Photometric Guide

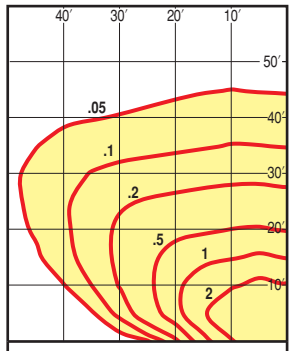
DBF11-17
45° Nominal Optical Aiming Angle

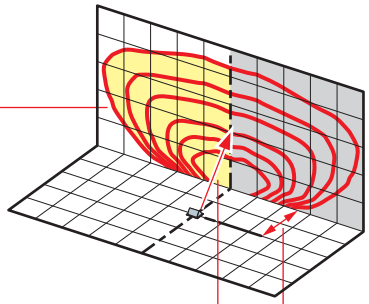
Photometric charts for these models show lines of equal footcandle values on a vertical surface, with a selected setback distance, and the optical aiming angle. Distances up and along the vertical surface are shown. Because the overall light pattern is symmetrical in halves, only one half is shown for easier readability.

Legend for Optics

WF - Wide Flood
VF - Vertical Flood
MF - Medium Flood
NF - Narrow Flood
SP - Spot
NSP - Narrow Spot
HSP - Horizontal Spot

Footcandle Diagram
Typical Half





Fixture: DBF11
Optics: WF
Lamp Mode: 70PMH

ED-17
70W Metal Halide
45° Optical Aiming Angle
10' Setback

Lamp

6,200 Initial Lumens
Test No.: **KL00546**
I.E.S. Type: 7H x 6V
Field Angle: 147.9° x 125.5°
(10% of max.)
Beam Angle: 131.5° x 73.0°
(50% of max.)

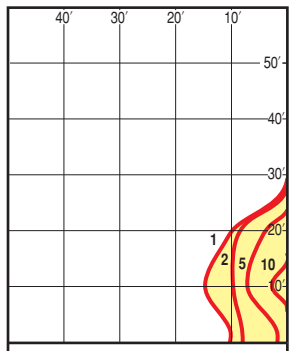
DBF18 and 19
0° Nominal Optical Aiming Angle

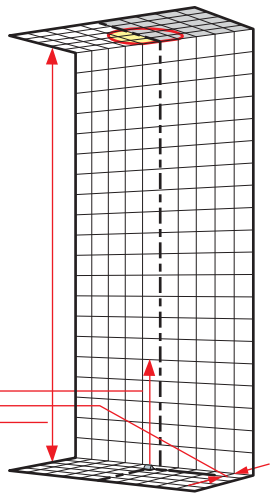
Photometric charts for these models show lines of equal footcandle values on a surface directly above the fixture, representing a building overhang. Footcandle lines are not shown on the vertical surface because the purpose of grazing light is to create texture and highlights, which footcandle lines do not depict. Since the overall light pattern is symmetrical in halves, only one half is shown for easier readability.

Legend for Optics

SPG - Spot Grazer
HG - Horizontal Grazer

Footcandle Diagram
Typical Half





Fixture: DBF18
Optics: SPG
Lamp Mode: 70PMH

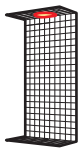
ED-17
70W Metal Halide
0° Optical Aiming Angle
5' Setback
50' Target Distance

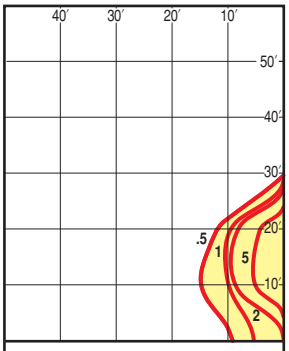
Lamp

5,900 Initial Lumens
Test No.: **KL00421**
I.E.S. Type: 1H x 2V
Field Angle: 12.4° x 18.2°
(10% of max.)
Beam Angle: 6.9° x 11.6°
(50% of max.)

DBF18

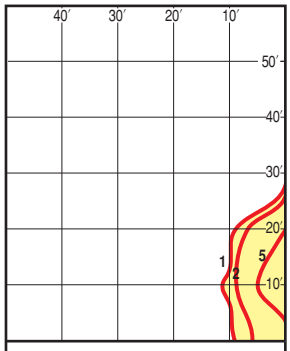
SPG - Spot Grazer





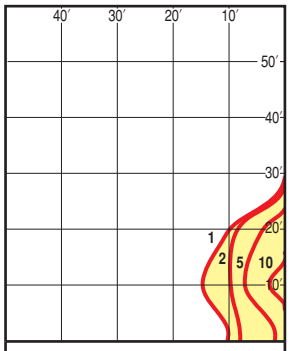
DBF18 SPG 39PMH
T6 Clear G-12 Base
39W Metal Halide
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

3,400 Initial Lumens
Test No.: **KL00367**
I.E.S. Type: 1H x 1V
Field Angle: 9.9° x 15.4°
(10% of max.)
Beam Angle: 5.7° x 7.2°
(50% of max.)



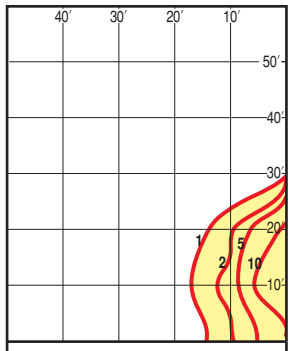
DBF18 SPG 50PMH
ED-17
50W Metal Halide
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

4,000 Initial Lumens
Test No.: **KL00422**
I.E.S. Type: 1H x 2V
Field Angle: 12.4° x 18.2°
(10% of max.)
Beam Angle: 6.9° x 11.6°
(50% of max.)



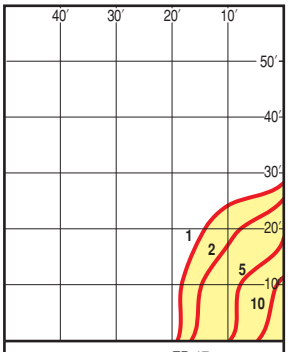
DBF18 SPG 70PMH
ED-17
70W Metal Halide
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

5,900 Initial Lumens
Test No.: **KL00421**
I.E.S. Type: 1H x 2V
Field Angle: 12.4° x 18.2°
(10% of max.)
Beam Angle: 6.9° x 11.6°
(50% of max.)



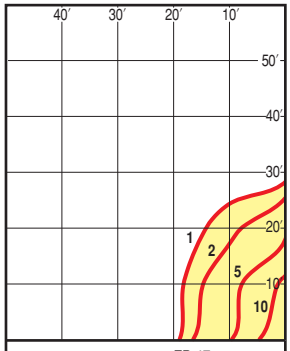
DBF18 SPG 100PMH
ED-17
100W Metal Halide
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

8,800 Initial Lumens
Test No.: **KL00359**
I.E.S. Type: 1H x 2V
Field Angle: 12.4° x 18.2°
(10% of max.)
Beam Angle: 6.9° x 11.6°
(50% of max.)



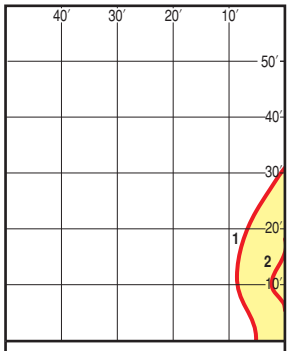
DBF18 SPG 150PMH
ED-17
150W Metal Halide
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

12,600 Initial Lumens
Test No.: **KL00404**
I.E.S. Type: 1H x 2V
Field Angle: 16.8° x 26.4°
(10% of max.)
Beam Angle: 8.6° x 13.4°
(50% of max.)



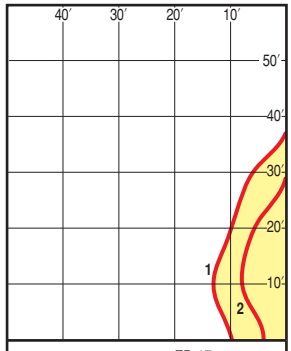
DBF18 SPG 175MH
ED-17
175W Metal Halide
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

12,800 Initial Lumens
Test No.: **KL00350**
I.E.S. Type: 1H x 2V
Field Angle: 16.8° x 26.4°
(10% of max.)
Beam Angle: 8.6° x 13.4°
(50% of max.)



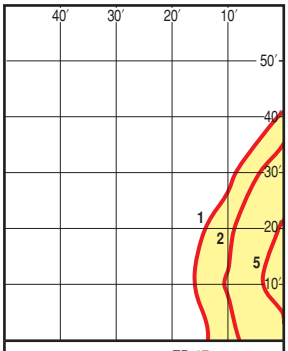
DBF18 SPG 35HPS
ED-17
35W HPS
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

2,250 Initial Lumens
Test No.: **KL00454**
I.E.S. Type: 1H x 3V
Field Angle: 16.1° x 31.7°
(10% of max.)
Beam Angle: 9.3° x 17.9°
(50% of max.)



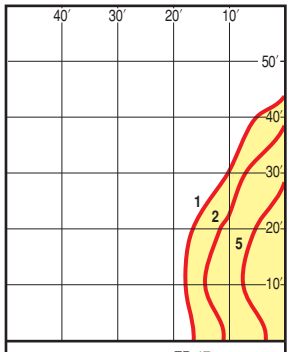
DBF18 SPG 50HPS
ED-17
50W HPS
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

4,000 Initial Lumens
Test No.: **KL00441**
I.E.S. Type: 1H x 3V
Field Angle: 16.1° x 31.7°
(10% of max.)
Beam Angle: 9.3° x 17.9°
(50% of max.)



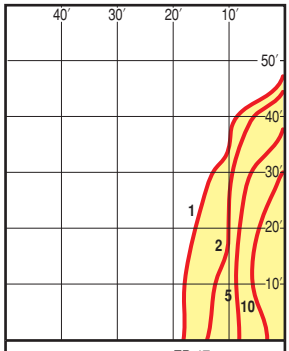
DBF18 SPG 70HPS
ED-17
70W HPS
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

6,300 Initial Lumens
Test No.: **KL00437**
I.E.S. Type: 1H x 3V
Field Angle: 16.1° x 31.7°
(10% of max.)
Beam Angle: 9.3° x 17.9°
(50% of max.)



DBF18 SPG 100HPS
ED-17
100W HPS
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

9,500 Initial Lumens
Test No.: **KL00371**
I.E.S. Type: 1H x 3V
Field Angle: 16.1° x 31.7°
(10% of max.)
Beam Angle: 9.3° x 17.9°
(50% of max.)



DBF18 SPG 150HPS
ED-17
150W HPS
0° Optical Aiming Angle
5′ Setback
50′ Target Distance

16,000 Initial Lumens
Test No.: **KL00375**
I.E.S. Type: 1H x 3V
Field Angle: 13.0° x 33.4°
(10% of max.)
Beam Angle: 6.5° x 19.5°
(50% of max.)

Application Assistance

Applications Assistance

Kim Lighting utilizes the latest computer technology and software to provide specifiers with reliable evaluations of lighting system performance.

Kim can analyze a proposed luminaire layout or provide recommendations based on performance criteria.

Hard copies of plans can be sent directly to the Kim Applications Department via fax, express or regular mail. Any .dwg or .dxf file can be transmitted via modem or email **(kim.apps@kimlighting.com)**, or placed on diskette, CD ROM or Zip disk, and forwarded to Kim Lighting c/o Kim Apps.

Photometric Files

Kim photometric files are available free in both electronic and hard copy format.

Electronic photometric files include .pdf file format pages for printing and .ies files for use in lighting calculation software. The complete .ies / .pdf library is available on CD ROM and on the internet at **www.kimlighting.com**.

Surface Reflectance

Approximate Reflectance of Some Common Surfaces

Material	Reflectance
Brick, dark buff	40%
Brick, light buff	48%
Brick, dark red	30%
Concrete	40%
Glass, clear	7%
Glass, reflective	20-30%
Glass, tinted	7%
Vegetation, average	25%
White Marble	45%
White Paint, new	75%
White Paint, old	55%

Pier Lighting

DESTINY™

Destiny SL

features

- Intense narrow beam rectangular projection for long throw applications
- Available with narrow asymmetric beam for small setback distances
- Adjustable mounting brackets
- Uniform color mixing with 180 Luxeon® LEDs
- DMX512 compatibility for dynamic color control with 1' resolution
- TIR® Thermal management system protects electronic components from heat damage
- Robust construction suitable for outdoor applications
- Operational and environmental benefits of LED technology

standard specifications

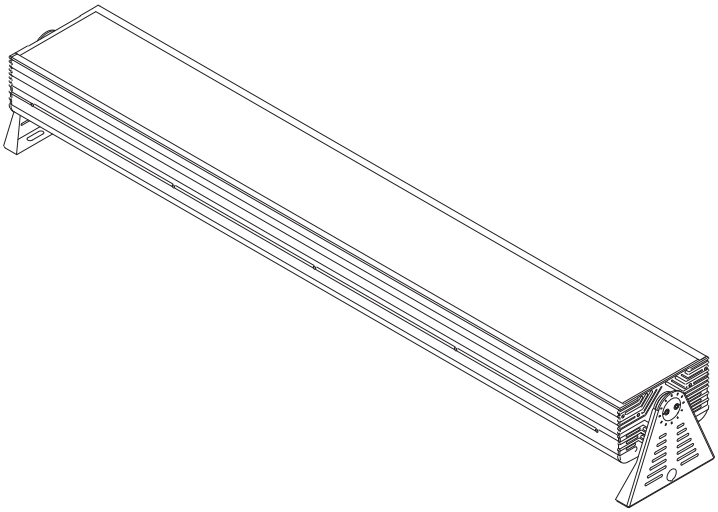
OPTICS	22º or 45º flood optic or narrow graze optic
LIGHT SOURCE	180 Luxeon® high flux LEDs
DISTRIBUTION	Horizontal rectangular beam projection
SETBACK DISTANCE	10” to 30’ setback
FINISH	3 standard powdercoat finishes: black, silver or white
POWER SUPPLY	90 VAC to 264 VAC integral power supply auto ranging (50-60 Hz)

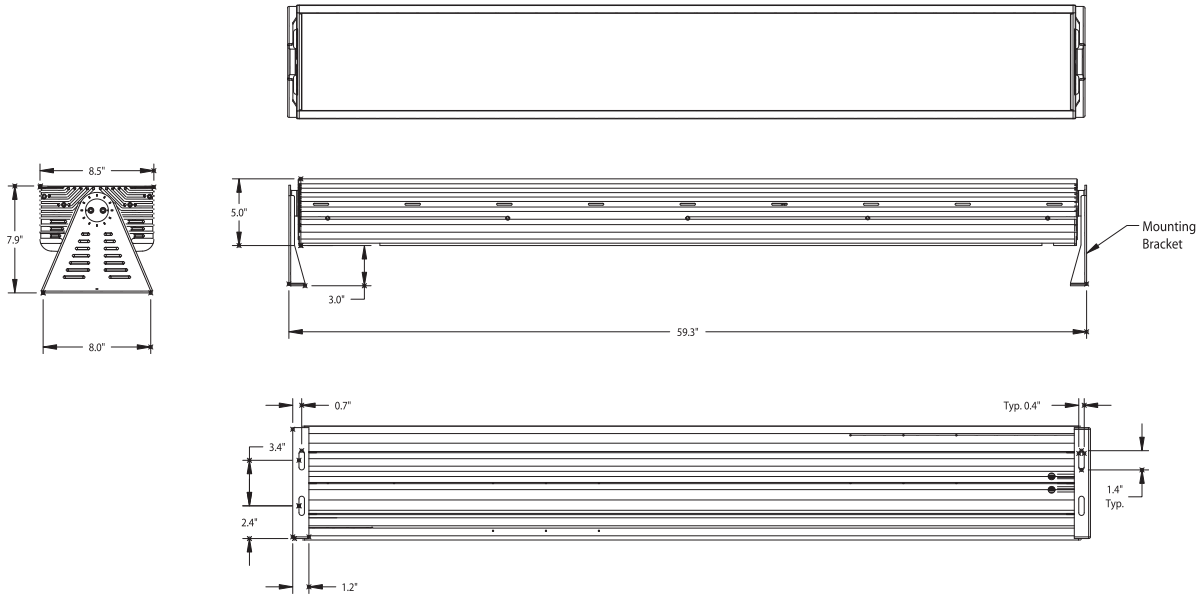
standard order codes

DES — SL — _____ — _____ --- _____ — DMX

SERIES	PRODUCT	OPTIC	LED LIGHT COLOR	FINISH	NETWORK
Destiny™	**Destiny SL**	**22** 22° beam angle **45** 45° beam angle **NGO** Narrow graze optic	**RGB** 60 red 60 blue 60 green **RED** 180 red **GRN** 180 green **BLU** 180 blue **ABR** 180 amber **WWH** 180 warm white, 3300K **CWH** 180 cool white, 5500K	**BLK** Black **SLR** Silver **WHT** White **CUS** Custom color	**DMX** DMX Network

STANDARD





technical specifications

mechanical

HOUSING	Extruded aluminum; PSU and controller are integral to the luminaire
MOUNTING	Wall, ceiling or floor mount; powdercoated stainless steel bracket 180° rotation of luminaire

electrical

INPUT VOLTAGE	90 VAC to 264 VAC

MAX INPUT POWER

MODEL	OUTPUT COLOR (ON FULL)	LUMINAIRE INPUT POWER	LUMINAIRE INPUT CURRENT (100 VAC)
RGB 180	Red	120W	1.2 A
RGB 180	Green	120W	1.2 A
RGB 180	Blue	120W	1.2 A
RGB 180	White	320W	3.2 A
Single Color option	Red, Green, Blue Amber, White	320W	3.2 A

CONNECTIONS	AC: Industrial grade AC cable; 16/3 DATA: Indivually shielded 24 AWG twisted pair + bare drain input and output DMX 10' standard cable length

environmental

TEMPERATURE RANGE	-40°F to 104°F (-40°C to 40°C) operating temperature -4°F to 104°F (-20°C to 40°C) starting temperature
CERTIFICATION	CE/CUL/CE
INGRESS PROTECTION	IP66 Rated

TIR Systems Ltd. 1 800 663 2036
7700 Riverfront Gate T 604 294 8477
Burnaby BC F 604 294 3733
Canada V5J 5M4 **www.tirsys.com**

narrow graze illuminance distribution

Throw Distance (ft) **Vertical Illuminance (fc)**

10” SETBACK

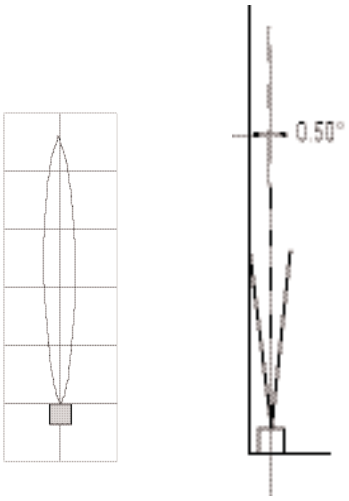
20	3.4	4.3	5.1	5.5	5.5	5.1	4.3	3.4
18	3.7	5	6.2	6.9	6.9	6.2	5	3.7
16	4	5.7	7.1	8.1	8.1	7.1	5.7	4
14	4.2	6.3	8.2	9.5	9.5	8.2	6.3	4.2
12	4.8	9	10.4	12.3	12.3	10.4	9	4.8
10	4.8	8.4	12.1	14.7	14.7	12.1	8.4	4.8
8	4.5	9.2	14.5	17.5	17.5	14.5	9.2	4.5
6	3.7	9.7	16.7	19.3	19.3	16.7	9.7	3.7
4	2.4	9.2	18.4	19.4	19.4	18.4	9.2	2.4
2	1.3	6.5	16.6	15.6	15.6	16.6	6.5	1.3
0	0	0	0	0	0	0	0	0

-3.5’ -2.5’ -1.5’ -0.5’ +0.5’ +1.5’ +2.5’ +3.5’

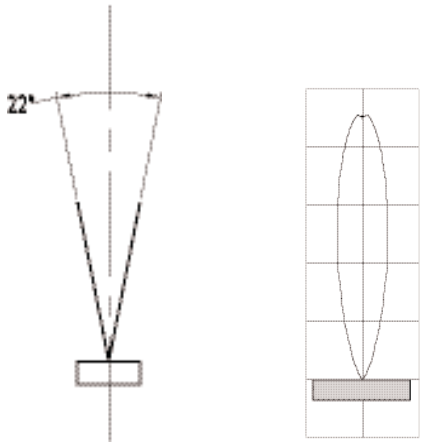
Centerline

Iluminance Distribution (for single 5’ unit*); *Linear uniformity will approach 100% at all throw distances for continuous illumination.

End ViewCandela Distribution



Face View Candela Distribution



TIR Systems Ltd. 1 800 663 2036
7700 Riverfront Gate T 604 294 8477
Burnaby BC F 604 294 3733
Canada V5J 5M4 **www.tirsys.com**

Abutment Wall Floodlighting

Visit **www.kimlighting.com** for a complete guide to floodlighting, including the complete range of Kim Floodlighting products and accessories, including color filters available.

Specifications

Housing: One-piece, die-cast low copper (<0.6% Cu) aluminum in a cylindrical shape with integral cooling fins over the entire length, and ⅛″ minimum wall thickness. One-piece silicone gasket between housing and door frame concealed when fixture is closed. Concealed integral cast slip hinges with stainless steel pins.

Door Frame: One-piece, die-cast low copper (<0.6% Cu) aluminum with integral cooling fins, ⅛″ minimum wall thickness, mates with housing to create a continuous cylindrical shape. Concealed integral cast slip hinges allow removal without tools. Stop-arm provided to limit door frame opening. 3⁄16″ thick clear tempered glass lens is sealed to the lens frame by a one-piece silicone gasket. Door frame secures to housing by four stainless steel recessed captive allen-head screws. Four tapped and plugged holes provided for attachment of options.

Heavy Duty Swivel: Cast, low copper (<0.6% Cu) aluminum with locking teeth providing 5° adjustment intervals. ⅜″ stainless steel locking bolt. Two ⅜″ stainless steel set point screws secure swivel to any 2″ pipe-size tenon (2⅜″ O.D. x 3½″ min. length). Clear anodized prior to Titanated Zirconium conversion coating for added corrosion resistance.

Reflector Assemblies: Interchangeable in all three KN-AFL10 models. Specular Alzak® aluminum optical components mounted to aluminum frame. Reflector assembly snaps into fixture housing with spring clips. Sockets are 4KV porcelain medium base.

Electrical Components: All electrical components are UL and CSA recognized with leads extending out of the swivel. High power factor ballast rated -20°F for MH lamp modes.

Finish: Super TGIC thermoset polyester powder coat paint, 2.5 mil nominal thickness, applied over a Titanated Zirconium conversion coating; 2500 hour salt spray test endurance rating.

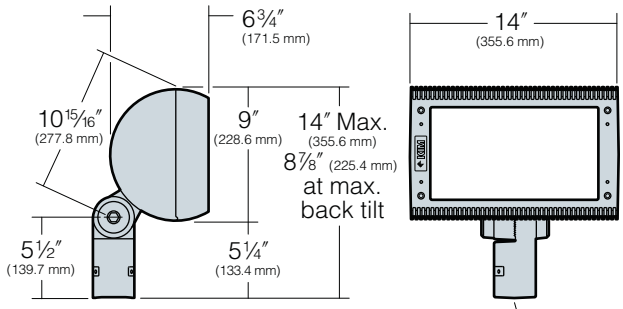
CAUTION: Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

Listings and Ratings		
UL cUL 1598	–	25C Ambient
IP67 Rated	CE	ISO 9001:2000

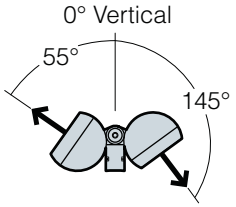
Dimensions

KN-AFL10 Models
175 Watt Metal Halide
Medium Base Lamp

EPA: 0.8 (45° tilt)
1.1 (Face on)
Maximum weight: 25 lbs



SIDE **FRONT**



AIMING RANGE
May be limited by selected mounting option

Ordering Information

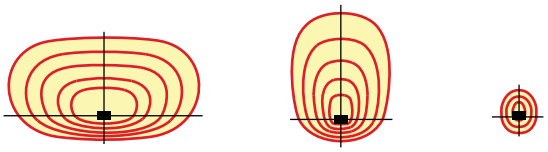
Catalog Number:

Fixtures provided with the following lamp:

175MH - 175W Clear Universal ED17 Metal Halide 120/208/240/277 Volt Ballast

See photometrics on pages **40-41**.

See lamp and electrical data on page **44**.



Wide Flood | Vertical Flood | Spot

Lamp	Color	Fixture Order Number		
175MH	Dark Bronze	**KN-AFL11-80DB**	**KN-AFL12-80DB**	**KN-AFL15-80DB**
	White	**KN-AFL11-80WH**	**KN-AFL12-80WH**	**KN-AFL15-80WH**

NOTE: All fixtures provided with multi-tap ballasts for 120, 208, 240 and 277 Volt operation, factory pre-wired for 277 Volt connection. Connection to other voltages completed in field by installer.

Fixture Accessories:

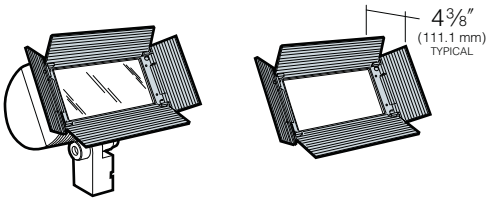
Ordered separately from fixture.

Accessories are field installed and include all required hardware and complete installation instructions.

Mounting Accessories

See pages **28-29**.

Barn Doors

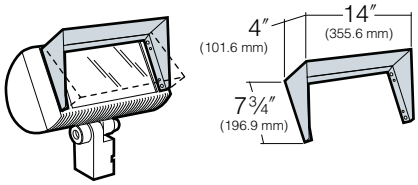


Color	Order Number
Dark Bronze	**KN-AFLBD-DB**
White	**KN-AFLBD-WH**

Extruded aluminum doors with anti-reflection baffles. Each door is hinged to a cast low copper aluminum frame, and locks by set screws. Doors are individually removable. Barn Door assembly mounts to predrilled door frame holes.

NOTE: Not recommended for ground mounted fixtures in vandal prone areas.

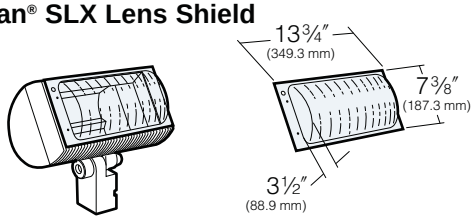
Fixed Hood



Color	Order Number
Dark Bronze	**KN-AFLFH-DB**
White	**KN-AFLFH-WH**

Formed 1⁄16″ thick aluminum. Mounts to predrilled door frame holes. Can be mounted along the top or bottom of the fixture to shield the lamp and lens from view.

Lexan® SLX Lens Shield



Color	Order Number
Clear	**KN-AFLLS**

3⁄16″ clear convex, vacuum formed, advanced polymer (Lexan SLX from GE Advanced Materials) lens shield with gasket. Mounts over lens to predrilled door frame holes and may be used with Barn Door or Fixed Hood option.

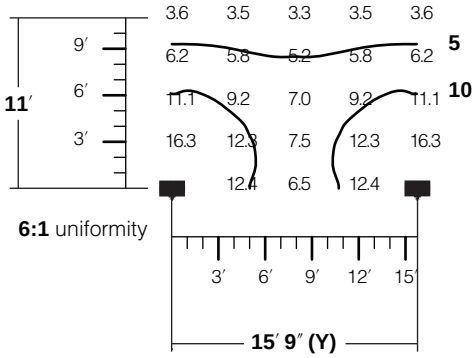
NOTE: Lexan SLX Resin dramatically reduces lens yellowing and becomes stable within the first 100 hours of operation. Lexan SLX offers significantly greater retained impact and vandal resistance during the life of the lens.

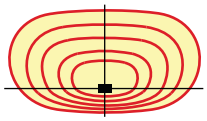
Caution: Use only when vandalism is anticipated.

Performance

KN-CFL1

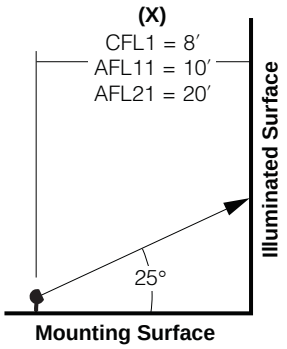
70MH - Recommended distance from the lighted surface is **3**′ to **15**′.





Wide Flood

The **Wide Flood** beam pattern is engineered to illuminate surfaces that are more horizontal than vertical, or wider areas when wall mounted. This optical system is designed for broad illumination with the fixture relatively close to the lighted surface and maintains excellent uniformity throughout its beam pattern.



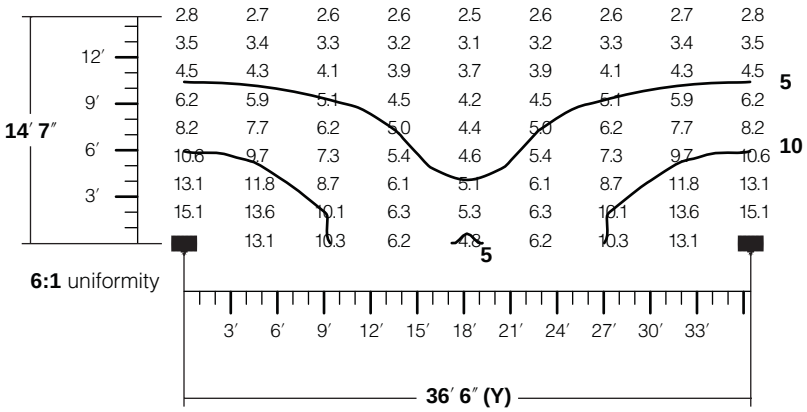
To calculate spacing **(Y)** for set-back distances other than those shown, multiply the desired set-back distance **(X)** by the following factor:

Uniformity Ratio	CFL1 Factor	AFL11 Factor	AFL21 Factor
3:1	1.56	2.80	3.00
6:1	1.97	3.65	3.90
12:1	2.56	4.60	4.90

Example: A 24′ set-back distance applied to an AFL11, with a desired Uniformity Ratio of 6:1, **(Y)**=**24**′ x 3.65, or **87.6**′ **(X)** fixture spacing.

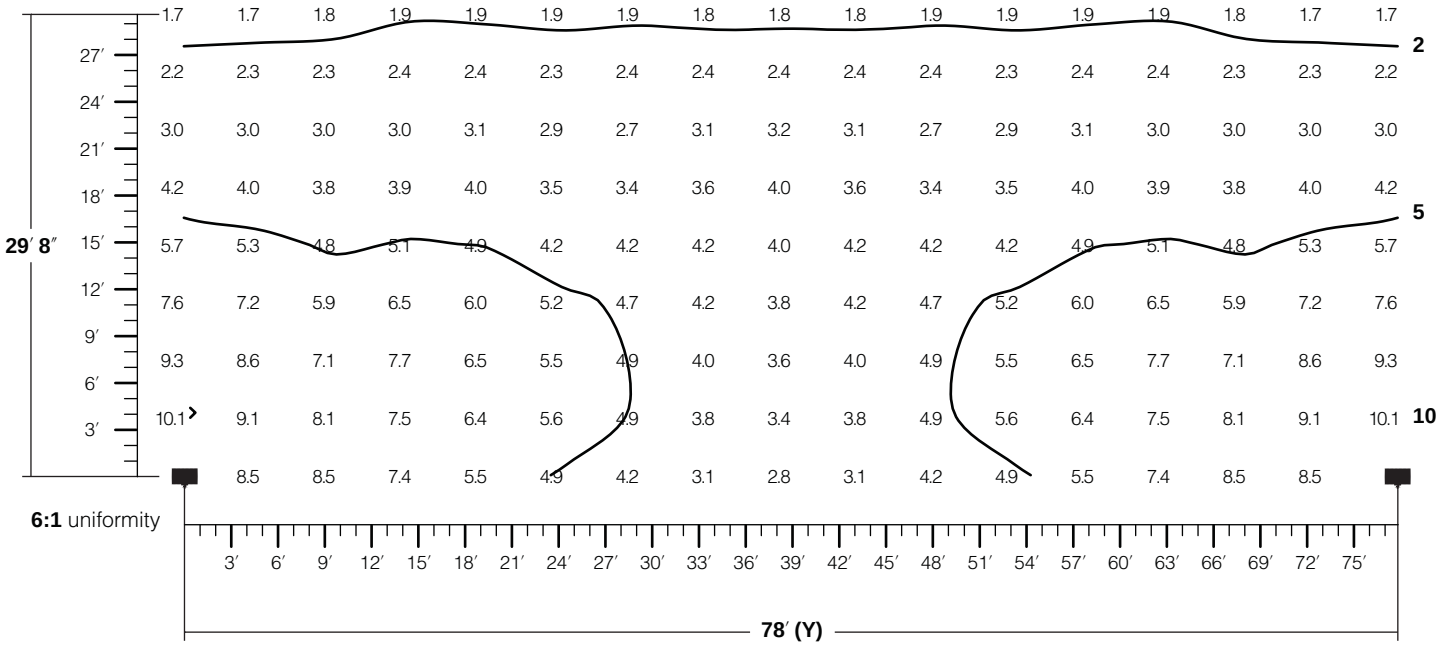
KN-AFL11

175MH - Recommended distance from the lighted surface is **10**′ to **20**′.



KN-AFL21

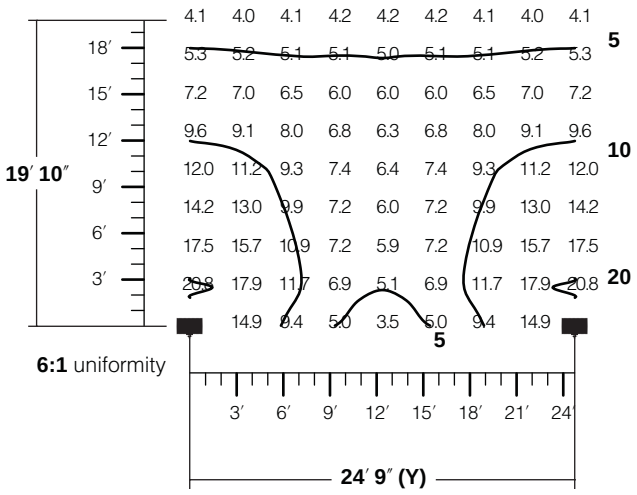
400MH - Recommended distance from the lighted surface is **15**′ to **30**′.



Uniformity is defined as the ratio of brightness between the highest footcandle value on a surface and the lowest value produced. A ratio of 6:1 indicates the brightness directly in front of each fixture is 6 times the brightness between each fixture, with the setback and spacing indicated.

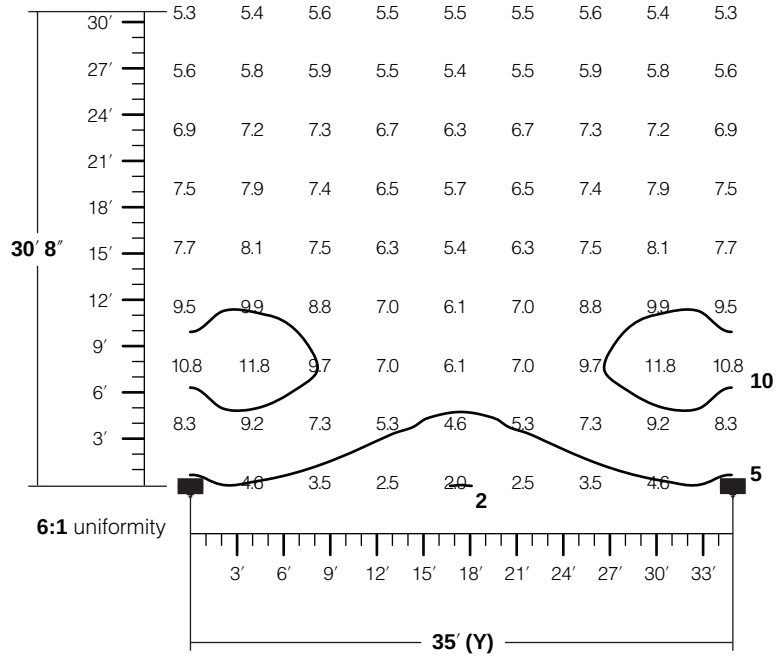
KN-AFL12

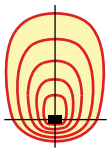
175MH - Recommended distance from the lighted surface is **10**′ to **20**′.



KN-AFL22

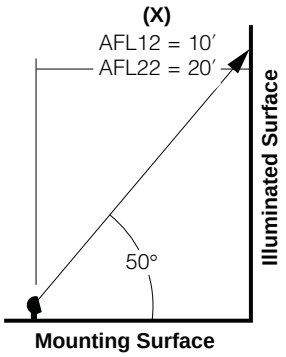
400MH - Recommended distance from the lighted surface is **6**′ to **30**′.





Vertical Flood

The **Vertical Flood** produces a unique distribution in which the peak intensity occurs above the aiming line and rapidly reduces below the aiming line to generate outstanding uniformity of illumination on vertical surfaces when the fixture is at optimum 50° tilt. As a pole or wall mounted luminaire, the **Vertical Flood** has very low brightness at high angles for increased visibility.



To calculate spacing **(Y)** for set-back distances other than those shown, multiply the desired set-back distance **(X)** by the following factor:

Uniformity Ratio	AFL12 Factor	AFL22 Factor
3:1	2.00	1.30
6:1	2.48	1.75
12:1	2.90	2.20

Example: A 24′ set-back distance applied to an AFL12, with a desired Uniformity Ratio of 6:1, **(Y)**=**24**′ x 2.48, or **59.5**′ **(X)** fixture spacing.

Pathway Lighting

KN-VRB1 KimNOW!® Vandal Resistant Bollard

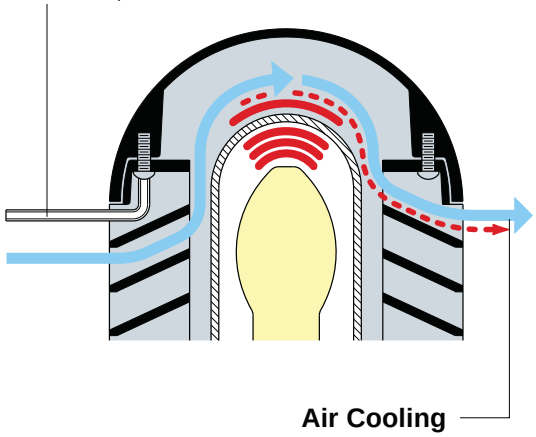
Path / Landscape Zone

Refer to inside front cover for
Kim Lighting's Theory of Relativity

Specific Product Features

Concealed Access

Added security against vandalism is provided by concealed access screws. A standard allen wrench loosens screws, allowing access for lamp replacement by twist-lock removal of the top cap. Complete removal of screws is not required.

