02'$
 $C = 454.58'$
 C.B. = N $13^\circ 16' 51''$ W

(C3) PI STA 204+04.56
 $\Delta = 22^\circ 44' 51''$ (LT)
 $Dc = 1^\circ 35' 45''$
 $R = 3,590.34'$
 $T = 722.23'$
 $L = 1,425.43'$
 $E = 71.92'$
 $C = 1,416.09'$
 C.B. = N $21^\circ 37' 21''$ W
 $\theta_{max} = 0.039$

(C4) PI STA 232+75.63
 $\Delta = 61^\circ 02' 03''$ (RT)
 $Dc = 2^\circ 30' 00''$
 $R = 2,291.83'$
 $T = 1,350.91'$
 $L = 2,441.37'$
 $E = 368.52'$
 $C = 2,327.56'$
 C.B. = N $2^\circ 28' 45''$ W
 $\theta_{max} = 0.051$

(C5) PI STA 251+83.62
 $\Delta = 6^\circ 38' 26''$ (RT)
 $Dc = 2^\circ 00' 00''$
 $R = 2,864.79'$
 $T = 166.20'$
 $L = 332.02'$
 $E = 4.82'$
 $C = 331.84'$
 C.B. = N $31^\circ 21' 29''$ E
 $\theta_{max} = 0.045$

(C6) PI STA 259+43.67
 $\Delta = 39^\circ 54' 03''$ (RT)
 $Dc = 3^\circ 30' 00''$
 $R = 1,637.02'$
 $T = 594.23'$
 $L = 1,140.03'$
 $E = 104.51'$
 $C = 1,117.13'$
 C.B. = N $54^\circ 37' 44''$ E
 $\theta_{max} = 0.058$

(C7) PI STA 274+43.30
 $\Delta = 16^\circ 05' 10''$ (LT)
 $Dc = 2^\circ 00' 00''$
 $R = 2,864.79'$
 $Ls = 250.00'$
 $\theta_s = 2^\circ 30' 00''$
 $LT = 166.68'$
 $ST = 83.35'$
 $x = 249.95'$
 $y = 3.64'$
 $k = 124.99'$
 $p = 0.91'$

(C8) PI STA 295+15.02
 $\Delta = 1^\circ 14' 02''$ (LT)
 $Dc = 0^\circ 33' 00''$
 $R = 10,417.41'$
 $T = 112.17'$
 $L = 224.33'$
 $E = 0.60'$
 $C = 224.32'$
 C.B. = N $64^\circ 52' 35''$ E

EX (C9) PI STA 311+66.43
 $\Delta = 37^\circ 57' 07''$ (RT)
 $Dc = 3^\circ 00' 00''$
 $R = 1,909.86'$
 $T = 656.72'$
 $L = 1,265.06'$
 $E = 109.76'$
 $C = 1,242.06'$
 C.B. = N $83^\circ 14' 07''$ E

EX (C10) PI STA 339+13.10
 $\Delta = 75^\circ 26' 08''$ (LT)
 $Dc = 2^\circ 55' 24''$
 $R = 1,960.00'$
 $T = 1,515.83'$
 $L = 2,580.53'$
 $E = 517.77'$
 $C = 2,398.15'$
 C.B. = N $64^\circ 29' 37''$ E

IR 74 EB

EX (C11) PI STA 968+88.11
 $Ls = 400.00'$
 $\theta_s = 7^\circ 00' 00''$
 $LT = 266.88'$
 $ST = 133.52'$
 $x = 399.40'$
 $y = 16.27'$
 $k = 199.90'$
 $p = 4.07'$

EX (C12) PI STA 979+45.70
 $\Delta = 69^\circ 02' 57''$ (RT)
 $Dc = 3^\circ 30' 00''$
 $R = 1,637.02'$
 $\Delta c = 62^\circ 02' 57''$ (RT)
 $Lc = 1,772.83'$
 $Es = 352.41'$
 $C = 1,687.46'$
 C.B.1 = N $55^\circ 40' 02''$ E
 C.B. = S $88^\circ 38' 28''$ E

(C13) PI STA 1028+73.19
 $\Delta = 33^\circ 33' 19''$ (RT)
 $Dc = 3^\circ 54' 00''$
 $R = 1,469.12'$
 $Ls = 400.00'$
 $\theta_s = 7^\circ 48' 00''$
 $LT = 266.93'$
 $ST = 133.57'$
 $x = 399.26'$
 $y = 18.13'$
 $k = 199.88'$
 $p = 4.53'$

EX (C14) PI STA 1040+29.02
 $\Delta = 1^\circ 29' 25''$ (LT)
 $Dc = 0^\circ 30' 00''$
 $R = 11,459.16'$
 $T = 149.03'$
 $L = 298.05'$
 $E = 0.97'$
 $C = 298.04'$
 C.B. = S $18^\circ 57' 56''$ E
 $\theta_{max} = NC$

(C15) PI STA 1045+18.02
 $\Delta = 3^\circ 19' 35''$ (RT)
 $Dc = 1^\circ 00' 00''$
 $R = 5,729.58'$
 $T = 166.37'$
 $L = 332.64'$
 $E = 2.41'$
 $C = 332.59'$
 C.B. = S $18^\circ 02' 51''$ E
 $\theta_{max} = 0.02$

EX (C16) PI STA 966+39.07
 $Ls = 400.00'$
 $\theta_s = 6^\circ 12' 56''$
 $LT = 266.83'$
 $ST = 133.48'$
 $x = 399.53'$
 $y = 14.45'$
 $k = 199.92'$
 $p = 3.61'$

EX (C17) PI STA 978+39.03
 $\Delta = 69^\circ 02' 57''$ (RT)
 $Dc = 3^\circ 06' 28''$
 $R = 1,843.63'$
 $\Delta c = 62^\circ 50' 01''$ (RT)
 $Lc = 2,021.82'$
 $Es = 396.30'$
 $C = 1,922.02'$
 C.B.1 = N $55^\circ 24' 21''$ E
 C.B. = S $89^\circ 02' 01''$ E

EX (C18) PI STA 1025+58.14
 $Ls = 400.00'$
 $f_s = 7^\circ 00' 00''$
 $LT = 266.88'$
 $ST = 133.52'$
 $x = 399.40'$
 $y = 16.27'$
 $k = 199.90'$
 $p = 4.07'$

EX (C19) PI STA 1028+27.31
 $\Delta = 9^\circ 30' 05''$ (RT)
 $Dc = 3^\circ 30' 00''$
 $R = 1,637.02'$
 $T = 136.05'$
 $L = 271.47'$
 $E = 5.64'$
 $C = 271.16'$
 C.B. = S $40^\circ 58' 47''$ E

EX (C20) PI STA 1030+98.25
 $\Delta = 10^\circ 48' 33''$ (RT)
 $Dc = 4^\circ 00' 00''$
 $R = 1,432.39'$
 $T = 135.52'$
 $L = 270.23'$
 $E = 6.40'$
 $C = 269.83'$
 C.B. = S $30^\circ 49' 28''$ E

EX (C21) PI STA 1033+66.54
 $Ls = 400.00'$
 $f_s = 8^\circ 00' 00''$
 $LT = 266.94'$
 $ST = 133.58'$
 $x = 399.22'$
 $y = 18.59'$
 $k = 199.87'$
 $p = 4.65'$

IR 74 WB

(C22) PI STA 1040+09.33
 $\Delta = 17^\circ 28' 33''$ (LT)
 $Dc = 4^\circ 30' 00''$
 $R = 1,273.24'$
 $Ls = 260.00'$
 $\theta_s = 5^\circ 51' 00''$
 $LT = 173.43'$
 $ST = 86.75'$
 $x = 259.73'$
 $y = 8.84'$
 $k = 129.95'$
 $p = 2.21'$

(C23) PI STA 1041+58.45
 $Ls = 260.00'$
 $f_s = 5^\circ 51' 00''$
 $LT = 173.43'$
 $ST = 86.75'$
 $x = 259.73'$
 $y = 8.84'$
 $k = 129.95'$
 $p = 2.21'$

(C24) PI STA 1048+15.41
 $\Delta = 19^\circ 46' 26''$ (RT)
 $Dc = 3^\circ 06' 12''$
 $R = 1,846.24'$
 $T = 321.79'$
 $L = 637.17'$
 $E = 27.83'$
 $C = 634.01'$
 C.B. = S $25^\circ 00' 32''$ E
 $\theta_{max} = 0.056$

EX (C25) PI STA 990+95.76
 $\Delta = 14^\circ 59' 55''$ (RT)
 $Dc = 2^\circ 30' 00''$
 $R = 2,291.85'$
 $T = 301.70'$
 $L = 599.95'$
 $E = 19.77'$
 $C = 598.24'$
 C.B. = S $50^\circ 07' 02''$ E

EX (C26) PI STA 994+94.07
 $Ls = 300.04'$
 $\theta_s = 3^\circ 45' 02''$
 $LT = 200.07'$
 $ST = 100.05'$
 $x = 299.91'$
 $y = 6.54'$
 $k = 150.00'$
 $p = 1.64'$

EX (C27) PI STA 1005+55.79
 $\Delta = 13^\circ 51' 46''$ (LT)
 $Dc = 1^\circ 28' 00''$
 $R = 3,906.56'$
 $T = 474.91'$
 $L = 945.19'$
 $E = 28.76'$
 $C = 942.89'$
 C.B. = S $45^\circ 47' 56''$ E

EX (C28) PI STA 186+16.91
 $\Delta = 64^\circ 19' 48''$ (RT)
 $Dc = 17^\circ 36' 28''$
 $R = 325.40'$
 $T = 204.64'$
 $L = 365.35'$
 $E = 59.00'$
 $C = 346.46'$
 C.B. = N $4^\circ 42' 39''$ W

(C29) PI STA 191+81.67
 $\Delta = 27^\circ 24' 05''$ (LT)
 $Dc = 7^\circ 44' 34''$
 $R = 740.00'$
 $T = 180.40'$
 $L = 353.90'$
 $E = 21.67'$
 $C = 350.54'$
 C.B. = N $13^\circ 45' 13''$ E
 $\theta_{max} = 0.040$ (EX)

(C30) PI STA 196+43.87
 $\Delta = 14^\circ 14' 52''$ (LT)
 $Dc = 2^\circ 28' 49''$
 $R = 2,310.00'$
 $T = 288.70'$
 $L = 574.43'$
 $E = 17.97'$
 $C = 572.95'$
 C.B. = N $7^\circ 04' 15''$ W
 $\theta_{max} = 0.040$ (EX)

IR 74

RAMP E

(C31) PI STA 235+25.63
 $\Delta = 19^\circ 57' 14''$ (RT)
 $Dc = 11^\circ 00' 00''$
 $R = 520.87'$
 $T = 91.63'$
 $L = 181.40'$
 $E = 8.00'$
 $C = 180.48'$
 C.B. = N $7^\circ 53' 46''$ W
 $\theta_{max} = 0.06$

(C32) PI STA 236+82.30
 $\Delta = 19^\circ 57' 14''$ (RT)
 $Dc = 11^\circ 00' 00''$
 $R = 520.87'$
 $T = 91.63'$
 $L = 181.40'$
 $E = 8.00'$
 $C = 180.48'$
 C.B. = N $7^\circ 53' 46''$ W
 $\theta_{max} = 0.06$

(C33) PI STA 239+36.29
 $\Delta = 134^\circ 55' 26''$ (LT)
 $Dc = 38^\circ 00' 00''$
 $R = 150.78'$
 $T = 363.33'$
 $L = 355.06'$
 $E = 242.59'$
 $C = 278.53'$
 C.B. = S $84^\circ 54' 24''$ E
 $\theta_{max} = 0.06$

(C34) PI STA 242+53.62
 $\Delta = 3^\circ 15' 19''$ (RT)
 $Dc = 0^\circ 30' 00''$
 $R = 11,459.16'$
 $T = 325.60'$
 $L = 651.03'$
 $E = 4.62'$
 $C = 650.94'$
 C.B. = N $29^\circ 15' 32''$ E
 $\theta_{max} = NC$

(C35) PI STA 247+21.50
 $\Delta = 2^\circ 50' 55''$ (LT)
 $Dc = 1^\circ 00' 00''$
 $R = 5,729.58'$
 $T = 142.45'$
 $L = 284.85'$
 $E = 1.77'$
 $C = 284.82'$
 C.B. = N $29^\circ 27' 44''$ E
 $\theta_{max} = 0.027$

RAMP O

(C33) PI STA 239+36.29
 $\Delta = 134^\circ 55' 26''$ (LT)
 $Dc = 38^\circ 00' 00''$
 $R = 150.78'$
 $T = 363.33'$
 $L = 355.06'$
 $E = 242.59'$
 $C = 278.53'$
 C.B. = S $84^\circ 54' 24''$ E
 $\theta_{max} = 0.06$

(C39) PI STA 244+09.35
 $\Delta = 7^\circ 59' 12''$ (RT)
 $Dc = 11^\circ 30' 00''$
 $R = 498.22'$
 $T = 34.78'$
 $L = 69.45'$
 $E = 1.21'$
 $C = 69.39'$
 C.B. = N $10^\circ 15' 24''$ E
 $\theta_{max} = 0.048$

(C40) PI STA 245+10.94
 $Ls = 200.00'$
 $f_s = 11^\circ 30' 00''$
 $LT = 133.62'$
 $ST = 66.92'$
 $x = 199.20'$
 $y = 13.34'$
 $k = 99.87'$
 $p = 3.34'$
 $\theta_{max} = 0.048$

RAMP P

(C36) PI STA 228+61.19
 $\Delta = 7^\circ 21' 05''$ (LT)
 $Dc = 2^\circ 12' 13''$
 $R = 2,600.00'$
 $T = 167.03'$
 $L = 333.59'$
 $E = 5.36'$
 $C = 333.36'$
 C.B. = S $22^\circ 50' 36''$ E
 $\theta_{max} = 0.033$

(C37) PI STA 231+58.60
 $Ls = 206.88'$
 $f_s = 19^\circ 36' 22''$
 $LT = 130.84'$
 $ST = 77.84'$
 $x = 204.17'$
 $y = 26.12'$
 $k = 103.04'$
 $p = 4.51'$
 $\theta_{max} = 0.06$

(C38) PI STA 239+29.98
 $\Delta = 127^\circ 36' 41''$ (LT)
 $Dc = 16^\circ 45' 00''$
 $R = 342.06'$
 $T = 695.34'$
 $L = 761.86'$
 $E = 432.86'$
 $C = 613.87'$
 C.B. = N $70^\circ 04' 09''$ E
 $\theta_{max} = 0.06$

DE1 DESIGN EXCEPTION RECEIVED FOR STOPPING SIGHT DISTANCE
 DE2 DESIGN EXCEPTION RECEIVED FOR CURVE RADIUS
 DE3 DESIGN EXCEPTION RECEIVED FOR S.E. RATE

UTILITIES

LISTED BELOW ARE ALL UTILITIES LOCATED WITHIN THE PROJECT CONSTRUCTION LIMITS TOGETHER WITH THEIR RESPECTIVE OWNERS:

WATER, STORM, & SEWER

METROPOLITAN SEWER DISTRICT OF GREATER CINCINNATI
ATTN: ROB FRANKLIN
1600 GEST STREET
CINCINNATI, OH 45204
513-557-7188
ROB.FRANKLIN@CINCINNATI-OH.GOV

ATTN: ANDY BACHMAN
1600 GEST STREET
CINCINNATI, OH 45204
513-244-3904
ANDY.BACHMAN@CINCINNATI-OH.GOV

CINCINNATI STORMWATER MANAGEMENT UTILITY
ATTN: ROB GOODPASTER
4747 SPRING GROVE AVE
CINCINNATI, OH 45232
513-591-7746
ROBERT.GOODPASTER@CINCINNATI-OH.GOV

GREATER CINCINNATI WATER WORKS
ATTN: JON HUNSEDER
4747 SPRING GROVE AVE
CINCINNATI, OH 45232
513-591-5056
JON.HUNSEDER@GCWW.CINCINNATI-OH.GOV

ELECTRIC

DUKE ENERGY - ELECTRIC
ATTN: AARON WRIGHT
139 EAST 4TH STREET, ROOM 467A
CINCINNATI, OH 45202
513-287-3674
AARON.WRIGHT@DUKE-ENERGY.COM

GAS

DUKE ENERGY - GAS
ATTN: BRAD SEITER
139 EAST 4TH ST., ROOM 460A
CINCINNATI, OH 45202
513-287-4415
BRALEY.SEITER@DUKE-ENERGY.COM

TELEPHONE & CABLE

CINCINNATI BELL - UNDERGROUND
ATTN: MARK CONNER
221 E 4TH ST, BLDG 121-900
CINCINNATI, OH 45201
513-565-7043
MARK.CONNER@CINBELL.COM

CINCINNATI BELL - AERIAL
ATTN: DORIAN JOHNSON
221 E 4TH ST, BLDG 121-900
CINCINNATI, OH 45201
513-566-5120
DORIAN.JOHNSON@CINBELL.COM

CHARTER (FKA TIME WARNER CABLE)
ATTN: KENT RIEGER
11252 CORNELL PARK DR
CINCINNATI, OH 45242
513-386-5499
KENT.RIEGER@TWCABLE.COM

TELEPHONE & CABLE - CONTINUED

MCI/VERIZON
ATTN: ALLAN GUEST
120 RAVINE ST
AKRON, OH
330-253-8267
ALLAN.GUEST@VERIZONBUSINESS.COM

QUEST/CENTURYLINK
ATTN: CHRIS STRAYER
441 W. BROAD ST
PATASKALA, OH 43062
330-886-1299
CHRISTOPHER.STRAYER@CENTURYLINK.COM

CITY OF CINCINNATI TELECOM
ATTN: EDDIE SELLON
1106 BATES AVENUE
CINCINNATI, OH 45225
513-352-2391
EDDIE.SELLON@CINCINNATI-OH.GOV

ITS (FORMERLY ARTIMIS)
ODOT CENTRAL OFFICE OF TRAFFIC OPERATIONS
1606 WEST BROAD STREET
COLUMBUS, OH 43223

ODOT ITS IS A NON-OUPS MEMBER
FOR LOCATES CONTACT:
ODOT CENTRAL OFFICE OF TRAFFIC OPERATIONS
1606 WEST BROAD STREET
COLUMBUS, OH 43223
614-387-4113
CEN.ITS.LAB@DOT.OHIO.GOV

LOCAL MUNICIPALITIES

CITY OF CINCINNATI ENGINEERING
ATTN: CITY ENGINEER
CHRIS KELLY
801 PLUM ST, ROOM 450
CITY HALL
CINCINNATI, OH 45202
513-352-3721
CHRIS.KELLY@CINCINNATI-OH.GOV

CITY OF CINCINNATI TRAFFIC
ATTN: LINDA KISER
801 PLUM ST, ROOM 320
CINCINNATI, OH 45202
513-352-3730
LINDA.KISER@CINCINNATI-OH.GOV

CITY OF CINCINNATI LIGHTING
ATTN: CURTIS HINES
801 PLUM ST, ROOM 320
CINCINNATI, OH 45202
513-532-3462
CURTIS.HINE@CINCINNATI-OH.GOV

CITY OF CINCINNATI SIGNALS
ATTN: ANDY CARTER
801 PLUM ST, ROOM 320
CINCINNATI, OH 45202
513-352-5272
ANDY.CARTER@CINCINNATI-OH.GOV

THE LOCATION OF THE UNDERGROUND UTILITIES SHOWN ON THE PLANS ARE AS OBTAINED FROM THE OWNERS AS REQUIRED BY SECTION 153.64 O.R.C.

SURVEYING PARAMETERS

PRIMARY PROJECT CONTROL MONUMENTS GOVERN ALL POSITIONING ON ODOT PROJECTS. SEE SHEETS 4-5 OF THE BU-14 PLANS FOR A TABLE CONTAINING PROJECT CONTROL INFORMATION.

USE THE FOLLOWING PROJECT CONTROL, VERTICAL POSITIONING, AND HORIZONTAL POSITIONING PARAMETERS FOR ALL SURVEYING:

PROJECT CONTROL

POSITIONING METHOD: GNSS
MONUMENT TYPE: B

VERTICAL POSITIONING

ORTHOMETRIC HEIGHT DATUM: NAVD 1988
GEOID: GEOID 03

HORIZONTAL POSITIONING

REFERENCE FRAME: NAD 1983 (1995)
ELLIPSOID: GRS80
MAP PROJECTION: LAMBERT CONFORMAL CONIC
COORDINATE SYSTEM: OHIO SOUTH (3402)
COMBINED SCALE FACTOR: 0.999916592897
ORIGIN OF COORDINATE SYSTEM: 0, 0

USE THE POSITIONING METHODS AND MONUMENT TYPE USED IN THE ORIGINAL SURVEY TO RESTORE ALL MONUMENTS RELATED TO PRIMARY PROJECT CONTROL THAT ARE DAMAGED OR DESTROYED BY CONSTRUCTION ACTIVITIES. RESTORE THE DAMAGED OR DESTROYED MONUMENTS IN ACCORDANCE WITH CMS 623.

UNITS ARE IN U.S. SURVEY FEET.

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CALCULATED
EMS
CHECKED
CRH

GENERAL NOTES

HAM-75-3.84

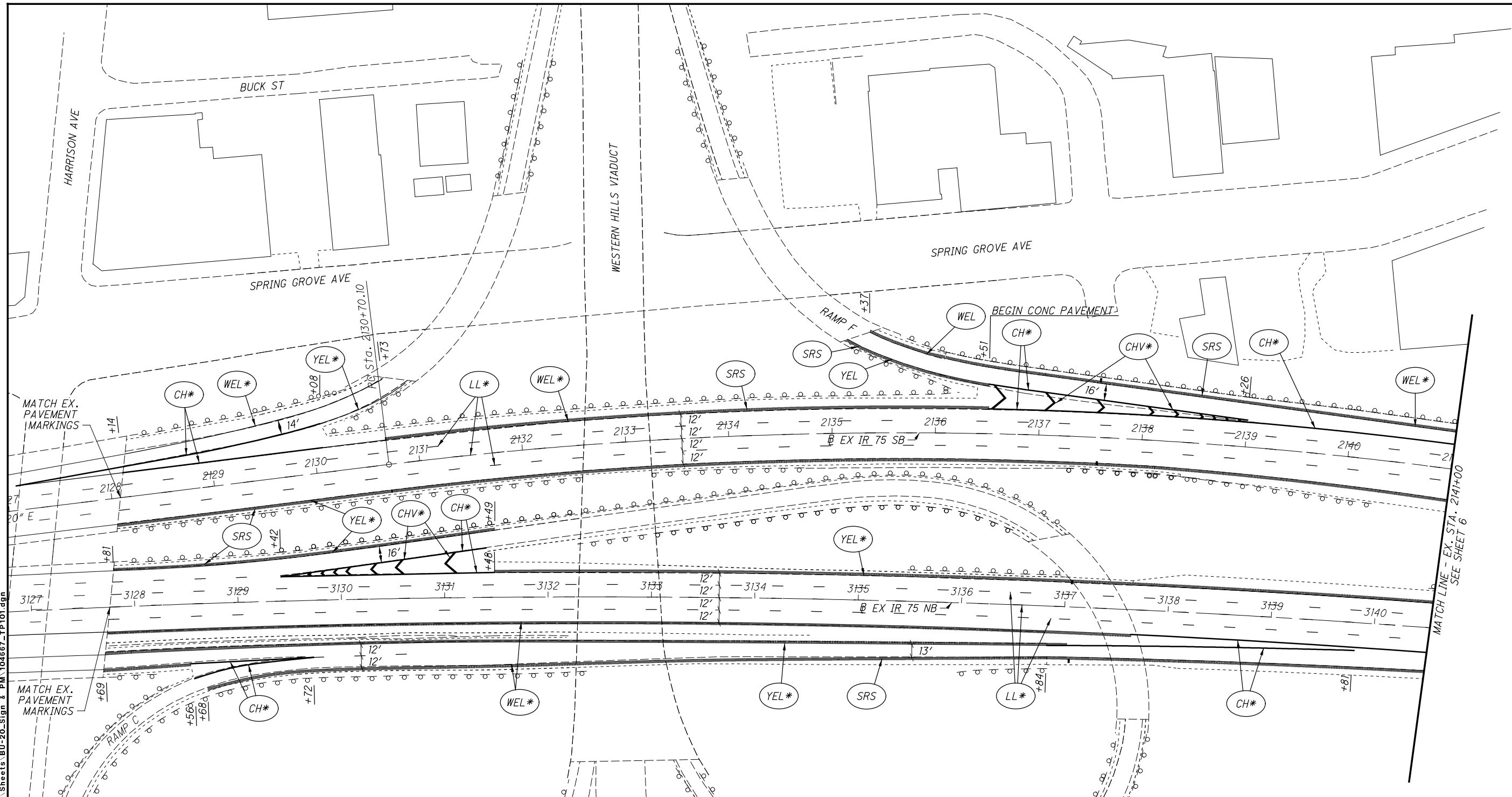


CALCULATED LZS CHECKED JS

SIGNING & PAVEMENT MARKING PLAN - IR 75
EX. STA. 2127+69 TO EX. STA. 2141+00

HAM-75-3.84

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PAVEMENT MARKINGS LEGEND

DL	ITEM 642 - DOTTED LINE, 6"	DL*	ITEM 642 - DOTTED LINE, 6"
DLW	ITEM 642 - WIDE DOTTED LINE, 12"	DLW*	ITEM 642 - WIDE DOTTED LINE, 12"
CH	ITEM 642 - CHANNELIZING LINE, 12"	CH*	ITEM 642 - CHANNELIZING LINE, 12"
LL	ITEM 642 - LANE LINE, 6"	LL*	ITEM 642 - LANE LINE, 6"
WEL	ITEM 642 - EDGE LINE, 6", WHITE	WEL*	ITEM 642 - EDGE LINE, 6", WHITE
YEL	ITEM 642 - EDGE LINE, 6", YELLOW	YEL*	ITEM 642 - EDGE LINE, 6", YELLOW
SL	ITEM 642 - STOP LINE, 24"	SL*	ITEM 642 - STOP LINE, 24"
LA	ITEM 642 - LANE ARROW	LA*	ITEM 642 - LANE ARROW
WTL	ITEM 642 - TRANSVERSE LINE, 24", WHITE	WTL*	ITEM 642 - TRANSVERSE LINE, 24", WHITE
CHV	ITEM 642 - CHEVRON LINE, 24", WHITE	CHV*	ITEM 642 - CHEVRON LINE, 24", WHITE

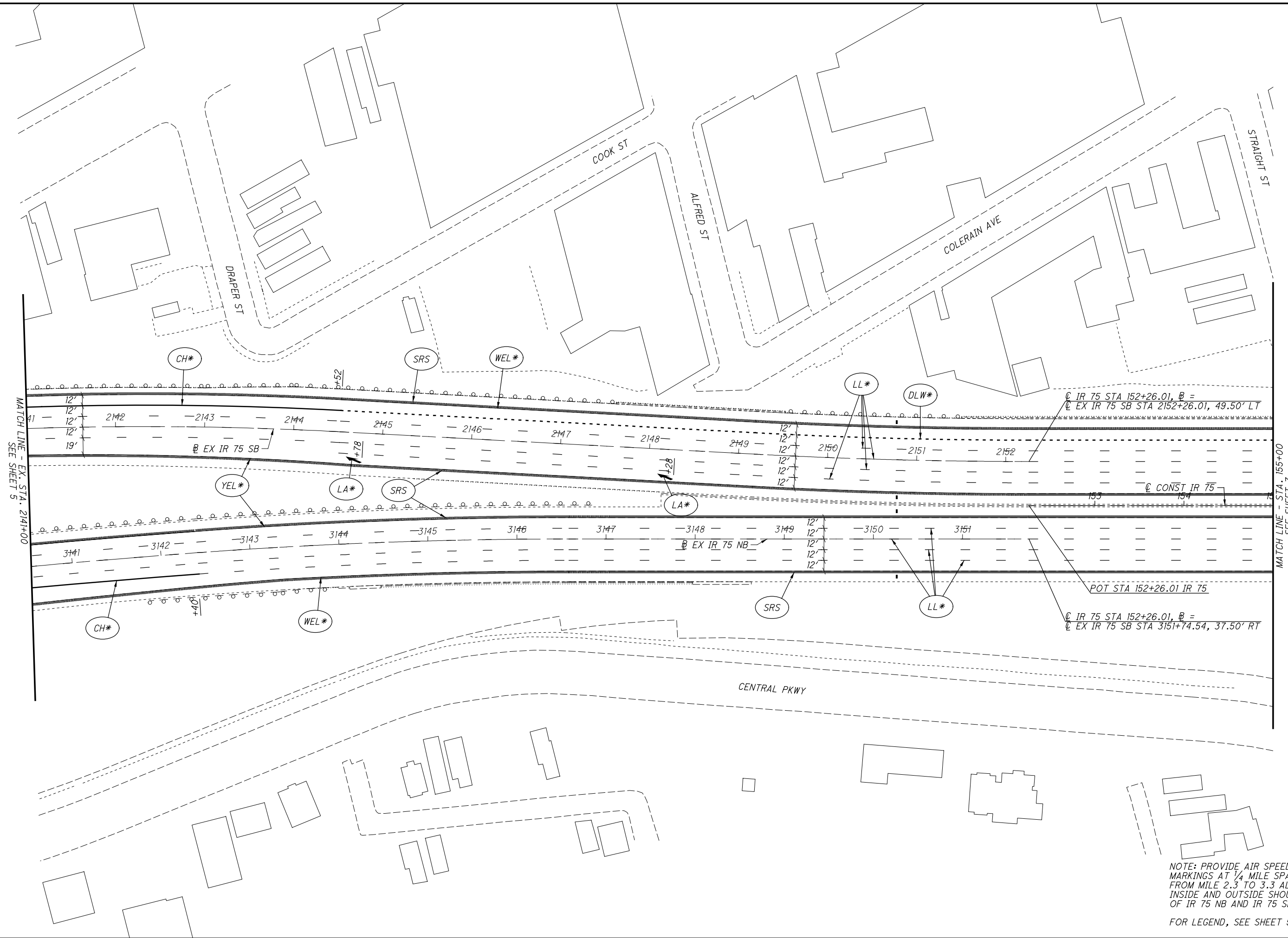
SIGNING LEGEND

	REMOVE EXISTING SIGN & DISPOSE	RS	SIGN REMOVAL
	REMOVE EXISTING SIGN FOR REUSE	OS	OVERHEAD SIGN
	PROPOSED SIGN	GS	GROUND MOUNTED SIGN
		SRS	SHOULDER RUMBLE STRIPS, INSTALLED PER SCD BP-9.1

NOTE: OBJECT MARKERS, BARRIER REFLECTORS, DELINEATORS, AND RPMS WILL BE PROVIDED AS REQUIRED PER ODOT STANDARDS.

PROVIDE AIR SPEED ZONE MARKINGS AT 1/4 MILE SPACING FROM MILE 2.3 TO 3.3 ALONG INSIDE AND OUTSIDE SHOULDER OF IR 75 NB AND IR 75 SB

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MATCH LINE - EX. STA. 2141+00
 SEE SHEET 5

MATCH LINE - STA. 155+00
 SEE SHEET 7

IR 75 STA 152+26.01, B =
 EX IR 75 SB STA 2152+26.01, 49.50' LT

CONST IR 75

POT STA 152+26.01 IR 75

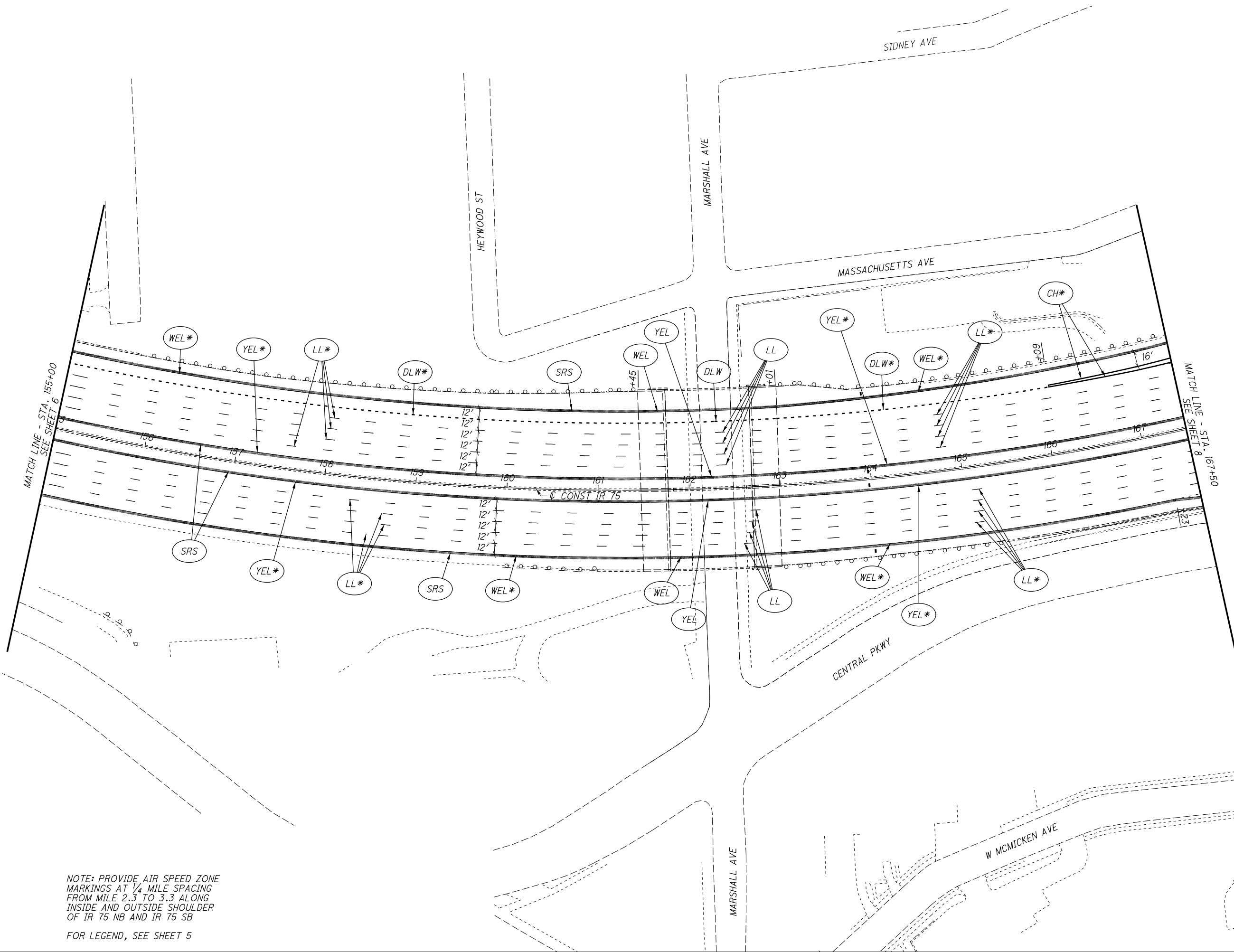
IR 75 STA 152+26.01, B =
 EX IR 75 SB STA 3151+74.54, 37.50' RT

NOTE: PROVIDE AIR SPEED ZONE
 MARKINGS AT 1/4 MILE SPACING
 FROM MILE 2.3 TO 3.3 ALONG
 INSIDE AND OUTSIDE SHOULDER
 OF IR 75 NB AND IR 75 SB
 FOR LEGEND, SEE SHEET 5

CALCULATED LZS CHECKED JS
 0 50 100
 25
 HORIZONTAL SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
EX. STA. 2141+00 TO STA. 155+00

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NOTE: PROVIDE AIR SPEED ZONE MARKINGS AT 1/4 MILE SPACING FROM MILE 2.3 TO 3.3 ALONG INSIDE AND OUTSIDE SHOULDER OF IR 75 NB AND IR 75 SB FOR LEGEND, SEE SHEET 5

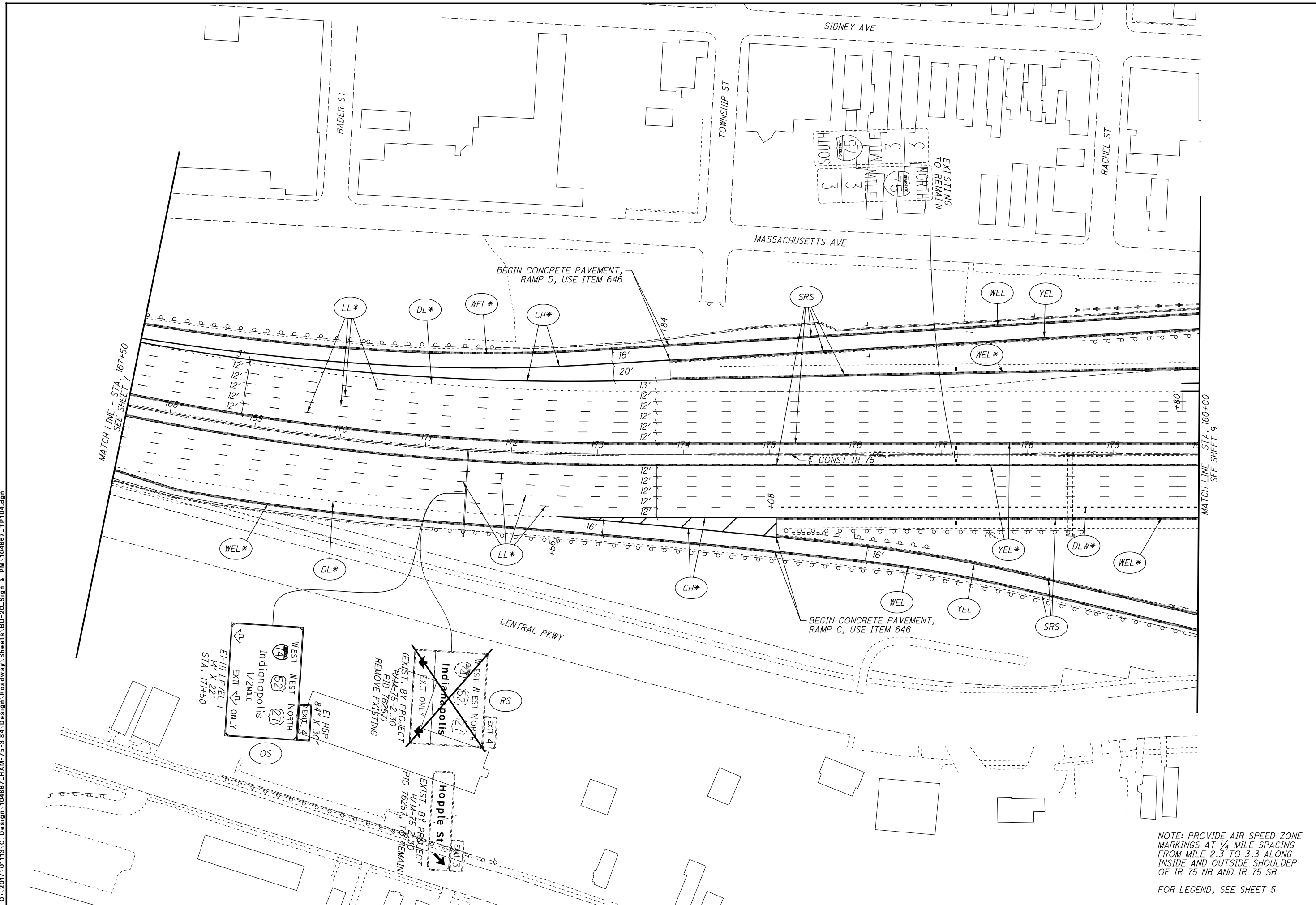


CALCULATED LZS
CHECKED JS

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 155+00 TO STA. 167+50

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NOTE: PROVIDE AIR SPEED ZONE MARKINGS AT 1/4 MILE SPACING FROM MILE 2.3 TO 3.3 ALONG INSIDE AND OUTSIDE SHOULDER OF IR 75 NB AND IR 75 SB
 FOR LEGEND, SEE SHEET 5

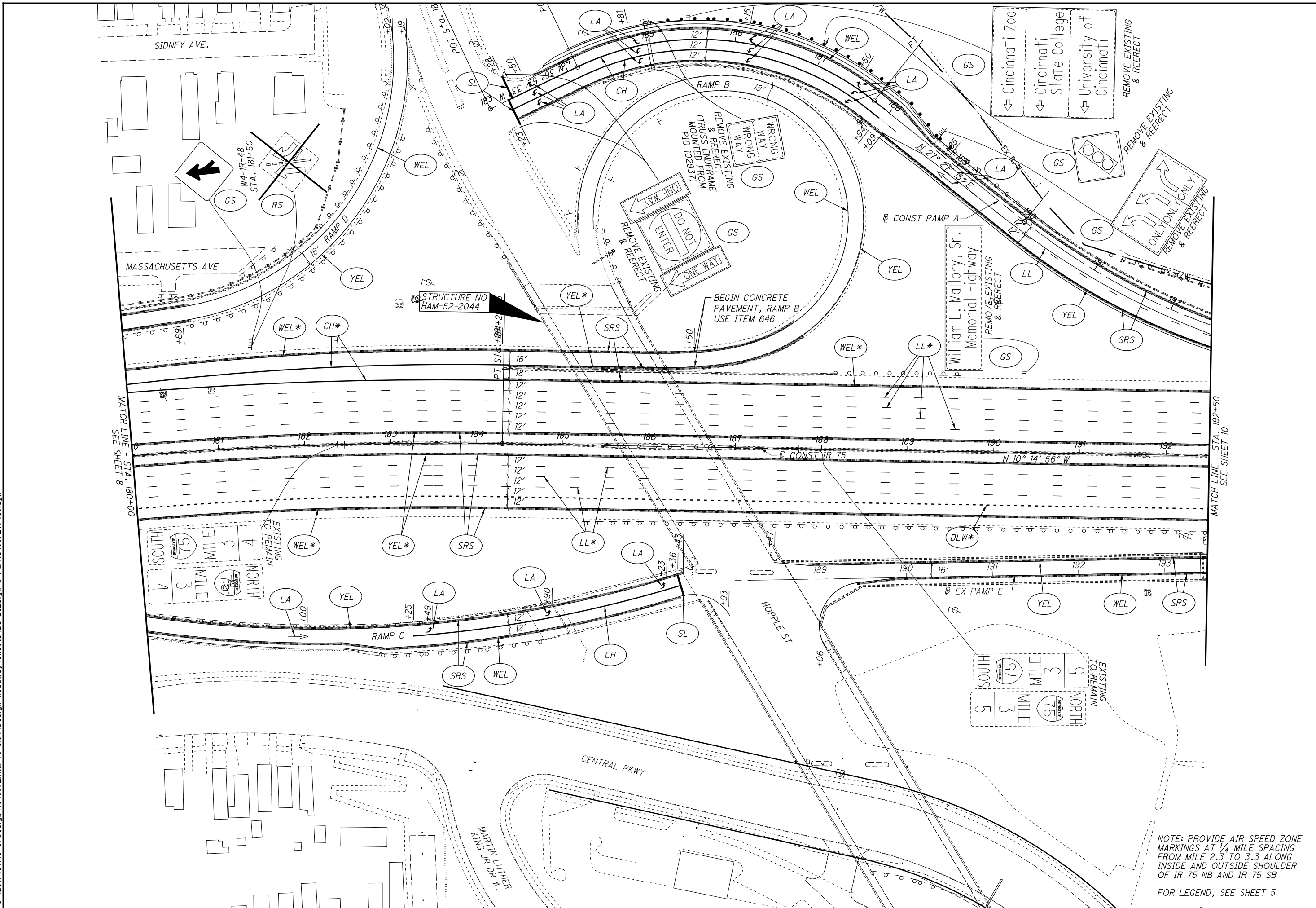
CALCULATED LZS CHECKED JS

0 50 100
 HORIZONTAL SCALE IN FEET

**SIGNING & PAVEMENT MARKING PLAN - IR 75
 STA. 167+50 TO STA. 180+00**

HAM-75-3.84

8
 106

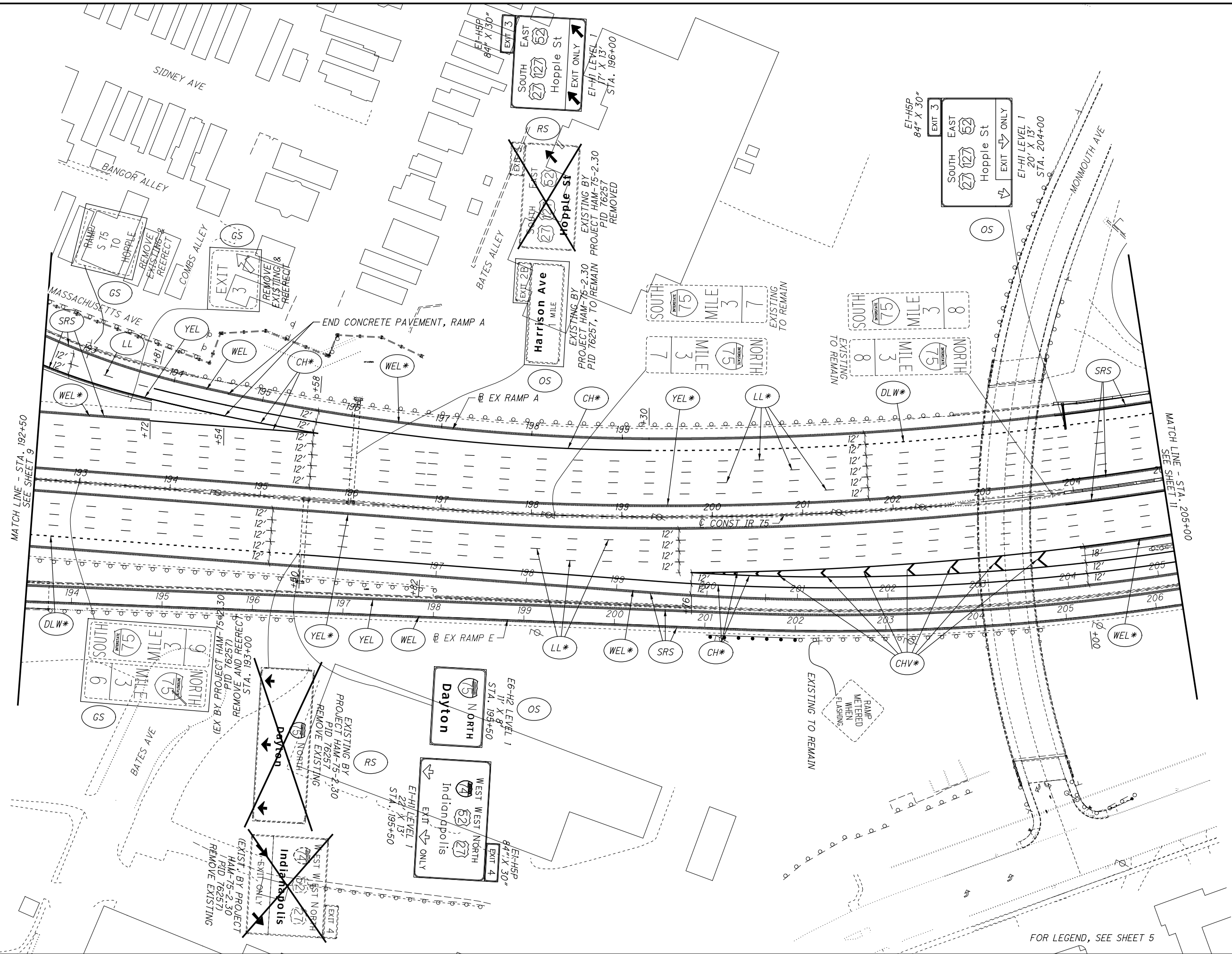


**SIGNING & PAVEMENT MARKING PLAN - IR 75
 STA. 180+00 TO STA. 192+50**

HAM-75-3.84

9
 106

NOTE: PROVIDE AIR SPEED ZONE MARKINGS AT 1/4 MILE SPACING FROM MILE 2.3 TO 3.3 ALONG INSIDE AND OUTSIDE SHOULDER OF IR 75 NB AND IR 75 SB FOR LEGEND, SEE SHEET 5

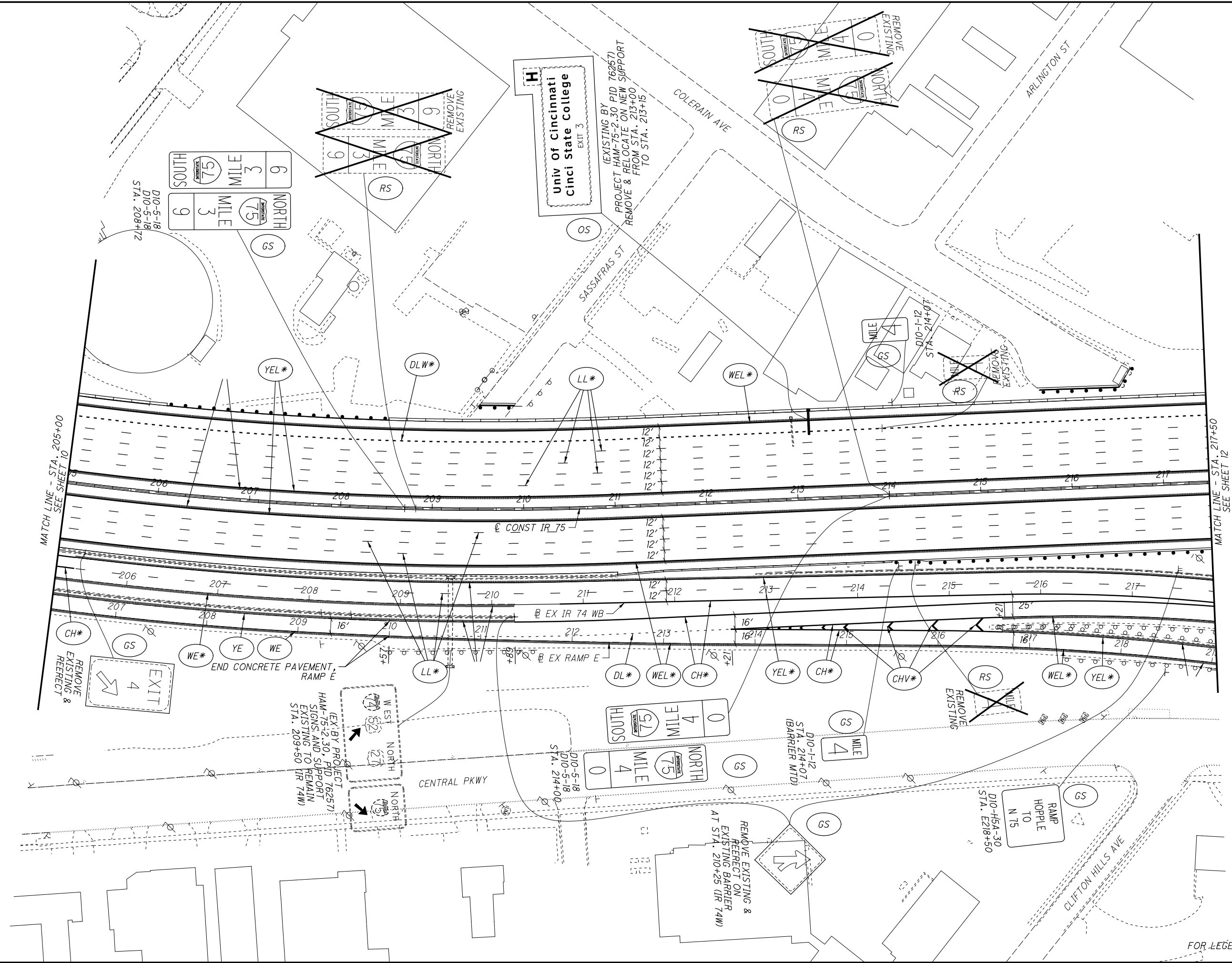


FOR LEGEND, SEE SHEET 5

CALCULATED LVS CHECKED JS
0 50 100
25 HORIZONTAL SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 192+50 TO STA. 205+00

HAM-75-3.84
10
106

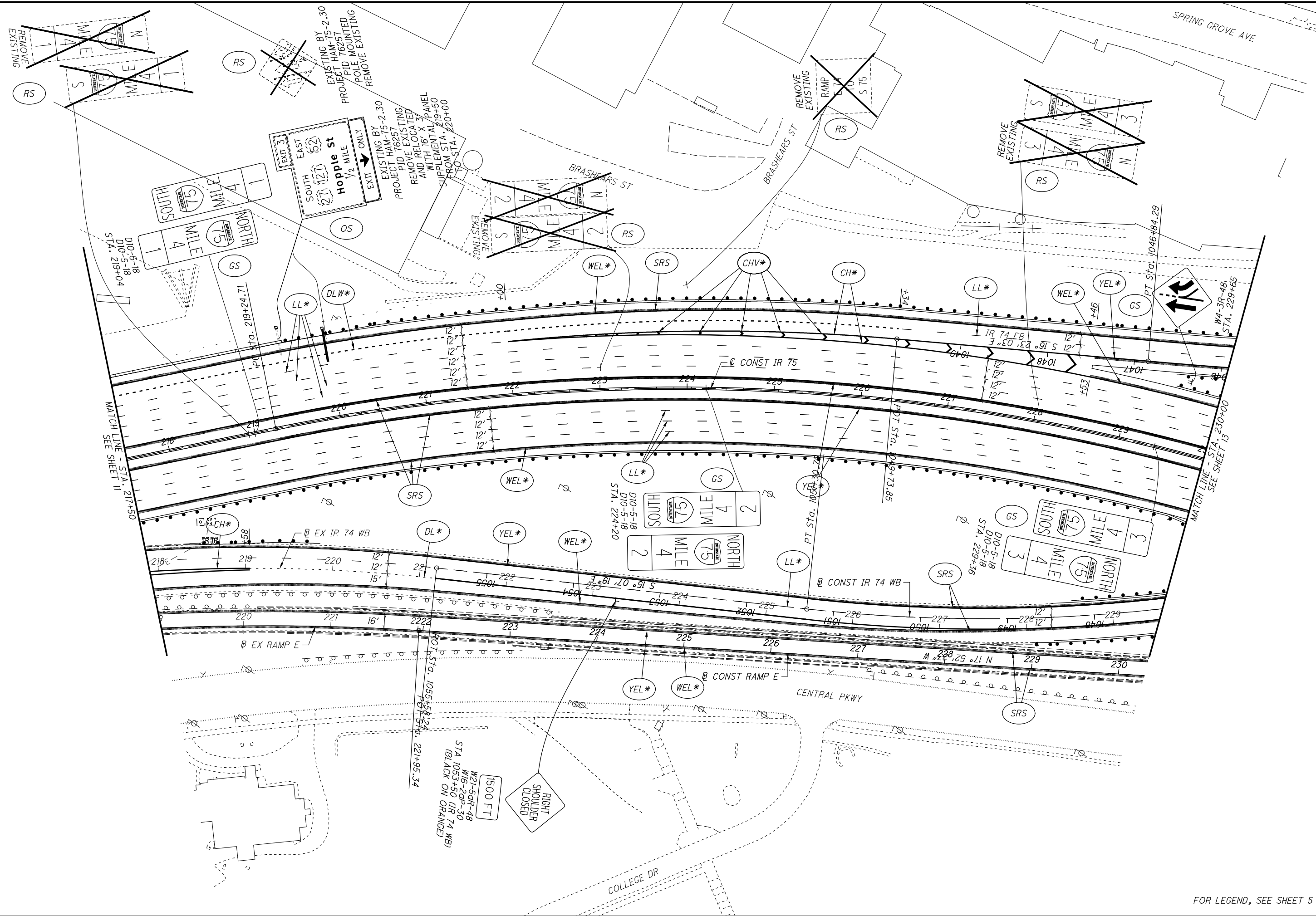


FOR LEGEND, SEE SHEET 5

CALCULATED LZS CHECKED JS
0 50 100
25
HORIZONTAL SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 205+00 TO STA. 217+50

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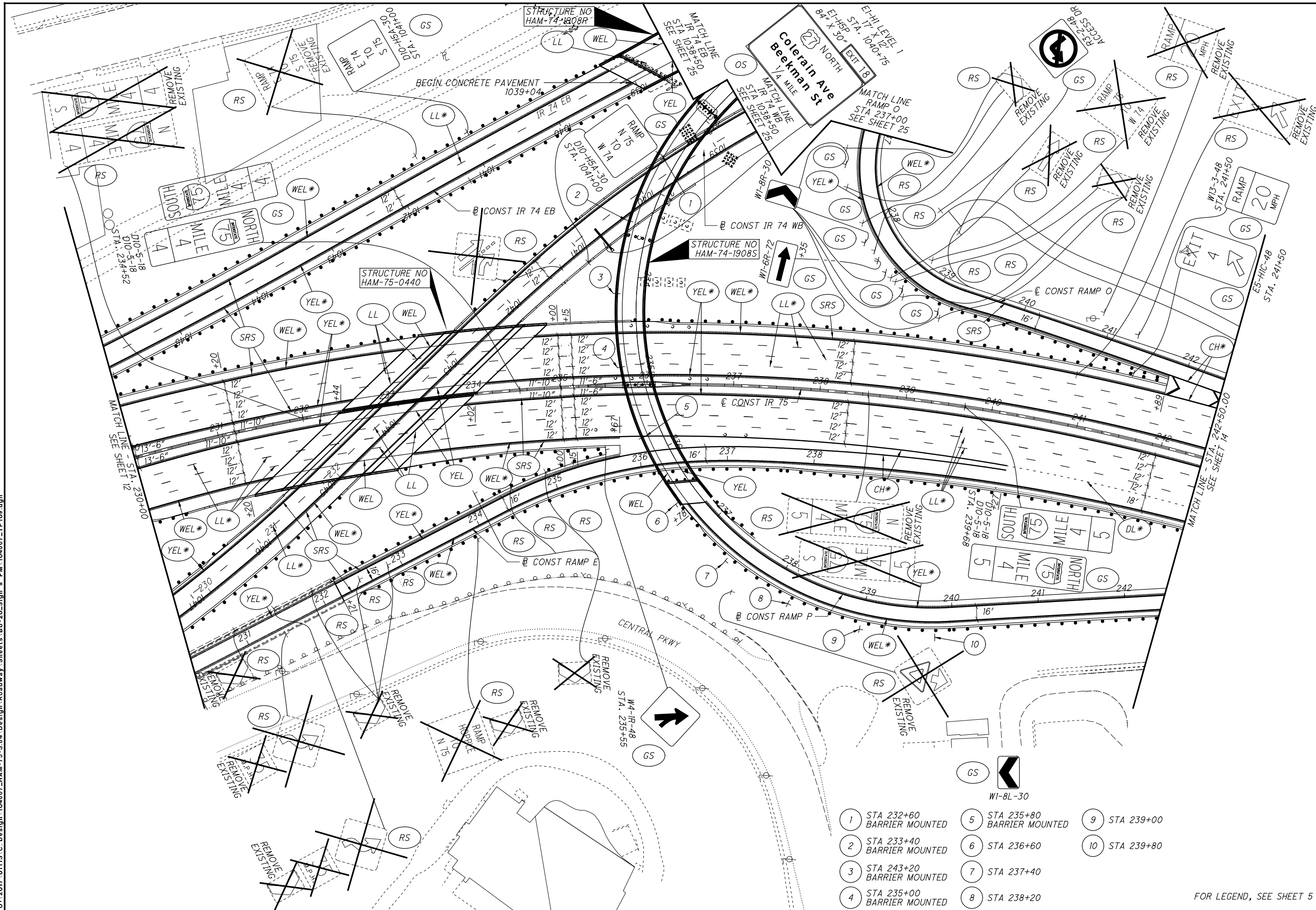
CALCULATED LZS CHECKED JS
0 50 100
25
HORIZONTAL SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 217+50 TO STA. 230+00

HAM-75-3.84
12
106

FOR LEGEND, SEE SHEET 5

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- | | | | | | |
|---|-------------------------------|---|-------------------------------|----|------------|
| 1 | STA 232+60
BARRIER MOUNTED | 5 | STA 235+80
BARRIER MOUNTED | 9 | STA 239+00 |
| 2 | STA 233+40
BARRIER MOUNTED | 6 | STA 236+60 | 10 | STA 239+80 |
| 3 | STA 243+20
BARRIER MOUNTED | 7 | STA 237+40 | | |
| 4 | STA 235+00
BARRIER MOUNTED | 8 | STA 238+20 | | |

FOR LEGEND, SEE SHEET 5

CALCULATED LZS
CHECKED JS

SIGNING & PAVEMENT MARKING PLAN - IR 75

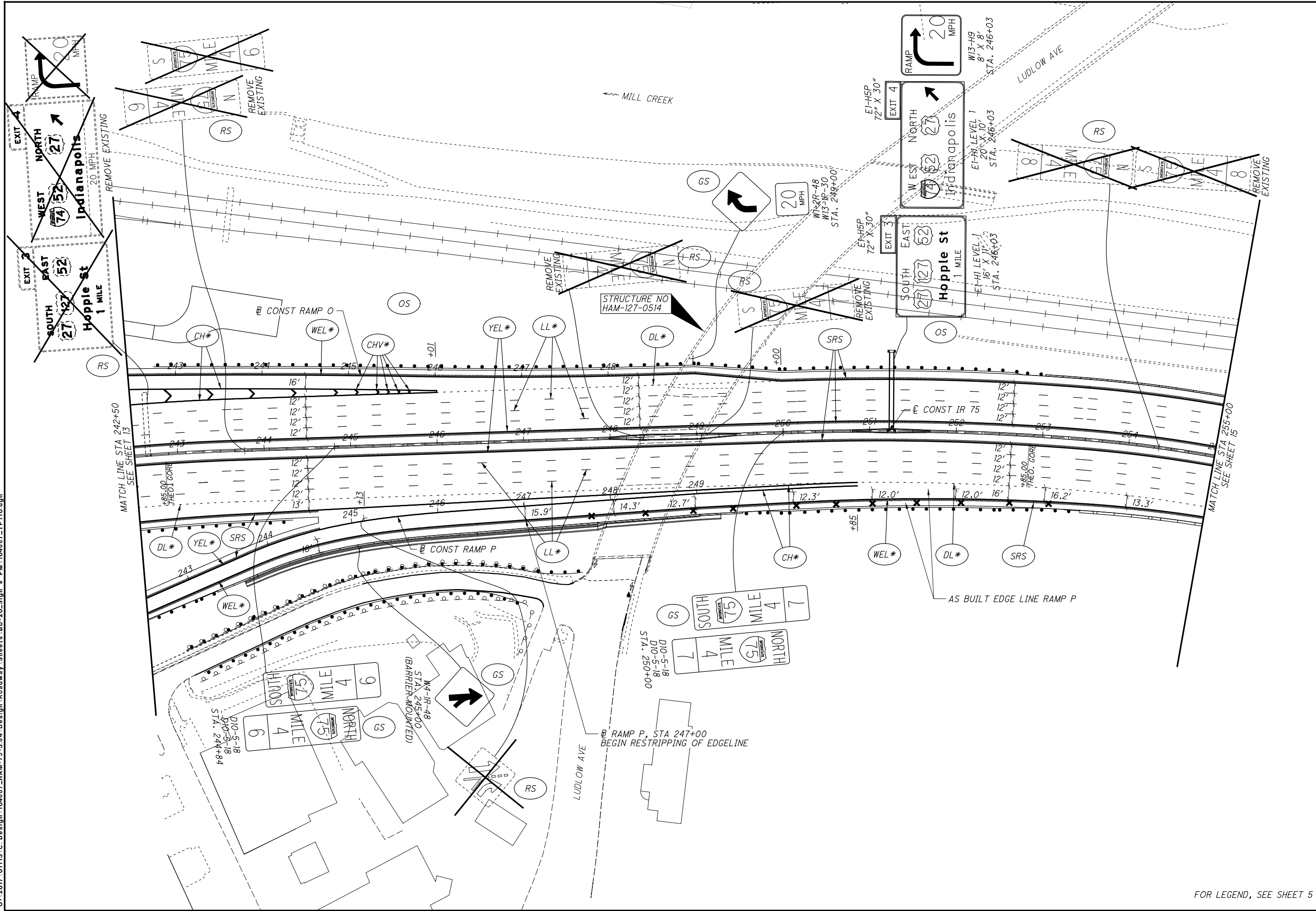
STA. 230+00 TO STA. 242+50

HAM-75-3.84

13
106

0 50 100
25
HORIZONTAL
SCALE IN FEET

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CALCULATED LZS CHECKED JS

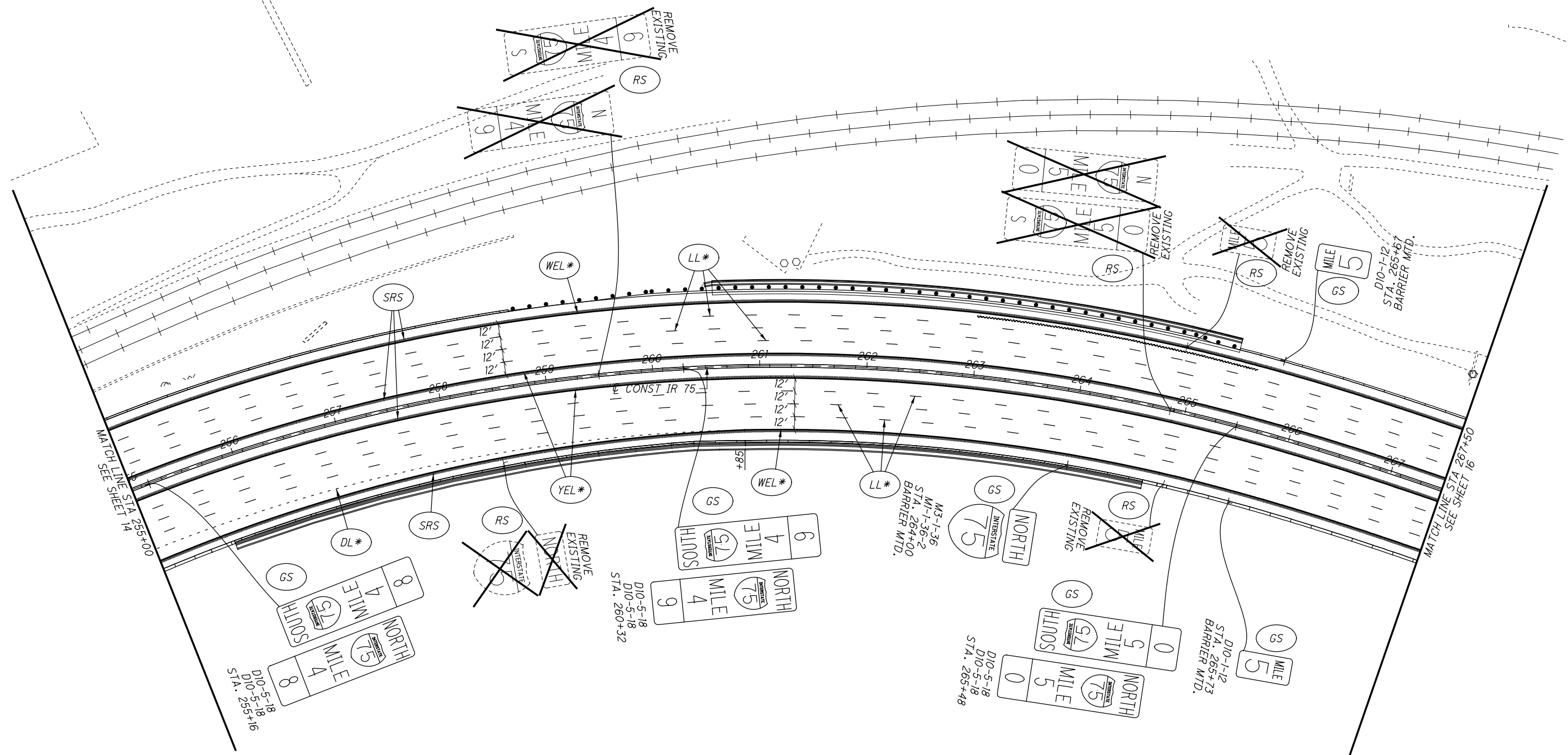
0 50 100
25
HORIZONTAL SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 242+50 TO STA. 255+00

HAM-75-3.84

14
106

FOR LEGEND, SEE SHEET 5



CALCULATED
 LZS
 CHECKED JS

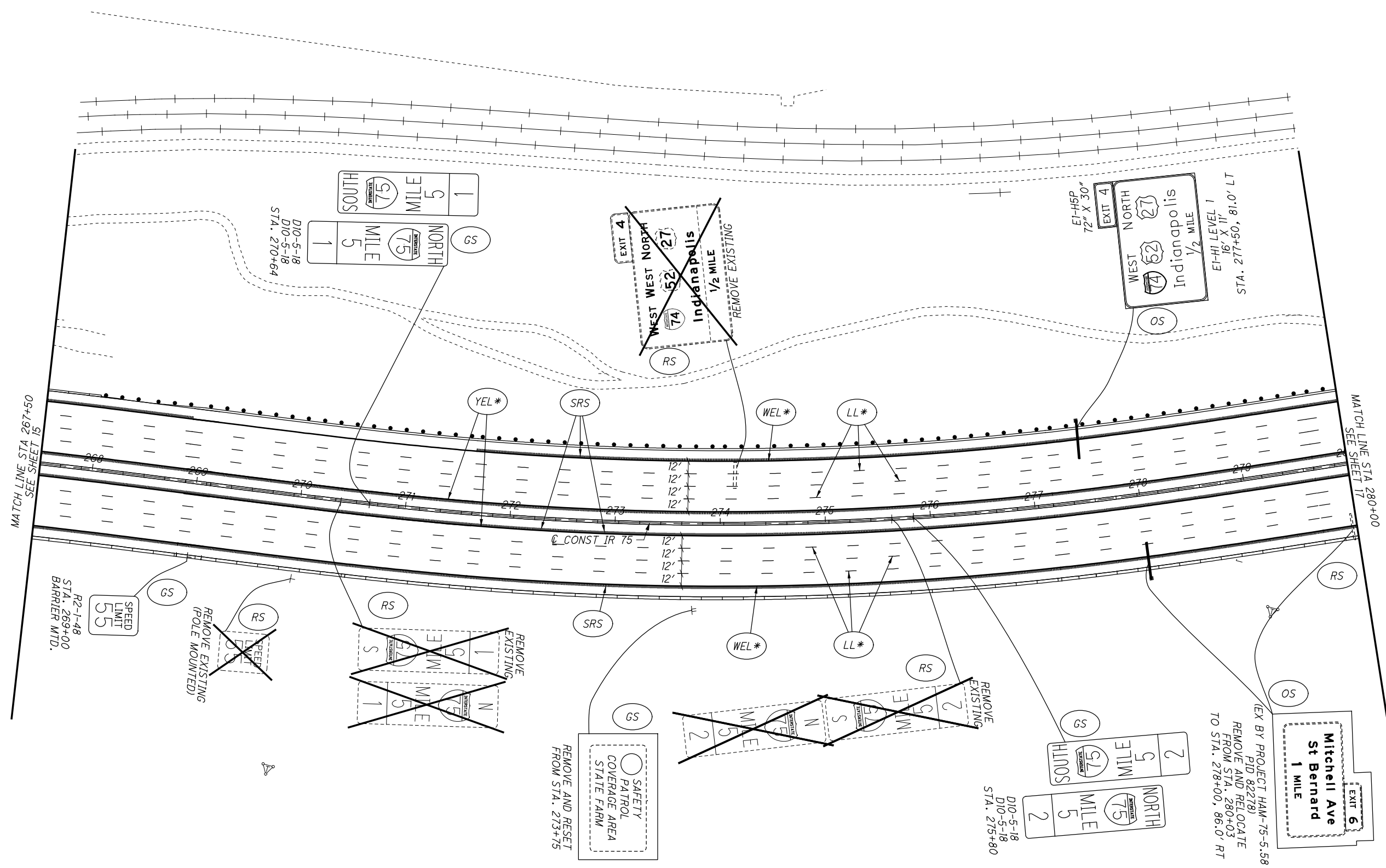
0 50 100
 HORIZONTAL
 SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 255+00 TO STA. 267+50

HAM-75-3.84

15
 106

FOR LEGEND, SEE SHEET 5



MATCH LINE STA 267+50
 SEE SHEET 15

MATCH LINE STA 280+00
 SEE SHEET 17

R2-1-48
 STA. 269+00
 BARRIER MTD.
 SPEED LIMIT 55

REMOVE EXISTING
 (POLE MOUNTED)

REMOVE EXISTING

REMOVE AND RESET
 FROM STA. 273+75

D10-5-18
 D10-5-18
 STA. 275+80

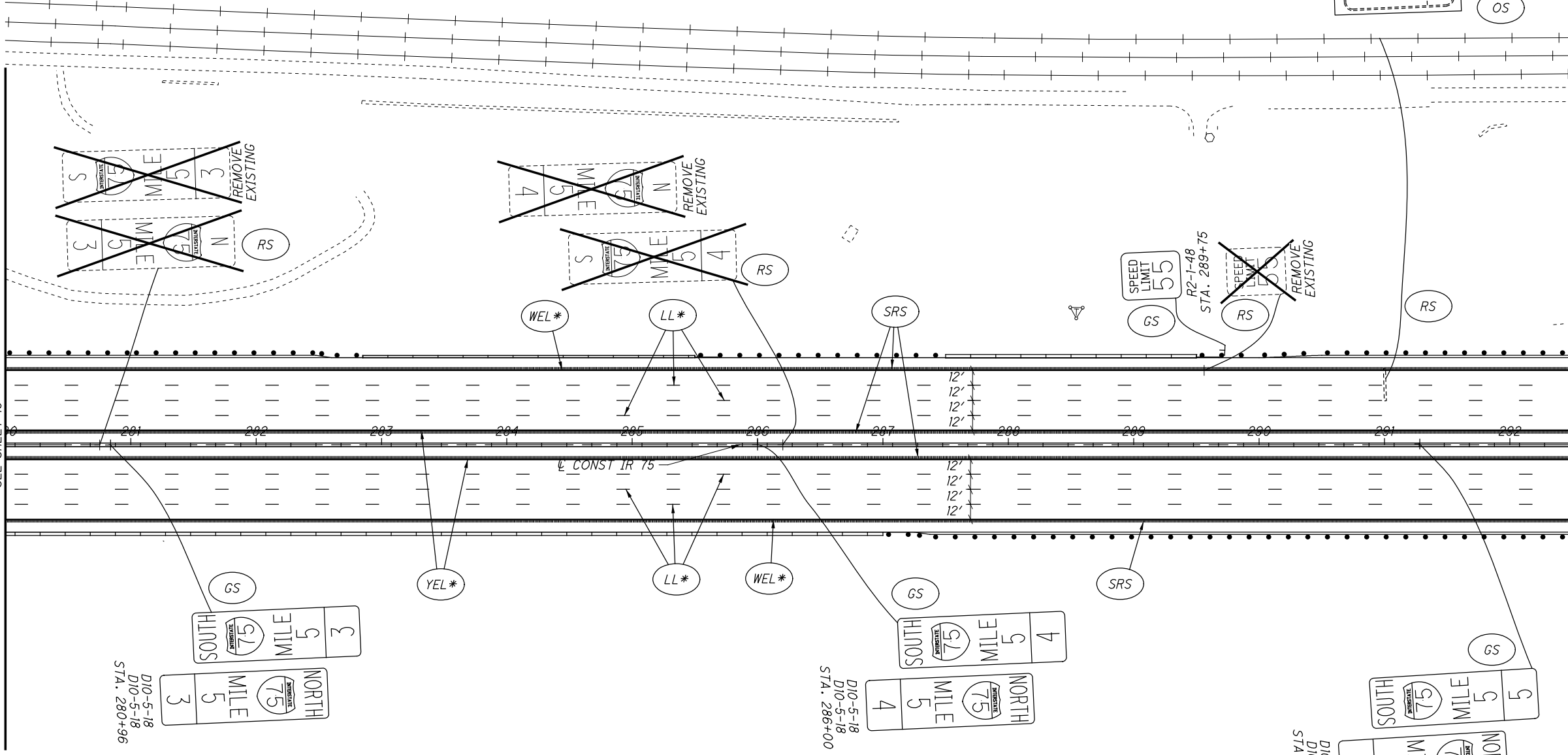
EX BY PROJECT HAM-75-5.58
 PID 822781
 REMOVE AND RELOCATE
 FROM STA. 280+03
 TO STA. 278+00, 86.0' RT

D10-5-18
 D10-5-18
 STA. 270+64

REMOVE EXISTING

ET-HSP
 72" X 30"
 EXIT 4
 NORTH
 WEST
 Indianapolis
 1/2 MILE
 ET-HI, LEVEL 1
 16" X 11"
 STA. 277+50, 81.0' LT

MATCH LINE STA 280+00
 SEE SHEET 16



MATCH LINE STA 292+50
 SEE SHEET 18

**EXISTING BY PROJECT HAM-75-5.58
 PID 82278
 REMOVE AND RELOCATE TO NEW SIGN SUPPORT AT STA. 302+00 FROM EXISTING AT STA. 291+00**

EXIT 4
WEST 74
NORTH 27
Indianapolis 1 MILE

GS

GS

**D10-5-18
 D10-5-18
 STA. 280+96**

SOUTH MILE 5 3
NORTH MILE 5 3

YEL*

LL*

WEL*

GS

**D10-5-18
 D10-5-18
 STA. 286+00**

SOUTH MILE 5 4
NORTH MILE 5 4

SRS

**D10-5-18
 D10-5-18
 STA. 291+28**

GS

SOUTH MILE 5 5
NORTH MILE 5 5

RS

REMOVE EXISTING

SOUTH MILE 5 5
NORTH MILE 5 5

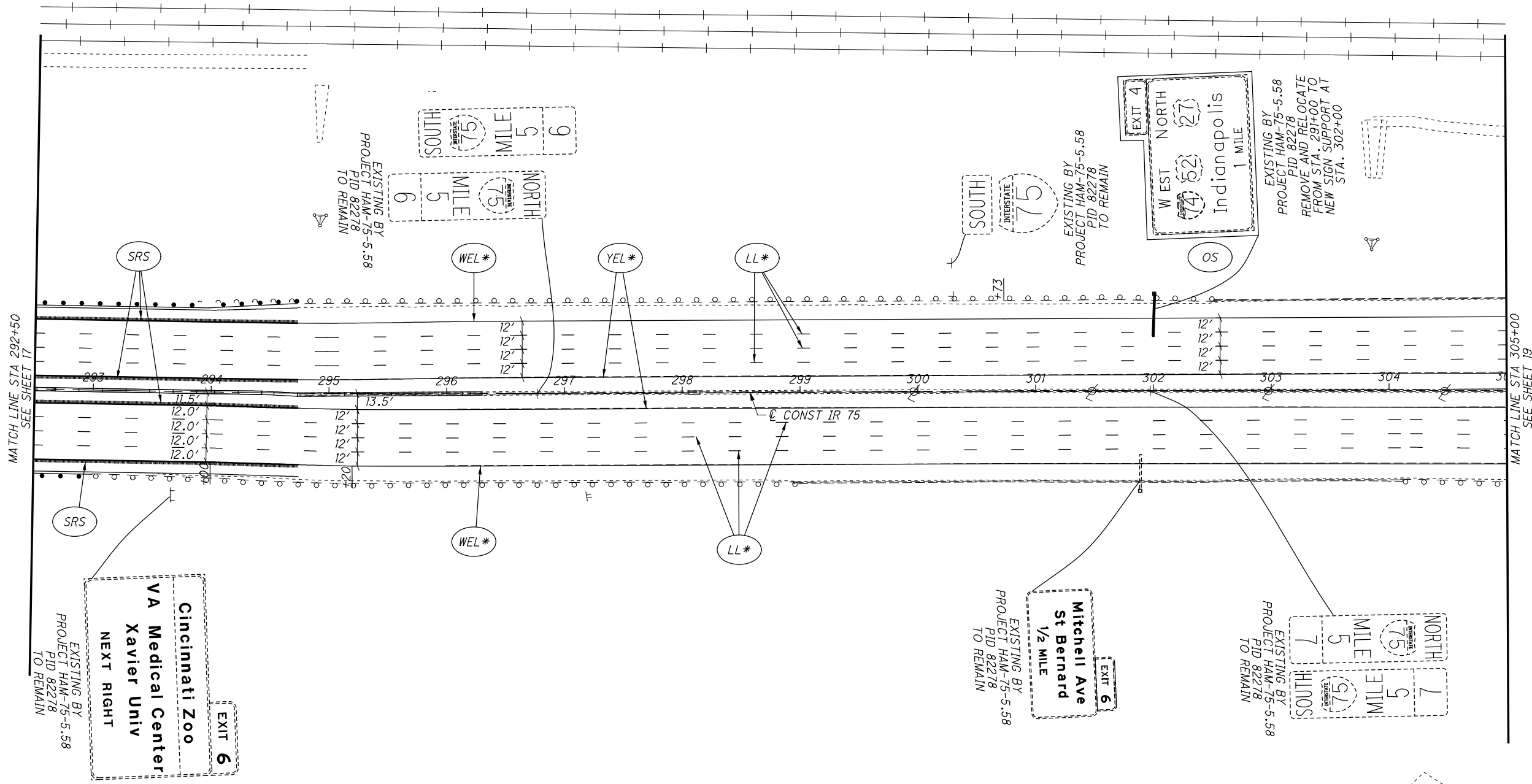
CALCULATED LZS CHECKED JS

0 50 100
 25
 HORIZONTAL SCALE IN FEET

17
106

**SIGNING & PAVEMENT MARKING PLAN - IR 75
 STA. 280+00 TO STA. 292+50**

HAM-75-3.84



MATCH LINE STA 292+50
 SEE SHEET 17

MATCH LINE STA 305+00
 SEE SHEET 19

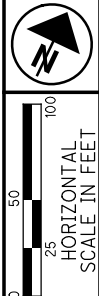
CALCULATED
 LZS
 CHECKED
 JS

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 292+50 TO STA. 305+00

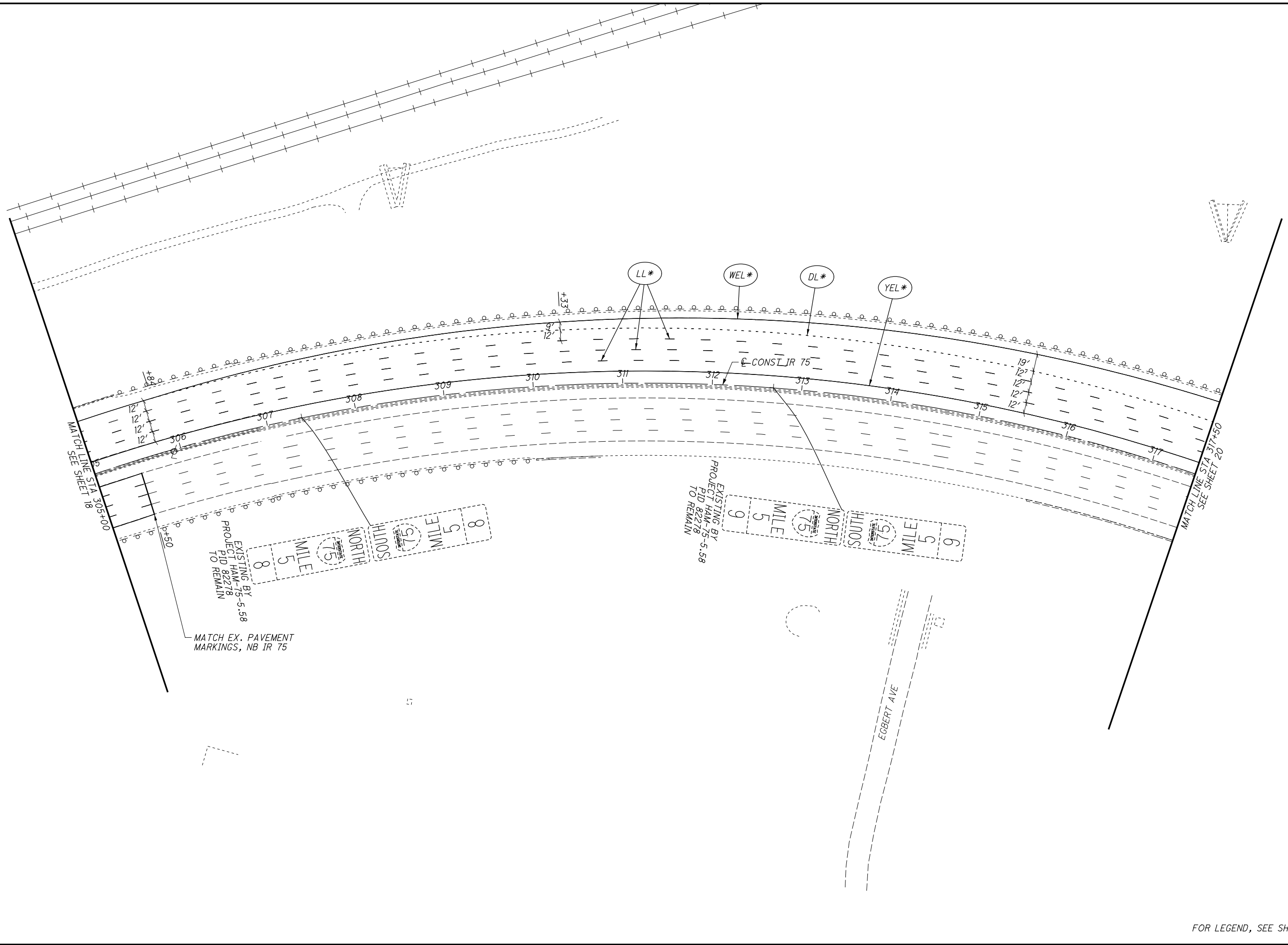
HAM-75-3.84

18
 106

FOR LEGEND, SEE SHEET 5



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CALCULATED LZS
CHECKED JS

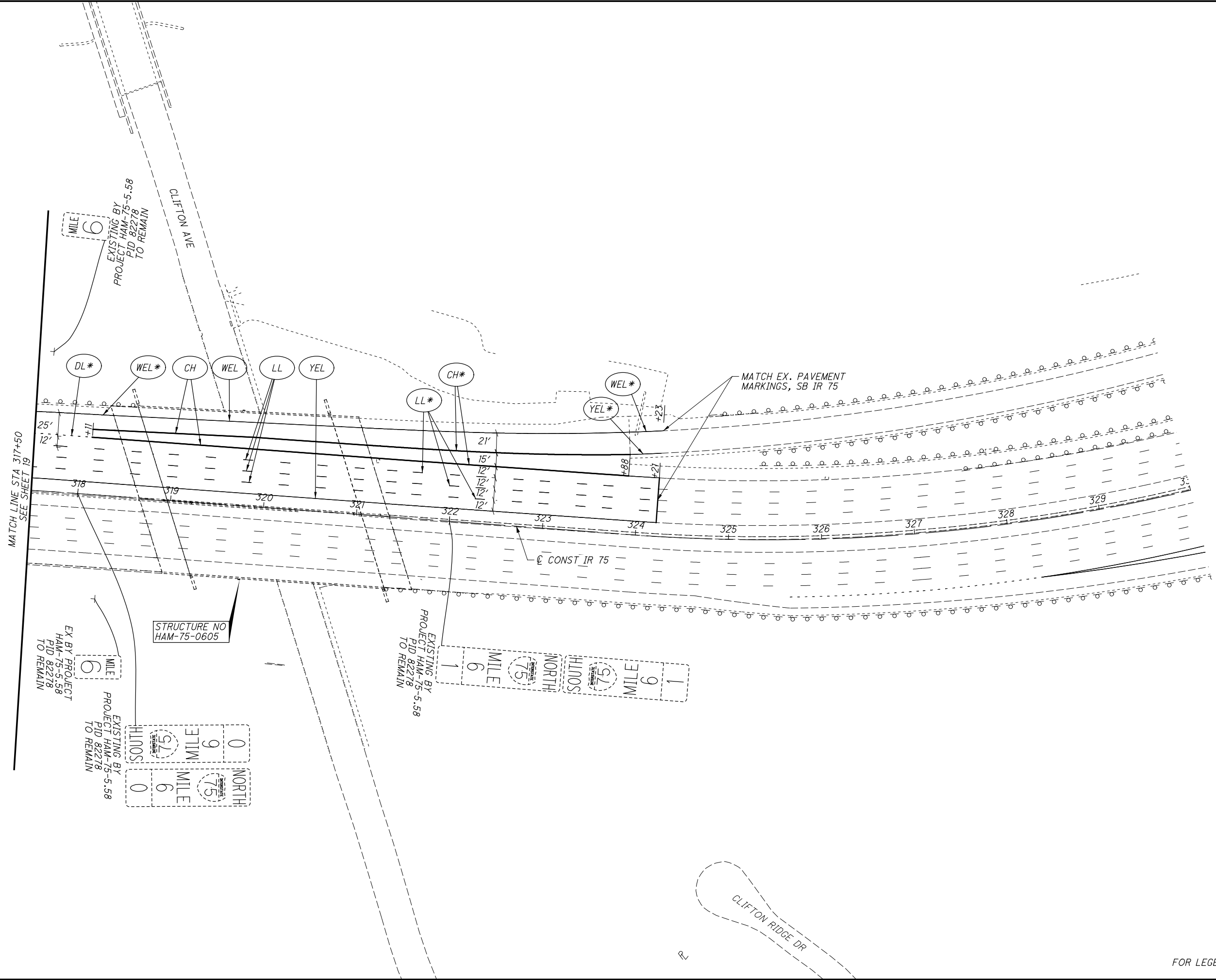
0 50 100
25
HORIZONTAL
SCALE IN FEET

SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 305+00 TO STA. 317+50

HAM-75-3.84

19
106

FOR LEGEND, SEE SHEET 5



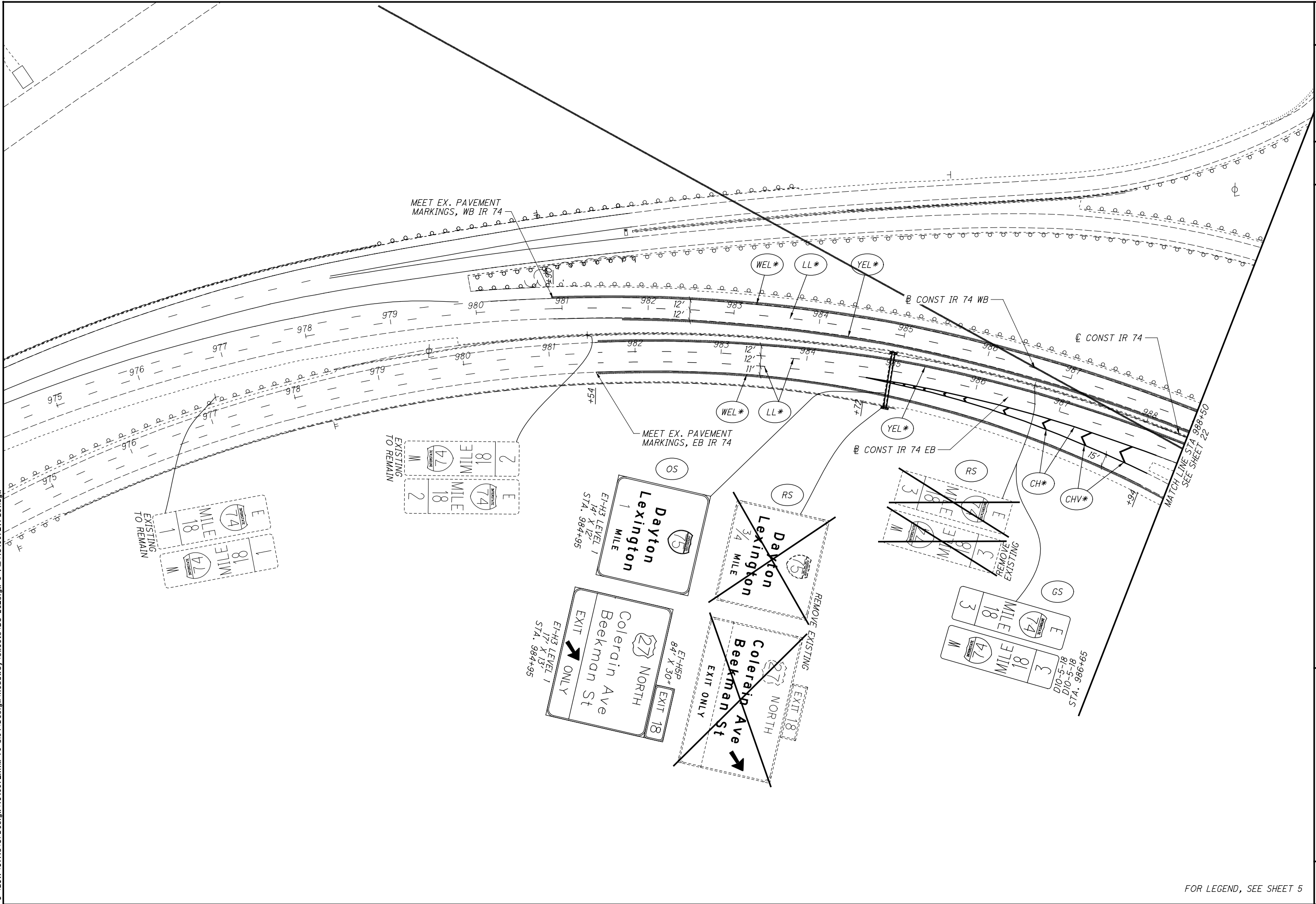
CALCULATED LZS CHECKED JS

**SIGNING & PAVEMENT MARKING PLAN - IR 75
STA. 317+50 TO STA. 330+00**

HAM-75-3.84

FOR LEGEND, SEE SHEET 5

20
106



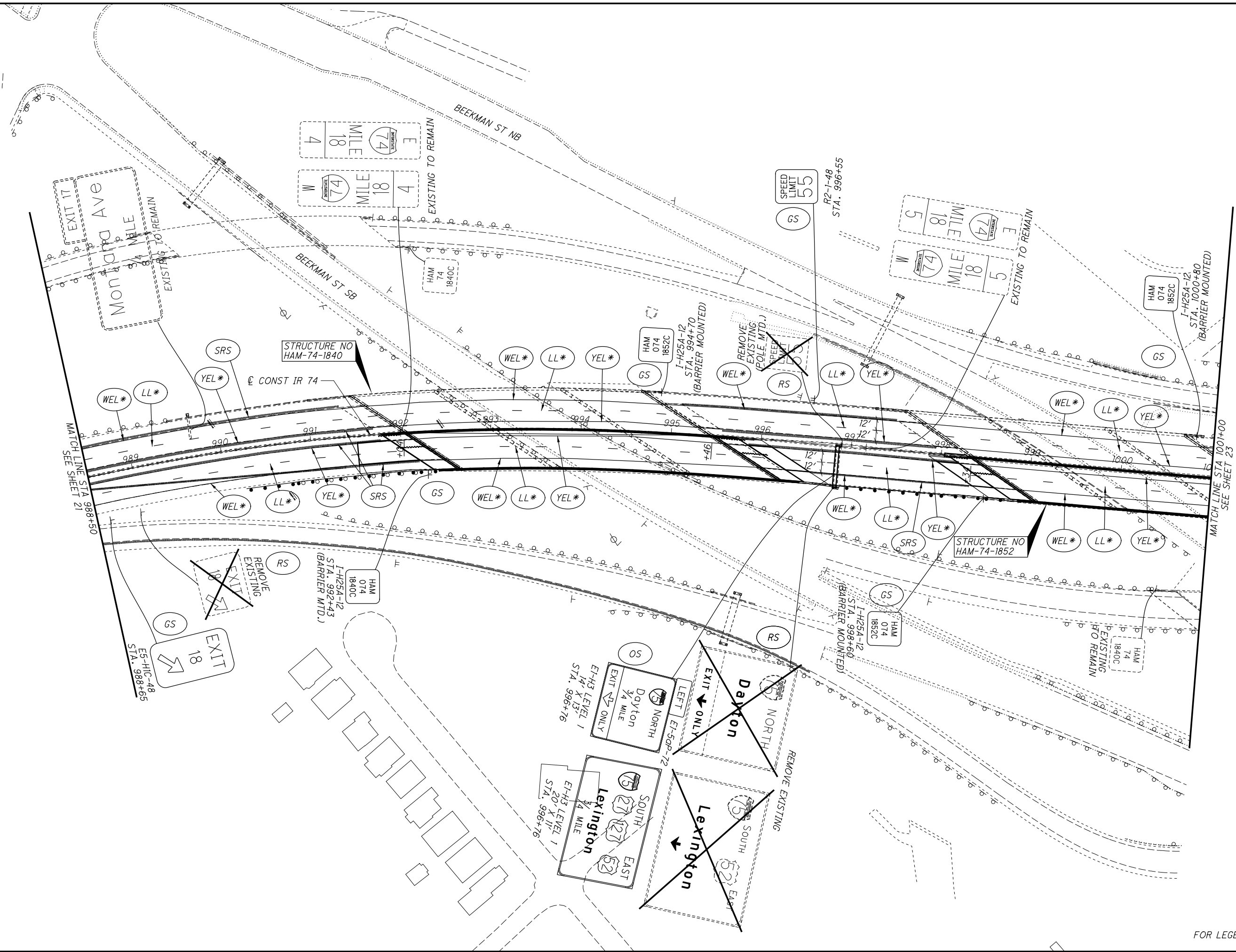
CALCULATED
 LZS
 CHECKED
 JS

0 50 100
 HORIZONTAL
 SCALE IN FEET

**SIGNING & PAVEMENT MARKING PLAN - IR 74
 STA 975+00 TO STA 988+50**

HAM-75-3.84

21
 106

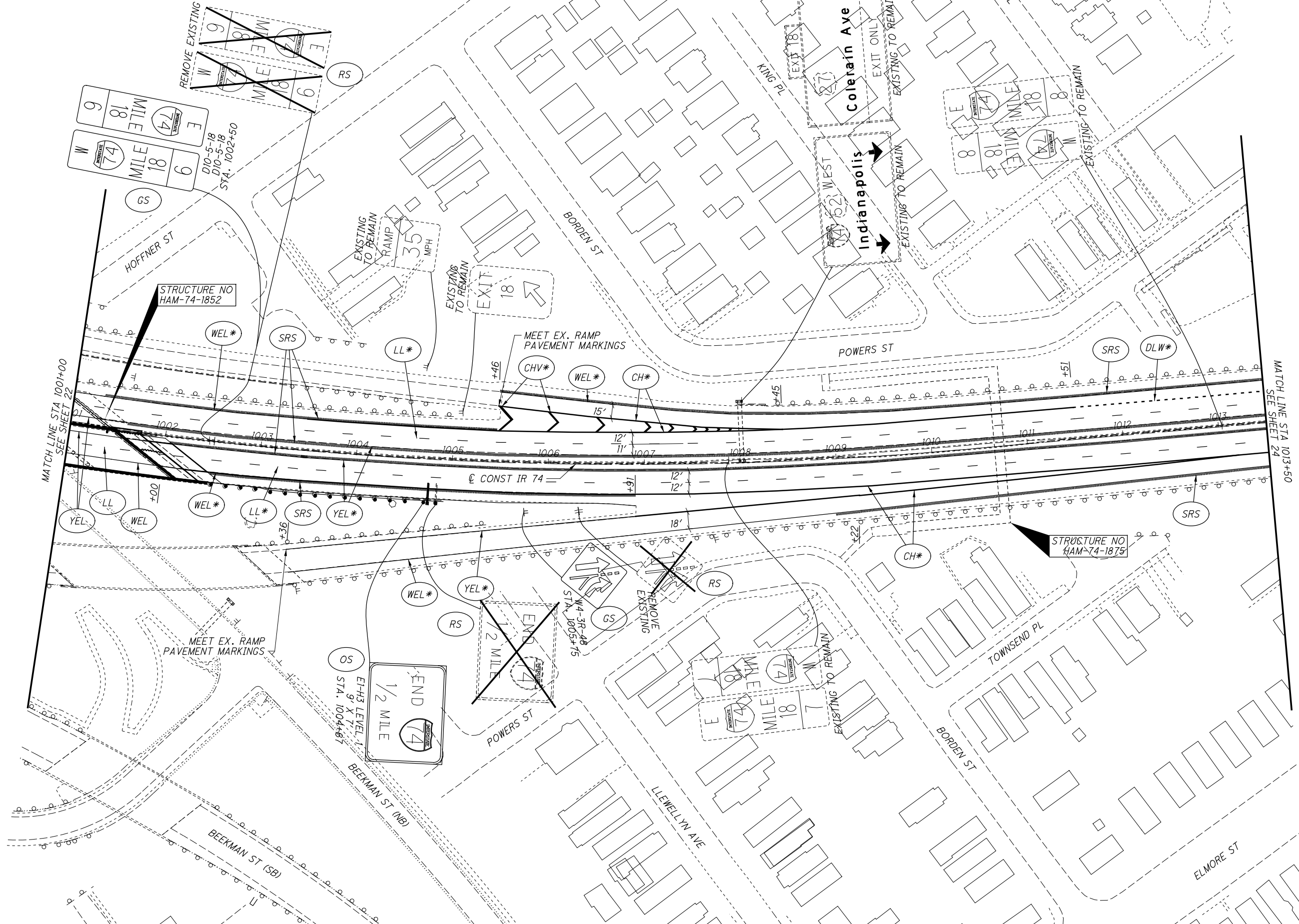


CALCULATED LZS CHECKED JS
SIGNING & PAVEMENT MARKING PLAN - IR 74
STA 988+50 TO STA 1001+00

HAM-75-3.84
22
106

FOR LEGEND, SEE SHEET 5

FOR LEGEND, SEE SHEET 5



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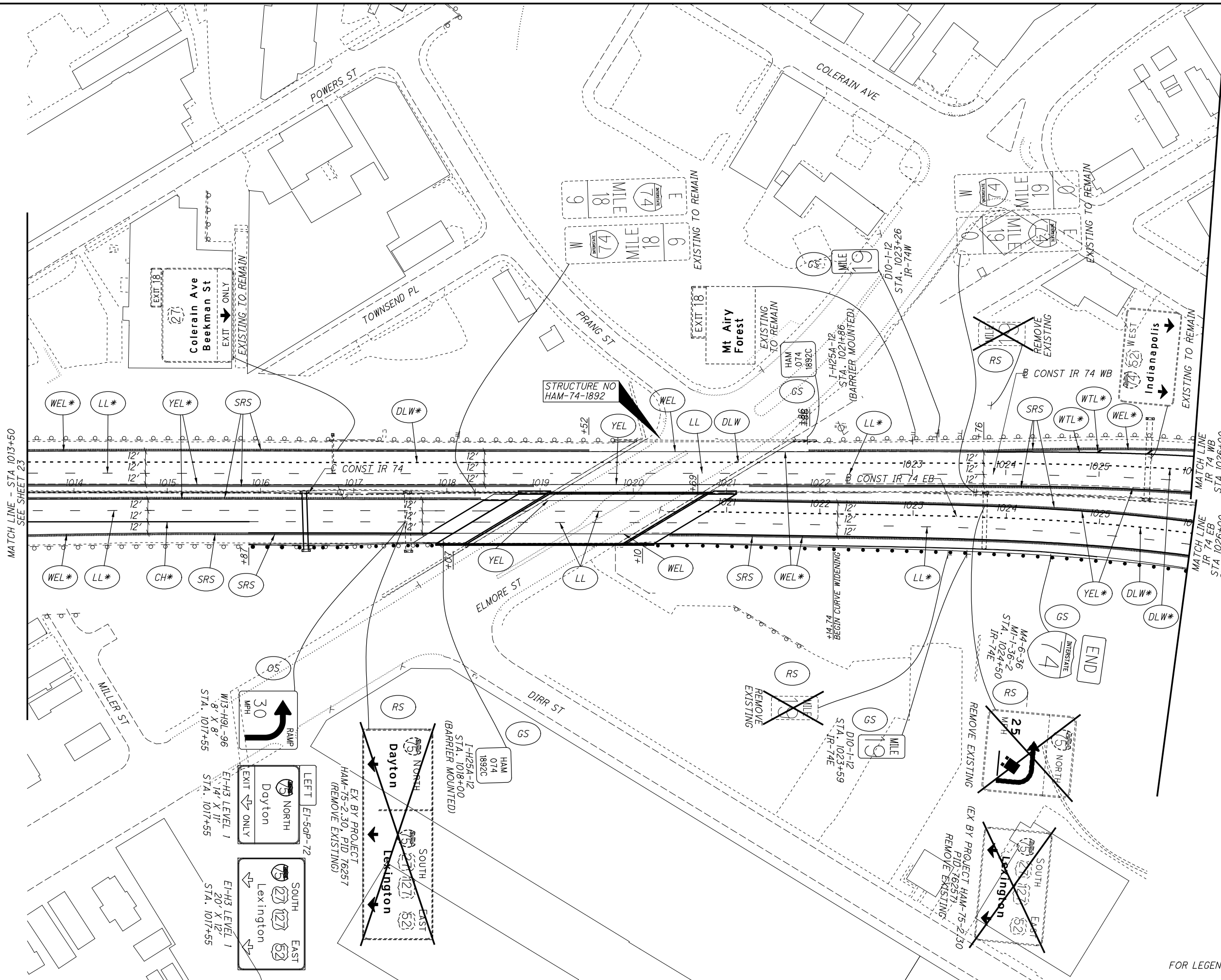
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 CHECKED JS

SIGNING & PAVEMENT MARKING PLAN - IR 74

HAM-75-3.84

STA 1001+00 TO STA 1013+50

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MATCH LINE - STA 1013+50
 SEE SHEET 23

MATCH LINE
 IR 74 WB
 STA 1026+00
 SEE SHEET 25

MATCH LINE
 IR 74 EB
 STA 1026+00
 SEE SHEET 25

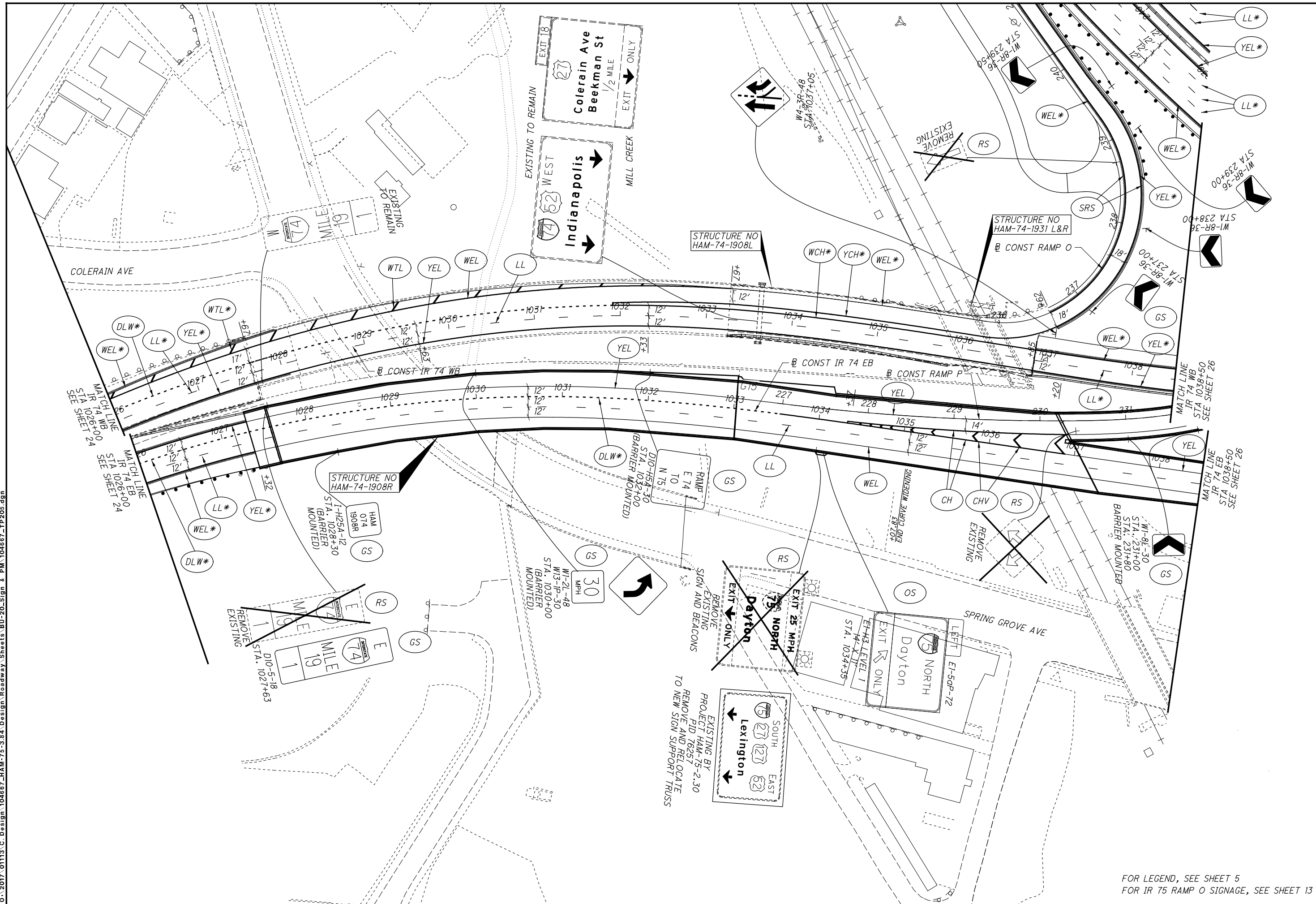


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SIGNING & PAVEMENT MARKING PLAN - IR 74
STA 1013+50 TO STA 1026+00

HAM-75-3.84
 24
 106

FOR LEGEND, SEE SHEET 5

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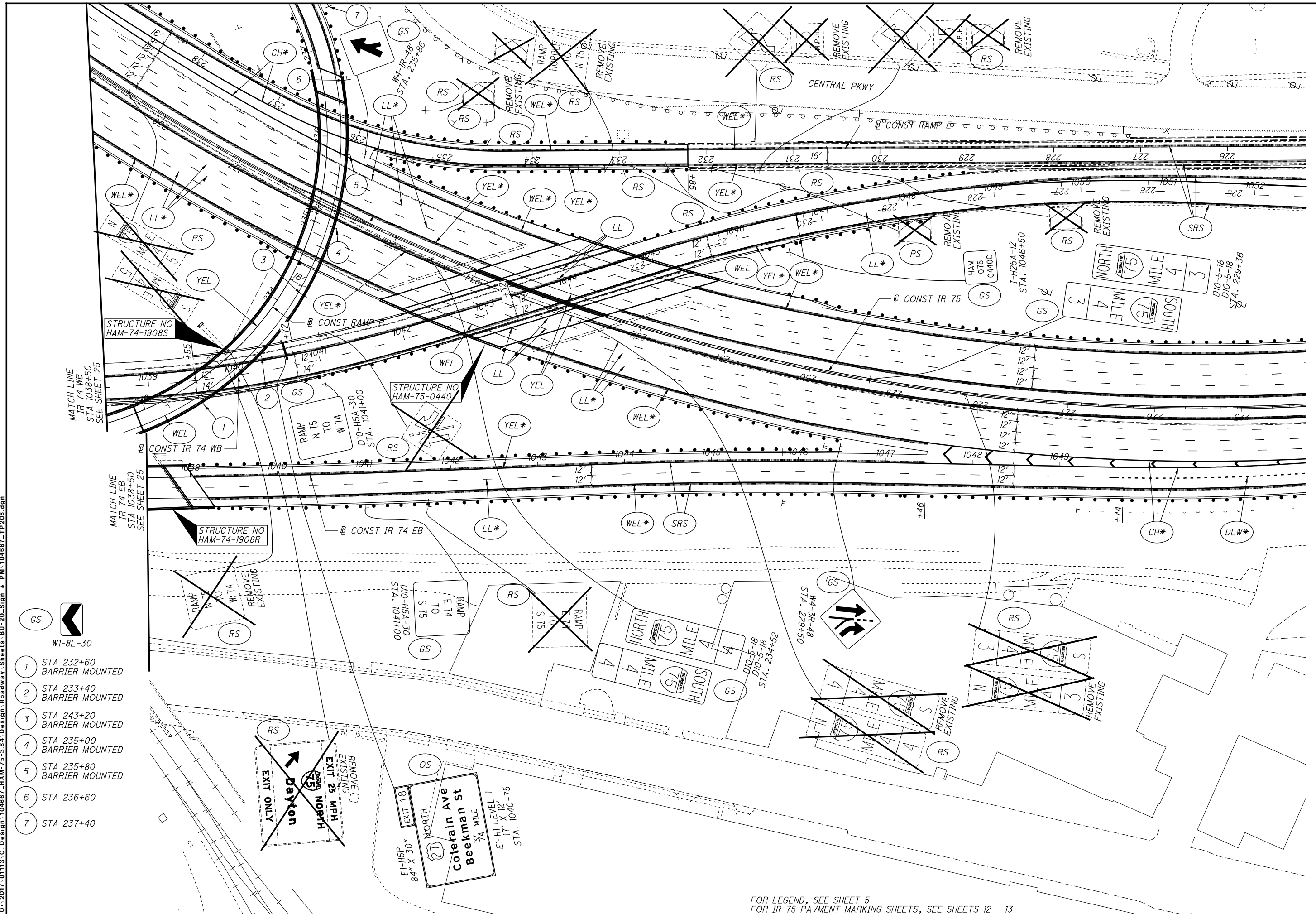


FOR LEGEND, SEE SHEET 5
FOR IR 75 RAMP O SIGNAGE, SEE SHEET 13

CALCULATED		LZS		CHECKED		JS	
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HORIZONTAL		SCALE		IN FEET			
SIGNING & PAVEMENT MARKING PLAN - IR 74							25
STA 1026+00 TO STA 1038+50							106
HAM-75-3.84							

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- GS W1-8L-30
- 1 STA 232+60 BARRIER MOUNTED
- 2 STA 233+40 BARRIER MOUNTED
- 3 STA 243+20 BARRIER MOUNTED
- 4 STA 235+00 BARRIER MOUNTED
- 5 STA 235+80 BARRIER MOUNTED
- 6 STA 236+60
- 7 STA 237+40

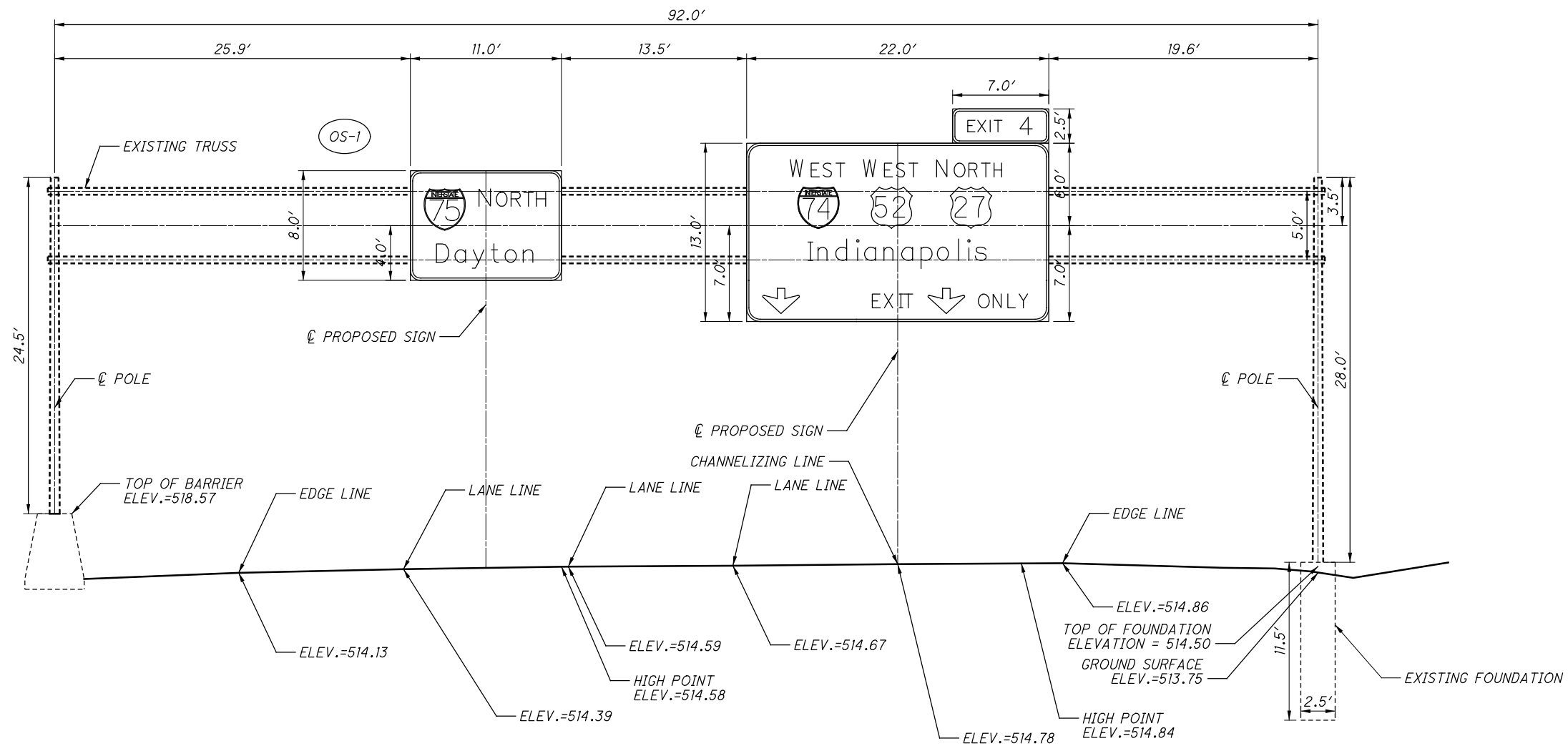


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SIGNING & PAVEMENT MARKING PLAN - IR 74
STA 1038+50 TO STA 1049+74

HAM-75-3.84
 26
 106

FOR LEGEND, SEE SHEET 5
 FOR IR 75 PAVMENT MARKING SHEETS, SEE SHEETS 12 - 13

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OVERHEAD SIGN SUPPORT (OS-1)

STA. 195+50.00, IR 75 NB
 EXISTING TYPE TC-7.65 DESIGN 8 WITH 5' BOX TRUSS, 92' SPAN
 EXISTING SIGN AREA = 267.0 SF, PROPOSED SIGN AREA = 88.0 SF
 TOTAL SIGN AREA = 355.0 SF
 LEVEL 1

CALCULATED
CML
CHECKED
JS

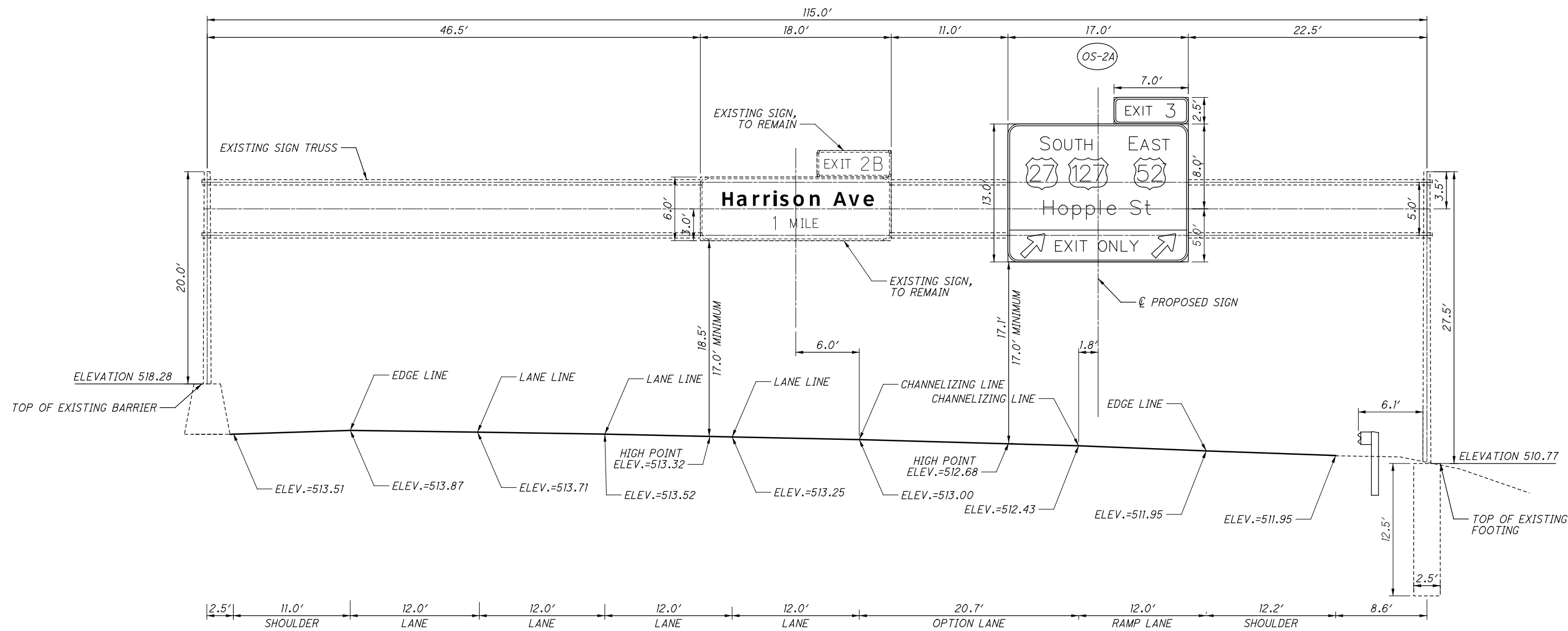
SIGN ELEVATION IR 75

HAM-75-3.84

27

106

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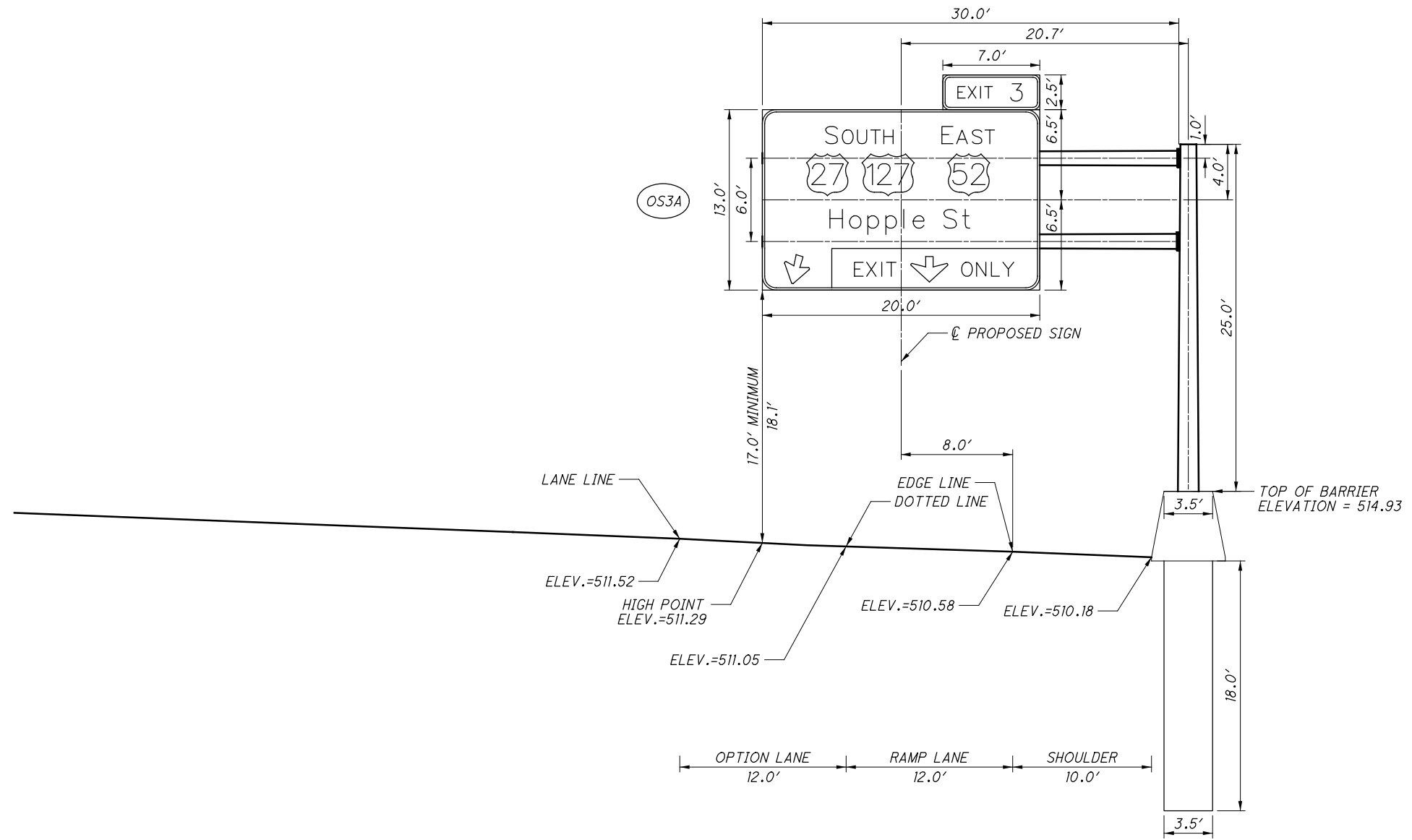
OVERHEAD SIGN SUPPORT (OS-2)

STA. 196+00.00, IR 75 SB
 USE EXISTING SIGN TRUSS
 TYPE TC-15.115 WITH 5' BOX TRUSS, 115' SPAN
 EXISTING SIGN AREA = 125.5 SF, PROPOSED SIGN AREA = 238.5 SF
 TOTAL SIGN AREA = 364.0 SF
 LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 75

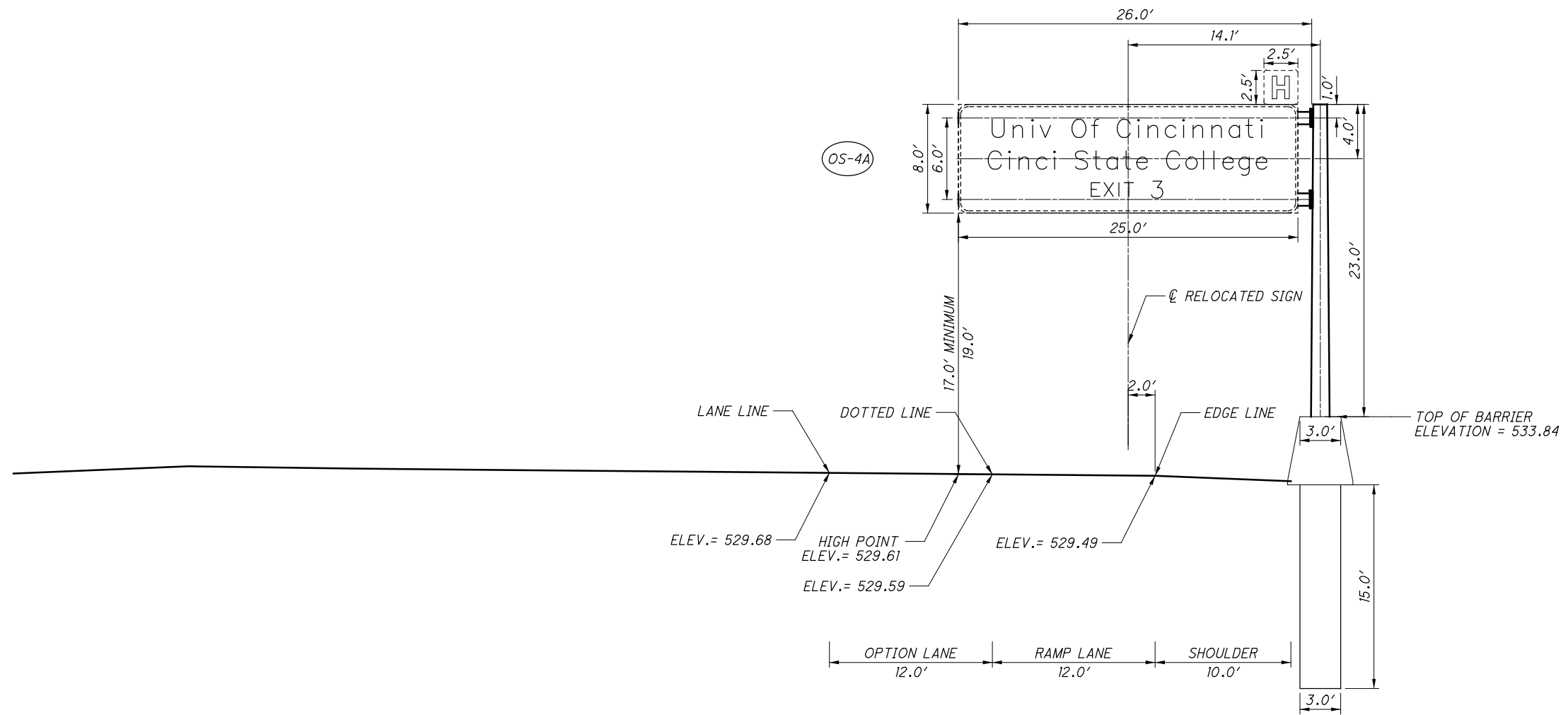
HAM-75-3.84



OVERHEAD SIGN SUPPORT (OS-3)

STA. 204+00.00, IR 75 SB
 TYPE TC-12.30 WITH TRUSS, DESIGN 12
 MOMENT ARM = 20.7', TOTAL ARM = 30.0'
 PROPOSED SIGN AREA = 277.5 SF LEVEL 1

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OVERHEAD SIGN SUPPORT (OS-4)

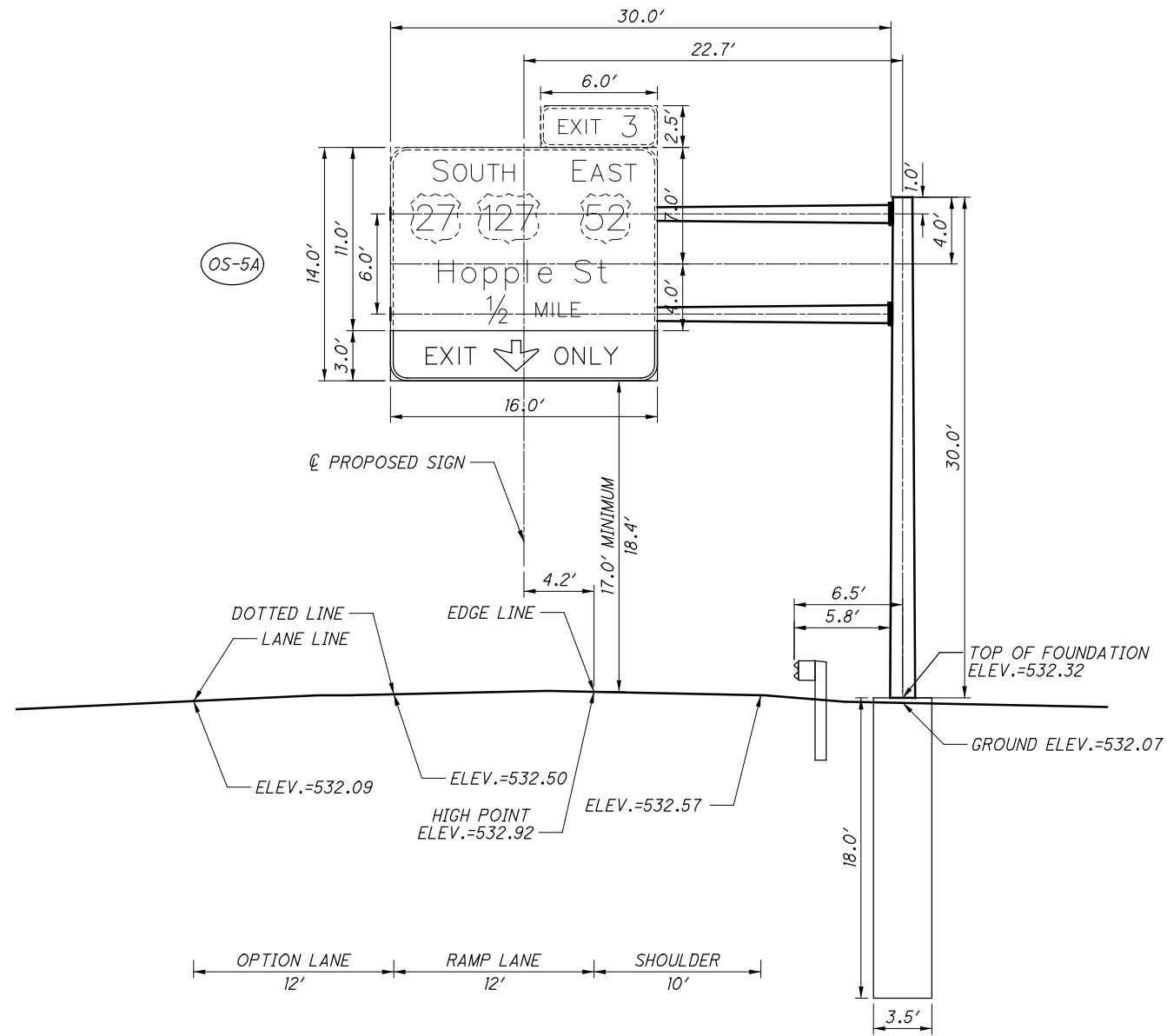
STA. 213+15.00, IR 75 SB
 TYPE TC-12.30 WITH TRUSS, DESIGN 9
 MOMENT ARM = 14.1', TOTAL ARM = 26.0'
 EXISTING SIGN AREA = 206.25 SF LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 75

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OVERHEAD SIGN SUPPORT (OS-5)

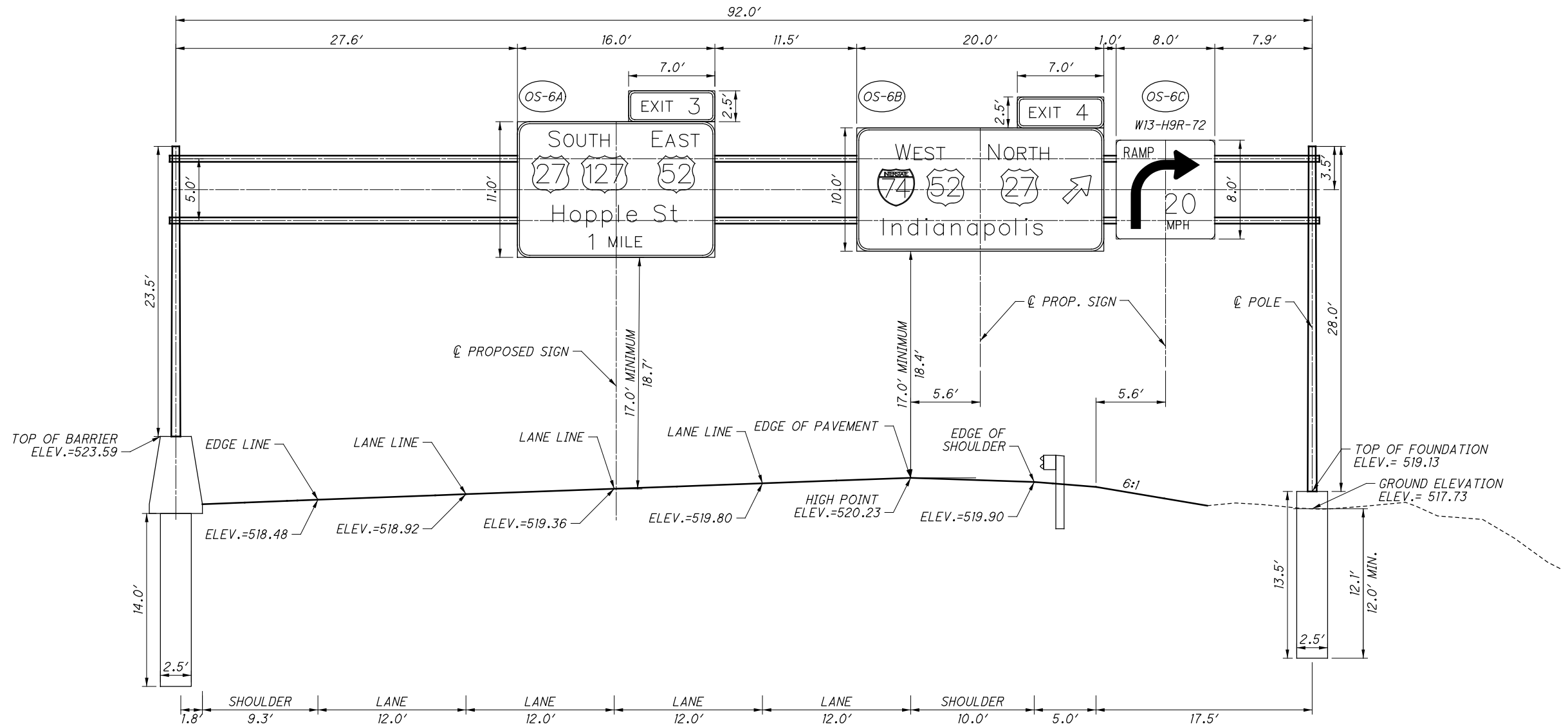
STA. 220+00.00, IR 75 SB
 TYPE TC-12.30 WITH TRUSS, DESIGN 12
 MOMENT ARM = 22.7', TOAL ARM = 30.0'
 EXISTING SIGN AREA = 191.0 SF, PROPOSED SIGN AREA = 48.0 SF
 TOTAL SIGN AREA = 239.0 SF LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 75

HAM-75-3.84

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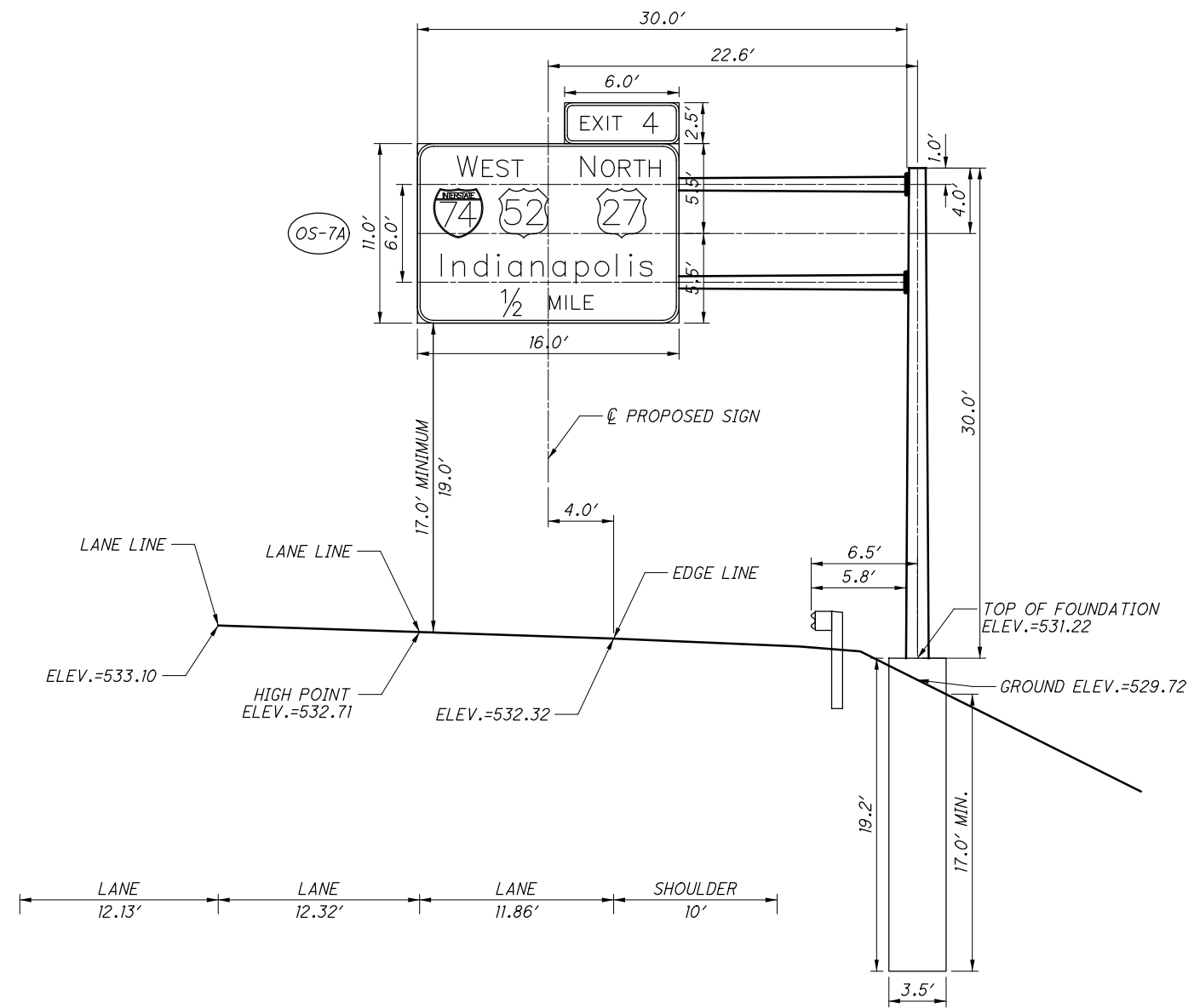
OVERHEAD SIGN SUPPORT (OS-6)
 STA. 251+25.00, IR 75 SB
 TYPE TC-15.115 WITH 5' BOX TRUSS, 92.0' SPAN
 PROPOSED SIGN AREA = 475.0 SF
 (DESIGN SIGN AREA = 5 LANES X 120 SF = 600.0 SF)
 LEVEL 1

CALCULATED
CML
CHECKED
JS

SIGN ELEVATION IR 75

HAM-75-3.84

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OVERHEAD SIGN SUPPORT (OS-7)

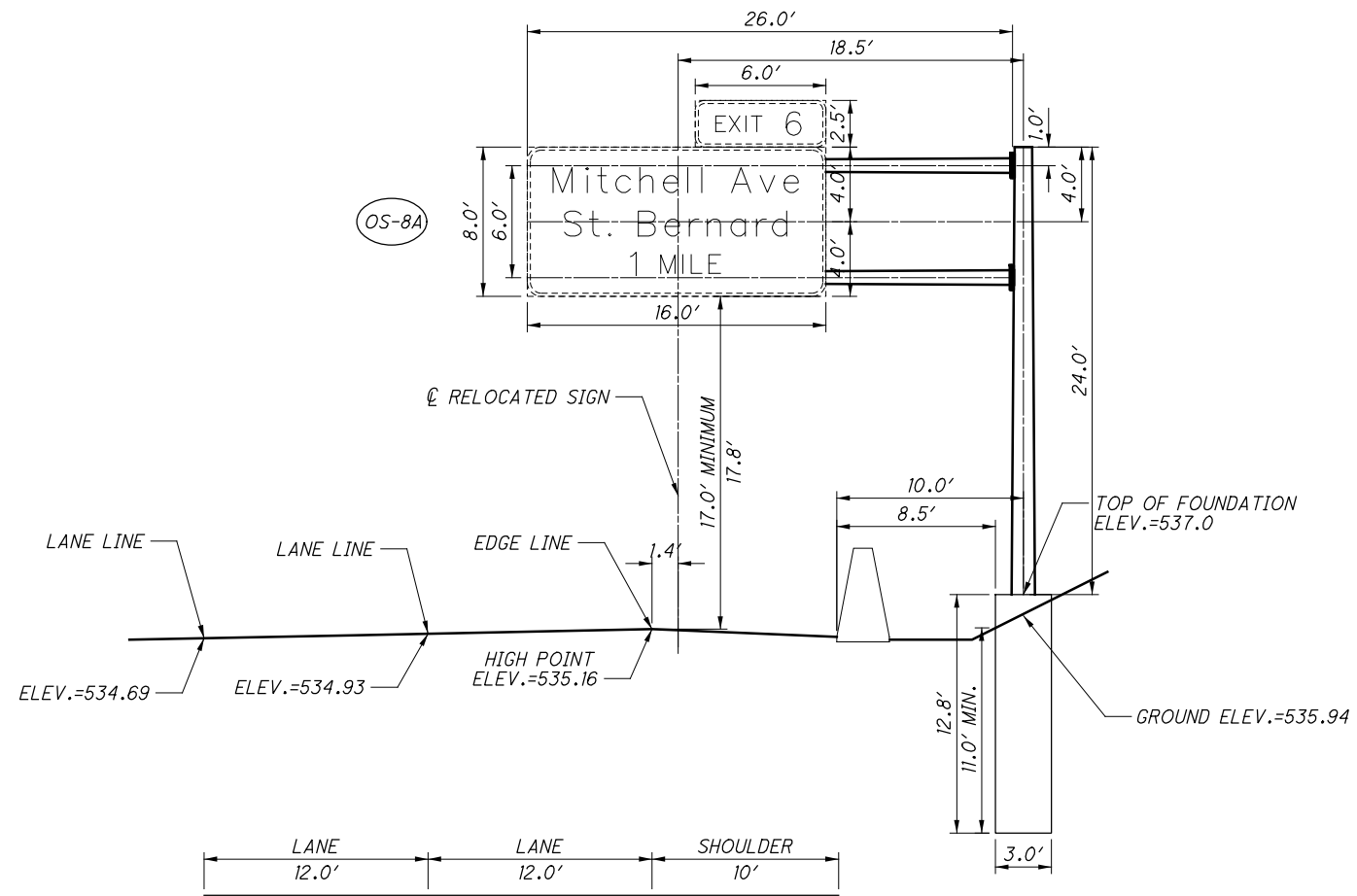
STA. 277+50.00, IR 75 SB
 TYPE TC-12.30 WITH TRUSS, DESIGN 10
 MOMENT ARM = 22.6', TOTAL ARM = 30.0'
 PROPOSED SIGN AREA = 191.0 SF LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 75

HAM-75-3.84

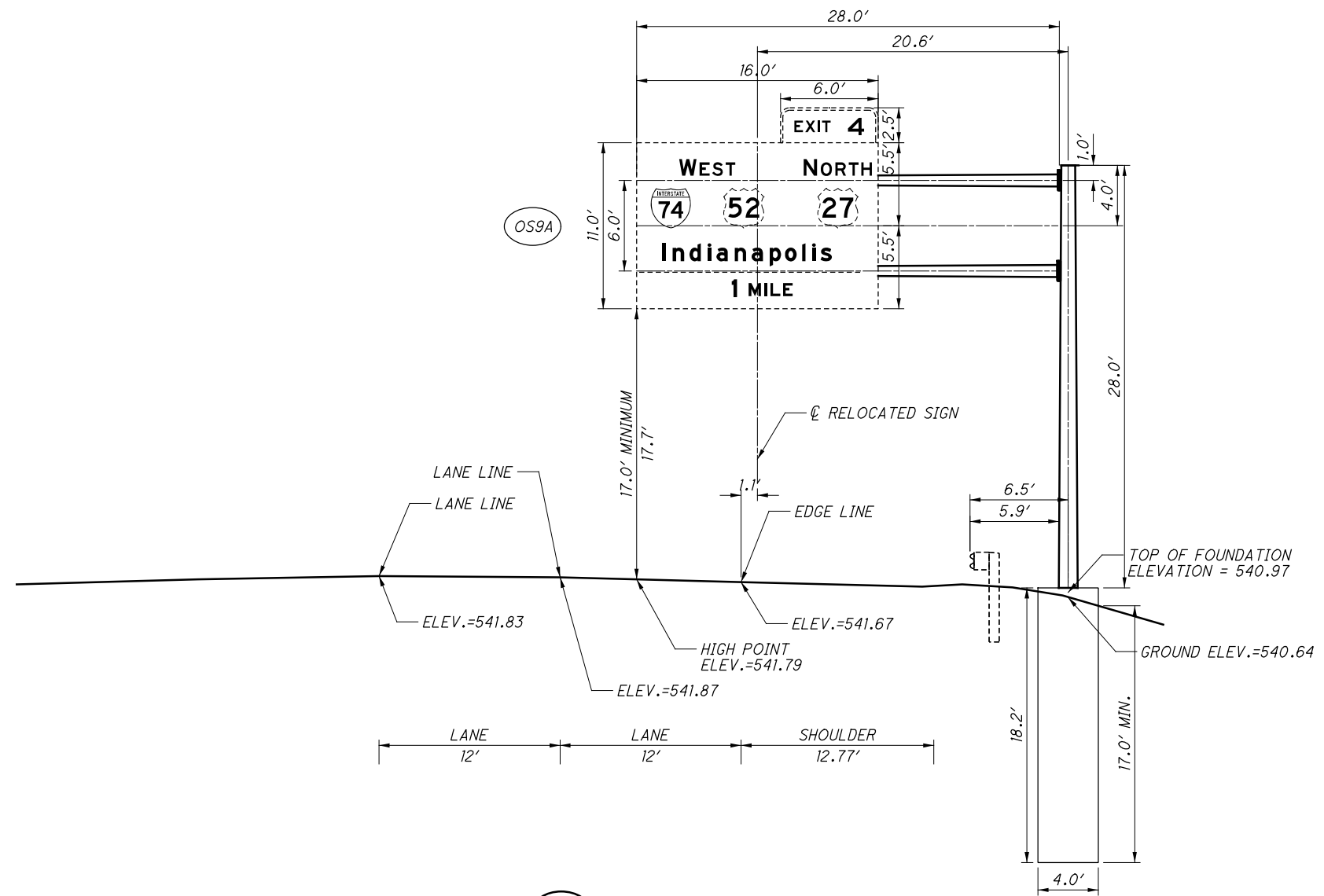
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OVERHEAD SIGN SUPPORT (OS-8)

STA. 278+00.00, IR 75 NB
TYPE TC-12.30 WITH TRUSS, DESIGN 6
MOMENT ARM = 18.5', TOTAL ARM = 26.0'
PROPOSED SIGN AREA = 143.0 SF LEVEL 1

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OVERHEAD SIGN SUPPORT (OS-9)

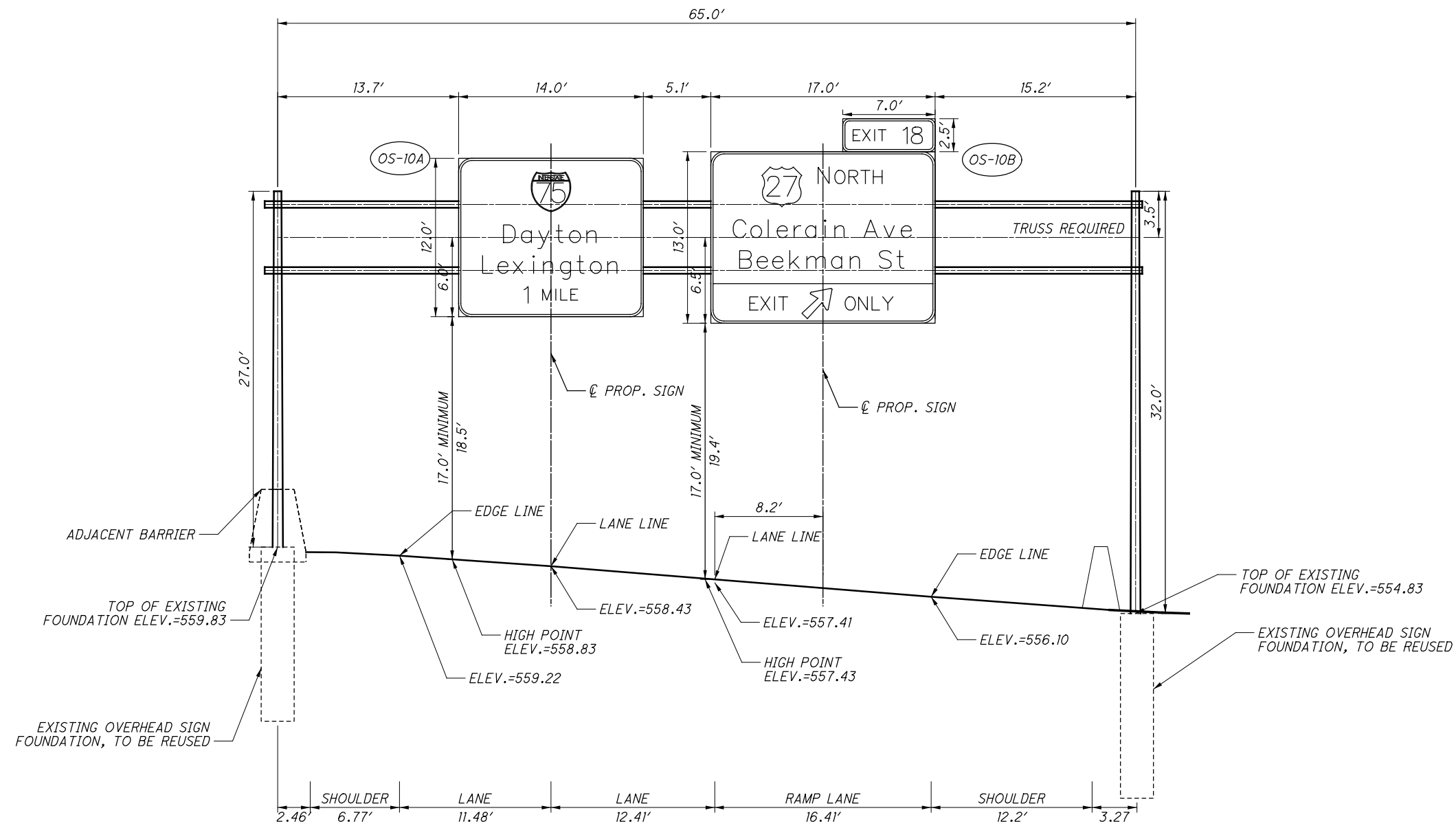
STA. 302+00.00, IR 75 SB
 TYPE TC-12.30 WITH TRUSS, DESIGN 10
 MOMENT ARM = 20.6', TOTAL ARM = 28.0'
 EXISTING SIGN AREA = 191.0 SF LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 75

HAM-75-3.84

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OVERHEAD SIGN SUPPORT (OS-10)

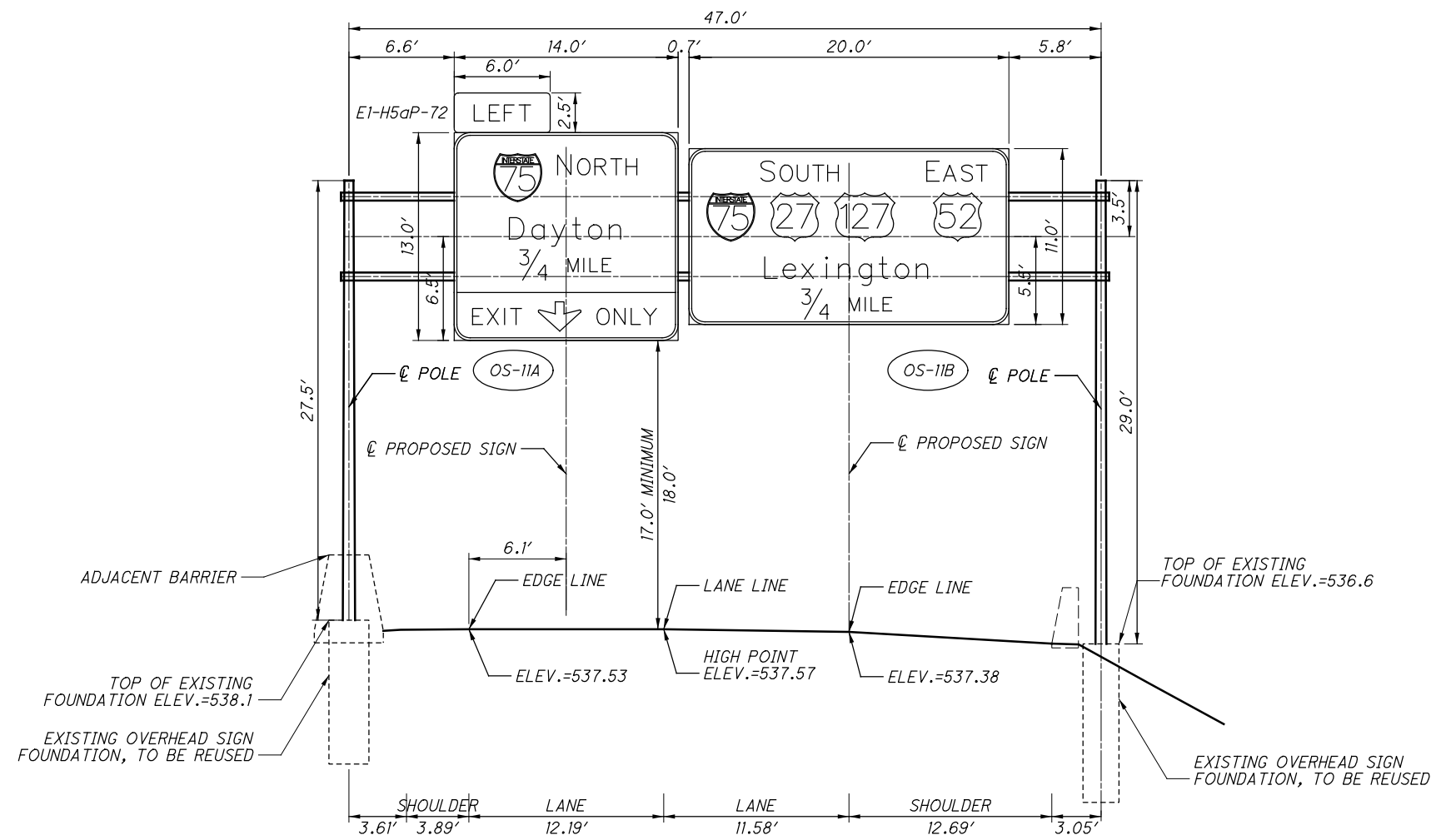
STA. 984+95, IR 74 EB
TRUSS TYPE TC-7.65 WITH 5' BOX TRUSS, 65.0' SPAN
PROPOSED SIGN AREA = 406.5 SF
LEVEL 1

CALCULATED
CML
CHECKED
JS

SIGN ELEVATION IR 74

HAM-75-3.84

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OVERHEAD SIGN SUPPORT (OS-11)

STA. 996+76.00, IR 74 EB
 TRUSS TYPE TC-7.65 DESIGN 8 WITH 5' BOX TRUSS, 47.0' SPAN
 PROPOSED SIGN AREA = 417.0 SF
 LEVEL 1

CALCULATED	
CML	
CHECKED	JS

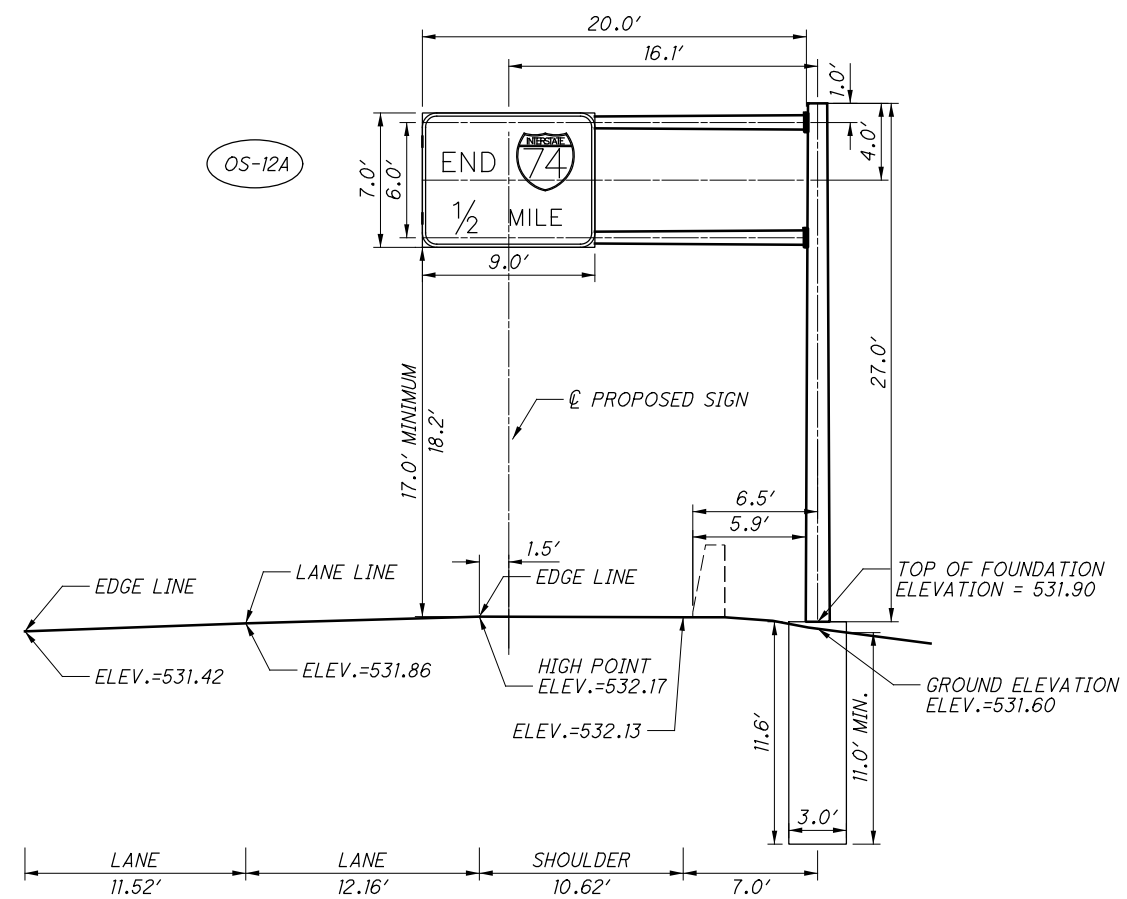
SIGN ELEVATION IR 74

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OVERHEAD SIGN SUPPORT (OS-12)

STA. 1004+67.00, IR 74 EB
 TC-12.30 WITH TRUSS, DESIGN 5
 MOMENT ARM = 16.1', TOTAL ARM = 20.0'
 PROPOSED SIGN AREA = 63.0 SF
 DESIGN SIGN AREA = 120.0 SF MIN.
 LEVEL 1

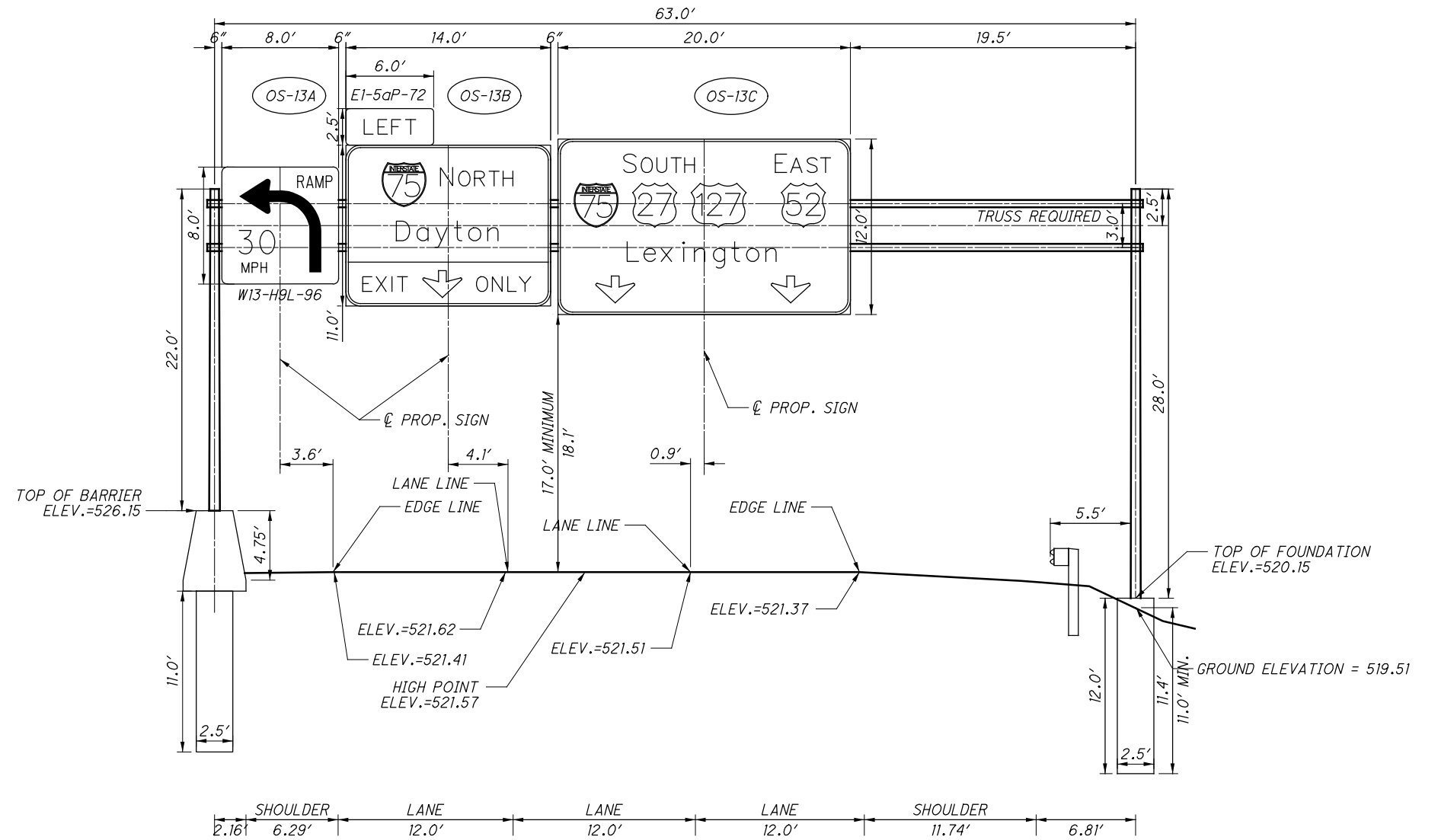


CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 74

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OVERHEAD SIGN SUPPORT (OS-13)

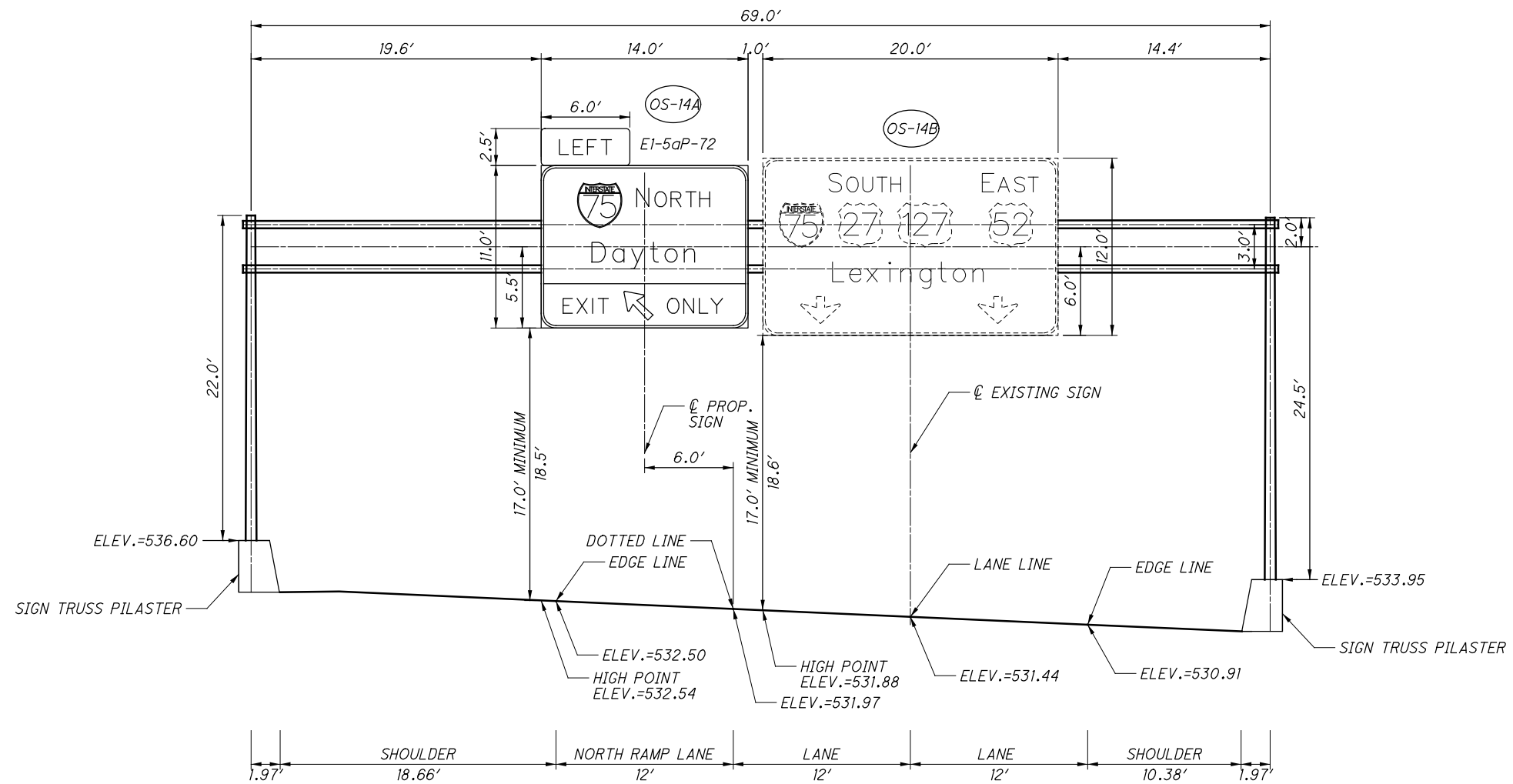
STA. 1016+49.00, IR 74 EB
 TYPE TC-7.65 WITH 3' BOX TRUSS, DESIGN 6 63.0' SPAN
 PROPOSED SIGN AREA = 473.0 SF
 LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 74

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OVERHEAD SIGN SUPPORT (OS-14)

STA. 1033+00.00, IR 74 EB
 TYPE TC-7.65 WITH 3' BOX TRUSS, DESIGN 6 69.0' SPAN
 EXISTING SIGN AREA = 240.0 SF, PROPOSED SIGN AREA = 169.0 SF
 TOTAL SIGN AREA = 409.0 SF
 LEVEL 1

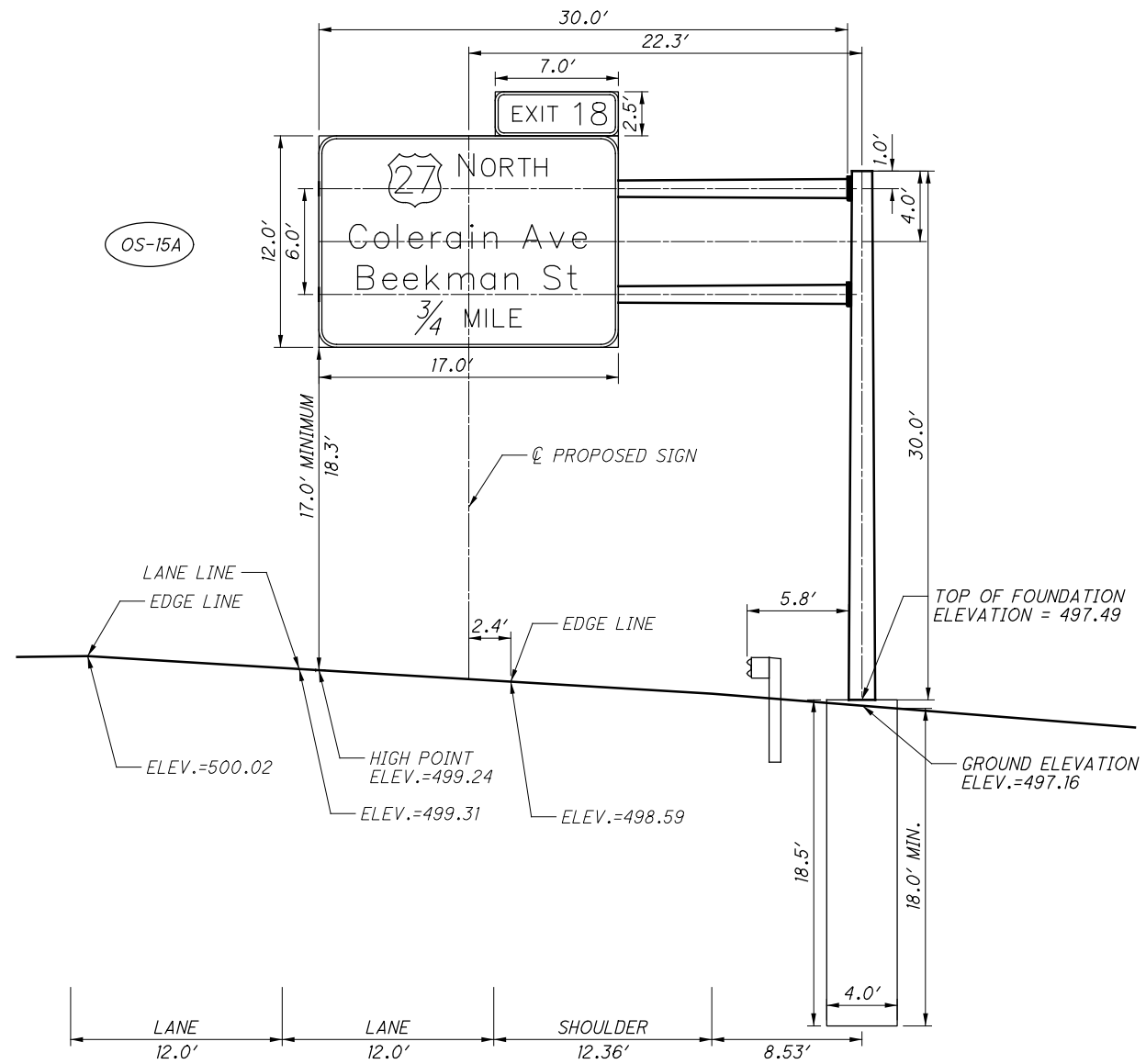
APPROVED FOR CONSTRUCTION - ##/##/####

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SIGN ELEVATION IR 74

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CHECKED	JS

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OVERHEAD SIGN SUPPORT OS-15

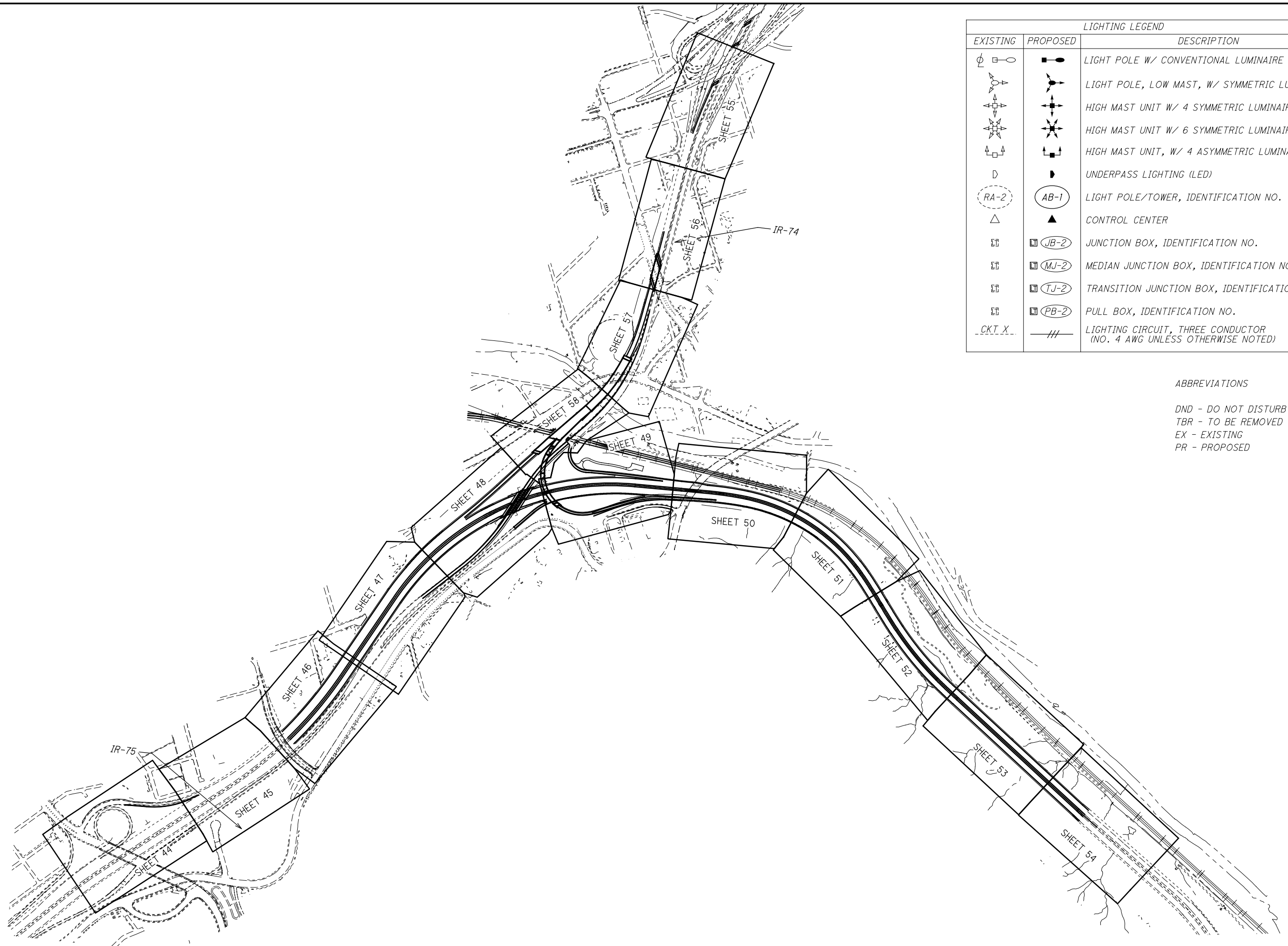
STA. 1040+75.00, IR 74 WB
 TYPE TC-12.30 WITH TRUSS, DESIGN 12
 MOMENT ARM = 22.3', PROPOSED SIGN AREA = 221.5 SF
 LEVEL 1

CALCULATED	
CML	
CHECKED	JS

SIGN ELEVATION IR 74

HAM-75-3.84

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LIGHTING LEGEND		
EXISTING	PROPOSED	DESCRIPTION
		LIGHT POLE W/ CONVENTIONAL LUMINAIRE
		LIGHT POLE, LOW MAST, W/ SYMMETRIC LUMINAIRE
		HIGH MAST UNIT W/ 4 SYMMETRIC LUMINAIRES
		HIGH MAST UNIT W/ 6 SYMMETRIC LUMINAIRES
		HIGH MAST UNIT, W/ 4 ASYMMETRIC LUMINAIRE
		UNDERPASS LIGHTING (LED)
		LIGHT POLE/TOWER, IDENTIFICATION NO.
		CONTROL CENTER
		JUNCTION BOX, IDENTIFICATION NO.
		MEDIAN JUNCTION BOX, IDENTIFICATION NO.
		TRANSITION JUNCTION BOX, IDENTIFICATION NO.
		PULL BOX, IDENTIFICATION NO.
		LIGHTING CIRCUIT, THREE CONDUCTOR (NO. 4 AWG UNLESS OTHERWISE NOTED)

ABBREVIATIONS

- DND - DO NOT DISTURB
- TBR - TO BE REMOVED
- EX - EXISTING
- PR - PROPOSED



LIGHTING SCHEMATIC PLAN

HAM-75-3.84

625. CONDUIT CLEANED AND CABLES REMOVED

THIS ITEM SHALL CONSIST OF CLEANING AN EXISTING CONDUIT BY REMOVING EXISTING CABLES, MUD AND DEBRIS SO THAT NEW CABLE CAN BE INSTALLED. INCIDENTAL TO THE CLEANING IS THE INSTALLATION OF BUSHINGS AND/OR COUPLINGS ON THE ENDS OF EXISTING CONDUIT AS REQUIRED. MATERIALS REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR FOR PROPER DISPOSAL OFF OF THE PROJECT SITE. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

PAYMENT WILL BE MADE AT THE UNIT PRICE BID UNDER C&MS ITEM 625, "CONDUIT CLEANED AND CABLES REMOVED" PER FOOT OF CONDUIT CLEANED WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

LUMINAIRE, LOW MAST, AS PER PLAN

THE LUMINAIRE ARRAYS AND ASSOCIATED ILLUMINATION TEST AREAS SPECIFIED IN C&MS 725.11 ARE HEREBY WAIVED. INSTEAD, THE LUMINAIRES FOR HIGH-MAST AND LOW-MAST LIGHTING SHALL MEET THE FOLLOWING REQUIREMENTS:

LUMINAIRES FOR HIGH-MAST AND LOW MAST LIGHTING UNITS WITH SYMMETRIC DISTRIBUTION SHALL BE HOLOPHANE "HMLD3-PK2-30K" WITH AREA WIDE PHOTOMETRIC DISTRIBUTION.