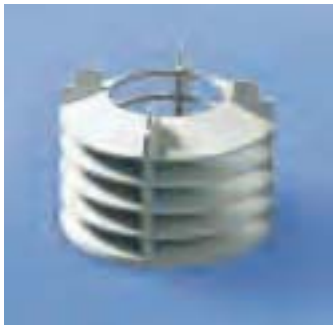


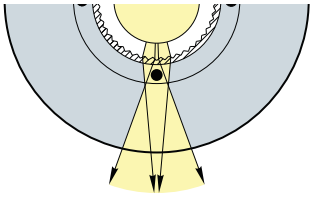
Air Cooling

Natural air currents provide flow-through ventilation, cooling the exterior metal surfaces and interior optical compartment, thereby minimizing excessive heat build-up.

Vandal Resistant Construction

Luminaire components are heavy-wall aluminum castings. The louver module is a one-piece casting which provides greater strength than individually stacked louvers.



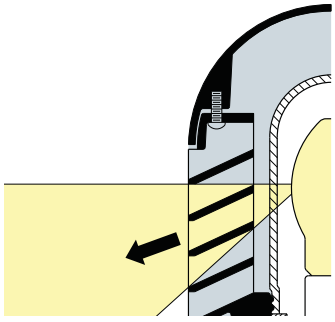


Shadowless Lighting

Internal flutes in the glass lamp enclosure eliminate shadows by refracting light around structural supports and vertical louvers.

65° Louver Angle

The louvers are set at 65° instead of 45° (the standard for cutoff) to allow the vanes to be deeper, therefore more vandal-resistant. The shallower angle also allows for greater spacing between fixtures than would louvers set at 45°. The louver also produces total source cutoff above 90°. The high-angle light throw provides excellent light uniformity and wide fixture spacing.



Internally fluted, tempered and gasketed glass lamp enclosure.

Specifications

Top Cap: One-piece aluminum casting 3⁄16″ minimum thickness, secured to louvers by concealed allen screws in keyhole slots. For relamping access, allen screws shall not require complete removal.

Louvers: One-piece aluminum casting with vertical support ribs at 90° intervals. Horizontal louver blades shall have a 1¾″ depth, a 65° upward pitch and provide light source cutoff above horizontal. Louver casting shall be secured to shaft by four internal tie rods.

Lamp Enclosure: One-piece tempered molded glass with internal flutes and full gasketing at bottom edge.

Socket: Porcelain medium base socket rated 4KV.

Fixture Head: Allows flow-through ventilation around and above the lamp enclosure.

Shaft: One-piece, extruded aluminum, .125″ wall thickness with a heavy cast aluminum twist-lock anchor base concealed within the shaft. Concealed set screws shall lock shaft onto the cast anchor base.

Ballast: High power factor ballasts are mounted to the anchor base and are factory prewired. Wiring shall be supplied from the socket for field connection to the prewired ballast components. Starting temperatures are -20°F.

Anchor Bolts: Four 3⁄8″ x 10″ + 2″ zinc plated L-hooks, each with two nuts, washers and a rigid pressed board template.

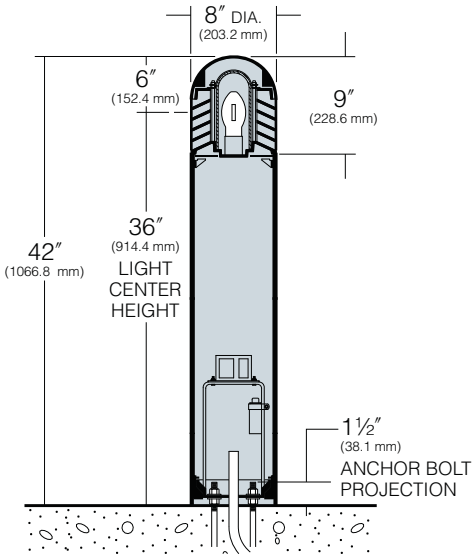
Finish: Super TGIC thermoset polyester powder coat paint, 2.5 mil nominal thickness, applied over a Titanated Zirconium conversion coating; 2500 hour salt spray test endurance rating.

CAUTION: Fixtures must be grounded in accordance with national, state and/or local electrical codes. Failure to do so may result in serious personal injury.

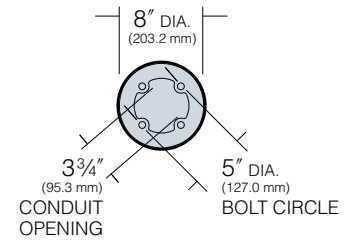
Listings and Ratings		
UL cUL 1598	–	25C Ambient
IP46 Rated	CE	ISO 9001:2000
CO = Cut Off		

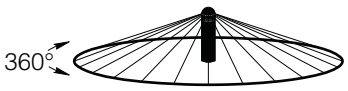
Dimensions

KN-VRB1 Models
100 Watt Metal Halide
Medium Base Lamp



Base Plan





Ordering Information

Catalog Number:

Fixtures provided with the following lamp:

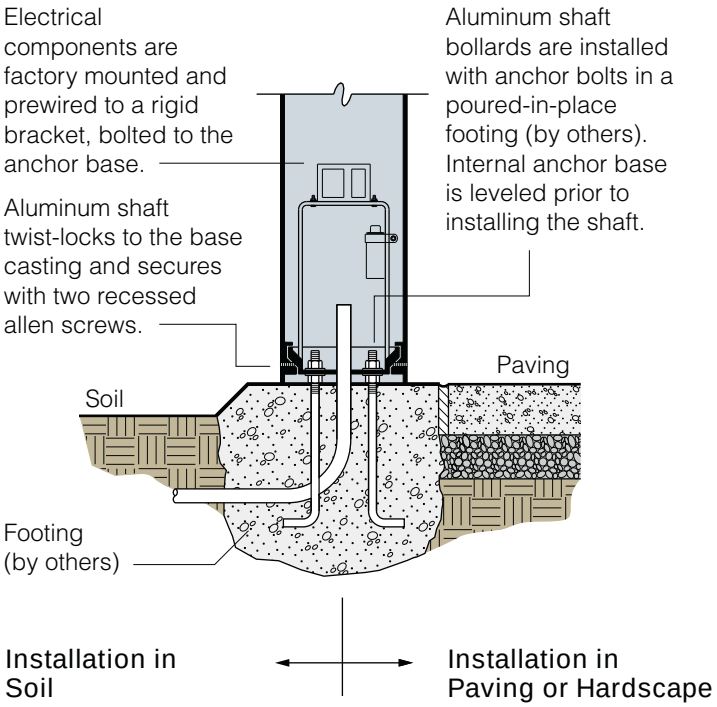
100MH - 100W Coated Universal ED17 Metal Halide 120/208/240/277 Volt Ballast

See photometrics on page **39**.

See lamp and electrical data on page **44**.

Lamp	Color	Fixture Order Number
100MH	Dark Bronze	KN-VRB1-60DB
	White	KN-VRB1-60WH

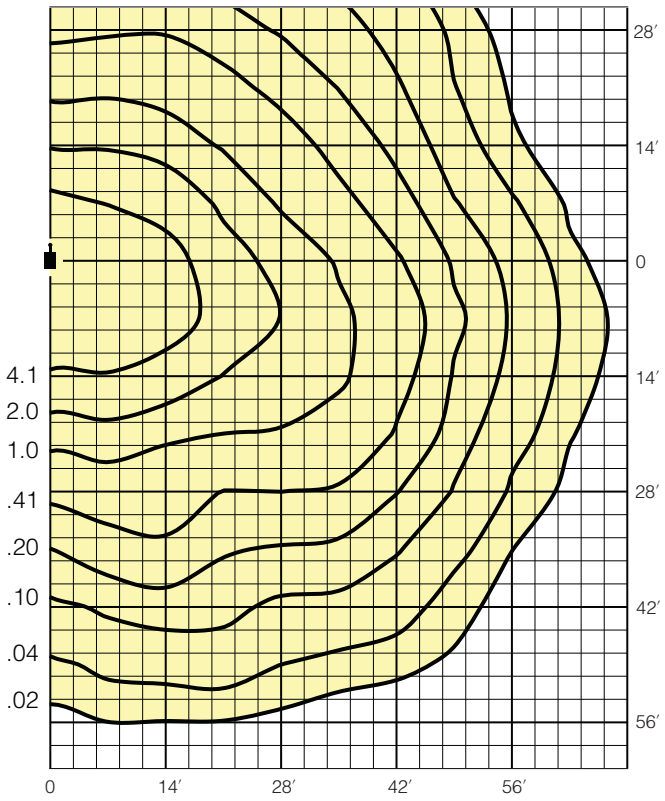
NOTE: All fixtures provided with multi-tap ballasts for 120, 208, 240 and 277 Volt operation, factory pre-wired for 277 Volt connection. Connection to other voltages completed in field by installer.



Performance

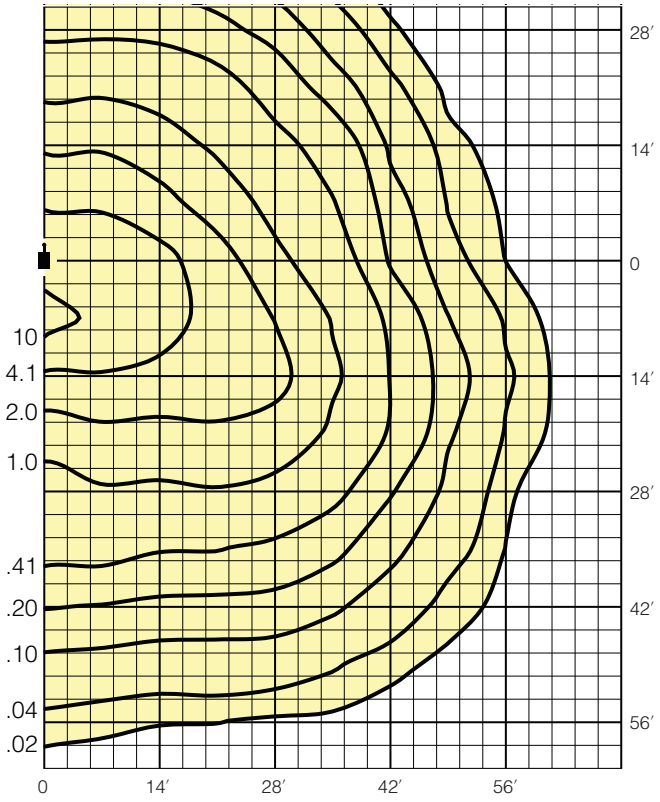
KN-SAR2

175MH - 14′ Pole Height / Initial Footcandles



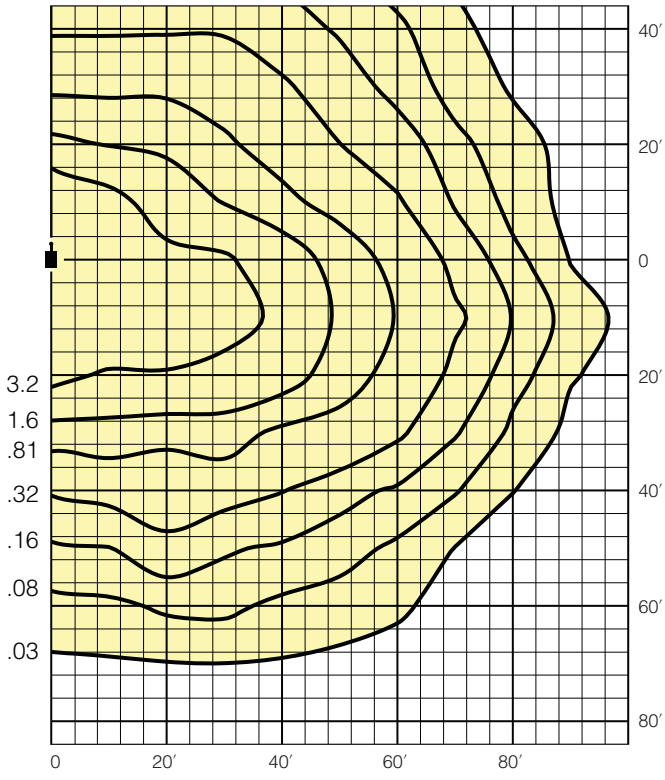
KN-SAR3

175MH - 14′ Pole Height / Initial Footcandles



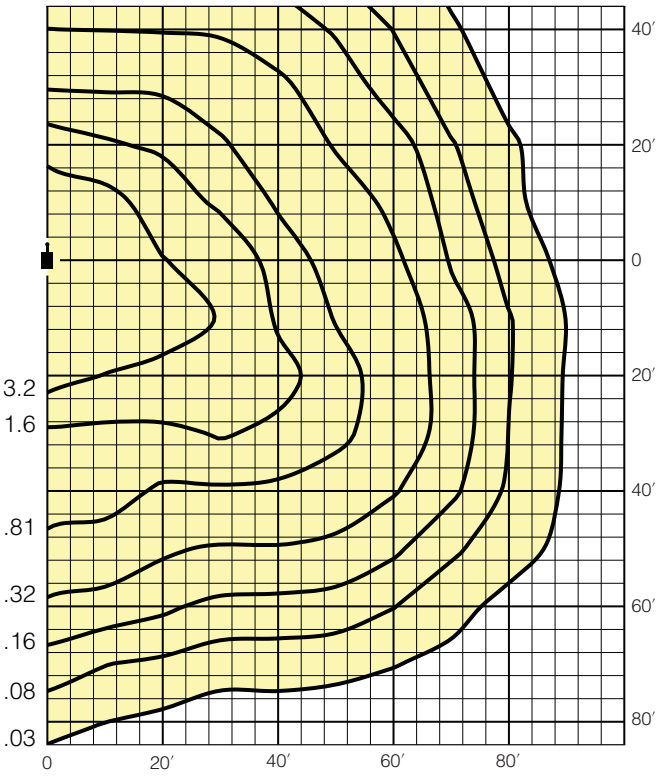
KN-AR2

400MH - 20′ Pole Height / Initial Footcandles



KN-AR3

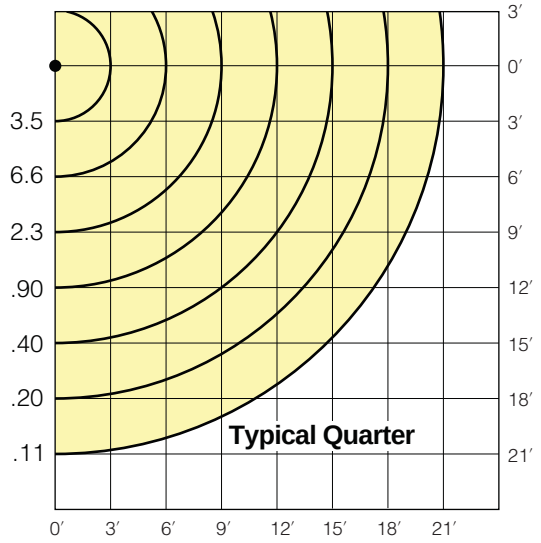
400MH - 20′ Pole Height / Initial Footcandles



Performance

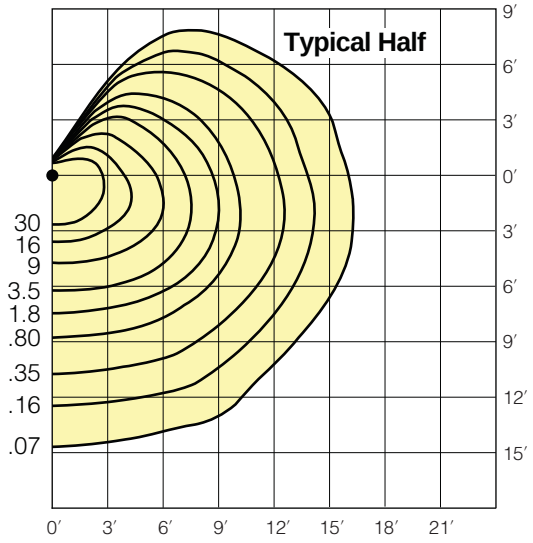
KN-VRB1

100MH / Initial Footcandles
White Luminaire



KN-SL1 Bollard

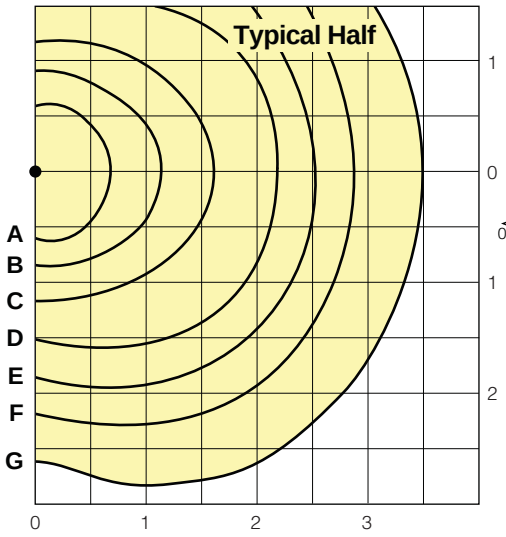
70MH / Initial Footcandles



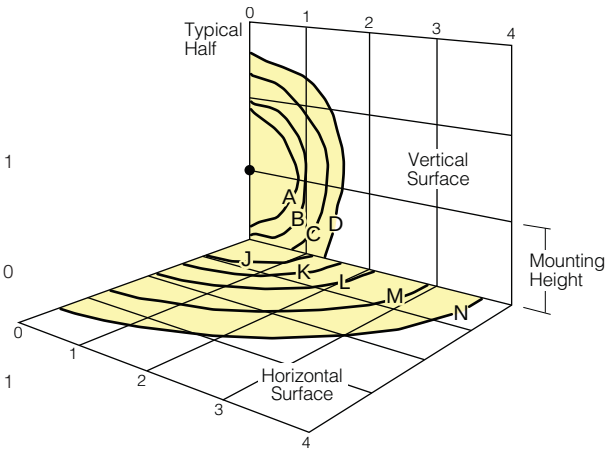
Performance

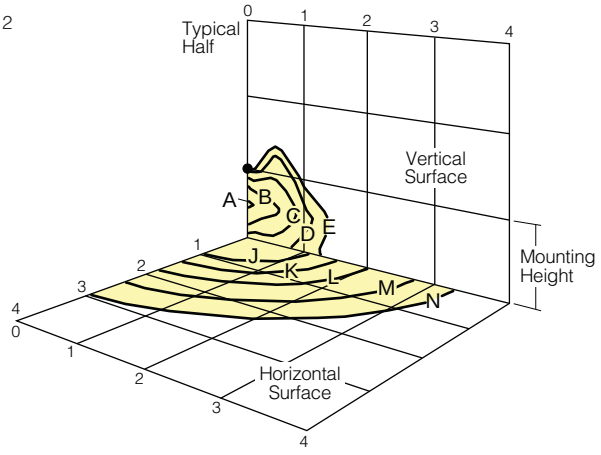
KN-SW Wall Mount

50MH / Initial Footcandles



	6′	8′	10′	12′
A	6.2	3.5	2.2	1.5
B	3.7	2.1	1.3	.92
C	2.1	1.2	.77	.53
D	.89	.50	.32	.22
E	.50	.28	.18	.12
F	.25	.14	.09	.06
G	.12	.07	.04	.03





KN-WF20 Wall Mount

70MH / Initial Footcandles
Mounting Height

		7′	8′	9′	10′
VERTICAL	**A**	1.5	1.0	.70	.51
	B	.75	.50	.35	.26
	C	.30	.20	.14	.10
	D	.15	.10	.07	.05
HORIZONTAL	**J**	2.6	2.0	1.6	1.3
	K	1.3	1.0	.79	.64
	L	.66	.50	.40	.32
	M	.26	.20	.16	.13
	N	.13	.10	.08	.06

KN-WF21 Wall Mount

70MH / Initial Footcandles
Mounting Height

		7′	8′	9′	10′
VERTICAL	**A**	3.0	2.0	1.4	1.0
	B	1.5	1.0	.70	.51
	C	.75	.50	.35	.26
	D	.30	.20	.14	.10
	E	.15	.10	.07	.05
HORIZONTAL	**J**	2.6	2.0	1.6	1.3
	K	1.3	1.0	.79	.64
	L	.66	.50	.40	.32
	M	.26	.20	.16	.13
	N	.13	.10	.08	.06

Lamp and Electrical Guide

Lamp	Lamp Watts	ANSI Ballast Type	Life (Hours)	Initial Lumens	Voltage	Operating Amps	Open Circuit Volts	Starting Amps	Max. Amps
METAL HALIDE									
50MH ED-17 Coated, Medium Base, Universal Orientation	50	M-110	15,000+	3,750	120	0.64	1.05	0.75	1.05
50MH ED-17 Clear, Medium Base, Universal Orientation	50	M-110	15,000+	3,750	120	0.64	1.05	0.75	1.05
70MH KN-CFL1 and KN-WF fixtures ED-17 Clear, Medium Base, Universal Orientation	70	M-98	12,000	5,500	120	0.85	1.90	0.55	1.90
					277	0.39	0.78	0.39	0.78
70MH ED-17 Clear, Medium Base, Universal Orientation	70	M-98	15,000+	6,000	120	0.80	1.90	0.55	1.90
					208	0.46	1.00	0.30	1.00
					240	0.40	0.90	0.25	0.90
					277	0.35	0.80	0.25	0.80
100MH ED-17 Coated, Medium Base, Universal Orientation	100	M-90	15000+	8,700	120	1.15	2.30	1.20	2.30
					208	0.66	1.40	0.80	1.40
					240	0.58	1.15	0.65	1.15
					277	0.50	1.00	0.60	1.00
100MH ED-17 Clear, Medium Base, Universal Orientation	100	M-90	15,000+	9,000	120	1.15	2.30	1.20	2.30
					208	0.66	1.40	0.80	1.40
					240	0.58	1.15	0.65	1.15
					277	0.50	1.00	0.60	1.00
150MH ED-17 Clear, Medium Base, Universal Orientation	150	M-102	9,000+	13,500	120	1.60	3.65	1.75	3.65
					208	1.00	2.10	1.30	2.10
					240	0.80	1.80	0.85	1.80
					277	0.70	1.58	0.77	1.58
175MH ED-17 Clear, Medium Base, Universal Orientation	175	M-57	10,000+	13,500	120	1.80	1.80	1.30	1.80
					208	1.04	1.04	0.75	1.04
					240	0.90	0.90	0.65	0.90
					277	0.80	0.80	0.55	0.80
250MH ED-28 Clear, Mogul Base, Universal Orientation	250	M-58	10,000+	20,500	120	2.50	2.10	1.50	2.50
					208	1.40	1.20	1.00	1.40
					240	1.30	1.10	0.80	1.30
					277	1.10	1.00	0.70	1.10
					480	0.65	0.54	0.40	0.65
400MH ED-28 Clear, Mogul Base, Universal Orientation	400	M-59 / H-33	20,000+	36,000	120	4.00	3.20	2.50	4.00
					208	2.30	1.80	1.40	2.30
					240	2.00	1.60	1.20	2.00
					277	1.75	1.50	1.00	1.75
					480	1.00	0.90	0.60	1.00
COMPACT FLUORESCENT									
42PL Coated, GX24q-4 Base	42	-	10,000	3,200	120	-	-	-	0.41
					208	-	-	-	0.24
					240	-	-	-	0.20
					277	-	-	-	0.18
HALOGEN									
50PAR20 Flood	50		2,000	550/1,400	120	-	-	-	-
90PAR38 Flood	90	-	2,000	1,280/4,500	120	-	-	-	-
250PAR38 Flood	250		4,200	3,600/9,000	120	-	-	-	-

NOTES:

1. Voltages shown are not available in all fixtures. Refer to individual fixture specification and order information for available voltages for specific fixtures.
2. Lamps provided with each fixture order by various lamp providers. Lamps shipped with order in separate carton to protect against breakage and to facilitate inventory at job site.
3. Lamp data shown above may vary slightly based on actual lamp provided.

CAUTION: Fixtures must be grounded in accordance with national, state and/or local codes. Failure to do so may result in serious personal injury.

LUMARK

Tribute

Area Luminaire

COOPER Lighting

TR TRIBUTE

AREA LUMINAIRE

THE RIGHT CHOICE

From the parking lot to the highway, Tribute is the ideal lighting solution for area and roadway applications. Tribute's rugged die-cast construction and classic form provide enduring performance and universal appeal. Coupled with contractor-friendly features such as toolless entry and an optional electrical power tray, Tribute is a breeze to install and maintain.

OPTIMAL PERFORMANCE

Tribute is available with nine (9) uniquely shaped optical distributions, each classifying as dark sky friendly IESNA full cutoff. Whether selecting a high efficiency hydroformed optic or a premium 95% reflective segmented reflector, Tribute's optical versatility provides custom tailored lighting solutions for exacting site requirements. Tribute also features Cooper's-exclusive SLE Spill Light Eliminator optic which provides outstanding cutoff behind the pole and maximum street-side reach.

MOUNTING VERSATILITY

Tribute is offered in five (5) distinct mounting configurations, providing unrivaled versatility in mounting. Choose from arm mount, mast arm or wall mount for horizontal fixture attachment, or trunnion or slipfitter mount for vertical tilt adjustment.


TOOLLESS ENTRY


SLE SPILL LIGHT ELIMINATOR


WALL MOUNT

SPECIFICATION FEATURES

CONSTRUCTION

Rugged one-piece die-cast aluminum housing and door frame. One-piece silicone gasket protects the optical chamber from performance degrading contaminants. One (1) stainless spring latch and two (2) stainless steel hinges allow toolless opening and removal of door frame.

REFLECTOR

Choice of nine (9) high efficiency optical distributions, including five (5) segmented optical systems constructed of premium 95% reflective anodized aluminum sheet. Optical segments are rigidly mounted inside a thick gauge aluminum housing for superior protection. All segment faces are clean of rivet heads, tabs or other means of attachment which may cause streaking in the light distribution. Optical modules are field rotatable in 90° increments and offered standard with mogul-base lampholders for 150-400W assemblies or medium-base lampholders for 100W and below.

ELECTRICAL

Ballast and related electrical componentry are hard mounted to die-cast housing for optimal heat transfer and operating efficiency. Optional swing-down galvanized steel power tray with integral handle and quick disconnects allows tray to be completely removed from housing providing ample room for fixture installation and maintenance.

MOUNTING

Extruded 8" aluminum arm features internal bolt guides for easy positioning of fixture during installation to pole or wall surface. Standard single carton packaging of housing, square pole arm and round pole adapter allow for consolidated product arrival to site. Optional internal mast arm mount accepts a 1 1/4" to 2 3/8" O.D. horizontal tenon, while 4-bolt clamping mechanism secures fixture. Cast-in leveling guides provide ±5° vertical leveling adjustment.

FINISH

Housing and arm finished in a 5 stage premium TGIC bronze polyester powder coat paint. Optional colors include black, grey, white, dark platinum and graphite metallic. RAL and custom color matches available.

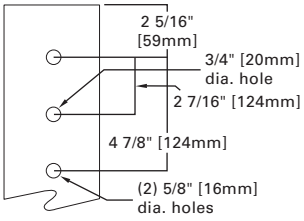
DARK SKY COMPLIANT FCO Full Cutoff

ROTATIONAL FLEXIBILITY

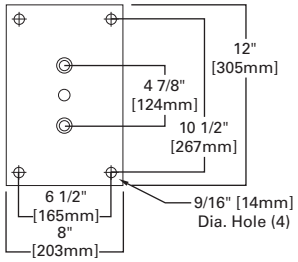
Optical assemblies can be rotated in 90° increments, allowing for manipulation of distribution orientation independent of fixture orientation.

DRILLING PATTERNS

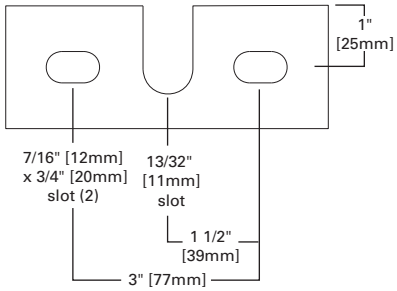
Type "M"



Wall Mount

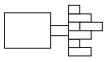


Trunnion Mount



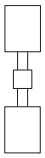
MOUNTING CONFIGURATIONS

Wall Mount

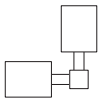


Arm Mount Single
EPA: 1.62

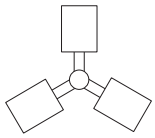
Arm Mount 2 @ 180°
EPA: 3.24



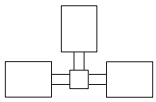
Arm Mount 2 @ 90°
EPA: 3.24



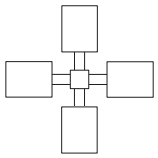
Arm Mount 3 @ 120°
(Round Pole Only)
EPA: 4.43



Arm Mount 3 @ 90°
EPA: 4.43



Arm Mount 4 @ 90°
EPA: 5.03



OPTIONS + ACCESSORIES [Order Separately]

ELECTRICAL POWER TRAY [PT]

Electrical componentry mounted to an optional swing-down galvanized steel power tray with integral handle. Electrical disconnects allow tray to be completely removed from housing providing ample hand and tool room during fixture maintenance and installation.

EXTERNAL HOUSE SIDE SHIELD [MA1221]

External house side shield designed to provide sharp cutoff behind pole while shielding the lamp from direct view. Mounted to the door via four (4) stainless steel fasteners, the MA1221 external house side shield provides industry leading glare and spill light control.

VANDAL SHIELD [TR/VS]

Door mounted 3/16" thick polycarbonate shield prevents lens damage from particulates and projectiles. Treated with a UV inhibitor to discourage the gradual discoloration that results from exposure to UV emitting sources.

PREMIUM SEGMENTED OPTICS

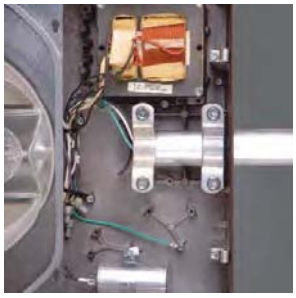
Five (5) optional high efficiency segmented optical systems constructed of premium 95% reflective anodized aluminum sheet. Optical segments are rigidly mounted inside a thick gauge aluminum housing for superior protection. All segment faces are clean of rivet heads, tabs or other means of attachment which may cause streaking in the light distribution.

QUARTZ RESTRIKE [Q, EM, EM/SC]

Optional quartz restrike [Q] energizes auxiliary quartz lamp upon power reactivation and extinguishes once HID lamp re-ignites. Quartz restrike with time delay [EM] adds cold start activation. Emergency Separate Circuit [EM/SC] allows the quartz lamp socket to be wired to an independent relay controlled power source.

NEMA TWISTLOCK PHOTOCONTROL RECEPTACLE [PER]

Gasketed photocontrol receptacle for mounting a standard NEMA photocontrol (order separately). Button-style photocontrol [PC] also available.



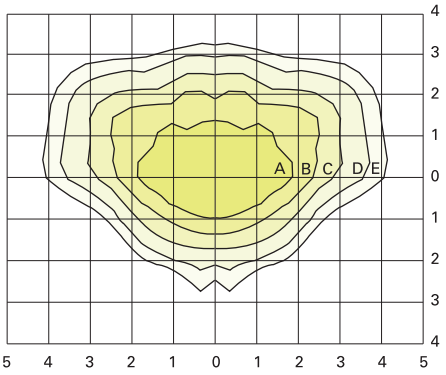
INTERNAL MAST ARM MOUNT [S]

Optional internal mast arm mount accepts a 1 1/4" to 2 3/8" O.D. horizontal tenon while 4-bolt clamping mechanism secures fixture. Cast-in leveling guides provide ±5° vertical leveling adjustment.

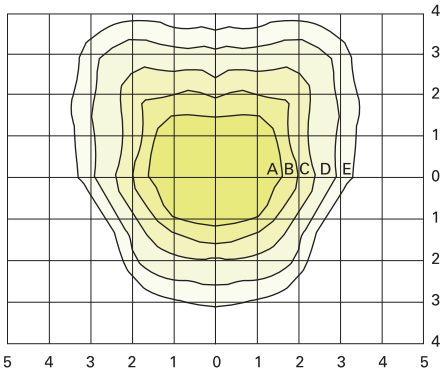
ADJUSTABLE SLIPFITTER [OA1090]

Optional knuckle mount with internal wireway enables vertical tilt adjustment. Knuckle slip fits over vertical 2 3/8" O.D tenon and is secured by two (2) 1/2" bolts.

PHOTOMETRICS [Complete IES files available at www.cooperlighting.com]



MHTR-3S-400
400-Watt MH
40,000-Lumen Clear Lamp
Type III Segmented

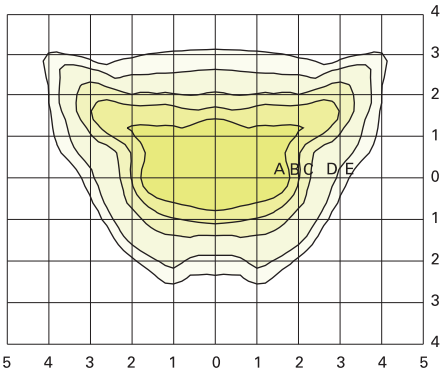


MHTR-4S-400
400-Watt MH
40,000-Lumen Clear Lamp
Type IV Segmented

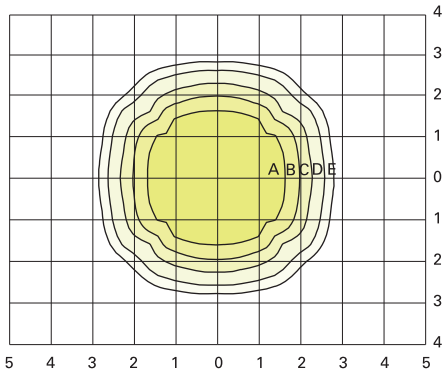
FOOTCANDLE TABLE

Select mounting height and read across for footcandle values of each isofootcandle line. Distance in units of mounting height.

Mounting Height	Footcandle Values for Isofootcandle Lines				
	A	B	C	D	E
MHTR-3S-400 / MHTR-4S-400					
20'	3.00	1.50	0.75	0.30	0.15
25'	**2.00**	**1.00**	**0.50**	**0.20**	**0.10**
30'	1.38	0.69	0.34	0.13	0.06



MHTR-3F-400
400-Watt MH
40,000-Lumen Clear Lamp
Type III Formed

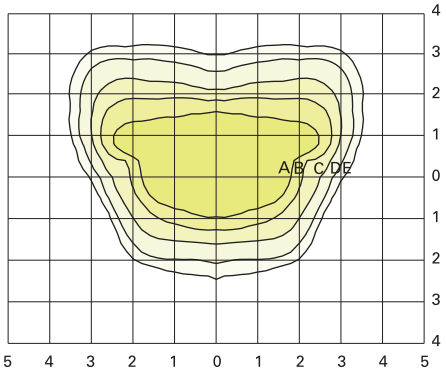


MHTR-5F-400
400-Watt MH
40,000-Lumen Clear Lamp
Type V Formed

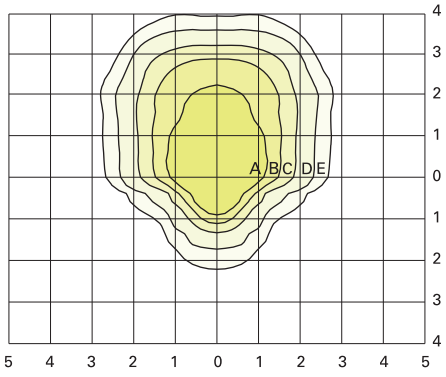
FOOTCANDLE TABLE

Select mounting height and read across for footcandle values of each isofootcandle line. Distance in units of mounting height.

Mounting Height	Footcandle Values for Isofootcandle Lines				
	A	B	C	D	E
MHTR-3F-400 / MHTR-5F-400					
20'	3.00	1.50	0.75	0.30	0.15
25'	**2.00**	**1.00**	**0.50**	**0.20**	**0.10**
30'	1.38	0.69	0.34	0.13	0.06



HPTR-3F-400
400-Watt HPS
50,000-Lumen Clear Lamp
Type III Formed

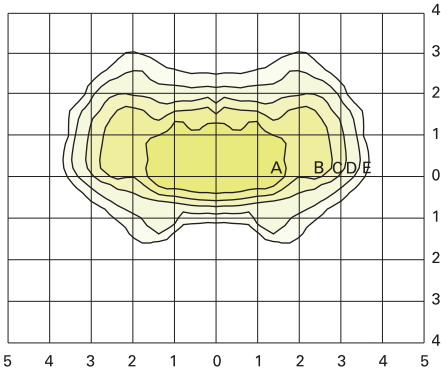


HPTR-4F-400
400-Watt HPS
50,000-Lumen Clear Lamp
Type IV Formed

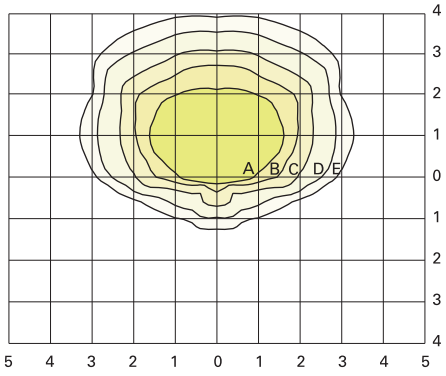
FOOTCANDLE TABLE

Select mounting height and read across for footcandle values of each isofootcandle line. Distance in units of mounting height.

Mounting Height	Footcandle Values for Isofootcandle Lines				
	A	B	C	D	E
HPTR-3F-400 / HPTR-4F-400					
20'	3.00	1.50	0.75	0.30	0.15
25'	**2.00**	**1.00**	**0.50**	**0.20**	**0.10**
30'	1.38	0.69	0.34	0.13	0.06



MHTR-3S-400-HS
400-Watt MH
40,000-Lumen Clear Lamp
Type III Segmented w/ House Side Shield



MHTR-SL-400
400-Watt MH
40,000-Lumen Clear Lamp
SLE-Spill Light Eliminator

FOOTCANDLE TABLE

Select mounting height and read across for footcandle values of each isofootcandle line. Distance in units of mounting height.

Mounting Height	Footcandle Values for Isofootcandle Lines				
	A	B	C	D	E
MHTR-3S-400-HS / MHTR-SL-400					
20'	3.00	1.50	0.75	0.30	0.15
25'	**2.00**	**1.00**	**0.50**	**0.20**	**0.10**
30'	1.38	0.69	0.34	0.13	0.06

TR TRIBUTE

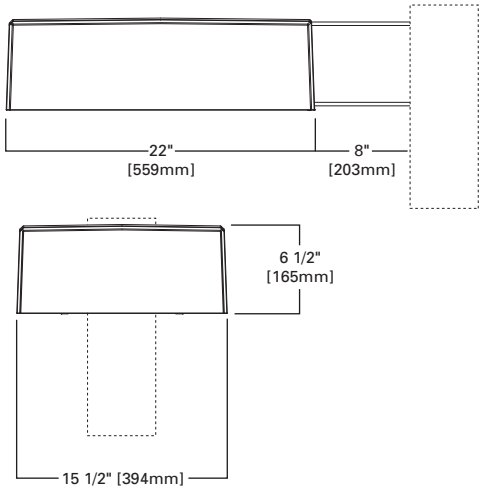
AREA LUMINAIRE

70-400W MH/MP/HPS

LUMARK

IP55 RATING

DARK SKY COMPLIANT FCO Full Cutoff



CONSTRUCTION

Rugged one-piece die-cast aluminum housing and door frame One-piece silicone gasket protects the optical chamber from performance degrading contaminants One (1) stainless spring latch and two (2) stainless steel hinges allow toolless opening and removal of door frame

REFLECTOR

Choice of nine (9) high efficiency optical distributions, including five (5) segmented optical systems constructed of premium 95% reflective anodized aluminum sheet Optical segments are rigidly mounted inside a thick gauge aluminum housing for superior protection All segment faces are clean of rivet heads, tabs or other means of attachment which may cause streaking in the light distribution Optical modules are field rotatable in 90° increments and offered standard with mogul-base lampholders for 150-400W assemblies or medium-base lampholders for 100W and below

ELECTRICAL

Ballast and related electrical componentry are hard mounted to die-cast housing for optimal heat transfer and operating efficiency Optional swing-down galvanized steel power tray with integral handle and quick disconnects allows tray to be completely removed from housing providing ample room for fixture installation and maintenance

MOUNTING

Extruded 8" aluminum arm features internal bolt guides for easy positioning of fixture during installation to pole or wall surface Standard single carton packaging of housing, square pole arm and round pole adapter allow for consolidated product arrival to site Optional internal mast arm mount accepts a 1 1/4" to 2 3/8" O D horizontal tenon, while 4-bolt clamping mechanism secures fixture Cast-in leveling guides provide ±5° vertical leveling adjustment

FINISH

Housing and arm finished in a 5 stage premium TGIC bronze polyester powder coat paint Optional colors include black, grey, white, dark platinum and graphite metallic RAL and custom color matches available

EPA

Effective Projected Area (Sq Ft)**:**
1 19 (Without Arm)

SHIPPING DATA

Approximate Net Weight:
39 lbs (17 73 kgs)

ORDERING INFORMATION

SAMPLE NUMBER: MHTR-SL-400-MT-LL

LAMP TYPE
MH=Metal Halide
MP=Pulse Start Metal Halide
HP=High Pressure Sodium

SERIES [1]
TR=Tribute
(Arm Included)

DISTRIBUTION
2F=Type II Formed
2S=Type II Segmented
3F=Type III Formed
3S=Type III Segmented
4F=Type IV Formed
4S=Type IV Segmented
5F=Type V Formed
5S=Type V Segmented
SL=Spill Light Eliminator

LAMP WATTAGE [2]
70=70W
100=100W
150=150W
175=175W
250=250W
320=320W [3]
400=400W [4]

VOLTAGE [5]
120V
208V
240V
277V
347V
480V
DT=Dual-Tap Wired 277V [6]
MT=Multi-Tap Wired 277V [6]
TT=Triple-Tap Wired 347V [6]
5T=5-Tap Wired 480V [6]

OPTIONS + ACCESSORIES
(See Below)

OPTIONS + ACCESSORIES [Must be listed in the order shown and separated by a dash]

OPTIONS (add as suffix) [7]
F1=Single Fuse (120, 277 or 347V) [8]
F2=Double Fuse (208, 240 or 480V) [8]
Q=Quartz Restrike (Hot Strike Only) [9]
EM=Quartz Restrike with Time Delay [9]
EM/SC=Emergency Separate Circuit [9]
LL=Lamp Included
S=1 1/4"-2 3/8" Internal Mast Arm Mount
TM=Trunnion Mount
PT=Electrical Power Tray
PER=NEMA Twistlock Photocontrol Receptacle
PC=Button Type Photocontrol
HS=House Side Shield [10]
LA=Less Arm (Order Mounting Separately)
WH=White
BK=Black
AP=Grey
DP=Dark Platinum
GM=Graphite Metallic

ACCESSORIES (order separately/replace XX with color designation)
MA1201-XX=Direct Wall Mount Kit [1]
MA1216-XX=8" Tribute Arm [EPA=0.43] [1] (Includes Round Pole Adapter)
MA1218-XX=Direct Mount for Pole [1]
MA1219-XX=Wall Bracket with 8" Arm [1]
OA1090-XX=Adjustable Slipfitter Arm for Tenon Mount 2 3/8" O.D. [1]
TR/VS=Field Installed Vandal Shield [11]
MA1221-XX=External House Side Shield Kit [EPA=0.38]
MA1222=Internal House Side Shield Kit for 2S/3S
MA1223=Internal House Side Shield Kit for 4S
MA1224=Internal House Side Shield Kit for 2F/3F
MA1225=Internal House Side Shield Kit for 4F
OA/RA1016=Photoelectric Control 105-285V NEMA Type
OA/RA1027=Photoelectric Control 480V NEMA Type
OA/RA1201=Photoelectric Control 347V NEMA Type
OA/RA1013=Shorting Cap
MA1010-XX=Single Tenon Adapter for 3 1/2" O.D. Tenon
MA1011-XX=2 @ 180° Tenon Adapter for 3 1/2" O.D. Tenon
MA1012-XX=3 @ 120° Tenon Adapter for 3 1/2" O.D. Tenon
MA1013-XX=4 @ 90° Tenon Adapter for 3 1/2" O.D. Tenon
MA1014-XX=2 @ 90° Tenon Adapter for 3 1/2" O.D. Tenon
MA1015-XX=2 @ 120° Tenon Adapter for 3 1/2" O.D. Tenon
MA1016-XX=3 @ 90° Tenon Adapter for 3 1/2" O.D. Tenon
MA1017-XX=Single Tenon Adapter for 2 3/8" O.D. Tenon
MA1018-XX=2 @ 180° Tenon Adapter for 2 3/8" O.D. Tenon
MA1019-XX=3 @ 120° Tenon Adapter for 2 3/8" O.D. Tenon
MA1045-XX=4 @ 90° Tenon Adapter for 2 3/8" O.D. Tenon
MA1048-XX=2 @ 90° Tenon Adapter for 2 3/8" O.D. Tenon
MA1049-XX=3 @ 90° Tenon Adapter for 2 3/8" O.D. Tenon

LAMP TYPE	WATTAGE
Metal Halide	70, 100, 175, 250, 400W
High Pressure Sodium	70, 100, 150, 250, 400W
Pulse Start Metal Halide	250, 320W

NOTES: **1** 8" arm and round pole adapter included with fixture Specify Less Arm "LA" option when mounting accessory is ordered separately **2** Standard with mogul-base socket for 150-400W and medium-base socket 100W and below **3** 320W Pulse Start Metal Halide lamps only **4** Requires reduces envelope lamp **5** Products also available in non-US voltages for international markets Consult factory for availability and ordering information **6** Dual-Tap is 120/277V wired 277V Multi-Tap is 120/208/240/277V wired 277V Triple-Tap is 120/277/347V wired 347V 5-Tap is 120/208/240/277/480V wired 480V **7** Custom and RAL color matching available upon request Consult Cooper Lighting Representative for further information **8** Must specify voltage **9** Quartz options not available with SL optic **10** House side shield not available on 5S, 5F or SL optics **11** Not available with SLE or House Side Shield **12** Specifications and dimensions subject to change without notice

STOCK SAMPLE NUMBER [Lamp Included]

SAMPLE NUMBER: MHTR2340

LAMP TYPE
MH=Metal Halide
HP=High Pressure Sodium

SERIES [1]
TR=Tribute

DISTRIBUTION
23=Type II/III Formed

LAMP WATTAGE
15=150W
17=175W
25=250W
40=400W

NOTES: **1** Short logic fixtures include multi-tap ballast, lamp, and arm (including round pole adapter) Other options not available Refer to standard ordering logic

Cooper Lighting
Customer First Center
1121 Highway 74 South
Peachtree City, GA 30269

P: 770-486-4800
F: 770-486-4801

www.cooperlighting.com

International Sales, USA
Cooper Lighting
1121 Highway 74 South
Peachtree City, GA 30269

P: 770-486-4800
F: 770-486-4801

Canada
Cooper Lighting
5925 McLaughlin Road
Mississauga, Ontario L5R 1B8

P: 905-507-4000
F: 905-568-7049

The Cooper Lighting Family
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Lumark
Sure-Lites
Neo-Ray
Corelite
Portfolio
Iris
Shaper
io
Lumière
Invue
McGraw-Edison
Streetworks
Fail-Safe
MWS
DLS
RSA
Ametrix

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Irving, Texas
Ontario, California
Peachtree City, Georgia

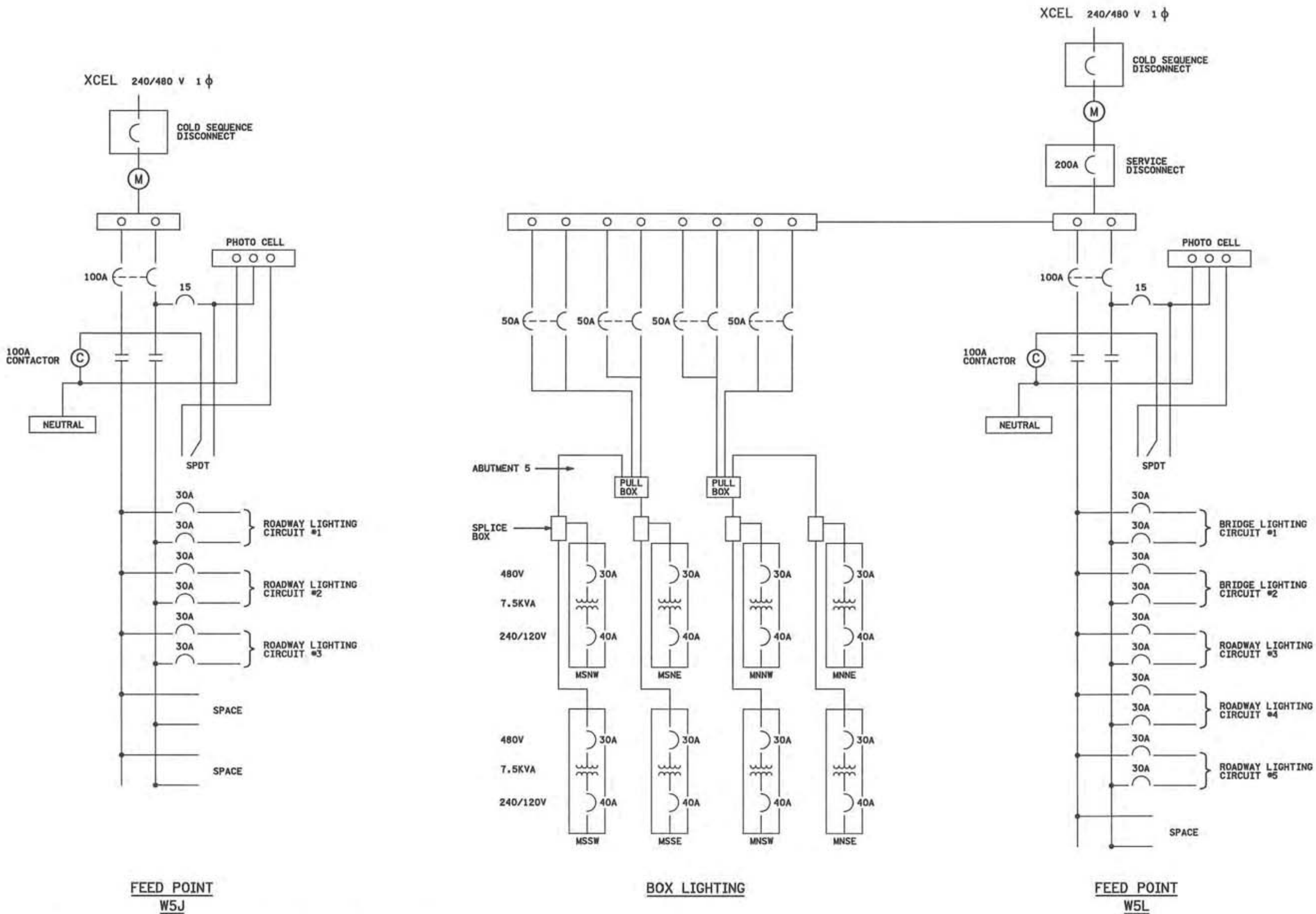
Canadian Facilities
Calgary, Alberta T2E 7V9
Chomedey, Laval P.Q.

Cooper Industries, Ltd.
600 Travis, Ste. 5800
Houston, TX 77002-1001
P: 713-209-8400
www.cooperindustries.com

ADH071180

Printed in USA

Electrical Feedpoint Diagrams



NO.	DATE	BY	DESCRIPTION OF REVISIONS
REV 0	6/27/08	JEB	RELEASED FOR CONSTRUCTION
REV 0	6/30/08	JEB	RELEASED FOR CONSTRUCTION
NDC-059	7/6/08	JEB	GENERAL REVISIONS
	9/23/08	RLY	AS-BUILT PLAN

DES: JEB
DRW: SFH
CHK: JEB

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
SIGNATURE: [signature]
PRINTED NAME: ROBERT L. YOUNG
DATE: 9/23/2008 LIC. NO. 26746

TKDA
ENGINEERS·ARCHITECTS·PLANNERS

AS-BUILT ACCEPTED
MN/DOT
DATE:

MINNESOTA DEPARTMENT OF TRANSPORTATION

LIGHTING PLANS
FEED POINT DETAILS

SAINT ANTHONY FALLS (35W) BRIDGE
DESIGN BUILD PROJECT
S.P. 2783-120 (I-35W)

Sheet No. R-LI20 | Sht. 255 of 409

DATE: 9/23/2008 TIME: 8:53:47 AM
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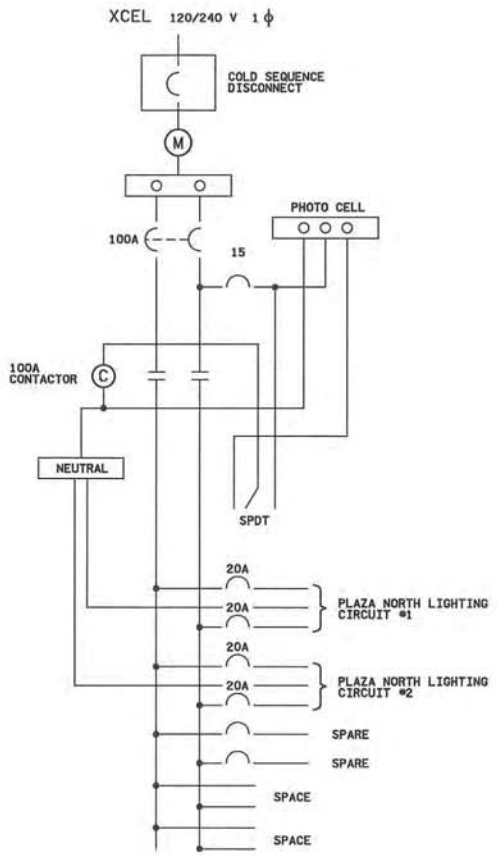
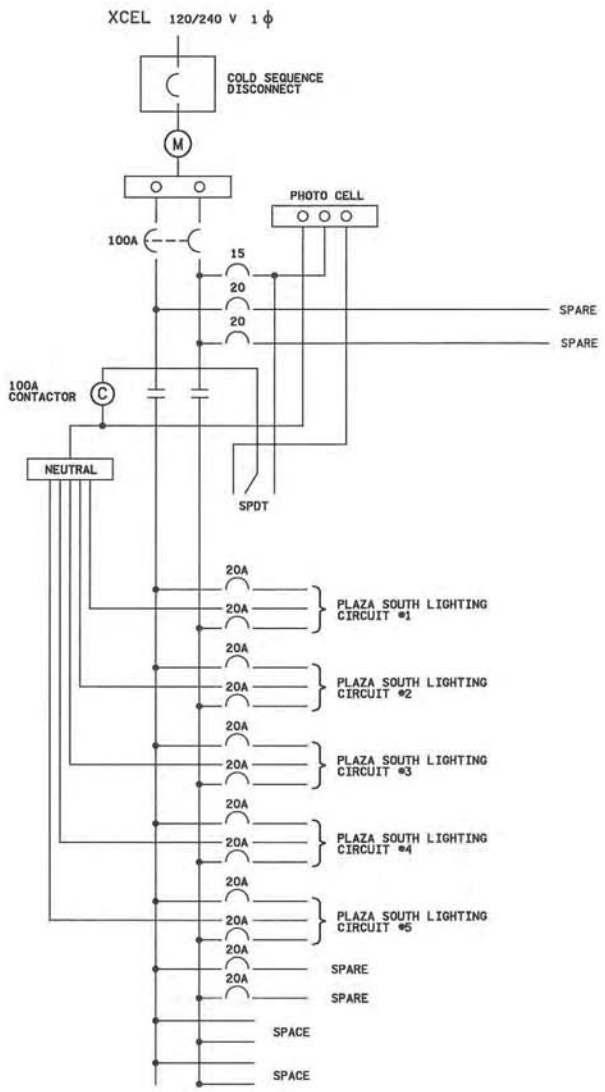


FEED POINT
FPNL



FEED POINT
FPSL

NO.	DATE	BY	DESCRIPTION OF REVISIONS
REV 0	8/11/08	JEB	RELEASED FOR CONSTRUCTION
	9/23/08	RLY	AS-BUILT PLAN

DES: JEB
DRW: SFH
CHK: JEB

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
SIGNATURE: Robert L. Young
PRINTED NAME: ROBERT L. YOUNG
DATE: 9/23/2008 LIC. NO. 26746

TKDA
ENGINEERS·ARCHITECTS·PLANNERS

AS-BUILT ACCEPTED
MN/DOT
DATE:

PATHWAY LIGHTING PLANS
FEED POINT DETAILS

SAINT ANTHONY FALLS (35W) BRIDGE
DESIGN BUILD PROJECT
S.P. 2783-120 (I-35W)

Sheet No. R-LI30 | Sht. 271 of 409

Anti-Icing System

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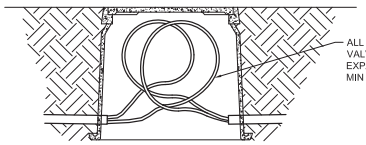
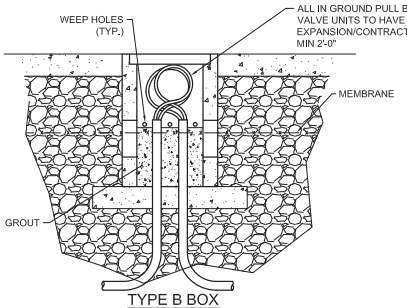
1. Roadway Weather Information System (RWIS)
    1.1. GFS 3000 Remote Processing Unit Manuals
    1.2. Sensor Connection & Conditioning Unit (SCU) Manual
2. Sensors
    2.1. Pavement Sensors
    2.2. RWIS & Environmental Sensors
3. Video System
4. BORRMA Software
5. Pump Station Equipment
    5.1. Ebara Self-Priming Pump
    5.2. Grundfos Pump
    5.3. Manifold Material
    5.4. Electronics
    5.5. Additional Pump Station Material
6. Pump Station Controller
    6.1. Spray System Controller (TMS) Manuals
    6.2. Maintenance Spraying
7. Auxiliary Power Systems
8. Valve Units
    8.1. Drawing & Parts List
    8.2. Valve Unit Part Details
9. General Materials
10. System Maintenance & Warranty
    10.1. Maintenance Procedures
    10.2. System Warranty
11. Contacts
12. (Volume 2) Boschung Project Drawings
13. (Volume 2) Bill of Materials
14. (Volume 2)
15. (Volume 3) Pump Station Building
    15.1. Foundation & Building Drawings
    15.2. Structural Calculations
    15.3. Building Materials



TYPE A BOX

SCALE: ¾" = 1'

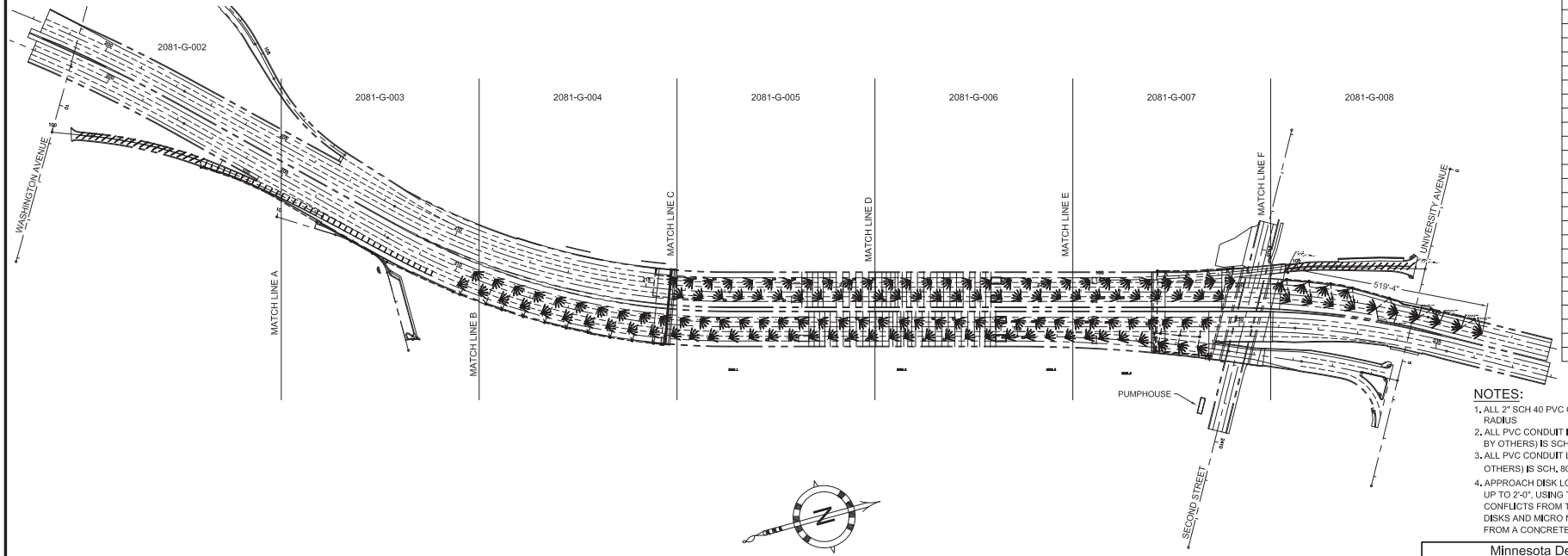
PULL BOXES LOCATED IN GROUND
QUAZITE 24x36x24 OR SIMILAR APPROVED
(BY OTHERS)



TYPE B BOX

SCALE: ¾" = 1'

PULL BOXES LOCATED IN CONCRETE SHOULDERS AND MEDIANS
HEAVY TRAFFIC RATED
PER MNDOT STANDARD PLATE # 8117F WITH VEHICLE LOAD
26 x 26 x 36 (BY OTHERS)
SEE MACCAFERRI PLANS FOR INSTALLATION DETAILS WITHIN
REINFORCEMENT ZONE OF GABION WALLS.



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E-075	Relay Cabinet Layout

NOTES:

1. ALL 2" SCH 40 PVC CONDUIT SWEEPS TO HAVE 9 ½" MIN. RADIUS
2. ALL PVC CONDUIT IN BRIDGE AND DIRECT BURIED (SUPPLIED BY OTHERS) IS SCH. 40 PER MNDOT SPEC #3803
3. ALL PVC CONDUIT LOCATED UNDER PAVEMENT (SUPPLIED BY OTHERS) IS SCH. 80 PER MNDOT SPEC #3803
4. APPROACH DISK LOCATIONS CAN BE MOVED LONGITUDINALLY UP TO 2'-0", USING THE SAME OFFSET FROM P.G.L., TO AVOID CONFLICTS FROM TRANSVERSE CONCRETE PAVEMENT JOINTS. DISKS AND MICRO NOZZLES SHALL BE NO CLOSER THAN 1'-0" FROM A CONCRETE PAVEMENT JOINT.

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM	-	WCH

Minnesota Department of Transportation

BOSCHUNG America, LLC

St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
SHEET 1 OF 8

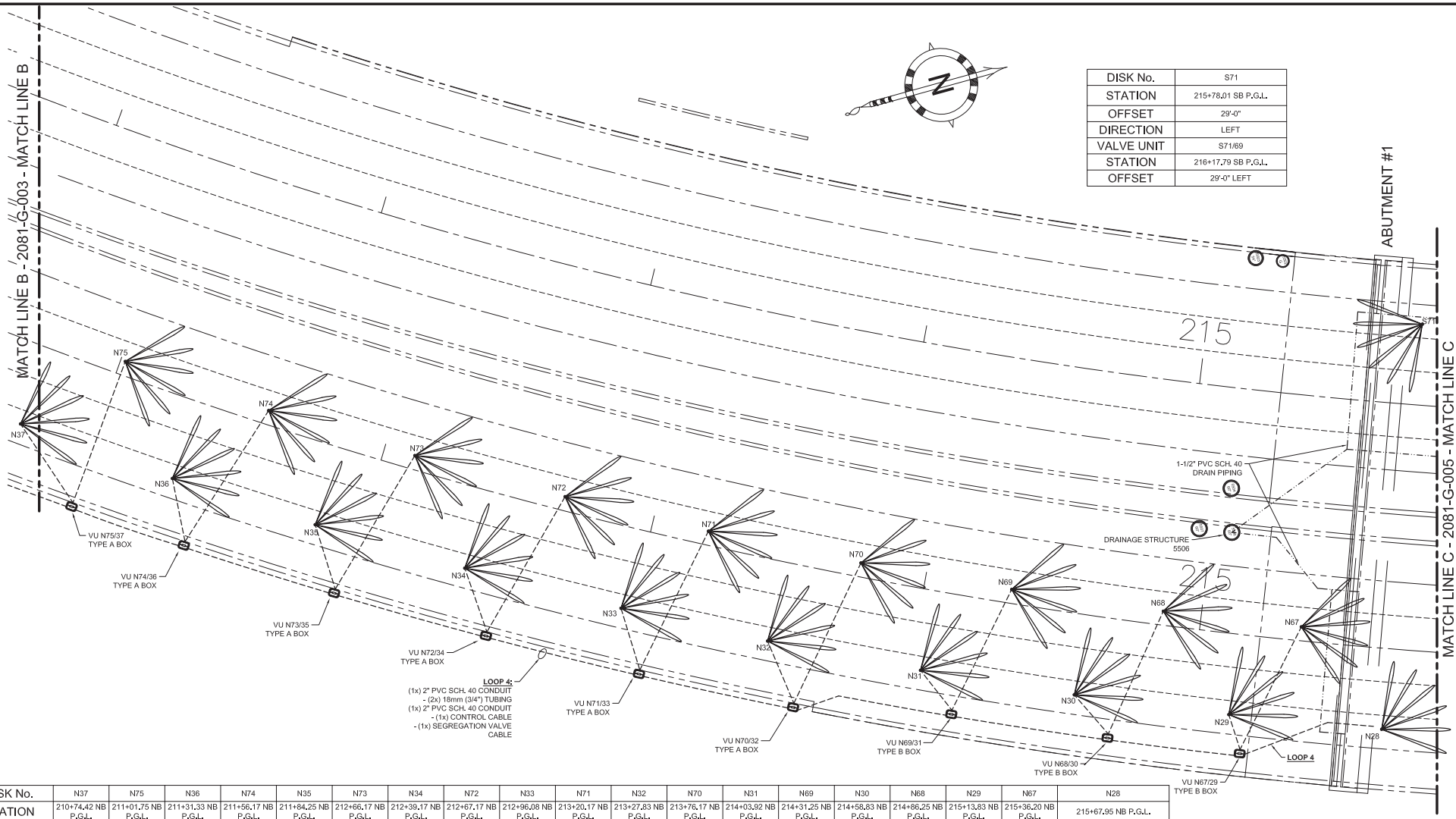
DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD.FOR BD ____
10/02/08	1/128" = 1'	STM	WCH	Hensel	DATE ____

APD.FOR CONST.

JOB No. BA2081A

DRAWING No. 2081-G-001

REVISION 4



DISK No.	S71
STATION	215+78.01 SB P.G.L.
OFFSET	29'-0"
DIRECTION	LEFT
VALVE UNIT	S71/69
STATION	216+17.79 SB P.G.L.
OFFSET	29'-0" LEFT

DISK No.	N37	N75	N36	N74	N35	N73	N34	N72	N33	N71	N32	N70	N31	N69	N30	N68	N29	N67	N28
STATION	210+74.42 NB P.G.L.	211+01.75 NB P.G.L.	211+31.33 NB P.G.L.	211+56.17 NB P.G.L.	211+84.25 NB P.G.L.	212+66.17 NB P.G.L.	212+39.17 NB P.G.L.	212+67.17 NB P.G.L.	212+96.08 NB P.G.L.	213+20.17 NB P.G.L.	213+27.83 NB P.G.L.	213+76.17 NB P.G.L.	214+03.92 NB P.G.L.	214+31.25 NB P.G.L.	214+58.83 NB P.G.L.	214+86.25 NB P.G.L.	215+13.83 NB P.G.L.	215+36.20 NB P.G.L.	215+67.95 NB P.G.L.
OFFSET	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"	5'-0"	29'-0"
DIRECTION	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT
VALVE UNIT	N75/37		N74/36		N73/35		N72/34		N71/33		N70/32		N39/31		N68/30		N67/29		N28/26
STATION	211+01.25 NB P.G.L.		211+42.58 NB P.G.L.		211+97.58 NB P.G.L.		212+52.50 NB P.G.L.		213+07.50 NB P.G.L.		213+62.42 NB P.G.L.		214+17.50 NB P.G.L.		214+72.42 NB P.G.L.		215+19.17 NB P.G.L.		216+14.00 NB P.G.L.
OFFSET	49'-0" RIGHT		49'-0" RIGHT		49'-0" RIGHT		49'-0" RIGHT		49'-0" RIGHT		49'-0" RIGHT		42'-8" RIGHT		42'-8" RIGHT		42'-8" RIGHT		29'-0" RIGHT

NOTES:
1. FOR CONDUIT AND VALVE UNIT DETAILS SEE DRAWINGS 2081-H-016, 017 & 018
2. FOR CROSS SECTIONS SEE DWG. 2081-H-021, H-022, H-023 & H-024
3. ALL NORTHBOUND APPROACH DISKS ARE FED FROM LOOP 4, ALTERNATING VALVE UNITS BETWEEN PRESSURE AND RETURN LINES. SEE DWG. 2081-G-012 FOR SCHEMATIC.
4. FOR DRAINAGE INFORMATION SEE DRAINAGE PLAN R-DR2
5. SEE DRAWINGS 2081-G-011 & 012 FOR HYDRAULIC SCHEMATIC AND DISK CONNECTION DETAILS

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM	-	WCH

Minnesota Department of Transportation

St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
SHEET 4 OF 8

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD. FOR BID	APPD. FOR CONST.
10/02/08	1/16" = 1'	STM	WCH	Hensel	DATE	

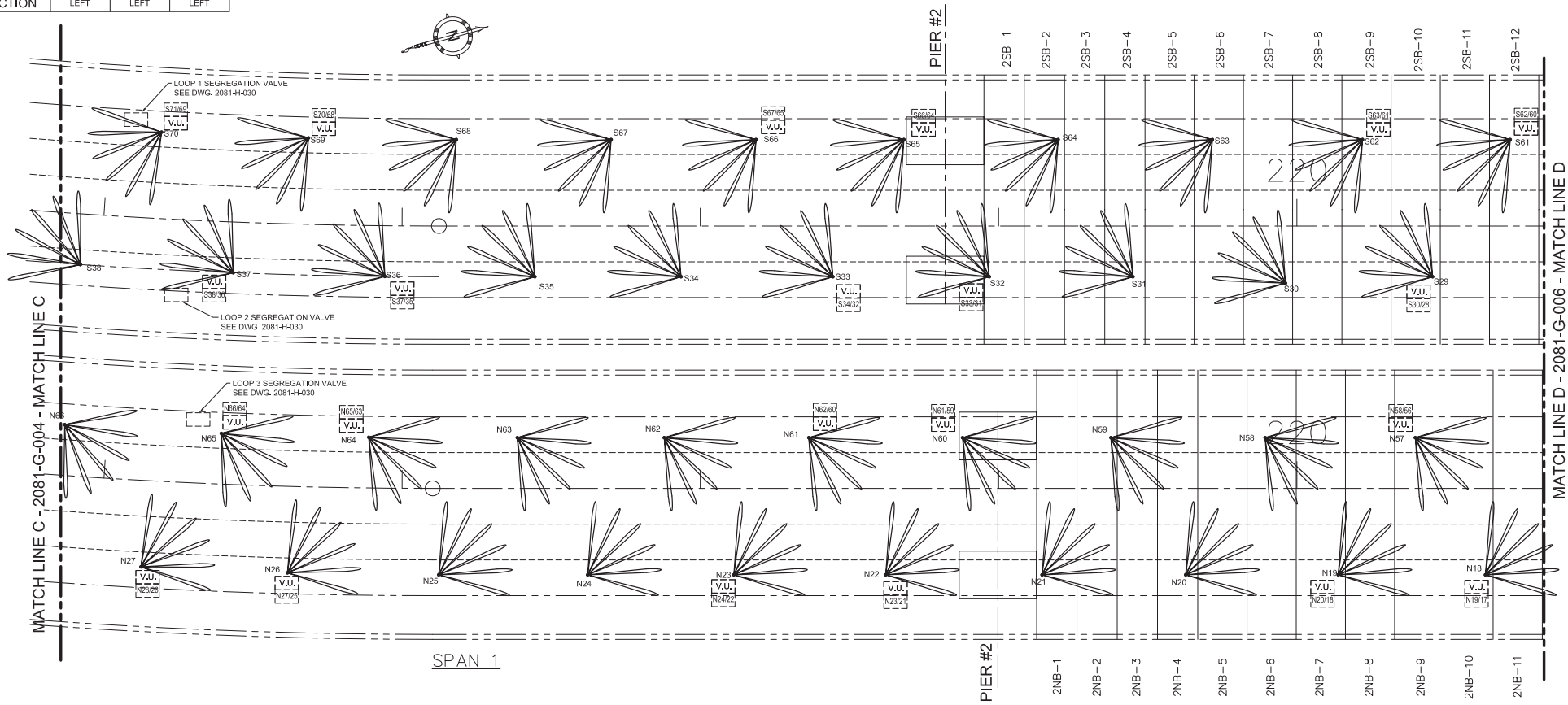
JOB No. BA2081A

DRAWING No. 2081-G-004

REVISION 4

SEG. VALVE	LOOP 1	LOOP 2	LOOP 3
STATION	216+09.00 SB P.G.L.	216+ 25.50 SB P.G.L.	216+30.50 NB P.G.L.
OFFSET	29'-0"	29'-0"	29'-0"
DIRECTION	LEFT	LEFT	LEFT

DISK No.	S71	S70	S69	S68	S67	S66	S65	S64	S63	S62	S61	S38	S37	S36	S35	S34	S33	S32	S31	S30	S29
STATION	215+78.01 SB P.G.L.	216+17.79 SB P.G.L.	216+67.91 SB P.G.L.	217+18.26 SB P.G.L.	217+70.19 SB P.G.L.	218+18.67 SB P.G.L.	218+68.24 SB P.G.L.	219+19.92 SB P.G.L.	219+71.67 SB P.G.L.	219+19.92 SB P.G.L.	220+71.50 SB P.G.L.	215+93.22 SB P.G.L.	216+44.05 SB P.G.L.	216+94.42 SB P.G.L.	217+44.53 SB P.G.L.	217+93.53 SB P.G.L.	218+44.44 SB P.G.L.	218+96.83 SB P.G.L.	219+45.00 SB P.G.L.	219+96.17 SB P.G.L.	220+45.50 SB P.G.L.
OFFSET	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	19'-2"	17'-0"
DIRECTION	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
VALVE UNIT	S71/69		S70/68		S67/65		S66/64		S63/61		S62/60		S38/36		S37/35		S34/32		S33/31		S30/28
STATION	216+17.79 SB P.G.L.		216+67.91 SB P.G.L.		218+18.67 SB P.G.L.		218+68.24 SB P.G.L.		219+19.92 SB P.G.L.		220+71.50 SB P.G.L.		216+44.05 SB P.G.L.		216+94.42 SB P.G.L.		218+44.44 SB P.G.L.		218+96.83 SB P.G.L.		220+45.50 SB P.G.L.
OFFSET	29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		17'-0" RIGHT		17'-0" RIGHT		17'-0" RIGHT		17'-0" RIGHT		17'-0" RIGHT



DISK No.	N66	N65	N64	N63	N62	N61	N60	N59	N58	N57	N27	N26	N25	N24	N23	N22	N21	N20	N19	N18
STATION	215+85.60 NB P.G.L.	216+38.69 NB P.G.L.	216+88.63 NB P.G.L.	217+38.65 NB P.G.L.	217+87.90 NB P.G.L.	218+36.37 NB P.G.L.	218+87.87 NB P.G.L.	219+37.67 NB P.G.L.	219+89.33 NB P.G.L.	220+39.66 NB P.G.L.	216+14.00 NB P.G.L.	216+62.35 NB P.G.L.	217+12.29 NB P.G.L.	217+62.23 NB P.G.L.	218+11.23 NB P.G.L.	218+62.15 NB P.G.L.	219+14.58 NB P.G.L.	219+62.67 NB P.G.L.	220+13.83 NB P.G.L.	220+63.17 NB P.G.L.
OFFSET	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"
DIRECTION	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
VALVE UNIT	N66/64		N65/63		N62/60		N61/59		N58/56		N28/26		N27/25		N24/22		N23/21		N20/18	
STATION	216+38.69 NB P.G.L.		216+88.63 NB P.G.L.		218+36.37 NB P.G.L.		218+87.87 NB P.G.L.		220+39.66 NB P.G.L.		216+14.00 NB P.G.L.		216+62.35 NB P.G.L.		218+11.23 NB P.G.L.		218+62.15 NB P.G.L.		220+13.83 NB P.G.L.	
OFFSET	17'-0" LEFT		17'-0" LEFT		17'-0" LEFT		17'-0" LEFT		17'-0" LEFT		29'-0 RIGHT		29'-0 RIGHT		29'-0 RIGHT		29'-0 RIGHT		29'-0 RIGHT	