LUMINAIRES FOR HIGH-MAST LIGHTING UNITS WITH ASYMMETRIC DISTRIBUTION SHALL BE HOLOPHANE "HMLD3-PK2-30K" WITH A MEDIUM, ASYMMETRIC PHOTOMETRIC DISTRIBUTION.

"MVOLT" AUTO-SENSING VOLTAGE FEATURE SHALL BE USED FOR LIGHTING UNITS ON 240V CIRCUITS WHILE "HVOLT" AUTO-SENSING VOLTAGE SHALL BE USED FOR 480V CIRCUITS.

625. LUMINAIRE, UNDERPASS, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF ODOT'S CONSTRUCTION AND MATERIAL SPECIFICATIONS, LUMINAIRES FOR UNDERPASS LIGHTING SHALL BE AS FOLLOWS:

LUMINAIRES FOR UNDERPASS LIGHTING UNITS SHALL BE HOLOPHANE "WALLPACK-LED 20C1000-30K" WITH A TYPE III MEDIUM PHOTOMETRIC DISTRIBUTION.

LUMINAIRES FOR UNDERPASS LIGHTING UNIT WHICH ARE WALL MOUNTED SHALL BE FURNISHED WITH AN INTEGRAL FUSE HOLDER AND 10-AMPERE FUSES.

PAYMENT WILL BE MADE AT THE UNIT PRICE BID UNDER C&MS ITEM 625, "LUMINAIRE, UNDERPASS, AS PER PLAN" FOR EACH LUMINAIRE WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

CONDUIT EXPANSION AND DEFLECTION

EXPANSION FITTINGS SHALL BE OZ TYPE AX, CROUSE HINDS TYPE XJG, OR EQUAL APPROVED BY THE ENGINEER. EACH EXPANSION FITTING SHALL PROVIDE EITHER 4 OR 8 INCHES TOTAL MOVEMENT AS SPECIFIED BY THE PLAN DETAILS AND SHALL HAVE AN EXTERNAL COPPER BONDING JUMPER, UNLESS SPECIFIED OTHERWISE BY THE PLAN DETAILS.

DEFLECTION COUPLINGS SHALL BE OZ TYPE DX, CROUSE HINDS TYPE XD, OR EQUAL APPROVED BY THE ENGINEER. EACH DEFLECTION COUPLING SHALL HAVE AN EXTERNAL COPPER BONDING JUMPER, UNLESS SPECIFIED OTHERWISE BY THE PLAN DETAILS. MINIMUM DEFLECTION CAPABILITY: 25°.

EXPANSION AND DEFLECTION FITTINGS FULLY OR PARTIALLY EMBEDDED IN CONCRETE, SOIL, OR SIMILAR MATERIAL SHALL BE COMPLETELY WRAPPED IN A NEOPRENE SLEEVE OR SHEET OF 1/2-INCH MINIMUM THICKNESS.

SECURE NEOPRENE WRAP WITH TIE-WRAPS PRIOR TO EMBEDMENT OF THE FITTING.

625. POWER SERVICE, AS PER PLAN

IN ADDITION TO THE REQUIREMENTS OF THE SPECIFICATIONS, THE FOLLOWING IS ADDED. THE POWER SUPPLYING AGENCY FOR THIS PROJECT IS:

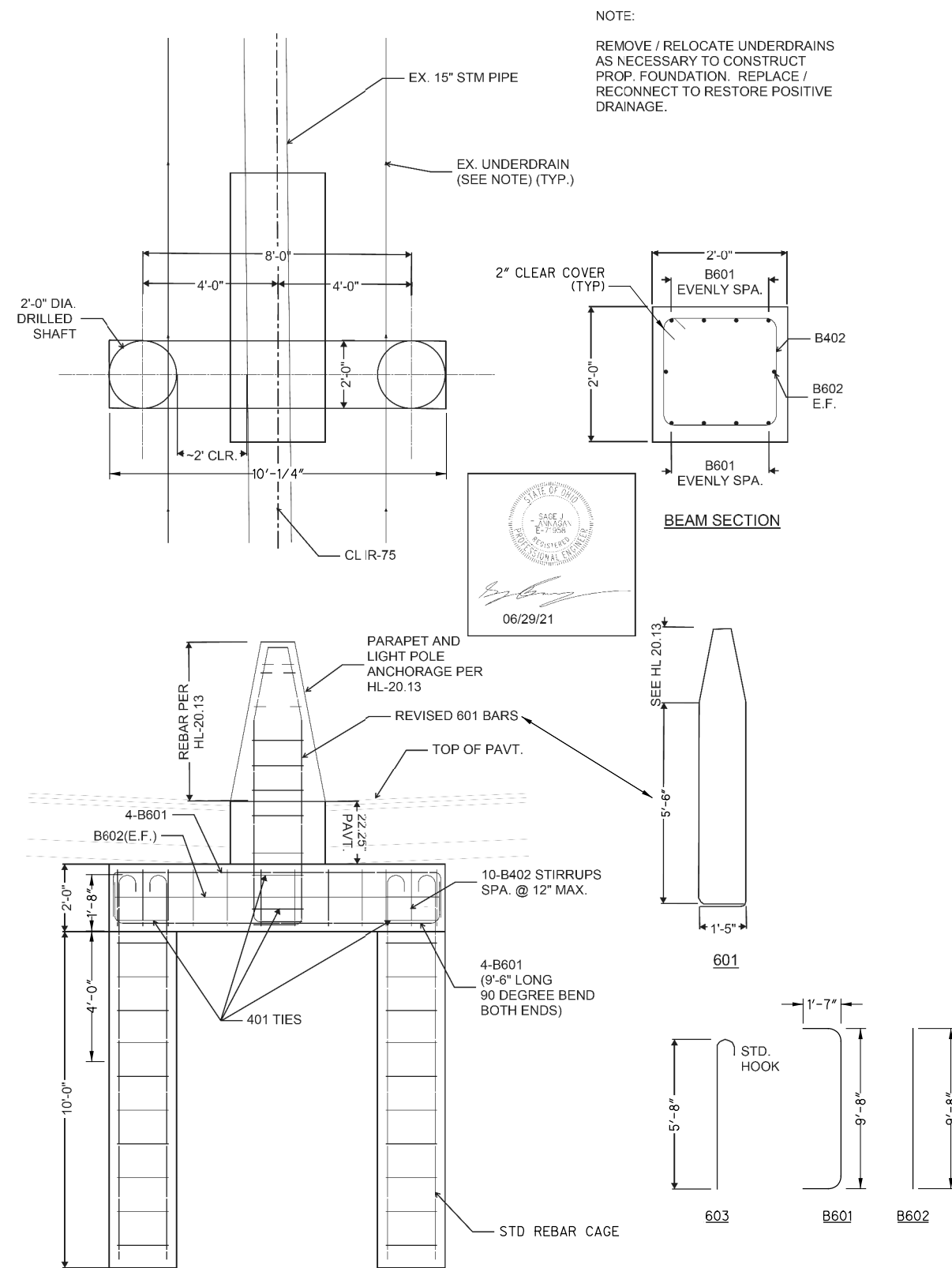
POWER COMPANY: DUKE ENGERY
 E-MAIL: Aaron.Wright@duke-energy.com
 PHONE #: (513) 479-1886
 CONTACT NAME: AARON WRIGHT

THE ENGINEER SHALL ENSURE THAT EACH POWER SERVICE ELECTRICAL ENERGY ACCOUNT IS IN THE NAME OF AND THAT THE BILLING ADDRESS IS TO THE MAINTAINING AGENCY NOTED IN THE PLANS. THIS SHALL BE DONE NOT ONLY FOR EACH NEW POWER SERVICE ESTABLISHED BY THIS PROJECT BUT ALSO FOR EACH EXISTING POWER SERVICE, SINCE THERE MAY BE A REASSIGNMENT OF THE RESPONSIBILITY FOR AN EXISTING SERVICE AS A RESULT OF THE WORK PERFORMED BY THIS PROJECT.

PAYMENT WILL BE MADE AT THE UNIT BID PRICE FOR EACH C&MS ITEM 625, "POWER SERVICE, AS PER PLAN" WHICH SHALL BE FULL COMPENSATION FOR ALL LABOR, MATERIALS AND INCIDENTALS REQUIRED TO COMPLETE THIS ITEM IN A SATISFACTORY AND WORKMANLIKE MANNER.

ALTERNATE FOUNDATION DETAIL

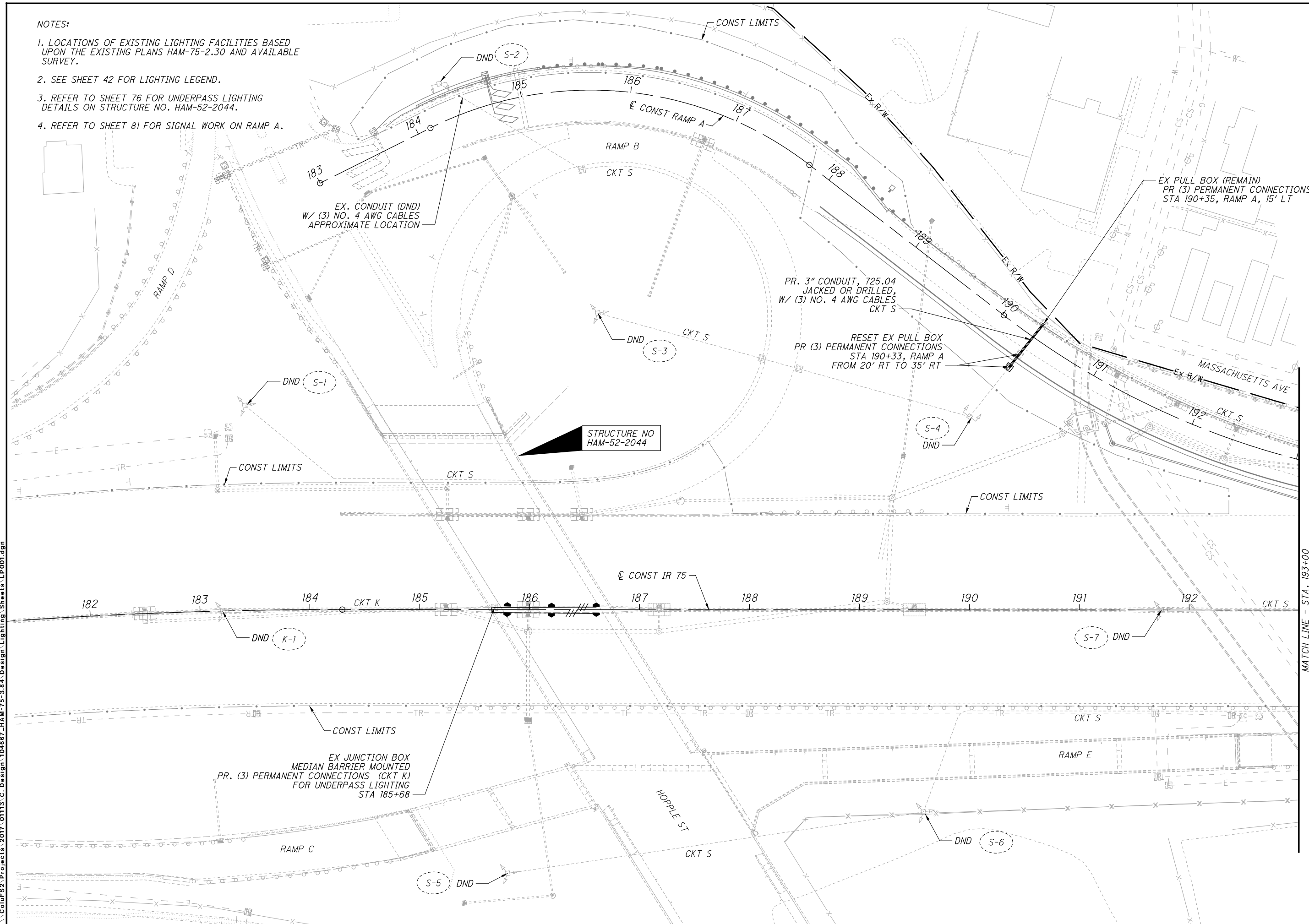
THE FOUNDATION SHALL DIFFER FROM THE SCD HL-20.13 AT THE FOLLOWING LOCATIONS IN ACCORDANCE WITH THE DETAIL BELOW:
 R-3, STA 207+28
 R-4, STA 208+76
 E-5, STA 287+00
 E-6, STA 288+85
 E-7, STA 290+70



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NOTES:

- 1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75-2.30 AND AVAILABLE SURVEY.
- 2. SEE SHEET 42 FOR LIGHTING LEGEND.
- 3. REFER TO SHEET 76 FOR UNDERPASS LIGHTING DETAILS ON STRUCTURE NO. HAM-52-2044.
- 4. REFER TO SHEET 81 FOR SIGNAL WORK ON RAMP A.



CALCULATED	EMS	CHECKED	CRH
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LIGHTING PLAN - IR 75
STA. 182+00 TO STA. 193+00

HAM-75-3.84

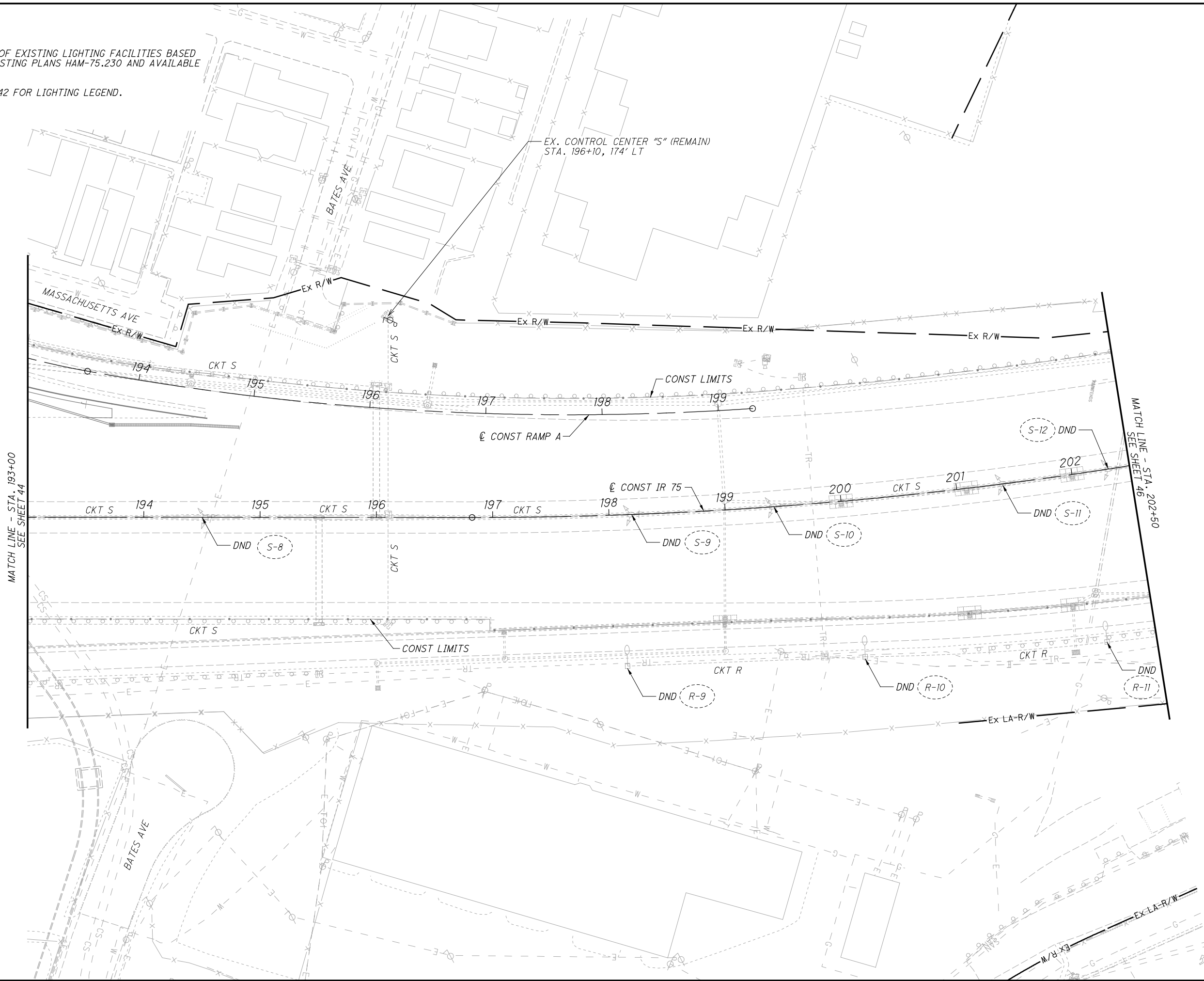
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MATCH LINE - STA. 193+00
 SEE SHEET 45

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NOTES:

- 1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.
- 2. SEE SHEET 42 FOR LIGHTING LEGEND.



CALCULATED	EM	CHECKED	CRH

0 40 80
HORIZONTAL SCALE IN FEET

LIGHTING PLAN - IR 75
STA. 193+00 TO STA. 202+50

HAM-75-3.84

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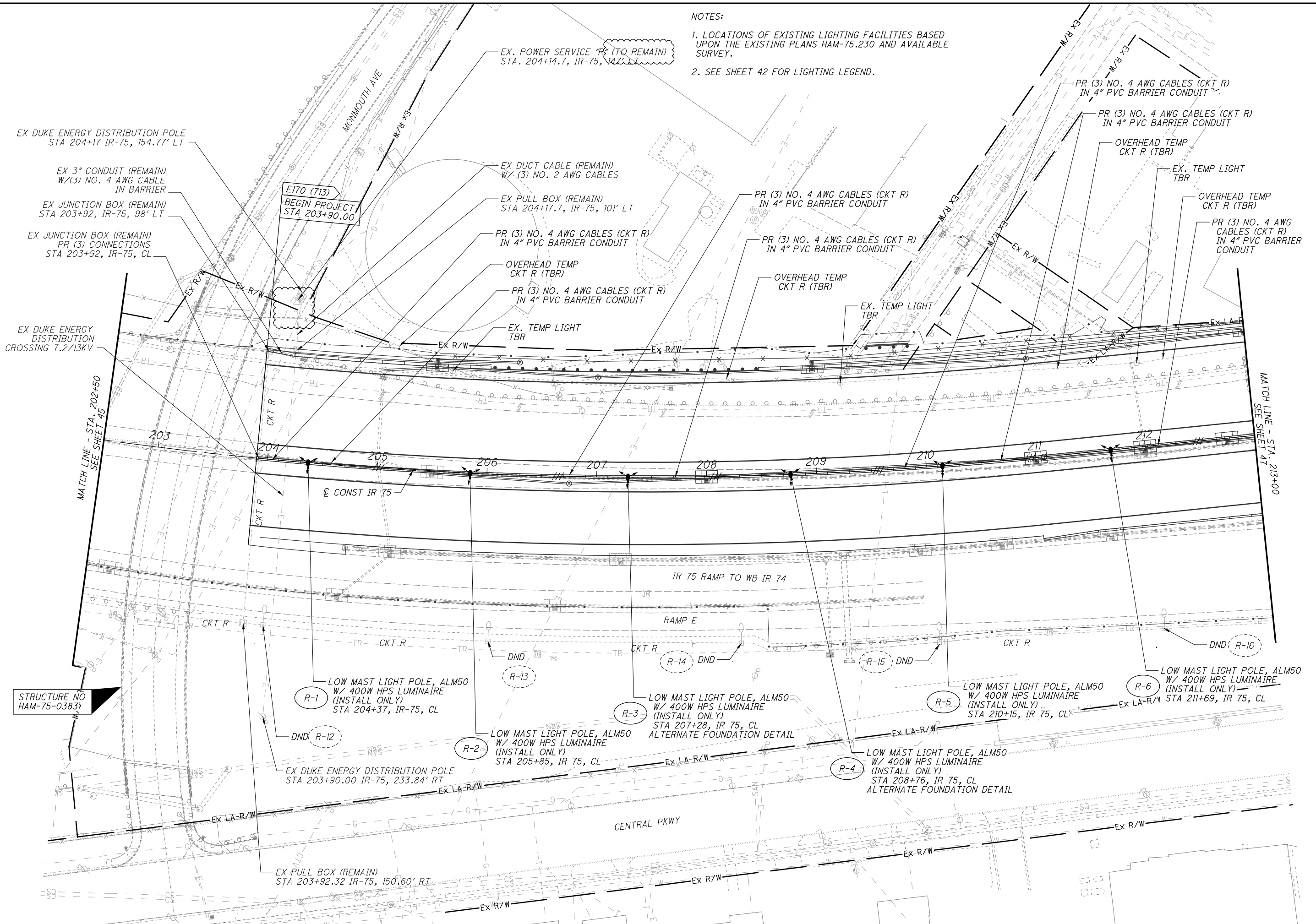
- NOTES:
1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.
 2. SEE SHEET 42 FOR LIGHTING LEGEND.

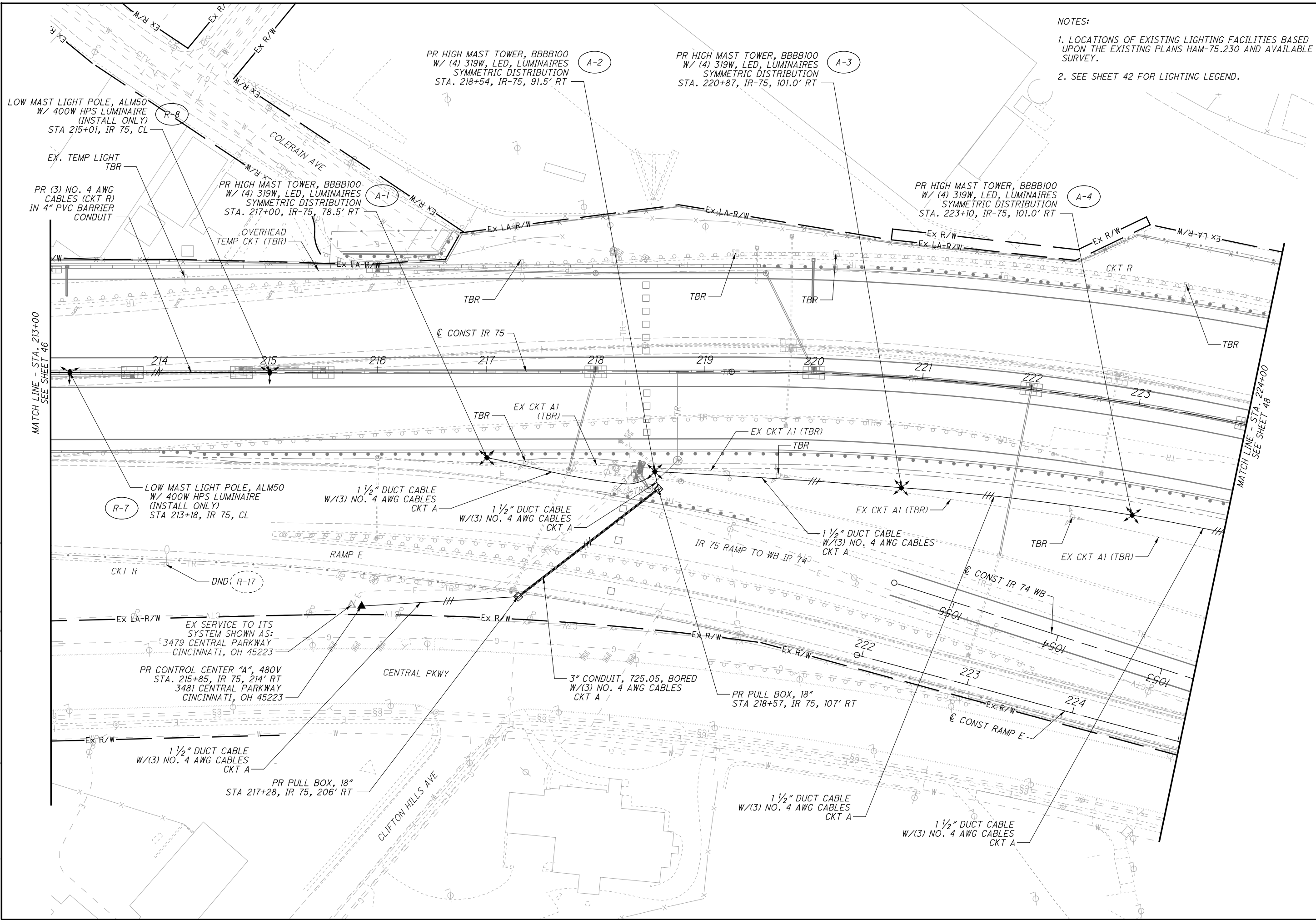
CALCULATED
EMS
CHECKED
CRH

0 20 40 80
HORIZONTAL
SCALE IN FEET

LIGHTING PLAN - IR 75
STA. 202+50 TO STA. 213+00

HAM-75-3.84





NOTES:
1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.
2. SEE SHEET 42 FOR LIGHTING LEGEND.

CALCULATED
E.M.S.
CHECKED
CRH

0 20 40 80
HORIZONTAL
SCALE IN FEET

LIGHTING PLAN - IR 75
STA. 213+00 TO STA. 224+00

HAM-75-3.84

NOTES:

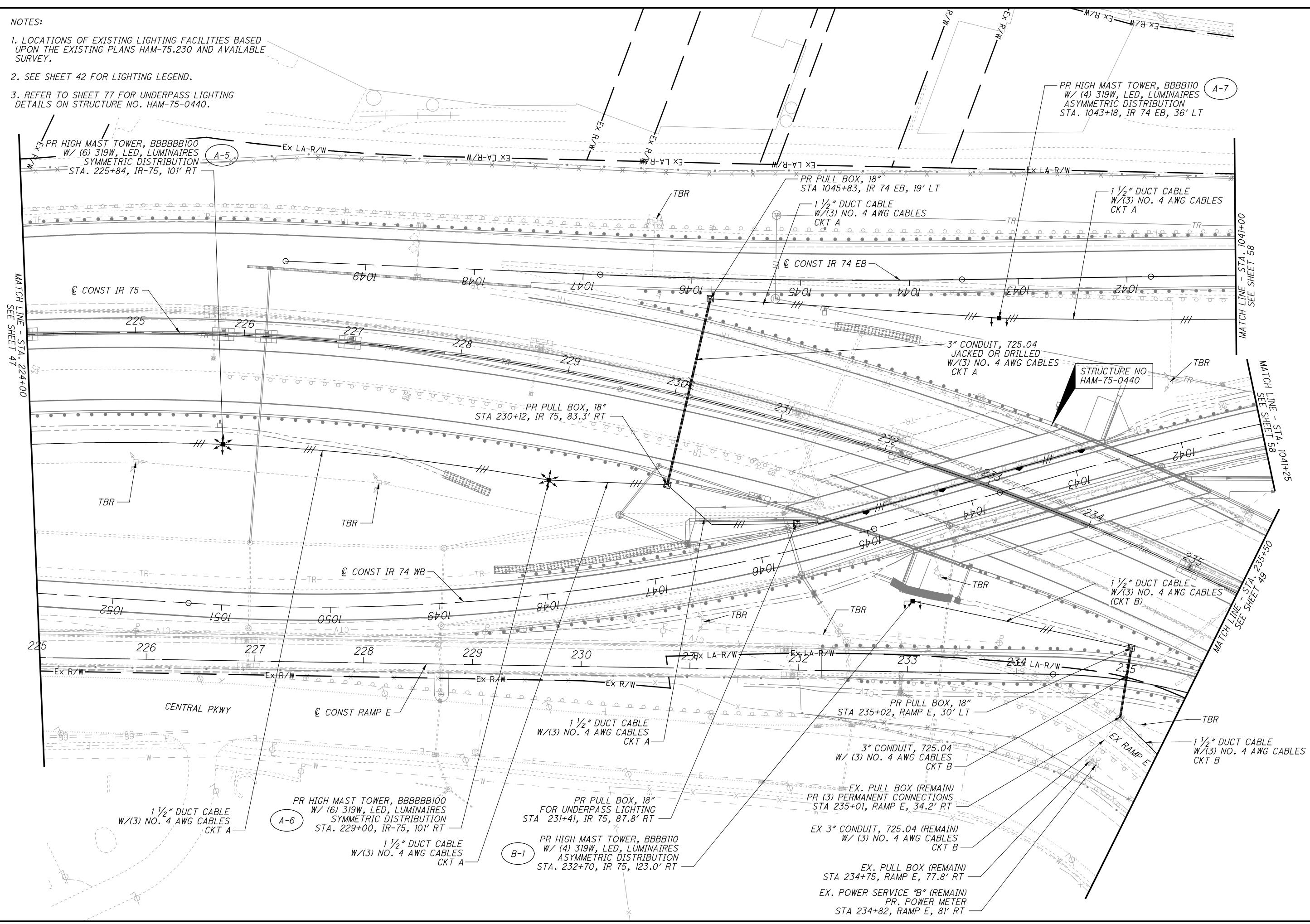
1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.
2. SEE SHEET 42 FOR LIGHTING LEGEND.
3. REFER TO SHEET 77 FOR UNDERPASS LIGHTING DETAILS ON STRUCTURE NO. HAM-75-0440.



CALCULATED
EMS
CHECKED
CRH

LIGHTING PLAN - IR 75
STA. 224+00 TO STA. 235+50

HAM-75-3.84



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NOTES:

1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.
2. SEE SHEET 42 FOR LIGHTING LEGEND.



CALCULATED	EMS	CHECKED	CRH
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LIGHTING PLAN - IR 75
STA. 235+50 TO STA. 247+00

HAM-75-3.8.4

PR HIGH MAST TOWER, BBBB120
W/ (4) 319W, LED, LUMINAIRES
SYMMETRIC DISTRIBUTION
STA. 237+25, IR 75, 101' LT

B-3

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
(CKT X)

PR PULL BOX, 18"
STA 237+25, IR 75, 76.5' LT

PR. PULL BOX
SEE ITS SHEET 84

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
(CKT X)

PR. PULL BOX
SEE ITS SHEET 84

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
(CKT X)

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
TRENCH = 335' (CKT X)

PR. PULL BOX, 18"
SEE ITS SHEET 84

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 244+45, IR 75, CL

C-1

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

3" CONDUIT 725.051, SCH 80
W/ (3) NO. 4 AWG CABLES
TRENCH, 475' (CKT X)

MATCH LINE - STA. 234+00
SEE SHEET 58

MATCH LINE - STA. 237+00
SEE SHEET 58

MATCH LINE - STA. 235+50
SEE SHEET 48

MATCH LINE - STA. 247+00
SEE SHEET 50

STRUCTURE NO
HAM-74-1908S

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
(CKT B)

PR PULL BOX, 18"
STA 237+45, RAMP P, 33.0' RT

3" CONDUIT, 725.05, BORED
W/ (3) NO. 4 AWG CABLES
CKT B

PR PULL BOX, 18"
STA 237+45, RAMP P, 17.0' LT

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
(CKT B)

PR HIGH MAST TOWER, BBBB100
W/ (4) 319W, LED, LUMINAIRES
ASYMMETRIC DISTRIBUTION
STA. 238+38, RAMP P, 54.3' LT

B-2

1 1/2" DUCT CABLE
W/(3) NO. 4 AWG CABLES
(CKT B)

B-4

PR HIGH MAST TOWER, BBBB100
W/ (4) 319W, LED, LUMINAIRES
ASYMMETRIC DISTRIBUTION
STA. 241+75, RAMP P, 57.8' LT

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 246+30, IR 75, CL

C-2

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NOTES:

1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.

2. SEE SHEET 42 FOR LIGHTING LEGEND.

3" CONDUIT 725.051, SCH 80
W/ (3) NO. 4 AWG CABLES
TRENCH, 475' (CKT X)

PR POWER SERVICE "X", 480 V
W/LIGHTING CABINET AND METER
W/ITS CABINET AND METER
STA. 248+75.1, RAMP O, 65.2' LT
SEE ITS SHEET 85.

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 248+15, IR-75, CL

LUDLOW AVE

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 250+04, IR-75, CL

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 251+74, IR-75, CL

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 255+55, IR-75, CL

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 253+70, IR-75, CL

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

MATCH LINE - STA. 247+00
SEE SHEET 49

PR (3) NO. 4 AWG
CABLES (CKT C)
IN 4" PVC BARRIER
CONDUIT

248

249

250

251

252

253

254

255

256

257

248

CONST RAMP P

EX SERVICE TO LIGHTING SYSTEM
UNABLE TO LOCATE ADDRESS
ON METER BOX

EX POWER SERVICE (TBR)
STA 249+91, IR 75, 103' RT

PR PULL BOX, 18"
STA 250+30, IR 75, 104.5' RT

3" CONDUIT, 725.04
W/ (3) NO. 4 AWG CABLES
CKT C

PR PULL BOX, 18"
STA 250+30, IR 75, CL

3" CONDUIT, 725.04,
JACKED OR DRILLED
W/ (3) NO. 4 AWG CABLES
CKT C

PR POWER SERVICE "C", 480V
W/ POWER METER
STA 250+35, IR 75, 108' RT
LIGTHING CIRCUIT "C", 480V:
3744 LUDLOW AVE
CINCINNATI, OH 45220

LOW MAST LIGHT POLE, ALM50
W/ 319W LED LUMINAIRE
STA 257+40, IR-75, CL

PR (3) NO. 4 AWG CABLES (CKT C)
IN 4" PVC BARRIER CONDUIT

MATCH LINE - STA. 258+00
SEE SHEET 51



CALCULATED
EMS
CHECKED
CRH

LIGHTING PLAN - IR 75
STA. 247+00 TO STA. 258+00

HAM-75-3.84

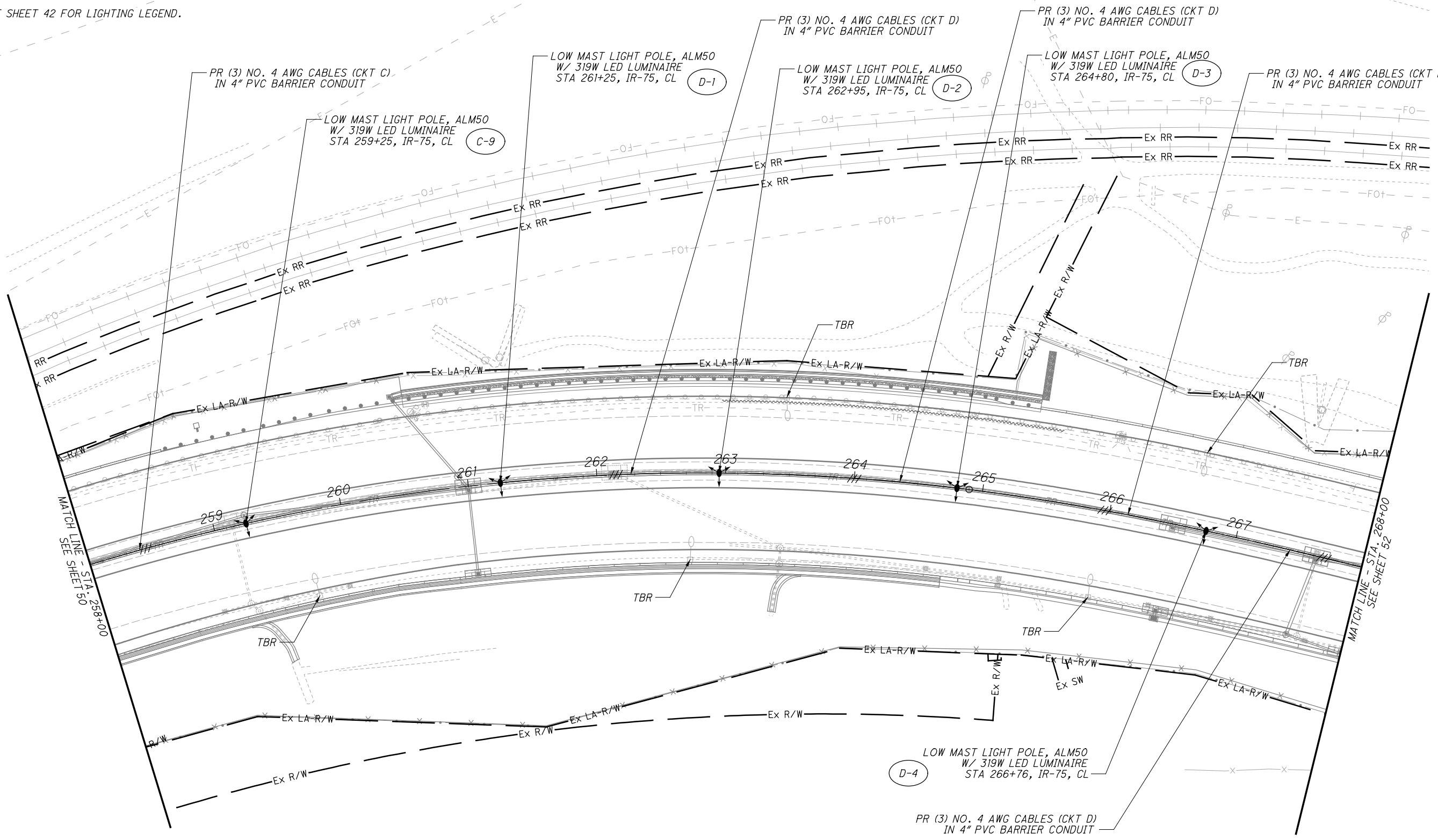
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NOTES:

1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.

2. SEE SHEET 42 FOR LIGHTING LEGEND.



CALCULATED
EMS
CHECKED
CRH

LIGHTING PLAN - IR 75
STA. 258+00 TO STA. 268+00

HAM-75-3.84

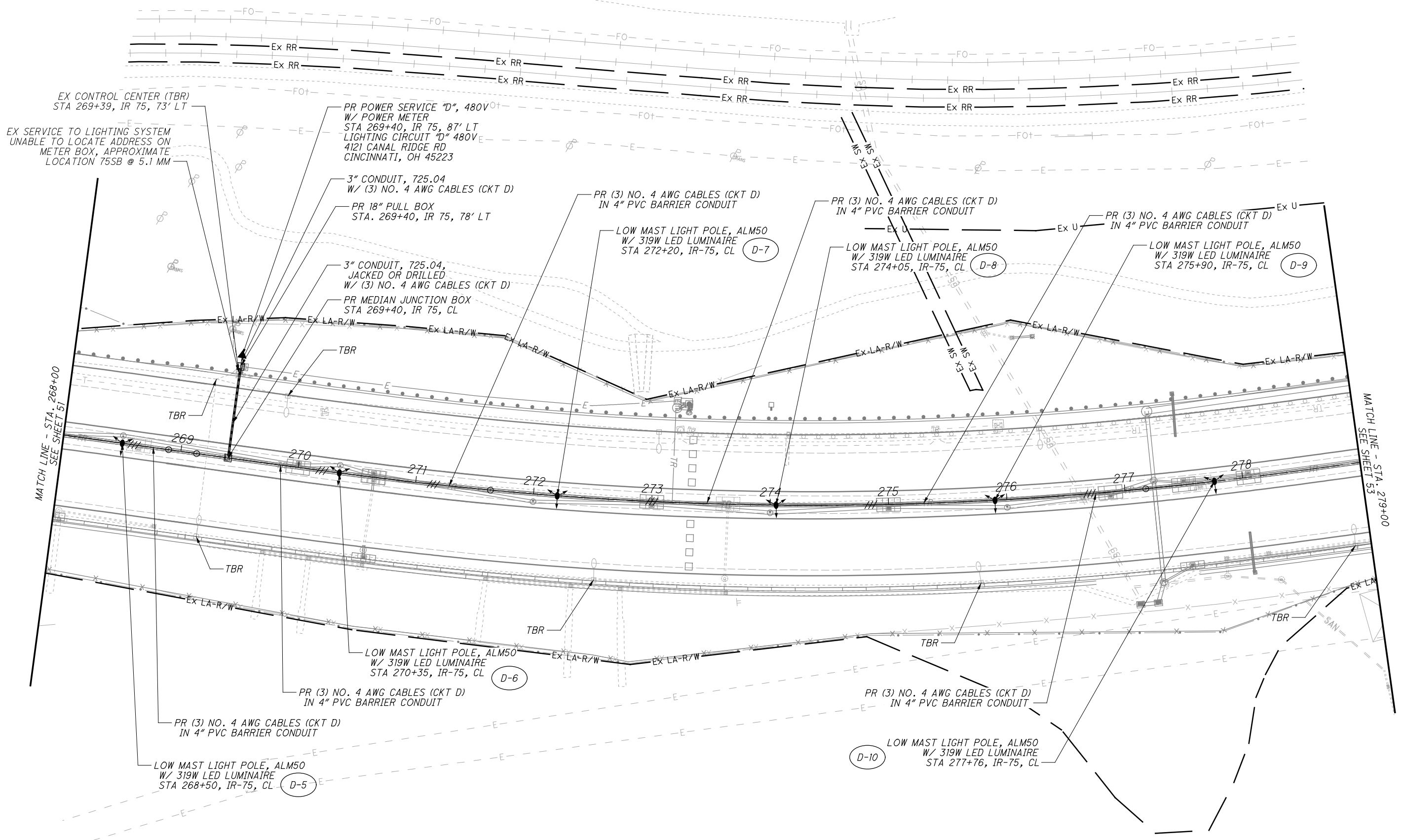
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- NOTES:
1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75.230 AND AVAILABLE SURVEY.
 2. SEE SHEET 42 FOR LIGHTING LEGEND.

CALCULATED
EMS
CHECKED
CRH

0 20 40 80
HORIZONTAL
SCALE IN FEET



MATCH LINE - STA. 268+00
SEE SHEET 51

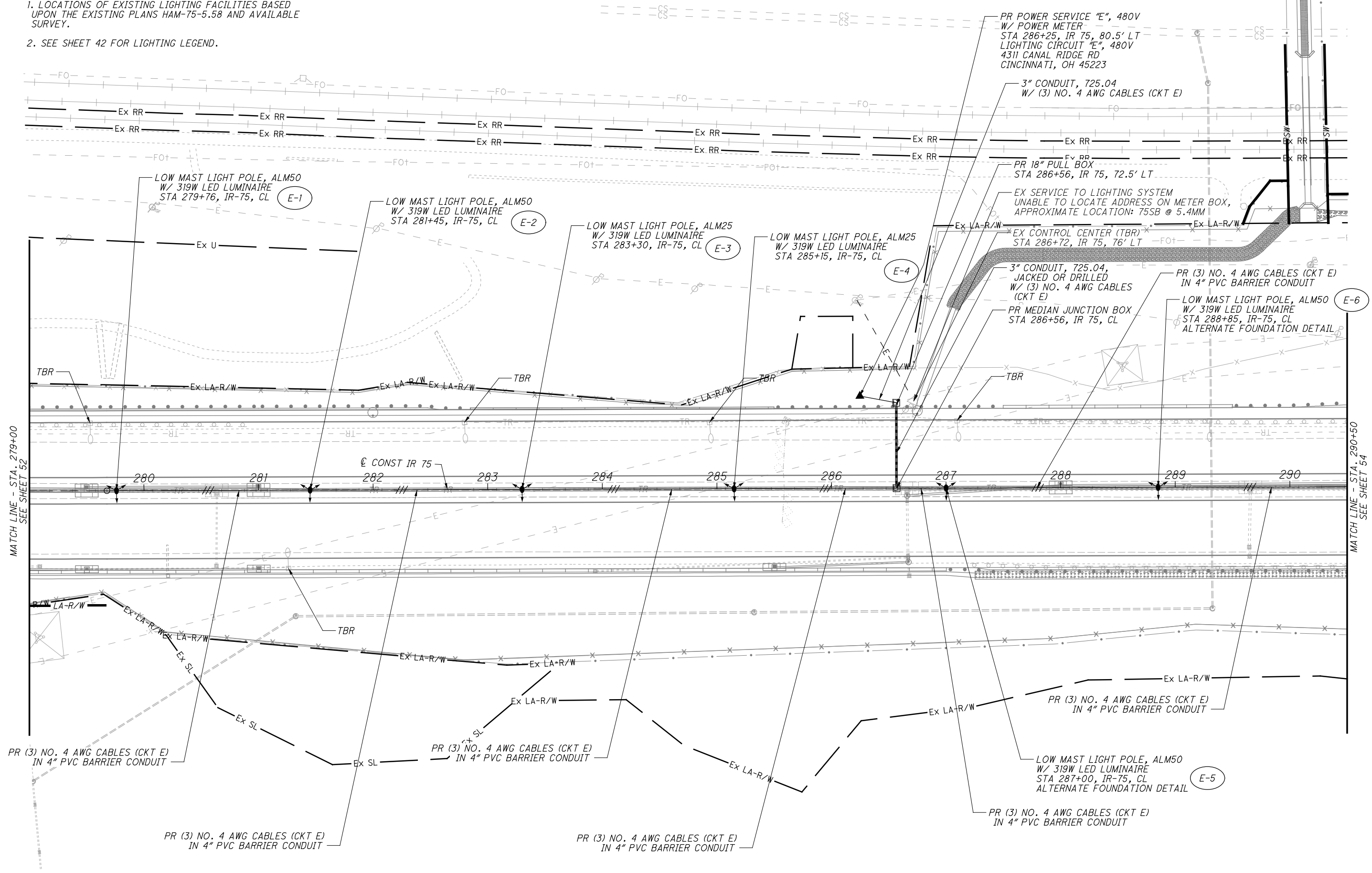
MATCH LINE - STA. 279+00
SEE SHEET 53

LIGHTING PLAN - IR 75
STA. 268+00 TO STA. 279+00

HAM-75-3.84

NOTES:

1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75-5.58 AND AVAILABLE SURVEY.
2. SEE SHEET 42 FOR LIGHTING LEGEND.



MATCH LINE - STA. 279+00
SEE SHEET 52

MATCH LINE - STA. 290+50
SEE SHEET 54

CALCULATED
EMS
CHECKED
CRH

0 40 80
HORIZONTAL
SCALE IN FEET

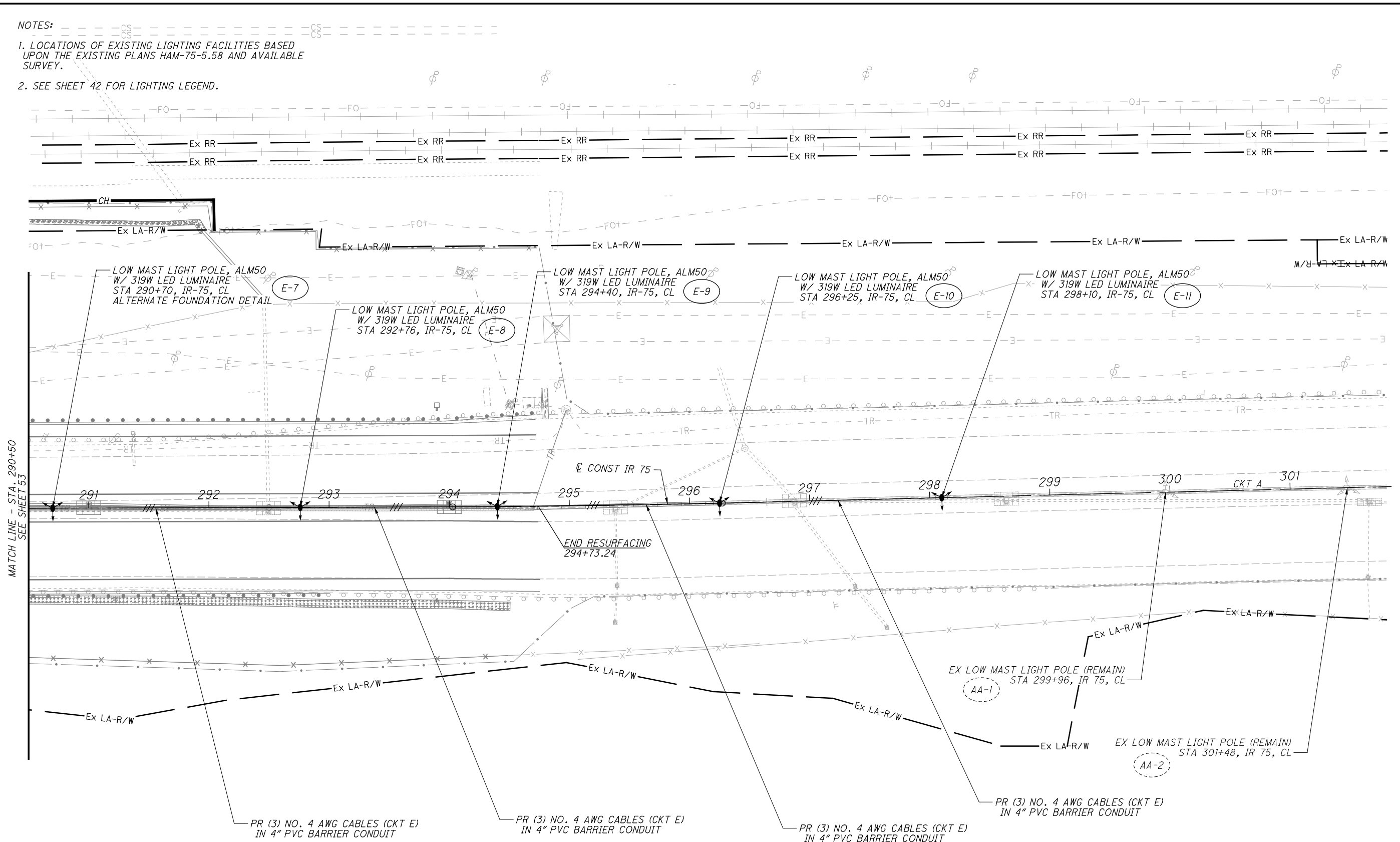
LIGHTING PLAN - IR 75
STA. 279+00 TO STA. 290+50

HAM-75-3.84

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NOTES:

1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-75-5.58 AND AVAILABLE SURVEY.
2. SEE SHEET 42 FOR LIGHTING LEGEND.



MATCH LINE - STA. 290+50
SEE SHEET 53

CALCULATED
EMS
CHECKED
CRH

HORIZONTAL
SCALE IN FEET

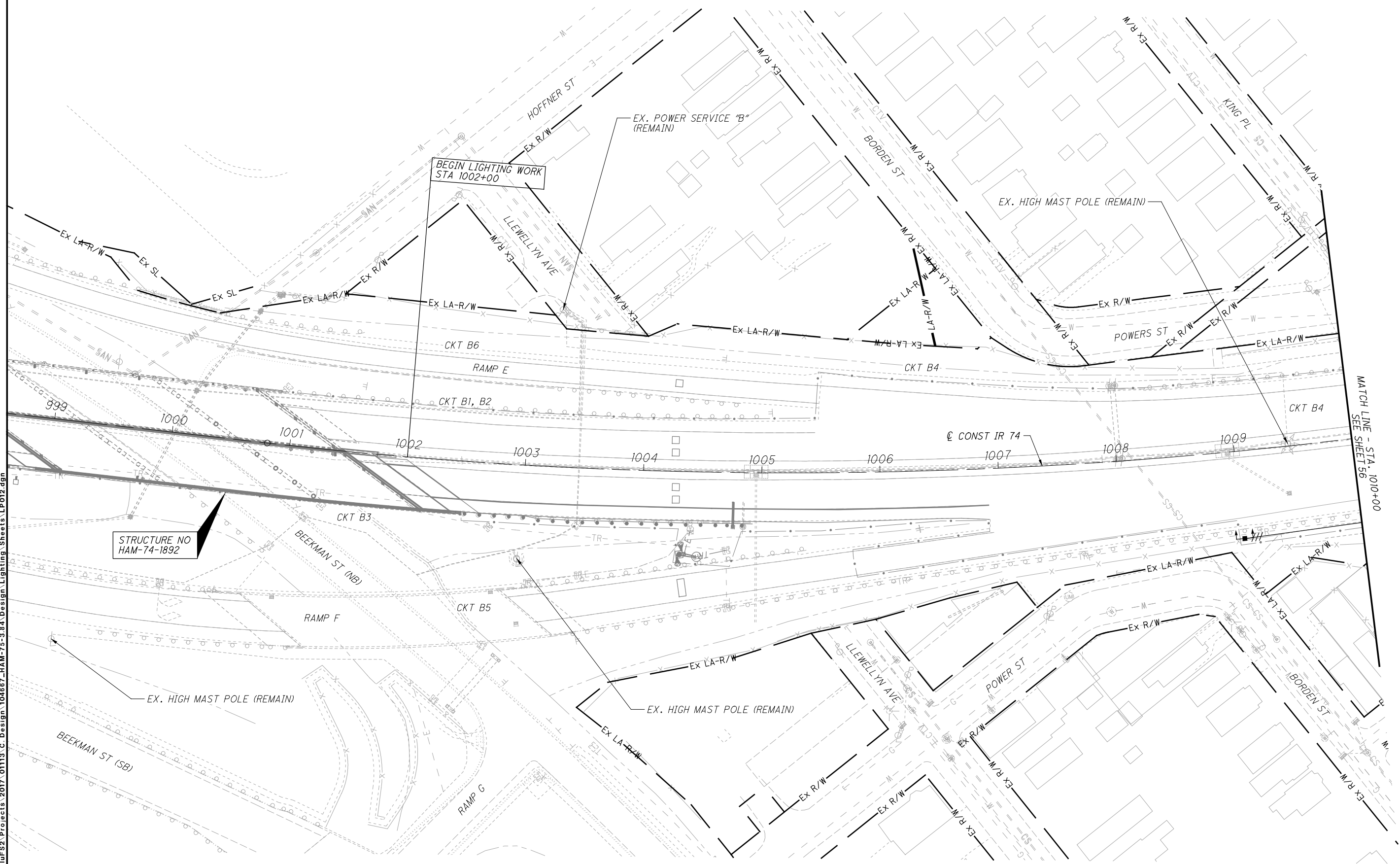
LIGHTING PLAN - IR 75
STA. 290+50 TO STA. 302+00

HAM-75-3.8.4

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NOTES:

- 1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-74-18.00, HAM-74.17.2, AND AVAILABLE SURVEY.
- 2. SEE SHEET 42 FOR LIGHTING LEGEND.



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CALCULATED
EMS
CHECKED
CRH

0 20 40 80
HORIZONTAL
SCALE IN FEET

LIGHTING PLAN - IR 74
STA. 1000+00 TO STA. 1010+00

HAM-75-3.84

NOTES:

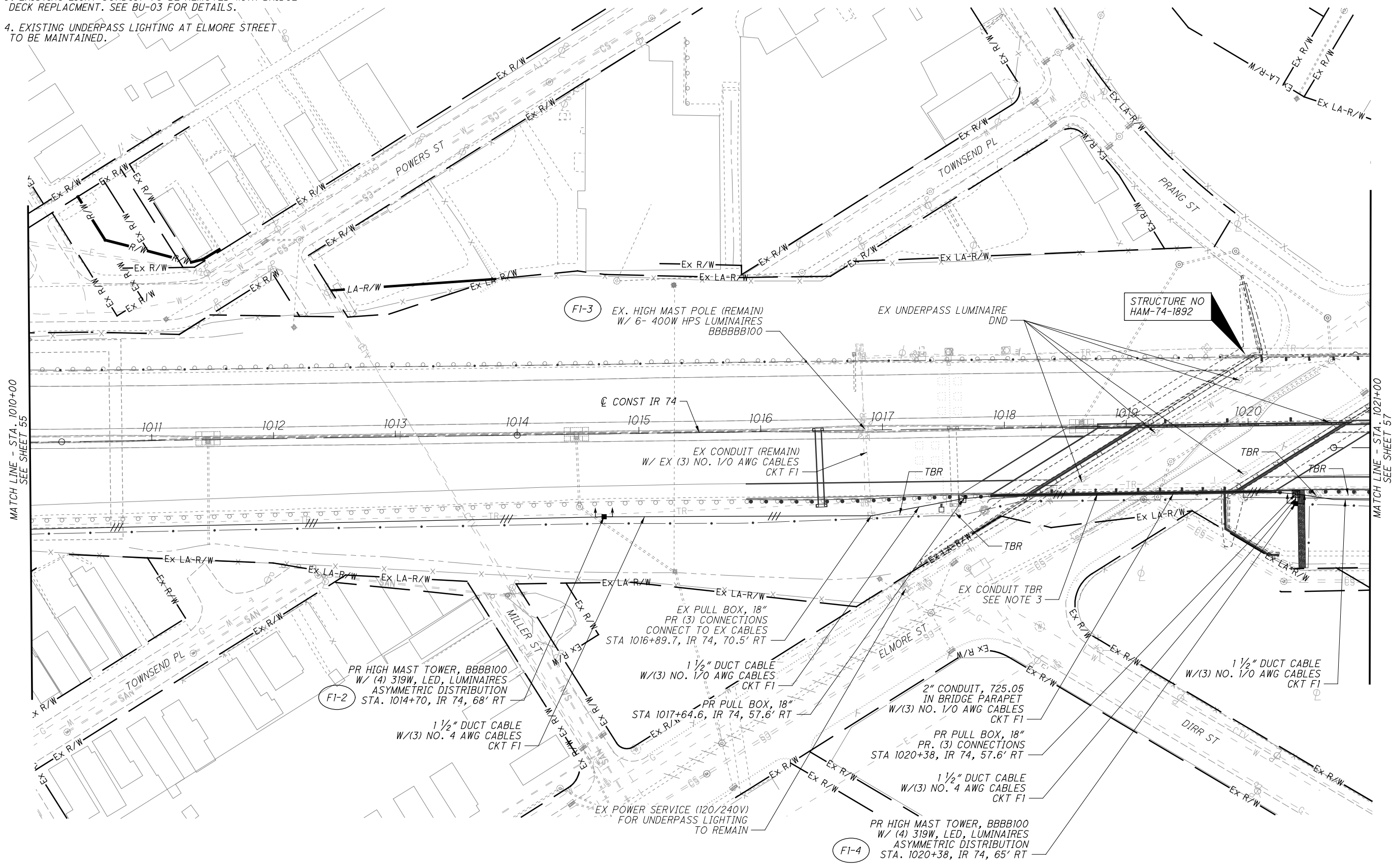
- LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-74-18.00, HAM-74.17.2, AND AVAILABLE SURVEY.
- SEE SHEET 42 FOR LIGHTING LEGEND.
- EXISTING LIGHT CONDUIT TO BE REMOVED WITH BRIDGE DECK REPLACEMENT. SEE BU-03 FOR DETAILS.
- EXISTING UNDERPASS LIGHTING AT ELMORE STREET TO BE MAINTAINED.



CALCULATED	EMS	CHECKED	CRH
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LIGHTING PLAN - IR 74
STA. 1010+00 TO STA. 1021+00

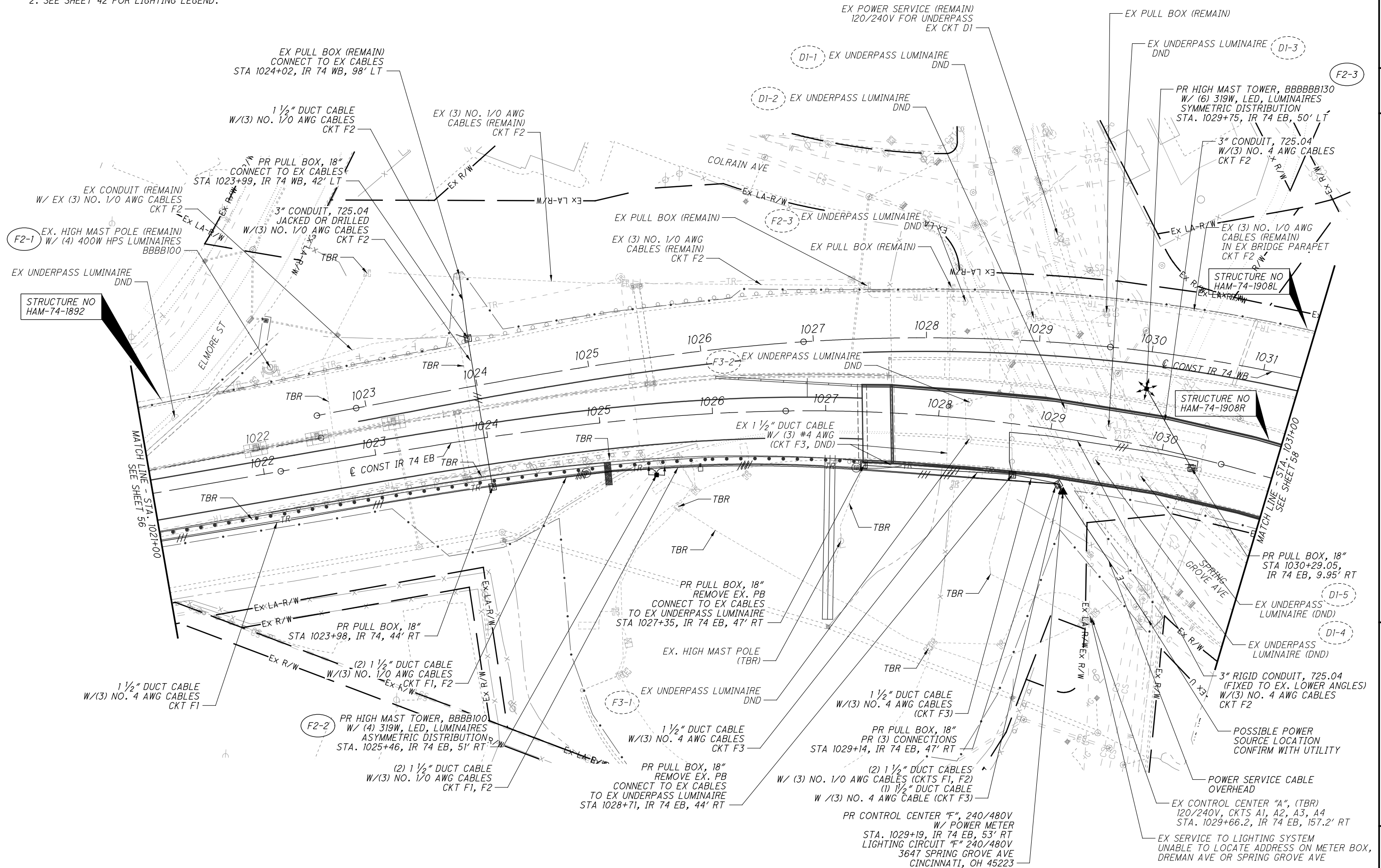
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NOTES:

- LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-74-18.00, HAM-74.17.2, AND AVAILABLE SURVEY.
- SEE SHEET 42 FOR LIGHTING LEGEND.



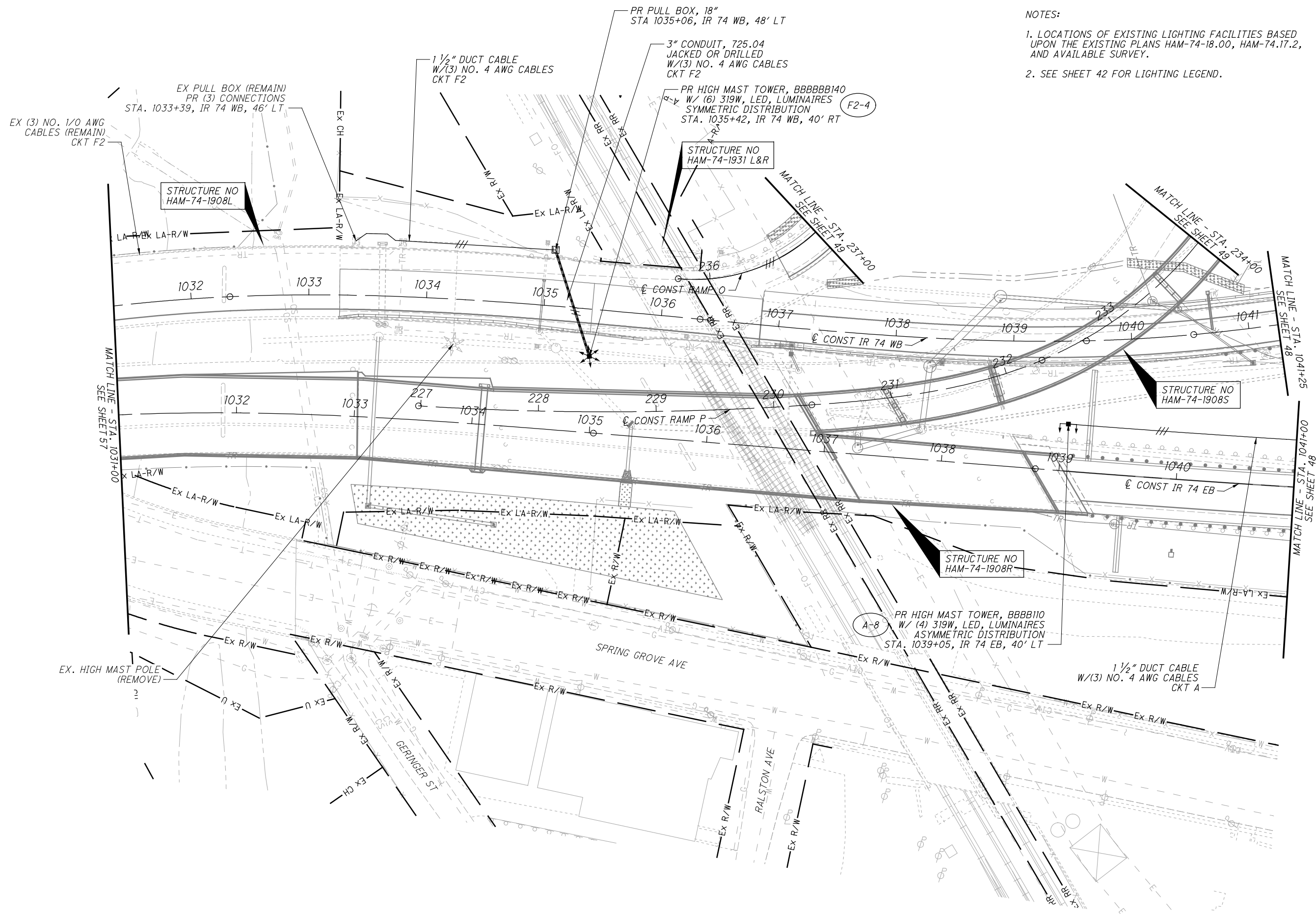
CALCULATED
EMS
CHECKED
CRH

LIGHTING PLAN - IR 74
STA. 1021+00 TO STA. 1031+00

HAM-75-3.84

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NOTES:

1. LOCATIONS OF EXISTING LIGHTING FACILITIES BASED UPON THE EXISTING PLANS HAM-74-18.00, HAM-74.17.2, AND AVAILABLE SURVEY.
2. SEE SHEET 42 FOR LIGHTING LEGEND.



CALCULATED EMS
CHECKED CRH

**LIGHTING PLAN - IR 74
STA. 1031+00 TO STA. 1041+00**

HAM-75-3.84

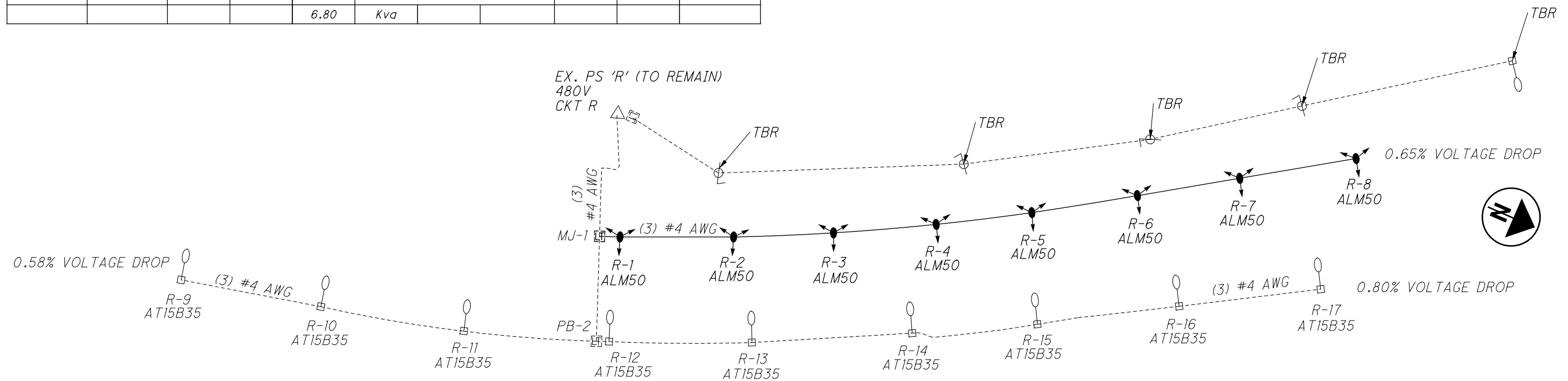
VOLTAGE DROP - CIRCUIT 'R'

Voltage:	480	Wire Factor Used (Two - No. 4 AWG Wires):	0.62	ohms/mft/1000	Circuit: 'R'
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Section			Amperes		Ampere-Feet	AWG	Voltage Drop			At Point	
From	To	Design Feet	At Point	Accum.			In Section	Accum.	% Drop		
R8	R7	169	0.83	0.83	141	4	0.09	3.74	0.78	R8	
R7	R6	149	0.83	1.67	248	4	0.15	3.65	0.76	R7	
R6	R5	154	0.83	2.50	385	4	0.24	3.50	0.73	R6	
R5	R4	138	0.83	3.33	460	4	0.29	3.26	0.68	R5	
R4	R3	148	0.83	4.17	617	4	0.38	2.98	0.62	R4	
R3	R2	144	0.83	5.00	720	4	0.45	2.59	0.54	R3	
R2	R1	150	0.83	5.83	875	4	0.54	2.15	0.45	R2	
R1	MJ-1	27	0.83	6.67	180	4	0.11	1.60	0.33	R1	
R9	R10	205	0.83	0.83	171	4	0.11	2.81	0.59	R9	
R10	R11	208	0.83	1.67	347	4	0.21	2.70	0.56	R10	
R11	PB-2	190	0.83	2.50	475	4	0.29	2.49	0.52	R11	
R17	R16	205	0.83	0.83	171	4	0.11	3.86	0.80	R17	
R16	R15	205	0.83	1.67	342	4	0.21	3.75	0.78	R16	
R15	R14	182	0.83	2.50	455	4	0.28	3.54	0.74	R15	
R14	R13	231	0.83	3.33	770	4	0.48	3.26	0.68	R14	
R13	R12	205	0.83	4.17	854	4	0.53	2.78	0.58	R13	
R12	PB-2	18	0.83	5.00	90	4	0.06	2.25	0.47	R12	
PB-2	MJ-1	151	0.00	7.50	1,133	4	0.70	2.20	0.46	PB-2	
MJ-1	EX CC-R	170	0.00	14.17	2,408	4	1.49	1.49	0.31	MJ-1	
			SUM	14.17	AMPS PROPOSED LOAD		MAX %		0.80		
				6.80	Kva						

EXIST.	PROP.	LEGEND
		CONVENTIONAL LIGHT POLE WITH 400W HPS LUMINAIRE
		TEMP LIGHT POLE WITH LUMINAIRE
		LOW MAST LIGHT POLE WITH 400W HPS LUMINAIRE
		POWER SERVICE
		PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM



CONTROL CENTER DATA

CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
'R' (IR-75 AT MONMOUTH)	480	6.8	(3) NO. 2	60	1	14.17	20	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	

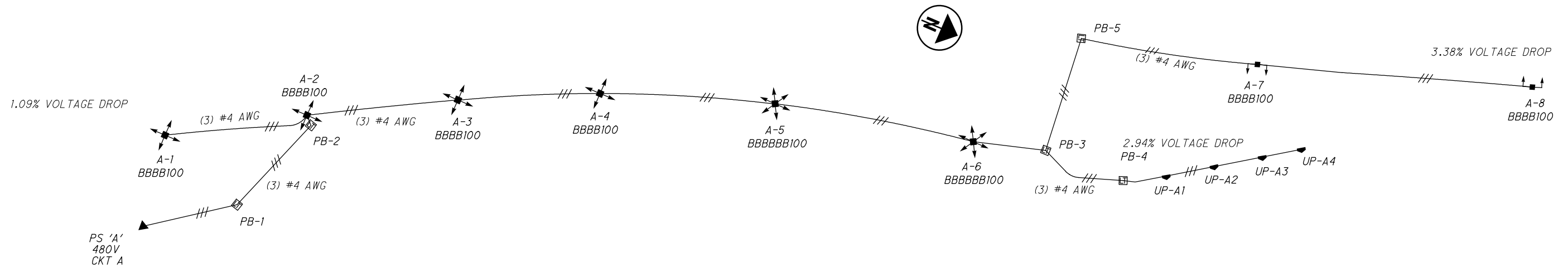
VOLTAGE DROP - CIRCUIT 'A'

Voltage: 480 Wire Factor Used (Two - No. 4 AWG Wires): 0.62 ohms/mft/1000 Circuit: 'A'

Section			Amperes		Ampere-Feet	AWG	Voltage Drop			At Point
From	To	Design Feet	At Point	Accum.			In Section	Accum.	% Drop	
A8	A7	413	2.66	2.66	1,098	4	0.68	16.21	3.38	A8
A7	PB-3	442	2.66	5.32	2,350	4	1.46	15.53	3.24	A7
UP PB-4	PB-3	133	0.35	0.35	47	4	0.03	14.10	2.94	UP PB-4
PB-3	A6	109	0.00	5.67	618	4	0.38	14.07	2.93	PB-3
A6	A5	302	3.99	9.65	2,916	4	1.81	13.69	2.85	A6
A5	A4	262	3.99	13.64	3,574	4	2.22	11.88	2.48	A5
A4	A3	213	2.66	16.30	3,472	4	2.15	9.67	2.01	A4
A3	A2	227	2.66	18.96	4,304	4	2.67	7.51	1.57	A3
A1	A2	227	2.66	2.66	603	4	0.37	5.22	1.09	A1
A2	PB2	16	2.66	24.28	388	4	0.24	4.85	1.01	A2
PB-2	PB-1	162	0.00	24.28	3,933	4	2.44	4.61	0.96	PB-2
PB-1	CC-A	144	0.00	24.28	3,496	4	2.17	2.17	0.45	PB-1
			SUM	24.28	AMPS PROPOSED LOAD			MAX %	3.38	
				11.65	Kva					

PROP.	LEGEND
	HIGH MAST LIGHT TOWER WITH 4 LED LUMINAIRES ASYMMETRICAL, (319W)
	HIGH MAST LIGHT TOWER WITH 4 LED LUMINAIRES SYMMETRICAL, (319W)
	HIGH MAST LIGHT TOWER WITH 6 LED LUMINAIRES SYMMETRICAL, (319W)
	LED UNDERPASS LUMINAIRE (42W)
	POWER SERVICE
	PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM



CONTROL CENTER DATA

CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
'A' STA 215+85, IR-75	480	11.7	(3) NO. 2	60	1	24.28	40	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	

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HAM-75-3.84

CALCULATED
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CIRCUIT SCHEMATIC & CONTROL CENTER DATA
IR 75 CIRCUIT 'A'

HAM-75-3.84

60
106

CONTROL CENTER DATA									
CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
EX CC-'B' STA 234+82, RAMP E	480	3.8	(3) NO. 2	100	1	7.98	10	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	
PR CC-'X' STA 2848+01, RAMP O	480	2.6	(3) NO. 2	60	1	5.32	10	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	

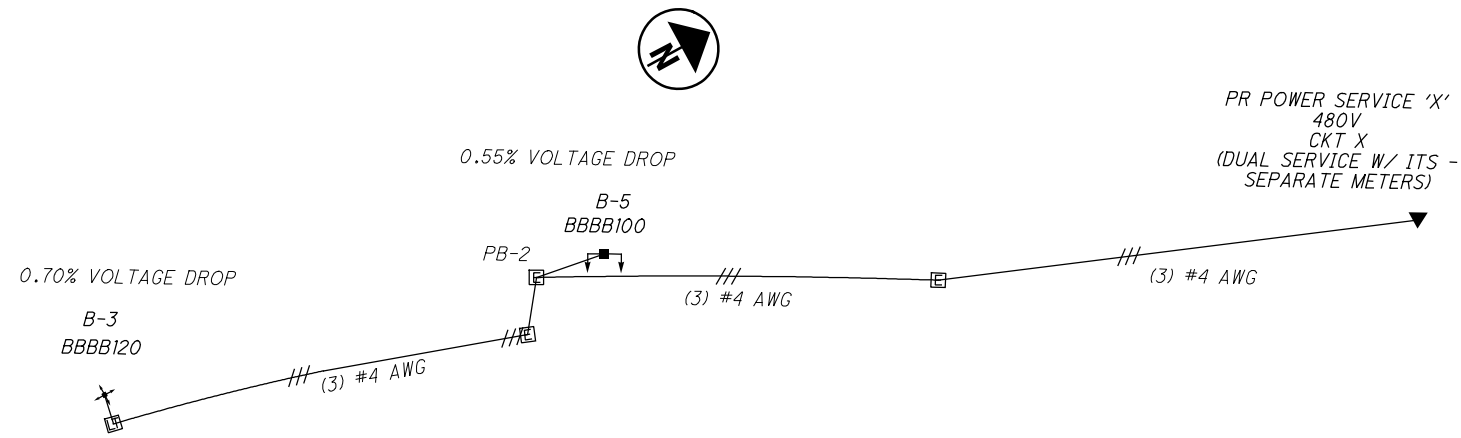
EXIST.	PROP.	LEGEND
		HIGH MAST LIGHT TOWER WITH 4 LED LUMINAIRES ASYMMETRICAL, (319W)
		HIGH MAST LIGHT TOWER WITH 4 LED LUMINAIRES SYMMETRICAL, (319W)
		HIGH MAST LIGHT TOWER WITH 6 LED LUMINAIRES SYMMETRICAL, (319W)
		POWER SERVICE
		PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM

VOLTAGE DROP - CIRCUIT 'X'

Voltage:	480	Wire Factor Used (Two - No. 4 AWG Wires):	0.62 ohms/mft/1000	Circuit: 'X'
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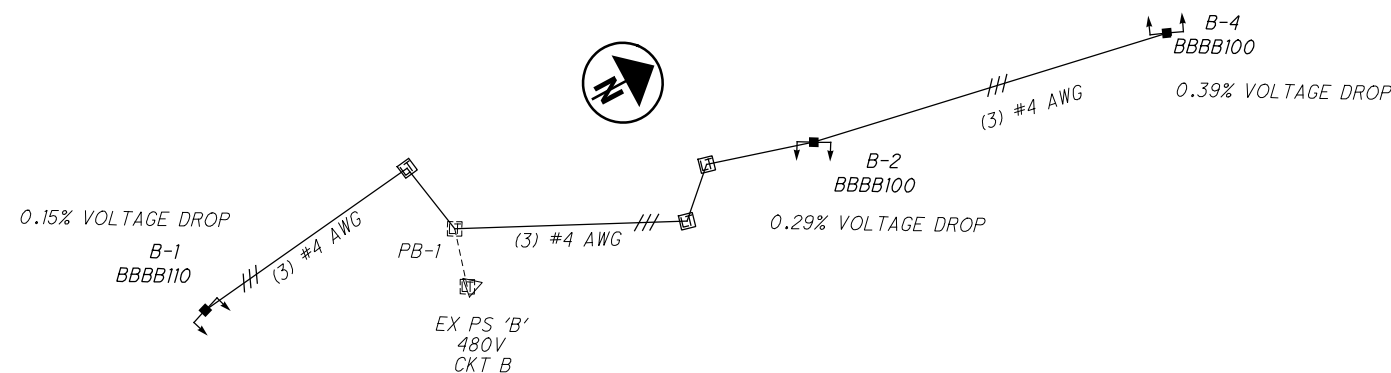
Section			Amperes				Voltage Drop		% Drop	At Point
From	To	Design Feet	At Point	Accum.	Ampere-Feet	AWG	In Section	Accum.		
B3	PB-2	427	2.66	2.66	1,135	4	0.70	3.37	0.70	B3
B5	PB-2	60	2.66	2.66	160	4	0.10	2.77	0.58	B5
PB-2	CC-B	810	0.00	5.32	4,307	4	2.67	2.67	0.56	PB-2
				SUM	5.32	AMPS PROPOSED LOAD		MAX %	0.70	
					2.55	Kva				



VOLTAGE DROP - CIRCUIT 'B'

Voltage:	480	Wire Factor Used (Two - No. 4 AWG Wires):	0.62 ohms/mft/1000	Circuit: 'B'
----------	-----	---	--------------------	--------------

Section			Amperes				Voltage Drop		% Drop	At Point
From	To	Design Feet	At Point	Accum.	Ampere-Feet	AWG	In Section	Accum.		
B4	B2	308	2.66	2.66	819	4	0.51	1.88	0.39	B4
B2	PB-1	335	2.66	5.32	1,781	4	1.10	1.37	0.29	B2
B1	PB-1	270	2.66	2.66	718	4	0.45	0.71	0.15	B1
PB-1	CC-B	54	0.00	7.98	431	4	0.27	0.27	0.06	PB-1
				SUM	7.98	AMPS PROPOSED LOAD		MAX %	0.39	
					3.83	Kva				



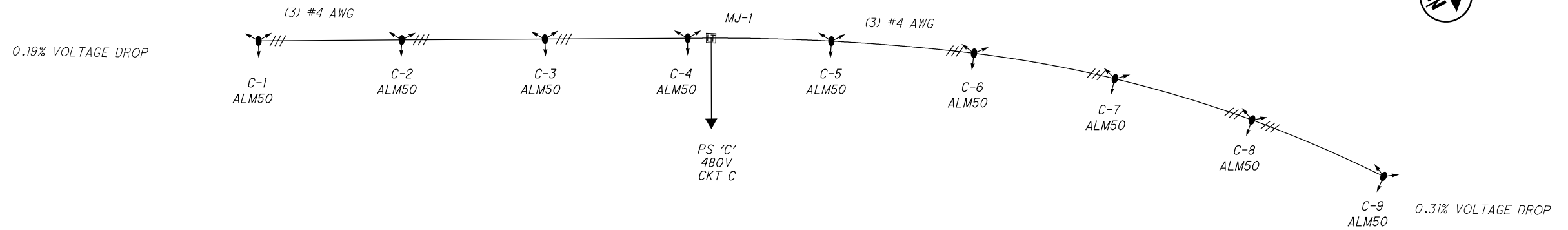
VOLTAGE DROP - CIRCUIT 'C'

Voltage:	480	Wire Factor Used (Two - No. 4 AWG Wires):	0.62	ohms/mft/1000	Circuit: 'C'
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Section			Amperes				Voltage Drop		z Drop	At Point
From	To	Design Feet	At Point	Accum.	Ampere-Feet	AWG	In Section	Accum.		
C9	C8	185	0.66	0.66	123	4	0.08	1.48	0.31	C9
C8	C7	185	0.66	1.33	246	4	0.15	1.41	0.29	C8
C7	C6	185	0.66	1.99	369	4	0.23	1.26	0.26	C7
C6	C5	185	0.66	2.66	492	4	0.30	1.03	0.21	C6
C5	MJ-1	156	0.66	3.32	518	4	0.32	0.72	0.15	C5
C1	C2	185	0.66	0.66	123	4	0.08	0.91	0.19	C1
C2	C3	185	0.66	1.33	246	4	0.15	0.83	0.17	C2
C3	C4	185	0.66	1.99	369	4	0.23	0.68	0.14	C3
C4	MJ-1	31	0.66	2.66	82	4	0.05	0.45	0.09	C4
MJ-1	CC-C	108	0.00	5.98	646	4	0.40	0.40	0.08	MJ-1
			SUM	5.98	AMPS PROPOSED LOAD			MAX %	0.31	
				2.87	Kva					

EXIST.	PROP.	LEGEND
		LOW MAST LIGHT POLE WITH LED LUMINAIRE (319W)
		POWER SERVICE
		PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM



CONTROL CENTER DATA

CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
'C' (IR-75 AT MONMOUTH)	480	2.9	(3) NO. 2	60	1	5.98	10	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	

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CALCULATED
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CIRCUIT SCHEMATIC & CONTROL CENTER DATA
IR 75 CIRCUIT 'C'

HAM-75-3.84

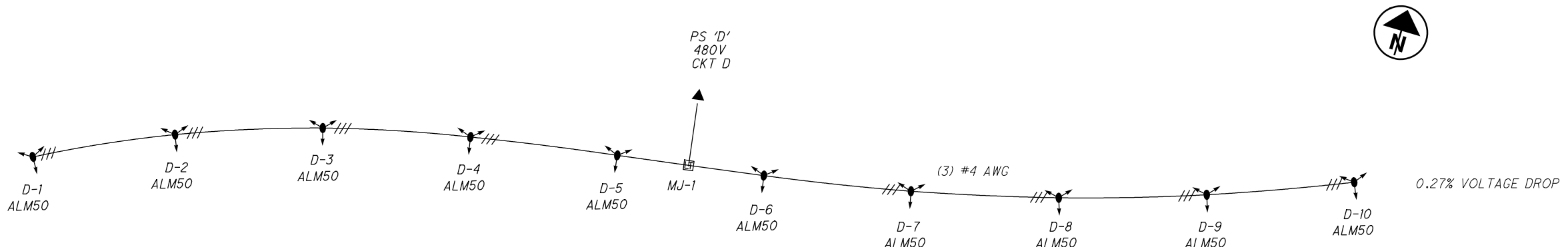
VOLTAGE DROP - CIRCUIT 'D'

Voltage: 480 Wire Factor Used (Two - No. 4 AWG Wires): 0.62 ohms/mft/1000 Circuit: 'D'

Section			Amperes		Ampere-Feet	AWG	Voltage Drop			At Point
From	To	Design Feet	At Point	Accum.			In Section	Accum.	% Drop	
D10	D9	185	0.66	0.66	123	4	0.08	1.32	0.27	D10
D9	D8	185	0.66	1.33	246	4	0.15	1.24	0.26	D9
D8	D7	185	0.66	1.99	369	4	0.23	1.09	0.23	D8
D7	D6	185	0.66	2.66	492	4	0.30	0.86	0.18	D7
D6	MJ-1	95	0.66	3.32	316	4	0.20	0.55	0.12	D6
D1	D2	180	0.66	0.66	120	4	0.07	1.31	0.27	D1
D2	D3	185	0.66	1.33	246	4	0.15	1.23	0.26	D2
D3	D4	185	0.66	1.99	369	4	0.23	1.08	0.22	D3
D4	D5	185	0.66	2.66	492	4	0.30	0.85	0.18	D4
D5	MJ-1	91	0.66	3.32	302	4	0.19	0.55	0.11	D5
MJ-1	CC-D	87	0.00	6.65	578	4	0.36	0.36	0.07	MJ-1
			SUM	6.65	AMPS PROPOSED LOAD		MAX %	0.27		
				3.19	Kva					

EXIST.	PROP.	LEGEND
		LOW MAST LIGHT POLE WITH LED LUMINAIRE (319W)
		POWER SERVICE
		PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM



CONTROL CENTER DATA									
CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
'D'	480	3.2	(3) NO. 2	60	1	6.65	10	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	

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CALCULATED EMS CHECKED CRH
CIRCUIT SCHEMATIC & CONTROL CENTER DATA
IR 75 CIRCUIT 'D'
HAM-75-3.84
63
106

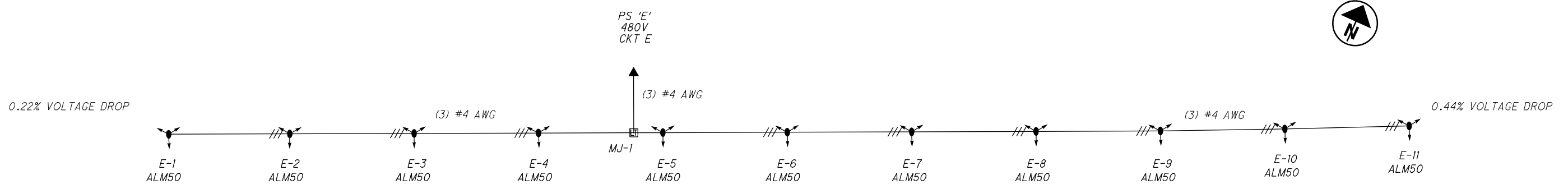
VOLTAGE DROP - CIRCUIT 'E'

Voltage: 480 Wire Factor Used (Two - No. 4 AWG Wires): 0.62 ohms/mft/1000 Circuit: 'E'

Section			Amperes				AWG	Voltage Drop			At Point
From	To	Design Feet	At Point	Accum.	Ampere-Feet	In Section		Accum.	% Drop		
E11	E10	185	0.66	0.66	123	4	0.08	2.12	0.44	E11	
E10	E9	185	0.66	1.33	246	4	0.15	2.04	0.43	E10	
E9	E8	185	0.66	1.99	369	4	0.23	1.89	0.39	E9	
E8	E7	185	0.66	2.66	492	4	0.30	1.66	0.35	E8	
E7	E6	185	0.66	3.32	615	4	0.38	1.36	0.28	E7	
E6	E5	185	0.66	3.99	738	4	0.46	0.97	0.20	E6	
E5	MJ-1	44	0.66	4.65	205	4	0.13	0.52	0.11	E5	
E1	E2	180	0.66	0.66	120	4	0.07	1.08	0.22	E1	
E2	E3	185	0.66	1.33	246	4	0.15	1.00	0.21	E2	
E3	E4	185	0.66	1.99	369	4	0.23	0.85	0.18	E3	
E4	MJ-1	142	0.66	2.66	377	4	0.23	0.62	0.13	E4	
MJ-1	CC-E	86	0.00	7.31	629	4	0.39	0.39	0.08	MJ-1	
			SUM	7.31	AMPS PROPOSED LOAD		MAX %	0.44			
				3.51	Kva						

EXIST.	PROP.	LEGEND
		LOW MAST LIGHT POLE WITH LED LUMINAIRE (319W)
		POWER SERVICE
		PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM



CONTROL CENTER DATA

CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
'E'	480	3.5	(3) NO. 2	60	1	7.31	10	NO. 4	ODOT
					-	-	-	-	
					-	-	-	-	

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CALCULATED
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CIRCUIT SCHEMATIC & CONTROL CENTER DATA
IR 75 CIRCUIT 'E'

HAM-75-3.84

VOLTAGE DROP - CIRCUIT 'F'

Voltage:240	Wire Factor Used (Two - No. 1/0 AWG Wires):	0.24	ohms/mft/1000	Circuit: 'F1'
	Wire Factor Used (Two - No. 4 AWG Wires):	0.62	ohms/mft/1000	

Section		Design Feet	Amperes		Ampere-Feet	AWG	Voltage Drop		Σ Drop	At Point
From	To		At Point	Accum.			In Section	Accum.		
F1-1	F1-2	570	5.32	5.32	3,031	4	1.88	10.50	4.37	F1-1
F1-2	PB-1	220	5.32	10.63	2,339	4	1.45	8.62	3.59	F1-2
EX F1-3	PB-1	71	10.00	10.00	710	4	0.44	7.61	3.17	EX F1-3
PB-1	PB-2	350	0.00	20.63	7,222	1/0	1.73	7.17	2.99	PB-1
F1-4	PB-2	8	5.32	5.32	43	4	0.03	5.46	2.28	F1-4
PB-2	PB-3	358	0.00	25.95	9,290	1/0	2.23	5.44	2.27	PB-2
PB-3	PB-4	507	0.00	25.95	13,157	1/0	3.16	3.21	1.34	PB-3
PB-4	CC-F	8	0.00	25.95	208	1/0	0.05	0.05	0.02	PB-4
SUM			25.95	AMPS PROPOSED LOAD			MAX %	4.37		
			6.23	Kva						

Voltage:240	Wire Factor Used (Two - No. 1/0 AWG Wires):	0.24	ohms/mft/1000	Circuit: 'F2'
	Wire Factor Used (Two - No. 4 AWG Wires):	0.62	ohms/mft/1000	

Section		Design Feet	Amperes		Ampere-Feet	AWG	Voltage Drop		Σ Drop	At Point
From	To		At Point	Accum.			In Section	Accum.		
F2-4	PB7	258	7.98	7.98	2,058	4	1.28	5.99	2.49	F2-4
PB-7	PB-5	1,025	0.00	7.98	8,174	1/0	1.96	4.71	1.96	PB-7
EX F2-1	PB-5	187	6.67	6.67	1,247	4	0.77	3.52	1.47	EX F2-1
PB-5	PB-3	130	0.00	14.64	1,903	1/0	0.46	2.75	1.15	PB-5
PB-3	F2-2	148	0.00	14.64	2,167	1/0	0.52	2.29	0.96	PB-3
F2-2	PB-4	359	5.32	19.96	7,165	1/0	1.72	1.77	0.74	F2-2
F2-3	PB-8	81	7.98	7.98	646	4	0.40	1.80	0.75	F2-3
PB-8	PB-4	273	0.00	7.98	2,177	4	1.35	1.40	0.58	PB-8
PB-4	CC-F	8	0.00	27.93	223	1/0	0.05	0.05	0.02	PB-4
SUM			27.93	AMPS PROPOSED LOAD			MAX %	2.49		
			6.70	Kva						

Voltage:240	Wire Factor Used (Two - No. 4 AWG Wires):	0.62	ohms/mft/1000	Circuit: 'F3'
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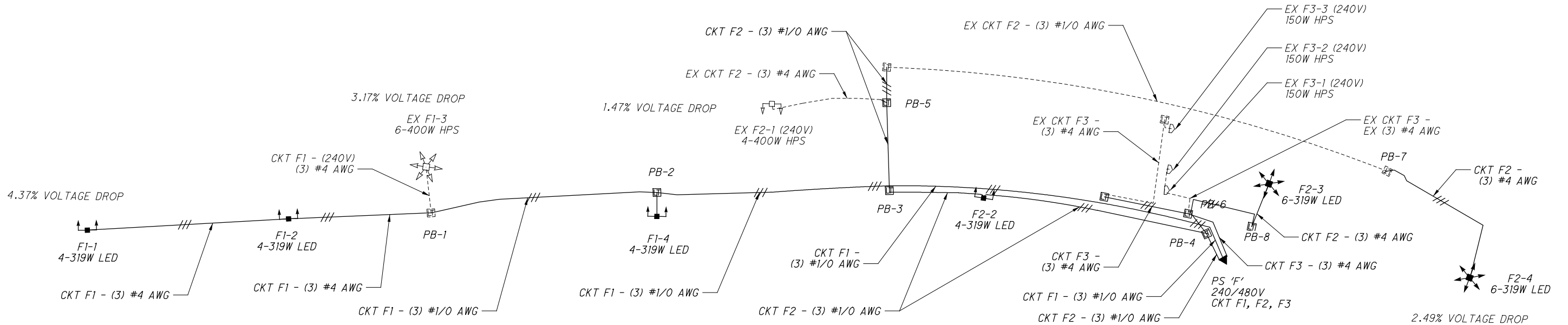
Section		Design Feet	Amperes		Ampere-Feet	AWG	Voltage Drop		Σ Drop	At Point
From	To		At Point	Accum.			In Section	Accum.		
F3-3	PB-6	389	0.63	0.63	243	4	0.15	0.21	0.09	F3-3
F3-2	F3-1	40	0.63	0.63	25	4	0.02	0.13	0.05	F3-2
F3-1	PB-6	71	0.63	1.25	89	4	0.06	0.11	0.05	F3-1
PB-6	PB-4	41	0.00	1.88	77	4	0.05	0.06	0.02	PB-6
PB-4	CC-F	9	0.00	1.88	17	4	0.01	0.01	0.00	PB-4
SUM			1.88	AMPS PROPOSED LOAD			MAX %	0.09		
			0.45	Kva						

CONTROL CENTER DATA

CONTROL CENTER DESIGNATION	LINE VOLTS	CONNECTED LOAD (KVA)	SERVICE ENTRANCE CONDUCTOR SIZE - AWG	ENCLOSURE RATING (AMPS)	CIRCUIT NO.	CIRCUIT LOAD AMPS	CIRCUIT FUSE SIZE AMPS	CIRCUIT CABLE SIZE AWG	MAINTAINING AGENCY
'F'	240	13.4	(3) NO. 2	100	1	25.95	40	NO. 1/0	ODOT
					2	27.93	40	NO. 1/0	
					3	1.88	10	NO. 4	

EXIST.	PROP.	LEGEND
		HIGH MAST LIGHT TOWER WITH 4 HPS LUMINAIRES ASYMMETRICAL, (400W)
		HIGH MAST LIGHT TOWER WITH 4 LED LUMINAIRES ASYMMETRICAL, (319W)
		HIGH MAST LIGHT TOWER WITH 6 HPS LUMINAIRES SYMMETRICAL, (400W)
		HIGH MAST LIGHT TOWER WITH 6 LED LUMINAIRES SYMMETRICAL, (319W)
		UNDERPASS LUMINAIRE
		POWER SERVICE
		PULL BOX WITH SPLICES *

* ONLY PULL BOXES FOR BRANCH CIRCUITS ARE SHOWN IN CIRCUIT DIAGRAM



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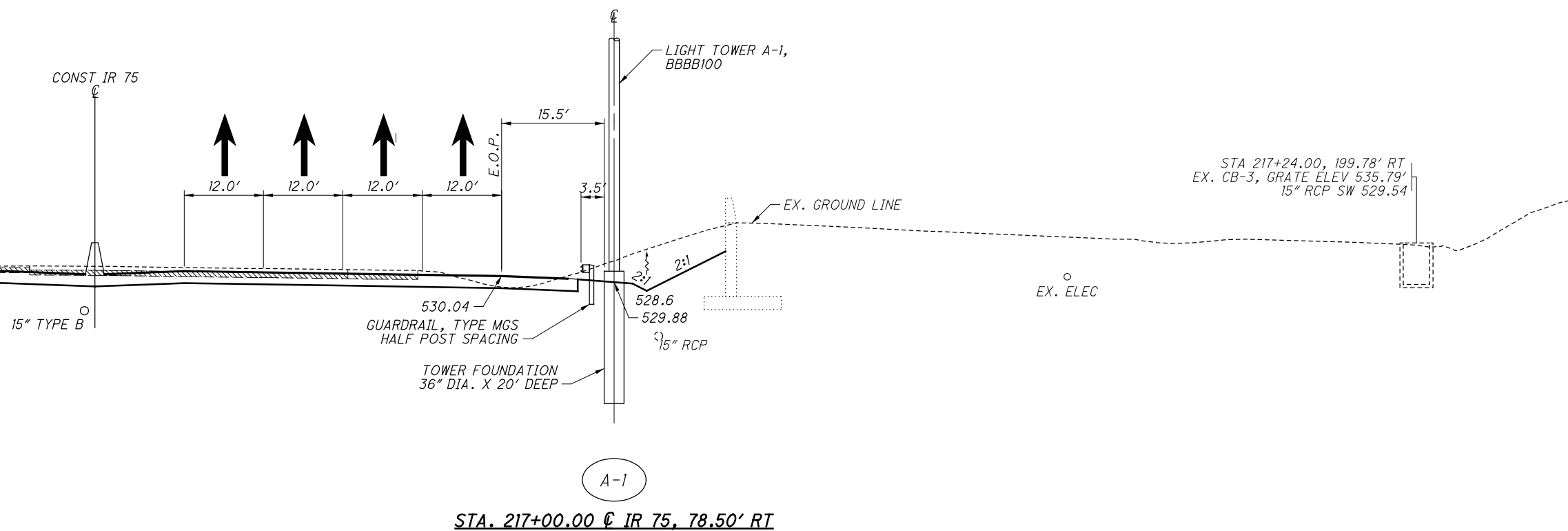
CALCULATED EMS CHECKED CRH
CIRCUIT SCHEMATIC & CONTROL CENTER DATA
IR 74 CIRCUITS 'F'
HAM-75-3.84
65
106

LIGHT TOWER SCHEDULE

NO.	TOWER		LOCATION				DETAILS			REFERENCE BORING(S)	FOR DETAIL SEE SHEET		
	HEIGHT (FT.)	NO. OF LUMINAIRES		ALIGNMENT	STATION	OFFSET	SIDE	ELEV (FT) (NOTE 2)	DIA (IN)			REINF. BARS (NOTE 3)	LENGTH (FT) (NOTE 1)
		SYM	ASYM										
A-1	100.00	4		IR 75	217+00.00	78.50'	RT	529.88	36	16 #9	20		
A-2	100.00	4		IR 75	218+54.00	91.50'	RT	528.81	36	16 #9	20		67
A-3	100.00	4		IR 75	220+87.45	101.00'	RT	531.62	36	16 #9	20		67
A-4	100.00	4		IR 75	223+10.60	101.00'	RT	530.22	36	16 #9	20		68
A-5	100.00	6		IR 75	225+84.31	101.00'	RT	528.45	36	16 #9	20		68
A-6	100.00	6		IR 75	229+00.00	101.00'	RT	523.88	36	16 #9	20		69
B-1	110.00		4	IR 75	232+70.00	123.00'	RT	517.06	36	16 #9	20		69
B-3	120.00	4		IR 75	237+25.11	101.80'	LT	516.08	36	16 #9	20		70
B-4	100.00		4	RAMP P	241+75.00	57.81'	LT	519.00	36	16 #9	20		70
F1-1	100.00		4	IR 74	1009+01.98	74.10'	RT	528.30	36	16 #9	20		71
F1-2	100.00		4	IR 74	1014+70.20	68.13'	RT	519.06	36	16 #9	20		71
F1-4	100.00		4	IR 74	1020+38.07	65.47'	RT	515.82	36	16 #9	20		72
F2-2	100.00		4	IR 74 EB	1025+46.04	50.59'	RT	511.61	36	16 #9	20		72
F2-3	130.00	6		IR 74 EB	1029+75.66	49.77'	LT	487.18	42	16 #9	25		73
F2-4	140.00	6		IR 74 WB	1035+30.00	72.74'	LT	489.88	42	16 #9	25		73
A-8	110.00		4	IR 74 EB	1039+05.00	40.00'	LT	532.40	36	16 #9	20		74
A-7	110.00		4	IR 74 EB	1043+18.00	36.00'	LT	522.55	36	16 #9	20		74
B-5	100.00		4	RAMP O	241+21.92	31.50'	LT	506.27	36	16 #9	20		75
B-2	100.00		4	RAMP P	238+38.44	54.38'	LT	533.32	36	16 #9	20		75

NOTES:

1. LENGTH OF THE DRILLED SHAFT IS FROM TOP OF FOUNDATION PER HL-20.24
2. ELEVATION IS FINAL GROUND SURFACE (EXISTING OR PROPOSED) AT TOWER FOUNDATION CENTERLINE.
3. SEE STANDARD DRAWING HL-20.21 FOR ADDITIONAL REINFORCING STEEL DETAILS. REINFORCING STEEL SHALL BE ITEM 509, GRADE 60. CONCRETE SHALL BE QC 1 OR QC MISC.



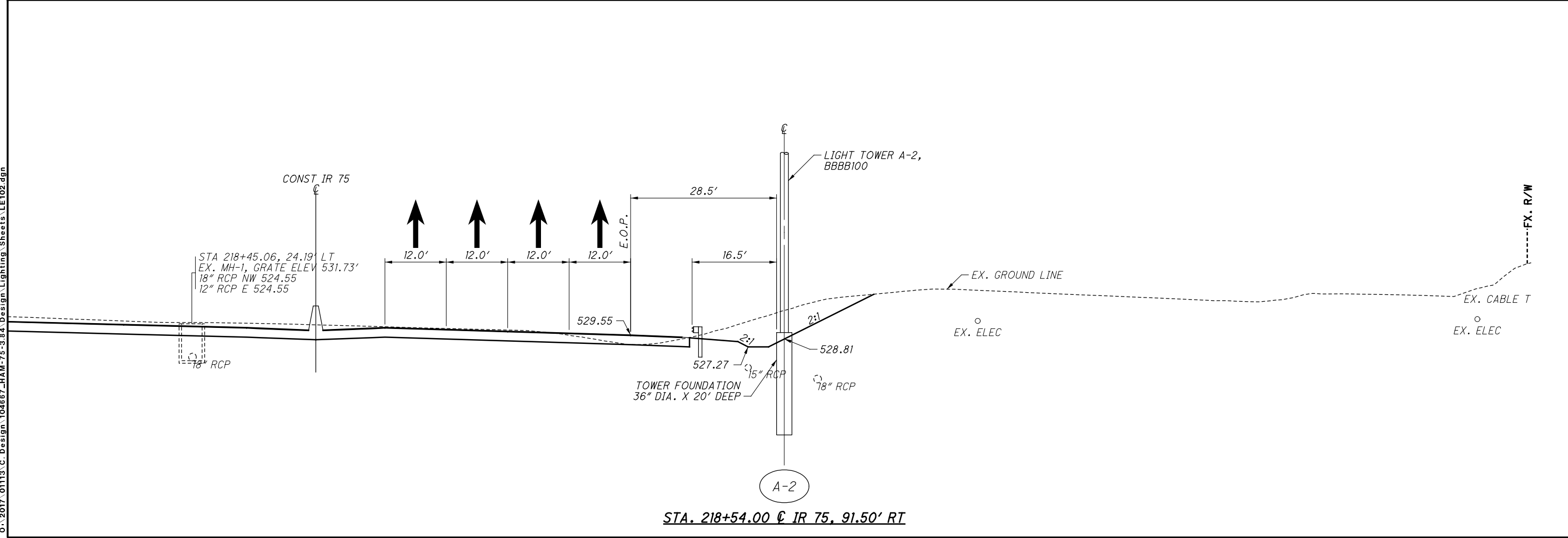
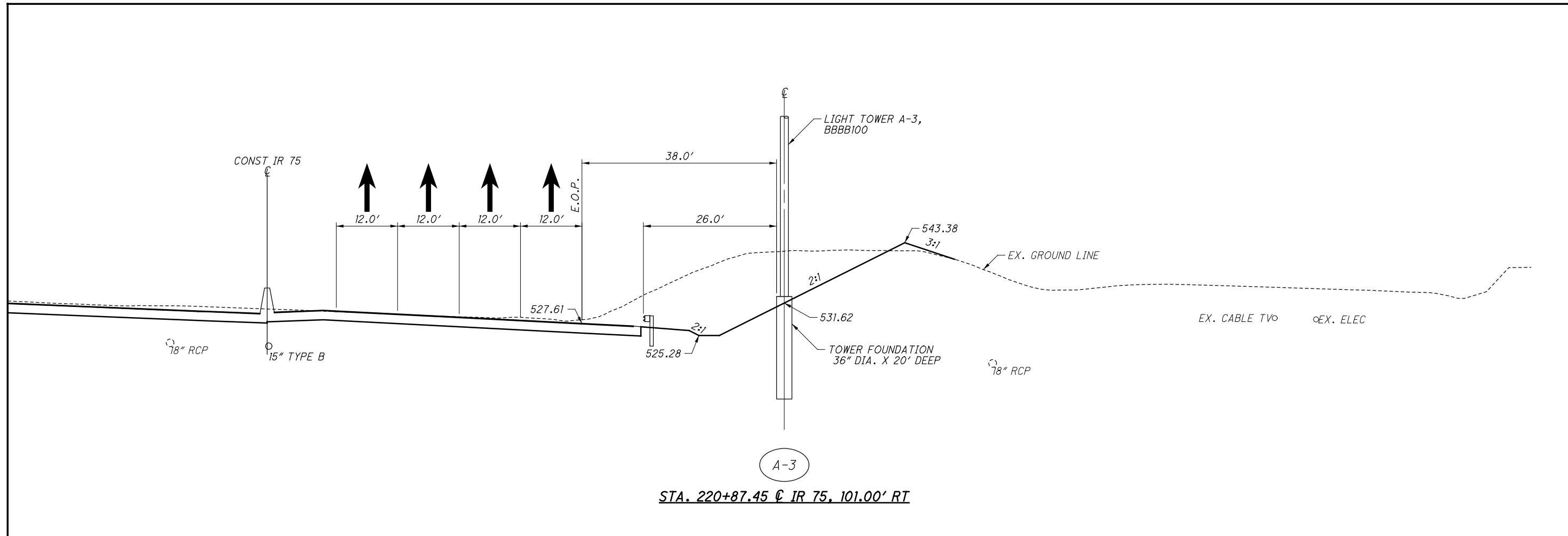
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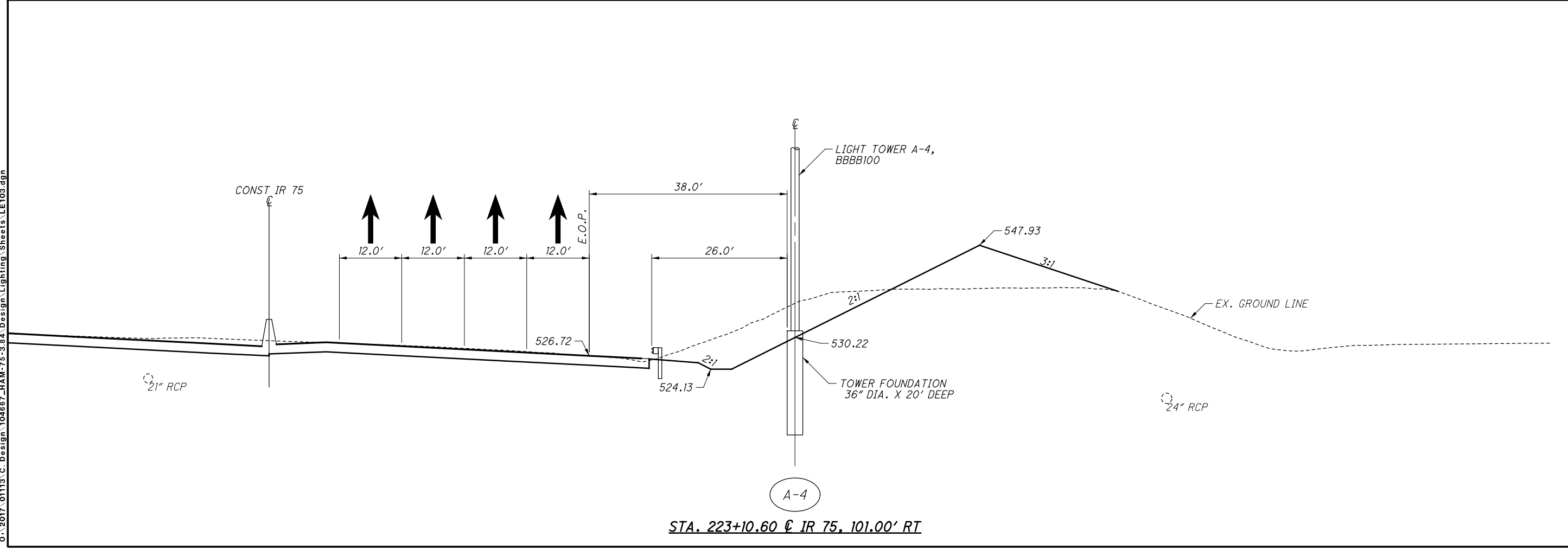
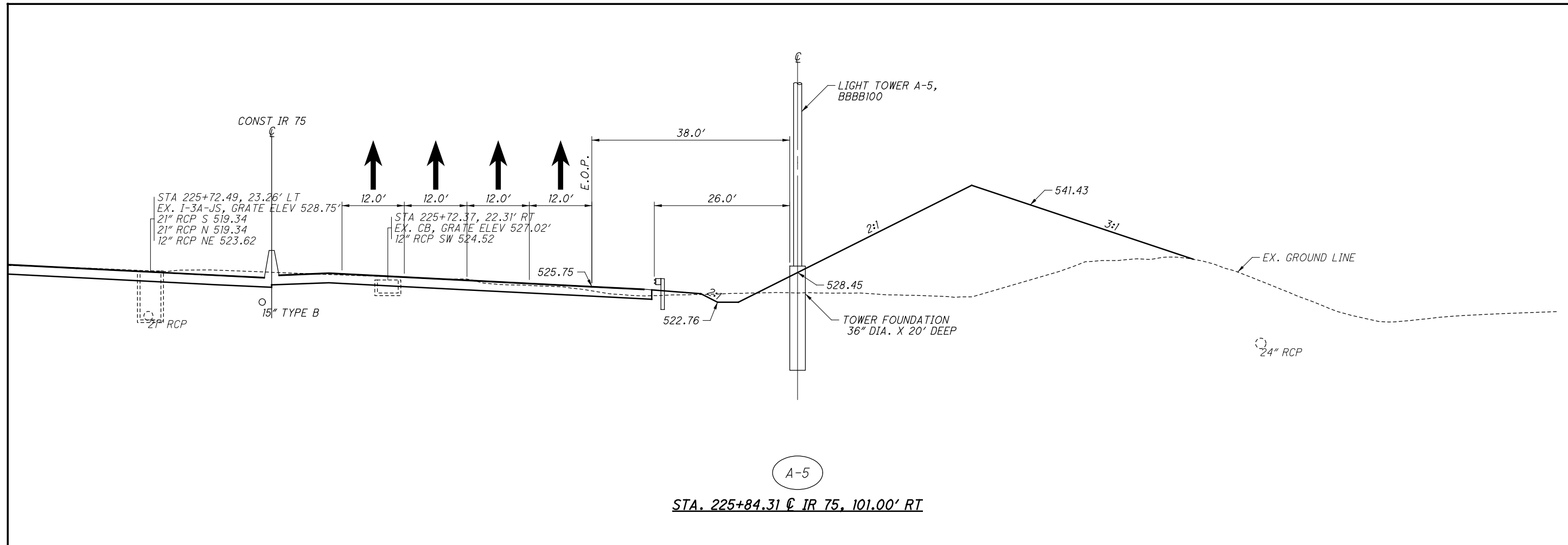
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**LIGHTING DETAILS
LIGHTING TOWER SCHEDULE / TOWER A-1 ELEVATION**

HAM-75-3.84

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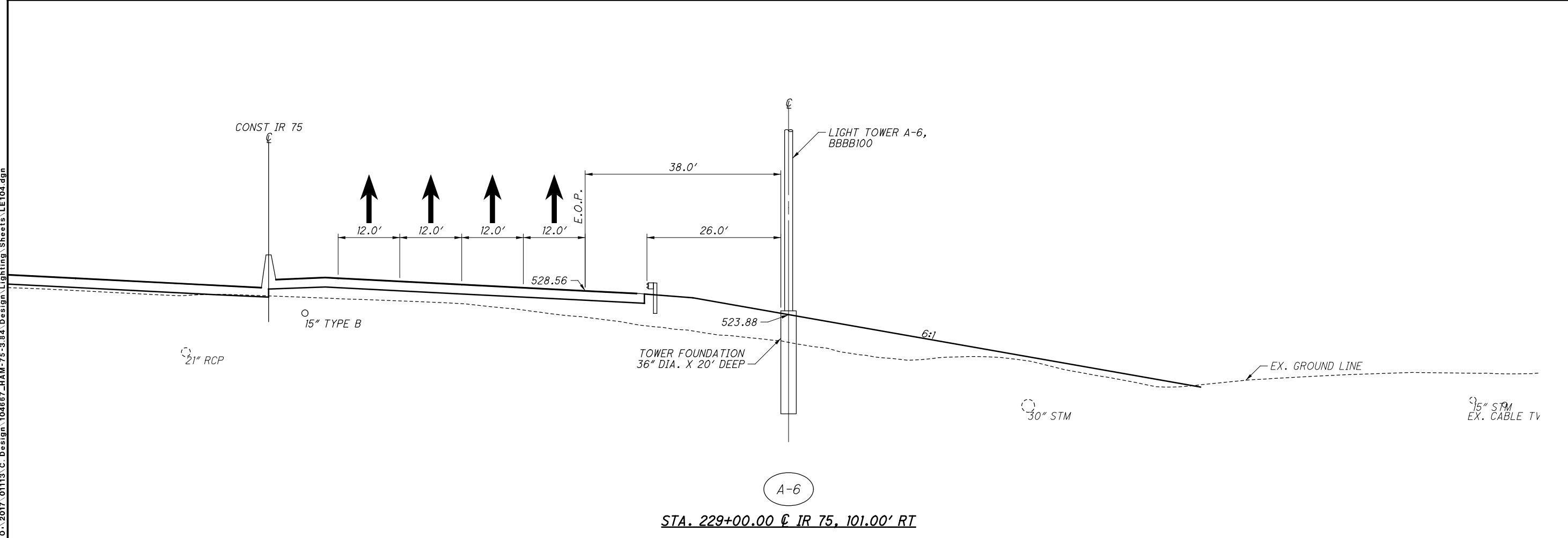
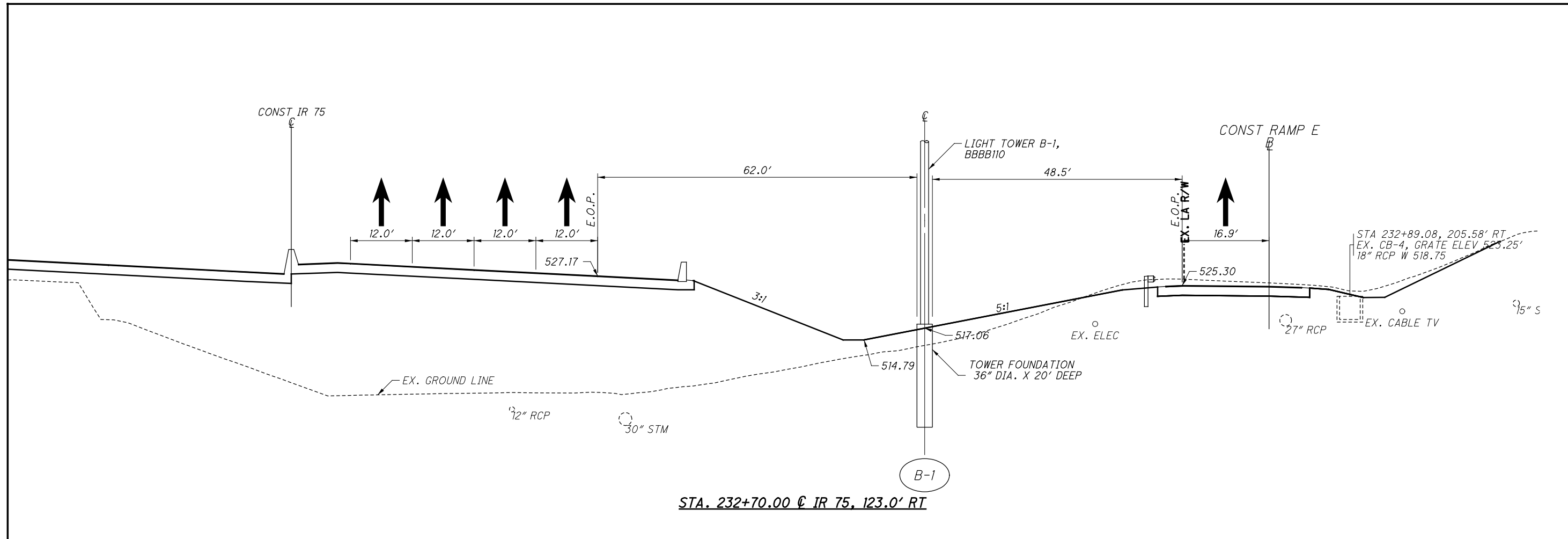


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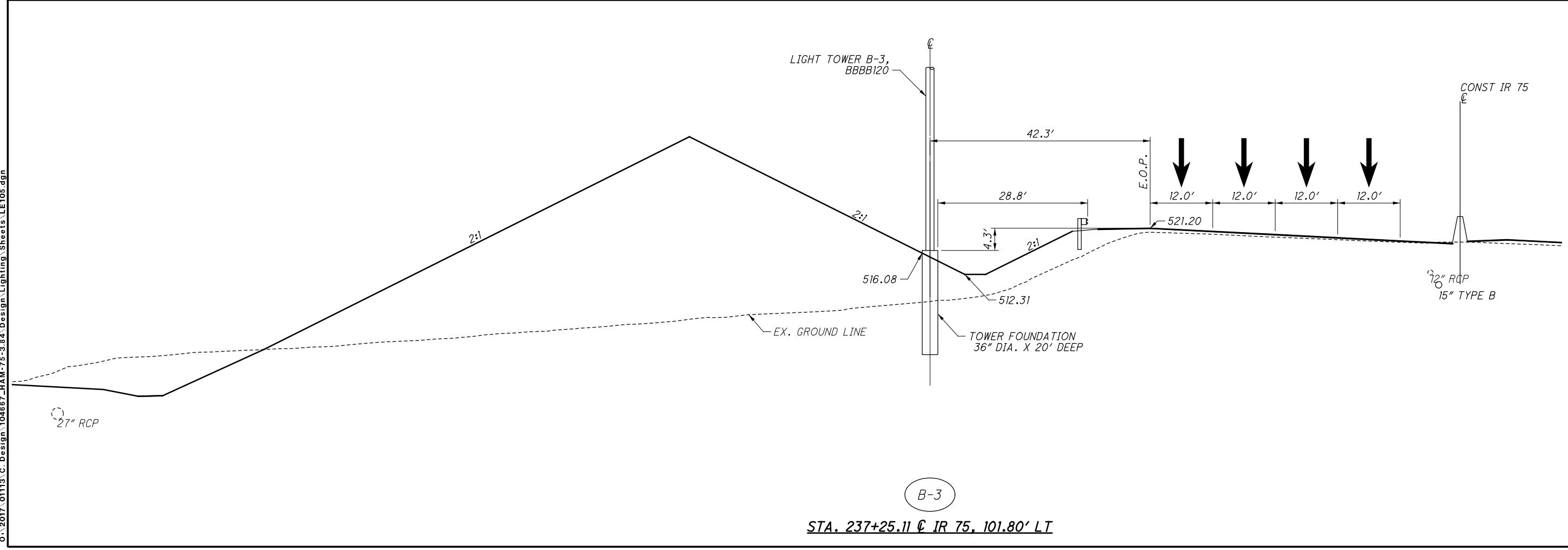
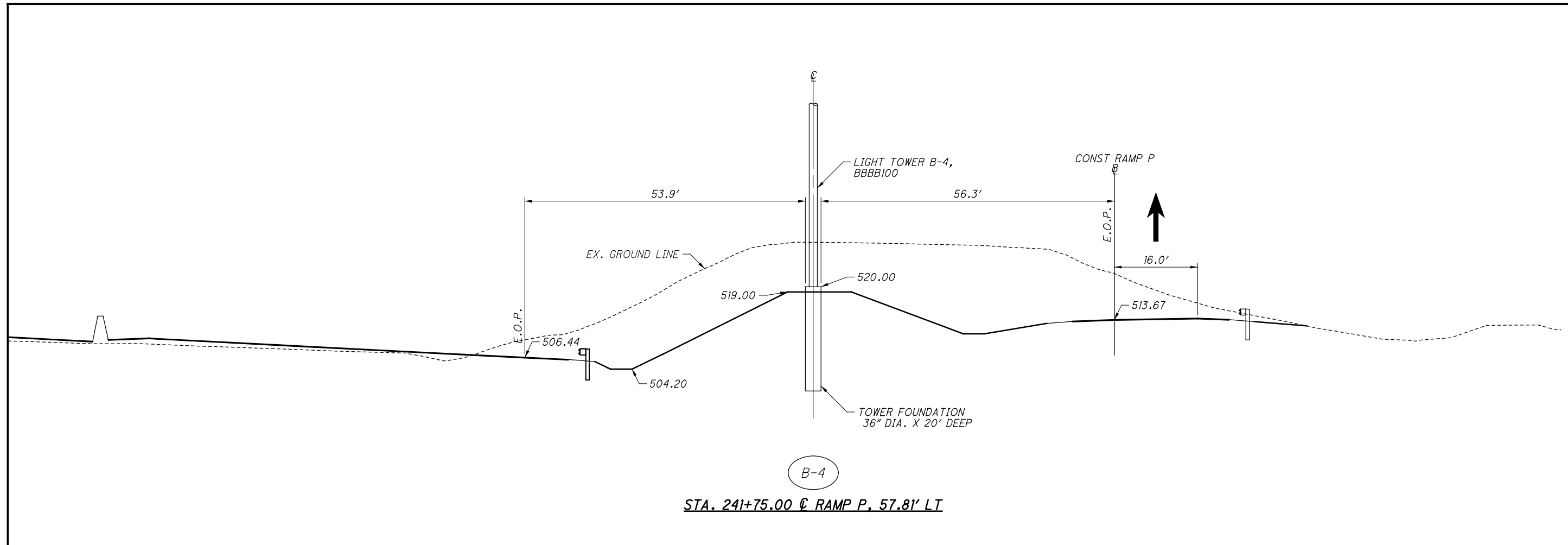
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**LIGHTING DETAILS
TOWER A-6 ELEVATION/TOWER B-1 ELEVATION**

HAM-75-3.84



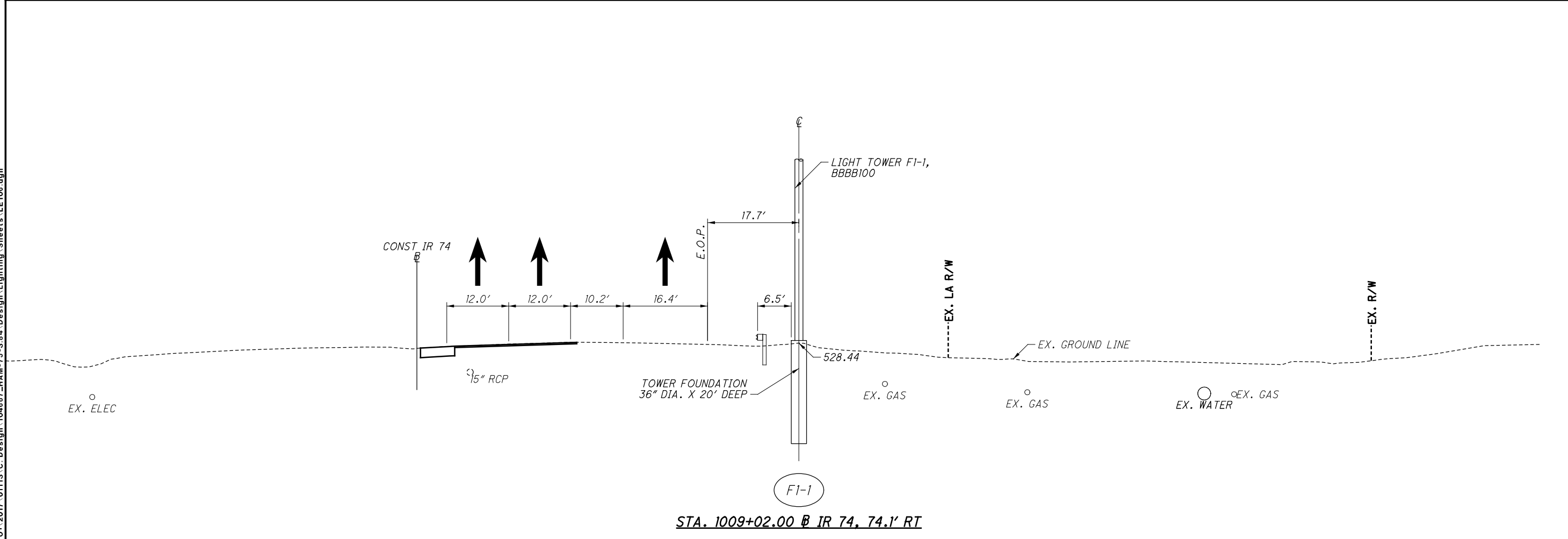
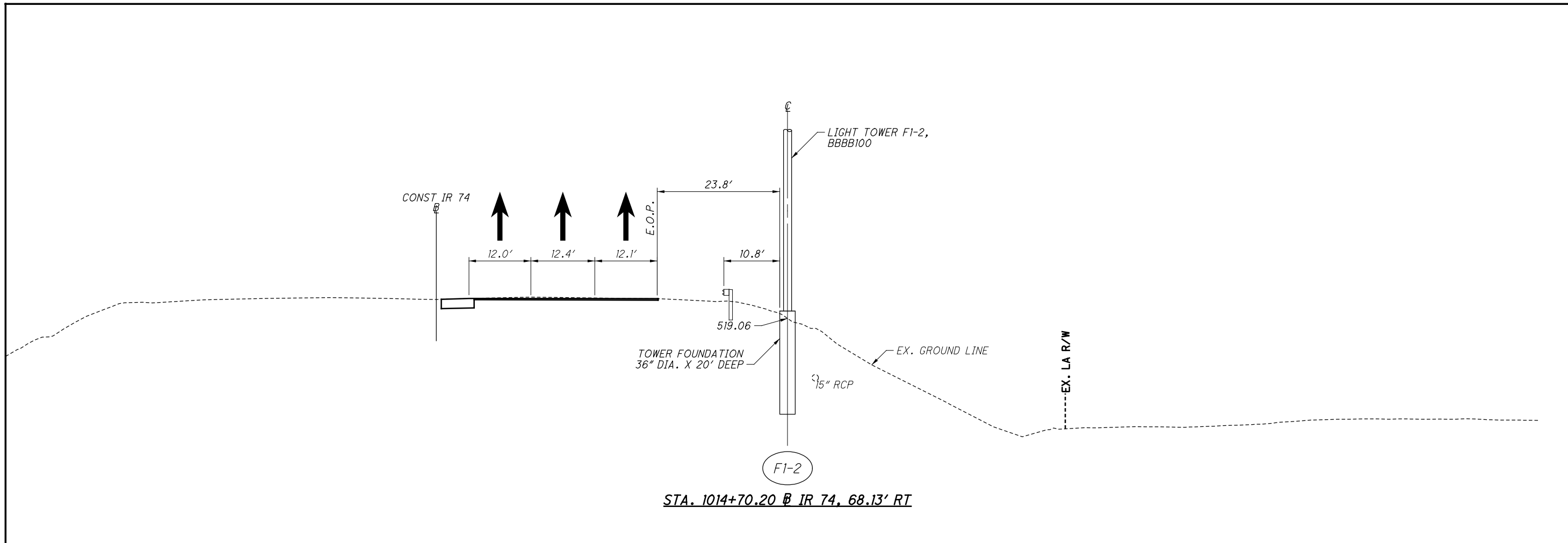
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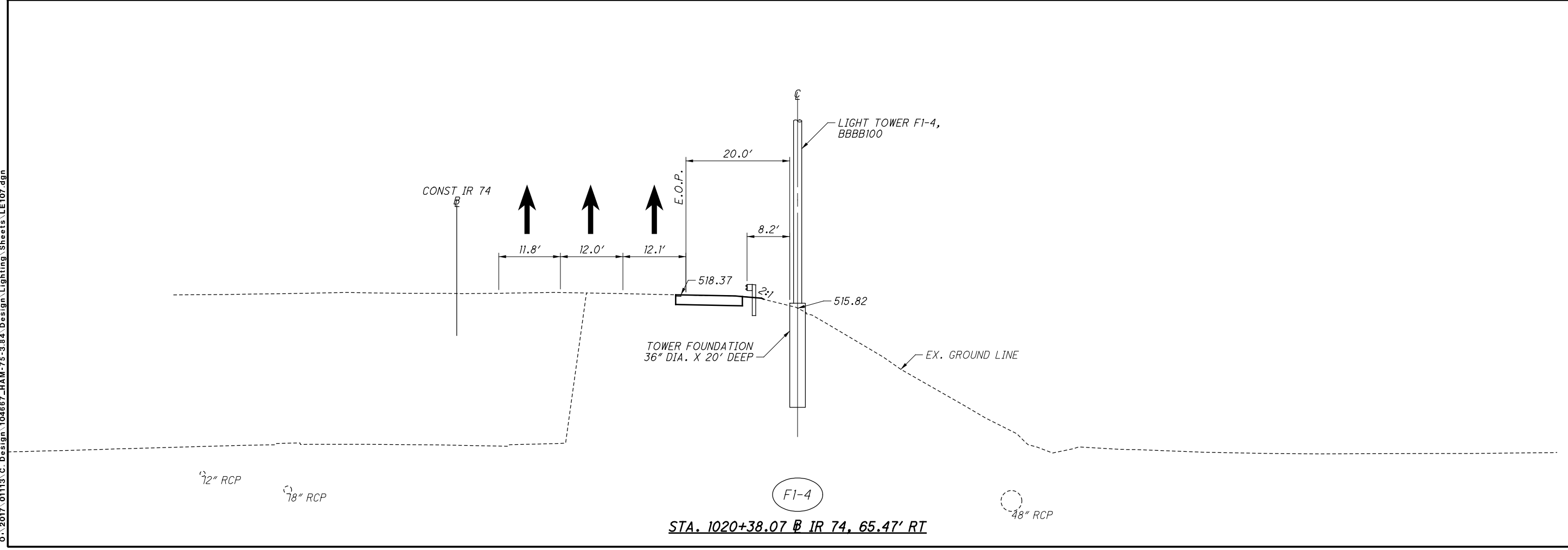
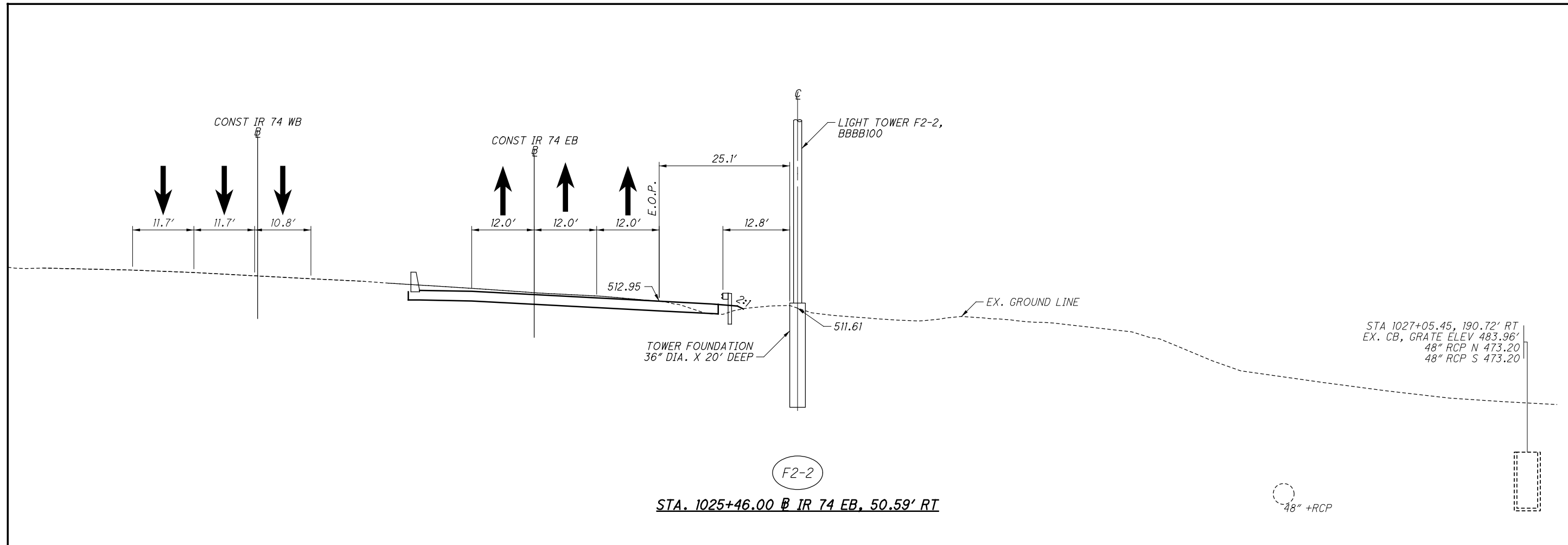
CALCULATED
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LIGHTING DETAILS
TOWER F1-1 ELEVATION/ TOWER F1-2 ELEVATION

HAM-75-3.84

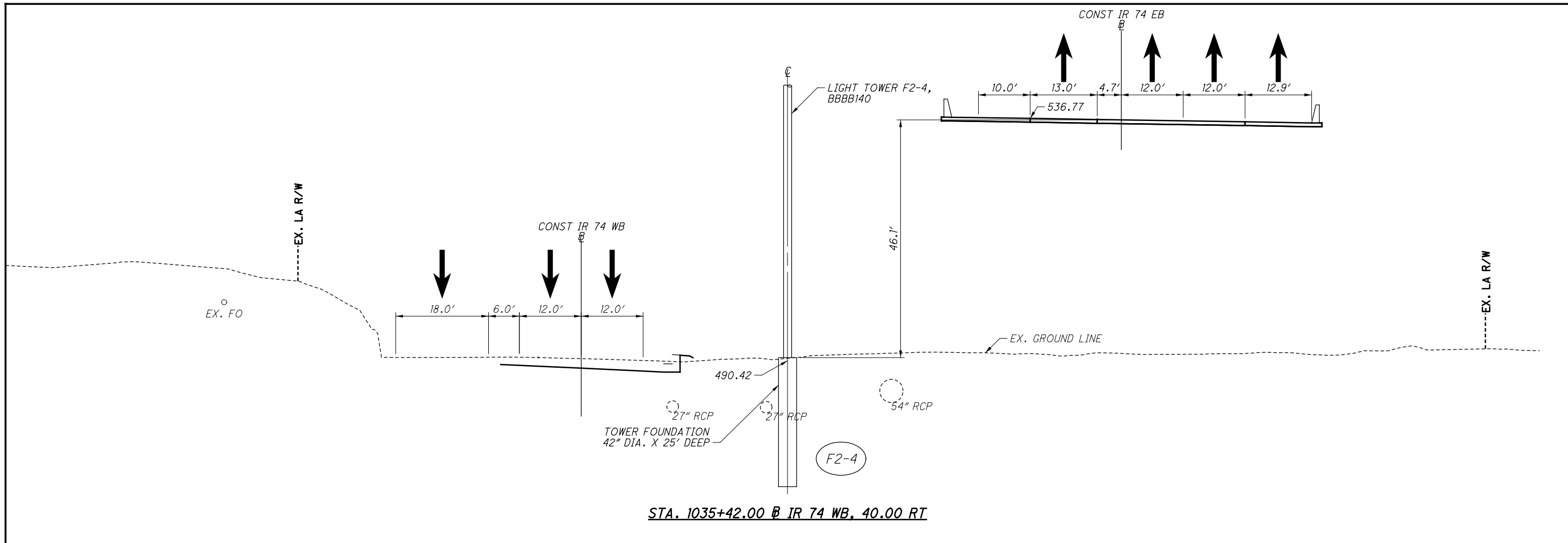
**LIGHTING DETAILS
TOWER F1-4 ELEVATION / TOWER F2-2 ELEVATION**

HAM-75-3.84

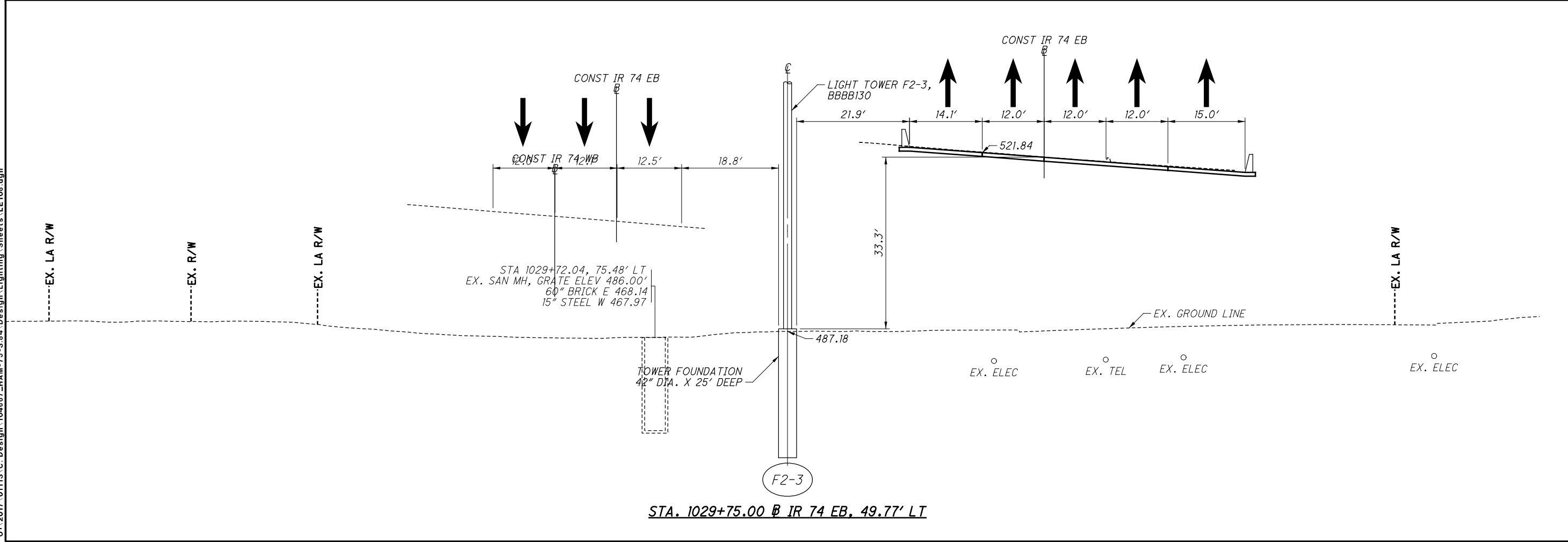


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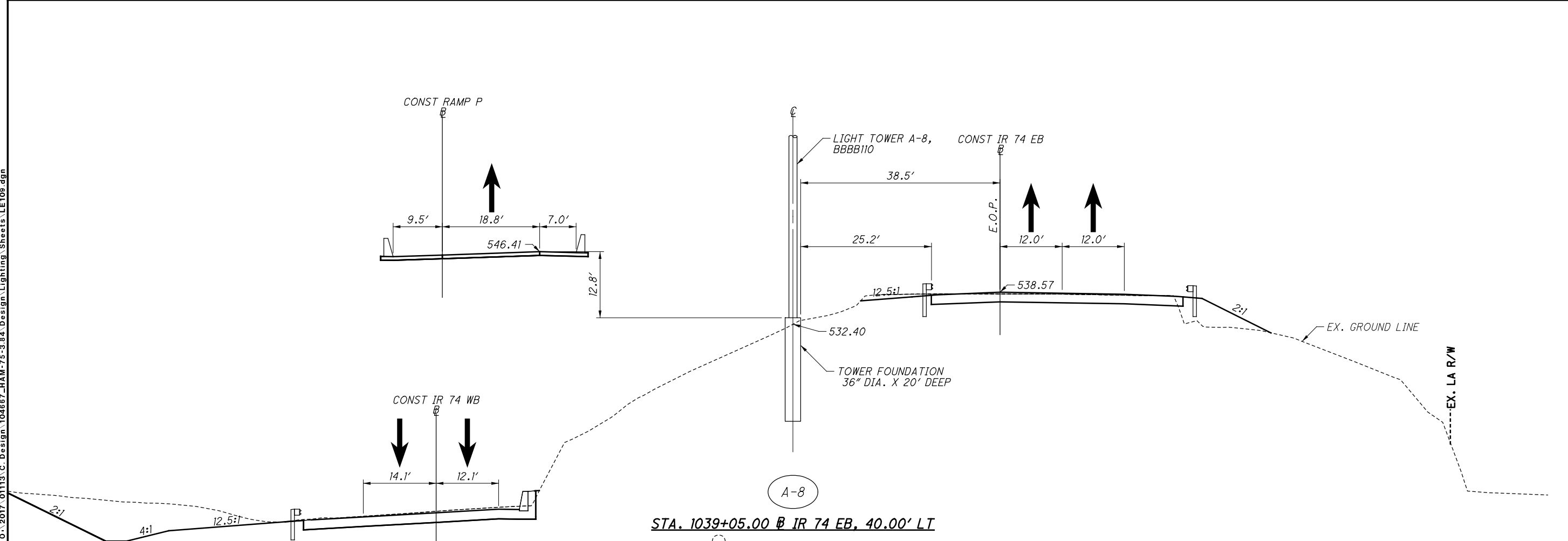
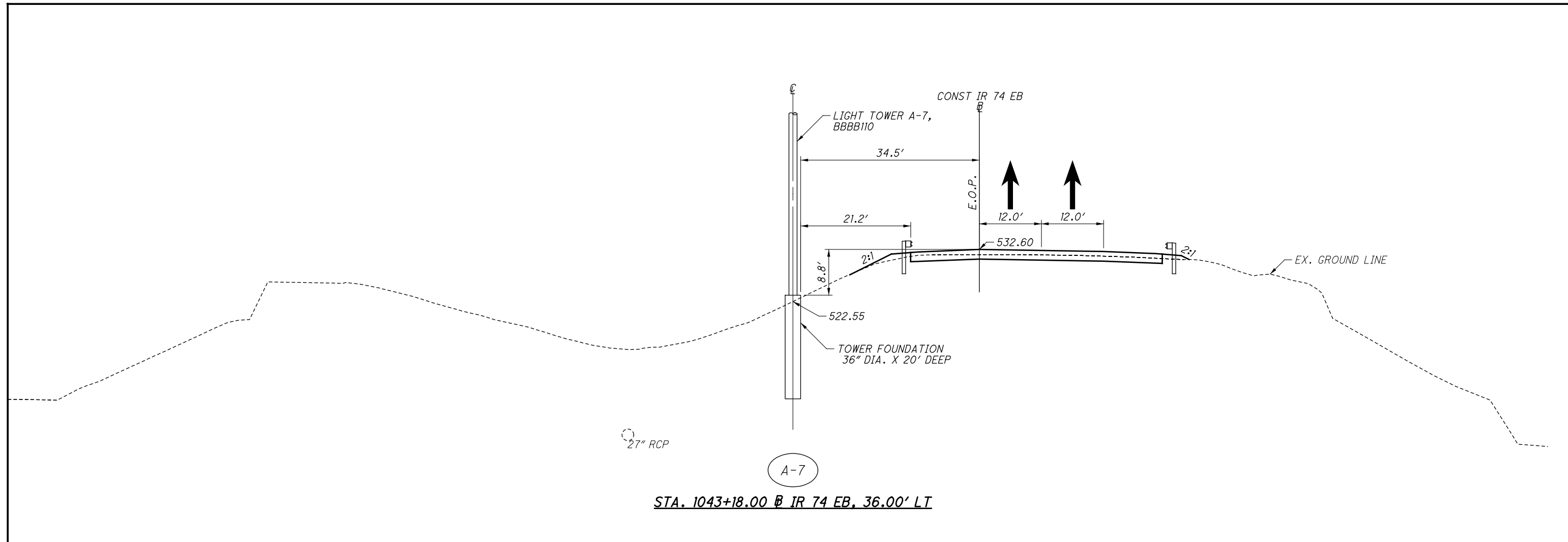
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STA. 1035+42.00 @ IR 74 WB, 40.00 RT

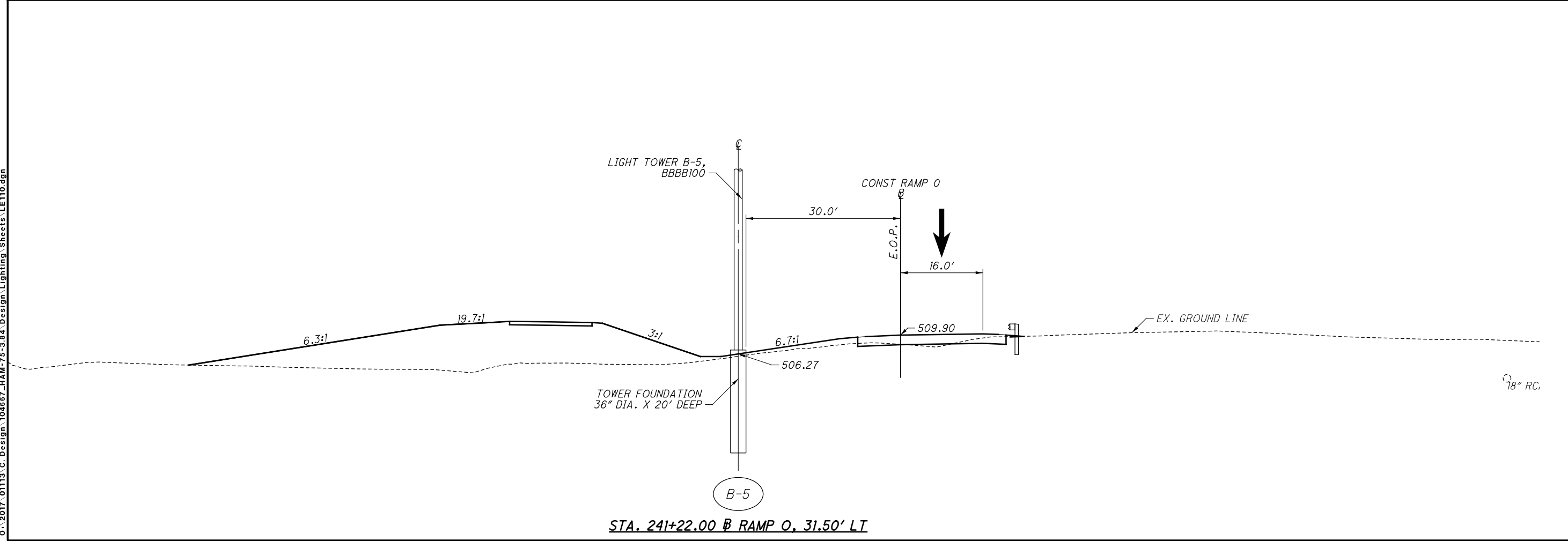
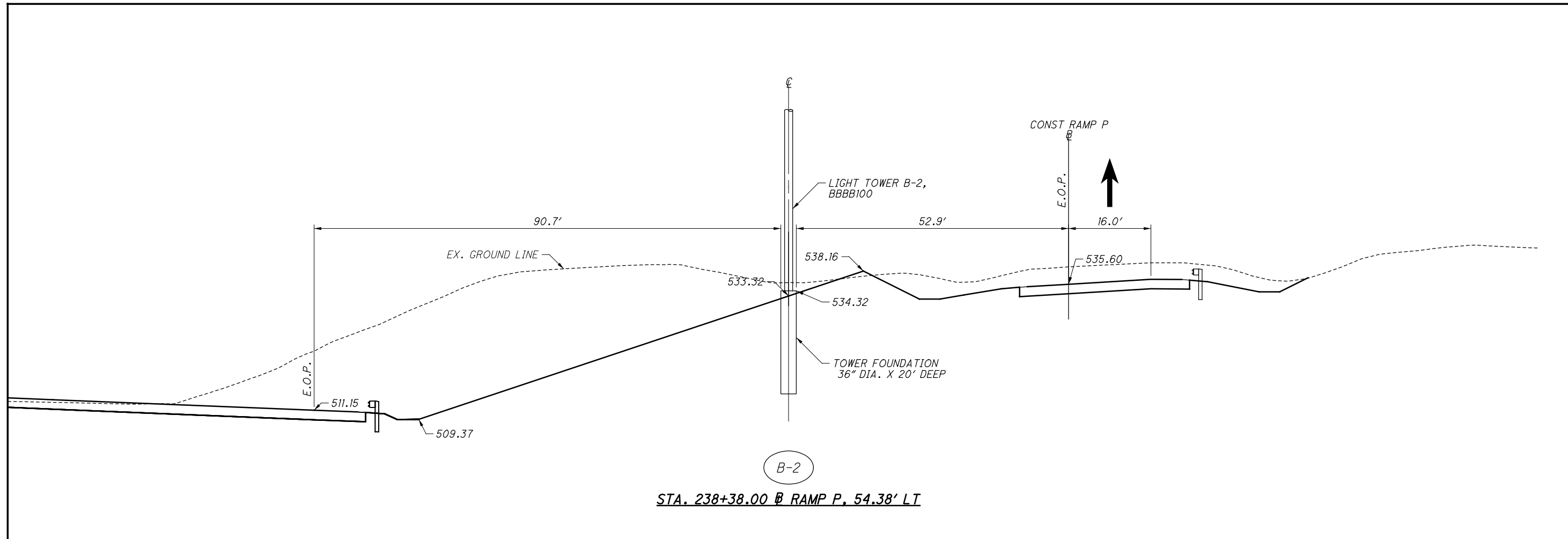


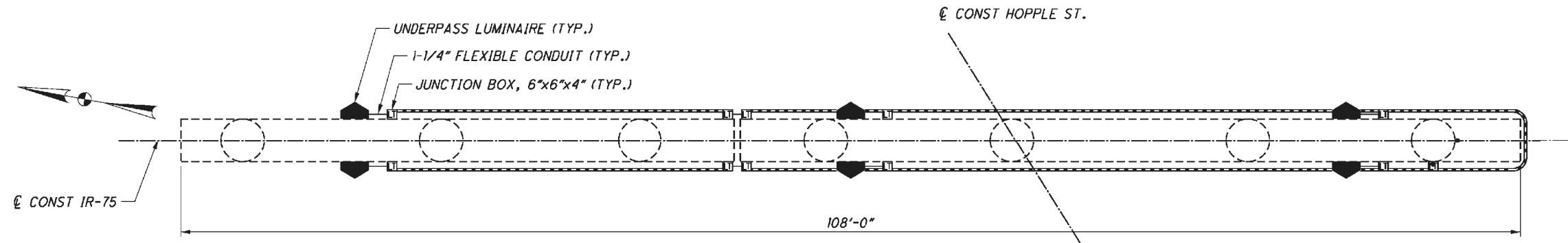
STA. 1029+75.00 @ IR 74 EB, 49.77' LT



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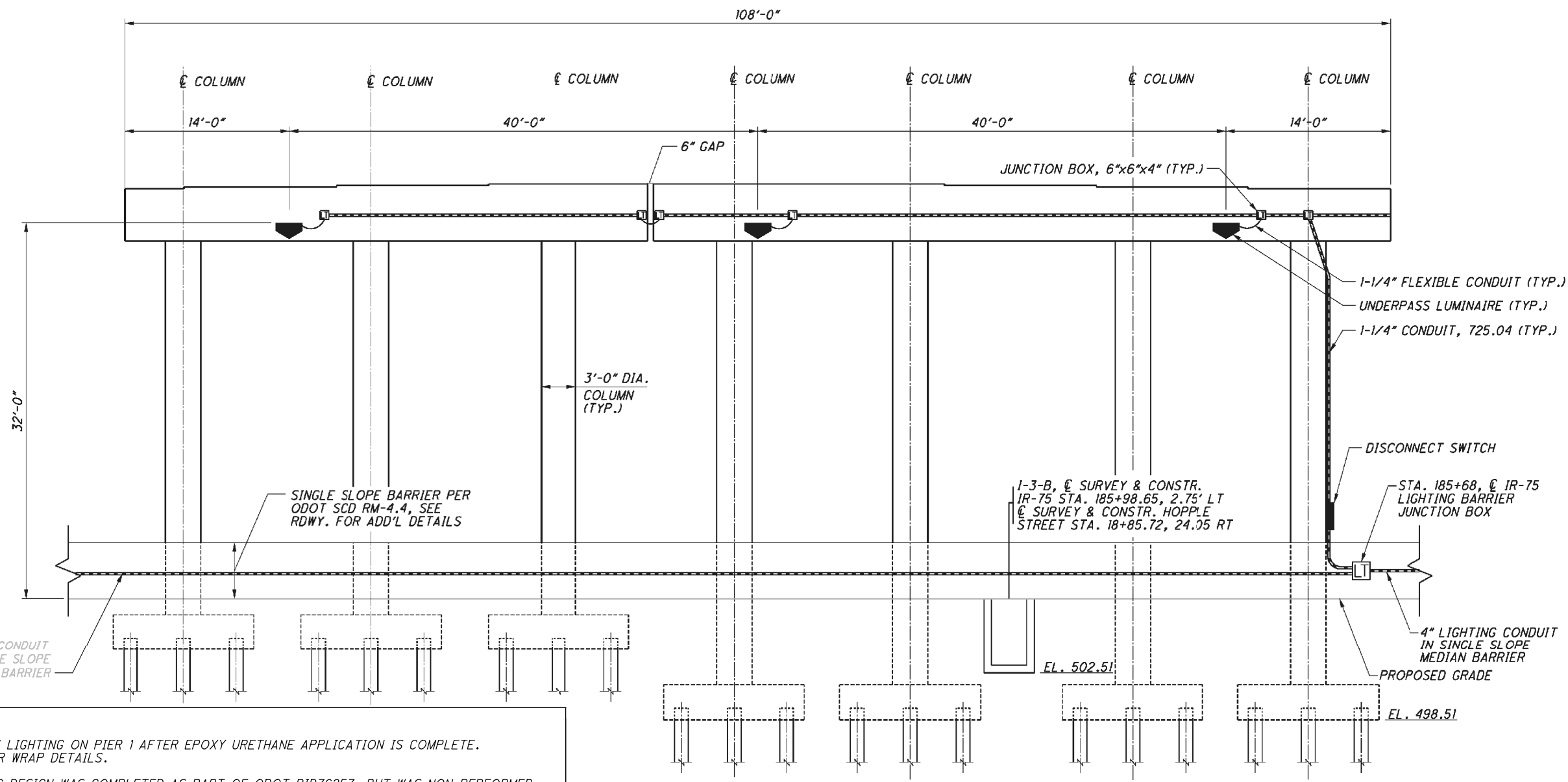
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CAP PLAN

STRUCTURE NO. HAM-52-2044 (HOPPLE ST.), PIER 1



ELEVATION

STRUCTURE NO. HAM-52-2044 (HOPPLE ST.), PIER 1
LOOKING EAST

- NOTES:
1. INSTALL UNDERPASS LIGHTING ON PIER 1 AFTER EPOXY URETHANE APPLICATION IS COMPLETE. SEE BU-18 FOR FIBER WRAP DETAILS.
 2. UNDERPASS LIGHTING DESIGN WAS COMPLETED AS PART OF ODOT PID76257, BUT WAS NON-PERFORMED. UNDERPASS LUMINAIRES WERE PREVIOUSLY PURCHASED AND STORED AT ODOT DISTRICT 8. CONTACT PROJECT ENGINEER FOR PICK-UP. THE DBT SHALL BE RESPONSIBLE FOR ALL OTHER MATERIALS NECESSARY FOR A COMPLETE INSTALLATION OF UNDERPASS LIGHTING, INCLUDING BUT NOT LIMITED TO FLEXIBLE CONDUIT, WIRES, JUNCTION BOXES, DISCONNECT SWITCH, AND NECESSARY CONNECTIONS.
 3. UNDERPASS LIGHTING SHALL BE CONNECTED TO EXISTING CIRCUIT K VIA THE PERVIOUSLY INSTALLED MEDIAN BARRIER JUNCTION BOX. EXISTING LIGHTING CONTROL CENTER (CC-K) IS LOCATED AT STA. 174+41 RAMP D, 24' LT.

CALCULATED RJB CHECKED HJF
UNDERPASS LIGHTING DETAILS - HAM-52-2044 (PIER 1)

HAM-75-2.30

1142
1450

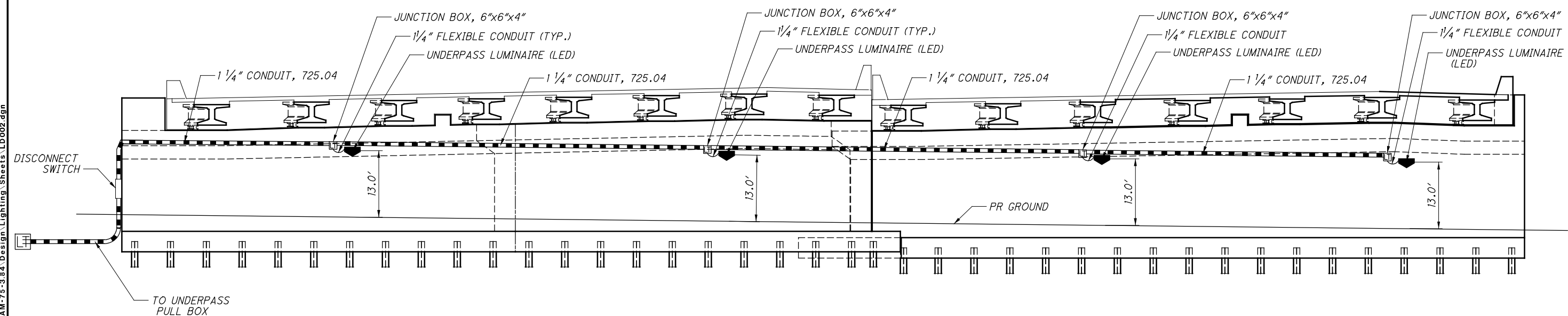
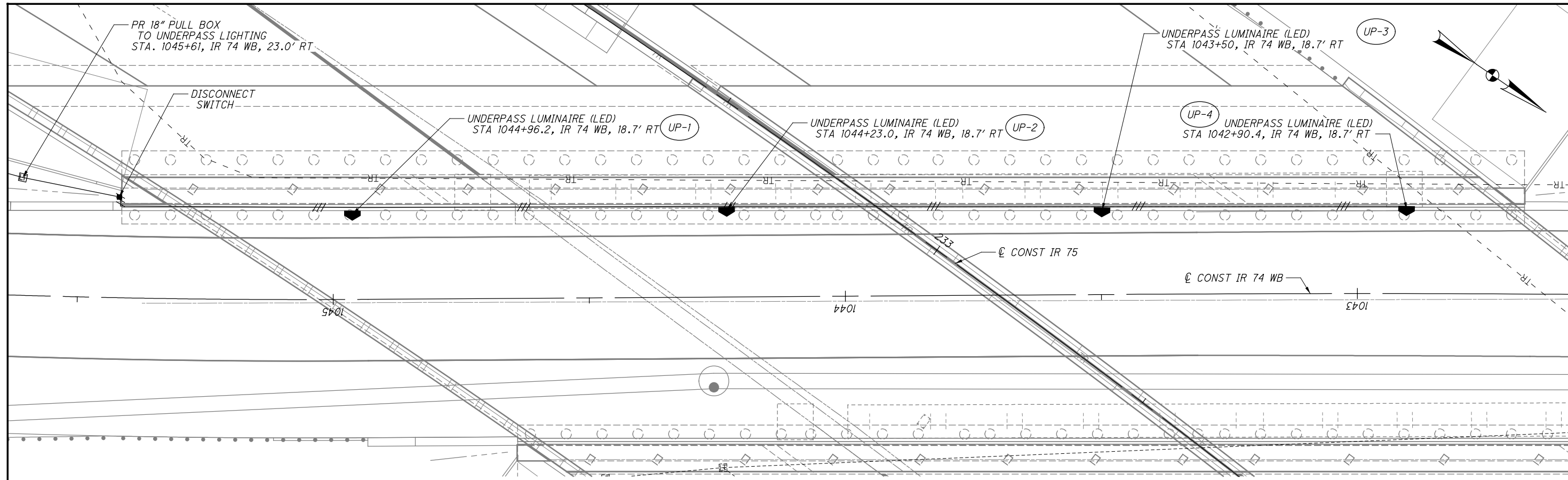
CALCULATED EMS CHECKED CRH
UNDERPASS LIGHTING DETAILS - HAM-75-2044

HAM-75-3.84

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106

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ELEVATION - REAR ABUTMENT

CALCULATED
 EMS
 CHECKED
 CRH

UNDERPASS LIGHTING DETAILS - HAM-75-0440

HAM-75-3.84



ITS LEGEND		
EXISTING	PROPOSED	DESCRIPTION
		ITS COMMUNICATION PULL BOX
		ITS COMMUNICATION MAN HOLE
		ITS COMMUNICATION EQUIPMENT POLE
		ITS COMMUNICATION CONTROLLER
		CCTV CAMERA
		SIDE-FIRE RADAR UNIT
		ITS CONDUIT
		POWER CONDUIT

CALCULATED
 EMS
 CHECKED
 CRH

0 400 800
 HORIZONTAL
 SCALE IN FEET

ITS SCHEMATIC PLAN

HAM-75-3.84

ITS SPECIFICATIONS

SUPPLEMENTAL SPECIFICATIONS 804 AND 904 ADDRESS FIBER OPTIC CABLE AND COMPONENTS. ALL CONSTRUCTION PROJECTS WHERE INSTALLATION, RELOCATION, AND/OR SPLICING OF FIBER OPTIC CABLE IS INVOLVED NEED TO REFERENCE ODOT SUPPLEMENTAL SPECIFICATIONS 804 AND 904.

SUPPLEMENTAL SPECIFICATION 809 ADDRESSES INTELLIGENT TRANSPORTATION SYSTEM (ITS) DEVICES AND COMPONENTS. ALL CONSTRUCTION PROJECTS INVOLVING ITS OR ANY ITEM LISTED IN CHAPTER 1303 NEEDS TO REFERENCE ODOT SUPPLEMENTAL SPECIFICATION 809. THE 809 SUPPLEMENTAL SPECIFICATION HAS A SECTION FOR EACH ITEM AND DESCRIBES THE WORK THAT NEEDS TO BE PERFORMED FOR EACH ITEM. THE 809

SPECIFICATION ALSO REFERS THE CONTRACTORS TO THE TRAFFIC AUTHORIZED PRODUCT LIST.

202, REMOVAL MISC.: ITS EQUIPMENT

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY ITS EQUIPMENT NOT SPECIFIED ON ITS PLAN SHEETS. MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

202, REMOVAL MISC.: CONTROLLER

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY ITS CONTROLLERS INCLUDING ALL ITEMS ASSOCIATED WITH SPECIFIED CONTROLLER.

MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

202, REMOVAL MISC.: VEHICLE DETECTION SYSTEM (LOOP DETECTORS)

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY VEHICLE DETECTION SYSTEM (LOOP DETECTORS) INCLUDING ALL ITEMS ASSOCIATED WITH SPECIFIED DETECTION SYSTEMS. MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

202, REMOVAL MISC.: CABINET

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY CABINET INCLUDING ALL ITEMS ASSOCIATED WITH SPECIFIED CABINET. MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

202, REMOVAL MISC.: ITS POLE

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY ITS POLE OR SUPPORT INCLUDING ALL ITEMS ASSOCIATED WITH SPECIFIED POLE. MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

202, REMOVAL MISC.: SIDE-FIRED DETECTORS (INCLUDES ALL EQUIPMENT FOR SYSTEM)

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY SIDE-FIRED DETECTORS (INCLUDES ALL EQUIPMENT FOR SYSTEM) INCLUDING ALL ITEMS ASSOCIATED WITH SPECIFIED SIDE-FIRED DETECTOR. MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

202, REMOVAL MISC.: FIBER OPTIC CABLE

THIS ITEM SHALL CONSIST OF THE REMOVAL OF ANY ITS FIBER OPTIC CABLE INCLUDING ALL ASSOCIATED ITEMS. MATERIALS REMOVED MAY BE RETURNED TO ODOT; CONTRACTOR TO CONTACT ODOT ITS REGARDING WHICH ITEMS ARE TO BE RETURNED. DISTURBED AREAS SHALL BE PROPERLY RESTORED.

809, CCTV INSTALLATIONS

THE CONTRACTOR SHALL FURNISH AND INSTALL THIS ITEM ACCORDING TO ODOT SUPPLEMENTAL SPECIFICATION 809, AS WELL AS ANY STANDARD CONSTRUCTION DRAWINGS NOTED ON THE PLANS.

809, VEHICLE DETECTION INSTALLATIONS

THE CONTRACTOR SHALL FURNISH AND INSTALL THIS ITEM ACCORDING TO ODOT SUPPLEMENTAL SPECIFICATION 809, AS WELL AS ANY STANDARD CONSTRUCTION DRAWINGS NOTED ON THE PLANS.

809, SIDE-FIRED RADAR DETECTORS

THE CONTRACTOR SHALL INSTALL SIDE-FIRED RADAR DETECTORS PER ODOT SUPPLEMENTAL SPECIFICATIONS 809 ON EACH CCTV CONCRETE POLE IN A MANNER TO CAPTURE ALL MAINLINE AND RAMP LANES IN THE DIRECT AREA.

THE DETECTORS SHALL UTILIZE SIDE-MOUNT BRACKETS IN A WAY THAT DOES NOT INTERFERE WITH THE OPERATION OF THE CCTV LOWERING UNIT.

THE CONTRACTOR SHALL INSTALL ALL CABLING ON THE INSIDE OF THE POLE, LEAVING A DRIP LOOP PRIOR TO ENTERING THE POLE. ALL CABLES SHALL TERMINATE ON A DETECTOR MANUFACTURER SURGE ARRESTOR PANEL IN THE ITS CABINET.

ITS POWER SERVICE

NEW POWER SERVICES FOR ITS DEVICES SHALL BE 120/240V UNLESS OTHERWISE NOTED ON THE PLANS. STEP-DOWN TRANSFORMERS SHALL BE PROVIDED ADJACENT TO THE ITS DEVICE ACCORDING TO STANDARD CONSTRUCTION DRAWING ITS-50.11. POWER CABLE SHALL NOT EXCEED #1/0 AWG.

625, CONDUIT 4" MULTI-CELL SCHEDULE 40 & SCHEDULE 80, 725.20

DESCRIPTION

THIS CONDUIT IS INTENDED FOR THE USE IN UNDERGROUND SITUATIONS REQUIRING MORE THAN ONE SINGLE CONDUIT. THIS INCLUDES THE MAIN CONDUIT RACEWAY ALONG THE FREEWAY, CONNECTION FROM PULL BOXES TO THE ROAD SIDE CABINETS AND FOR RUNS OF CONDUIT FOR MULTIPLE PURPOSES, E.G., AT RAMP METER INSTALLATIONS, FOR LOOP LEAD-IN CABLE, SIGNALS CABLE FOR RAMP METER DISPLAYS, SIGNAL CABLE FOR RAMP METER SIGNING FLASHERS & ILLUMINATION AND POWER. THE CONTRACTOR SHALL PLUG ALL UNUSED CELLS WITH CONDUIT CAPS TO ASSURE AIR AND WATER INTEGRITY OF EACH INDIVIDUAL INNERDUCT.

MATERIALS

THE TRAFFIC SURVEILLANCE RACEWAY SHALL CONSIST OF A FACTORY-ASSEMBLED SYSTEM OF FOUR (4) INNERDUCTS ASSEMBLED WITHIN A PROTECTIVE OUTER DUCT. THE INNERDUCTS SHALL BE NOMINAL 1.25 INCH INSIDE DIAMETER, TYPE DB PVC PER NEMA TC-8 WITH A BELL INSERTION DEPTH OF 1.75 INCHES MINIMUM. THE OUTER DUCT SHALL BE NOMINAL 4 INCH (INSIDE DIAMETER), SCHEDULE 40 PVC. CARLON TYPE SCHEDULE 40 AND 80 OR APPROVED EQUIVALENT.

THE COUPLING SHALL BE DESIGNED IN A MANNER TO PERMIT EASY FIELD ASSEMBLY. THE COUPLING SHALL BE MARKED OR KEYED IN A MANNER TO ENSURE THE INNERDUCTS ARE PROPERLY ALIGNED, ANY COLOR CODES ARE CONTINUED AND THE ADJOINING SECTION IS INSERTED TO THE PROPER DEPTH IN THE BELL. ALL KEYS AND/OR MARKINGS SHALL BE VISIBLE AFTER ASSEMBLY TO ALLOW THE INSPECTION OF EACH JOINT OR PROPER ASSEMBLY BEFORE BURIAL. THE SEALING SYSTEM SHALL BE DESIGNED TO ASSURE AIR INTEGRITY OF EACH INDIVIDUAL INNERDUCT AND WATER INTEGRITY OF THE ENTIRE SYSTEM.

WHERE INNERDUCT(S) WITHIN A MULTI-CELL DUCT ARE TO REMAIN EMPTY, ONE 1/2-INCH NYLON ROPE SHALL BE INSTALLED IN EACH OF THE OPEN INNERDUCTS, THE ROPE WILL REMAIN TO BE USED FOR A FUTURE CABLE INSTALLATION. ALSO, EACH INNERDUCT SHALL BE PLUGGED TO MAINTAIN THE AIR AND WATER INTEGRITY. IN ADDITION, THE OUTER DUCT SHALL BE CAPPED TO MAINTAIN THE AIR AND WATER INTEGRITY OF THE ENTIRE SYSTEM. FOR MULTI-CELL DUCT INSTALLED IN MEDIAN WALLS, ALL ROPES AND PLUGS SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT.

INSTALLED IN TRENCH
INSTALLATION WILL BE IN 30-INCH DEEP TRENCH, EXCEPT AS NOTED ON THE PLANS.

ALL JOINTS WILL BE JOINED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, IN ORDER TO PROVIDE AN AIR-TIGHT ENCLOSURE OF THE INTERIOR DUCTS AND A WATER-TIGHT ENCLOSURE OF THE OUTER DUCT. ALL MULTI-CELL CONDUIT INSTALLED OUTSIDE OF THE ROADWAY IN TRENCH SHALL BE SCHEDULE 40 UNLESS DIRECTED BY THE ODOT ENGINEER TO USE SCHEDULE 80 FOR USE IN WELL-TRAVELED VEHICULAR AREAS.

INSTALLED UNDER ROADWAY
INSTALLATION WILL BE AT LEAST 30 INCHES DEEP JACKED OR DRILLED UNDER PAVEMENT, EXCEPT AS NOTED ON THE PLANS.

ALL JOINTS WILL BE JOINED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, IN ORDER TO PROVIDE AN AIR-TIGHT ENCLOSURE OF THE INTERIOR DUCTS AND A WATER-TIGHT ENCLOSURE OF THE OUTER DUCT. ALL MULTI-CELL CONDUIT INSTALLED UNDER THE ROADWAY SHALL BE SCHEDULE 80.

INSTALLED WITHIN 6 FEET OF GUARDRAIL
INSTALLATION WILL BE AT LEAST 30 INCHES DEEP TRENCH AND ENCASED IN CONCRETE.

ALL JOINTS WILL BE JOINED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS, IN ORDER TO PROVIDE AN AIR-TIGHT ENCLOSURE OF THE INTERIOR DUCTS AND A WATER-TIGHT ENCLOSURE OF THE OUTER DUCT. ALL MULTI-CELL CONDUIT INSTALLED UNDER THE ROADWAY SHALL BE SCHEDULE 80.

METHOD OF MEASUREMENT

THE CONDUIT WILL BE MEASURED BY THE AMOUNT OF CONDUIT IN FEET FURNISHED AND INSTALLED OF EACH TYPE SCHEDULE 40 OR 80 MEASURED FROM CENTER-TO-CENTER OF PULL BOXES, FOUNDATION, ETC., AND WILL INCLUDE ALL FITTINGS AND APPURTENANCES, JOINTS, BENDS, GROUNDS AND CONCRETE ENCASEMENT WHERE SPECIFIED.

THE TRENCH WILL BE MEASURED BY THE NUMBER OF FEET OF TRENCH COMPLETED AS PER C&MS 625.21.

804, FIBER OPTIC CABLE MARKERS AND TRACER WIRE

REFERENCE ODOT 2016 STANDARD SPECIFICATION 804 & 904 FOR DETAILS.

FIBER OPTIC CABLE MARKERS SHALL BE INSTALLED PER TRAFFIC ENGINEERING MANUAL 1342-9.

TRACER WIRE SHALL BE INSTALLED IN ONE OF THE MULTI-CELL INNER-DUCTS IN ALL CONDUIT RUNS. TRACER WIRE SHALL BE 19 GAUGE, TIN COATED, COPPER CONDUCTOR WITH POLY-ETHYLENE INSULATION. THE WIRE SHALL BE HDPE INSULATED AND ORANGE IN COLOR.

APPROXIMATELY 10 FEET OF SLACK OF THE TRACER WIRE SHALL BE LEFT INSIDE THE ADJACENT PULL BOXES CONNECTING THE CONDUIT RUNS. IN SITUATIONS WHERE A TYPE 2 FIBER OPTIC CABLE MARKER IS TO BE INSTALLED IN CONJUNCTION WITH THE TRACER WIRE, THE TRACER WIRE SHALL BE RUN THROUGH THE MARKER AND CONNECTED TO TERMINALS AT THE TOP OF THE MARKER. TRACER WIRE WILL NOT CONDUCT AN ELECTRICAL CURRENT WHEN STRUCK BY LIGHTNING AND WILL BE DESIGNED FOR DIRECT BURY AND DIRECTIONAL BORING APPLICATIONS. WHEN SPLICES AND LATERAL CONNECTIONS ARE MADE, ONLY GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH A WOVEN POLYESTER FIBER CORE ARE TO BE USED.

809, DYNAMIC MESSAGE SIGN INSTALLATIONS

THE DMS ON I-75 SB NEAR MILE MARKER 5.6 SHALL BE MAINTAINED AS WELL AS THE CABINET FOR THIS DEVICE.

IF MODIFICATIONS DUE TO CONSTRUCTION ARE REQUIRED, THE CONTRACTOR SHALL FURNISH AND INSTALL THIS ITEM ACCORDING TO ODOT SUPPLEMENTAL SPECIFICATION 809, AS WELL AS ANY STANDARD CONSTRUCTION DRAWINGS NOTED ON THE PLANS.

THE CONTRACTOR SHALL FURNISH SHOP DRAWINGS TO THE PROJECT ENGINEER FOR APPROVAL. THE DRAWINGS SHALL BE STAMPED BY A PROFESSIONAL ENGINEER FROM THE MANUFACTURER. THE ITEM SHALL NOT BE RELEASED FOR CONSTRUCTION UNTIL APPROVED BY THE OFFICE OF TRAFFIC OPERATIONS.

UTILITIES

TRAFFIC MONITORING SECTION ODOT, 1980 WEST BROAD STREET,
COLUMBUS, OHIO 43223

BRYAN STANIFER (DISTRICT 1, 7, 8) 614-204-0971
SANDRA MAPEL (FIELD OPERATIONS) 614-644-0391

ODOT CENTRAL OFFICE OF TRAFFIC OPERATIONS
1606 WEST BROAD STREET
COLUMBUS, OH 43223
614-387-4113
CEN.ITS.LAB@DOT.OHIO.GOV

PROTECTION OF TRAFFIC MONITORING EQUIPMENT

PRIOR TO BEGINNING ANY PAVEMENT ACTIVITIES OR ANY
EXCAVATION ACTIVITIES BETWEEN SLM 2.4 AND SLM 5.7 THE
CONTRACTOR, THE PROJECT ENGINEER, AND A REPRESENTATIVE
FROM THE OWNER WILL COORDINATE A TIME FOR THE
OWNER/MAINTAINING AGENCY TO DISCONNECT THE EQUIPMENT.
FOLLOWING THE DISCONNECTION BY THE OWNER, THE
CONTRACTOR WILL BE ALLOWED TO PERFORM THEIR PAVEMENT
ACTIVITIES, INCLUDING PAVEMENT REMOVAL. THE REMOVE
LOOPS AND SENSORS BECOME THE PROPERTY OF THE
CONTRACTOR.

THE OWNER/MAINTAINING AGENCY WILL IDENTIFY EQUIPMENT
LOCATIONS. DO NOT DISTURB PULL BOXES, CONTROLLERS,
CABINETS, POLES AND CONDUITS. ANY DAMAGE WILL BE THE
RESPONSIBILITY OF THE CONTRACTION AND REPAIRS
MUST BE ACCEPTED BY THE OWNER.

GPS COORDINATES / AS-BUILT PLANS

PRIOR TO THE FINAL ACCEPTANCE OF THE PROJECT, THE
CONTRACTOR SHALL PROVIDE AS-BUILT PLANS OF THE ENTIRE
ITS PORTION OF THE PROJECT TO THE ODOT ITS ENGINEER IN
THE FOLLOWING FORMATS: DGN FILES, PDF FILE, AND ONE (1)
HALF-SIZE PLAN HARD COPY. ALL HARD COPIES SHALL BE
SUBMITTED IN SEPARATE 3- RING BINDERS, NOTING THE CONTENTS
ON THE OUTSIDE OF THE BINDER.

INCLUDED WITH THE PDF AND HARD COPY VERSIONS OF THIS
DOCUMENTATION, THE CONTRACTOR SHALL PROVIDE ACTUAL
FIELD DATA OF ALL SITES. THIS DATA SHALL INCLUDE THE
FOLLOWING:

- GPS COORDINATES, WITHIN 3 FEET ACCURACY, OF ALL PULL
BOXES, POLES, CABINETS, AND POWER SERVICES WITH
COORDINATING DEVICE ID NUMBER. (DEVICE ID # SHALL BE
NOTED ON THE PLANS OR PROVIDED BY THE ODOT ITS ENGINEER
PRIOR TO THE COLLECTION OF THE DATA).
- METER NUMBERS AND UTILITY PROVIDER OF ALL POWER
SERVICES WITH THEIR SERVICE LOCATIONS.

ITS DEVICE DOWNTIMES

ITS DEVICES, INCLUDING POWER AND COMMUNICATION,
DOWNTIMES SHALL BE EXECUTED PER ODOT SUPPLEMENTAL
SPECIFICATION 809.14

MAINTAINING ITS DURING CONSTRUCTION

IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN AND
RESTORE AS NECESSARY THE FUNCTIONALITY OF ALL ITS FIBER
AND EQUIPMENT IN ACCORDANCE WITH THE "ITS DEVICE DOWNTIME
SECTION" OF THIS SUPPLEMENTAL SPECIFICATION, AS WELL AS
MAINTAINING THE INITIAL ITS FIELD LOCATE THAT ODOT PERFORMS,
WITHIN THE PROJECT AREA.

EQUIPMENT NOT DAMAGED OR DISTURBED DUE TO CONSTRUCTION
ACTIVITIES SHALL REMAIN OPERATIONAL BY PROVIDING SOME
TYPE OF TEMPORARY CONNECTION BETWEEN THE PIECES OF
EQUIPMENT AND AN ADJACENT OPERATIONAL CABINET. THIS MAY
BE ACCOMPLISHED VIA AERIAL CONNECTION OR THROUGH AND
EXISTING/NEW CONDUIT AND FIBER CABLE. THE CONTRACTOR
SHALL BE RESPONSIBLE FOR ALL CONNECTIONS AND WORK SHALL
NOT BE ACCEPTABLE UNTIL REVIEWED AND INSPECTED BY THE
PROJECT ENGINEER AND ITS PERSONNEL. SERVICE TO ALL ITS
DEVICE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION.

THE ITS INFRASTRUCTURE IS NOT LISTED AS A MEMBER OF
OUPS AT THIS TIME. ALL REQUESTS FOR LOCATES SHALL BE
COORDINATED THROUGH THE OFFICE OF TRAFFIC OPERATIONS,
ITS FIELD OPERATIONS SECTION. THE CONTRACTOR SHALL
SUBMIT REQUESTS TO CEN.ITS.LAB@DOT.OHIO.GOV. THE ITS
SHALL BE MARKED ONCE BY ODOT PERSONNEL OR AN ODOT
REPRESENTATIVE AND THE CONTRACTOR SHALL TAKE CARE TO
NOTE WHERE THE INFRASTRUCTURE IS LOCATED. AFTER THIS
INITIAL MARKING HAS OCCURRED, IT SHALL BE THE RESPONSIBILITY
OF THE CONTRACTOR TO PERFORM ANY REMARKING OF THE ITS
INFRASTRUCTURE WHEN NEEDED. LOCATING BY THE CONTRACTOR
WILL BE DONE EVERY 10 DAYS.

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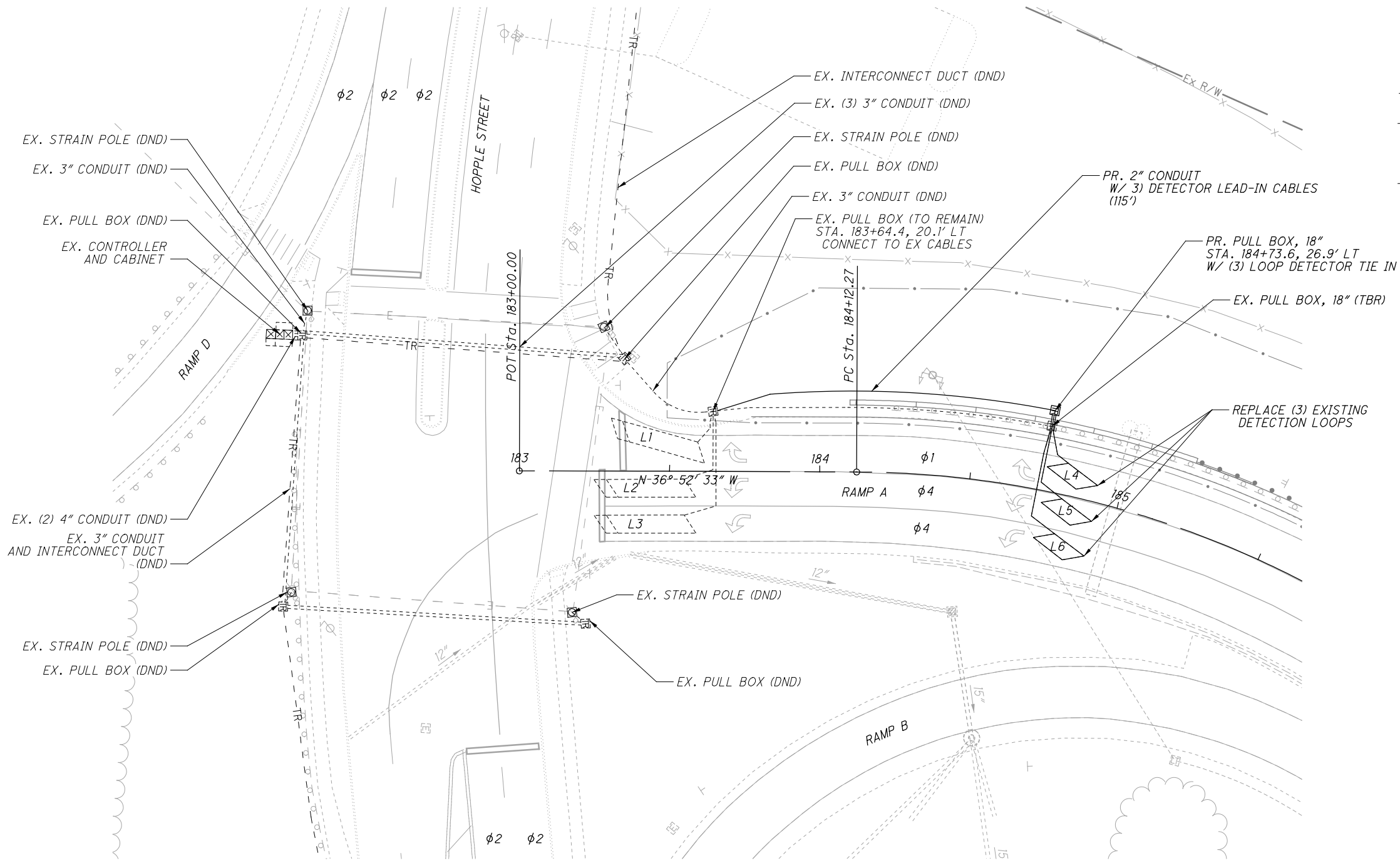
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ITS GENERAL NOTES

HAM - 75 - 3.84

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TRAFFIC SIGNAL LEGEND

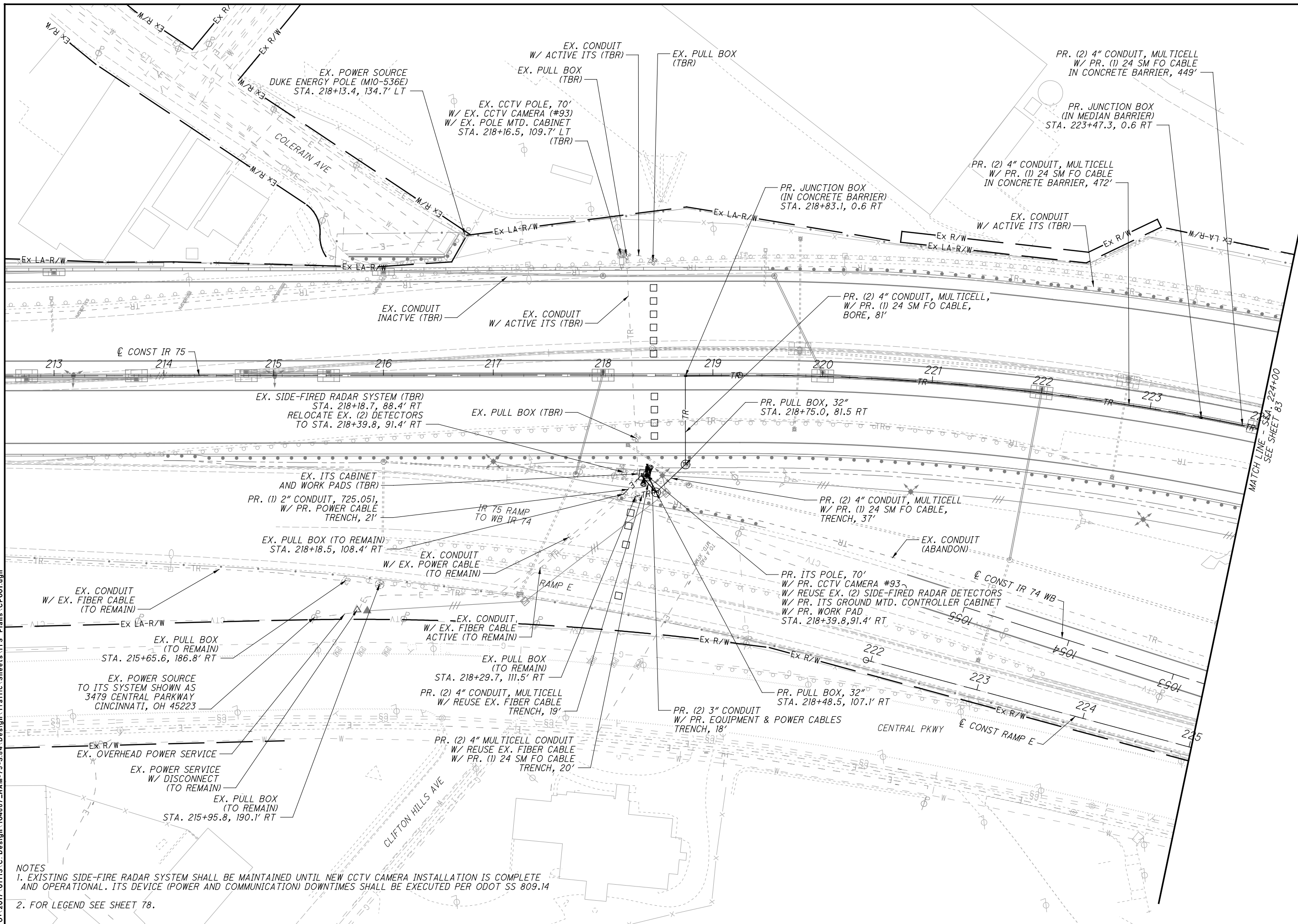
EXISTING	PROPOSED	
- -TR- -	—TR—	INTERCONNECT DUCT
-----	————	SIGNAL CONDUIT
☐	☐	PULL BOX
-----	————	LOOP DETECTOR
☐	☐	SIGNAL STRAIN POLE



**TRAFFIC SIGNAL MODIFICATION PLAN
 HOPPLE STREET AND RAMP A**

HAM-75-3.84

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NOTES
1. EXISTING SIDE-FIRE RADAR SYSTEM SHALL BE MAINTAINED UNTIL NEW CCTV CAMERA INSTALLATION IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14
2. FOR LEGEND SEE SHEET 78.

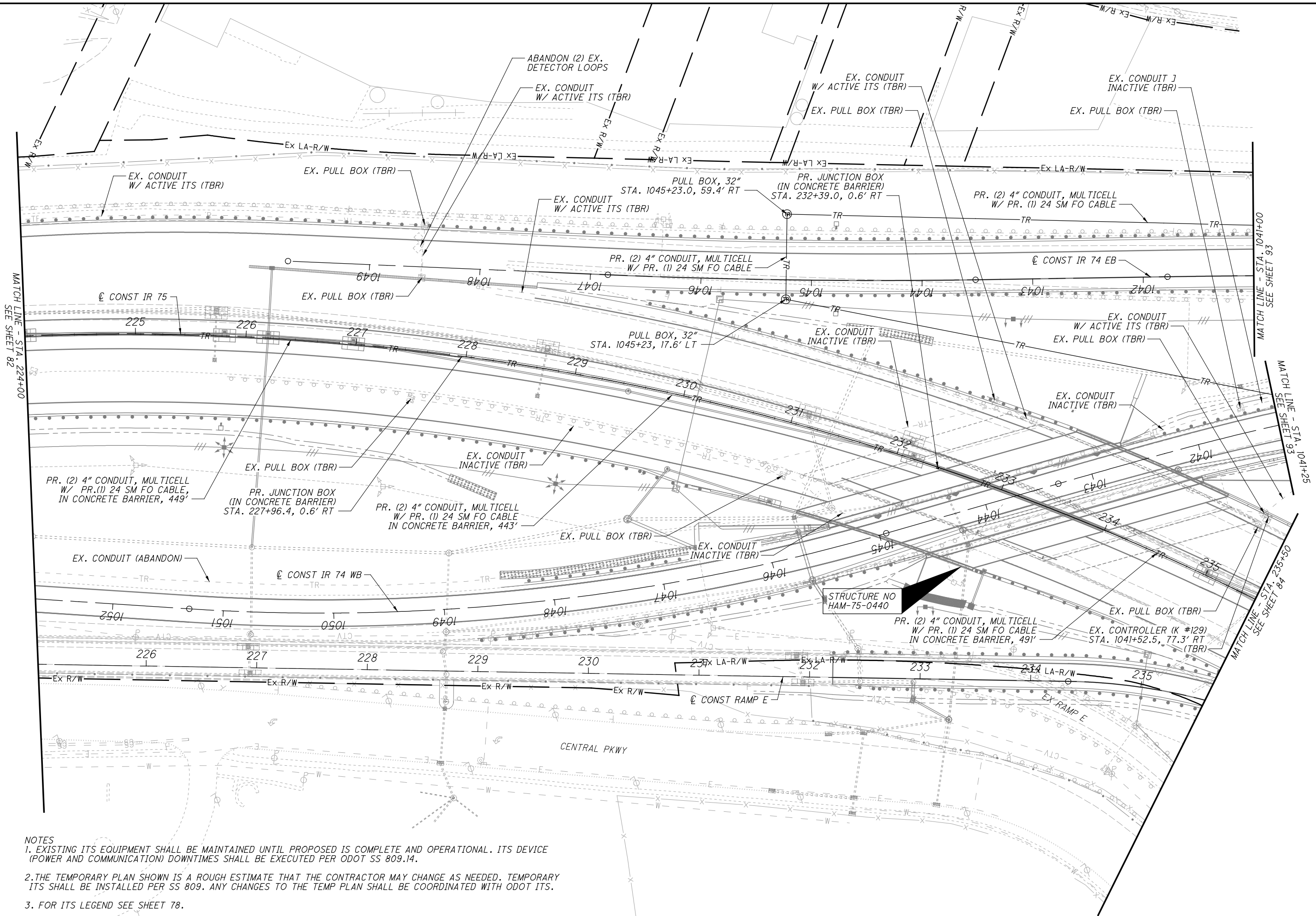


CALCULATED
EMS
CHECKED
CRH

ITS PLAN - IR 75
STA. 213+00 TO STA. 224+00

HAM-75-3.84
82
106

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- NOTES
1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.
 3. FOR ITS LEGEND SEE SHEET 78.

CALCULATED
EMS
CHECKED
CRH

HORIZONTAL
SCALE IN FEET

ITS PLAN - IR 75
STA. 224+00 TO STA. 235+50

HAM-75-3.84

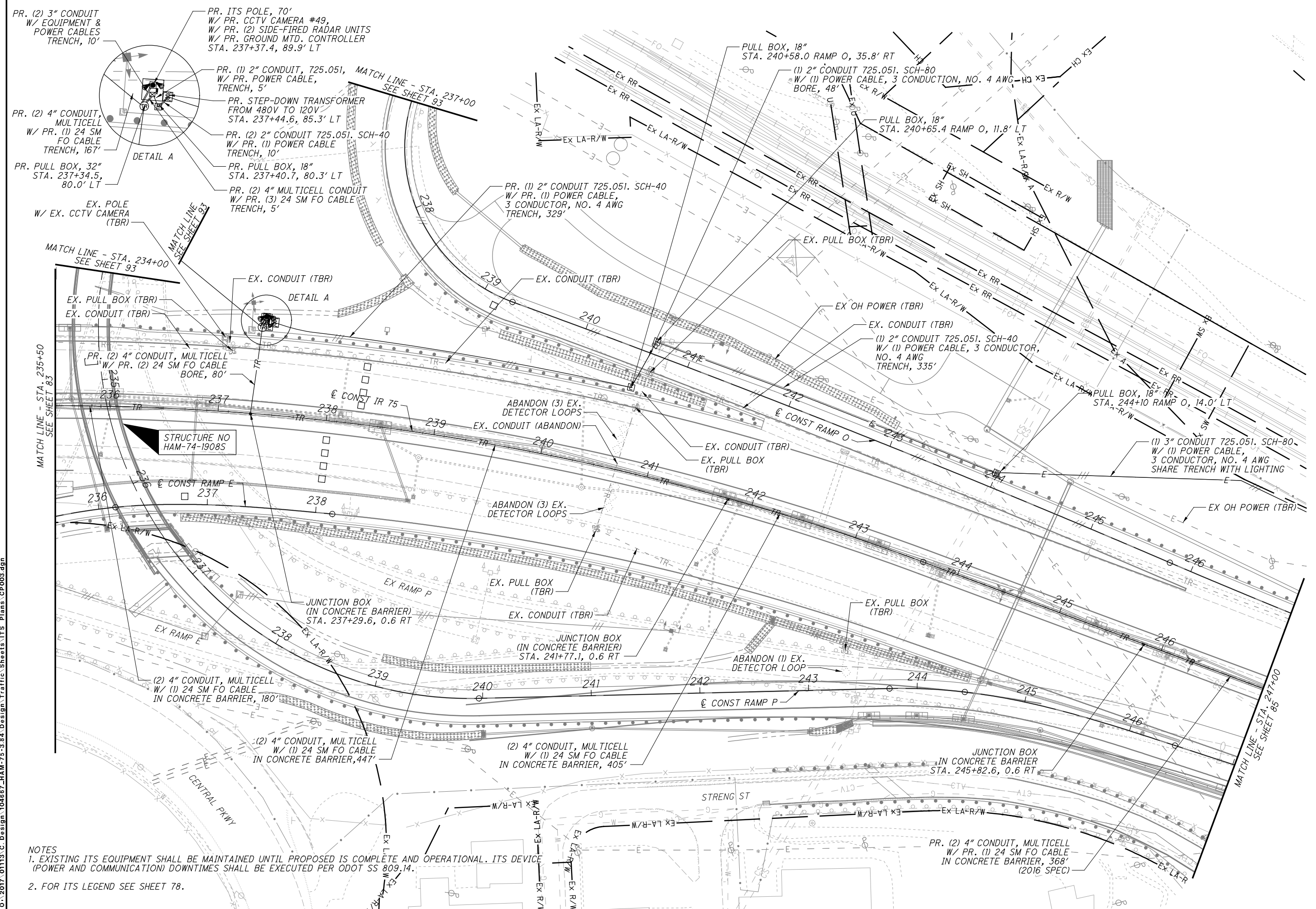


0 20 40 60 80
 HORIZONTAL SCALE IN FEET
 CALCULATED EMS CHECKED CRH

ITS PLAN - IR 75
 STA. 235+50 TO STA. 247+00

HAM-75-3.84

84
 106



PR. (2) 3" CONDUIT W/ EQUIPMENT & POWER CABLES TRENCH, 10'
 PR. (1) 2" CONDUIT, 725.051, W/ PR. POWER CABLE, TRENCH, 5'
 PR. (2) 4" CONDUIT, MULTICELL W/ PR. (1) 24 SM FO CABLE TRENCH, 167'
 PR. PULL BOX, 32" STA. 237+34.5, 80.0' LT
 EX. POLE W/ EX. CCTV CAMERA (TBR)
 PR. (2) 4" CONDUIT, MULTICELL W/ PR. (2) 24 SM FO CABLE BORE, 80'
 PR. (2) 2" CONDUIT 725.051, SCH-40 W/ PR. (1) POWER CABLE TRENCH, 10'
 PR. PULL BOX, 18" STA. 237+40.7, 80.3' LT
 PR. (2) 4" MULTICELL CONDUIT W/ PR. (3) 24 SM FO CABLE TRENCH, 5'
 PR. (1) 2" CONDUIT 725.051, SCH-40 W/ PR. (1) POWER CABLE, 3 CONDUCTOR, NO. 4 AWG TRENCH, 329'



MATCH LINE - STA. 234+00 SEE SHEET 93

MATCH LINE - STA. 237+00 SEE SHEET 93

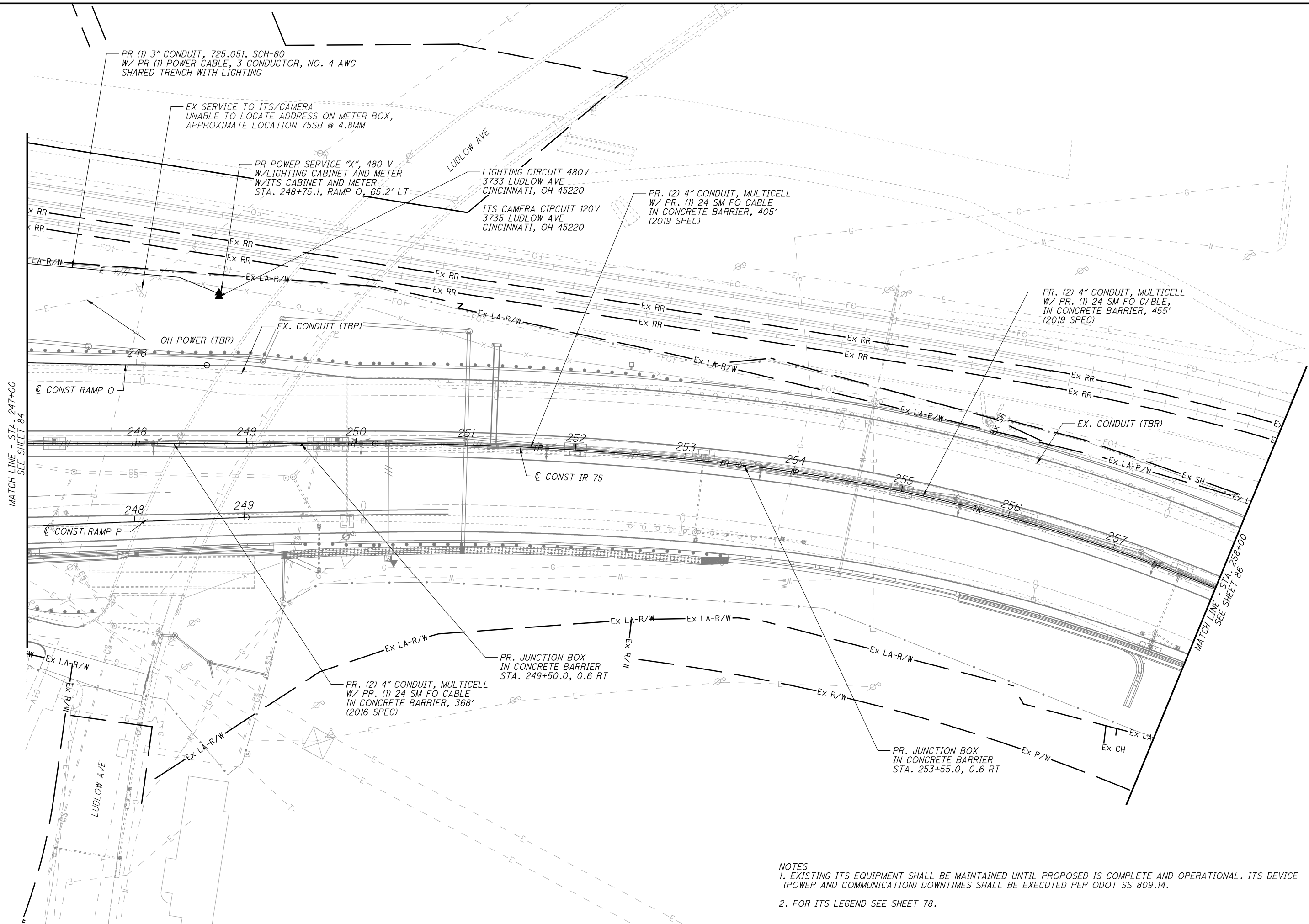
MATCH LINE - STA. 235+50 SEE SHEET 85

STRUCTURE NO HAM-74-1908S

NOTES
 1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. FOR ITS LEGEND SEE SHEET 78.

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PR (1) 3" CONDUIT, 725.051, SCH-80
 W/ PR (1) POWER CABLE, 3 CONDUCTOR, NO. 4 AWG
 SHARED TRENCH WITH LIGHTING

EX SERVICE TO ITS/CAMERA
 UNABLE TO LOCATE ADDRESS ON METER BOX,
 APPROXIMATE LOCATION 75SB @ 4.8MM

PR POWER SERVICE "X", 480 V
 W/LIGHTING CABINET AND METER
 W/ITS CABINET AND METER
 STA. 248+75.1, RAMP O, 65.2' LT

LIGHTING CIRCUIT 480V
 3733 LUDLOW AVE
 CINCINNATI, OH 45220
 ITS CAMERA CIRCUIT 120V
 3735 LUDLOW AVE
 CINCINNATI, OH 45220

PR. (2) 4" CONDUIT, MULTICELL
 W/ PR. (1) 24 SM FO CABLE
 IN CONCRETE BARRIER, 405'
 (2019 SPEC)

PR. (2) 4" CONDUIT, MULTICELL
 W/ PR. (1) 24 SM FO CABLE,
 IN CONCRETE BARRIER, 455'
 (2019 SPEC)

PR. (2) 4" CONDUIT, MULTICELL
 W/ PR. (1) 24 SM FO CABLE
 IN CONCRETE BARRIER, 368'
 (2016 SPEC)

PR. JUNCTION BOX
 IN CONCRETE BARRIER
 STA. 249+50.0, 0.6 RT

PR. JUNCTION BOX
 IN CONCRETE BARRIER
 STA. 253+55.0, 0.6 RT

- NOTES
- EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 - FOR ITS LEGEND SEE SHEET 78.



CALCULATED
 EMS
 CHECKED
 CRH

HAM-75-3.84
ITS PLAN - IR 75
STA. 247+00 TO STA. 258+00

HAM-75-3.84

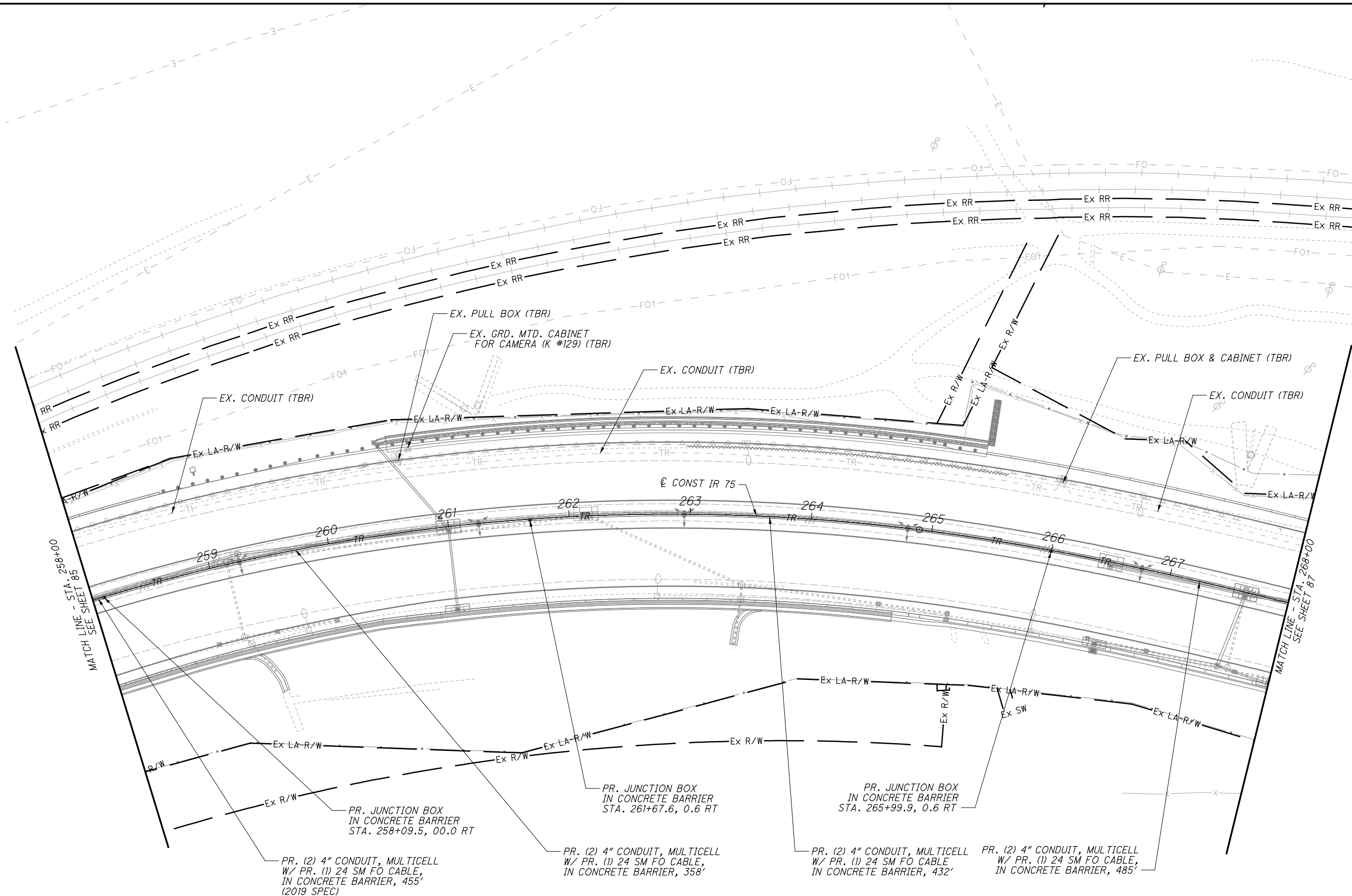
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CALCULATED
 EMS
 CHECKED
 CRH

HORIZONTAL
 SCALE IN FEET

HAM-75-3.84
ITS PLAN - IR 75
STA. 258+00 TO STA. 268+00

HAM-75-3.84



NOTES
 1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. FOR ITS LEGEND SEE SHEET 78.



CALCULATED
EMS
CHECKED
CRH

ITS PLAN - IR 75
STA. 268+00 TO STA. 279+00

HAM-75-3.84

87
106

EX SERVICE TO LIGHTING SYSTEM
UNABLE TO LOCATED ADDRESS ON
METER BOX, APPROXIMATE LOCATION
75SB @ 5.1MM

POWER SOURCE FOR ITS CAMERA
PR. POWER SERVICE WITH METER, 120V
STA. 269+40.2, 87.5' LT
ITS CAMERA 120V
4123 CANAL RIDGE RD
CINCINNATI, OH 45223

PR. (1) 2" CONDUIT 725.051. SCH-40
W/ PR. (1) POWER CABLE
TRENCH, 10'

PR. PULL BOX, 18"
STA. 269+43.4, 78.0' LT

PR. (1) 2" CONDUIT, 725.051
W/ PR. (1) POWER CABLE
TRENCH, 6'

PR. (2) 4" MULTICELL CONDUIT
W/ PR. (2) 24 SM FO CABLE
TRENCH, 7'

PR. (2) 4" CONDUIT, MULTICELL,
W/ PR. (1) 24 SM FO CABLES,
IN CONCRETE BARRIER, 405'

PR. ITS POLE, 70'
W/ PR. CCTV CAMERA #16
W/ PR. (1) SIDE-FIRED RADAR UNITS
W/ PR. GRD. MTD. CONTROLLER (K #128)
W/ PR. WORK PAD
STA. 273+28.6, 83.4' LT

PR. (1) 2" CONDUIT, 725.051,
W/ PR. (1) POWER CABLE
TRENCH, 368'

PR. PULL BOX, 18"
STA. 273+18.5, 85.9' LT

PR. PULL BOX, 32"
STA. 273+18.3, 80.0 LT

PR. (2) 3" CONDUIT
W/ PR. EQUIPMENT & POWER CABLES
TRENCH, 11'

MATCH LINE - STA. 268+00
SEE SHEET 86

MATCH LINE - STA. 279+00
SEE SHEET 88

PR. (2) 4" CONDUIT, MULTICELL,
W/ PR. (1) 24 SM FO CABLE,
IN CONCRETE BARRIER, 485'

PR. JUNCTION BOX
(IN CONCRETE BARRIER)
STA. 270+85.0, 0.6 RT

PR. JUNCTION BOX
IN CONCRETE BARRIER
STA. 273+18.0, 0.6 RT

PR. (2) 4" CONDUIT, MULTICELL,
W/ PR. (2) 24 SM FO CABLE,
BORE, 80'

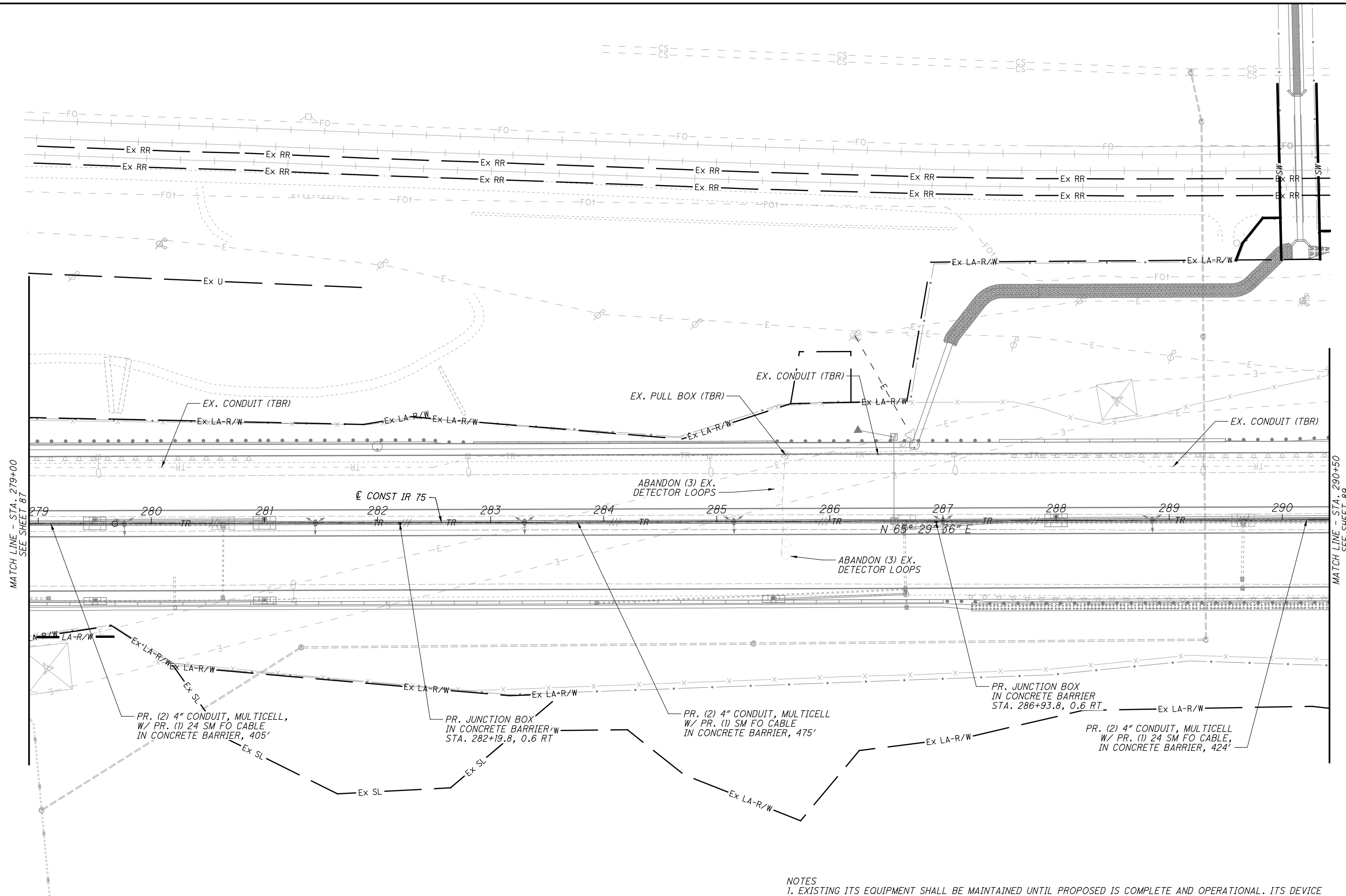
PR. (2) 4" CONDUIT, MULTICELL,
W/ PR. (1) 24 SM FO CABLE,
IN CONCRETE BARRIER, 498'

PR. (2) 4" CONDUIT, MULTICELL,
W/ PR. (1) 24 SM FO CABLE,
IN CONCRETE BARRIER, 232'

PR. JUNCTION BOX
(IN CONCRETE BARRIER)
STA. 278+14.5, 0.6 RT

NOTES
1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE
(POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
2. FOR ITS LEGEND SEE SHEET 78.

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MATCH LINE - STA. 279+00
 SEE SHEET 87

MATCH LINE - STA. 290+50
 SEE SHEET 89

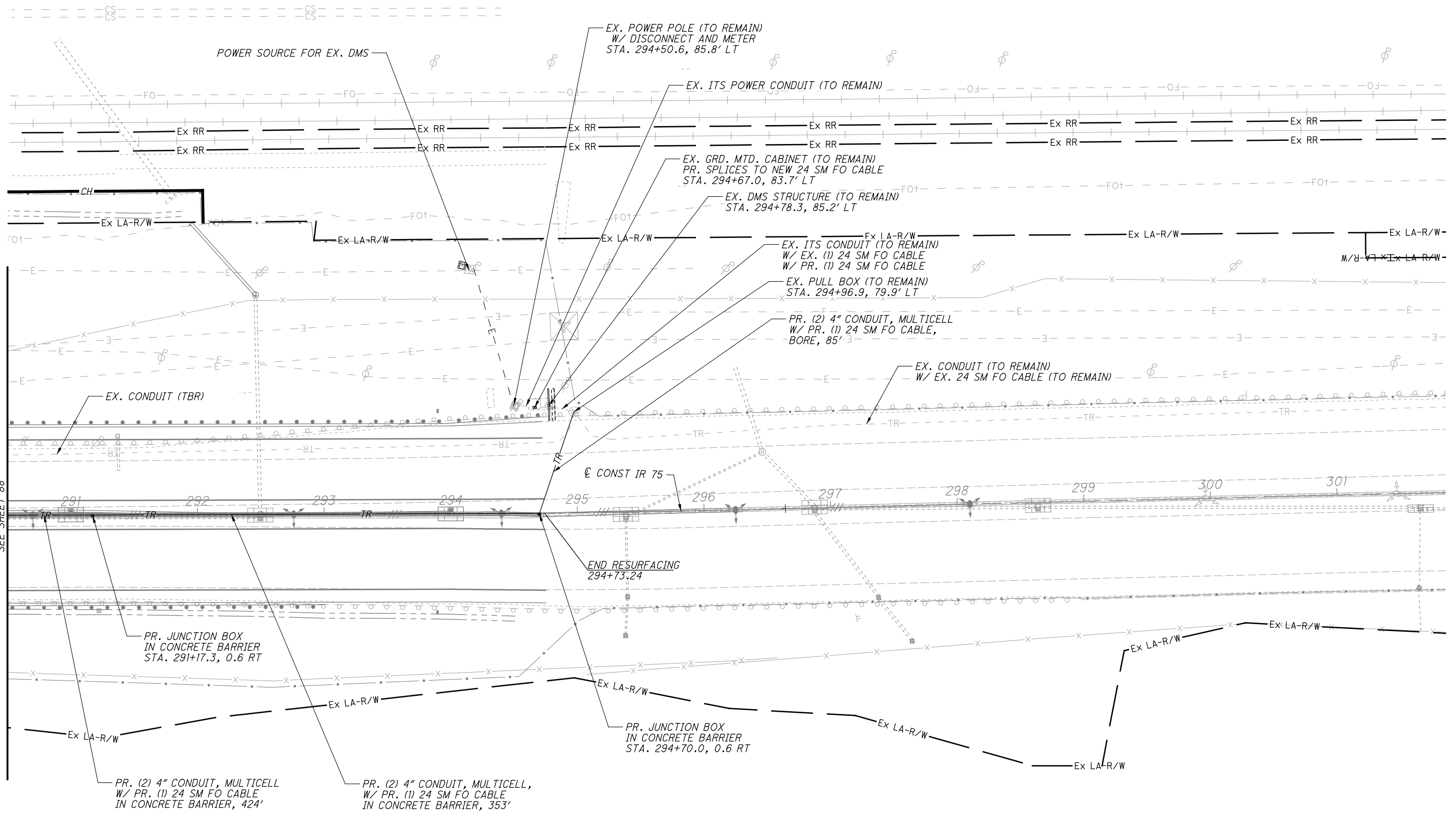
- NOTES
 1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. FOR ITS LEGEND SEE SHEET 78.

CALCULATED
 EMS
 CHECKED
 CRH

0 20 40 80
 HORIZONTAL
 SCALE IN FEET

ITS PLAN - IR 75
 STA. 279+00 TO STA. 290+50

MATCH LINE - STA. 290+50
 SEE SHEET 88



- NOTES
- EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 - FOR ITS LEGEND SEE SHEET 78.

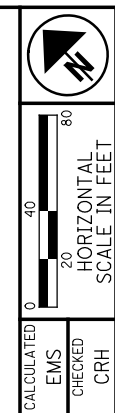
CALCULATED
 EMS
 CHECKED
 CRH

0 20 40 80
 HORIZONTAL
 SCALE IN FEET

ITS PLAN - IR 75
 STA. 290+50 TO STA. 302+00

HAM-75-3.84

NOTES
 1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. FOR ITS LEGEND SEE SHEET 78.

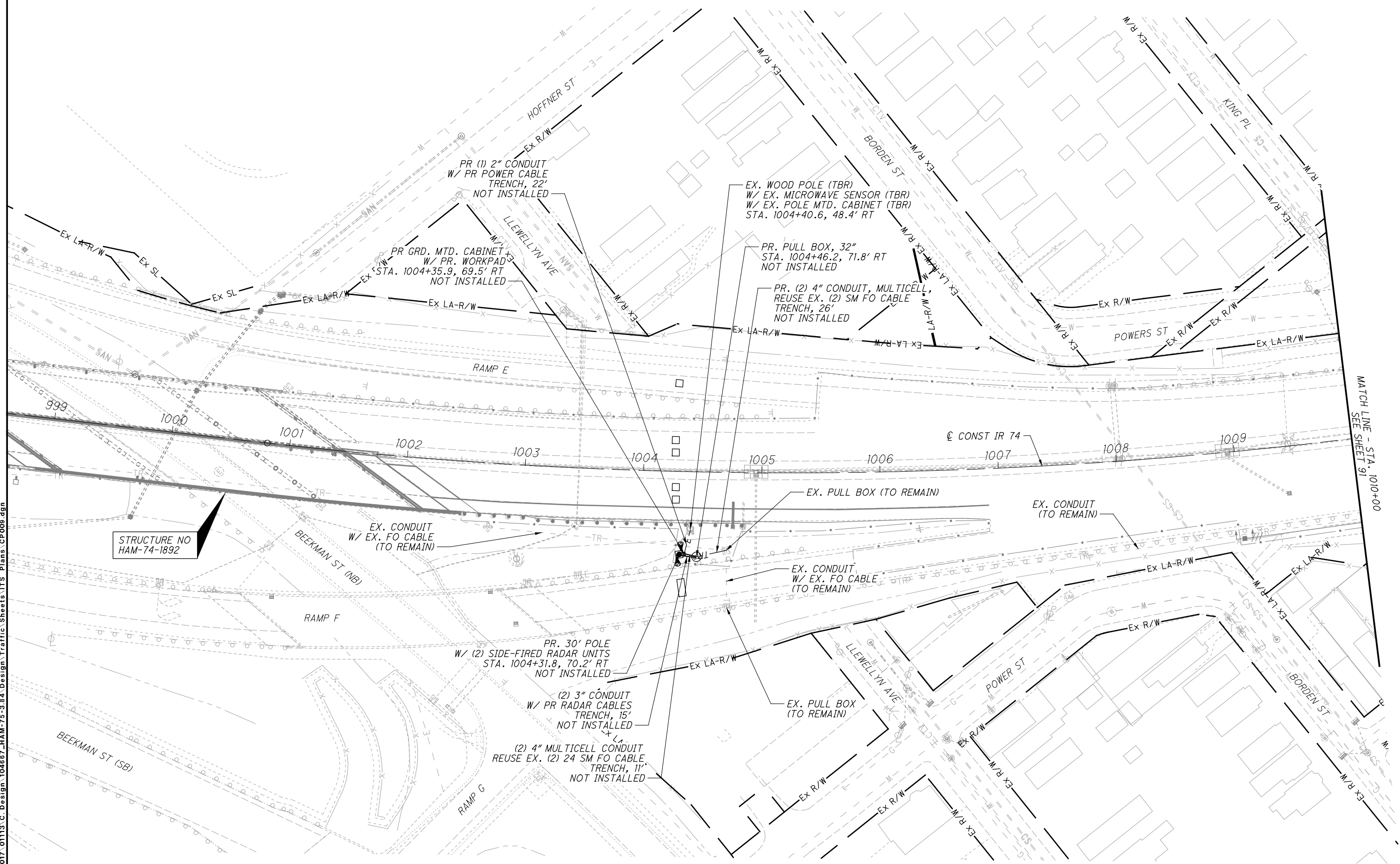


CALCULATED
 EMS
 CHECKED
 CRH

ITS PLAN - IR 74
 STA. 999+00 TO STA. 1010+00

HAM-75-3.84

90
 106



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NOTES

1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.

2. FOR ITS LEGEND SEE SHEET 78.

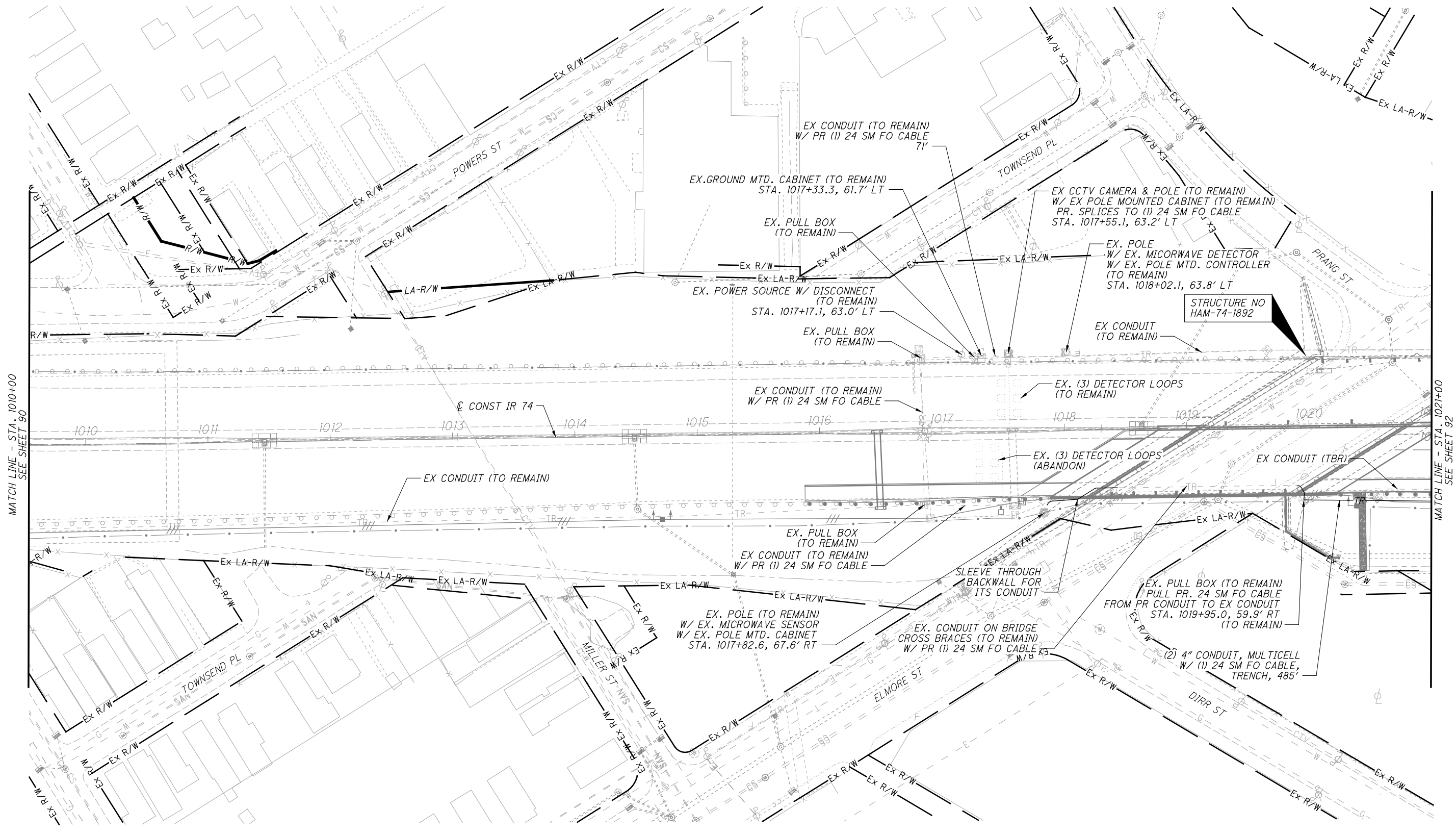


CALCULATED
EMS
CHECKED
CRH

ITS PLAN - IR 74
STA. 1010+00 TO STA. 1021+00

HAM-75-3.84

91
106



MATCH LINE - STA. 1010+00
SEE SHEET 90

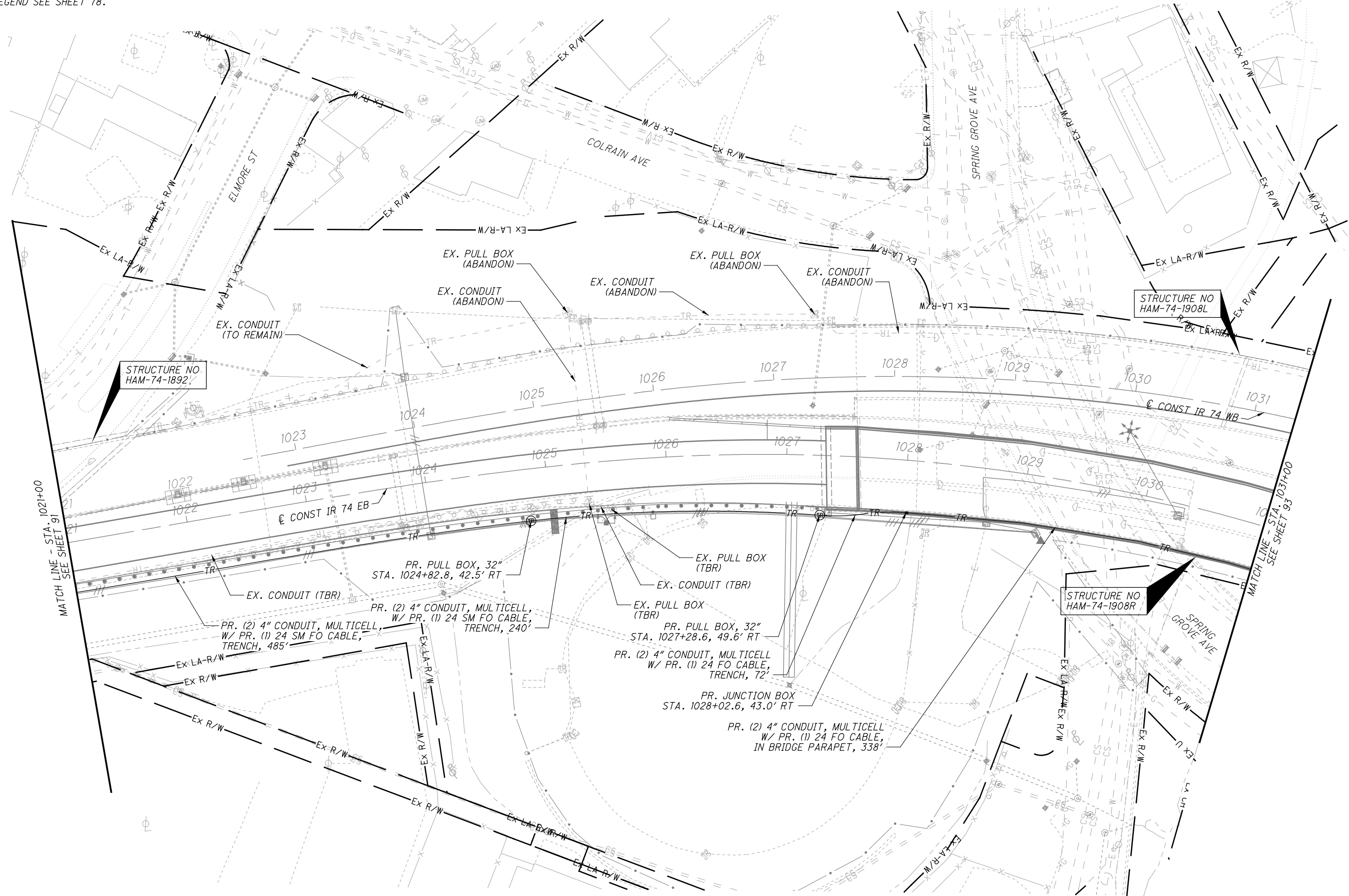
MATCH LINE - STA. 1021+00
SEE SHEET 92

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NOTES

1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.

2. FOR ITS LEGEND SEE SHEET 78.



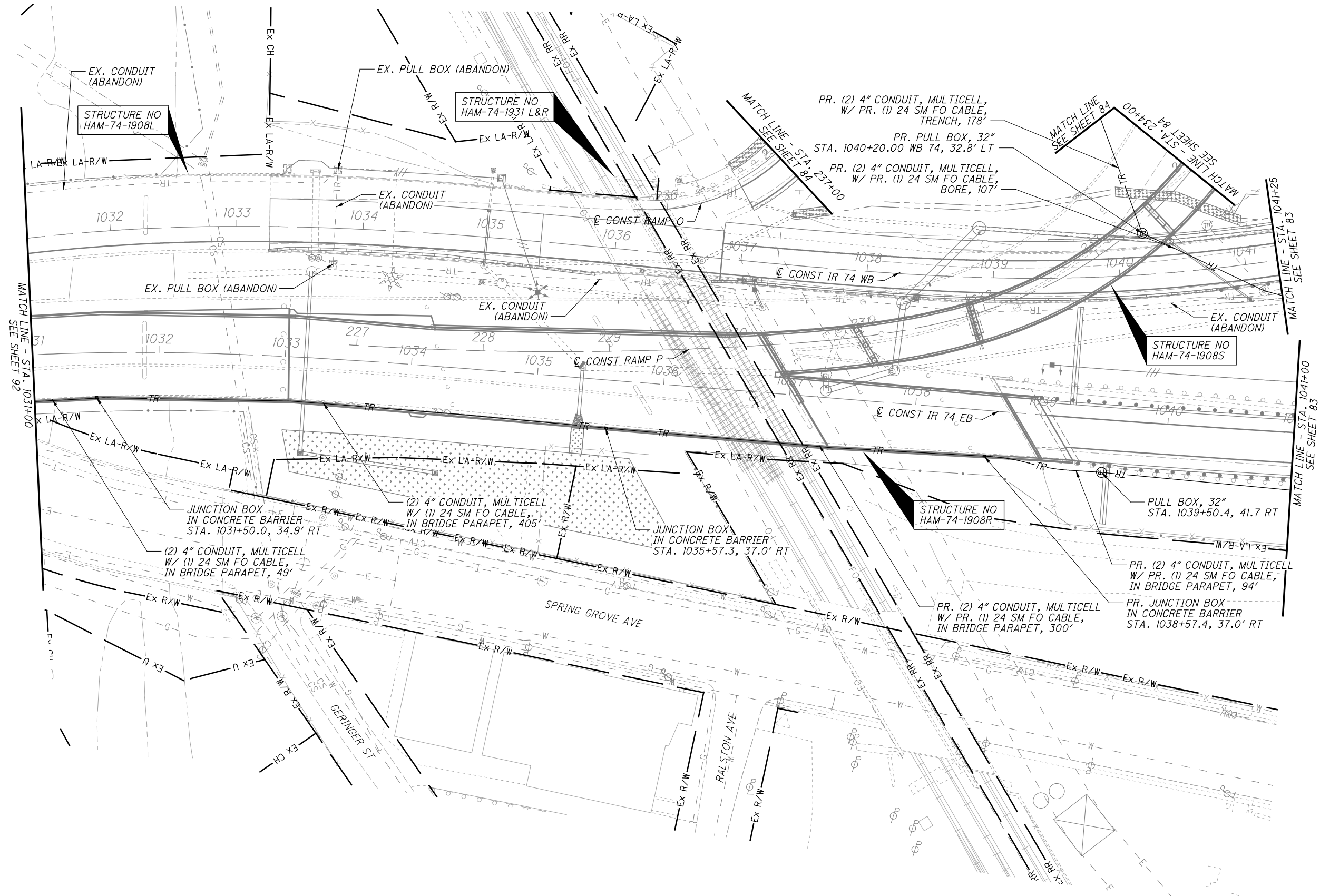
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CALCULATED 0
 EMS 20
 CHECKED CRH
 HORIZONTAL SCALE IN FEET

ITS PLAN - IR 74
 STA. 1021+00 TO STA. 1031+00

HAM-75-3.84

NOTES
 1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. FOR ITS LEGEND SEE SHEET 78.



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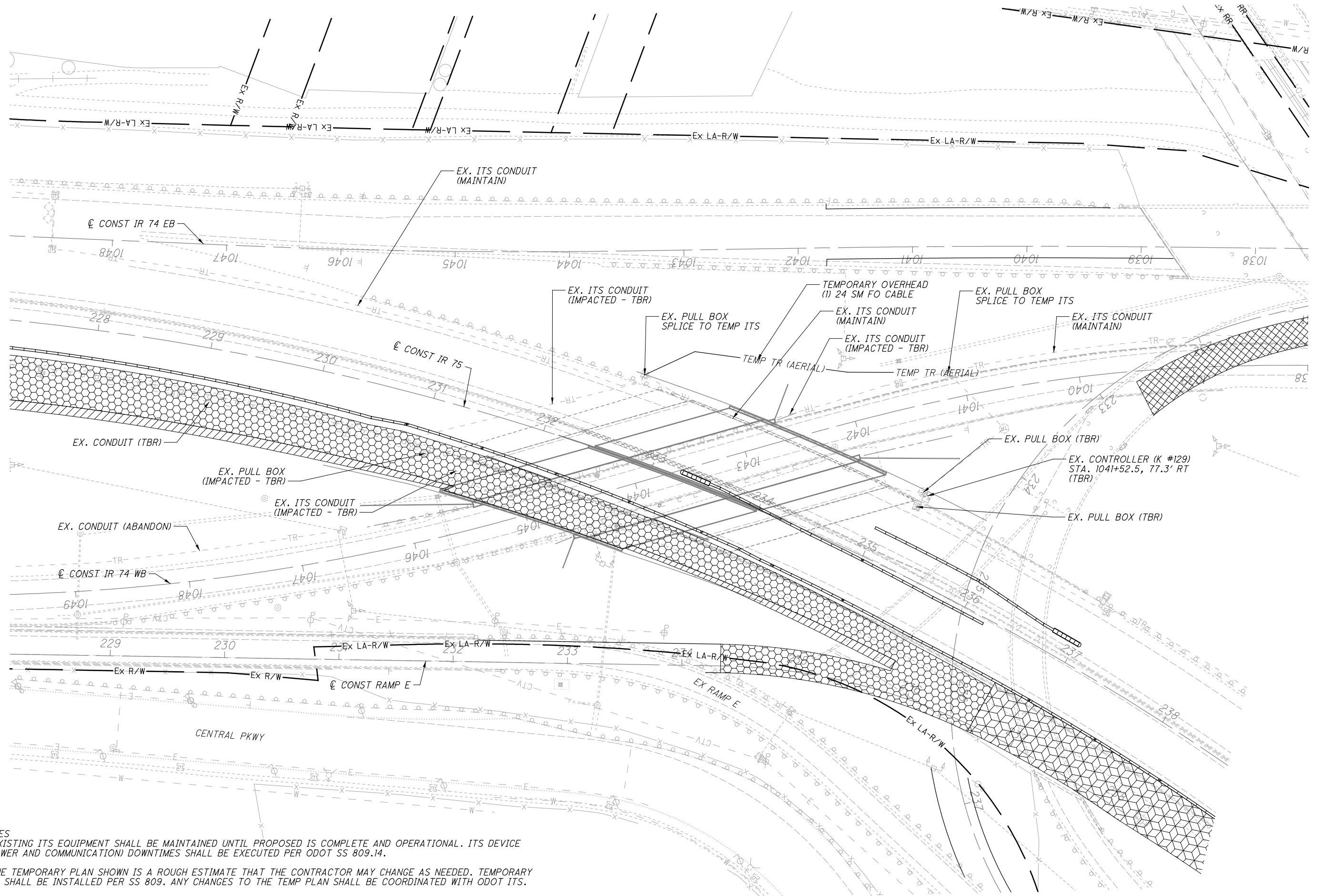
ITS PLAN - IR 74
 STA. 1031+00 TO STA. 1041+00

HAM-75-3.84

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NOTES

1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
2. THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.
3. FOR ITS LEGEND SEE SHEET 78.



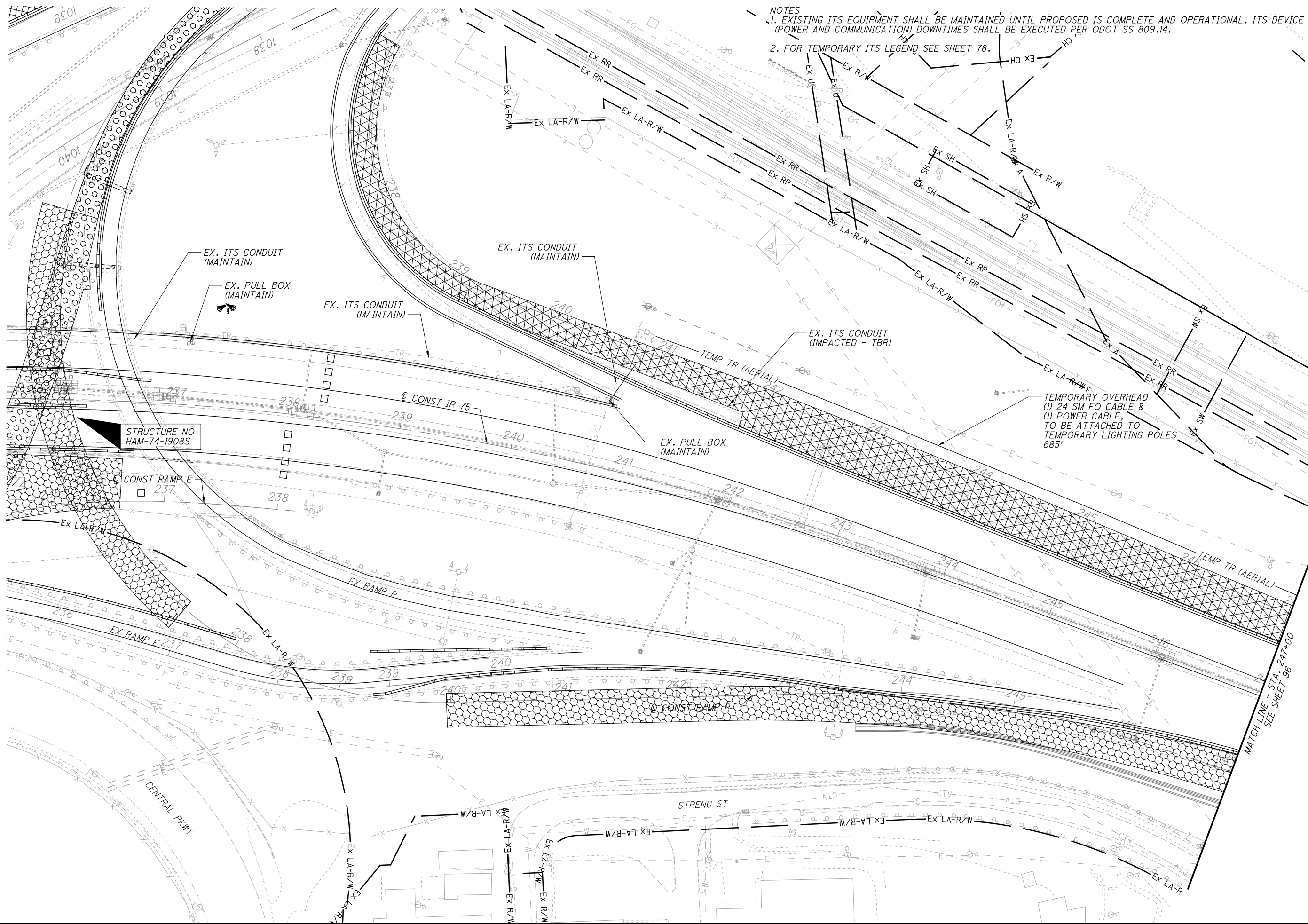
CALCULATED
E.M.S.
CHECKED
CRH

0 40 80
HORIZONTAL
SCALE IN FEET

TEMPORARY ITS PLAN - IR 75
STA. 235+50 TO STA. 247+00

HAM-75-3.84

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NOTES
1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
2. FOR TEMPORARY ITS LEGEND SEE SHEET 78.

STRUCTURE NO
HAM-74-1908S

EX. ITS CONDUIT
(MAINTAIN)
EX. PULL BOX
(MAINTAIN)

EX. ITS CONDUIT
(MAINTAIN)

EX. ITS CONDUIT
(IMPACTED - TBR)

TEMPORARY OVERHEAD
(1) 24 SM FO CABLE &
(1) POWER CABLE,
TO BE ATTACHED TO
TEMPORARY LIGHTING POLES
685'

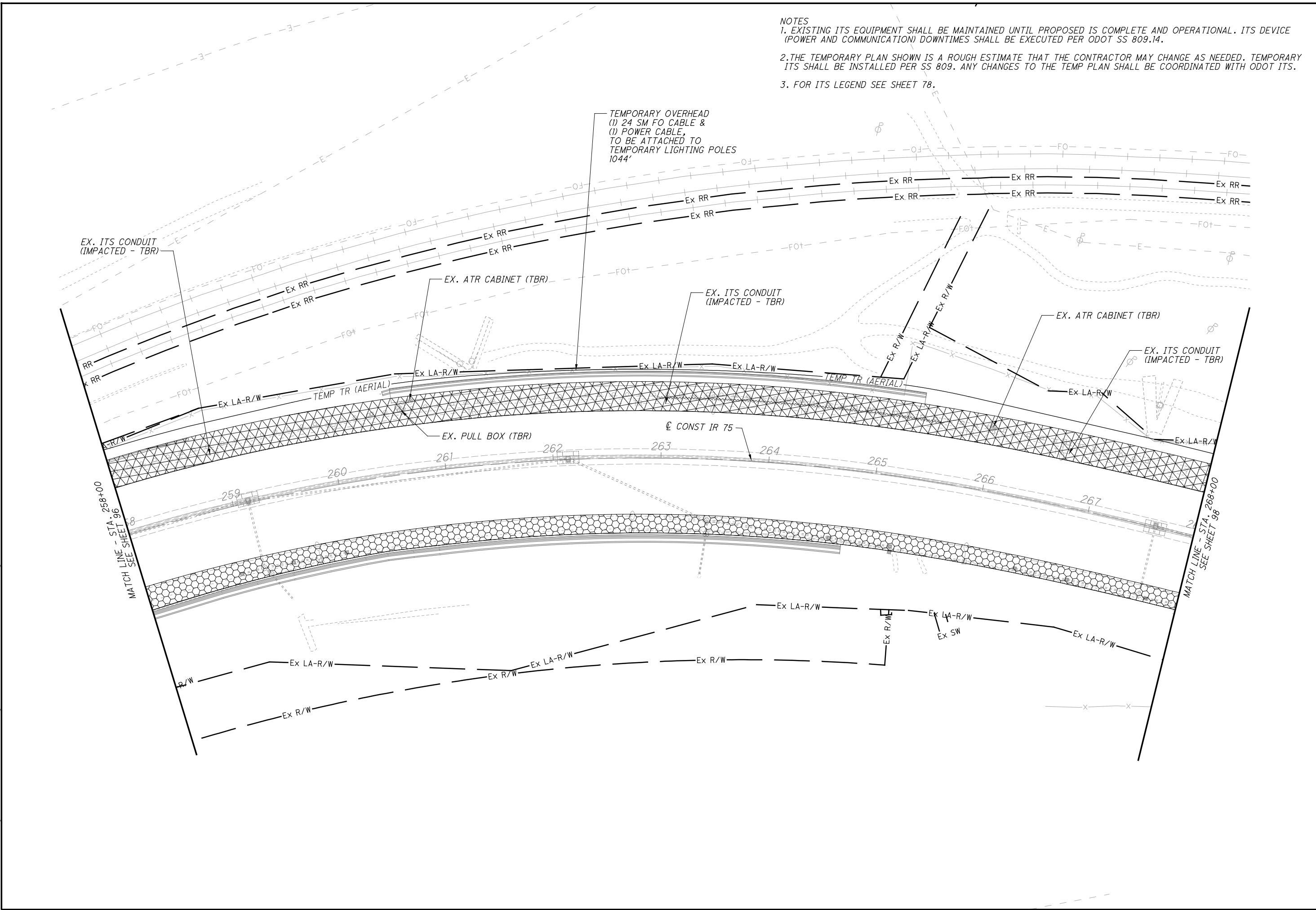
MATCH LINE - STA. 247+00
SEE SHEET 96



TEMPORARY ITS PLAN - IR 75
STA. 235+50 TO STA. 247+00

HAM-75-3.84

95
106



- NOTES
1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.
 3. FOR ITS LEGEND SEE SHEET 78.

CALCULATED
EMS
CHECKED
CRH

0 20 40 80
HORIZONTAL
SCALE IN FEET

TEMPORARY ITS PLAN - IR 75
STA. 258+00 TO STA. 268+00

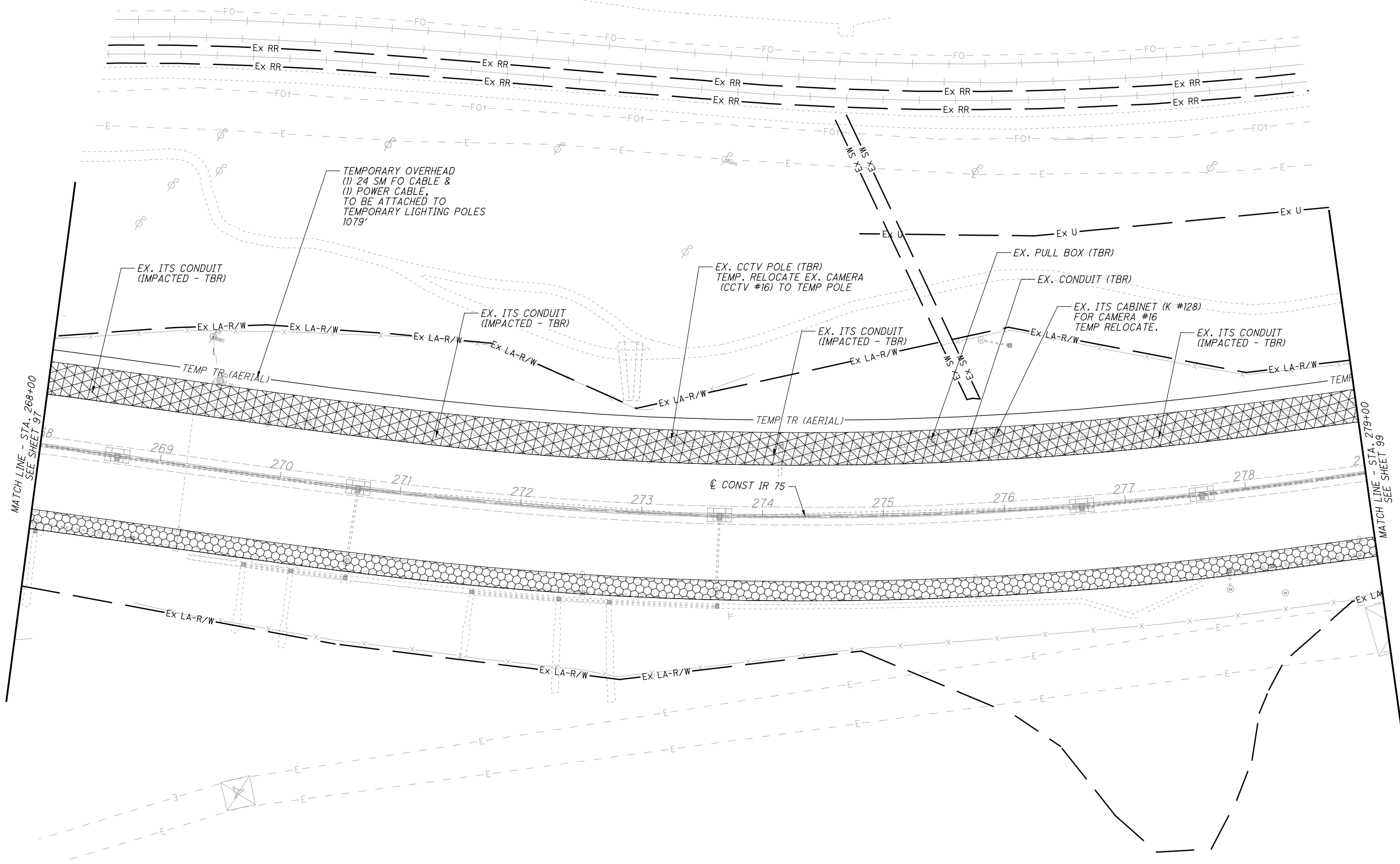
HAM-75-3.84

NOTES

1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
2. THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.
3. FOR ITS LEGEND SEE SHEET 78.



CALCULATED
EMS
CHECKED
CRH



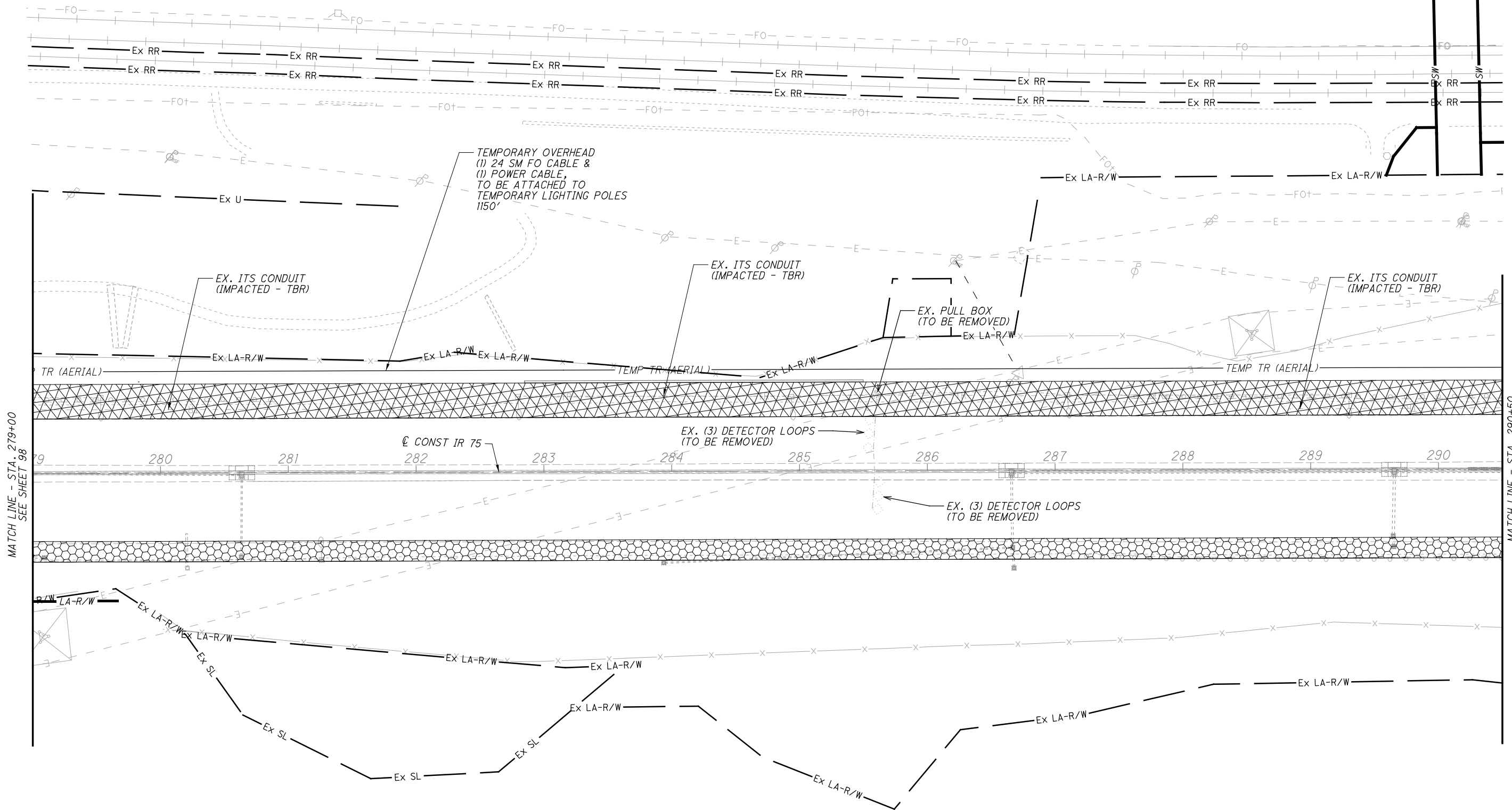
TEMPORARY ITS PLAN - IR 75
STA. 268+00 TO STA. 279+00

HAM-75-3.84

NOTES
 1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 2. THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.
 3. FOR ITS LEGEND SEE SHEET 78.

CALCULATED
 EMS
 CHECKED
 CRH

0 20 40 80
 HORIZONTAL
 SCALE IN FEET



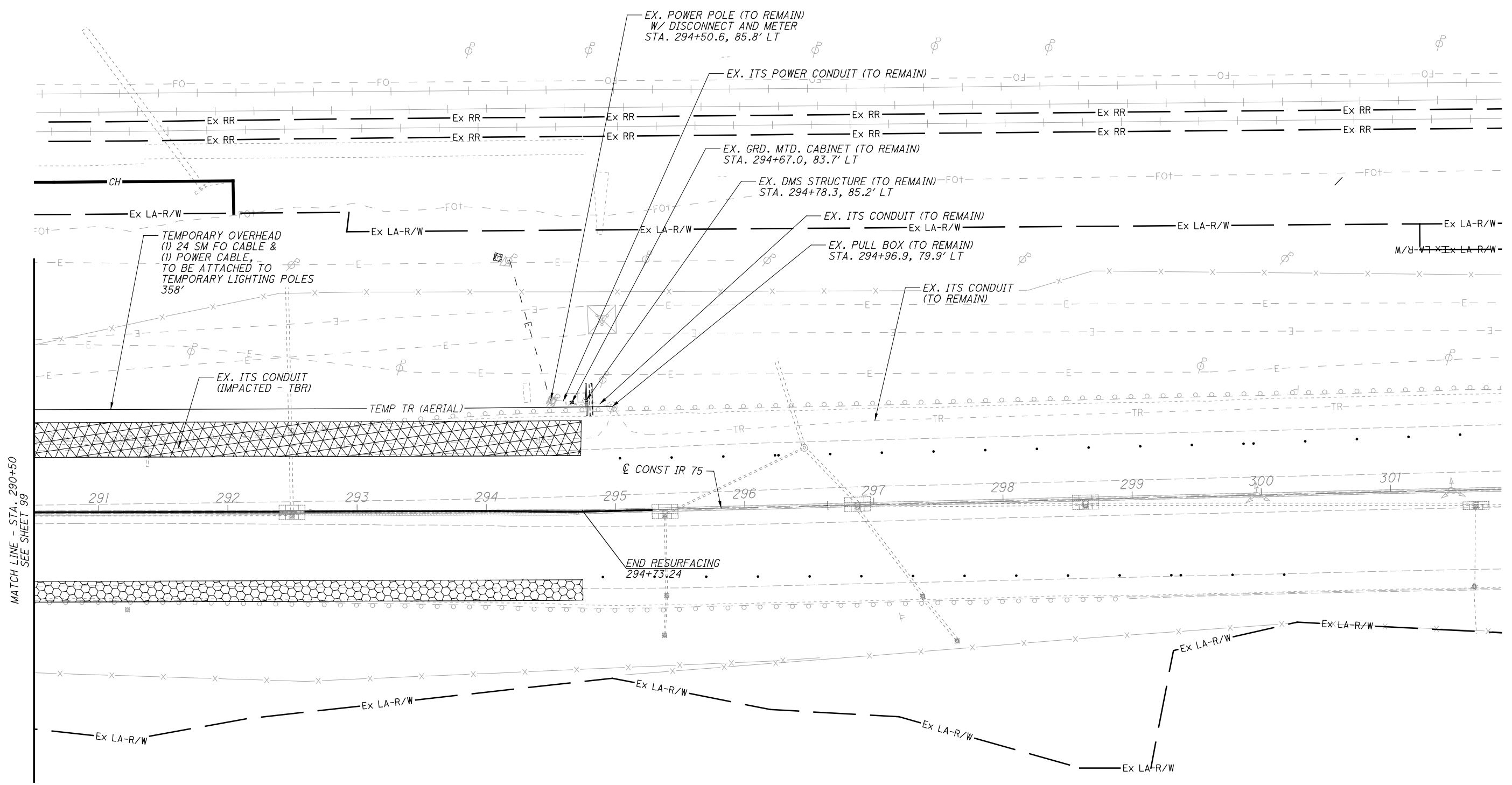
MATCH LINE - STA. 279+00
 SEE SHEET 98

MATCH LINE - STA. 290+50
 SEE SHEET 100

ITS PLAN - IR 75
 STA. 279+00 TO STA. 290+50

HAM-75-3.84

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MATCH LINE - STA. 290+50
 SEE SHEET 99

CALCULATED
 EMS
 CHECKED
 CRH

0 20 40 80
 HORIZONTAL
 SCALE IN FEET

TEMPORARY ITS PLAN - IR 75
 STA. 290+50 TO STA. 302+00

HAM-75-3.84

100
 106

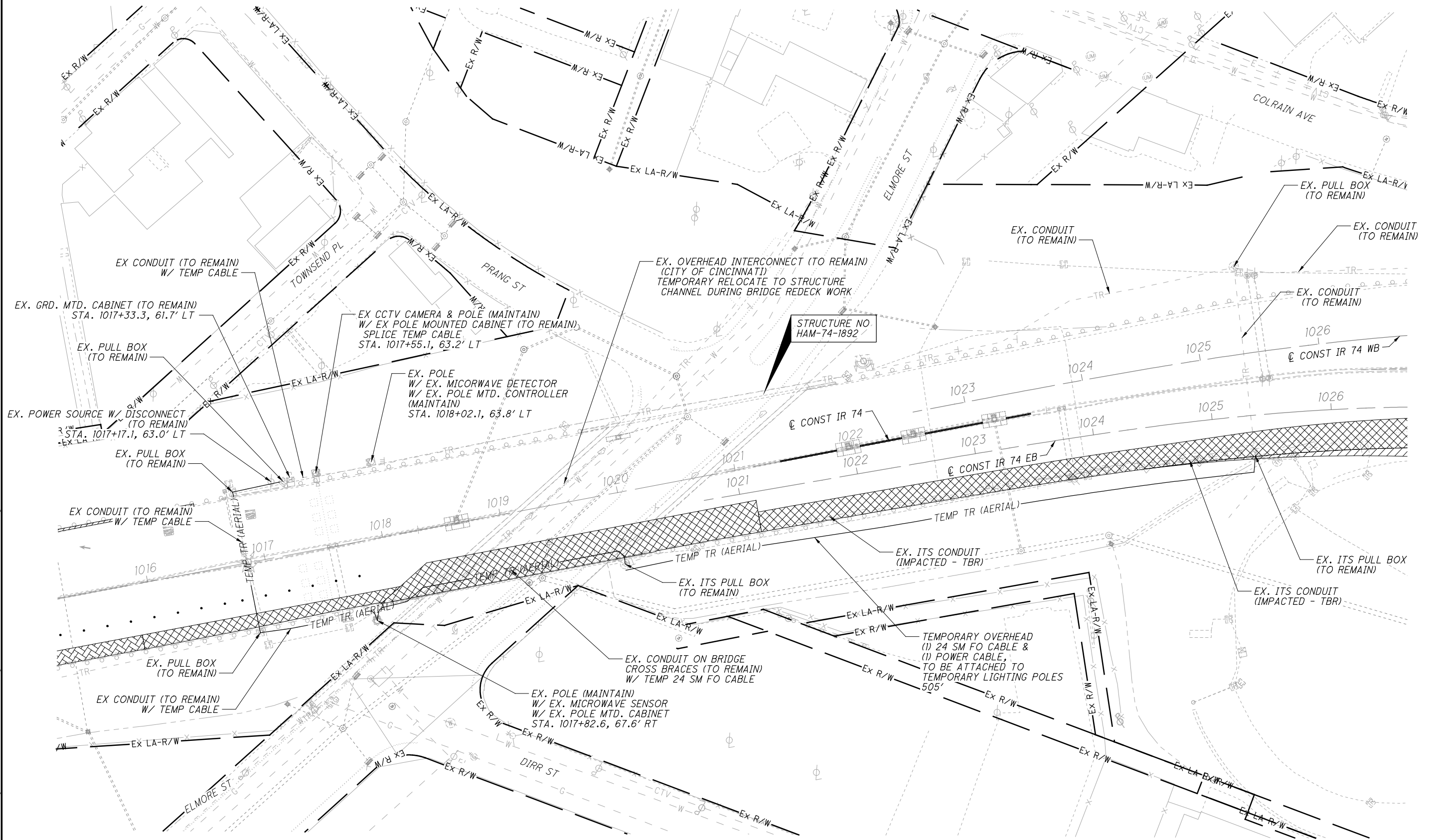
- NOTES
- EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.
 - THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.
 - FOR ITS LEGEND SEE SHEET 78.

NOTES

1. EXISTING ITS EQUIPMENT SHALL BE MAINTAINED UNTIL PROPOSED IS COMPLETE AND OPERATIONAL. ITS DEVICE (POWER AND COMMUNICATION) DOWNTIMES SHALL BE EXECUTED PER ODOT SS 809.14.

2. THE TEMPORARY PLAN SHOWN IS A ROUGH ESTIMATE THAT THE CONTRACTOR MAY CHANGE AS NEEDED. TEMPORARY ITS SHALL BE INSTALLED PER SS 809. ANY CHANGES TO THE TEMP PLAN SHALL BE COORDINATED WITH ODOT ITS.

3. FOR ITS LEGEND SEE SHEET 78.



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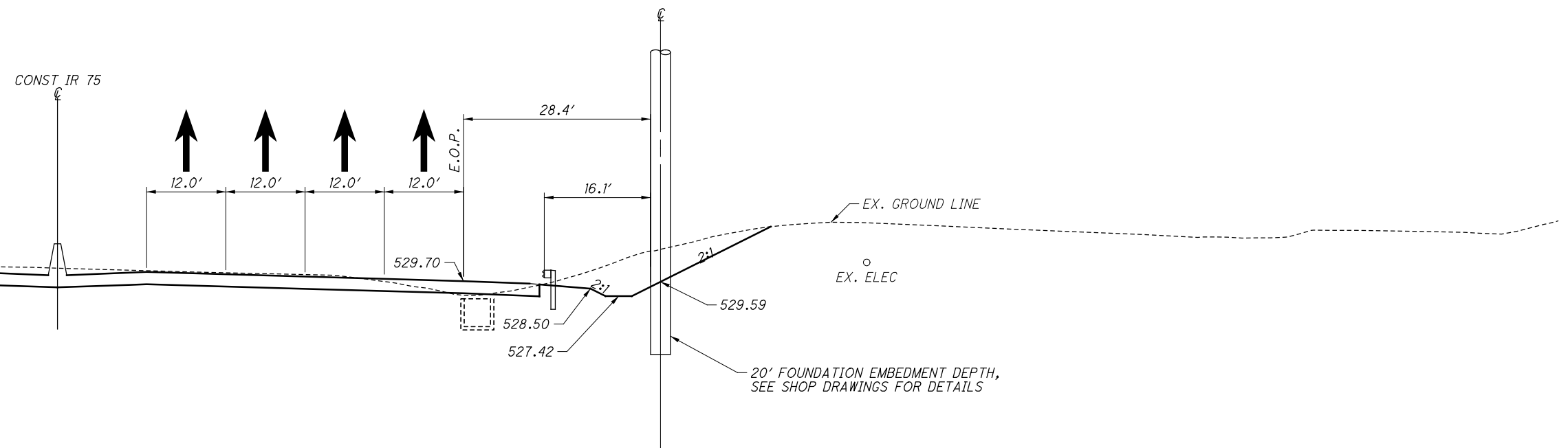
TEMPORARY ITS PLAN - IR 74
STA. 1018+00 TO STA. 1029+00

HAM-75-3.84

101
 106

CCTV TOWER SCHEDULE

NO.	HEIGHT (FT.)	NO. OF LUMINAIRES		LOCATION				ELEV (FT) (NOTE 2)	DETAILS			REFERENCE BORING(S)	FOR DETAIL SEE SHEET
		SYM	ASYM	ALIGNMENT	STATION	OFFSET	SIDE		DIA (IN)	REINF. BARS (NOTE 3)	LENGTH (FT) (NOTE 1)		
#93	90			IR 75	218+39.83	91.37	RT					102	
#49	85			IR 75	237+37.40	89.94	LT					103	
#16	90			IR 75	273+28.61	83.40'	LT					103	



STA. 218+39.83 @ IR 75, 91.37' RT

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CALCULATED
 EMS
 CHECKED
 CRH

ITS DETAILS
 CCTV TOWER SCHEDULE / TOWER #93 ELEVATION

HAM-75-3.84

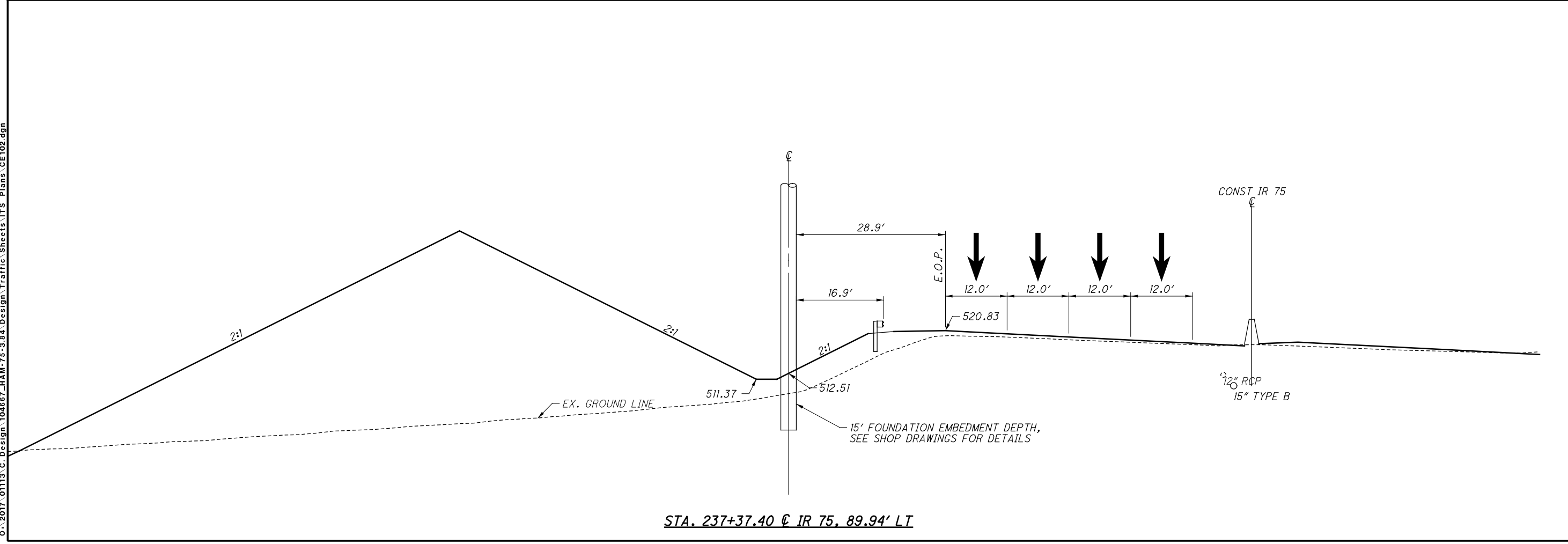
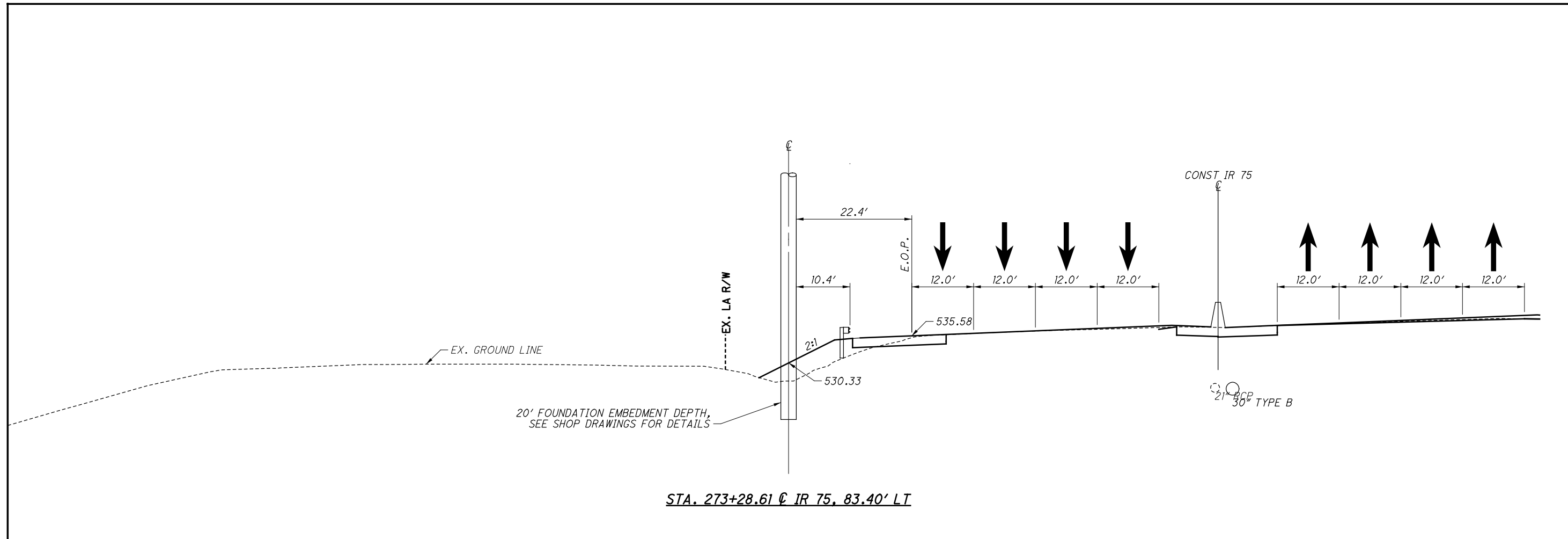
102
 106

CALCULATED	EMS
CHECKED	CRH

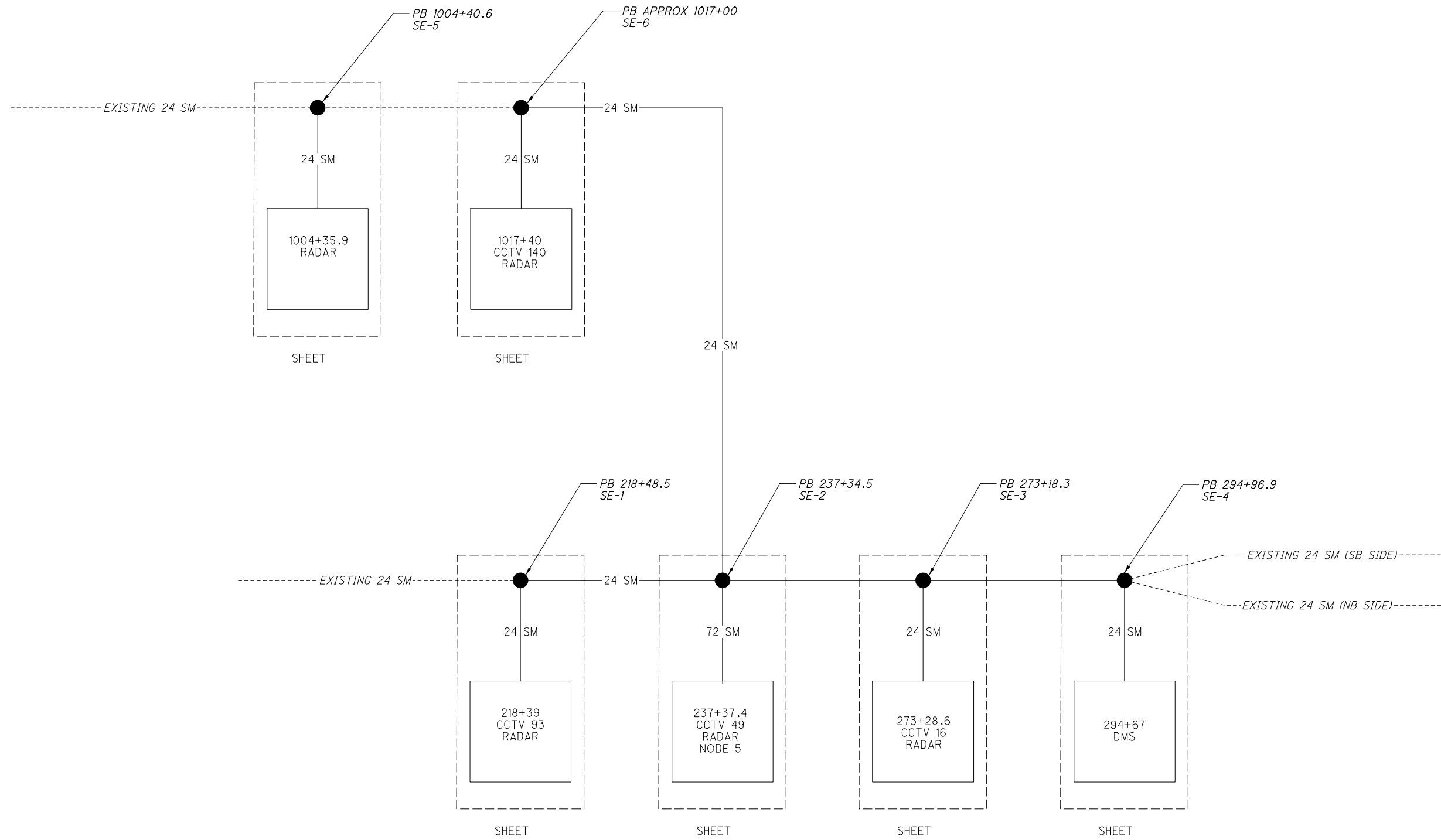
**ITS DETAILS
TOWER #49 ELEVATION / TOWER #16 ELEVATION**

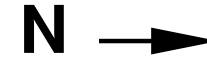
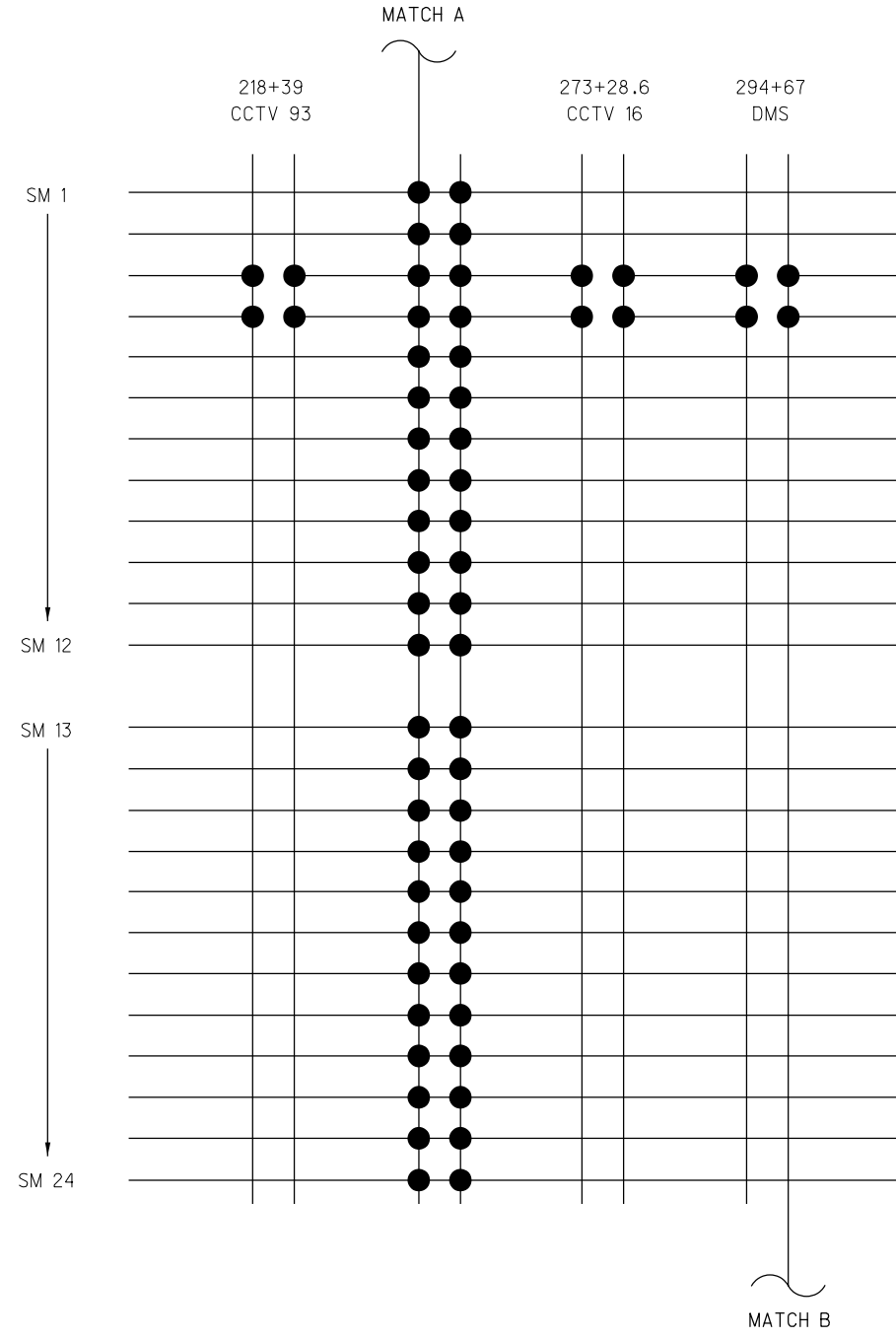
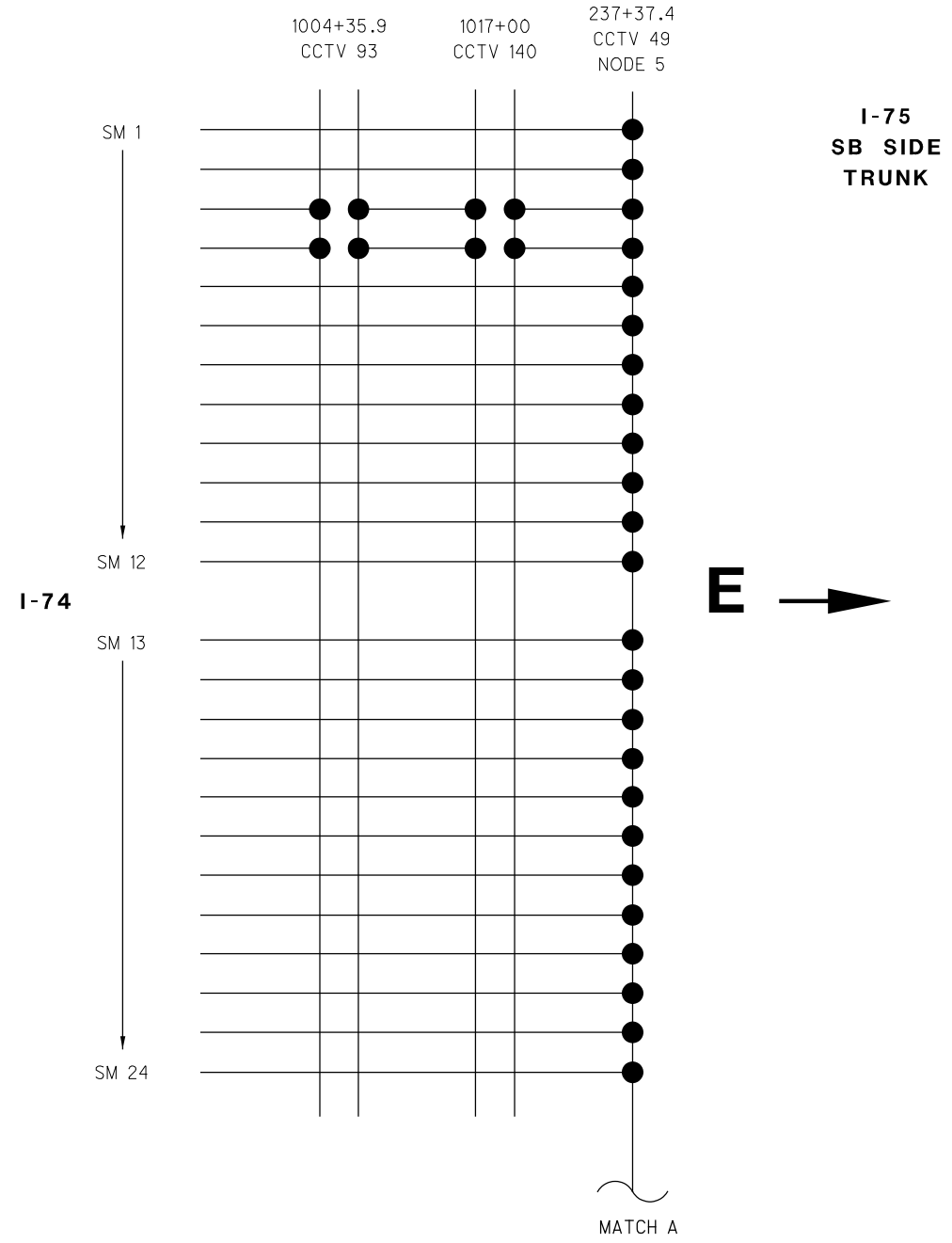
HAM-75-3.84

103
106

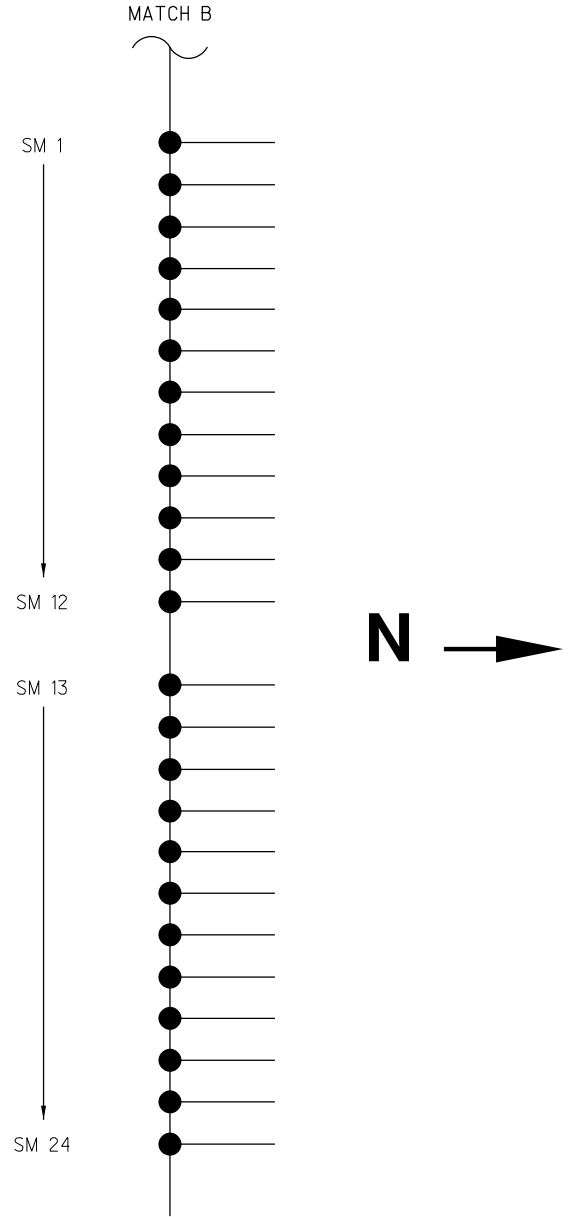


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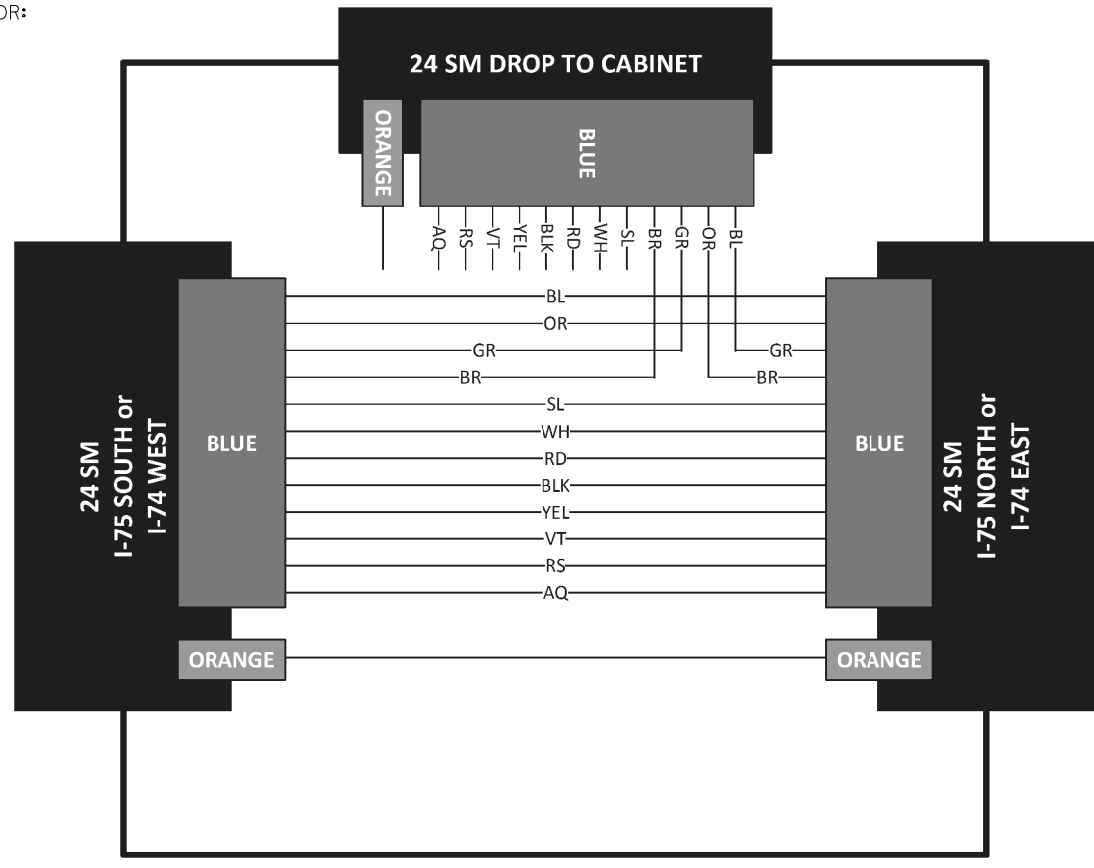




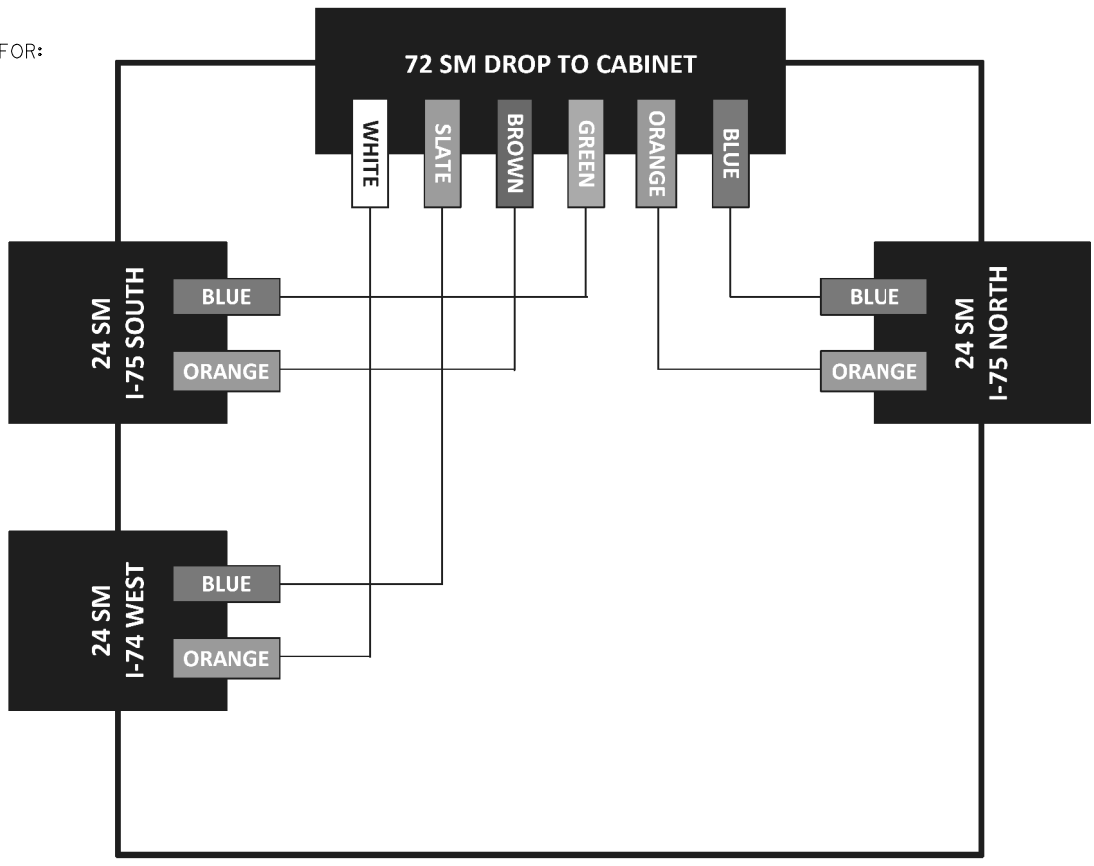
**I-75
NB SIDE
TRUNK**



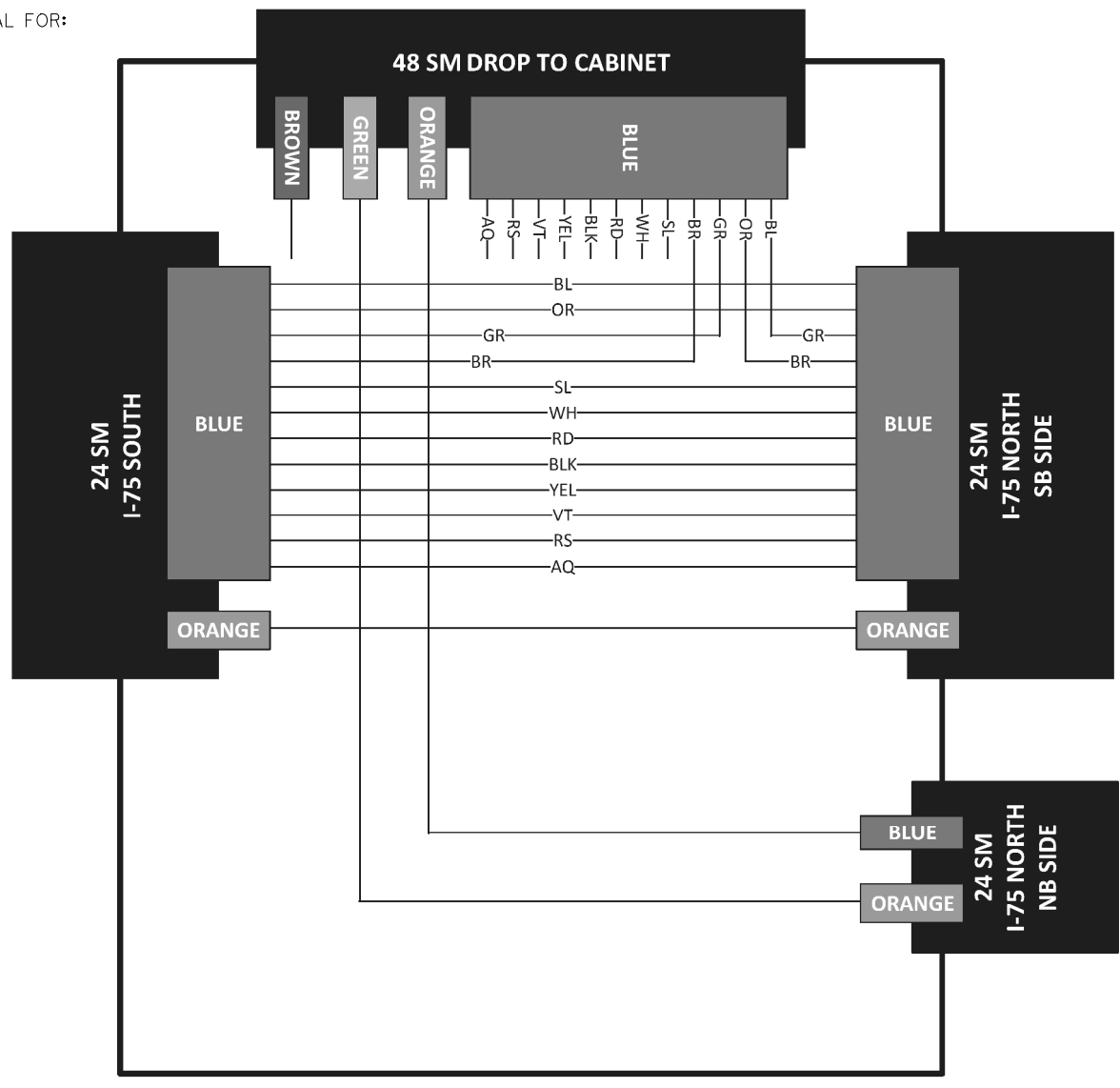
TYPICAL FOR:
 SE-1
 SE-3
 SE-5
 SE-6



TYPICAL FOR:
 SE-2

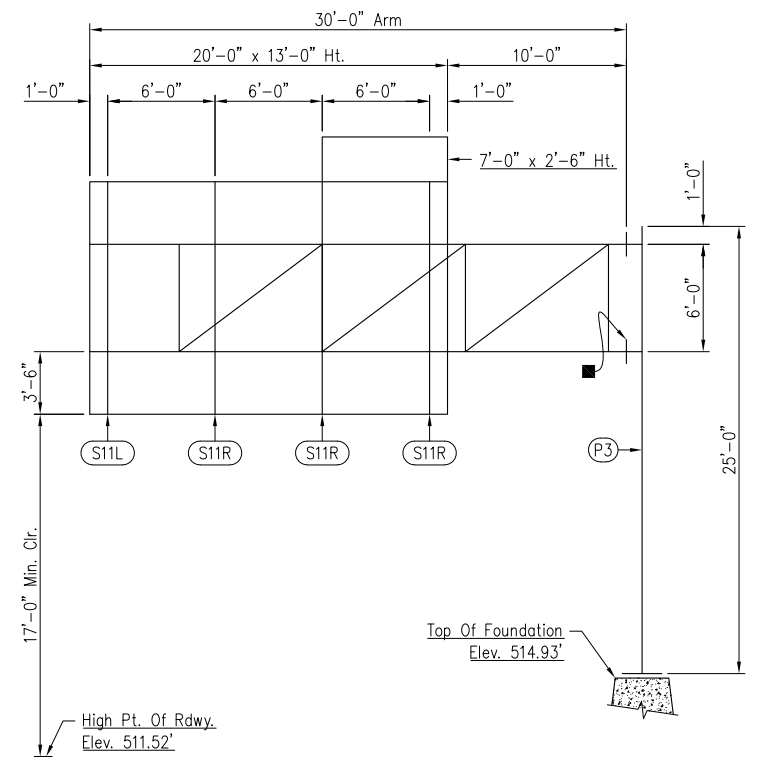
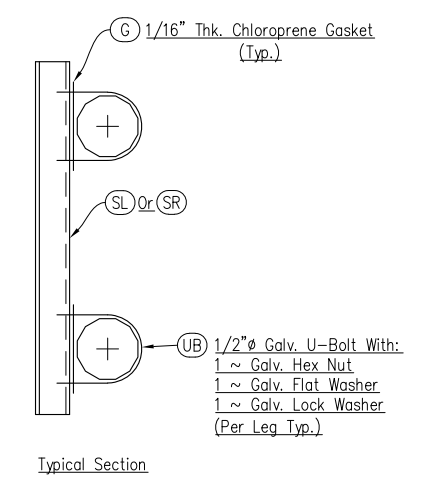
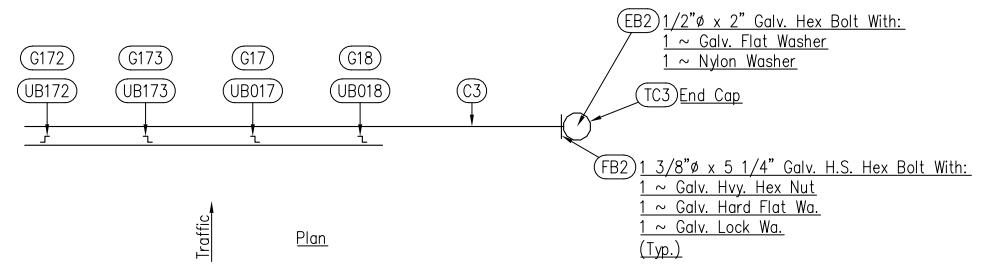


TYPICAL FOR:
 SE-4



CALCULATED
EMS
CHECKED
CRH

ITS TERMINATION DETAILS



Elevation
 Ref. No. OS-3
 Sta. 204+00.00, IR 75 SB
 TC-12.30, Des. 12
 (Looking @ Face Of Sign)

Notes:
 Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
 1 ~ Overhead Sign Support, TC-12.30, Design 12, Ref. No. 7006

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

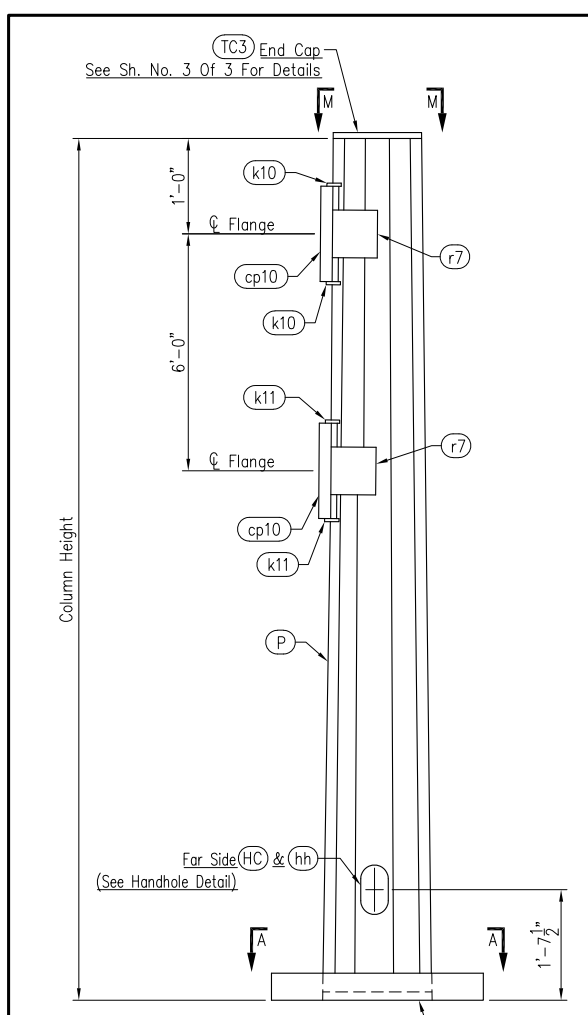
BROOKFIELD FABRICATING CORPORATION
 P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:
 Security Fence Group, Inc. P.O. No: 183000-3

Project:
 3000-18
 Hamilton Co., OH

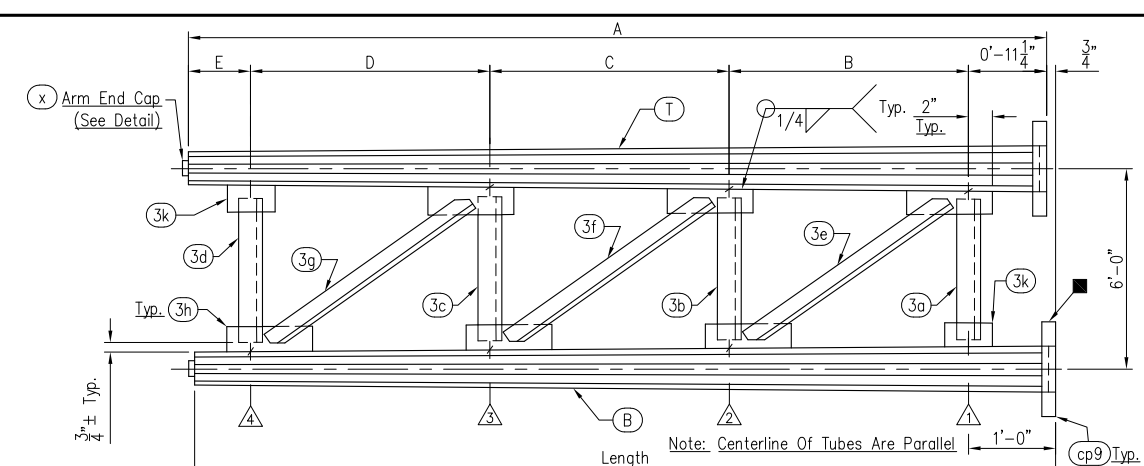
Description:
 Erection Details Of Overhead Cantilever Type TC-12.30, Des. 12
 Sign Ref. No. OS-3

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR TP | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



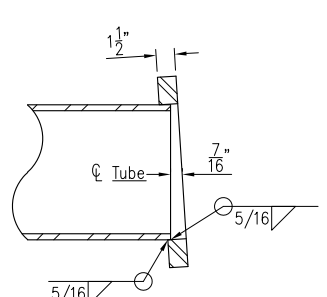
Elevation Cantilever Column

Qty.	MK	Column Height
1	P3	25'-0"

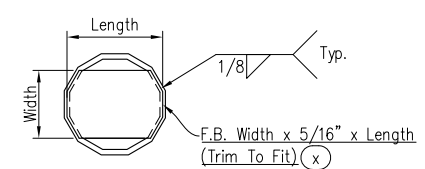
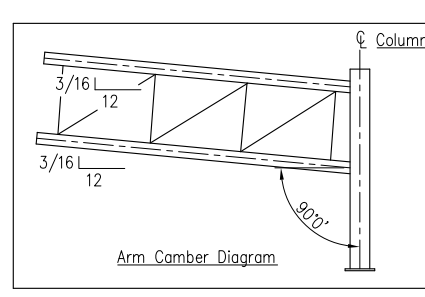


Arm Detail

Qty.	MK	Length	A	B	C	D	E	1	2	3	4	End Cap MK
1	C3	30'-0"	29'-11 1/4"	8'-0"	8'-0"	8'-0"	5'-0"	12 7/8"	11 3/4"	10 5/8"	9 1/2"	x5

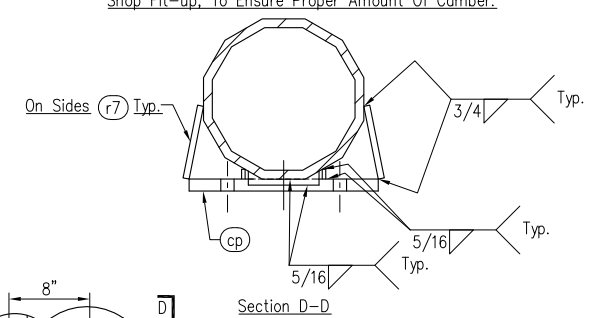
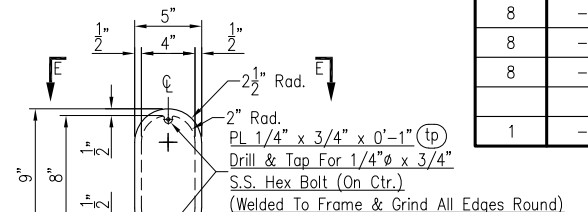
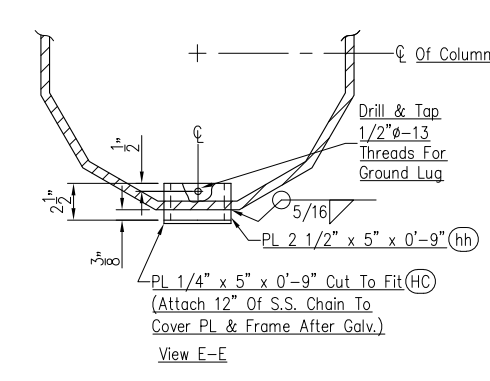


Note: Final Welding Of Arm Flanges Shall Be Accomplished During Shop Fit-up, To Ensure Proper Amount Of Camber.

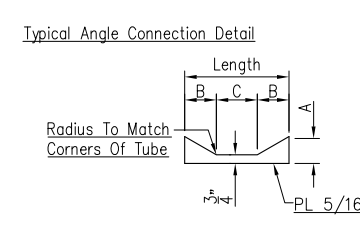
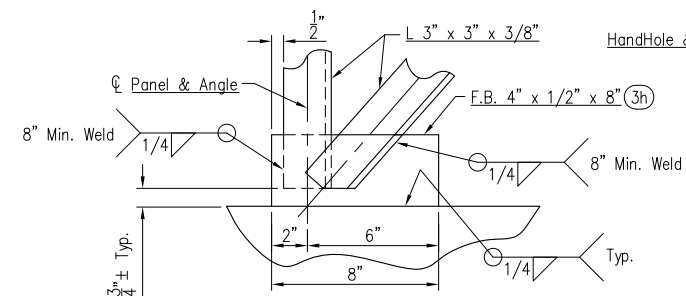


Arm End Cap Detail

Qty.	MK	Length	Width
2	x5	8 9/16"	5"

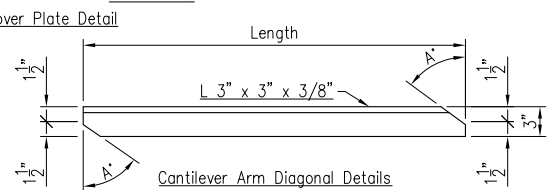


Note: Flanges Are Flush With Face Of Pole.