NOTES:
1. FOR CONDUIT AND VALVE UNIT DETAILS SEE DRAWINGS 2081-H-016, 017 & 018
2. FOR CROSS SECTIONS SEE DWG. 2081-H-021, H-022, H-023 & H-024
3. SEE DRAWINGS 2081-G-011 7 012 FOR HYDRAULIC SCHEMATIC AND DISK CONNECTION DETAILS

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENT	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

Minnesota Department of Transportation

St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
SHEET 5 OF 8

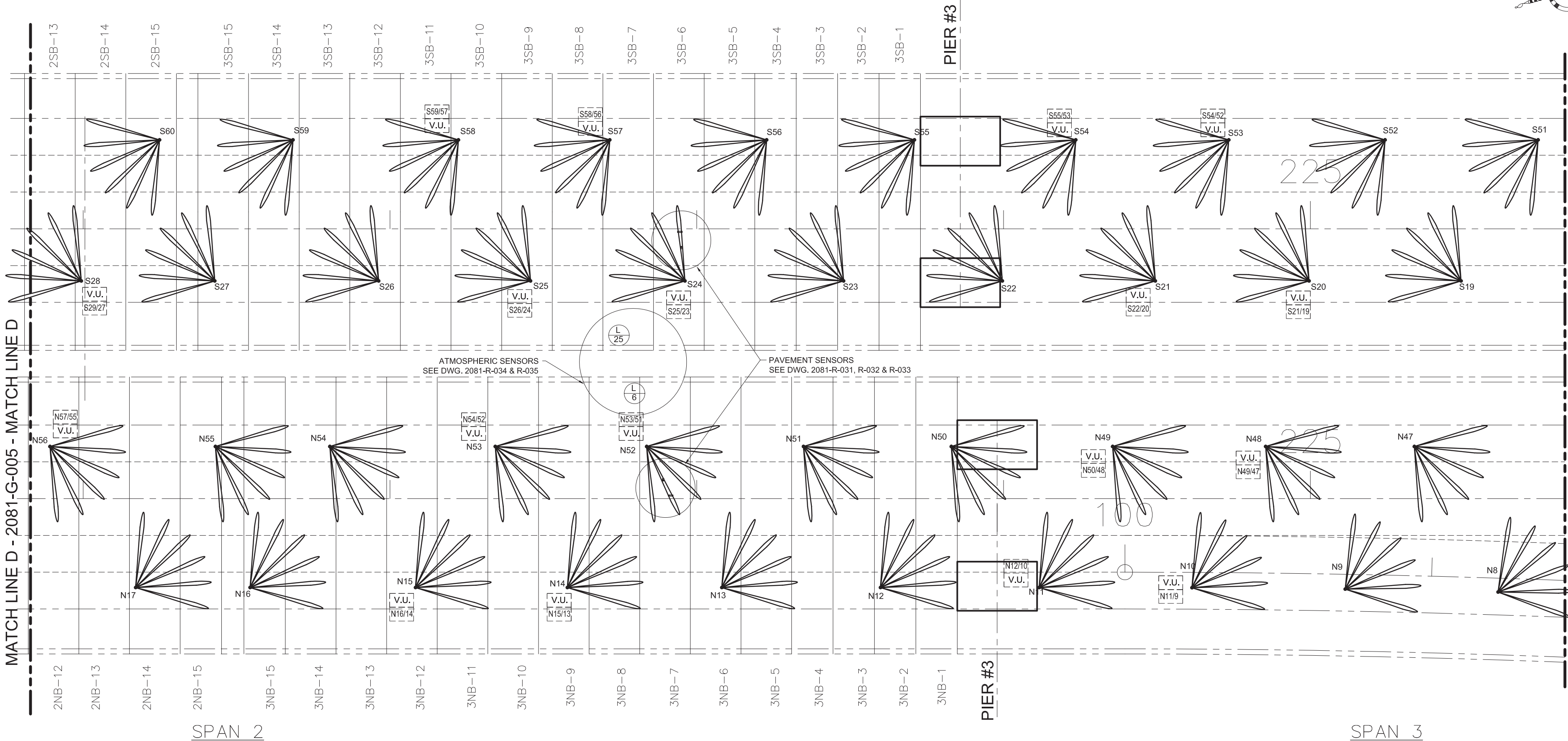
DATE	SCALE	DRAWN	CHKD.	ENGR.	APP'D FOR BID	APP'D FOR DIST.
10/02/08	1/16" = 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A

DRAWING No. 2081-G-005

REVISION 4

DISK No.	S60	S59	S58	S57	S56	S55	S54	S53	S52	S51	S28	S27	S26	S25	S24	S23	S22	S21	S20	S19
STATION	221+25.65 SB P.G.L.	221+67.98 SB P.G.L.	222+22.33 SB P.G.L.	222+71.66 SB P.G.L.	223+22.75 SB P.G.L.	223+70.92 SB P.G.L.	224+23.53 SB P.G.L.	224+73.56 SB P.G.L.	225+24.34 SB P.G.L.	225+74.22 SB P.G.L.	220+99.82 SB P.G.L.	221+42.15 SB P.G.L.	221+96.33 SB P.G.L.	222+45.83 SB P.G.L.	222+96.17 SB P.G.L.	223+47.83 SB P.G.L.	223+99.59 SB P.G.L.	224+49.46 SB P.G.L.	224+99.57 SB P.G.L.	225+79.11 SB P.G.L.
OFFSET	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"
DIRECTION	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
VALVE UNIT	S59/57		S58/56		S55/53		S54/52		S51/49		S29/27		S26/24		S25/23		S22/20		S21/19	
STATION	222+22.33 SB P.G.L.		222+71.66 SB P.G.L.		224+23.53 SB P.G.L.		224+73.56 SB P.G.L.		226+20.09 SB P.G.L.		220+99.42 SB P.G.L.		222+45.83 SB P.G.L.		222+96.17 SB P.G.L.		224+49.46 SB P.G.L.		224+99.57 SB P.G.L.	
OFFSET	29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		29'-0" LEFT		17'-0" RIGHT		17'-0" RIGHT		17'-0" RIGHT		17'-0" RIGHT		17'-0" RIGHT	



DISK No.	N56	N55	N54	N53	N52	N51	N50	N49	N48	N47	N17	N16	N15	N14	N13	N12	N11	N10	N9	N8
STATION	220+89.19 NB P.G.L.	221+43.08 NB P.G.L.	221+79.99 NB P.G.L.	222+34.33 NB P.G.L.	222+83.66 NB P.G.L.	223+34.75 NB P.G.L.	223+82.92 NB P.G.L.	224+35.54 NB P.G.L.	224+85.41 NB P.G.L.	225+33.88 NB P.G.L.	221+17.52 NB P.G.L.	221+54.42 NB P.G.L.	222+08.33 NB P.G.L.	222+57.83 NB P.G.L.	223+08.17 NB P.G.L.	223+59.83 NB P.G.L.	224+11.60 NB P.G.L.	100+21.88 UNIV. NB RAMP P.G.L.	100+71.91 UNIV. NB RAMP P.G.L.	101+21.79 UNIV. NB RAMP P.G.L.
OFFSET	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	17'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	29'-0"	5'-0"	4'-10"	4'-6 3/8"
DIRECTION	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
VALVE UNIT	N57/55		N54/52		N53/51		N50/48		N49/47		N19/17		N16/14		N15/13		N12/10		N11/9	
STATION	220+10.83 NB P.G.L		222+34.33 NB P.G.L.		222+83.66 NB P.G.L.		224+35.54 NB P.G.L.		224+85.41 NB P.G.L.		220+63.17 NB P.G.L.		222+08.33 NB P.G.L.		222+57.83 NB P.G.L.		224+11.60 NB P.G.L.		100+21.88 UNIV. NB RAMP P.G.L.	
OFFSET	17'-0" LEFT		17'-0" LEFT		17'-0" LEFT		17'-0" LEFT		17'-0" LEFT		29'-0" RIGHT		29'-0" RIGHT		29'-0" RIGHT		29'-0" RIGHT		29'-0" RIGHT	

NOTES:

1. FOR CONDUIT AND VALVE UNIT DETAILS SEE DRAWINGS 2081-H-016, 017 & 018
2. FOR CROSS SECTIONS SEE DWG. 2081-H-021, H-022, H-023 & H-024
3. SEE DRAWINGS 2081-G-011 & 012 FOR HYDRAULIC SCHEMATIC AND DISK CONNECTION DETAILS

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

Minnesota Department of Transportation

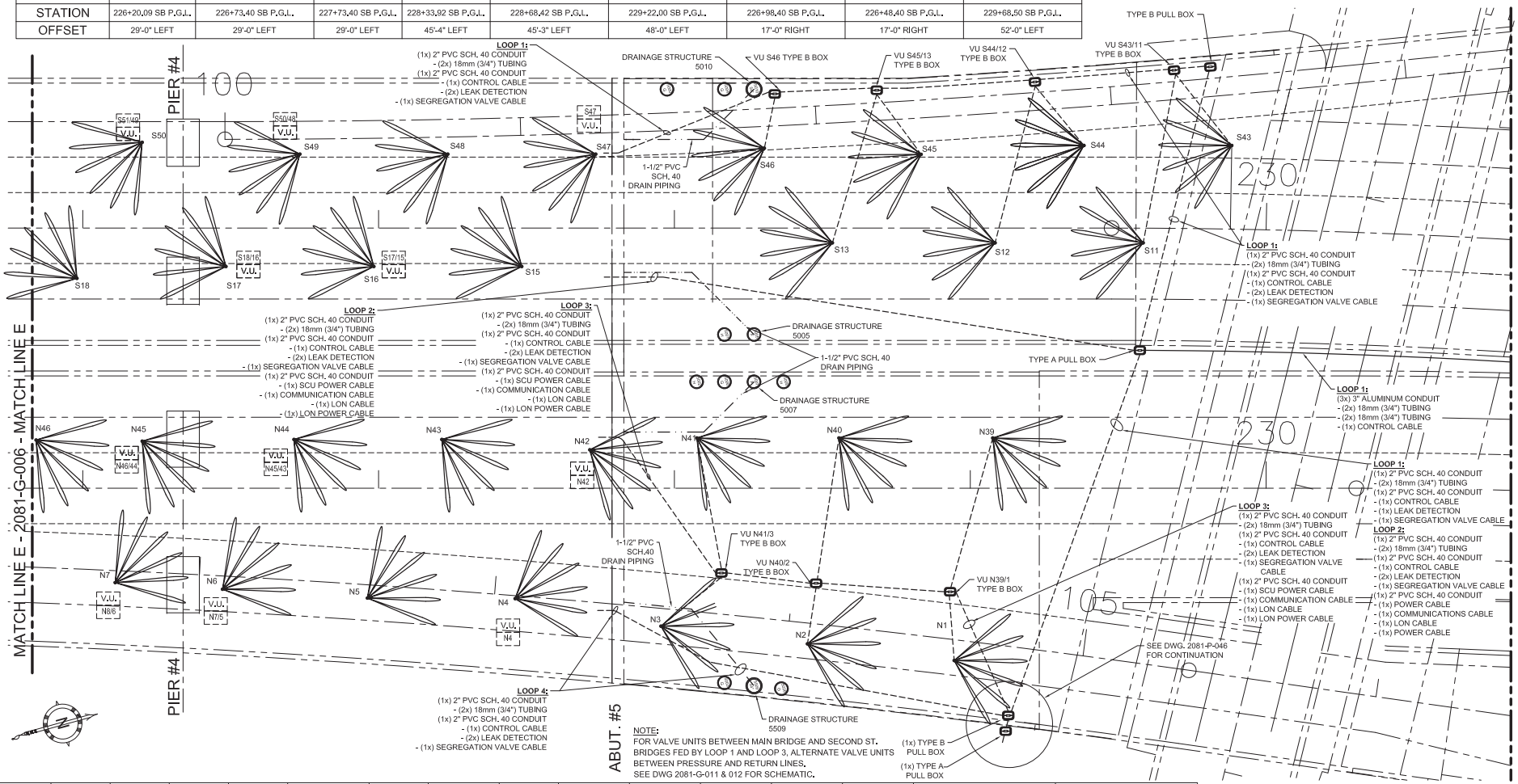
BOSCHUNG America, LLC

St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
SHEET 6 OF 8

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD. FOR BID	APPD. FOR CONST.
10/02/08	1/16" = 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A DRAWING No. 2081-G-006 REVISION 4

DISK No.	S49	S50	S48	S47	S46	S45	S13	S44	S12	S17	S15	S18	S16	S43	S11
STATION	226+73.42 SB P.G.L.	226+20.09 SB P.G.L.	227+23.42 SB P.G.L.	227+71.57 SB P.G.L.	228+30.40 SB P.G.L.	228+83.40 SB P.G.L.	228+53.42 SB P.G.L.	229+38.40 SB P.G.L.	229+08.42 SB P.G.L.	226+48.42 SB P.G.L.	227+48.42 SB P.G.L.	225+98.04 SB P.G.L.	226+98.42 SB P.G.L.	229+87.98 SB P.G.L.	229+58.50 SB P.G.L.
OFFSET	25'-0"	29'-0"	25'-0"	25'-0"	27'-0"	24'-11"	5'-0"	27'-11"	5'-0"	13'-0"	13'-0"	17'-0"	13'-0"	28'-3"	5'-0"
DIRECTION	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	RIGHT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	LEFT	RIGHT
VALVE UNIT	S51/49	S50/48		S47	S46	S45/13		S44/12		S17/15		S18/16		S43/11	
STATION	226+20.09 SB P.G.L.	226+73.40 SB P.G.L.		227+73.40 SB P.G.L.	228+33.92 SB P.G.L.	228+68.42 SB P.G.L.		229+22.00 SB P.G.L.		226+98.40 SB P.G.L.		226+48.40 SB P.G.L.		229+68.50 SB P.G.L.	
OFFSET	29'-0" LEFT	29'-0" LEFT		29'-0" LEFT	45'-4" LEFT	45'-3" LEFT		48'-0" LEFT		17'-0" RIGHT		17'-0" RIGHT		52'-0" LEFT	



NOTE:
FOR VALVE UNITS BETWEEN MAIN BRIDGE AND SECOND ST. BRIDGES FED BY LOOP 1 AND LOOP 3, ALTERNATE VALVE UNITS BETWEEN PRESSURE AND RETURN LINES. SEE DWG 2081-G-011 & 012 FOR SCHEMATIC.

DISK No.	N46	N44	N45	N43	N42	N41	N3	N40	N2	N39	N1	N5	N7	N6	N4
STATION	225+84.23 NB P.G.L.	226+71.42 NB P.G.L.	226+20.10 NB P.G.L.	227+21.42 NB P.G.L.	227+71.42 NB P.G.L.	228+07.58 NB P.G.L.	103+57.06 UNIV. NB RAMP P.G.L.	228+55.58 NB P.G.L.	104+07.05 UNIV. NB RAMP P.G.L.	229+07.58 NB P.G.L.	104+57.05 UNIV. NB RAMP P.G.L.	102+57.17 UNIV. NB RAMP P.G.L.	101+70.92 UNIV. NB RAMP P.G.L.	102+08.00 UNIV. NB RAMP P.G.L.	103+07.00 UNIV. NB RAMP P.G.L.
OFFSET	16'-3⅝"	16'-6"	15'-11"	16'-6"	13'-0"	17'-0"	6'-0"	17'-0"	7'-0"	17'-0"	7'-0"	4'-6"	4'-0 ¾"	4'-6"	1'-0"
DIRECTION	LEFT	LEFT	LEFT	LEFT	LEFT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
VALVE UNIT	N46/44		N45/43		N42	N41/3		N40/2		N39/1		N7/5		N6	N4
STATION	226+20.10 NB P.G.L.		226+71.40 NB P.G.L.		227+71.40 NB P.G.L.	228+15.83 NB P.G.L.		228+47.92 NB P.G.L.		228+93.20 NB P.G.L.		102+07.04 UNIV. NB RAMP P.G.L.		101+71.67 UNIV. NB RAMP P.G.L.	103+07.06 UNIV. NB RAMP P.G.L.
OFFSET	17'-0" LEFT		17'-0" LEFT		17'-0" LEFT	27'-0" RIGHT		30'-6" RIGHT		35'-0" RIGHT		11-⅞" RIGHT		11-⅞" RIGHT	11-⅞" RIGHT

NOTES:
1. FOR CONDUIT AND VALVE UNIT DETAILS SEE DRAWINGS 2081-H-016, 017 & 018
2. FOR CROSS SECTIONS SEE DWG. 2081-H-021, H-022, H-023 & H-024
3. FOR DRAINAGE INFORMATION SEE DRAINAGE PLAN R-DR3
4. SEE DRAWINGS 2081-G-011 & 012 FOR HYDRAULIC SCHEMATIC AND DISK CONNECTION DETAILS

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD/BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	09/09/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

Minnesota Department of Transportation

BOSCHUNG America, LLC

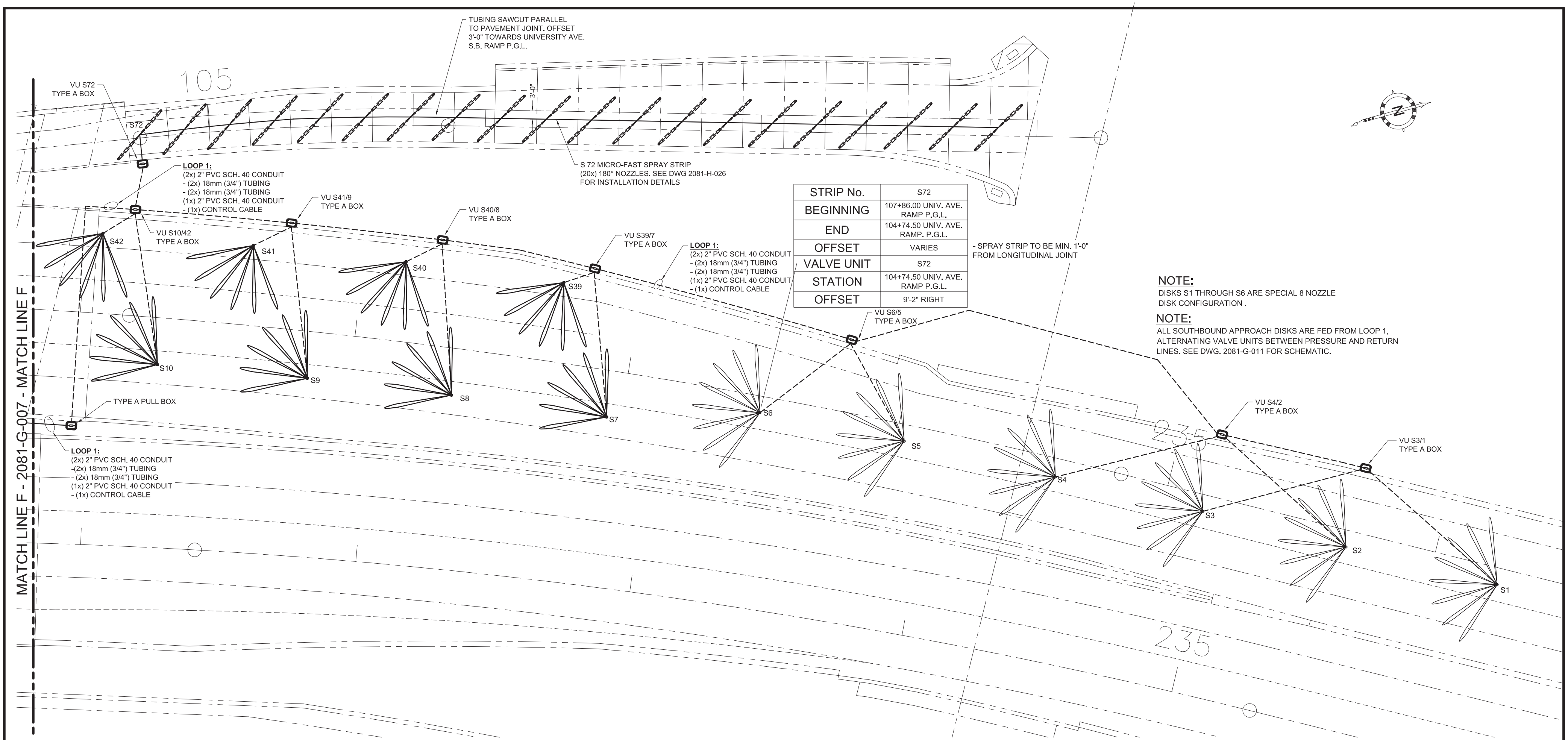
St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
SHEET 7 OF 8

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD. FOR ID	APPL FOR CONST.
10/02/08	1/16" = 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A

DRAWING No. 2081-G-007

REVISION 4



STRIP No.	S72
BEGINNING	107+86.00 UNIV. AVE. RAMP P.G.L.
END	104+74.50 UNIV. AVE. RAMP. P.G.L.
OFFSET	VARIES
VALVE UNIT	S72
STATION	104+74.50 UNIV. AVE. RAMP P.G.L.
OFFSET	9'-2" RIGHT

NOTE:
DISKS S1 THROUGH S6 ARE SPECIAL 8 NOZZLE DISK CONFIGURATION .

NOTE:
ALL SOUTHBOUND APPROACH DISKS ARE FED FROM LOOP 1, ALTERNATING VALVE UNITS BETWEEN PRESSURE AND RETURN LINES. SEE DWG. 2081-G-011 FOR SCHEMATIC.

									SPECIAL 8 NOZZLE DISK CONFIGURATION					
DISK No.	S42	S10	S9	S41	S8	S40	S7	S39	S6	S5	S4	S3	S2	S1
STATION	231+06.31 SB P.G.L.	231+29.33 SB P.G.L.	231+84.33 SB P.G.L.	231+60.25 SB P.G.L.	232+37.50 SB P.G.L.	232+15.17 SB P.G.L.	232+94.58 SB P.G.L.	232+71.17 SB P.G.L.	233+49.58 SB P.G.L.	234+03.08 SB P.G.L.	234+59.58 SB P.G.L.	235+17.58 SB P.G.L.	235+68.08 SB P.G.L.	236+17.58 SB P.G.L.
OFFSET	29'-0"	17'-0"	17'-0"	29'-0"	17'-0"	29'-0"	17'-0"	29'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"
DIRECTION	LEFT	RIGHT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT	RIGHT
VALVE UNIT	S42/10		S41/9		S40/8		S39/7		S6/5		S4/2		S3/1	
STATION	231+17.33 SB P.G.L.		231+72.29 SB P.G.L.		232+27.34 SB P.G.L.		232+82.38 SB P.G.L.		233+77.08 SB P.G.L.		235+17.58 SB P.G.L.		235+68.08 SB P.G.L.	
OFFSET	37'-0" LEFT		37'-0" LEFT		37'-0" LEFT		34'-4" LEFT		24'-10" LEFT		20'-10" LEFT		20'-10" LEFT	

NOTES:
1. FOR CONDUIT AND VALVE UNIT DETAILS SEE DRAWINGS 2081-H-016, 017 & 018
2. FOR CROSS SECTIONS SEE DWG. 2081-H-021, H-022, H-023 & H-024
3. SEE DRAWINGS 2081-G-011 & 012 FOR HYDRAULIC SCHEMATIC AND DISK CONNECTION DETAILS

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

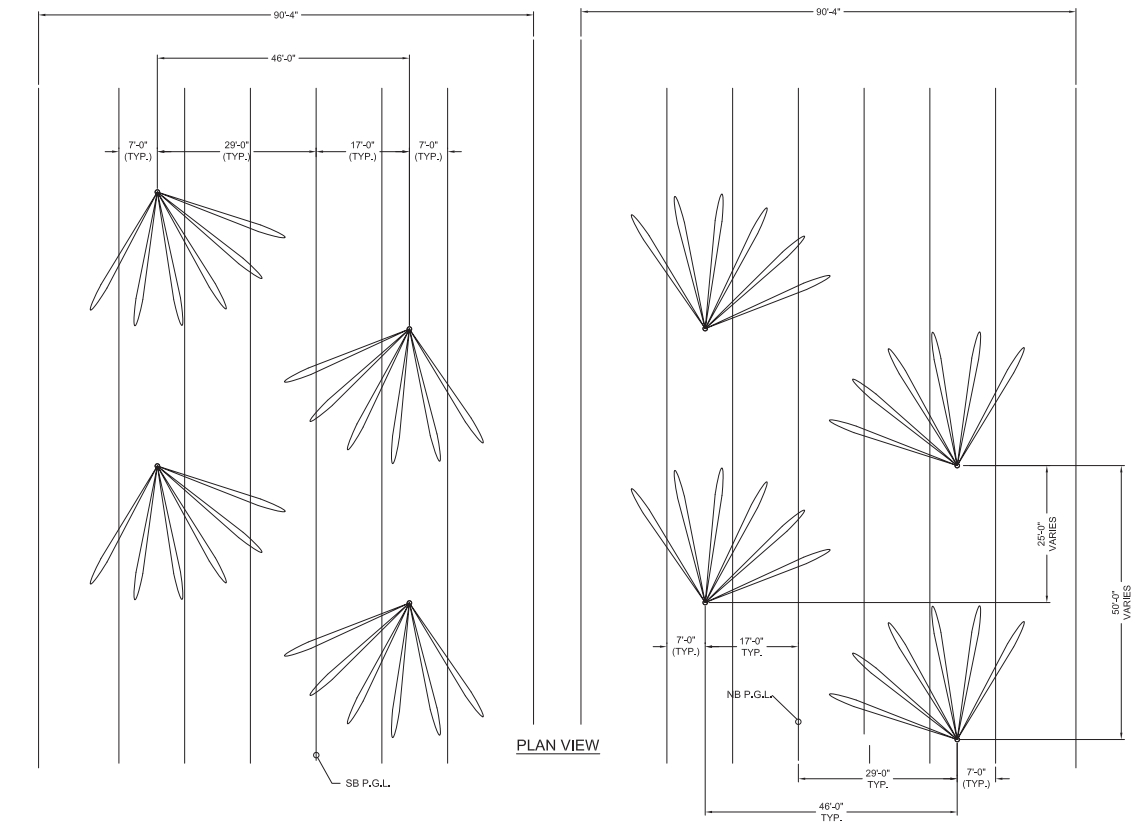
Minnesota Department of Transportation

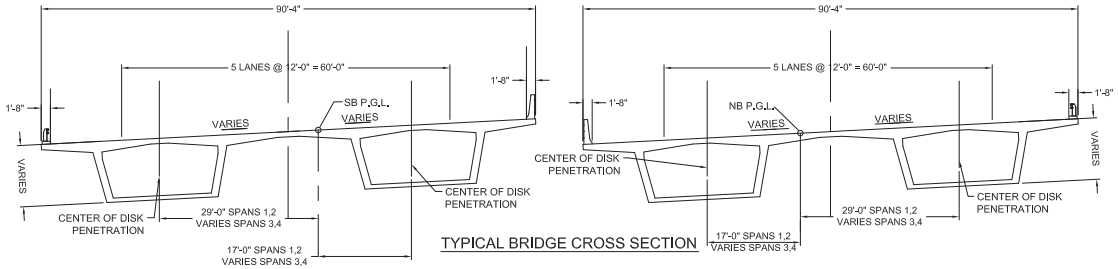
BOSCHUNG America, LLC

St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
SHEET 8 OF 8

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD. FOR BID	APPD. FOR CONST.
10/02/08	1/16" = 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A | DRAWING No. 2081-G-008 | REVISION 4





TYPICAL BRIDGE CROSS SECTION

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

Minnesota Department of Transportation

BOSCHUNG America, LLC

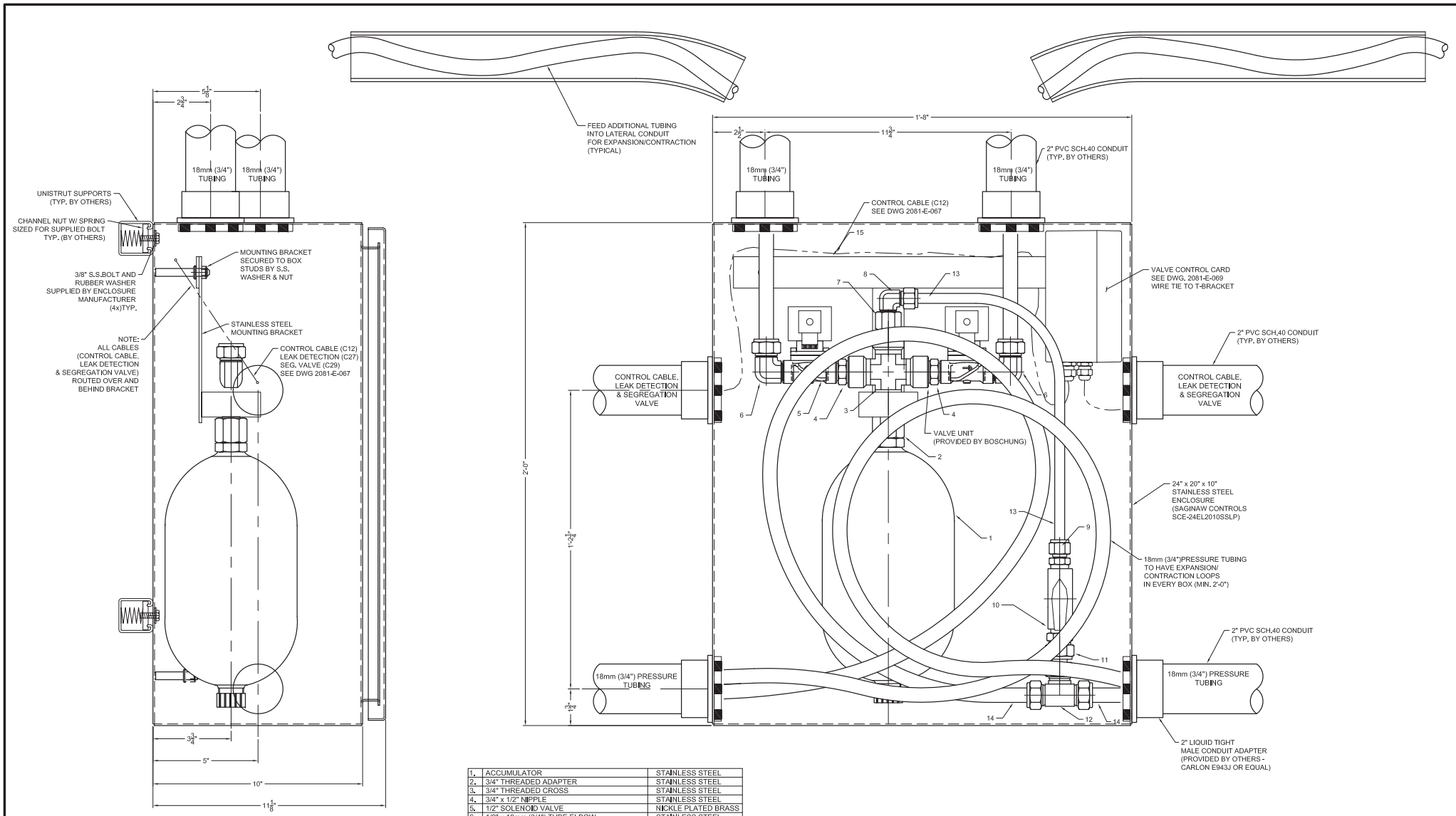
St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SYSTEM LAYOUT
BRIDGE DISK LOCATIONS

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD.FOR BID	APPD.FOR DET.
10/02/08	3/32" = 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A

DRAWING No. 2081-G-009

REVISION 4



1.	ACCUMULATOR	STAINLESS STEEL
2.	3/4" THREADED ADAPTER	STAINLESS STEEL
3.	3/4" THREADED CROSS	STAINLESS STEEL
4.	3/4" x 1/2" NIPPLE	STAINLESS STEEL
5.	1/2" SOLENOID VALVE	NICKLE PLATED BRASS
6.	1/2" x 18mm (3/4") TUBE ELBOW	STAINLESS STEEL
7.	3/4" x 3/8" THREADED ADAPTER	STAINLESS STEEL
8.	3/8" x 12mm (3/8") TUBE ELBOW	STAINLESS STEEL
9.	3/8" x 12mm (3/8") MALE TUBE ADAPTER	STAINLESS STEEL
10.	3/8" PLUG VALVE	STAINLESS STEEL
11.	THREADED CHECK VALVE	STAINLESS STEEL
12.	18mm (3/4") TUBE TEE	STAINLESS STEEL
13.	12mm (3/8") NYLON TUBE	NYLON 12
14.	18mm (3/4") NYLON TUBE	NYLON 12
15.	VALVE UNIT MOUNTING BRACKET	STAINLESS STEEL

NOTE:
-EACH VALVE BOX TO BE LABELED WITH 2" HIGH BLACK LETTERS.
-ALL CABLES TO BE ROUTED BEHIND VALVE ASSEMBLY AND SUPPORTED OFF THE BOTTOM OF THE BOX

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM	-	WCH

Minnesota Department of Transportation

BOSCHUNG America LLC

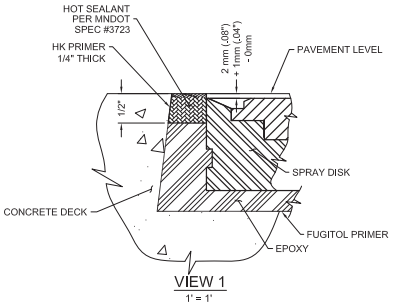
St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
VALVE UNITS
BOX INSTALLATION

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD.FOR BD.	APPD.FOR CONST.
10/02/08	6" = 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A

DRAWING No. 2081-H-019

REVISION 4

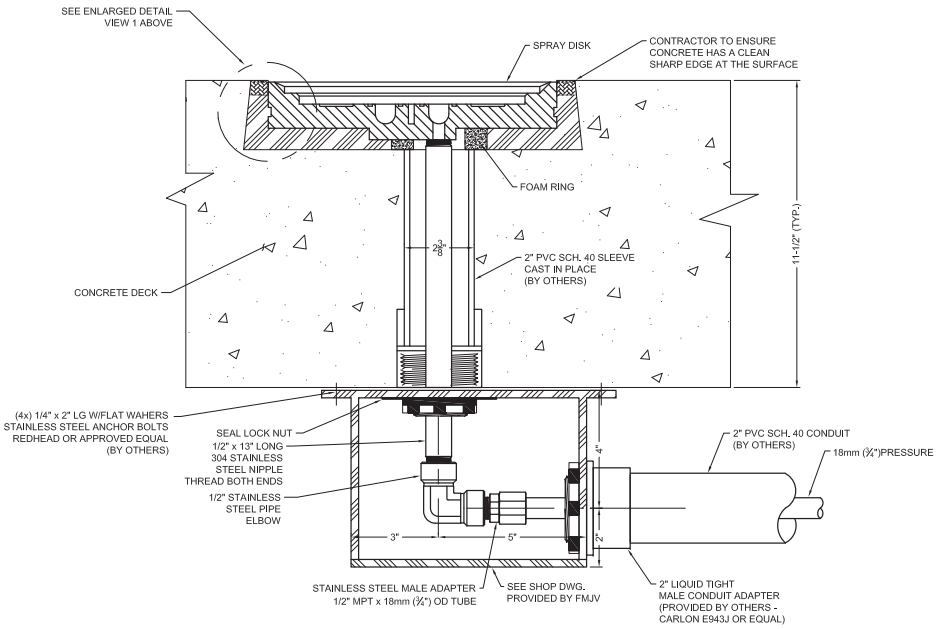


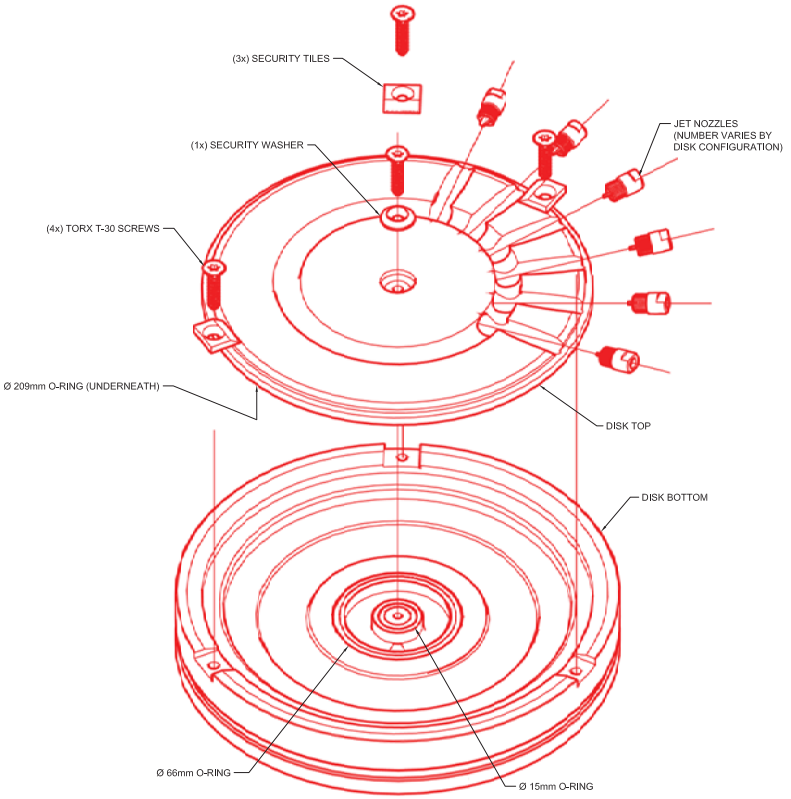
INSTALLATION INSTRUCTIONS FOR EPOXY

1. PREPARE HOLE FOR EPOXY BY MAKING SURE THAT IT IS CLEAN - APPLY SOLVENT - AND ALLOW TO DRY COMPLETELY. THE HOLE SHOULD BE "KEYED" AND HOLES AROUND THE CONDUIT SHOULD BE PLUGGED WITH DUCT SEAL.
2. PRIME THE HOLE WITH BLACK FUGITOL PRIMER USING A PAINT BRUSH. WAIT UNTIL THE PRIMER IS TACKY BEFORE PROCEEDING.
3. REMOVE DISK TOP, SCREWS, TILES AND O-RINGS - RETAIN FOR REINSTALLATION.
4. MOUNT THE DISK SETTING JIG ON THE DISK BOTTOM USING THE CENTER SCREW.
5. PLACE A FOAM RING IN THE BOTTOM OF THE HOLE AS SHOWN.
6. MIX PRODOFIX FC-1 WITH A DRILL-MOUNTED MIXER AT LOW SPEED. AVOID INTRODUCING AIR INTO EPOXY AND MIX ONLY ONE KIT AT A TIME.
7. POUR PRODOFIX FC-1 INTO THE VOID BETWEEN THE DISK & CONCRETE TO A DEPTH NOT TO EXCEED ¼" ONTO THE DISK BOTTOM. ALLOW THE PRODOFIX FC-1 TO CURE TILL TACKY. MIX A NEW KIT AS IN STEP #6, MAKING SURE THE PREVIOUS POUR IS KEPT CLEAN OF ALL DIRT AND DEBRIS, FILL THE VOID BETWEEN THE PRODOFIX FC-1, DISK AND CONCRETE TO A DEPTH OF ½". ALLOW PRODOFIX FC-1 TO CURE TILL TACKY REPEAT STEP #6 AND AGAIN MAKING SURE THE LAST POUR OF PRODOFIX FC-1 HAS COOLED, IS TACKY, AND IS CLEAN AND FREE OF DEBRIS, POUR THE NEWLY MIXED KIT OF PRODOFIX FC-1 INTO THE VOID BETWEEN THE PRODOFIX FC-1, DISK AND CONCRETE TO A DEPTH OF ½" OR TO WITHIN ¼" OF TOP OF PAVEMENT.
8. PRIME THE EPOXY, INSIDE OF HOLE AND EXPOSED EDGE OF THE DISK WITH HK PRIMER FOR HOT SEAL ADHESION.
9. AFTER REMOVING DISK SETTING JIG, REINSTALL DISK TOP, TILES, SCREWS AND O-RINGS: TAKING CARE NOT TO DAMAGE O-RINGS OR INTRODICE DIRT.
10. ADJUST DISK TOP ORIENTATION TO SUIT - SEE PLAN VIEW.
11. HOT SEAL WITH A Mn/DOT APPROVED SEALING TECHNIQUE. WHEN DRY, GRIND HIGH SPOTS FLUSH WITH ROAD SURFACE FOR SMOOTH/CLEAN INSTALLATION.