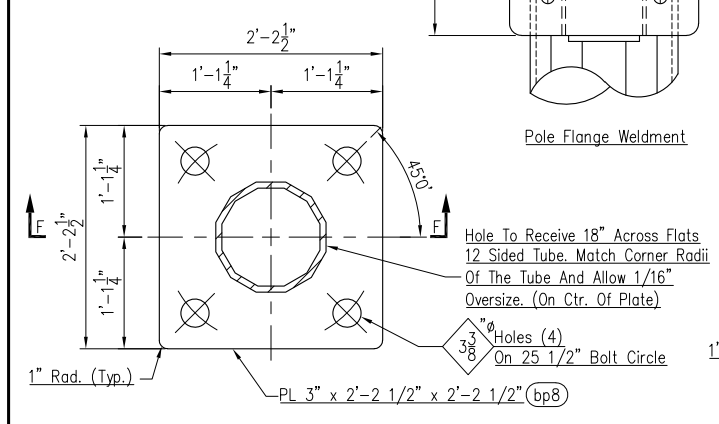
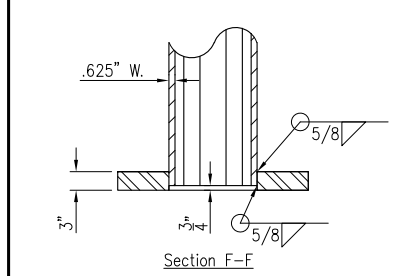
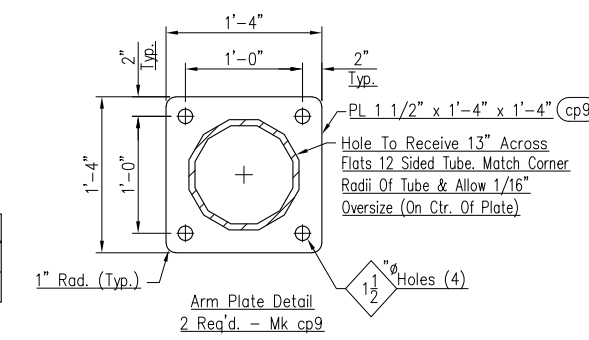
Gusset Plate Detail

Qty.	MK	Length	A	B	C
2	k10	6 3/4"	1 9/16"	1 3/8"	4"
2	k11	6 3/4"	1 1/2"	1 1/4"	4 1/4"



Cantilever Arm Diagonal Details

Qty.	MK	Length	A'
1	3e	9'-2 3/16"	58'-08'
1	3f	9'-2 13/16"	57'-39'
1	3g	9'-3 1/2"	57'-10'



Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P3	18" A.F. x 14.51" A.F. Tapered Tube	24'-11 1/4"	.625" Wall (12 Sided)	TTAF18X.625-S12AI
1	C3T	13" A.F. x 8.81" A.F. Tapered Tube	29'-10 13/16"	.312" Wall (12 Sided)	TTAF13X.313-S12AI
1	C3B	do	29'-11 9/16"	.312" Wall (12 Sided)	TTAF13X.313-S12AI
1	3a	L 3" x 3" x 3/8"	4'-9 5/8"		L3X3X.375A
1	3b	do	4'-10 3/4"		L3X3X.375A
1	3c	do	4'-11 7/8"		L3X3X.375A
1	3d	do	5'-1"		L3X3X.375A
1	3e	do	9'-2 3/16"	See Detail	L3X3X.375A
1	3f	do	9'-2 13/16"	See Detail	L3X3X.375A
1	3g	do	9'-3 1/2"	See Detail	L3X3X.375A
1	bp8	PL 3" x 2'-2 1/2"	2'-2 1/2"		PL3A
2	cp9	PL 1 1/2" x 1'-4"	1'-4"		PL1.5A
2	cp10	do	1'-4"		PL1.5A
2	k10	PL 5/16" x 1 9/16"	0'-6 3/4"		PL.313A
2	k11	PL 5/16" x 1 1/2"	0'-6 3/4"		PL.313A
2	x5	PL 5/16" x 5"	0'-8 9/16"		PL.313A
4	m7	PL 5/16" x 1"	1'-4"		PL.313A
4	r7	F.B. 6" x 3/4"	0'-7 3/8"		FB6X.75A
6	3h	F.B. 4" x 1/2"	0'-8"		FB4X.5A
2	3k	do	0'-4"		FB4X.5A
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4"Ø S.S. Hex Bolt	3/4"		BSS02.75
8	FB2	1 3/8"Ø Galv. H.S. Hex Bolt	5 1/4"		BSG115.253
8	-	1 3/8"Ø Galv. Hvy. Hex Nut	-		NSG114
8	-	1 3/8"Ø Galv. Hard Flat Washer	-		WSG113
8	-	1 3/8"Ø Galv. Lock Washer	-		LWSG112
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

Notes:

For View M-M See Sh. # 3 Of 3

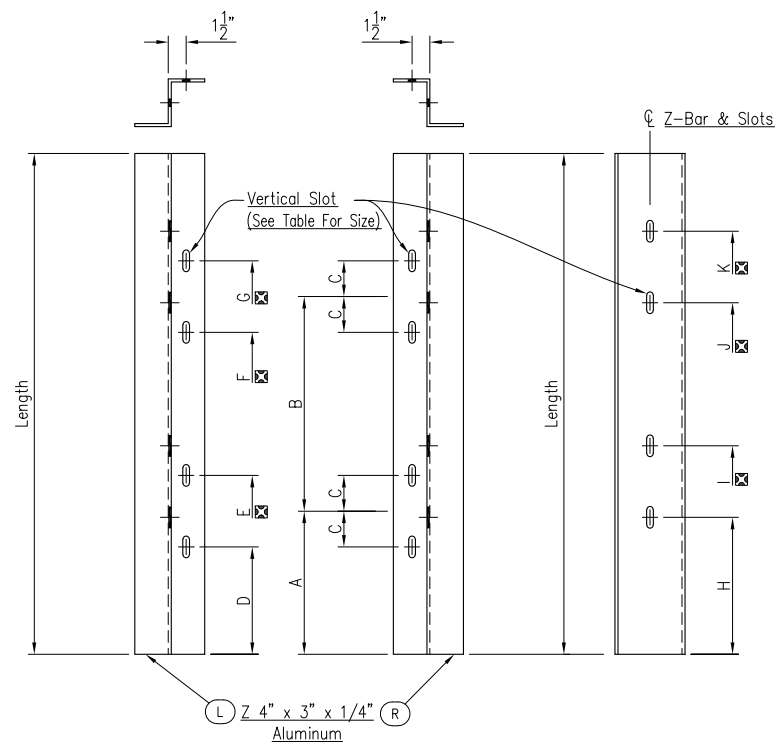
Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:

Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Plate, Angle & Flat Bar: A.S.T.M. A36
All Steel To Be Galvanized Per A.S.T.M. A123
H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be: A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
Lock Washers To Be A.S.T.M. A307
Galvanize Hardware Per A.S.T.M. A153
S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

Customer:	Security Fence Group, Inc.	P.O. No: 183000-3
Project:	3000-18	Hamilton Co., OH
Description:	Fabrication Details Of Tapered Cantilever Structure Type TC-12.30, Des. 12 Sign Ref. No. OS-3	
Printed For:	Ohio	Rev. 2 Of 3
Drawn By:	JH	Date: 8-31-19
Checked By:	CR	Date: 9-9-19
Job No:	OH-15319	Rev.

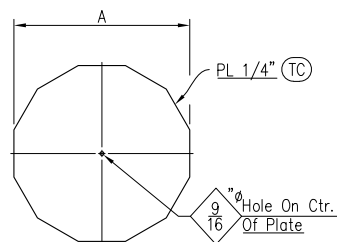


Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	3	S11L S11R	13'-0"	9/16" ϕ x 2" Slots	3'-6"	6'-0"	5 11/16"	3'-0 5/16"	3'-11 11/16"	9'-0 5/16"	9'-11 11/16"	-	-	-

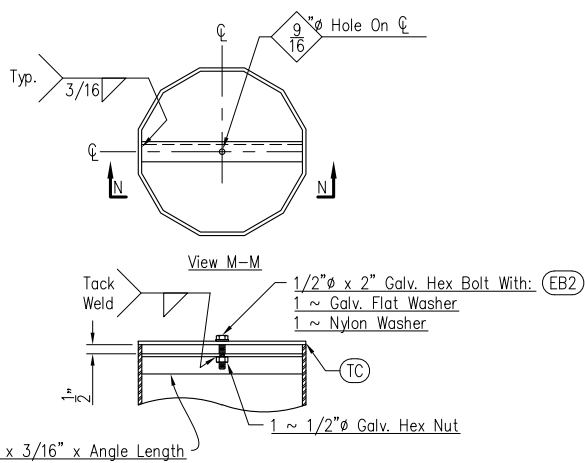
Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S11L	Z 4" x 3" x 1/4"	13'-0"	Alum.	AZ4X2.85*
3	S11R	do	13'-0"	Alum.	AZ4X2.85*
1	TC3	PL 1/4" x 1'-2 1/2"	1'-2 1/2"	Steel	PL.25A
1	ta3	L 2" x 2" x 3/16"	1'-1 1/4"	Steel	L2X2X.188A
1	EB2	1/2" ϕ Galv. Hex Bolt	2"		BSG0422
1	-	1/2" ϕ Galv. Hex Nut	-		NSG042
1	-	1/2" ϕ Galv. Flat Washer	-		WSG042
1	-	1/2" ϕ Nylon Washer	-		WN04
2	UB172	1/2" ϕ Galv. U-Bolt	2'-4 3/8"		RD.5A
2	UB173	do	2'-7"		RD.5A
2	UB017	do	2'-8 1/4"		RD.5A
2	UB018	do	2'-10 13/16"		RD.5A
16	-	1/2" ϕ Galv. Hex Nut	-		NSG042
16	-	1/2" ϕ Galv. Flat Washer	-		WSG042
16	-	1/2" ϕ Galv. Lock Washer	-		LWSG042
2	G172	1/16" x 3"	0'-11 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G173	1/16" x 3"	1'-0 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G17	1/16" x 3"	1'-1 1/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G18	1/16" x 3"	1'-2 1/8"	Chloroprene Gasket	1/16" NEOPRENE



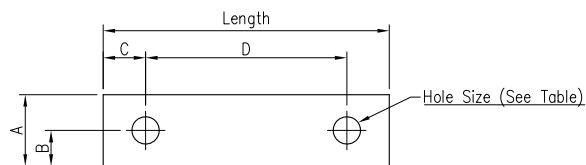
End Cap Detail

Qty.	MK	Tube/Pipe Size	A	Remarks
1	TC3	14.51" A.F. x .625" W. Tapered Tube	1'-2 1/2"	Galv. Steel



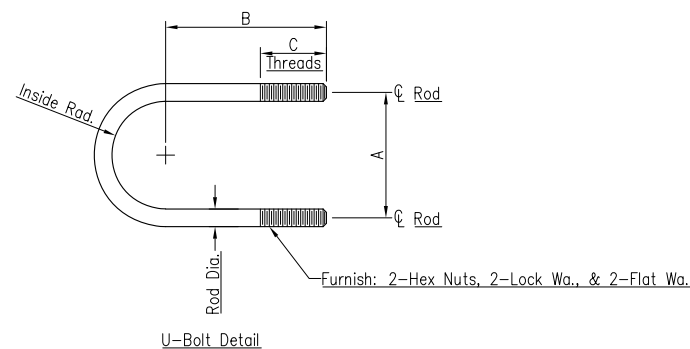
Section N-N

Qty.	MK	F.B. Length	To Be Used With End Cap MK
1	ta3	1'-1 1/4"	TC3



1/16" Thick Chloroprene Gasket Detail (G)

Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
2	G172	11 5/8"	3"	1 1/2"	3/4"	10 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB172
2	G173	1'-0 5/8"	3"	1 1/2"	3/4"	11 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB173
2	G17	1'-1 1/8"	3"	1 1/2"	3/4"	11 5/8"	9/16"	Sign Support To Steel Chord, Use W/UB017
2	G18	1'-2 1/8"	3"	1 1/2"	3/4"	1'-0 5/8"	9/16"	Sign Support To Steel Chord, Use W/UB018



U-Bolt Detail

Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
2	UB172	1/2"	10 1/8"	6 1/4"	2 1/2"	2'-4 3/8"	0'-4 13/16"	9" To 9.5" O.D. Arm To Sign Support	Galv. Stl.
2	UB173	1/2"	11 1/8"	6 3/4"	2 1/2"	2'-7"	0'-5 5/16"	10" To 10.5" O.D. Arm To Sign Support	do
2	UB017	1/2"	11 5/8"	7"	2 1/2"	2'-8 1/4"	0'-5 9/16"	10.5" To 11" O.D. Arm To Sign Support	do
2	UB018	1/2"	1'-0 5/8"	7 1/2"	2 1/2"	2'-10 13/16"	0'-6 1/16"	11.5" To 12" O.D. Arm To Sign Support	do

NOTE:
 Indicates Progressive Dimensions.

MATERIAL SPECIFICATIONS:
 Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

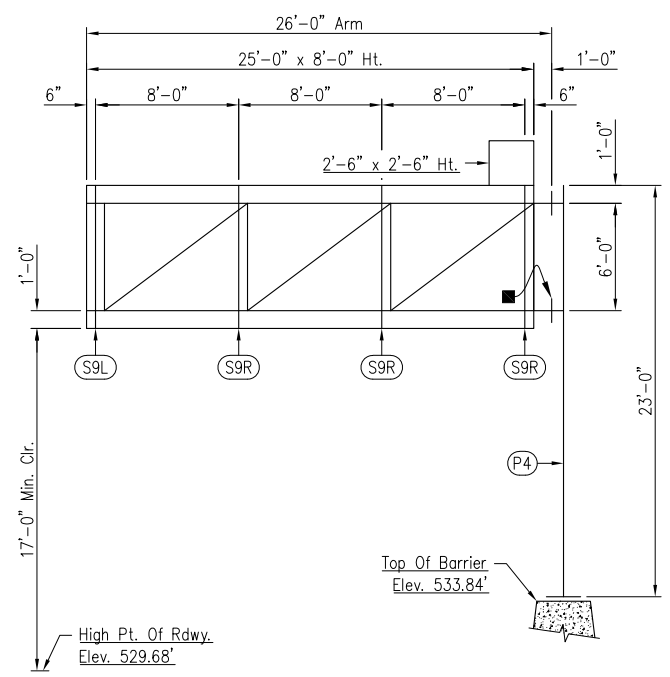
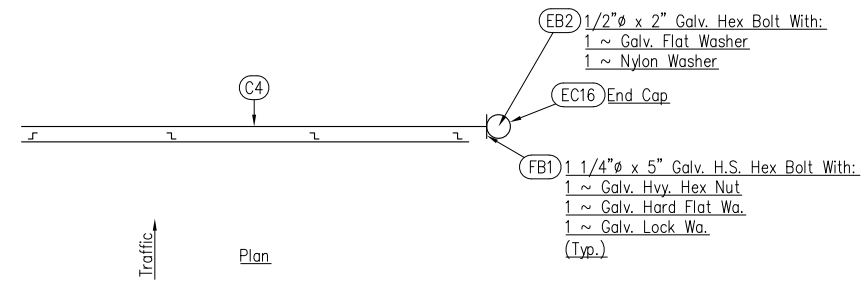


Customer: Security Fence Group, Inc. P.O. No: 183000-3

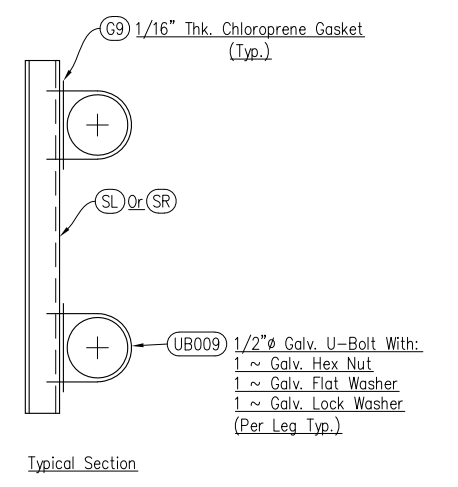
Project: 3000-18 Hamilton Co., OH

Description: Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev: | Sheet No: 3 Of 3



Elevation
Ref. No. OS-4
Sta. 213+15.00, IR 75 SB
TC-12.30, Des. 9
(Looking @ Face Of Sign)




Notes:
Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
1 ~ Overhead Sign Support, TC-12.30, Design 9, Ref. No. 7005

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



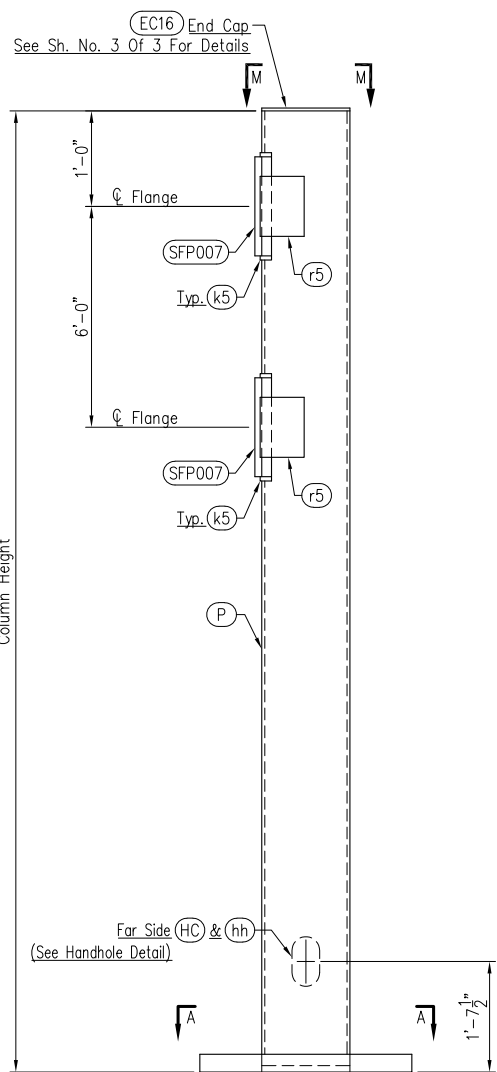
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer:
Security Fence Group, Inc. P.O. No: 183000-3

Project:
3000-18
Hamilton Co., OH

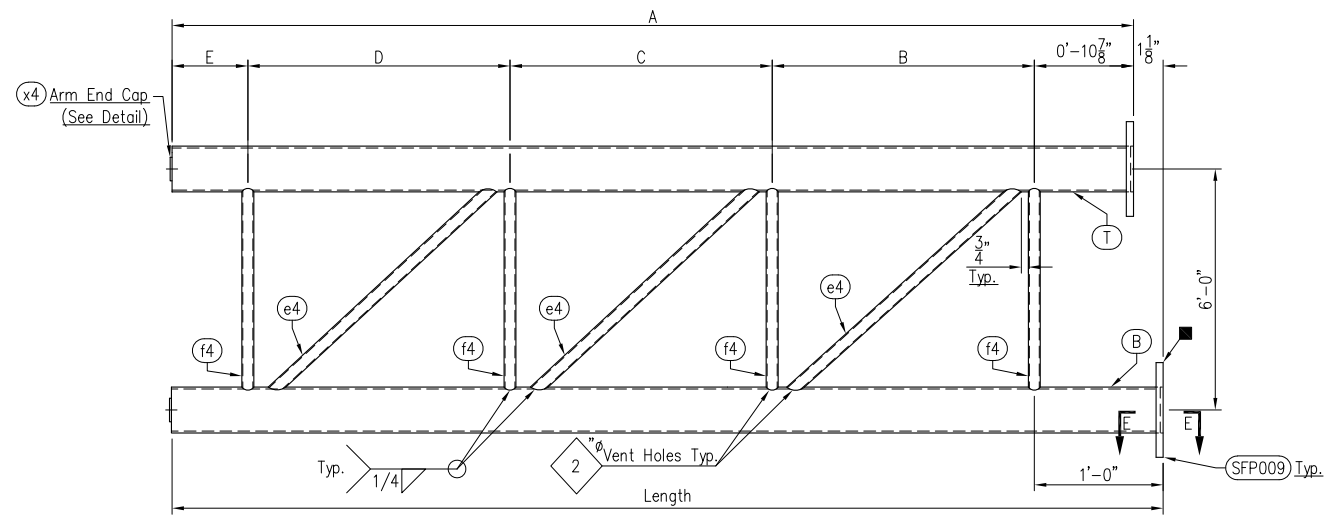
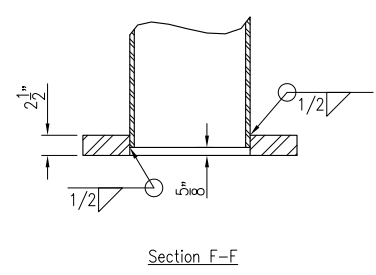
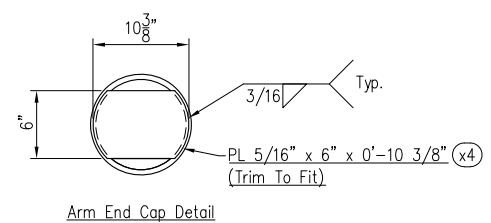
Description:
Erection Details Of Overhead Cantilever Type TC-12.30, Des. 9
Sign Ref. No. OS-4

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR TP | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



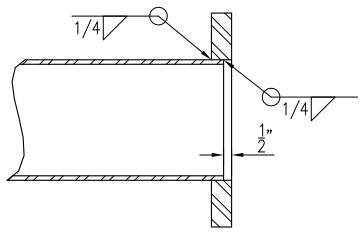
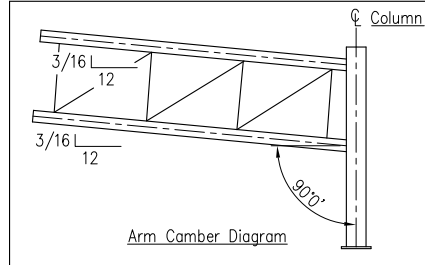
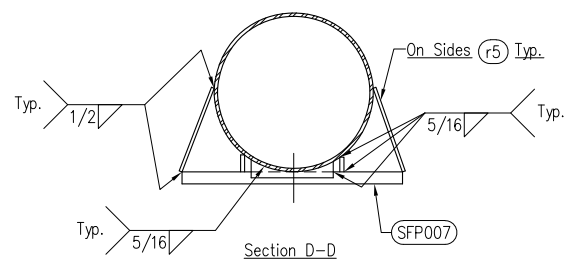
Elevation
Cantilever Column

Qty.	MK	Column Height
1	P4	23'-0"



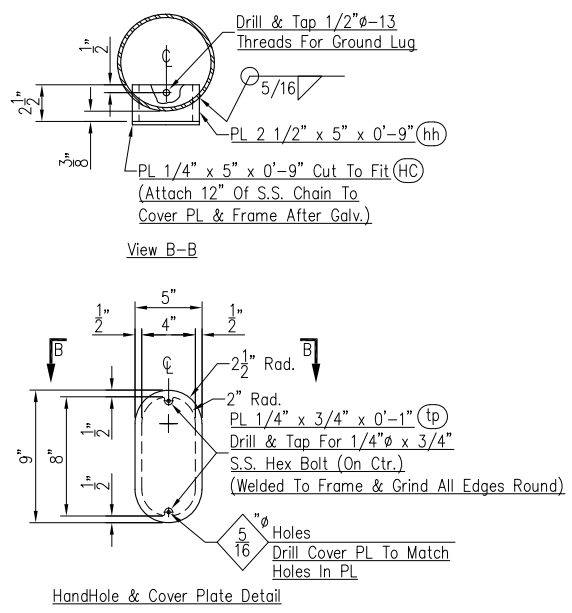
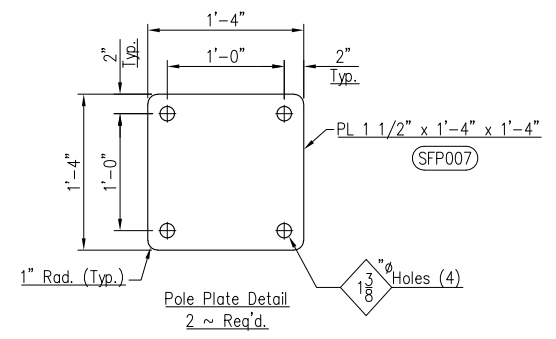
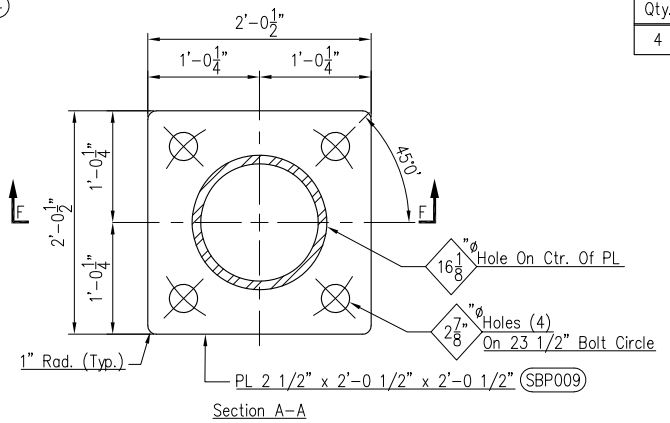
Arm Detail

Qty.	MK	Length	A	B	C	D	E
1	C4	26'-0"	25'-10 7/8"	8'-0"	8'-0"	8'-0"	1'-0"



Gusset Plate Detail

Qty.	MK	Length	A	Radius
4	k5	6 3/4"	1 1/2"	8 1/16"



Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P4	16" O.D. x .500" W. Pipe	22'-11 3/8"		P16X.500J52
1	C4T	10.75" O.D. x .279" W. Pipe	25'-10 3/8"		P10.75X.279J52
1	C4B	do	25'-11 1/2"		P10.75X.279J52
3	e4	2.875" O.D. x .203" W. Pipe	9'-2 11/16"	Mill To: 8'-10 1/8" @ 54'-44'	P2.875X.203H
4	f4	do	5'-1 1/2"	Mill To: 5'-1 1/4" @ 0'	P2.875X.203H
2	SFP007	PL 1 1/2" x 1'-4"	1'-4"		SFP007
2	SFP009	do	1'-4"		SFP009
4	k5	PL 5/16" x 1 1/2"	0'-6 3/4"		PL.313A
4	r5	FB 6" x 1/2"	0'-8"		FB6X.5A
4	m5	PL 5/16" x 7/8"	1'-4"		PL.313A
2	x4	PL 5/16" x 6"	0'-10 3/8"		PL.313A
1	SBP009	PL 2 1/2" x 2'-0 1/2"	2'-0 1/2"		SBP009
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4" S.S. Hex Bolt	3/4"		BSS02.75
8	FB1	1 1/4" Galv. H.S. Hex Bolt	5"		BSG1053
8	-	1 1/4" Galv. Hvy. Hex Nut	-		NSG104
8	-	1 1/4" Galv. Hard Flat Washer	-		WSG103
8	-	1 1/4" Galv. Lock Washer	-		LWSG102
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

NOTE:

For View M-M See Sh. # 3 Of 3

Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:

Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield
Steel Brace Pipe To Be:
A.S.T.M. A53 Gr. B Or
A.S.T.M. A500 Gr. B
Steel Plate & Flat Bar To Be A.S.T.M. A36
All Steel To Be Galvanized Per A.S.T.M. A123
H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be:
A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
Lock Washers To Be A.S.T.M. A307
Galvanize Hardware Per A.S.T.M. A153
S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

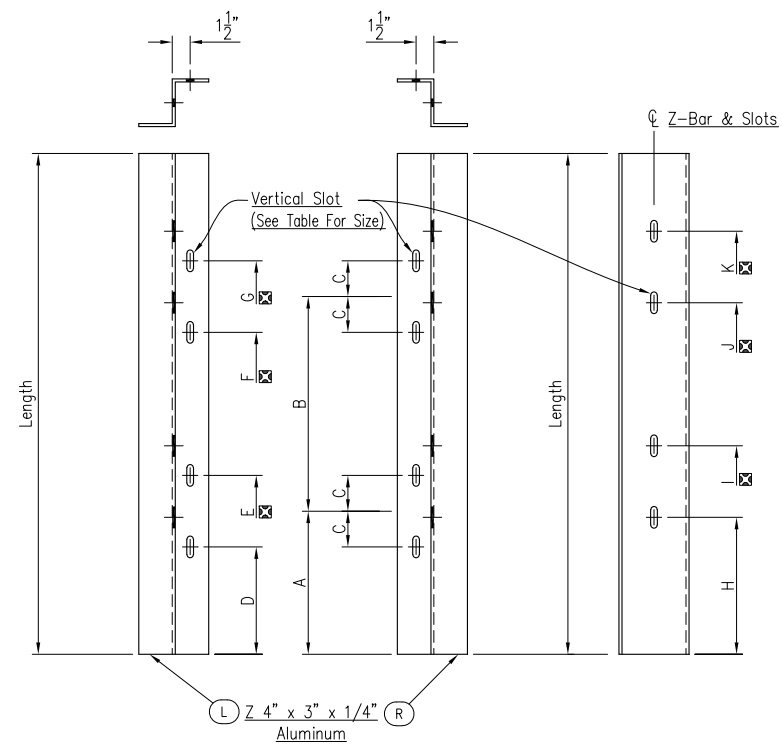
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18
Hamilton Co., OH

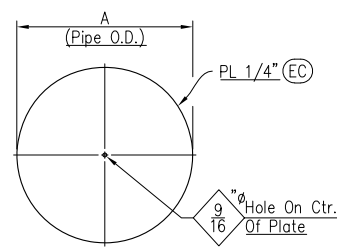
Description: Fabrication Details Of Cantilever Structure Type 12.30, Des. 9
Sign Ref. No. OS-4

Printed For: Ohio
Drawn By: JH
Date: 8-31-19
Checked By: CR
Date: 9-9-19
Job No: OH-15319
Rev: 2 Of 3



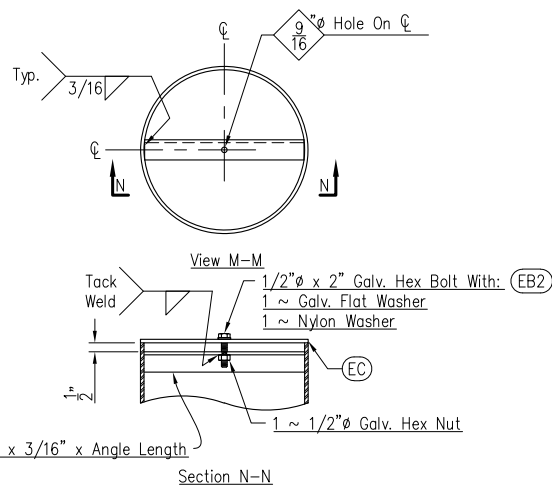
Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	3	S9L S9R	8'-0"	9/16"Ø x 1" Slots	1'-0"	6'-0"	5 11/16"	0'-6 5/16"	1'-5 11/16"	6'-6 5/16"	7'-5 11/16"	-	-	-



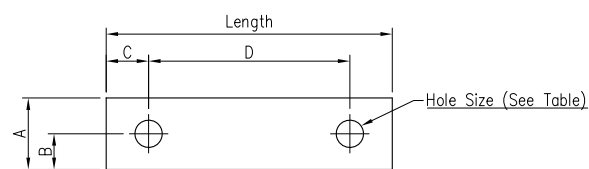
End Cap Detail

Qty.	MK	Tube/Pipe Size	A	Remarks
1	EC16	16" O.D. x .500" W. Pipe	1'-4"	Galv. Steel



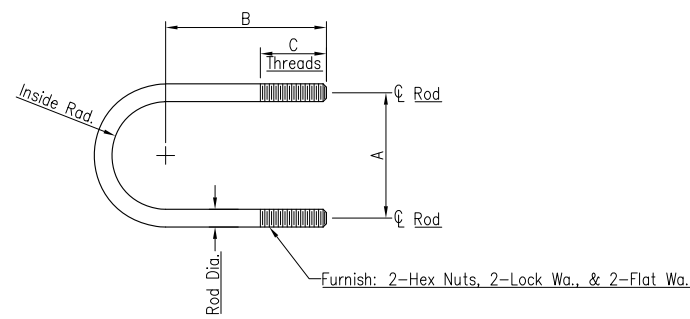
Section N-N

Qty.	MK	Angle Length	To Be Used With End Cap MK
1	ea11	1'-2 7/8"	EC16



1/16" Thick Chloroprene Gasket Detail G

Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
8	G9	1'-0 7/8"	3"	1 1/2"	3/4"	11 3/8"	9/16"	Sign Support To Steel Chord, Use W/UB009



U-Bolt Detail

Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
8	UB009	1/2"	11 3/8"	6 7/8"	2 1/2"	2'-7 5/8"	0'-5 7/16"	10.75" O.D. Chord To Sign Support	Galv. Stl.

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S9L	Z 4" x 3" x 1/4"	8'-0"	Alum.	AZ4X2.85*
3	S9R	do	8'-0"	Alum.	AZ4X2.85*
1	EC16	PL 1/4" x 1'-4" Dia.	-	Steel	CIRCLE-16X.25A
1	ea11	L 2" x 2" x 3/16"	1'-2 7/8"	Steel	L2X2X.188A
1	EB2	1/2"Ø Galv. Hex Bolt	2"		BSG0422
1	-	1/2"Ø Galv. Hex Nut	-		NSG042
1	-	1/2"Ø Galv. Flat Washer	-		WSG042
1	-	1/2"Ø Nylon Washer	-		WN04
8	UB009	1/2"Ø Galv. U-Bolt	2'-7 5/8"		RD.5A
16	-	1/2"Ø Galv. Hex Nut	-		NSG042
16	-	1/2"Ø Galv. Flat Washer	-		WSG042
16	-	1/2"Ø Galv. Lock Washer	-		LWSG042
8	G8	1/16" x 3"	0'-10 3/4"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:
 ☒ Indicates Progressive Dimensions.

MATERIAL SPECIFICATIONS:
 Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

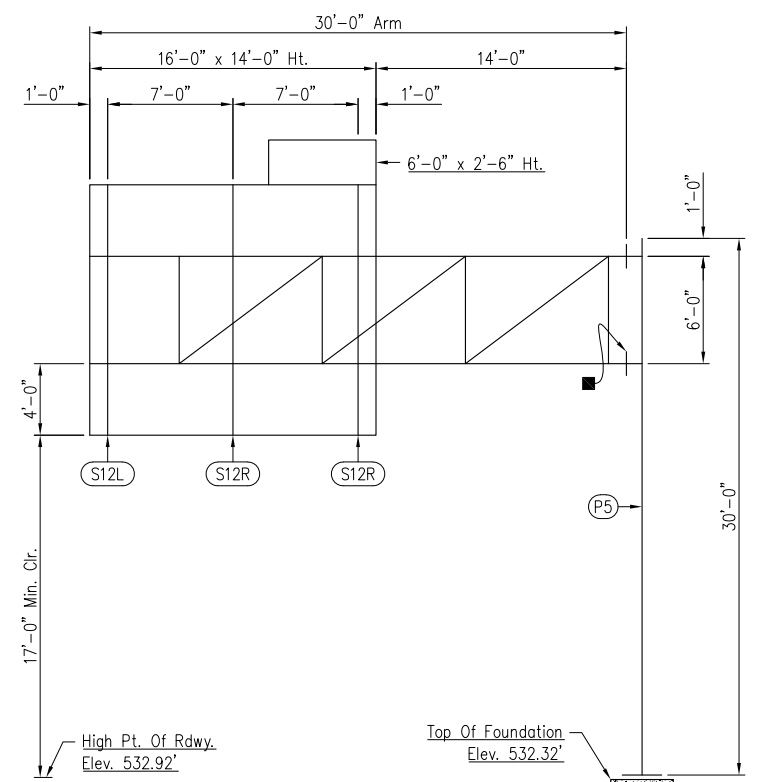
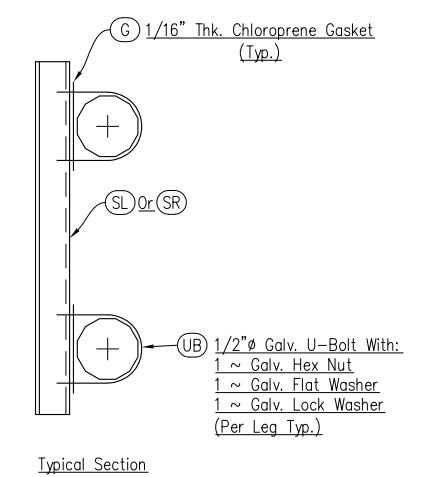
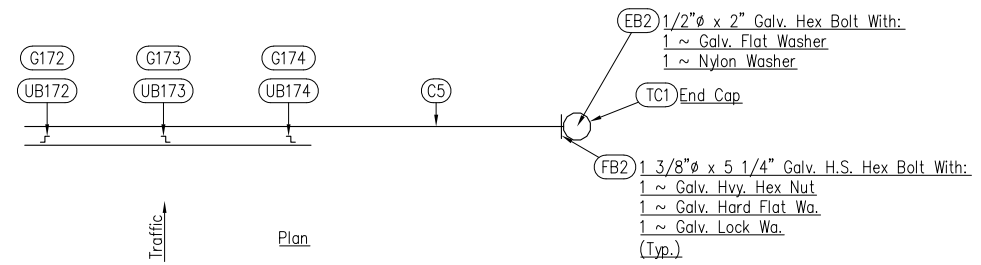
PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18
 Hamilton Co., OH

Description: Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware

Printed For: Ohio
 Drawn By: JH
 Date: 8-31-19
 Checked By: CR
 Date: 9-9-19
 Job No: OH-15319
 Rev: 3 Of 3



Elevation
Ref. No. OS-5
Sta. 220+00.00, IR 75 SB
TC-12.30, Des. 12
(Looking @ Face Of Sign)

Notes:
Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
1 ~ Overhead Sign Support, TC-12.30, Design 12, Ref. No. 7006

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

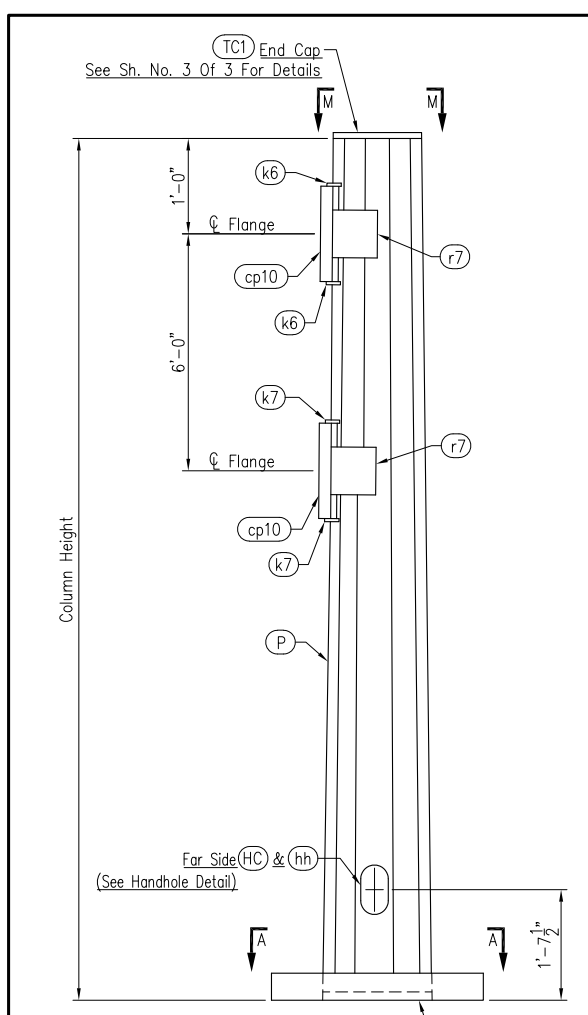
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18
Hamilton Co., OH

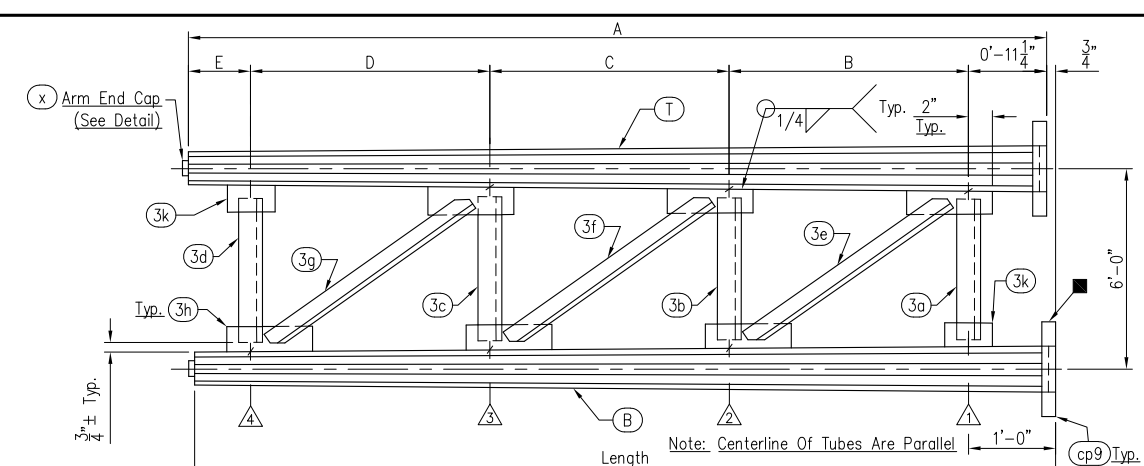
Description: Erection Details Of Overhead Cantilever Type TC-12.30, Des. 12
Sign Ref. No. OS-5

Printed For: Ohio | Drawn By: JH | Date: 9-3-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



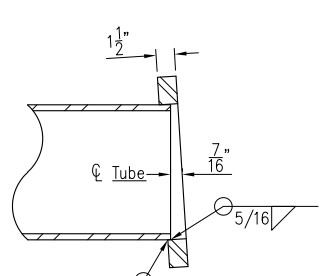
Elevation Cantilever Column

Qty.	MK	Column Height
1	P5	30'-0"

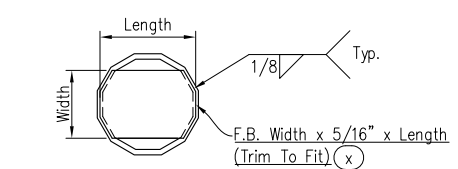
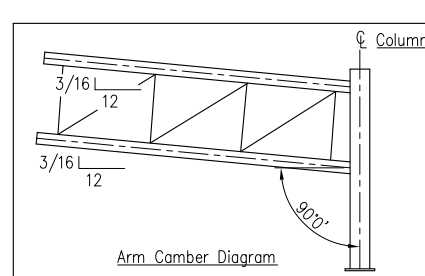
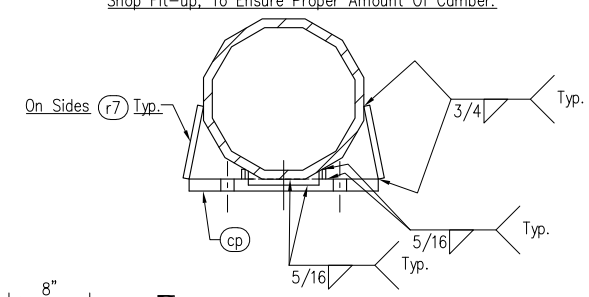


Arm Detail

Qty.	MK	Length	A	B	C	D	E	1	2	3	4	End Cap MK
1	C5	30'-0"	29'-11 1/4"	8'-0"	8'-0"	8'-0"	5'-0"	12 7/8"	11 3/4"	10 5/8"	9 1/2"	x5

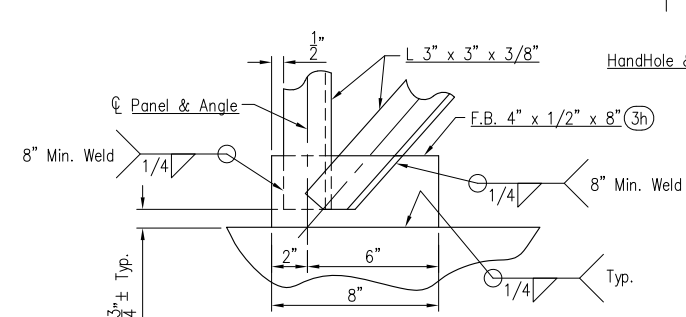
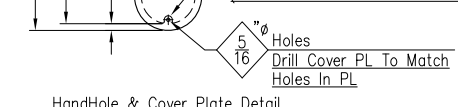
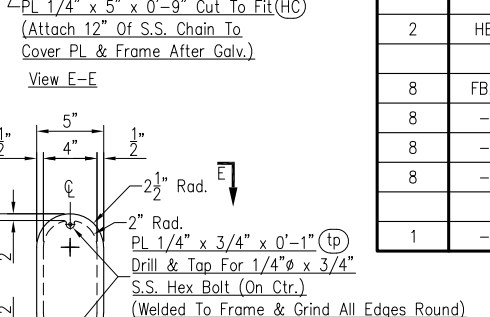
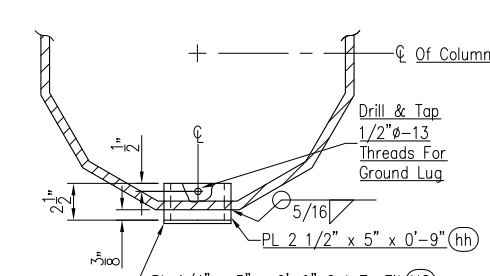


Note: Final Welding Of Arm Flanges Shall Be Accomplished During Shop Fit-up, To Ensure Proper Amount Of Camber.

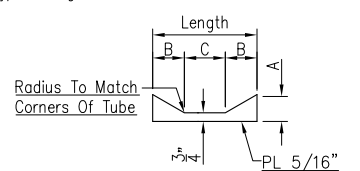


Arm End Cap Detail

Qty.	MK	Length	Width
2	x5	8 9/16"	5"

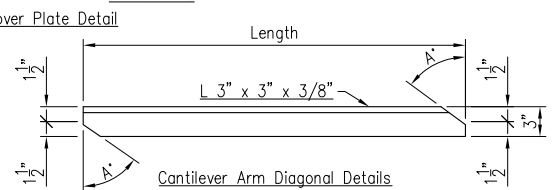


Typical Angle Connection Detail



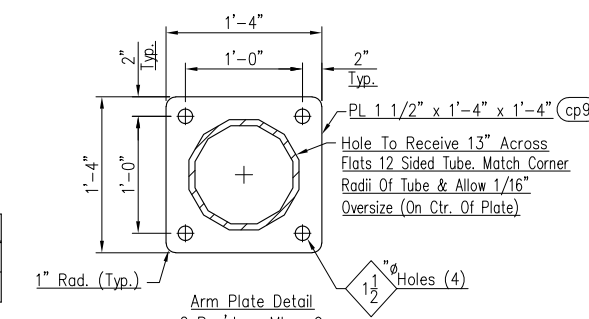
Gusset Plate Detail

Qty.	MK	Length	A	B	C
2	k6	6 3/4"	1 5/8"	1 1/2"	3 3/4"
2	k7	6 3/4"	1 9/16"	1 3/8"	4"

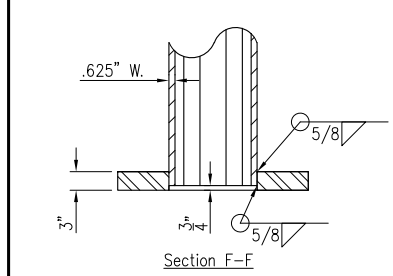


Cantilever Arm Diagonal Details

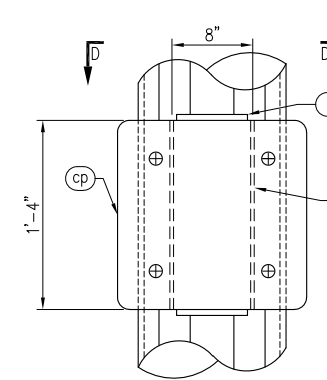
Qty.	MK	Length	A'
1	3e	9'-2 3/16"	58'-08'
1	3f	9'-2 13/16"	57'-39'
1	3g	9'-3 1/2"	57'-10'



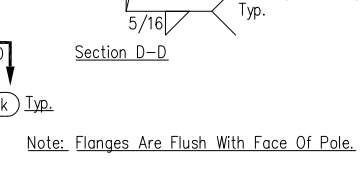
Arm Plate Detail
2 Req'd. - Mk cp9



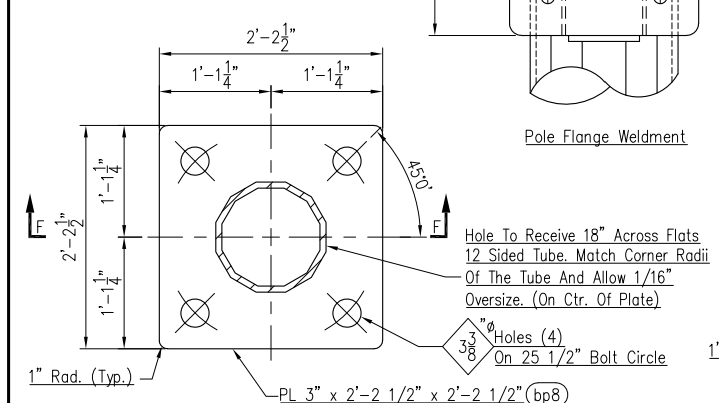
Section F-F



Pole Flange Weldment



Section D-D



Pole Plate Detail
2 Req'd. - Mk cp10

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P5	18" A.F. x 13.81" A.F. Tapered Tube	29'-11 1/4"	.625" Wall (12 Sided)	TTAF18X.625-S12AI
1	C5T	13" A.F. x 8.81" A.F. Tapered Tube	29'-10 13/16"	.312" Wall (12 Sided)	TTAF13X.313-S12AI
1	C5B	do	29'-11 9/16"	.312" Wall (12 Sided)	TTAF13X.313-S12AI
1	3a	L 3" x 3" x 3/8"	4'-9 5/8"		L3X3X.375A
1	3b	do	4'-10 3/4"		L3X3X.375A
1	3c	do	4'-11 7/8"		L3X3X.375A
1	3d	do	5'-1"		L3X3X.375A
1	3e	do	9'-2 3/16"	See Detail	L3X3X.375A
1	3f	do	9'-2 13/16"	See Detail	L3X3X.375A
1	3g	do	9'-3 1/2"	See Detail	L3X3X.375A
1	bp8	PL 3" x 2'-2 1/2"	2'-2 1/2"		PL3A
2	cp9	PL 1 1/2" x 1'-4"	1'-4"		PL1.5A
2	cp10	do	1'-4"		PL1.5A
2	k6	PL 5/16" x 1 5/8"	0'-6 3/4"		PL.313A
2	k7	PL 5/16" x 1 9/16"	0'-6 3/4"		PL.313A
2	x5	PL 5/16" x 5"	0'-8 9/16"		PL.313A
4	m6	PL 5/16" x 1 1/16"	1'-4"		PL.313A
4	r7	F.B. 6" x 3/4"	0'-7 3/8"		FB6X.75A
6	3h	F.B. 4" x 1/2"	0'-8"		FB4X.5A
2	3k	do	0'-4"		FB4X.5A
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4" S.S. Hex Bolt	3/4"		BSS02.75
8	FB2	1 3/8" Galv. H.S. Hex Bolt	5 1/4"		BSG115.253
8	-	1 3/8" Galv. Hvy. Hex Nut	-		NSG114
8	-	1 3/8" Galv. Hard Flat Washer	-		WSG113
8	-	1 3/8" Galv. Lock Washer	-		LWSG112
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

Notes:

For View M-M See Sh. # 3 Of 3

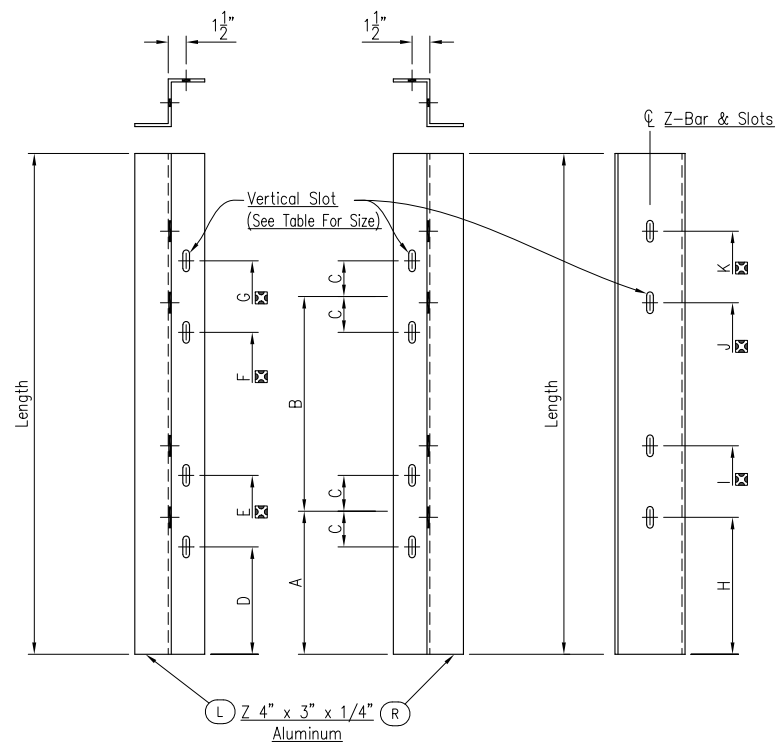
Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:

Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Plate, Angle & Flat Bar: A.S.T.M. A36
All Steel To Be Galvanized Per A.S.T.M. A123
H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be: A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
Lock Washers To Be A.S.T.M. A307
Galvanize Hardware Per A.S.T.M. A153
S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

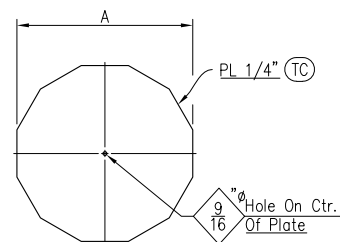
Customer:	Security Fence Group, Inc.	P.O. No: 183000-3
Project:	3000-18	Hamilton Co., OH
Description:	Fabrication Details Of Tapered Cantilever Structure Type TC-12.30, Des. 12 Sign Ref. No. OS-5	
Printed For:	Ohio	Rev. 2 Of 3
Drawn By:	JH	Date: 9-3-19
Checked By:	CR	Date: 9-9-19
Job No:	OH-15319	Rev.



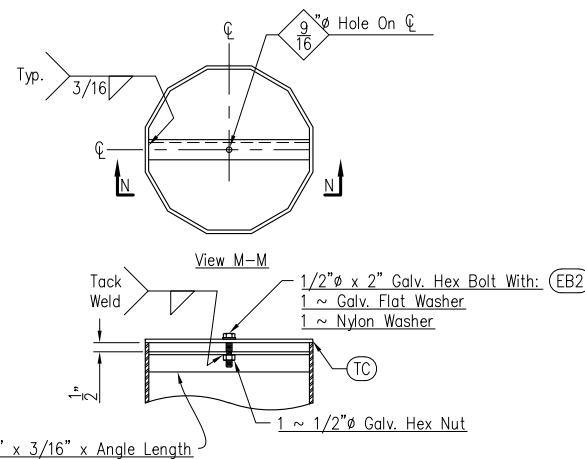
Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	2	S12L S12R	14'-0"	9/16" ϕ x 2" Slots	4'-0"	6'-0"	5 9/16"	3'-6 7/16"	4'-5 9/16"	9'-6 7/16"	10'-5 9/16"	-	-	-

Bill Of Materials

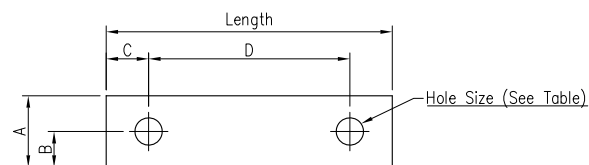
Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S12L	Z 4" x 3" x 1/4"	14'-0"	Alum.	AZ4X2.85*
2	S12R	do	14'-0"	Alum.	AZ4X2.85*
1	TC1	PL 1/4" x 1'-1 13/16"	1'-1 13/16"	Steel	PL.25A
1	ta1	L 2" x 2" x 3/16"	1'-0 9/16"	Steel	L2X2X.188A
1	EB2	1/2" ϕ Galv. Hex Bolt	2"		BSG0422
1	-	1/2" ϕ Galv. Hex Nut	-		NSG042
1	-	1/2" ϕ Galv. Flat Washer	-		WSG042
1	-	1/2" ϕ Nylon Washer	-		WN04
2	UB172	1/2" ϕ Galv. U-Bolt	2'-4 3/8"		RD.5A
2	UB173	do	2'-7"		RD.5A
2	UB174	do	2'-9 9/16"		RD.5A
12	-	1/2" ϕ Galv. Hex Nut	-		NSG042
12	-	1/2" ϕ Galv. Flat Washer	-		WSG042
12	-	1/2" ϕ Galv. Lock Washer	-		LWSG042
2	G172	1/16" x 3"	0'-11 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G173	1/16" x 3"	1'-0 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G174	1/16" x 3"	1'-1 5/8"	Chloroprene Gasket	1/16" NEOPRENE



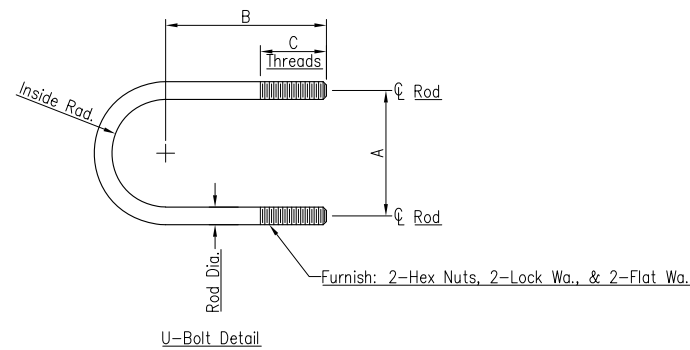
Qty.	MK	Tube/Pipe Size	A	Remarks
1	TC1	13.81" A.F. x .500" W. Tapered Tube	1'-1 13/16"	Galv. Steel



Qty.	MK	F.B. Length	To Be Used With End Cap MK
1	ta4	1'-0 9/16"	TC1



Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
2	G172	11 5/8"	3"	1 1/2"	3/4"	10 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB172
2	G173	1'-0 5/8"	3"	1 1/2"	3/4"	11 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB173
2	G174	1'-1 5/8"	3"	1 1/2"	3/4"	1'-0 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB174



Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
2	UB172	1/2"	10 1/8"	6 1/4"	2 1/2"	2'-4 3/8"	0'-4 13/16"	9" To 9.5" O.D. Arm To Sign Support	Galv. Stl.
2	UB173	1/2"	11 1/8"	6 3/4"	2 1/2"	2'-7"	0'-5 5/16"	10" To 10.5" O.D. Arm To Sign Support	do
2	UB174	1/2"	1'-0 1/8"	7 1/4"	2 1/2"	2'-9 9/16"	0'-5 13/16"	11" To 11.5" O.D. Arm To Sign Support	do

NOTE:
 Indicates Progressive Dimensions.

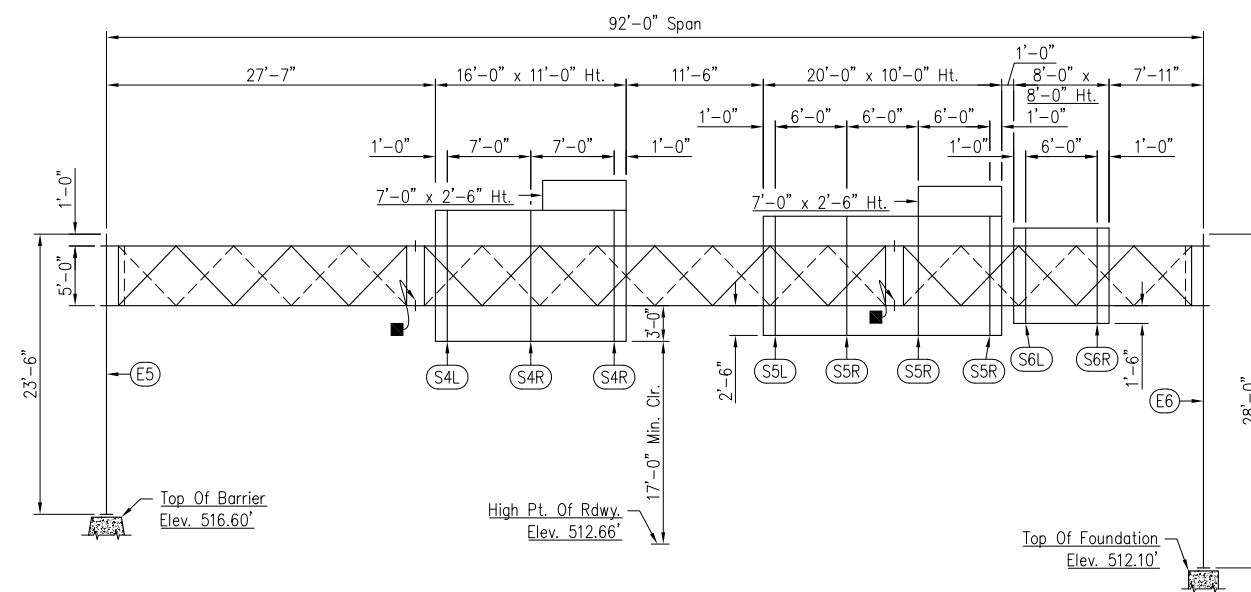
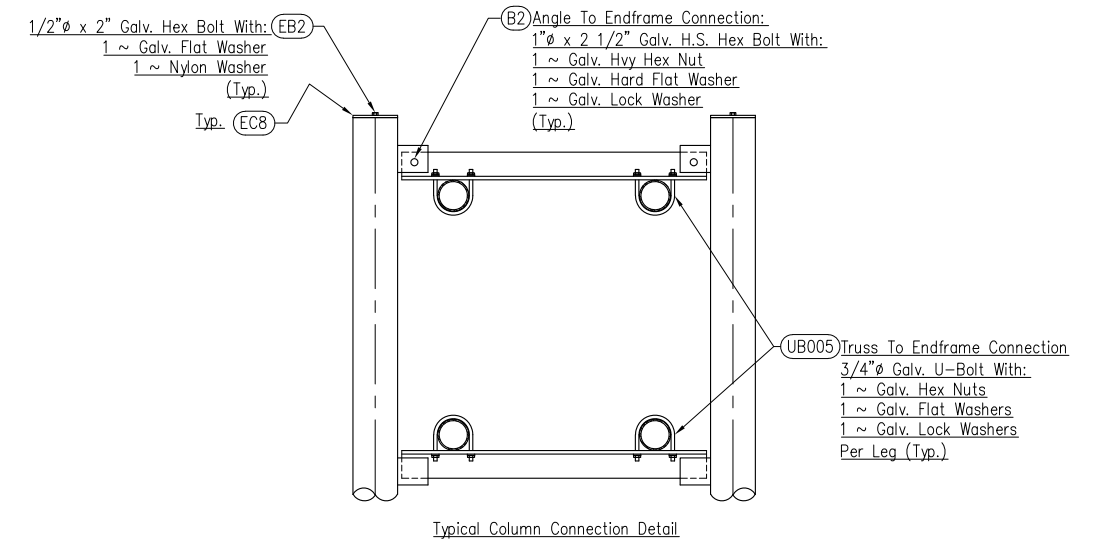
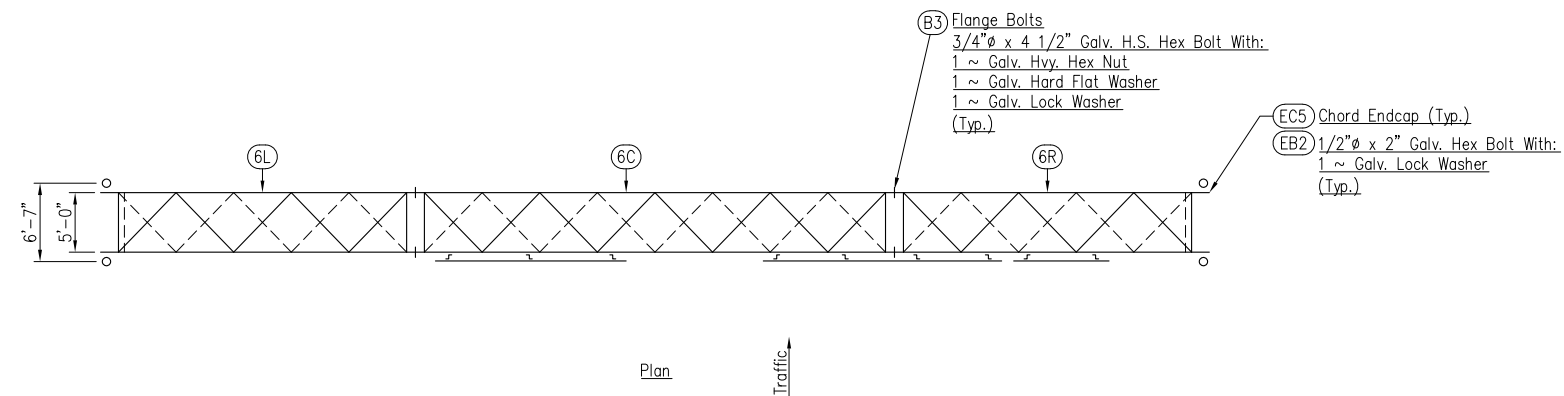
MATERIAL SPECIFICATIONS:
 Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

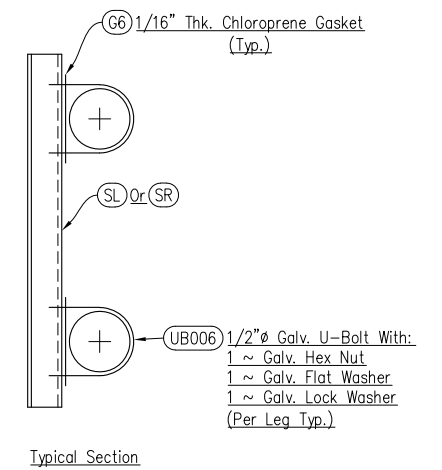
PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



Customer:	Security Fence Group, Inc.	P.O. No: 183000-3
Project:	3000-18	Hamilton Co., OH
Description:	Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware	
Printed For:	Ohio	Rev. 0H-15319
Drawn By:	JH	
Date:	9-3-19	
Checked By:	CR	
Date:	9-9-19	
Job No:	OH-15319	
Sheet No:	3 Of 3	



Elevation
 Ref. No. OS-6
 Sta. 246+03.00, IR 75 SB
 TC-15.115
 (Looking @ Face Of Signs)



Notes:
 Sign Sizes, Elevations, Span Length, & Column Heights Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Truss Section MK No's. Are Stamped On The Top Of The Bottom Front Flanges.

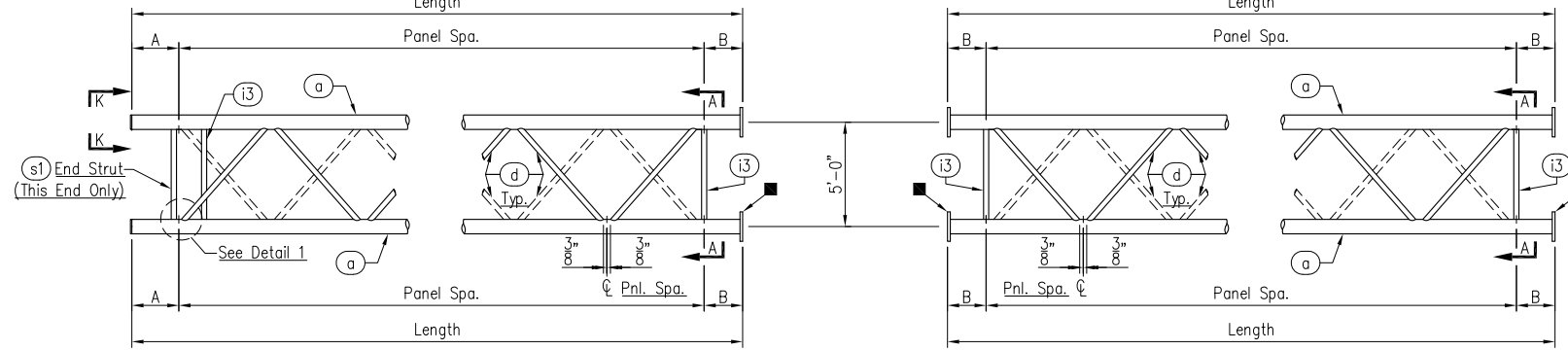
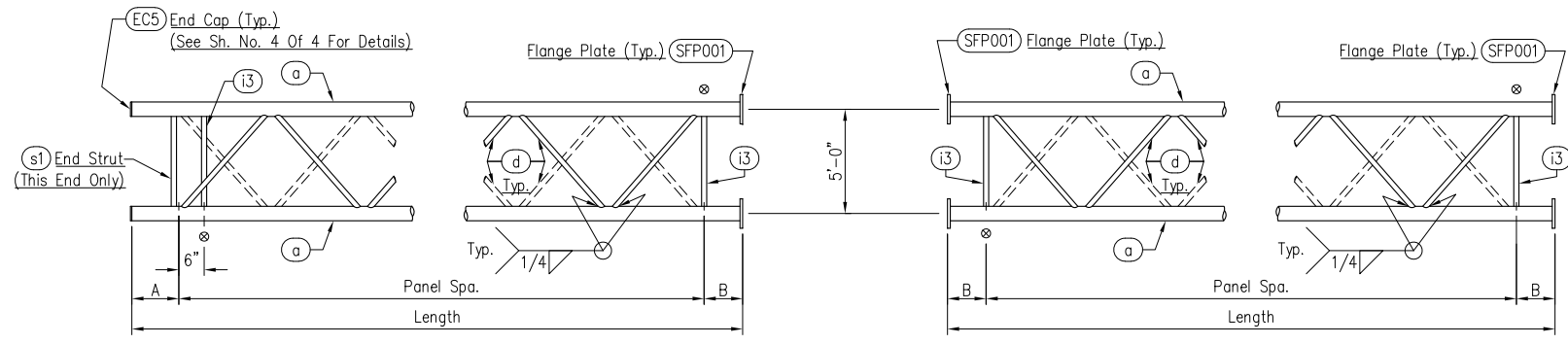
Pay Items:
 1 ~ Overhead Sign Support, TC-15.115, Ref. No: 115

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



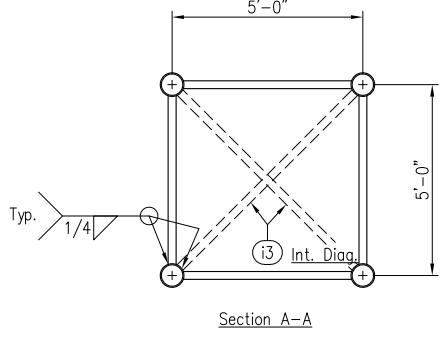
BROOKFIELD FABRICATING CORPORATION
 P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:		Security Fence Group, Inc. P.O. No: 183000-3	
Project:		3000-18 Hamilton Co., OH	
Description:		Erection Details Of Overhead Truss Type TC-15.115 Sign Ref. No. OS-6	
Printed For:	Drawn By:	Date:	Checked By:
Ohio	JH	8-31-19	CR TP
Job No:	Rev.	Date:	Date:
OH-15319		9-9-19	
Sheet No: 1 Of 4			

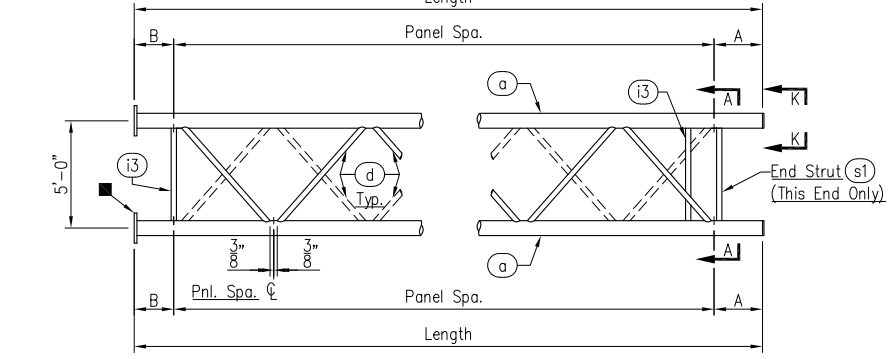
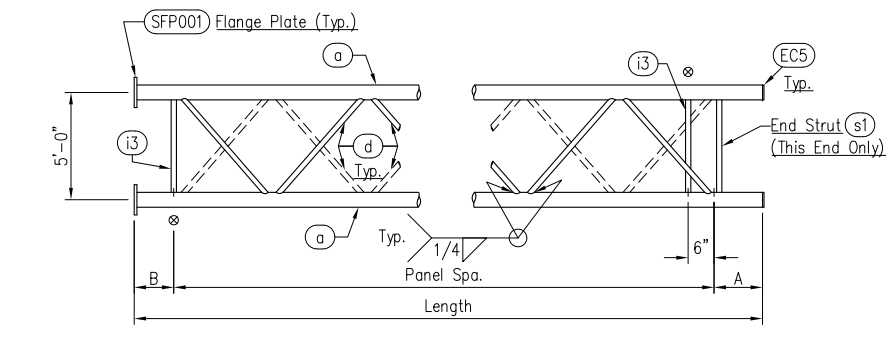


Qty.	Mk	Length	Panel Spacing	Dia. Mk.	A	B
1	6L	26'-5"	5 Spa. @ 4'-10" = 24'-2"	d7	1'-6"	9"

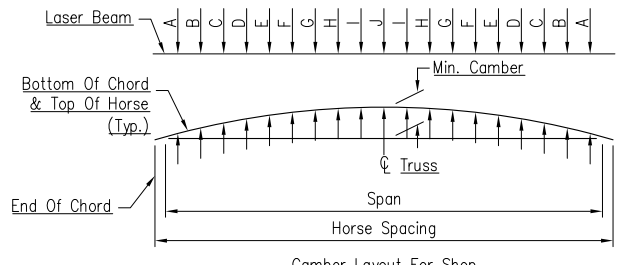
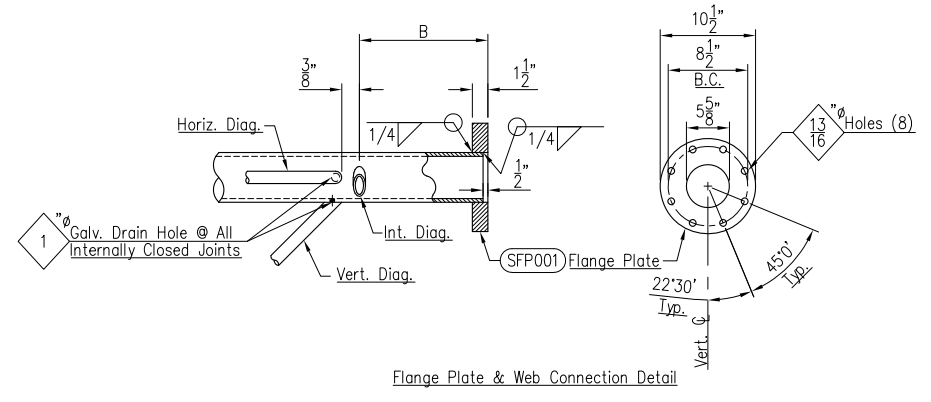
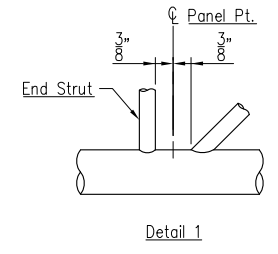
Qty.	Mk	Length	Panel Spacing	Dia. Mk.	B
1	6C	40'-2"	8 Spa. @ 4'-10" = 38'-8"	d7	9"



NOTE:
Interior Diagonals Alternate Directions @ Each End Section.
See Plan View Of Truss Section & Note @ For Exact Interior Diagonal Placement.



Qty.	Mk	Length	Panel Spacing	Dia. Mk.	A	B
1	6R	26'-5"	5 Spa. @ 4'-10" = 24'-2"	d7	1'-6"	9"




Truss Sections	Horse Spacing	Min. Camber	Span	A	B	C	D	E	F	G	H	I	J
6L/6C/6R	7 Horse Spa. @ 11'-7 1/2"	3 1/4"	92'-0"	1'-7 13/16"	1'-6 11/16"	1'-5 15/16"	-	-	-	-	-	-	1'-5 3/4"

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
4	6La	5.563" O.D. x .258" W. Pipe	26'-4 1/2"	Steel	P5.563X.258J52
4	6Ca	do	40'-1"	Steel	P5.563X.258J52
4	6Ra	do	26'-4 1/2"	Steel	P5.563X.258J52
72	d7	2.375" O.D. x .154" W. Pipe	6'-7 1/2"	Mill To: 6'-4 5/8 @ 44"-43'	P2.375X.154H
6	i3	do	6'-7 11/16"	Mill To: 6'-7 5/16" @ 0'	P2.375X.154H
8	s1	do	4'-6 13/16"	Mill To: 4'-6 7/16" @ 0'	P2.375X.154H
16	SFP001	PL 1 1/2" x 10 1/2" Dia.	-	Steel	SFP001
64	B3	3/4" Galv. H.S. Hex Bolt	4 1/2"		BSC064.53
64	-	3/4" Galv. Hvy. Hex Nut	-		NSG064
64	-	3/4" Galv. Hard Flat Washer	-		WSG063
64	-	3/4" Galv. Lock Washer	-		LWSG062

NOTES:
 ■ Stamp Truss Section MK No's. On The Top Of The Bottom Front Flanges.
 ⊗ Indicates Where Interior Diagonals Connect With Top Chords.
 For View K-K See Sh. # 4 Of 4
 MATERIAL SPECIFICATIONS:
 Steel Pipe For Truss Chords: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Brace Pipe To Be:
 A.S.T.M. A53 Gr. B Or
 A.S.T.M. A500 Gr. B
 Steel Plate & Flat Bar To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be:
 A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
 Lock Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



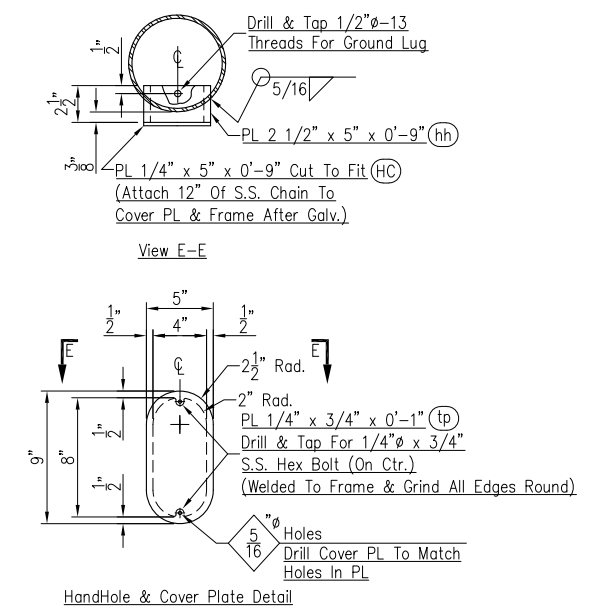
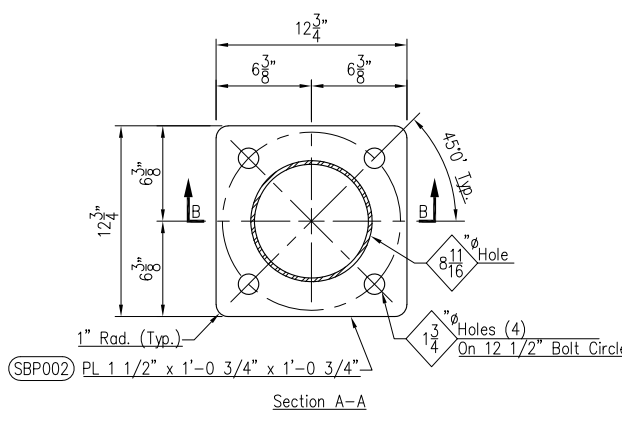
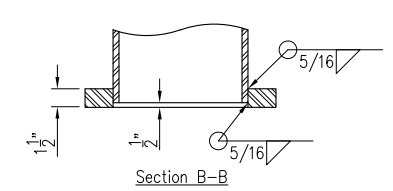
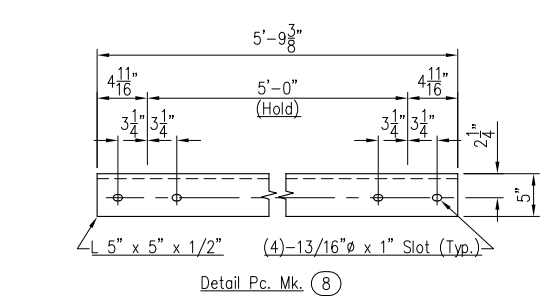
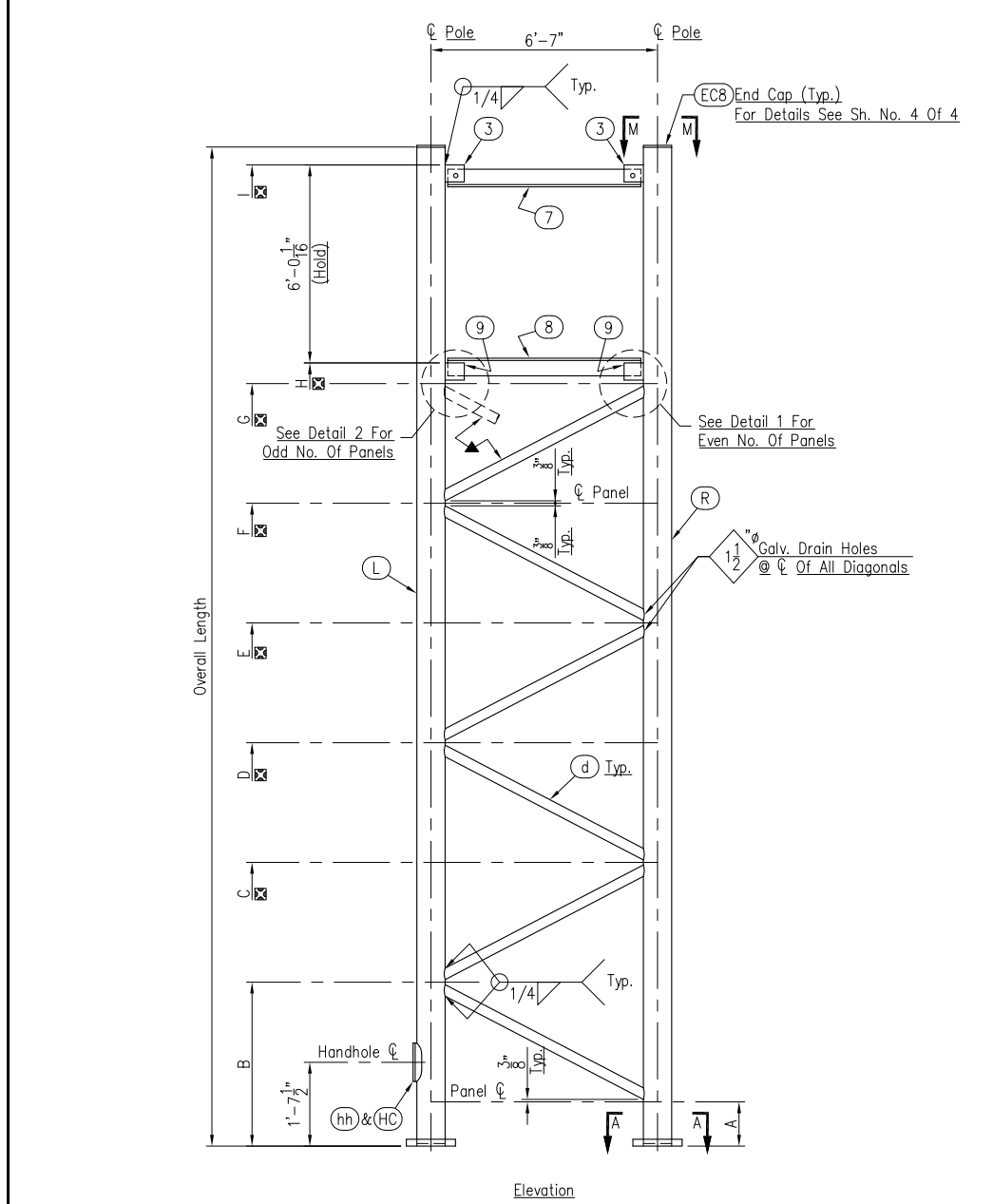
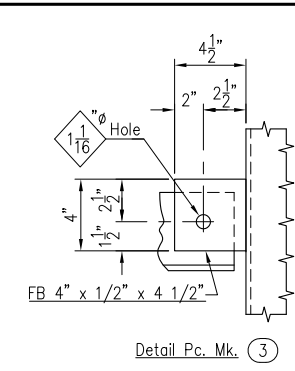
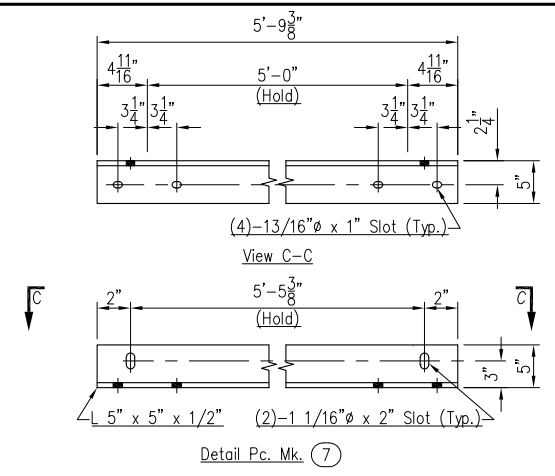
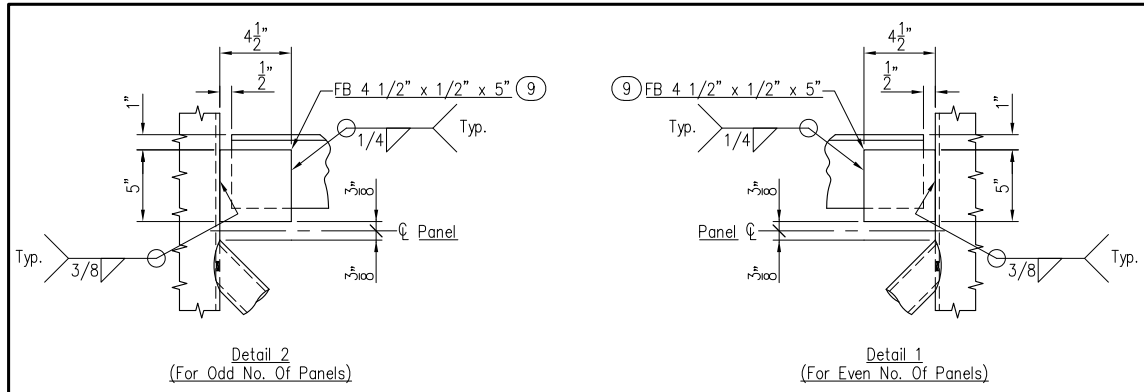
BROOKFIELD FABRICATING CORPORATION
 P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18
 Hamilton Co., OH

Description: Fabrication Details For Type TC-15.115 Steel Truss Sections
 Sign Ref. No. OS-6

Printed For: Ohio
 Drawn By: JH
 Date: 8-31-19
 Checked By: CR
 Date: 9-9-19
 Job No: OH-15319
 Rev: 2 Of 4



Qty.	Mk.	Overall Length	Pipe Cut Length	Diag. Mk.	No. Panels	Panel Spa.	A	B	C	D	E	F	G	H	I	Remarks
1	E5	23'-6"	23'-5 1/2"	d8	3	5'-1"	1'-5 7/8"	6'-6 7/8"	11'-7 7/8"	----	----	----	16'-8 7/8"	17'-2 1/4"	23'-2 5/16"	
1	E6	28'-0"	27'-11 1/2"	d9	3	6'-7"	1'-5 7/8"	8'-0 7/8"	14'-7 7/8"	----	----	----	21'-2 7/8"	21'-8 1/4"	27'-8 5/16"	

NOTES:

For View M-M See Sh. # 4 Of 4

☒ Indicates Progressive Dimensions.

▲ Even No. Of Panels Shown Landing On Right Leg.
For An Odd No. Of Panels Diagonal Lands On Left Leg.

Bill Of Material

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	ESL	8.625" O.D. x .322" W. Pipe	23'-5 1/2"		P8.625X.322J52
1	E5R	do	23'-5 1/2"		P8.625X.322J52
1	E6L	do	27'-11 1/2"		P8.625X.322J52
1	E6R	do	27'-11 1/2"		P8.625X.322J52
3	d8	2.875" O.D. x .203" W. Pipe	7'-9 1/16"	Mill To: 7'-6 5/16" @ 38°-47'	P2.875X.203H
3	d9	do	8'-9 3/4"	Mill To: 8'-6 3/16" @ 46°-28'	P2.875X.203H
2	7	L 5" x 5" x 1/2"	5'-9 3/8"		ENDFRAME-UP-ANGLE-3
2	8	do	5'-9 3/8"		ENDFRAME-LW-ANGLE-3
4	3	FB 4" x 1/2"	0'-4 1/2"		ENDFRAME-UP-TAB-1
4	9	FB 4 1/2" x 1/2"	0'-5"		ENDFRAME-LW-TAB-2
2	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
2	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
4	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
4	SBP002	PL 1 1/2" x 1'-0 3/4"	1'-0 3/4"		SBP002
4	HB	1/4"Ø S.S. Hex Bolt	3/4"		BSS02.75
4	B2	1"Ø Galv. H.S. Hex Bolt	2 1/2"		BSG082.53
4	-	1"Ø Galv. Hvy. Hex Nut	-		NSG084
4	-	1"Ø Galv. Hard Flat Washer	-		WSG083
4	-	1"Ø Galv. Lock Washer	-		LWSG082
2	-	S.S. Chain	1'-0"		HANDHOLE_CHAIN

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MATERIAL SPECIFICATIONS:

Steel Pipe For Endframe Poles: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Brace Pipe To Be:
A.S.T.M. A53 Gr. B Or
A.S.T.M. A500 Gr. B

Steel Angle, Plate & Flat Bar To Be A.S.T.M. A36

All Steel To Be Galvanized Per A.S.T.M. A123

H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be:
A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)

Lock Washers To Be A.S.T.M. A307

Galvanize Hardware Per A.S.T.M. A153

S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

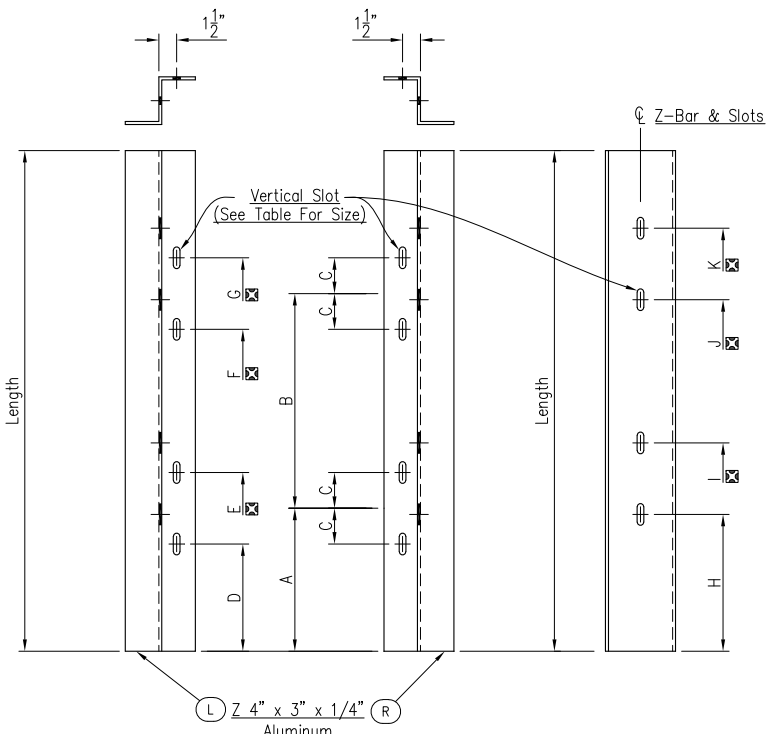
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18
Hamilton Co., OH

Description: Fabrication Details Of Type TC-15.115 Endframes
Sign Ref. No. OS-6

Printed For: Ohio
Drawn By: JH
Date: 8-31-19
Checked By: CR
Date: 9-9-19
Job No: OH-15319
Rev: 3 Of 4

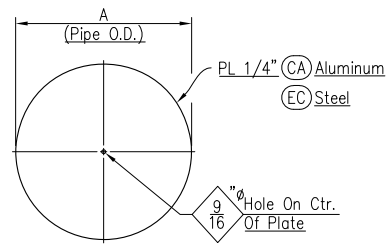


Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	2	S4L	S4R	11'-0"	9/16" ϕ x 1" Slot	3'-0"	5'-0"	3 1/8"	2'-8 7/8"	3'-3 1/8"	7'-8 7/8"	8'-3 1/8"	-	-
1	3	S5L	S5R	10'-0"	9/16" ϕ x 1" Slot	2'-6"	5'-0"	3 1/8"	2'-2 7/8"	2'-9 1/8"	7'-2 7/8"	7'-9 1/8"	-	-
1	1	S6L	S6R	8'-0"	9/16" ϕ x 1" Slot	1'-6"	5'-0"	3 1/8"	1'-2 7/8"	1'-9 1/8"	6'-2 7/8"	6'-9 1/8"	-	-

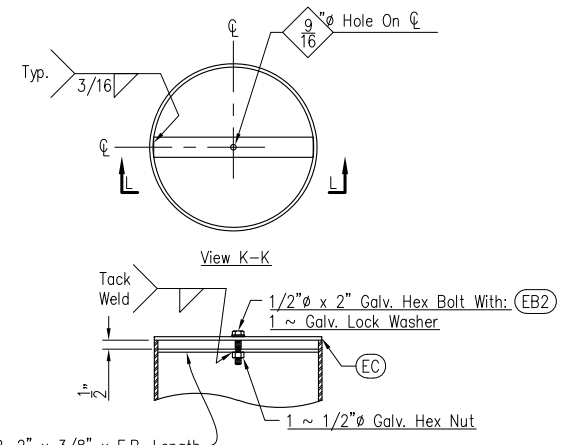
Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S4L	Z 4" x 3" x 1/4"	11'-0"	Alum.	AZ4X2.85*
2	S4R	do	11'-0"		AZ4X2.85*
1	S5L	do	10'-0"		AZ4X2.85*
3	S5R	do	10'-0"		AZ4X2.85*
1	S6L	do	8'-0"		AZ4X2.85*
1	S6R	do	8'-0"	Alum.	AZ4X2.85*
8	EC5	PL 1/4" x 5 9/16" Dia.	-	Steel	CIRCLE-5.563X.25A
4	EC8	PL 1/4" x 8 5/8" Dia.	-		CIRCLE-8.625X.25A
8	sf2	F.B. 2" x 3/8"	0'-5"		EC-FB2X.375X5Z
4	sf3	do	0'-7 15/16"	Steel	EC-FB2X.375X7.938Z
12	EB2	1/2" ϕ Galv. Hex Bolt	2"		BSG0422
12	-	1/2" ϕ Galv. Hex Nut	-		NSG042
4	-	1/2" ϕ Galv. Flat Wa.	-		WSG042
8	-	1/2" ϕ Galv. Lock Wa.	-		LWSG042
4	-	1/2" ϕ Nylon Washer	-		WN04
8	UB005	3/4" ϕ Galv. U-Bolt	1'-7 11/16"		RD.75A
16	-	3/4" Galv. Hex Nut	-		NSG062
16	-	3/4" ϕ Galv. Flat Washer	-		WSG062
16	-	3/4" ϕ Galv. Lock Washer	-		LWSG062
18	UB006	1/2" ϕ Galv. U-Bolt	1'-6 9/16"		RD.5A
36	-	1/2" ϕ Galv. Hex Nut	-		NSG042
36	-	1/2" ϕ Galv. Flat Washer	-		WSG042
36	-	1/2" ϕ Galv. Lock Washer	-		LWSG042
18	G6	1/16" x 3"	0'-7 3/4"	Chloroprene Gasket	1/16" NEOPRENE



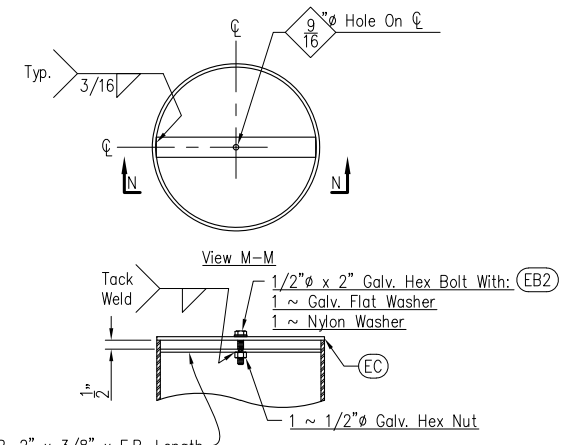
End Cap Detail

Qty.	MK	A	Material
8	EC5	5 9/16"	Steel
4	EC8	8 5/8"	Steel



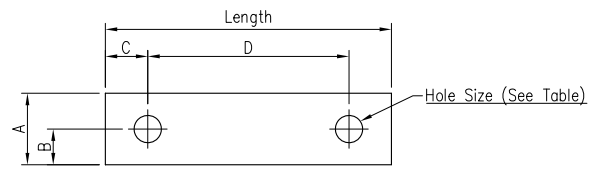
Section L-L

Qty.	MK	F.B. Length	To Be Used With End Cap MK
8	sf2	5"	EC5



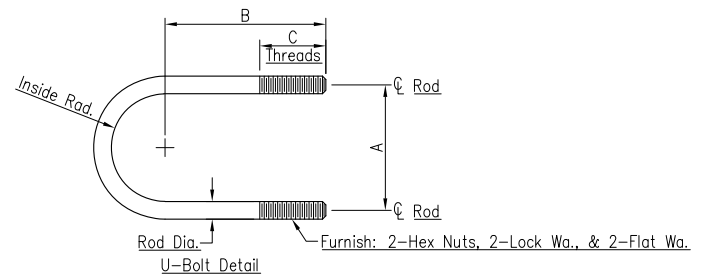
Section N-N

Qty.	MK	F.B. Length	To Be Used With End Cap MK
4	sf3	7 15/16"	EC8



1/16" Thick Chloroprene Gasket Detail (G)

Qty.	MK	Length	A	B	C	D	Hole Size	Remarks
18	G6	0'-7 3/4"	3"	1 1/2"	3/4"	6 1/4"	9/16"	Sign Suppt. To Steel Chord, Use W/UB006



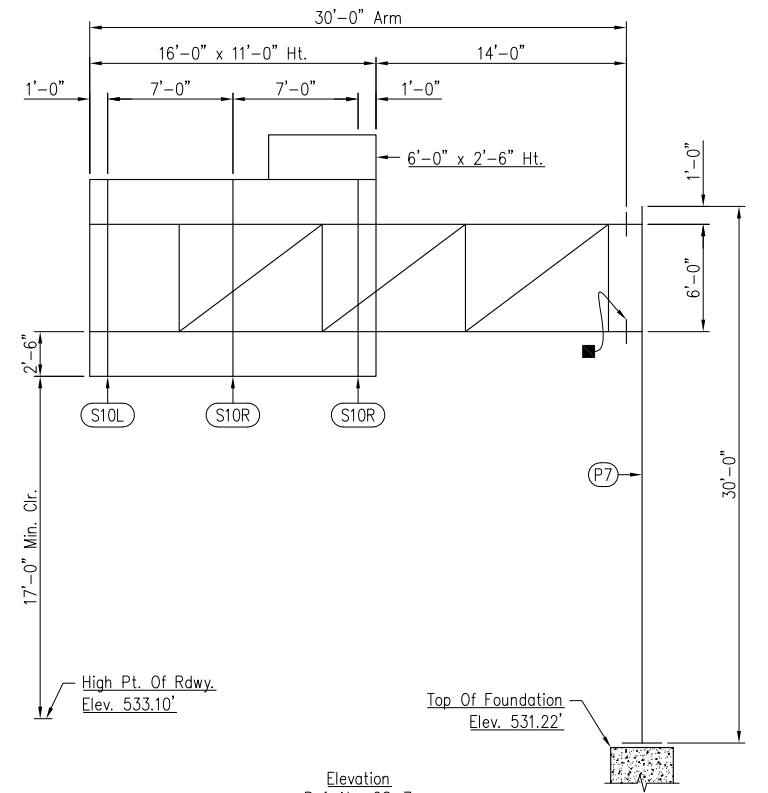
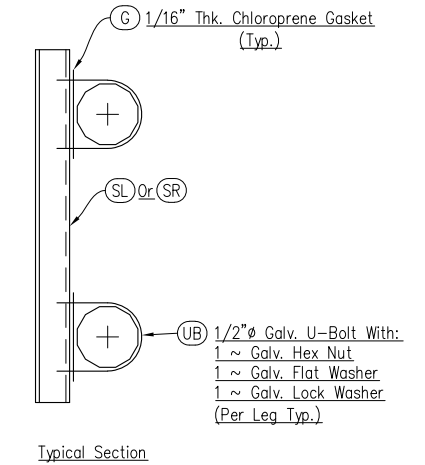
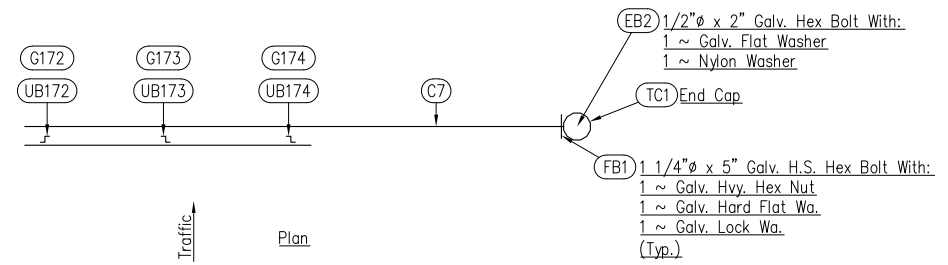
U-Bolt Detail

Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
8	UB005	3/4"	6 1/2"	4 3/4"	2"	1'-7 11/16"	0'-2 7/8"	5.563" O.D. Chord To Endframe	Galv. Steel
18	UB006	1/2"	6 1/4"	4 3/8"	2"	1'-6 9/16"	0'-2 7/8"	5.563" O.D. Chord To Sign Support	do

NOTE:
 Indicates Progressive Dimensions.
MATERIAL SPECIFICATIONS:
 Steel F.B. & Plate To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Hex Bolts To Be A.S.T.M. A307
 Steel Nuts & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

Customer: Security Fence Group, Inc. P.O. No: 183000-3
 Project: 3000-18 Hamilton Co., OH
 Description: Fabrication Details Of Sign Supports, U-Bolts, End Caps, Gaskets, & Related Hardware
 Printed For: Ohio Drawn By: JH Date: 8-31-19 Checked By: CR TP Date: 9-9-19 Job No: OH-15319 Rev. 4 Of 4



Elevation
 Ref. No. OS-7
 Sta. 277+50.00, IR 75 SB
 TC-12.30, Des. 10
 (Looking @ Face Of Sign)

Notes:
 Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
 1 ~ Overhead Sign Support, TC-12.30, Design 10, Ref. No. 112

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

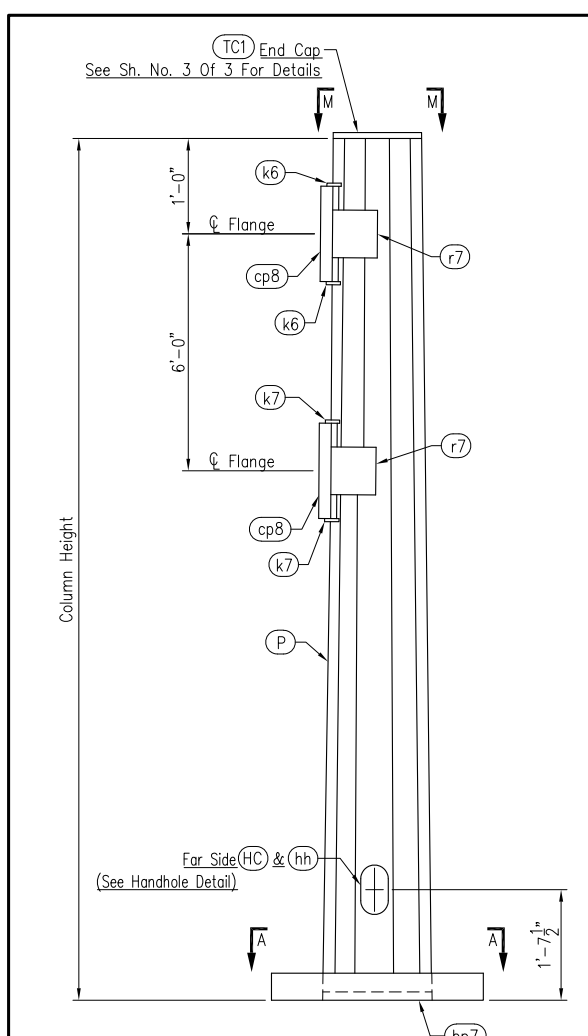
BROOKFIELD FABRICATING CORPORATION
 P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:
 Security Fence Group, Inc. P.O. No: 183000-3

Project:
 3000-18
 Hamilton Co., OH

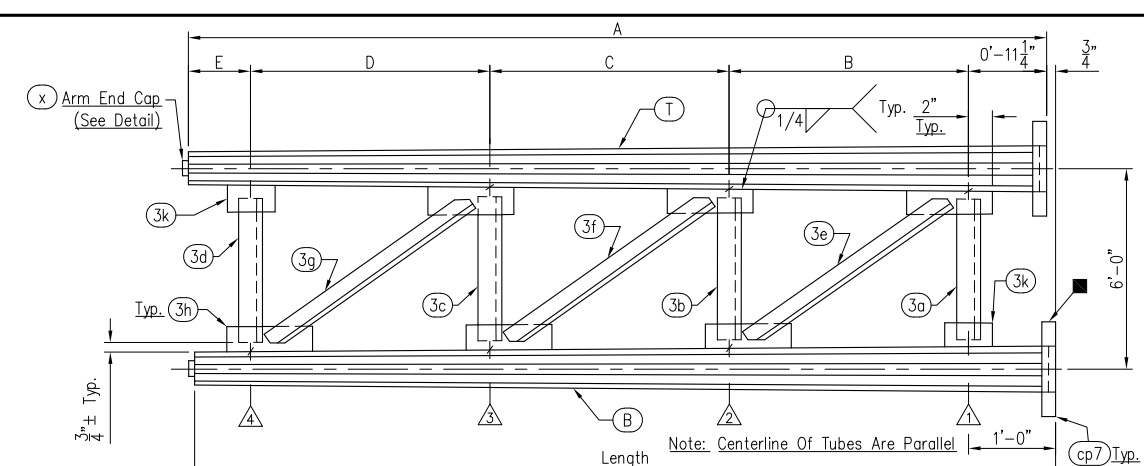
Description:
 Erection Details Of Overhead Cantilever Type TC-12.30, Des. 10
 Sign Ref. No. OS-7

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



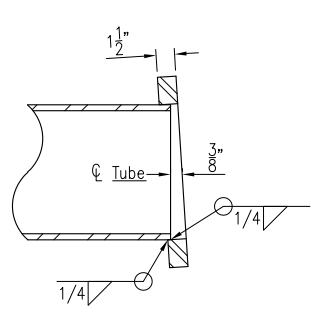
Elevation Cantilever Column

Qty.	MK	Column Height
1	P7	30'-0"

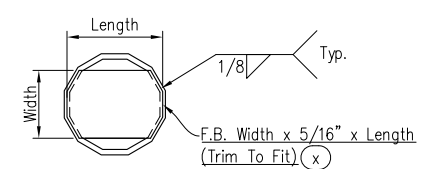
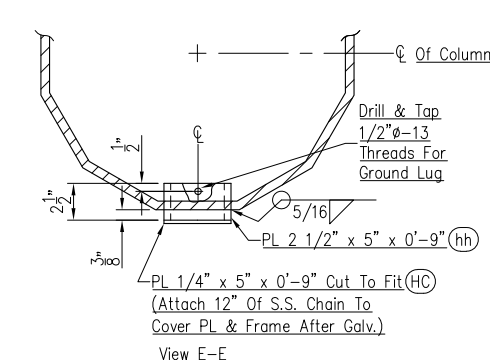
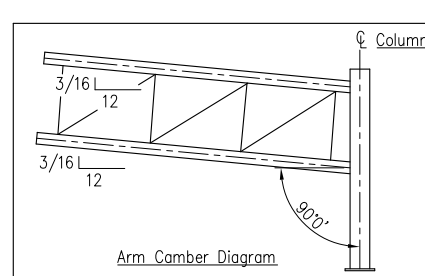


Arm Detail

Qty.	MK	Length	A	B	C	D	E	1	2	3	4	End Cap MK
1	C7	30'-0"	29'-11 1/4"	8'-0"	8'-0"	8'-0"	5'-0"	12 7/8"	11 3/4"	10 5/8"	9 1/2"	x5

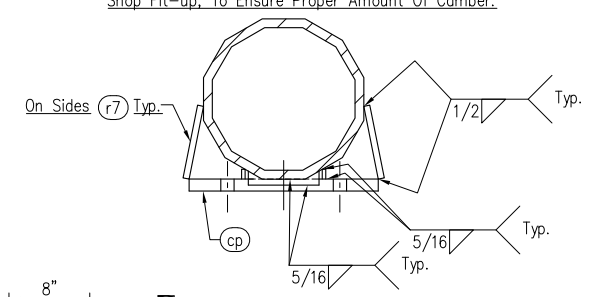
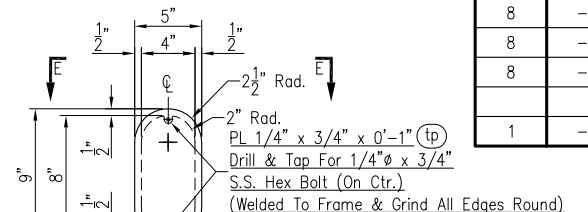


Note: Final Welding Of Arm Flanges Shall Be Accomplished During Shop Fit-up, To Ensure Proper Amount Of Camber.

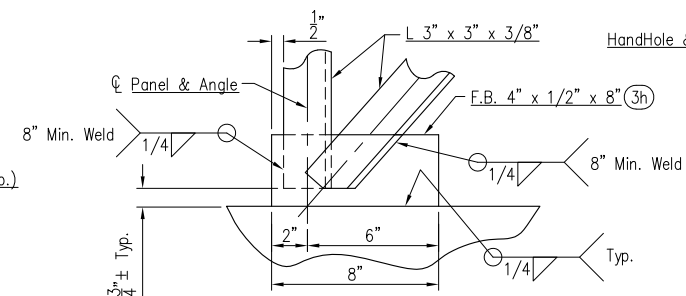


Arm End Cap Detail

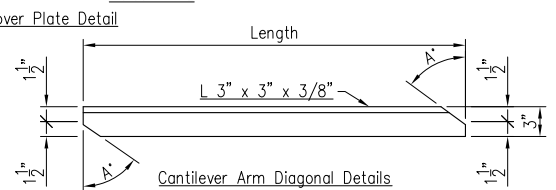
Qty.	MK	Length	Width
2	x5	8 9/16"	5"



Note: Flanges Are Flush With Face Of Pole.

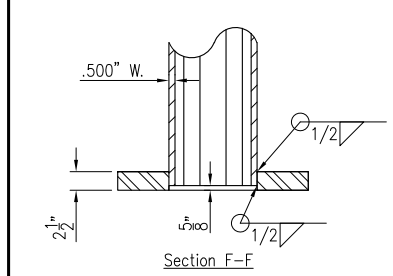


Typical Angle Connection Detail

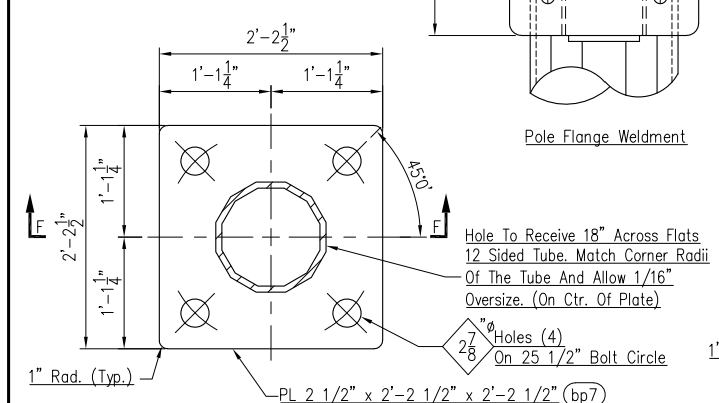


Cantilever Arm Diagonal Details

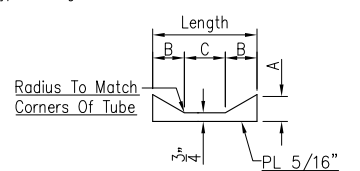
Qty.	MK	Length	A'
1	3e	9'-2 3/16"	58'-08'
1	3f	9'-2 13/16"	57'-39'
1	3g	9'-3 1/2"	57'-10'



Section F-F

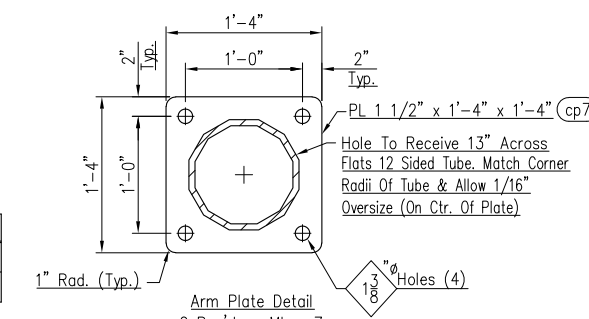


Pole Plate Detail
2 ~ Req'd. - MK cp8



Gusset Plate Detail

Qty.	MK	Length	A	B	C
2	k6	6 3/4"	1 5/8"	1 1/2"	3 3/4"
2	k7	6 3/4"	1 9/16"	1 3/8"	4"



Arm Plate Detail
2 Req'd. - MK cp7

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P7	18" A.F. x 13.81" A.F. Tapered Tube	29'-11 3/8"	.500" Wall (12 Sided)	TTAF18X.5-S12AI
1	C7T	13" A.F. x 8.81" A.F. Tapered Tube	29'-10 7/8"	.250" Wall (12 Sided)	TTAF13X.250-S12AI
1	C7B	13" A.F. x 8.80" A.F. Tapered Tube	29'-11 5/8"	.250" Wall (12 Sided)	TTAF13X.250-S12AI
1	3a	L 3" x 3" x 3/8"	4'-9 5/8"		L3X3X.375A
1	3b	do	4'-10 3/4"		L3X3X.375A
1	3c	do	4'-11 7/8"		L3X3X.375A
1	3d	do	5'-1"		L3X3X.375A
1	3e	do	9'-2 3/16"	See Detail	L3X3X.375A
1	3f	do	9'-2 13/16"	See Detail	L3X3X.375A
1	3g	do	9'-3 1/2"	See Detail	L3X3X.375A
1	bp7	PL 2 1/2" x 2'-2 1/2"	2'-2 1/2"		PL2.5A
2	cp7	PL 1 1/2" x 1'-4"	1'-4"		PL1.5A
2	cp8	do	1'-4"		PL1.5A
2	k6	PL 5/16" x 1 5/8"	0'-6 3/4"		PL.313A
2	k7	PL 5/16" x 1 9/16"	0'-6 3/4"		PL.313A
2	x5	PL 5/16" x 5"	0'-8 9/16"		PL.313A
4	m6	PL 5/16" x 1 1/16"	1'-4"		PL.313A
4	r7	F.B. 6" x 1/2"	0'-7 3/8"		FB6X.5A
6	3h	F.B. 4" x 1/2"	0'-8"		FB4X.5A
2	3k	do	0'-4"		FB4X.5A
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4" S.S. Hex Bolt	3/4"		BSS02.75
8	FB1	1 1/4" Galv. H.S. Hex Bolt	5"		BSG1053
8	-	1 1/4" Galv. Hvy. Hex Nut	-		NSG104
8	-	1 1/4" Galv. Hard Flat Washer	-		WSG103
8	-	1 1/4" Galv. Lock Washer	-		LWSG102
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

Notes:

For View M-M See Sh. # 3 Of 3

Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:

Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Plate, Angle & Flat Bar: A.S.T.M. A36
All Steel To Be Galvanized Per A.S.T.M. A123
H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be: A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
Lock Washers To Be A.S.T.M. A307
Galvanize Hardware Per A.S.T.M. A153
S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

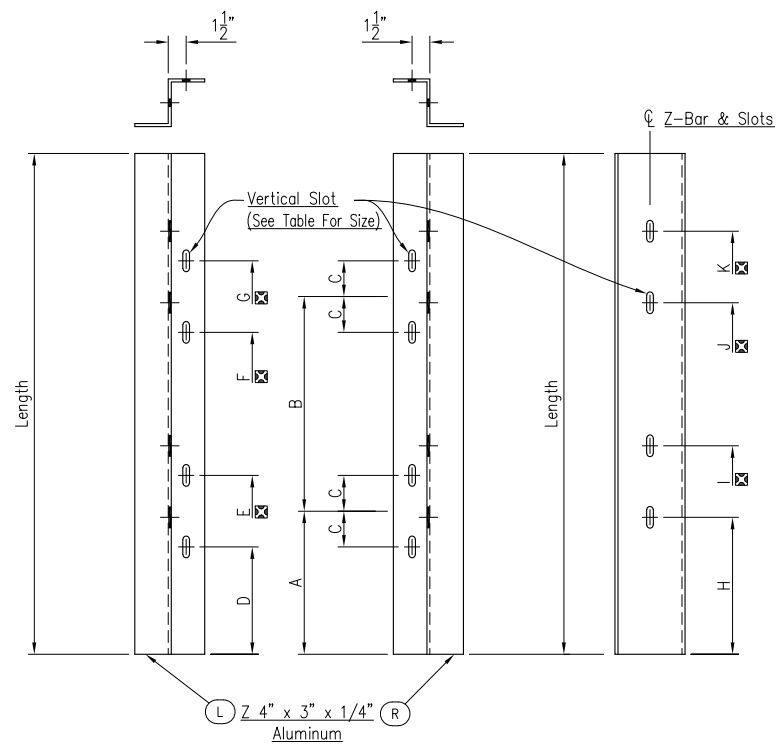
PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18 Hamilton Co., OH

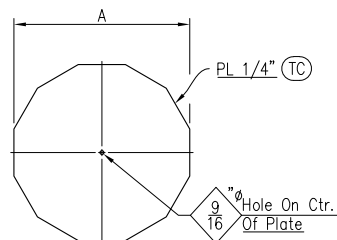
Description: Fabrication Details Of Tapered Cantilever Structure Type TC-12.30, Des. 10 Sign Ref. No. OS-7

Printed For: Ohio
Drawn By: JH
Date: 8-31-19
Checked By: []
Date: []
Job No: OH-15319
Rev: []



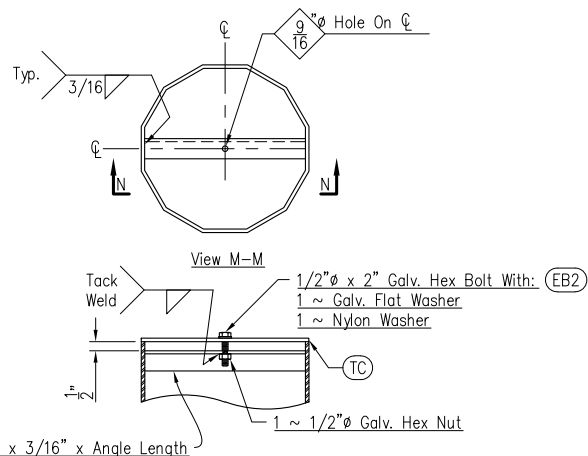
Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	2	S6L S6R	9'-0"	9/16" ϕ x 2" Slots	1'-6"	6'-0"	5 11/16"	1'-0 5/16"	1'-11 11/16"	7'-0 5/16"	7'-11 11/16"	-	-	-



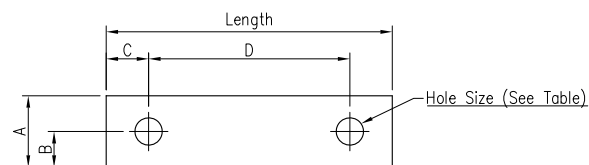
End Cap Detail

Qty.	MK	Tube/Pipe Size	A	Remarks
1	TC1	13.81" A.F. x .500" W. Tapered Tube	1'-2 1/4"	Galv. Steel



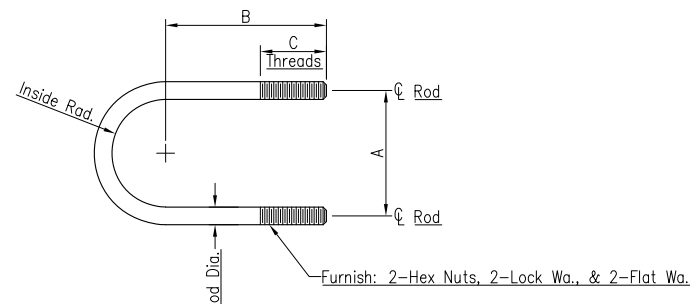
Section N-N

Qty.	MK	F.B. Length	To Be Used With End Cap MK
1	ta1	1'-1 1/4"	TC1



1/16" Thick Chloroprene Gasket Detail (G)

Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
2	G172	11 5/8"	3"	1 1/2"	3/4"	10 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB172
2	G173	1'-0 5/8"	3"	1 1/2"	3/4"	11 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB173
2	G174	1'-1 5/8"	3"	1 1/2"	3/4"	1'-0 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB174



U-Bolt Detail

Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
2	UB172	1/2"	10 1/8"	6 1/4"	2 1/2"	2'-4 3/8"	0'-4 13/16"	9" To 9.5" O.D. Arm To Sign Support	Galv. Stl.
2	UB173	1/2"	11 1/8"	6 3/4"	2 1/2"	2'-7"	0'-5 5/16"	10" To 10.5" O.D. Arm To Sign Support	do
2	UB174	1/2"	1'-0 1/8"	7 1/4"	2 1/2"	2'-9 9/16"	0'-5 13/16"	11" To 11.5" O.D. Arm To Sign Support	do

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S6L	Z 4" x 3" x 1/4"	9'-0"	Alum.	AZ4X2.85*
2	S6R	do	9'-0"	Alum.	AZ4X2.85*
1	TC1	PL 1/4" x 1'-1 13/16"	1'-2 1/4"	Steel	PL.25A
1	ta1	L 2" x 2" x 3/16"	1'-1 1/4"	Steel	L2X2X.188A
1	EB2	1/2" ϕ Galv. Hex Bolt	2"		BSG0422
1	-	1/2" ϕ Galv. Hex Nut	-		NSG042
1	-	1/2" ϕ Galv. Flat Washer	-		WSG042
1	-	1/2" ϕ Nylon Washer	-		WN04
2	UB172	1/2" ϕ Galv. U-Bolt	2'-4 3/8"		RD.5A
2	UB173	do	2'-7"		RD.5A
2	UB174	do	2'-9 9/16"		RD.5A
12	-	1/2" ϕ Galv. Hex Nut	-		NSG042
12	-	1/2" ϕ Galv. Flat Washer	-		WSG042
12	-	1/2" ϕ Galv. Lock Washer	-		LWSG042
2	G172	1/16" x 3"	0'-11 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G173	1/16" x 3"	1'-0 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G174	1/16" x 3"	1'-1 5/8"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:
 Indicates Progressive Dimensions.

MATERIAL SPECIFICATIONS:
 Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

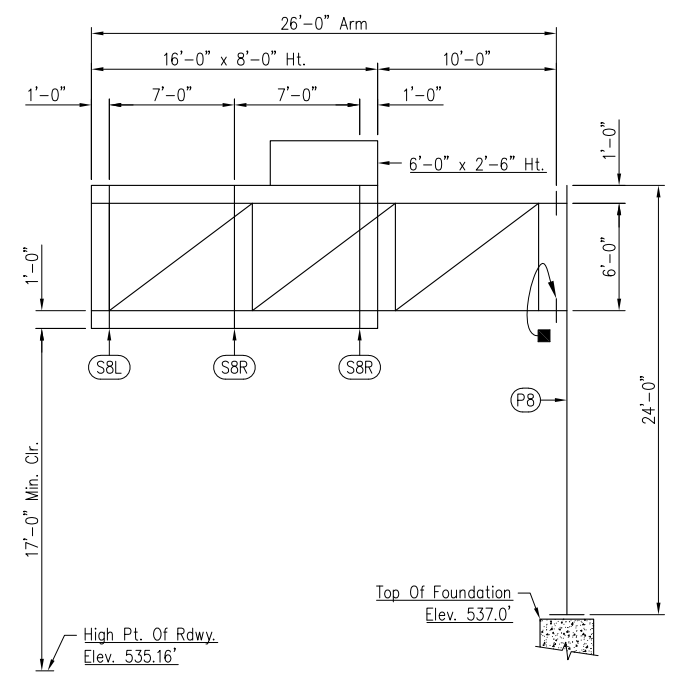
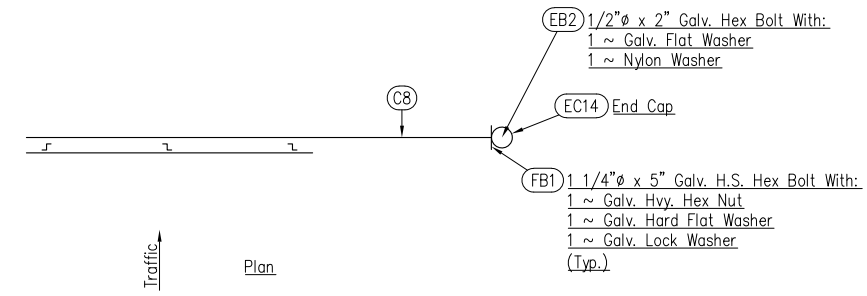


Customer: Lake Erie Construction Company P.O. No: 190328

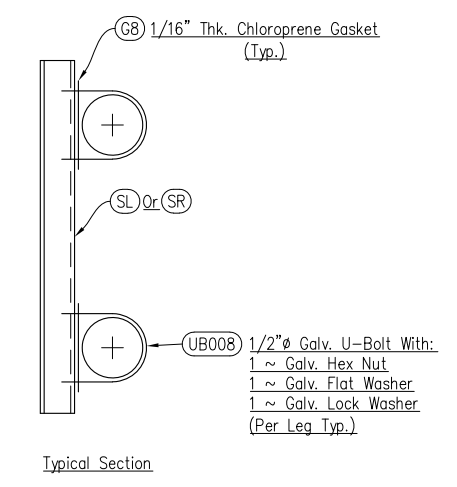
Project: 328-19 Stark County, Ohio

Description: Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware

Printed For: Ohio Drawn By: DAS Date: 9-11-19 Checked By: Date: Job No: OH-15343 Rev. 3 Of 3



Elevation
Ref. No. OS-8
Sta. 278+00.00, IR 75 NB
TC-12.30, Des. 6
(Looking @ Face Of Sign)



Notes:
Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
1 ~ Overhead Sign Support, TC-12.30, Design 6, Ref. No. 7003

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

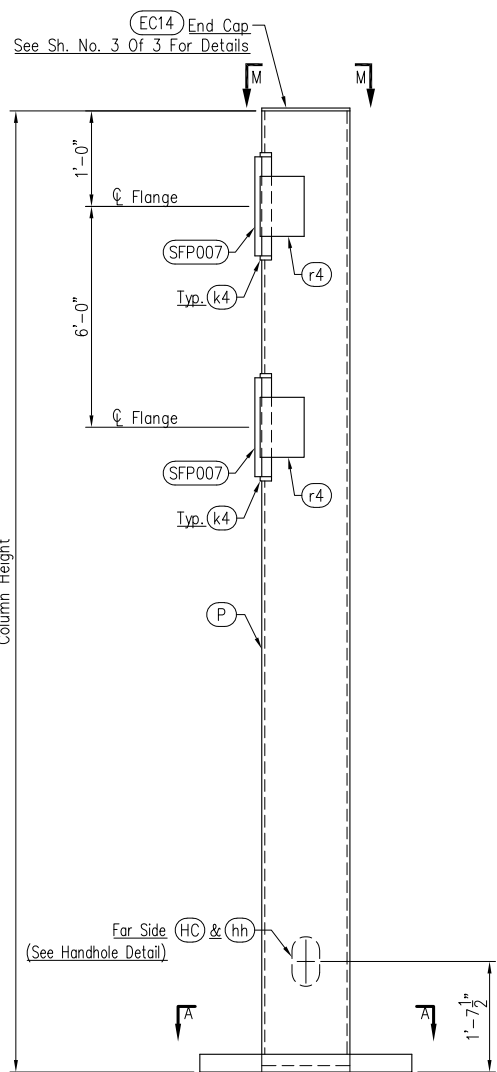
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer:
Security Fence Group, Inc. P.O. No: 183000-3

Project:
3000-18
Hamilton Co., OH

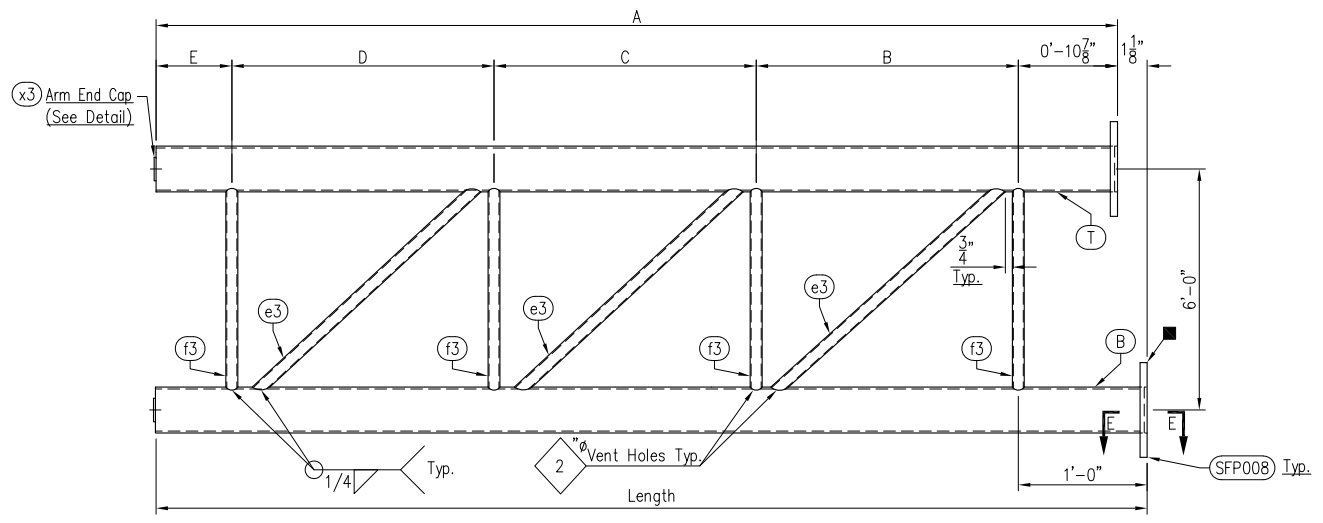
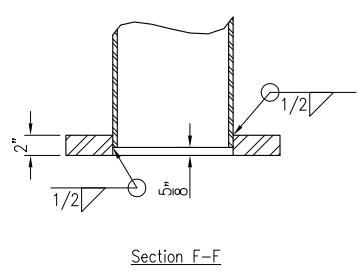
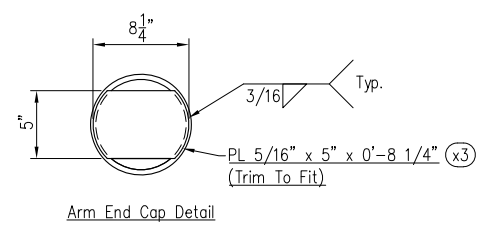
Description:
Erection Details Of Overhead Cantilever Type TC-12.30, Des. 6
Sign Ref. No. OS-8

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



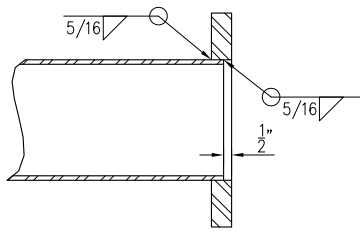
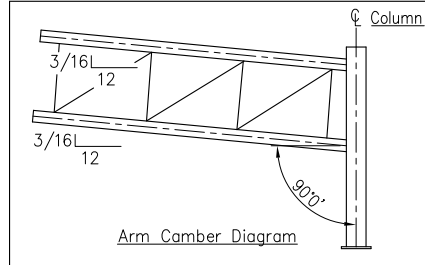
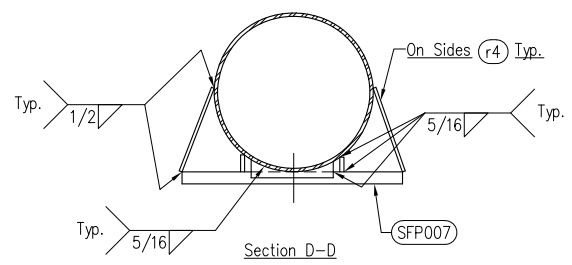
**Elevation
Cantilever Column**

Qty.	MK	Column Height
1	P8	24'-0"

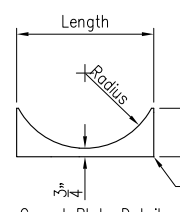


Arm Detail

Qty.	MK	Length	A	B	C	D	E
1	C8	26'-0"	25'-10 7/8"	8'-0"	8'-0"	8'-0"	1'-0"

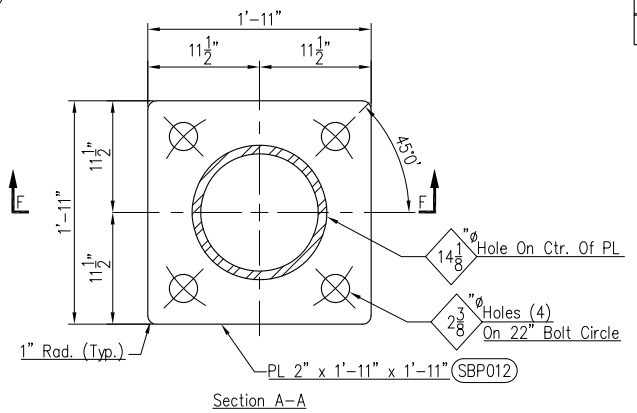


Section E-E

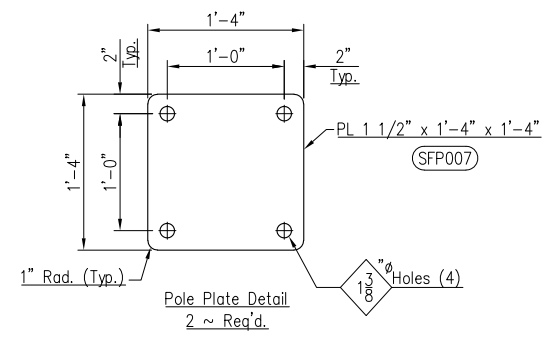


Gusset Plate Detail

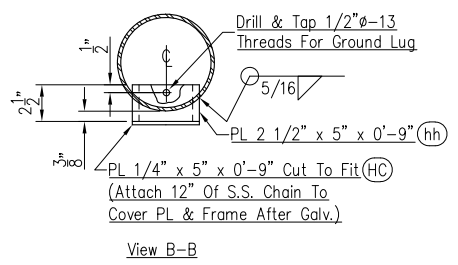
Qty.	MK	Length	A	Radius
4	k4	6 3/4"	1 5/8"	7 1/16"



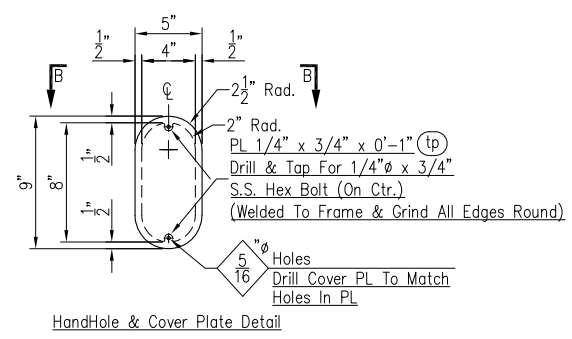
Section A-A



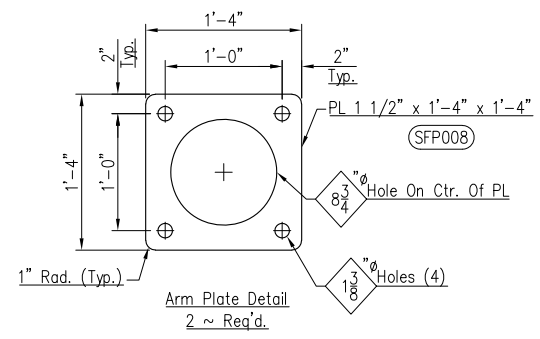
Pole Plate Detail
2 ~ Req'd.



View B-B



HandHole & Cover Plate Detail



Arm Plate Detail
2 ~ Req'd.

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P8	14" O.D. x .500" W. Pipe	23'-11 3/8"		P14X.500J52
1	C8T	8.625" O.D. x .322" W. Pipe	25'-10 3/8"		P8.625X.322J52
1	C8B	do	25'-11 1/2"		P8.625X.322J52
3	e3	2.875" O.D. x .203" W. Pipe	9'-4"	Mill To: 8'-11 7/16" @ 53'-51'	P2.875X.203H
4	f3	do	5'-3 3/4"	Mill To: 5'-3 3/8" @ 0'	P2.875X.203H
2	SFP007	PL 1 1/2" x 1'-4"	1'-4"		SFP007
2	SFP008	do	1'-4"		SFP008
4	k4	PL 5/16" x 1 5/8"	0'-6 3/4"		PL.313A
4	r4	FB 6" x 1/2"	0'-7 1/16"		FB6X.5A
4	m4	PL 5/16" X 1 1/16"	1'-4"		PL.313A
2	x3	PL 5/16" x 5"	0'-8 1/4"		PL.313A
1	SBP012	PL 2" x 1'-11"	1'-11"		SBP012
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4" S.S. Hex Bolt	3/4"		BSS02.75
8	FB1	1 1/4" Galv. H.S. Hex Bolt	5"		BSG1053
8	-	1 1/4" Galv. Hvy. Hex Nut	-		NSG104
8	-	1 1/4" Galv. Hard Flat Washer	-		WSG103
8	-	1 1/4" Galv. Lock Washer	-		LWSG102
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

NOTES:

For View M-M See Sh. # 3 Of 3

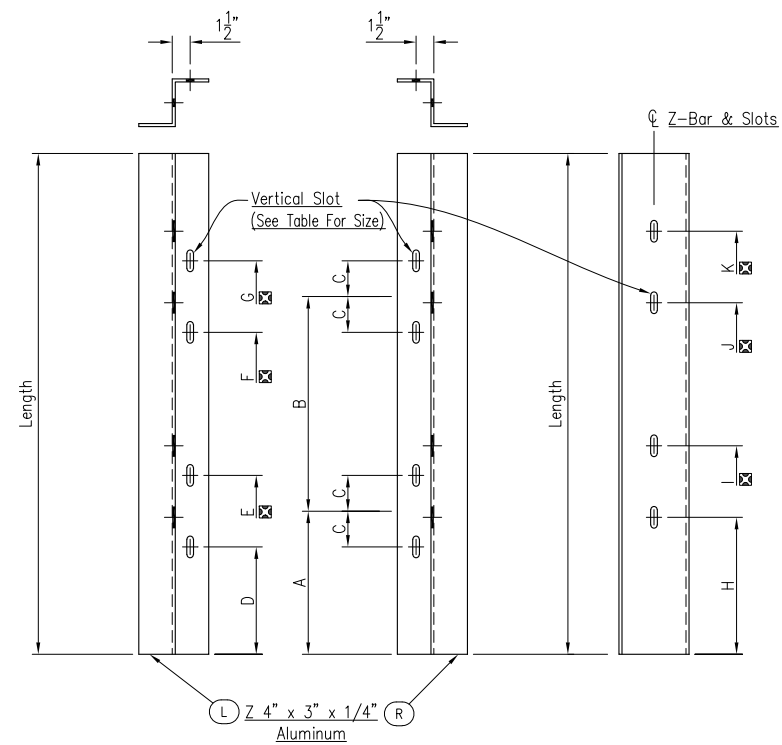
Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:

Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Brace Pipe To Be:
 A.S.T.M. A53 Gr. B Or
 A.S.T.M. A500 Gr. B
 Steel Plate & Flat Bar To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be:
 A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
 Lock Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153
 S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

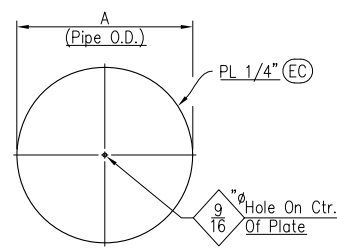
PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

Customer:		Security Fence Group, Inc. P.O. No: 183000-3			
Project:		3000-18 Hamilton Co., OH			
Description:		Fabrication Details Of Cantilever Structure Type TC-12.30, Des. 6 Sign Ref. No. OS-8			
Printed For:	Drawn By:	Date:	Checked By:	Date:	Job No:
Ohio	JH	8-31-19	CR	9-9-19	OH-15319
Sheet No: 2 Of 3					Rev.

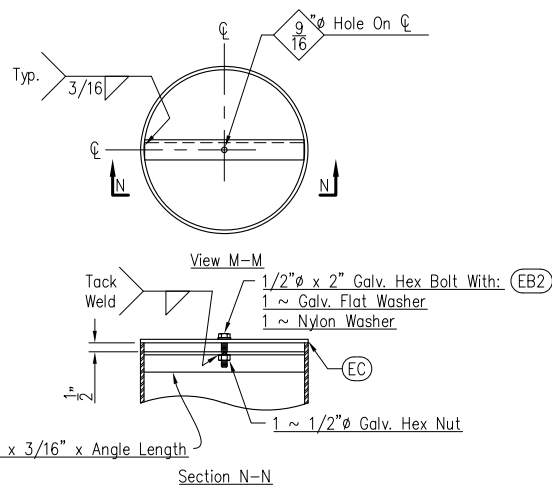


Sign Support Detail

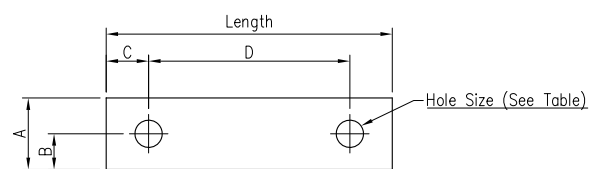
Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	SBL SBR	8'-0"	9/16"Ø x 1" Slots	1'-0"	6'-0"	4 5/8"	0'-7 3/8"	1'-4 5/8"	6'-7 3/8"	7'-4 5/8"	-	-	-	-



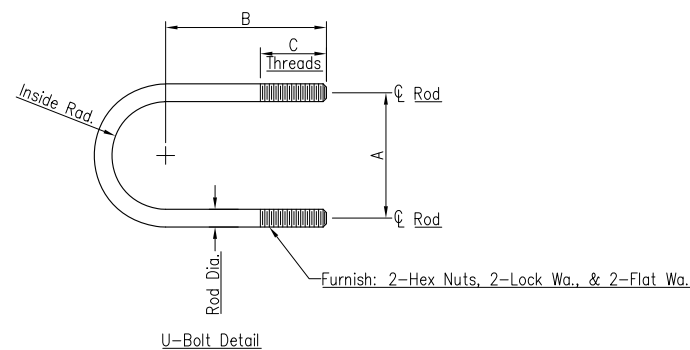
Qty.	MK	Tube/Pipe Size	A	Remarks
1	EC14	14" O.D. x .500" W. Pipe	1'-2"	Galv. Steel



Qty.	MK	Angle Length	To Be Used With End Cap MK
1	ea10	1'-0 7/8"	EC14 (.500" W.)



Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
6	G8	0'-10 3/4"	3"	1 1/2"	3/4"	9 1/4"	9/16"	Sign Support To Steel Chord, Use W/UB008



Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
6	UB008	1/2"	9 1/4"	5 7/8"	2"	2'-2 1/4"	0'-4 3/8"	8.625" O.D. Chord To Sign Support	Galv. Stl.

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	SBL	Z 4" x 3" x 1/4"	8'-0"	Alum.	AZ4X2.85*
2	SBR	do	8'-0"	Alum.	AZ4X2.85*
1	EC14	PL 1/4" x 1'-2" Dia.	-	Steel	CIRCLE-14X.25A
1	ea10	L 2" x 2" x 3/16"	1'-0 7/8"	Steel	L2X2X.188A
1	EB2	1/2"Ø Galv. Hex Bolt	2"		BSG0422
1	-	1/2"Ø Galv. Hex Nut	-		NSG042
1	-	1/2"Ø Galv. Flat Washer	-		WSG042
1	-	1/2"Ø Nylon Washer	-		WN04
6	UB008	1/2"Ø Galv. U-Bolt	2'-2 1/4"		RD.5A
12	-	1/2"Ø Galv. Hex Nut	-		NSG042
12	-	1/2"Ø Galv. Flat Washer	-		WSG042
12	-	1/2"Ø Galv. Lock Washer	-		LWSG042
6	G8	1/16" x 3"	0'-10 3/4"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:
 ☒ Indicates Progressive Dimensions.

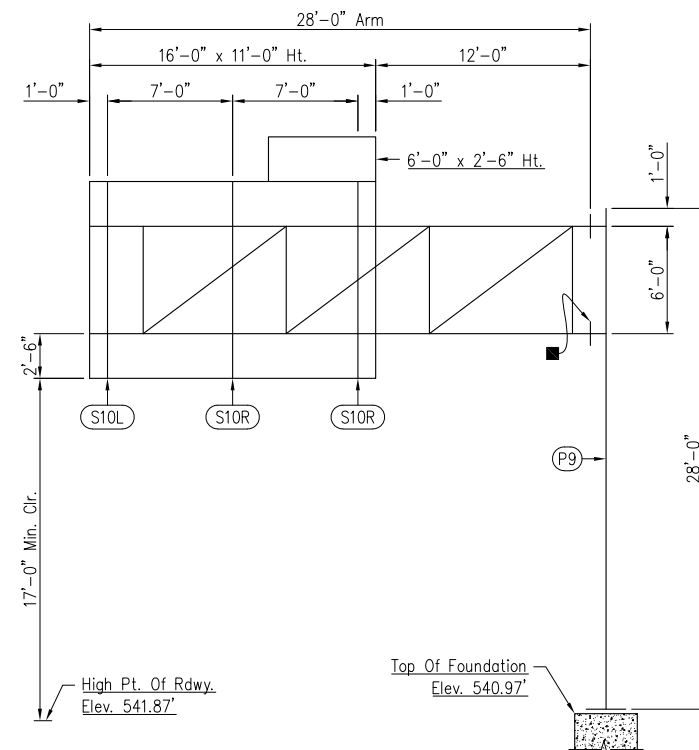
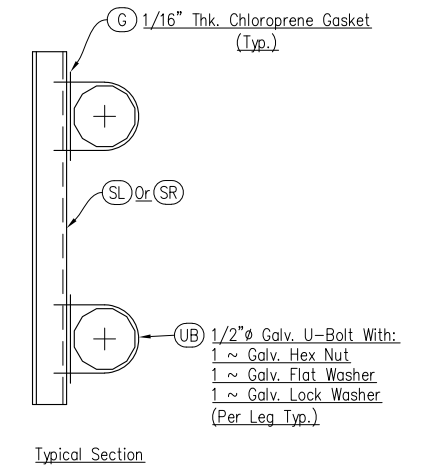
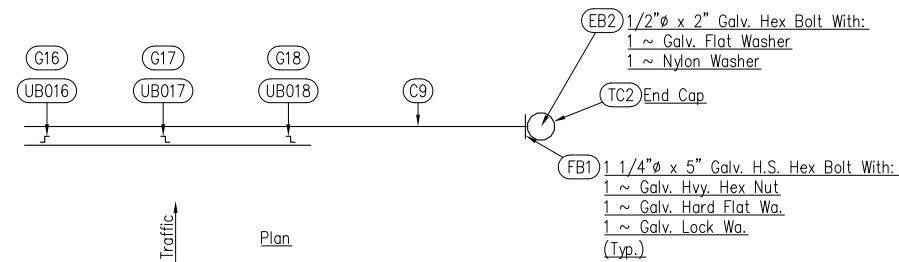
MATERIAL SPECIFICATIONS:
 Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



Customer:		Security Fence Group, Inc.		P.O. No: 183000-3	
Project:		3000-18		Hamilton Co., OH	
Description: Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware					
Printed For:	Ohio	Drawn By:	JH	Date:	8-31-19
Checked By:	CR	Date:	9-9-19	Job No:	OH-15319
			Sheet No:	3 Of 3	



Elevation
 Ref. No. OS-9
 Sta. 302+00.00, IR 75 SB
 TC-12.30, Des. 10
 (Looking @ Face Of Sign)

Notes:
 Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
 1 ~ Overhead Sign Support, TC-12.30, Design 10, Ref. No. 112

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

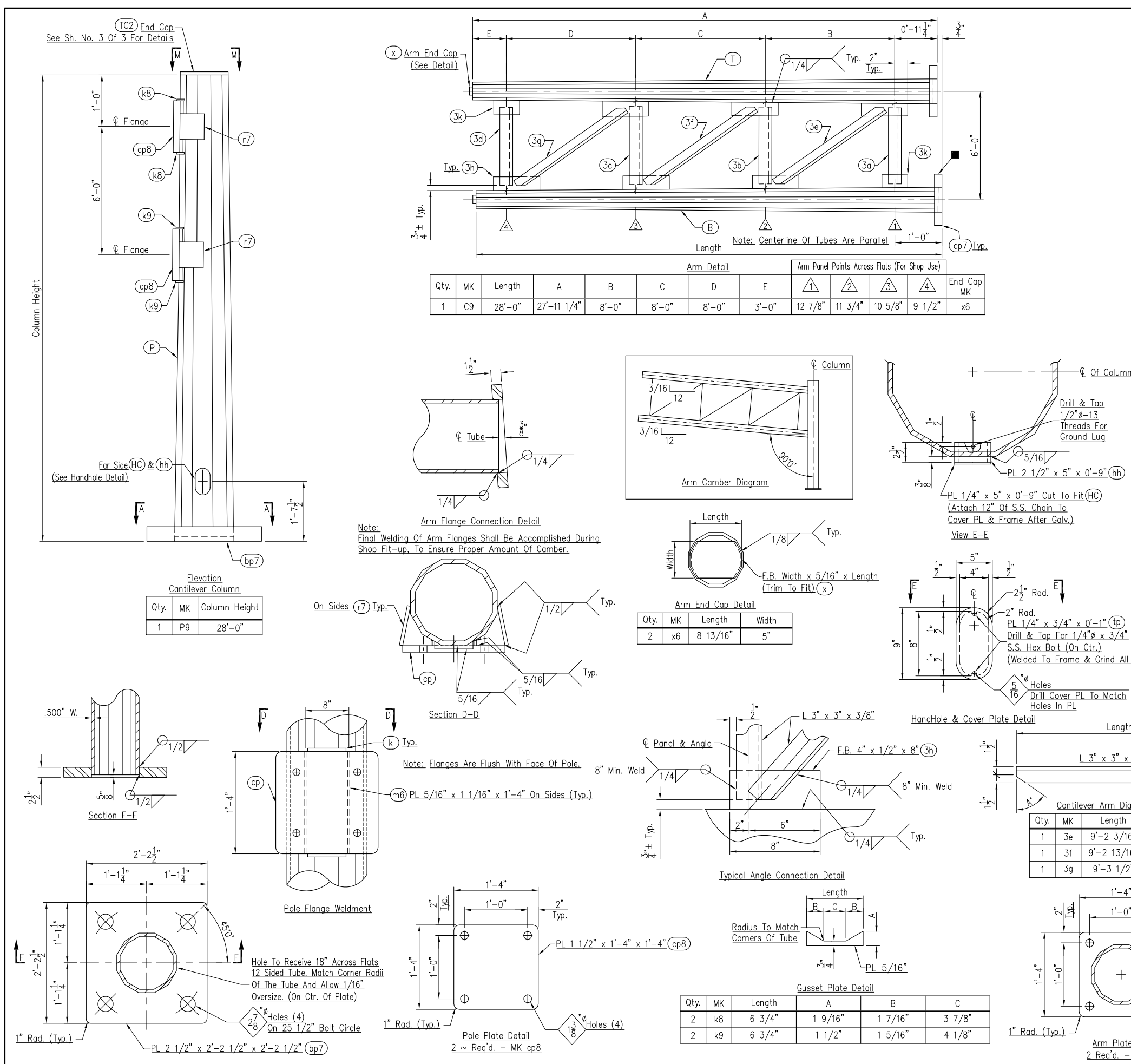
BROOKFIELD FABRICATING CORPORATION
 P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:
 Security Fence Group, Inc. P.O. No: 183000-3

Project:
 3000-18
 Hamilton Co., OH

Description:
 Erection Details Of Overhead Cantilever Type TC-12.30, Des. 10
 Sign Ref. No. OS-9

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P9	18" A.F. x 14.09" A.F. Tapered Tube	27'-11 3/8"	.500" Wall (12 Sided)	TTAF18X.5-S12AI
1	C9T	13" A.F. x 9.09" A.F. Tapered Tube	27'-10 7/8"	.250" Wall (12 Sided)	TTAF13X.250-S12AI
1	C9B	13" A.F. x 9.08" A.F. Tapered Tube	27'-11 5/8"	.250" Wall (12 Sided)	TTAF13X.250-S12AI
1	3a	L 3" x 3" x 3/8"	4'-9 5/8"		L3X3X.375A
1	3b	do	4'-10 3/4"		L3X3X.375A
1	3c	do	4'-11 7/8"		L3X3X.375A
1	3d	do	5'-1"		L3X3X.375A
1	3e	do	9'-2 3/16"	See Detail	L3X3X.375A
1	3f	do	9'-2 13/16"	See Detail	L3X3X.375A
1	3g	do	9'-3 1/2"	See Detail	L3X3X.375A
1	bp7	PL 2 1/2" x 2'-2 1/2"	2'-2 1/2"		PL2.5A
2	cp7	PL 1 1/2" x 1'-4"	1'-4"		PL1.5A
2	cp8	do	1'-4"		PL1.5A
2	k8	PL 5/16" x 1 9/16"	0'-6 3/4"		PL.313A
2	k9	PL 5/16" x 1 1/2"	0'-6 3/4"		PL.313A
2	x6	PL 5/16" x 5"	0'-8 13/16"		PL.313A
4	m6	PL 5/16" x 1 1/16"	1'-4"		PL.313A
4	r7	F.B. 6" x 1/2"	0'-7 3/8"		FB6X.5A
6	3h	F.B. 4" x 1/2"	0'-8"		FB4X.5A
2	3k	do	0'-4"		FB4X.5A
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4" S.S. Hex Bolt	3/4"		BSS02.75
8	FB1	1 1/4" Galv. H.S. Hex Bolt	5"		BSG1053
8	-	1 1/4" Galv. Hvy. Hex Nut	-		NSG104
8	-	1 1/4" Galv. Hard Flat Washer	-		WSG103
8	-	1 1/4" Galv. Lock Washer	-		LWSG102
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

Notes:

For View M-M See Sh. # 3 Of 3

Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:

Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Plate, Angle & Flat Bar: A.S.T.M. A36

All Steel To Be Galvanized Per A.S.T.M. A123

H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be: A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)

Lock Washers To Be A.S.T.M. A307

Galvanize Hardware Per A.S.T.M. A153

S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

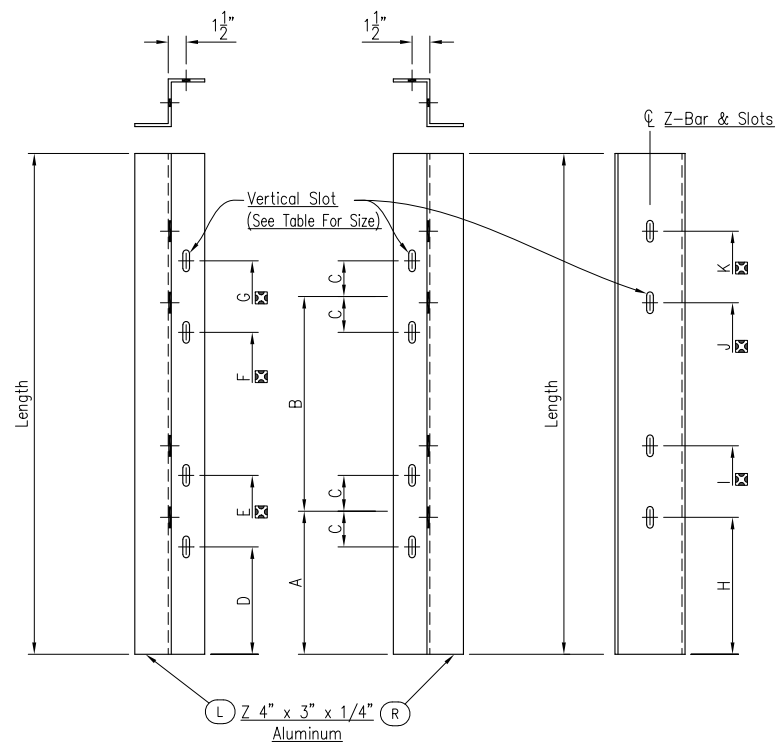
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18 Hamilton Co., OH

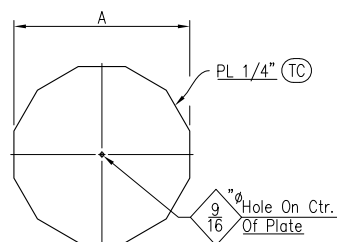
Description: Fabrication Details Of Tapered Cantilever Structure Type TC-12.30, Des. 10 Sign Ref. No. OS-9

Printed For: Ohio Drawn By: JH Date: 8-31-19 Checked By: CR TP Date: 9-9-19 Job No: OH-15319 Rev. 2 Of 3

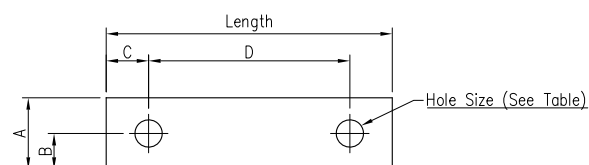


Sign Support Detail

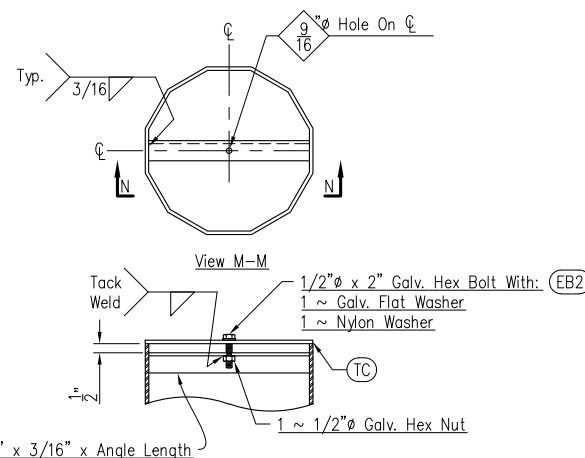
Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	2	S10L S10R	11'-0"	9/16"Ø x 2" Slots	2'-6"	6'-0"	5 11/16"	2'-0 5/16"	2'-11 11/16"	8'-0 5/16"	8'-11 11/16"	-	-	-



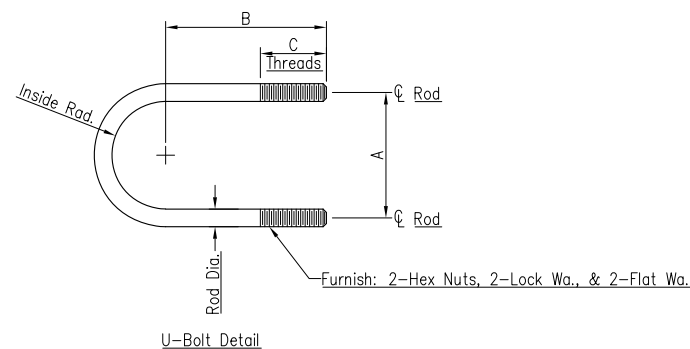
Qty.	MK	Tube/Pipe Size	A	Remarks
1	TC2	14.09" A.F. x .500" W. Tapered Tube	1'-2 1/16"	Galv. Steel



Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
2	G16	1'-0 1/8"	3"	1 1/2"	3/4"	10 5/8"	9/16"	Sign Support To Steel Chord, Use W/UB172
2	G17	1'-1 1/8"	3"	1 1/2"	3/4"	11 5/8"	9/16"	Sign Support To Steel Chord, Use W/UB173
2	G18	1'-2 1/8"	3"	1 1/2"	3/4"	1'-0 5/8"	9/16"	Sign Support To Steel Chord, Use W/UB174



Qty.	MK	F.B. Length	To Be Used With End Cap MK
1	ta2	1'-1 1/16"	TC2



Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
2	UB016	1/2"	10 5/8"	6 1/2"	2 1/2"	2'-5 11/16"	0'-5 1/16"	9.5" To 10" O.D. Arm To Sign Support	Galv. Stl.
2	UB017	1/2"	11 5/8"	7"	2 1/2"	2'-8 1/4"	0'-5 9/16"	10.5" To 11" O.D. Arm To Sign Support	do
2	UB018	1/2"	1'-0 5/8"	7 1/2"	2 1/2"	2'-10 13/16"	0'-6 1/16"	11.5" To 12" O.D. Arm To Sign Support	do

Bill Of Materials

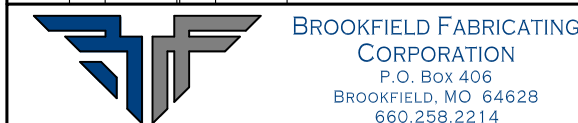
Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S10L	Z 4" x 3" x 1/4"	11'-0"	Alum.	AZ4X2.85*
2	S10R	do	11'-0"	Alum.	AZ4X2.85*
1	TC2	PL 1/4" x 1'-2 1/16"	1'-2 1/16"	Steel	PL.25A
1	ta2	L 2" x 2" x 3/16"	1'-1 1/16"	Steel	L2X2X.188A
1	EB2	1/2"Ø Galv. Hex Bolt	2"		BSG0422
1	-	1/2"Ø Galv. Hex Nut	-		NSG042
1	-	1/2"Ø Galv. Flat Washer	-		WSG042
1	-	1/2"Ø Nylon Washer	-		WN04
2	UB016	1/2"Ø Galv. U-Bolt	2'-5 11/16"		RD.5A
2	UB017	do	2'-8 1/4"		RD.5A
2	UB018	do	2'-10 13/16"		RD.5A
12	-	1/2"Ø Galv. Hex Nut	-		NSG042
12	-	1/2"Ø Galv. Flat Washer	-		WSG042
12	-	1/2"Ø Galv. Lock Washer	-		LWSG042
2	G16	1/16" x 3"	1'-0 1/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G17	1/16" x 3"	1'-1 1/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G18	1/16" x 3"	1'-2 1/8"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:
☒ Indicates Progressive Dimensions.

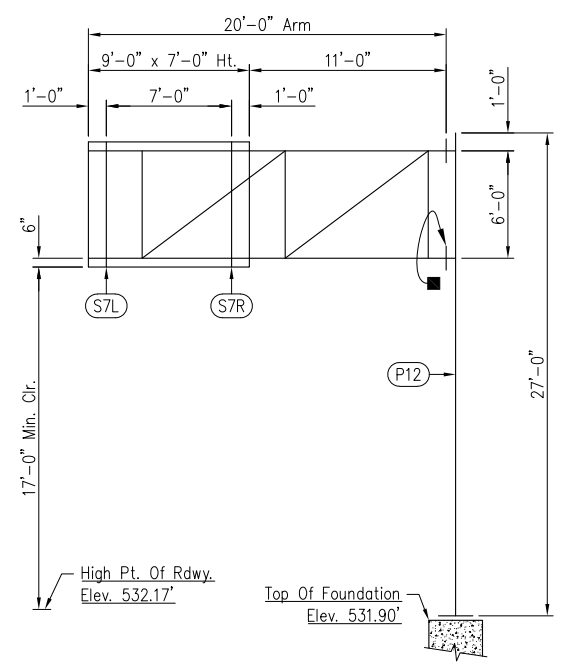
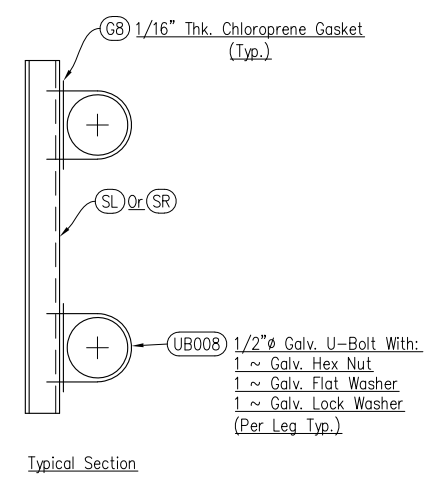
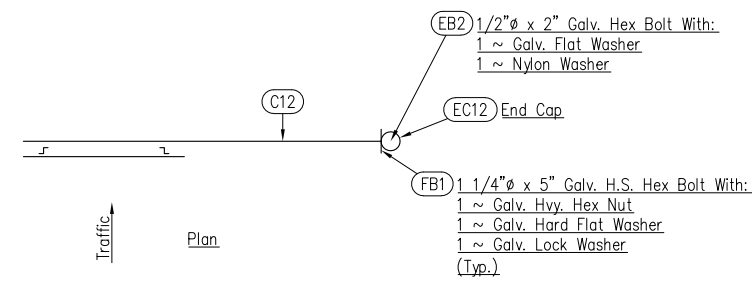
MATERIAL SPECIFICATIONS:
Steel Plate & Shapes To Be A.S.T.M. A36
All Steel To Be Galvanized Per A.S.T.M. A123
Steel U-Bolts To Be A.S.T.M. A307
Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



Customer:	Security Fence Group, Inc.	P.O. No: 183000-3
Project:	3000-18 Hamilton Co., OH	
Description:	Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware	
Printed For:	Ohio	Rev. 0H-15319
Drawn By:	JH	
Date:	8-31-19	
Checked By:	CR	
Date:	9-9-19	
Job No:	OH-15319	
Sheet No:	3 Of 3	



Elevation
Ref. No. OS-12
Sta. 1004+67.00, IR 74 EB
TC-12.30, Des. 5
(Looking @ Face Of Sign)

Notes:
Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
1 ~ Overhead Sign Support, TC-12.30, Design 5, Ref. No. 7002

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

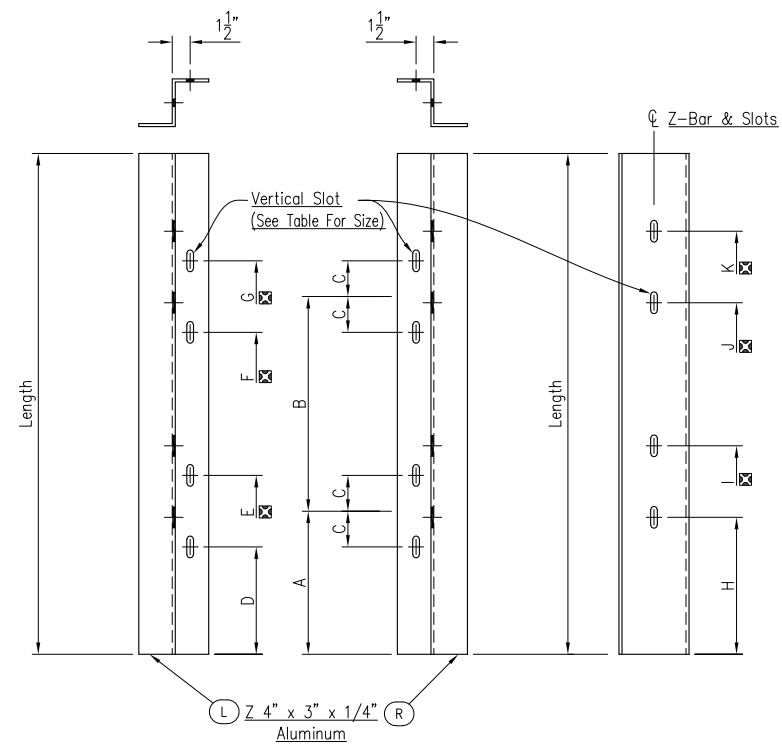
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer:
Security Fence Group, Inc. P.O. No: 183000-3

Project:
3000-18
Hamilton Co., OH

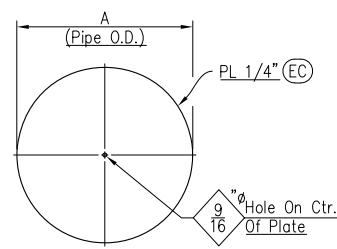
Description:
Erection Details Of Overhead Cantilever Type TC-12.30, Des. 5
Sign Ref. No. OS-12

Printed For: Ohio | Drawn By: JH | Date: 8-31-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev. | Sheet No: 1 Of 3



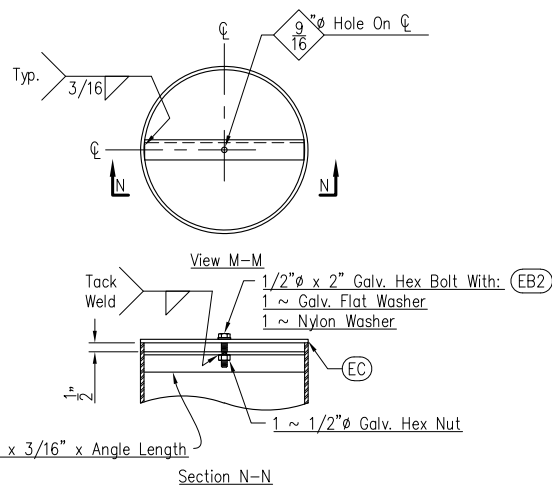
Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	S7L S7R	7'-0"	9/16"Ø x 1" Slots	6"	6'-0"	4 5/8"	0'-1 3/8"	0'-10 5/8"	6'-1 3/8"	6'-10 5/8"	-	-	-	-



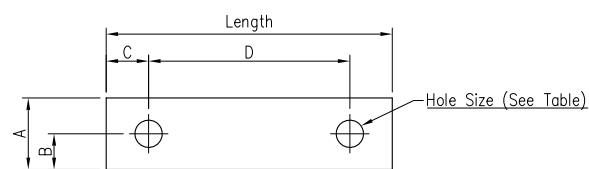
End Cap Detail

Qty.	MK	Tube/Pipe Size	A	Remarks
1	EC12	12.75" O.D. x .500" W. Pipe	1'-0 3/4"	Galv. Steel



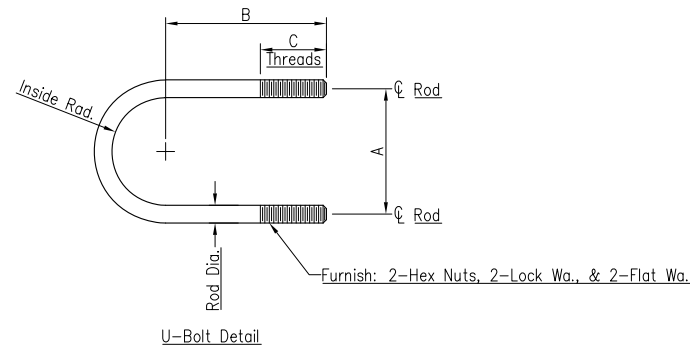
Section N-N

Qty.	MK	Angle Length	To Be Used With End Cap MK
1	ea9	11 9/16"	EC12



1/16" Thick Chloroprene Gasket Detail G

Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
4	G8	0'-10 3/4"	3"	1 1/2"	3/4"	9 1/4"	9/16"	Sign Support To Steel Chord, Use W/UB008



U-Bolt Detail

Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
4	UB008	1/2"	9 1/4"	5 7/8"	2"	2'-2 1/4"	0'-4 3/8"	8.625" O.D. Chord To Sign Support	Galv. Stl.

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S7L	Z 4" x 3" x 1/4"	7'-0"	Alum.	AZ4X2.85*
1	S7R	do	7'-0"	Alum.	AZ4X2.85*
1	EC12	PL 1/4" x 1'-0 3/4" Dia.	-	Steel	CIRCLE-12.75X.25A
1	ea9	L 2" x 2" x 3/16"	0'-11 9/16"	Steel	L2X2X.188A
1	EB2	1/2"Ø Galv. Hex Bolt	2"		BSG0422
1	-	1/2"Ø Galv. Hex Nut	-		NSG042
1	-	1/2"Ø Galv. Flat Washer	-		WSG042
1	-	1/2"Ø Nylon Washer	-		WN04
4	UB008	1/2"Ø Galv. U-Bolt	2'-2 1/4"		RD.5A
8	-	1/2"Ø Galv. Hex Nut	-		NSG042
8	-	1/2"Ø Galv. Flat Washer	-		WSG042
8	-	1/2"Ø Galv. Lock Washer	-		LWSG042
4	G8	1/16" x 3"	0'-10 3/4"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:

☒ Indicates Progressive Dimensions.

MATERIAL SPECIFICATIONS:

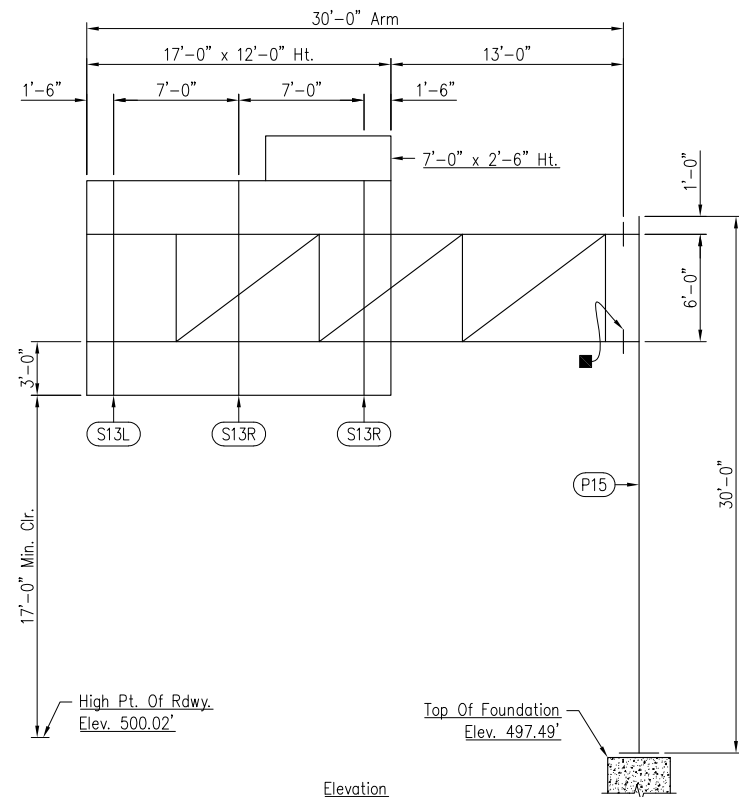
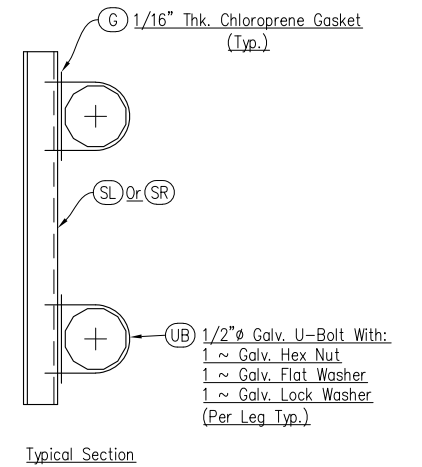
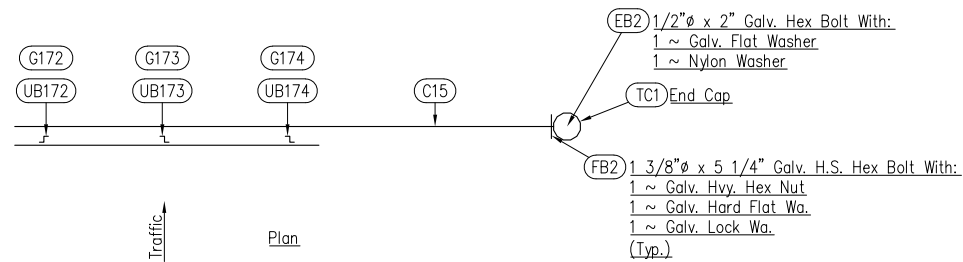
Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

BROOKFIELD FABRICATING CORPORATION
 P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:		Security Fence Group, Inc. P.O. No: 183000-3			
Project:		3000-18 Hamilton Co., OH			
Description: Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware					
Printed For:	Drawn By:	Date:	Checked By:	Date:	Job No:
Ohio	JH	8-31-19	CR TP	9-9-19	OH-15319
					Sheet No: 3 Of 3
					Rev.



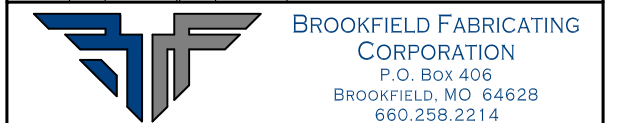
Elevation
 Ref. No. OS-15
 Sta. 1040+75.00, IR 74 WB
 TC-12.30, Des. 12
 (Looking @ Face Of Sign)

Notes:
 Sign Sizes, Elevations, Arm Length, & Column Height Are Per The Contract Plans. Contractor To Verify Prior To Fabrication.

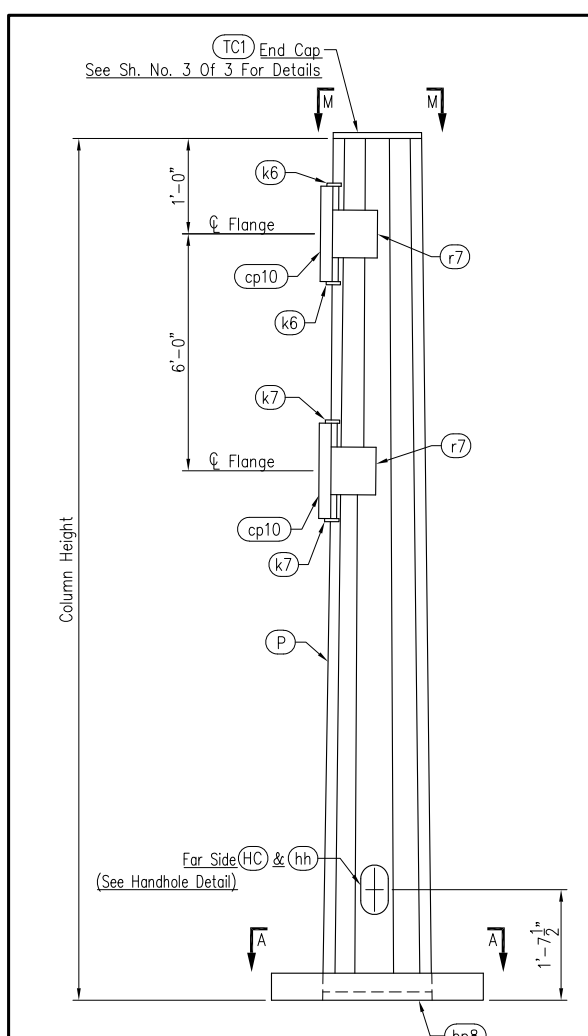
■ - Cantilever Arm Section MK No's. Are Stamped On The Top Of The Bottom Flange.

Pay Items:
 1 ~ Overhead Sign Support, TC-12.30, Design 12, Ref. No. 7006

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

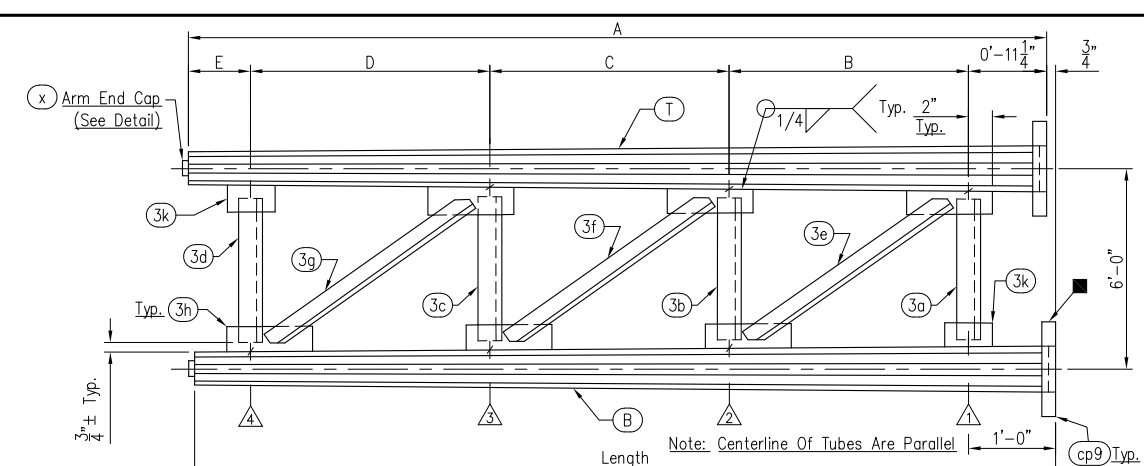


Customer: Security Fence Group, Inc. P.O. No: 183000-3					
Project: 3000-18 Hamilton Co., OH					
Description: Erection Details Of Overhead Cantilever Type TC-12.30, Des. 12 Sign Ref. No. OS-15					
Printed For: Ohio	Drawn By: JH	Date: 9-3-19	Checked By: CR	Date: 9-9-19	Job No: OH-15319
Sheet No: 1 Of 3					Rev.



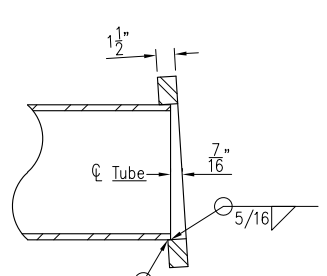
Elevation Cantilever Column

Qty.	MK	Column Height
1	P15	30'-0"

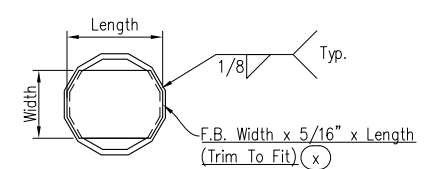
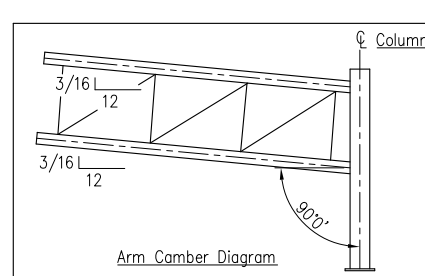


Arm Detail

Qty.	MK	Length	A	B	C	D	E	1	2	3	4	End Cap MK
1	C15	30'-0"	29'-11 1/4"	8'-0"	8'-0"	8'-0"	5'-0"	12 7/8"	11 3/4"	10 5/8"	9 1/2"	x5

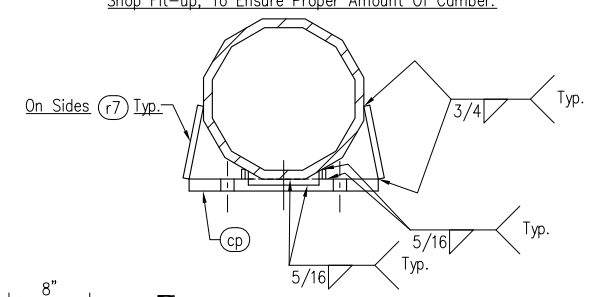
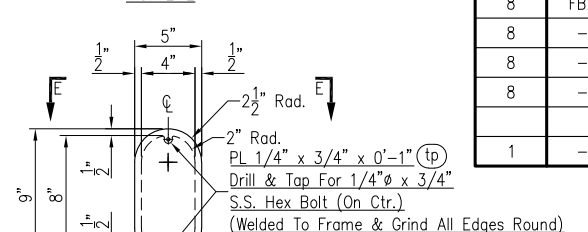
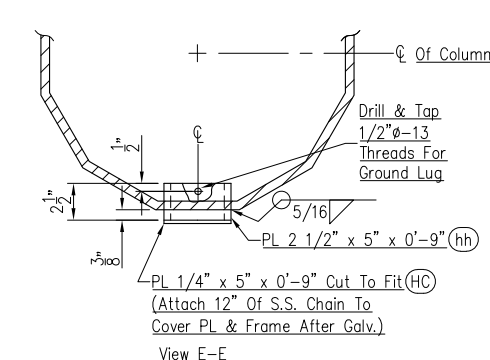


Note: Final Welding Of Arm Flanges Shall Be Accomplished During Shop Fit-up, To Ensure Proper Amount Of Camber.

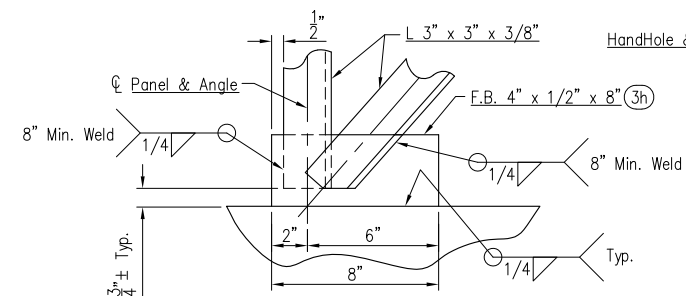


Arm End Cap Detail

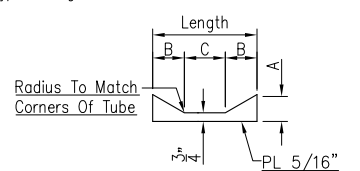
Qty.	MK	Length	Width
2	x5	8 9/16"	5"



Note: Flanges Are Flush With Face Of Pole.

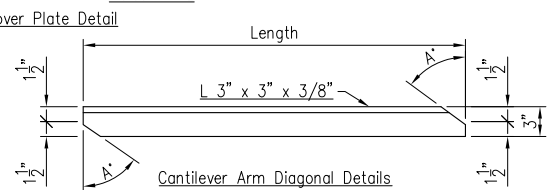


Typical Angle Connection Detail



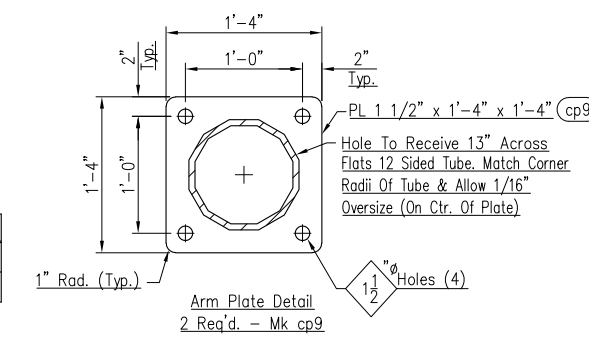
Gusset Plate Detail

Qty.	MK	Length	A	B	C
2	k6	6 3/4"	1 5/8"	1 1/2"	3 3/4"
2	k7	6 3/4"	1 9/16"	1 3/8"	4"

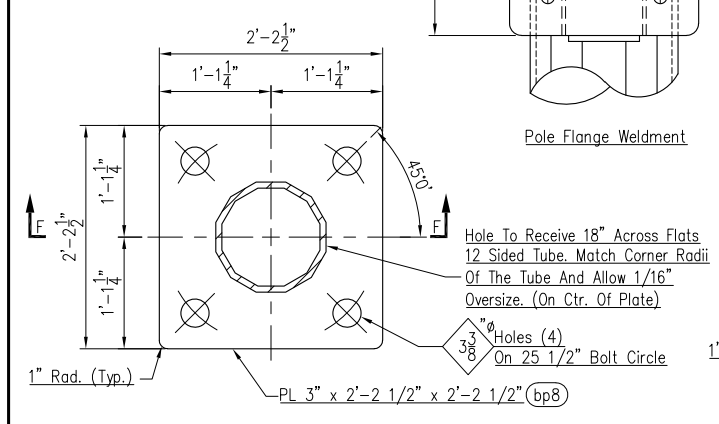
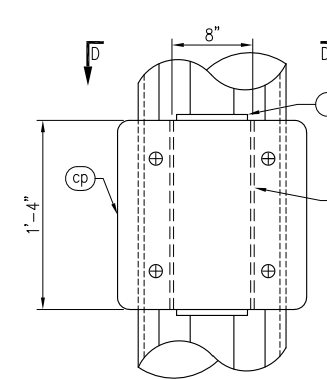
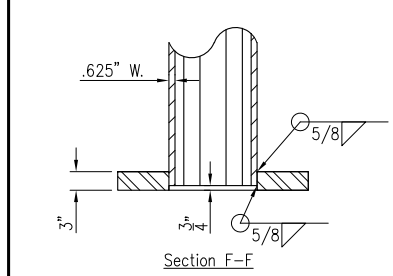


Cantilever Arm Diagonal Details

Qty.	MK	Length	A'
1	3e	9'-2 3/16"	58'-08'
1	3f	9'-2 13/16"	57'-39'
1	3g	9'-3 1/2"	57'-10'



Arm Plate Detail
2 Req'd. - Mk cp9



Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	P15	18" A.F. x 13.81" A.F. Tapered Tube	29'-11 1/4"	.625" Wall (12 Sided)	TTAF18X.625-S12AI
1	C15T	13" A.F. x 8.81" A.F. Tapered Tube	29'-10 13/16"	.312" Wall (12 Sided)	TTAF13X.313-S12AI
1	C15B	do	29'-11 9/16"	.312" Wall (12 Sided)	TTAF13X.313-S12AI
1	3a	L 3" x 3" x 3/8"	4'-9 5/8"		L3X3X.375A
1	3b	do	4'-10 3/4"		L3X3X.375A
1	3c	do	4'-11 7/8"		L3X3X.375A
1	3d	do	5'-1"		L3X3X.375A
1	3e	do	9'-2 3/16"	See Detail	L3X3X.375A
1	3f	do	9'-2 13/16"	See Detail	L3X3X.375A
1	3g	do	9'-3 1/2"	See Detail	L3X3X.375A
1	bp8	PL 3" x 2'-2 1/2"	2'-2 1/2"		PL3A
2	cp9	PL 1 1/2" x 1'-4"	1'-4"		PL1.5A
2	cp10	do	1'-4"		PL1.5A
2	k6	PL 5/16" x 1 5/8"	0'-6 3/4"		PL.313A
2	k7	PL 5/16" x 1 9/16"	0'-6 3/4"		PL.313A
2	x5	PL 5/16" x 5"	0'-8 9/16"		PL.313A
4	m6	PL 5/16" x 1 1/16"	1'-4"		PL.313A
4	r7	F.B. 6" x 3/4"	0'-7 3/8"		FB6X.75A
6	3h	F.B. 4" x 1/2"	0'-8"		FB4X.5A
2	3k	do	0'-4"		FB4X.5A
1	HC	PL 1/4" x 5"	0'-9"	Cut To Fit	HANDHOLE-COVER-5X9A
1	hh	PL 2 1/2" x 5"	0'-9"		HANDHOLE-5X9A
2	tp	PL 1/4" x 3/4"	0'-1"		HANDHOLE-TAB
2	HB	1/4" S.S. Hex Bolt	3/4"		BSS02.75
8	FB2	1 3/8" Galv. H.S. Hex Bolt	5 1/4"		BSG115.253
8	-	1 3/8" Galv. Hvy. Hex Nut	-		NSG114
8	-	1 3/8" Galv. Hard Flat Washer	-		WSG113
8	-	1 3/8" Galv. Lock Washer	-		LWSG112
1	-	S.S. Chain	1'-0"		HANDHOLE CHAIN

Notes:
For View M-M See Sh. # 3 Of 3.
Stamp Arm MK No's. On The Top Of The Bottom Flange.

MATERIAL SPECIFICATIONS:
Steel Pipe For Columns & Arms: Steel Pipe Or Tube To Be 52 KSI Min. Yield Steel Plate, Angle & Flat Bar: A.S.T.M. A36
All Steel To Be Galvanized Per A.S.T.M. A123
H.S. Bolts, Hvy. Hex Nuts & Hard Flat Washers To Be: A.S.T.M. A325 (Hvy. Hex Nuts To Be Lubricated & Dyed)
Lock Washers To Be A.S.T.M. A307
Galvanize Hardware Per A.S.T.M. A153
S.S. Hardware To Be A.S.T.M. A320 (AISI 300 Series) Passivated Commercial Gr.

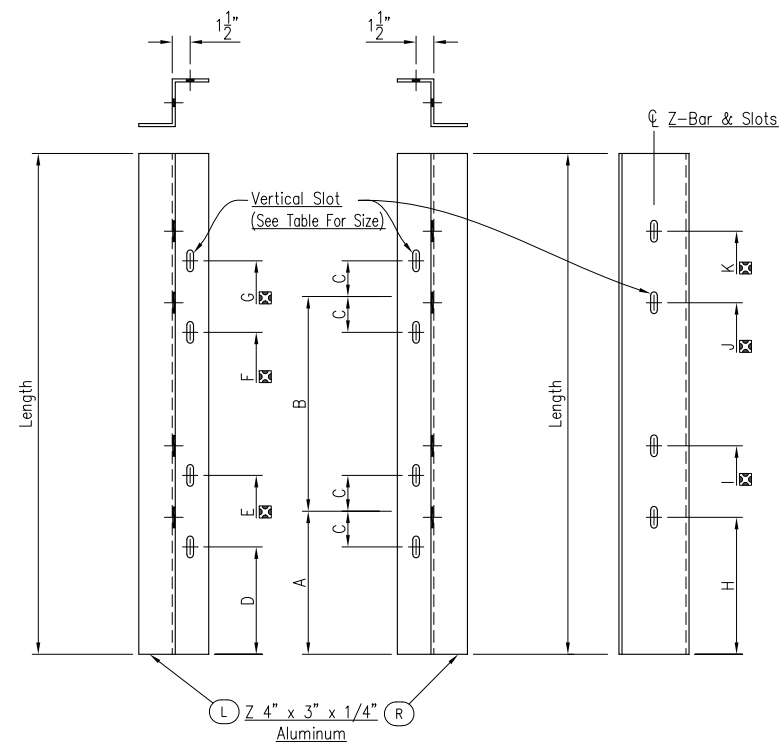
PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18 Hamilton Co., OH

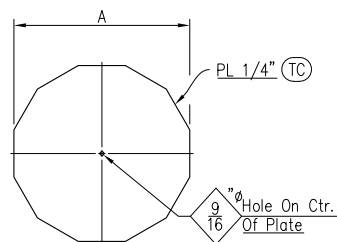
Description: Fabrication Details Of Tapered Cantilever Structure Type TC-12.30, Des. 12 Sign Ref. No. OS-15

Printed For: Ohio
Drawn By: JH
Date: 9-3-19
Checked By: CR
Date: 9-9-19
Job No: OH-15319
Rev: 2 Of 3



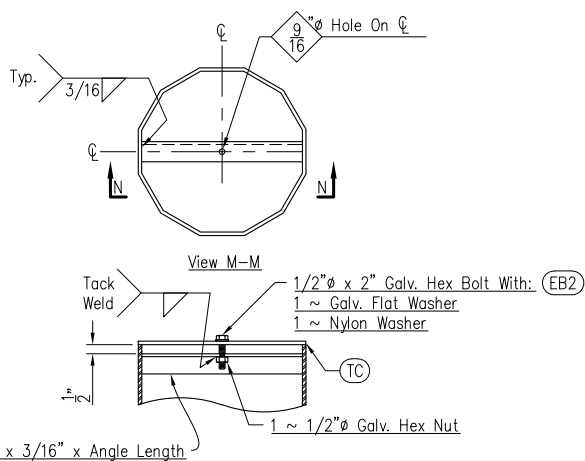
Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	2	S13L S13R	12'-0"	9/16" ϕ x 2" Slots	3'-0"	6'-0"	5 9/16"	2'-6 7/16"	3'-5 9/16"	8'-6 7/16"	9'-5 9/16"	-	-	-



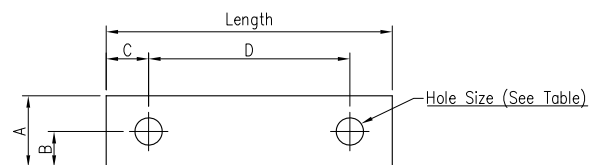
End Cap Detail

Qty.	MK	Tube/Pipe Size	A	Remarks
1	TC1	13.81" A.F. x .500" W. Tapered Tube	1'-1 13/16"	Galv. Steel



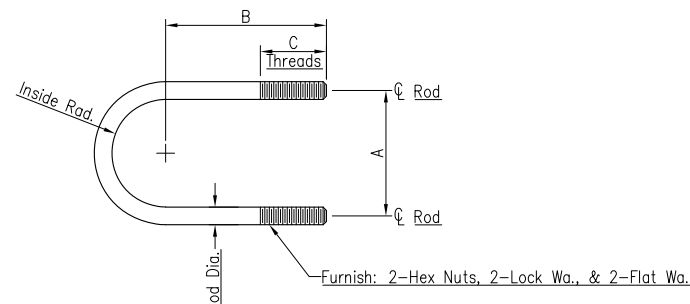
Section N-N

Qty.	MK	F.B. Length	To Be Used With End Cap MK
1	ta4	1'-0 9/16"	TC1



1/16" Thick Chloroprene Gasket Detail (G)

Qty.	Mk	Length	A	B	C	D	Hole Size	Remarks
2	G172	11 5/8"	3"	1 1/2"	3/4"	10 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB172
2	G173	1'-0 5/8"	3"	1 1/2"	3/4"	11 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB173
2	G174	1'-1 5/8"	3"	1 1/2"	3/4"	1'-0 1/8"	9/16"	Sign Support To Steel Chord, Use W/UB174



U-Bolt Detail

Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
2	UB172	1/2"	10 1/8"	6 1/4"	2 1/2"	2'-4 3/8"	0'-4 13/16"	9" To 9.5" O.D. Arm To Sign Support	Galv. Stl.
2	UB173	1/2"	11 1/8"	6 3/4"	2 1/2"	2'-7"	0'-5 5/16"	10" To 10.5" O.D. Arm To Sign Support	do
2	UB174	1/2"	1'-0 1/8"	7 1/4"	2 1/2"	2'-9 9/16"	0'-5 13/16"	11" To 11.5" O.D. Arm To Sign Support	do

Bill Of Materials

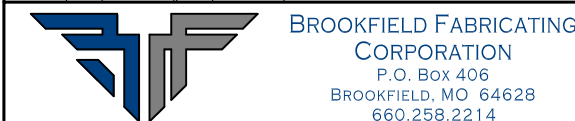
Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S13L	Z 4" x 3" x 1/4"	12'-0"	Alum.	AZ4X2.85*
2	S13R	do	12'-0"	Alum.	AZ4X2.85*
1	TC1	PL 1/4" x 1'-1 13/16"	1'-1 13/16"	Steel	PL.25A
1	ta1	L 2" x 2" x 3/16"	1'-0 9/16"	Steel	L2X2X.188A
1	EB2	1/2" ϕ Galv. Hex Bolt	2"		BSG0422
1	-	1/2" ϕ Galv. Hex Nut	-		NSG042
1	-	1/2" ϕ Galv. Flat Washer	-		WSG042
1	-	1/2" ϕ Nylon Washer	-		WN04
2	UB172	1/2" ϕ Galv. U-Bolt	2'-4 3/8"		RD.5A
2	UB173	do	2'-7"		RD.5A
2	UB174	do	2'-9 9/16"		RD.5A
12	-	1/2" ϕ Galv. Hex Nut	-		NSG042
12	-	1/2" ϕ Galv. Flat Washer	-		WSG042
12	-	1/2" ϕ Galv. Lock Washer	-		LWSG042
2	G172	1/16" x 3"	0'-11 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G173	1/16" x 3"	1'-0 5/8"	Chloroprene Gasket	1/16" NEOPRENE
2	G174	1/16" x 3"	1'-1 5/8"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:
 Indicates Progressive Dimensions.

MATERIAL SPECIFICATIONS:
 Steel Plate & Shapes To Be A.S.T.M. A36
 All Steel To Be Galvanized Per A.S.T.M. A123
 Steel U-Bolts To Be A.S.T.M. A307
 Steel Bolts, Nuts, & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



Customer:	Security Fence Group, Inc.	P.O. No: 183000-3
Project:	3000-18	Hamilton Co., OH
Description:	Fabrication Details Of U-Bolts, Gaskets, Sign Supports, End Caps, & Related Hardware	
Printed For:	Ohio	Job No: OH-15319
Drawn By:	JH	Rev.
Date:	9-3-19	
Checked By:	CR	
Date:	9-9-19	
Sheet No:	3	Of 3

Bill Of Materials

Qty.	Mk.	Description	Length	Remarks	Inventory No.
32	AB0018	1 1/4"Ø Rod	4'-6"		AB10-432R64-32GAG
128	-	1 1/4"Ø Galv. Hvy. Hex Nut	-		NSG104
64	-	1 1/4"Ø Galv. Hard Flat Washer	-		WSG103
16	AB0133	1 1/2"Ø Rod	4'-7"		AB12-440R72-36GAG
64	-	1 1/2"Ø Galv. Hvy. Hex Nut	-		NSG124
32	-	1 1/2"Ø Galv. Hard Flat Washer	-		WSG123
8	AB0136	2"Ø Rod	4'-10"		AB16-464R72-44GAG
32	-	2"Ø Galv. Hvy. Hex Nut	-		NSG164
16	-	2"Ø Galv. Hard Flat Washer	-		WSG163
12	AB0138	2 1/2"Ø Rod	4'-11"		AB20-472R80-52GAG
48	-	2 1/2"Ø Galv. Hvy. Hex Nut	-		NSG204
24	-	2 1/2"Ø Galv. Hard Flat Washer	-		WSG203

Material Specs.

Steel Anchor Rod To Be A.S.T.M. F1554 Gr. 105
Hvy. Hex Nuts To Be:
 A.S.T.M. A563 Gr. DH (Lubricated & Dyed)
Hard Flat Washers To Be A.S.T.M. F436
Galvanize Hardware Per A.S.T.M. A153
Steel Bottom Plate To Be A.S.T.M. A709, Gr. 36
Galvanize Plate Washer Per A.S.T.M. A123



BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer:							
Security Fence Group, Inc.				P.O. No: 183000-3			
Project:							
3000-18				Hamilton Co., OH			
Description:							
Bill Of Material For Anchor Bolts							
Ref. OS-3, OS-4, OS-5, OS-6, OS-7, OS-8, OS-9, OS-12, OS-13, OS-14, & OS-15							
Printed For:	Drwn By:	Date:	Chk. By:	Date:	Job No:	Part:	Sheet No:
Ohio	JH	8-19-19	CR AM	8-20-19	OH-15319		1 Of 3

Bill Of Materials

Qty.	Mk.	Description	Length	Remarks	Inventory No.
12	AB0139	3"∅ Rod	5'-1"		AB24-488R96-60GAG
48	-	3"∅ Galv. Hvy. Hex Nut	-		NSG244
24	-	3"∅ Galv. Hard Flat Washer	-		WSG243
32	OHPW1	PL 1" x 0'-3" Dia.	-	Galv. Purchase With Bolts	PLWA1X3W-1.375Z
16	OHPW2	PL 1" x 0'-3" Dia.	-	Galv. Purchase With Bolts	PLWA1X3W-1.625Z
8	OHPW4	PL 1" x 0'-4" Dia.	-	Galv. Purchase With Bolts	PLWA1X4W-2.125Z
12	OHPW6	PL 1" x 0'-5" Dia.	-	Galv. Purchase With Bolts	PLWA1X5W-2.625Z
12	OHPW7	PL 1" x 0'-6" Dia.	-	Galv. Purchase With Bolts	PLWA1X6W-3.125Z



BROOKFIELD FABRICATING CORPORATION

P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer:

Security Fence Group, Inc. P.O. No: 183000-3

Project:

3000-18
Hamilton Co., OH

Description:

Bill Of Material For Anchor Bolts
Ref. OS-3, OS-4, OS-5, OS-6, OS-7, OS-8, OS-9, OS-12, OS-13, OS-14, & OS-15

Printed For:

Ohio

Drwn By:

JH

Date:

8-19-19

Chk. By:

CR AM

Date:

8-20-19

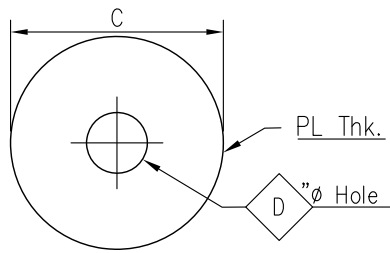
Job No:

OH-15319

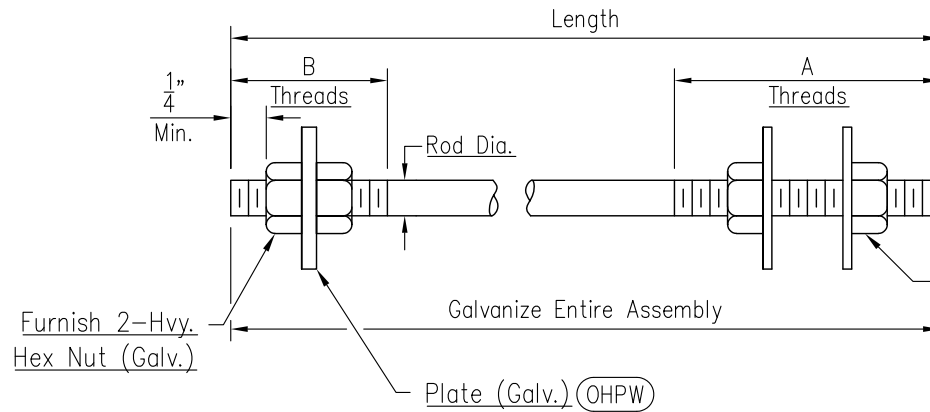
Part:

Sheet No:

2 Of 3



Anchor Bolt Plate
 32 ~ Req'd. OHPW1
 16 ~ Req'd. OHPW2
 8 ~ Req'd. OHPW4
 12 ~ Req'd. OHPW6
 12 ~ Req'd. OHPW7



Furnish 2-Hvy.
Hex Nut (Galv.)

Furnish 2 ~ Hvy. Hex Nuts
& 2 ~ Flat Washers Ea.
(Galv.)

Anchor Bolt Detail

Qty.	MK	Rod Dia.	Length	A	B	C	D	PLATE MK	PL Thk.	Remarks
32	AB0018	1 1/4"	4'-6"	8"	4"	3"	1 3/8"	OHPW1	1"	Use With TC-7.65, Des. 6, Ref. OS-13 & OS-14
16	AB0133	1 1/2"	4'-7"	9"	4 1/2"	3"	1 5/8"	OHPW2	1"	Use With TC-15.115, Ref. OS-6
8	AB0136	2"	4'-10"	9"	5 1/2"	4"	2 1/8"	OHPW4	1"	Use With TC-12.30, Des. 5 Or 6, Ref. OS-8 & OS-12
12	AB0138	2 1/2"	4'-11"	10"	6 1/2"	5"	2 5/8"	OHPW6	1"	Use With TC-12.30, Des. 9 Or 10, Ref. OS-4, OS-7, & OS-9
12	AB0139	3"	5'-1"	12"	7 1/2"	6"	3 1/8"	OHPW7	1"	Use With TC-12.30 Des. 12, Ref. OS-3, OS-5, & OS-15

Material Specs.

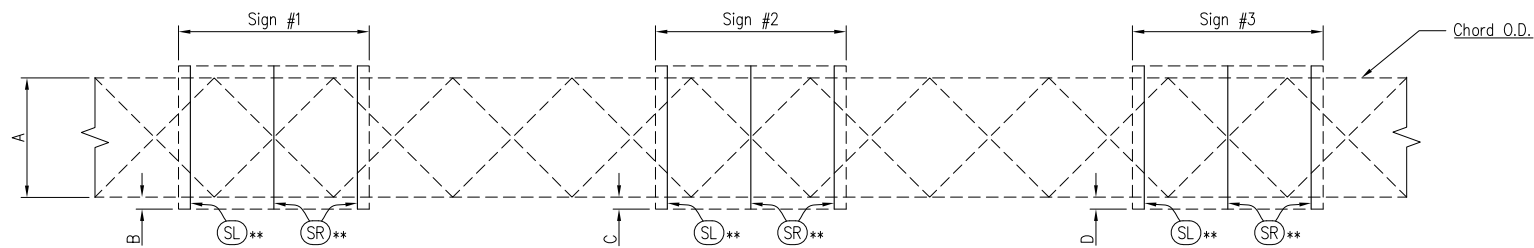
Steel Anchor Rod To Be A.S.T.M. F1554 Gr. 105
 Hvy. Hex Nuts To Be:
 A.S.T.M. A563 Gr. DH (Lubricated & Dyed)
 Hard Flat Washers To Be A.S.T.M. F436
 Galvanize Hardware Per A.S.T.M. A153
 Steel Bottom Plate To Be A.S.T.M. A709, Gr. 36
 Galvanize Plate Washer Per A.S.T.M. A123



BROOKFIELD FABRICATING CORPORATION

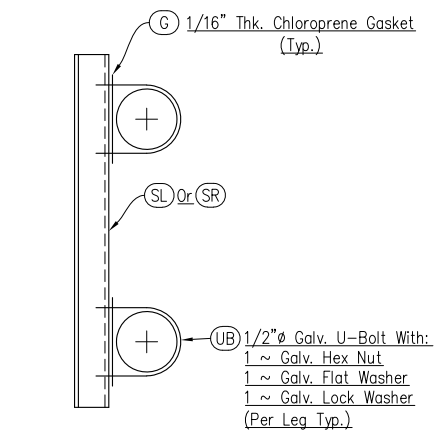
P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:							
Security Fence Group, Inc.				P.O. No: 183000-3			
Project:							
3000-18				Hamilton Co., OH			
Description:							
Fabrication Details For Anchor Bolts & Anchor Plates Ref. OS-3, OS-4, OS-5, OS-6, OS-7, OS-8, OS-9, OS-12, OS-13, OS-14, & OS-15							
Printed For:	Drwn By:	Date:	Chk. By:	Date:	Job No:	Part:	Sheet No:
Ohio	JH	8-19-19	CR AM	8-20-19	OH-15319		3 Of 3

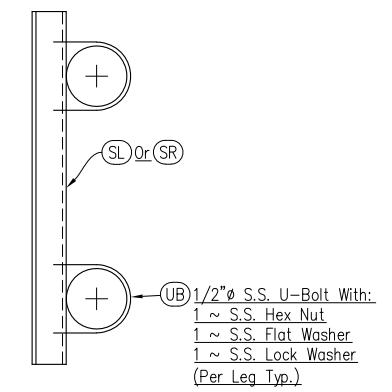


**See Table For Actual Quantity & Mark No. Of Sign Supports.

Sta.	Ref. No.	A	Chord O.D.	Chord Material	Gasket		U-Bolt		Sign #1				Sign #2				Sign #3																		
					Qty.	MK	Qty.	MK	Sign Size (Length x Height)	B	See Detail	Sign Support L		Sign Support R		Sign Size (Length x Height)	C	See Detail	Sign Support L		Sign Support R														
												Qty.	MK	Qty.	MK				Qty.	MK	Qty.	MK	Qty.	MK											
195+50.00	OS-1	5'-0"	5.5"	Aluminum	-	-	4	UB003	11'-0" x 8'-0"	1'-6"	B	1	S6L	1	S6R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
196+00.00	OS-2	5'-0"	5.563"	Steel	10	G6	10	UB006	17'-0" x 13'-0"	2'-6"	A	1	S14L	4	S14R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



Detail A
Standard Connection Detail
(Steel Structure)



Detail B
Standard Connection Detail
(Aluminum Structure)

Note: If Intermediate Sign Supports Are Req'd., Use 1/2 The Normal Spacing Between Sign Supports

Sign Length (Feet)	No. Of Sign Supp. Zee's	Sign Support Zee Spacing (Inches)						Sign Length (Feet)	No. Of Sign Supp. Zee's	Sign Support Zee Spacing (Inches)						
		6"	36"	6"						12"	90"	90"	90"	90"	12"	
4'-0"	2	6"	36"	6"				32'-0"	5	12"	90"	90"	90"	90"	12"	
5'-0"		6"	48"	6"				33'-0"		18"	90"	90"	90"	90"	18"	
6'-0"		6"	60"	6"				34'-0"		12"	96"	96"	96"	96"	12"	
7'-0"		6"	72"	6"				35'-0"		18"	96"	96"	96"	96"	18"	
8'-0"		12"	72"	12"				36'-0"		6"	84"	84"	84"	84"	6"	
9'-0"		12"	84"	12"				37'-0"		12"	84"	84"	84"	84"	12"	
10'-0"	3	12"	96"	12"				38'-0"	6	18"	84"	84"	84"	84"	18"	
11'-0"		18"	96"	18"				39'-0"		9"	90"	90"	90"	90"	9"	
12'-0"		6"	66"	66"	6"			40'-0"		15"	90"	90"	90"	90"	15"	
13'-0"		6"	72"	72"	6"			41'-0"		6"	96"	96"	96"	96"	6"	
14'-0"		12"	72"	72"	12"			42'-0"		12"	96"	96"	96"	96"	12"	
15'-0"		18"	72"	72"	18"			43'-0"		18"	96"	96"	96"	96"	18"	
16'-0"	4	12"	84"	84"	12"			44'-0"	7	12"	84"	84"	84"	84"	12"	
17'-0"		18"	84"	84"	18"			45'-0"		18"	84"	84"	84"	84"	18"	
18'-0"		12"	96"	96"	12"			46'-0"		6"	90"	90"	90"	90"	6"	
19'-0"		18"	96"	96"	18"			47'-0"		12"	90"	90"	90"	90"	12"	
20'-0"		12"	72"	72"	72"	12"				48'-0"	18"	90"	90"	90"	90"	18"
21'-0"		18"	72"	72"	72"	18"				49'-0"	6"	96"	96"	96"	96"	6"
22'-0"	5	6"	84"	84"	84"	6"			50'-0"	8	12"	96"	96"	96"	96"	12"
23'-0"		12"	84"	84"	84"	12"			51'-0"		18"	96"	96"	96"	96"	18"
24'-0"		18"	84"	84"	84"	18"			52'-0"		18"	84"	84"	84"	84"	18"
25'-0"		6"	96"	96"	96"	6"			53'-0"		24"	84"	84"	84"	84"	24"
26'-0"		12"	96"	96"	96"	12"			54'-0"		9"	90"	90"	90"	90"	9"
27'-0"		18"	96"	96"	96"	18"			55'-0"		15"	90"	90"	90"	90"	15"
28'-0"	5	12"	78"	78"	78"	12"			56'-0"	8	21"	90"	90"	90"	90"	21"
29'-0"		6"	84"	84"	84"	6"			57'-0"		6"	96"	96"	96"	96"	6"
30'-0"		12"	84"	84"	84"	12"			58'-0"		12"	96"	96"	96"	96"	12"
31'-0"		18"	84"	84"	84"	18"			59'-0"		18"	96"	96"	96"	96"	18"

Pay Item:
7 ~ Sign Attachment Assembly, Ref. No. 116

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION

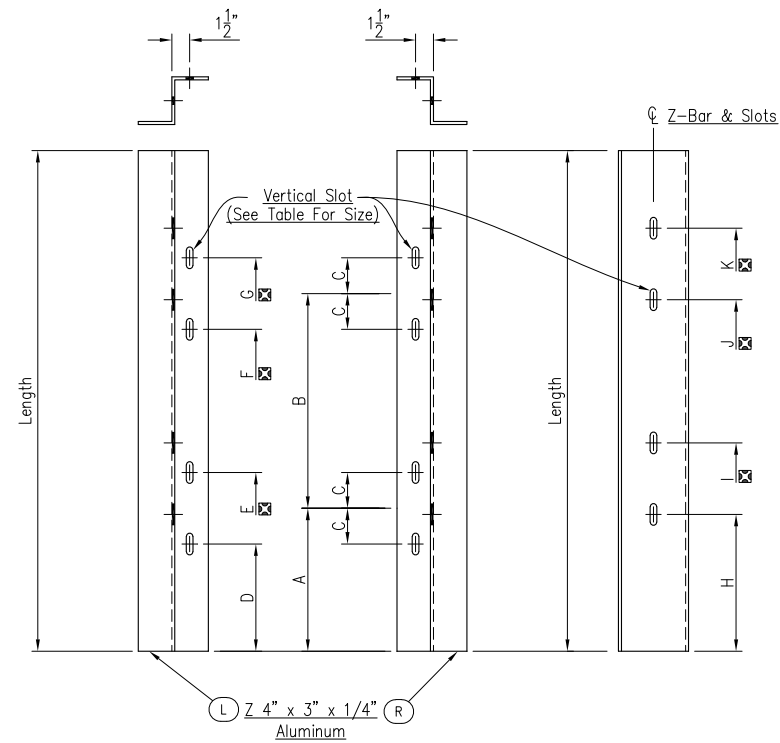
BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3

Project: 3000-18
Hamilton Co., OH

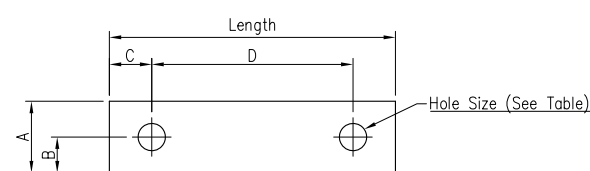
Description: Erection Details Of New Sign Supports For Existing Structure
Ref. No. OS-1 & OS-2

Printed For: Ohio | Drawn By: JH | Date: 9-3-19 | Checked By: CR | Date: 9-9-19 | Job No: OH-15319 | Rev: 1 Of 2



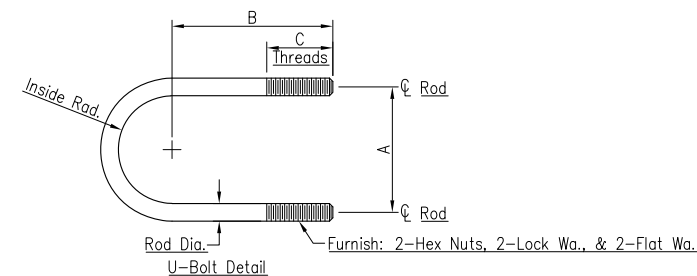
Sign Support Detail

Qty.	MK	Length	Vertical Slot Size	A	B	C	D	E	F	G	H	I	J	K
1	S6L S6R	8'-0"	9/16"Ø x 1" Slot	1'-6"	5'-0"	3 1/8"	1'-2 7/8"	1'-9 1/8"	6'-2 7/8"	6'-9 1/8"	-	-	-	-
1	S14L S14R	13'-0"	9/16"Ø x 1" Slot	2'-6"	5'-0"	3 1/8"	2'-2 7/8"	2'-9 1/8"	7'-2 7/8"	7'-9 1/8"	-	-	-	-



1/16" Thick Chloroprene Gasket Detail (G)

Qty.	MK	Length	A	B	C	D	Hole Size	Remarks
10	G6	0'-7 3/4"	3"	1 1/2"	3/4"	6 1/4"	9/16"	Sign Suppt. To Steel Chord, Use W/UB006



Qty.	MK	Rod Dia.	A	B	C	"Rod Length"	"Inside Rad."	Connection	Materials
4	UB003	1/2"	6 1/8"	4 1/4"	2"	1'-6 1/8"	0'-2 13/16"	5.5" O.D. Chord To Sign Support	Stn. Stl.
10	UB006	1/2"	6 1/4"	4 3/8"	2"	1'-6 9/16"	0'-2 7/8"	5.563" O.D. Chord To Sign Support	Galv. Steel

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
1	S6L	Z 4" x 3" x 1/4"	8'-0"	Alum.	AZ4X2.85*
1	S6R	do	8'-0"		AZ4X2.85*
1	S14L	do	13'-0"		AZ4X2.85*
4	S14R	do	13'-0"	Alum.	AZ4X2.85*
2	UB003	1/2"Ø S.S. U-Bolt	1'-6 1/8"		SSRD.5**
4	-	1/2"Ø S.S. Hex Nut	-		NSS04
4	-	1/2"Ø S.S. Flat Washer	-		WSS04
4	-	1/2"Ø S.S. Lock Washer	-		LWSS04
10	UB006	1/2"Ø Galv. U-Bolt	1'-6 9/16"		RD.5A
20	-	1/2"Ø Galv. Hex Nut	-		NSG042
20	-	1/2"Ø Galv. Flat Washer	-		WSG042
20	-	1/2"Ø Galv. Lock Washer	-		LWSG042
10	G6	1/16" x 3"	0'-7 3/4"	Chloroprene Gasket	1/16" NEOPRENE

NOTE:

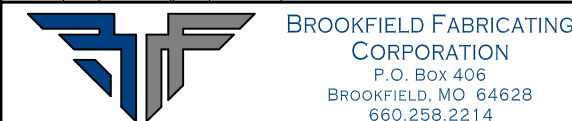
☒ Indicates Progressive Dimensions.

MATERIAL SPECIFICATIONS:

Steel U-Bolts To Be A.S.T.M. A307
 Steel Nuts & Washers To Be A.S.T.M. A307
 Galvanize Hardware Per A.S.T.M. A153

Aluminum Zee To Be A.S.T.M. B211, 6061-T6

PRINTS ISSUED			REVISIONS		
FOR	NO.	DATE	NO.	DATE	DESCRIPTION



Customer:	Security Fence Group, Inc.	P.O. No: 183000-3
Project:	3000-18	Hamilton Co., OH
Description:	Fabrication Details Of Sign Supports, U-Bolts, Gaskets, & Related Hardware	
Printed For:	Ohio	Job No: OH-15319
Drawn By:	JH	Rev:
Date:	9-3-19	Sheet No: 4 Of 4
Checked By:	CR	
Date:	9-9-19	

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
35	za	F.B. 5" x 1/4"	2'-0"		FB5X.25A
70	zb	PL 1/8" x 4 5/16"	0'-7"	(Before Bending)	PL.125A
140	-	5/8"∅ S.S. Hilti Kwik Bolt III Exp. Anchor	8 1/2"	Stainless Steel (Long Thread)	KB3SS05X68-52-**

Pay Items:

35 Ea. ~ Reference Marker Barrier Bracket, Ref # 20

MATERIAL SPECIFICATIONS:

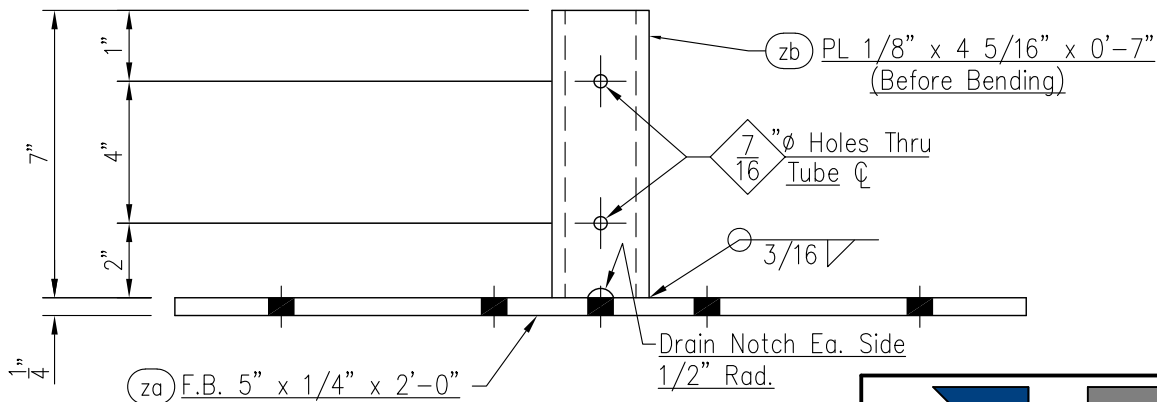
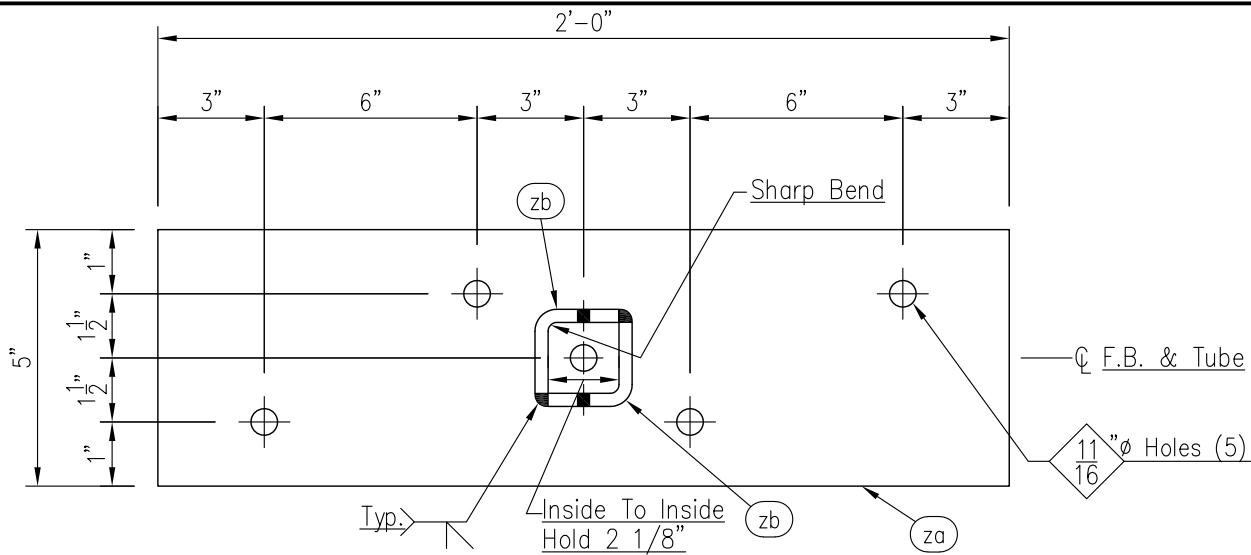
Steel F.B. & Plate: A.S.T.M. A36
 Galvanize Steel After Fabrication Per A.S.T.M. A123
 S.S. Hardware Shall Be Passivated Commercial Grade
 A.S.T.M. A320 (AISI 300 Series)



BROOKFIELD FABRICATING CORPORATION

P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:							
Security Fence Group, Inc.				P.O. No: 183000-3			
Project:							
3000-18				Hamilton Co., OH			
Description:							
Bill Of Materials For Sleeve Assembly For Concrete Median Barrier Mounted Posts							
Ref. No: 20							
Printed For:	Drwn By:	Date:	Chk. By:	Date:	Job No:	Part:	Sheet No:
Ohio	SB	7-21-20	CR DAS	7-28-20	OH-15319		1 of 2



MATERIAL SPECIFICATIONS:

Steel F.B. & Plate: A.S.T.M. A36

Galvanize Steel After Fabrication Per A.S.T.M. A123

S.S. Hardware Shall Be Passivated Commercial Grade

A.S.T.M. A320 (AISI 300 Series)



BROOKFIELD FABRICATING CORPORATION

P.O. Box 406
 BROOKFIELD, MO 64628
 660.258.2214

Customer:							
Security Fence Group, Inc.				P.O. No: 183000-3			
Project:							
3000-18				Hamilton Co., OH			
Description:							
Fabrication Details Of Sleeve Assembly For Concrete Median Barrier Mounted Posts							
Ref. No: 20							
Printed For:	Drwn By:	Date:	Chk. By:	Date:	Job No:	Part:	Sheet No:
Ohio	SB	7-21-20	CR DAS	7-28-20	OH-15319		2 of 2

Bill Of Materials

Qty.	Mk	Description	Length	Remarks	Inventory No.
3	x1	C15 x 50#	3'-0"		C15X50A
3	x2	C7 x 9.8#	1'-0"		C7X9.8A
12	AB2	5/8"∅ Galv. Full Thread Rod	0'-7"	Chisel Point	RD.625A
12	-	5/8"∅ Galv. Hex Nut	-		NSG052
12	-	5/8"∅ Galv. Flat Washer	-		WSG052
12	-	5/8"∅ Hilti Adhesive Capsule	0'-5"	(Or Approved Equal)	HCAP5/8X5
6	-	5/16"∅ Galv. Full Thread Hex Bolt	3 1/2"	(Full Threaded)	BSG.3123.52-FTD
6	-	5/16"∅ Galv. Hex Nut	-		NSG.3122
6	-	5/16"∅ Galv. Flat Washer	-		WSG.3122
6	-	5/16"∅ Galv. Lock Washer	-		LWSG.3122

Pay Items:

3 Ea. ~ Sign Support Assembly, Median Barrier Mounted, Method A, Ref. # 20

Material Specifications:

Steel Channel To Be A.S.T.M. A36

Galvanize Steel After Fabrication Per A.S.T.M. A123

Steel Rod & Hardware To Be A.S.T.M. A307

Galv. Steel Rod & Hardware Per A.S.T.M. A153



BROOKFIELD FABRICATING CORPORATION

P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer:

Security Fence Group, Inc. P.O. No: 183000-3

Project:

3000-18
Hamilton Co., OH

Description:

Bill Of Materials For Barrier Mounted Sign Support Assembly, Method A
Ref. No: 20

Printed For:

Ohio

Drwn By:

SB

Date:

7-21-20

Chk. By:

CR DAS

Date:

7-28-20

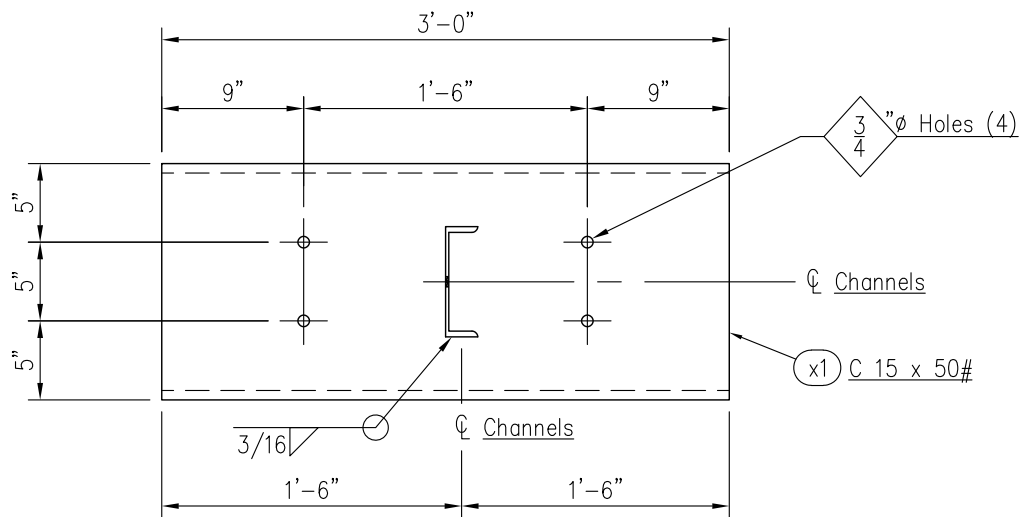
Job No:

OH-15319

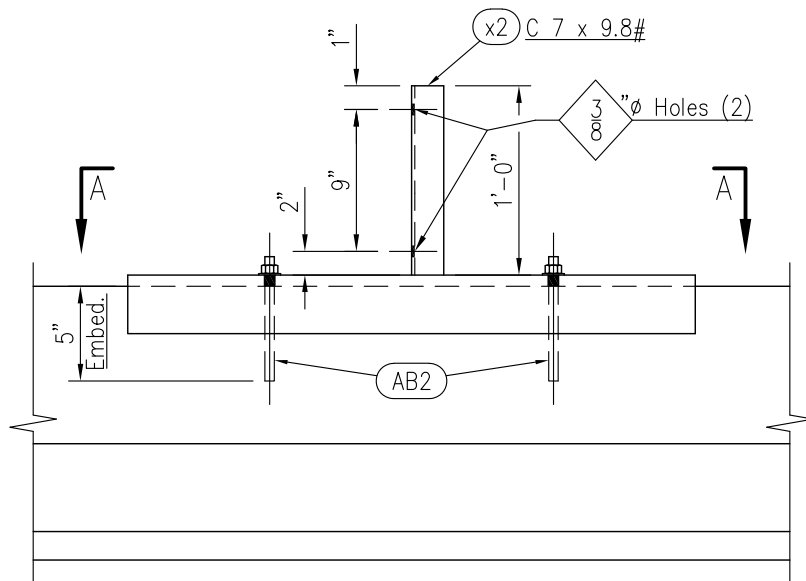
Part:

Sheet No:

1 of 2



View A-A



Barrier Mounted Sign Support (X1)
3 ~ Req'd.



BROOKFIELD FABRICATING CORPORATION
P.O. Box 406
BROOKFIELD, MO 64628
660.258.2214

Customer: Security Fence Group, Inc. P.O. No: 183000-3							
Project: 3000-18 Hamilton Co., OH							
Description: Erection & Fabrication Details Of Barrier Mounted Sign Support Assembly, Method A Ref. No: 20							
Printed For:	Drwn By:	Date:	Chk. By:	Date:	Job No:	Part:	Sheet No:
Ohio	SB	7-21-20	CR DAS	7-28-20	OH-15319		2 of 2



SUBMITTAL FOR ACCEPTANCE

Project: **183000**
Ref. No.: **Various**
Description: **Light Pole, Towers & Luminaires**
Quantity:

Date: 6/13/2019

To: Mr. Dan Kleinhenz
Walsh Construction

From: Dan Wackerman
Security Fence Group
Traffic Signals & Lighting Division
1500 Farr Drive, Suite 2
Dayton, OH 45404

In accordance with ODOT C&MS, submittals for the following reference number are attached. All material meets the requirements of the plan documents and ODOT CMS 2016. Please forward to ODOT for Acceptance.

Ref. No.	Item Code	Description	Quantity	Unit
23		Light Pole, Low Mast (ALM50)	30	EA
25		Light Tower (BBBB100)	15	EA
26		Light Tower (BBBBBB100)	4	EA
38A		LED High Mast Luminaire, APP, Symmetric	1	EA
39A		LED High Mast Luminaire, APP, Symmetric	44	EA
40A		LED High Mast Luminaire, APP Asymmetric	40	EA
41A		LED Low Mast Luminaire, APP, Symmetric	30	EA
42A		LED Underpass Luminaire, APP	4	EA

If you have any questions regarding this submission, please contact me at (937) 424-3000 or by e-mail at danw@sfence.com

Sincerely,

Dan Wackerman
Project Manager



April 19, 2019

Dan Wackerman
Security Traffic Signals & Lighting
4260 Dane St.
Cincinnati, OH 45223

Ref: Submittal for ODOT Project 3000-18; Hamilton Co.

Dear Dan:

This is to certify that all of the traffic signal material represented by the enclosed catalog cuts are in conformance with all contract requirements for ODOT Project 3000-18; Hamilton Co. **This order will be released upon approval of the enclosed catalog cuts.**

Sincerely,
Path Master, Inc.

Ben Stidd
General Manager

cc: Project File

State of Ohio
County of Summit

Sworn to before me and subscribed in my presence this 19th day of April, 20 19.

Notary Public Jody Cronin

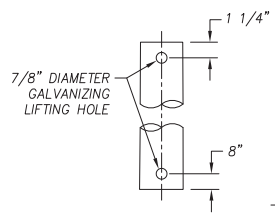


Jody Cronin
Resident Summit County
Notary Public, State of Ohio
My Commission Expires: 2/15/2022

ODOT 3000-18; Hamilton Co.
B/R# 23
Qty. 30

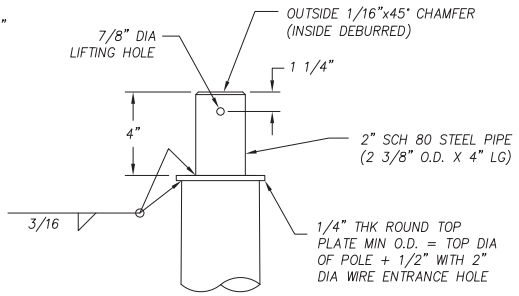
QTY	UMIC DESIGN NUMBER	OHIO NUMBER	POLE TUBE SIZES			POLE BASE CONNECTION DATA (in)					ANCHOR BOLT SIZE (in)
			TUBE A	JTI LGTH	TUBE B	B.C.	S	F	P	T	
30	70805-B45-Y1	ALM50	11E-10.00x7.48x18'-0"	18	11E-7.97x3.91x29'-0"	13	13	9 3/16	4 1/4	1	1 x 36 x 4

11 GA = .120" WALL THICKNESS
E = ROUND STEEL MONOTUBE @ .14 in/ft TAPER

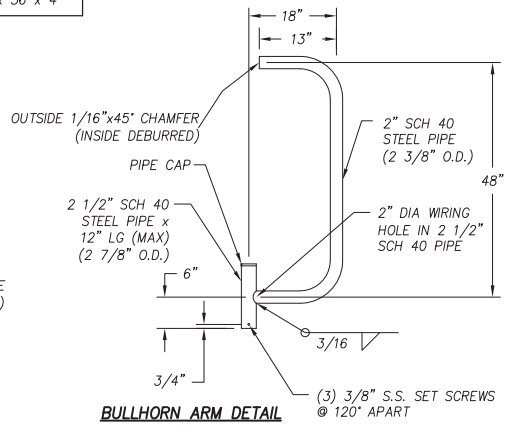


ORIENTATION OF HOLES AS REQUIRED

LIFTING HOLE REQUIREMENTS
BOTTOM SECTION:
• TOP HOLE ONLY
TOP SECTION:
• BOTTOM HOLE ONLY



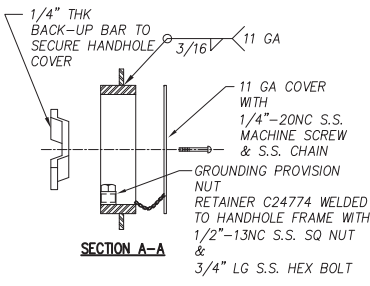
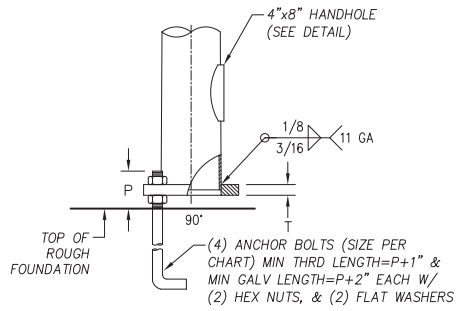
POLE TENON DETAIL



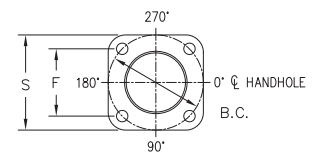
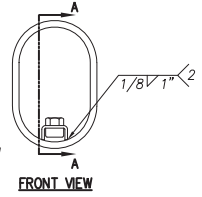
BULLHORN ARM DETAIL

DESIGN CRITERIA:

1. DESIGNED IN ACCORDANCE WITH 2001 AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS" FOR 90 M.P.H. WIND ZONE.
2. ANCHOR BOLTS ANALYZED FOR STEEL STRENGTH ONLY. THE ANCHOR BOLT EMBEDMENT LENGTH SHOWN ON THIS DRAWING SHALL BE VERIFIED BY THE FOUNDATION ENGINEER.
3. CUSTOMER TO CONFIRM ALL DIMENSIONS & ORIENTATIONS BEFORE RELEASING ORDER FOR MANUFACTURING.

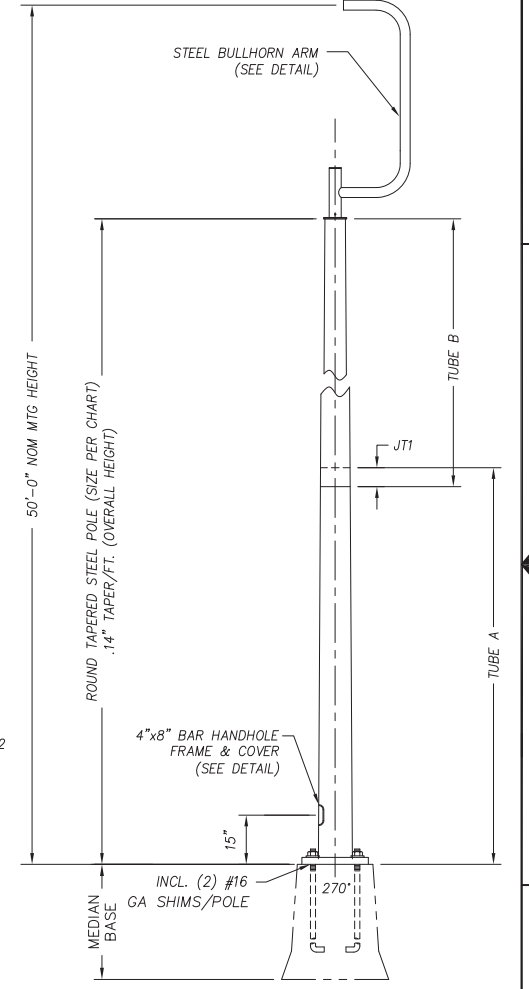


4" x 8" HANDHOLE FRAME DETAIL



BASE PLATE DETAIL

MATERIAL SPECIFICATIONS	
TAPERED TUBE (-J)	ASTM A572 GR 50
PLATE	ASTM A36
HANDHOLE FRAME	ASTM A529 GR 50 or A572 GR 50
HANDHOLE COVER	ASTM A36 or A1011
ANCHOR BOLTS	ASTM F1554 GR 55
ANCHOR BOLT NUTS	ASTM A563 GR A
FLAT WASHERS	ASTM F436
POLE TOP	ASTM B26 (356.0F) or A1011
PIPE	ASTM A501, A53 GR B, OR A500 GR B
S.S. HARDWARE	AISI-300 SERIES (18-8)
STRUCTURE FINISH	PER SALES ORDER
HARDWARE FINISH	HD GALV TO ASTM A153



STATE:	OH	REQ# / SO# :	DOH-61808-1	REV		DESCRIPTION		DATE		REV BY/PK BY	
PROJECT NAME:		ODOT 8000-18		REVISIONS							
STEEL STREET MEDIAN MOUNTED LIGHTING POLES FOR HAMILTON COUNTY, OHIO											
DESIGNED BY	DJH	CHECKED BY	KALP	DATE	3/12/19	SCALE	NTS	ENG REF	70805-B37		
UNION METAL INDUSTRIES CORPORATION						70805-B45		REVISION	RO	SHEET	1 OF 1

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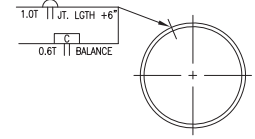
QTY	CUSTOMER NUMBER	UMC DESIGN NUMBER	NOM HEIGHT	TAPER	POLE TUBE SIZES						POLE BASE CONNECTION DATA (in)					ANCHOR BOLTS		
					TUBE A		TUBE B		TUBE C		B.C.	S	F	P	T	QTY	SIZE (in)	
					NOM	MIN	NOM	MIN	NOM	MIN								
15	BBBB100	72118-B356-Y1	100'-0"	0.14	3E-18.00x13.49x32'-3"	27	20.8	7E-14.20x8.71x39'-3"	24	13.5	7E-9.38x4.94x31'-9"	24	26	12	7 1/4	1 3/4	6	1 3/4 x 84 x 6
4	BBBBBB100	72118-B356-Y2	100'-0"	0.14	3E-18.00x13.49x32'-3"	27	20.8	7E-14.20x8.71x39'-3"	24	13.5	7E-9.38x4.94x31'-9"	24	26	12	7 1/4	1 3/4	6	1 3/4 x 84 x 6

ODOT 3000-18; Hamilton Co.
B/R# 25, Qty. 15
B/R# 26, Qty. 4

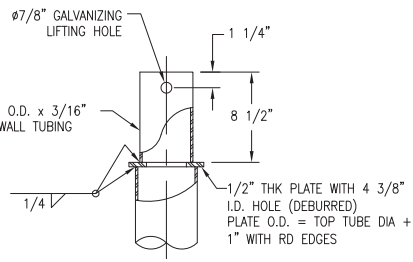
7 GA = 0.179" WALL THICKNESS
3 GA = 0.250" WALL THICKNESS
E = ROUND TAPERED STEEL TUBE @ 0.14 in/ft TAPER

DESIGN CRITERIA:

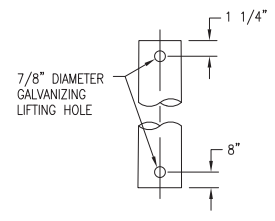
- DESIGNED IN ACCORDANCE WITH THE 2001 AASHTO, "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" FOR 90 MPH WIND ZONE. OHIO DOT 2010 CMS OF 1-1-10.
THE DESIGN PARAMETERS INCLUDE:
50 YEAR STRUCTURE DESIGN LIFE
FATIGUE CATEGORY III
NATURAL WIND GUST
TRUCK GUST 65MPH
- DESIGNED FOR THE FOLLOWING LOADS: (6) LUMINAIRE FIXTURES (75 lbs & 3.50 sq ft EPA PER FIXTURE) AND (1) LOWERING DEVICE (340 lbs & 5.3 sq ft EPA).
- ANCHOR BOLTS ANALYZED FOR STEEL STRENGTH ONLY. THE ANCHOR BOLT EMBEDMENT LENGTH SHOWN ON THIS DRAWING SHALL BE VERIFIED BY THE FOUNDATION ENGINEER.
- THE EXPOSED LENGTH OF THE ANCHOR BOLT BETWEEN THE TOP OF THE FOUNDATION AND THE BOTTOM OF THE LEVELING NUT SHOULD NOT EXCEED ONE BOLT DIAMETER.
- PER AASHTO THE MINIMUM LENGTH OF ANY TELESCOPIC FIELD JOINT SHALL BE 1.5 TIMES THE INSIDE DIAMETER OF THE END OF THE FEMALE SECTION.
- LONGITUDINAL TUBE SEAM WELDS: 100% PENETRATION FOR MINIMUM JOINT LENGTH PLUS 6" (FEMALE TUBES ONLY) & FOR 6" NEXT TO A FULL PENETRATION CIRCUMFERENTIAL WELD SEAM. ALL OTHER SEAM WELDS ARE 60%.
- CUSTOMER TO CONFIRM ALL DIMENSIONS & ORIENTATIONS BEFORE RELEASING ORDER FOR MANUFACTURING.



WELD SEAM FOR ROUND SHAFT
(ANGULAR ORIENTATION MAY VARY FROM THAT SHOWN)

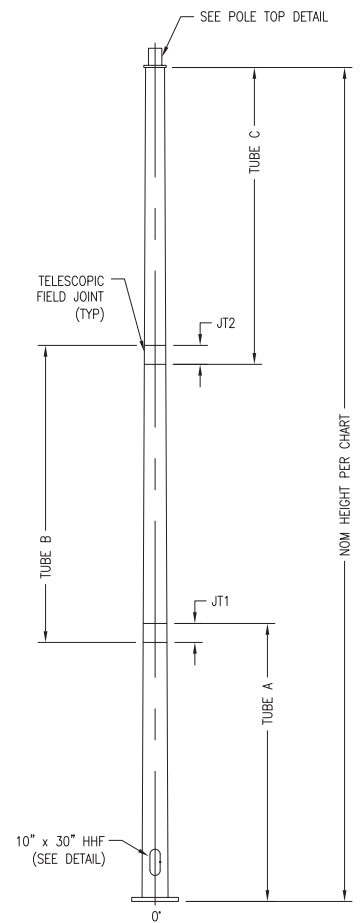


POLE TOP (TENON) DETAIL



ORIENTATION OF HOLES AS REQUIRED

- LIFTING HOLE REQUIREMENTS**
- BOTTOM SECTION:
 - TOP HOLE ONLY
 - MIDDLE SECTION:
 - BOTH HOLES
 - TOP SECTION:
 - BOTTOM HOLE ONLY



MATERIAL SPECIFICATIONS	
MANDREL TUBE	ASTM A595 GR A
PLATE	ASTM A36
HANDHOLE FRAME	ASTM A529 GR 50 or ASTM A572 GR 50 or ASTM A709 GR 50
HANDHOLE COVER	ASTM A1011
ANCHOR BOLTS	ASTM F1554 GR 55
ANCHOR BOLT NUTS	ASTM A563 GR A
FLAT WASHERS	ASTM F436
TENON	ASTM A513
S.S. HARDWARE	AISI-300 SERIES (18-8)
STRUCTURE FINISH	HD GALV TO ASTM A123
HARDWARE FINISH	HD GALV TO ASTM A153

STATE:	REQ# / SO# :	REV	DESCRIPTION	DATE	REV BY/CHK BY
OH	DOH-61808-1				
PROJECT NAME: ODOT 8000-18			REVISIONS		
STEEL AREA LIGHTING HIGHMAST POLES FOR USE WITH HOLOPHANE LOWERING DEVICE HAMILTON COUNTY, OHIO					
UNION METAL INDUSTRIES CORPORATION	DESIGNED BY	CHECKED BY	DATE	SCALE	ENG REF
	DJH	KMS	3/12/19	NTS	72118-B302
72118-B356				REVISION	SHEET
				RO	1 OF 2

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CANTON, OHIO

3/12/19 11:29 AM

ANALYSIS AND DESIGN OF
TAPERED STEEL LIGHTING SUPPORT STRUCTURES

FOR

HAMILTON, OH

DESIGN CRITERIA

2001 AASHTO - 90 MPH WIND
AND
CUSTOMER SPECIFICATIONS

Product Engineer
Donald Herman

REQ NO. 61808-1

UNION METAL CORPORATION

1432 Maple Avenue NE, Canton, Ohio 44705

Phone:330-456-7653 Fax: 330-456-0196

Mast Arm and Pole Design Program - Version 2.0.2 - July 15, 2007

Engineer: Donald Herman

Phone:

Fax:

Email: dherman@unionmetal.com

Computer File: C:\CALCS\OH\61808\1-150 LIGHTING - BULLHORN ARM.dat

3/12/2019 11:23:59 AM

UMC Reference No. 61808-1

Structure Description: ROUND TAPERED STEEL LIGHTING SUPPORT

Project Description: HAMILTON, OH

Design Code: 2001 AASHTO

Basic Wind Speed: 90 mph

Wind Pressure Method: 2001 AASHTO

Gust Effect Factor: 1.14

Allowable Stress Increase for Wind: 1.33

Ice Loading: 3.0 psf

Structure Design Life: 50 yrs

Wind Importance Factor: 1.00

Wind Exposure: Alpha: 9.5 Zg: 900 ft Zmin: 16.4 ft

Structure Identification: 50 LIGHTING POLE WITH BULLHORN ARM - MEDIAN MOUNTED

Pole - Structure Data

Number of Tubes: 3

Total Pole Length: 50.00 ft

Tube 1: 0.120 in wall x 10.00 in OD x 7.48 in OD x 18.00 ft length

Tube 2: 0.120 in wall x 7.97 in OD x 3.91 in OD x 29.00 ft length w/ 1.50 ft Slip Joint Splice

Tube 3: 0.154 in wall x 2.38 in OD x 2.38 in OD x 4.50 ft length w/ Smooth Full Pen. Butt Weld

Pole Base Connection Type: Base Plate with Embedded Anchor Bolts

Anchor Bolt Specification: ASTM-F1554 GR 55

Anchor Bolt Diameter: 1.00 in

Number of Bolts: 4

Base Plate Shape: Polygon

Anchor Bolt Orientation: X-axis between bolts

Base Plate Type: Socket - Fillet

Plate Specification: ASTM-A36

Base Plate Thickness: 1.00 in

Bolt Circle: 13 in

Plate Width: 13 in

Outside Fillet Weld Size: 0.188 in

Inside Fillet Weld Size: 0.125 in

Weld Line Offset: 0.375 in

Weld Electrode: ER70S-X

Pole Signal Loads (lbs)(ft)

No.	Height	Orientation	Weight	Front Area	Side Area	Ice Area	Horz. Cd	H. Offset
1	50	90	67	2.62	2.62	5.24	1.0	1.5

Pole - Member Geometry (ft) - Section Properties (in)

Member	Yi	Yj	Length	WindHt	Wall	ODi	ODj	AveOD	Si	Sj	Ai	Aj	Ri	Rj	Taper	Shape	Material
1	0.00	1.50	1.50	4.25	0.120	10.00	9.79	9.90	9.20	8.81	3.72	3.64	4.94	4.84	0.14	Round	ASTM A595 GR A
2	1.50	6.50	5.00	7.50	0.120	9.79	9.09	9.44	8.81	7.58	3.64	3.38	4.84	4.49	0.14	Round	ASTM A595 GR A

3	6.50	11.50	5.00	12.50	0.120	9.09	8.39	8.74	7.58	6.44	3.38	3.12	4.49	4.14	0.14	Round	ASTM A595 GR A
4	11.50	16.50	5.00	17.50	0.120	8.39	7.69	8.04	6.44	5.40	3.12	2.85	4.14	3.79	0.14	Round	ASTM A595 GR A
5	16.50	18.00	1.50	20.75	0.240	7.97	7.76	7.87	11.26	10.65	5.83	5.67	3.87	3.76	0.14	Round	ASTM A595 GR A
6	18.00	22.58	4.58	23.79	0.120	7.76	7.12	7.44	5.50	4.61	2.88	2.64	3.82	3.50	0.14	Round	ASTM A595 GR A
7	22.58	27.17	4.58	28.38	0.120	7.12	6.48	6.80	4.61	3.81	2.64	2.40	3.50	3.18	0.14	Round	ASTM A595 GR A
8	27.17	31.75	4.58	32.96	0.120	6.48	5.84	6.16	3.81	3.08	2.40	2.15	3.18	2.86	0.14	Round	ASTM A595 GR A
9	31.75	36.33	4.58	37.54	0.120	5.84	5.19	5.51	3.08	2.42	2.15	1.91	2.86	2.54	0.14	Round	ASTM A595 GR A
10	36.33	40.92	4.58	42.13	0.120	5.19	4.55	4.87	2.42	1.85	1.91	1.67	2.54	2.22	0.14	Round	ASTM A595 GR A
11	40.92	45.50	4.58	46.71	0.120	4.55	3.91	4.23	1.85	1.35	1.67	1.43	2.22	1.90	0.14	Round	ASTM A595 GR A
12	45.50	50.00	4.50	51.25	0.154	2.38	2.38	2.38	0.56	0.56	1.08	1.08	1.11	1.11	0.00	Round	ASTM A53 GR B

Pole - Member Forces (ft & lbs)

Group I																		
Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	499	0	0	0	109	0	499	0	0	0	109	0	480	0	0	0	109
2	0	480	0	0	0	109	0	480	0	0	0	109	0	420	0	0	0	109
3	0	420	0	0	0	109	0	420	0	0	0	109	0	365	0	0	0	109
4	0	365	0	0	0	109	0	365	0	0	0	109	0	314	0	0	0	108
5	0	314	0	0	0	108	0	314	0	0	0	108	0	285	0	0	0	108
6	0	285	0	0	0	108	0	285	0	0	0	108	0	242	0	0	0	108
7	0	242	0	0	0	108	0	242	0	0	0	108	0	203	0	0	0	107
8	0	203	0	0	0	107	0	203	0	0	0	107	0	167	0	0	0	106
9	0	167	0	0	0	106	0	167	0	0	0	106	0	136	0	0	0	105
10	0	136	0	0	0	105	0	136	0	0	0	105	0	108	0	0	0	104
11	0	108	0	0	0	104	0	108	0	0	0	104	0	83	0	0	0	103
12	0	83	0	0	0	103	0	83	0	0	0	103	0	67	0	0	0	101
Group II																		
Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	499	534	-15,728	-114	109	0	498	535	-15,728	-114	109	0	479	523	-14,935	-114	109
2	0	480	522	-14,935	-114	109	0	475	526	-14,935	-114	108	0	416	485	-12,408	-114	108
3	0	420	481	-12,408	-114	109	0	409	490	-12,408	-114	106	0	355	447	-10,065	-114	106
4	0	365	439	-10,065	-113	108	0	349	452	-10,065	-114	104	0	300	407	-7,920	-114	104
5	0	314	396	-7,920	-113	108	0	297	409	-7,920	-114	103	0	268	394	-7,318	-114	103
6	0	285	382	-7,318	-112	108	0	265	396	-7,318	-114	102	0	225	350	-5,609	-114	101
7	0	242	339	-5,609	-111	107	0	221	353	-5,609	-114	100	0	184	304	-4,105	-114	99
8	0	203	292	-4,105	-110	106	0	181	306	-4,105	-114	98	0	149	254	-2,823	-114	97
9	0	167	243	-2,823	-109	105	0	147	256	-2,823	-114	96	0	119	201	-1,778	-114	95
10	0	136	191	-1,777	-108	104	0	117	202	-1,778	-114	94	0	94	149	-976	-114	93
11	0	108	140	-975	-106	103	0	93	150	-976	-114	92	0	74	102	-402	-114	91
12	0	83	94	-401	-105	102	0	73	103	-402	-113	90	0	59	76	-1	-113	89
Group III																		
Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	773	341	-9,890	-60	140	0	773	342	-9,890	-60	140	0	742	334	-9,383	-60	140
2	0	742	333	-9,383	-60	140	0	740	338	-9,383	-60	139	0	644	309	-7,767	-60	139
3	0	646	305	-7,767	-60	139	0	641	314	-7,767	-60	139	0	552	284	-6,274	-60	138
4	0	556	276	-6,274	-59	139	0	550	288	-6,274	-60	137	0	468	256	-4,913	-60	136
5	0	474	246	-4,913	-59	138	0	467	259	-4,913	-60	136	0	428	248	-4,533	-60	136
6	0	435	237	-4,533	-59	137	0	427	250	-4,533	-60	135	0	359	219	-3,458	-60	134
7	0	365	208	-3,458	-58	136	0	357	222	-3,458	-60	134	0	295	190	-2,516	-60	132
8	0	302	178	-2,515	-57	135	0	293	192	-2,515	-60	132	0	237	158	-1,715	-60	130
9	0	244	147	-1,715	-56	133	0	236	160	-1,715	-60	130	0	186	124	-1,066	-60	128
10	0	192	115	-1,066	-55	131	0	186	125	-1,066	-60	128	0	142	91	-572	-60	126
11	0	147	83	-572	-54	129	0	142	91	-572	-60	126	0	104	60	-226	-60	124
12	0	108	54	-226	-53	127	1	104	61	-226	-60	123	1	80	40	0	-60	120

Pole - Member Deflections (in & Deg)

Group I							Group II						Group III					
Member	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.14	0.00	0.00	0.00	0.00	0.01	-0.09	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	-0.64	0.00	0.00	0.00	0.00	0.27	-0.40	0.00	0.01
3	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	1.36	-1.15	0.00	0.01	0.01	0.00	0.85	-0.71	0.00	0.01
4	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.00	2.84	-1.68	0.00	0.02	0.03	0.00	1.77	-1.04	0.00	0.02
5	0.03	0.00	0.00	0.00	0.00	0.02	0.03	0.00	3.38	-1.75	0.00	0.02	0.04	0.00	2.10	-1.09	0.00	0.02
6	0.05	0.00	0.00	0.00	0.00	0.02	0.05	0.00	5.27	-2.19	0.00	0.02	0.06	0.00	3.27	-1.35	0.00	0.03
7	0.08	0.00	0.00	0.00	0.00	0.03	0.08	0.00	7.58	-2.62	0.00	0.03	0.10	0.00	4.70	-1.62	0.00	0.04
8	0.12	0.00	0.00	0.00	0.00	0.05	0.11	0.00	10.29	-3.04	0.00	0.05	0.15	0.00	6.37	-1.87	0.00	0.06
9	0.17	0.00	0.00	0.00	0.00	0.07	0.16	0.00	13.39	-3.42	0.00	0.06	0.21	0.00	8.28	-2.10	0.00	0.08
10	0.24	0.00	0.00	0.00	0.00	0.09	0.24	0.00	16.84	-3.75	0.00	0.09	0.30	0.00	10.39	-2.29	0.00	0.11
11	0.35	0.00	0.00	0.00	0.00	0.13	0.33	0.00	20.56	-4.00	0.00	0.12	0.43	0.00	12.66	-2.43	0.00	0.16
12	0.57	0.00	0.00	0.00	0.00	0.33	0.54	0.00	24.56	-4.37	0.02	0.31	0.70	0.00	15.08	-2.64	0.01	0.41

Pole - Member Stresses (psi)

Group I														
Member	fai	fvi	fbi	Fai	Fvi	Fbi	CSRi	faj	fvj	fbj	Faj	Fvj	Fbj	CSRj
1	134	0	143	33,000	15,953	33,528	0.008	132	0	149	33,000	16,469	33,787	0.008
2	132	0	149	33,000	16,469	33,787	0.008	124	0	173	33,000	18,150	34,737	0.009
3	124	0	173	33,000	18,150	34,737	0.009	117	0	203	33,000	18,150	35,845	0.009
4	117	0	203	33,000	18,150	35,845	0.009	110	0	241	33,000	18,150	36,300	0.010
5	54	0	116	33,000	18,150	36,300	0.005	50	0	122	33,000	18,150	36,300	0.005
6	99	0	236	33,000	18,150	36,300	0.010	92	0	280	33,000	18,150	36,300	0.010
7	92	0	280	33,000	18,150	36,300	0.010	85	0	337	33,000	18,150	36,300	0.012
8	85	0	337	33,000	18,150	36,300	0.012	78	0	413	33,000	18,150	36,300	0.014
9	78	0	413	33,000	18,150	36,300	0.014	71	0	519	33,000	18,150	36,300	0.016
10	71	0	519	33,000	18,150	36,300	0.016	64	0	673	33,000	18,150	36,300	0.020
11	64	0	673	33,000	18,150	36,300	0.020	58	0	909	33,000	18,150	36,300	0.027
12	78	1	2,184	21,000	11,550	23,100	0.098	62	1	2,142	21,000	11,550	23,100	0.096

Group II														
Member	fai	fvi	fbi	Fai	Fvi	Fbi	CSRi	faj	fvj	fbj	Faj	Fvj	Fbj	CSRj
1	134	361	20,526	43,890	21,218	44,592	0.464	132	364	20,347	43,890	21,904	44,936	0.456
2	130	366	20,347	43,890	21,904	44,936	0.456	123	377	19,645	43,890	24,140	46,200	0.428
3	121	380	19,645	43,890	24,140	46,200	0.428	114	393	18,749	43,890	24,140	47,674	0.396
4	112	396	18,749	43,890	24,140	47,674	0.396	105	412	17,608	43,890	24,140	48,279	0.367
5	51	201	8,443	43,890	24,140	48,279	0.176	47	203	8,243	43,890	24,140	48,279	0.172
6	92	399	15,973	43,890	24,140	48,279	0.333	85	414	14,592	43,890	24,140	48,279	0.304
7	84	416	14,592	43,890	24,140	48,279	0.304	77	433	12,946	43,890	24,140	48,279	0.270
8	76	435	12,946	43,890	24,140	48,279	0.270	69	458	11,016	43,890	24,140	48,279	0.230
9	68	459	11,016	43,890	24,140	48,279	0.230	62	492	8,810	43,890	24,140	48,279	0.184
10	61	493	8,810	43,890	24,140	48,279	0.184	56	547	6,357	43,890	24,140	48,279	0.133
11	56	548	6,357	43,890	24,140	48,279	0.133	52	647	3,654	43,890	24,140	48,279	0.078
12	68	1,327	8,779	27,930	15,362	30,723	0.296	55	1,277	1,889	27,930	15,362	30,723	0.070

Group III														
Member	fai	fvi	fbi	Fai	Fvi	Fbi	CSRi	faj	fvj	fbj	Faj	Fvj	Fbj	CSRj
1	208	223	12,908	43,890	21,218	44,592	0.294	204	224	12,784	43,890	21,904	44,936	0.289
2	203	226	12,784	43,890	21,904	44,936	0.289	190	230	12,300	43,890	24,140	46,200	0.271
3	190	233	12,300	43,890	24,140	46,200	0.271	177	238	11,689	43,890	24,140	47,674	0.249
4	176	241	11,689	43,890	24,140	47,674	0.249	164	246	10,927	43,890	24,140	48,279	0.230
5	80	121	5,240	43,890	24,140	48,279	0.110	76	121	5,108	43,890	24,140	48,279	0.108
6	148	239	9,898	43,890	24,140	48,279	0.208	136	244	9,001	43,890	24,140	48,279	0.190
7	135	246	9,001	43,890	24,140	48,279	0.190	123	253	7,941	43,890	24,140	48,279	0.167
8	122	255	7,941	43,890	24,140	48,279	0.167	110	264	6,708	43,890	24,140	48,279	0.142
9	110	265	6,708	43,890	24,140	48,279	0.142	97	278	5,313	43,890	24,140	48,279	0.112
10	97	279	5,313	43,890	24,140	48,279	0.112	85	303	3,798	43,890	24,140	48,279	0.081

11	85	304	3,798	43,890	24,140	48,279	0.081	73	350	2,286	43,890	24,140	48,279	0.049
12	96	711	5,493	27,930	15,362	30,723	0.184	75	672	2,566	27,930	15,362	30,723	0.088

Pole Base - Connection Stresses (psi) - Strength Design

	Group I	Group II	Group III
Bolt Stress			
Applied Tensile	118	17,065	10,807
Applied Shear	0	307	187
Allowable Tensile	27,500	36,575	36,575
Allowable Shear	16,500	21,945	21,945
Bolt Ratio	0.004	0.467	0.296
Base Plate Stress			
Applied Bending	108	15,584	9,800
Allowable Bending	27,000	35,910	35,910
Ratio	0.004	0.434	0.273
Fillet Weld Stress			
Applied Outside Socket	169	7,283	4,690
Applied Inside Socket	74	10,626	6,682
Allowable Stress	21,000	27,930	27,930
Outside Socket Ratio	0.008	0.261	0.168
Inside Socket Ratio	0.004	0.380	0.239

UNION METAL CORPORATION

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Mast Arm and Pole Design Program - Version 2.0.2 - July 15, 2007

Engineer: Nick Gallucci

Phone: 330-458-5151

Fax: 330-458-5276

Email: ngallucci@unionmetal.com

Computer File: C:\CALCS\OH\61808\11100 HM.dat

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UMC Reference No. 49309-1

Structure Description: ROUND TAPERED STEEL LIGHT TOWER

Project Description: FRANKLIN COUNTY, OH

Design Code: Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals

Basic Wind Speed: 90 mph

Wind Pressure Method: 2001 AASHTO

Gust Effect Factor: 1.14

Allowable Stress Increase for Wind: 1.33

Ice Loading: 3.0 psf

Structure Design Life: 50 yrs

Wind Importance Factor: 1.00

Wind Exposure: Alpha: 9.5 Zg: 900 ft Zmin: 16.4 ft

Fatigue Category: III

Fatigue Structure Type: High Level Lighting

Galloping: Importance Factor: N/A Basic Pressure: 21.0 psf

Natural Wind Gust: Importance Factor: 0.44 Basic Pressure: 5.2 psf Yearly Mean Wind Speed: 11.2 mph

Truck-Induced Gust: Importance Factor: N/A Basic Pressure: 18.8 psf Truck Vehicle Speed: 65 mph

Structure Identification: 100' HIGHMAST (WORST CASE - 6 LUMINAIRES)

Pole - Structure Data

Number of Tubes: 3

Total Pole Length: 99.00 ft

Tube 1: 0.250 in wall x 18.00 in OD x 13.49 in OD x 32.25 ft length

Tube 2: 0.179 in wall x 14.20 in OD x 8.71 in OD x 39.25 ft length w/ 2.25 ft Slip Joint Splice

Tube 3: 0.179 in wall x 9.38 in OD x 4.94 in OD x 31.75 ft length w/ 2.00 ft Slip Joint Splice

Pole Base Connection Type: Base Plate with Embedded Anchor Bolts

Anchor Bolt Specification: ASTM-F1554 GR 55

Anchor Bolt Diameter: 1.75 in

Number of Bolts: 6

Base Plate Shape: Polygon

Anchor Bolt Orientation: X-axis between bolts

Base Plate Type: Full Weld Backup - Full Pen.

Plate Specification: ASTM-A36

Base Plate Thickness: 1.75 in

Bolt Circle: 24 in

Plate Width: 26.5 in

Pole Signal Loads (lbs)(ft)

No.	Height	Orientation	Weight	Front Area	Side Area	Ice Area	Horz. Cd	H. Offset
1	99	90	790	26.3	26.3	52.6	1.0	2.0

Pole - Member Geometry (ft) - Section Properties (in)

Member	Yi	Yj	Length	WindHt	Wall	ODi	ODj	AveOD	Si	Sj	Ai	Aj	Ri	Rj	Taper	Shape	Material
1	0.00	5.00	5.00	3.50	0.250	18.00	17.30	17.65	61.83	57.05	13.93	13.38	8.88	8.53	0.14	Round	ASTM A595 GR A

2	5.00	10.00	5.00	8.50	0.250	17.30	16.60	16.95	57.05	52.46	13.38	12.83	8.53	8.18	0.14	Round	ASTM A595 GR A
3	10.00	15.00	5.00	13.50	0.250	16.60	15.90	16.25	52.46	48.07	12.83	12.29	8.18	7.83	0.14	Round	ASTM A595 GR A
4	15.00	20.00	5.00	18.50	0.250	15.90	15.20	15.55	48.07	43.86	12.29	11.74	7.83	7.48	0.14	Round	ASTM A595 GR A
5	20.00	25.00	5.00	23.50	0.250	15.20	14.50	14.85	43.86	39.85	11.74	11.19	7.48	7.13	0.14	Round	ASTM A595 GR A
6	25.00	30.00	5.00	28.50	0.250	14.50	13.80	14.15	39.85	36.03	11.19	10.64	7.13	6.78	0.14	Round	ASTM A595 GR A
7	30.00	32.25	2.25	32.13	0.429	14.20	13.89	14.04	63.86	60.98	18.55	18.13	6.89	6.73	0.14	Round	ASTM A595 GR A
8	32.25	37.25	5.00	35.75	0.179	13.89	13.19	13.54	26.40	23.77	7.70	7.31	6.85	6.50	0.14	Round	ASTM A595 GR A
9	37.25	42.25	5.00	40.75	0.179	13.19	12.49	12.84	23.77	21.28	7.31	6.92	6.50	6.15	0.14	Round	ASTM A595 GR A
10	42.25	47.25	5.00	45.75	0.179	12.49	11.79	12.14	21.28	18.93	6.92	6.52	6.15	5.80	0.14	Round	ASTM A595 GR A
11	47.25	52.25	5.00	50.75	0.179	11.79	11.09	11.44	18.93	16.71	6.52	6.13	5.80	5.45	0.14	Round	ASTM A595 GR A
12	52.25	57.25	5.00	55.75	0.179	11.09	10.39	10.74	16.71	14.64	6.13	5.74	5.45	5.10	0.14	Round	ASTM A595 GR A
13	57.25	62.25	5.00	60.75	0.179	10.39	9.69	10.04	14.64	12.70	5.74	5.34	5.10	4.75	0.14	Round	ASTM A595 GR A
14	62.25	67.25	5.00	65.75	0.179	9.69	8.99	9.34	12.70	10.90	5.34	4.95	4.75	4.40	0.14	Round	ASTM A595 GR A
15	67.25	69.25	2.00	69.25	0.358	9.38	9.10	9.24	22.87	21.48	10.14	9.83	4.51	4.37	0.14	Round	ASTM A595 GR A
16	69.25	74.21	4.96	72.73	0.179	9.10	8.41	8.75	11.18	9.51	5.01	4.62	4.46	4.11	0.14	Round	ASTM A595 GR A
17	74.21	79.17	4.96	77.69	0.179	8.41	7.71	8.06	9.51	7.97	4.62	4.23	4.11	3.77	0.14	Round	ASTM A595 GR A
18	79.17	84.13	4.96	82.65	0.179	7.71	7.02	7.36	7.97	6.57	4.23	3.84	3.77	3.42	0.14	Round	ASTM A595 GR A
19	84.13	89.08	4.96	87.60	0.179	7.02	6.32	6.67	6.57	5.30	3.84	3.45	3.42	3.07	0.14	Round	ASTM A595 GR A
20	89.08	94.04	4.96	92.56	0.179	6.32	5.63	5.98	5.30	4.17	3.45	3.06	3.07	2.73	0.14	Round	ASTM A595 GR A
21	94.04	99.00	4.96	97.52	0.179	5.63	4.94	5.28	4.17	3.18	3.06	2.67	2.73	2.38	0.14	Round	ASTM A595 GR A

Pole - Member Forces (ft & lbs)

Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	3,395	0	0	0	2,239	0	3,395	0	0	0	2,239	0	3,163	0	0	0	2,238
2	0	3,163	0	0	0	2,238	1	3,163	0	0	0	2,238	1	2,940	0	0	0	2,234
3	0	2,940	0	0	0	2,234	1	2,940	0	0	0	2,234	1	2,726	0	0	0	2,228
4	0	2,726	0	0	0	2,228	2	2,726	0	0	0	2,228	2	2,522	0	0	0	2,220
5	0	2,522	0	0	0	2,220	2	2,522	0	0	0	2,220	2	2,327	0	0	0	2,209
6	0	2,327	0	0	0	2,209	3	2,327	0	0	0	2,209	2	2,141	0	0	0	2,196
7	0	2,141	0	0	0	2,196	3	2,141	0	0	0	2,196	3	2,001	0	0	0	2,190
8	0	2,001	0	0	0	2,190	3	2,001	0	0	0	2,190	3	1,873	0	0	0	2,175
9	0	1,873	0	0	0	2,175	4	1,873	0	0	0	2,175	4	1,752	0	0	0	2,156
10	0	1,752	0	0	0	2,156	5	1,752	0	0	0	2,156	4	1,637	0	0	0	2,133
11	0	1,637	0	0	0	2,133	6	1,637	0	0	0	2,133	5	1,530	0	0	0	2,106
12	0	1,530	0	0	0	2,106	6	1,530	0	0	0	2,106	6	1,429	0	0	0	2,075
13	0	1,429	0	0	0	2,075	7	1,429	0	0	0	2,075	7	1,335	0	0	0	2,040
14	0	1,335	0	0	0	2,040	8	1,335	0	0	0	2,040	8	1,247	0	0	0	1,999
15	0	1,247	0	0	0	1,999	9	1,247	0	0	0	1,999	8	1,179	0	0	0	1,981
16	0	1,179	0	0	0	1,981	10	1,179	0	0	0	1,981	9	1,098	0	0	0	1,936
17	0	1,098	0	0	0	1,936	11	1,098	0	0	0	1,936	10	1,023	0	0	0	1,884
18	0	1,023	0	0	0	1,884	12	1,023	0	0	0	1,884	11	955	0	0	0	1,825
19	0	955	0	0	0	1,825	14	955	0	0	0	1,825	13	893	0	0	0	1,757
20	0	893	0	0	0	1,757	17	893	0	0	0	1,757	16	838	0	0	0	1,676
21	0	838	0	0	0	1,676	20	838	0	0	0	1,676	19	790	0	0	0	1,580

Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	3,395	1,988	-155,696	-2,048	2,081	0	3,385	2,006	-155,696	-2,048	2,071	0	3,153	1,937	-145,842	-2,048	2,070
2	0	3,163	1,921	-145,841	-2,047	2,080	1	3,132	1,970	-145,842	-2,048	2,048	1	2,910	1,901	-136,164	-2,048	2,045
3	0	2,940	1,856	-136,164	-2,045	2,077	1	2,889	1,934	-136,165	-2,048	2,021	1	2,677	1,866	-126,666	-2,048	2,016
4	0	2,726	1,793	-126,665	-2,042	2,071	2	2,654	1,898	-126,667	-2,048	1,991	1	2,453	1,829	-117,352	-2,048	1,983
5	0	2,522	1,732	-117,351	-2,037	2,064	2	2,429	1,859	-117,353	-2,048	1,956	2	2,238	1,788	-108,235	-2,048	1,947
6	0	2,327	1,671	-108,234	-2,030	2,054	2	2,213	1,818	-108,236	-2,048	1,918	2	2,032	1,745	-99,329	-2,048	1,908
7	0	2,141	1,610	-99,327	-2,022	2,043	2	2,017	1,763	-99,329	-2,048	1,888	2	1,879	1,725	-95,406	-2,048	1,883
8	0	2,001	1,582	-95,403	-2,017	2,037	3	1,859	1,746	-95,406	-2,048	1,859	2	1,737	1,674	-86,856	-2,048	1,846
9	0	1,873	1,521	-86,853	-2,006	2,024	3	1,703	1,709	-86,857	-2,048	1,802	3	1,589	1,637	-78,496	-2,048	1,787

10	0	1,752	1,461	-78,492	-1,993	2,007	4	1,554	1,670	-78,497	-2,047	1,740	3	1,448	1,598	-70,329	-2,047	1,723
11	0	1,637	1,403	-70,324	-1,976	1,987	4	1,411	1,631	-70,330	-2,047	1,672	4	1,313	1,560	-62,356	-2,047	1,653
12	0	1,530	1,348	-62,350	-1,956	1,965	4	1,275	1,591	-62,357	-2,047	1,598	4	1,185	1,521	-54,578	-2,047	1,577
13	0	1,429	1,295	-54,571	-1,933	1,939	5	1,145	1,552	-54,580	-2,047	1,518	5	1,063	1,481	-47,000	-2,047	1,495
14	0	1,335	1,242	-46,991	-1,906	1,909	5	1,021	1,510	-47,002	-2,047	1,432	5	948	1,437	-39,637	-2,047	1,407
15	0	1,247	1,187	-39,626	-1,875	1,877	5	923	1,453	-39,639	-2,048	1,367	5	863	1,415	-36,770	-2,048	1,357
16	0	1,179	1,165	-36,758	-1,862	1,863	5	840	1,429	-36,772	-2,047	1,321	5	776	1,353	-29,878	-2,047	1,296
17	0	1,098	1,108	-29,864	-1,827	1,827	5	739	1,374	-29,881	-2,048	1,235	5	684	1,296	-23,265	-2,048	1,209
18	0	1,023	1,049	-23,249	-1,787	1,788	6	648	1,314	-23,268	-2,048	1,147	5	602	1,235	-16,951	-2,048	1,120
19	0	955	988	-16,933	-1,743	1,745	6	569	1,251	-16,955	-2,048	1,060	6	532	1,170	-10,958	-2,048	1,031
20	0	893	924	-10,936	-1,693	1,697	6	504	1,182	-10,963	-2,049	979	6	476	1,100	-5,308	-2,049	948
21	0	838	857	-5,282	-1,637	1,643	7	458	1,108	-5,314	-2,049	914	7	440	1,025	-32	-2,049	879

Group III Member		FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	4,445	1,105	-88,265	-1,182	2,895	0	4,442	1,118	-88,265	-1,182	2,891	0	4,140	1,073	-82,789	-1,182	2,889	
2	0	4,143	1,061	-82,789	-1,182	2,893	1	4,134	1,098	-82,789	-1,182	2,882	1	3,845	1,053	-77,414	-1,182	2,876	
3	0	3,854	1,018	-77,413	-1,180	2,886	2	3,838	1,077	-77,414	-1,182	2,868	2	3,561	1,032	-72,142	-1,182	2,858	
4	0	3,576	978	-72,141	-1,177	2,876	3	3,554	1,056	-72,142	-1,182	2,850	3	3,289	1,011	-66,975	-1,182	2,836	
5	0	3,311	938	-66,974	-1,173	2,862	4	3,282	1,035	-66,976	-1,182	2,827	3	3,030	990	-61,916	-1,182	2,809	
6	0	3,058	901	-61,914	-1,168	2,845	4	3,022	1,013	-61,916	-1,182	2,800	4	2,783	968	-56,965	-1,182	2,778	
7	0	2,816	865	-56,963	-1,162	2,823	5	2,778	982	-56,965	-1,182	2,772	4	2,613	959	-54,781	-1,182	2,761	
8	0	2,651	849	-54,779	-1,158	2,813	5	2,607	976	-54,781	-1,182	2,753	5	2,428	933	-50,010	-1,182	2,727	
9	0	2,470	814	-50,007	-1,150	2,786	6	2,417	961	-50,010	-1,182	2,713	6	2,248	917	-45,316	-1,182	2,682	
10	0	2,299	781	-45,313	-1,139	2,755	8	2,237	945	-45,317	-1,182	2,665	7	2,077	902	-40,702	-1,182	2,629	
11	0	2,137	749	-40,698	-1,126	2,717	9	2,065	929	-40,703	-1,181	2,611	8	1,916	885	-36,170	-1,181	2,569	
12	0	1,984	719	-36,165	-1,111	2,674	10	1,903	912	-36,172	-1,181	2,550	9	1,764	868	-31,723	-1,181	2,502	
13	0	1,841	689	-31,716	-1,092	2,624	11	1,751	895	-31,724	-1,181	2,482	10	1,621	850	-27,364	-1,181	2,428	
14	0	1,708	660	-27,356	-1,071	2,567	13	1,607	876	-27,366	-1,181	2,406	12	1,488	829	-23,105	-1,181	2,345	
15	0	1,583	629	-23,095	-1,046	2,502	13	1,480	844	-23,107	-1,182	2,332	12	1,400	820	-21,443	-1,182	2,306	
16	0	1,501	616	-21,432	-1,035	2,475	14	1,392	833	-21,444	-1,181	2,293	13	1,283	784	-17,438	-1,181	2,228	
17	0	1,385	584	-17,426	-1,005	2,405	15	1,271	804	-17,441	-1,181	2,207	14	1,171	753	-13,584	-1,181	2,135	
18	0	1,279	550	-13,569	-972	2,327	17	1,159	771	-13,587	-1,181	2,114	15	1,070	719	-9,895	-1,181	2,035	
19	0	1,183	514	-9,877	-934	2,239	19	1,059	735	-9,899	-1,181	2,014	17	981	681	-6,389	-1,181	1,926	
20	0	1,095	477	-6,367	-892	2,141	21	971	695	-6,394	-1,181	1,908	20	903	639	-3,091	-1,181	1,807	
21	0	1,017	436	-3,064	-843	2,028	24	897	647	-3,098	-1,180	1,796	23	839	590	-32	-1,180	1,679	

Galloping Member		FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Natural Wind Gust																		
Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	0	299	-15,608	-121	0	0	0	299	-15,608	-121	0	0	0	281	-14,157	-121	0
2	0	0	281	-14,157	-121	0	0	0	281	-14,157	-121	0	0	0	263	-12,797	-121	0
3	0	0	263	-12,797	-121	0	0	0	263	-12,797	-121	0	0	0	246	-11,525	-121	0
4	0	0	246	-11,525	-121	0	0	0	246	-11,525	-121	0	0	0	230	-10,336	-121	0
5	0	0	230	-10,336	-121	0	0	0	230	-10,336	-121	0	0	0	214	-9,227	-121	0
6	0	0	214	-9,227	-121	0	0	0	214	-9,227	-121	0	0	0	199	-8,195	-121	0
7	0	0	199	-8,195	-121	0	0	0	199	-8,195	-121	0	0	0	192	-7,754	-121	0
8	0	0	192	-7,754	-121	0	0	0	192	-7,754	-121	0	0	0	178	-6,828	-121	0
9	0	0	178	-6,828	-121	0	0	0	178	-6,828	-121	0	0	0	165	-5,971	-121	0
10	0	0	165	-5,971	-121	0	0	0	165	-5,971	-121	0	0	0	152	-5,180	-121	0
11	0	0	152	-5,180	-121	0	0	0	152	-5,180	-121	0	0	0	140	-4,451	-121	0
12	0	0	140	-4,451	-121	0	0	0	140	-4,451	-121	0	0	0	129	-3,780	-121	0
13	0	0	129	-3,780	-121	0	0	0	129	-3,780	-121	0	0	0	118	-3,163	-121	0
14	0	0	118	-3,163	-121	0	0	0	118	-3,163	-121	0	0	0	108	-2,598	-121	0
15	0	0	108	-2,598	-121	0	0	0	108	-2,598	-121	0	0	0	104	-2,385	-121	0
16	0	0	104	-2,385	-121	0	0	0	104	-2,385	-121	0	0	0	95	-1,891	-121	0
17	0	0	95	-1,891	-121	0	0	0	95	-1,891	-121	0	0	0	87	-1,440	-121	0
18	0	0	87	-1,440	-121	0	0	0	87	-1,440	-121	0	0	0	79	-1,029	-121	0
19	0	0	79	-1,029	-121	0	0	0	79	-1,029	-121	0	0	0	72	-655	-121	0
20	0	0	72	-655	-121	0	0	0	72	-655	-121	0	0	0	66	-313	-121	0
21	0	0	66	-313	-121	0	0	0	66	-313	-121	0	0	0	60	0	-121	0

Truck-Induced Gust																		
Member	FxiW	FyiW	FziW	MxiW	MyiW	MziW	Fxi	Fyi	Fzi	Mxi	Myi	Mzi	Fxj	Fyj	Fzj	Mxj	Myj	Mzj
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Pole - Member Deflections (in & Deg)

Member	Group I						Group II						Group III					
	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z
1	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.20	-0.39	0.00	0.01	0.00	0.00	0.11	-0.22	0.00	0.01
2	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.83	-0.80	0.00	0.01	0.01	0.00	0.46	-0.44	0.00	0.01
3	0.03	0.00	0.00	0.00	0.00	0.02	0.03	0.00	1.89	-1.24	0.00	0.02	0.03	0.00	1.05	-0.69	0.00	0.02
4	0.05	0.00	0.00	0.00	0.00	0.03	0.05	0.00	3.43	-1.70	0.00	0.03	0.06	0.00	1.90	-0.94	0.00	0.03

5	0.08	0.00	0.00	0.00	0.00	0.04	0.08	0.00	5.47	-2.19	0.00	0.03	0.10	0.00	3.02	-1.21	0.00	0.04
6	0.12	0.00	0.00	0.00	0.00	0.05	0.12	0.00	8.03	-2.71	0.00	0.04	0.16	0.00	4.44	-1.50	0.00	0.06
7	0.15	0.00	0.00	0.00	0.00	0.05	0.14	0.00	9.34	-2.85	0.00	0.05	0.19	0.00	5.17	-1.58	0.00	0.06
8	0.21	0.00	0.00	0.00	0.00	0.07	0.20	0.00	12.70	-3.57	0.00	0.06	0.26	0.00	7.03	-1.98	0.00	0.08
9	0.28	0.00	0.00	0.00	0.00	0.08	0.27	0.00	16.83	-4.33	0.00	0.08	0.36	0.00	9.32	-2.40	0.00	0.11
10	0.38	0.00	0.00	0.00	0.00	0.11	0.36	0.00	21.78	-5.15	0.00	0.10	0.48	0.00	12.06	-2.85	0.00	0.13
11	0.51	0.00	0.00	0.00	0.00	0.13	0.48	0.00	27.61	-6.02	0.00	0.12	0.64	0.00	15.30	-3.34	0.00	0.17
12	0.67	0.00	0.00	0.00	0.00	0.17	0.62	0.00	34.38	-6.95	0.00	0.15	0.83	0.00	19.06	-3.85	0.00	0.20
13	0.86	0.00	0.00	0.00	0.00	0.20	0.79	0.00	42.15	-7.94	0.00	0.18	1.07	0.00	23.38	-4.40	0.00	0.25
14	1.10	0.00	0.00	0.00	0.00	0.25	1.00	0.00	50.97	-8.99	0.01	0.22	1.36	0.00	28.29	-4.99	0.01	0.31
15	1.21	0.00	0.00	0.00	0.00	0.26	1.10	0.00	54.76	-9.19	0.01	0.23	1.49	0.00	30.40	-5.10	0.01	0.32
16	1.51	0.00	0.00	0.00	0.00	0.32	1.36	0.00	64.76	-10.16	0.01	0.28	1.86	0.00	35.96	-5.64	0.01	0.39
17	1.88	0.00	0.00	0.00	0.00	0.39	1.67	0.00	75.77	-11.16	0.02	0.33	2.31	0.00	42.09	-6.19	0.01	0.47
18	2.33	0.00	0.00	0.00	0.00	0.49	2.05	0.00	87.79	-12.15	0.02	0.40	2.86	0.00	48.80	-6.74	0.02	0.58
19	2.90	0.00	0.00	0.00	0.00	0.61	2.52	0.00	100.80	-13.08	0.04	0.50	3.53	0.00	56.05	-7.25	0.03	0.72
20	3.61	0.00	0.00	0.00	0.00	0.78	3.09	0.00	114.67	-13.84	0.06	0.62	4.38	0.00	63.79	-7.67	0.05	0.92
21	4.54	0.00	0.00	0.00	0.00	1.02	3.82	0.00	129.12	-14.18	0.10	0.79	5.46	0.00	71.86	-7.86	0.08	1.18

Galloping		Natural Wind Gust										Truck-Induced Gust						
Member	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z	Disp-X	Disp-Y	Disp-Z	Ang-X	Ang-Y	Ang-Z
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	-0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	-0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	-0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	-0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	-0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	-0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	-0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	-0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05	-0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.56	-0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.14	-0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.80	-0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.54	-0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.85	-0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.67	-0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.55	-0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.51	-0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.53	-1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.60	-1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.72	-1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Pole - Member Stresses (psi)

Group I															
Member	fai	fvi	fbi	Fai	Fvi	Fbi	CSRi	faj	fvj	fbj	Faj	Fvj	Fbj	CSRj	
1	244	0	435	33,000	18,150	35,429	0.020	236	0	471	33,000	18,150	35,994	0.020	
2	236	0	471	33,000	18,150	35,994	0.020	229	0	511	33,000	18,150	36,300	0.021	
3	229	0	511	33,000	18,150	36,300	0.021	222	0	556	33,000	18,150	36,300	0.022	
4	222	0	556	33,000	18,150	36,300	0.022	215	0	607	33,000	18,150	36,300	0.023	
5	215	0	607	33,000	18,150	36,300	0.023	208	0	665	33,000	18,150	36,300	0.025	
6	208	0	665	33,000	18,150	36,300	0.025	201	0	732	33,000	18,150	36,300	0.026	
7	115	0	413	33,000	18,150	36,300	0.015	110	0	431	33,000	18,150	36,300	0.015	
8	260	1	996	33,000	17,764	34,425	0.037	256	1	1,098	33,000	18,150	35,114	0.039	
9	256	1	1,098	33,000	18,150	35,114	0.039	253	1	1,216	33,000	18,150	35,880	0.042	
10	253	1	1,216	33,000	18,150	35,880	0.042	251	1	1,352	33,000	18,150	36,300	0.045	
11	251	2	1,352	33,000	18,150	36,300	0.045	250	2	1,512	33,000	18,150	36,300	0.049	
12	250	2	1,512	33,000	18,150	36,300	0.049	249	2	1,702	33,000	18,150	36,300	0.054	

13	249	3	1,702	33,000	18,150	36,300	0.054	250	3	1,928	33,000	18,150	36,300	0.061
14	250	3	1,928	33,000	18,150	36,300	0.061	252	3	2,201	33,000	18,150	36,300	0.068
15	123	2	1,048	33,000	18,150	36,300	0.033	120	2	1,107	33,000	18,150	36,300	0.034
16	235	4	2,126	33,000	18,150	36,300	0.066	237	4	2,442	33,000	18,150	36,300	0.074
17	237	5	2,442	33,000	18,150	36,300	0.074	242	5	2,835	33,000	18,150	36,300	0.085
18	242	6	2,835	33,000	18,150	36,300	0.085	248	6	3,333	33,000	18,150	36,300	0.099
19	248	7	3,333	33,000	18,150	36,300	0.099	259	8	3,974	33,000	18,150	36,300	0.117
20	259	10	3,974	33,000	18,150	36,300	0.117	274	10	4,820	33,000	18,150	36,300	0.141
21	274	13	4,820	33,000	18,150	36,300	0.141	295	14	5,965	33,000	18,150	36,300	0.173

Group II														
Member	fai	fvi	fbi	Fai	Fvi	Fbi	CSRi	faj	fvj	fbj	Faj	Fvj	Fbj	CSRj
1	243	487	30,220	43,890	24,140	47,120	0.647	236	505	30,679	43,890	24,140	47,872	0.647
2	234	510	30,679	43,890	24,140	47,872	0.647	227	531	31,149	43,890	24,140	48,279	0.651
3	225	536	31,149	43,890	24,140	48,279	0.651	218	559	31,627	43,890	24,140	48,279	0.661
4	216	565	31,627	43,890	24,140	48,279	0.661	209	592	32,110	43,890	24,140	48,279	0.670
5	207	597	32,110	43,890	24,140	48,279	0.670	200	628	32,597	43,890	24,140	48,279	0.680
6	198	633	32,597	43,890	24,140	48,279	0.680	191	669	33,086	43,890	24,140	48,279	0.690
7	109	383	18,667	43,890	24,140	48,279	0.389	104	392	18,779	43,890	24,140	48,279	0.392
8	241	919	43,381	43,890	23,626	45,785	0.954	238	975	43,860	43,890	24,140	46,701	0.946
9	233	984	43,860	43,890	24,140	46,701	0.946	230	1,051	44,278	43,890	24,140	47,720	0.935
10	225	1,060	44,278	43,890	24,140	47,720	0.935	222	1,139	44,602	43,890	24,140	48,279	0.931
11	216	1,149	44,602	43,890	24,140	48,279	0.931	214	1,244	44,788	43,890	24,140	48,279	0.935
12	208	1,254	44,788	43,890	24,140	48,279	0.935	207	1,370	44,766	43,890	24,140	48,279	0.935
13	200	1,380	44,766	43,890	24,140	48,279	0.935	199	1,522	44,441	43,890	24,140	48,279	0.929
14	191	1,533	44,441	43,890	24,140	48,279	0.929	192	1,708	43,679	43,890	24,140	48,279	0.914
15	91	824	20,806	43,890	24,140	48,279	0.434	88	860	20,559	43,890	24,140	48,279	0.429
16	168	1,668	39,484	43,890	24,140	48,279	0.826	168	1,877	37,736	43,890	24,140	48,279	0.791
17	160	1,886	37,736	43,890	24,140	48,279	0.791	162	2,153	35,063	43,890	24,140	48,279	0.738
18	153	2,162	35,063	43,890	24,140	48,279	0.738	157	2,512	31,023	43,890	24,140	48,279	0.657
19	148	2,521	31,023	43,890	24,140	48,279	0.657	154	2,994	24,897	43,890	24,140	48,279	0.535
20	146	3,002	24,897	43,890	24,140	48,279	0.534	156	3,664	15,502	43,890	24,140	48,279	0.348
21	150	3,669	15,502	43,890	24,140	48,279	0.348	164	4,635	3,321	43,890	24,140	48,279	0.109

Group III														
Member	fai	fvi	fbi	Fai	Fvi	Fbi	CSRi	faj	fvj	fbj	Faj	Fvj	Fbj	CSRj
1	319	275	17,140	43,890	24,140	47,120	0.371	309	285	17,424	43,890	24,140	47,872	0.371
2	309	288	17,424	43,890	24,140	47,872	0.371	300	299	17,720	43,890	24,140	48,279	0.374
3	299	303	17,720	43,890	24,140	48,279	0.374	290	316	18,025	43,890	24,140	48,279	0.380
4	289	319	18,025	43,890	24,140	48,279	0.380	280	334	18,340	43,890	24,140	48,279	0.386
5	280	338	18,340	43,890	24,140	48,279	0.386	271	355	18,663	43,890	24,140	48,279	0.393
6	270	359	18,663	43,890	24,140	48,279	0.393	262	379	18,994	43,890	24,140	48,279	0.400
7	150	217	10,716	43,890	24,140	48,279	0.225	144	222	10,795	43,890	24,140	48,279	0.227
8	338	522	24,935	43,890	23,626	45,785	0.553	332	554	25,285	43,890	24,140	46,701	0.550
9	331	561	25,285	43,890	24,140	46,701	0.550	325	598	25,600	43,890	24,140	47,720	0.544
10	323	606	25,600	43,890	24,140	47,720	0.544	318	651	25,859	43,890	24,140	48,279	0.544
11	317	659	25,859	43,890	24,140	48,279	0.544	313	713	26,036	43,890	24,140	48,279	0.547
12	310	722	26,036	43,890	24,140	48,279	0.547	307	787	26,089	43,890	24,140	48,279	0.548
13	305	796	26,089	43,890	24,140	48,279	0.548	303	876	25,963	43,890	24,140	48,279	0.546
14	301	886	25,963	43,890	24,140	48,279	0.546	301	985	25,576	43,890	24,140	48,279	0.538
15	146	476	12,183	43,890	24,140	48,279	0.256	142	497	12,050	43,890	24,140	48,279	0.253
16	278	966	23,143	43,890	24,140	48,279	0.487	277	1,084	22,183	43,890	24,140	48,279	0.468
17	275	1,093	22,183	43,890	24,140	48,279	0.468	277	1,244	20,696	43,890	24,140	48,279	0.438
18	274	1,253	20,696	43,890	24,140	48,279	0.438	279	1,452	18,447	43,890	24,140	48,279	0.392
19	276	1,461	18,447	43,890	24,140	48,279	0.392	284	1,730	15,095	43,890	24,140	48,279	0.324
20	281	1,738	15,095	43,890	24,140	48,279	0.324	295	2,115	10,293	43,890	24,140	48,279	0.228
21	293	2,119	10,294	43,890	24,140	48,279	0.228	314	2,670	6,340	43,890	24,140	48,279	0.151

Galloping

Natural Wind Gust

Truck-Induced Gust

Member	fbi	Fbi	Ratio i	fj	Fj	Ratio j	fbi	Fbi	Ratio i	fj	Fj	Ratio j	fbi	Fbi	Ratio i	fj	Fj	Ratio j
1	0	12,000	0.000	0	12,000	0.000	3,029	12,000	0.252	2,978	12,000	0.248	0	12,000	0.000	0	12,000	0.000
2	0	12,000	0.000	0	12,000	0.000	2,978	12,000	0.248	2,927	12,000	0.244	0	12,000	0.000	0	12,000	0.000
3	0	12,000	0.000	0	12,000	0.000	2,927	12,000	0.244	2,877	12,000	0.240	0	12,000	0.000	0	12,000	0.000
4	0	12,000	0.000	0	12,000	0.000	2,877	12,000	0.240	2,828	12,000	0.236	0	12,000	0.000	0	12,000	0.000
5	0	12,000	0.000	0	12,000	0.000	2,828	12,000	0.236	2,779	12,000	0.232	0	12,000	0.000	0	12,000	0.000
6	0	12,000	0.000	0	12,000	0.000	2,779	12,000	0.232	2,729	12,000	0.227	0	12,000	0.000	0	12,000	0.000
7	0	12,000	0.000	0	12,000	0.000	1,540	12,000	0.128	1,526	12,000	0.127	0	12,000	0.000	0	12,000	0.000
8	0	12,000	0.000	0	12,000	0.000	3,525	12,000	0.294	3,447	12,000	0.287	0	12,000	0.000	0	12,000	0.000
9	0	12,000	0.000	0	12,000	0.000	3,447	12,000	0.287	3,367	12,000	0.281	0	12,000	0.000	0	12,000	0.000
10	0	12,000	0.000	0	12,000	0.000	3,367	12,000	0.281	3,284	12,000	0.274	0	12,000	0.000	0	12,000	0.000
11	0	12,000	0.000	0	12,000	0.000	3,284	12,000	0.274	3,196	12,000	0.266	0	12,000	0.000	0	12,000	0.000
12	0	12,000	0.000	0	12,000	0.000	3,196	12,000	0.266	3,099	12,000	0.258	0	12,000	0.000	0	12,000	0.000
13	0	12,000	0.000	0	12,000	0.000	3,099	12,000	0.258	2,990	12,000	0.249	0	12,000	0.000	0	12,000	0.000
14	0	12,000	0.000	0	12,000	0.000	2,990	12,000	0.249	2,861	12,000	0.238	0	12,000	0.000	0	12,000	0.000
15	0	12,000	0.000	0	12,000	0.000	1,363	12,000	0.114	1,333	12,000	0.111	0	12,000	0.000	0	12,000	0.000
16	0	12,000	0.000	0	12,000	0.000	2,560	12,000	0.213	2,386	12,000	0.199	0	12,000	0.000	0	12,000	0.000
17	0	12,000	0.000	0	12,000	0.000	2,386	12,000	0.199	2,168	12,000	0.181	0	12,000	0.000	0	12,000	0.000
18	0	12,000	0.000	0	12,000	0.000	2,168	12,000	0.181	1,880	12,000	0.157	0	12,000	0.000	0	12,000	0.000
19	0	12,000	0.000	0	12,000	0.000	1,880	12,000	0.157	1,481	12,000	0.123	0	12,000	0.000	0	12,000	0.000
20	0	12,000	0.000	0	12,000	0.000	1,481	12,000	0.123	899	12,000	0.075	0	12,000	0.000	0	12,000	0.000
21	0	12,000	0.000	0	12,000	0.000	899	12,000	0.075	0	12,000	0.000	0	12,000	0.000	0	12,000	0.000

Pole Base - Connection Stresses (psi) - Strength Design

	Group I	Group II	Group III
Bolt Stress			
Applied Tensile	340	27,323	15,490
Applied Shear	0	354	201
Allowable Tensile	27,500	36,575	36,575
Allowable Shear	16,500	21,945	21,945
Bolt Ratio	0.012	0.747	0.424

Base Plate Stress

Applied Bending	244	16,948	9,612
Allowable Bending	27,000	35,910	35,910
Ratio	0.009	0.472	0.268

Pole Base - Connection Stresses (psi) - Fatigue Design

	Galloping	Natural Wind	Truck Gust
Ex. 8 - Detail 5 (Connection Bolts)			
Bolt SR	0	2,739	0
Bolt CAFL	7,000	7,000	7,000
Ratio	0.000	0.391	0.000
Ex. 5 - Detail 11 (Full Weld Backup - Full Pen.)			
Tube SR	0	3,029	0
Tube CAFL	4,500	4,500	4,500
Ratio	0.000	0.673	0.000

ODOT 3000-18; Hamilton Co.
 B/R# 23
 Qty. 30
 Qty. 120 Anchor Bolts



FOUNDATION SYSTEMS & ANCHORS, INC.

2300 Allen Avenue S.E • Canton, Ohio 44707

DRAWING SUBMITTAL FORM

MATERIAL SPECIFICATIONS:

STEEL:

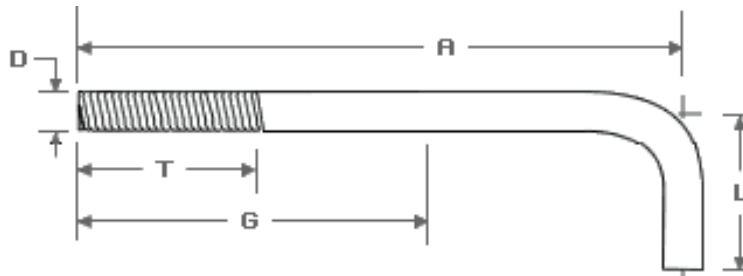
A-36.....
 A-36M55/F1554 GR 55.....
 A-687/F1554 GR 105.....
 OTHER (SPECIFY).....

FINISH:

PLAIN – NO FINISH.....
 HOT DIP GALVANIZING (A153/A123).....
 OTHER GALVANIZING.....
 OTHER FINISH (SPECIFY).....

THREADING:

UNC CLASS 2A (CUT).....
 UNC CLASS 2A (ROLLED).....
 OTHER THREADS (SPECIFY).....



"D"	"A"	"L"	"T"	"G"	OTHER
3/4"	26"	4"	4"	Partial	
1"	36"	4"	6"	Partial	
1 1/4"	42"	6"	8"	Partial	
1 1/2 "	54"	6"	10"	Partial	
1 3/4"	84"	6"	10"	Partial	
2"	84"	6"	10"	Partial	
2"	90"	6"	12"	Partial	
2 1/4"	90"	6"	12"	Partial	
2 1/2"	114"	6"	12"	Partial	

ODOT 3000-18; Hamilton Co.
 B/R# 25, Qty. 15
 B/R# 26, Qty. 4
 Qty. 114 Anchor Bolts



FOUNDATION SYSTEMS & ANCHORS, INC.

2300 Allen Avenue S.E • Canton, Ohio 44707

DRAWING SUBMITTAL FORM

MATERIAL SPECIFICATIONS:

STEEL:

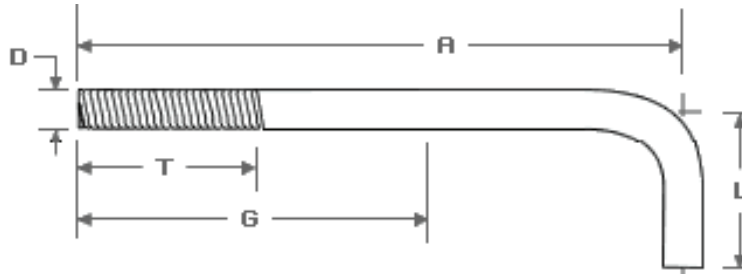
A-36.....
 A-36M55/F1554 GR 55.....
 A-687/F1554 GR 105.....
 OTHER (SPECIFY).....

FINISH:

PLAIN – NO FINISH.....
 HOT DIP GALVANIZING (A153/A123).....
 OTHER GALVANIZING.....
 OTHER FINISH (SPECIFY).....

THREADING:

UNC CLASS 2A (CUT).....
 UNC CLASS 2A (ROLLED).....
 OTHER THREADS (SPECIFY).....

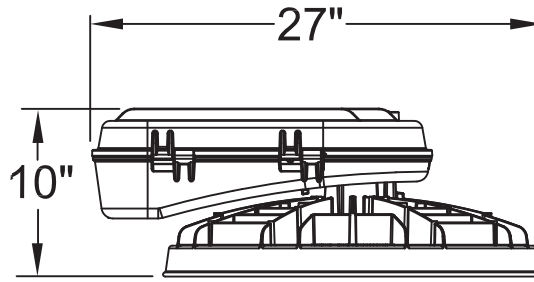
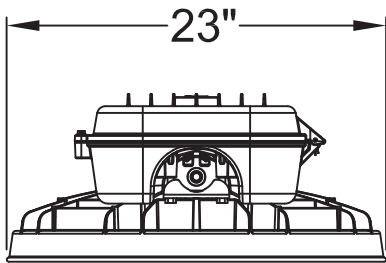
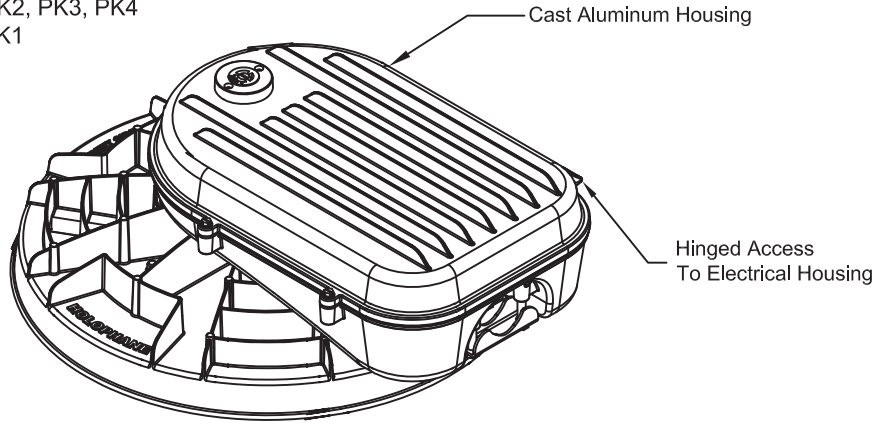


"D"	"A"	"L"	"T"	"G"	OTHER
3/4"	26"	4"	4"	Partial	
1"	36"	4"	6"	Partial	
1 1/4"	42"	6"	8"	Partial	
1 1/2 "	54"	6"	10"	Partial	
1 3/4"	84"	6"	10"	Partial	
2"	84"	6"	10"	Partial	
2"	90"	6"	12"	Partial	
2 1/4"	90"	6"	12"	Partial	
2 1/2"	114"	6"	12"	Partial	

Weight = 52lbs
 EPA =1.30 sq. ft
 UL1598, 40C, Wet location PK2, PK3, PK4
 UL1598, 50C, Wet location PK1

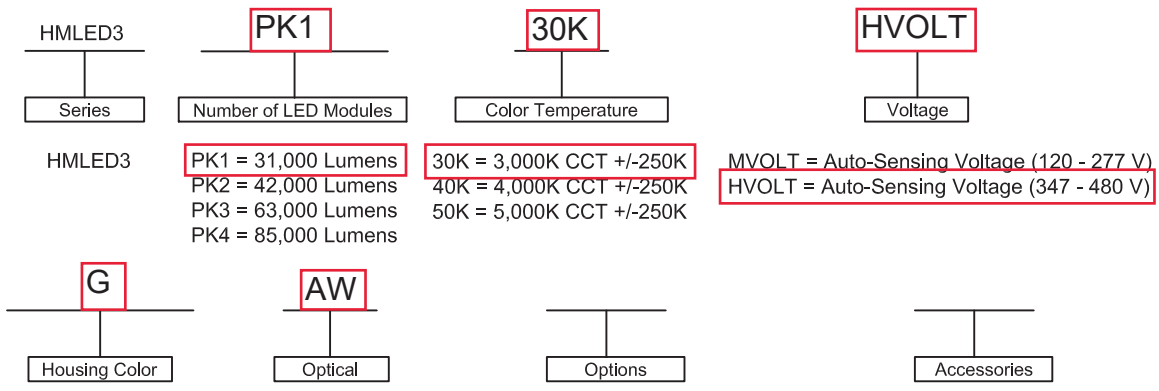
TYPE: 182400

ODOT 3000-18; Hamilton Co.
 B/R# 38A, Qty. 1
 B/R# 39A, Qty. 44
 B/R# 41A, Qty. 30



HMLEd3™
LED High Mast Lighting

**Infrastructure
 Specialty**



ORDERING INFORMATION:

A = As Specified
G = Gray
 H = Graphite
 K = Black
 Z = Bronze
 W = White

LN= Long and Narrow
 M = Medium, Asymmetric
 N= Narrow, Asymmetric
 F = Forward Throw, Asymmetric
 AN = Area Narrow
AW = Area Wide

AO = Field Adjustable Output
 DM = 0-10v Dimming
 FD1 = Single Fusible Disconnect
 FD2 = Double Fusible Disconnect
 P3 = 3 Pin NEMA Receptacle
 P7 = 7 Pin NEMA Receptacle
 PCSS = DTL Solid-State Lighting Photocontrol 120-277V
 PCL1 = DTL DLL Photocontrol for 120-277V
 PCL3 = DTL Twist-off Photocontrol for 347V
 PCL4 = DTL Twist-off Photocontrol for 480V
 PSC = Shorting Cap
 50C = PK2/PK3 Only, Drive current reduced to provide 95% light output with surge rating 10 kV/5kA for this option only.

HMLEdF1FUS10R= Single Fusing
 HMLEdF2FUS10R= Double Fusing
 HMLEd3D90 = 90 Degree Shield
 HMLEd3D120 = 120 Degree Shield
 HMLEd3D180 = 180 Degree Shield

THIS DRAWING, WHEN APPROVED, SHALL BECOME THE COMPLETE SPECIFICATION FOR THE MATERIAL TO BE FURNISHED BY HOLOPHANE ON THE ORDER NOTED ABOVE. A UNIT OF SIMILAR DESIGN MAY BE SUBSTITUTED FOR THE UNIT ORDERED IF THE SUBSTITUTION DOES NOT AFFECT THE PERFORMANCE OF THE UNIT. HOLOPHANE SHALL BE RESPONSIBLE FOR THE PROVISION OF THE UNIT. HOLOPHANE SHALL BE RESPONSIBLE FOR THE PROVISION OF THE UNIT. HOLOPHANE SHALL BE RESPONSIBLE FOR THE PROVISION OF THE UNIT. HOLOPHANE SHALL BE RESPONSIBLE FOR THE PROVISION OF THE UNIT.

ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	10/2/18
DWG #:	LUM_HMLEd3

Specifications

General Construction

Rugged die cast, low copper content aluminum 380 alloy electrical and optical housing are polyester powder coated with super durable paint for durability and corrosion resistance. Rigorous pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (per ASTM B117). Four bolt horizontal arm mount with +/- 5 degree vertical adjustment provides 3G vibration rating per ANSI C136. Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8"). Two captive bolts disengage top electrical cover for easy access to LED drivers, surge protection, and terminal block. IP66 rated LED modules, IP65 electrical assembly per IEC60068-2-3. Luminaire electrical and optical housing ship complete in one carton facilitating installation and minimizing carton disposal at jobsite.

Electrical

Quick disconnect connectors for ease of installation and maintenance. Extreme surge protection meets 20KV/10KA per ANSI/IEEE C62.41. Driver meets maximum total harmonic distortion (THD) of 20% and is ROHS compliant. A three stage terminal block is standard for ease of installation. Minimum operating temperature is -40C. Electronic driver has an expected life of 100,000 hours at 25C.

	Input Operating Amps					
	120V	208V	240V	277V	347V	480V
PK1	1.77	1.01	0.90	0.79	0.62	0.45
PK2	2.69	1.54	1.34	1.13	0.94	0.68
PK3	3.99	2.28	1.99	1.73	1.40	1.01
PK4	5.29	3.05	2.62	2.29	1.85	1.33

Optical

PCB mounted LED technology comprised of multi-cluster LED's on single metal core board, Color temperature options of 3000K, 4000K and 5000K with CRI of 70 minimum. Borosilicate prismatic glass optics ensure longevity and minimize dirt depreciation. Zero upright optics reduce sky glow and meets Dark Sky requirements. Prismatic glass optics provide overlapping pattern on application space eliminating dark spots. Prismatic glass optics minimize direct view of LED, reducing glare. Rotatable optic assembly provides alignment of asymmetric distributions to roadway.

Controls (Optional)

Controls options include the **P3** and **P7** locking style photocontrol receptacles. The P7 receptacle option is factory pre-wired to dimming leads of drivers.

PCSS - Premium solid state locking style photocontrol (10 year rated life)

PCL1 - Extreme long life solid state locking-style photocontrol (20 year rated life)

Field Adjustable Output (AO) module - An onboard device that adjusts the light output and input wattage to meet site specific requirements, allowing a single fixture configuration to be flexibly applied in many different applications. The AO module is pre-set at the factory to position number 8.

Testing Compliance

See Holophane HMAO-LED Validation Test Specification - Luminaire conforms to following standards: ANSI/IEEE C62.41:2002 - Surge protection. ANSI C82.77:2002 - Harmonic distortion. ANSIC136.31:2001- Luminaire vibration. ASTM B 117:2003 - Salt spray test. FCC title 47 CFR Part 18 - Federal Communications Commission. IEC 60068 - Environmental testing. IEC 60529:1999 - Degrees of protection provided by enclosure (IP) IEC 61000 - Electromagnetic Compatibility testing (EMC). IEEE 519 - Harmonic control in Electrical Power systems. UL-1598, 40C, Wet Location - Safety listing. DesignLights ConsortiumR (DLC) qualified product.

Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Manufacturing

Manufactured in Crawfordsville, Indiana. ARRA compliant. Test 100% electrical of all luminaires before shipment. No less than five (5) years experience in manufacturing LED- based products.

Warranty

Five Year Limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note

Actual performance may differ as a result of end-user environment and application.
Actual wattage may differ by +/- 8% when operating between 120-480V +/-10%.
Specifications subject to change without notice.

HMLED3™
LED High Mast Lighting

**Infrastructure
Specialty**



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ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	10/2/18
DWG #:	LUM_HMLED3

HMAO LED III	Distribution	Lumens		Input Watts	LPW
		4000K			
PK1	LN	32,718		209	157
	N	30,114		209	144
	M	30,095		209	144
	F	27,138		209	130
	AN	32,836		209	157
	AW	31,700		209	152
PK2	LN	46,349		319	145
	N	42,662		319	134
	M	42,635		319	134
	F	38,445		319	121
	AN	46,517		319	146
	AW	44,908		319	141
PK3	LN	66,820		475	141
	N	61,503		475	129
	M	61,464		475	129
	F	55,424		475	117
	AN	67,061		475	141
	AW	64,741		475	136
PK4	LN	85,840		627	137
	N	79,010		627	126
	M	78,960		627	126
	F	71,200		627	114
	AN	86,150		627	137
	AW	83,170		627	133

30K lumens = .95 40K

AO Module		
AO setting	Lumens %	Wattage %
8	100%	100%
7	100%	100%
6	100%	100%
5	88%	85%
4	80%	75%
3	67%	61%
2	57%	49%
1	41%	34%

LAT				
0C	15C	25C	35C	40C
1.05	1.02	1.00	0.98	0.97

LLD				
L70	PK1	PK2	PK3	PK4
25,000 hours	0.96	0.95	0.94	0.95
50,000 hours	0.92	0.90	0.90	0.91
75,000 hours	0.88	0.85	0.86	0.87
100,000 hours	0.84	0.81	0.82	0.82

HMLED3™
LED High Mast Lighting

Infrastructure
Specialty



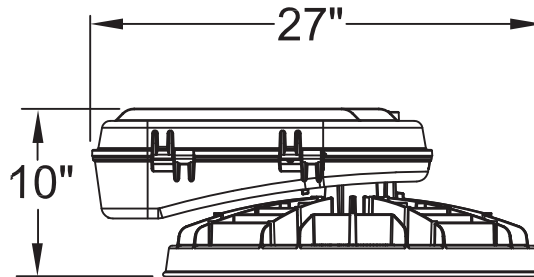
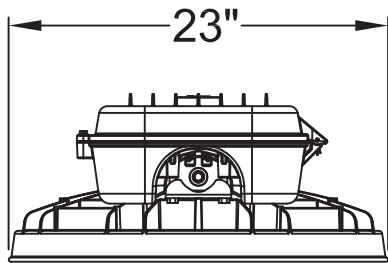
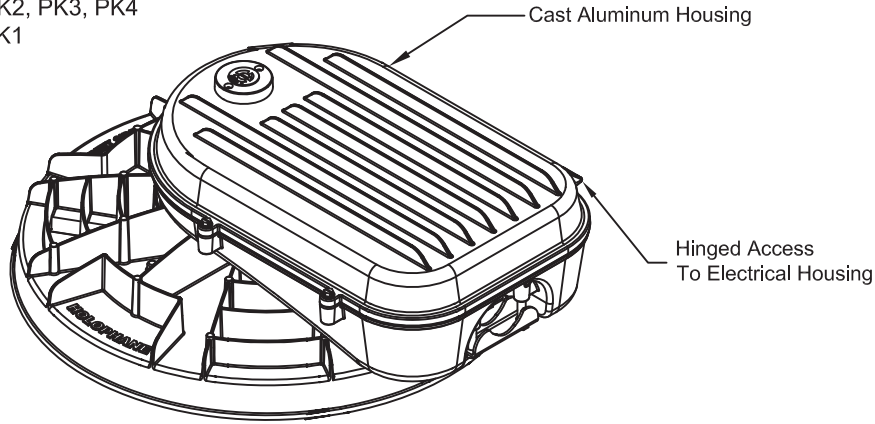
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ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	10/2/18
DWG #:	LUM_HMLED3

Weight = 52lbs
 EPA =1.30 sq. ft
 UL1598, 40C, Wet location PK2, PK3, PK4
 UL1598, 50C, Wet location PK1

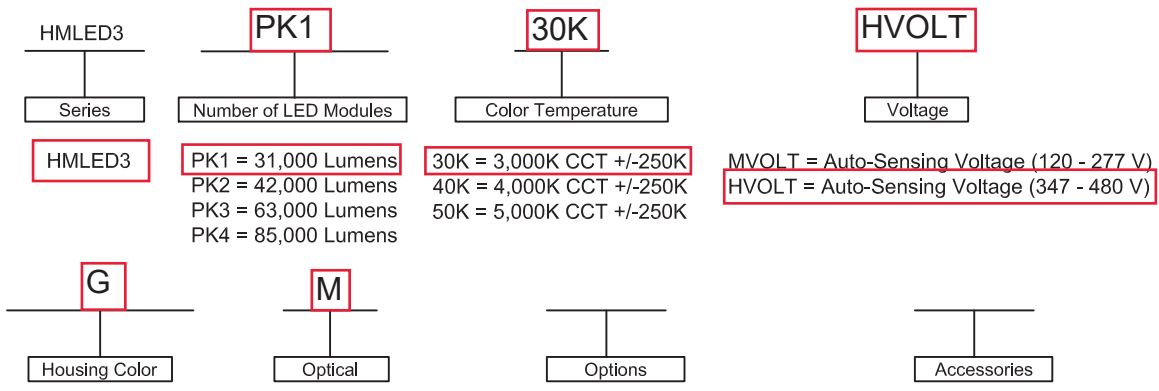
TYPE: 182400

ODOT 3000-18; Hamilton Co.
 B/R# 40A
 Qty. 40



HMLE3™
LED High Mast Lighting

**Infrastructure
 Specialty**



ORDERING INFORMATION:

A = As Specified
G = Gray
 H = Graphite
 K = Black
 Z = Bronze
 W = White

LN= Long and Narrow
M = Medium, Asymmetric
 N= Narrow, Asymmetric
 F = Forward Throw, Asymmetric
 AN = Area Narrow
 AW = Area Wide

AO = Field Adjustable Output
 DM = 0-10v Dimming
 FD1 = Single Fusible Disconnect
 FD2 = Double Fusible Disconnect
 P3 = 3 Pin NEMA Receptacle
 P7 = 7 Pin NEMA Receptacle
 PCSS = DTL Solid-State Lighting Photocontrol 120-277V
 PCL1 = DTL DLL Photocontrol for 120-277V
 PCL3 = DTL Twist-off Photocontrol for 347V
 PCL4 = DTL Twist-off Photocontrol for 480V
 PSC = Shorting Cap
 50C = PK2/PK3 Only, Drive current reduced to provide 95% light output with surge rating 10 kV/5kA for this option only.

HMLEDF1FUS10R= Single Fusing
 HMLEDF2FUS10R= Double Fusing
 HMLE3D90 = 90 Degree Shield
 HMLE3D120 = 120 Degree Shield
 HMLE3D180 = 180 Degree Shield

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ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	10/2/18
DWG #:	LUM_HMLE3

Specifications

General Construction

Rugged die cast, low copper content aluminum 380 alloy electrical and optical housing are polyester powder coated with super durable paint for durability and corrosion resistance. Rigorous pre-treating and painting process yields a finish that achieves a scribe creepage rating of 8 (per ASTM D1654) after over 5,000 hours exposure to salt fog chamber (per ASTM B117). Four bolt horizontal arm mount with +/- 5 degree vertical adjustment provides 3G vibration rating per ANSI C136. Mast arm mount is adjustable for arms from 1-1/4" to 2" (1-5/8" to 2-3/8"). Two captive bolts disengage top electrical cover for easy access to LED drivers, surge protection, and terminal block. IP66 rated LED modules, IP65 electrical assembly per IEC60068-2-3. Luminaire electrical and optical housing ship complete in one carton facilitating installation and minimizing carton disposal at jobsite.

Electrical

Quick disconnect connectors for ease of installation and maintenance. Extreme surge protection meets 20KV/10KA per ANSI/IEEE C62.41. Driver meets maximum total harmonic distortion (THD) of 20% and is ROHS compliant. A three stage terminal block is standard for ease of installation. Minimum operating temperature is -40C. Electronic driver has an expected life of 100,000 hours at 25C.

	Input Operating Amps					
	120V	208V	240V	277V	347V	480V
PK1	1.77	1.01	0.90	0.79	0.62	0.45
PK2	2.69	1.54	1.34	1.13	0.94	0.68
PK3	3.99	2.28	1.99	1.73	1.40	1.01
PK4	5.29	3.05	2.62	2.29	1.85	1.33

Optical

PCB mounted LED technology comprised of multi-cluster LED's on single metal core board, Color temperature options of 3000K, 4000K and 5000K with CRI of 70 minimum. Borosilicate prismatic glass optics ensure longevity and minimize dirt depreciation. Zero uplight optics reduce sky glow and meets Dark Sky requirements. Prismatic glass optics provide overlapping pattern on application space eliminating dark spots. Prismatic glass optics minimize direct view of LED, reducing glare. Rotatable optic assembly provides alignment of asymmetric distributions to roadway.

Controls (Optional)

Controls options include the **P3** and **P7** locking style photocontrol receptacles. The P7 receptacle option is factory pre-wired to dimming leads of drivers.

PCSS - Premium solid state locking style photocontrol (10 year rated life)

PCL1 - Extreme long life solid state locking-style photocontrol (20 year rated life)

Field Adjustable Output (AO) module - An onboard device that adjusts the light output and input wattage to meet site specific requirements, allowing a single fixture configuration to be flexibly applied in many different applications. The AO module is pre-set at the factory to position number 8.

Testing Compliance

See Holophane HMAO-LED Validation Test Specification - Luminaire conforms to following standards: ANSI/IEEE C62.41:2002 - Surge protection. ANSI C82.77:2002 - Harmonic distortion. ANSIC136.31:2001- Luminaire vibration. ASTM B 117:2003 - Salt spray test. FCC title 47 CFR Part 18 - Federal Communications Commission. IEC 60068 - Environmental testing. IEC 60529:1999 - Degrees of protection provided by enclosure (IP) IEC 61000 - Electromagnetic Compatibility testing (EMC). IEEE 519 - Harmonic control in Electrical Power systems. UL-1598, 40C, Wet Location - Safety listing. DesignLights ConsortiumR (DLC) qualified product.

Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.

Manufacturing

Manufactured in Crawfordsville, Indiana. ARRA compliant. Test 100% electrical of all luminaires before shipment. No less than five (5) years experience in manufacturing LED- based products.

Warranty

Five Year Limited warranty. Full warranty terms located at www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note

Actual performance may differ as a result of end-user environment and application.
Actual wattage may differ by +/- 8% when operating between 120-480V +/-10%.
Specifications subject to change without notice.

HMLED3™
LED High Mast Lighting

**Infrastructure
Specialty**



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ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	10/2/18
DWG #:	LUM_HMLED3

HMAO LED III	Distribution	Lumens		Input Watts	LPW
		4000K			
PK1	LN	32,718		209	157
	N	30,114		209	144
	M	30,095		209	144
	F	27,138		209	130
	AN	32,836		209	157
	AW	31,700		209	152
PK2	LN	46,349		319	145
	N	42,662		319	134
	M	42,635		319	134
	F	38,445		319	121
	AN	46,517		319	146
	AW	44,908		319	141
PK3	LN	66,820		475	141
	N	61,503		475	129
	M	61,464		475	129
	F	55,424		475	117
	AN	67,061		475	141
	AW	64,741		475	136
PK4	LN	85,840		627	137
	N	79,010		627	126
	M	78,960		627	126
	F	71,200		627	114
	AN	86,150		627	137
	AW	83,170		627	133

30K lumens = .95 40K

AO Module		
AO setting	Lumens %	Wattage %
8	100%	100%
7	100%	100%
6	100%	100%
5	88%	85%
4	80%	75%
3	67%	61%
2	57%	49%
1	41%	34%

LAT				
0C	15C	25C	35C	40C
1.05	1.02	1.00	0.98	0.97

LLD				
L70	PK1	PK2	PK3	PK4
25,000 hours	0.96	0.95	0.94	0.95
50,000 hours	0.92	0.90	0.90	0.91
75,000 hours	0.88	0.85	0.86	0.87
100,000 hours	0.84	0.81	0.82	0.82

HMLED3™
LED High Mast Lighting

Infrastructure
Specialty



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ORDER #:
TYPE:
DRAWN: BGW
DATE: 10/2/18
DWG #: LUM_HMLED3

ODOT 3000-18; Hamilton Co.
B/R# 42A
Qty. 4

HOLOPHANE
LEADER IN LIGHTING SOLUTIONS

Catalog Number		W4GLED 30C1000 30K T3M 240 SPD LWG GYSDP	
Notes	ODOT 183000, Hamilton Co., design & build	2009-18-13852-8	Type 182700

Wallpack® LED



LVG - Vandal guard



LWG - Wire guard

Description

Perimeter and security lighting requires excellent control and uniformity while minimizing light trespass and glare. The W4GLED/W4PLED Wallpack LED luminaires excel at this, requiring fewer luminaires to achieve required light levels in infrastructure, industrial and municipal applications. With energy cost reductions up to 77% and expected service life of over 20 years, Wallpack LED provides the latest lighting technology from the company that introduced the very first Wallpack to the market.

Optics

- The W4G uses a tempered glass lens and the W4P uses a protective polycarbonate lens that covers the light engine's precision-molded proprietary acrylic lenses.
- Type 3 medium
- Type 3 short (IP66 rated light engine)

Mechanical

- The housing is constructed of die-cast aluminum and is fully gasketed for ease of maintenance
- The LED driver is mounted to the front casting to thermally isolate it from the light engine for low operating temperature and long life
- Housing is completely sealed against moisture and environmental contaminants, IP55
- Exterior parts are protected by a zinc-infused Super Durable TGIC thermoset powder coat finish that provides superior resistance to corrosion and weathering.
- A tightly controlled multi-stage process ensures a minimum 3 mils thickness for a finish that can withstand extreme climate changes without cracking or peeling.

Electrical

- Light engine(s) consist of 10-30 high-efficacy LEDs mounted to a metal-core circuit board and integral aluminum heat sink to maximize heat dissipation and promote long life
- The dimmable electronic driver has a power factor of >90%, THD <20%
- SPD: 20kV/10kA standard
- CCT: 3000K, 4000K, 5000K
- CRI: 70CRI
- Integrated emergency backup on W4GLED with T3M option

Installation

- Top 3/4" threaded wiring access
- Back access through removable 3/4" knockout
- Feed-thru wiring can be achieved by using a conduit tee

Certification and Standards

- UL listed for wet locations. Rated for -40°C to 40°C ambient, refer to page 4 for details
- Designlights ConsortiumÆ (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at www.designlights.org/QPL to confirm which versions are qualified.
- LM-79 compliant
- The projected LED Lumen Maintenance shall be based only on IES LM-80-08 and TM-21

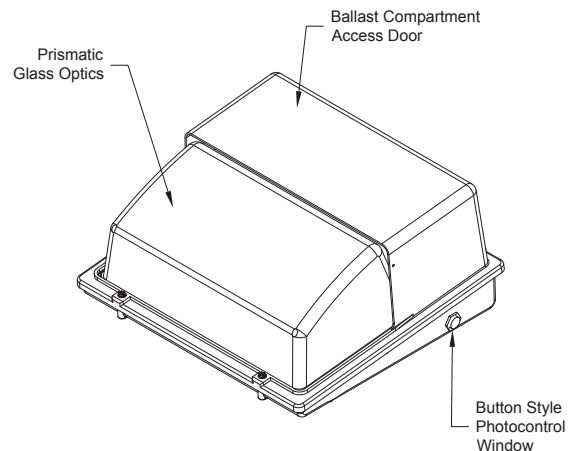
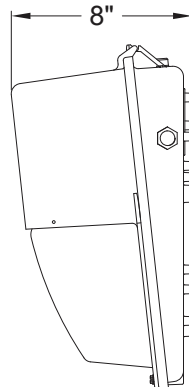
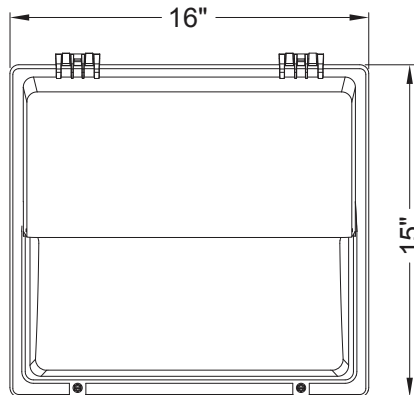
Warranty

5-year limited warranty. Complete warranty terms located at: www.acuitybrands.com/CustomerResources/Terms_and_Conditions.aspx.