PROTECTIVE EQUIPMENT

WHEN MIXING AND SETTING PRODOFIX FC-1, CHEMICAL RESISTANT CLOTHING SHOULD BE WORN INCLUDING, BUT NOT LIMITED TO, SAFETY GOGGLES AND CHEMICAL RESISTANT GLOVES. PRODOFIX FC-1 SHOULD BE USED ONLY WITH ADEQUATE VENTILATION OR WITH THE USE OF PROPERLY FITTED, NIOSH APPROVED RESPIRATORS.





NOTES:

1) ONLY USE HAND TOOL TORX T-30 FOR PT-SCREWS
2) MAXIMUM TORQUE FOR SCREWS IS 5 NM
3) DURING INSTALLATION KEEP SCREWS, TILES, O-RINGS AND WASHERS IN A SAFE PLACE
4) INTERNAL O-RINGS NEED TO BE IN PLACE BEFORE SPRAYING SYSTEM
5) SPRAY DISKS ARE PRE-ASSEMBLED

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

Minnesota Department of Transportation

BOSCH-LING Applied LLC

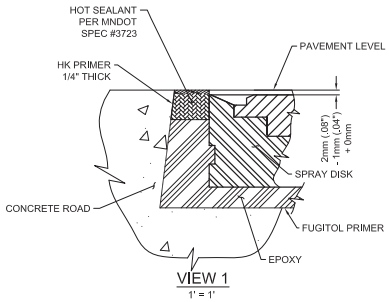
St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SPRAY DISKS
BRIDGE DECK INSTALLATION

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD. FOR BD	APPD.FOR DEC.
10/02/08	6" - 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A

DRAWING No. 2081-H-020

REVISION 4



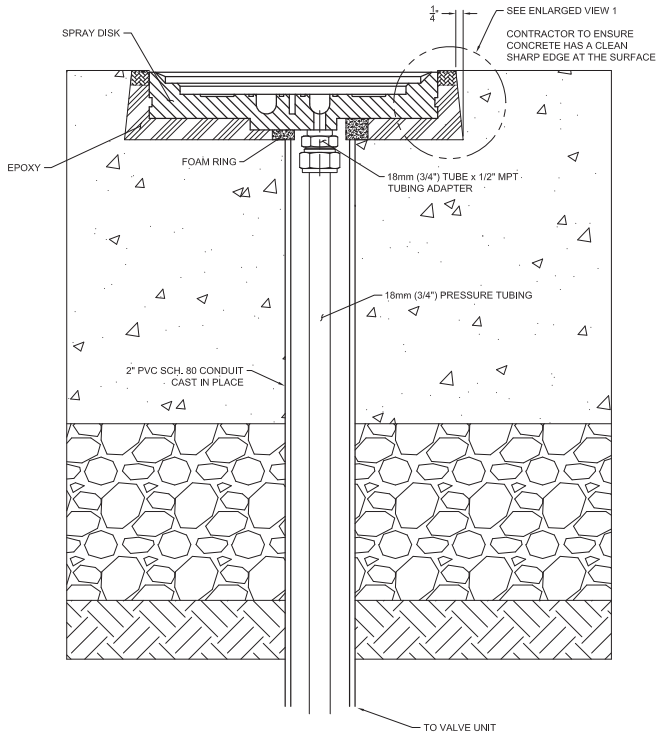
VIEW 1
1" = 1"

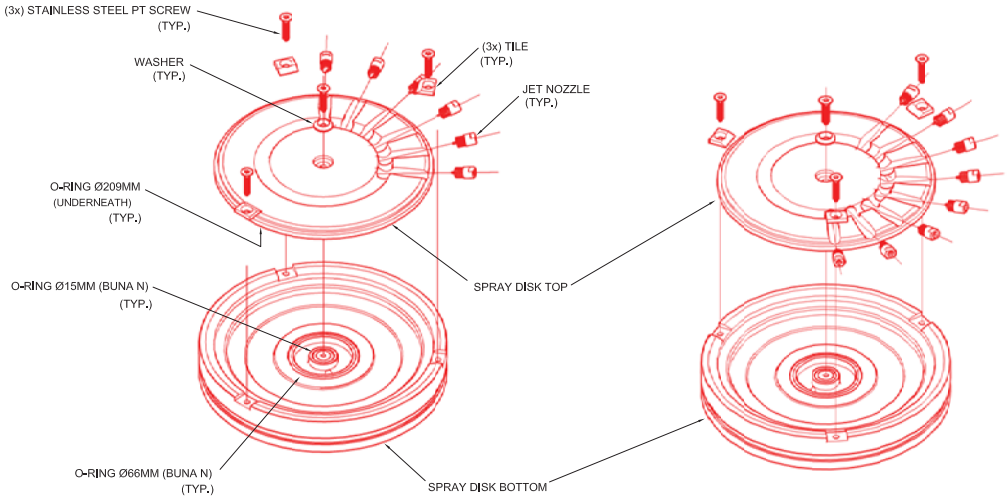
INSTALLATION INSTRUCTIONS FOR EPOXY

1. PREPARE HOLE FOR EPOXY BY MAKING SURE THAT IT IS CLEAN - APPLY SOLVENT - AND ALLOW TO DRY COMPLETELY. THE HOLE SHOULD BE "KEYED" AND HOLES AROUND THE CONDUIT SHOULD BE PLUGGED WITH DUCT SEAL.
2. PRIME THE HOLE WITH BLACK FUGITOL PRIMER USING A PAINT BRUSH. WAIT UNTIL THE PRIMER IS TACKY BEFORE PROCEEDING.
3. REMOVE DISK TOP, SCREWS, TILES AND O-RINGS - RETAIN FOR REINSTALLATION.
4. MOUNT THE DISK SETTING JIG ON THE DISK BOTTOM USING THE CENTER SCREW.
5. PLACE A FOAM RING IN THE BOTTOM OF THE HOLE AS SHOWN.
6. MIX PRODOFIX FC-1 WITH A DRILL-MOUNTED MIXER AT LOW SPEED. AVOID INTRODUCING AIR INTO EPOXY AND MIX ONLY ONE KIT AT A TIME.
7. POUR PRODOFIX FC-1 INTO THE VOID BETWEEN THE DISK & CONCRETE TO A DEPTH NOT TO EXCEED ¼" ONTO THE DISK BOTTOM. ALLOW THE PRODOFIX FC-1 TO CURE TILL TACKY. MIX A NEW KIT AS IN STEP #6, MAKING SURE THE PREVIOUS POUR IS KEPT CLEAN OF ALL DIRT AND DEBRIS. FILL THE VOID BETWEEN THE PRODOFIX FC-1, DISK AND CONCRETE TO A DEPTH OF ½". ALLOW PRODOFIX FC-1 TO CURE TILL TACKY REPEAT STEP #6 AND AGAIN MAKING SURE THE LAST POUR OF PRODOFIX FC-1 HAS COOLED, IS TACKY, AND IS CLEAN AND FREE OF DEBRIS, POUR THE NEWLY MIXED KIT OF PRODOFIX FC-1 INTO THE VOID BETWEEN THE PRODOFIX FC-1, DISK AND CONCRETE TO A DEPTH OF ½" OR TO WITHIN ¼" OF TOP OF PAVEMENT.
8. PRIME THE EPOXY, INSIDE OF HOLE AND EXPOSED EDGE OF THE DISK WITH HK PRIMER FOR HOT SEAL ADHESION.
9. AFTER REMOVING DISK SETTING JIG, REINSTALL DISK TOP, TILES, SCREWS AND O-RINGS: TAKING CARE NOT TO DAMAGE O-RINGS OR INTRODICE DIRT.
10. ADJUST DISK TOP ORIENTATION TO SUIT - SEE PLAN VIEW.
11. HOT SEAL WITH A Mn/DOT APPROVED SEALING TECHNIQUE. WHEN DRY, GRIND HIGH SPOTS FLUSH WITH ROAD SURFACE FOR SMOOTH/CLEAN INSTALLATION.

PROTECTIVE EQUIPMENT

WHEN MIXING AND SETTING PRODOFIX FC-1, CHEMICAL RESISTANT CLOTHING SHOULD BE WORN INCLUDING, BUT NOT LIMITED TO, SAFETY GOGGLES AND CHEMICAL RESISTANT GLOVES. PRODOFIX FC-1 SHOULD BE USED ONLY WITH ADEQUATE VENTILATION OR WITH THE USE OF PROPERLY FITTED, NIOSH APPROVED RESPIRATORS.





SPRAY DISK ASSEMBLY (BOTTOM CONNECTION)
WITH ADJUSTABLE SPRAY PATTERN
AND ROTATION PLATE

SPRAY DISK ASSEMBLY
8 NOZZLE SPRAY DISK
DISKS S1 THROUGH S6 ONLY
ALL OTHER DISKS HAVE 6 NOZZLES

NOTES:

1) ONLY USE HAND TOOL TORX T-30 FOR PT-SCREWS
2) MAXIMUM TORQUE FOR SCREWS IS 5 NM
3) DURING INSTALLATION KEEP SCREWS, TILES, O-RINGS AND WASHERS IN A SAFE PLACE
4) INTERNAL O-RINGS NEED TO BE IN PLACE BEFORE SPRAYING SYSTEM
5) SPRAY DISKS ARE PRE-ASSEMBLED

AS-BUILT

NO.	REVISIONS	DATE	BY	CHK	APPD.BY
4	AS-BUILT ACCEPTED	10/02/08	STM	PB	WCH
3	UPDATED TO MNDOT COMMENTS	06/06/08	STM	PB	WCH
2	UPDATED TO REVIEW COMMENTS	04/21/08	STM	PB	WCH
1	GENERAL UPDATE	03/31/08	STM		WCH

Minnesota Department of Transportation

BOSCHUNG America, LLC

St. Anthony Falls (35W) Bridge
Minneapolis, Minnesota
Automated Anti-Icing System
SPRAY DISK
APPROACH INSTALLATION

DATE	SCALE	DRAWN	CHKD.	ENGR.	APPD.FOR BD.	APPD.FOR CONST.
10/02/08	6"= 1'	STM	WCH	Hensel	DATE	

JOB No. BA2081A

DRAWING No. 2081-H-027

REVISION 4

Health Monitoring System

LEGEND - STATIC MONITORING SYSTEM

- [SM] STATIC SYSTEM MULTIPLEXER
- [DL] DATALOGGER
- ● VIBRATING WIRE STRAIN GAUGE (VWSG) WITH TEMPERATURE READOUT
- (1T) ONE (1) THERMISTOR ARRANGEMENT
- (2T) TWO (2) THERMISTOR ARRANGEMENT
- (3T) THREE (3) THERMISTOR ARRANGEMENT
- (6T) SIX (6) THERMISTOR ARRANGEMENT
- ⊗ FIBER OPTIC CONVERTER
- – – – – – – – IRC-81 STATIC SYSTEM COMMUNICATION CABLE (DAISY CHAINED)
- ======= FIBER CABLE (FOR CFO-3STR)

LEGEND - DYNAMIC MONITORING SYSTEM

- [DM] DYNAMIC SYSTEM MULTIPLEXER
- ✳ LINEAR POTENTIOMETER
- ▼ ACCELEROMETER
- [R] REPEATER
- ———— CAT-5E DYNAMIC SYSTEM COMMUNICATION CABLE (DAISY CHAINED)

LEGEND - CORSENSYS

- [CD] DATALOGGER
- ◆ CORROSION PENETRATION SENSOR
- – – – – – – – CAT-5E CORSENSYS COMMUNICATION CABLE (DAISY CHAINED)

LEGEND - SECURITY MONITORING SYSTEM

- (SC) SECURITY CONTACT
- ····· SECURITY WIRING (18AWG2)

PULL BOX - BOX IN WHICH CABLE TRAVELS THROUGH ONLY

SPLICE BOX - BOX IN WHICH CABLE TRAVELS THROUGH BUT HAS A CONNECTION BETWEEN THE END OF A CABLE THAT IS TOO SHORT AND A CABLE THAT TRAVELS THE REST OF THE WAY TO THE JUNCTION BOX

JUNCTION BOX - BOX IN WHICH MULTIPLE CABLES FROM SENSORS ENTER AND ONE DATA COMMUNICATION CABLE EXITS

LEGEND - SOFO MONITORING SYSTEM

- (SS) SOFO SENSOR
- [OJ] OPTICAL JUNCTION BOX
- ——·——·—— MULTI-FIBER OPTICAL CABLE 12F

NOTES:
1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION
FDC319	MN	08/12/08	SEE FDC319 FOR DESCRIPTION OF REVISIONS

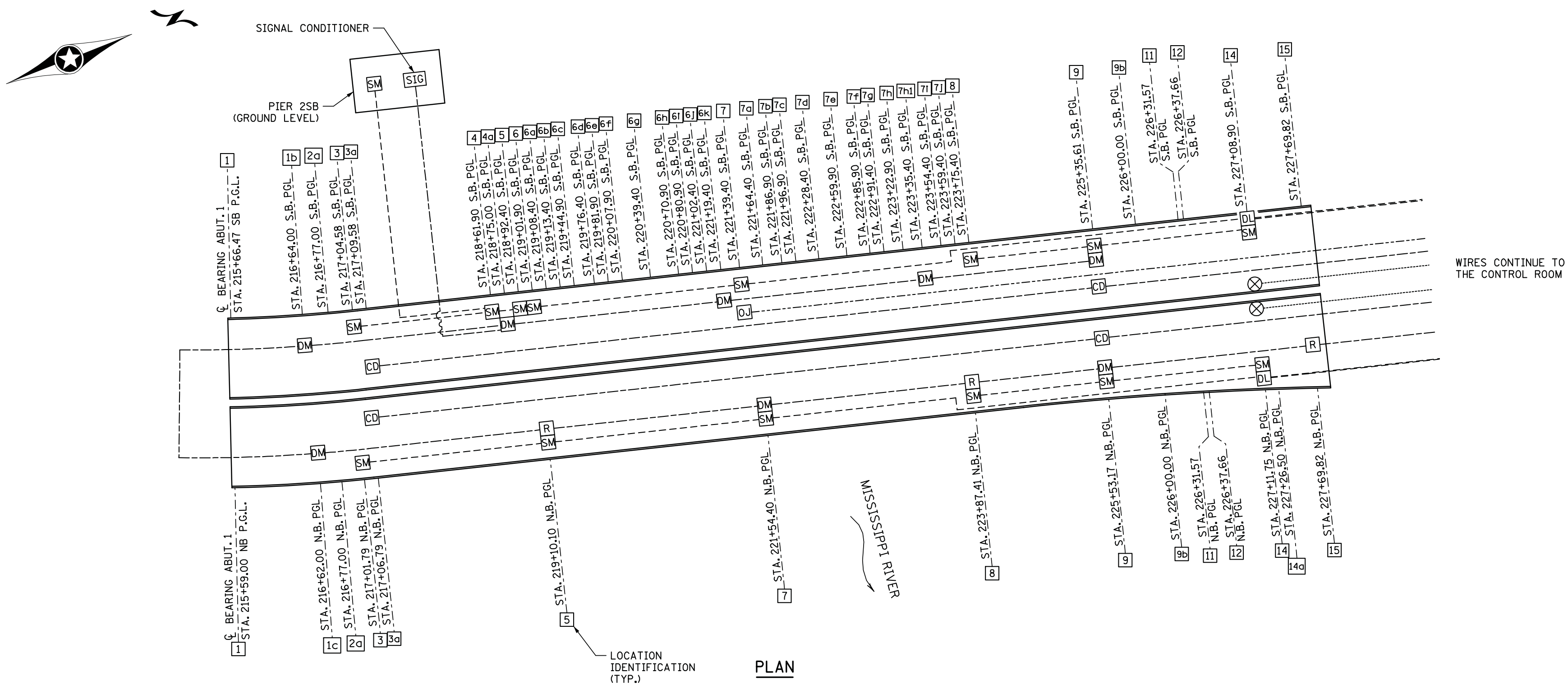
TITLE:
HEALTH MONITORING SYSTEM
GENERAL NOTES

DES:	ECJ	DR:	JMG	APPROVED:
CHK:	ADH	CHK:	DLS	

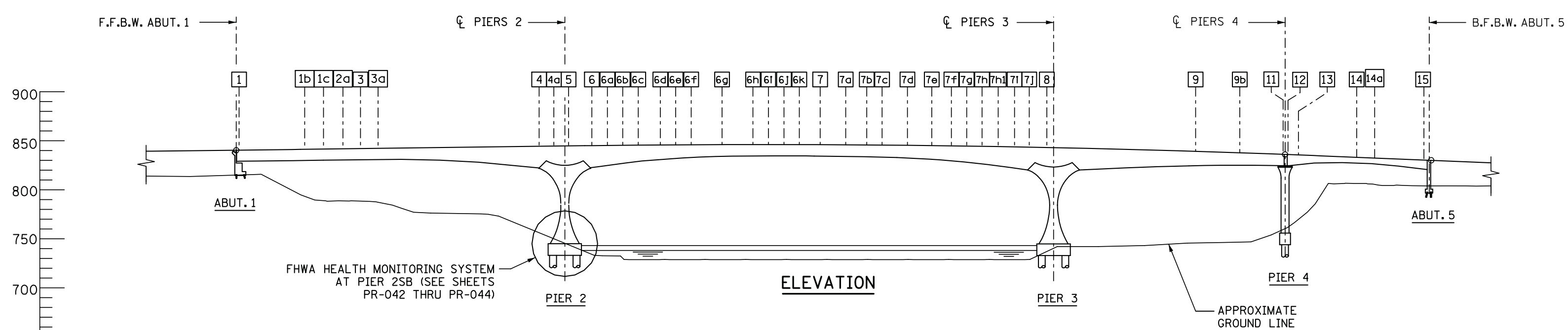
B-099

BRIDGE NOS.
27409(SB)
27410(NB)

10/6/2008 4:29:17 PM g:\projects\1-35w\struct\as-builts\3.readg_for_official_qc\ASB_B099_CBR27409_HMS_General_Notes.dgn



PLAN



ELEVATION

NOTES:

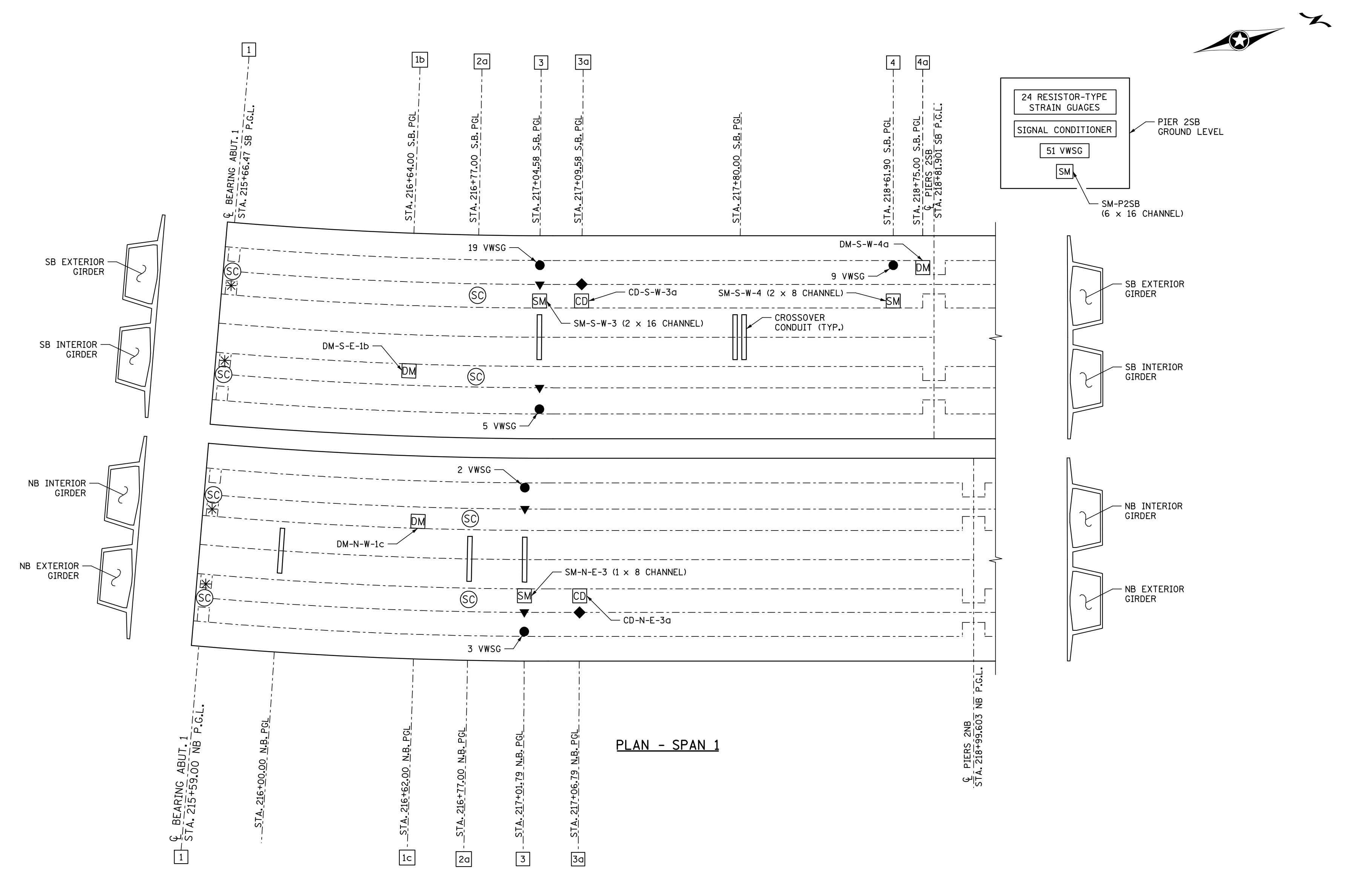
1. LOCATIONS 1a, 2, 9a, 10 AND 13 HAVE BEEN INTENTIONALLY OMITTED.
2. SEE SHEET B-99 FOR WIRING / LINETYPE DESIGNATIONS.

AS-BUILT

AS-BUILT ACCEPTED	FIGG	CERTIFIED BY *Christopher J. Burgess* LICENSED PROFESSIONAL ENGINEER — 10/07/08 DATE	DRAWING REVISION	TITLE: HEALTH MONITORING SYSTEM WIRING PLAN AND ELEVATION	DES: ECJ, CHK: ADH, DR: JMF, CHK: DLS	APPROVED:	BRIDGE NOS. 27409(SB) 27410(NB)
MN/DOT DATE		NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833			B-100		

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

10/6/2008 4:29:24 PM g:\projects\i-35w\struct\as-builts\3_ready_for_official_qc\ASB_B100_CBR27409_HMS_Wiring Plan and Elevation.dgn



AS-BUILT

AS-BUILT ACCEPTED	FIGG	CERTIFIED BY *Christopher J. Burgess* LICENSED PROFESSIONAL ENGINEER 10/07/08 DATE	TITLE: HEALTH MONITORING SYSTEM SPAN 1 PLAN	DES: ECJ	DR: JMG	APPROVED:	BRIDGE NOS. 27409(SB) 27410(NB)
MN/DOT DATE		NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833		CHK: ADH	CHK: DLS	B-101	

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

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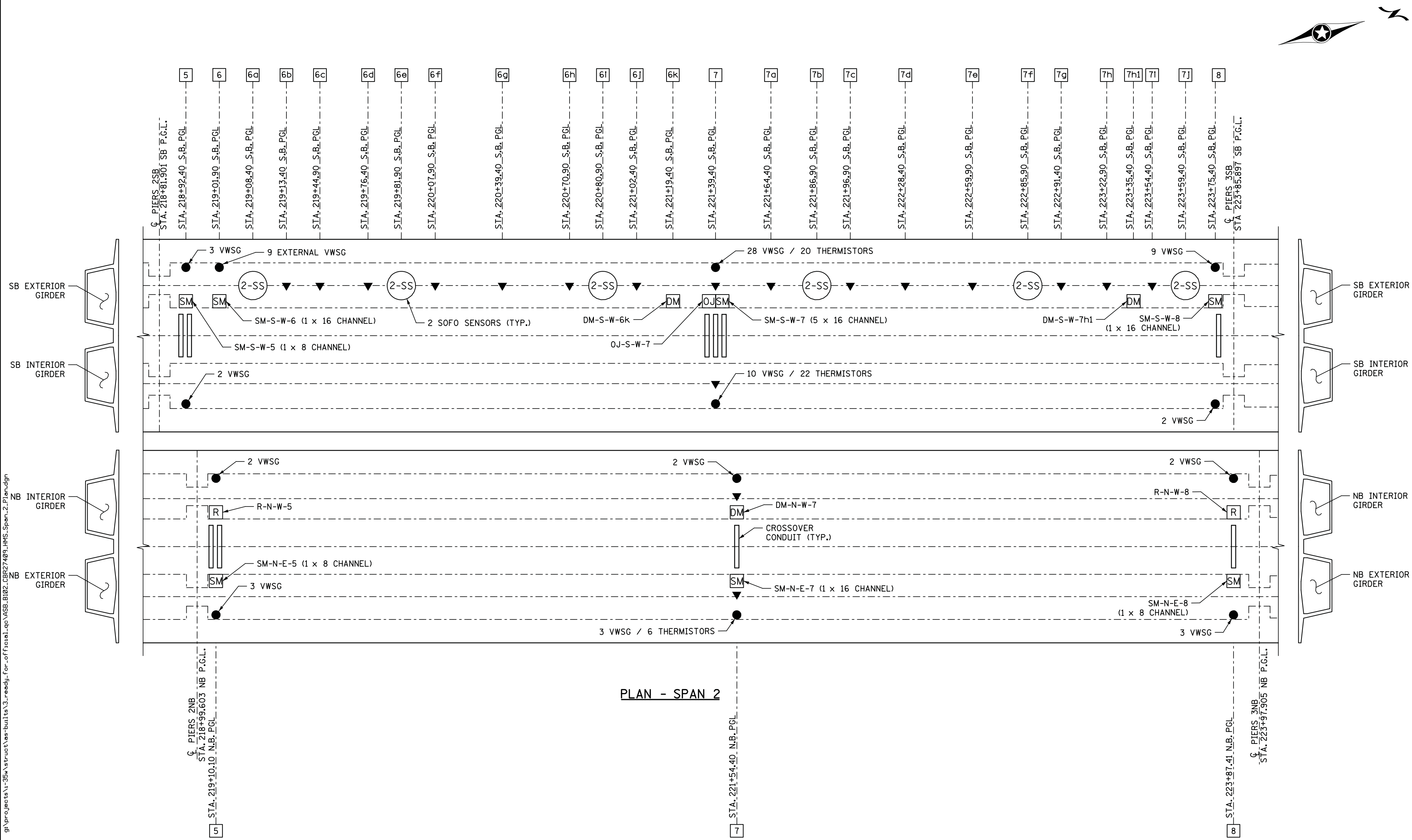

PLAN - SPAN 2

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08 LICENSED PROFESSIONAL ENGINEER DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833	

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE: HEALTH MONITORING SYSTEM SPAN 2 PLAN

DES:	ECJ	DR:	JMG	APPROVED:
CHK:	ADH	CHK:	DLS	

B-102

BRIDGE NOS. 27409(SB) 27410(NB)

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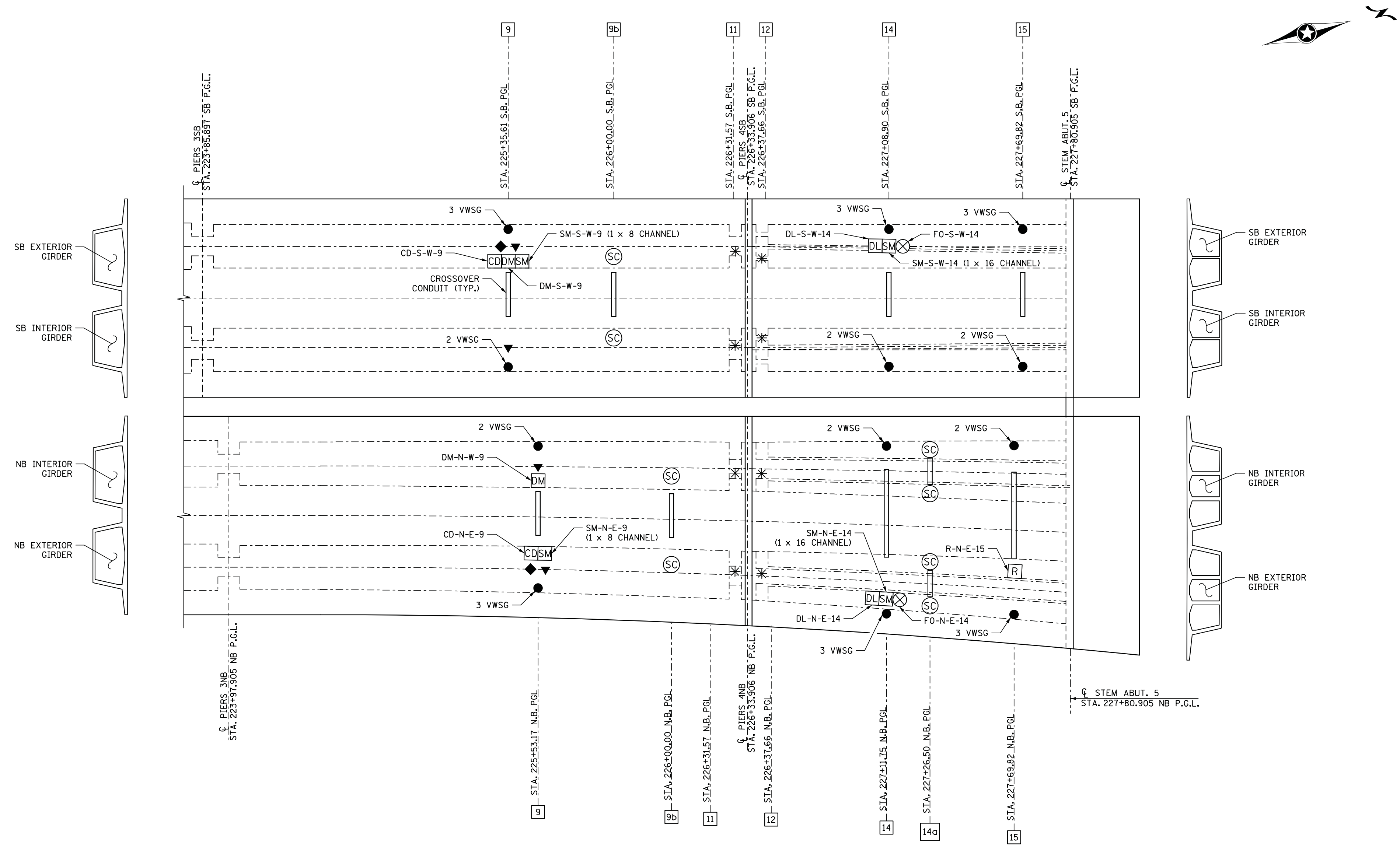

PLAN - SPANS 3 & 4

AS-BUILT

AS-BUILT ACCEPTED	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08			
MN/DOT DATE		LICENSED PROFESSIONAL ENGINEER DATE			
		NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833			

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
SPANS 3 & 4 PLAN

DES:	ECJ	DR:	JMG	APPROVED:
CHK:	ADH	CHK:	DLS	
B-103				

BRIDGE NOS.
27409(SB)
27410(NB)

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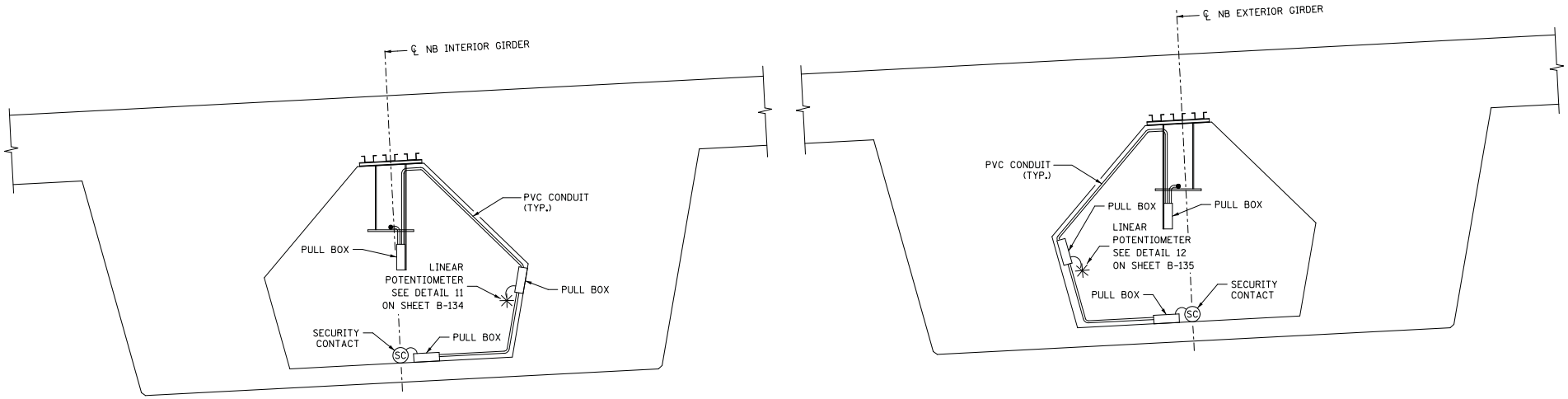
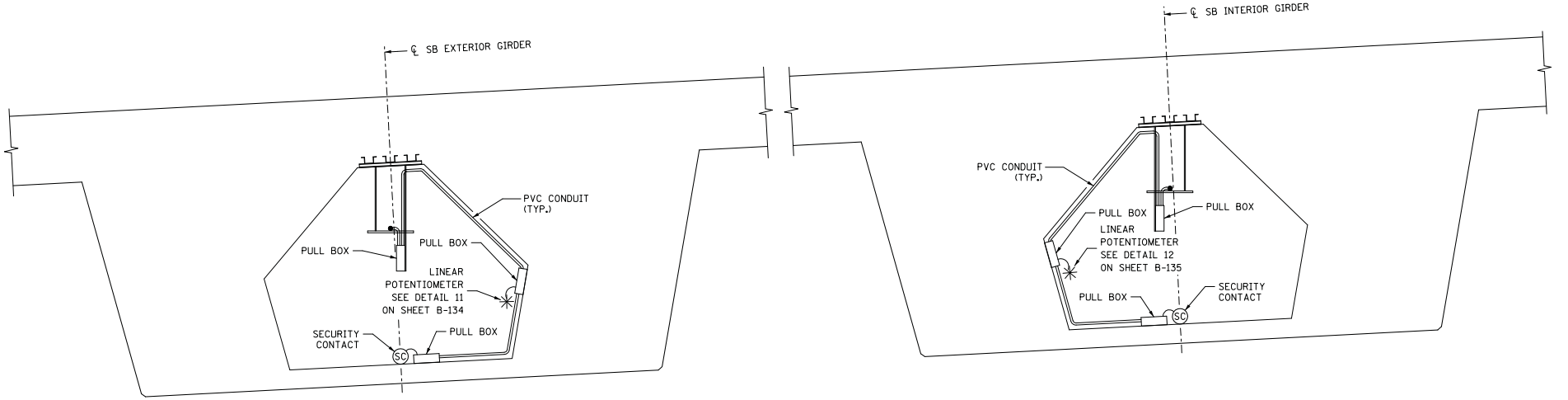


NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 215+59.00 NB P.G.L.



SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 215+66.47 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 1

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-105

BRIDGE NOS.
27409(SB)
27410(NB)

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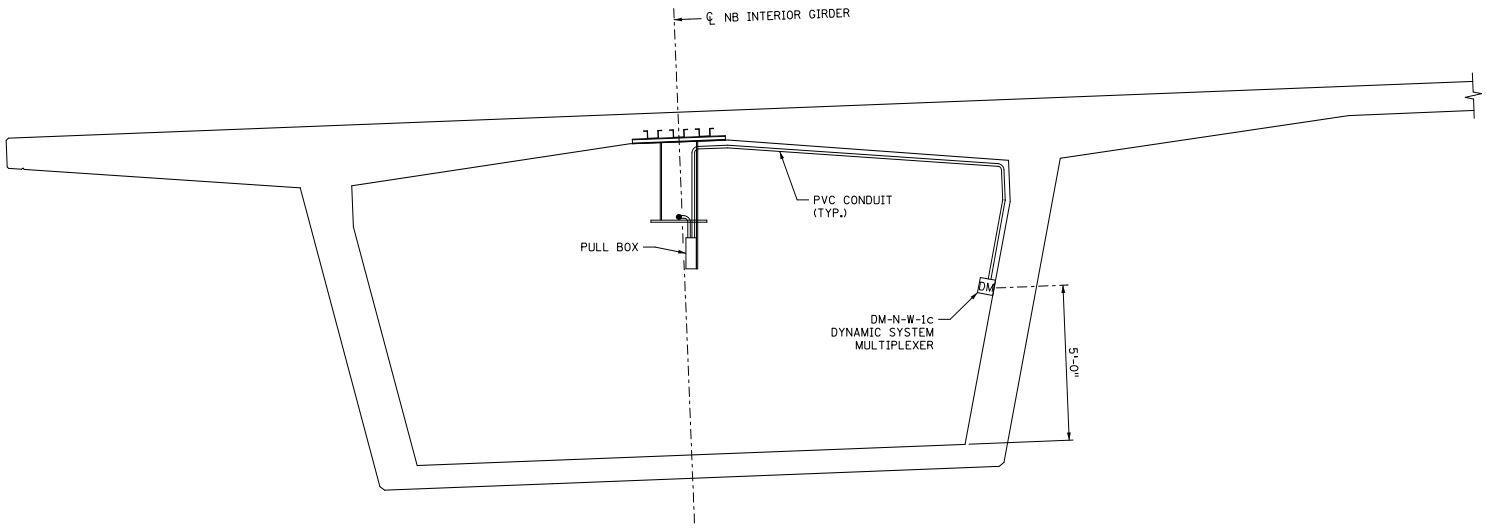

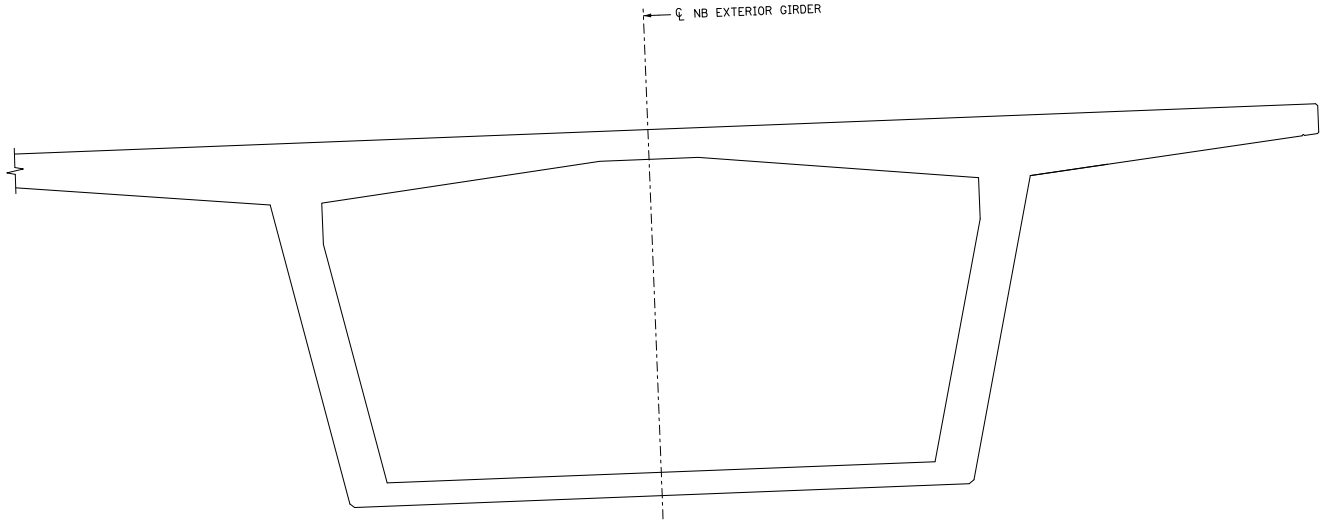

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

NORTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 216+62.00 NB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 1cNB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-105c

BRIDGE NOS.
27409(SB)
27410(NB)

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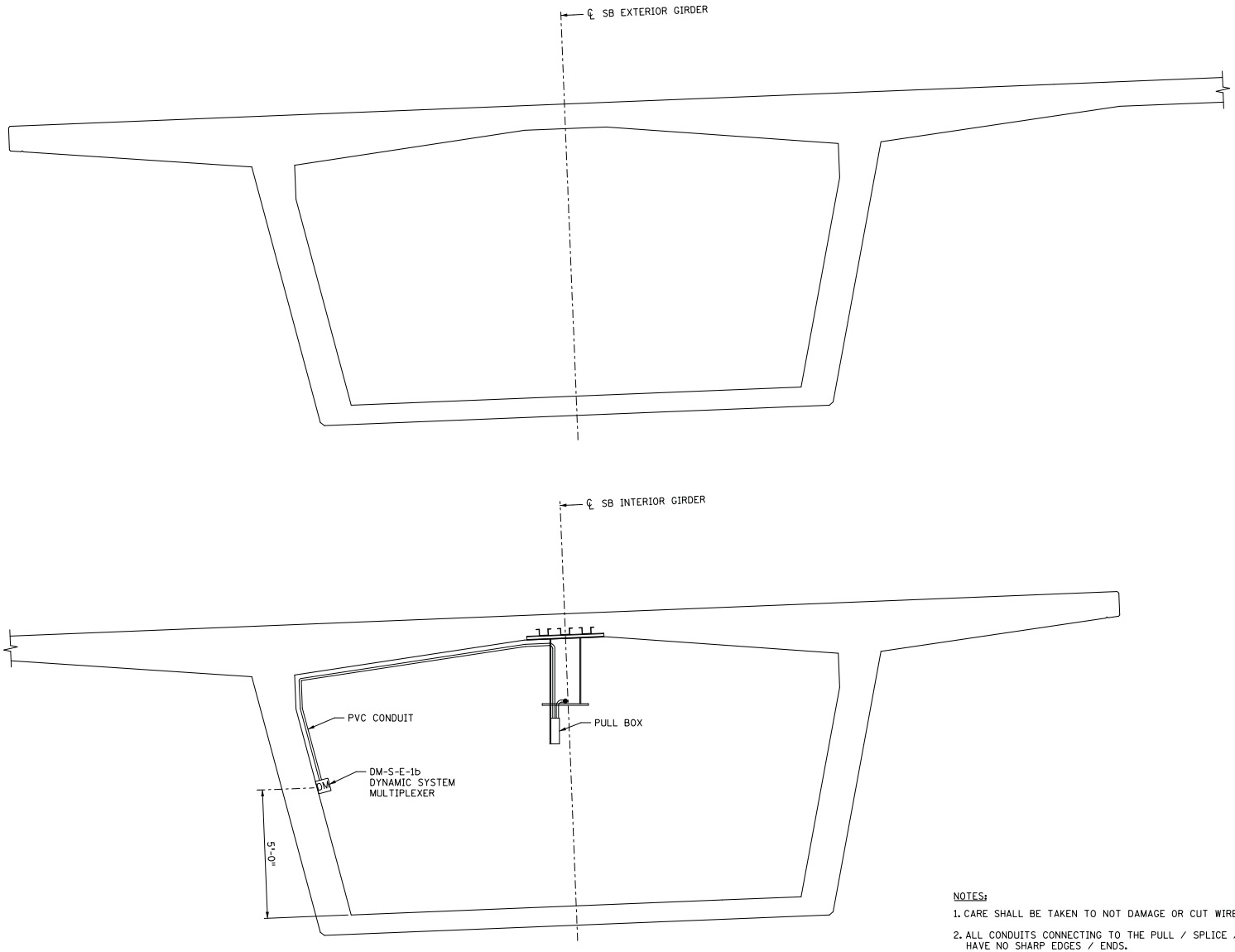

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 216+64.00 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 1bSB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-105d

BRIDGE NOS.
27409(SB)
27410(NB)

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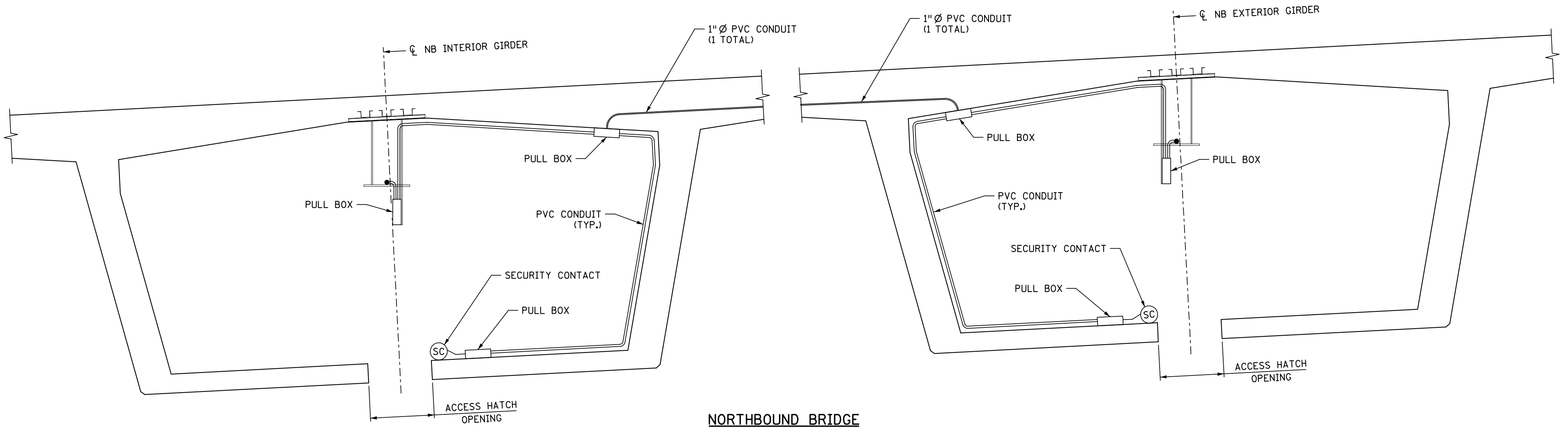
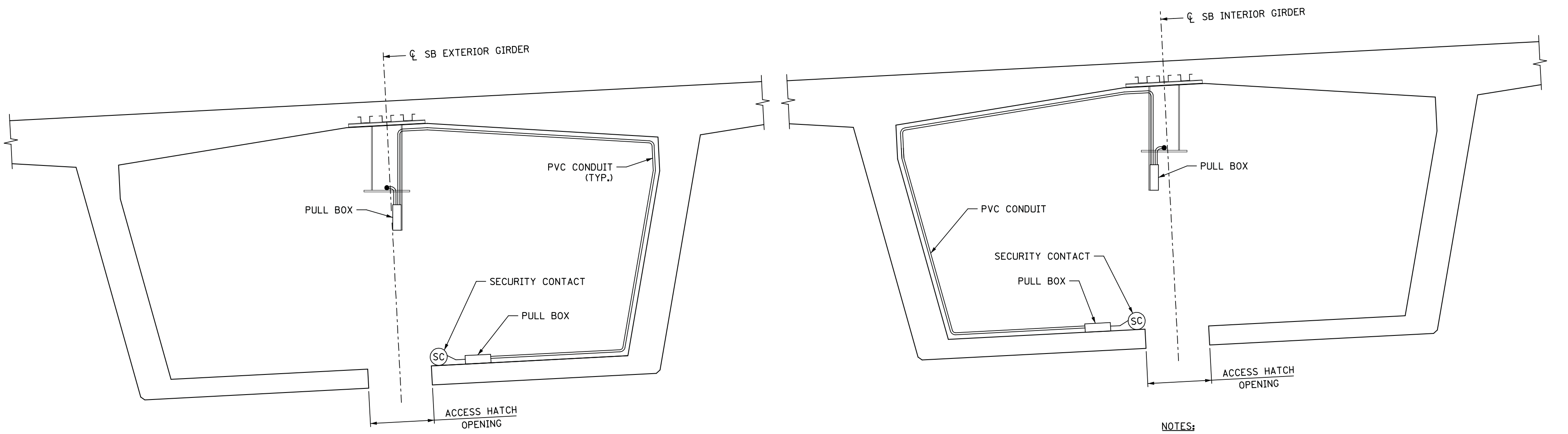


NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 216+77.00 NB P.G.L.



SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 216+77.00 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED	
MN/DOT	DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 2a

DES: ECJ	DR: JMG	APPROVED:		BRIDGE NOS.
CHK: ADH	CHK: DLS			27409(SB)
B-106a				27410(NB)

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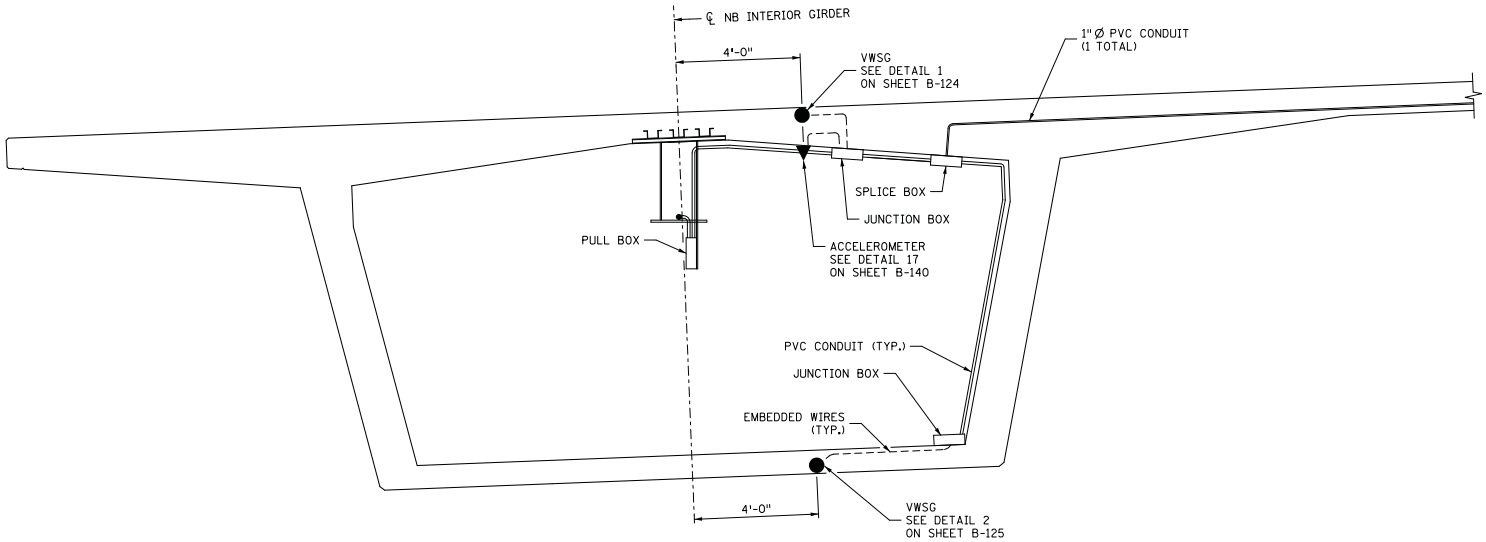

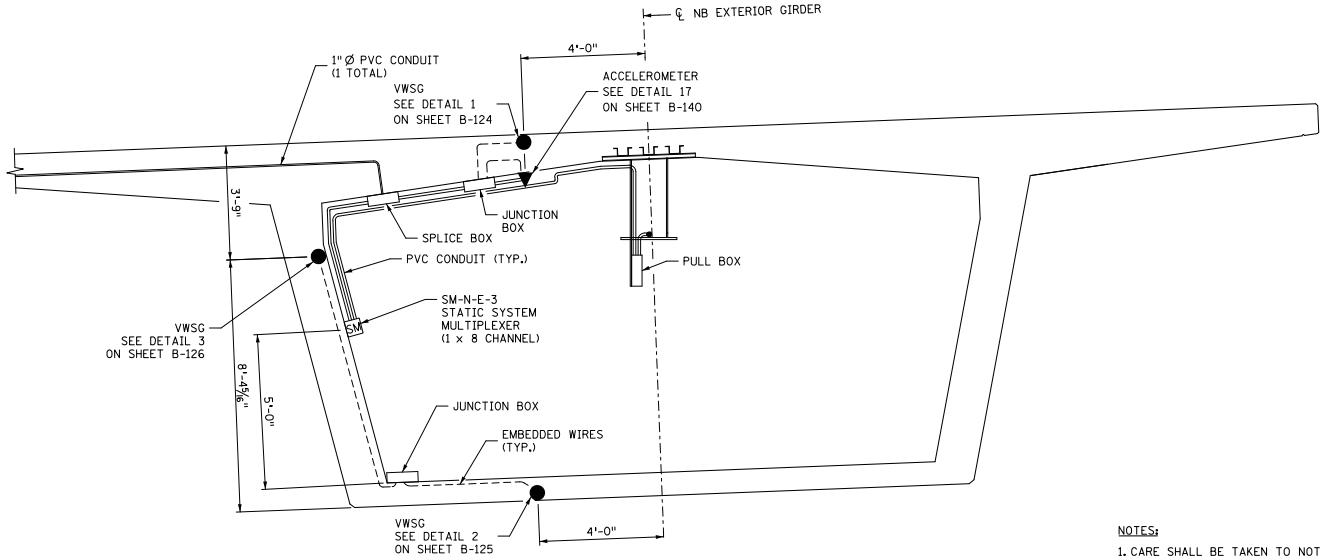

NORTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 217+01.79 NB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 3NB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-107

BRIDGE NOS.
27409(SB)
27410(NB)

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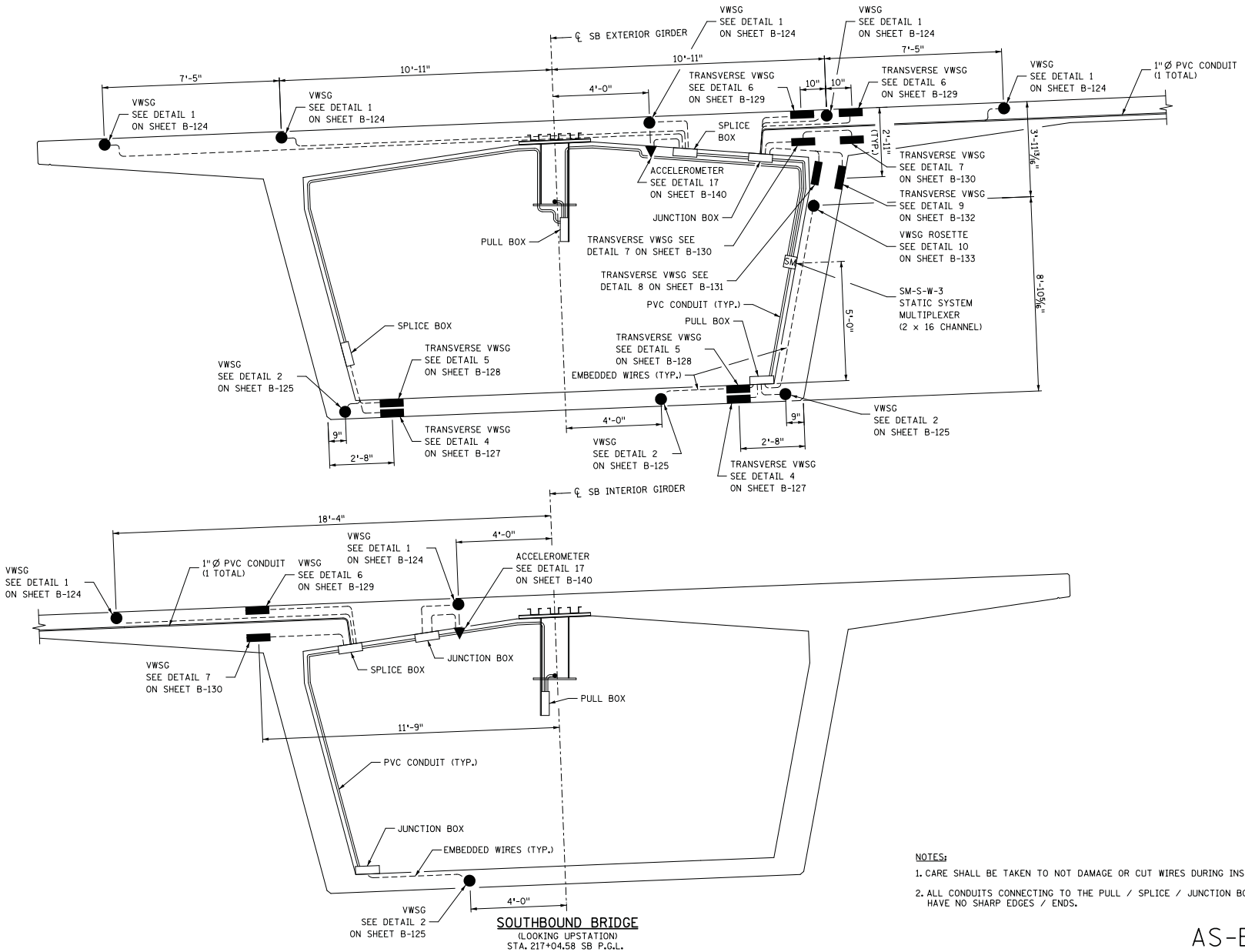


SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 217+04.58 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

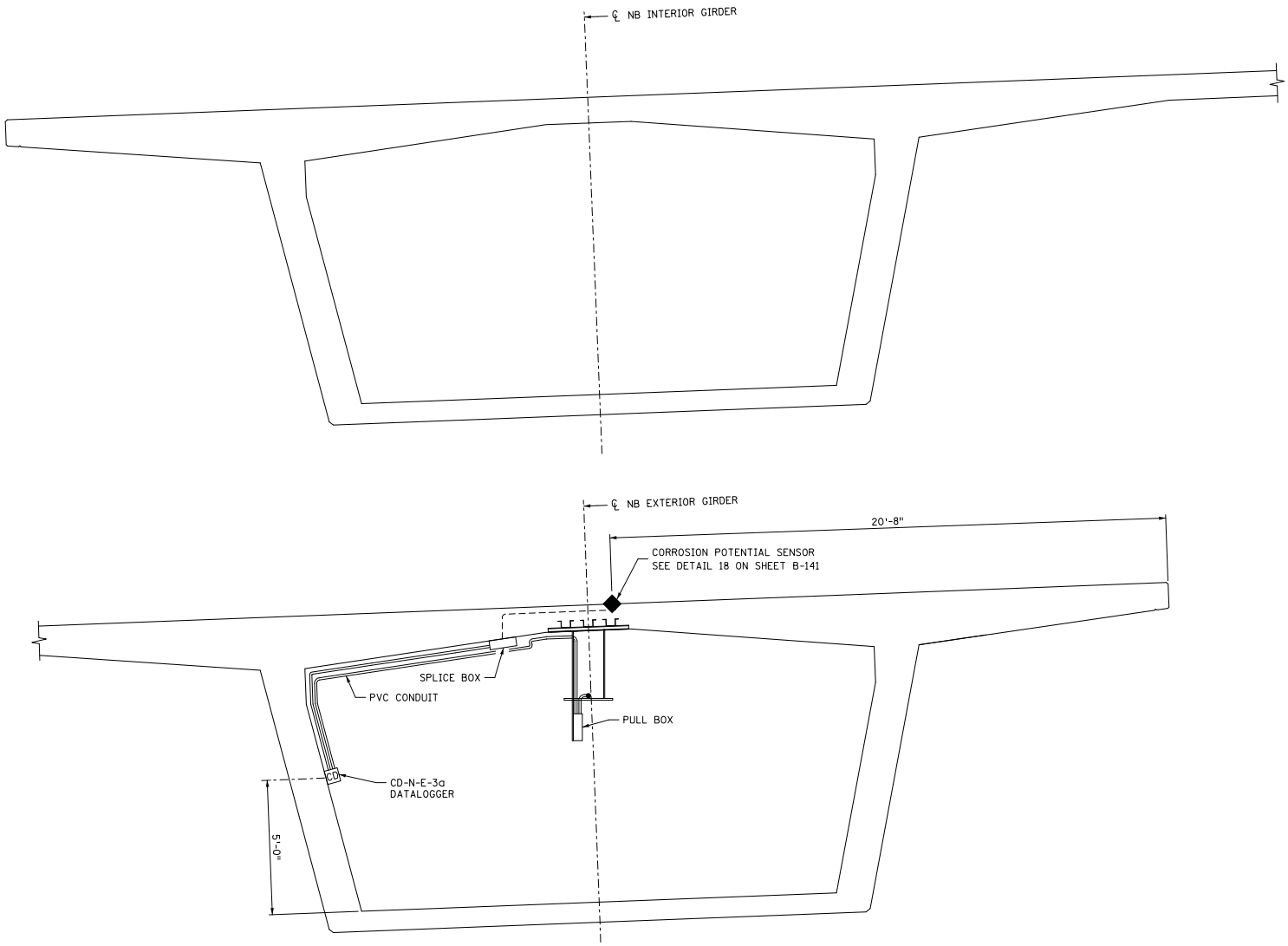
DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 3SB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-108

BRIDGE NOS.
27409(SB)
27410(NB)



NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 217+06.79 NB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 3aNB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-108a

BRIDGE NOS.
27409(SB)
27410(NB)

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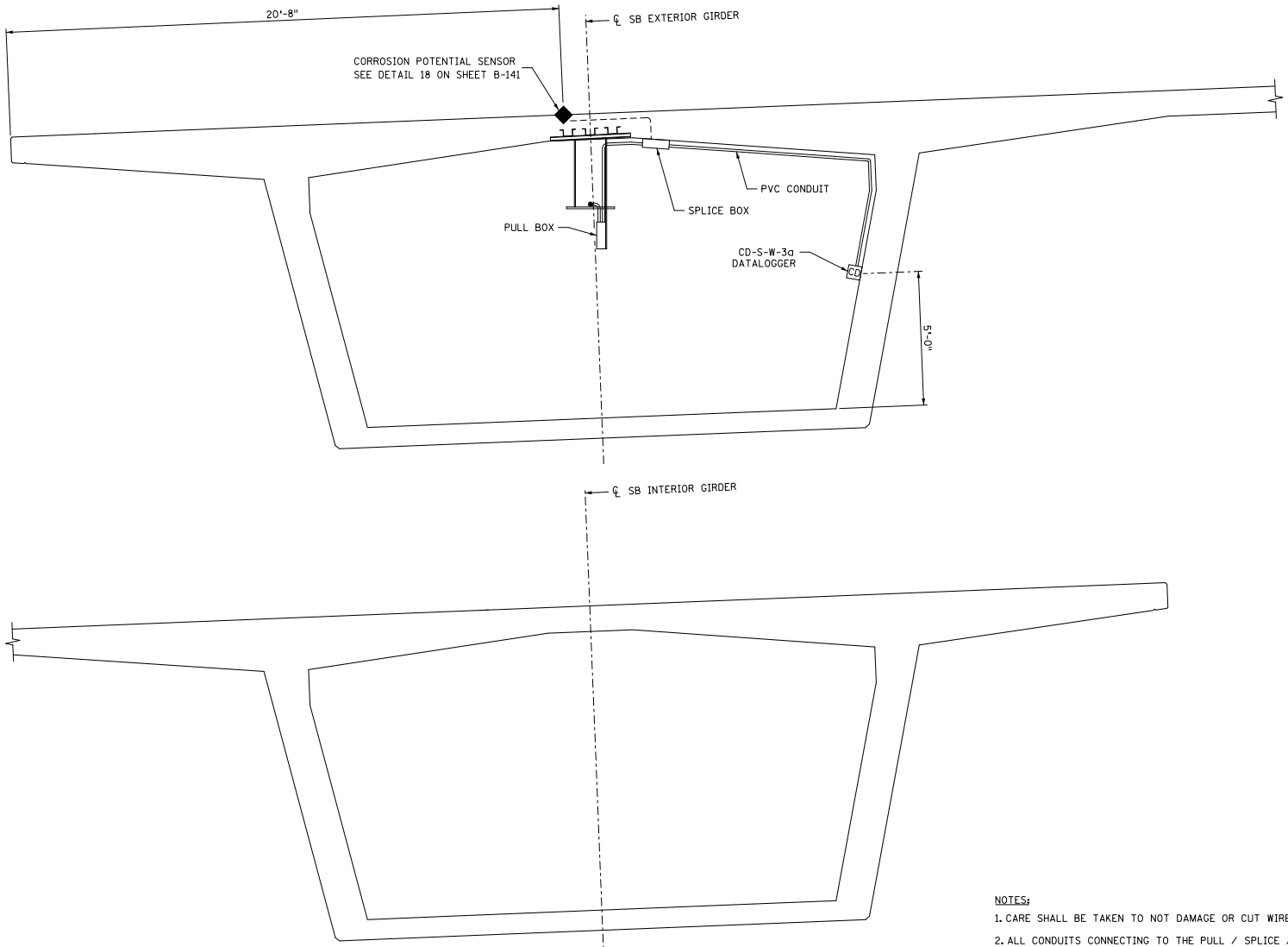

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 217+09.58 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 3aSB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-108b

BRIDGE NOS.
27409(SB)
27410(NB)

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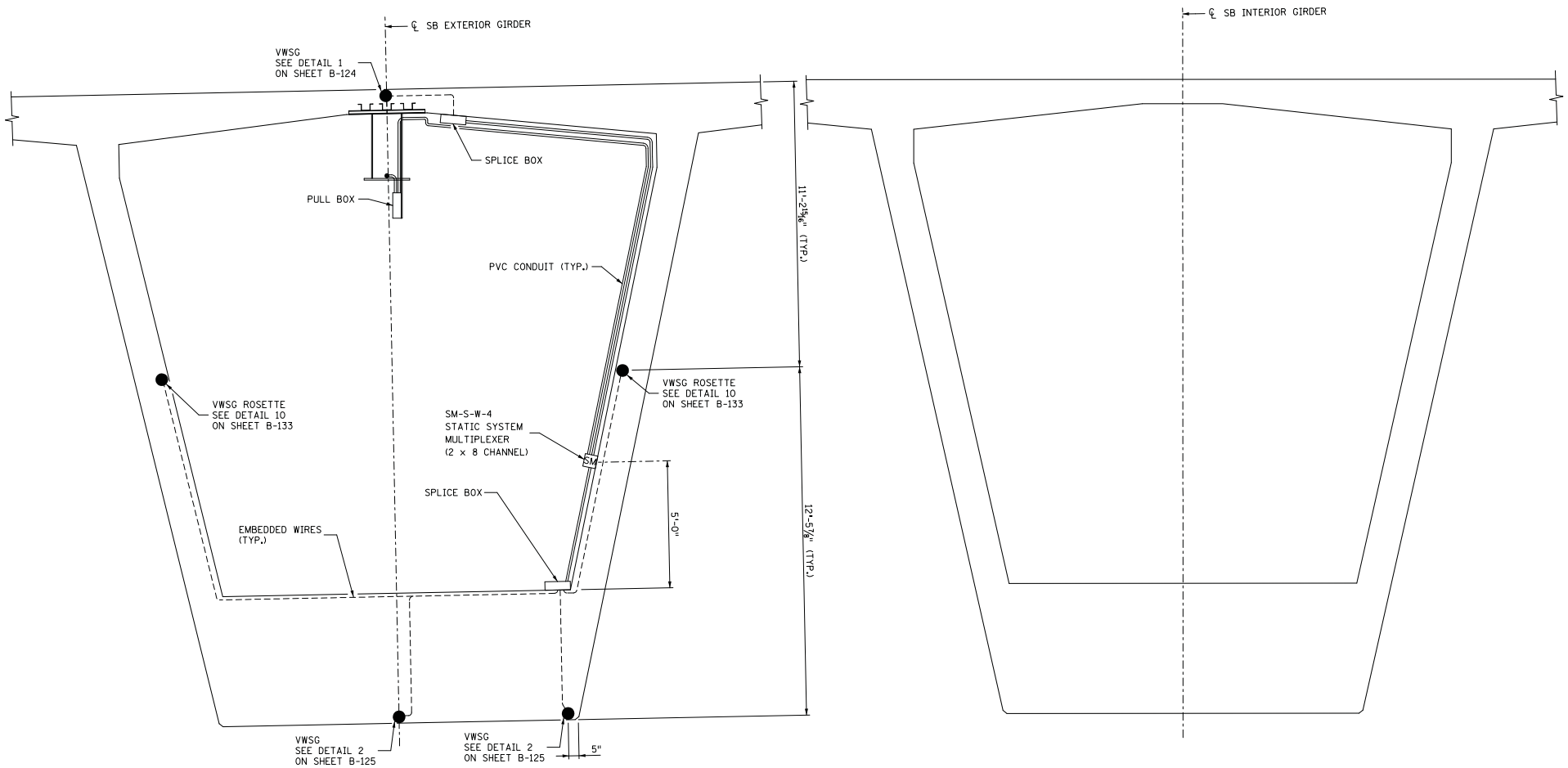

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 218+61.90 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 4SB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-109

BRIDGE NOS.
27409(SB)
27410(NB)

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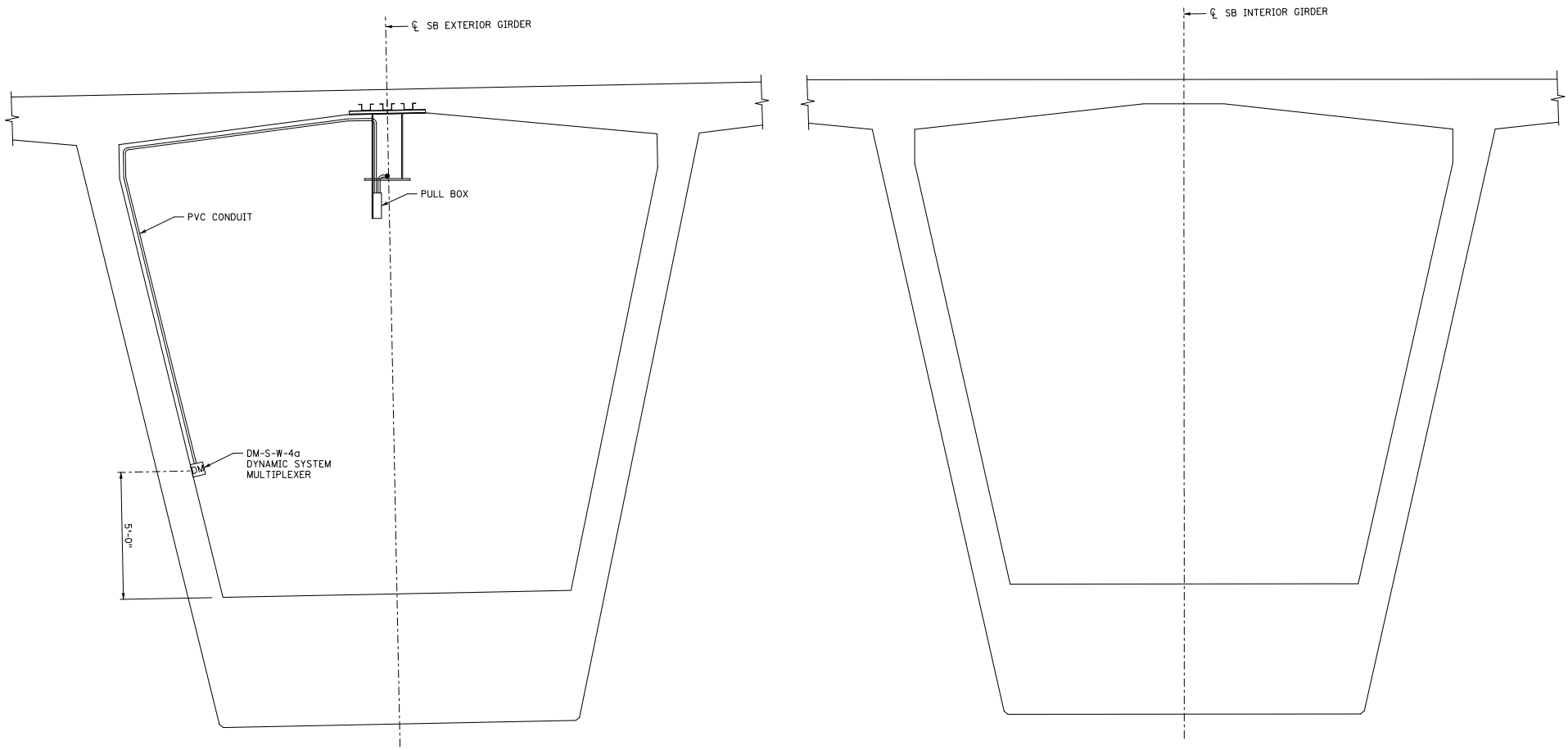

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 218+75.00 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 4aSB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-109a

BRIDGE NOS.
27409(SB)
27410(NB)

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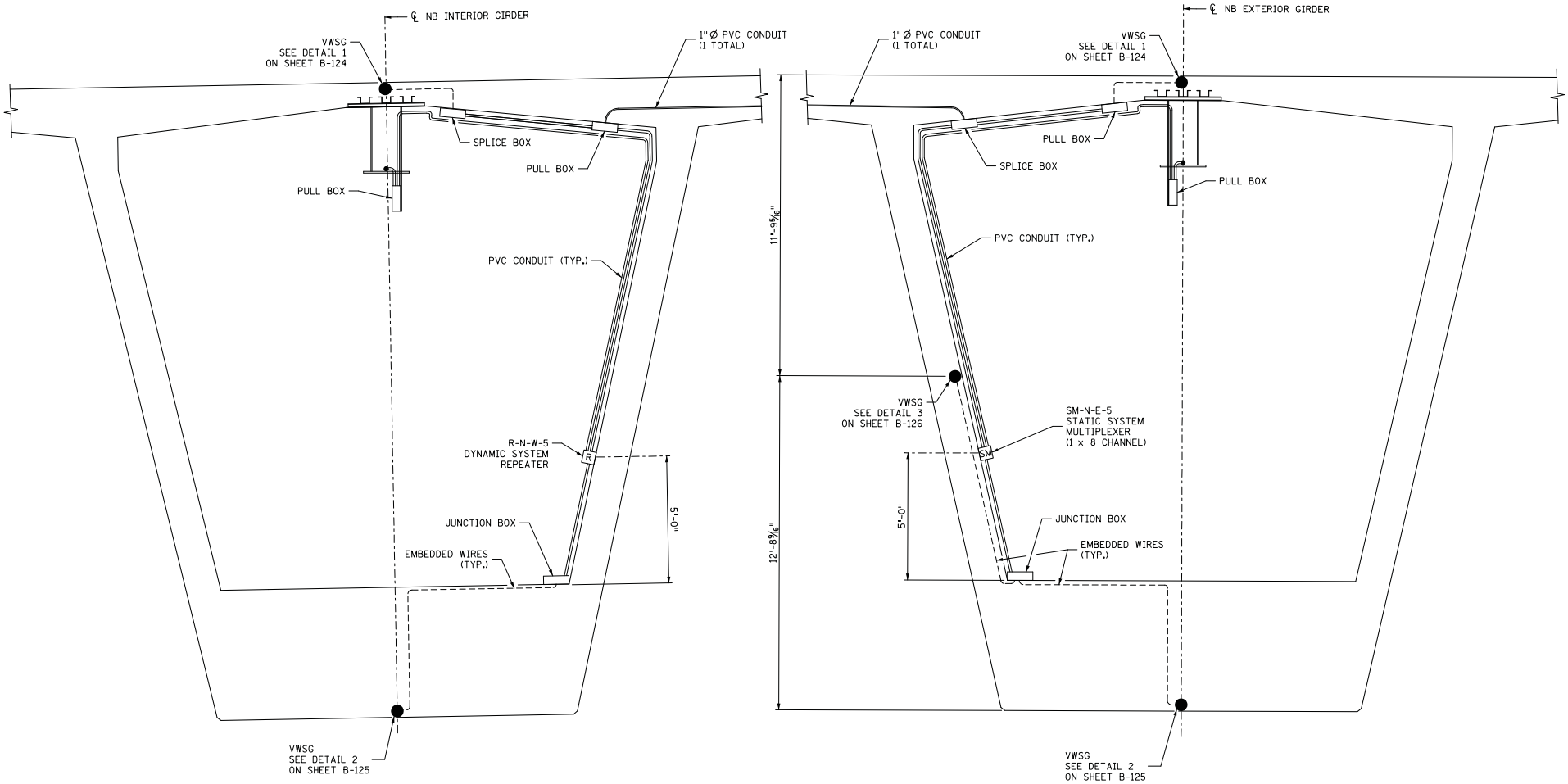


NORTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 219+10.10 NB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

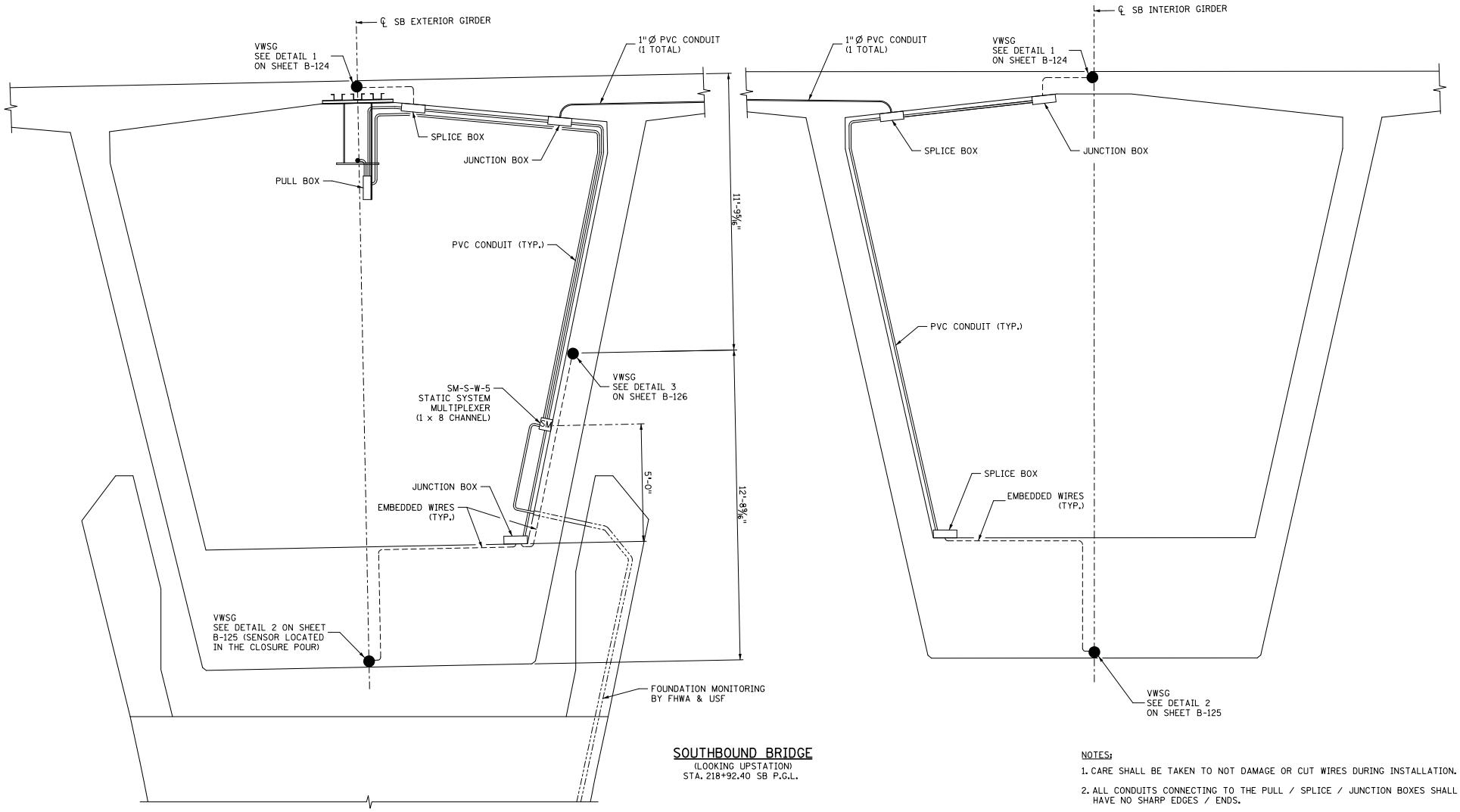
TITLE:
HEALTH MONITORING SYSTEM
LOCATION 5NB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-110

BRIDGE NOS.
27409(SB)
27410(NB)

10/6/2008 4:30:35 PM g:\projects\-35w\struct\as-builts\3.readg_for_official_qc\ASB_B110_CDR27409_HMS_Location_05NB.dgn



SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 218+92.40 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

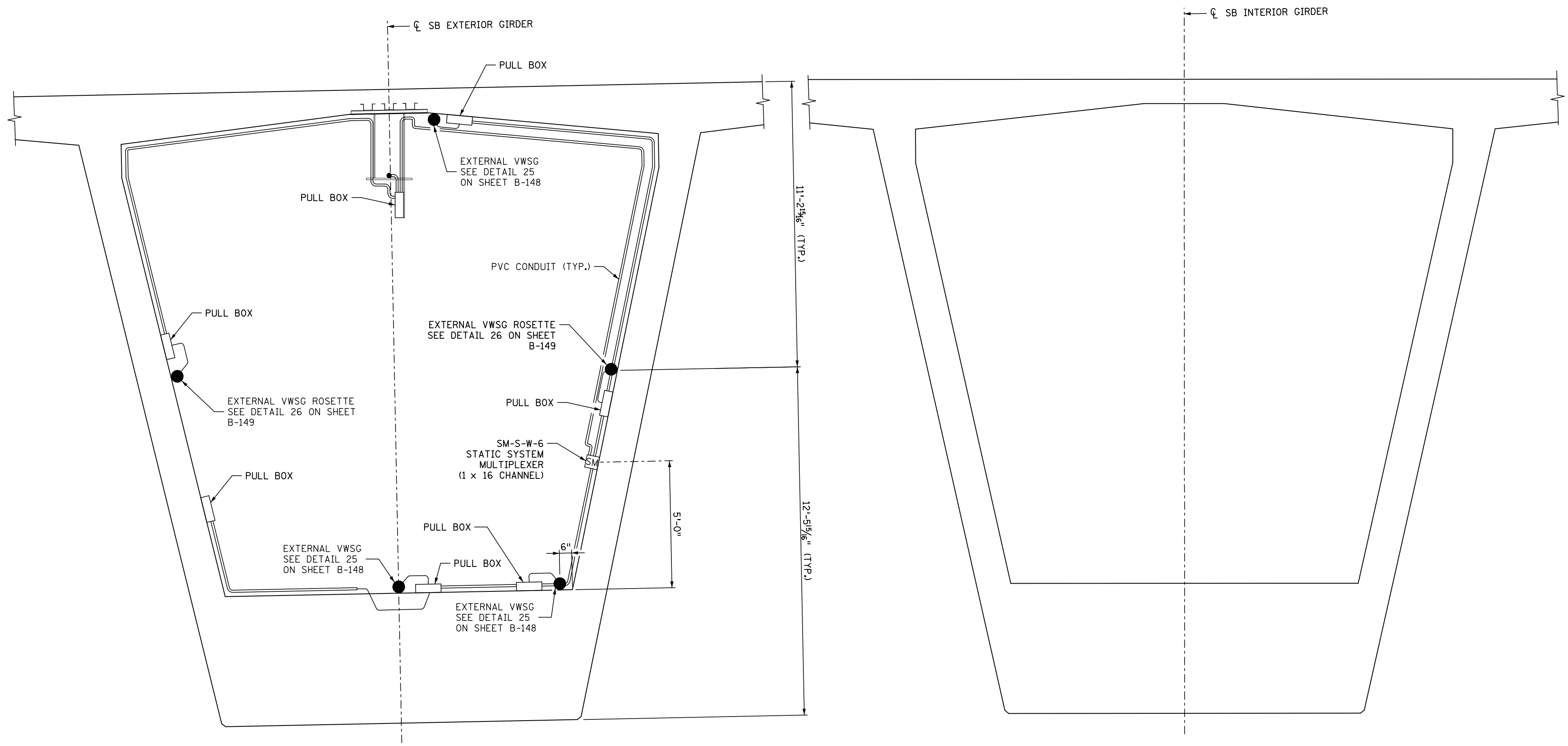
DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 5SB

DES: ECJ	DR: JMF	APPROVED:
CHK: ADH	CHK: DLS	

B-111

BRIDGE NOS.
27409(SB)
27410(NB)



SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 219+01.90 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08 LICENSED PROFESSIONAL ENGINEER DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833		

DRAWING REVISION NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE: HEALTH MONITORING SYSTEM LOCATION 6SB

DES: ECJ	DR: JMF	APPROVED:		
CHK: ADH	CHK: DLS			
B-112				

BRIDGE NOS. 27409(SB) 27410(NB)

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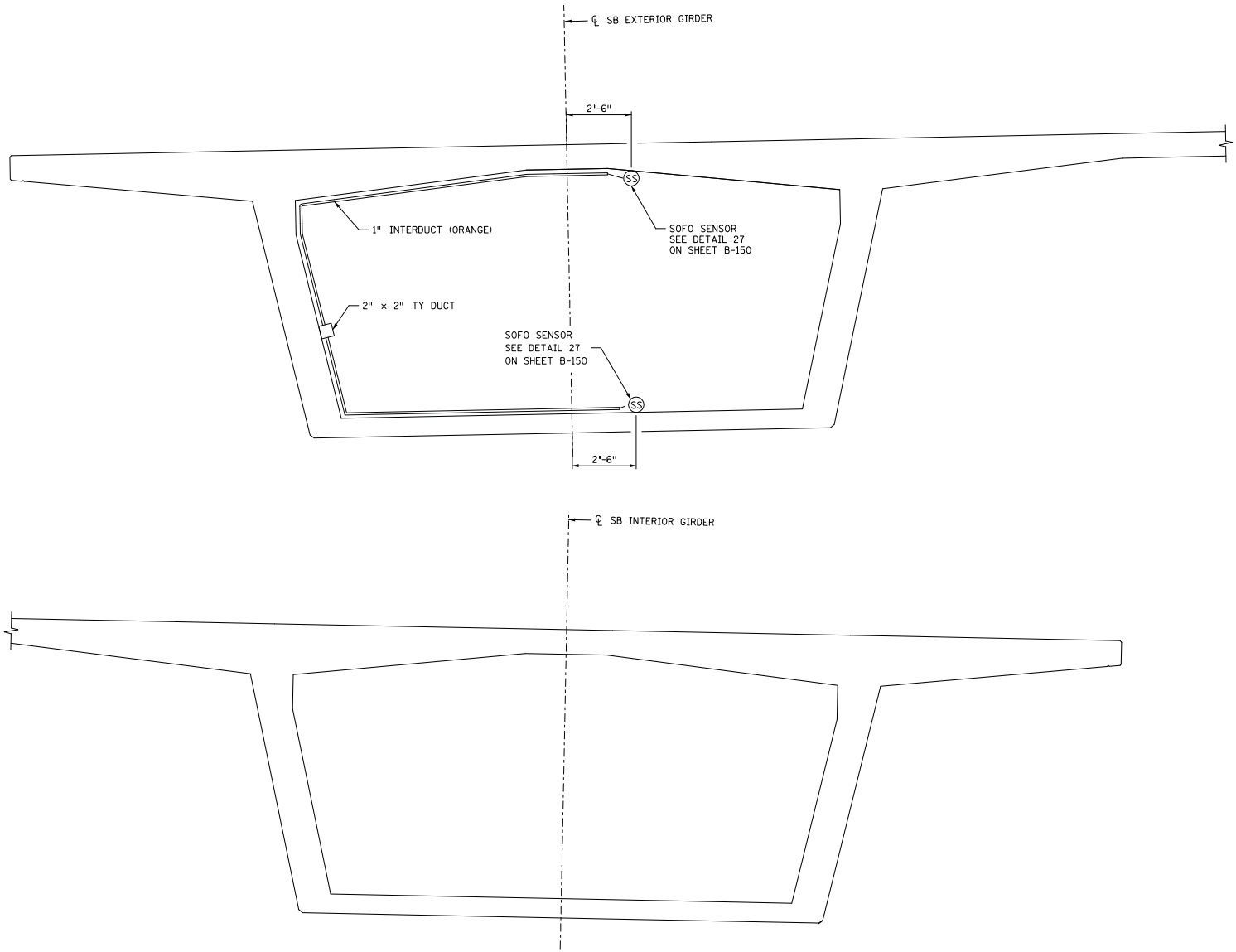

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 219+08.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 6a

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-112a

BRIDGE NOS.
27409(SB)
27410(NB)

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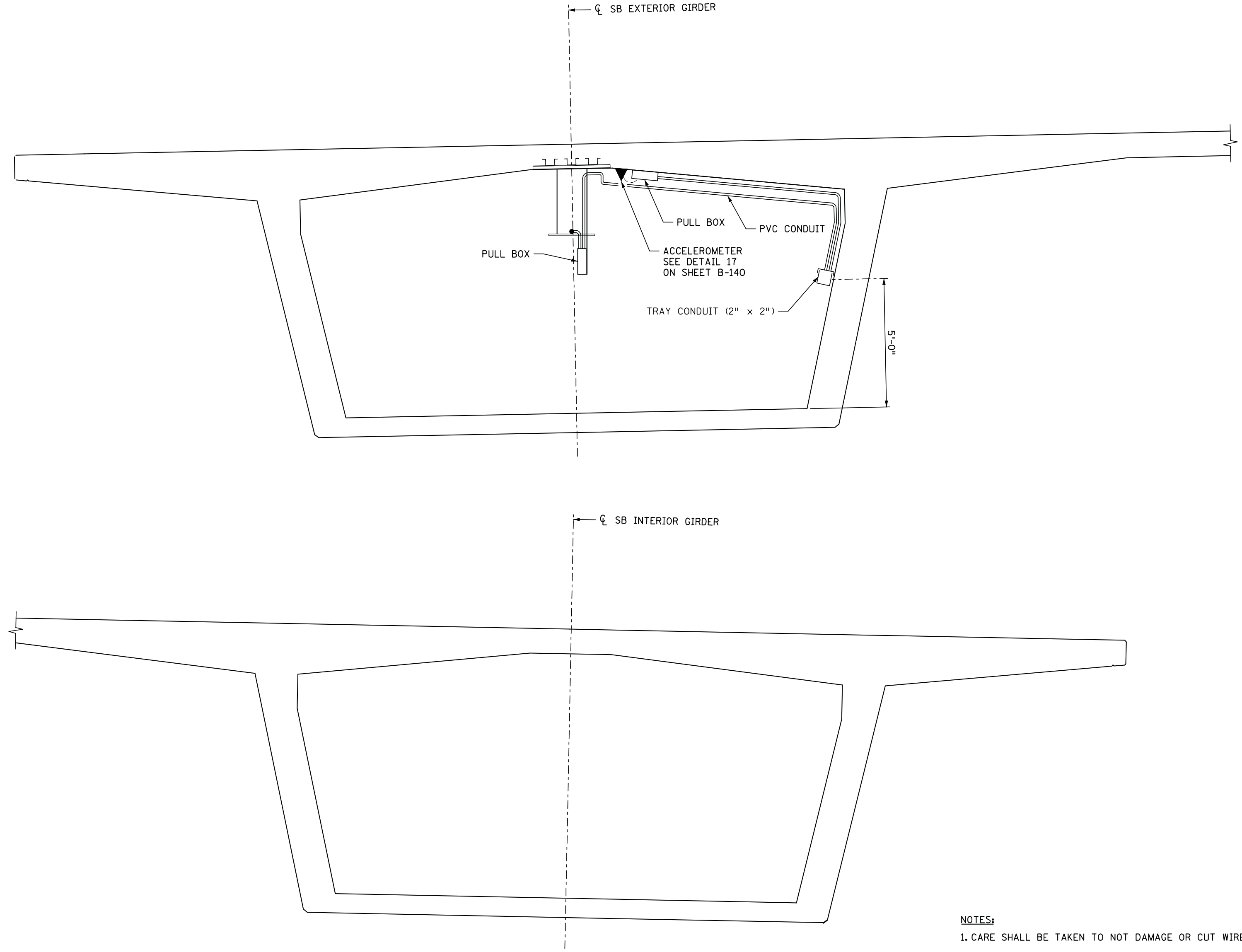

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 219+13.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY *Christopher J. Burgess* LICENSED PROFESSIONAL ENGINEER 10/07/08 DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833	DRAWING REVISION: NO. RFC, BY ECJ, DATE 08/11/08, DESCRIPTION RELEASED FOR CONSTRUCTION	TITLE: HEALTH MONITORING SYSTEM LOCATION 6b	DES: ECJ DR: JMF APPROVED: CHK: ADH CHK: DLS B-112b
					BRIDGE NOS. 27409(SB) 27410(NB)

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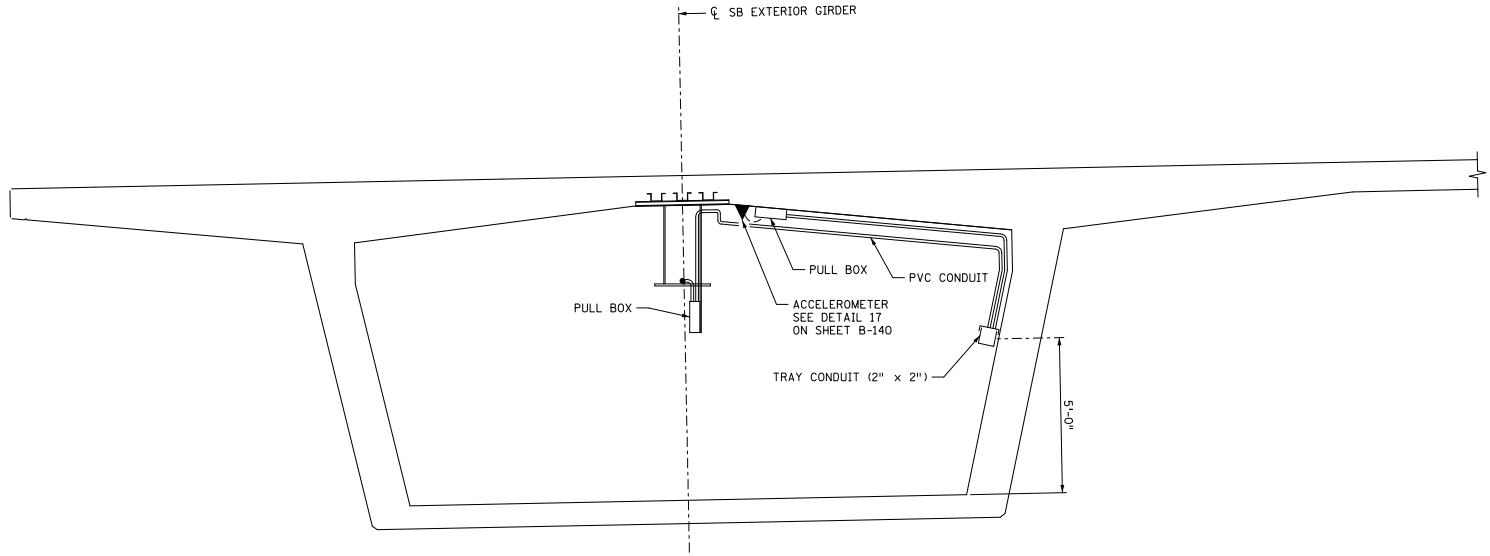

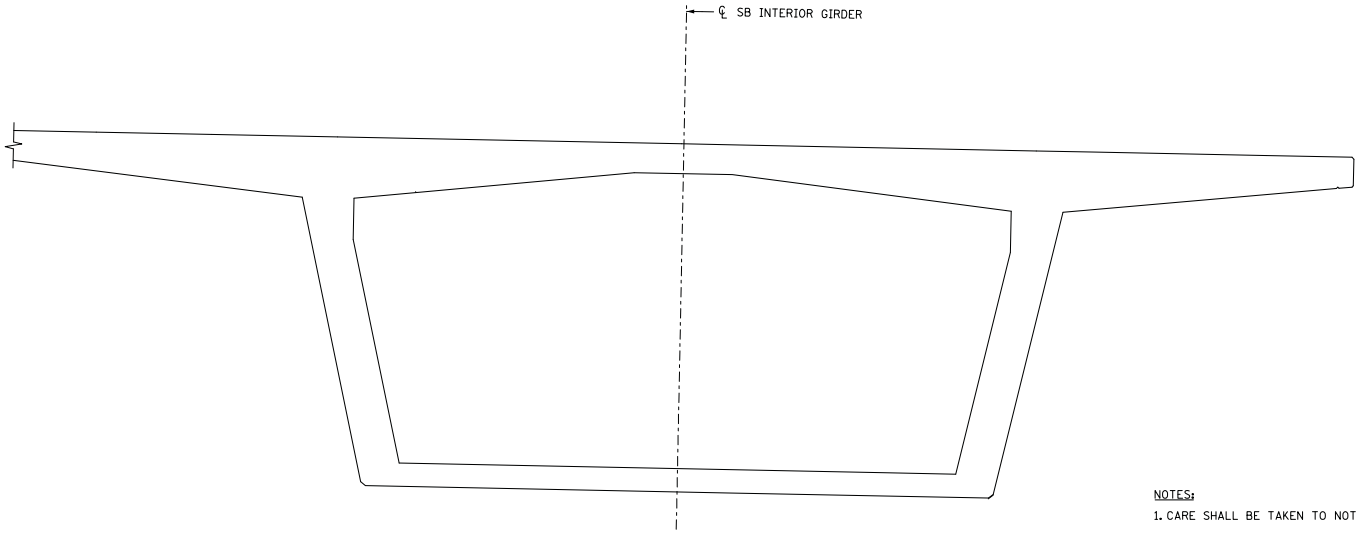

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 219+44.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08 LICENSED PROFESSIONAL ENGINEER DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833	DRAWING REVISION: NO. RFC; BY ECJ; DATE 08/11/08; DESCRIPTION RELEASED FOR CONSTRUCTION	TITLE: HEALTH MONITORING SYSTEM LOCATION 6c	DES: ECJ; DR: JMF; CHK: ADH; CHK: DLS; APPROVED: B-112c	BRIDGE NOS. 27409(SB) 27410(NB)

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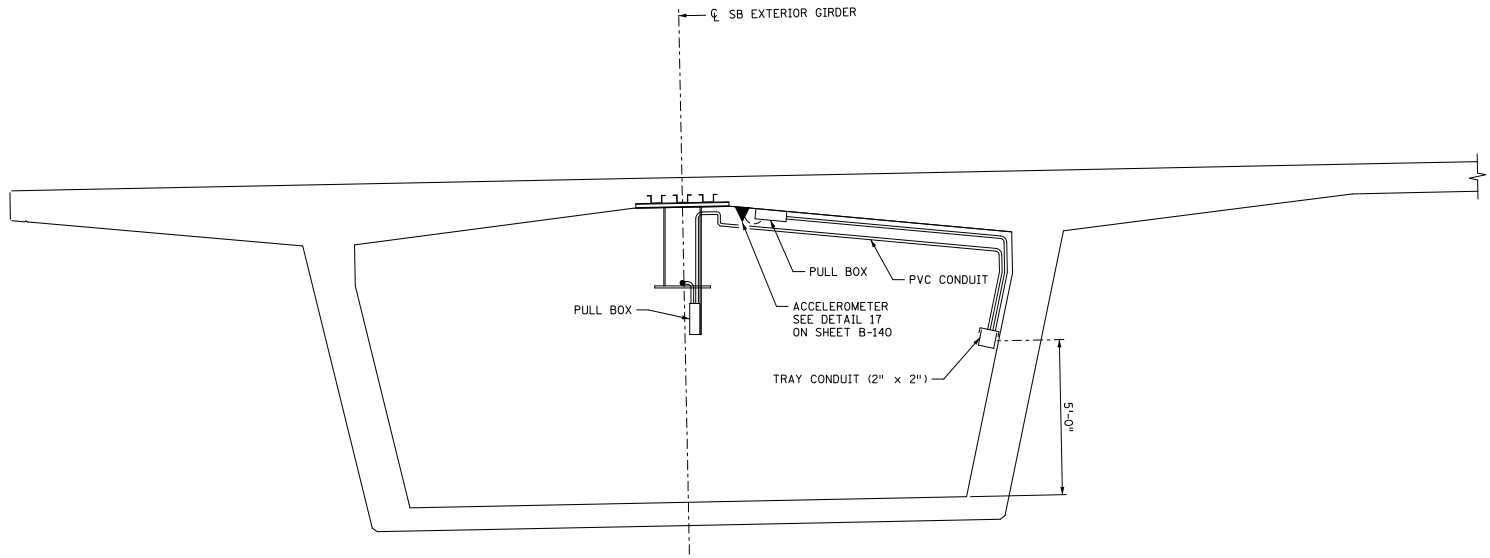

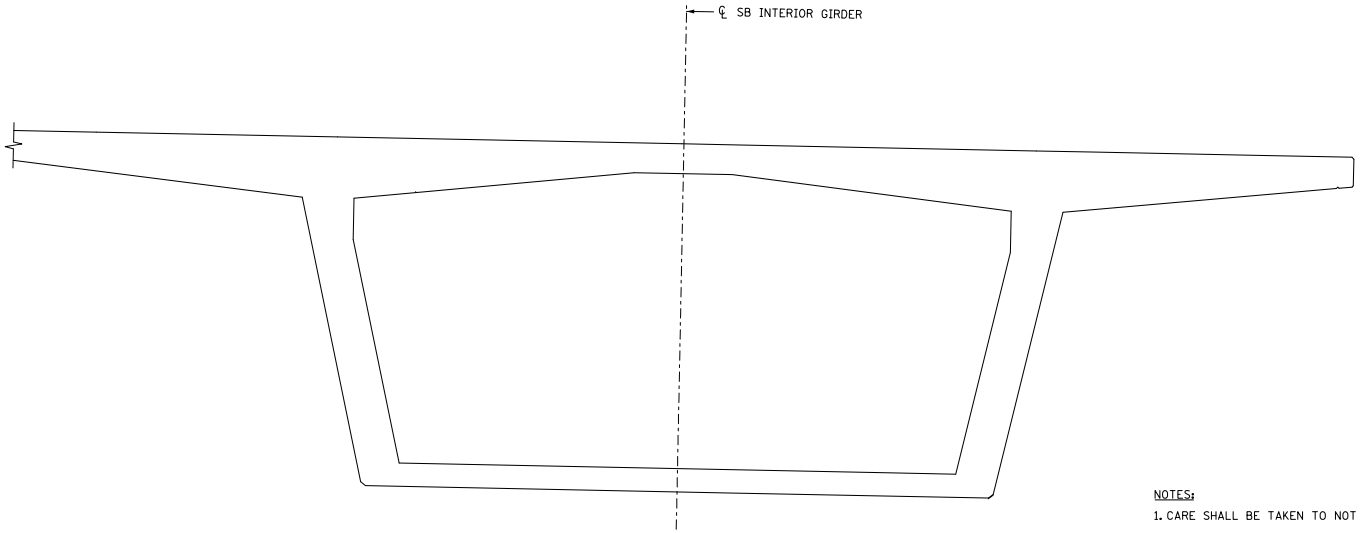

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 219+76.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 6d

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-112d

BRIDGE NOS.
27409(SB)
27410(NB)

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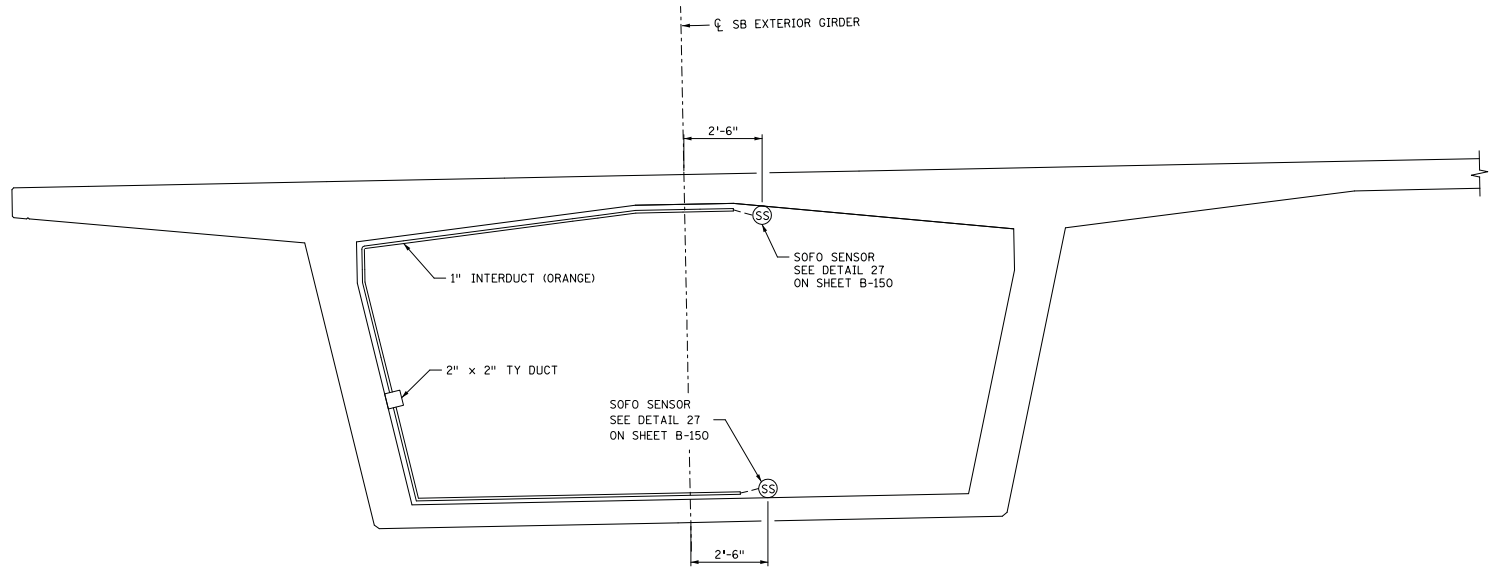

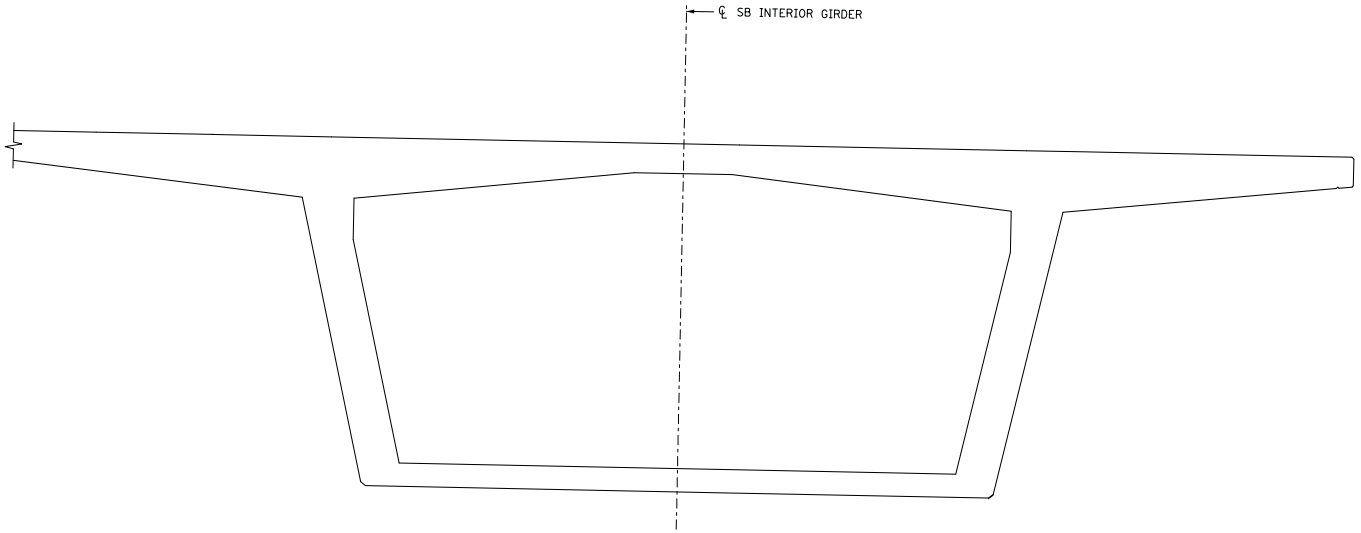

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 219+81.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 6e

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-112e

BRIDGE NOS.
27409(SB)
27410(NB)

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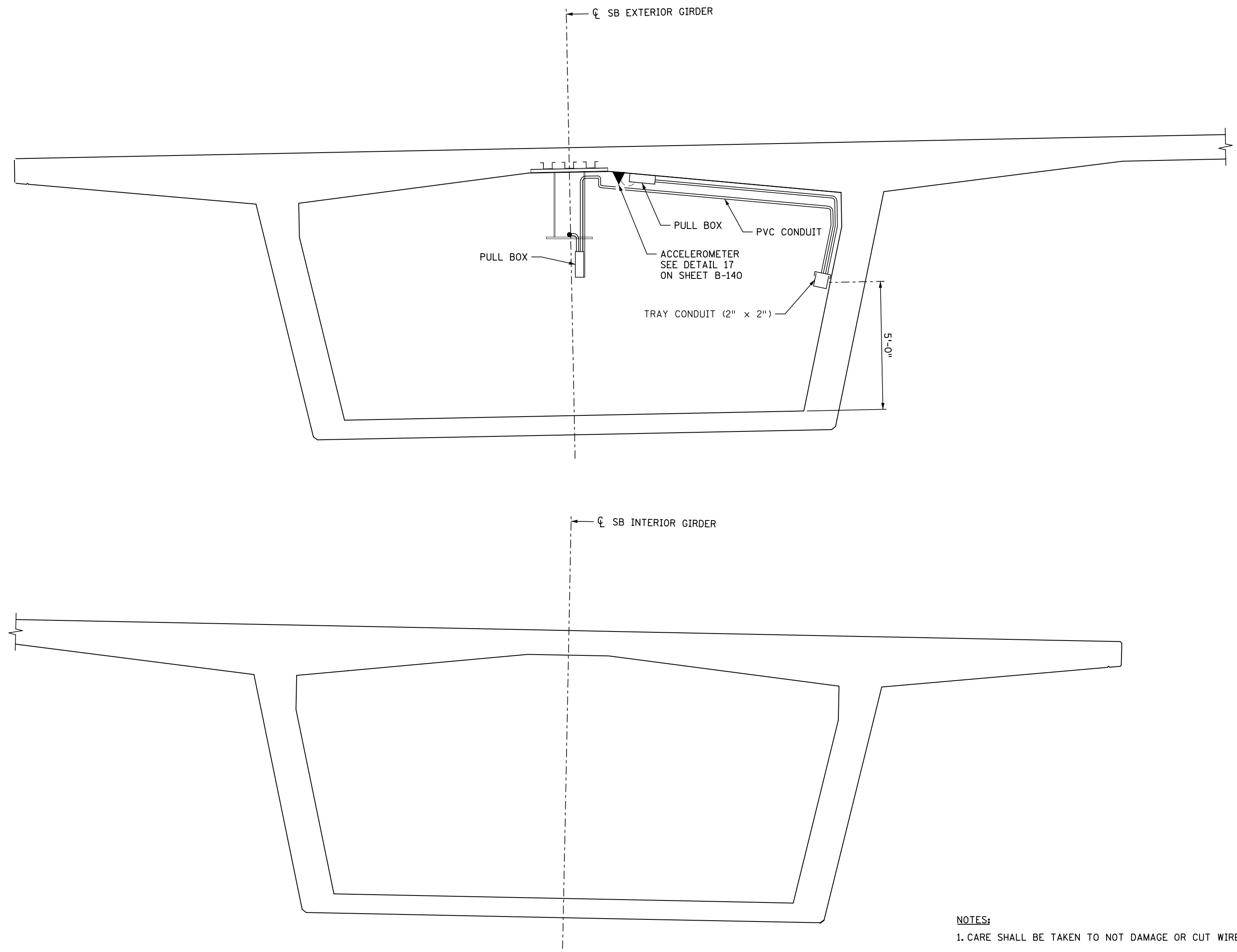

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 220+07.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED	FIGG	CERTIFIED BY Christopher J. Burgess LICENSED PROFESSIONAL ENGINEER 10/07/08 DATE	DRAWING REVISION	TITLE: HEALTH MONITORING SYSTEM LOCATION 6f	DES: ECJ	DR: JMF	APPROVED:	BRIDGE NOS.
MN/DOT DATE		NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833			CHK: ADH	CHK: DLS		27409(SB) 27410(NB)
					B-112f			