Note: Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C.



DIMENSIONAL DATA



ORDERING INFORMATION *Italicized and Blue INDICATES OPTIONS ONLY AVAILABLE WITH W4GLED*

Example: W4GLED 30C1000 40K T3S MVOLT SPD P7 BZSDP

W4GLED	30C1000	30K	T3M	240	SPD
Series	Performance Package	Color Temperature	Distribution	Voltage	Surge Protection
W4GLED <i>Wallpack IV Glass LED</i>	<i>10C1000 10 LED</i>	30K 3000 series CCT	T3M Type III Medium	MVOLT Multi-volt: 120-277 volt	SPD 20kV/10kA (Standard)
W4PLED Wallpack IV Plastic LED	<i>20C1000 20 LED</i>	40K 4000 series CCT	T3S Type III Short	120 120 Volt	
	30C1000 30 LED	50K 5000 series CCT		208 208 Volt	
	10C700 10 LED			240 240 Volt	
	20C700 20 LED			277 277 Volt	
	30C700 30 LED			347 347 Volt	
				480 480 Volt	

Control Options	LWG	GYSDP
Options	Options	Super Durable Paint
PE Button Style Photoelectric Cell	<i>AO</i> <i>Field Adjustable Output</i>	BKSDP Black Super Durable Paint
<i>P3</i> <i>N.E.M.A. Twistlock 3-pin Receptacle - Control not included</i>	SF Single Fusing	BZSDP Bronze Super Durable Paint
<i>P7</i> <i>N.E.M.A. Twistlock 7-pin Receptacle - Control not included</i>	DF Double Fusing	GYSDP Grey Super Durable Paint
	TP Tamper resistant screws	WHSDP White Super Durable Paint
	NOM NOM Certified	
	<i>ELSW</i> <i>Emergency Battery Backup (Standard 0°C)</i>	
	<i>ELCW</i> <i>Emergency Battery Backup (Cold Weather -20°C)</i>	
	LWG Wire Guard	
	<i>LVG</i> <i>Vandal Guard</i>	

Accessories: Order as separate catalog number.	
<i>DLL127F 1.5 JU</i>	<i>Photocell - SSL Twist-Lock (120-277V)</i>
<i>DLL347 1.5 CUL JU</i>	<i>Photocell - SSL Twist-Lock (347V)</i>
<i>DLL480 1.5 CUL JU</i>	<i>Photocell - SSL Twist-Lock (480V)</i>
<i>SCU</i>	<i>Shorting Cap</i>
<i>W4GVGU</i>	<i>Vandal Guard</i>
<i>W4GWGU</i>	<i>Wire Guard</i>

OPTIONS MATRIX

Parameters		Voltage Options by LED Package			SELECTED OPTION											
		10Cxxxx	20Cxxxx	30Cxxxx	A0	PE	P3	P7	SF	DF	TP	NOM	ELSW	ELCW	LWG	LVG
LED Package	10Cxxxx				N	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	20Cxxxx				Y	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	30Cxxxx				Y	Y	W4G	W4G	Y	Y	Y	T3M	N	N	Y	W4G
Voltage	MVOLT	Y	Y	Y	Y	Y	W4G	W4G	Y	N	Y	T3M	W4GM	W4GM	Y	W4G
	120	Y	Y	Y	Y	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	208	Y	Y	Y	Y	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	240	Y	Y	Y	Y	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	277	Y	Y	Y	Y	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	347	N	Y	Y	Y	Y	W4G	W4G	Y	Y	Y	T3M	N	N	Y	W4G
	480	N	Y	Y	Y	N	W4G	W4G	Y	Y	Y	T3M	N	N	Y	W4G
Optic	T3M				Y	Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	T3S				W4G	Y	W4G	W4G	Y	Y	Y	N	N	N	Y	W4G
Controls	A0					Y	W4G	W4G	Y	Y	Y	T3M	W4GM	W4GM	Y	W4G
	PE				Y		N	N	Y	N	Y	T3M	N	N	Y	W4G
	P3				W4G	N		N	W4G	W4G	W4G	W4GM	N	N	W4G	W4G
	P7				W4G	N	N		W4G	W4G	W4G	W4GM	N	N	W4G	W4G
Options	SF				Y	Y	W4G	W4G		N	Y	T3M	W4GM	W4GM	Y	W4G
	DF				Y	Y	W4G	W4G	N		Y	T3M	W4GM	W4GM	Y	W4G
	TP				Y	Y	W4G	W4G	Y	Y		T3M	W4GM	W4GM	Y	W4G
	NOM				Y	W4G	W4G	W4G	Y	Y	Y		W4GM	W4GM	N	W4G
	ELSW				Y	N	N	N	W4G	W4G	W4G	T3M			W4G	W4G
	ELCW				Y	N	N	N	W4G	W4G	W4G	T3M			W4G	W4G
	LWG				Y	Y	Y	Y	Y	Y	Y	T3M	W4GM	W4GM		N
	LVG				W4G	W4G	W4G	W4G	W4G	W4G	W4G	W4GM	W4GM	W4GM	N	

LEGEND

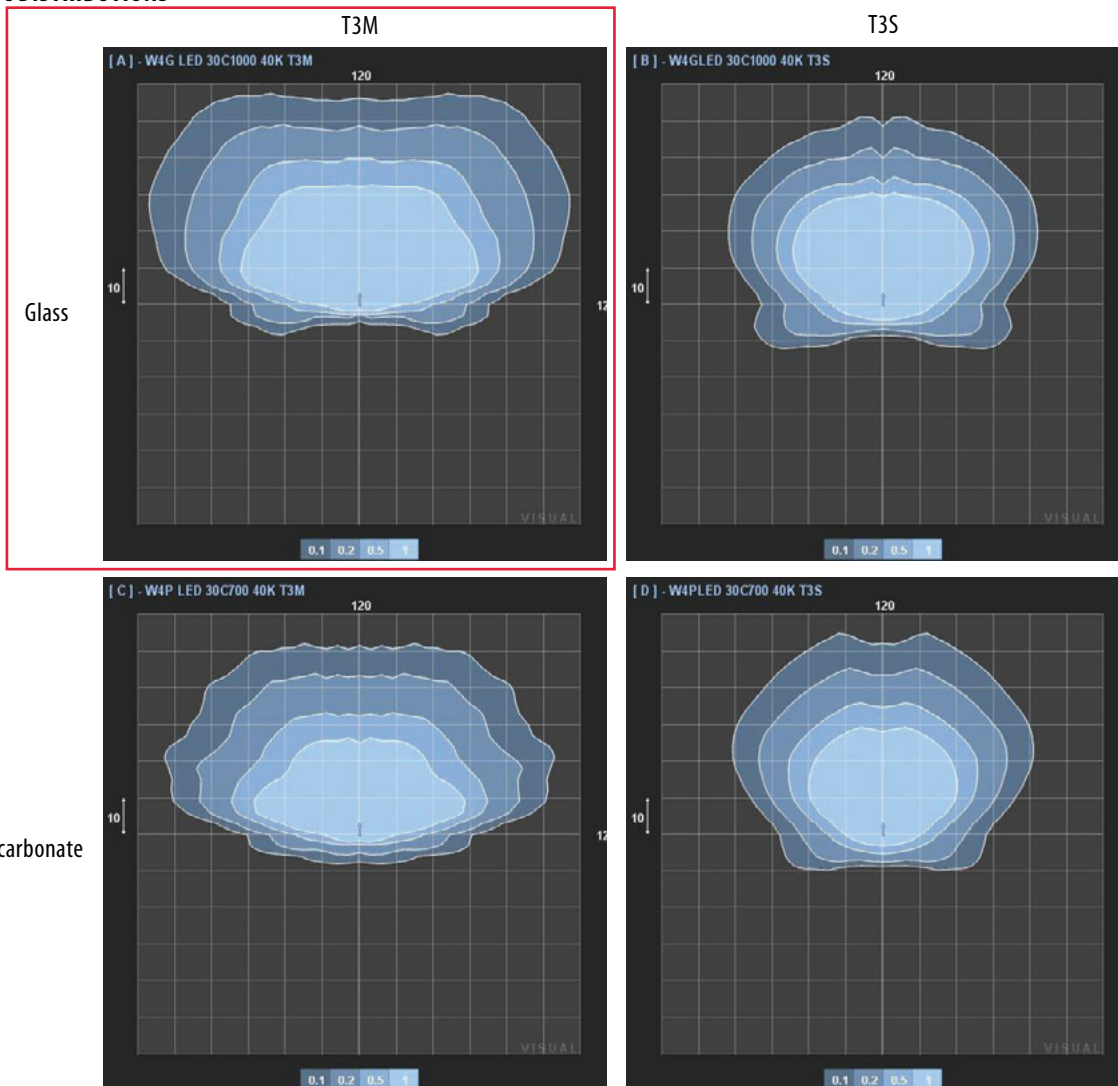
- N = Not available with W4GLED & W4PLED
- Y = Valid combination with W4GLED & W4PLED
- T3M = Only available on W4GLED & W4PLED with T3M distribution
- W4G = Only available with W4GLED
- W4GM = Only available on W4GLED with T3M distribution

OPERATIONAL DATA

Operating Characteristics

Series	LED Package	System Watts	Distribution Type	30K (3000K, 70 CRI)					40K (4000K, 70 CRI)					50K (5000K, 70 CRI)					
				Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	
W4G	10C1000	39	T3M	3140	81	0	3	3	3377	87	0	3	3	3398	87	0	3	3	
	20C1000	72		6495	90	1	3	4	6983	97	1	3	4	7027	98	1	3	4	
	30C1000	104		7789	75	1	3	4	8375	81	1	3	5	8427	81	1	3	5	
W4P	10C700	26		2030	78	0	3	2	2183	84	0	3	2	2197	85	0	3	2	
	20C700	45		3912	87	0	3	3	4207	93	1	3	3	4233	94	1	3	3	
	30C700	67		4813	72	1	3	3	5176	77	1	3	4	5208	78	1	3	4	
W4G	10C1000	28		T3S	3206	115	0	3	2	3485	124	0	3	2	3485	124	0	3	2
	20C1000	57			6507	114	1	3	2	7073	124	1	3	3	7073	124	1	3	3
	30C1000	77			8477	110	1	3	3	9214	120	1	3	3	9214	120	1	3	3
W4P	10C700	27	2709		100	0	3	2	2944	109	0	3	3	2944	109	0	3	3	
	20C700	38	3299		87	0	3	3	4017	106	1	3	3	4017	106	1	3	3	
	30C700	49	4203		86	1	3	3	5173	106	1	3	3	5173	106	1	3	3	

PHOTOMETRIC DISTRIBUTIONS



OPERATIONAL DATA

Lumen Maintenance

Data references the extrapolated performance projections for the platforms noted in a 25°C ambient, based on 10,000 hours of LED testing (tested per IESNA LM-80-08 and projected per IESNA TM-21-11).

To calculate LLF, use the lumen maintenance factor that corresponds to the desired number of operating hours below. For other lumen maintenance values, contact factory.

Lumen Maintenance Factor with TM3 Optic Option

Operating Hours	0	25,000	50,000	100,000
Glass Lumen Maintenance Factor	1.00	0.969	0.935	0.870
Polycarbonate Lumen Maintenance Factor	1.00	0.998	0.993	0.982

Lumen Maintenance Factor with T3S Optic Option

Operating Hours	0	25,000	50,000	100,000
Glass Lumen Maintenance Factor	1.00	1.00	0.977	0.925
Polycarbonate Lumen Maintenance Factor	1.00	1.00	0.977	0.925

The italicized is extrapolated beyond the TM-21 standard.

$$E = (LM) \times (LAT) \times (LLD)$$

Lumen Ambient Temperature (LAT) Multipliers

Use this factors to determine relative lumen output for average ambient temperatures from 0-40° C (32-104°F)

Ambient		Lumen Temperature	
		LEDs with T3M	LEDs with T3S
0° C	32° F	1.02	1.05
10° C	50° F	1.01	1.03
20° C	68° F	1.00	1.01
25° C	77° F	1.00	1.00
30° C	86° F	1.00	0.99
40° C	104° F	0.98	0.97

Ambient Temperature Ratings

Distribution	LED Package	Temperature
T3M	10C1000	40° C
	20C1000	35° C
	30C1000	35° C
	ELSW Option	30° C
	ELCW Option	30° C

Distribution	LED Package	Temperature
T3M	10C700	40° C
	20C700	40° C
	30C700	40° C

Distribution	LED Package	Temperature
T3S	10C700	40° C
	20C700	40° C
	30C700	40° C
	10C1000	40° C
	20C1000	40° C
	30C1000	40° C

TYPE 05 LOWERING DEVICE

TOP LATCHING, CENTERING SYSTEM WITH INTERNAL WINCH

DEVICE SERIES	NUMBER OF CIRCUITS	QUANTITY OF FIXTURES	FIXTURE SERIES	WATTAGE & SOURCE OF FIXTURES
05	<input checked="" type="checkbox"/> 1 CIRCUIT <input type="checkbox"/> 2 CIRCUITS	<input type="checkbox"/> 02 TWO (2) <input type="checkbox"/> 03 THREE (3) <input checked="" type="checkbox"/> 04 FOUR (4) <input type="checkbox"/> 05 FIVE (5) <input type="checkbox"/> 06 SIX (6) <input type="checkbox"/> 07 SEVEN (7) <input type="checkbox"/> 08 EIGHT (8) <input type="checkbox"/> 09 NINE (9) <input type="checkbox"/> 10 TEN (10) <input type="checkbox"/> 12 TWELVE (12)	<input type="checkbox"/> HC HMSC <input type="checkbox"/> HD HMSD <input type="checkbox"/> HA HMSP ASYMMETRIC <input type="checkbox"/> HS HMSP SYMMETRIC <input checked="" type="checkbox"/> HT HMST <input type="checkbox"/> MY MA, MV, MC <input type="checkbox"/> PB PB2 <input type="checkbox"/> PF PF	<input checked="" type="checkbox"/> 4H 400W HPS <input type="checkbox"/> 4M 400W MH <input type="checkbox"/> 4R 400W HPS MAGREG <input type="checkbox"/> 7H 750W HPS <input type="checkbox"/> 7M 750W MH <input type="checkbox"/> 1H 1000W HPS <input type="checkbox"/> 1M 1000W MH <input type="checkbox"/> 5M 1500W MH <input type="checkbox"/> 6M 1650W MH

FREQUENCY, VOLTAGE & PHASING	POLE HEIGHT	CABLE TYPE
<input type="checkbox"/> A 120V SINGLE PHASE	<input type="checkbox"/> 050 50 FEET	<input checked="" type="checkbox"/> A GALVANIZED - 1/4" WINCH
<input type="checkbox"/> B 120/208V 3 PHASE-4 WIRE	<input type="checkbox"/> 060 60 FEET	<input type="checkbox"/> B GALVANIZED - 5/16" WINCH
<input type="checkbox"/> C 208V SINGLE PHASE	<input type="checkbox"/> 070 70 FEET	<input type="checkbox"/> C STAINLESS STEEL - 1/4" WINCH
<input type="checkbox"/> D 208V 3 PHASE	<input type="checkbox"/> 080 80 FEET	<input type="checkbox"/> D STAINLESS STEEL - 5/16" WINCH
<input type="checkbox"/> E 240V SINGLE PHASE LL	<input type="checkbox"/> 090 90 FEET	
<input type="checkbox"/> F 240V SINGLE PHASE LN	<input checked="" type="checkbox"/> 100 100 FEET	
<input type="checkbox"/> G 277V SINGLE PHASE	<input type="checkbox"/> 110 110 FEET	
<input type="checkbox"/> H 277/480V 3 PHASE-4 WIRE	<input type="checkbox"/> 120 120 FEET	
<input type="checkbox"/> J 347/600V 3 PHASE-4 WIRE	<input type="checkbox"/> 130 130 FEET	
<input checked="" type="checkbox"/> K 480V SINGLE PHASE	<input type="checkbox"/> 140 140 FEET	
<input type="checkbox"/> L 480V 3 PHASE	<input type="checkbox"/> 150 150 FEET	
	<input type="checkbox"/> 15M 15 METERS	
	<input type="checkbox"/> 20M 20 METERS	
	<input type="checkbox"/> 25M 25 METERS	
	<input type="checkbox"/> 30M 30 METERS	
	<input type="checkbox"/> 35M 35 METERS	
	<input type="checkbox"/> 40M 40 METERS	
	<input type="checkbox"/> 45M 45 METERS	

OPTIONS	ACCESSORIES
<input checked="" type="checkbox"/> 1 LIGHTNING ARRESTOR - CB ENCLOSURE	<input type="checkbox"/> LDM-W-X-Y-Z PORTABLE DRIVE MOTOR
<input checked="" type="checkbox"/> 2 LIGHTNING ARRESTOR - RING J-BOX	SEE SHEET 5 FOR LETTER DESIGNATIONS
<input type="checkbox"/> R PHOTOCONTROL RECEPTACLE - RING J-BOX	<input type="checkbox"/> 09249 LEVELING BLOCK ASSEMBLY
<input type="checkbox"/> FAA1 SINGLE WARNING LIGHT	
<input type="checkbox"/> FAA2 DOUBLE WARNING LIGHT	
<input type="checkbox"/> FAA2TR DOUBLE WITH TRANSFER RELAY	
<input type="checkbox"/> FWC FIXED WIREWAY COVER ON RING	
<input type="checkbox"/> LR LIGHTNING ROD	

QUANTITY _____

CATALOG NUMBER

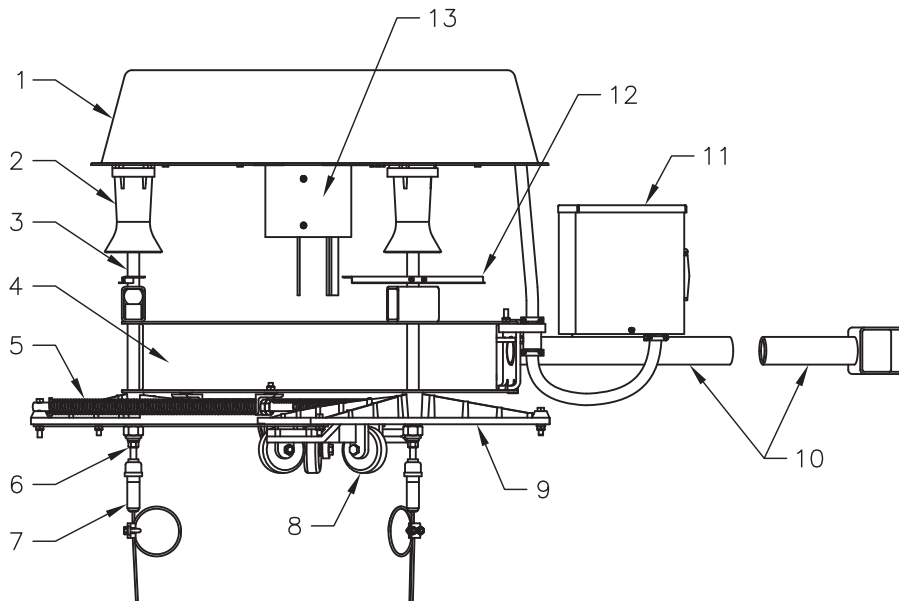
05104HT6HK100A2OHDOT



QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 1

TYPE 05 HEADFRAME AND RING ASSEMBLY

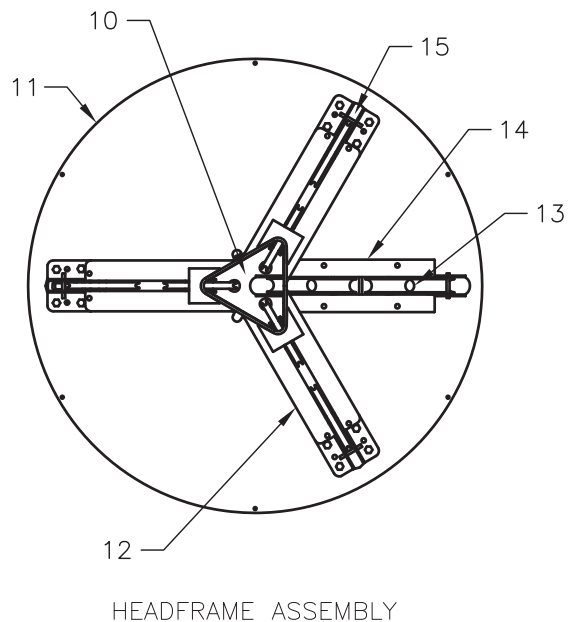
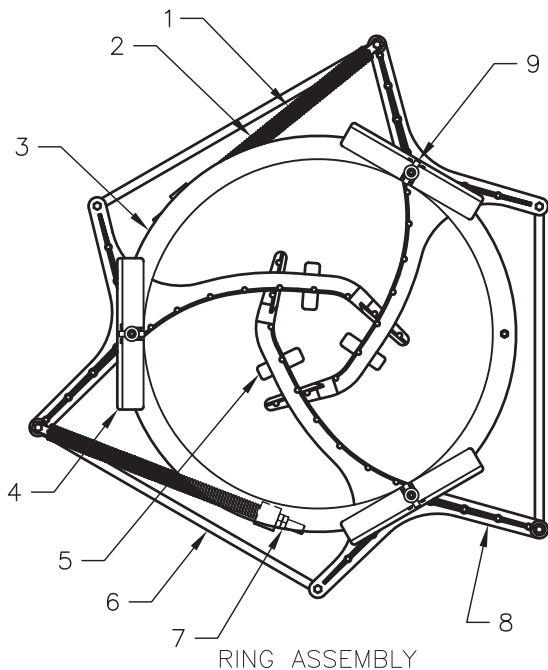


EPA = 5.62 SQUARE FEET
 WEIGHT = 250 POUNDS
 DIAMETER OF ASSEMBLY WITH LUMINAIRES VARIES FROM 8 TO 11 FEET

1. SPUN COPPER FREE ALUMINUM COVER
2. CAST HIGH STRENGTH COPPER FREE ALUMINUM LATCH BARREL
3. STAINLESS STEEL LATCH PIN
4. GALVANIZED STEEL LUMINAIRE RING
5. STAINLESS STEEL CENTERING SPRING
6. STAINLESS STEEL ADJUSTMENT NUT
7. STRANVISE WIRE ROPE GRIP
8. NON MARKING GUIDE ARM ROLLER
9. CAST ALUMINUM IRIS GUIDE ARM
10. GALVANIZED LUMINAIRE MOUNTING ARMS, LUMINAIRE TYPE DEPENDENT
11. ALUMINUM JUNCTION BOX
12. REFLECTING LATCH INDICATOR
13. GALVANIZED HEADFRAME, SLIPFITS A 4.63 TO 4.75 O.D. POLE TOP OR TENON

SCALE 1/16

TYPE 05 HEADFRAME AND RING ASSEMBLY



- | |
|---|
| <ol style="list-style-type: none"> 1. STAINLESS STEEL CENTERING COMPRESSION SPRING 2. SOLID ALUMINUM GUIDE ROD 3. GALVANIZED STEEL LUMINAIRE RING 4. REFLECTING LATCH INDICATOR 5. NON MARKING GUIDE ARM ROLLER 6. ALUMINUM GUIDE ARM CONNECTING BRACKET 7. GUIDE ARM ADJUSTMENT NUT 8. CAST ALUMINUM IRIS GUIDE ARM 9. STAINLESS STEEL LATCH PIN 10. STEEL CABLE / CORD SEPARATOR WELDED IN SLIPFITTER 11. STEEL HEADFRAME PLATE 12. STEEL HOIST CABLE BRACKET 13. ACETAL RESIN CORD ROLLERS 14. STEEL POWER CORD ROLLER BRACKET 15. STEEL HOIST CABLE SHEAVE |
|---|

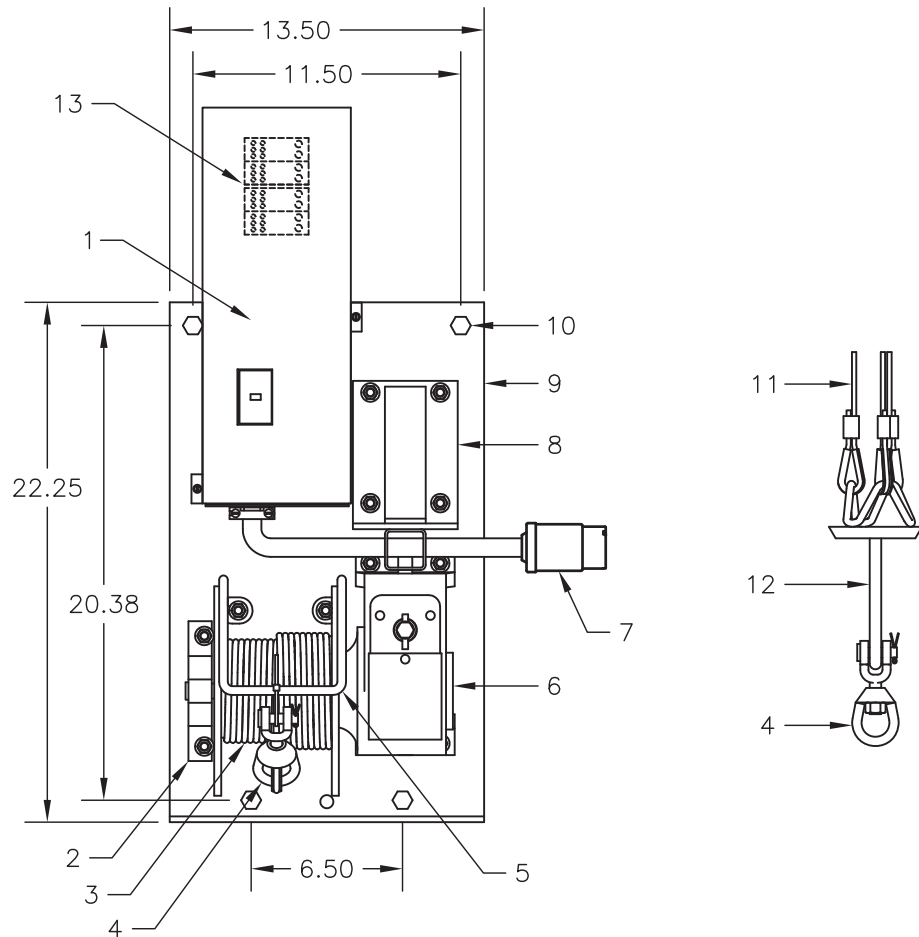
SCALE 1/16



QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 3

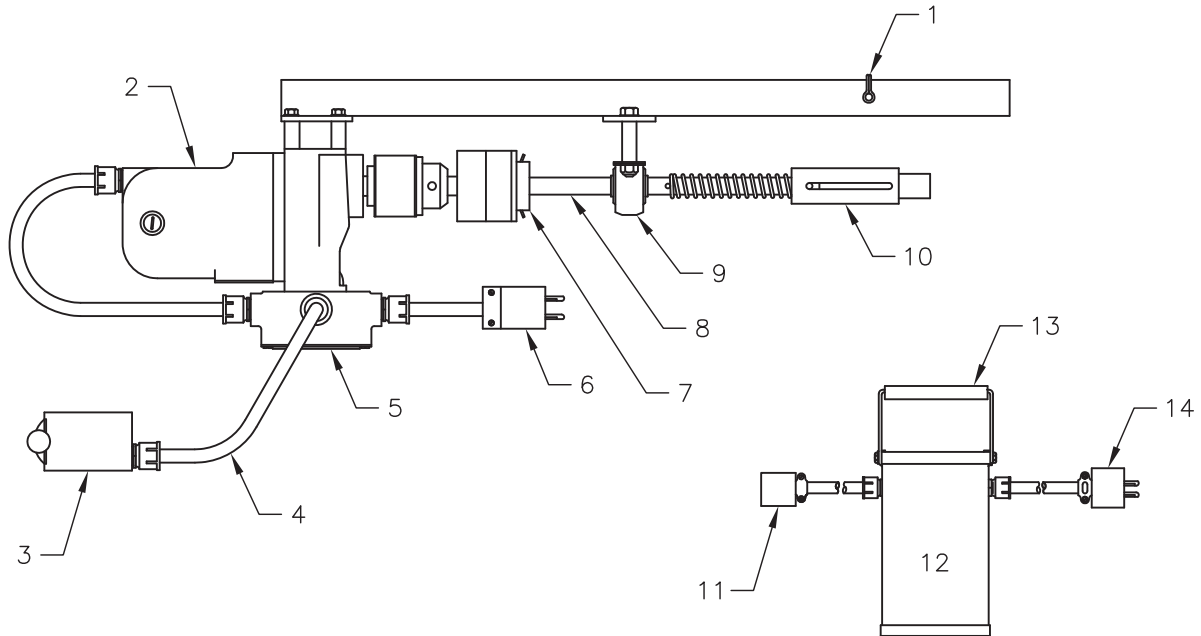
TYPE 05 WINCH PLATE ASSEMBLY



1. CIRCUIT BREAKER OR BREAKERS AND ENCLOSURE WITH (2) TERMINAL BLOCKS
2. WINCH OUTBOARD SUPPORT
3. 1/4" DIAMETER WINCH CABLE, GALVANIZED
LENGTH EQUALS POLE HEIGHT PLUS 6 FEET
4. FORGED STEEL SWIVEL, 11,000 POUND ULTIMATE STRENGTH
5. WINCH CABLE GUARD
6. WINCH, 30:1 GEAR RATIO WITH INTERNAL DRAG BRAKE
7. POWER SUPPLY CORD AND CONNECTOR
8. STEEL POWER UNIT MOUNTING BRACKET
9. STEEL WINCH PLATE
10. 1/2-13 MOUNTING BOLT
11. 3/16" DIAMETER HOIST CABLES, GALVANIZED
12. STEEL CLEVIS TRANSITION ASSEMBLY
13. (2) POWER DISTRIBUTION BLOCKS

SCALE 1/16

TYPE 05 PORTABLE DRIVE MOTOR
LDM-W-X-Y-Z



1. HITCH PIN
2. 3/4" REVERSIBLE ELECTRIC MOTOR, 120 VOLTS, 11.5 AMP, 350 RPM
3. REVERSING DRUM SWITCH
4. CONTROL CORD, 20 FOOT LENGTH
5. WIRING HOUSING
6. PLUG TO MATE TO CONNECTOR IN POLE BASE OR TRANSFORMER SECONDARY
7. TORQUE LIMITER COUPLING
8. 3/4" STEEL SHAFT
9. BALLBEARING PILLOWBLOCK
10. 5/8" HEX SOCKET CRANK SHAFT COUPLING
11. CONNECTOR TO MOTOR FROM 120V TRANSFORMER SECONDARY
12. STEPDOWN TRANSFORMER, 120V SECONDARY, 1.5 KVA FOR 240V, 277V AND 480V, 2.0 KVA FOR 208V
13. 1/2" CARRY HANDLE
14. PLUG TO CONNECTOR IN POLE BASE FROM TRANSFORMER PRIMARY

TYPICAL CATALOG NUMBER IS LDM-W-X-Y-Z WHERE:

- W = NUMBER OF CIRCUITS (1 OR 2)
- X = PHASE (1 FOR SINGLE PHASE, 3 FOR 3 PHASE OR 4 FOR 3 PHASE/4 WIRE)
- Y = VOLTAGE (120, 208, 240, 277, 480 OR 600)
- Z = AMPS (25, 30, 35, 45, 50, 60 OR 70)

CATALOG NUMBER _____ QUANTITY 1

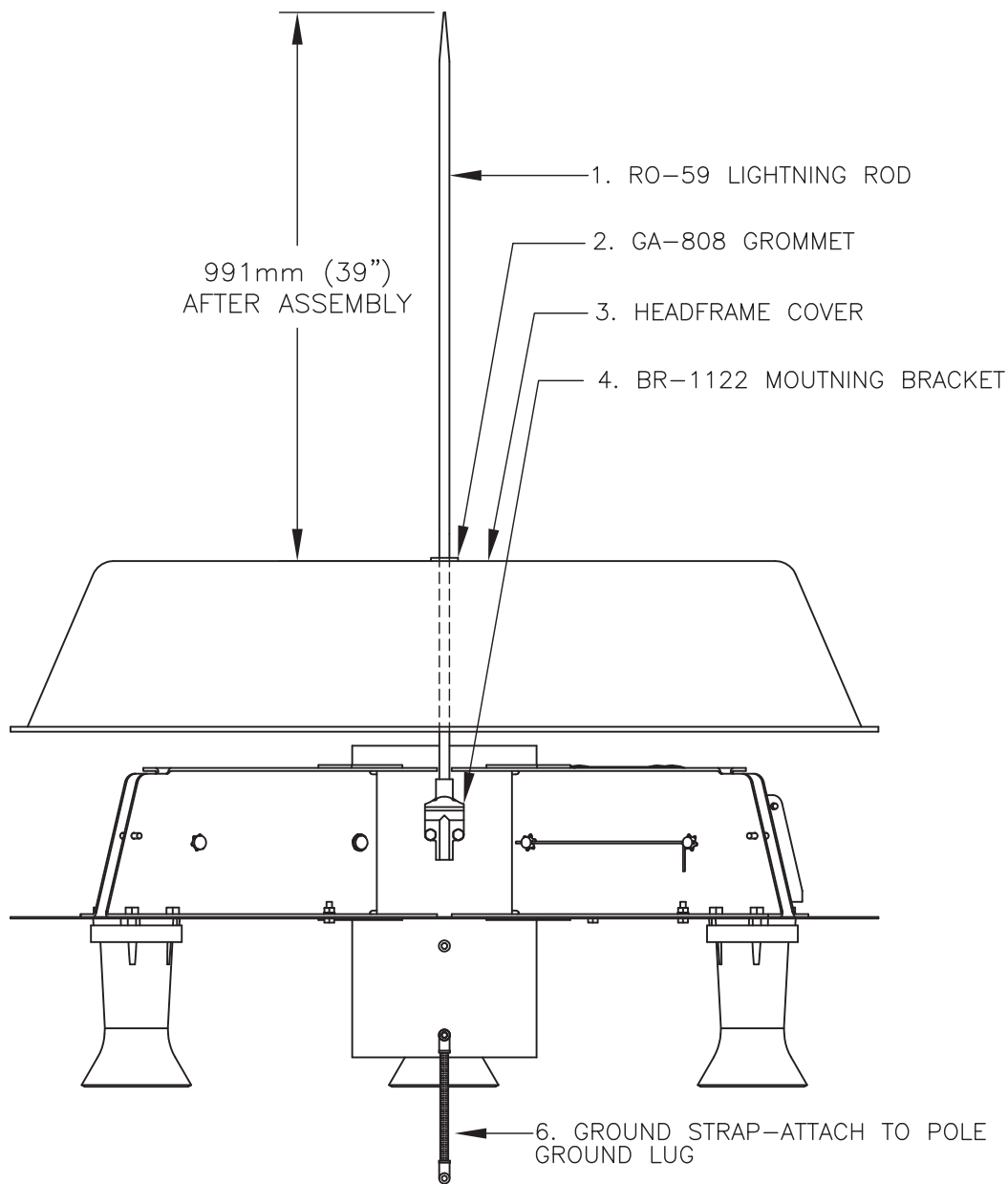


QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 5

LOWERING DEVICE

LIGHTNING ROD OPTION



FIELD INSTALLATION INSTRUCTIONS

1. REMOVE HEADFRAME COVER AND FIND THE DIMPLE LOCATED ON THE TOP SURFACE.
2. PUNCH A 7/8" HOLE IN THE COVER AT THE DIMPLE LOCATION AND INSTALL THE RUBBER GROMMET.
3. THREAD LIGHTNING ROD INTO THE LIGHTNING ROD BRACKET (BR-1122), TIGHTENING SECURELY.
4. SLIDE THE HEADFRAME COVER OVER THE LIGHTNING ROD ONTO THE HEADFRAME,
5. SECURE THE HEADFRAME COVER WITH THE PROPER FASTENERS AS DESCRIBED IN THE OWNERS MANUAL.



An Acuity Brands Company

QUOTE NO: _____

TYPE NO: _____

LOCATION _____

PROJECT NO. _____

CAD MODEL: LD05.DWG

DATE: 8/2/05

SHEET 6

TYPE 05 LOWERING DEVICE

TOP LATCHING, CENTERING SYSTEM WITH INTERNAL WINCH

DEVICE SERIES	NUMBER OF CIRCUITS	QUANTITY OF FIXTURES	FIXTURE SERIES	WATTAGE & SOURCE OF FIXTURES
05	<input checked="" type="checkbox"/> 1 CIRCUIT <input type="checkbox"/> 2 CIRCUITS	<input type="checkbox"/> 02 TWO (2) <input type="checkbox"/> 03 THREE (3) <input type="checkbox"/> 04 FOUR (4) <input type="checkbox"/> 05 FIVE (5) <input checked="" type="checkbox"/> 06 SIX (6) <input type="checkbox"/> 07 SEVEN (7) <input type="checkbox"/> 08 EIGHT (8) <input type="checkbox"/> 09 NINE (9) <input type="checkbox"/> 10 TEN (10) <input type="checkbox"/> 12 TWELVE (12)	<input type="checkbox"/> HC HMSC <input type="checkbox"/> HD HMSD <input type="checkbox"/> HA HMSP ASYMMETRIC <input type="checkbox"/> HS HMSP SYMMETRIC <input checked="" type="checkbox"/> HT HMST <input type="checkbox"/> MY MA, MV, MC <input type="checkbox"/> PB PB2 <input type="checkbox"/> PF PF	<input checked="" type="checkbox"/> 4H 400W HPS <input type="checkbox"/> 4M 400W MH <input type="checkbox"/> 4R 400W HPS MAGREG <input type="checkbox"/> 7H 750W HPS <input type="checkbox"/> 7M 750W MH <input type="checkbox"/> 1H 1000W HPS <input type="checkbox"/> 1M 1000W MH <input type="checkbox"/> 5M 1500W MH <input type="checkbox"/> 6M 1650W MH

FREQUENCY, VOLTAGE & PHASING	POLE HEIGHT	CABLE TYPE
<input type="checkbox"/> A 120V SINGLE PHASE	<input type="checkbox"/> 050 50 FEET	<input checked="" type="checkbox"/> A GALVANIZED - 1/4" WINCH
<input type="checkbox"/> B 120/208V 3 PHASE-4 WIRE	<input type="checkbox"/> 060 60 FEET	<input type="checkbox"/> B GALVANIZED - 5/16" WINCH
<input type="checkbox"/> C 208V SINGLE PHASE	<input type="checkbox"/> 070 70 FEET	<input type="checkbox"/> C STAINLESS STEEL - 1/4" WINCH
<input type="checkbox"/> D 208V 3 PHASE	<input type="checkbox"/> 080 80 FEET	<input type="checkbox"/> D STAINLESS STEEL - 5/16" WINCH
<input type="checkbox"/> E 240V SINGLE PHASE LL	<input type="checkbox"/> 090 90 FEET	
<input type="checkbox"/> F 240V SINGLE PHASE LN	<input checked="" type="checkbox"/> 100 100 FEET	
<input type="checkbox"/> G 277V SINGLE PHASE	<input type="checkbox"/> 110 110 FEET	
<input type="checkbox"/> H 277/480V 3 PHASE-4 WIRE	<input type="checkbox"/> 120 120 FEET	
<input type="checkbox"/> J 347/600V 3 PHASE-4 WIRE	<input type="checkbox"/> 130 130 FEET	
<input checked="" type="checkbox"/> K 480V SINGLE PHASE	<input type="checkbox"/> 140 140 FEET	
<input type="checkbox"/> L 480V 3 PHASE	<input type="checkbox"/> 150 150 FEET	
	<input type="checkbox"/> 15M 15 METERS	
	<input type="checkbox"/> 20M 20 METERS	
	<input type="checkbox"/> 25M 25 METERS	
	<input type="checkbox"/> 30M 30 METERS	
	<input type="checkbox"/> 35M 35 METERS	
	<input type="checkbox"/> 40M 40 METERS	
	<input type="checkbox"/> 45M 45 METERS	

OPTIONS	ACCESSORIES
<input checked="" type="checkbox"/> 1 LIGHTNING ARRESTOR - CB ENCLOSURE	<input type="checkbox"/> LDM-W-X-Y-Z PORTABLE DRIVE MOTOR
<input checked="" type="checkbox"/> 2 LIGHTNING ARRESTOR - RING J-BOX	SEE SHEET 5 FOR LETTER DESIGNATIONS
<input type="checkbox"/> R PHOTOCONTROL RECEPTACLE - RING J-BOX	<input type="checkbox"/> 09249 LEVELING BLOCK ASSEMBLY
<input type="checkbox"/> FAA1 SINGLE WARNING LIGHT	
<input type="checkbox"/> FAA2 DOUBLE WARNING LIGHT	
<input type="checkbox"/> FAA2TR DOUBLE WITH TRANSFER RELAY	
<input type="checkbox"/> FWC FIXED WIREWAY COVER ON RING	
<input type="checkbox"/> LR LIGHTNING ROD	

QUANTITY _____

CATALOG NUMBER

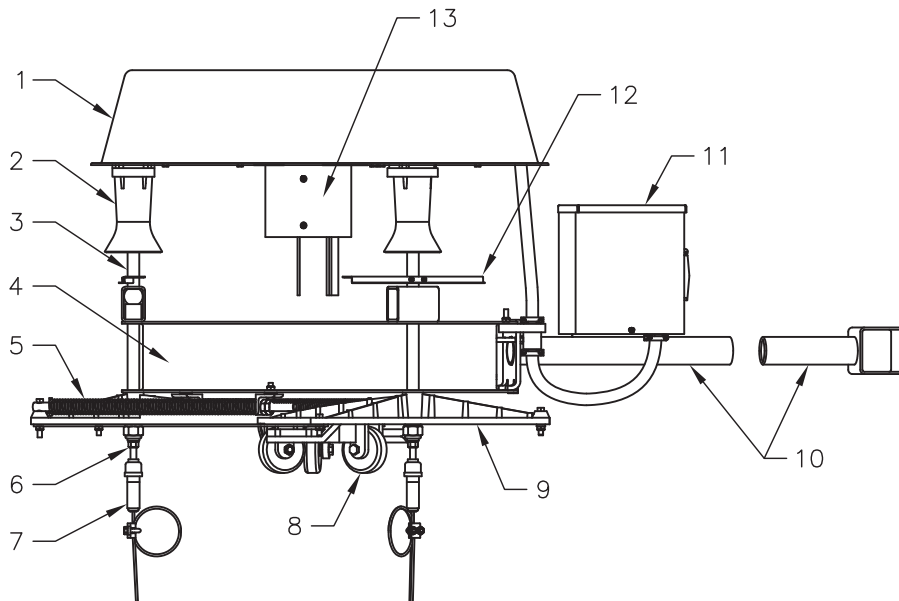
05104HT6HK100A2OHDOT



QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 1

TYPE 05 HEADFRAME AND RING ASSEMBLY



EPA = 5.62 SQUARE FEET
 WEIGHT = 250 POUNDS
 DIAMETER OF ASSEMBLY WITH LUMINAIRES VARIES FROM 8 TO 11 FEET

1. SPUN COPPER FREE ALUMINUM COVER
2. CAST HIGH STRENGTH COPPER FREE ALUMINUM LATCH BARREL
3. STAINLESS STEEL LATCH PIN
4. GALVANIZED STEEL LUMINAIRE RING
5. STAINLESS STEEL CENTERING SPRING
6. STAINLESS STEEL ADJUSTMENT NUT
7. STRANVISE WIRE ROPE GRIP
8. NON MARKING GUIDE ARM ROLLER
9. CAST ALUMINUM IRIS GUIDE ARM
10. GALVANIZED LUMINAIRE MOUNTING ARMS, LUMINAIRE TYPE DEPENDENT
11. ALUMINUM JUNCTION BOX
12. REFLECTING LATCH INDICATOR
13. GALVANIZED HEADFRAME, SLIPFITS A 4.63 TO 4.75 O.D. POLE TOP OR TENON

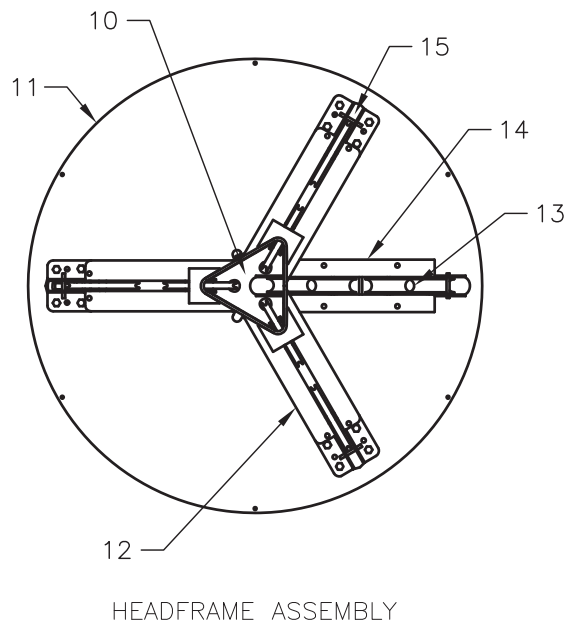
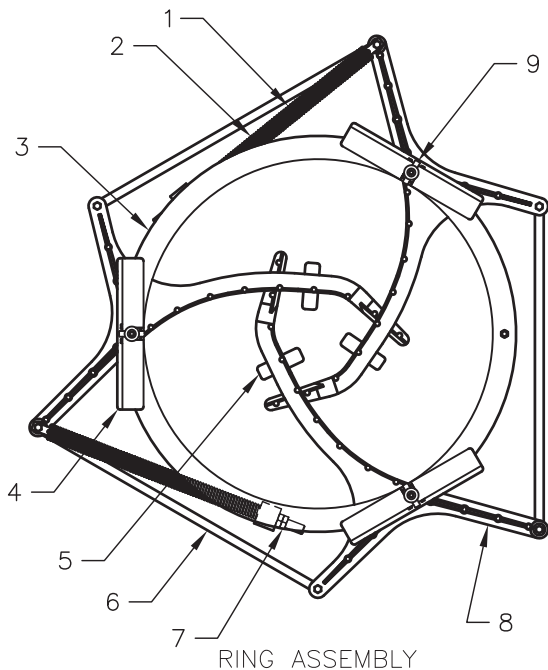
SCALE 1/16



QUOTE NO: _____
 TYPE NO: _____

LOCATION _____
 PROJECT NO. _____
 CAD MODEL: LD05.DWG
 DATE: 8/2/05
 SHEET 2

TYPE 05 HEADFRAME AND RING ASSEMBLY



- | |
|---|
| <ol style="list-style-type: none"> 1. STAINLESS STEEL CENTERING COMPRESSION SPRING 2. SOLID ALUMINUM GUIDE ROD 3. GALVANIZED STEEL LUMINAIRE RING 4. REFLECTING LATCH INDICATOR 5. NON MARKING GUIDE ARM ROLLER 6. ALUMINUM GUIDE ARM CONNECTING BRACKET 7. GUIDE ARM ADJUSTMENT NUT 8. CAST ALUMINUM IRIS GUIDE ARM 9. STAINLESS STEEL LATCH PIN 10. STEEL CABLE / CORD SEPARATOR WELDED IN SLIPFITTER 11. STEEL HEADFRAME PLATE 12. STEEL HOIST CABLE BRACKET 13. ACETAL RESIN CORD ROLLERS 14. STEEL POWER CORD ROLLER BRACKET 15. STEEL HOIST CABLE SHEAVE |
|---|

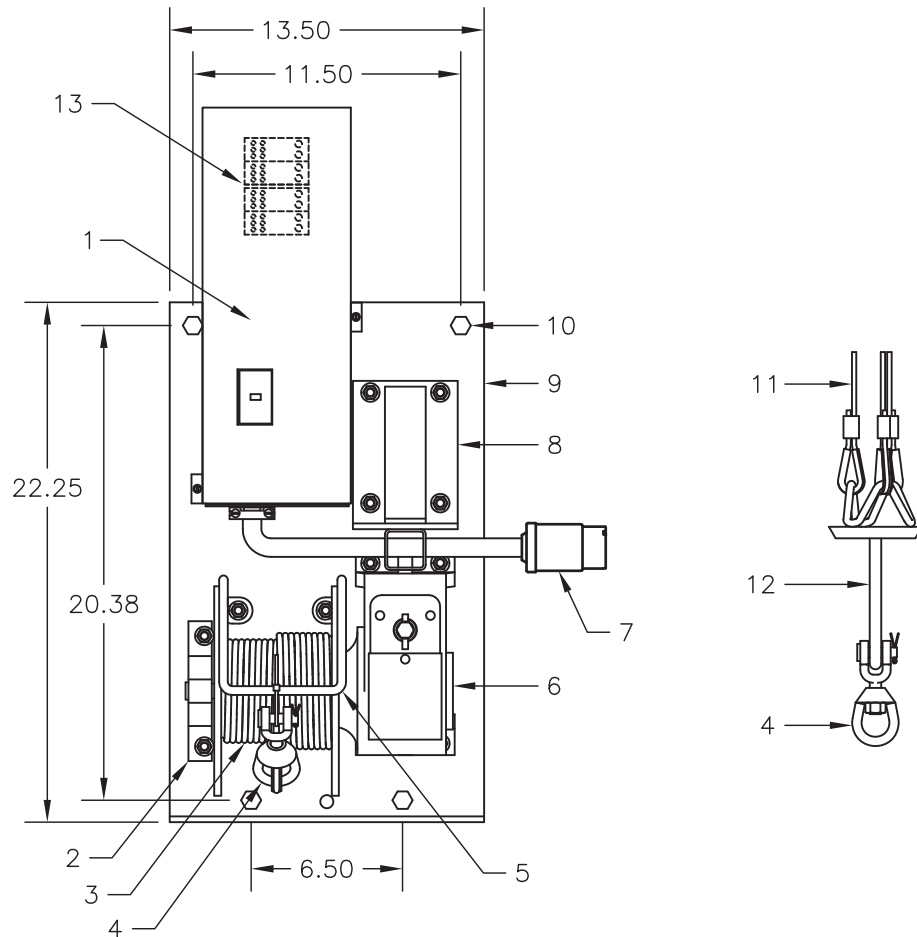
SCALE 1/16



QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 3

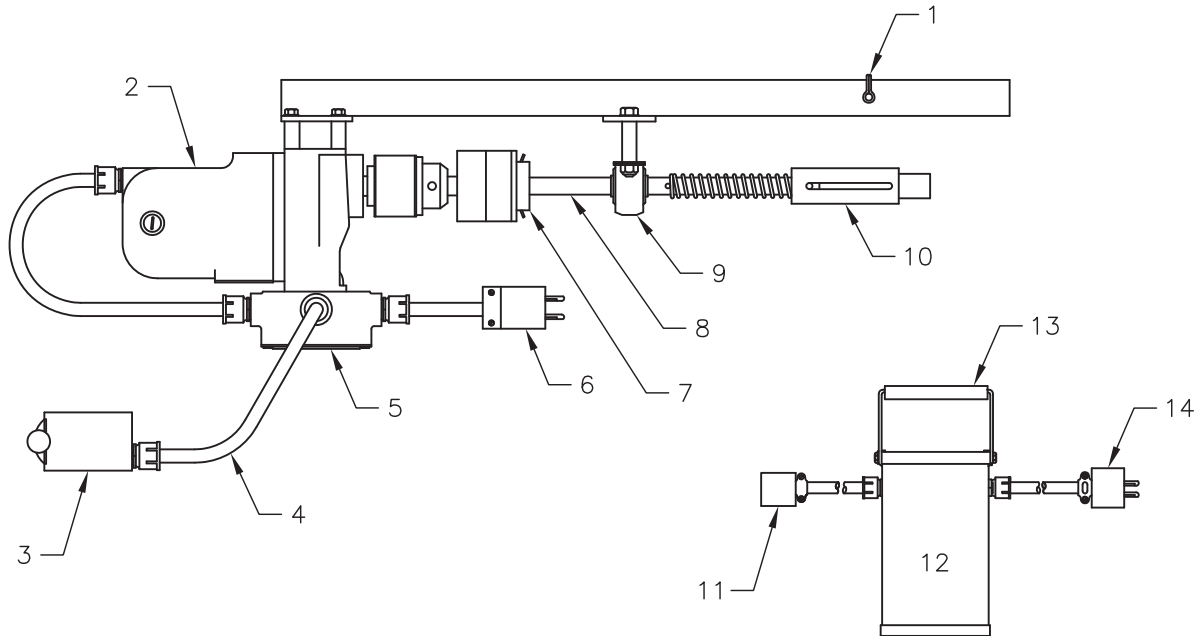
TYPE 05 WINCH PLATE ASSEMBLY



- | |
|--|
| <ol style="list-style-type: none"> 1. CIRCUIT BREAKER OR BREAKERS AND ENCLOSURE WITH (2) TERMINAL BLOCKS 2. WINCH OUTBOARD SUPPORT 3. 1/4" DIAMETER WINCH CABLE, GALVANIZED
LENGTH EQUALS POLE HEIGHT PLUS 6 FEET 4. FORGED STEEL SWIVEL, 11,000 POUND ULTIMATE STRENGTH 5. WINCH CABLE GUARD 6. WINCH, 30:1 GEAR RATIO WITH INTERNAL DRAG BRAKE 7. POWER SUPPLY CORD AND CONNECTOR 8. STEEL POWER UNIT MOUNTING BRACKET 9. STEEL WINCH PLATE 10. 1/2-13 MOUNTING BOLT 11. 3/16" DIAMETER HOIST CABLES, GALVANIZED 12. STEEL CLEVIS TRANSITION ASSEMBLY 13. (2) POWER DISTRIBUTION BLOCKS |
|--|

SCALE 1/16

TYPE 05 PORTABLE DRIVE MOTOR
LDM-W-X-Y-Z



1. HITCH PIN
2. 3/4" REVERSIBLE ELECTRIC MOTOR, 120 VOLTS, 11.5 AMP, 350 RPM
3. REVERSING DRUM SWITCH
4. CONTROL CORD, 20 FOOT LENGTH
5. WIRING HOUSING
6. PLUG TO MATE TO CONNECTOR IN POLE BASE OR TRANSFORMER SECONDARY
7. TORQUE LIMITER COUPLING
8. 3/4" STEEL SHAFT
9. BALLBEARING PILLOWBLOCK
10. 5/8" HEX SOCKET CRANK SHAFT COUPLING
11. CONNECTOR TO MOTOR FROM 120V TRANSFORMER SECONDARY
12. STEPDOWN TRANSFORMER, 120V SECONDARY, 1.5 KVA FOR 240V, 277V AND 480V, 2.0 KVA FOR 208V
13. 1/2" CARRY HANDLE
14. PLUG TO CONNECTOR IN POLE BASE FROM TRANSFORMER PRIMARY

TYPICAL CATALOG NUMBER IS LDM-W-X-Y-Z WHERE:

- W = NUMBER OF CIRCUITS (1 OR 2)
- X = PHASE (1 FOR SINGLE PHASE, 3 FOR 3 PHASE OR 4 FOR 3 PHASE/4 WIRE)
- Y = VOLTAGE (120, 208, 240, 277, 480 OR 600)
- Z = AMPS (25, 30, 35, 45, 50, 60 OR 70)

CATALOG NUMBER _____ QUANTITY 1

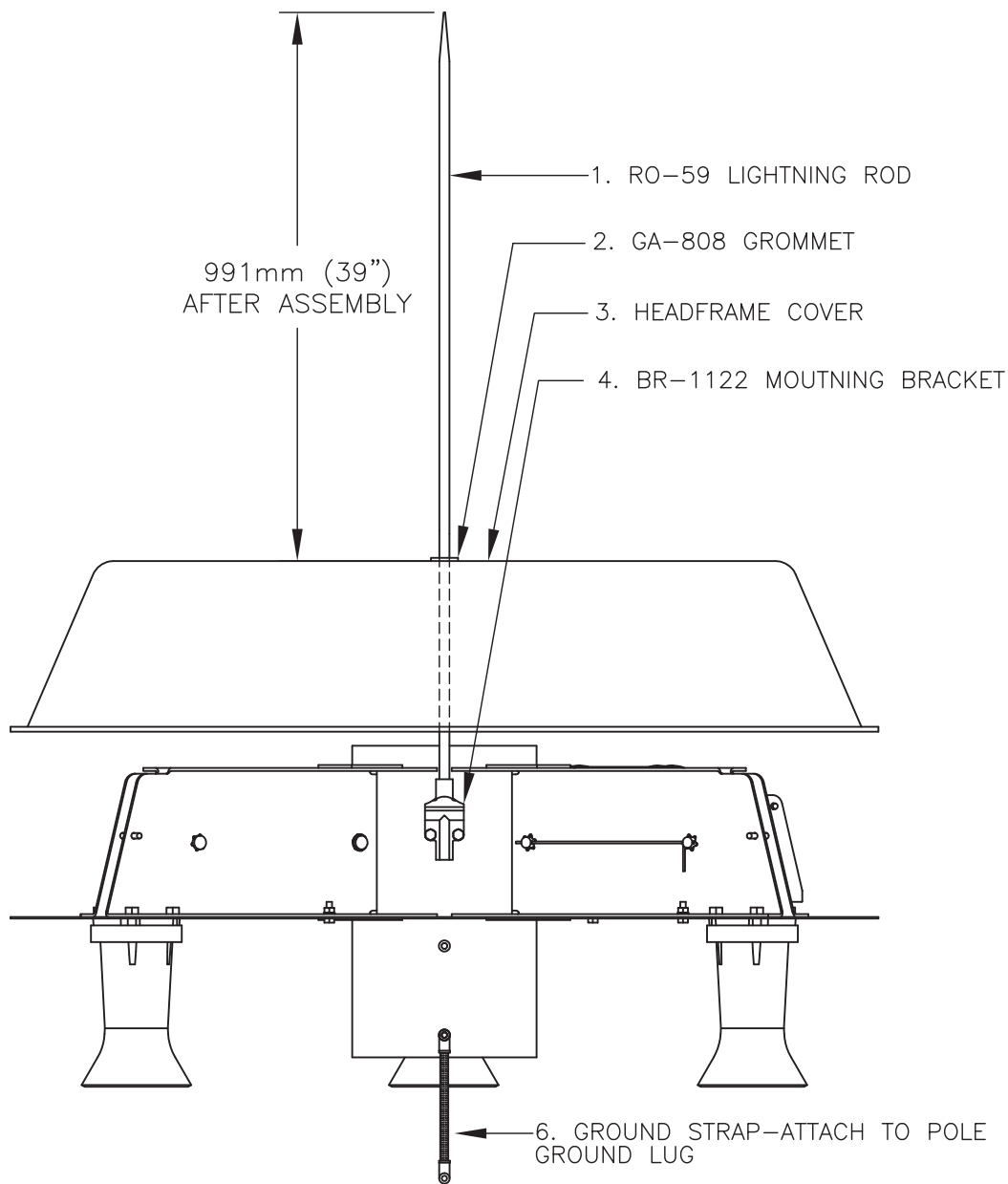


QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 5

LOWERING DEVICE

LIGHTNING ROD OPTION



FIELD INSTALLATION INSTRUCTIONS

1. REMOVE HEADFRAME COVER AND FIND THE DIMPLE LOCATED ON THE TOP SURFACE.
2. PUNCH A 7/8" HOLE IN THE COVER AT THE DIMPLE LOCATION AND INSTALL THE RUBBER GROMMET.
3. THREAD LIGHTNING ROD INTO THE LIGHTNING ROD BRACKET (BR-1122), TIGHTENING SECURELY.
4. SLIDE THE HEADFRAME COVER OVER THE LIGHTNING ROD ONTO THE HEADFRAME,
5. SECURE THE HEADFRAME COVER WITH THE PROPER FASTENERS AS DESCRIBED IN THE OWNERS MANUAL.



QUOTE NO: _____
TYPE NO: _____

LOCATION _____
PROJECT NO. _____
CAD MODEL: LD05.DWG
DATE: 8/2/05
SHEET 6

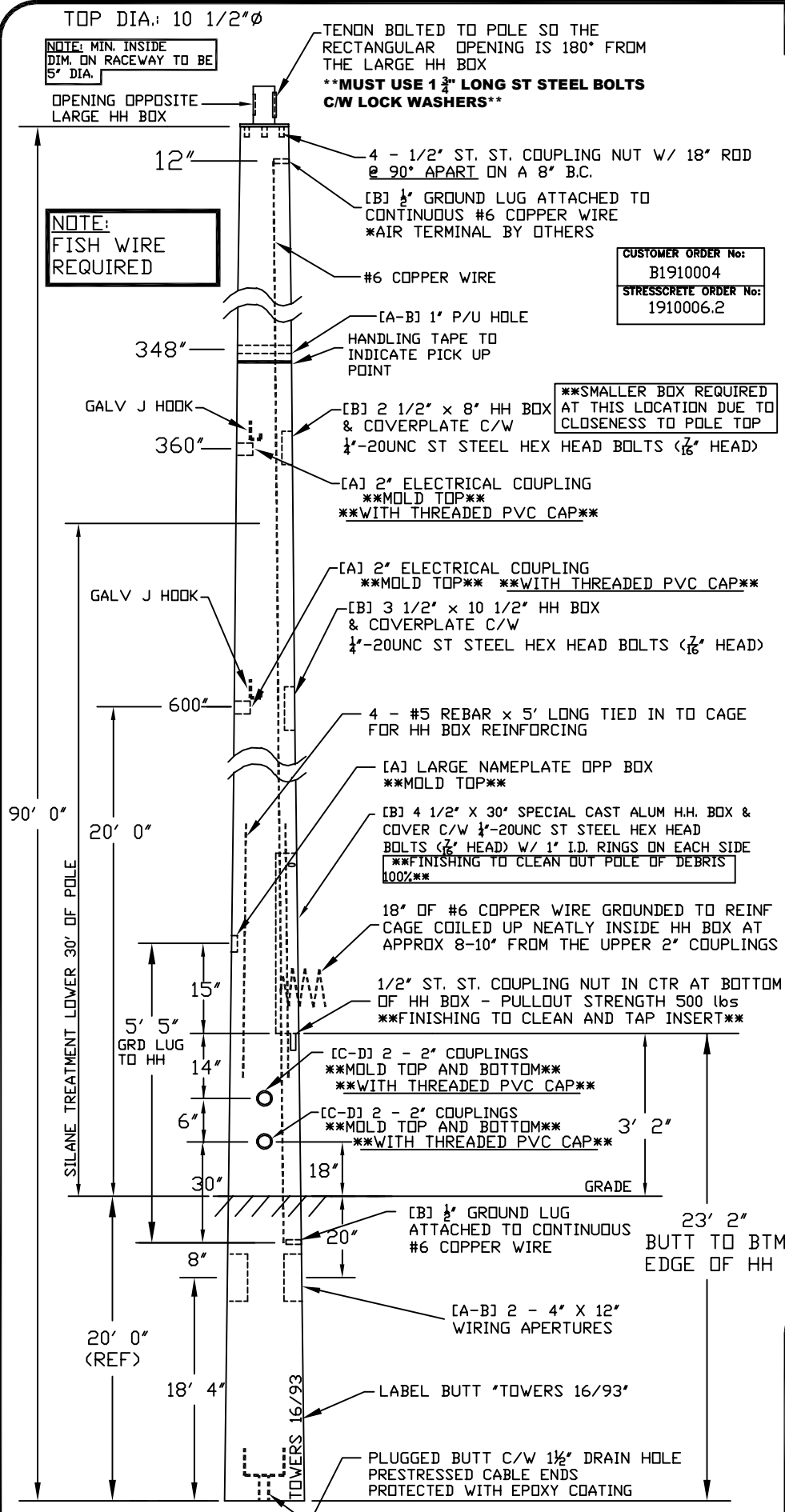
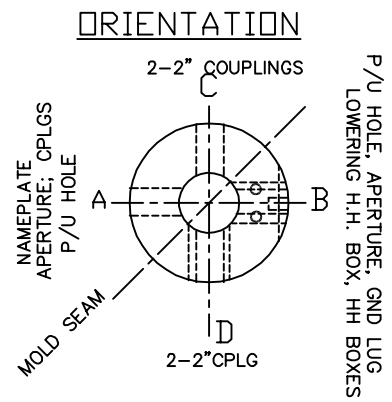
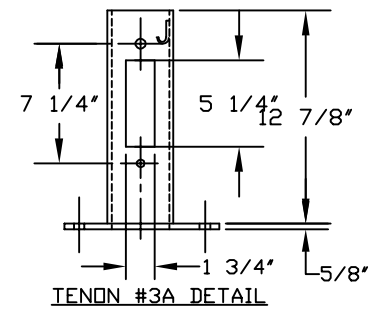
REV.	ALTERATION	DATE	BY

SPECIFICATIONS:

CAT. NO.: E-900-KPR-G-CAM
-SPECIAL TENON

POLE TOP: 10 1/2"φ
POLE BUTT: 26.70"φ
POLE TAPER: 0.18"
POLE LENGTH: 90' 0"
POLE WEIGHT: 16,650 lbs.
QUANTITY: 2
POLE REINFORCING: 12 - 1/2" 270KSI
PRESTRESS STRAND
DOMESTIC
4-#5 REBAR x 43'

DOMESTIC
CONCRETE COMP STR: 8,000 PSI MIN
@ 28 DAY
COATINGS: WEATHERPROOF
SILANE COATING
BOTTOM 30'
DEFLECTION AT 30 MPH: LESS THAN 1.0"



CUSTOMER APPROVAL & DATE:

CUSTOMER AFFIXES ITS AUTHORIZED SIGNATURE ABOVE, ACKNOWLEDGING THAT THIS DRAWING IS IN CONFORMANCE WITH THE SPECIFICATIONS OF THE CUSTOMER.

King Luminaire • StressCrete • Est. 1953

STRESSCRETE GROUP

Manufacturing Locations:

Burlington, Ontario 1-800-268-7809

Northport, Alabama 1-800-435-6563

Atchison, Kansas 1-800-837-1024

Jefferson, Ohio 1-800-268-7809

PROJECT/CUSTOMER:
OH 1-74/75 MILL CREEK EXPRESSWAY #183000E-26; HAM104667
70' AG CAMERA LOWERING POLE - 20' EMBEDMENT
TOWERS #16 & 93

DRAWN BY: RF	AT: SC3	CHECKED BY:	DATE: 3-9-20	REVISION:
DRAWING TYPE: APPROVAL / MFG DWG			DESIGN NUMBER: 1910006.2	

***NOTE:**
STRESSCRETE MAKES NO CLAIMS THAT THE REFERENCE EMBEDMENT DEPTH SHOWN IS SUITABLE FOR SUPPORTING THIS STRUCTURE. IT IS RECOMMENDED THAT A COMPETENT PROFESSIONAL EVALUATE THE SOILS PRESENT ON SITE, CONFIRMING REQUIRED EMBEDMENT DEPTH, HOLE DIAMETER AND BACKFILL MATERIAL TO BE USED.

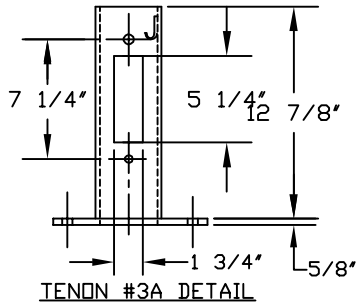
REV.	ALTERATION	DATE	BY
A	POLE WAS 82'	3-9-20	RF

SPECIFICATIONS:

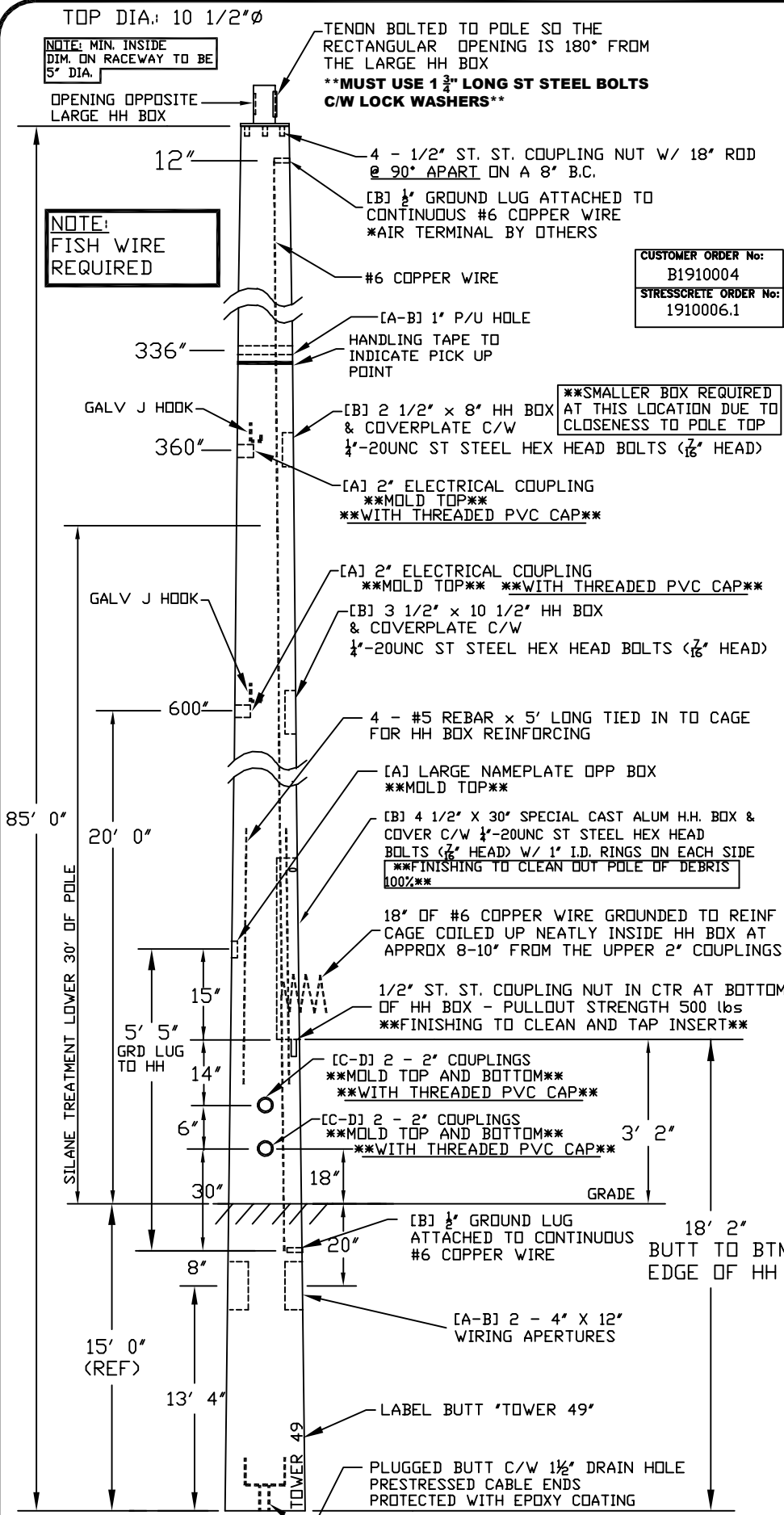
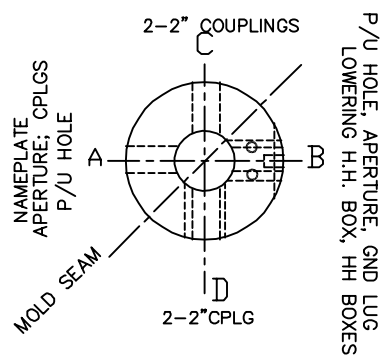
CAT. NO.: E-850-KPR-G-CAM
-SPECIAL TENON

POLE TOP: 10 1/2"φ
POLE BUTT: 25.8"φ
POLE TAPER: 0.18"
POLE LENGTH: 85' 0"
POLE WEIGHT: 15,255 lbs.
QUANTITY: 1
POLE REINFORCING: 12 - 1/2" 270KSI
PRESTRESS STRAND
DOMESTIC
4-#5 REBAR x 37'

DOMESTIC
CONCRETE COMP STR: 8,000 PSI MIN
@ 28 DAY
COATINGS: WEATHERPROOF
SILANE COATING
BOTTOM 30'
DEFLECTION AT 30 MPH: LESS THAN 1.0"



ORIENTATION



CUSTOMER ORDER No:
B1910004
STRESSCRETE ORDER No:
1910006.1

****SMALLER BOX REQUIRED AT THIS LOCATION DUE TO CLOSENESS TO POLE TOP**

****FINISHING TO CLEAN OUT POLE OF DEBRIS 100%****

****FINISHING TO CLEAN AND TAP INSERT****

NOTE:
STRESSCRETE MAKES NO CLAIMS THAT THE REFERENCE EMBEDMENT DEPTH SHOWN IS SUITABLE FOR SUPPORTING THIS STRUCTURE. IT IS RECOMMENDED THAT A COMPETENT PROFESSIONAL EVALUATE THE SOILS PRESENT ON SITE, CONFIRMING REQUIRED EMBEDMENT DEPTH, HOLE DIAMETER AND BACKFILL MATERIAL TO BE USED.

CUSTOMER APPROVAL & DATE:

CUSTOMER AFFIXES ITS AUTHORIZED SIGNATURE ABOVE, ACKNOWLEDGING THAT THIS DRAWING IS IN CONFORMANCE WITH THE SPECIFICATIONS OF THE CUSTOMER.

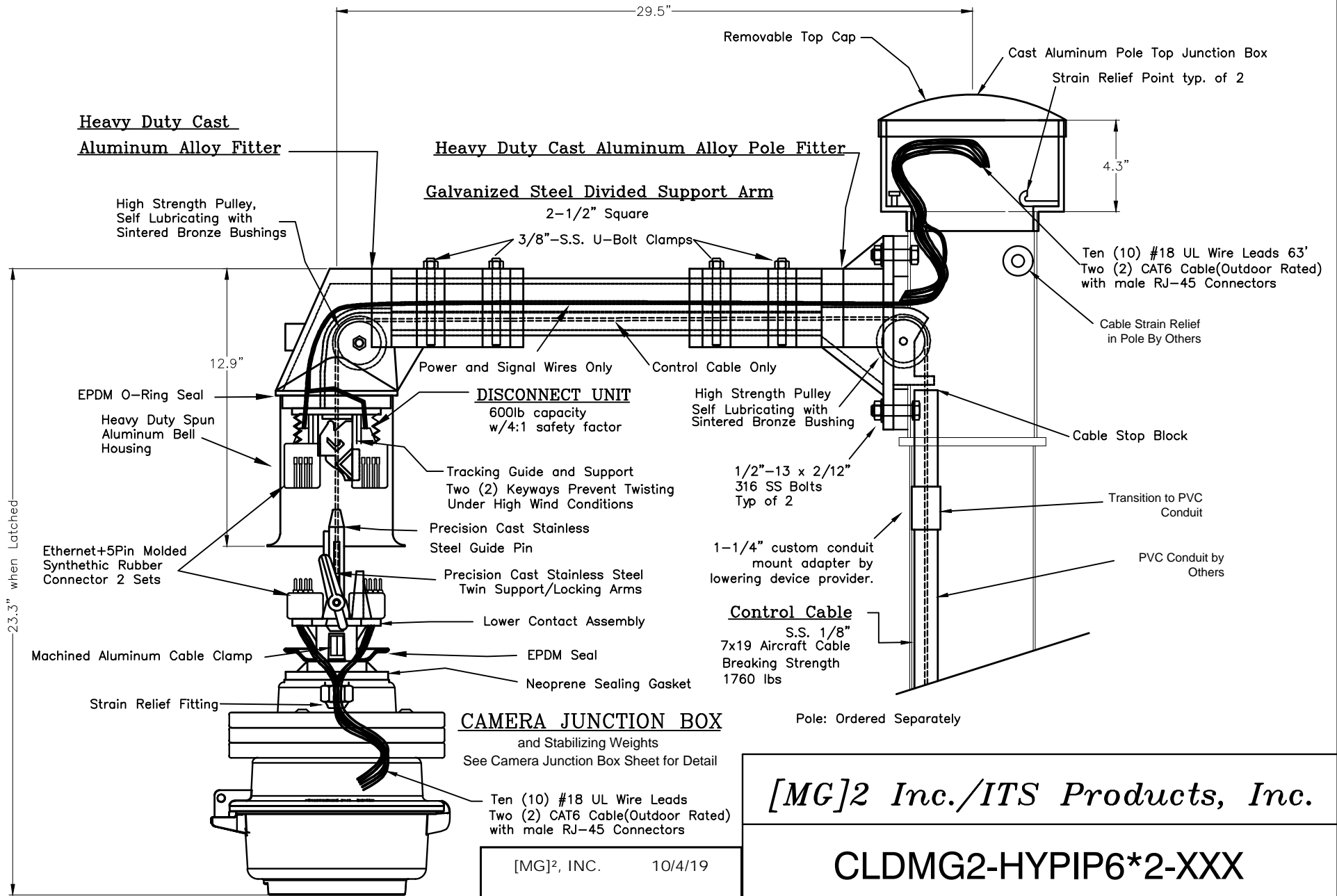
King Luminaire • StressCrete • Est. 1953
STRESSCRETE GROUP

Manufacturing Locations:
Burlington, Ontario 1-800-268-7809
Northport, Alabama 1-800-435-6563
Atchison, Kansas 1-800-837-1024
Jefferson, Ohio 1-800-268-7809

PROJECT/CUSTOMER:
OH 1-74/75 MILL CREEK EXPRESSWAY #183000E-26; HAM104667
70'AG CAMERA LOWERING POLE - 15' EMBEDMENT
TOWER #49

DRAWN BY: RF	AT: SC3	CHECKED BY:	DATE: 10-5-19	REVISION: A
DRAWING TYPE: APPROVAL / MFG DWG			DESIGN NUMBER: 1910006.1	

Camera Lowering Device for Pole Mounting Multi-Function Surveillance Cameras



Lowering Device has been tested and is rated for at least a wind load of 100mph w/ 30% gust with a 1.65 factor of safety

Tapped 1-1/2" NPT Camera Mounting Hole

[MG]², INC. 10/4/19
 OH DOT
 I-74/75 MILL CREEK
 EXPRESSWAY #183000E-26
 HAM104667

[MG]² Inc./ITS Products, Inc.

CLDMG2-HYPIP6*2-XXX

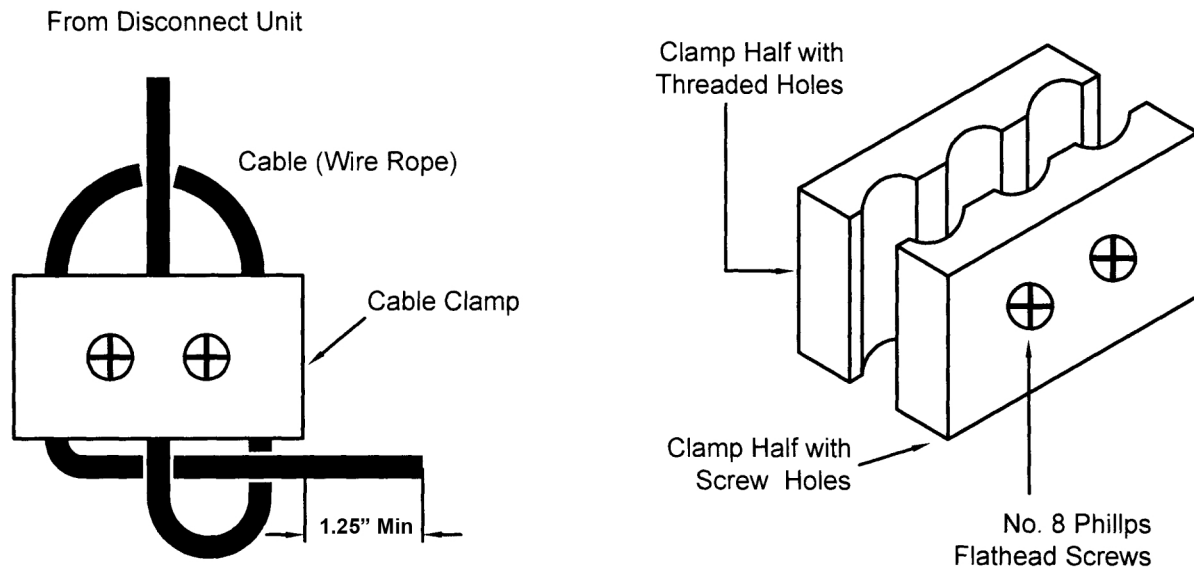
SIZE	DATE 02/25/09	DWG NO. C090030	REV 7/05/18
SCALE NTS	SHEET		



CABLE CLAMP ASSEMBLY AND USE FOR SYSTEMS WITH CAPACITIES UP TO 600 POUNDS

- To facilitate ease of feeding the wire through the cable clamp, trim leading end of cable square making sure there are no protruding strands of wire. **Do Not Use Lubricant of Any Kind On The Portion of Cable That Is To Be Within The Cable Clamp.**
- Loosen screws of clamp to separate the clamp halves enough to fit the cable through the notches but do not remove the screws completely.

ADJUSTING CABLE IN CLAMP



- Feed cable end coming from the bottom of the disconnect unit into the center notches of the cable clamp. Pull approximately 5 inches of cable through the clamp.
- Insert the end of the cable through one of the side notches. Cable should move easily through the notches of the clamp. If the cable is too loose and moves out of the notches, tighten the screws slightly until the cable stays within the notches. Do not pull cable tight.
- Pass the end of the cable across to the other side notch and through the clamp.
- End of cable must be fed through loop formed by cable coming from center notch and first side notch so that when cable is pulled tight the loop closes on the end portion of the cable.
- Carefully pull the cable loops tight by back pulling on the cable portion coming from the disconnect unit. Be sure cable remains within the notches of the clamp. With all loops small as possible, tighten screws in an alternating pattern until tight. End of cable should extend approximately 1.25 inch past edge of cable clamp. Trim cable end as required.
- Check cable clamp, cable, and screws for tightness every time cable clamp is lowered when the system is operated.

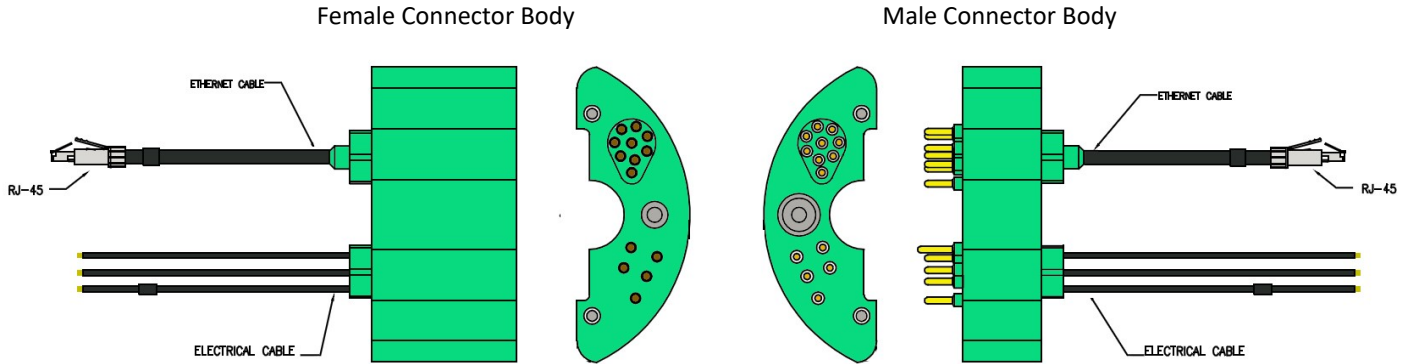
WARNING: TO PREVENT SERIOUS PERSONAL INJURY, THE CABLE CLAMP MUST BE PROPERLY ASSEMBLED AND THE CABLE MUST BE PROPERLY ROUTED THROUGH THE CLAMP AS SPECIFIED WITHIN. NO ATTEMPT AT LIFTING ANY LOAD SHOULD BE MADE UNTIL ALL SPECIFICATION CONDITIONS ARE MET.

**DO NOT LIFT PEOPLE OR OPERATE ANY LOWERING SYSTEM OVER PEOPLE.
USE ONLY 1/8 INCH OR 5/32 INCH DIAMETER 7x19 CONSTRUCTION CABLE WITH THIS CLAMP.**

[MG]², INC. 10/4/19

OH DOT
I-74/75 MILL CREEK EXPRESSWAY
#183000E-26 HAM104667

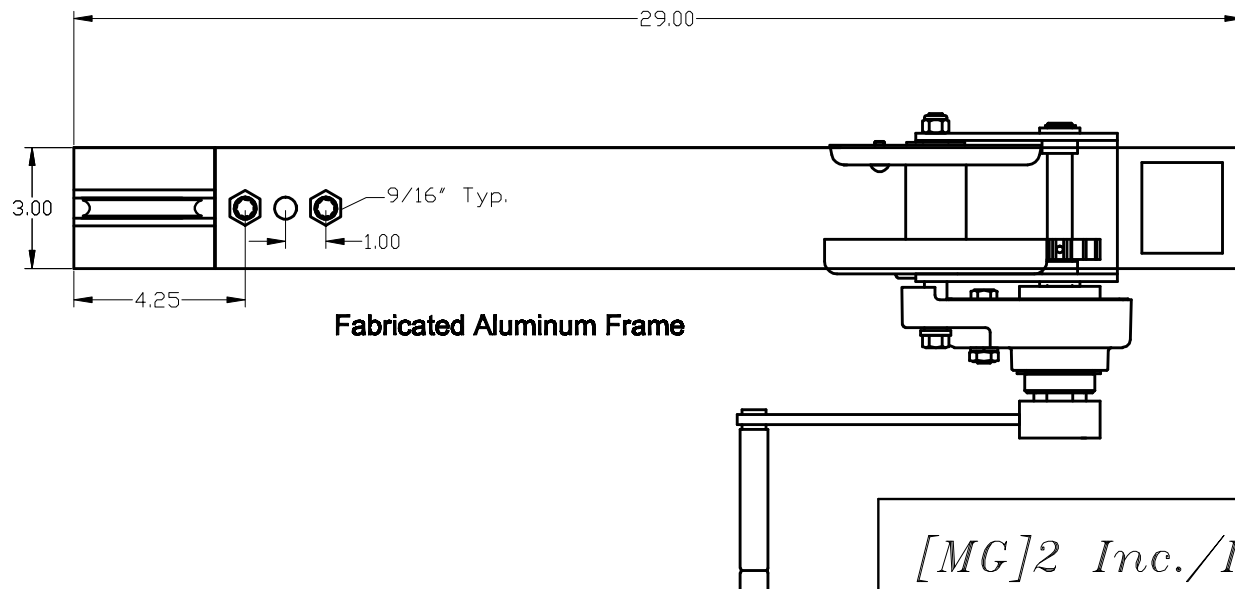
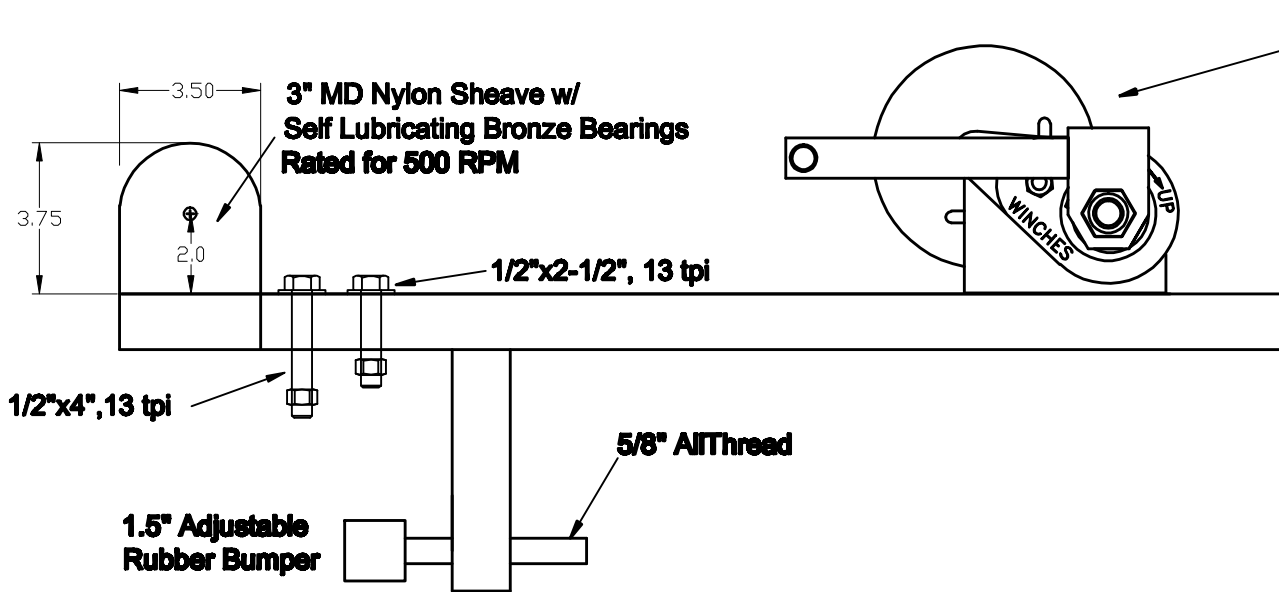
Rev. 10/25/2013



CAT6a Shielded Connectors: MG2 CAT6a Shielded Ethernet/IP connectors are specifically designed for outdoor use within the disconnect unit of the MG2 camera lowering device (CLD). The insulating connector bodies are molded from thermosetting synthetic rubber (Neoprene or Hypalon). All current carrying male pin and female socket contacts shall be Copper Alloy and Gold Plated per ASTM-B-488. To ensure pins are not easily bent, each of the gold plated contacts measures 0.09" min. outside diameter. Each individual female barrel contact shall have a sleeve to prevent foreign particles from entering the contact area, as well as preclude the possibility of the tines of the female contact from opening beyond allowable limits and ensure a snug fit around the respective male pins. The contact block shall have a spring loaded design that provides constant pressure on the contact block enabling consistent electrical and data performance during moderate shaking conditions.

For proper and complete performance, each Ethernet/IP Male-Female connector shall be equipped with a total of fourteen (14) specifically designed contacts. Of the fourteen (14) contacts - Nine (9) 0.09" diameter gold plated contacts silver soldered to CAT6a High Flex Shielded Industrial Grade Outdoor Rated Network Cable, for Ethernet/IP/DATA/Video transmissions/Control/ and POE (Power Over Ethernet) where applicable. Shielding shall include both an overall shield of 38 AWG tinned copper braid over the cable core and a second shield of aluminized foil applied over the braid. The CAT6a shielded cable is terminated with a shielded RJ-45 male connector. In addition there are five (5) 0.09" diameter gold plated contacts silver soldered to #18/1 AWG, 600V UL wire leads utilizing a chlorosulfonated polyethylene (CSPE) jacket - bare and numbered 1-5 (for optional ground, alarms, power, analog connections where applicable). All cable jackets shall be outdoor rated. All silver soldering shall be per IPC J STD-001E. Each contact is rated up to 600V, 7A Max and is de-rated according to the wire used in the application.

These Male/Female contacts are permanently and integrally molded in the synthetic rubber body. Each male Pin shall incorporate an "O" Ring type shoulder at the base of each Pin to completely isolate and protect each contact individually from the environmental exposure. The male and female connector is equipped with a spring-assisted disconnect when mounted in the disconnect head which maintains constant pressure upon the contact bodies. Each contact is tested & verified for Ethernet data transmission speeds up to 1000BASE-T (1GB/s).



[MG]², INC. 10/4/19

OH DOT
I-74/75 MILL CREEK EXPRESSWAY
#183000E-26 HAM104667

[MG]² Inc./ITS Products, Inc.

Lowering Tool Model LWR5-XX

SIZE	DATE 4/19/13	DWG NO. C99108	REV 3/07/11
SCALE N.T.S.			SHEET 1/1



DRILL MOTOR LOWERING TOOL FOR POLE MOUNTED LOWERING SYSTEMS. HAND HELD DRILL MOTOR WITH AUTOMATIC RESETTING OVERLOAD CLUTCH

Overload Clutch Specifications

CATALOG NO. DWAC-200

CLUTCH TYPE: Automatic resetting, spring pawl/detent action

TORQUE SETTING: 100 inch-pounds Clockwise Blocked in Counterclockwise Direction

HUB SHAFT SIZE: 1/2" diameter. With 7/16" hex to insert into 1/2" drill.

SLEEVESHAF T SIZE: 1/2" diameter with 1/8" square key (clutch end). 1/2" square for winch socket.

TORQUE ADJUSTING: Replaceable springs. Consult Factory

WINCH DRIVE: 1-1/8", 1/2" drive impact hex socket.

DIMENSIONS: 2-1/4" diameter; clutch 2-3/8" long, 6-3/4" overall

Drill Motor Specifications

DRILL TYPE: 1/2" heavy duty, reversible, D-handle with side handle, Quik-Lok Cord Set, UL listed.

CHUCK SIZE: 1/2" key type chuck (key included)

SPEED: Variable Speed 0-500 rpm



Electric Drill



Battery Powered Drill

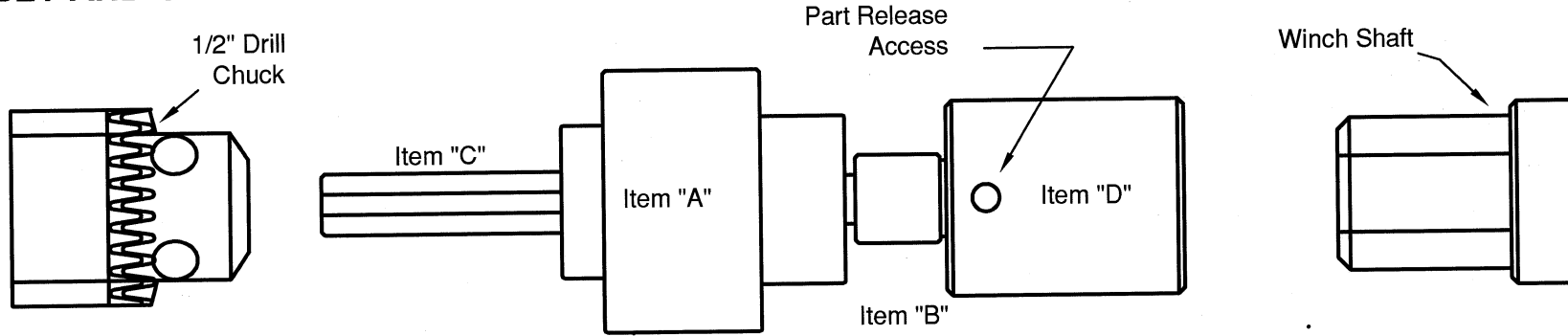
NOTE: DO NOT USE ANY KIND OF SPEED INCREASER OR REDUCER WHEN USING DRILL MOTOR TO RAISE OR LOWER CAMERA/LUMINAIRE.

[MG]², INC. 10/4/19

OH DOT
I-74/75 MILL CREEK EXPRESSWAY
#183000E-26 HAM104667

ASSEMBLY AND USE INSTRUCTIONS

CATALOG NO. DWAC-200



WARNING: TO REDUCE THE RISK OF PERSONAL INJURY AND TO AVOID SYSTEM DAMAGE, DO NOT OPERATE THE DRIVE ADAPTOR AT MORE THAN 500 RPM. WEAR SAFETY GLASSES AT ALL TIMES DURING THE OPERATION OF THIS DEVICE.

NOTES:

- DRIVE ADAPTOR MUST BE USED WITH A DRILL MOTOR HAVING AT LEAST A 1/2 INCH CAPACITY CHUCK, VARIABLE SPEED, REVERSIBLE, AND SHOULD BE OPERATED AT 500 RPM (MAX. OPERATING SPEED) OR LESS.
- THE PURPOSE OF THIS DRIVE ADAPTOR IS TO PROVIDE A SAFE AND EFFICIENT MEANS OF RAISING AND LOWERING A POLE MOUNTED CAMERA/LUMINAIRE WITH THE ASSISTANCE OF A HAND HELD DRILL MOTOR. AN AUTOMATICALLY RESETTING TORQUE LIMITER (OVERLOAD CLUTCH) IS USED TO PROTECT THE OPERATOR AND THE SYSTEM FROM POTENTIALLY DAMAGING AMOUNTS OF TORQUE.
- THE HANDLE ASSEMBLY FOR THE HAND OPERATING OF THE WINCH SHOULD BE KEPT NEARBY AS IT IS NEEDED FOR THE LOCKING/ UNLOCKING OF THE ELECTRICAL CONTACT UNIT. FOLLOW THE PROCEDURE SPECIFIED WITHIN THESE INSTRUCTIONS.

CAUTION: THE TORQUE LIMITER OF THIS DRIVE ADAPTOR IS INTENDED FOR THE EXPRESS LIFTING AND LOWERING OF A POLE MOUNTED CAMERA/LUMINAIRE. DO NOT USE THIS DRIVE ADAPTOR FOR ANY OTHER LIFTING OR PULLING PURPOSES NOT SPECIFIED WITHIN THESE INSTRUCTIONS.

THE PARTS OF THIS DRIVE ADAPTOR ARE PRE-ASSEMBLED AT THE FACTORY AND HAVE A PRESET TORQUE OF APPROXIMATELY 100 inch-pounds.

CONTACT THE FACTORY IF IT SHOULD BECOME NECESSARY TO ADJUST THE TORQUE SETTING ON THE TORQUE LIMITER (ITEM A),

TO UNLOCK AND LOWER CAMERA/LUMINAIRE:

1. Using the handle for the manual operation of the winch, operate the winch to raise the camera/luminaire approximately 3/4 of an inch. This will unlock the electrical disconnect unit. Operate the winch by hand to lower the camera/luminaire enough to confirm that the lower and upper halves of the disconnect unit have been separated. Remove the manual use handle from the winch.
2. Insert the drill motor adaptor shaft (Item C) of the drive adaptor assembly into the chuck of the drill and tighten the chuck. Slip the 1-1/8 inch hex drive socket (Item D) of the drive adaptor over hex shaft of the winch until shaft is fully inserted into the socket. Keeping the drill and the drive adaptor in line with the winch shaft, operate the drill to lower the camera/luminaire to the desired height for servicing. Be sure to keep the drive socket over the winch shaft at all times while using the drill to power the winch.

CAUTION: SHOULD THE DRIVE SOCKET SLIP OFF THE WINCH SHAFT DURING LOWERING OR RAISING OPERATIONS, DO NOT ATTEMPT TO PUT DRIVE SOCKET BACK ON THE WINCH SHAFT UNTIL ALL PARTS HAVE STOPPED MOVING.



[MG]², INC. 10/4/19

OH DOT
I-74/75 MILL CREEK
EXPRESSWAY #183000E-26
HAM104667

DRILL MOTOR TO WINCH DRIVE ADAPTOR WITH CLUTCH

ASSEMBLY AND USE INSTRUCTIONS

CATALOG NO. DWAC-200

WARNING: DO NOT ATTEMPT TO RAISE THE CAMERA/LUMINAIRE INTO THE ELECTRICAL DISCONNECT UNIT WITHOUT STOPPING PRIOR TO ENGAGEMENT. AN EXCESSIVE AMOUNT OF TORQUE IS GENERATED WHEN THE CAMERA/LUMINAIRE UNIT AND THE ATTACHED GUIDEPOST SPIN AROUND INTO POSITION WHEN MATING WITH THE FIXED PORTION OF THE DISCONNECT UNIT. TORQUE IS COMPOUNDED BY THE SIZE, WEIGHT, AND SHAPE OF THE CAMERA/LUMINAIRE. ENGAGEMENT OF THE MOVEABLE PORTION OF THE DISCONNECT UNIT (ATTACHED TO THE TOP OF THE CAMERA/LUMINAIRE UNIT) WITH THE FIXED PORTION OF THE DISCONNECT UNIT (ATTACHED TO END OF THE POLE MOUNTED ARM) SHOULD BE DONE SLOWLY TO CONTROL POTENTIALLY DAMAGING TORQUE.

TO RAISE AND LOCK CAMERA/LUMINAIRE UNIT:

1. After servicing the camera/luminaire, slip the hex drive socket of the drive adaptor over the winch shaft completely and operate the drill at a moderate speed to raise the camera/luminaire unit to a position that will place the moveable portion of the disconnect unit about one foot from engaging the fixed portion; then, stop the raising operation. To minimize pole shaking and vibrations, it may be necessary to stop the operation periodically during the raising of the camera/luminaire until movement subsides.
2. Remove the drill motor and the drive adaptor from the winch shaft. Install the manually operated winch handle onto the winch shaft and secure. Proceed to **SLOWLY** raise the camera/luminaire by operating the manual winch handle in the raising direction. The camera/luminaire will noticeably turn as the disconnect unit is aligning for engagement. Continue to slowly raise the camera/luminaire unit. When all parts are in proper position, and at the very top, the raising motion will stop and the lowering cable will become taut. At this stage, the camera/luminaire and disconnect unit are all the way to the top and there is still tension on the cable.
3. Operate the winch in reverse to lower the camera/luminaire approximately ¾ of an inch. Continue to operate the winch in the lowering direction until there is noticeable slack in the lowering cable. This indicates that the camera/luminaire and disconnect unit are in the locked position.

4. For additional information on the lowering system and the winch, refer to specific instructions for those items.

CAUTION: ALWAYS BE SURE THAT ALL PARTS OF THE DRIVE ADAPTER ARE SECURED PRIOR TO OPERATION OF THE DRIVE ADAPTOR.

MAINTENANCE AND CARE OF DRIVE ADAPTOR:

- PERIODICALLY EXAMINE ALL MECHANICAL COMPONENTS FOR EXCESSIVE WEAR.
- REPLACE ANY PARTS THAT EXHIBIT EXCESSIVE WEAR OR VISIBLE DAMAGE SUCH AS CRACKS OR BENT PARTS, SUCH AS A SHAFT.
- PROTECT PARTS FROM DIRECT CONTACT WITH WATER OR ANY OTHER CORROSIVE LIQUIDS.
- TORQUE LIMITER CONTAINS LUBRICATED PARTS. EXCESSIVELY HOT OR COLD TEMPERATURES MAY AFFECT THE ACCURACY OF THE TORQUE SETTING.
- CHECK ALL RETAINING PINS AND SET SCREWS OF THE DRIVE COMPONENTS FOR PROPER OPERATION.

PARTS LIST

Description	Quantity	Part Number
A. PRE-SET TORQUE LIMITER	1 EACH	C10006
B. 1/2" DRIVE ADAPTOR	1 EACH	C10012
C. 7/16" DRILL MOTOR ADAPTOR	1 EACH	C10013
D. 1-1/8" HEX DRIVE SOCKET	1 EACH	C10011

For replacement parts, contact:
<ITS> PRODUCTS, INC. at 334 -794-4137



LOWERING TOOL CASE Model# W00805

[MG]², INC. 10/4/19

OH DOT
I-74/75 MILL CREEK
EXPRESSWAY #183000E-26
HAM104667



Features

- Pelican Brand iM2950 case
- Five Press & Pull Latches
- Three Double-Layered Soft Grip handles
- Two Padlockable Hasps
- In-Line Wheels
- Telescoping Handle
- Vortex® Valve
- Flush Powerful Hinges
- Lightweight Strong HPX® Resin
- Watertight
- Interior Foam Cut-outs to Cradle Lowering Tool
- Exterior Dimensions (L x W x D)
31.30" x 20.40" x 12.20"
- Interior Dimensions (L x W x D)
29.00" x 18.00" x 10.50"



Select Backfill Kits



Utility Structural Systems

These kits are generally considered to be maintenance or leaning pole repair kits. They are the only ones that are packaged in boxes. Boxes are not the mixing container. Kit code and expiration dates are marked on box.

PS-205: 1 Cubic Foot Straightening Kit

This kit will yield approximately 1 cubic foot of expanded backfill.

- 1- 1 Gallon Plastic Jug "A"
- 1-1 Gallon Plastic Jug "B"
- 1-Pair Vinyl Gloves
- 1-Wooden Stir Stick
- 1-Metal Drill Mixer

This kit comes complete as illustrated. **HIGH-SPEED** drill is the recommended method of mixing.



PS-210: 2 Cubic Feet Straightening Kit

This kit will yield approximately 2 cubic feet of expanded backfill.

- 1- 1 Gallon Plastic Jug "A"
- 1-2 Gallon Plastic Jug "B"
- 1-Pair Vinyl Gloves
- 1-Wooden Stir Stick
- 1-Metal Drill Mixer

This kit comes complete as illustrated. **HIGH-SPEED** drill is the recommended method of mixing.



PS-215: 3 Cubic Feet Straightening Kit

This kit will yield approximately 3 cubic feet of expanded backfill.

- 1- 1 Gallon Plastic Jug "A"
- 1-2 Gallon Plastic Jug "B"
- 1-Pair Vinyl Gloves
- 1-Wooden Stir Stick
- 1-Metal Drill Mixer

This kit comes complete as illustrated. **HIGH-SPEED** drill is the recommended method of mixing.



Select Backfill Kits

These kits are generally considered to be setting new installation kits. Setting kits are supplied in pail packaging and the larger A pail is the mixing container.

PS-225 5 Cubic Foot Setting Kit

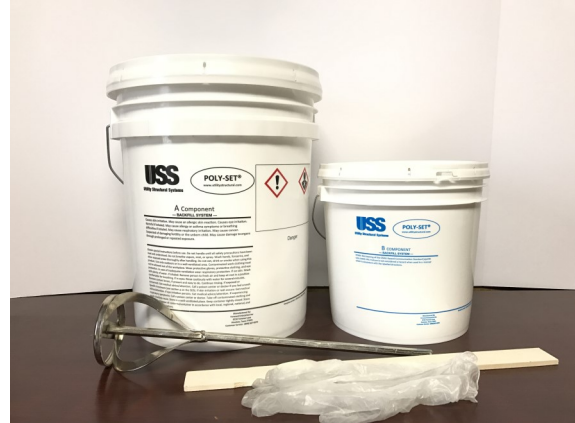
This kit will yield approximately 5 cubic foot of expanded backfill.

- 1- 5 Gallon Pail "A"
- 1-2 Gallon Pail "B"
- 1-Pair Vinyl Gloves
- 1-Wooden Stir Stick
- 1-Metal Drill Mixer



Kit Description Is Color Coded For Easy Reference

This kit comes complete as illustrated. **HIGH-SPEED** drill is the recommended method of mixing.



PS-230 6 Cubic Foot Setting Kit

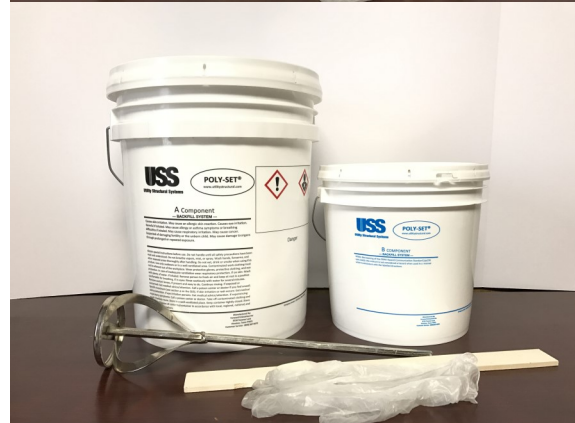
This kit will yield approximately 6 cubic foot of expanded backfill.

- 1- 5 Gallon Pail "A"
- 1-2 Gallon Pail "B"
- 1-Pair Vinyl Gloves
- 1-Wooden Stir Stick
- 1-Metal Drill Mixer



Kit Description Is Color Coded For Easy Reference

This kit comes complete as illustrated. **HIGH-SPEED** drill is the recommended method of mixing.



PS-250 10 Cubic Foot Setting Kit

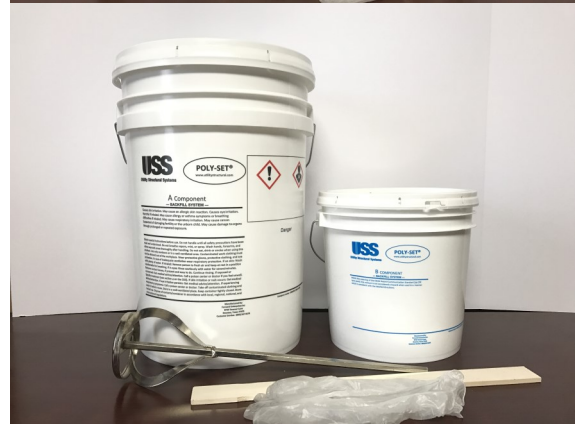
This kit will yield approximately 10 cubic foot of expanded backfill.

- 1- 6 Gallon Pail "A"
- 1-2 Gallon Pail "B"
- 1-Pair Vinyl Gloves
- 1-Wooden Stir Stick
- 1-Metal Drill Mixer



Kit Description Is Color Coded For Easy Reference

This kit comes complete as illustrated. **HIGH-SPEED** drill is the recommended method of mixing.



Shipping Information:

Box Kits:

PS-205, PS-210, PS-212 and PS-215 kits are 45 kits per pallet (PS-212 is not shown)

Pail Kits:

PS-225, PS-230, PS-235 are 24 kits per pallet (PS-235 is not shown purple identifier)
PS-240, and PS-250 kits are 16 kits per pallet (PS-240 is not shown red identifier)

5- Kits Required Per Pole.

POLY-SET®

PRODUCT DATA SHEET

POLY-SET® is specially formulated to be moisture-insensitive. The reaction rates and physical properties are not affected significantly by the presence of moisture and therefore may be used to fill damp cavities.

Design Parameters	Typical Values	Standard
Density (pcf)	5.0	ASTM Standard D 1622
Compressive Strength (psi)	75	ASTM Standard D 1621 Procedure A
Shear Strength (psi)	34	ASTM Standard D 732
Tensile Strength (psi)	82	ASTM Standard D 1623 Type A

Refer to Mixing Instructions Brochure and Material Safety Data Sheets for additional information on use, safety, temperature limitations, storage and handling precautions, and product liability limitations.

This POLY-SET® product data sheet is for the sole use of the intended recipient(s) and contains confidential and/or privileged information. Any unauthorized review, use, disclosure or distribution is strictly prohibited.

CONFIDENTIAL

POLY-SET[®]
VOID CALCULATION WORKSHEET FOR
ROUND POLES

Enter the Requested Numbers

Hole Diameter = inches

Pole Diameter = inches

Setting Depth = feet

Void To Fill (in ft³) = cubic feet

Choose the Appropriate POLY-SET[®] Kit(s)
Needed To Fill The Void:

- 2 ft³ = PS210W
- 3 ft³ = PS215W
- 5 ft³ = PS225W
- 6 ft³ = PS230W
- 7 ft³ = PS235W
- 8 ft³ = PS240W
- 10 ft³ = PS250W

[CLICK HERE FOR
SQUARE POLES](#)

Please enter the required data into the Yellow boxes on the left. Be sure to enter the data in the requested measurements (inches or feet). The Setting Depth should be entered as feet. After entering all the data press the [ENTER] key or click the Green Box. The void will be calculated in cubic feet (based on the entered numbers) and that number (in the green box) is used to determine which POLY-SET[®] kit(s) you will need for the job. To figure another void simply delete the numbers from the Yellow boxes and enter new data.



Utility Structural Systems
2201 N. Collins St., Suite 240
Arlington, TX 76011
(800)-367-9273 fax: 817-277-3441
info@poly-set.com
www.utilitystructural.com

DESIGN CALCULATIONS - CCTV POLE EMBEDMENT DEPTH

PROJECT - HAM-75-3.84
 PID - 104667
 TOWERS 16, 93

* Assumed CCTV pole embedment depth based on foundation depth recommendations for light towers as provided in ODOT TEM Section 1100.

CCTV Pole height above ground
 70 ft

Class of Soil Material
 Compact Inorganic Sand and Silt Mix

Recommended Lateral Soil Pressure for Foundations (TEM Table 1197-9)

Compact Inorganic Sand and Silt Mix = 200 psf/ft of depth

Table 1197-9. Recommended Lateral Soil Pressures for Foundations

Recommended Lateral Soil Pressure (Pounds Per Square Foot Per Foot of Depth)	
CLASS OF MATERIAL	Value
Rock in Natural Beds - Limited by the Stress in the Pile	
Compact Well Graded Gravel	400
Hard Dense Clay	400
Compact Coarse Sand	350
Compact Coarse and Fine Sand	300
Medium Stiff Clay	300
Compact Fine Sand	250
Ordinary Silt	200
Sandy Clay	200
Compact Inorganic Sand and Silt Mixtures	200
Soft Clay	100
Loose Organic Sand and Silt Mixtures and Muck or Bay Mud	0

Pole Foundation Depth

70 ft pole w/ 200 psf/ft of depth = 20 ft foundation depth

Table 1197-11. Allowable Lateral Soil Resistance

Tower Height (Feet)	Foundation Diameter (Feet)	Allowable Lateral Soil Resistance (psf/ft. of depth)					
		100	200	300	400	500	600
		Foundation Depth (Feet)					
70	3	25	20	15	15	15	15
80	3	25	20	15	15	15	15
90	3	25	20	20	15	15	15
100	3	30	25	20	20	15	15
120	3	30	25	20	20	20	20
130	3.5	30	25	25	20	20	20
140	3.5	35	25	25	20	20	20

DESIGN CALCULATIONS - CCTV POLE EMBEDMENT DEPTH

PROJECT - HAM-75-3.84
 PID - 104667
 TOWER 49

* Assumed CCTV pole embedment depth based on foundation depth recommendations for light towers as provided in ODOT TEM Section 1100.

CCTV Pole height above ground
 70 ft

Class of Soil Material
 Medium Stiff Clay

Recommended Lateral Soil Pressure for Foundations (TEM Table 1197-9)

Medium Stiff Clay = 300 psf/ft of depth

Table 1197-9. Recommended Lateral Soil Pressures for Foundations

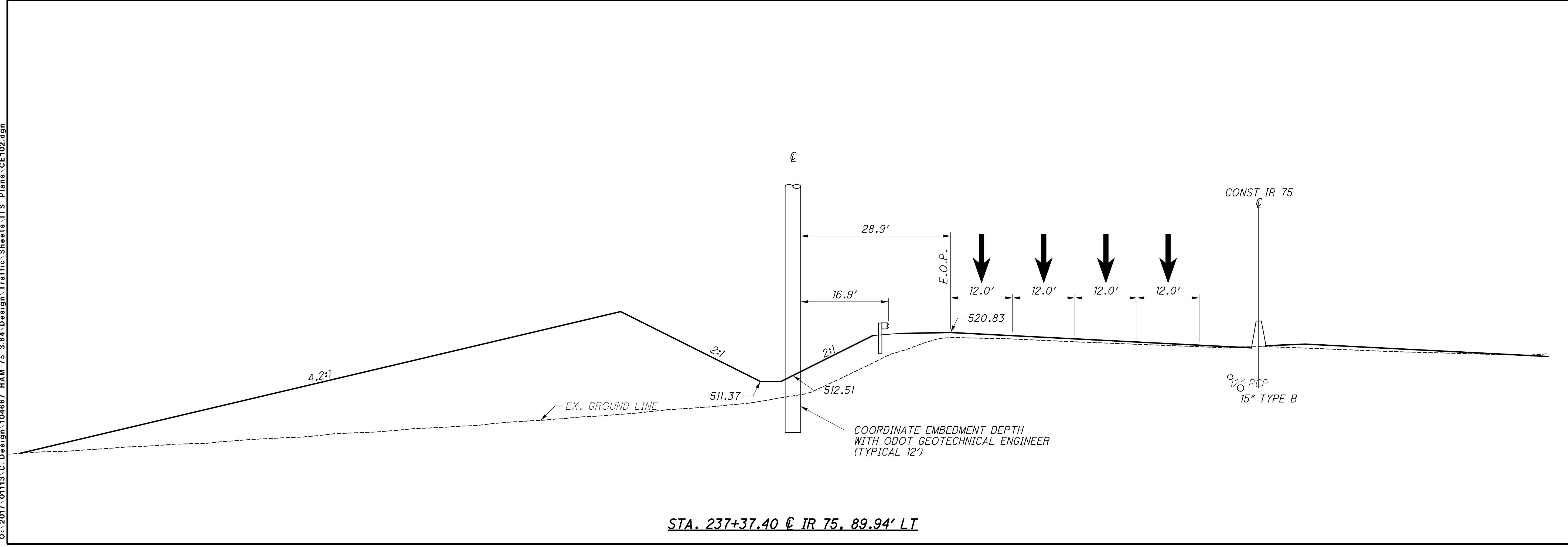
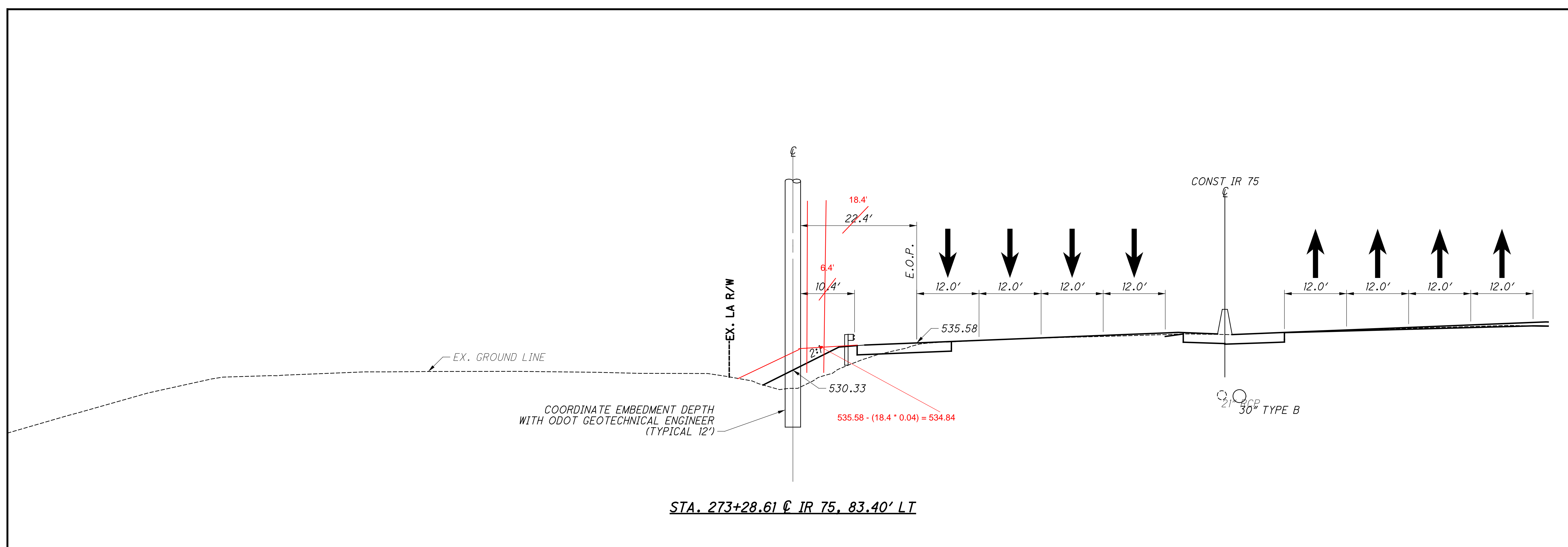
Recommended Lateral Soil Pressure (Pounds Per Square Foot Per Foot of Depth)	
CLASS OF MATERIAL	Value
Rock in Natural Beds - Limited by the Stress in the Pile	
Compact Well Graded Gravel	400
Hard Dense Clay	400
Compact Coarse Sand	350
Compact Coarse and Fine Sand	300
Medium Stiff Clay	300
Compact Fine Sand	250
Ordinary Silt	200
Sandy Clay	200
Compact Inorganic Sand and Silt Mixtures	200
Soft Clay	100
Loose Organic Sand and Silt Mixtures and Muck or Bay Mud	0

Pole Foundation Depth

70 ft pole w/ 300 psf/ft of depth = 15 ft foundation depth

Table 1197-11. Allowable Lateral Soil Resistance

Tower Height (Feet)	Foundation Diameter (Feet)	Allowable Lateral Soil Resistance (psf/ft. of depth)					
		100	200	300	400	500	600
		Foundation Depth (Feet)					
70	3	25	20	15	15	15	15
80	3	25	20	15	15	15	15
90	3	25	20	20	15	15	15
100	3	30	25	20	20	15	15
120	3	30	25	20	20	20	20
130	3.5	30	25	25	20	20	20
140	3.5	35	25	25	20	20	20



istuttler 12:51:54 PM
 2/7/2020
 C:\2017\01113\C.Design\104667_HAM-75-3.84\Design\Traffic\Sheets\ITS_Plans\CE102.dgn



SUBMITTAL FOR ACCEPTANCE

Project: **183000**
Ref. No.: **101**
Description: **ITS CABINET - GROUND MOUNTED**
Quantity: **4**

Date: 1/28/2020

To: Mr. Dan Kleinhenz
Walsh Construction

From: Dan Wackerman
Security Fence Group
Traffic Signals & Lighting Division
1500 Farr Drive, Suite 2
Dayton, OH 45404

In accordance with ODOT C&MS, submittals for the following reference number are attached. All material meets the requirements of the plan documents and ODOT CMS 2016. Please forward to ODOT for Acceptance.

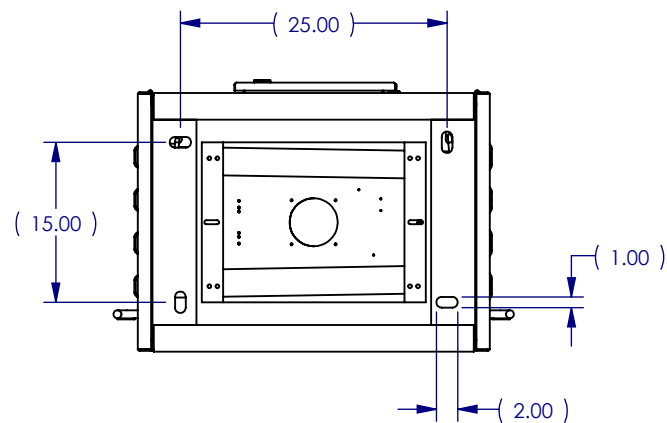
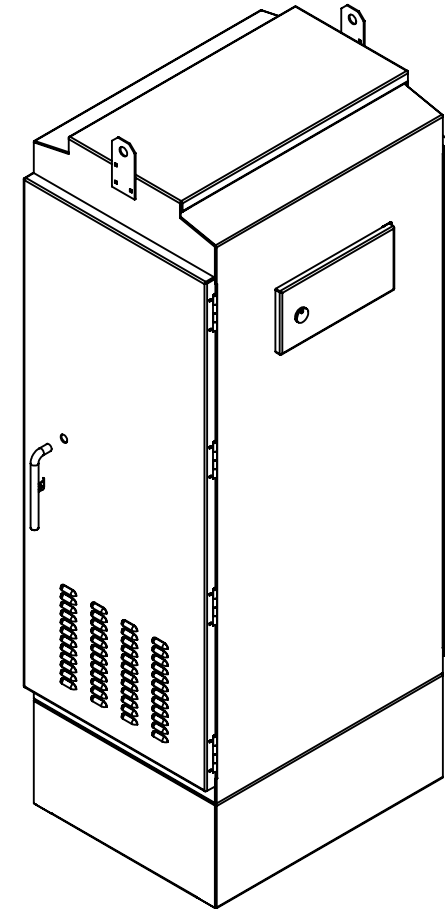
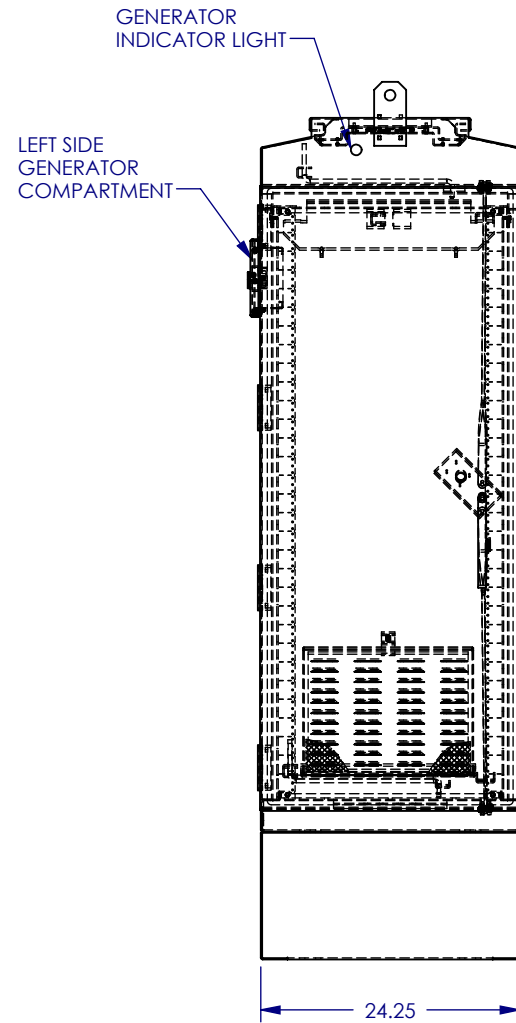
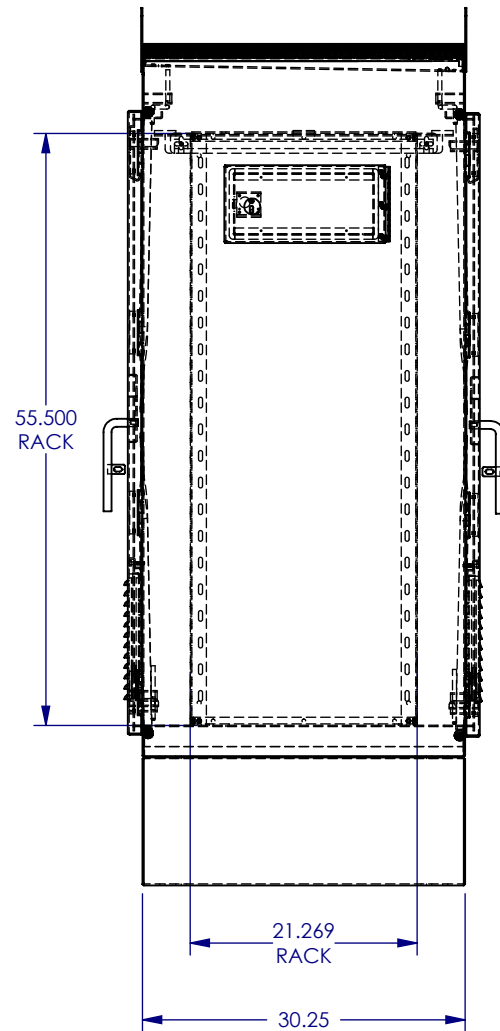
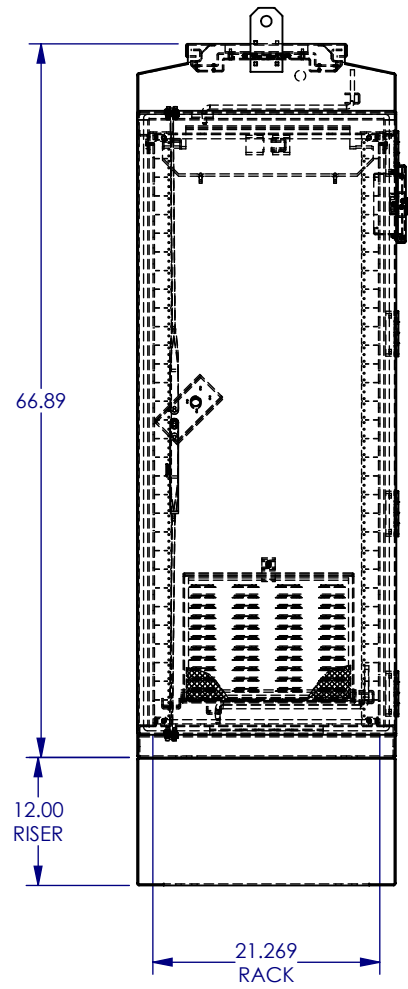
Prop Line #	Item Code	Description	Quantity	Unit
019		ITS CABINET - GROUND MOUNTED	4	EA

If you have any questions regarding this submission, please contact me at (937) 424-3000 or by e-mail at danw@sfence.com

Sincerely,

Dan Wackerman
Project Manager

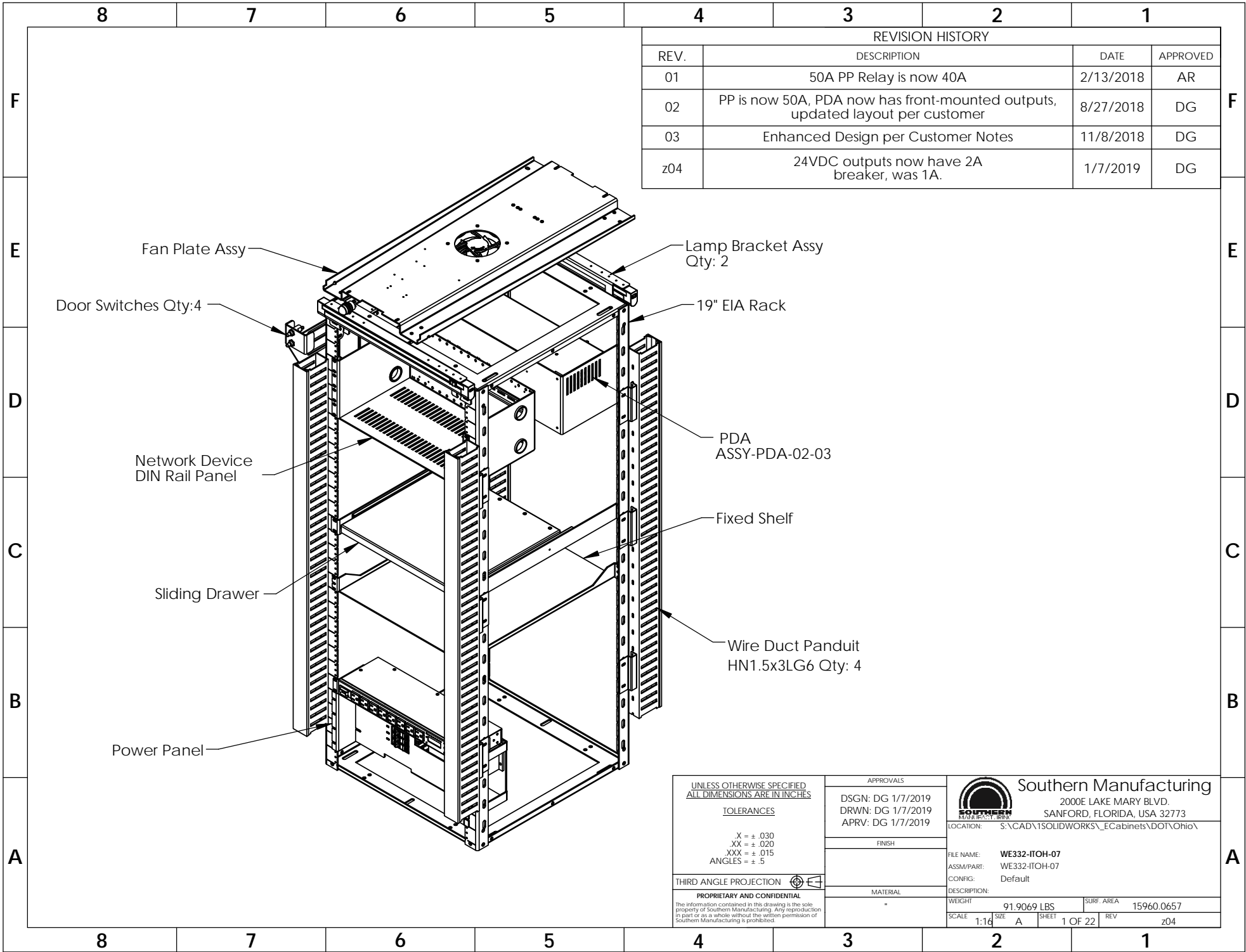
Part # SOUH-WE334-ODOT-ITS-B-07 Rev 4



NOTES:

1. PROUDLY MADE IN AMERICA AT OUR ISO 9001 REGISTERED FACILITY.
2. CABINET IS NEMA 3R RATED AND UL TYPE 3 LISTED.
3. CABINET IS CONSTRUCTED FROM .125" 5052-H32 ALUMINUM WITH MILL FINISH.
4. CABINET IS DESIGNED FOR BASE MOUNT APPLICATIONS WITH AN OPEN BOTTOM.
5. FRONT DOOR IS HINGED ON THE LEFT (VIEWED FROM THE FRONT), REAR DOOR IS HINGED ON THE RIGHT.
6. DOORS HAVE LOUVERS, 12" X 16" AIR FILTERS WITH METAL LOUVER COVERS, DOCUMENT POUCH HOOKS / GASKET RETAINER AND ARE SEALED WITH CLOSED CELL NEOPRENE GASKET. ONE DOCUMENT POUCH IS INCLUDED.
7. EACH DOOR HAS 3/4" DIA. PAD LOCKABLE STAINLESS STEEL HANDLES WITH THREE POINT LATCHING, TWO POSITION DOOR STOPS, CORBIN STYLE #2 LOCK, AND (4) CONCEALED STAINLESS STEEL HINGES PER DOOR.
8. CABINET HAS A 19" STANDARD RACK, 55.5H X 21.27W X 21.27D WITH 31 RACK UNITS TAPPED TO #10-32.
9. CABINET HAS A SINGLE REMOVABLE FAN PLATE FOR 4" FAN.
10. ALL HARDWARE IS STAINLESS STEEL.

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES TOLERANCES .X = ± .030 .XX = ± .020 .XXX = ± .015 ANGLES = ± .5	APPROVALS DSGN: JBH 10/30/2018 DRWN: JRW 10/30/2018 APRV: 10/30/2018	Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773 LOCATION: V:_Cabinets\SHELL ASSEMBLIES\332-334\
	FINISH MILL	
THIRD ANGLE PROJECTION	MATERIAL .125" 5052-H32 ALUMINUM	WEIGHT: LBS SURF. AREA SCALE: 1:18 SIZE: B SHEET: 1 OF 2 REV: 01



REVISION HISTORY			
REV.	DESCRIPTION	DATE	APPROVED
01	50A PP Relay is now 40A	2/13/2018	AR
02	PP is now 50A, PDA now has front-mounted outputs, updated layout per customer	8/27/2018	DG
03	Enhanced Design per Customer Notes	11/8/2018	DG
z04	24VDC outputs now have 2A breaker, was 1A.	1/7/2019	DG

Fan Plate Assy

Lamp Bracket Assy
Qty: 2

Door Switches Qty:4

19" EIA Rack

Network Device
DIN Rail Panel

PDA
ASSY-PDA-02-03

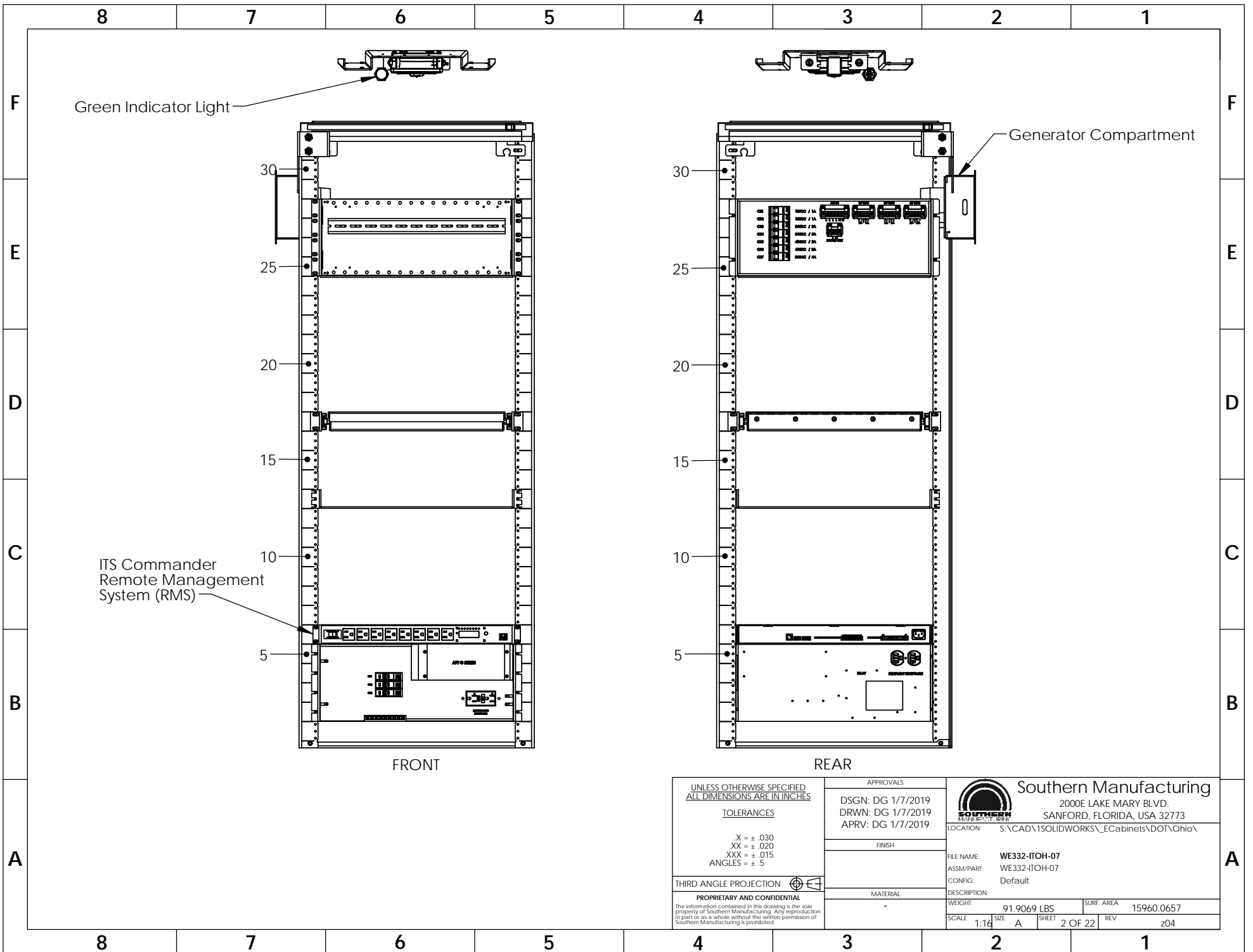
Sliding Drawer

Fixed Shelf

Power Panel

Wire Duct Panduit
HN1.5x3LG6 Qty: 4

<p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES</p> <p>TOLERANCES</p> <p>X = ± .030 XX = ± .020 XXX = ± .015 ANGLES = ± .5</p>	<p>APPROVALS</p> <p>DSGN: DG 1/7/2019 DRWN: DG 1/7/2019 APRV: DG 1/7/2019</p>	<p>Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773</p> <p>LOCATION: S:\CAD\1SOLIDWORKS_ECabinets\DOT\Ohio\</p>
	<p>FINISH</p>	
<p>THIRD ANGLE PROJECTION</p>	<p>MATERIAL</p>	<p>DESCRIPTION:</p>
<p>PROPRIETARY AND CONFIDENTIAL</p> <p>The information contained in this drawing is the sole property of Southern Manufacturing. Any reproduction in part or as a whole without the written permission of Southern Manufacturing is prohibited.</p>	<p>WEIGHT: 91.9069 LBS</p>	<p>SURF. AREA: 15960.0657</p>
<p>SCALE: 1:14 SIZE: A SHEET: 1 OF 22 REV: z04</p>		



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ALL DIMENSIONS ARE IN INCHES

TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

DSGN: DG 1/7/2019
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL

Southern Manufacturing
2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

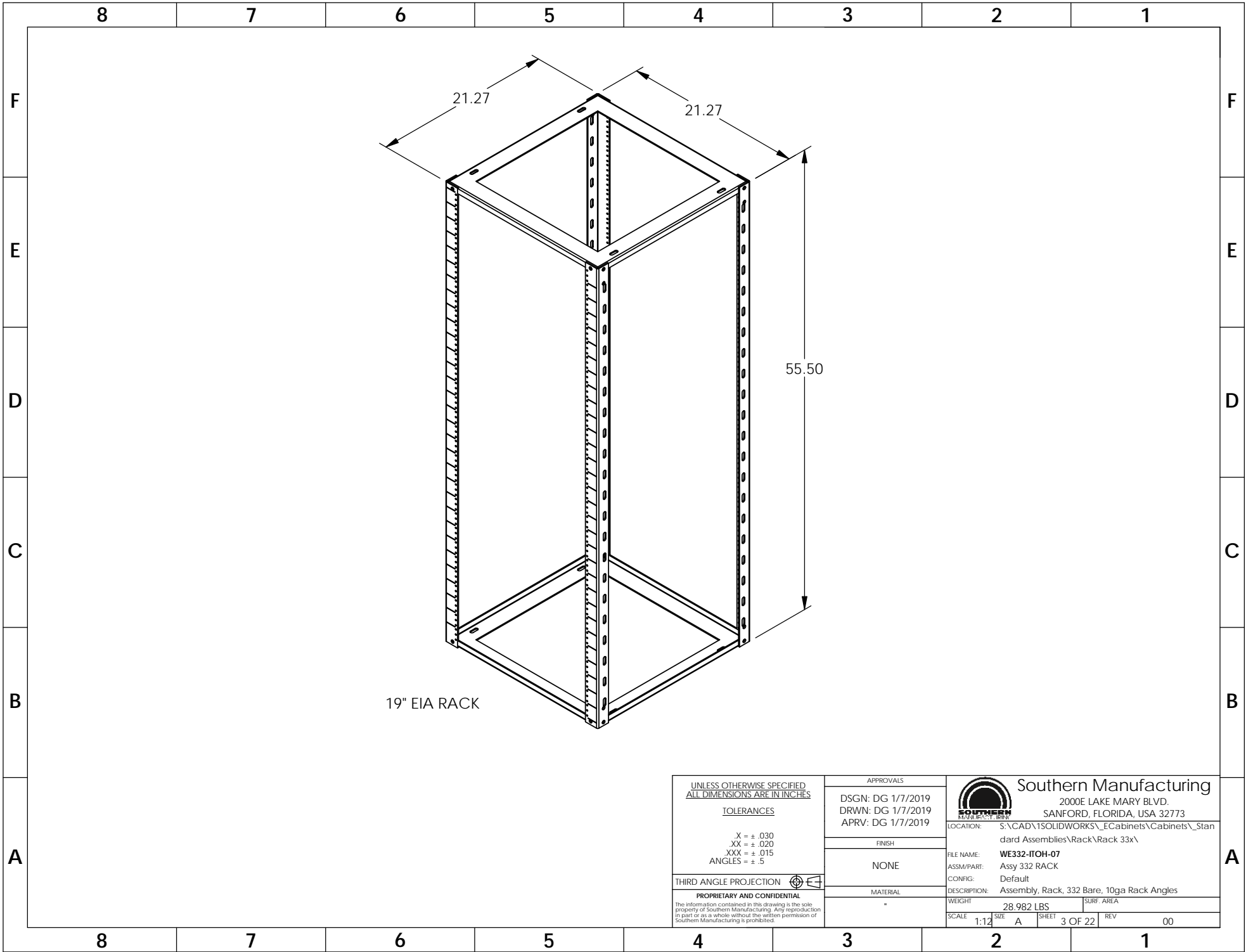
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FILE NAME: WE332-ITOH-07
ASSM/PART: WE332-ITOH-07
CONFIG: Default



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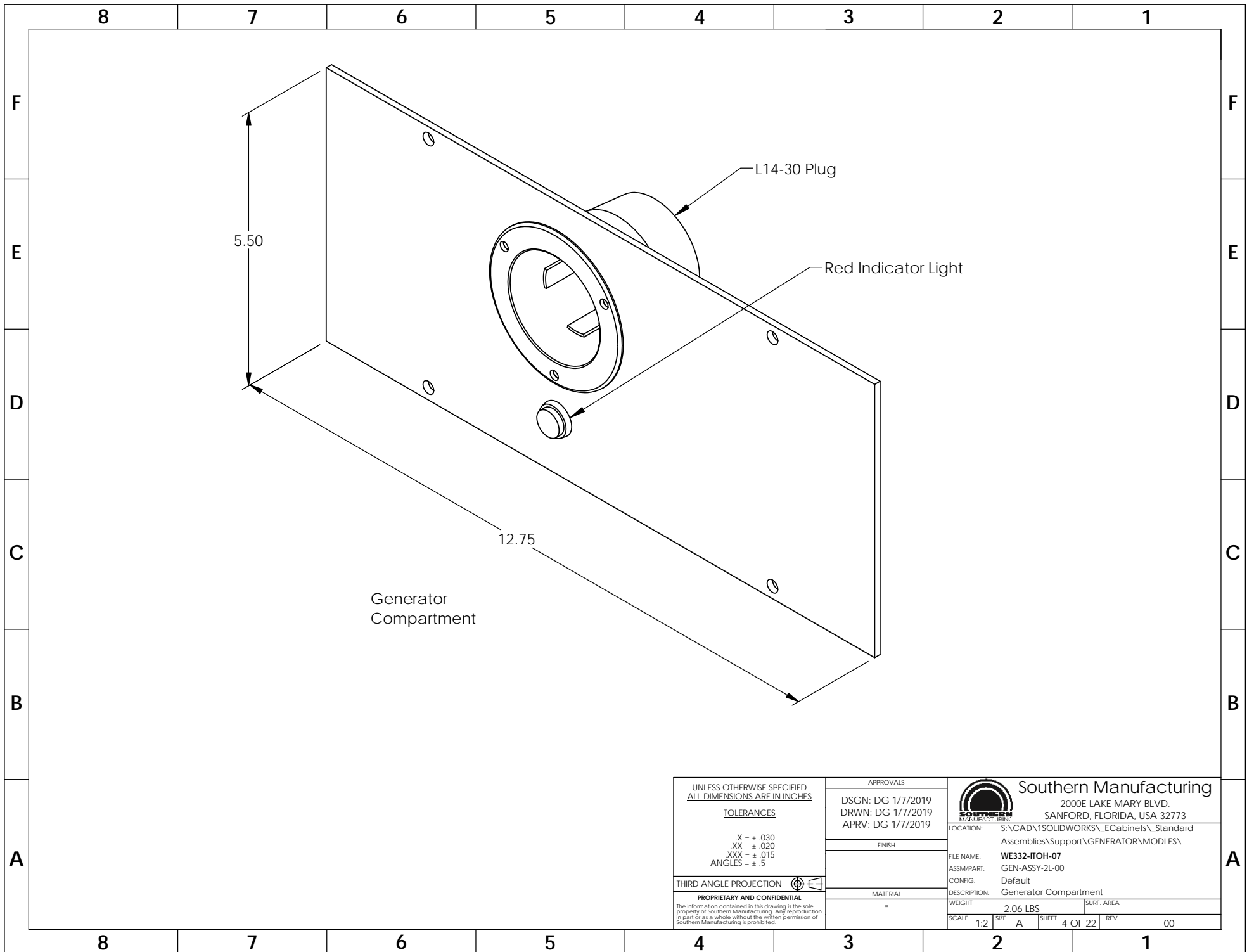
WEIGHT: 91.9069 LBS SURF. AREA: 15960.0657

SCALE: 1:16 SIZE: A SHEET: 2 OF 22 REV: z04



19" EIA RACK

<p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES</p> <p><u>TOLERANCES</u></p> <p>X = ± .030 XX = ± .020 XXX = ± .015 ANGLES = ± .5</p>	<p>APPROVALS</p> <p>DSGN: DG 1/7/2019 DRWN: DG 1/7/2019 APRV: DG 1/7/2019</p>		 <p>Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773</p>	
	<p>FINISH</p> <p>NONE</p>	<p>LOCATION: S:\CAD\1SOLIDWORKS\E_Cabinets\Cabinets\Standard Assemblies\Rack\Rack 33x\ FILE NAME: WE332-ITOH-07 ASSM/PART: Assy 332 RACK CONFIG: Default DESCRIPTION: Assembly, Rack, 332 Bare, 10ga Rack Angles</p>		
<p>THIRD ANGLE PROJECTION </p> <p>PROPRIETARY AND CONFIDENTIAL The information contained in this drawing is the sole property of Southern Manufacturing. Any reproduction in part or as a whole without the written permission of Southern Manufacturing is prohibited.</p>	<p>MATERIAL</p> <p>-</p>	<p>WEIGHT</p> <p>28.982 LBS</p>	<p>SURF. AREA</p>	
<p>SCALE 1:12</p>		<p>SIZE A</p>	<p>SHEET 3 OF 22</p>	<p>REV 00</p>



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES

TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

DSGN: DG 1/7/2019
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL



Southern Manufacturing

2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

LOCATION: S:\CAD\1SOLIDWORKS_ECabinets_Standard
Assemblies\Support\GENERATOR\MODULES\

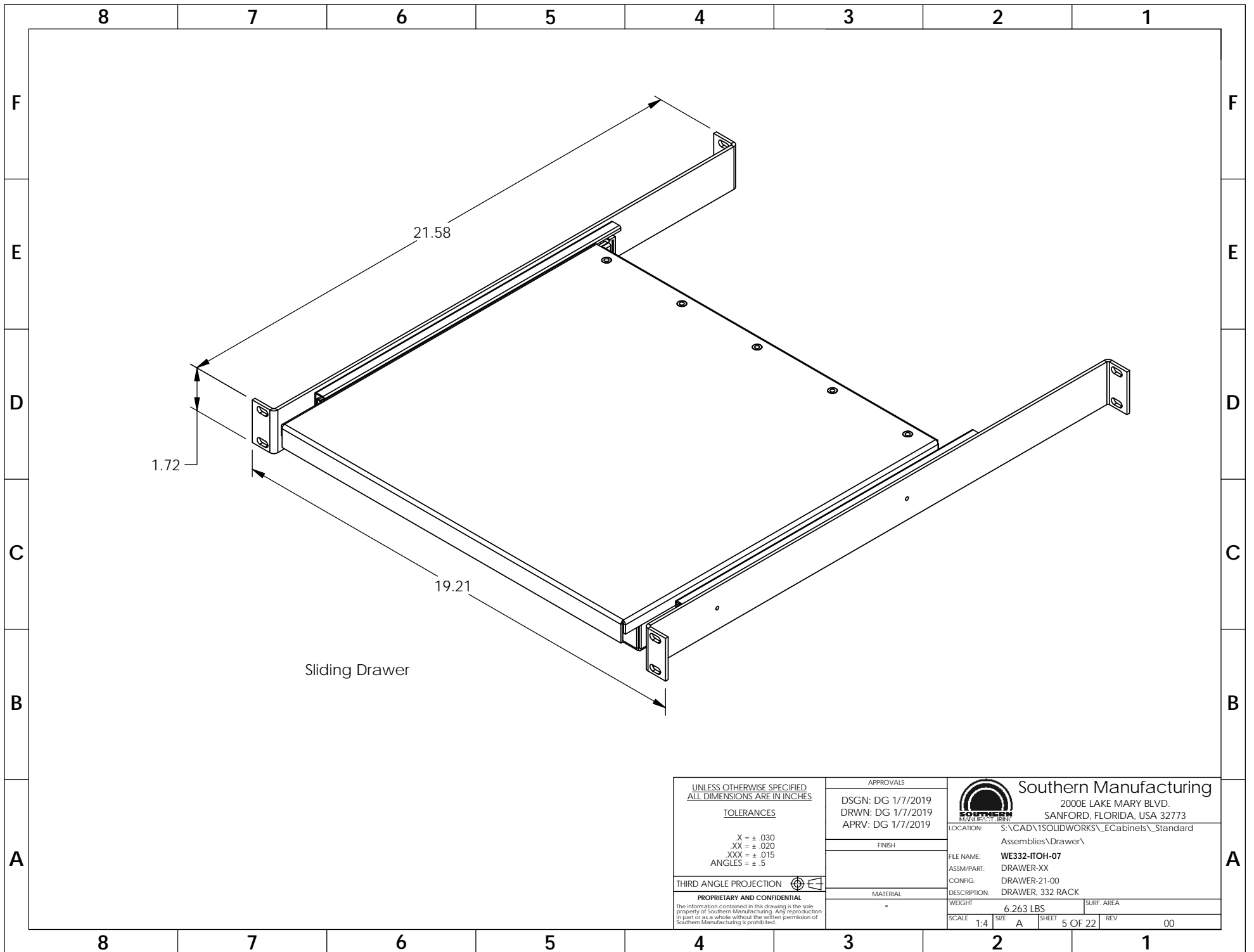
FILE NAME: WE332-ITOH-07
ASSM/PART: GEN-ASSY-2L-00

CONFG: Default
DESCRIPTION: Generator Compartment

WEIGHT: 2.06 LBS

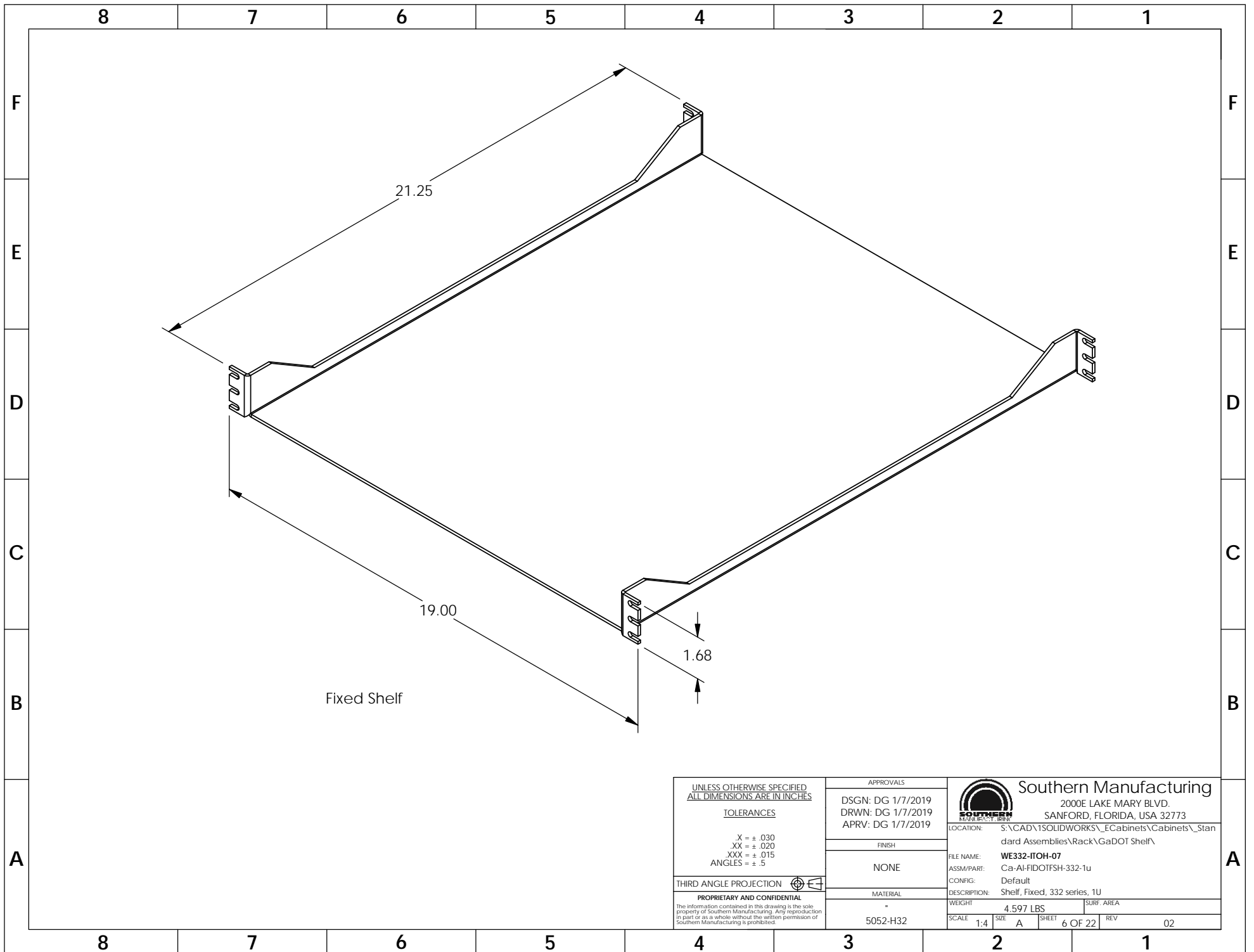
SURF. AREA

SCALE 1:2 SIZE A SHEET 4 OF 22 REV 00



Sliding Drawer

<p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES</p> <p><u>TOLERANCES</u></p> <p>X = ± .030 XX = ± .020 XXX = ± .015 ANGLES = ± .5</p> <p>THIRD ANGLE PROJECTION </p> <p>PROPRIETARY AND CONFIDENTIAL The information contained in this drawing is the sole property of Southern Manufacturing. Any reproduction in part or as a whole without the written permission of Southern Manufacturing is prohibited.</p>	<p>APPROVALS</p> <p>DSGN: DG 1/7/2019 DRWN: DG 1/7/2019 APRV: DG 1/7/2019</p>		<p> Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773</p>	
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	<p>MATERIAL</p>		<p>FILE NAME: WE332-ITOH-07 ASSM/PART: DRAWER-XX CONFIG: DRAWER-21-00 DESCRIPTION: DRAWER, 332 RACK</p>	
	<p>WEIGHT: 6.263 LBS</p>		<p>SURF. AREA</p>	
<p>SCALE 1:4</p>		<p>SIZE A</p>	<p>SHEET 5 OF 22</p>	<p>REV 00</p>



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES


TOLERANCES

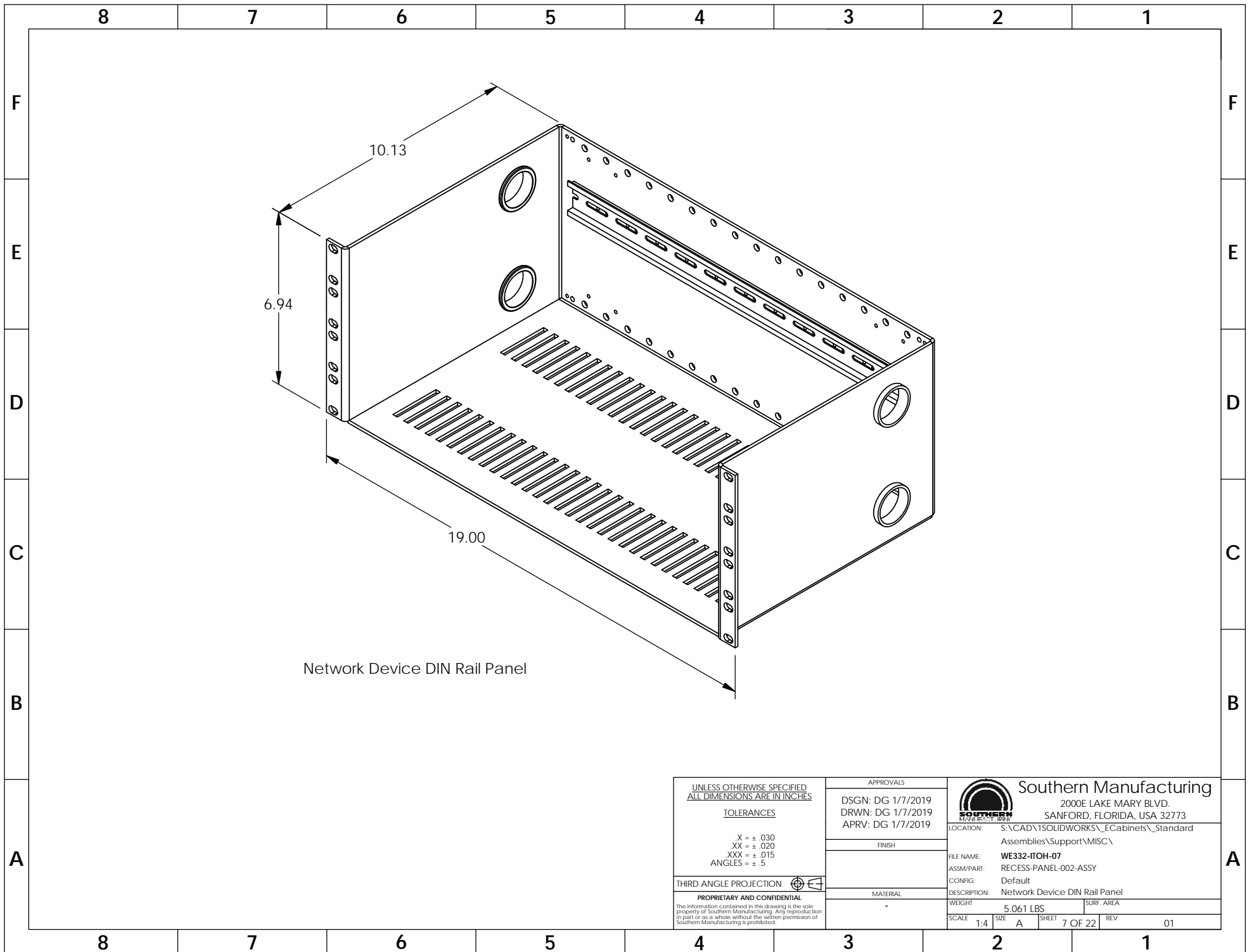
X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION 

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APPROVALS	
DSGN: DG 1/7/2019	
DRWN: DG 1/7/2019	
APRV: DG 1/7/2019	
FINISH	
NONE	
MATERIAL	
5052-H32	

 Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773	
FILE NAME:	WE332-ITOH-07
ASSM/PART:	Ca-AI-FIDOTFSH-332-1u
CONFIG:	Default
DESCRIPTION:	Shelf, Fixed, 332 series, 1U
WEIGHT:	4.597 LBS
SCALE:	1:4
SIZE:	A
SHEET:	6 OF 22
REV:	02



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES

TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

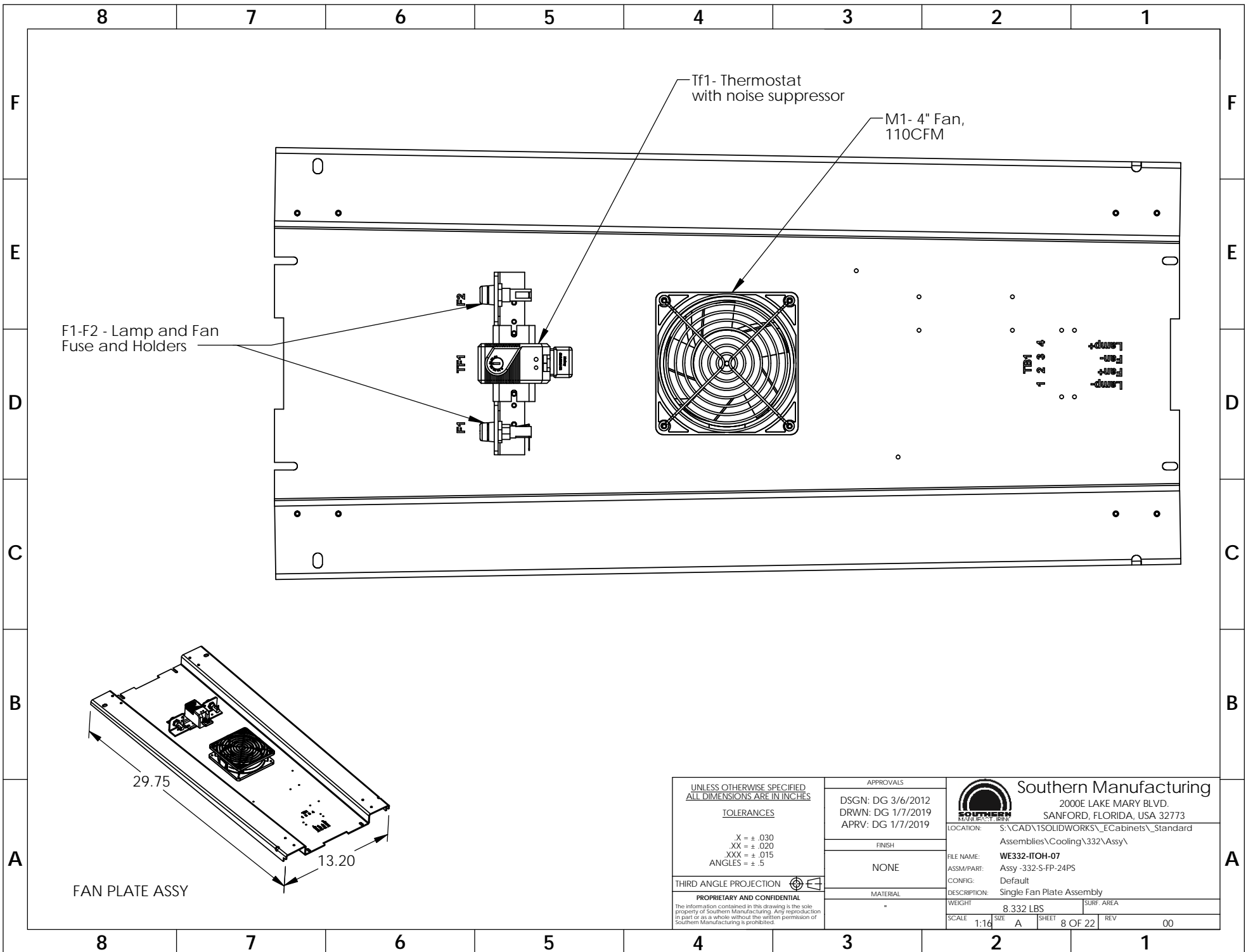
DSGN: DG 1/7/2019
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL

-

		Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773	
		LOCATION: S:\CAD\1SOLIDWORKS_ECabinets_Standard Assemblies\Support\MISC\	
FILE NAME: WE332-ITOH-07		ASSM/PART: RECESS-PANEL-002-ASSY	
CONFIG: Default		DESCRIPTION: Network Device DIN Rail Panel	
WEIGHT: 5.061 LBS		SURF. AREA	
SCALE: 1:4	SIZE: A	SHEET: 7 OF 22	REV: 01



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES

TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

DSGN: DG 3/6/2012
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

NONE

MATERIAL

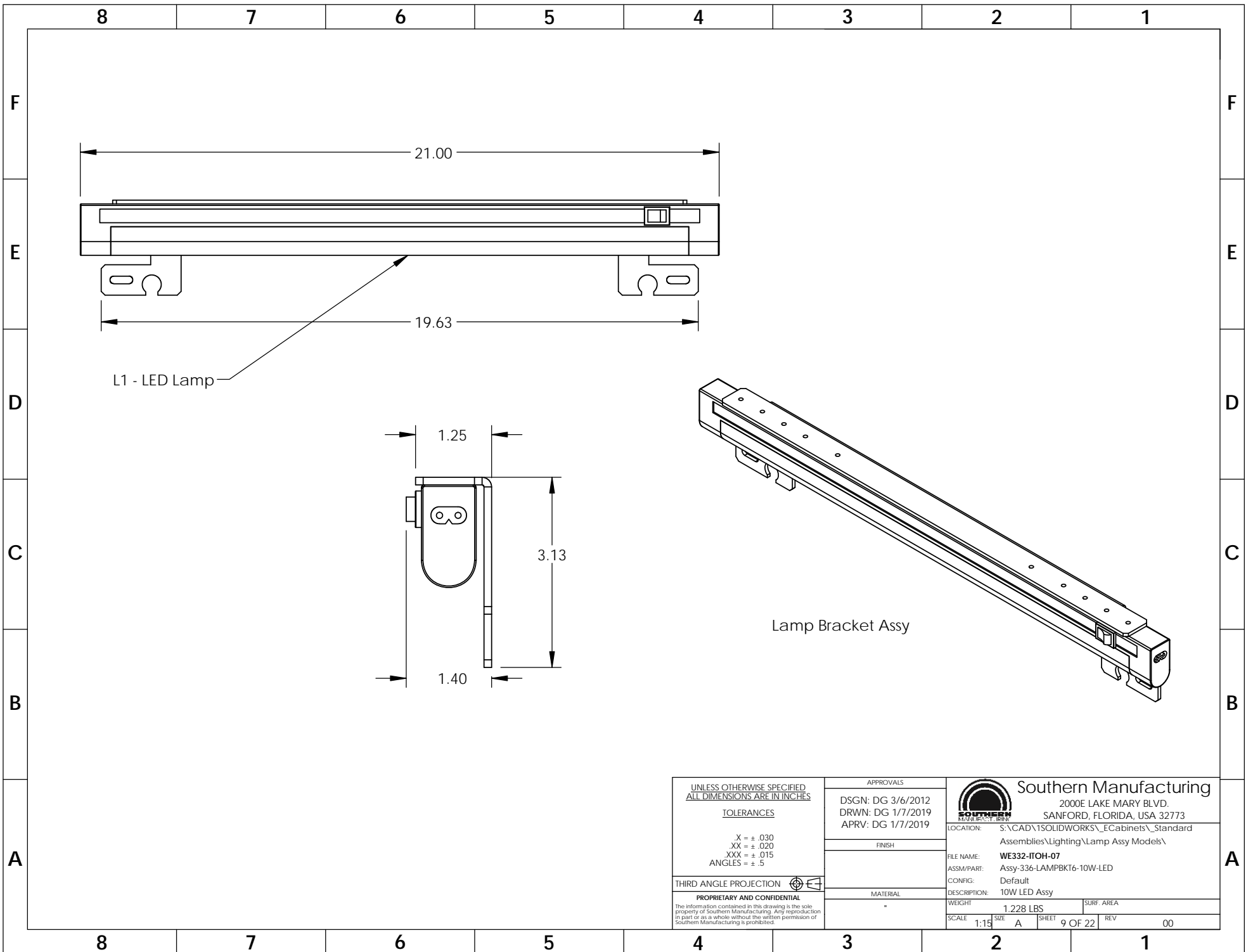
-

Southern Manufacturing
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SANFORD, FLORIDA, USA 32773

LOCATION: S:\CAD\1SOLIDWORKS\Cabinets_Standard Assemblies\Cooling\332\Assy\
FILE NAME: WE332-ITOH-07
ASSM/PART: Assy -332-S-FP-24PS
CONFIG: Default
DESCRIPTION: Single Fan Plate Assembly

WEIGHT: 8.332 LBS SURF. AREA

SCALE 1:14 SIZE A SHEET 8 OF 22 REV 00



UNLESS OTHERWISE SPECIFIED
ALL DIMENSIONS ARE IN INCHES

TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

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APPROVALS

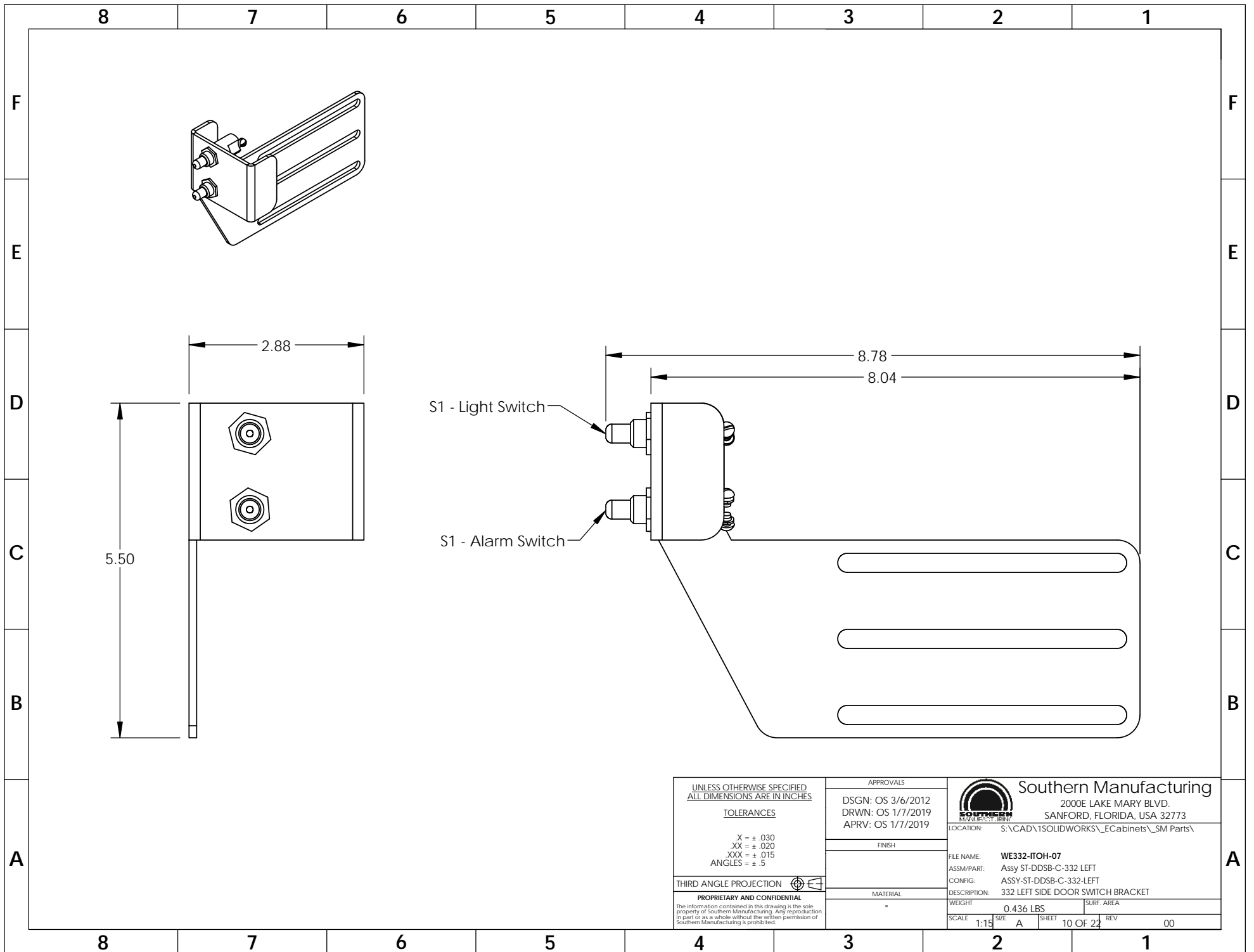
DSGN: DG 3/6/2012
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL

-

	Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773		
	LOCATION: S:\CAD\1SOLIDWORKS_ECabinets_Standard Assemblies\Lighting\Lamp Assy Models\		
FILE NAME:	WE332-ITOH-07		
ASSM/PART:	Assy-336-LAMPBKT6-10W-LED		
CONFIG:	Default		
DESCRIPTION:	10W LED Assy		
WEIGHT:	1.228 LBS	SURF. AREA	
SCALE: 1:15	SIZE: A	SHEET: 9 OF 22	REV: 00



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TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

DSGN: OS 3/6/2012
DRWN: OS 1/7/2019
APRV: OS 1/7/2019

FINISH

MATERIAL



Southern Manufacturing

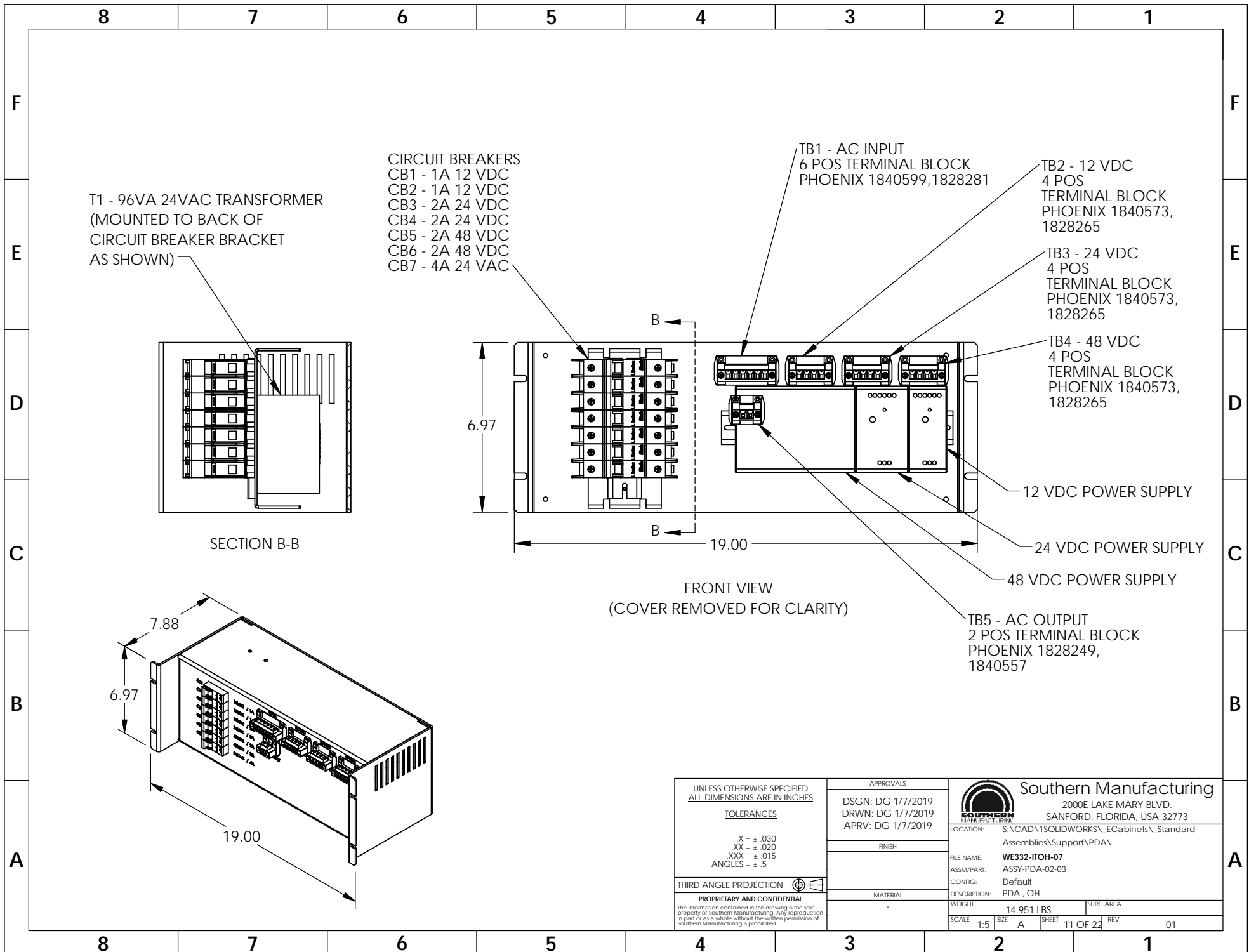
2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

LOCATION: S:\CAD\1SOLIDWORKS_ECabinets_SM Parts\

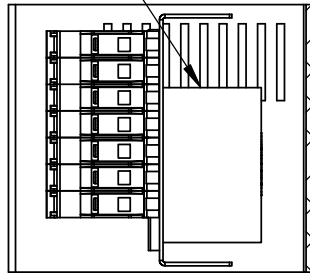
FILE NAME: WE332-ITOH-07
ASSM/PART: Assy ST-DDSB-C-332 LEFT
CONFIG: ASSY-ST-DDSB-C-332-LEFT
DESCRIPTION: 332 LEFT SIDE DOOR SWITCH BRACKET

WEIGHT: 0.436 LBS SURF. AREA

SCALE 1:15 SIZE A SHEET 10 OF 22 REV 00

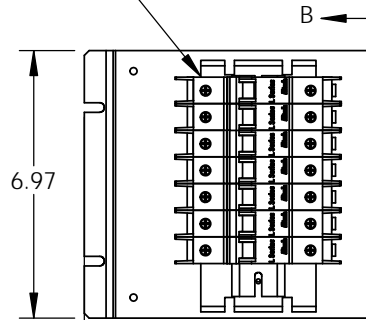


T1 - 96VA 24VAC TRANSFORMER
(MOUNTED TO BACK OF
CIRCUIT BREAKER BRACKET
AS SHOWN)



SECTION B-B

CIRCUIT BREAKERS
CB1 - 1A 12 VDC
CB2 - 1A 12 VDC
CB3 - 2A 24 VDC
CB4 - 2A 24 VDC
CB5 - 2A 48 VDC
CB6 - 2A 48 VDC
CB7 - 4A 24 VDC



FRONT VIEW
(COVER REMOVED FOR CLARITY)

TB1 - AC INPUT
6 POS TERMINAL BLOCK
PHOENIX 1840599,1828281

TB2 - 12 VDC
4 POS
TERMINAL BLOCK
PHOENIX 1840573,
1828265

TB3 - 24 VDC
4 POS
TERMINAL BLOCK
PHOENIX 1840573,
1828265

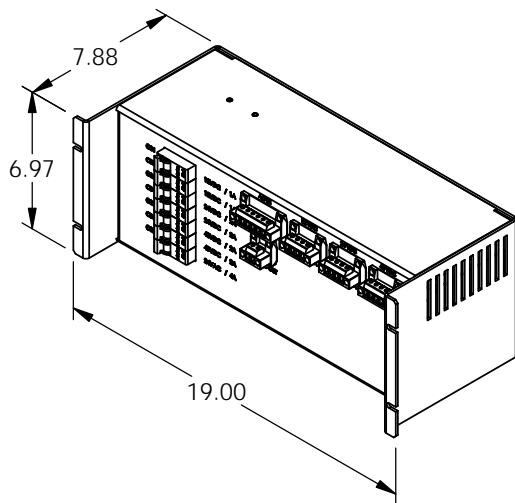
TB4 - 48 VDC
4 POS
TERMINAL BLOCK
PHOENIX 1840573,
1828265



12 VDC POWER SUPPLY

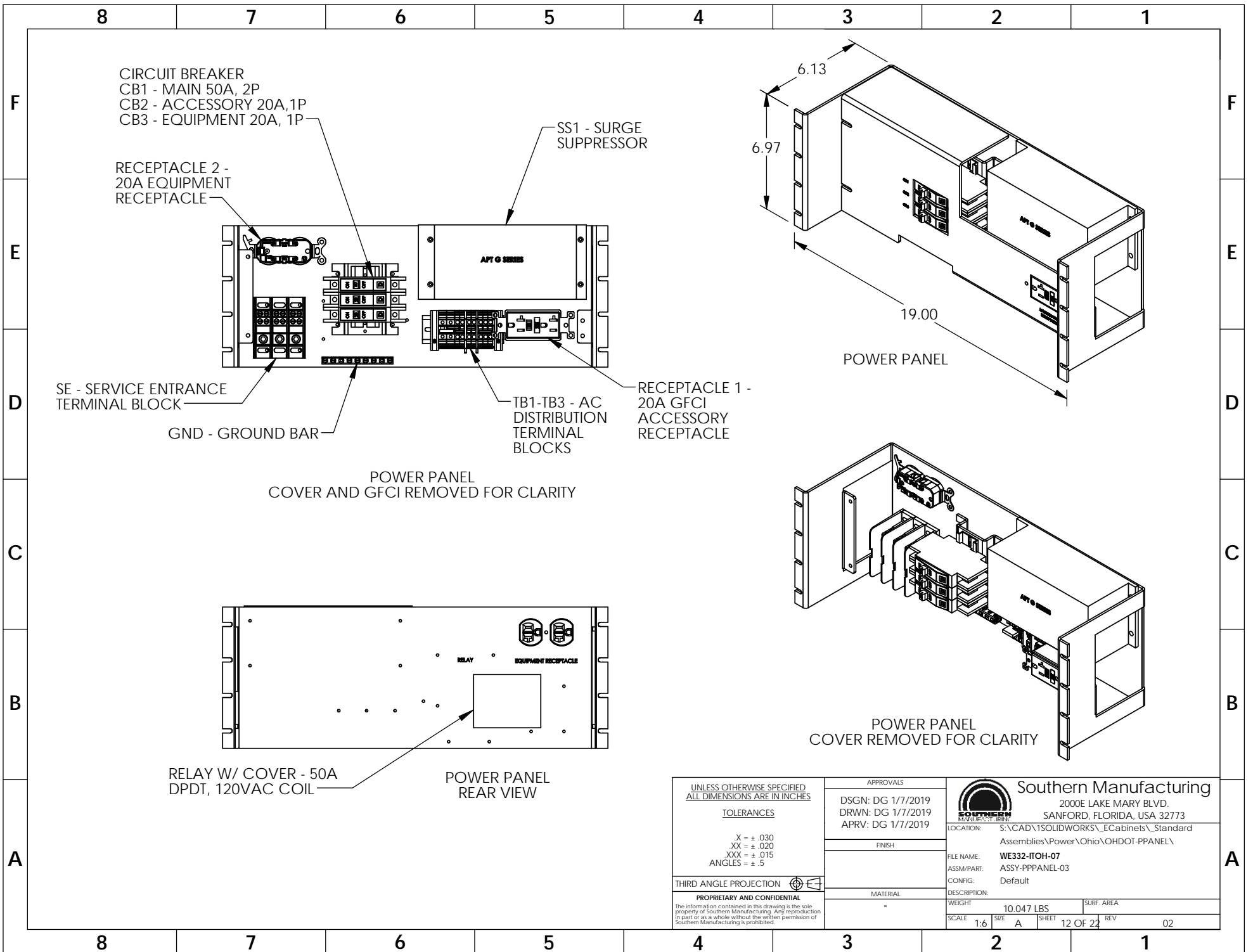
24 VDC POWER SUPPLY

48 VDC POWER SUPPLY

TB5 - AC OUTPUT
2 POS TERMINAL BLOCK
PHOENIX 1828249,
1840557



UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES TOLERANCES X = ± .030 XX = ± .020 XXX = ± .015 ANGLES = ± .5	APPROVALS DSGN: DG 1/7/2019 DRWN: DG 1/7/2019 APRV: DG 1/7/2019	 Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773 LOCATION: S:\CAD\1SOLIDWORKS\E Cabinets\E Cabinets\Standard Assemblies\Support\PDA\
	FINISH	
THIRD ANGLE PROJECTION 	MATERIAL -	WEIGHT: 14.951 LBS SURF. AREA
PROPRIETARY AND CONFIDENTIAL <small>The information contained in this drawing is the sole property of Southern Manufacturing. Any reproduction in part or as a whole without the written permission of Southern Manufacturing is prohibited.</small>	SCALE: 1:5 SIZE: A SHEET: 11 OF 22 REV: 01	



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TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

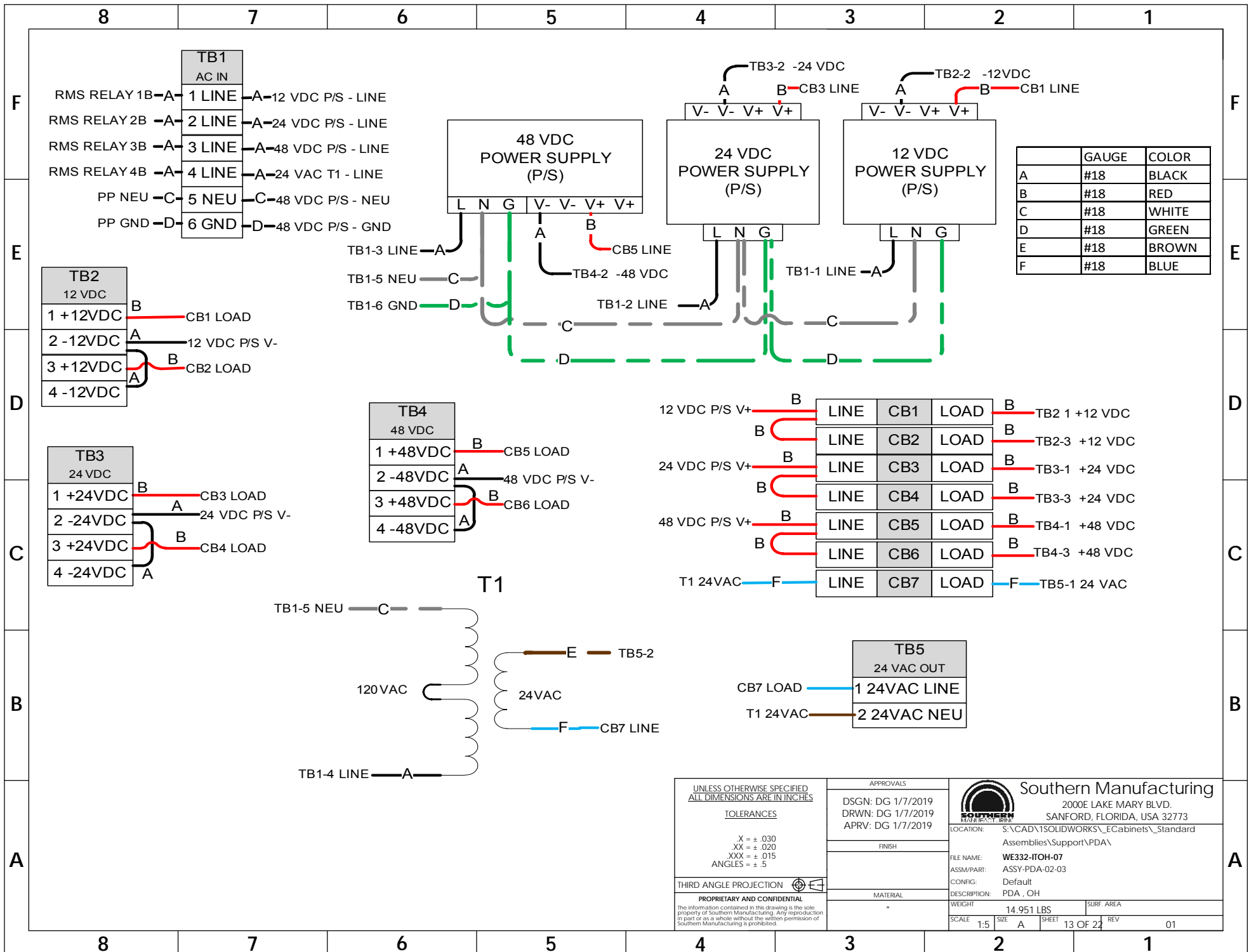
MATERIAL

-

Southern Manufacturing
2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

LOCATION: S:\CAD\1SOLIDWORKS\E Cabinets_Standard Assemblies\Power\Ohio\OHDOT-PPANEL\
FILE NAME: WE332-ITOH-07
ASSM/PART: ASSY-PPANEL-03
CONFIG: Default
DESCRIPTION:

WEIGHT: 10.047 LBS SURF. AREA
SCALE: 1:6 SIZE: A SHEET: 12 OF 22 REV: 02



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TOLERANCES

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XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

DSGN: DG 1/7/2019
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL

WEIGHT

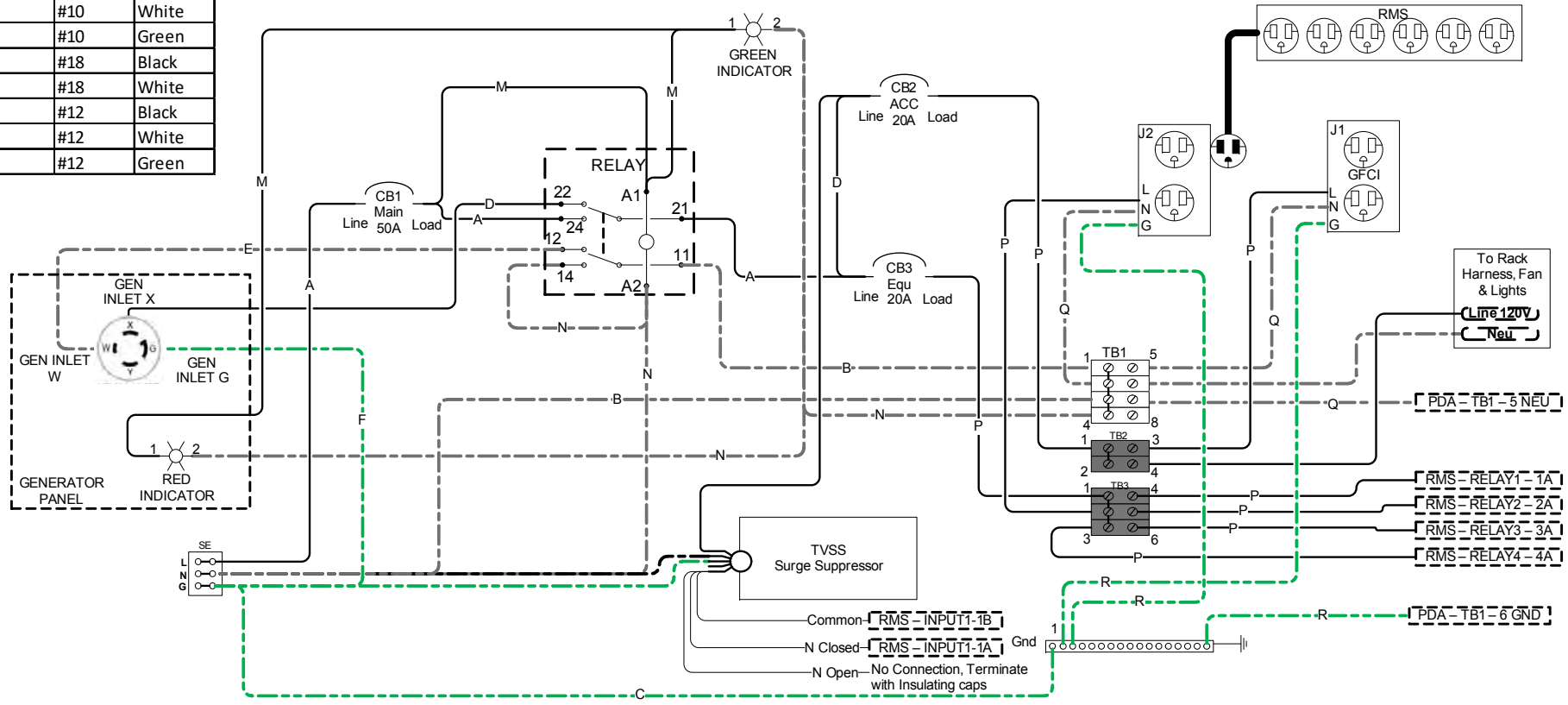
SCALE 1:5 SIZE A SHEET 13 OF 22 REV 01

Southern Manufacturing
2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

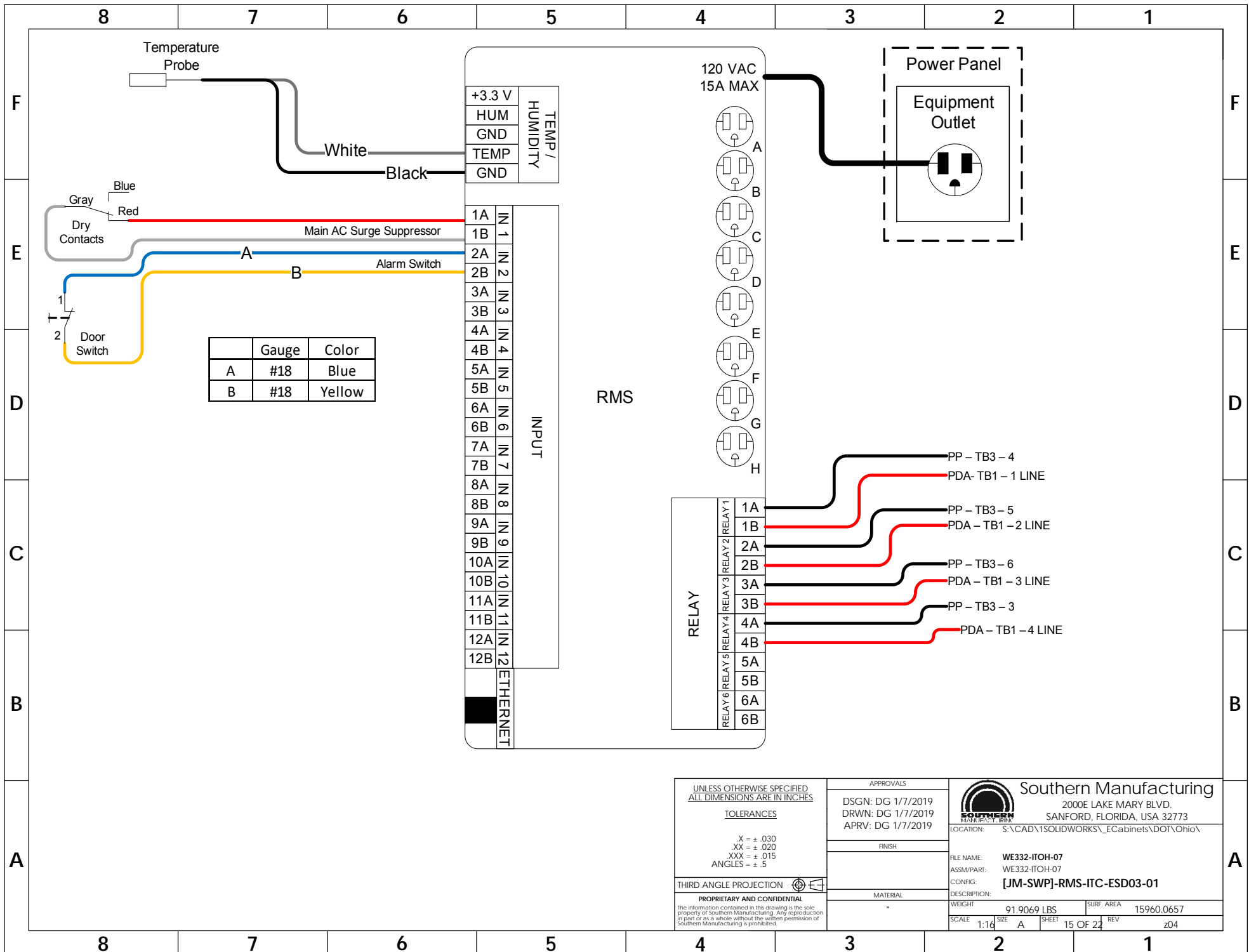
LOCATION: S:\CAD\1SOLIDWORKS\E_Cabinets_Standard Assemblies\Support\PDA\
FILE NAME: WE332-ITOH-07
ASSM/PART: ASSY-PDA-02-03
CONFIG: Default
DESCRIPTION: PDA, OH

WEIGHT: 14.951 LBS SURF. AREA

	Gauge	Color
A	#8	Black
B	#8	White
C	#8	Green
D	#10	Black
E	#10	White
F	#10	Green
M	#18	Black
N	#18	White
P	#12	Black
Q	#12	White
R	#12	Green



<p>UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN INCHES</p> <p>TOLERANCES</p> <p>X = ± .030 XX = ± .020 XXX = ± .015 ANGLES = ± .5</p>	<p>APPROVALS</p> <p>DSGN: DG 1/7/2019 DRWN: DG 1/7/2019 APRV: DG 1/7/2019</p>	<p>Southern Manufacturing 2000E LAKE MARY BLVD. SANFORD, FLORIDA, USA 32773</p> <p>LOCATION: S:\CAD\1SOLIDWORKS\E_Cabinets\Standard Assemblies\Power\Ohio\OHDOT-PPANEL\</p> <p>FILE NAME: WE332-ITOH-07 ASSM/PART: ASSY-PPANEL-03 CONFIG: [JM-SWP]-PPANEL-01-60A-001</p>
	<p>THIRD ANGLE PROJECTION</p> <p>PROPRIETARY AND CONFIDENTIAL The information contained in this drawing is the sole property of Southern Manufacturing. Any reproduction in part or as a whole without the written permission of Southern Manufacturing is prohibited.</p>	



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APPROVALS

DSGN: DG 1/7/2019
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL

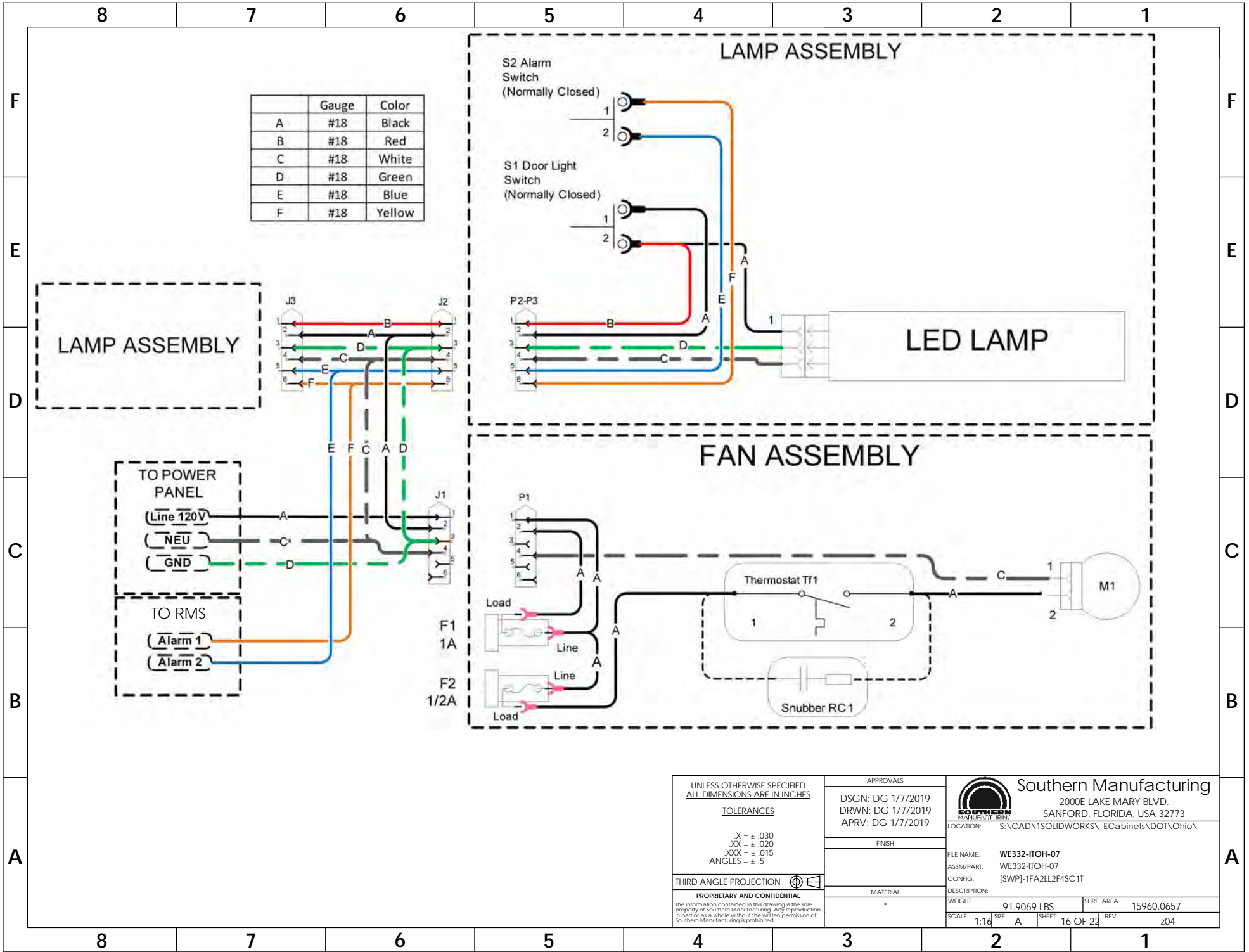
Southern Manufacturing
2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

LOCATION: S:\CAD\1SOLIDWORKS_ECabinets\DOT\Ohio\

FILE NAME: WE332-ITOH-07
ASSM/PART: WE332-ITOH-07
CONFIG: [JM-SWP]-RMS-ITC-ESD03-01
DESCRIPTION:

WEIGHT: 91.9069 LBS SURF. AREA: 15960.0657

SCALE: 1:14 SIZE: A SHEET: 15 OF 22 REV: z04



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ALL DIMENSIONS ARE IN INCHES

TOLERANCES

X = ± .030
XX = ± .020
XXX = ± .015
ANGLES = ± .5

THIRD ANGLE PROJECTION

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APPROVALS

DSGN: DG 1/7/2019
DRWN: DG 1/7/2019
APRV: DG 1/7/2019

FINISH

MATERIAL

Southern Manufacturing
2000E LAKE MARY BLVD.
SANFORD, FLORIDA, USA 32773

LOCATION: S:\CAD\1SOLIDWORKS_ECabinets\DOT\Ohio\

FILE NAME: WE332-ITOH-07
ASSM/PART: WE332-ITOH-07
CONFIG: [SWP]-1FA2LL2F4SC1T
DESCRIPTION:

WEIGHT: 91.9069 LBS SURF. AREA: 15960.0657

SCALE: 1:16 SIZE: A SHEET: 16 OF 22 REV: z04

AP Enterprises

8/21/09

Spec Sheet for Cabinet Enclosure Lock
Part Number: APL C03001R (pictured)



#2 KEY - DEAD BOLT

Description: Cabinet enclosure lock that is provided with two keys and a dust cap to cover the keyway

Options: Available in a right hand (pictured) or left hand version as well as a dead bolt (pictured) or slam bolt version

Material: Brass

Manufacturing description: Casting and machining of parts to produce cabinet locks

Availability: Our APL C03001R (pictured) model is in stock in our US warehouse

Certificate of Origin: China

Technical sheet: Drawings are available upon request

Cost: Please contact an AP Enterprises Representative for a quote

Vendor information: AP Enterprises is the vendor responsible for this lock. Please feel free to contact us at the information below or through your local representative.

AP Enterprises
3209 Bridle Path Court
Garland, TX 75044
972-215-9555

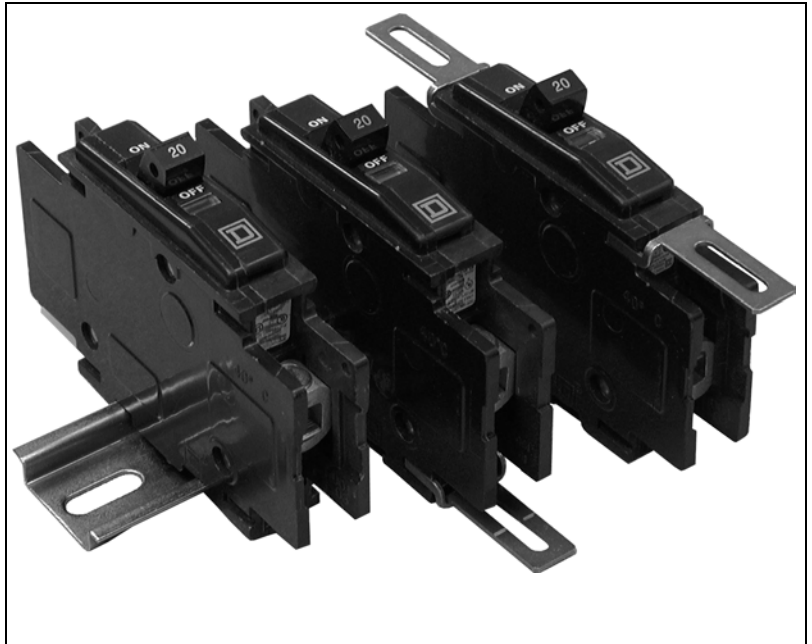
www.apenterprises.net

QOU120 - 20 A., 1P
QOU150 - 50 A., 1P

QOU Miniature Circuit Breakers and Switches Unit Mount (Cable-in/Cable-out)

Class 720

Catalog
September
2005



CONTENTS

Description	Page
Application Information	page 2
Accessories	page 12
UL Requirements	page 17
Circuit Breaker Tripping Characteristics (Trip Curves)	page 19
Dimensions	page 28
QYU One-Pole 277 Vac Supplementary Protectors	page 30

QOU Miniature Circuit Breakers and Switches

Application Information

APPLICATION INFORMATION

QOU Miniature Circuit Breaker Types

Miniature molded case circuit breakers are intended for use in residential and commercial applications. They are tested and listed according to UL Standard 489 and CSA Standard C22.2 No. 5-02 for molded case circuit breakers and enclosures.

QOU miniature circuit breakers are unit-mount (lug/lug) thermal-magnetic circuit breakers which:

- Provide a means to manually open a circuit.
- Automatically open a circuit under overload or short circuit conditions.
- Feature common tripping of all poles.
- Have a Visi-Trip[®] trip indicator.
- Can be flush-, surface-, or DIN rail-mounted.
- Has lugs at both ends (cable-in/cable-out construction)
- Operate in any position.
- Are fully tested, UL Listed, and CSA certified for reverse connection without restrictive line/load markings.

Non-automatic Switches

QOU non-automatic switches are intended for use as disconnect devices only. UL Standard 489 requires switches to be protected by a thermal-magnetic circuit breaker (or fuse) of equivalent rating. QOU switches are UL Listed for use on circuits capable of delivering not more than 10,000 amperes when protected by an equivalent rated circuit breaker or fuse. QOU switches contain no automatic tripping mechanisms and do not provide overcurrent protection.

Description

QOU miniature circuit breakers and switches are available for surface-, flush-, or DIN rail mounted applications in one-, two-, and three-pole constructions. QOU miniature circuit breakers are used for overcurrent protection and switching on both ac and dc electrical systems. QOU circuit breakers and switches measure 0.75 in. (19 mm) wide per pole. Two- and three-pole circuit breakers are both equipped with an internal crossbar for common tripping of all poles. QOU switches are available in one-pole, 60 ampere and two- and three-pole, 60, 100 and 125 ampere construction.

Cases for QOU miniature circuit breakers and switches are constructed of a glass-reinforced insulating material that provides high dielectric strength. Current carrying components are isolated from the handle. The handle position indicates whether the circuit breaker is off, on or tripped.

Applications

One-pole QOU miniature circuit breakers rated 120/240 Vac are UL Listed for use on 120/240 Vac single-phase, three-wire or 208Y/120 Vac three-phase, four-wire electrical systems.

Two-pole QOU circuit breakers rated 120/240 Vac are UL Listed for use on 120/240 Vac single-phase, three-wire or 208Y/120 Vac three-phase, four-wire electrical systems. They cannot be used on 240 Vac delta systems. Use QOU-H two-pole circuit breakers rated 240 Vac on 240 Vac delta and 240 Vac single-phase, two wire systems.

Three-pole QOU circuit breakers rated 240 Vac are UL Listed for use on any system where the maximum phase-to-phase or phase-to-ground voltage is 240 Vac or less.

For application information on other systems, contact your local field office

QOU Miniature Circuit Breakers and Switches Application Information

Table 1: Selection Data

Catalog Number								Terminal Lug Wire Size (AWG)
Rating	One-Pole		Two-Pole			Three-Pole		
	120/240 Vac		120/240 Vac	240 Vac	120/240 Vac	240 Vac		
	10K AIR	22K AIR	10-K AIR		22K AIR	10K AIR		
10 A	QOU110	—	QOU210	—	—	QOU310	1—#14—#2 Cu or Al	
15 A	QOU115*	QOU115VH	QOU215*	QOU215H*	QOU215VH	QOU315*		
15 A	QOU115HM*†	—	—	—	—	—		
20 A	QOU120*	QOU120VH	QOU220*	QOU220H*	QOU220VH	QOU320*		
20 A	QOU120HM*†	—	—	—	—	—		
25 A	QOU125*	QOU125VH	QOU225*	QOU225H*	QOU225VH	QOU325*		
30 A	QOU130*	QOU130VH	QOU230*	QOU230H*	QOU230VH	QOU330*		
35 A	QOU135*	QOU135VH	QOU235*	—	QOU235VH	QOU335*		
40 A	QOU140*	QOU140VH	QOU240*	—	QOU240VH	QOU340*		
45 A	QOU145*	QOU145VH	QOU245*	—	QOU245VH	QOU345*		
50 A	QOU150*	QOU150VH	QOU250*	—	QOU250VH	QOU350*		
60 A	QOU160*	QOU160VH	QOU260*	—	QOU260VH	QOU360*		
70 A	QOU170‡	—	QOU270‡	—	—	QOU370‡		1—#12—#2/0 Cu or Al
80 A	QOU180‡	—	QOU280‡	—	—	QOU380‡		
90 A	QOU190‡	—	QOU290‡	—	—	QOU390‡		
100 A	QOU1100‡	—	QOU2100‡	—	—	QOU3100‡		
125 A	—	—	QOU2125‡	—	—	—		
Switch—60 Amperes Max.—240 Vac				QOU200	—	QOU300	1—#14—#2	
Switch—100 Amperes Max.—240 Vac				QOU2000‡	—	QOU3000‡	1—#12—#2/0	
Switch—125 Amperes Max.—240 Vac				QOU20001‡	—	QOU30001‡	1—#12—#2/0	

* UL Listed as HACR type for use with heating, air conditioning and refrigeration equipment containing motor-group combinations and marked for use with HACR type circuit breakers.

† High-magnetic trip circuit breakers. Recommended for applications where high initial inrush current can occur and for individual dimmer applications.

‡ Available as Series 1 with forward box lugs only. (No optional terminations)

Tripping Mechanisms

A tripping mechanism is an assembly within the circuit breaker molded case that causes the circuit breaker to open automatically under sustained overload or short circuit conditions.

The tripping mechanisms in two- and three-pole circuit breakers operate such that an overcurrent on any pole of the circuit breaker will cause all poles of the circuit breaker to open simultaneously. Thermal and magnetic factory calibration (with current) is performed on each pole of every Square D circuit breaker.

These mechanisms operate to trip the circuit breaker:

- Thermal trip
- Magnetic trip
- Optional shunt trip accessory (see Accessories, page 12)

The sensing system is an integral part of a thermal-magnetic circuit breaker. The sensing system continually monitors current flowing through the circuit breaker. It detects abnormal current conditions and, depending on the magnitude of the current, initiates an inverse-time or an instantaneous tripping response. This action causes the tripping mechanism to open the circuit breaker contacts and interrupt current flow. The speed of the tripping process must be controllable and inversely matched to the severity of the overcurrent. QOU miniature circuit breakers have an over-center toggle mechanism for quick-make, quick-break action with positive handle indication. The handle assumes a position between ON (I) and OFF (O) when the circuit breaker has tripped.



Features

- **UL 1449 4th Edition Listed** Type 2 SPD and CSA 22.2 No. 269.2
- **Customizable Voltage, Configuration & Labeling Design**
 - Including International Voltages & Power Systems
- **Rapid-Ship, Cellular Manufacturing in Florida, USA**
- **160kA - 40kA Per Phase Ratings**
- **20kA Nominal Discharge Current (I-nominal)**
- **100kA SCCR's**
- **NEMA 4X Polycarbonate Enclosure**
- **UL 96A Lightning Protection Master Label compliant**
- **All Modes of Protection**
- **Optional Sinewave-Tracking EMI/RFI Filtering**
- **Easy Installation**
 - Pre-wired 10 AWG Leads (3 feet / 1m), Connect to 20 - 30A breaker

Surge Current Ratings

Surge Capacities	L-N	L-G	N-G	L-L
160kA Per Phase	80kA	80kA	80kA	160kA
120kA Per Phase	60kA	60kA	60kA	120kA
80kA Per Phase	40kA	40kA	40kA	80kA
40kA Per Phase*	20kA	20kA	20kA	40kA

*10kA I_n

Performance Specifications

- UL 1449-4 tested I-nominal: 20kA
- UL 1449-4 tested SCCR: 100kA
- Response Time: < 1ns
- **Optional Filtering up to -50dB from 10kHz to 100MHz**
- Repetitive Impulse: 5,000 hits
- Data table on back

Diagnostic Monitoring

- **LED indicator monitoring:**
 - Separate L-N and L-G LEDs for each phase
- **Phase Loss monitoring**
- **Optional Form C Dry Contact, (Contact rated 240V, 5A; leads are pre-wired through nipple with 18 AWG)**

Quality, Standards & Validation

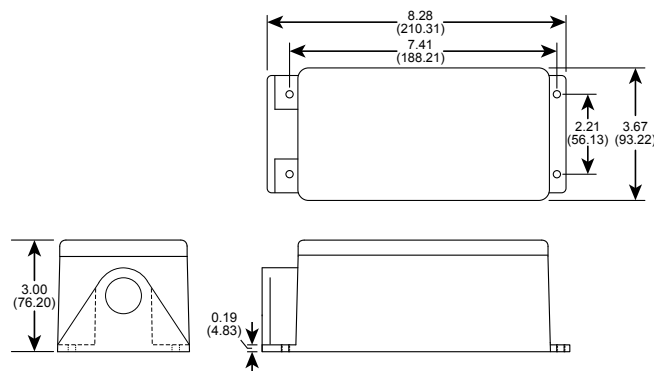
- UL 1449 Fourth Edition, CSA 22.2 No. 269.2
- UL file: VZCA.E321351 at www.UL.com
- RoHS-compliant
- IEC 61643, CE
- 5 year warranty (longer optional)
- Burn-In tested prior to shipment
- ISO 9001:2008 Quality Management System
- ISO 17025:2005 Laboratory Qualification

Design & Application

- Designed, Manufactured & Tested consistent with:
 - ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, IEEE C62.62 and C62.72
 - NEC® Article 285
 - IEC 61643, CE
- High Energy Parallel Design for IEEE Category C3 & C-High applications, plus Categories B & A
- For Internal or External Mounting in Process, Automation, Traffic Control, UL 508 Cabinets, Switchgear
- Robust 25mm Thermally Protected MOVs
- Solid State Bidirectional Operation

Physical Specifications

- Relative Humidity Range: 0 - 95% non-condensing
- Operating Frequency: 40 - 500Hz
- **Operating Temperature: -40°C (-40°F) to +85°C (185°F)**
- Weight: 3lbs (1.5kg)
- NEMA 4X Polycarbonate enclosure: UL 746C(f1) & UL 94-5VA
- 3/4" female threaded hub

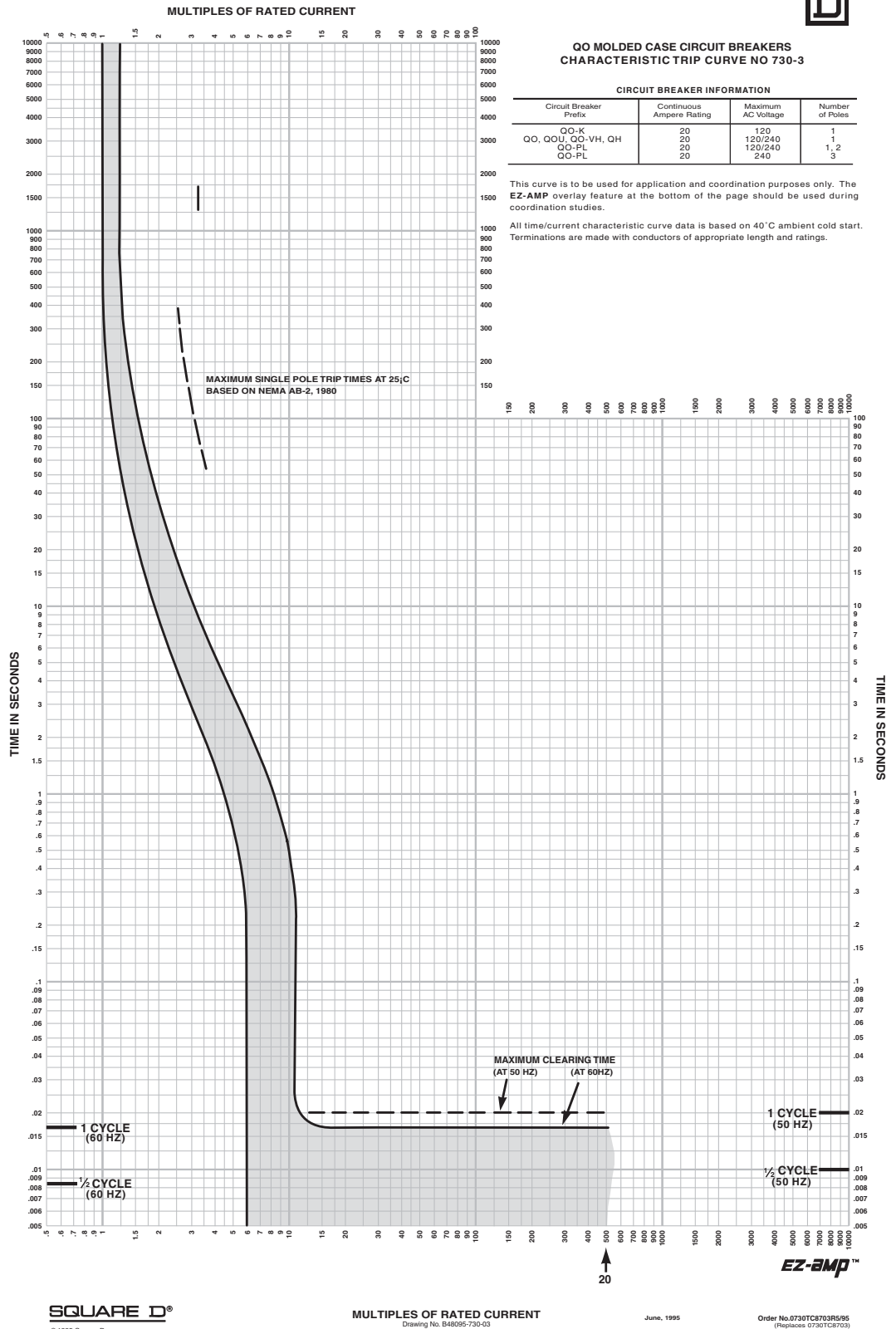


QOU Miniature Circuit Breakers and Switches Tripping Curves

QOU120



Curve 730-3

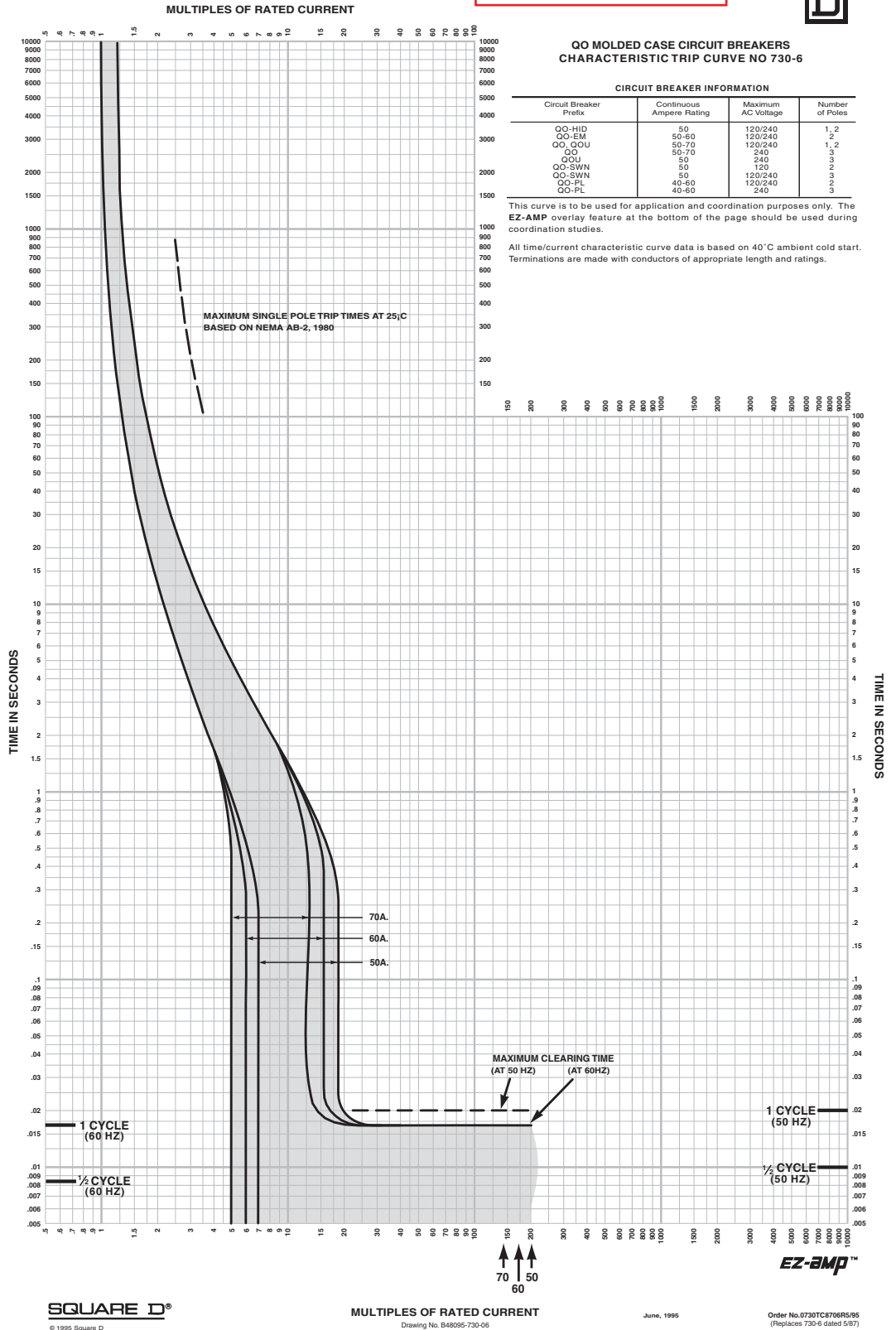


QOU Miniature Circuit Breakers and Switches Tripping Curves

QOU150



Curve 730-6



Power Distribution Blocks

**600 Volts AC/DC
Up to 1000 Volts AC/DC (CE)⁺**

Specifications:

- Connector, High Conductive Aluminum, Tin Plated, Rated for Copper and Aluminum Wire
- CU Connector, High Conductive Copper, Tin Plated, Rated for Copper Wire Only
- Amp Rating Based on NEC Table 310-16 Using 75°C Copper Wire
- UL Recognized File No. XCFR2.E62806
- CSA Certified File No. LR19766
- **CE**
- Flexible Stranded Wire Compliant
- RoHS Compliant
- **For detailed SCCR information with fuses and circuit breakers, please refer to datasheets on www.marathonsp.com**

+ Refer to www.marathonsp.com/PDFs/1000VCERating.pdf for details on availability of CE voltage ratings greater than 600 Volts



1423570



1414400

** Openings rated for #4-14 AWG are multiple wire rated:
(2) #10 CU Str, (2 to 4) #12 CU Str, and (2 to 4) #14 CU Str.

*** Openings rated for #2-14 AWG are multiple wire rated:
(2) #8 CU Str, (2) #10 CU Str, (2) #12 CU Str, and (2) #14 CU Str.

Replace "X" with # of poles (0 = Adder)

Catalog #	Hinge Cover	Poles (X)	Amps	MATERIAL		LINE SIDE			LOAD SIDE		
				Insulator	Conn.	Wire Range AWG/kcmil	Openings Per Pole	Connector Configuration	Wire Range AWG/kcmil	Openings Per Pole	Connector Configuration
141X403		1/2/3/4	60	Plastic	AL	#2 - #14 AWG	1		#10 - #16 AWG	2	
141X400		1/2/3/4	115	Plastic	AL	#2 - #14 AWG	1		#10 - #16 AWG	4	
132X570	CH	0/1/2/3	175	Plastic	AL	2/0 - #14 AWG	1		#4 - #14 AWG**	4	
142X570		1/2/3	175	Phenolic	AL	2/0 - #14 AWG	1		#4 - #14 AWG**	4	
132X580	CH	0/1/2/3	175	Plastic	AL	2/0 - #14 AWG	1		#4 - #14 AWG**	6	
140X402		2/3	175	Phenolic	AL	2/0 - #14 AWG	1		#4 - #14 AWG**	4	
140X401		2/3	175	Phenolic	AL	2/0 - #14 AWG	1		#4 - #14 AWG**	6	
132X970	CH	0/1/2/3	175	Plastic	CU	2/0 - #14 AWG	1		#4 - #14 AWG**	4	
142X970		1/2/3	175	Phenolic	CU	2/0 - #14 AWG	1		#4 - #14 AWG**	4	
140X404		2/3	310	Phenolic	AL	350 kcmil - #6 AWG	1		#4 - #14 AWG	6	
133X554	CH	1/2/3	310	Plastic	AL	350 kcmil - #6 AWG	1		2/0 - #14 AWG	2	

CH = Block is also available with hinge cover attached - include "CH" at end of part number when ordering (not available on Adder blocks) - See page 55 for available covers

See pages 52-54 for dimensional information

The modular terminal block system - CLIPLINE complete

UT screw connection terminal blocks

UT ... feed-through terminal blocks



The UT screw terminal block series is characterized by the system features of the CLIPLINE complete system and the following features:

- As well as saving space, the compact design allows the device to be conveniently wired in tight spaces
- The large connection space enables solid and stranded conductors to be connected without a ferrule, even if greater than the nominal cross section
- The cable entry funnel enables conductors to be used with ferrules and plastic collars within the nominal cross section
- The multiple-conductor connection offers maximum flexibility and wiring density
- Optimum guidance of screwdriver through closed screw shafts
- For corresponding **torque screwdrivers**, see CLIPLINE catalog, part 2

Terminal strip service

We produce fully pre-assembled terminal strips for fitting straight into the control cabinet or switch system. This simplifies installation, saves time and cuts costs.



Notes:

- 1) For information on installation when using accessories for Ex e applications, see page 578.
- 2) The reducing bridge table should be followed, see page 392.

PHOENIX CONTACT DIN RAIL MOUNT TERMINAL BLOCKS
UT 4 BK - BLACK (3045143)
UT 4 WHT - WHITE (3045130)



2.5 (4) mm², 32 A, feed-through terminal block



KE MA 04ATEX2048 U/IECEx KEM 06.0027U

Dimensions		Width	Length	Height NS 35/7.5
	[mm]	5.2	47.7	47.5
Max. electrical data		I _{max.} [A]	U _{max.} [V]	max. Ø [mm ²] AWG
		32	1000	0.14 - 4 26 - 12
Rated data		IEC 60947-7-1	IEC	UL/CUL
Rated voltage	[V]	1000	600	600
Nominal current/cross section	[A]/[mm ²]	24/2.5	20/-	20/-
Rated cross section	[mm ²]	2.5	-	-
Cross-section range	AWG	26 - 12	26 - 12	26 - 12
Connection capacity		One conductor	Two conductors (of the same type)	Two stranded conductors with a TWIN ferrule
	[mm ²]	0.14 - 4	0.14 - 4	0.14 - 2.5
	[mm ²]	0.14 - 1.5	0.14 - 1.5	0.14 - 1.5
	[mm ²]			0.5 - 1.5
General data		Stripping length	Screw thread	Tightening torque
	[mm]	9	M3	0.5 - 0.6
	[Nm]			
				PA
				V0

Description	No. of pos.	Color
Terminal block, for mounting on NS 35...		gray
		blue
		orange
		red
		black

Description	No. of pos.	Color
Pick-off terminal block, for snapping into the lateral guide		gray
Cover, width 2.2 mm		gray
Plug-in bridge		
	2	red
	3	red
	4	red
	5	red
	10	red
	20	red

Reducing bridge ²⁾	2	red
Reducing bridge ²⁾	2	red

Partition plate, 2 mm wide		gray
Test adapter, 4 mm test socket hole		gray
Test plug, consisting of: metal part for 2.3 mm Ø socket hole and insulating sleeve for MPS metal part		red
Modular test plug, for the individual assembly of test plug strips		red
Warning sign for UT series		yellow
Screwdriver		

Lateral groove labeling

Technical data			
Width	Length	Height NS 35/7.5	
5.2	47.7	47.5	
I _{max.} [A]	U _{max.} [V]	max. Ø [mm ²] AWG	
32	1000	0.14 - 4 26 - 12	
IEC 60947-7-1	IEC	UL/CUL	CSA
			EC/EN 60079-7
Rated voltage	[V]	1000	600
Nominal current/cross section	[A]/[mm ²]	24/2.5	20/-
Rated cross section	[mm ²]	2.5	-
Cross-section range	AWG	26 - 12	26 - 12
Connection capacity		Solid	Stranded
		Without plastic sleeve	With plastic sleeve
One conductor	[mm ²]	0.14 - 4	0.14 - 2.5
Two conductors (of the same type)	[mm ²]	0.14 - 4	0.14 - 1.5
Two stranded conductors with a TWIN ferrule	[mm ²]		0.5 - 1.5
General data			
Stripping length	[mm]	9	
Screw thread		M3	
Tightening torque	[Nm]	0.5 - 0.6	
Insulating material		PA	
Inflammability class according to UL 94		V0	

Ordering data			
Type	I _{max.}	Order No.	Pcs./Pkt.
UT 2,5		3044076	50
UT 2,5 BU		3044089	50
UT 2,5 OG		3045046	50
UT 2,5 RD		3045062	50
UT 2,5 BK		3045088	50

Accessories ¹⁾			
D-UT 2,5/10		3047028	50
FBS 2-5	24 A	3030161	50
FBS 3-5	24 A	3030174	50
FBS 4-5	24 A	3030187	50
FBS 5-5	24 A	3030190	50
FBS 10-5	24 A	3030213	10
FBS 20-5	24 A	3030226	10

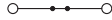
ATP-UT		3047167	50
PAI-4-N GY		3032871	10
MPS-4T		0201744	10
MPS-IH RD		0201676	10
PS 5		3030983	10
WVS UT 2,5		3047923	10
SF-SL 0,6X3,5-100 S-VDE		1212587	1

UC-TM 5, UCT-TM 5 or ZB 5 (CLIPLINE catalog, part 2)

UT 4



4 (6) mm², 41 A, feed-through terminal block



6 (10) mm², 57 A, feed-through terminal block



10 (16) mm², 76 A, feed-through terminal block

UL US CB CB UL CB CB
Ex: Ex KEMAR KEMAR KEMAR

KEMA 04ATEX2048 U/IECEX KEM 06.0027U

Technical data

Width	Length	Height NS 35/7.5	
6.2	47.7	47.5	
I _{max} [A]	U _{max} [V]	max. Ø [mm ²]	AWG
41	1000	0.14 - 6	26 - 10
IEC 60947-7-1			
IEC	UL/CUL	CSA	IEC/EN 60079-7
1000	600	600	690
32/4	30/-	30/-	30/4 // 38/6
4	-	-	4
26 - 10	26 - 10	26 - 10	26 - 10
Solid	Stranded	Ferrule	
Without/with plastic sleeve			
0.14 - 6	0.14 - 6	0.14 - 4	0.14 - 4
0.14 - 1.5	0.14 - 1.5	0.14 - 1.5	-
0.5 - 2.5			
9	M3	0.6 - 0.8	PA
V0			

Ordering data

Type	I _{max}	Order No.	Pcs./Pkt.
UT 4		3044102	50
UT 4 BU		3044115	50
UT 4 OG		3045101	50
UT 4 BK		3045143	50

Accessories¹⁾

D-UT 2,5/10	3047028	50
FBS 2-6	32 A 3030336	50
FBS 3-6	32 A 3030242	50
FBS 4-6	32 A 3030255	50
FBS 5-6	32 A 3030349	50
FBS 10-6	32 A 3030271	10
FBS 20-6	32 A 3030365	10
ATP-UT	3047167	50
PAI-4-N GY	3032871	10
MPS-MT	0201744	10
MPS-IH RD	0201676	10
PS-6	3030996	10
WS UT 4	3047332	10
SF-SL 0,6X3,5-100 S-VDE	1212587	1

UC-TM 6, UCT-TM 6 or ZB 6 (CLIPLINE catalog, part 2)

UL US CB CB UL CB CB
Ex: Ex KEMAR KEMAR KEMAR

KEMA 04ATEX2048 U/IECEX KEM 06.0027U

Technical data

Width	Length	Height NS 35/7.5	
8.2	47.7	47.5	
I _{max} [A]	U _{max} [V]	max. Ø [mm ²]	AWG
57	1000	0.2 - 10	24 - 8
IEC 60947-7-1			
IEC	UL/CUL	CSA	IEC/EN 60079-7
1000	600	600	690
41/6	50/-	50/-	40/6 // 50/10
6	-	-	6
24 - 8	24 - 8	24 - 8	24 - 8
Solid	Stranded	Ferrule	
Without/with plastic sleeve			
0.2 - 10	0.2 - 10	0.25 - 6	0.25 - 6
0.2 - 2.5	0.2 - 2.5	0.25 - 1.5	-
0.5 - 4			
10	M4	1.5 - 1.8	PA
V0			

Ordering data

Type	I _{max}	Order No.	Pcs./Pkt.
UT 6		3044131	50
UT 6 BU		3044144	50
UT 6 OG		3045169	50
UT 6 RD		3045185	50
UT 6 BK		3045208	50

Accessories¹⁾

D-UT 2,5/10	3047028	50
FBS 2-8	41 A 3030284	10
FBS 3-8	41 A 3030297	10
FBS 4-8	41 A 3030307	10
FBS 5-8	41 A 3030310	10
FBS 10-8	41 A 3030323	10
RB UT 6-(2,5/4)	3047251	10
RB UT 6-ST(2,5/4)	3047264	10
ATP-UT	3047167	50
PAI-4-N GY	3032871	10
PS-8	3031005	10
WS UT 6	3047345	10
SZS 1,0X4,0 VDE	1205066	10

UC-TM 8, UCT-TM 8 or ZB 8 (CLIPLINE catalog, part 2)

UL US CB CB UL CB CB
Ex: Ex KEMAR KEMAR KEMAR

KEMA 04ATEX2048 U/IECEX KEM 06.0027U

Technical data

Width	Length	Height NS 35/7.5	
10.2	47.7	47.5	
I _{max} [A]	U _{max} [V]	max. Ø [mm ²]	AWG
76	1000	0.5 - 16	20 - 6
IEC 60947-7-1			
IEC	UL/CUL	CSA	IEC/EN 60079-7
1000	600	600	690
57/10	65/-	65/-	54/10 // 69/16
10	-	-	10
20 - 6	20 - 6	20 - 6	20 - 6
Solid	Stranded	Ferrule	
Without/with plastic sleeve			
0.5 - 16	0.5 - 16	0.5 - 10	0.5 - 10
0.5 - 4	0.5 - 4	0.5 - 2.5	-
0.5 - 6			
10	M4	1.5 - 1.8	PA
V0			

Ordering data

Type	I _{max}	Order No.	Pcs./Pkt.
UT 10		3044160	50
UT 10 BU		3044188	50
UT 10 OG		3046281	50
UT 10 RD		3046304	50
UT 10 BK		3046320	50

Accessories¹⁾

AGK 4-UT 10	3047112	50
D-UT 2,5/10	3047028	50
FBS 2-10	57 A 3005947	10
RB UT 10-(2,5/4)	3047060	10
RB UT 10-ST(2,5/4)	3047086	10
ATP-UT	3047167	50
WS UT 10	3047361	10
SZS 1,0X4,0 VDE	1205066	10

UC-TM 10, UCT-TM 10 or ZB 10 (CLIPLINE catalog, part 2)

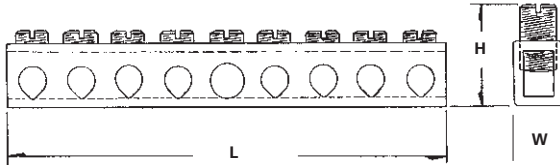
TYPE D167

Features

- Manufactured from high strength copper tubing
- Range taking
- UL Recognized for 600 volts

Benefits

- Provides maximum conductivity
- A wide range of conductor sizes can be used in the same connector
- Ensures reliability for copper conductor



C

Catalog Number	Number Of Taps	Wire Range		Dimensions					Mounting Hole Positions	
		Main	Tap	L	Height With Maximum Wire	W	Bolt Size	Two Mounting Holes	From End Of Bar To First Mounting Hole	Distance Between Holes
D167-4	4	4-14	6-14	2-3/4	3/4	11/32	#10	13/64	.581 (2nd hole)	1.98
D167-6	6	4-14	6-14	3-1/2	3/4	11/32	#10	13/64	.978 (3rd hole)	1.98
D167-8	8	4-14	6-14	4-7/16	3/4	11/32	#10	13/64	1.375 (4th hole)	1.98
D167-10	10	4-14	6-14	5-1/8	3/4	11/32	#10	13/64	1.772 (5th hole)	1.98
D167-12	12	4-14	6-14	5-15/16	3/4	11/32	#10	13/64	2.169 (6th hole)	1.98
D167-14	14	4-14	6-14	6-23/32	3/4	11/32	#10	13/64	2.566 (7th hole)	1.98

All wire sizes, unless noted otherwise, are American Wire Gauge (AWG)
Tested to UL 486A/B, UL File E6207

Ground Fault Products

Heavy Duty Commercial GFCI Receptacles

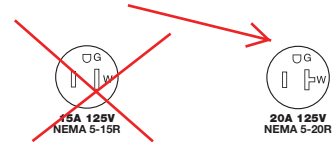
15 and 20 Ampere, 125 Volts AC
2 Pole, 3 Wire Grounding

Meets July 28, 2006
UL Standard 943
Class A GFCI



10ka Short Circuit Current Rating

- Comprehensive diagnostics.
 - When test button is actuated, both the electronic components and mechanical trip mechanism are functionally tested.
- Ground fault indicator.
 - Flashing **RED** indicates device has lost capability to provide protection.
- No power at face if reverse wired.
 - Open circuit condition eliminates false assumption of protection at face.
- Visible Termination.
 - External bundling clamp.



Circuit Guard® GFCI Receptacles



GF15IL

Description	Rating	Color	Catalog Numbers	
Flush, nylon face, back and side wired, multiple drive screws.	15 and 20A 125V AC	Almond	GF15ALL	GF20ALL
		Black	GF15BKL	GF20BKL
		Brown	GF15L	GF20L
		Gray	GF15GYL	GF20GYL
		Ivory	GF15IL	GF20IL
		Light Almond	GF15LAL	GF20LAL
		Office White	GF15OWL	GF20OWL
		Red	GF15RL	GF20RL
		White	GF15WL	GF20WL

Hospital Grade ● Circuit Guard® GFCI Receptacles



GFR8200HOWL

Description	Rating	Color	Catalog Numbers	
Flush, nylon face, back and side wired, multiple drive screws.	15 and 20A 125V AC	Almond	GFR8200HALL	GFR8300HALL
		Black	GFR8200HBKL	GFR8300HBKL
		Brown	GFR8200HL	GFR8300HL
		Gray	GFR8200HGYL	GFR8300HGYL
		Ivory	GFR8200HIL	GFR8300HIL
		Office White	GFR8200HOWL	GFR8300HOWL
		Red	GFR8200HRL	GFR8300HRL
		White	GFR8200HWL	GFR8300HWL

Notes: GFCI type receptacles should not be used in critical care, patient areas or for electrical life support equipment applications because of the possibility of power interruption. All GFCI receptacles listed above are furnished with a matching color nylon wallplate. 20 amp feedthrough capability.



15A 125V & 250V, 20A 125V & 250V



Commercial Grade

2 YEAR LIMITED WARRANTY



ELECTRICAL		
DIELECTRIC VOLTAGE	CURRENT INTERRUPT.	TEMP. RISE
Withstands 2000V per UL 498	Full rated current	30°C max at full rated current after 100 cycles overload at 150% rated current for both AC and DC per UL 498

MECHANICAL		
TERMINAL I.D.	TERMINAL ACCOMM.	PRODUCT I.D.
Brass, hot Grounding White, neutral	#14 - #10 AWG	Rateds are permanently marked on device
ENVIRONMENTAL		
FLAMMABILITY	OPERATING TEMP.	
Rated V-2 per UL 94	-40°C to 60°C	

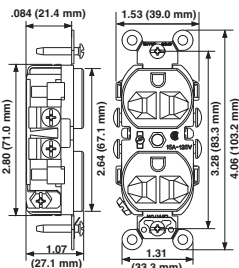
STANDARDS & CERTIFICATIONS					
NEMA WD6	ANSI C-73	UL 498	UL Fed Spec WC-596	CSA C22.2 No. 42	NOM
✓	✓	#E13399	-	#152105	#057
AC HORSEPOWER RATINGS					
15A 125V	15A 250V	20A 125V	20A 250V		
.5	1.5	1.0	2.0		

Side Wired

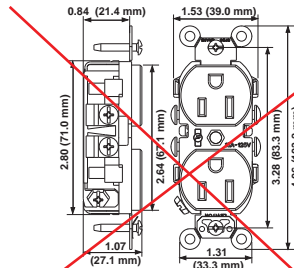


FACE COLOR	DUPLEX RECEPTACLE	DUPLEX RECEPTACLE CANADIAN	DUPLEX RECEPTACLE TAMPER RESISTANT	DUPLEX RECEPTACLE SMOOTH FACE
15A 125V, NEMA 5-15R, 2-P 3-W, Grounding				
Brown Ivory White Gray Almond Black	GR15 GR15-I GR15-W GR15-GY GR15-A GR15-E	GR15-G GR15-GI	- CR15-SGI CR15-SGW	GR015 CR015-I CR015-W GR015-GY
15A 250V, NEMA 6-15R, 2-P 3-W, Grounding				
Brown Ivory	5028 5028-I	- -	- -	- -
20A 125V, NEMA 5-20R, 2-P 3-W, Grounding				
Brown Ivory White Gray Almond Black	GR20 GR20-I GR20-W GR20-GY GR20-A GR20-E	- - - - - -	- - - - - -	GR020 CR020-I CR020-W GR020-GY
20A250V, NEMA 6-20R, 2-P 3-W, Grounding				
Brown Ivory White	5822 5822-I 5822-W	- - -	- - -	- - -

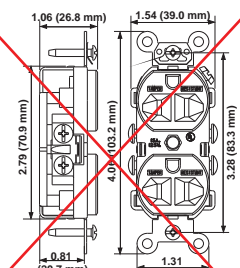
FOR ADDITIONAL WALLPLATE OPTIONS SEE SECTION Q



CR15, CR20, 5822, CR15C, 5028



CR015, CR020



CR15S

Commercial Grade Straight Blade Receptacles

B 19

Infinity Green Lighting

LED T5 SLIM SLEEK

Type	
Project	
Catalog No.	



Specifications

Model #	IG-LED-T5-10W		
Input Voltage	AC120V		
Wattage	10W		
Lumens	80LM/W		
Beam angle	120°		
Dimmable	YES	Dimmer Model: ELV	
CRI	80+		
Power supply	Built-In Power Supply		
Life-span	50000 hours		
Color Temp	WW 3000K	NW 4100K	CW 6500K
Housing	Aluminum		
Environment	Indoor - Dry		
Certifications	c-ETL-us		
Warranty	3 Years		

APPLICATIONS

- Under- and over-cabinet
- Under-lighting of counters in bars, restaurants, stores, hotel reception desks, hospitals, offices and home workstations.
- Retail and merchandise showrooms displays, case lighting, store counters, display shelves.
- Bookcases, cabinet shelves.
- Integrated into furniture, bedroom headboards, decorative trims for homes, offices, hotels.
- Cove lighting.
- Backlighting of signage or decorative tiles or panels in stores, restaurants, hotels, offices.

DESCRIPTION

The Slim Sleek LED T5 is the next generation of our award winning, linkable Slim Sleek LED Plus series. Using the same miniature profile and minimal footprint of our market leading Slim Sleek LED fixture, we engineered these fixtures to incorporate the latest in LED technology. The T5 uses the same direct- and cable-connectors making the plug and play installation quick and easy as well as making retrofitting/upgrading from fluorescent simple. Using the provided direct connector allows for end-to-end placement, reducing shadowing and allowing the light to be continuous.

The fixed or adjustable white opal cover encloses the ultra bright LEDs, provides for an even glow exiting the fixture and eliminates unwanted "point of light" visibility. T5 continues to be a pioneer in the use of LEDs which are environmentally friendly with Our LEDs have an average rated life of 50,000 hours.

FEATURES

- Dimmable isolated driver
- Linkable Units
- Direct AC input
- Perfect color with CRI 80+
- Smooth light source
- ETL listed & Energy Star qualified

Wattage	Energy Saving (Output Equivalent)	Lumen Output (lm)	Max Linking Wattage	Dimensions
10W	100W	950-1000 lm	280	(L) 21" x (W) 3/4" x (H) 1-1/4"

3 PUSHBUTTON SWITCHES

General Purpose Pushbutton Switches — AC Rated

These general purpose ac rated pushbutton switches offer a wide variety of configurations, button styles and termination types. The 7835 and 7836 light duty series are ac only pushbutton switches. They feature Slow-make/Slow-break butt type contacts with a light operating pressure that is particularly suited to instrumentation applications.

SPECIFICATIONS

Ratings:
See selection table.

Circuits:

1PST, 1PDT, 2PDT.
Momentary action.

Contact Material:

3-6A Rated
Movable — Silver plated copper.
Stationary — Silver plated copper.

10-15A Rated

Movable — Silver plated copper with fine or coin silver contact face button.
Stationary — Copper with fine or coin silver contact face button.

Terminal Types:

Screw Terminals — Brass.
Furnished unassembled.

8448 Series
#6-32 x 3/16" binding head screws (Cat. No. 811-2).

8410/8411 Series
#5-40 x 3/16" (Cat. No. 811-7206).

8406/8440 Series
#5-40 x 5/32" screws (Cat. No. 11-26).

Solder Lug — Brass silver plated.

AC RATED PUSHBUTTON SWITCHES SELECTION TABLE (BOLD FACE TYPE INDICATES ITEMS NORMALLY IN DISTRIBUTOR STOCK)

Type	Rating	Poles and Throw	Contacts	CIRCUIT NUMBER SEE PAGE 4.28	BUTTON				Typical Maximum Operating Force	Mounting or Bushing Length Dimension "A"		CATALOG NUMBER			
					Construction	Color	Button Extension Dimension "B"			mm	inches	Solder Lugs	Screw Terminals	Spade Terminals (250°)	Wire Leads ⑤
					NON-ILLUMINATED				NON-ILLUMINATED						
Flush-Mounted Light-Duty Momentary Contact	3/4A, 125V ac/dc	1 P.S.T. 1 P.S.T.	NC	A	Nylon	Black	11.50	.453"	0.7 lbs. ②	—	Flush	—	8410K1	—	—
	1/4A, 250V ac/dc		NC	A	Nylon	Black	11.89	.468"	0.7 lbs. ②	—	Flush	—	8406K1	—	—
Snap-In Mounted Light-Duty Momentary Contact	3/4A, 125V ac/dc	1 P.S.T. 1 P.S.T.	NC	A	Nylon	White	9.53	.375"	—	—	Snap-In	—	—	8423K1 ①	—
	1/4A, 250V ac/dc		NO	A	Nylon	White	9.53	.375"	—	—	Snap-In	—	—	8424K1 ①	—
One Hole Mounted Light Duty Momentary Contact	3/4A, 125V ac/dc 1/4A, 250V ac/dc	1 P.S.T. 1 P.S.T.	NC	A	Nylon	Black	6.35	.250"	1.5 lbs. ②	6.35	.250"	8411K5	—	—	—
			NO	A	Nylon	Red	6.35	.250"	1.5 lbs. ②	6.35	.250"	—	—	8411K13 ①	—
	3A, 125V ac	1 P.S.T. 1 P.S.T.	NC	A	Nylon	Black	10.31	.406"	1.5 lbs. ②	11.89	.468"	8411K8	8411K7	8411K10	—
			NO	A	Nylon	Black	9.53	.375"	1.5 lbs. ②	11.89	.468"	—	8411K12	8411K11 ①	—
	5A, 12V de ①③ 3A, 125V ac	1 P.S.T.	NC	A	Nylon	Black	6.35	.250"	1.5 lbs. ②	6.35	.250"	—	—	8418K1 ①	—
			NO	A	Nylon	Black	10.31	.406"	1.5 lbs. ②	11.89	.468"	—	—	8418K12 ①	—
Metal	—	7.52	.296"	2.5 lbs.	11.89	.468"	8440K2	8440K3	—	—	—	—			
	Metal Nylon (Snap-On)	Black	7.92	.312"	—	14.27	.562"	7835K11A	—	—	—	7835K12A			
		Red	—	—	—	14.27	.562"	7835K11G	—	—	—	—			
	Metal Nylon (Snap-On)	Black	7.92	.312"	—	14.27	.562"	7835K11D	—	—	—	—			
Red		—	—	—	14.27	.562"	7836K11A	7836K13A	—	—	7836K12A				
Metal Nylon (Snap-On)	Black	—	—	—	14.27	.562"	7836K11G	—	—	—	—				
	Red	—	—	—	14.27	.562"	7836K11D	—	—	—	—				
One Hole Mounted Medium-Duty Momentary Contact	15A, 125V ac 10A, 250V ac	1 P.S.T.	NO	A	Metal	—	13.49	.531"	0.9 lbs.	17.45	.687"	—	8444K3	8444K2	—
	1/3 Hp, 125-250V ac		NO	A	Metal	—	6.35	.250"	—	8.71	.343"	—	8444K4	—	—
Metal Bakelite	15A, 125V ac, NO	1 P.D.T.	NO, NC	B	Metal	—	13.49	.531"	2.0 lbs.	17.45	.687"	—	8434K2	8434K1	—
	10A, 125V ac, NC		NO, NC	B	Metal	—	13.49	.531"	—	17.45	.687"	—	8435K2	8435K1	—
	10A, 250V ac, NO		NO, NC	B	Metal	—	13.49	.531"	—	17.45	.687"	—	8435K2	8435K1	—
5A, 250V ac, NG	1/2 Hp, 250V ac	1/4 Hp, 250V ac	1/4 Hp, 125V ac	—	—	—	—	—	—	—	—	—	—	—	
15A, 125V ac 10A, 250V ac	2 P.S.T.	NO	C	Metal	—	6.35	.250"	—	8.71	.343"	—	8448K2 ④	8448K1 ④	—	

① Combination spade and solder lug terminal.
 ② To change operating pressure, refer to your local Eaton Sales Representative.
 ③ Operating pressure cannot be changed.
 ④ UL and CSA listings not applicable.
 ⑤ Standard length is 152.40mm (6"), stripped 15.88mm (.625").

Wire Leads — 18 gauge, 152mm (6") long, skinned 19mm (.750"). Lengths beyond 152mm (6") are additional charge.

Mounting Means:

One hole mount.

Threaded Bushing — 11.90mm (.468" dia. 32 threads /inch).

Keyway — 1.73 x 0.89mm (.068 wide x .035" deep); provides anti-rotation feature.

Keyway on 7835/7836 Series is 2.03 wide x 1.01mm deep (.080 wide x .040" deep).

Hardware supplied — One hexagon locknut (Cat. No. 15-192) and one bright nickel plated knurled facenut (Cat. No. 15-124F1). 8411/8418 Series has a bright nickel plated hexagon facenut (Cat. No. 15-966-2). All hardware is furnished unassembled.

Other mounting types are flush, nest and snap-in.

Operating Temperature Range: -17.8°C to +65.6°C (0°F to +150°F).

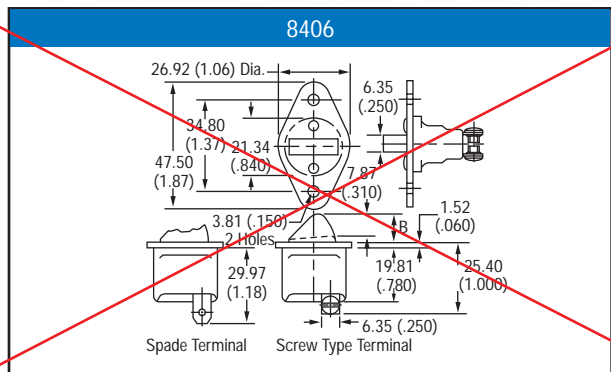
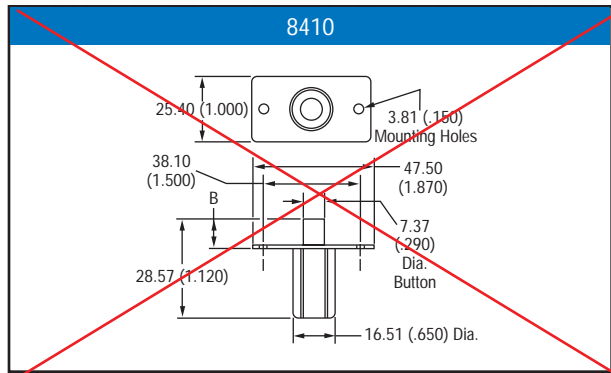
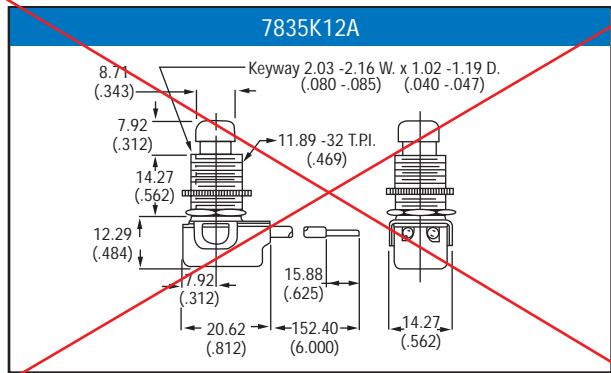
Approvals:

UL Recognized.
CSA Certified.

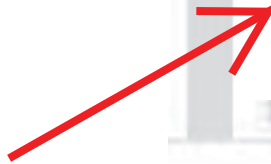
• Except where noted.



DIMENSIONS APPROXIMATE IN MM (INCHES)



Dimensions continue on [page 3.4](#).



8411K7



8423K1/8424K1



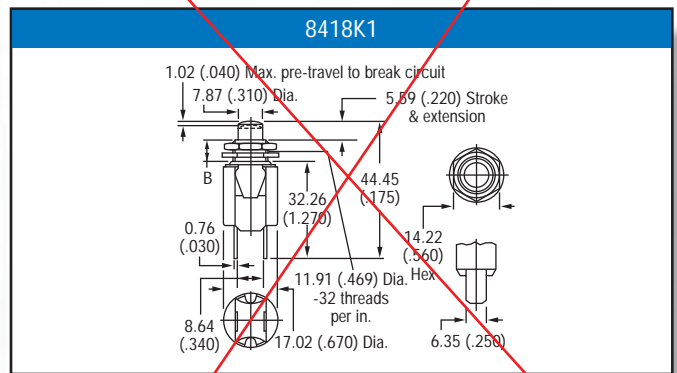
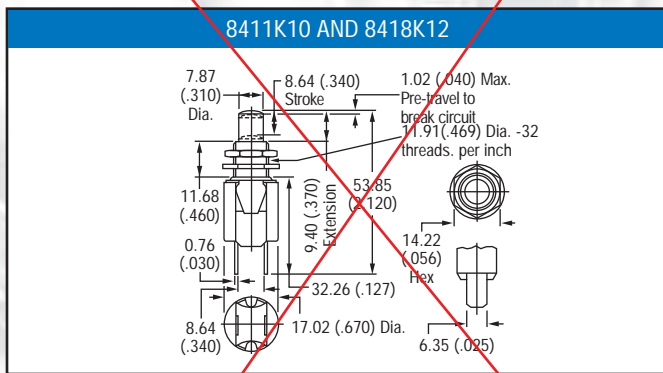
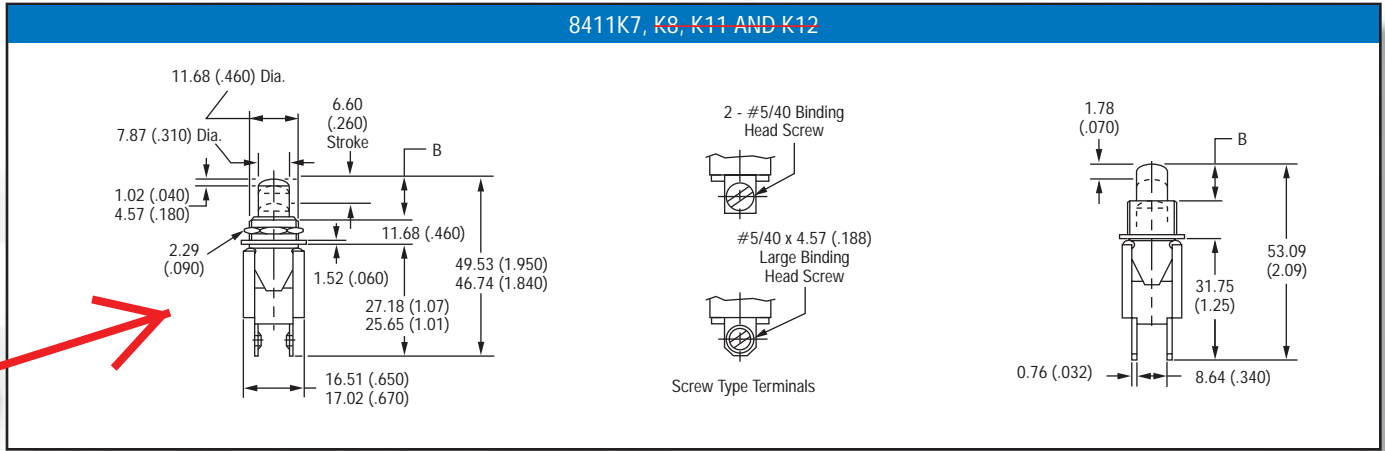
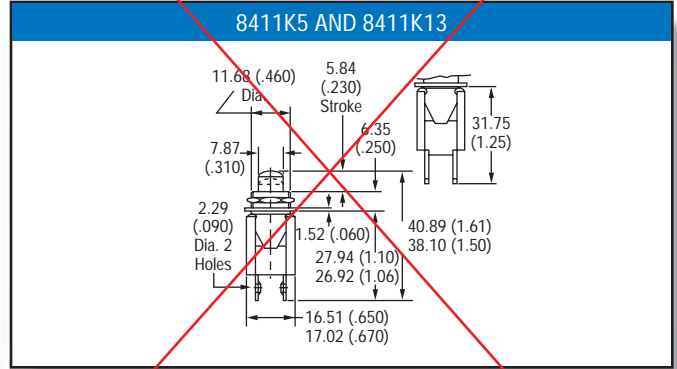
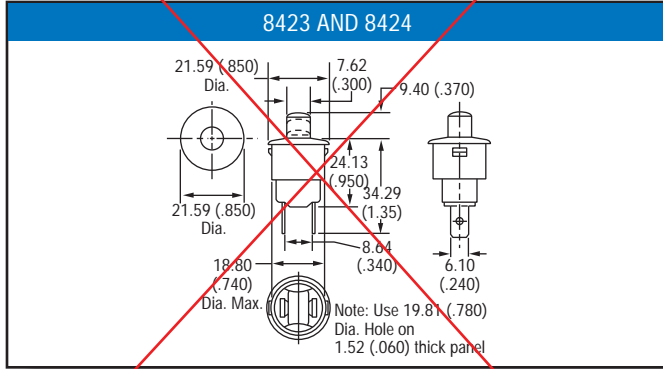
8440K3



8435K2

General Purpose AC Rated Pushbutton Switches (continued)

DIMENSIONS APPROXIMATE IN MM (INCHES)



Fuseholders


For 3AG, 5 x 20mm, or 2AG Fuses

International Shock-Safe Panel Mount Type



A complete selection of styles and options satisfy a wide variety of fuseholder design needs. Designed to eliminate the possibility of electrical shock, as defined in IEC standards 60065 and 60127. The universal fuseholder body will accept 3AG, 5 x 20mm, and 2AG fuse sizes depending on knob selected. Permits inventory reduction of bodies and provides knob interchange versatility. Anti-tease feature eliminates circuit interruption when knob is accidentally depressed. Five fuseholder types assure design flexibility. Available with two knob styles — screwdriver slot or fingertip. Drip-proof option is available on screwdriver slot knob style. Available in two terminal styles — dual-purpose for soldering or 3/16" NEMA quick connect; and 1/4" NEMA/DIN quick connect. Quick fuse size identification is provided with letters on fingertip knob and color-coded screwdriver slot knobs.

APPROVALS:

	3AG	5 x 20mm	2AG
	20A 250V	10A 250V	10A 250V
CSA	20A 250V	10A 250V	10A 250V
VDE	10A 250V	10A 250V	—

SPECIFICATIONS:

Electrical: Insulation Resistance: 10,000 megohm minimum at 500 VDC. Contact Resistance: Less than .005 ohm average at currents up to 1 ampere.

Mounting: Threaded styles withstand 15 in.-lb. mounting torque. Low profile and High profile panel thickness: .032" min./ .310" max. Quick mount panel thickness: .012" min./ .360" max. Rear mount panel thickness: .012" min./ .260" max.

Molded Parts: Body Material: Black glass-filled thermoplastic (UL 94V0).

Knob Material: Grey, blue or black glass-filled thermoplastic (UL94 V-0) Hex Nut Material: Black glass-filled thermoplastic.

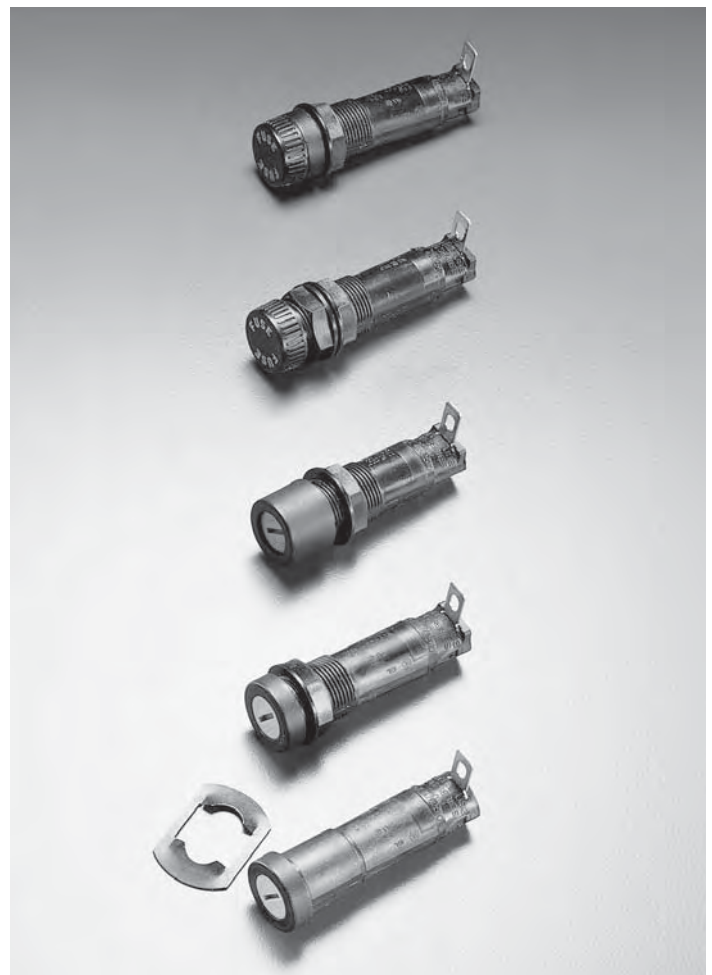
Knob: Finger-Grip, Fuse Extractor type or Screwdriver Slot, Fuse Extractor type with plated copper alloy insert. Plated copper alloy contact clips. Spring loaded, locking mechanism provides an anti-tease feature and will not vibrate loose.

Terminals: Copper alloy. Tin-plated. Three styles available. A .187" dual purpose terminal accepts wire for soldering or a Quick-Connect receptacle. .187" terminal for NEMA Quick-Connect and .250" terminal for NEMA/DIN Quick-Connect available.

Ambient Temperature: -40°C to +85°C.

Hardware: Threaded style fuseholders are supplied with a thermoplastic hex nut unassembled. Quick mount style fuseholders are supplied with a push-on type retaining nut, black oxide finish, unassembled. A synthetic rubber "O" ring will be supplied only with the screwdriver slot knob when the drip-proof version is requested. To order with a metal internal tooth lockwasher (L) and/or neoprene panel washer (N) and/or drip-proof synthetic rubber "O" ring with Neoprene washer (NP) [Screwdriver slot knob only], add the appropriate suffix (L, N, or NP) respectively (or in combination) to the catalog number.

Example: 3453LS7LNP is a holder supplied with a lockwasher, a neoprene panel washer, and a drip-proof "O" ring in addition to the hex nut.



* Please refer to Fuseology section for information on proper fuseholder de-rating.

Fuseholders

For 3AG, 5 x 20mm, or 2AG Fuses

International Shock-Safe Panel Mount Type



ORDERING INFORMATION:

#3453LF3H

EXAMPLE (Complete Assembly with options): 345 3 LS 7 L N NP
 Series Number

Fuse Size	Style	Terminals	Options*
2 2AG .177" x .570"	LF Low Profile Body Black Fingergrasp Knob	1 3/16" (Rt. Angle) Dual Purpose Solder/QC	L Lockwasher
3 3AG .250" x 1.250"	RF Rear Mount Body Black Fingergrasp Knob	2 3/16" (Straight) Dual Purpose Solder/QC	N Neoprene Washer
5 5 x 20mm .197" x .787"	HS High Profile Body Screwdriver Slot Knob	3 3/16" (Rt. Angle) NEMA QC	NP Drip-Proof "O" Ring** with Neoprene Washer
	LS Low Profile Body Screwdriver Slot Knob	4 3/16" (Straight) NEMA QC	
	QS Quick Mount Body Screwdriver Slot Knob	7 1/4" (Rt. Angle) NEMA/DIN QC	
	Screwdriver Slot Knob 2AG — Blue Knob 3AG — Grey Knob 5 x 20mm — Black Knob	8 1/4" (Straight) NEMA/DIN QC	

*Options (L, N, NP) can be ordered individually or in combination.

**Screwdriver slot knob only.

Note: To Order Knob Only:

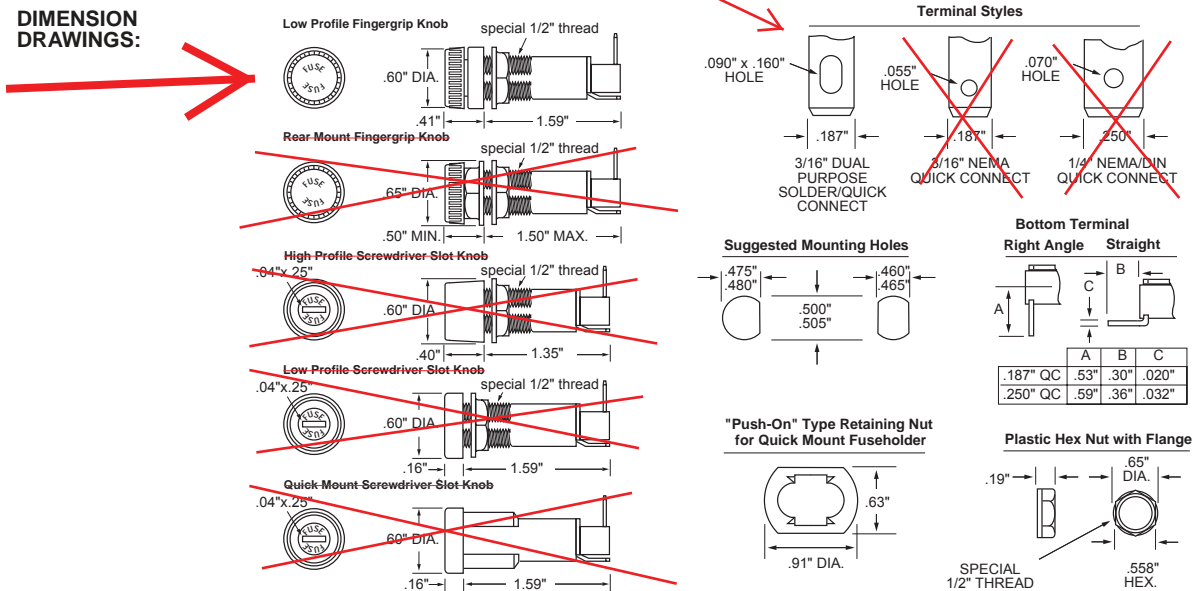
Fuse Size	Fingergrasp Knob Part Number	Screwdriver Slot Knob Part Number
2AG	3452LF1-020	3452LS1-020
3AG	3453LF1-020	3453LS1-020
5 x 20mm	3455LF1-020	3455LS1-020

To Order Body Including Nut(s) Only:

Terminal Style	Bottom Terminal	Low Profile Body Part Number***	High Profile Body Part Number	Rear Mount Body Part Number	Quick Mount Body Part Number
3/16" Dual Purpose	(Rt. Angle)	3453LF1-010	3453HS1-010	3453RF1-010	3453QS1-010
3/16" Dual Purpose	(Straight)	3453LF2-010	3453HS2-010	3453RF2-010	3453QS2-010
3/16" NEMA QC	(Rt. Angle)	3453LF3-010	3453HS3-010	3453RF3-010	3453QS3-010
3/16" NEMA QC	(Straight)	3453LF4-010	3453HS4-010	3453RF4-010	3453QS4-010
1/4" NEMA/DIN QC	(Rt. Angle)	3453LF7-010	3453HS7-010	3453RF7-010	3453QS7-010
1/4" NEMA/DIN QC	(Straight)	3453LF8-010	3453HS8-010	3453RF8-010	3453QS8-010

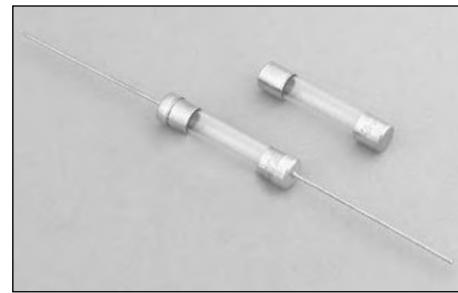
***Low Profile Body will accept either Fingergrasp or Screwdriver Slot Knob.

DIMENSION DRAWINGS:



Description

- Fast-acting, glass tube
- Optional axial leads available
- 1/4 x 1-1/4 (6.3mm x 32mm) physical size
- Glass tube, nickel-plated brass endcap construction
- UL Listed product meets standard 248-14



ELECTRICAL CHARACTERISTICS	
% of Amp Rating	Opening Time
100%	None
135%	60 Minutes Maximum
200%	120 Seconds Maximum

Agency Information

- UL Listed Card: AGC 1/500-10
- UL Recognition Card: AGC 11-45
- CSA Component Acceptance Card (Class No. 1422 30)
- CSA Certification Card (Class No. 1422 01)

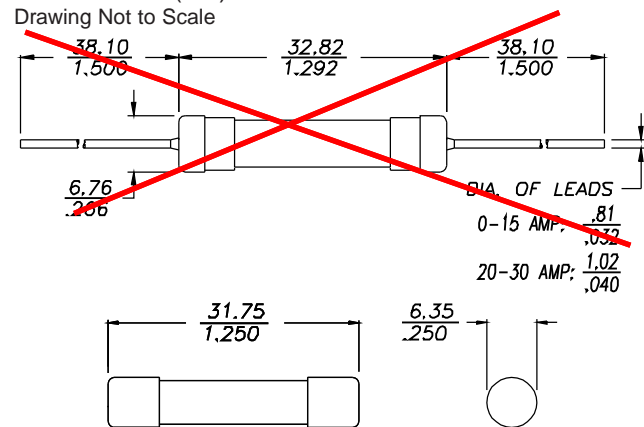
Environmental Data

- Shock: 1/100A thru 3/4A – MIL-STD-202, Method 213, Test Condition I; 1A thru 30A – MIL-STD-202, Method 207, (HI Shock)
- Vibration: 1/100A thru 30A – MIL-STD-202, Method 204, Test Condition A (Except 5g, 500HZ)

Ordering

- Specify packaging, product, and option code

Dimensions (mm/in)
Drawing Not to Scale



SPECIFICATIONS

Product Code	Voltage Rating AC	AC Interrupting Rating			Typical DC Cold Resistance** (ohms)	Typical Melting I ² t† AC	Typical Voltage Drop‡
		250V	125V	32V			
AGC-1/20	250V	35A	40000A	-	4.500	0.00773	0.67
AGC-1/16	250V	35A	40000A	-	29.000	0.000184	10.44
AGC-1/10	250V	35A	40000A	-	12.565	0.000787	6.00
AGC-1/8	250V	35A	40000A	-	6.800	0.00131	4.67
AGC-3/16	250V	35A	40000A	-	4.900	0.00637	4.12
AGC-2/10	250V	35A	40000A	-	3.360	0.00435	4.51
AGC-1/4	250V	35A	40000A	-	2.300	0.0148	0.89
AGC-3/10	250V	35A	40000A	-	1.670	0.0208	2.88
AGC-3/8	250V	35A	10000A	-	1.200	0.0321	4.30
AGC-1/2	250V	35A	10000A	-	0.615	0.269	0.59
AGC-3/4	250V	35A	10000A	-	0.712	0.170	0.71
AGC-1	250V	35A	10000A	-	0.190	1.615	0.31
AGC-1 1/4	250V	100A	10000A	-	0.145	0.016	0.30
AGC-1 1/2	250V	100A	40000A	-	0.115	0.0149	0.27
AGC-2	250V	100A	40000A	-	0.078	0.00509	0.28
AGC-2 1/4	250V	100A	40000A	-	0.067	0.00588	0.26
AGC-2 1/2	250V	100A	40000A	-	0.057	0.00879	0.31
AGC-3	250V	100A	40000A	-	0.045	0.0167	0.25
AGC-4	250V	200A	40000A	-	0.030	0.0305	0.22
AGC-5	250V	200A	10000A	-	0.024	0.045	0.23
AGC-6	250V	200A	40000A	-	0.020	0.071	0.23
AGC-7	250V	200A	40000A	-	0.017	0.105	0.23
AGC-7 1/2	250V	200A	40000A	-	0.0146	-	-
AGC-8	250V	200A	40000A	-	0.014	0.152	0.19
AGC-9	250V	200A	40000A	-	0.012	0.21	0.18
AGC-10	250V	200A	40000A	-	0.008	0.492	0.20
AGC-12	32V	-	-	1000A	0.0070	-	-
AGC-14	32V	-	-	1000A	0.0062	-	-
AGC-15	32V	-	-	1000A	0.006	0.566	0.14
AGC-20	32V	-	-	1000A	0.004	1.438	0.12
AGC-25	32V	-	-	1000A	0.003	2.109	0.11
AGC-30	32V	-	-	1000A	0.002	3.807	0.12
AGC-35	32V	-	-	70A	0.0014	-	-
AGC-40	32V	-	-	80A	0.0019	-	-

** DC Cold Resistance (Measured at ≤10% of rated current)
 † Typical Melting I²t (A²Sec) (I²t was measured at listed interrupting rating and rated voltage.)
 ‡ Typical Voltage Drop (Voltage drop was measured at 25°C ambient temperature at rated current)

SMALL THERMOSTAT

OMEGA



ELECTRIC HEATERS

KT011 Series



- ✓ Compact Design
- ✓ Wide Adjustment Range
- ✓ Available with °C or °F Scale
- ✓ Color Coded Temperature Dials
- ✓ DIN Rail Mountable



KT011469 shown actual size.



KT011479 shown actual size.

~~Thermostat “NC” (Normally Closed):~~

~~Thermostat opens at temperature. Comes with a RED temperature dial.~~

Thermostat “NO” (Normally Open):

Thermostat closes at temperature rise. Comes with a BLUE temperature dial.

Specifications

Sensor Element: Thermostatic bi-metal

Maximum Tolerance: ±7°F (4K)

Switching Difference (Hysteresis):

12.6°F ±5.4°F (7°C ±3K)

Service Life: 100,000 cycles

Switching Capacity (Max Load):

15 A resistive/2 A inductive @ 120 Vac

10 A resistive/2 A inductive @ 250 Vac
DC 30W

Minimum Load: 20 mA (all voltages)

Connections: 2-pole terminal for AWG 14 max [2.5 mm² (0.10 in²)]

Mounting: Clip for 35 mm (1.4") DIN rail (EN 50022)

Dimensions: 60 H x 33 W x 43 mm D (2.4 x 1.3 x 1.7")

Housing: Plastic, UL94V-0

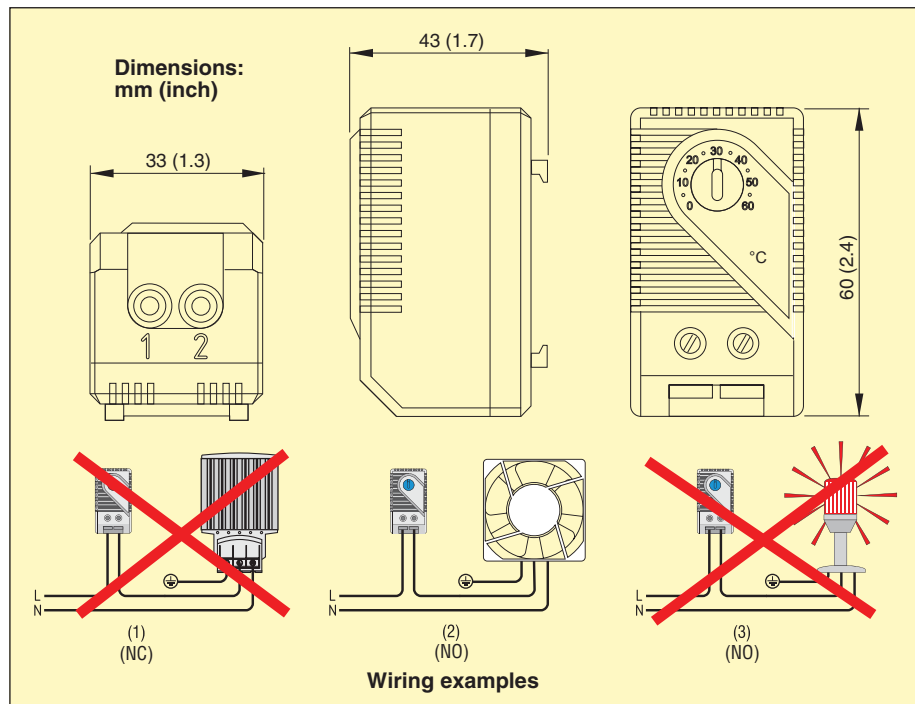
Weight: 40 g (1.4 oz)

Protection Type: NEMA 2 (IP20)

Operating Temperature: -45 to 70°C (-49 to 158°F)

Storage Temperature: -45 to 70°C (-49 to 158°F)

Note: Specifications are subject to change without notice. Suitability of this product for its intended use and any associated risks must be determined by the end customer/buyer in its final application.



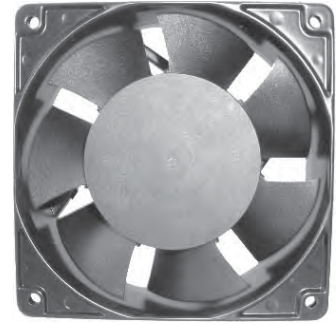
To Order Visit omega.com/kt011_series for Pricing and Details

Model No.	Description
KT011409	Thermostat, NC—open on rise, 32 to 140°F
KT011419	Thermostat, NO—close on rise, 32 to 140°F
KT011409	Thermostat, NC—open on rise, 0 to 60°C
KT011479	Thermostat, NO—close on rise, 0 to 60°C

Comes complete with operator's manual.

Ordering Examples: KT011409, thermostat, NC—open on rise, 32 to 140°F.
KT011479, thermostat, NO—close on rise, 0 to 60°C.

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- _ä~ÇÉÜÉéäçéá~éíáA VCsJmK KqK
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- ááÉáÉÁíéíáÉáÖiÜWRMMs NççáÉ~áááííÉ
- léÉé~iáçáééáéé~ííÉVNM T M` EeiááÇáíPRBJURBoeF
- príçé~ÖÉéáééé~ííÉVQM U R` EeiááÇáíPRBJURBoeF
- ççíçé mēçíÉÁíáçáééç~áÁE mēçíÉÁíÉÇ
- † ÉáÖÜWRMMÖ



Specification :

ççÉááíáÁÉé	É~éaaÖ ^i~áá~Ááááió	o~íÉÇ sçáí~ÖÉ (s^ ^)	céÉéíÉáAó (eó)	o~íÉÇ íééÉái (á^ ^)	mçíÉé (t)	péÉÉÇ (omj)	^áéçaçí (^cj)	pí~iáÁ mēÉéííÉÉ (ääJeOl)	kçáéÉ (Ç_^)
c^NOPU_NNqTJVT	O~áá çé páÉÉíÉ	NNR	RMLSM	OUMLOPM	OOLNU	OIRMMLOISM	MMQKRLNM	KSTKSLVKN	QTKPLRNKO
c^NOPU_OOqTJVT		OPM	RMLSM	NSMLNPM	OQLOM	OIQMMLOIR	MMQKRLNM	KSTKSLVKN	QTKPLRNKO

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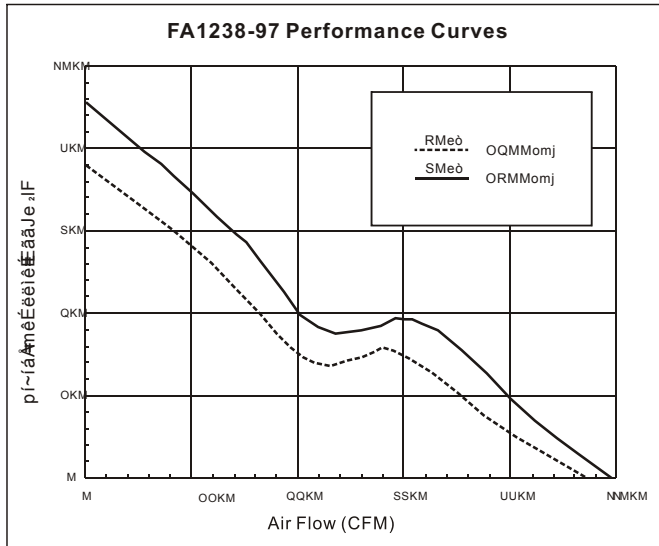


Accessories :

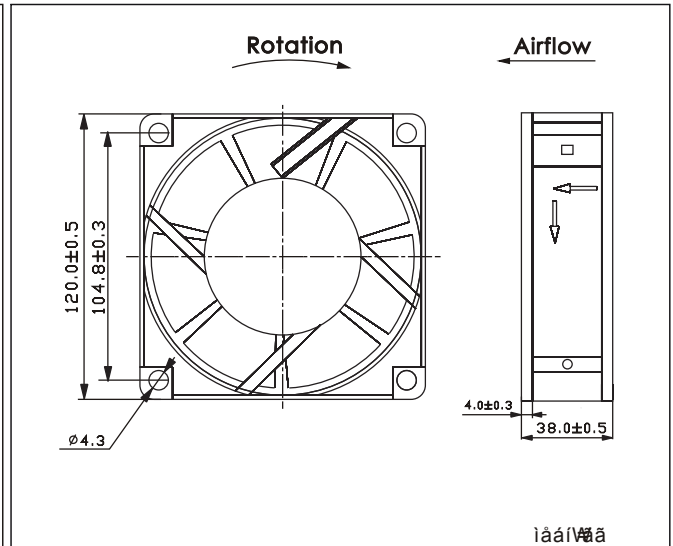
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m~éíçéÉ	táéÉççéá~di~éç	m~éíçáí~éç	m~éíçááíÉé	^áíááái~çááíÉé	mçíÉé~çéç
Part Number	edt JNOM	edm JNOM	emc JNOM	ec^ JNOM	^áó=çáÑáÖíé~iáçá

Characteristic Curves :

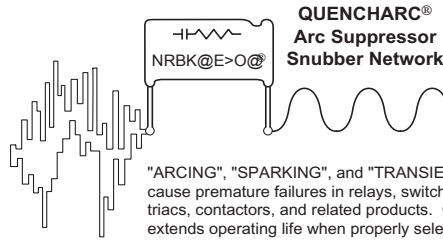


Out line DrawingW



Type Q/QRL (Quencharc®) Arc Suppressor/Snubber Network

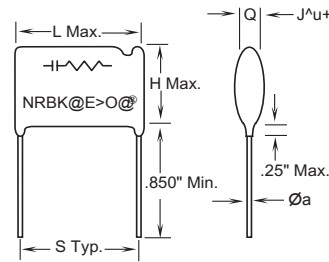
Radial Metallized Polyester RC Network for Transient Suppression



Highlights

- ◆ Noise and arc suppression
- ◆ RC Snubber Network
- ◆ Relay contact protection
- ◆ Noise reduction on controllers and drives
- ◆ EMI/RFI reduction
- ◆ Type QRL - UL/CSA verison
- ◆ Other ratings available by special request
- ◆ Coated with flame retardant epoxy

Outline Dimensions



Specifications

- Capacitance Range:** 0.10 μ F, 0.05 μ F, 1.0 μ F
- Voltage Range:** 200 Vdc/125 Vac, 60 Hz and 600 Vdc/250 Vac, 60 Hz
- Capacitance Tolerance:** \pm 20%
- Resistor Tolerance:** \pm 10%
- Resistor Values:** 22, 47, 100, 150, 220 ohms
- Operating Temperature Range :** -55° C to $+85^{\circ}$ C at full rated voltage
- Construction:** Metallized polyester in series with a carbon composition resistor
- Dielectric Withstand Voltage:** 1.6 x DC rated voltage @ $+25^{\circ}$ C
- DC Life Test:** 125% of rated voltage for a period of 500 hours at 85° C with capacitance change \leq 5% and DF \leq original limits
- Long Term Stability:** The capacitance shall not change more than 2% when stored at ambient temperature and humidity for a period of two years or less.

Ratings

RoHS Compliant

Catalog Part Number	Cap (μ F)	Resistor		Inches					Millimeters				
		Watts	Ohms \pm 10%	L Max	T Max	H Max	S Typ.	ϕ d	L Max	T Max	H Max	S Typ.	ϕ d
200 Vdc / 125 Vac													
504M02QA100	0.50	1/2	100	1.08	0.37	0.64	0.82	0.032	27.4	9.4	16.3	20.8	0.8
504M02QA220	0.50	1/2	220	1.08	0.37	0.64	0.82	0.032	27.4	9.4	16.3	20.8	0.8
105M02QB47	1.00	1/2	47	1.45	0.39	0.66	1.20	0.032	36.8	9.9	16.8	30.5	0.8
600 Vdc / 250 Vac													
104M06QC22	0.10	1/2	22	1.08	0.39	0.66	0.82	0.032	27.4	9.9	16.8	20.8	0.8
104M06QC47	0.10	1/2	47	1.08	0.39	0.66	0.82	0.032	27.4	9.9	16.8	20.8	0.8
104M06QC100	0.10	1/2	100	1.08	0.39	0.66	0.82	0.032	27.4	9.9	16.8	20.8	0.8
104M06QC150	0.10	1/2	150	1.08	0.39	0.66	0.82	0.032	27.4	9.9	16.8	20.8	0.8
UL/CSA Recognized Across-the-Line Application Type QRL 125 Vac Complies with UL1414/CSA-C22.2 No. 1)													
104MACQRL150	0.10	1/2	150	1.08	0.44	0.66	0.82	0.032	27.4	11.2	16.8	20.8	0.8

Type QRL: UL File No. E33628, CSA File No. LR32208



■ Features :

- Universal AC input/Full range
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- LED indicator for power on
- DC OK relay contact
- No load power consumption < 0.75W
- 100% full load burn-in test
- 3 years warranty

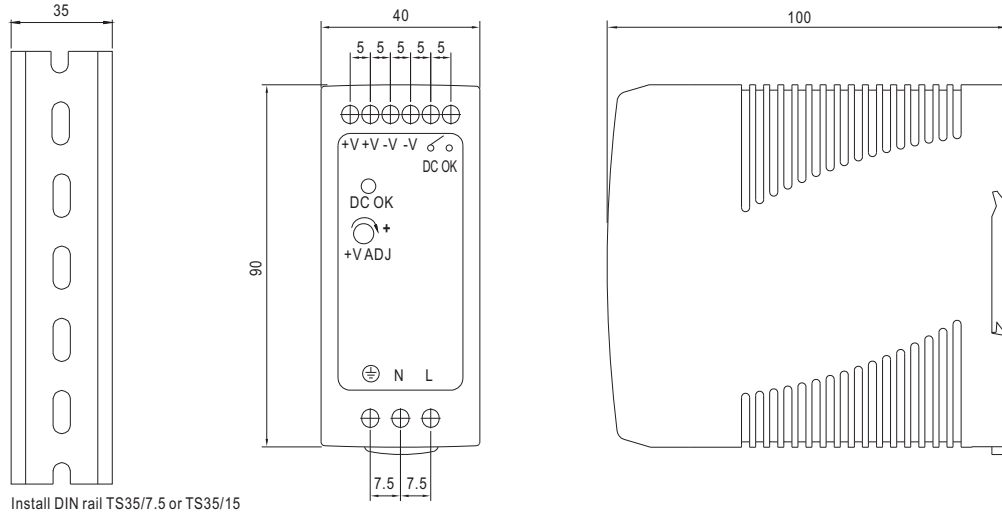


SPECIFICATION

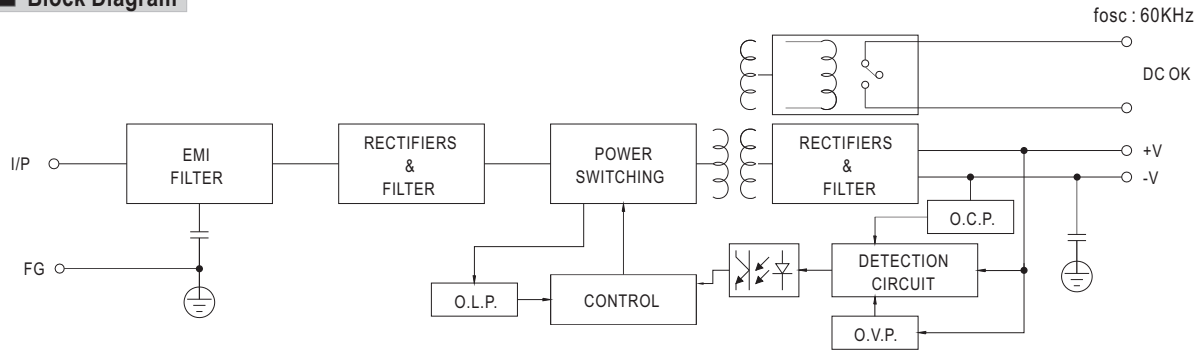
MODEL	MDR-60-5	MDR-60-12	MDR-60-24	MDR-60-48	
OUTPUT	DC VOLTAGE	5V	12V	24V	48V
	RATED CURRENT	10A	5A	2.5A	1.25A
	CURRENT RANGE	0 ~ 10A	0 ~ 5A	0 ~ 2.5A	0 ~ 1.25A
	RATED POWER	50W	60W	60W	60W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	120mVp-p	150mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	5 ~ 6V	12 ~ 15V	24 ~ 30V	48 ~ 56V
	VOLTAGE TOLERANCE Note.3	± 2.0%	± 1.0%	± 1.0%	± 1.0%
	LINE REGULATION	± 1.0%	± 1.0%	± 1.0%	± 1.0%
	LOAD REGULATION	± 1.5%	± 1.0%	± 1.0%	± 1.0%
SETUP, RISE TIME Note.5	500ms, 30ms/230VAC 500ms, 30ms/115VAC at full load				
HOLD UP TIME (Typ.)	50ms/230VAC 20ms/115VAC at full load				
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	EFFICIENCY (Typ.)	78%	86%	88%	87%
	AC CURRENT (Typ.)	1.8A/115VAC 1A/230VAC			
	INRUSH CURRENT (Typ.)	COLD START 30A/115VAC 60A/230VAC			
	LEAKAGE CURRENT	<1mA / 240VAC			
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed			
	OVER VOLTAGE	6.25 ~ 7.25V	15.6 ~ 18V	31.2 ~ 36V	57.6 ~ 64.8V
		Protection type : Shut down o/p voltage, re-power on to recover			
FUNCTION	DC OK SIGNAL	Relay contact rating(max.): 30V/1A resistive			
ENVIRONMENT	WORKING TEMP.	-20 ~ +70°C (Refer to "Derating Curve")			
	WORKING HUMIDITY	20 ~ 90% RH non-condensing			
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH			
	TEMP. COEFFICIENT	± 0.03%/°C (0 ~ 50°C)			
	VIBRATION	Component : 10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes ; Mounting : Compliance to IEC60068-2-6			
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, UL60950-1, TUV EN60950-1 approved			
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC			
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:>100M Ohms / 500VDC / 25°C / 70% RH			
	EMC EMISSION	Compliance to EN55011, EN55022 (CISPR22), EN61204-3 Class B, EN61000-3-2,-3			
	EMC IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2, EN61204-3, heavy industry level, criteria A			
OTHERS	MTBF	299.2K hrs min. MIL-HDBK-217F (25°C)			
	DIMENSION	40*90*100mm (W*H*D)			
	PACKING	0.33Kg; 42pcs/14.8Kg/0.82CUFT			
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uF & 47uF parallel capacitor.</p> <p>3. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.</p> <p>5. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time.</p>				

Mechanical Specification

Case No.962A Unit:mm



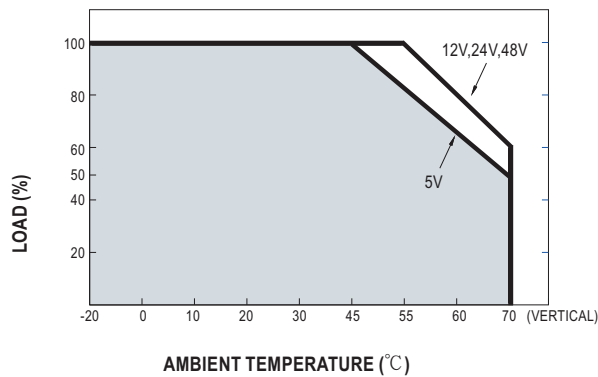
Block Diagram



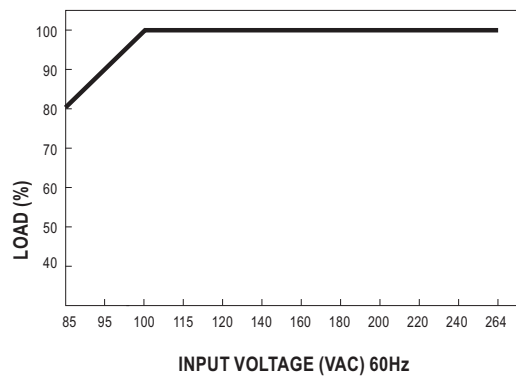
DC OK Relay Contact

Contact Close	PSU turns on / DC OK.
Contact Open	PSU turns off / DC Fail.
Contact Ratings (max.)	30V/1A resistive load.

Derating Curve



Output Derating VS Input Voltage





■ Features :

- AC input range selectable by switch
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- UL 508(industrial control equipment)approved
- LED indicator for power on
- 100% full load burn-in test
- Fixed switching frequency at 55KHz
- 3 years warranty

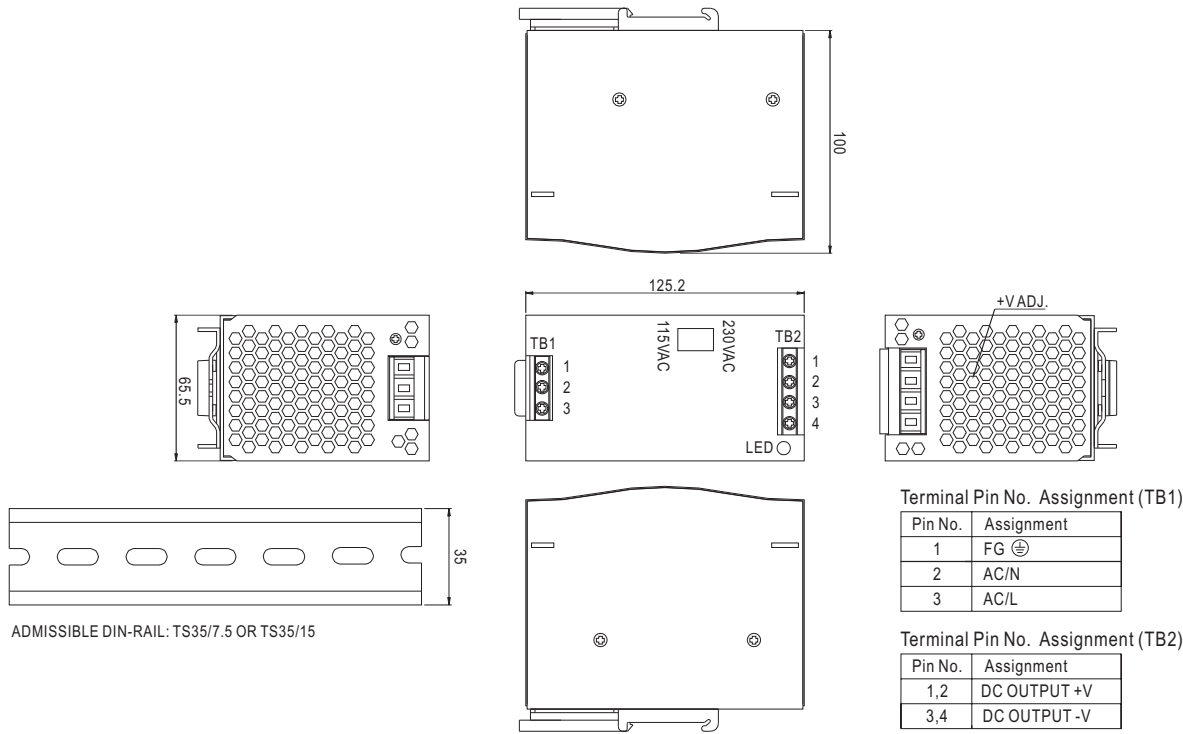


SPECIFICATION

MODEL	DR-120-12	DR-120-24	DR-120-48	
OUTPUT	DC VOLTAGE	12V	24V	48V
	RATED CURRENT	10A	5A	2.5A
	CURRENT RANGE	0 ~ 10A	0 ~ 5A	0 ~ 2.5A
	RATED POWER	120W	120W	120W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	100mVp-p
	VOLTAGE ADJ. RANGE	12 ~ 14V	24 ~ 28V	48 ~ 53V
	VOLTAGE TOLERANCE Note.3	±2.0%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%	±1.0%
SETUP, RISE TIME	500ms, 70ms/230VAC 500ms, 70ms/115VAC at full load			
HOLD UP TIME (Typ.)	36ms/230VAC 32ms/115VAC at full load			
INPUT	VOLTAGE RANGE	88 ~ 132VAC/176 ~ 264VAC by switch 248 ~ 370VDC		
	FREQUENCY RANGE	47 ~ 63Hz		
	EFFICIENCY (Typ.)	80%	84%	85%
	AC CURRENT (Typ.)	2.6A/115VAC 1.6A/230VAC		
	INRUSH CURRENT (Typ.)	COLD START 20A/115VAC 40A/230VAC		
	LEAKAGE CURRENT	<3.5mA / 240VAC		
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed		
	OVER VOLTAGE	15 ~ 16.5V	29 ~ 33V	58 ~ 65V
	OVER TEMPERATURE	85°C ±5°C (TSW1)	90°C ±5°C (TSW1)	90°C ±5°C (TSW1)
ENVIRONMENT	WORKING TEMP.	-10 ~ +60°C (Refer to "Derating Curve")		
	WORKING HUMIDITY	20 ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-20 ~ +85°C, 10 ~ 95% RH		
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)		
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6		
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, UL60950-1, TUV EN60950-1 approved		
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25°C / 70% RH		
	EMC EMISSION	Compliance to EN55011, EN55022 (CISPR22) Class B, EN61000-3-2, -3		
OTHERS	EMC IMMUNITY	Compliance to EN61000-4-2, 3, 4, 5, 6, 8, 11, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A		
	MTBF	136.8Khrs min. MIL-HDBK-217F (25°C)		
	DIMENSION	65.5*125.2*100mm (W*H*D)		
	PACKING	0.79Kg; 20pcs/16.5Kg/1.29CUFT		
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.</p> <p>3. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.</p>			

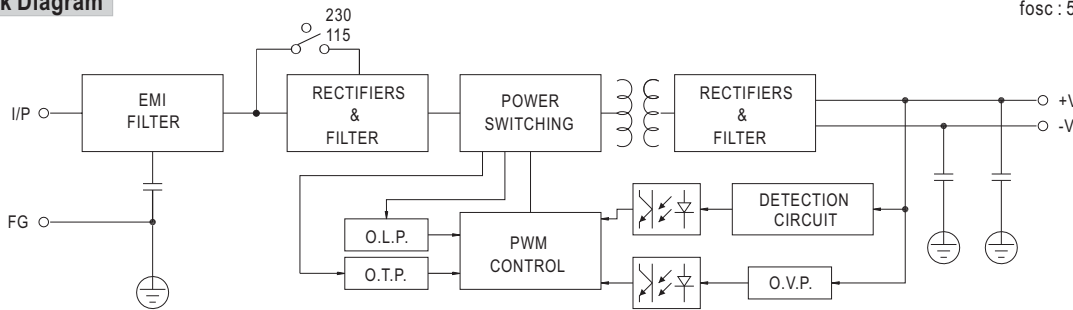
Mechanical Specification

Case No. 921A Unit:mm

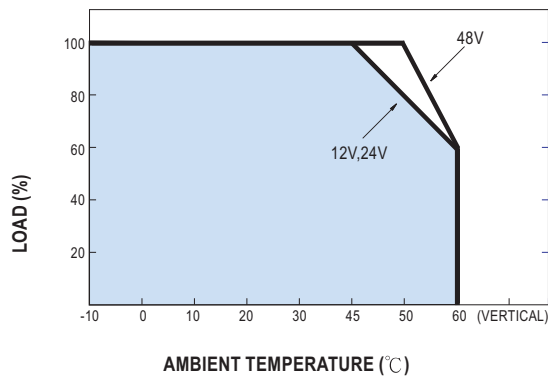


Block Diagram

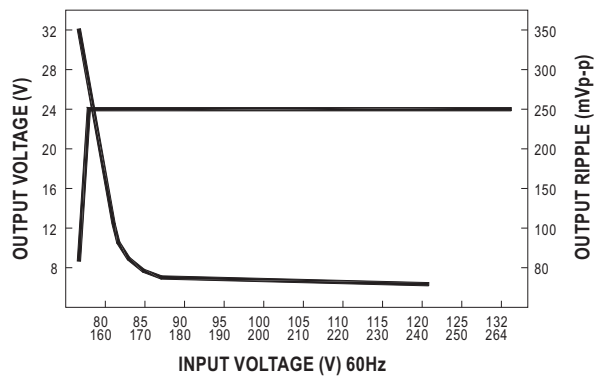
fosc : 55KHz



Derating Curve



Static Characteristics (24V)





240W Single Output Industrial DIN RAIL Power Supply

DRP-240 series



■ Features :

- Universal AC input / Full range
- Built in active PFC function
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Can be installed on DIN rail TS-35/7.5 or 15
- UL 508(industrial control equipment)approved
- LED indicator for power on
- 100% full load burn-in test
- Fixed switching frequency at 100KHz
- 3 years warranty

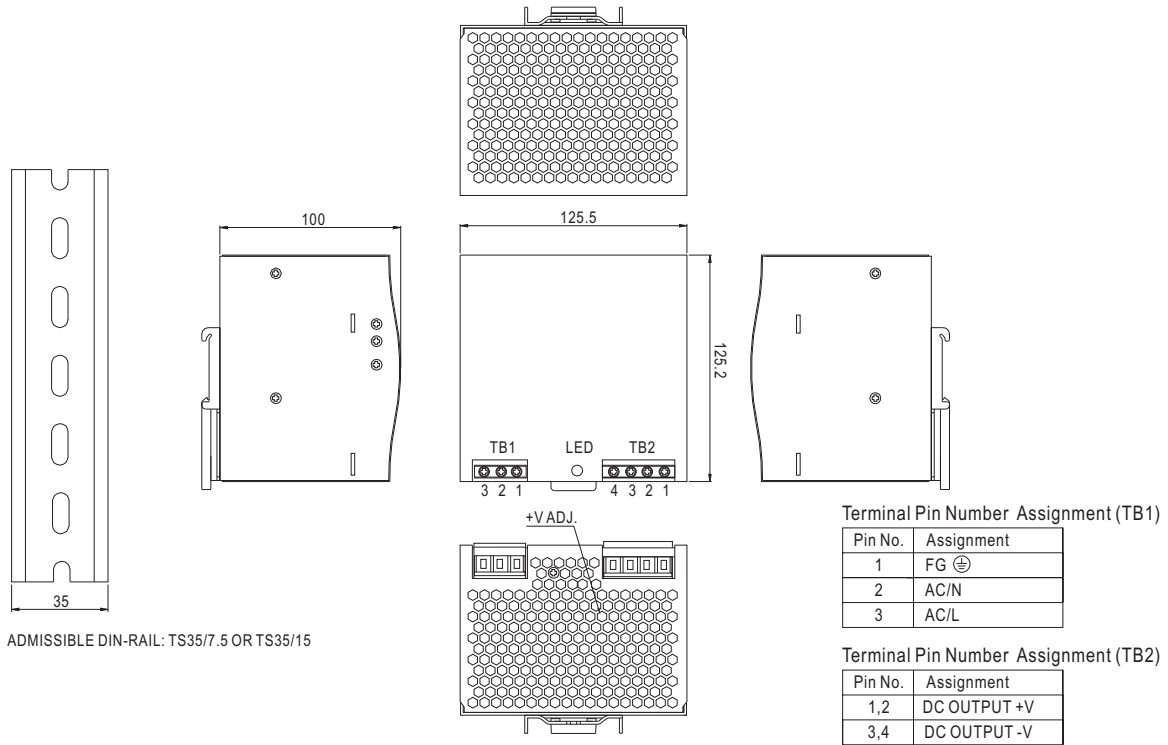


SPECIFICATION

MODEL	DRP-240-24	DRP-240-48	
OUTPUT	DC VOLTAGE	24V	48V
	RATED CURRENT	10A	5A
	CURRENT RANGE	0 ~ 10A	0 ~ 5A
	RATED POWER	240W	240W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	24 ~ 28V	48 ~ 53V
	VOLTAGE TOLERANCE Note.3	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±1.0%
SETUP, RISE TIME	800ms, 40ms/230VAC 800ms, 40ms/115VAC at full load		
HOLD UP TIME (Typ.)	24ms/230VAC 24ms/115VAC at full load		
INPUT	VOLTAGE RANGE Note.5	85 ~ 264VAC 120 ~ 370VDC	
	FREQUENCY RANGE	47 ~ 63Hz	
	POWER FACTOR (Typ.)	0.96/230VAC	0.99/115VAC at full load
	EFFICIENCY (Typ.)	84%	85%
	AC CURRENT (Typ.)	2.8A/115VAC	1.4A/230VAC
	INRUSH CURRENT (Typ.)	COLD START 27A/115VAC 45A/230VAC	
LEAKAGE CURRENT	<3.5mA / 240VAC		
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed	
	OVER VOLTAGE	30 ~ 36V	54 ~ 60V
	OVER TEMPERATURE	100°C ±5°C (TSW1)detect on heat sink of power transistor Protection type : Shut down o/p voltage, recovers automatically after temperature goes down	
ENVIRONMENT	WORKING TEMP.	-10 ~ +70°C (Refer to "Derating Curve")	
	WORKING HUMIDITY	20 ~ 90% RH non-condensing	
	STORAGE TEMP., HUMIDITY	-20 ~ +85°C, 10 ~ 95% RH	
	TEMP. COEFFICIENT	±0.03%/°C (0 ~ 50°C)	
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes; Mounting: Compliance to IEC60068-2-6	
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL508, UL60950-1, TUV EN60950-1 approved	
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC	
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC	
	EMC EMISSION	Compliance to EN55011, EN55022 (CISPR22) Class B, EN61000-3-2, -3	
OTHERS	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61000-6-2 (EN50082-2), heavy industry level, criteria A	
	MTBF	289.9Khrs min. MIL-HDBK-217F (25°C)	
	DIMENSION	125.5*125.2*100mm (W*H*D)	
	PACKING	1.2Kg; 12pcs/15.5Kg/1.29CUFT	
NOTE	<p>1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.</p> <p>2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.</p> <p>3. Tolerance : includes set up tolerance, line regulation and load regulation.</p> <p>4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.</p> <p>5. Derating may be needed under low input voltages. Please check the derating curve for more details.</p>		

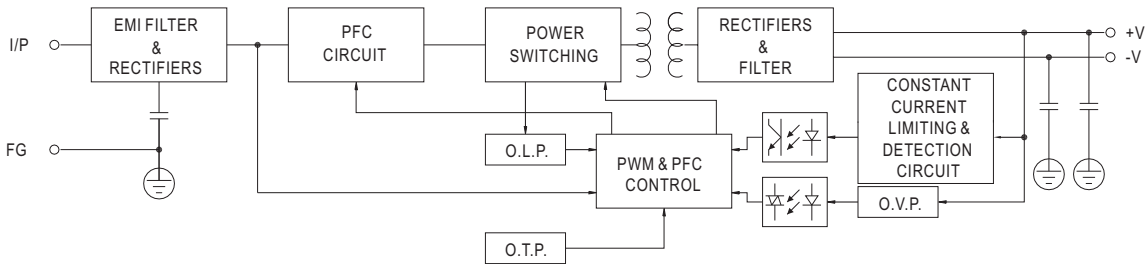
Mechanical Specification

Case No. 922A Unit:mm



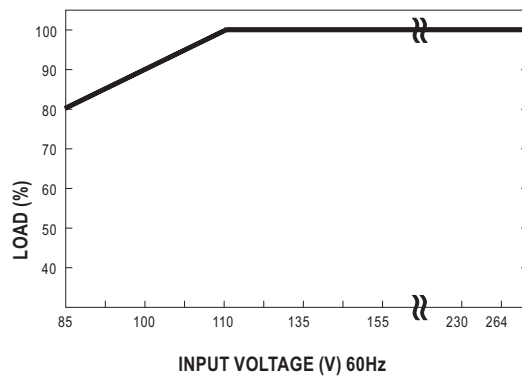
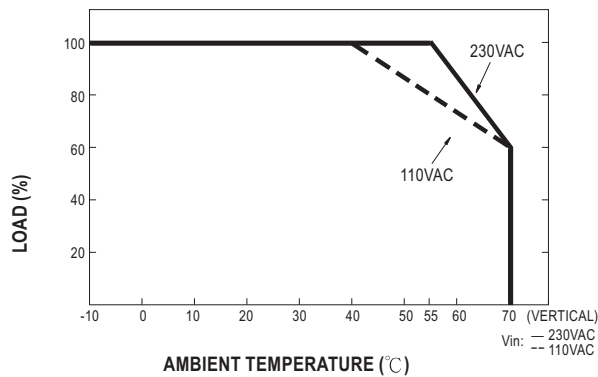
Block Diagram

fosc : 100KHz



Derating Curve

Output derating VS input voltage

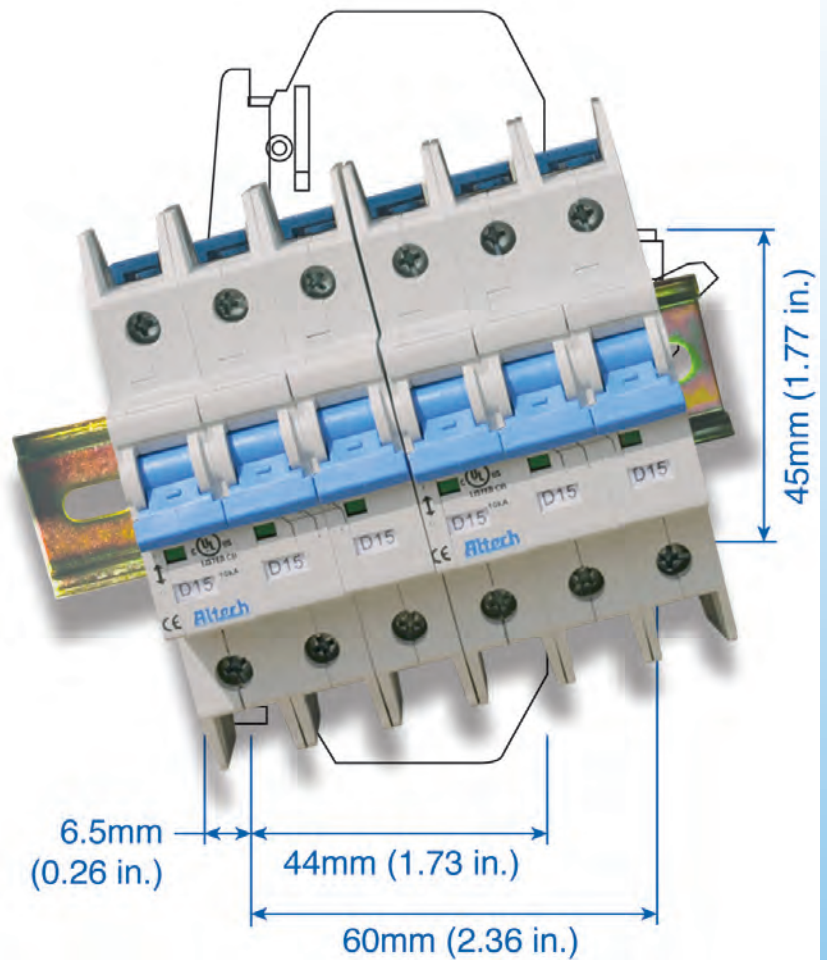


L-Series AC or DC Miniature Molded Case Circuit Breakers



UL489 Listed Circuit Breakers

- Available in AC and DC models
- DIN Rail Mounted
- 17.5mm width
- Thermal Magnetic
- 240V, 480Y/277V AC, 50/60Hz
- 125VDC (1 pole); 250VDC (2pole)
- 10kA Short Circuit Interrupting Capacity
- Positive Trip indicator (Green - off/tripped, Red - on)
- HACR Type 40°C
- Line/Load reversible



AC Version Current/ Voltage Rating	0.2-63A/240VAC, 0.2-32A/480Y/277VAC*
DC Version Current/ Voltage Rating	0.2-63A/125/250VDC
Calibration Temperature	40°C (104°F)
Operating Temperature	-25° to 60°C (-13° to 140°F)
Storage Temperature	-25° to 75°C (-13° to 167°F)
Terminal Size Acceptability and Torque	14-3 AWG: 17.5 lb-in. (2.0 Nm) 18-16 AWG: 25 lb-in. (2.8 Nm)
Terminal Protection Degree	IP20
Electrical Life	6000 cycles on/off
Mechanical Life	100000 cycles on/off
Wire Connection	copper wire only 60/75°C

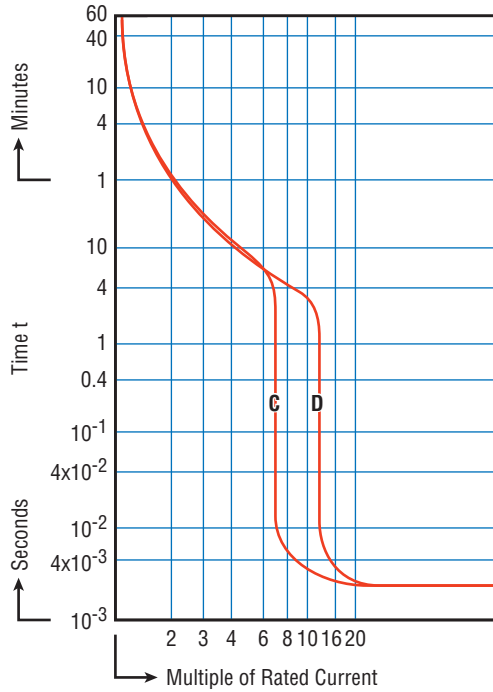
*One device dual voltage ratings.

AC - short circuit interrupting rating

No. Poles	Type	0.2-32A	33-63A
1	AC	10kA@120, 240, 277V	10kA@120, 240V
2-4	AC	10kA@120, 240V, 480Y/277V	10kA@120, 240V

DC - short circuit interrupting rating

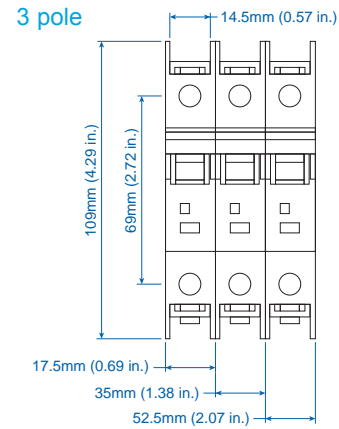
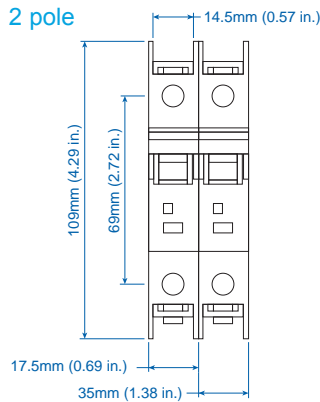
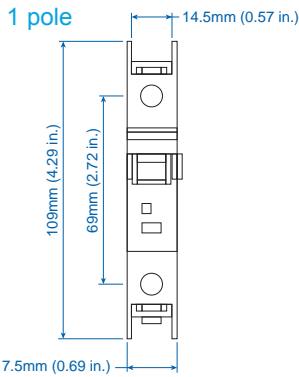
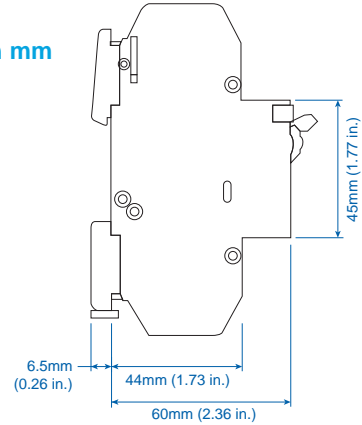
No. Poles	Type	0.2-32A	33-63A
1	DC	10kA@125V	10kA@125V
2	DC	10kA@250V	10kA@250V



Time versus Current Trip Curve

For the exact trip curve, please refer to page 56.

Dimensions in mm side view



Trip-Characteristics*				Type	Applications						
Characteristic Trip Boundaries					Lighting Wiring Protection Control Circuits	Business Equipment Appliances	Transformers	Power Supplies Heaters	Motors		Reactive Load
Thermal Trip		Magnetic Trip							Low Inrush	High Inrush	
Must not Trip >100ms	Must Trip <1hr	Must not Trip >100ms	Must Trip at 100ms								
C-Characteristics											
1.05xRC	1.3xRC	5xRC	10xRC	AC							
1.05xRC	1.3xRC	5xRC	10xRC	DC							
D-Characteristics											
1.05xRC	1.3xRC	10xRC	16xRC	AC							
1.05xRC	1.3xRC	10xRC	16xRC	DC							

*The value of each characteristic is shown vertically beneath its corresponding heading.



Warning!

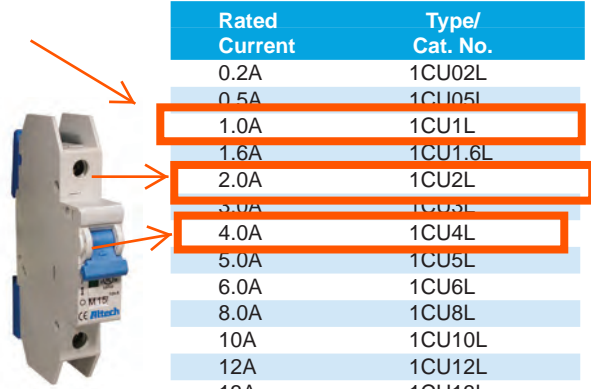
This information should only be used as a selection guide. The use of a Miniature Circuit Breaker in an application with a certain Trip-Characteristic always requires prototype testing! It is the responsibility of the circuit design engineer to select the appropriate Miniature Circuit Breaker for his specific application.

AC C-Trip Characteristics



LISTED
E305318

Application Examples:
Low inrush motors, resistive loads, wiring protection, receptacles, lighting, and control circuit applications. Relatively short thermal trip delay and medium magnetic trip point.



One Pole

Rated Current	Type/ Cat. No.
0.2A	1CU02L
0.5A	1CU05L
1.0A	1CU1L
1.6A	1CU1.6L
2.0A	1CU2L
3.0A	1CU3L
4.0A	1CU4L
5.0A	1CU5L
6.0A	1CU6L
8.0A	1CU8L
10A	1CU10L
12A	1CU12L
13A	1CU13L
15A	1CU15L
16A	1CU16L
20A	1CU20L
25A	1CU25L
30A	1CU30L
32A	1CU32L
40A	1CU40L
50A	1CU50L
60A	1CU60L
63A	1CU63L

Standard Pack: 12

Weight: 1.7kg (3.74 lb.)



Two Pole

Rated Current	Type/ Cat. No.
0.2A	2CU02L
0.5A	2CU05L
1.0A	2CU1L
1.6A	2CU1.6L
2.0A	2CU2L
3.0A	2CU3L
4.0A	2CU4L
5.0A	2CU5L
6.0A	2CU6L
8.0A	2CU8L
10A	2CU10L
12A	2CU12L
13A	2CU13L
15A	2CU15L
16A	2CU16L
20A	2CU20L
25A	2CU25L
30A	2CU30L
32A	2CU32L
40A	2CU40L
50A	2CU50L
60A	2CU60L
63A	2CU63L

Standard Pack: 6

Weight: 1.7kg (3.74 lb.)



Three Pole

Rated Current	Type/ Cat. No.
0.2A	3CU02L
0.5A	3CU05L
1.0A	3CU1L
1.6A	3CU1.6L
2.0A	3CU2L
3.0A	3CU3L
4.0A	3CU4L
5.0A	3CU5L
6.0A	3CU6L
8.0A	3CU8L
10A	3CU10L
12A	3CU12L
13A	3CU13L
15A	3CU15L
16A	3CU16L
20A	3CU20L
25A	3CU25L
30A	3CU30L
32A	3CU32L
40A	3CU40L
50A	3CU50L
60A	3CU60L
63A	3CU63L

Standard Pack: 4

Weight: 1.7kg (3.74 lb.)



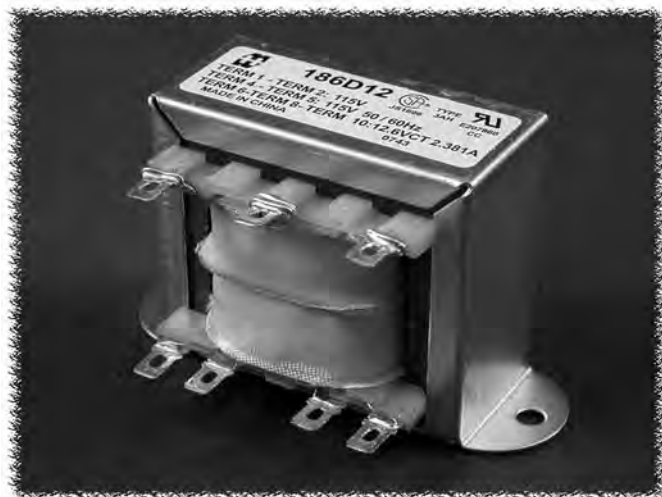
Four Pole
Please contact
Altech.



For ring tongue terminal version, replace "U" with "R" in part number. For example **1CR20L** instead of **1CU20L**.

L.V. Chassis Mount - Quick Connect (186/187 Series)

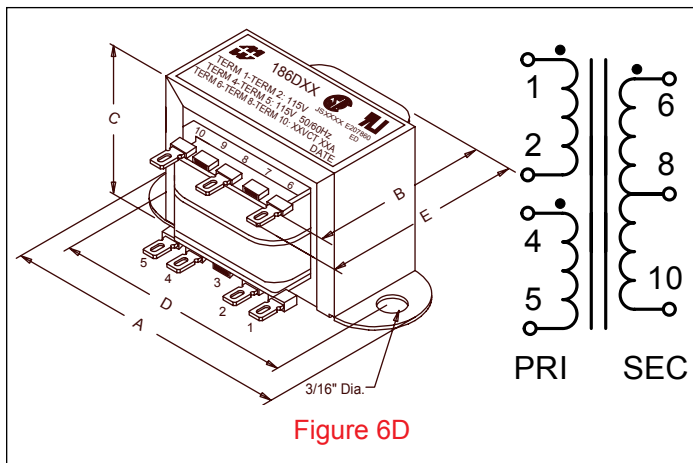
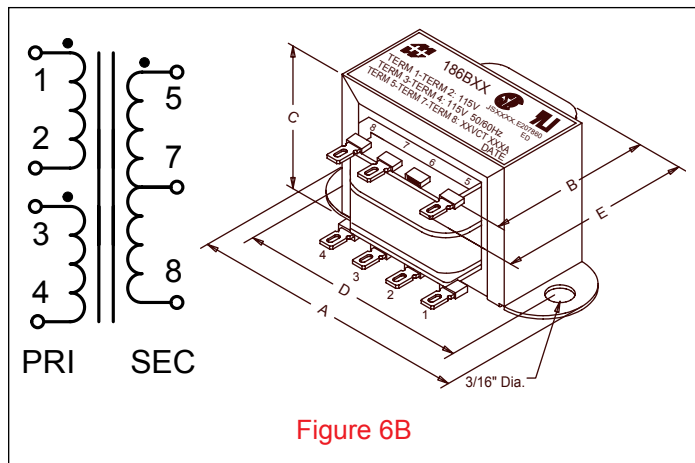
Power



LOW VOLTAGE - OPEN STYLE CHASSIS MOUNT

- Choice of two primaries: Single Primary 115VAC or Dual Primary 115/230 VAC.
- Either series operates on 50/60 Hz.
- Combination solder or quick connect terminals.
- Split bobbin construction eliminates need for electrostatic shield.
- Hi-pot tested to 2 KV RMS.
- Economical open style, channel frame - chassis mount design
- CSA certified & U recognized

Transformer Schematics Dual Primary (186 Series)



VA Size	Dimensions (Inches)				
	Length (A)	Depth (Not Including Terminals) (B)	Height (C)	Mtg. Centers (D)	Depth To Terminal (E)
2.34 - 2.50	2.06	1.06	1.18	1.75	1.435
5.60 - 6.40	2.37	1.25	1.37	2.00	1.625
12 - 12.8	2.81	1.37	1.62	2.37	1.725
30 - 32	3.25	1.68	1.93	2.81	2.055
50 - 60	3.68	1.81	2.25	3.12	2.185
96 - 102	4.03	2.25	2.56	3.50	2.625

EUROPE
Basingstoke, UK 01256 812812

AUSTRALIA
Queenstown, Australia 61-8-8240-2244

www.hammondmfg.com



CANADA
Guelph, Ontario (519) 822-2960
St. Laurent, Quebec (514) 343-9010

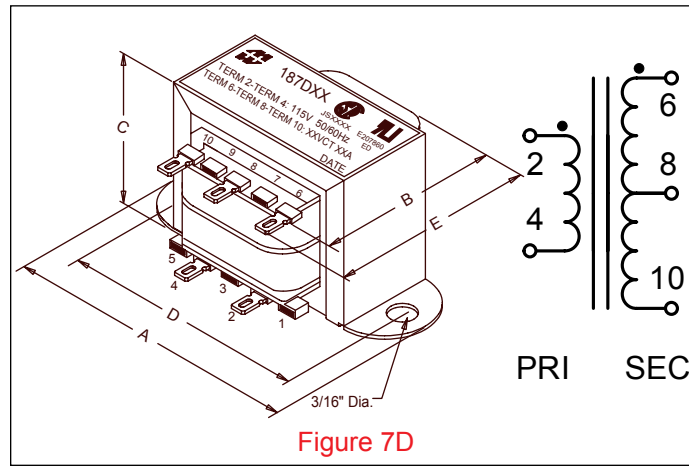
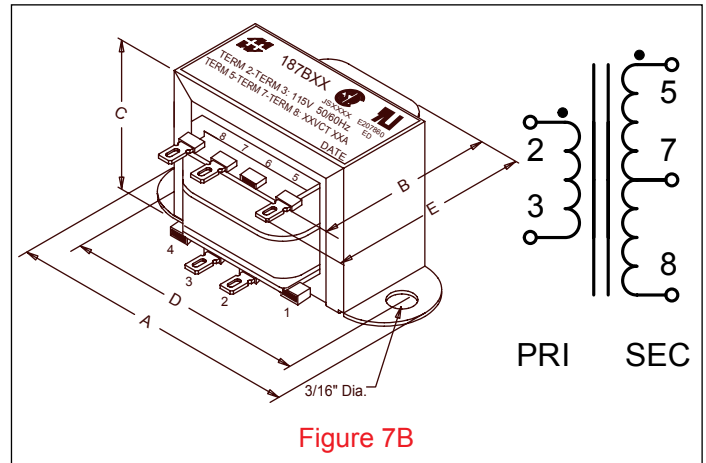
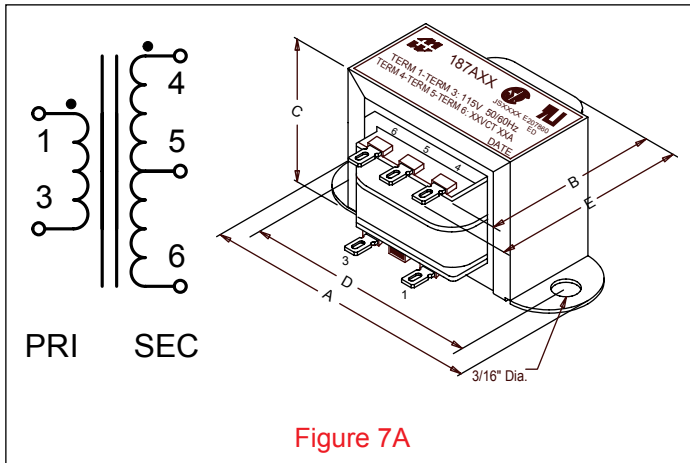
USA
Cheektowaga, NY (716) 630-7030



L.V. Chassis Mount - Quick Connect (186/187 Series)

Power

Transformer Schematics Single Primary (187 Series)



VA Size	Dimensions (Inches)				
	Length (A)	Depth (Not Including Terminals) (B)	Height (C)	Mtg. Centers (D)	Depth To Terminal (E)
2.34 - 2.50	2.06	1.06	1.18	1.75	1.435
5.6 - 6.4	2.37	1.25	1.37	2.00	1.625
12.0 - 12.8	2.81	1.37	1.62	2.37	1.725
30 - 32	3.25	1.68	1.93	2.81	2.055
50 - 60	3.68	1.81	2.25	3.12	2.185
96 - 102	4.03	2.25	2.56	3.50	2.625



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St. Laurent, Quebec (514) 343-9010
USA
Cheektowaga, NY (716) 630-7030

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Queenstown, Australia 61-8-8240-2244

L.V. Chassis Mount - Quick Connect (186/187 Series)

POWER

Part Number Single Primary 115VAC	Fig.	Part Number Dual Primary 115/230VAC	Fig.	Secondary (RMS)		VA Rating
				VAC	Current (Amps)	
187A10	7A	NOT AVAILABLE	-	10V C.T.	0.25	2.5
187B10	7B	186B10	6B	10V C.T.	0.60	6.0
187C10	7B	186C10	6B	10V C.T.	1.20	12.0
187D10	7D	186D10	6D	10V C.T.	3.00	30.0
187E10	7D	186E10	6D	10V C.T.	5.00	50.0
187F10	7D	186F10	6D	10V C.T.	10.00	100.0
187A12	7A	NOT AVAILABLE	-	12.6V C.T.	0.19	2.5
187B12	7B	186B12	6B	12.6V C.T.	0.50	6.3
187C12	7B	186C12	6B	12.6V C.T.	1.00	12.6
187D12	7D	186D12	6D	12.6V C.T.	2.50	31.5
187E12	7D	186E12	6D	12.6V C.T.	4.00	50.4
187F12	7D	186F12	6D	12.6V C.T.	8.00	100.8
187A16	7A	NOT AVAILABLE	-	16V C.T.	0.15	2.4
187B16	7B	186B16	6B	16V C.T.	0.40	6.4
187C16	7B	186C16	6B	16V C.T.	0.80	12.8
187D16	7D	186D16	6D	16V C.T.	2.00	32.0
187E16	7D	186E16	6D	16V C.T.	3.50	56.0
187F16	7D	186F16	6D	16V C.T.	6.25	100.0
187A20	7A	NOT AVAILABLE	-	20V C.T.	0.12	2.4
187B20	7B	186B20	6B	20V C.T.	0.30	6.0
187C20	7B	186C20	6B	20V C.T.	0.60	12.0
187D20	7D	186D20	6D	20V C.T.	1.50	30.0
187E20	7D	186E20	6D	20V C.T.	2.80	56.0
187F20	7D	186F20	6D	20V C.T.	5.00	100.0
187A24	7A	NOT AVAILABLE	-	24V C.T.	0.10	2.4
187B24	7B	186B24	6B	24V C.T.	0.25	6.0
187C24	7B	186C24	6B	24V C.T.	0.50	12.0
187D24	7D	186D24	6D	24V C.T.	1.25	30.0
187E24	7D	186E24	6D	24V C.T.	2.40	57.6
187F24	7D	186F24	6D	24V C.T.	4.00	96.0
187A28	7A	NOT AVAILABLE	-	28V C.T.	0.08	2.4
187B28	7B	186B28	6B	28V C.T.	0.20	5.6
187C28	7B	186C28	6B	28V C.T.	0.42	12.0
187D28	7D	186D28	6D	28V C.T.	1.07	30.0
187E28	7D	186E28	6D	28V C.T.	2.00	56.0
187F28	7D	186F28	6D	28V C.T.	3.57	100.0
187A36	7A	NOT AVAILABLE	-	36V C.T.	0.06	2.34
187B36	7B	186B36	6B	36V C.T.	0.17	6.12
187C36	7B	186C36	6B	36V C.T.	0.35	12.6
187D36	7D	186D36	6D	36V C.T.	0.85	30.6
187E36	7D	186E36	6D	36V C.T.	1.50	54.0
187F36	7D	186F36	6D	36V C.T.	2.80	100.8
187A48	7A	NOT AVAILABLE	-	48V C.T.	0.05	2.4
187B48	7B	186B48	6B	48V C.T.	0.12	6.0
187C48	7B	186C48	6B	48V C.T.	0.25	12.0
187D48	7D	186D48	6D	48V C.T.	0.62	30.0
187E48	7D	186E48	6D	48V C.T.	1.20	57.6
187F48	7D	186F48	6D	48V C.T.	2.00	96.0
187A56	7A	NOT AVAILABLE	-	56V C.T.	0.04	2.5
187B56	7B	186B56	6B	56V C.T.	0.11	6.16
187C56	7B	186C56	6B	56V C.T.	0.21	12.3
187D56	7D	186D56	6D	56V C.T.	0.53	30.0
187E56	7D	186E56	6D	56V C.T.	1.00	56.0
187F56	7D	186F56	6D	56V C.T.	1.80	100.8
187A120	7A	NOT AVAILABLE	-	120V C.T.	0.02	2.4
187B120	7B	186B120	6B	120V C.T.	0.05	6.0
187C120	7B	186C120	6B	120V C.T.	0.10	12.0
187D120	7D	186D120	6D	120V C.T.	0.25	30.0
187E120	7D	186E120	6D	120V C.T.	0.50	60.0
187F120	7D	186F120	6D	120V C.T.	0.85	102.0



EUROPE

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AUSTRALIA

Queenstown, Australia 61-8-8240-2244

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CANADA

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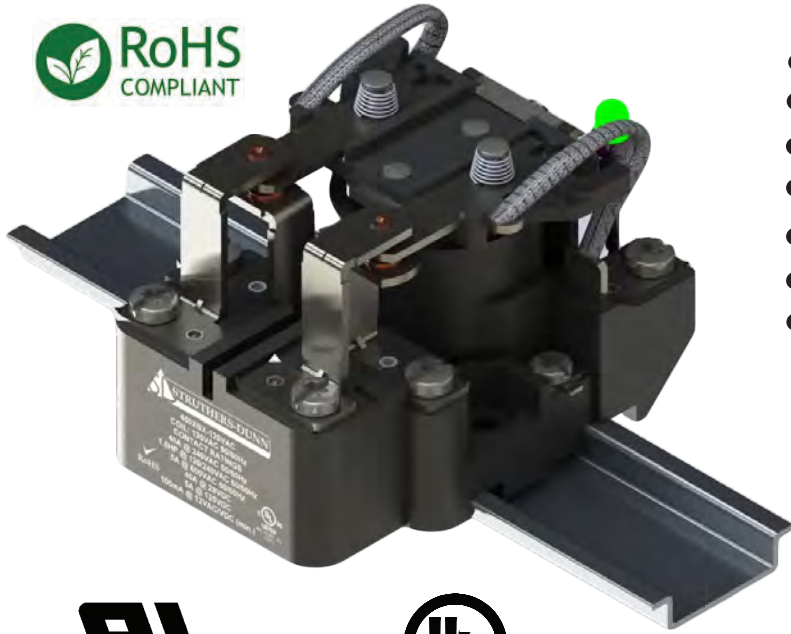
USA

Cheektowaga, NY (716) 630-7030



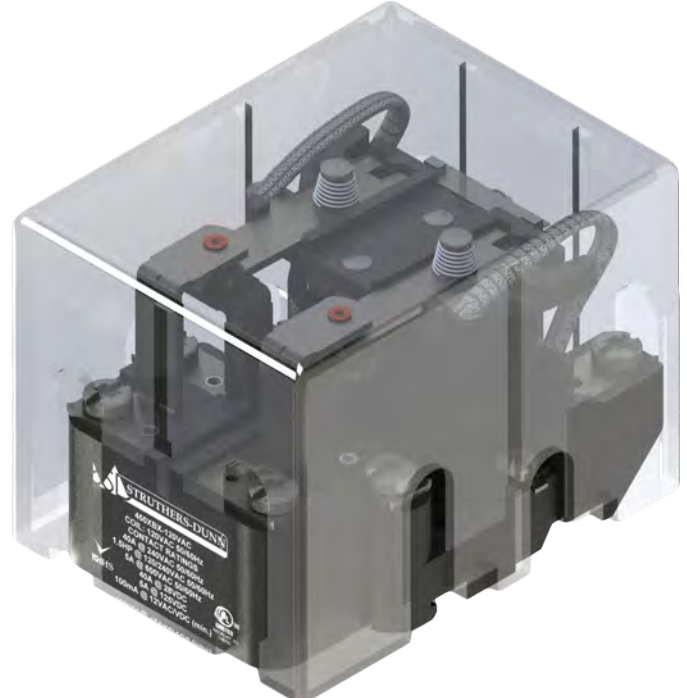


450 SERIES HEAVY DUTY POWER RELAY



450XBX50 120VAC

- UL Standard 60947-1 (UL 508) Qualified
- Standard Base with DIN Rail and Panel Mount Option
- 10,000,000 Cycles Mechanical and 100,000 Cycles Electrical
- Optional LED - Coil Power Indication
- Optional Polycarbonate Protective Cover
- Class F (155°C) Insulation System
- Max. Rating: 40 Amps or 50 Amps
 - 40 Amps @ 277 VAC - 50 Amps @ 240VAC
 - 40 Amps @ 28 VDC - 50 Amps @ 28VDC



GENERAL CHARACTERISTICS

Insulation System	Class F (155°C)	
Mechanical Life	10,000,000 operations	
Electrical Life	100,000 operations	
Operate Time	20ms	
Release Time	15ms	
Dielectric	Between coil and contact	2200VAC
	Between poles	2200VAC
	Between contacts	1500VAC
Ambient Temperature	AC Coil	-55°C to 70°C
	DC Coil	-55°C to 105°C
Connection	Listed wire connectors required for UL Listed Installations	
Weight	227-311 g	

INPUT CHARACTERISTICS

Rated Voltage	6, 12, 24, 120, 208, 220, 240, 277, 480VAC 6, 12, 24, 48, 110/125, 250VDC
Operating Range	AC: 85% to 110% of Rated Voltage DC: 80% to 110% of Rated Voltage
Dropout Voltage	10% of Rated Voltage
Insulation Resistance	1000 MΩ @ 500VDC

COIL CHARACTERISTICS

Nominal Voltage	Power Consumption	Coil Resistance
6 VAC	~10VA	0.85Ω
12VAC		2.85Ω
24VAC		12Ω
120VAC		290Ω
208VAC		850Ω
220VAC		1040Ω
240VAC		1200Ω
277VAC		1500Ω
480VAC		4500Ω
6VDC		~2W
12VDC	70Ω	
24VDC	290Ω	
48VDC	1200Ω	
110/125VDC	6000Ω	
250VDC	34000Ω	

CONTACT CHARACTERISTICS

Configurations	XAX (SPDT) (1 Form C); XBX (DPDT) (2 Form C); BXX (DPST) (2 Form A); HXX (SPST-NO-DM) (Form X); XXH (SPST-NC-DB) (Form Y); XHX (SPDT-DM-DB) (Form Z)	
Contact Material:	AgSnO2 - Silver Tin Oxide	
AC Rating:	40A	50A
	40A @ 277VAC 50/60Hz 20A @ 600VAC 50/60Hz 30A @ 120VAC (Ballast) 15A @ 240VAC (Ballast)	50A @ 240VAC 50/60Hz 10A @ 600VAC 50/60Hz
Motor Load Rating:	2HP @ 120/240VAC 50/60Hz	2HP @ 120/240VAC 50/60Hz
DC Rating:	40A @ 28VDC	50A @ 28VDC
DC Rating With Blowout Magnet:	20A @ 125VDC 4A @ 250VDC 1A @ 500VDC	20A @ 125VDC 4A @ 250VDC 2A @ 500VDC
Minimum Load Rating:	100mA @ 12 VAC/DC (min.)	100mA @ 12 VAC/DC (min.)
Auxiliary Switch Rating:	10A @ 125/250VAC	10A @ 125/250VAC
Pilot Duty:	A300	A300
Certifications:	UL/CUL Listed, UL/CUL Recognized	

*Additional Coil Voltages Available Upon Request

*Tungsten Contacts Also Available

STRUTHERS-DUNN

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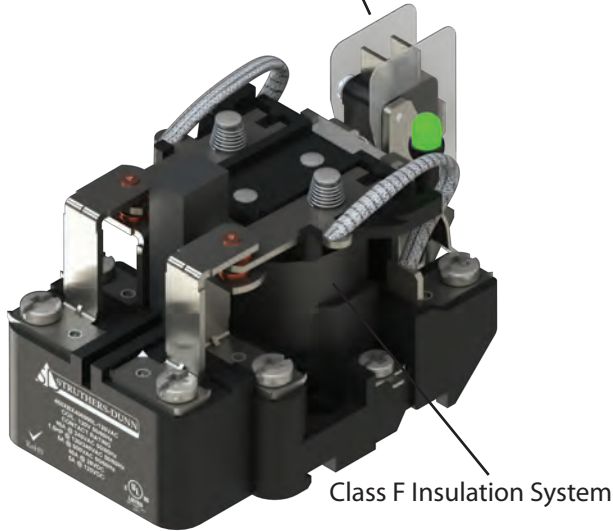
450 SERIES HEAVY DUTY POWER RELAY

SPECIAL FEATURES

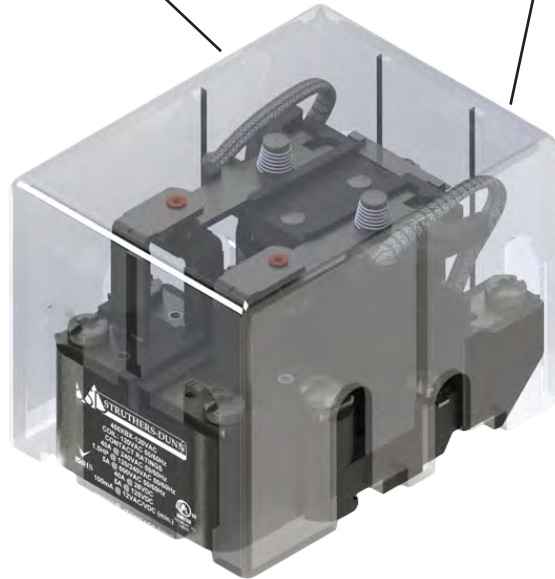
*Optional Auxiliary Switch - (Code "90")
*Dual Auxiliary Switch Available - (Code "91")

Optional Coil Suppression Diode - (Code "V")
(DC Version Only)

Optional Polycarbonate Protective Cover - (Code "C")



Class F Insulation System

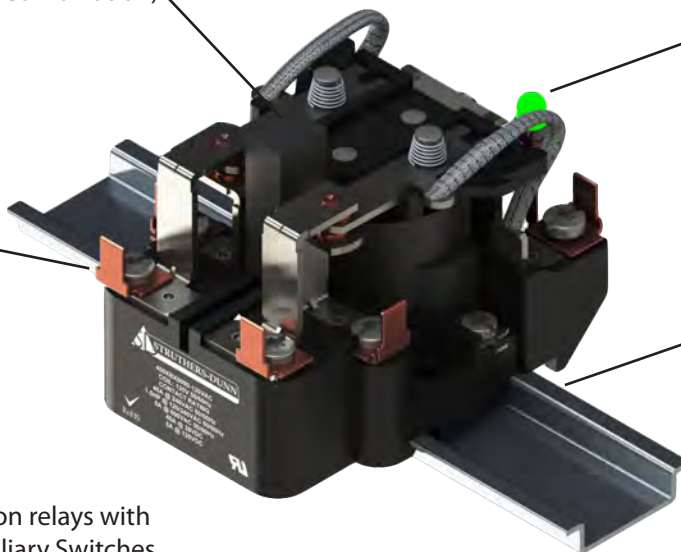


Optional Blowout Magnet - (Code "69")
(Not Available with XXH Contact Combination)

Optional Green LED Indicator - (Code "L")

*Optional Quick Connect Terminals - (Code "Q")

Standard Din Rail & Panel Mount Combination

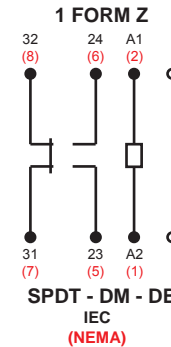
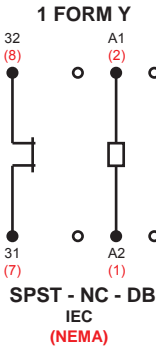
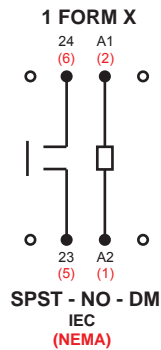
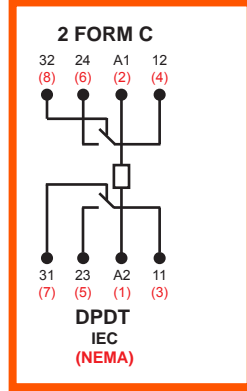
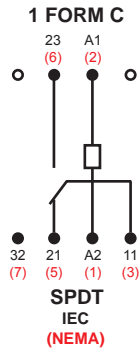
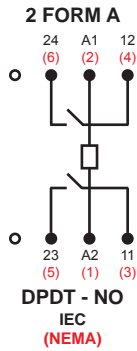


*Note: Covers can not be used on relays with Quick Connect Terminals or Auxiliary Switches



450 SERIES HEAVY DUTY POWER RELAY

WIRING DIAGRAMS



COIL SUPPRESSION DIODE



POLARITY SENSITIVE

PART NUMBERING INFORMATION

Series Part Number: 450 XBX 40 C 69 Q L V 90 120VAC

Contact Combination:

- XAX (SPDT) (1 Form C)
- XBX (DPDT) (2 Form C)
- BXX (DPST) (2 Form A)
- HXX (SPST- NO-DM) (1 Form X)
- XXH (SPST- NC-DB) (1 Form Y)
- XHX (SPDT - DM-DB) (1 Form Z)

Contact Type :

- 40 Amp Silver Alloy – 40
- 50 Amp Silver Alloy – 50
- (Tungsten Contacts Also Available)

Enclosure:

- No Cover Standard – No Code
- Polycarbonate Protective Cover – C

Din-rail:

- Standard Din Rail Mount Base – No Code

Other Options:

- Blowout Magnet – 69 (not available with a XXH contact combination)
- 3/8" Quick Connect Terminals – Q
- LED indicator – L
- Coil Suppression Diode – V (VDC version only)
- Auxiliary Switch – 90 *
- Dual Auxiliary Switch - 91 *

Coil Voltage – Class F, 155°C

- VAC – 6, 12, 24, 120, 208, 220, 240, 277, 480
- VDC - 6, 12, 24, 48, 110/125, 250
- (Other Coil Voltages Available Upon Request)

***NOTE: Covers cannot be used on relays with QC Terminals, Auxiliary Switches or 50A Relays with AC Coils.**

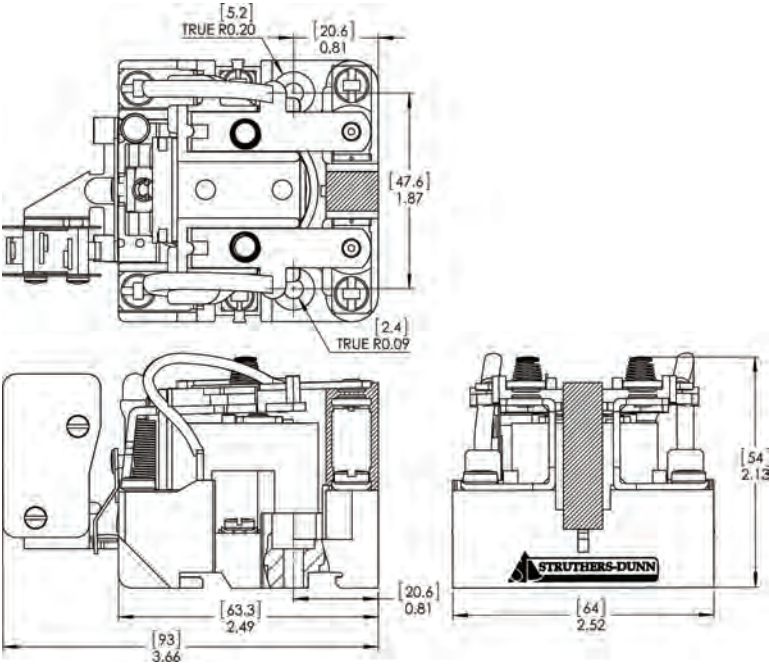
***NOTE: Covers cannot be used on relays with QC Terminals Auxiliary Switches or 50A relays with AC Coils.**



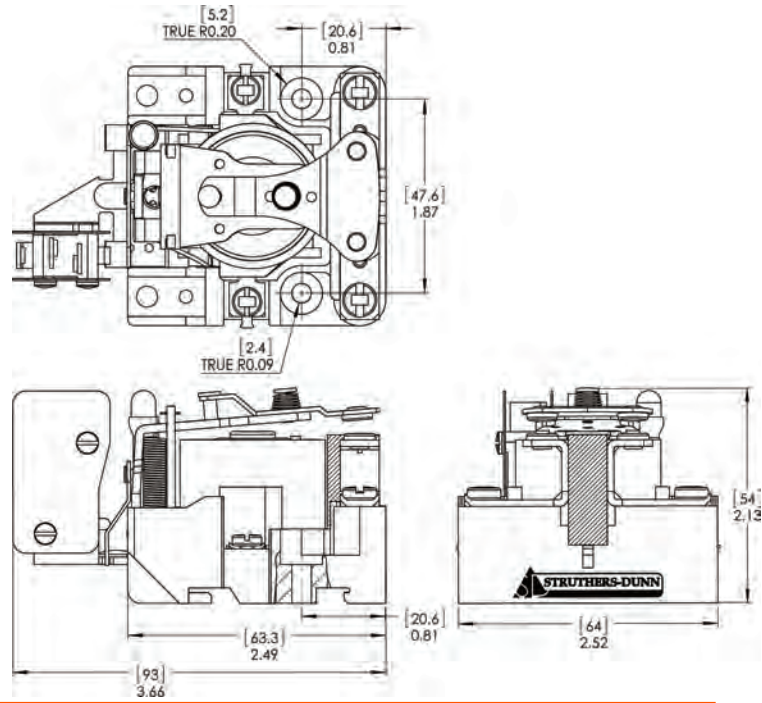
450 SERIES HEAVY DUTY POWER RELAY

OUTLINE DIMENSIONS

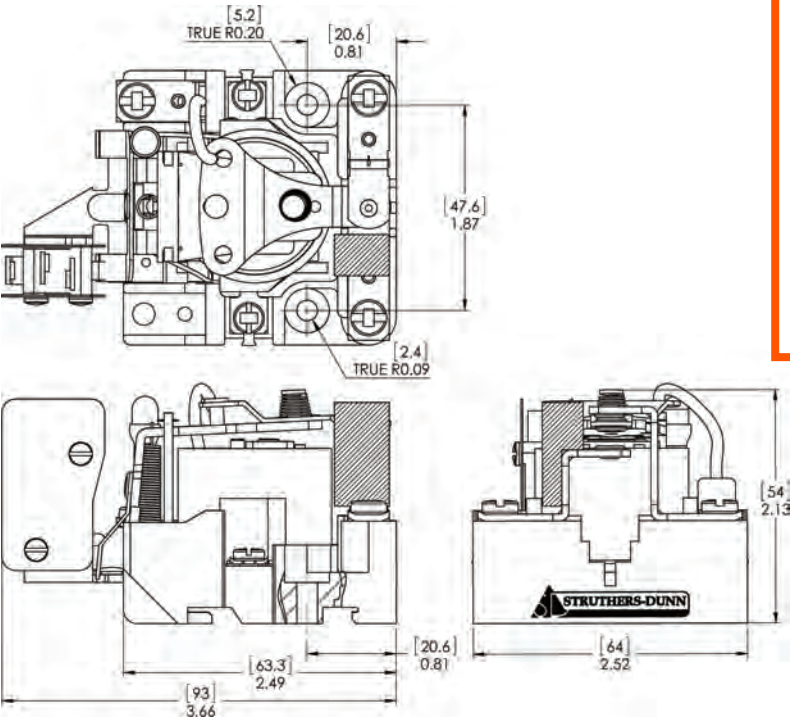
450BXX (DPST - 2 FORM A)



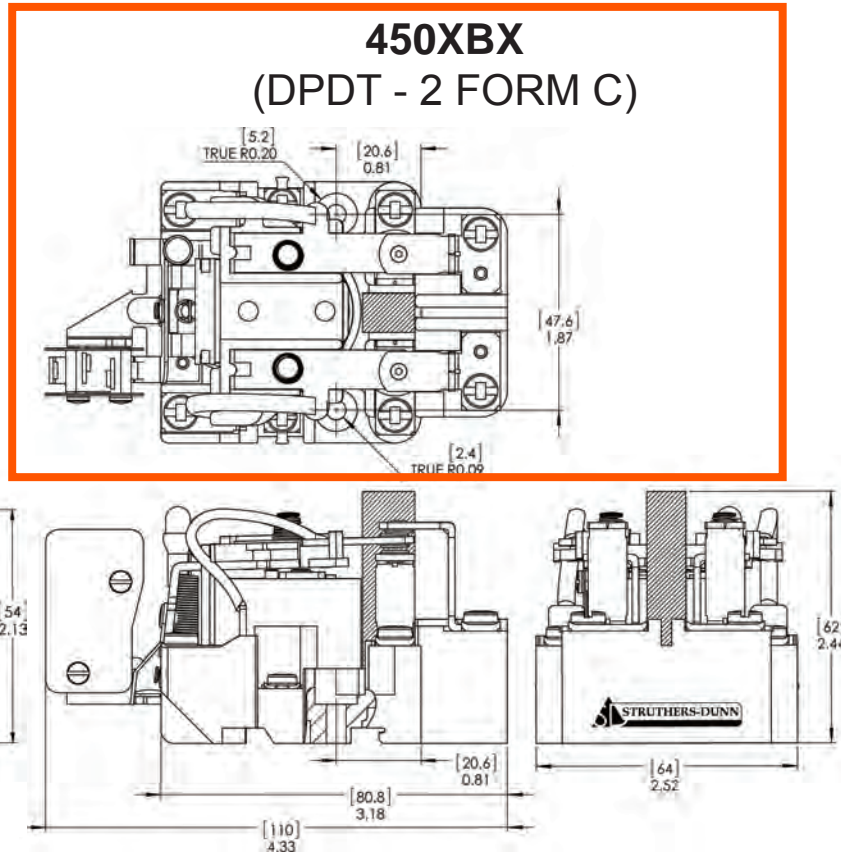
450HXX (SPST-NO-DM - 1 FORM X)



450XAX (SPDT - 1 FORM C)



450BXX (DPDT - 2 FORM C)



Printed-circuit board connector - PC 4/ 2-STF-7,62 - 1828249

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PCB connector, nominal current: 20 A, rated voltage (III/2): 630 V, number of positions: 2, pitch: 7.62 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin



The figure shows a 5-pos. version of the product

Why buy this product

- Well-known connection principle allows worldwide use
- Low temperature rise, thanks to maximum contact force
- Allows connection of two conductors
- Integrated double steel spring provides additional safety in the event of temperature and power fluctuations
- Screwable flange for superior mechanical stability



Key Commercial Data

Packing unit	1 STK
GTIN	 4 017918 050474
GTIN	4017918050474
Weight per Piece (excluding packing)	11.910 g
Custom tariff number	85366990
Country of origin	Germany

Technical data

Dimensions

Length [l]	30.7 mm
Width [w]	30.46 mm
Height [h]	18.1 mm
Pitch	7.62 mm

Printed-circuit board connector - PC 4/ 4-STF-7,62 - 1828265

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PCB connector, nominal current: 20 A, rated voltage (III/2): 630 V, number of positions: 4, pitch: 7.62 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin




The figure shows a 5-pos. version of the product

Why buy this product

- ✓ Well-known connection principle allows worldwide use
- ✓ Low temperature rise, thanks to maximum contact force
- ✓ Allows connection of two conductors
- ✓ Integrated double steel spring provides additional safety in the event of temperature and power fluctuations
- ✓ Screwable flange for superior mechanical stability



Key Commercial Data

Packing unit	1 STK
GTIN	 4 017918 050498
GTIN	4017918050498
Weight per Piece (excluding packing)	20.370 g
Custom tariff number	85366990
Country of origin	Germany

Technical data

Dimensions

Length [l]	30.7 mm
Width [w]	45.7 mm
Height [h]	18.1 mm
Pitch	7.62 mm

Printed-circuit board connector - PC 4/ 6-STF-7,62 - 1828281

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PCB connector, nominal current: 20 A, rated voltage (III/2): 630 V, number of positions: 6, pitch: 7.62 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin




The figure shows a 5-pos. version of the product

Why buy this product

- ✓ Well-known connection principle allows worldwide use
- ✓ Low temperature rise, thanks to maximum contact force
- ✓ Allows connection of two conductors
- ✓ Integrated double steel spring provides additional safety in the event of temperature and power fluctuations
- ✓ Screwable flange for superior mechanical stability



Key Commercial Data

Packing unit	1 STK
GTIN	 4 017918 050511
GTIN	4017918050511
Weight per Piece (excluding packing)	28.590 g
Custom tariff number	85366990
Country of origin	Germany

Technical data

Dimensions

Length [l]	30.7 mm
Width [w]	60.94 mm
Height [h]	18.1 mm
Pitch	7.62 mm

Header - DFK-PC 4/ 2-GF-7,62 - 1840557

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Feed-through header, nominal current: 20 A, rated voltage (III/2): 630 V, number of positions: 2, pitch: 7.62 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin, mounting: Direct mounting

The figure shows a 5-pos. version of the product

Why buy this product

- Well-known connection principle allows worldwide use
- Low temperature rise, thanks to maximum contact force
- Allows connection of two conductors
- Screwable flange for superior mechanical stability
- Flexible side panels enable convenient wall mounting prewired from the inside



Key Commercial Data

Packing unit	1 STK
GTIN	
GTIN	4017918111700
Weight per Piece (excluding packing)	11.050 g
Custom tariff number	85366990
Country of origin	Poland

Technical data

Item properties

Brief article description	Feed-through header
Range of articles	DFK-PC 4/..-GF
Pitch	7.62 mm
Type of contact	Male connector

Feed-through header - DFK-PC 4/ 4-GF-7,62 - 1840573

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Feed-through header, nominal current: 20 A, rated voltage (III/2): 630 V, number of positions: 4, pitch: 7.62 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin, mounting: Direct mounting

The figure shows a 5-pos. version of the product

Why buy this product

- ✓ Well-known connection principle allows worldwide use
- ✓ Low temperature rise, thanks to maximum contact force
- ✓ Allows connection of two conductors
- ✓ Screwable flange for superior mechanical stability
- ✓ Flexible side panels enable convenient wall mounting prewired from the inside



Key Commercial Data

Packing unit	1 STK
GTIN	
GTIN	4017918111724
Weight per Piece (excluding packing)	18.620 g
Custom tariff number	85366990
Country of origin	Poland

Technical data

Dimensions

Length [l]	32 mm
Width [w]	52.1 mm
Height [h]	30.5 mm
Pitch	7.62 mm

Feed-through header - DFK-PC 4/ 6-GF-7,62 - 1840599

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Feed-through header, nominal current: 20 A, rated voltage (III/2): 630 V, number of positions: 6, pitch: 7.62 mm, connection method: Screw connection with tension sleeve, color: green, contact surface: Tin, mounting: Direct mounting

The figure shows a 5-pos. version of the product

Why buy this product

- ✓ Well-known connection principle allows worldwide use
- ✓ Low temperature rise, thanks to maximum contact force
- ✓ Allows connection of two conductors
- ✓ Screwable flange for superior mechanical stability
- ✓ Flexible side panels enable convenient wall mounting prewired from the inside



Key Commercial Data

Packing unit	1 STK
GTIN	 4 017918 111748
GTIN	4017918111748
Weight per Piece (excluding packing)	25.800 g
Custom tariff number	85366990
Country of origin	Poland

Technical data

Dimensions

Length [l]	32 mm
Width [w]	67.34 mm
Height [h]	30.5 mm
Pitch	7.62 mm



The ITS Commander is designed to improve system reliability and lower the cost of ownership through reduced maintenance costs. The system benefits both the owning agency and maintaining agency by promptly sending signals of an abnormal situation, allowing routine monitoring of critical equipment, and providing the capability to remotely control outlets to reboot equipment. These features can reduce unnecessary trips to inspect or service the cabinet saving money.



FEATURES

- 8 outlets rated at 12A, 120 VAC
- 10 kA surge suppression
- 12 optically-isolated inputs to monitor dry contacts
- 6 electro-mechanical relays 10A at 120 VAC and 8A at 30VDC
- Temperature Monitoring
- Humidity monitoring
- Analog Input 0 to 60 VDC
- NTP server synchronization for real-time clock
- Static IP address configuration, XML, SNMP interface options
- Configurable data logging
- Scheduling with up to 100 programmable events.

REMOTE CONTROL

Includes the easy to use web-based interface with static IP address for controlling and monitoring connected devices. Users can gain access via the secure connection to the native web server using CAT5 cable.

OUT OF RANGE ALARMS

Temperature: Sends signal if temperature is above or below user set ranges.

Dry-Contacts: Used to signal if user set conditions are broken, including but not limited to, door alarms, surge failure and battery charge.

Power: Upon power failure, system will send alarm and safely shut down.

Notifications can be set-up for multiple users via email, SMS, web-based interface or any combination thereof. Units are configured using our easy, user friendly web-based interface.

Logging of events is also fully configurable to include period based logging and/or event based logging.

THE ITS ADVANTAGE

Southern Manufacturing's ITS Commander may be integrated with ITS enclosures from the factory. Power panel and factory installed equipment are pre-wired and connected.

SOUTHERN MANUFACTURING

2000 E. Lake Mary Blvd. • Lake Mary, FL 32773 • Phone: 800-866-5699
email: contactus@southernmfg.com • www.southernmfg.com



Fig. 2: Front View

- Input circuit breaker switch (15A)
- 8 Outlets
- LCD screen
- Outlet status LED indicators
- Selector button
- Ethernet port



Fig. 3: Rear View

- RJ11 Connection
- Analog Input Connector (4 position)
- Temperature / humidity connector (5 position)
- Optically isolated input status LED indicators
- Optically isolated inputs (24 position)
- Relay input status LED status LED indicators
- Relay inputs (12 position)
- Input power connector

ITS COMMANDER REMOTE MANAGEMENT SYSTEM SPECIFICATIONS	
Dimensions	1.7" x 5.5" x 19"
Operating Temperature Range	-34°C (-30°F) to + 74°C (165° F)
Operating Humidity Range	0% - 95%
Input Power	89-135 VAC, 60 ± 3 Hz
Rated Current	12A
Input Circuit Breaker	15 A
Input Power Cord	IEC 320 C19 to 5-15P
Receptacle	8 - 5-15/R, 12A at 120VAC
Optically Isolated Inputs	12
Relay Contacts	6 10A at 120 VAC
Network	10/10/100 Base-T Ethernet Port
Data Encryption	SSL
Alert Types	Email / SMS / SNMP
Voltage / Current	Yes (True RMS)
LCD Display	Yes
Clock	Manual or NTP
Scheduling	100 events, ON-OFF-RESET



Part 15
Subpart B



UL 60950-1

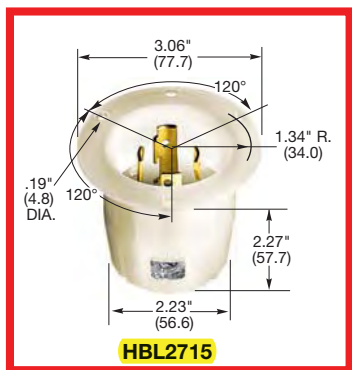
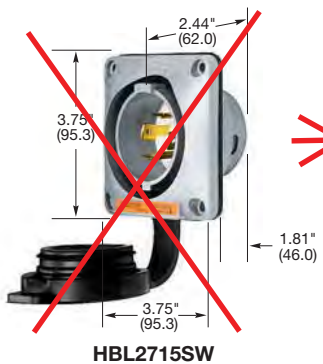
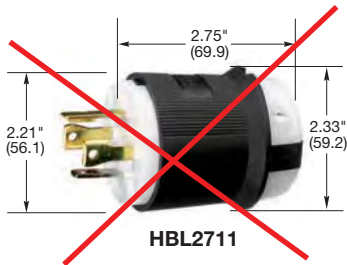
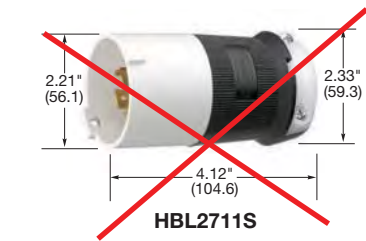
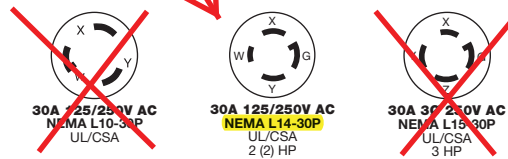


SOUTHERN MANUFACTURING

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Phone: 800-866-5699

email: contactus@southernmfg.com • www.southernmfg.com
www.itscommander.com

**HUBBELL #2715
 NEMA L14-30P INLET**



Dimensions in Inches (mm)

Plugs

Watertight Safety-Shroud®

Description	Cord Dia.	Catalog Number	IP66 SUITABILITY	UL-Type 4x, 12
Black Valox® housing, white Valox® clamps.	.350"-1.150" (9-29)	-	HBL2711SW	HBL2721SW

Safety-Shroud®

Description	Cord Dia.	Catalog Number	IP20 SUITABILITY
Black and white nylon body, white Valox® shroud. Can be used with the Insulgrip-Connector-Bodies.	.350"-1.150" (9-29)	-	HBL2711S HBL2721S

Note: See page B-40 for accessories.

Insulgrip®

Description	Cord Dia.	Catalog Number	IP20 SUITABILITY
Black and white nylon.	.350"-1.150" (9-29)	-	HBL2711 HBL2721
Black and white nylon, (Not shown).	.300"- .950" (7.6-24.1)	HBL2661	-
Corrosion-resistant, yellow nylon.	.350"-1.150" (9-29)	-	HBL27GM11 HBL27CM21
All black nylon.	.350"-1.150" (9-29)	-	HBL2711BK -

Note: See page B-53 for accessories.

Flanged Inlets

Watertight Safety-Shroud®

Description	Catalog Number	IP66 SUITABILITY	UL-Type 4x, 12
Gray Valox® housing and flange.	-	HBL2715SW	HBL2725SW
Reverse service, gray Valox® housing and flange (use with HBL2713SP), (Not shown).	-	HBL2715SWR	-

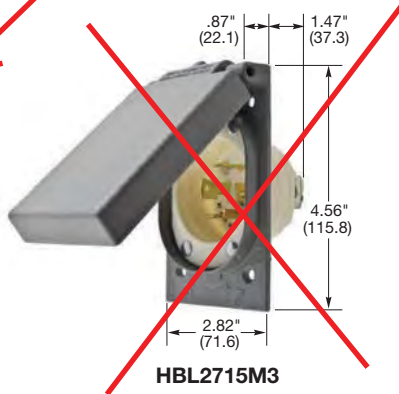
Note: See page B-54 for accessories.

Insulgrip®

Description	Catalog Number	IP20 SUITABILITY
Nylon casing, back wired.	-	HBL2715 HBL2725
Nylon casing, back wired, (Not shown).	HBL2665	-
Nylon casing, weather-protective, die-cast aluminum, back wired, self-closing lift cover.	-	HBL2715M3 -

Note: See page B-52 for accessories.

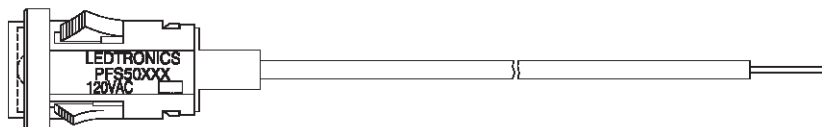
See pages B-69 and B-70 for technical information on Twist-Lock and Watertight Safety-Shroud devices.



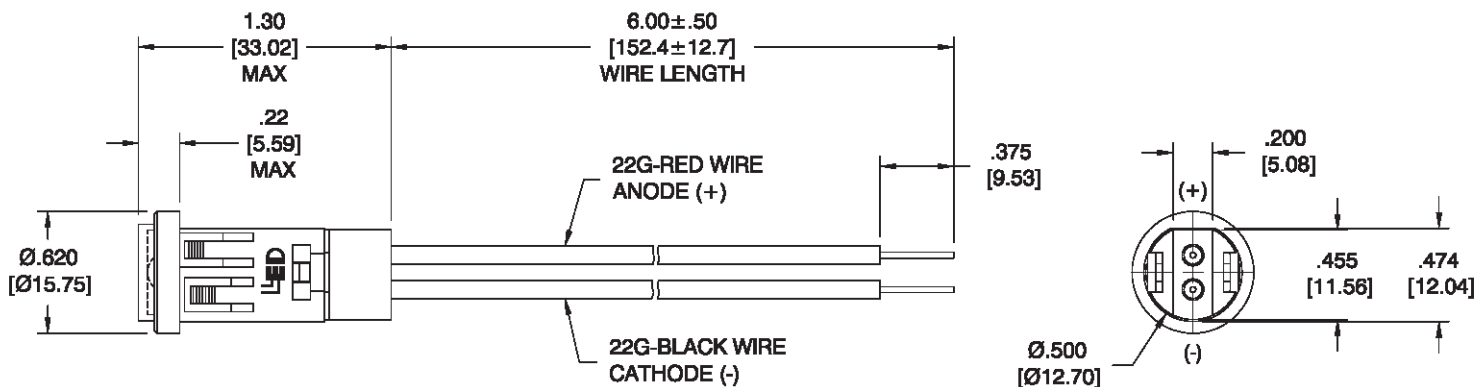
HBLMITL — For use with Watertight Safety-Shroud receptacles and reverse service inlet, see page B-39.



LTR	REVISION	DATE	APPD
A	102913-PL01: ADDED ALL P/N's	10-29-13	GP



ROTATED 90°



NOTES:

1. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
2. MOUNTING DIAMETER: $\varnothing 1/2"$ (12.7mm)
3. LENS MATERIAL: LEXAN 101-112
4. SLEEVE MATERIAL: BLACK, NYLON 66 (UL94V-1 MIN / UL94V-0 PREF)
5. HEADER MATERIAL: BLACK, NYLON 66 (UL94V-1 MIN / UL94V-0 PREF)



REVISION NOTIFICATION

- DLC
- UL/ETL
- MADE IN USA
- CUSTOMER _____
- OTHER _____

ELECTRO-OPTICAL CHARACTERISTICS (Ta = 25°C)

PFS50-0AG-120A-W6	AQUA GREEN	120VAC	0.006-0.008 A	2.500cd	520	30°
PFS50-0CW-120A-W6	COOL WHITE	120VAC	0.006-0.008 A	1.500cd	8000K	40°
PFS50-0UG-120A-W6	SUPER ORANGE	120VAC	0.006-0.008 A	-	613	30°
PFS50-0UR-120A-W6	ULTRA RED	120VAC	0.006-0.008 A	0.450cd	652	24°
PFS50-0UY-120A-W6	SUPER YELLOW	120VAC	0.006-0.008 A	0.900cd	595	30°
PFS50-1AG-120A-W6	AQUA GREEN	120VAC	0.006-0.008 A	2.500cd	520	30°
PFS50-1PB-120A-W6	SUPER BLUE	120VAC	0.006-0.008 A	-	460	25°
PFS50CG5-120VAC-W6	HI-EFF GREEN	120VAC	0.006-0.008 A	0.087cd	565	16°
PFS50CR6-120VAC-W6	ULTRA RED	120VAC	0.006-0.008 A	0.135cd	655	17°
PFS50CY5-120VAC-W6	YELLOW	120VAC	0.006-0.008 A	0.030cd	585	30°
LEDTRONICS PART NO.	COLOR EMITTED	INPUT VOLTAGE, V	CURRENT (A)	MAXIMUM CANDELA	λ_P nm COLOR TEMP. (K)	VIEWING ANGLE (FULL BEAM WIDTH @ 50% INTENSITY)



-PROPRIETARY-
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.XXX ± .010 TOLERANCE PER ANSI-Y14.5
 .XX ± .025 (UNLESS OTHERWISE STATED)
 ANGLES ± 0°,30'
 FRACT. ± 1/32

TITLE					
PFS50-0XX-120A-W6 PFS50CXX-120VAC-W6					
DWG NO	SCALE	SHEET	DATE		
PFS50-120VAC-W6	1:1	1 OF 1	06-04-07		
CODE IDENT NO.	DWG BY	CHK BY	QA	MFG	R&D
8Z410	GP 06-04-07	PL 10-29-13			BJ 10-29-13

Dialight

556 Series

High Intensity LED Panel Mount Indicators for 1" Mounting Hole Watertight - NEMA4X IP66



FEATURES / BENEFITS

- ▲ Daylight viewable
- ▲ Safety standards - UL and NEMA
- ▲ Tamperproof / Designed for high durability
- ▲ Long life, lasting up to 100k hours
- ▲ Uniform illumination - multi-LED construction
- ▲ Lens options:
 - Low profile flat
 - Wide angle domed

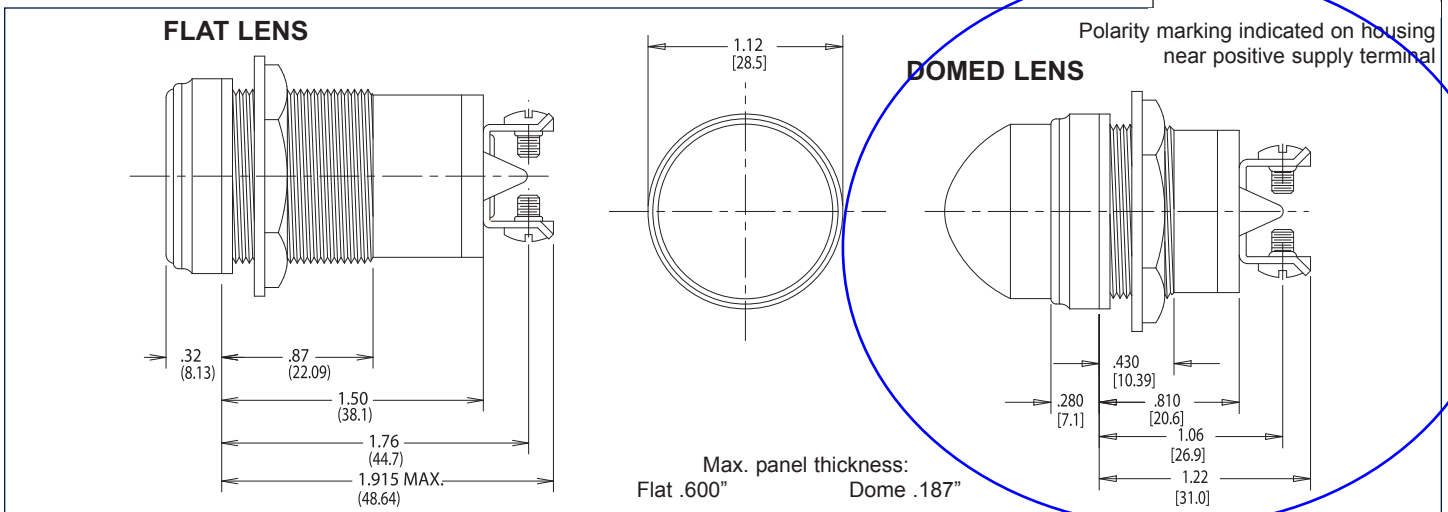
APPLICATIONS

The 556 Series LED Panel Mount Indicators incorporate both InGaN and AlInGaP technologies to offer higher intensities. This is a highly durable package, designed to withstand outdoor applications susceptible to rain, dust and sunlight.

- Instrument panels
 - Safety applications
 - Vending, gaming
 - Lane control
 - Display lighting
 - Transportation - rail, bus, airline
- ... and many more!

SPECIFICATIONS

- ▲ Available in red, yellow, green, blue, white, orange and cyan
- ▲ Voltage range of 12 to 125 VDC, 125 and 230 VAC
- ▲ Watertight seal from front of panel meets NEMA 4X IP66
 - Maximum Mounting Torque - 40 in./lb.
- ▲ Housing material: Nickel plated brass
- ▲ Lens material: Polycarbonate 94 - VO
- ▲ UL recognized - File #E156890
- ▲ Front mounting in 1" clearance hole
- ▲ Operating temperature: -30°C to +85°C
- ▲ Storage temperature: -40°C to +100°C



Please see back of page for part numbers and additional specifications.

Dialight reserves the right to make changes at any time in order to supply the best product possible.

Dialight Corporation

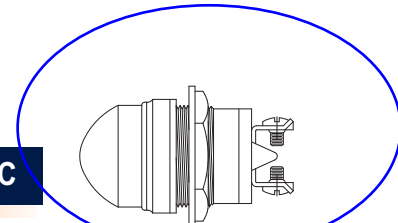
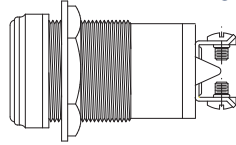
1501 Route 34 South • Farmingdale, NJ 07727 USA

Tel: (1) 732-919-3119 • Fax: (1) 732-751-5778 • www.dialight.com



MDEL556X001_D

556 Series High Intensity LED Panel Mount Indicators for 1" Mounting Hole Watertight - NEMA4X IP66



FLAT LENS - 12 AND 24 VDC

PART NUMBER	COLOR	VOLTAGE (VDC)	CURRENT (mA)	TYPICAL INTENSITY (fL)
556-1003-304F	White	12	60	4000
556-1503-304F	Red	12	95	3000
556-1603-304F	Green	12	60	4000
556-1683-304F	Cyan	12	60	4000
556-1703-304F	Yellow	12	95	3000
556-1803-304F	Blue	12	60	1200
556-1903-304F	Orange	12	95	3000
556-1004-304F	White	24	32	4000
556-1504-304F	Red	24	46	3000
556-1604-304F	Green	24	32	4000
556-1684-304F	Cyan	24	32	4000
556-1704-304F	Yellow	24	46	3000
556-1804-304F	Blue	24	32	1200
556-1904-304F	Orange	24	46	1200

DOME LENS - 12 AND 24 VDC

PART NUMBER	COLOR	VOLTAGE (VDC)	CURRENT (mA)	TYPICAL INTENSITY (fL)
556-3003-304F	White	12	60	1200
556-3503-304F	Red	12	95	1300
556-3603-304F	Green	12	60	1800
556-3683-304F	Cyan	12	60	1800
556-3703-304F	Yellow	12	95	1300
556-3803-304F	Blue	12	60	480
556-3903-304F	Orange	12	95	480
556-3004-304F	White	24	32	1200
556-3504-304F	Red	24	46	1300
556-3604-304F	Green	24	32	1800
556-3684-304F	Cyan	24	32	1800
556-3704-304F	Yellow	24	46	1300
556-3804-304F	Blue	24	32	480
556-3904-304F	Orange	24	46	480

FLAT LENS - 125 AND 230 VAC

PART NUMBER	COLOR	VOLTAGE (VAC)	CURRENT (mA)	TYPICAL INTENSITY (fL)
556-1005-304F	White	125	9	1800
556-1505-304F	Red	125	10.5	1200
556-1605-304F	Green	125	9.5	1800
556-1685-304F	Cyan	125	9.5	1800
556-1705-304F	Yellow	125	10.5	1200
556-1805-304F	Blue	125	9.5	500
556-1905-304F	Orange	125	10.5	500
556-1009-304F	White	230	7	1800
556-1509-304F	Red	230	7	1200
556-1609-304F	Green	230	7	1800
556-1709-304F	Yellow	230	7	1200
556-1809-304F	Blue	230	7	500
556-1909-304F	Orange	230	7	1800

DOME LENS - 125 AND 230 VAC

PART NUMBER	COLOR	VOLTAGE (VAC)	CURRENT (mA)	TYPICAL INTENSITY (fL)
556-3005-304F	White	125	9	700
556-3505-304F	Red	125	10.5	500
556-3605-304F	Green	125	9.5	700
556-3685-304F	Cyan	125	9.5	700
556-3705-304F	Yellow	125	10.5	500
556-3805-304F	Blue	125	9.5	180
556-3905-304F	Orange	125	10.5	180
556-3009-304F	White	230	7	700
556-3509-304F	Red	230	7	500
556-3609-304F	Green	230	7	700
556-3709-304F	Yellow	230	7	500
556-3809-304F	Blue	230	7	180
556-3909-304F	Orange	230	7	180

Other voltages are available.
Please contact our factory for more information.

Dialight reserves the right to make changes at any time
in order to supply the best product possible.

Dialight Corporation

1501 Route 34 South • Farmingdale, NJ 07727 USA

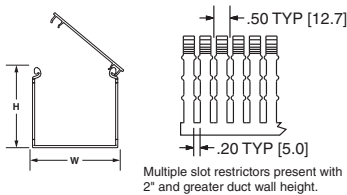
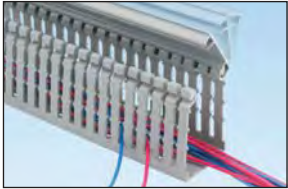
Tel: (1) 732-919-3119 • Fax: (1) 732-751-5778 • www.dialight.com



MDEL556X001_D

cULus Panduct® Type HN Hinged Cover Narrow Slot Wiring Duct

- Narrow slot/finger design provides excellent wire management with smaller wire diameters and high-density components such as terminal blocks, input/output devices, and other hardware
- Material: Lead-free PVC
- UL Recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with mounting holes
- Base and cover length is 6 feet

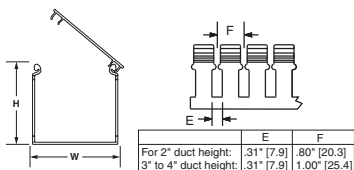
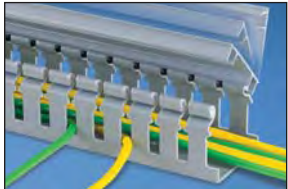


Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
HN1.5X2LG6	1.75 x 1.98	44.5 x 50.3	0.20	5.0	HC1.5LG6	6	120	120
HN1.5X3LG6	1.75 x 3.06	44.5 x 77.7	0.20	5.0	HC1.5LG6	6	120	120
HN2X2LG6	2.17 x 1.98	55.1 x 50.3	0.20	5.0	HC2LG6	6	120	120
HN2X3LG6	2.17 x 3.06	55.1 x 77.7	0.20	5.0	HC2LG6	6	60	120
HN2X4LG6	2.17 x 4.10	55.1 x 104.1	0.20	5.0	HC2LG6	6	60	120
HN3X3LG6	3.25 x 3.06	82.6 x 77.7	0.20	5.0	HC3LG6	6	60	120
HN3X4LG6	3.25 x 4.10	82.6 x 104.1	0.20	5.0	HC3LG6	6	60	120
HN4X4LG6	4.25 x 4.10	108.0 x 104.1	0.20	5.0	HC4LG6	6	60	60

Part Number shown for LG (Light Gray). Available in WH (White).
Base and cover sold separately.
**"H" dimension includes duct and cover.

cULus ~~C E~~ Panduct® Type H Hinged Cover Wide Slot Wiring Duct

- Wide slot/finger design provides excellent wire management in general purpose applications and is compatible with a wide range of wire sizes and component types
- Material: Lead-free PVC
- Rated for continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Conforms with NFPA 79-2007 section 13.3.1 requirement for flame retardant material
- Provided with standard mounting holes
- Base and cover length is 6 feet.

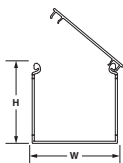
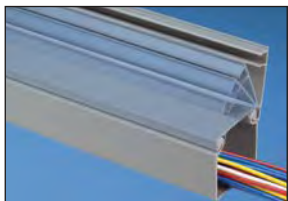


Base Part Number	Duct Size (W x H)*		Slot Width		Cover Part Number	Std. Pkg. Qty	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm	In.	mm				
H1.5X2LG6	1.75 x 1.98	44.5 x 50.3	.31	7.9	HC1.5LG6	6	120	120
H1.5X3LG6	1.75 x 3.06	44.5 x 77.7	.31	7.9	HC1.5LG6	6	120	120
H2X2LG6	2.17 x 1.98	55.1 x 50.3	.31	7.9	HC2LG6	6	120	120
H2X3LG6	2.17 x 3.06	55.1 x 77.7	.31	7.9	HC2LG6	6	60	120
H2X4LG6	2.17 x 4.10	55.1 x 104.1	.31	7.9	HC2LG6	6	60	120
H3X3LG6	3.25 x 3.06	82.6 x 77.7	.31	7.9	HC3LG6	6	60	120
H3X4LG6	3.25 x 4.10	82.6 x 104.1	.31	7.9	HC3LG6	6	60	120
H4X4LG6	4.25 x 4.10	108.0 x 104.1	.31	7.9	HC4LG6	6	60	60

Part Number shown for LG (Light Gray). Available in BL (Black) and WH (White).
Base and cover sold separately.
**"H" dimension includes duct and cover.

cULus ~~C E~~ Panduct® Type HS Hinged Cover Solid Wall Raceway

- Solid wall raceway conceals and protects wiring in continuous runs such as in low-voltage cord management applications between control panel stations in conveyor systems
- Material: Lead-free PVC
- UL recognized continuous use temperature: 122°F (50°C)
- UL 94 flammability rating of V-0
- Supplied without mounting holes
- Base and cover length is 6 feet



Base Part Number	Duct Size (W x H)*		Cover Part Number	Std. Pkg. Qty.	Base Ctn. Qty.	Cover Ctn. Qty.
	In.	mm				
HS1.5X2LG6NM	1.75 x 1.98	44.5 x 50.3	HC1.5LG6	6	120	120
HS1.5X3LG6NM	1.75 x 3.06	44.5 x 77.7	HC1.5LG6	6	60	120
HS2X2LG6NM	2.17 x 1.98	55.1 x 50.3	HC2LG6	6	120	120
HS2X3LG6NM	2.17 x 3.06	55.1 x 77.7	HC2LG6	6	60	120
HS2X4LG6NM	2.17 x 4.10	55.1 x 104.1	HC2LG6	6	60	120
HS3X3LG6NM	3.25 x 3.06	82.6 x 77.7	HC3LG6	6	60	120
HS3X4LG6NM	3.25 x 4.10	82.6 x 104.1	HC3LG6	6	60	120
HS4X4LG6NM	4.25 x 4.10	108.0 x 104.1	HC4LG6	6	60	60

Part Number shown for LG (Light Gray). For BL (Black) and WH (White) colors see color selection guide, page C1.48.
Base and cover sold separately.
**"H" dimension includes duct and cover.

A. System Overview

B1. Cable Ties

B2. Cable Accessories

B3. Stainless Steel Ties

C1. Wiring Duct

C2. Surface Raceway

C3. Abrasion Protection

C4. Cable Management

D1. Terminals

D2. Power Connectors

D3. Grounding Connectors

E1. Labeling Systems

E2. Labels

E3. Pre-Printed & Write-On Markers

E4. Permanent Identification

E5. Lockout/Tagout & Safety Solutions

F. Index



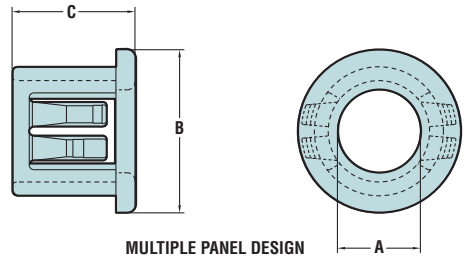
Heyco® Thick Panel Snap Bushings

Mounting Hole Diameter Range: .375" (9,5 mm) to 2.0" (50,8 mm)

MOUNTING HOLE DIAMETER		PART NO.		DESCRIPTION	PART DIMENSIONS					
in.	mm.	Black	White		A Inside Diameter		B Head Diameter		C Overall Height	
					in.	mm.	in.	mm.	in.	mm.
Single Locking Step for Panel Thickness up to .170" (4,3 mm)										
.375	9,5	2017	2018	SB 375-281	.281	7,1	.468	11,9	.406	10,3
1.000	25,4	3085	3088	SBT 1000-790*	.790	20,1	1.130	28,8	.450	11,4
Multiple Locking Steps for Panel Thickness up to .250" (6,4 mm)										
.500	12,7	3126	3127	SBT 500-6	.391	9,9	.578	14,7	.562	14,3
.625	15,9	2830	2831	SB 625-500**	.500	12,7	.703	17,9	.531	13,5
.750	19,1	2840	2841	SB 750-625**	.625	15,9	.828	21,0		
.875	22,2	3104	3105	SBT 875-11	.687	17,5	.953	24,2		
1.000	25,4	3108	3109	SBT 1000-12	.766	19,4	1.125	28,6	.562	14,3
1.093-1.125	27,8-28,6	3128	3129	SBT 1093-15	.937	23,8	1.218	30,9		
1.187	30,2	3130	3131	SBT 1187-15	.937	23,8	1.312	33,3		
1.250	31,8	3132	3133	SBT 1250-16	1.000	25,4	1.310	33,2		
1.375	34,9	3110	3111	SBT 1375-16	1.000	25,4	1.500	38,1		
1.500	38,1	3112	3113	SBT 1500-21	1.312	33,3	1.620	41,2		
1.750	44,5	3114	3115	SBT 1750-22	1.375	34,9	1.875	47,6		
2.000	50,8	3116	3117	SBT 2000-26	1.625	41,3	2.125	54,0		

- For use in mounting panels up to 1/4" thick.
- Converts raw-edged holes to smooth, neat, insulated holes.
- Insulates and mechanically protects electrical and telecommunications cables, tubing, hose, rope, and utility lines.
- Locking fingers snap into holes with fingertip pressure.
- Locking fingers in fractional increments up to the maximum panel thickness.
- Withstands a push back force of >35 pounds.
- Available in multiple sizes for use in .375" (9,5 mm) to 2.0" (50,8 mm) diameter holes.

Standard color black. Consult Heyco for white and other colors.
 *Notched head, triple locking finger design.
 **Single Locking Step for Panel Thickness up to .250" (6,4 mm).



Material Nylon 6/6

Certifications Recognized under the Component Program of Underwriters' Laboratories, File E15331
 Certified by Canadian Standards Association, File 8919

Flammability Rating 94V-2

Material Temperature Index 257°F (125°C)—Maximum temperature on part not to exceed 221°F (105°C)

Quick Specs



SUBMITTAL FOR ACCEPTANCE

Project: **183000**
Ref. No.: **99**
Description: **CCTV IP-CAMERA SYSTEM, DOME-TYPE**
Quantity: **3**

Date: 1/28/2020

To: Mr. Dan Kleinhenz
Walsh Construction

From: Dan Wackerman
Security Fence Group
Traffic Signals & Lighting Division
1500 Farr Drive, Suite 2
Dayton, OH 45404

In accordance with ODOT C&MS, submittals for the following reference number are attached. All material meets the requirements of the plan documents and ODOT CMS 2016. Please forward to ODOT for Acceptance.

Prop Line #	Item Code	Description	Quantity	Unit
019		CCTV IP-CAMERA SYSTEM, DOME-TYPE	3	EA

If you have any questions regarding this submission, please contact me at (937) 424-3000 or by e-mail at danw@sfence.com

Sincerely,

Dan Wackerman
Project Manager

MIC-ITS7530B2 and MIC-ITS7530W2 for Transportation Applications

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Exceptional strength and ruggedness for any outdoor application including traffic monitoring (bridges, tunnels, or highways), perimeter protection, city surveillance, and mining
- ▶ Built-in Intelligent Video Analytics alert operators in case of unusual scene activity
- ▶ Starlight camera technology with excellent low-light sensitivity (color = 0.0077 lx) and High dynamic range (120 dB) (to see details in bright and dark areas simultaneously)
- ▶ NTCIP-conformant, compass direction and absolute AZ/EL position readings

The camera's true advantage is its rugged design combined with Intelligent Video Analytics developed specifically for the most demanding environments. The camera is well-suited for extreme environments and adverse weather conditions such as high winds, rain, fog, ice, and snow. The camera operates at extreme temperatures ranging from -40 °C to +65 °C (-40 °F to +149 °F). Even in extreme conditions and challenging illumination scenarios, the camera provides the highest-quality video images and relevant data interpreted directly at the source. H.265 compression technology, Intelligent Dynamic Noise Reduction and dynamic Encoder Regions contribute to bit rate saving. The MIC IP starlight 7000i camera is an advanced PTZ surveillance platform for mission-critical applications. With starlight imaging technology and excellent low-light sensitivity, the MIC IP starlight 7000i camera is the perfect solution for robust and high-quality imaging needs.

The MIC ITS camera conforms to the National Transportation Communications for ITS Protocol (NTCIP) specification. NTCIP conformance ensures that the MIC camera integrates with transportation management devices.

Functions

Exceptional low-light performance

The latest sensor technology combined with the sophisticated noise suppression results in an exceptional sensitivity in color. The low-light performance is so good that the camera continues to provide excellent color performance even with a minimum of ambient light.

High dynamic range

The dynamic range of the camera is outstanding and is obvious in real-world performance comparisons. In extended dynamic range mode, the camera uses an electronic shutter to capture four images with different exposure time and reproduce a high-contrast frame. The result is that you can view details in both

the bright areas (highlights) and the dark areas (shadows) of a scene at the same time. You can easily distinguish objects and features (for example, faces) with bright backlight.

Ruggedized design for extreme applications

The camera is designed to last in surveillance applications that are beyond the mechanical capabilities of conventional positioning systems. The complete metal body has been engineered to withstand high-impact or continuous low-frequency vibration. The camera models comply to IK10 rating for impact resistance and to the IEC 60068 standards applicable to vibration and shock.

The closed-loop PTZ positioning system allows the camera to maintain its position under continuous vibration or after an extreme shock event, even without homing or pre-position calibration.

The camera benefits from Bosch domain knowledge in material engineering and coatings. As a result, the superior metallurgy and the finish of the camera provide unprecedented protection against corrosion. The camera has been tested for 2000 hours of salt spray per the ASTM B117 standard.

Robust design rated to an industry-leading IP68, Type 6P, IK10

Subjected and certified to rigorous dust and immersion tests (IP68, Type 6P) and impact test (IK10), MIC cameras are perfectly suited for installation in even the most unforgiving environments. The cameras' aluminum housing receives a corrosion protection surface treatment, along with robust, powder coat paint. Reliable O-ring seals completely protect the internal components from the external environment, meaning that there is no need to pressurize the camera. To guarantee unit integrity, the factory tests each MIC camera for leaks before shipping.

Pan and tilt drive and mechanism

The pan and tilt mechanism is a ruggedized, direct-drive system. The brushless motors directly control the pan and tilt movement using a finely-tuned gear train designed to minimize backlash and support continuous operation without significant wear and tear.

With a full 360° continuous rotation pan and 290° tilt control (on upright models without illuminators) and super-quick pan (120°/second) and tilt (90°/second) for exceptional viewing capability, the camera outperforms other cameras in its class.

Dual-mode Illumination

The field-installable MIC illuminator accessory (sold separately) consists of covert IR LEDs, visible IR LEDs, and White light LEDs. IR LEDs enable Detection of objects 450 m (1476 ft) away.

The following table identifies the application for each type of LED.

Application	Type of illuminator
Close-range covert illumination	940 nm IR LEDs
Long-range detection	850 nm IR LEDs
Identification and deterrent	White light LEDs

The MIC camera can steer the IR beam dynamically to match the illumination intensity with the camera's field of view according to the zoom level.

Beam intensity is controlled automatically or manually, depending on user preference. Decreasing intensity reduces overexposure.

The patented, integrated Constant Light technology delivers a consistent level of illumination performance throughout the life of the product, even in fluctuating temperatures.

White light mode allows operators to capture full scene details in color or use the light as a deterrent effect.

H.265 high-efficiency video encoding

The camera is designed on the most efficient and powerful H.264 and H.265/HEVC encoding platform. The camera is capable to deliver high-quality and high-resolution video with very low network load. With a doubling of encoding efficiency, H.265 is the new compression standard of choice for IP video surveillance systems.

Intelligent Dynamic Noise Reduction

The Intelligent Dynamic Noise Reduction technology reduces unnecessary load for the encoder by distinguishing between noise and relevant information in a scene. Because noise is reduced at the source during image capture, the encoder can produce a lower bit rate without compromising video quality. Intelligent Dynamic Noise Reduction technology adjusts spatial and temporal filtering. The filtering method is based on intelligent analysis of the scene content.

Motion compensated temporal filtering reduces motion blur normally associated with standard temporal filtering. This motion compensated temporal filtering also maintains image quality of fast moving objects while still optimizing the encoder input. The motion compensated temporal filtering allows the lowest possible bit rate.

Intelligent streaming

Smart encoding capabilities, together with Intelligent Dynamic Noise Reduction technology and analytics, make the bandwidth consumption drop to extremely low levels. Only relevant information in the scene, such as motion or objects found with the analytics, are encoded.

The camera is capable of quad streaming which allows the camera to deliver independent, configurable streams for live viewing, recording, or remote monitoring via constrained bandwidths.

Intelligent Video Analytics on the edge

The camera includes the latest release of the Intelligent Video Analytics application from Bosch. Designed for mission-critical applications, the video analytics can reliably detect, track, and analyze moving objects while suppressing unwanted alarms from spurious sources in the image, even in harsh weather conditions.

Advanced tasks such as wrong-way detection, parking in a forbidden area, automatic incident detection (AID), as well as object filters based on size, speed, direction, aspect ratio, and color can be defined. A simplified calibration mode reduces installation time significantly, because you only need to enter the camera installation height, Azimuth, and GPS location one time for each camera, independent of pre-positions.

After the camera is calibrated, the analytics engine can automatically classify and count objects as upright person, car, bike, or truck.

Note: Shadows and headlights may reduce reliability of this function.

Intelligent Tracking

When the Intelligent Video Analytics application in the camera detects objects or individuals, the camera can automatically activate the Intelligent Tracking feature, which controls the pan/tilt/zoom actions of the camera to track objects and keep them in view. The newest generation of the Intelligent Tracking feature ensures smoother camera motion for more comfortable viewing and more reliably tracking objects even under challenging scenes.

Areas with potentially interfering background motion (moving trees, pulsating lights, and busy roads) can be masked out.

The camera supports 2 Intelligent Tracking modes:

- **Auto mode:** In this mode, the camera follows any object that has triggered an alarm in the Intelligent Video Analytics application. This mode is most useful for scenarios where the alarm cases can be clearly defined, for example, when no motion is expected at all.
- **Click mode:** In this mode, users can click on any object detected by the Intelligent Video Analytics application to enable the camera to track the movement of the selected object. This mode is most useful for scenarios where normal scene activity is expected.

Data security

Special measures are necessary to ensure the highest level of security for device access and data transport. On initial setup, the camera is only accessible over secure channels and enforces a password.

Web browser and viewing client access can be protected using HTTPS or other secure protocols that support state-of-the-art TLS 1.2 protocol with updated cipher suites including AES encryption with 256 bit keys. No software can be installed in the camera, and only authenticated firmware can be uploaded. A three-

level password protection with security recommendations allows users to customize device access. Network and device access can be protected using 802.1x network authentication with EAP/TLS protocol. Superior protection from malicious attacks is guaranteed by the Embedded Login Firewall, on-board Trusted Platform Module (TPM) and Public Key Infrastructure (PKI) support.

The advanced certificate handling offers:

- Self-signed unique certificates automatically created when required
- Client and server certificates for authentication
- Client certificates for proof of authenticity
- Certificates with encrypted private keys

Backwards compatibility

While the MIC ITS camera can be connected directly to an IP network for live viewing and recording, it also offers installers the flexibility to integrate into an analog CCTV system. With the addition of a Bosch decoder, customers can access the high-performance features of MIC ITS cameras within existing analog infrastructures without investing in an entire system upgrade. Video and control connections from the decoder can be connected to a matrix switcher/controller system, or directly to an analog monitor sitting near a serial controller/keyboard.

System integration and ONVIF conformance

The camera conforms to the Open Network Video Interface Forum (ONVIF) Profile S and Profile G specifications. For H.265 configuration the camera also supports Media Service 2 which is part of the future ONVIF Profile T. Compliance with these standards guarantees interoperability between network video products regardless of manufacturer. Third-party integrators can easily access the internal feature set of the camera for integration into large projects. Visit the Bosch Integration Partner Program (IPP) website (ipp.boschsecurity.com) for more information.

The camera is also compliant to NTCIP for intelligent traffic systems.

Ease of installation

The camera has been designed for quick and easy installation, a key feature from Bosch IP video security products.

The camera supports mounting in upright, inverted, or canted orientation. The field-selectable canting option allows the upper section of the camera to be tilted down at a 45° angle. This is very useful for installations that require a view of the scene directly under the camera.

Power options

The camera can be powered by a network compliant to High Power-over-Ethernet using a Bosch model of High PoE Midspan (sold separately) or other device known to be compatible. With this configuration, only a single (Cat5e/Cat6e) cable connection is required to view, to power, and to control the camera.

For maximum reliability, the camera can operate with a redundant power system of a High PoE Midspan and a separate 24 VAC power source connected simultaneously. If either the High PoE or 24 VAC power source fails, the camera seamlessly transitions to the remaining power source.

The 60 W midspan (NPD-6001A) can supply power to models without an illuminator accessory. The 95 W midspan (NPD-9501A) can supply power to all models of MIC IP starlight 7000i, including models with the illuminator accessory.

The camera can also accept a standard 24 VAC power source if a High PoE network interface will not be used. User-supplied wiring must be in compliance with electrical codes (Class 2 power levels).

Refer to the table in the Installation/configuration notes section for more information.

Camera Diagnostics

The camera has several built-in sensors / advanced diagnostics that display warnings on the camera's OSD about the health of the camera. The diagnostics log records the events such as:

- Low voltage - a drop in incoming power below the level where the camera becomes non-functional
- High temperature - the internal temperature exceeds specifications
- Low temperature - the internal temperature exceeds minimum levels
- High humidity - the internal humidity exceeds 70%
- High vibration - the acceptable level of acceleration forces was exceeded
- Total hours of camera operation
- Illuminator aging history

Certain events also appear on the camera's OSD.

These diagnostic records are available for the installation or service technician to review.

Unsurpassed reliability

As with all Bosch products, the camera is designed using the industry's best design process and is subjected to the most stringent testing standards such as HALT (highly accelerated life testing), which pushes the limits of products to ensure reliability throughout their lifetime.

Certifications and approvals

Electromagnetic Compatibility (EMC)	Complies with FCC 47 CFR Part 15, ICES-003, and CE regulations, including latest versions of: EN 50130-4 EN 61000-3-3 EN 50121-4 (Railway applications) EN 55032 EN 61000 3-2 AS/NZS CISPR 22
Product Safety	Complies with UL, CE, CSA, EN, and IEC Standards including: UL 62368-1

UL 60950-1, Ed. 2
CAN/CSA-C22.2 No. E60950-1B-07
EN 62368-1

Marks UL, CE, WEEE, RCM, EAC, VCCI, FCC, RoHS

NEMA TS 2-2003 Complies with:
Section 2.2.7: Transients, Temperature, Voltage and Humidity tests
Section 2.2.8: Vibration test
Section 2.2.9: Shock test

Region	Regulatory compliance/quality marks	
Europe	CE	MIC IP starlight 7000i
USA	UL	MIC IP starlight 7000i

Installation/configuration notes

In the table below, an "X" identifies the power source options for MIC IP camera models.

CAMERA MODELS	60 W midspan	95 W midspan	VIDEOJET connect 7000	24 VAC PSU
Models with illuminator		X	X	X
Models without illuminator	X	X	X	X

Technical specifications

Imager	1/2.8-type Exmor R CMOS sensor
Effective Picture Elements (Pixels)	1945 x 1097 (2.13 MP)
Lens	30x motorized Zoom 4.3 mm to 129 mm F1.6 to F4.7
Field of View (FOV)	2.3° to 63.7°
Focus	Automatic with manual override
Iris	Automatic with manual override
Digital Zoom	12x

Video performance - Sensitivity

(3100K, reflectivity 89%, 1/30, F1.6, 30 IRE)

Color	0.0077 lx
Monochrome	0.0008 lx

Additional Camera Settings

Gain control	AGC, Fixed
Aperture Correction	Horizontal and vertical

Electronic Shutter Speed (AES)	1/1 sec to 1/10000 sec (22 steps)
Signal-to-Noise Ratio (SNR)	>55 dB
Day/Night switch	Automatic IR cut filter
Backlight compensation (BLC)	On, Off
White balance	2000 K to 10,000 K ATW, AWB Hold, Extended ATW, Manual, Sodium Lamp Auto, Sodium Lamp
Day/Night	Monochrome, Color, Auto
Defog mode feature	Improves visibility when viewing foggy or other low-contrast scenes.

High dynamic range (HDR)	120 dB (25/30 fps)
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Noise Reduction	Intelligent Dynamic Noise Reduction
-----------------	-------------------------------------

DORI	DORI definition	Distance to Object		
		WIDE 1X	TELE 30X	Scene width
Detect	25 px/m (8 px/ft)	62 m (203 ft)	1913 m (6276 ft)	77 m (252 ft)
Observe	63 px/m (19 px/ft)	25 m (81 ft)	765 m (2510 ft)	31 m (100 ft)
Recognize	125 px/m (38 px/ft)	12 m (41 ft)	383 m (1255 ft)	15 m (50 ft)
Identify	250 px/m (76 px/ft)	6 m (20 ft)	191 m (628 ft)	8 m (25 ft)

Video content analysis

Analysis type	Intelligent Video Analytics
---------------	-----------------------------

Configurations	Off / Global VCA / Profiles 1 - 16
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Calibration	Automatic self-calibrating when height is set
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Alarm rules (combinable)	Any object Object in field Crossing line Entering field Leaving field Loitering Following route Idle object Removed object Counter Occupancy Crowd detection Condition change Similarity search
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	Tampering
Object filters	Duration Size Aspect ratio v/h Speed Direction Object classes (Upright persons, Bikes, Cars, Trucks) Color

Network

Standard/Video compression	H.265, H.264 (ISO/IEC 14496), M-JPEG, JPEG
----------------------------	--

Streaming	Independent H.264 and H.265 streams 3 encoder instances of H.264 or H.265 stream
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Resolutions (H x V)

1080p HD	1920 x 1080
720p HD	1280 x 720
1.3 MP 5:4 (cropped)	1280x 1024
D1 4:3 (cropped)	704 x 480
640x 480	640x 480
432p SD	768 x 432
288p SD	512 x 288
144p SD	256 x 144

Protocols	IPv4, IPv6, UDP, TCP, HTTP, HTTPS, RTP/RTCP, IGMP V2/V3, ICMP, ICMPv6, RTSP, FTP, ARP, DHCP, APIPA (Auto-IP, link local address), NTP (SNTP), SNMP (V1, V3, MIB-II), 802.1x, DNS, DNSv6, DDNS (DynDNS.org, selfHOST.de, no-ip.com), SMTP, iSCSI, UPnP (SSDP), DiffServ (QoS), LLDP, SOAP, Dropbox™, CHAP, digest authentication
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Note: Dropbox is a trademark of Dropbox, Inc.

Ethernet	10BASE-T/100BASE-TX, auto-sensing, half/full duplex
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Encryption	TLS 1.2, SSL, DES, 3DES, AES
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Ethernet connector	RJ45
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GOP Structure	IP, IBP, IBBP
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Data Rate (H.265, 1080P)	61 kbps to 2.8 Mbps (depending on the scene, the frame rate, and the quality settings)
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Overall IP Delay	60fps: 200ms (typical)
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Connectivity	ONVIF Profile S ONVIF Profile G Auto-MDIX
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NTCIP Protocols	
CCTV Camera Control	NTCIP 1205
Application Layer	SNMP per NTCIP 1101:1996 & NTCIP 2301
Transport/Network Layers	TCP/IP per NTCIP 2202:2001
Sub-network Layer	PMPP (Point to Multi-Point Protocol) per NTCIP 2101:2001 & NTCIP 2102:2003

The average typical optimized bitrate in kbits/s for various frame rates is shown in the table:

FPS	1080p		720p	
	H.264	H.265	H.264	H.265
60	4200	1649	2600	1249
30	2600	1413	1300	1096
15	2100	1157	1100	902
12	1800	1075	1000	841
5	1250	746	600	597
2	500	407	270	343

Actual bitrate may vary depending on the scene complexities and encoding configurations.

Miscellaneous

Sectors / Title	4, 8, 12, or 16 user-selectable, independent Sectors, each with 20 characters per Title
Privacy Masks	24 individually configurable Privacy Masks; maximum 8 per Pre-position; programmable with 3, 4 or 5 corners; selectable color of Black, White, or Gray, "Auto" (average background color)
Virtual Masks	24 individually configurable Virtual Masks to hide parts of the scene (background motion such as moving trees, pulsating lights, busy roads, etc.) which should not be considered for flow analysis to trigger Intelligent Tracking.
Pre-positions	256 Pre-positions, each with 20 characters per Title
Guard Tours	Custom Recorded Tours - two (2), total duration 30 minutes: Pre-position tour - one (1), consisting of up to 256 scenes consecutively, and one (1) customized with up to 64 user-defined scenes
Supported Languages	English, Czech, Dutch, French, German, Italian, Polish, Portuguese, Russian, Spanish, Japanese, Chinese
Washer Pump Interface	Control functions integrated. MIC Alarm/Washer Interface Unit (MIC-ALM-WAS-24, sold separately) provides electrical interface to user supplied washer pump device.

Camera status monitoring	Integrated sensors monitor operational status such as internal temperature, humidity level, incoming voltage level, vibration, and shock events.
Diagnostics	Various status conditions are tracked in internal diagnostic log. Critical fault conditions will also be displayed on screen.
Supported mounting options (with applicable accessories)	Direct to a surface On a wall (Cables through the wall) On a wall (Conduit/cables down the wall) On the corner of a wall On a pole
Custom logo	File format: .bmp; 8 bit (256 colors), 128x128 pixels maximum
Camera titles	Twenty-character, two-line and three-line camera titles (on the OSD), with configurable text colors, that display either the options for Azimuth/Elevation/Compass/Zoom, or the camera title and compass data

Mechanical

Drive Unit	Brushless, integral pan/tilt motor drive
Supported mounting orientation	Upright Inverted Canted
Pan Range	360° continuous rotation
Tilt Angle	Without illuminators (camera upright): 290° Without illuminators (Inverted): 250° With illuminators: 186.6°
Tilt Range	Upright/Inverted: -55° - +90° Canted: -90° - +90°
Variable Pan Speed	0.2°/second - 120°/second
Variable Tilt Speed	0.2°/second - 90°/second
Intelligent Tracking Speed	>0.2°/second (minimum)
Pre-position Speed	120°/second
Preposition Accuracy	Without illuminators: +/-0.06° With illuminators: +/-0.07°
Proportional Pan / Tilt to Zoom	Yes
Audible Noise	<65 dB

Electrical

Input Voltage	21-30 VAC, ±10%, 50/60 Hz, and/or High Power over Ethernet (56 VDC nominal)
Power Consumption (typical)	Without illuminator: 40 W With illuminator: 70 W

Current Consumption	40 W (24 VAC): 2.4A 70 W (24 VAC): 4.1A 40 W (High PoE): 0.9A 70 W (High PoE): 1.25A
Redundant configuration	Connect both a High PoE Midspan and a separate 24 VAC power source. If either the High PoE or the 24 VAC power source fails, the camera seamlessly transitions over to use the remaining power source.
Surge protection	Built-in surge protection for power, data, and network interfaces

User Connections

Accessory Interface/ Control Data	RS-485, Simplex, half and full duplex, user-selectable baud rate or auto-baud Used to communicate with optional MIC Alarm/Washer Interface box (MIC-ALM-WAS-24) or Bosch OSRD, Pelco P/D, Forward Vision, and Cohu serial protocols.
Power, pigtail	24 VAC (nominal)
Chassis ground	Ground wire with connector lug
Power, Network	Without illuminator: RJ45 100BASE-TX Ethernet High PoE Midspan - 60 W (NPD-6001A) or 95 W (NPD-9501A) With illuminator: 95 W High PoE Midspan (NPD-9501A)*
Power, Camera	24 VAC (power supply)
Video and Control	RJ45 100BASE-TX Ethernet RS-485 Simplex 9600 baud (dedicated for MIC-ALM-WAS-24)
Alarm/Washer	3-wire RS-485

* Must purchase either NPD-9501A or VIDEOJET connect 7000 (VJC-7000-90) in order to use the High PoE solution.

Communications / Software Control

Camera Setup/Control	Via Internet Explorer web browser version 7.0 or later, Bosch Configuration Manager, Bosch Video Management System (BVMS), Bosch Video Client (BVC), or support for third party software
Software Update	Network firmware upload
Serial protocols	Bosch OSRD, Pelco P/D, Forward Vision, and Cohu (Note: For Pelco, Forward Vision, and Cohu protocols, a separate license (MVS-FCOM-PRCL) is required.)

Environmental

Note: Unit includes internal heater and fan.

Ingress Protection Rating/Standard	IEC 60529 IP68 / Type 6P (dust and immersion) when installed on a MIC-DCA or on a MIC wall mount IP67 (moisture and dust) rating on connectors in the base of the camera when using the IP67 Connector Kit (MIC-IP67-5PK), which is also required when using non-Bosch mounts
External Mechanical Impact (IK Code or Impact rating)	IEC 62262 IK10 (excluding glass window)
Operating Temperature	-40 °C to +65 °C (-40 °F to +149 °F) Compliant to -34 °C to +74 °C (-30 °F to +165 °F) based on NEMA TS 2-2003 (R2008), para 2.1.5.1 using fig. 2.1 test profile
Cold Start-up Temperature	-40 °C (-40 °F) (Requires 60-minute warm-up prior to PTZ operations.)
Storage Temperature	-60 °C to +70 °C (-76 °F to +158 °F)
Humidity	0-100%
Wind Load	241 km/h (150 mph) (sustained) (Gusts up to 290 km/h (180 mph)) MIC camera w/ Illuminator Coefficient of Drag: 1.370 Effective Projected Area (EPA): 0.089 m ² (0.96 ft ²)
Vibration	IEC 60068-2-6, Test Fc: Vibration (sinusoidal), 10m/s ² (1.0G) NEMA TS2 Section 2.2.8 Vibration: 5-30 Hz, (0.5G) Sinusoidal vibration test IAW MIL-STD-167-1A
Shock	IEC 60068-2-27, Test Ea: Shock, Half Sine Impulse, 6ms, 40G NEMA TS 2 Section 2.2.9 Shock (Impact) Test Half sine wave 11 ms, 10G
Salt Mist Spray (Corrosion Test)	ASTM B117 (2000 hours)

Construction

Dimensions (W x H x D)	Without illuminator accessory or sunshield: <i>Upright, Inverted:</i> 217.75 mm x 368.89 mm x 178.33 mm (8.57 in. x 14.52 in. x 7.02 in.) <i>Canted:</i> 217.75 mm x 330.96 mm x 239.68 mm (8.57 in. x 13.03 in. x 9.44 in.)
	Without illuminator accessory, but with sunshield: <i>Upright, Inverted:</i> 217.75 mm x 372.20 mm x 178.33 mm (8.57 in. x 14.65 in. x 7.02 in.) <i>Canted:</i> 217.75 mm x 334.27 mm x 239.68 mm (8.57 in. x 13.16 in. x 9.44 in.)
	With illuminator accessory: <i>Upright, Inverted:</i> 217.75 mm x 439.91 mm x 178.33 mm (8.57 in. x 17.32 in. x 7.02 in.) <i>Canted:</i> 217.75 mm x 401.98 mm x 239.68 mm (8.57 in. x 15.83 in. x 9.44 in.)

Weight	6.7 kg (14.7 lb) 7.9 kg (17.4 lb) with attached illuminator
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Window	Tempered flat glass
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Construction Material	Cast solid aluminum
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Window Wiper	Integrated, long-life silicone wiper
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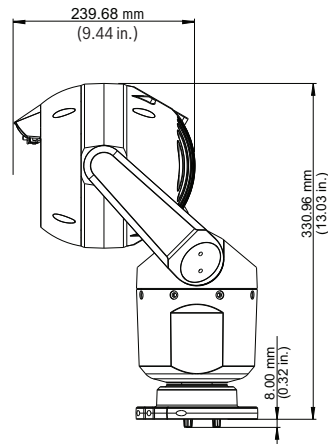
Sunshield (to prevent sun load in hot climates)	Optional; sold separately
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Canting	On-site canting functionality
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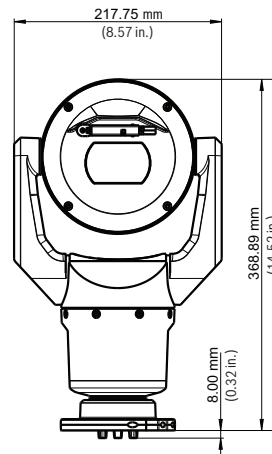
Standard Finish	Chromate-based surface treatment with powder coat paint, sand finish
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Standard Color	Black (RAL 9005) or White (RAL 9010)
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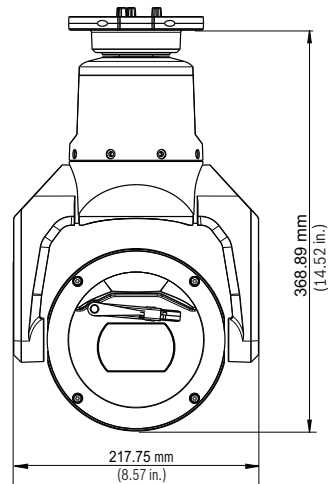
Dimensional Drawings



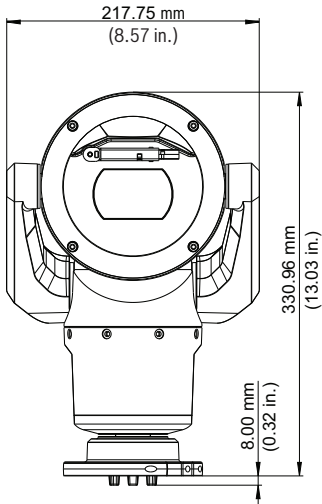
Side view - canted



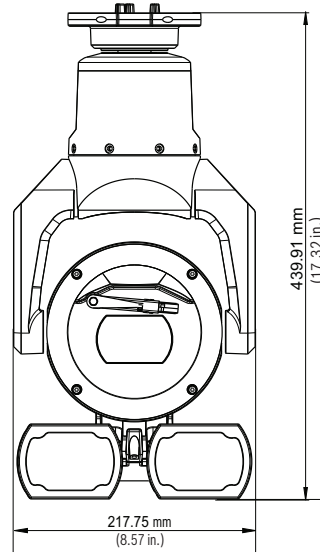
Front view - upright



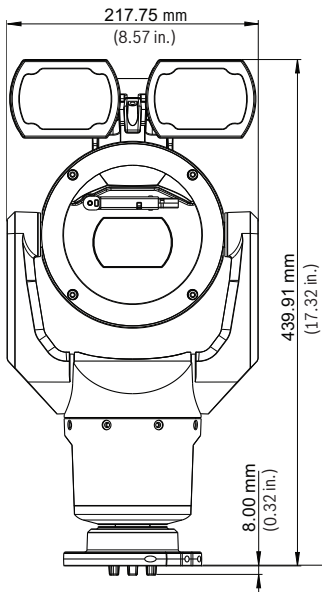
Front view - inverted



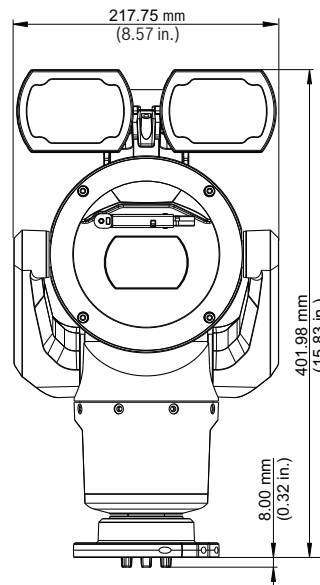
Front view - canted



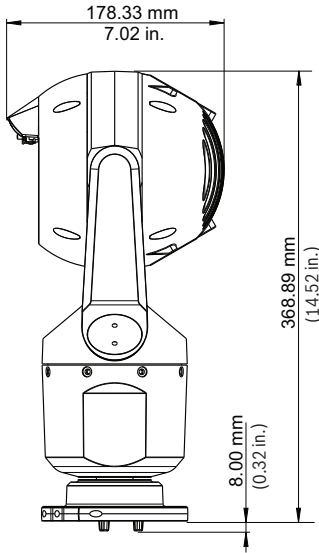
Front view, with illuminator - inverted



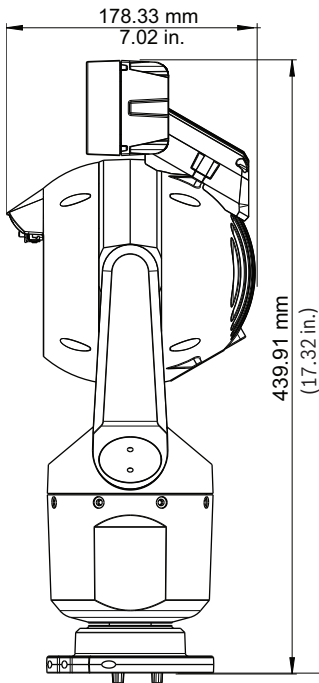
Front view, with illuminator - upright



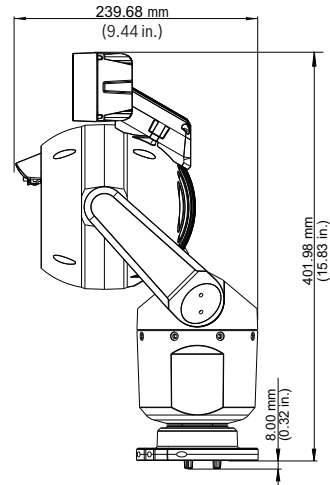
Front view, with illuminator - canted



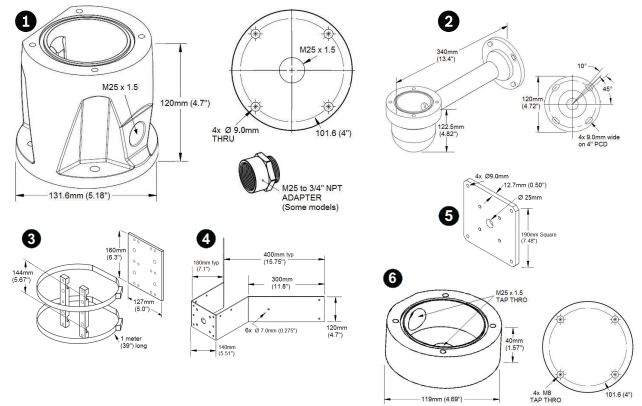
Side view - upright



Side view, with illuminator - upright



Side view, with illuminator - canted



MIC 7000i series Optional Mounts

- | | |
|------------------------|-----------------------------|
| 1 Deep conduit adapter | 4 Corner mount bracket |
| 2 Wall mount bracket | 5 Wall mount spreader plate |
| 3 Pole mount bracket | 6 Shallow conduit adapter |

Ordering information

MIC-ITS7530B2 PTZ camera 2MP HDR 30x IP68 black ITS

Ruggedized 2MP HD PTZ camera; H.265; starlight imaging; IVA; 30x. Full NTCIP support. Black housing color.

Order number **MIC-ITS7530B2**

MIC-ITS7530W2 PTZ camera 2MP HDR 30x IP68 white ITS

Ruggedized 2MP HD PTZ camera; H.265; starlight imaging; IVA; 30x. Full NTCIP support. White housing color.

Order number **MIC-ITS7530W2**

Accessories
MIC-ILB-300 Illuminator white-IR light 450m, black

Illuminator accessory for MIC IP starlight 7000i cameras. Combination of IR (850 nm/940 nm) + White light (5600-6300K) LEDs. Black (RAL 9005). Sand finish. Order number **MIC-ILB-300**

MIC-ILW-300 Illuminator white-IR light 450m, white

Illuminator accessory for MIC IP starlight 7000i cameras. Combination of IR (850 nm/940 nm) + White light (5600-6300K) LEDs. White (RAL 9010). Sand finish. Order number **MIC-ILW-300**

NPD-9501A Midspan, high PoE, single port, AC in

High PoE, 95 W, Single port indoor Midspan. 120/230VAC input. Supplies a data and power interface to camera using a single standard CAT5e (or better) network cable. Order number **NPD-9501A**

NPD-6001A Midspan, high PoE, single port, AC in

High Power, 60 W Single Port PoE Midspan with AC in Order number **NPD-6001A**

VG4-A-PSU1 PSU, 120VAC, for AUTODOME, MIC7000

Power supply, 120VAC input, 24VAC output @ 96VA. Suitable for powering AUTODOME, MIC IP 7000, and MIC IP fusion 9000i cameras. White aluminum enclosure with cover. IP66 ingress. IK10 impact. Order number **VG4-A-PSU1**

VG4-A-PSU2 Power supply, 230VAC, AUTODOME, MIC7000

Power supply, 230VAC input, 24VAC output @ 96VA. Suitable for powering AUTODOME, MIC IP 7000, and MIC IP fusion 9000i cameras. White aluminum enclosure with cover. IP66 ingress. IK10 impact. Order number **VG4-A-PSU2**

VJC-7000-90 PSU, PoE IP, 100-240VAC, 50/60Hz

IP power supply unit with PoE, 100 VAC - 240 VAC (90 VAC -264 VAC with tolerance), 50/60 Hz. Supports H. 264 with maximum 1080P30 resolution and frame rate. Order number **VJC-7000-90**

MIC-ALM-WAS-24 Interface box, alarm, washer pump, 24VAC

Interface box for alarms and washer pump connections for MIC7000 and MIC IP fusion 9000i cameras. Requires user-supplied 24 VAC, 50/60 Hz input. Impact-resistant polycarbonate enclosure. IP67 and NEMA 4X rated ingress. Includes four (4) watertight glands. Grey (RAL 7035) enclosure color. Order number **MIC-ALM-WAS-24**

MIC-DCA-HB Deep conduit mount, M25 holes, black

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Black (RAL 9005) color. Order number **MIC-DCA-HB**

MIC-DCA-HBA Deep conduit mount, M25 holes, black

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only. Black (RAL 9005) color. Order number **MIC-DCA-HBA**

MIC-DCA-HW Deep conduit mount, two M25 holes, white

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. White (RAL 9010) color. Order number **MIC-DCA-HW**

MIC-DCA-HWA Deep conduit mount, M25 holes, white

DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only. White (RAL 9010) color. Order number **MIC-DCA-HWA**

MIC-WMB-BD Wall mount bracket , black

Wall mount bracket, black sand finish (RAL9005) Order number **MIC-WMB-BD**

MIC-WMB-WD Wall mount bracket, white

Wall mount bracket, white sand finish (RAL9010) Order number **MIC-WMB-WD**

MIC-PMB Pole mount bracket

Pole mount bracket (includes 2 x 455 mm stainless steel banding straps for pole diameters 75 to 145 mm) Order number **MIC-PMB**

MIC-CMB-BD Corner mount bracket, black

Corner mount bracket, black sand finish (RAL9005) Order number **MIC-CMB-BD**

MIC-CMB-WD Corner mount bracket, white

Corner mount bracket, white sand finish (RAL9010) Order number **MIC-CMB-WD**

MIC-SPR-BD Wall mount spreader plate, black sand

Aluminum spreader plate suitable for brickwork surface mounting, black sand finish (RAL9005) Order number **MIC-SPR-BD**

MIC-SPR-WD Wall mount spreader plate, white sand

Aluminum spreader plate suitable for brickwork surface mounting, white sand finish (RAL9010) Order number **MIC-SPR-WD**

MIC-SCA-BD Shallow conduit adapter, black sand

Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR, black sand finish (RAL9005)

Order number **MIC-SCA-BD**

MIC-SCA-WD Shallow conduit adapter, white sand

Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR mount, white sand finish (RAL9010)

Order number **MIC-SCA-WD**

MIC-M25XNPT34 Adapter, M25 to 3/4"NPT, stainless steel

Stainless Steel M25 to 3/4" NPT thread adapter

Order number **MIC-M25XNPT34**

MIC-67SUNSHLD Sunshield for MIC7000 series, white

Three-part molded sunshield for MIC7000 family cameras - 1 bottom shell, 2 top shells (1 for around the optional illuminator accessory). White.

Order number **MIC-67SUNSHLD**

MIC-IP67-5PK Connector kit, IP67, 5pcs

5-pack weather protection kit for MIC7000 cameras. Provides an IP67-rated barrier against dust or moisture. Recommended when MIC camera is mounted directly to installation surface (instead of onto a MIC-DCA or MIC wall mount).

Order number **MIC-IP67-5PK**

MIC-WKT-IR Washer kit, MIC IR

Washer kit for MIC IP starlight 7000i and MIC IP fusion 9000i camera models

Washer kit for analog infrared MIC camera models

Order number **MIC-WKT-IR**

Represented by:

Europe, Middle East, Africa:
Bosch Security Systems B.V.
P.O. Box 80002
5600 JB Eindhoven, The Netherlands
Phone: + 31 40 2577 284
emea.securitysystems@bosch.com
emea.boschsecurity.com

Germany:
Bosch Sicherheitssysteme GmbH
Robert-Bosch-Ring 5
85630 Grasbrunn
Germany
www.boschsecurity.com

North America:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
onlinehelp@us.bosch.com
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Asia-Pacific:
Robert Bosch (SEA) Pte Ltd, Security Systems
11 Bishan Street 21
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Fax: +65 6571 2699
apr.securitysystems@bosch.com
www.boschsecurity.asia

MIC Mounting Brackets and Other Accessories

www.boschsecurity.com



BOSCH

Invented for life



- ▶ Full range of mounting brackets and other accessories.
- ▶ Designed to integrate seamlessly with the MIC family.
- ▶ Provides a best-fit solution for virtually any application.
- ▶ Easy to use and install.
- ▶ Accessories extend functionality.

Bosch Security Systems offers a range of mounting brackets and accessory products for the MIC family of cameras. The mounting brackets (for corner, wall, and pole mounting) are available in the standard colors of the MIC family. (Note: Not all colors of mounting brackets are available for all models of MIC cameras.) The accessories have been designed to work seamlessly with MIC cameras to extend their functionality for your application. This datasheet provides an overview of the available MIC accessories. The following accessories have their own datasheets:

- MIC power supplies
- MIC illuminators (for MIC7000 and MIC IP starlight 7000i models)
- MIC Alarm/Washer Interface (MIC-ALM-WAS-24)
- VIDEOJET connect 7000 (VJC-7000-90)
- High PoE Midspan models
- VG4-A-PSU series
- MIC composite cables

Also available is the Serial Protocol Software License (MVS-FCOM-PRCL), an e-license key for serial protocol for IP cameras such as MIC IP starlight 7000i and MIC IP fusion 9000i.

System overview

Mounting Accessories

Deep Conduit Adapter

The MIC Deep Conduit Adapter (MIC DCA) is designed to allow a weatherproof conduit or cable gland to be fitted to protect the signal cables. The MIC DCA, regardless of model, has two M25 holes, one in the base and one in the side.

An O-ring seals the camera-to-mount interface to an ingress rating of IP68.

Supplied hardware includes:

- Four (4) M8 x 20 stainless steel hex bolts
- Four (4) M8 stainless steel plain washers
- One (1) O-ring, 80 mm x 3 mm
- One (1) end cap/blanking plug, M25 x 1.5, with O-ring

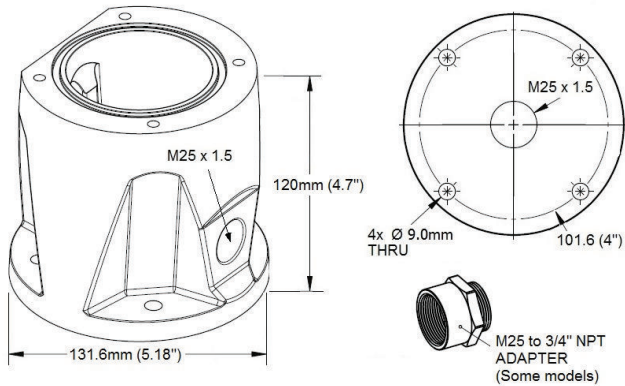
Hinged DCA Models

The MIC Hinged DCA (MIC-DCA-Hx) is deeper than the conventional MIC-DCA and provides a convenient mounting point for a MIC IP starlight 7000 HD, a MIC IP starlight 7000i, or a MIC IP fusion 9000i camera. In specific regions, certain hinged models (MIC-DCA-HxA) include:

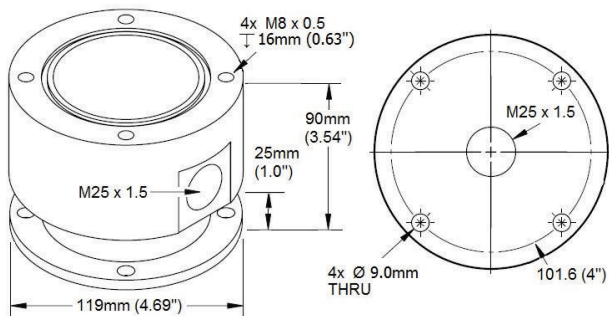
- One (1) conduit adapter (male M25 to female 3/4" NPT)

The hinge feature allows installers to “hang” the camera temporarily but securely during installation for easier connection of cables/wiring before final bolts are installed.

Although the hinge feature is only available when used with a MIC IP starlight 7000 HD, a MIC IP starlight 7000i, or a MIC IP fusion 9000i camera, this DCA is otherwise compatible also with MIC analog cameras.



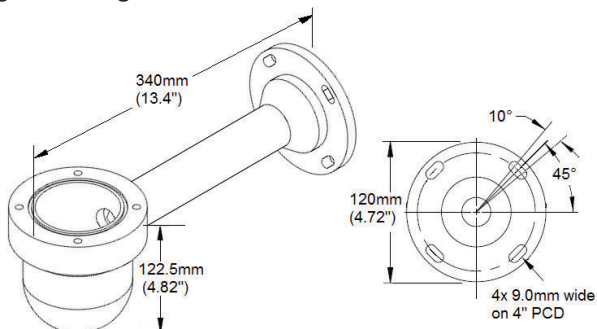
Conventional DCA Models



Wall Mount Bracket

The MIC Wall Mount Bracket (MIC-WMB) allows mounting on building walls. It also coordinates with a MIC Pole Mount Bracket (MIC-PMB) and a MIC Shallow Conduit Adapter (MIC-SCA) to allow mounting a MIC camera on a lamp post, scaffolding, or other non-standard mounting post. The MIC-WMB has a deep bowl to accommodate the signal cable connections.

An O-ring seals the camera-to-mount interface to an ingress rating of IP68.

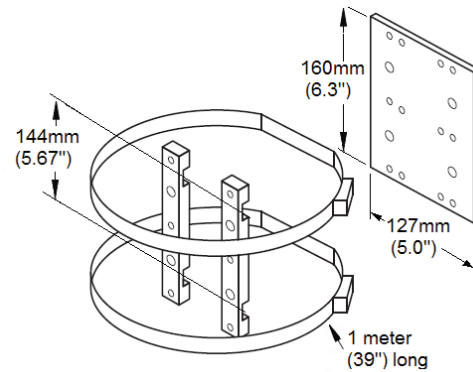


Supplied hardware includes:

- Four (4) M8 x 20 stainless steel hex bolts
- Four (4) M8 stainless steel plain washers
- One (1) O-ring, 80 mm x 3 mm

Pole Mount Bracket

The MIC Pole Mount Bracket (MIC-PMB) coordinates with a MIC-SCA and a MIC-WMB to allow mounting a MIC camera on a lamp post, scaffolding, or other non-standard mounting post. The MIC-PMB accommodates a wide range of diameters.

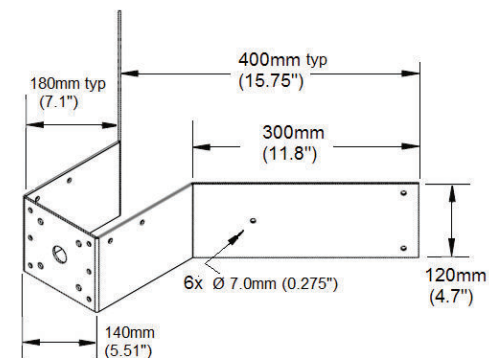


Supplied hardware includes:

- Four (4) M8 x 30 stainless steel cap head bolts
- Six (6) M6 x 20 stainless steel countersunk head bolts
- Two (2) high-torque stainless steel worm drive clips (banding straps), 1 m long
- Two (2) pole mount blocks
- One (1) mounting plate

Corner Mount Bracket

The MIC Corner Mount Bracket (MIC-CMB) coordinates with a MIC-SCA and a MIC-WMB to allow mounting a MIC camera on the corner of a building.

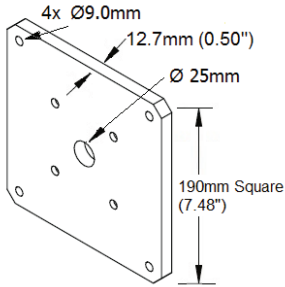


Supplied hardware includes:

- Four (4) M8 x 25 stainless steel hex bolts
- Four (4) M8 stainless steel plain washers
- Four (4) M8 stainless steel nuts

Spreader Plate

The MIC Spreader Plate (MIC-SPR) is used to spread the weight of a MIC camera and its supporting brackets so that the camera can be mounted securely to a flat masonry surface.



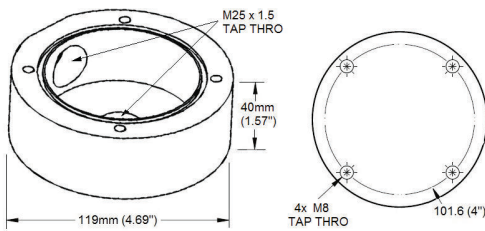
Supplied hardware includes:

- Four (4) M8 x 30 stainless steel cap head bolts
- Four (4) M8 stainless steel plain washers
- Four (4) M8 stainless steel nuts

Shallow Conduit Adapter

The MIC Shallow Conduit Adapter (MIC-SCA) is used as required with other mounting brackets. The MIC-SCA has a single M25 side entry conduit fitting hole. There is not sufficient room inside to allow the camera to be mounted to it directly. (Use a MIC-DCA-Hx or a MIC-DCA instead.)

An O-ring seals the camera-to-mount interface to an ingress rating of IP68.



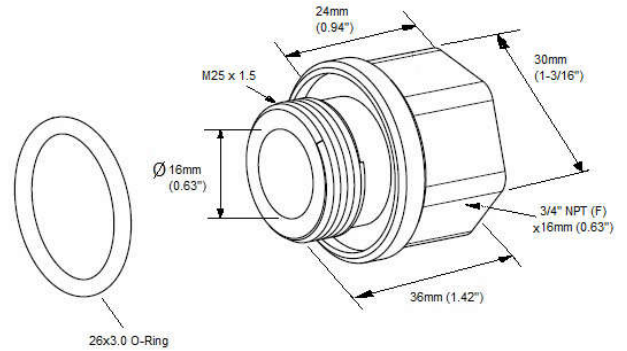
Supplied hardware includes:

- Four (4) M8 x 20 stainless steel hex bolts
- Four (4) M8 stainless steel plain washers
- One (1) O-ring, 80 mm x 3 mm
- One (1) end cap/blanking plug, M25 x 1.5, with O-ring

Other Hardware Accessories

M25 to 3/4" NPT Thread Adapter (MIC-M25XNPT34)

The conduit adapter (male M25 to female 3/4" NPT) (MIC-M25XNPT34) allows attachment of 3/4" NPT conduit that is popular in the North American region to MIC-DCA-Hx, MIC-DCA, and MIC-SCA mounts that have M25x1.5 threaded holes. This adapter is included with the following DCA models: MIC-DCA-HBA, MIC-DCA-HWA, and MIC-DCA-HGA. The adapter is manufactured from 316 stainless steel and includes a silicone O-ring that seals the adapter to the conduit adapter to an ingress rating of IP68.

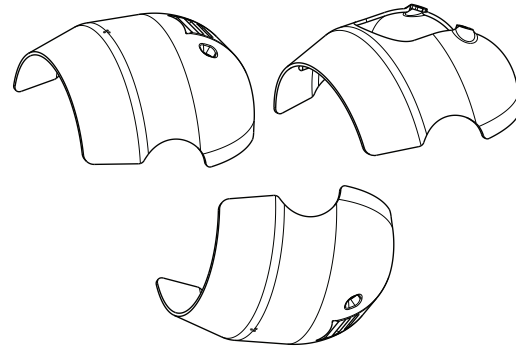


Sunshield Kits

Sunshield Kits are available for various MIC cameras. Each kit is designed to provide additional protection for the camera from direct solar radiation, particularly in sunny climates, by reflecting solar exposure, and by creating an insulating gap between the environment and the surface of the camera.

Sunshield Kit for MIC IP starlight 7000 HD and MIC IP starlight 7000i cameras

The Sunshield Kit for the MIC starlight cameras (MIC-67SUNSHLD) includes three (3) white, molded parts: a bottom shell, one top shell for a camera without an illuminator accessory, and one top shell for a camera with an illuminator accessory.

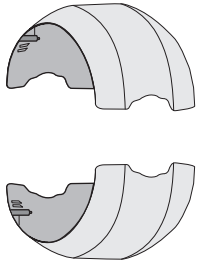


Supplied hardware includes:

- Two (2) M4 x 14 stainless steel socket head Torx screws
- Four (4) M4 x 8 stainless steel socket head Torx screws
- Four (4) M4 stainless steel flat washers

Sunshield Kit for MIC IP fusion 9000i cameras

The Sunshield Kit for MIC IP fusion 9000i cameras (MIC-9K-SNSHLD-W) includes two (2) white, molded shells that attach to the tilt head of the camera.



Supplied hardware includes:

- Four (4) M4 x 8 stainless steel socket head Torx screws
- Four (4) M4 stainless steel flat washers

Supplied hardware includes:

Supplied hardware includes:

Biphase Converters

The MIC Biphase converter cards allow up to eight MIC cameras to be interfaced with Bosch Biphase compatible equipment. The card translates Bosch Biphase protocol to RS-485, half duplex telemetry signals. It also allows the camera address to be set through its integrated DIP switch selector.

The **MIC-BP3** has its own enclosure (rated IP65) with its own power supply, which enables it to be used by MIC power supplies that do not have an available expansion slot.

The power supply for the MIC-BP3 includes a US plug, a European plug, and a UK plug.

The **MIC-BP4** is a plug-in card that fits into an available expansion slot within a non-infrared MIC power supply unit.

Alarm and Washer Pump Drive Card

The 8 Input Alarm Card (MIC-ALM) is designed to work with a MIC power supply with a free expansion slot. The MIC-ALM provides MIC cameras with eight alarm inputs, a washer pump drive function with test/pump priming capability and two additional relays, which can be configured to operate external equipment when an alarm signal is received. The card is compatible with non-infrared MIC power supply units. (The card cannot be used with a MIC IR power supply.)

Washer Kits

The MIC washer kits (MIC-WKT, MIC-WKT-IR) provide the necessary components to allow connection of a washer pump and water reservoir tank to a MIC camera, and control via the camera telemetry.

Supplied hardware includes:

- One (1) washer jet nozzle
- Two (2) mounting brackets for the washer jet nozzle

The MIC-WKT kit also includes a washer pump drive card (MIC-WSH), which fits into an empty expansion slot of the non-IR MIC power supply units and provides electrical connections, a washer pump relay, and a Push to Test / pump prime function.

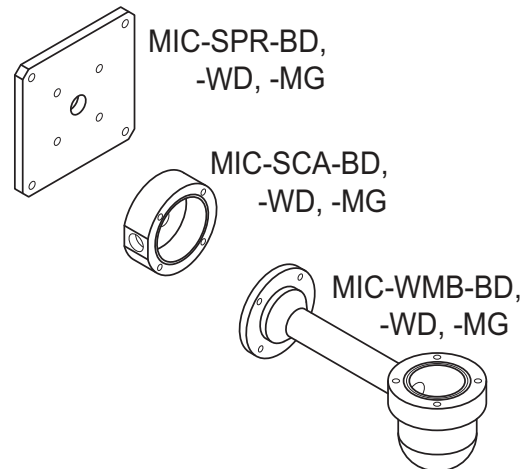
Note: The washer pump drive function is built-in to the MIC infrared (IR) power supply units.

Certifications and approvals

Region	Regulatory compliance/quality marks	
Europe	CE	- MIC-9K-IP67-5PK

Installation/configuration notes

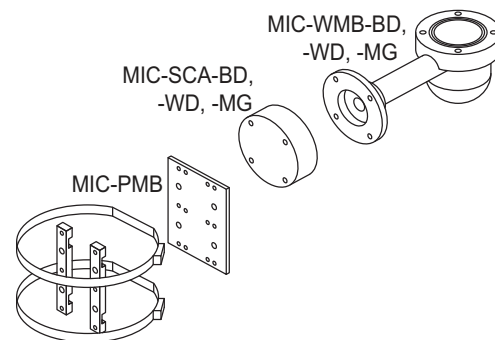
Typical Mounting Arrangement, Wall mount



Typical Wall mount configuration

Not shown: Mounting hardware.

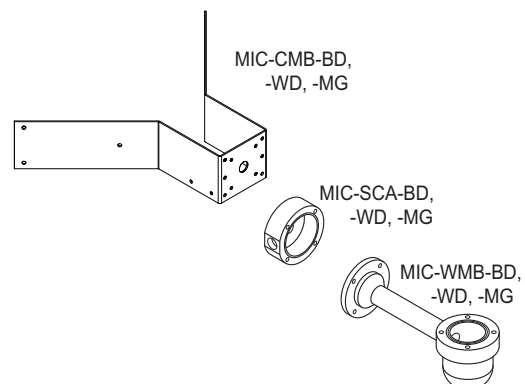
Typical Mounting Arrangement, Pole mount



Typical Pole mount configuration

Not shown: Mounting hardware.

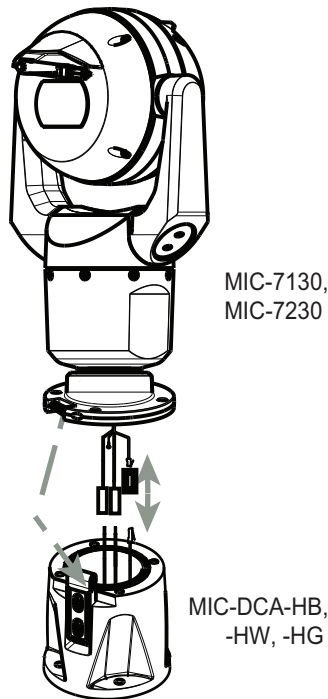
Typical Mounting Arrangement, Corner mount



Typical Corner mount configuration

Not shown: Mounting hardware.

Typical Mounting Arrangement, hinged DCA



Typical hinged DCA mount configuration

Technical specifications

MIC Hinged DCA

Dimensions (H x W)	120 x 131.6 mm (4.7 x 5.18 in.)	
Weight	2.5 kg (5.5 lb)	
Material	solid aluminum with painted polyester finish as below	
	MIC-DCA-HB	Black (RAL 9005), sand finish
	MIC-DCA-HW	White (RAL 9010), sand finish
	MIC-DCA-HG	Grey (RAL 9006), sand finish (Available in specific regions only.)
	MIC-DCA-HBA	Black (RAL 9005), sand finish
	MIC-DCA-HWA	White (RAL 9010), sand finish
	MIC-DCA-HGA	Grey (RAL 9006), sand finish (Available in specific regions only.)

MIC Deep Conduit Adapter

Dimensions (H x D)	90 x 120 mm (3.5 x 4.7 in.)	
Weight	1.45 kg (3 lb)	
Material	solid aluminum with painted polyester finish as below:	
	MIC-DCA-BD	Black (RAL 9005), sand finish

	MIC-DCA-WD	White (RAL 9010), sand finish
	MIC-DCA-GD	Grey (RAL 9006), sand finish

MIC Wall Mount Bracket

Dimensions (W x H x D)	340 x 124 x 120 mm (13 x 5 x 4.7 in.)	
Weight	1.95 kg (4.5 lb)	
Material	solid aluminum with painted polyester finish as below:	
	MIC-WMB-BD	Black (RAL 9005), sand finish
	MIC-WMB-WD	White (RAL 9010), sand finish
	MIC-WMB-GD	Grey (RAL 9006), sand finish
	MIC-WMB-MG	Grey (RAL 7001), sand finish (Available in specific regions only.)

MIC Pole Mount Bracket (MIC-PMB)

Dimensions (W x H x D)	127 x 160 x 9.5 mm (25.375 with pole mount blocks fitted) (5 x 6 x 0.4 in.)	
Weight	1.7 kg (3.75 lb)	
Material	Mounting bracket, mounting blocks: Aluminum Banding straps: Stainless steel	
Finish color	Clear anodized	

MIC Corner Mount Bracket

Dimensions (W x H x D)	564 x 120 x 394 mm (23 x 4.7 x 15.5 in.)	
Weight	2.9 kg (6.5 lb)	
Material	solid aluminum with painted polyester finish as below:	
	MIC-CMB-BD	Black (RAL 9005), sand finish
	MIC-CMB-WD	White (RAL 9010), sand finish
	MIC-CMB-GD	Grey (RAL 9006), sand finish
	MIC-CMB-MG	Grey (RAL 7001), sand finish (Available in specific regions only.)

MIC Spreader Plate

Dimensions (W x H x D)	190 x 190 x 12.7 mm (7.5 x 7.5 x 0.5 in.)	
Weight	1.24 kg (2.7 lb)	
Material	solid aluminum with painted polyester finish as below:	
	MIC-SPR-BD	Black (RAL 9005), sand finish
	MIC-SPR-WD	White (RAL 9010), sand finish

	MIC-SPR-GD	Grey (RAL 9006), sand finish
	MIC-SPR-MG	Grey (RAL 7001), sand finish (Available in specific regions only.)

MIC Shallow Conduit Adapter

Dimensions (H x D)	40 x 120 mm (1.6 x 4.7 in.)	
Weight	0.78 kg (1.7 lb)	
Material	solid aluminum with painted polyester finish as below:	
	MIC-SCA-BD	Black (RAL 9005), sand finish
	MIC-SCA-WD	White (RAL 9010), sand finish
	MIC-SCA-GD	Grey (RAL 9006), sand finish
	MIC-SCA-MG	Grey (RAL 7001), sand finish (Available in specific regions only.)

Sunshield for MIC IP starlight 7000 HD and MIC IP starlight 7000i cameras (MIC-67SUNSHLD)

Dimensions (W x H x D)	mm x mm x mm (x x in.)
Weight	0.42 kg (14.8 oz) [all 3 pieces; only 2 pieces are installed on each camera]

Sunshield for MIC IP fusion 9000i thermal cameras (MIC-9K-SNSHLD-W)

Dimensions (W x H x D)	150 x 232 x 110 mm (5.9 x 9.1 x 4.3 in.)
Weight	0.40 kg (14 oz)

Biphase converters (MIC-BP3, MIC-BP4)**Dimensions (W x H x D)**

• MIC-BP3 Enclosure	120 x 55 x 80 mm (4.7 x 2 x 3 in.)
• MIC-BP3 (Card only)	60 x 10 x 70 mm (2.4 x 0.4 x 2.8 in.)
• MIC-BP4 (Card)	

Weight

• MIC-BP3 (card + enclosure)	0.38 g (13 oz)
• MIC-BP4	0.035 g (1 oz)

Bi-phase Specifications	Shielded 2-wire, half-duplex, multi-drop, 5000 ft cable limit requires 18 AWG wire
Cable Type	Shielded Twisted Pair (STP)
Distance	Maximum 1524 m (5000 ft) (Belden 8760 recommended)
Transmission Rate	31.25 KHz

Gage	1.02 mm (18 AWG) (recommended; required for maximum distance)
Termination	110 Ω
Terminal Connector	Screw terminals
Voltage	4 Vpp

Alarm card (MIC-ALM)

Dimensions (W x H x D)	25 x 125 x 60 mm (1 x 5 x 2.4 in.)
Weight	61 g (2 oz)
Material	PCB Card
Alarm Inputs	8 with LEDs
Relays	2; Washer Pump Drive Function with prime/test button

Alarm/Washer card (MIC-WKT)

Dimensions (W x H x D)	125 x 25 x 60 mm (4.92 x 0.98 x 2.36 in.)
Weight	44 g (1.5 oz)

Ordering information

MIC-DCA-HB Deep conduit mount, M25 holes, black
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands.
Black (RAL 9005) color.
Order number **MIC-DCA-HB**

MIC-DCA-HW Deep conduit mount, two M25 holes, white
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands.
White (RAL 9010) color.
Order number **MIC-DCA-HW**

MIC-DCA-HG Deep conduit mount, two M25 holes, grey
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands.
Grey (RAL 7001) color. Available in specific regions only.
Order number **MIC-DCA-HG**

MIC-DCA-HBA Deep conduit mount, M25 holes, black
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.
Black (RAL 9005) color.
Order number **MIC-DCA-HBA**

MIC-DCA-HWA Deep conduit mount, M25 holes, white
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.
White (RAL 9010) color.
Order number **MIC-DCA-HWA**

MIC-DCA-HGA Deep conduit mount, M25 holes, grey
DCA mount for MIC7000 and MIC IP fusion 9000i cameras. Aluminum. Two M25 holes for conduit/cable glands. Includes an conduit adapter (male M25 to female 3/4" NPT). Available in specific regions only.
Grey (RAL 7001) color.
Order number **MIC-DCA-HGA**

MIC-WMB-BD Wall mount bracket , black
Wall mount bracket, black sand finish (RAL9005)
Order number **MIC-WMB-BD**

MIC-WMB-WD Wall mount bracket, white
Wall mount bracket, white sand finish (RAL9010)
Order number **MIC-WMB-WD**

MIC-WMB-GD Wall mount bracket , grey sand
Wall mount bracket, Grey (RAL 9006), sand finish, for MIC-612xxxxG36x series cameras
Order number **MIC-WMB-GD**

MIC-WMB-MG Wall mount for rugged PTZ camera, grey
Wall Mount Bracket.
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Order number **MIC-WMB-MG**

MIC-PMB Pole mount bracket
Pole mount bracket (includes 2 x 455 mm stainless steel banding straps for pole diameters 75 to 145 mm)
Order number **MIC-PMB**

MIC-CMB-BD Corner mount bracket, black
Corner mount bracket, black sand finish (RAL9005)
Order number **MIC-CMB-BD**

MIC-CMB-WD Corner mount bracket, white
Corner mount bracket, white sand finish (RAL9010)
Order number **MIC-CMB-WD**

MIC-CMB-MG Corner mount bracket, grey sand
Corner mount bracket.
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Order number **MIC-CMB-MG**

MIC-SPR-BD Wall mount spreader plate, black sand
Aluminum spreader plate suitable for brickwork surface mounting, black sand finish (RAL9005)
Order number **MIC-SPR-BD**

MIC-SPR-WD Wall mount spreader plate, white sand
Aluminum spreader plate suitable for brickwork surface mounting, white sand finish (RAL9010)
Order number **MIC-SPR-WD**

MIC-SPR-GD Wall mount spreader plate, grey sand
Aluminum spreader plate suitable for brickwork surface mounting, grey sand finish (RAL 9006), for MIC-612xxxxG36x series cameras
Order number **MIC-SPR-GD**

MIC-SPR-MG Wall mount spreader plate, grey sand
Aluminum spreader plate suitable for brickwork surface mounting.
Grey (RAL 7001). Available in specific regions only.
Sand finish.
Order number **MIC-SPR-MG**

MIC-SCA-BD Shallow conduit adapter, black sand
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR, black sand finish (RAL9005)
Order number **MIC-SCA-BD**

MIC-SCA-WD Shallow conduit adapter, white sand
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR mount, white sand finish (RAL9010)
Order number **MIC-SCA-WD**

MIC-SCA-GD Shallow conduit adapter, grey sand
Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR, grey sand finish (RAL 9006), for MIC-612xxxxD36x series
Order number **MIC-SCA-GD**

MIC-SCA-MG Conduit adapter, shallow, grey sand

Shallow conduit adapter for a MIC-WMB, a MIC-PMB, or a MIC-SPR.

Grey (RAL 7001). Available in specific regions only. Sand finish.

Order number **MIC-SCA-MG**

MIC-M25XNPT34 Adapter, M25 to 3/4" NPT, stainless steel

Stainless Steel M25 to 3/4" NPT thread adapter

Order number **MIC-M25XNPT34**

MIC-67SUNSHLD Sunshield for MIC7000 series, white

Three-part molded sunshield for MIC7000 cameras – 1 bottom shell, 2 top shells (1 for around the optional illuminator accessory). White.

Order number **MIC-67SUNSHLD**

MIC-9K-SNSHLD-W Sunshield thermal PTZ camera, white

Sunshield kit for MIC IP fusion 9000i cameras, white color. Recommended for use with white color MIC IP fusion 9000i cameras installed in locations with high sun load.

Order number **MIC-9K-SNSHLD-W**

MIC-BP3 Biphase converter, for power supply

Biphase converter for IR power supplies or non-IR power supplies without a free expansion slot available

Order number **MIC-BP3**

MIC-BP4 Biphase converter, for power supply

Biphase converter for non-IR versions of MIC series power supply units

Order number **MIC-BP4**

MIC-ALM 8 input alarm card for MIC400 non IR PSU

8 Input alarm and washer pump drive card for PSU (Not for IR PSU). Requires washer pump, purchase separately.

Order number **MIC-ALM**

MIC-WKT Washer kit, MIC non IR

Washer kit for non-infrared MIC camera models.

Order number **MIC-WKT**

MIC-WKT-IR Washer kit, MIC IR

Washer kit for analog infrared MIC camera models as well as for MIC IP starlight 7000i and MIC IP fusion 9000i camera models.

Order number **MIC-WKT-IR**

Represented by:**Europe, Middle East, Africa:**

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5600 JB Eindhoven, The Netherlands
Phone: + 31 40 2577 284
emea.securitysystems@bosch.com
emea.boschsecurity.com

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Fairport, New York, 14450, USA
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Fax: +1 585 223 9180
onlinehelp@us.bosch.com
www.boschsecurity.us

Asia-Pacific:

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Singapore 573943
Phone: +65 6571 2808
Fax: +65 6571 2699
apr.securitysystems@bosch.com
www.boschsecurity.asia

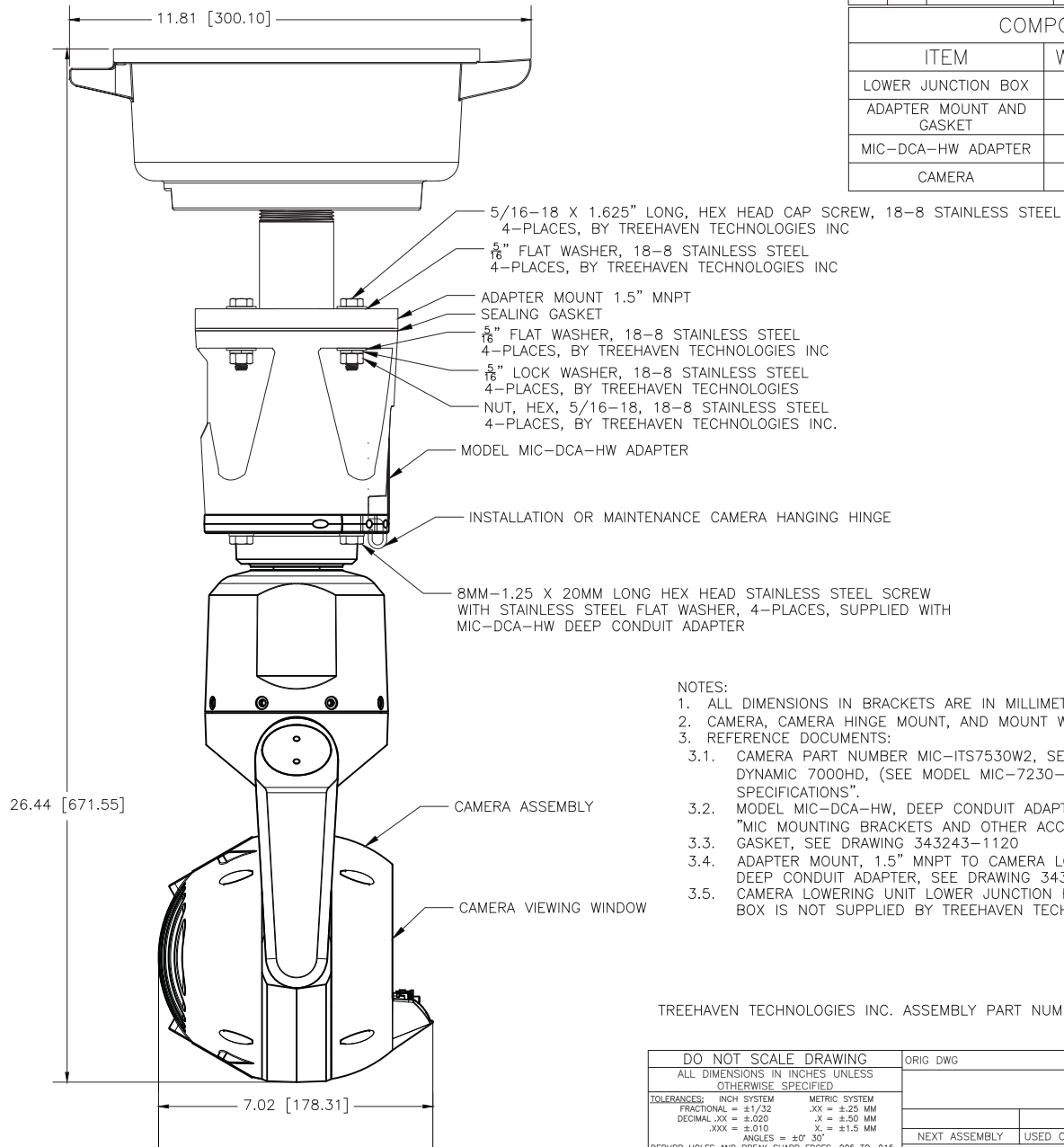
343244-1430

DWG. NO. SHEET 1 OF 1

REV.

MATERIAL LIST

QTY	DET. NO.	PART NUMBER	DESCRIPTION
COMPONENT WEIGHTS			
ITEM	WEIGHT POUNDS	MATERIAL	
LOWER JUNCTION BOX	5.0	ASSORTED	
ADAPTER MOUNT AND GASKET	3.5	STEEL & NEOPRENE	
MIC-DCA-HW ADAPTER	5.5	ALUMINUM	
CAMERA	14.7	ASSORTED	



NOTES:

- ALL DIMENSIONS IN BRACKETS ARE IN MILLIMETERS
- CAMERA, CAMERA HINGE MOUNT, AND MOUNT WITH 1-1/2" NPT NIPPLE ARE PAINTED WHITE.
- REFERENCE DOCUMENTS:
 - CAMERA PART NUMBER MIC-ITS7530W2, SEE BOSCH SPECIFICATION SHEET "MIC IP DYNAMIC 7000HD, (SEE MODEL MIC-7230-PW4 RUGGEDIZED HD CAMERA MECHANICAL SPECIFICATIONS".
 - MODEL MIC-DCA-HW, DEEP CONDUIT ADAPTER, HINGED, SEE BOSCH SPECIFICATION SHEET "MIC MOUNTING BRACKETS AND OTHER ACCESSORIES".
 - GASKET, SEE DRAWING 343243-1120
 - ADAPTER MOUNT, 1.5" MNPT TO CAMERA LOWERING DEVICE AND TO MODEL MIC-DCA-HW DEEP CONDUIT ADAPTER, SEE DRAWING 343242-1130
 - CAMERA LOWERING UNIT LOWER JUNCTION BOX SHOWN FOR REFERENCE, THE JUNCTION BOX IS NOT SUPPLIED BY TREEHAVEN TECHNOLOGIES INC.

TREEHAVEN TECHNOLOGIES INC. ASSEMBLY PART NUMBER 343244-1030

THE INFORMATION CONTAINED ON THIS DRAWING IS BELIEVED TO BE ACCURATE IN ALL RESPECTS. HOWEVER, TREEHAVEN TECHNOLOGIES INC. CANNOT ASSUME RESPONSIBILITY FOR ANY CONSEQUENCES RESULTING FROM THE USE THEREOF. THE INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE WITHOUT NOTICE. REVISIONS OR NEW EDITIONS OF THIS DRAWING MAY BE ISSUED TO INCORPORATE SUCH CHANGES.

REV.	DATE	REVISIONS	BY	APPV'D

DO NOT SCALE DRAWING		ORIG DWG	343244-1430	DRAWN K.SMITH
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED			CAD NO.	DATE 5/13/2019
TOLERANCES: INCH SYSTEM METRIC SYSTEM			MATERIAL SPEC.	FINISHING SPEC.
FRACTIONAL = ±1/32 .XX = ±.25 MM			MIC CAMERA, DEEP CONDUIT ADAPTER,	
DECIMAL .XX = ±.020 .X = ±.50 MM			1.5" MNPT MOUNT ADAPTER, & CAMERA	
.XXX = ±.010 X = ±1.5 MM			LOWERING UNIT (CLU) INSTALLATION	
ANGLES = ±0° 30'		DEBURR HOLES AND BREAK SHARP EDGES .005 TO .015	NEXT ASSEMBLY	USED ON
THIS DRAWING AND THE INFORMATION IT CONTAINS HAVE BEEN FURNISHED FOR USE BY YOUR OWN ORGANIZATION ONLY AND FOR PURPOSES CONSISTENT WITH THE TRANSACTION BETWEEN YOUR ORGANIZATION AND TREEHAVEN TECHNOLOGIES INC. NO COPIES OF OR DATA FROM THIS DRAWING SHALL BE FURNISHED TO ANY THIRD PARTY WITHOUT THE WRITTEN AGREEMENT OF TREEHAVEN TECHNOLOGIES INC.		TREEHAVEN TECHNOLOGIES INC		SCALE .5X
		3960 PRESIDENTIAL PARKWAY #B		DES. ENG. DATE
		POWELL, OHIO 43065-9033		343244-1430
		OFFICE 614.791.8843		REV.
		FAX 614.789.0252		
		www.treehavenvision.com		SIZE C
				DWG. NO. SHEET 1 OF 1
				PRODUCT DESIGNATION-

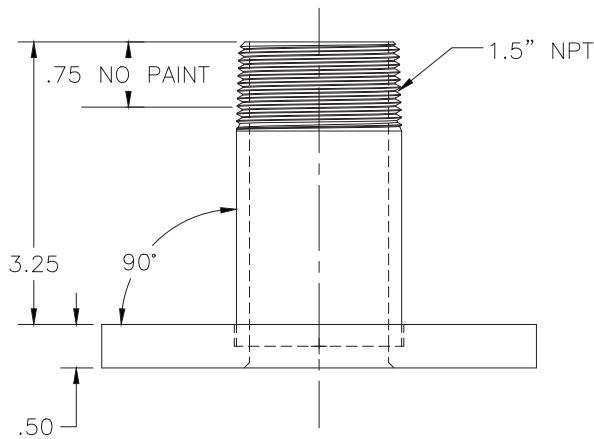
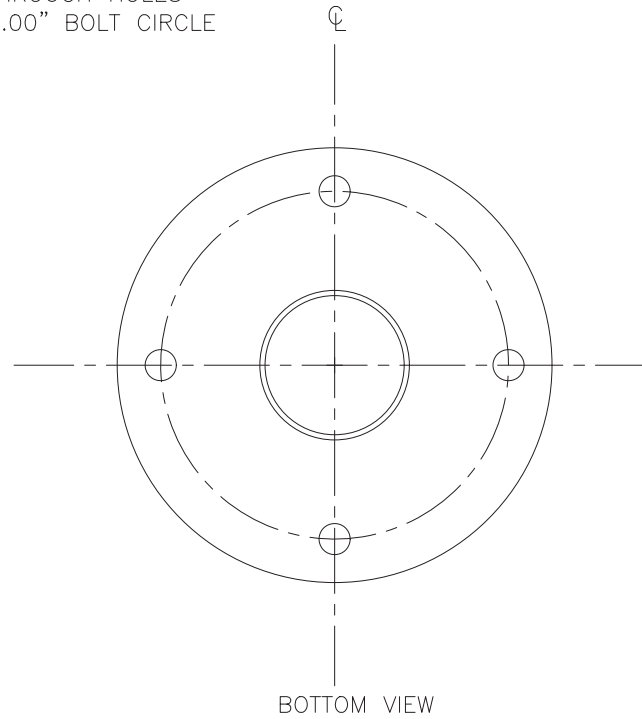
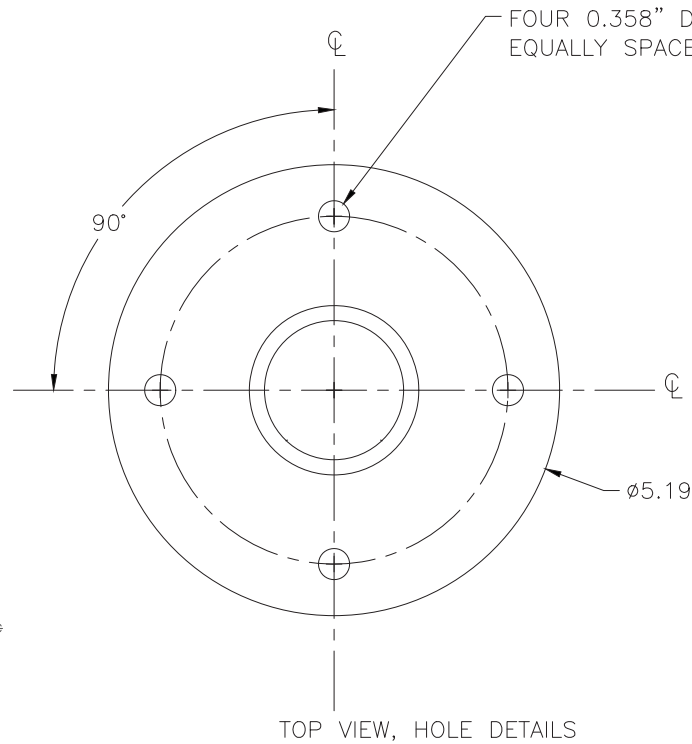
343242-1430

DWG. NO. SHEET 1 OF 1

REV.

MATERIAL LIST

QTY	DET. NO.	PART NUMBER	DESCRIPTION
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NOTES:

1. FINISH: WHITE GLOSS POWDER COAT, RL 9010 COLOR
2. CONSTRUCTION: STEEL PIPE NIPPLE WELDED TO COLD ROLLED CARBON STEEL PLATE
3. WEIGHT: 2.9 POUNDS
4. MOUNT ATTACHES TO DCA OR SCA CONDUIT ADAPTER WITH BOLTS AND TO CAMERA LOWERING UNIT (CLU) WITH 1.5" MALE PIPE THREADS.

TREEHAVEN TECHNOLOGIES INC. PART NUMBER 343242-1130

THE INFORMATION CONTAINED ON THIS DRAWING IS BELIEVED TO BE ACCURATE IN ALL RESPECTS. HOWEVER, TREEHAVEN TECHNOLOGIES INC. CANNOT ASSUME RESPONSIBILITY FOR ANY CONSEQUENCES RESULTING FROM THE USE THEREOF. THE INFORMATION CONTAINED HEREIN IS SUBJECT TO CHANGE WITHOUT NOTICE. REVISIONS OR NEW EDITIONS OF THIS DRAWING MAY BE ISSUED TO INCORPORATE SUCH CHANGES.

REV.	DATE	REVISIONS	BY	APP'VD
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DO NOT SCALE DRAWING		ORIG DWG	343242-1430		DRAWN K.Smith
ALL DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED			CAD NO.	MATERIAL SPEC.	DATE 6/13/2015
TOLERANCES: INCH SYSTEM METRIC SYSTEM				FINISHING SPEC.	QC
FRACTIONAL = ±1/32 .XX = ±.25 MM				INSTALLATION, MOUNT, MIC CAMERA	MFG DATE
DECIMAL .XX = ±.020 .X = ±.50 MM				DCA OR SCA CONDUIT ADAPTER TO	CHKD DATE
.XXX = ±.010 X = ±1.5 MM				CAMERA LOWERING UNIT (CLU)	DES ENG DATE
ANGLES = ±0° 30'					
DEBURR HOLES AND BREAK SHARP EDGES .005 TO .015		NEXT ASSEMBLY	USED ON	SCALE FULL	
THIS DRAWING AND THE INFORMATION IT CONTAINS HAVE BEEN FURNISHED FOR USE BY YOUR OWN ORGANIZATION ONLY AND FOR PURPOSES CONSISTENT WITH THE TRANSACTION BETWEEN YOUR ORGANIZATION AND TREEHAVEN TECHNOLOGIES INC. NO COPIES OR DATA FROM THIS DRAWING SHALL BE FURNISHED TO ANY THIRD PARTY WITHOUT THE WRITTEN AGREEMENT OF TREEHAVEN TECHNOLOGIES INC.		TREEHAVEN TECHNOLOGIES INC 3960 PRESIDENTIAL PARKWAY #B POWELL, OHIO 43065-9033 OFFICE 614.791.8843 FAX 614.789.0252 www.treehavenvision.com		343242-1430	
	SIZE C	DWG. NO. SHEET 1 OF 1	REV.	PRODUCT DESIGNATION-	

High PoE Midspans

www.boschsecurity.com



BOSCH
Invented for life



- ▶ Supports high-power PoE/PoH and complies to both the IEEE 802.3af and the IEEE 802.3at standards
- ▶ Lightning protection
- ▶ Detects and protects non-standard Ethernet terminals automatically
- ▶ Mounts to a wall, shelf, bench or desktop
- ▶ 95 W model also mounts to other 95 W model units

Bosch sells two (2) models of midspans (a 60 W model and a 95 W model) that enable remote power over an IP network connection for specific Bosch IP cameras. Rated for indoor installation only, the midspans can be installed indoors and wired to a camera installed outdoors.

Each midspan has a single port and is designed to carry data and power over a standard CAT5e (or better) cable, delivered through all 4 pairs.

95 W Midspan

The 95 W midspan is a high-power PoH (Power Over HDBase T) device that provides data and power between an Ethernet (remote network) switch and a MIC7000, MIC IP starlight 7000i, or MIC IP fusion 9000i camera.

60 W Midspan

The 60 W midspan (NPD-6001B) enables remote High Power over Ethernet (High PoE) for various Bosch IP/HD PTZ cameras. Generating a maximum of 60 W, it complies to both the IEEE 802.3af and the IEEE 802.3at standards, while doubling the available power.

Certifications and approvals

Electromagnetic Compatibility (EMC)	Complies with FCC Part 15, ICES-003, and CE regulations, including EN 55022 Class B (emission), EN 55024 (Immunity), and VCCI
Product Safety	Complies with UL/cUL, GS Mark per EN 60950-1
Regulatory Compliance	IEEE 802.3af (PoE), IEEE 802.3at (PoE+, including 2-event), RoHS Compliant, WEEE Compliant, CE
Lightning protection	Meets GR-1089-CORE lightning protection demands

60 W models only:

EN 61000-4-5 (10/700 µsec, 4kv)
Surge protection: IEC 61643-21
ITU-T K.45 International standard

Installation/configuration notes

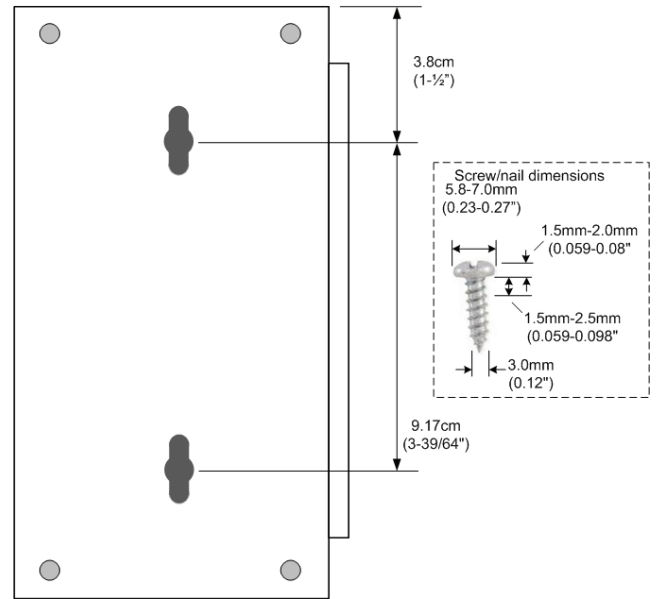
In the table below, an "X" identifies which midspans can supply power to which models of cameras.

CAMERA MODELS	60 W midspan (NPD-6001B)	95 W midspan (NPD-9501A)
AUTODOME 7000 - outdoor models (with heater)	X	
MIC7000 and MIC IP starlight 7000i models without illuminator	X	X
MIC7000 and MIC IP starlight 7000i models with illuminator		X
MIC IP fusion 9000i models		X
AUTODOME IP starlight 5000i and AUTODOME IP starlight 5000i IR models	X	

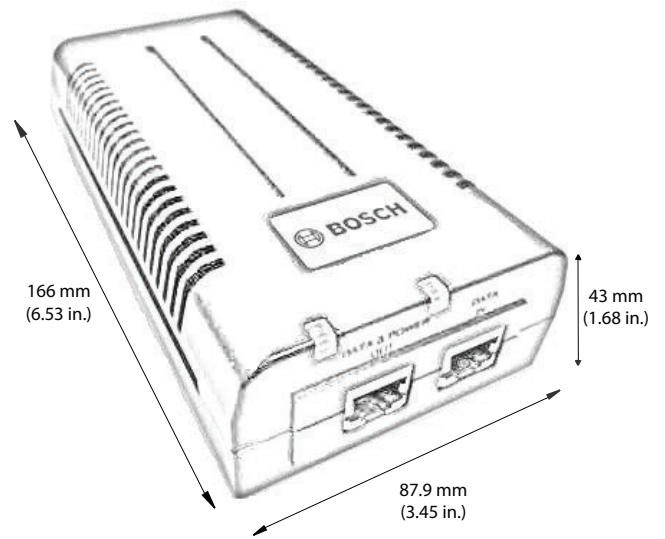
Surface mounting
60 W models:



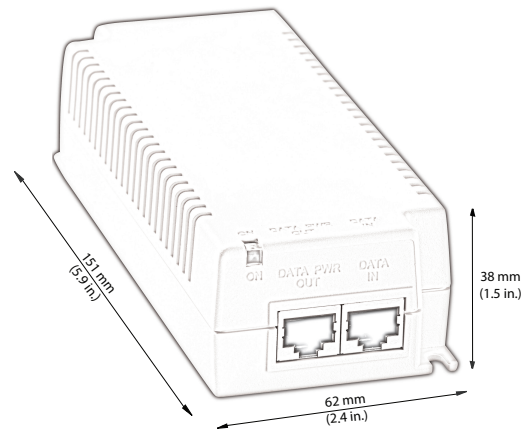
95 W models:



Dimensional Drawings
95 W models:



60 W models:



Technical specifications

Miscellaneous

60 W models:

Number of Ports	One (1)
Pass through data rates	10/100/1000 Mbps
Maximum cable length recommended	Not to exceed 100 m (333 ft) between network source and terminal
System Indicators	AC Power (green) Channel Power (green and orange)

95 W models:

Number of Ports	One (1)
Pass through data rates	10/100/1000 Mbps
Maximum cable length recommended	Not to exceed 100 m (333 ft) between network source and terminal
System Indicators	AC Power (yellow) Channel Power (green)

User Connections

Connectors	Shielded RJ-45 100 Base-TX Ethernet PoE++ EIA 568A and 568B
------------	--

Data

Data transmission	Data provided over pairs 1/2 and 3/6 for 10/100 Ethernet
-------------------	--

Electrical

Input Voltage	100 to 240 VAC, 50/60 Hz
Output Voltage	54-57 VDC (nominal)
Input Current	60 W model: 1.5 A 95 W model: 1.8 A (maximum)
High Power Over Ethernet (High PoE) Output	Pin Assignment and Polarity: 4 Pair power - Pairs 1/2 (-) and 3/6 (+) - Pairs 7/8 (-) and 4/5 (+) User Port Power: 60 W maximum for NPD-6001B 95 W maximum for NPD-9501A
Surge protection	60 W: Yes 95 W: No

Represented by:

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Phone: + 31 40 2577 284
emea.securitysystems@bosch.com
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Fax: +65 6571 2699
apr.securitysystems@bosch.com
www.boschsecurity.asia

Environmental

Operating Temperature	At 95 W: -10 °C to +40 °C (+14 °F to +104 °F) At 60 W: -10 °C to +40 °C (+14 °F to +104 °F) At 30 W: -10 °C to +50 °C (+14 °F to +122 °F)
Storage Temperature	-20 °C to +70 °C (-4 °F to +158 °F) (60 W and 95 W models)
Operating Humidity	60 W model: Maximum 90% relative, non-condensing 95 W model: 10% - 95%, non-condensing
Storage Humidity	60 W model: Maximum 95% relative, non-condensing 95 W model: 5% - 95%, non-condensing

Construction

60 W models:

Dimensions (W x H x L)	62 mm x 38 mm x 151 mm (2.44 in. x 1.5 in. x 5.94 in.)
Weight	340 g (0.75 lbs)
Mounting	To wall, shelf, bench or desktop

95 W models:

Dimensions (W x H x L)	87.9 mm x 43 mm x 166 mm (3.46 in. x 1.68 in. x 6.53 in.)
Weight	400 g (0.88 lb)
Mounting	To wall, shelf, bench, desktop, and to other 95 W model units

Ordering information

NPD-6001B High PoE midspan

High PoE Midspan, 60 W, single port, AC in
Order number **NPD-6001B**

NPD-9501A Midspan, high PoE, single port, AC in

High PoE, 95 W, Single port indoor Midspan.
120/230VAC input. Supplies a data and power interface to camera using a single standard CAT5e (or better) network cable.
Order number **NPD-9501A**

Dataline Surge Protectors

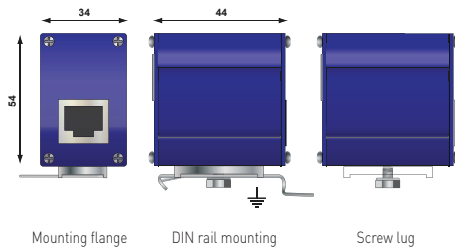
MJ8-POE Series



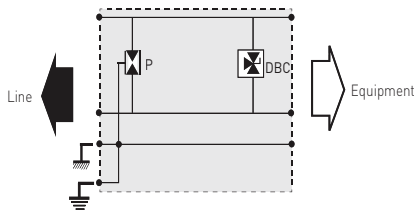
- **Power Over Ethernet Surge Protector**
- **Hybrid GDT and Diode Technology**
- **10/100/1000 Mbps Compatible**
- **Bi-Directional Protection**
- **Shielded Enclosure and Connectors**
- **DIN Rail Screw Lug and Flange Mounting**
- **UL497B Listed**

Dimensions and Electrical Diagram

(in mm)



Mounting flange DIN rail mounting Screw lug



P : 3-Electrode gas discharge tube
 DBC : 3-Pole low capacitance diode

Characteristics

CITEL Part Number	MJ8-POE-A	MJ8-POE-B
Description	RJ45 connection for PoE-A	RJ45 connection for PoE-B
Application	POE-A and Gigabit Ethernet, High PoE	POE-B and Gigabit Ethernet, High PoE
Max. Data Rate	1000Mbps	1000Mbps
Configuration	8 Wires + Shielding	8 Wires + Shielding
Pinout by pair	(1-2) (3-6) (4-5) (7-8)	(1-2) (3-6) (4-5) (7-8)
Line Voltage	Un 48Vdc	5Vdc/48Vdc
Max. DC Power Supply	Uc 60Vdc	7.5Vdc (1,2,3,6) 60Vdc (4,5,7,8)
Max. DC Current	IL 1200mA	1200mA
Frequency	f > 100Mhz	> 100Mhz
Insertion Loss	< 1dB	< 1dB
Lines-Grd Surge Current (8/20)	In 2000A	2000A
Line-Line Surge Current (8/20)	In 500A	500A
Lines-Grd Surge Current (8/20) Itotal	16,000A	16,000A
Max. Discharge Current (10/350) Iimp	500A	500A
L-L Clamping Voltage	20V	20V
L-G Spark Overvoltage	90V	90V
End of Life	Short-circuit	Short-circuit
Mechanical Characteristics		
Dimensions	See Diagram	

GenSPEED® 5000 Category 5e Outside Plant Cable Standards-Compliant



CONSTRUCTION

Conductors

- 24 AWG solid bare annealed copper

Insulation

- Polyolefin

Color Code

- Pair 1: Blue-White/Blue
- Pair 2: Orange-White/Orange
- Pair 3: Green-White/Green
- Pair 4: Brown-White/Brown

Optional Armor

- Aluminum applied helically (inner jacket is used with this construction)
- Armor diameter 12 mm

Flooding Compound

- Waterproof gel

Jacket

- UV- and Abrasion-Resistant Polyethylene

PHYSICAL DATA

	No Armor	Aluminum Armor
Nominal Cable Diameter (in)	0.230	0.340
Nominal Cable Weight (lbs/1000 ft)	25	50
Minimum Bend Radius (in)	1.0	1.0
Maximum Pulling Force (lbs)	25	25
Temperature Rating (°C)		
Installation:	-30 to +60	-30 to +60
Operation:	-45 to +80	-45 to +80

ELECTRICAL PERFORMANCE

Frequency MHz	Insertion Loss (max)	NEXT (min)	Return Loss (min)
1	2.0	65.3	20.0
4	4.1	56.3	23.0
10	6.5	50.3	25.0
16	8.2	47.2	25.0
20	9.3	45.8	25.0
25	10.4	44.3	24.3
31.25	11.7	42.9	23.6
62.5	17.0	38.4	21.5
100	22.0	35.3	20.1
155	28.1	32.4	—
200	32.4	30.8	—
250	36.9	29.3	—
300	41.0	28.1	—
350	44.9	27.1	—

Note: Values are expressed in dB per 100 m (328 ft.) length @ 20°C. Values above 100 MHz are for information only. *PSACR & ACR not specified in ANSI/TIA 568-C.2

PART NUMBERS

Standard packaging: 1000' Reel

Jacket Color	Reel	Armor
Black	5136100	None
Black	5136101	Aluminum

Features and Benefits

- Protects against environmental elements that can cause electrical performance failures
- TRU-Mark® print legend contains footage markings from 1000' to 0'
- Prevents moisture migration

Applications

- IEEE 802.3: 1000 BASE-T, 100 BASE-TX, 10 BASE-T, PoE, PoE+
- CDDI, Token Ring, ATM
- Broadband and Baseband Analog Video
- Armored: aerial, duct and buried installations
- Non-armored design is recommended for duct installation

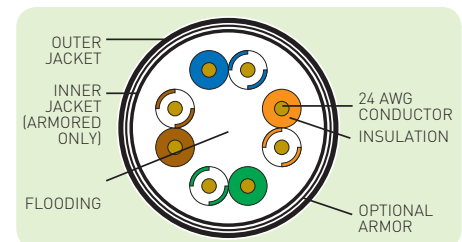
Standard Compliances

- ANSI/TIA 568-C.2
- UL 444
- RoHS Compliant Directive 2011/65/EU
- ANSI/TIA 862 (Building Automation)
- ICEA S-90-661
- ISO/IEC 11801 Ed. 2.0 (Class D)
- Telcordia (Bellcore) Specification GR-421-CORE Water Penetration Requirements

ELECTRICAL CHARACTERISTICS

DC Resistance (max) Ohms/100 m (328 ft) @ 20°C	9.38
DC Resistance Unbalance (max) Individual Pair %	4.00
Delay Skew (max) ns/100 m	45
Nom. Velocity of Propagation % Speed of Light	69
Characteristic Impedance Frequency (f): 1-100 MHz	Ohms 100 ± 15

CROSS-SECTION



Data subject to change without notice.