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

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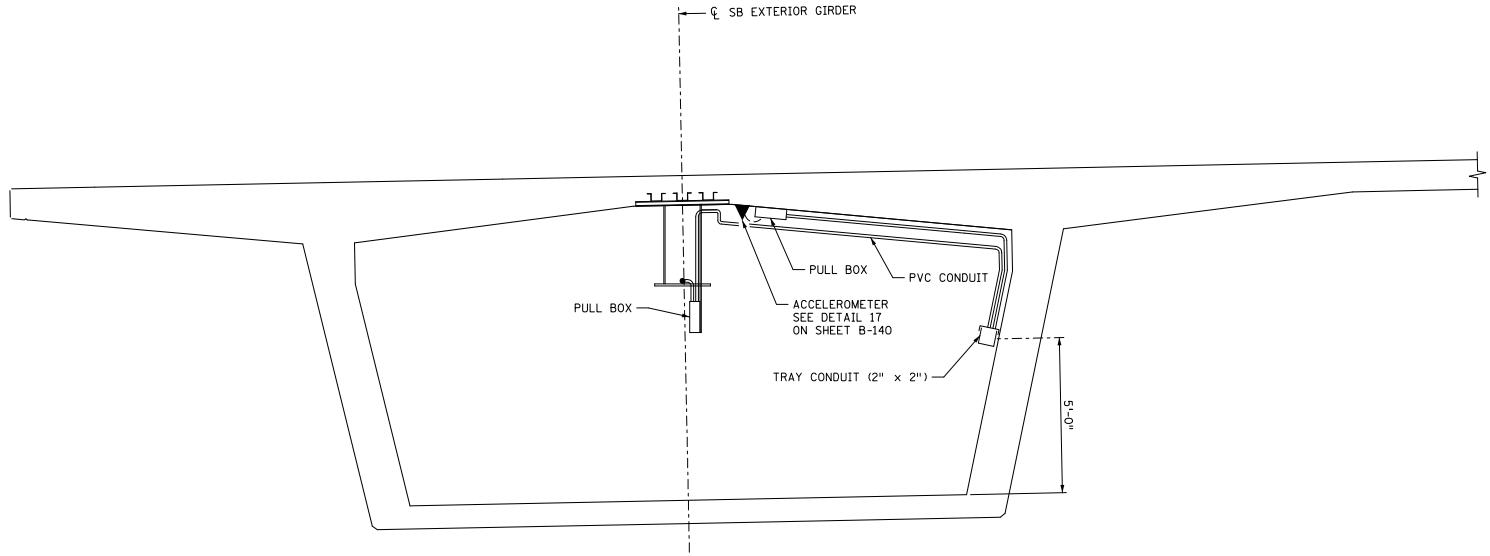
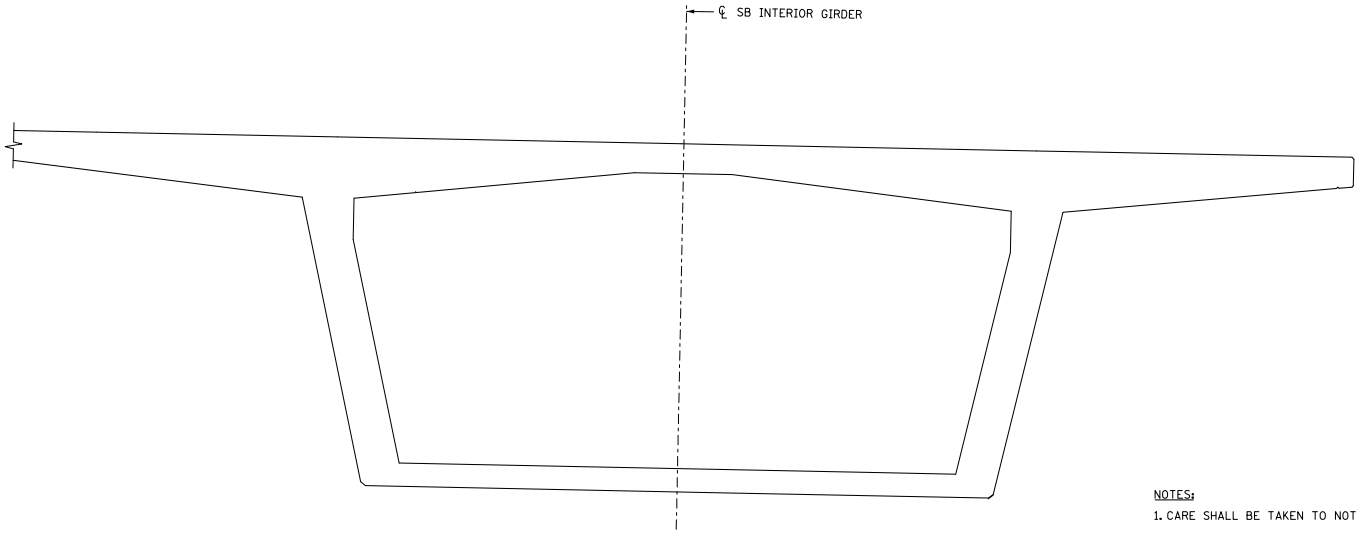




NOTES:

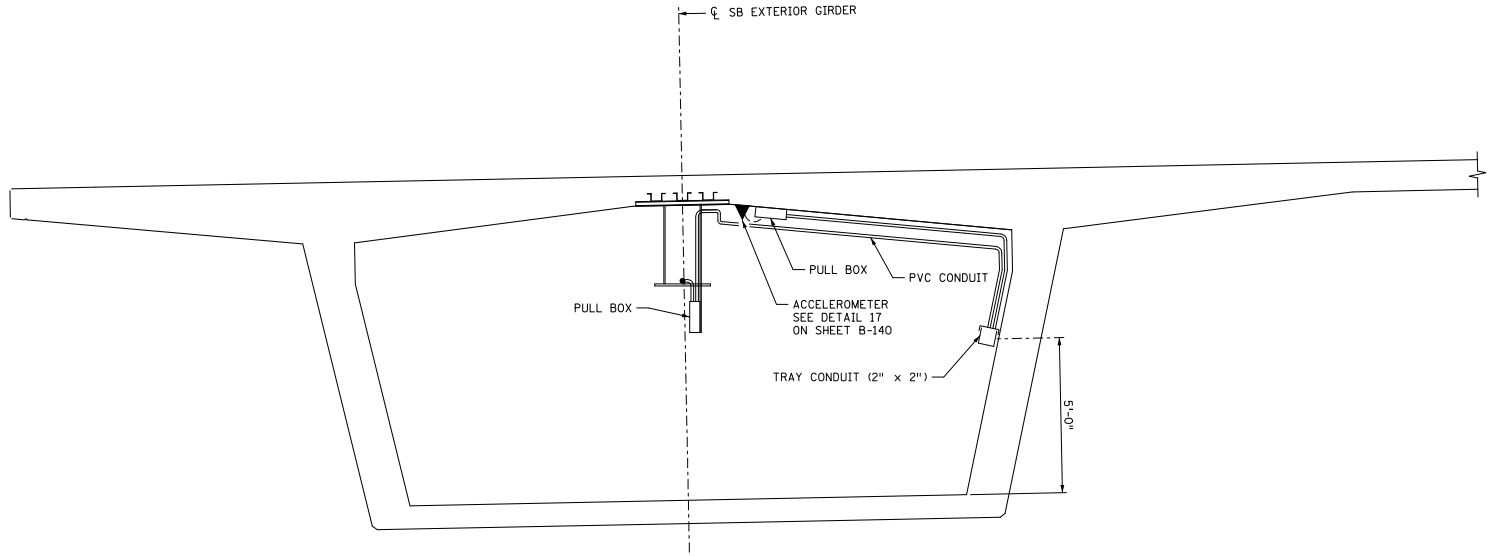
1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

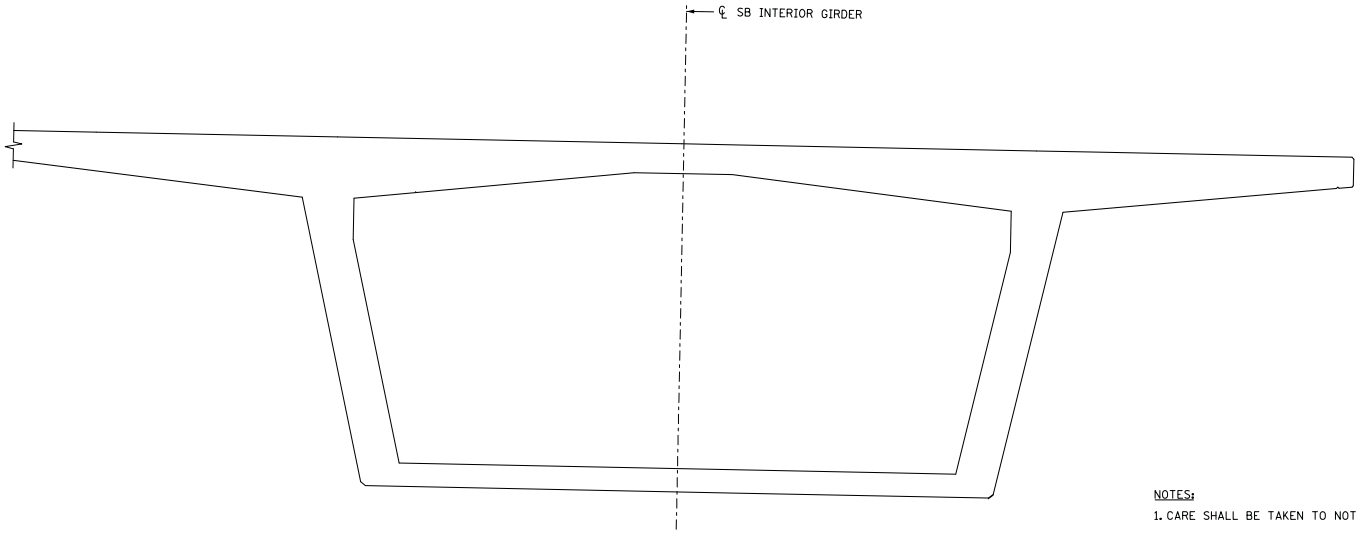
SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 220+39.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08 LICENSED PROFESSIONAL ENGINEER DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833	DRAWING REVISION: NO. RFC; BY ECJ; DATE 08/11/08; DESCRIPTION RELEASED FOR CONSTRUCTION	TITLE: HEALTH MONITORING SYSTEM LOCATION 6g	DES: ECJ; DR: JMF; APPROVED: CHK: ADH; CHK: DLS B-112g	BRIDGE NOS. 27409(SB) 27410(NB)





NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 220+70.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 6h

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-112h

BRIDGE NOS.
27409(SB)
27410(NB)

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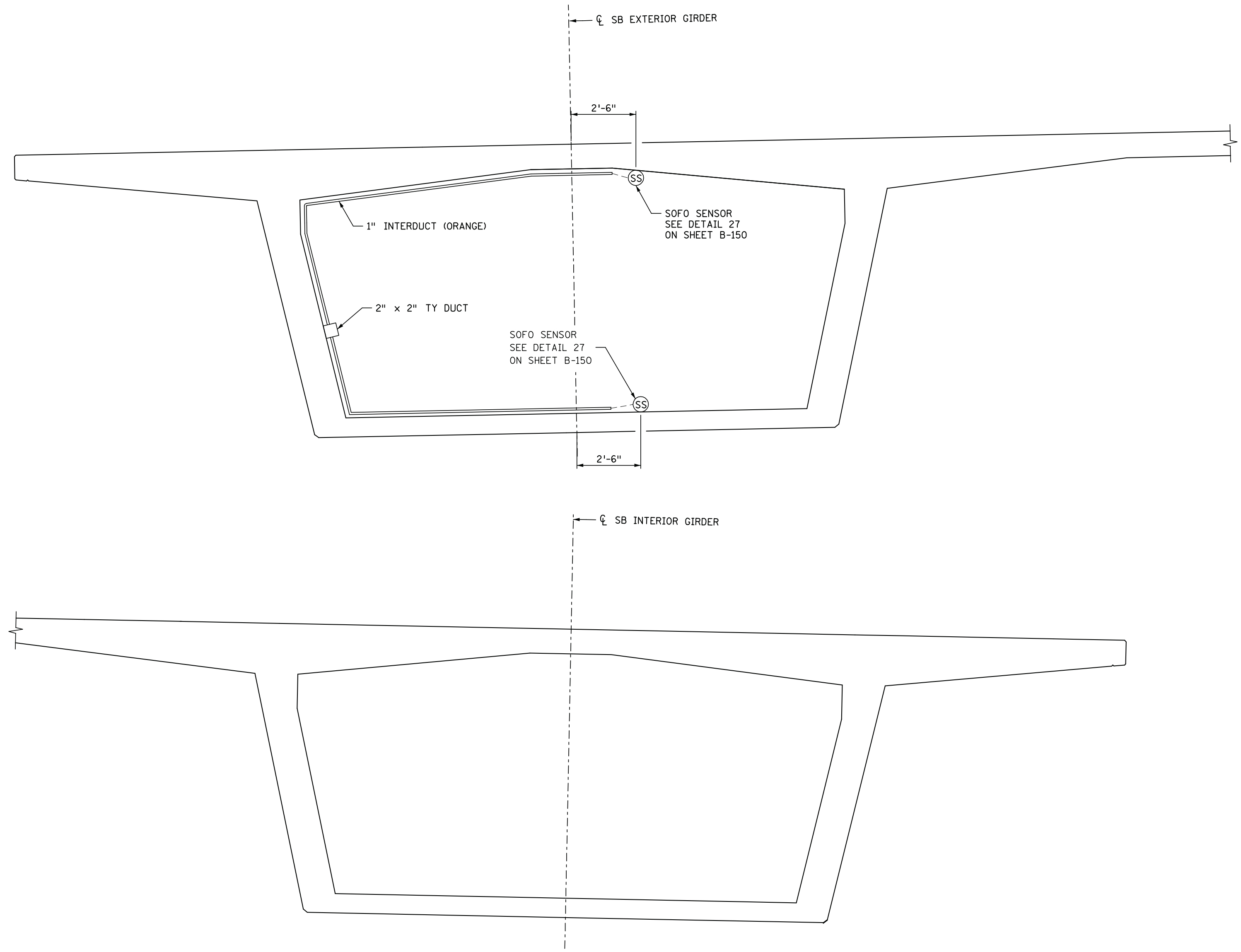

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 220+80.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08 LICENSED PROFESSIONAL ENGINEER DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833	DRAWING REVISION: NO. RFC, BY ECJ, DATE 08/11/08, DESCRIPTION RELEASED FOR CONSTRUCTION	TITLE: HEALTH MONITORING SYSTEM LOCATION 61	DES: ECJ DR: JMF CHK: ADH CHK: DLS APPROVED: B-1121	BRIDGE NOS. 27409(SB) 27410(NB)

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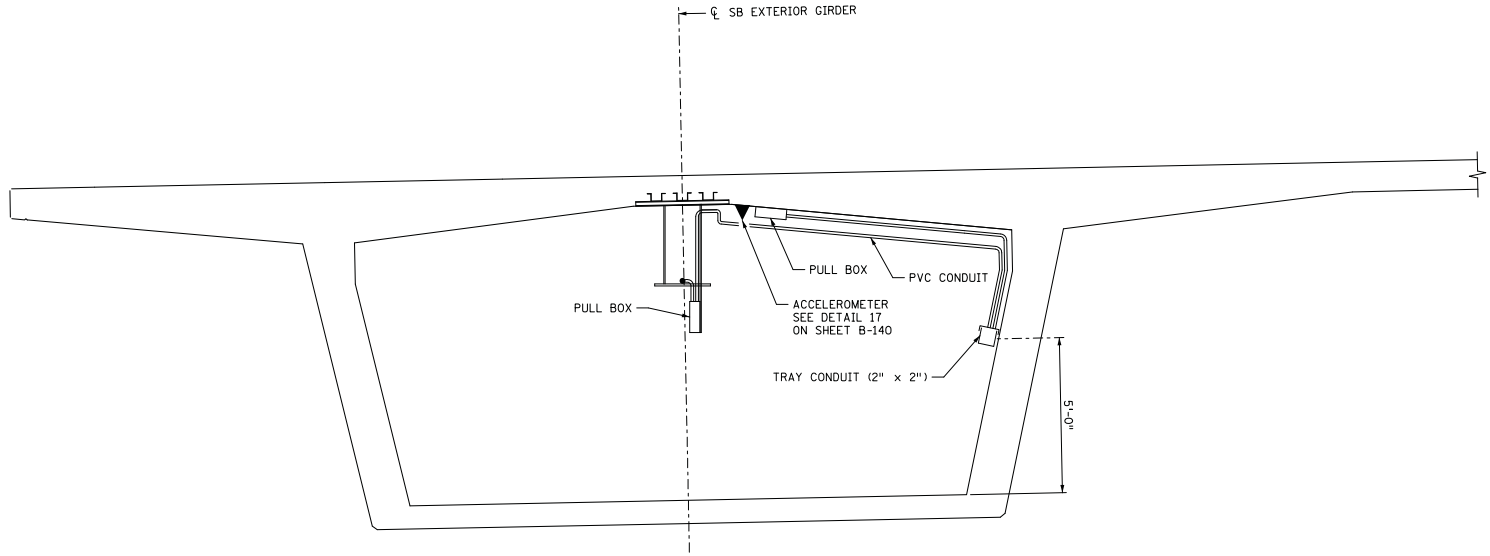

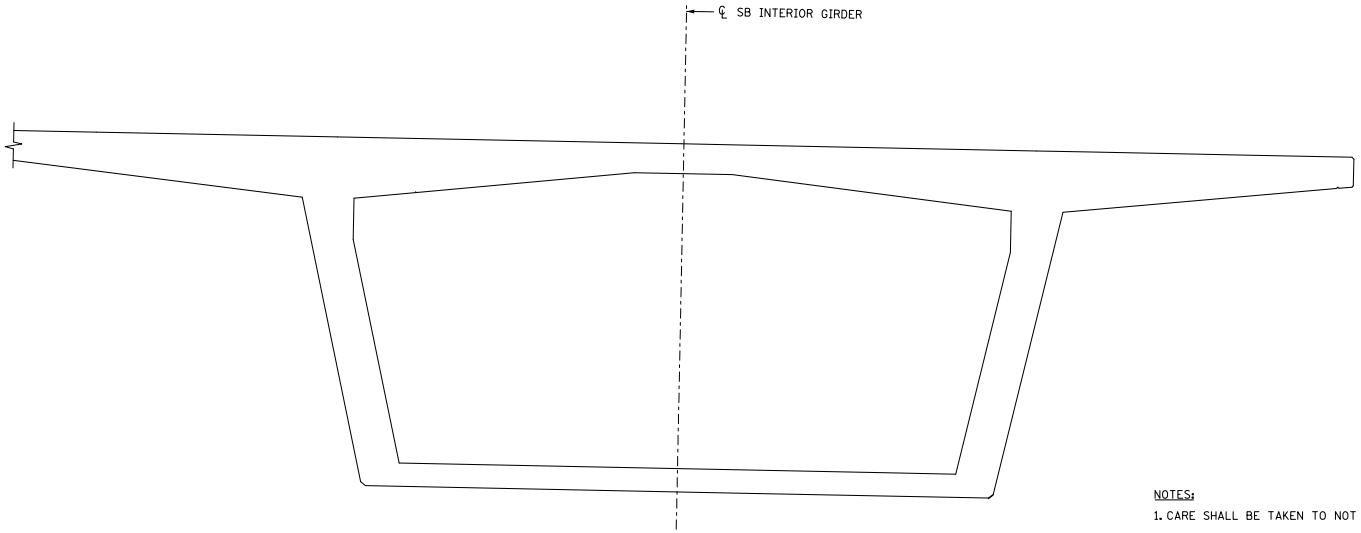

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 221+02.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 6J

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-112J

BRIDGE NOS.
27409(SB)
27410(NB)

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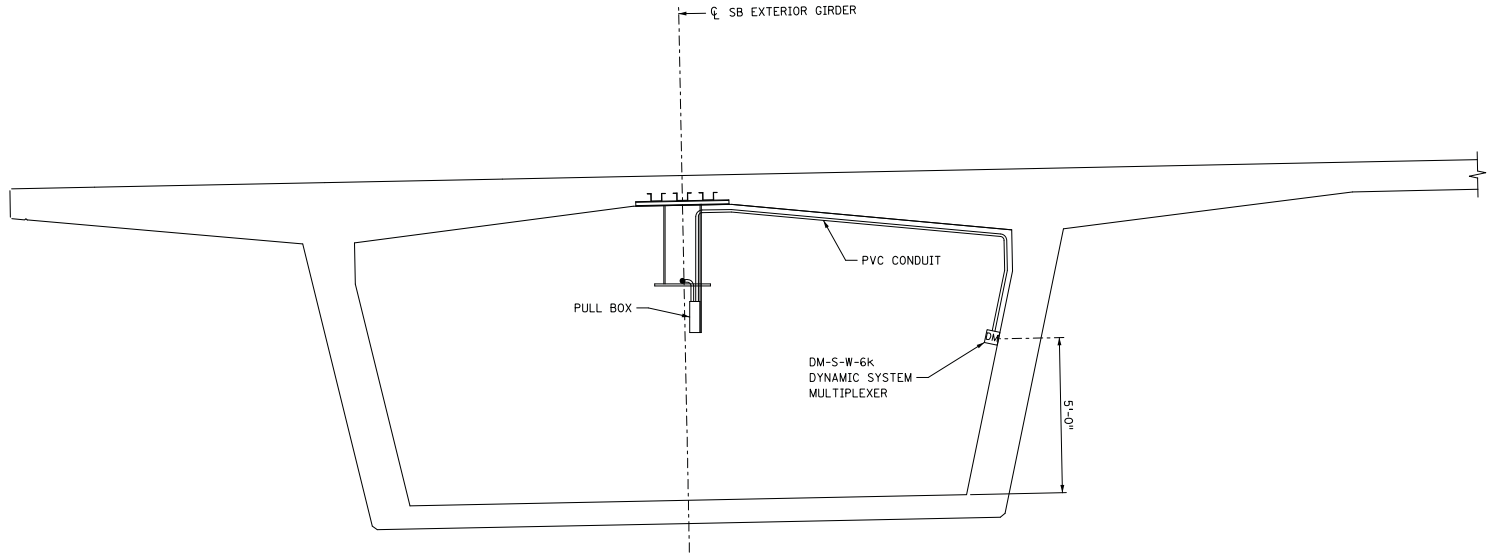

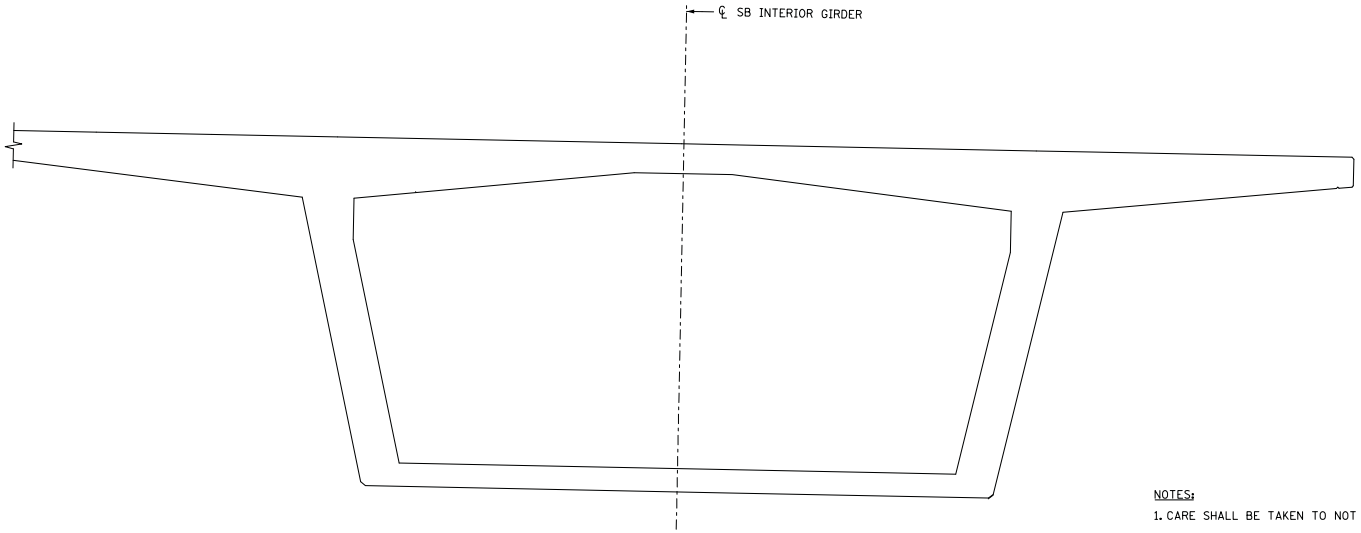

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 221+19.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 6k

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-112k

BRIDGE NOS.
27409(SB)
27410(NB)

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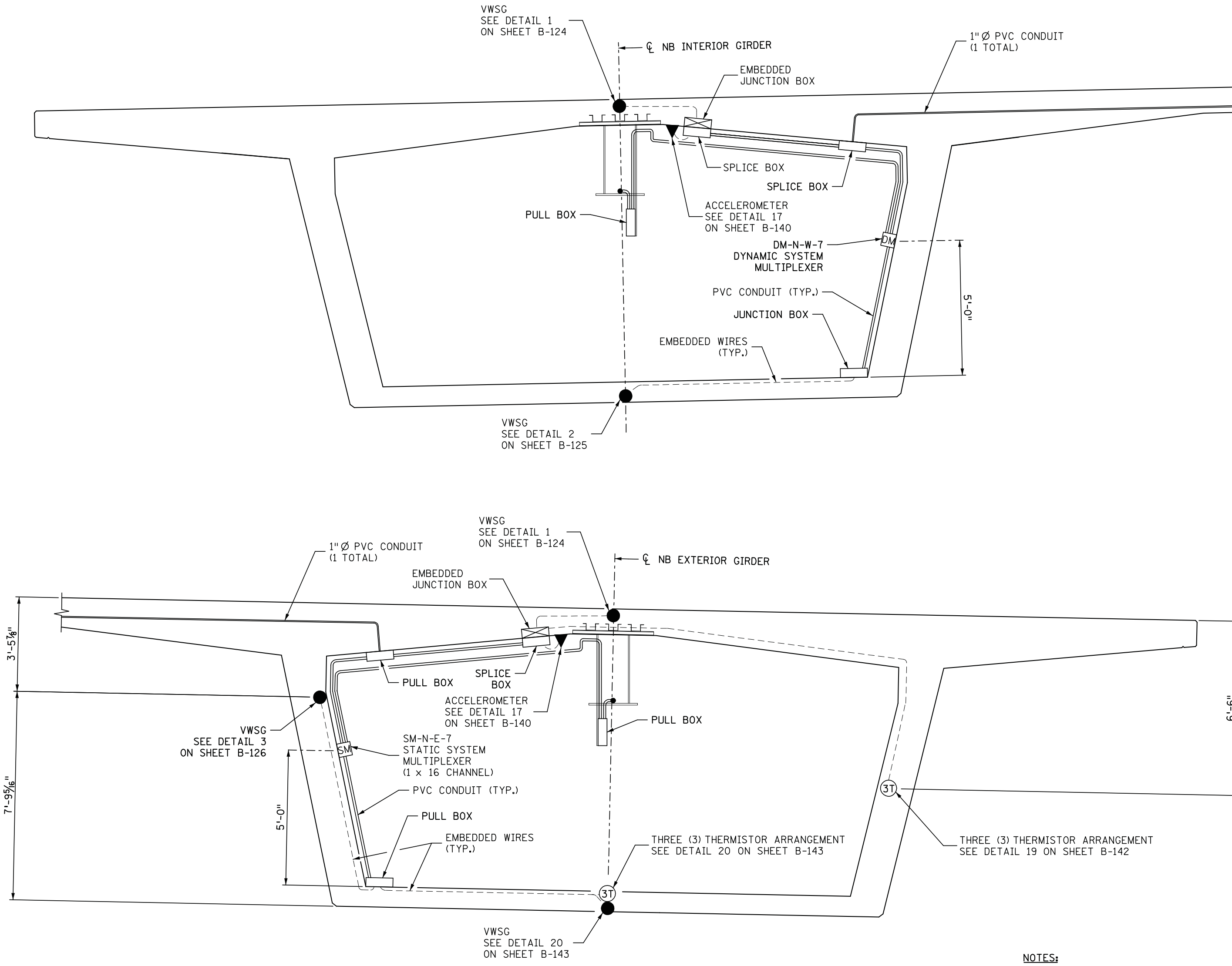

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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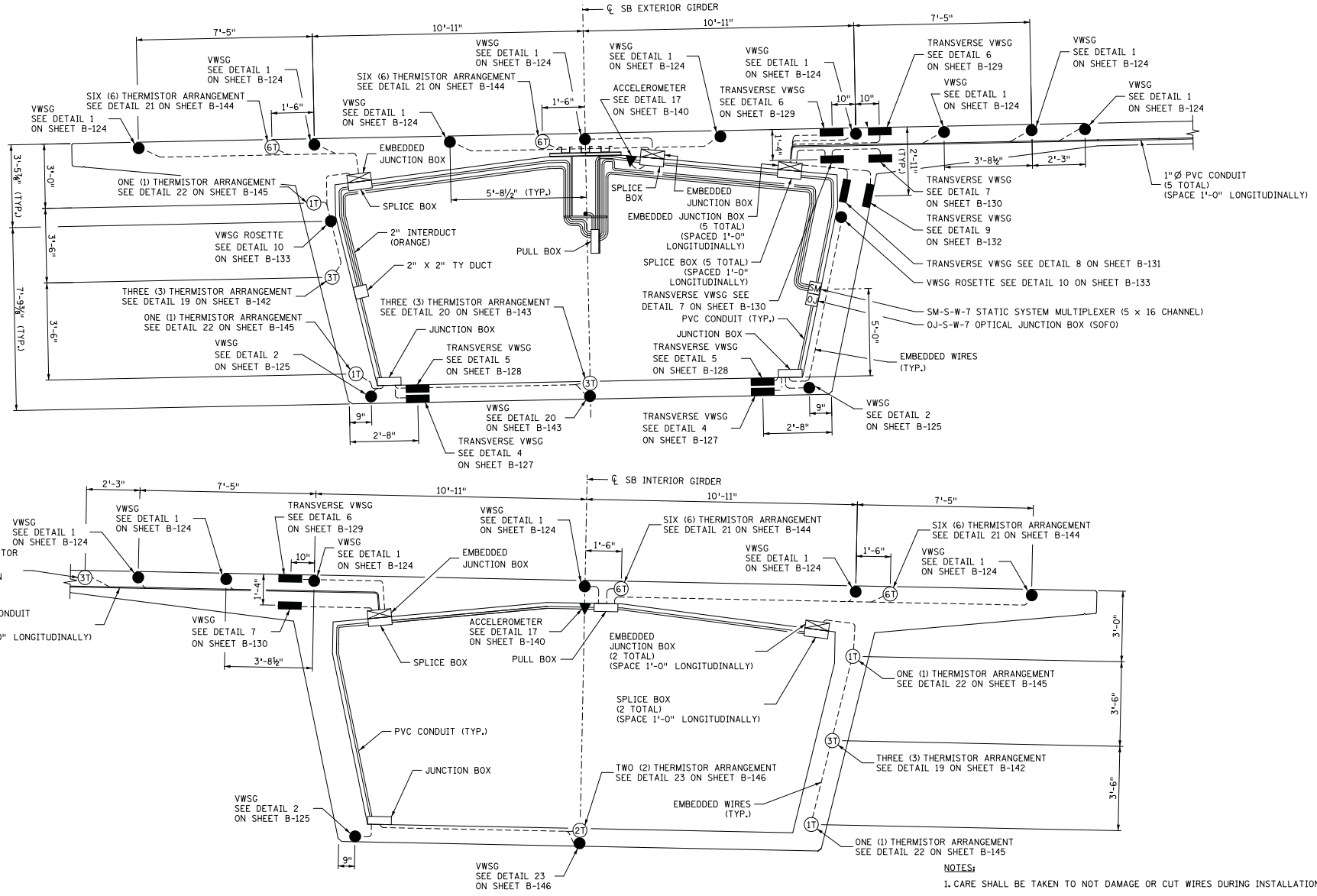
NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 221+54.40 NB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08	DRAWING REVISION	TITLE: HEALTH MONITORING SYSTEM LOCATION 7NB	DES: ECJ	DR: JMF	APPROVED:	BRIDGE NOS. 27409(SB) 27410(NB)
MN/DOT DATE		LICENSED PROFESSIONAL ENGINEER DATE			CHK: ADH	CHK: DLS		
		NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833			B-113			

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION



SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 221+39.40 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7SB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114

BRIDGE NOS.
27409(SB)
27410(NB)

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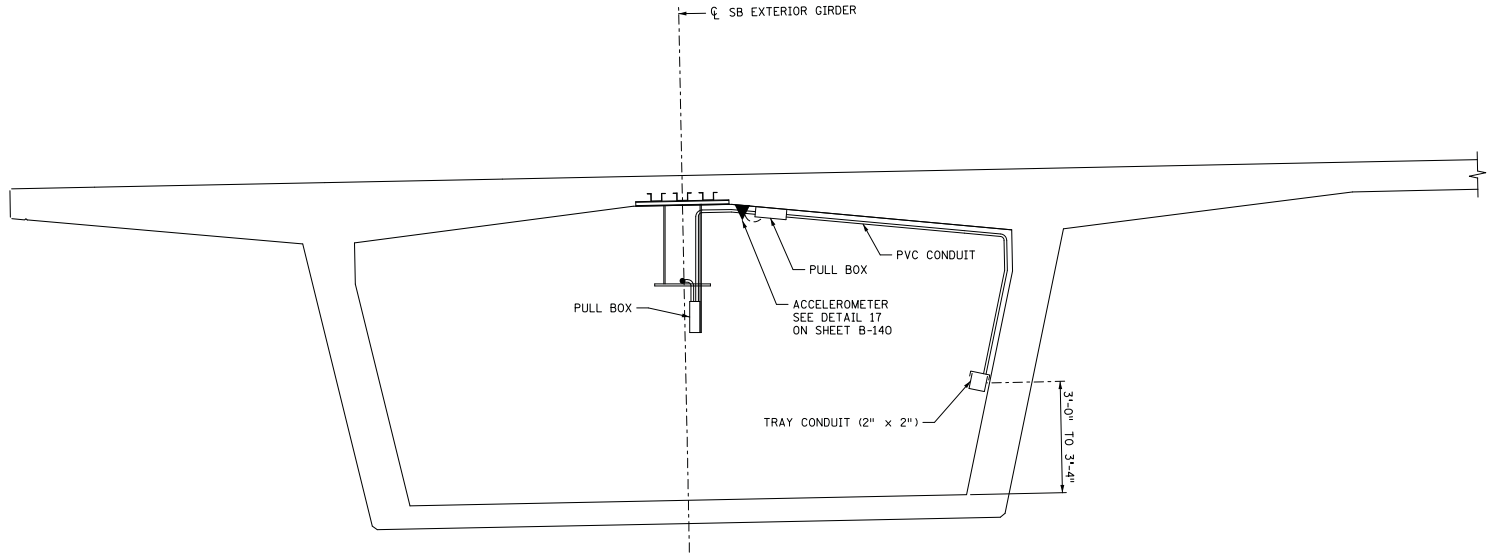

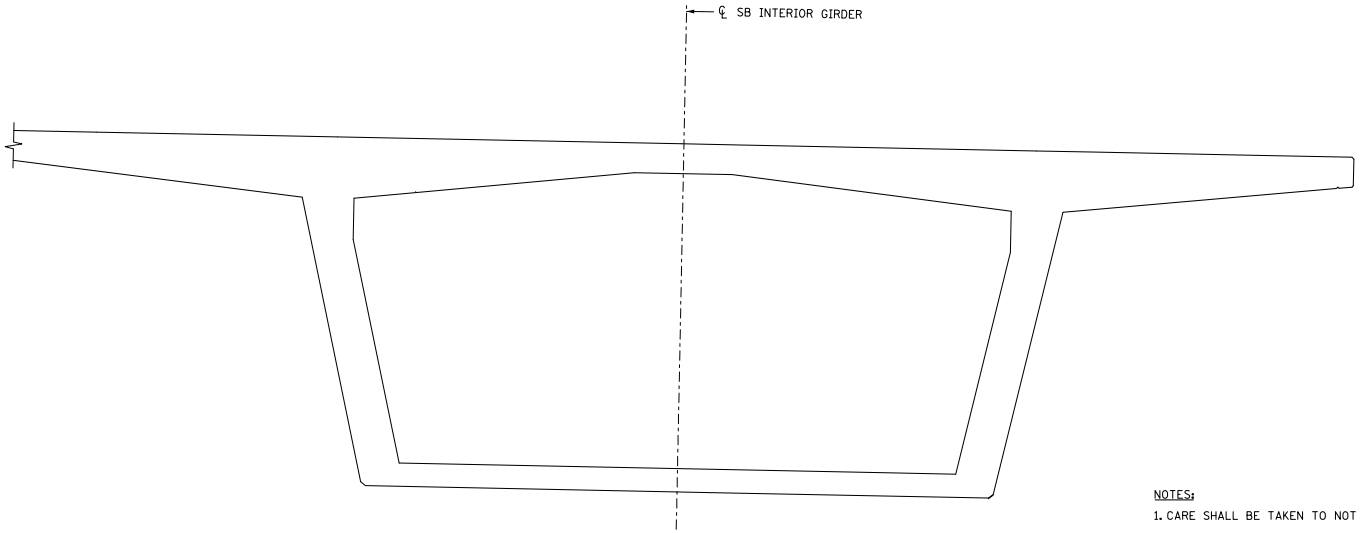

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 221+64.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7a

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114a

BRIDGE NOS.
27409(SB)
27410(NB)

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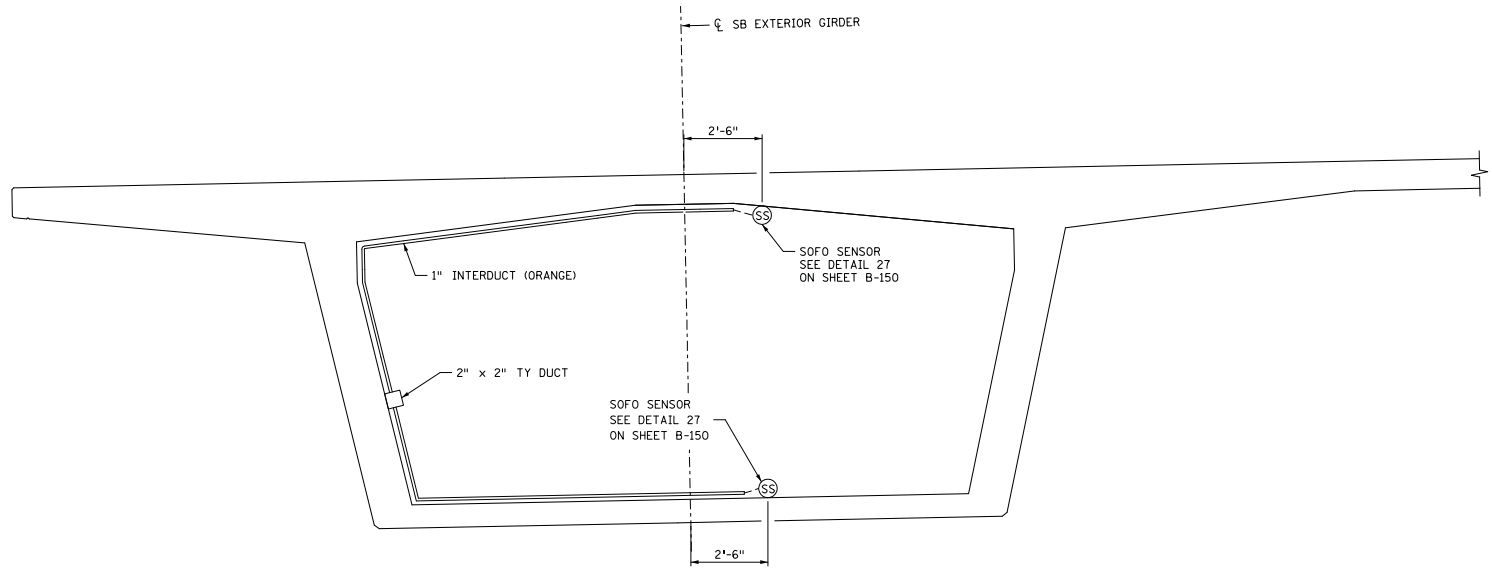

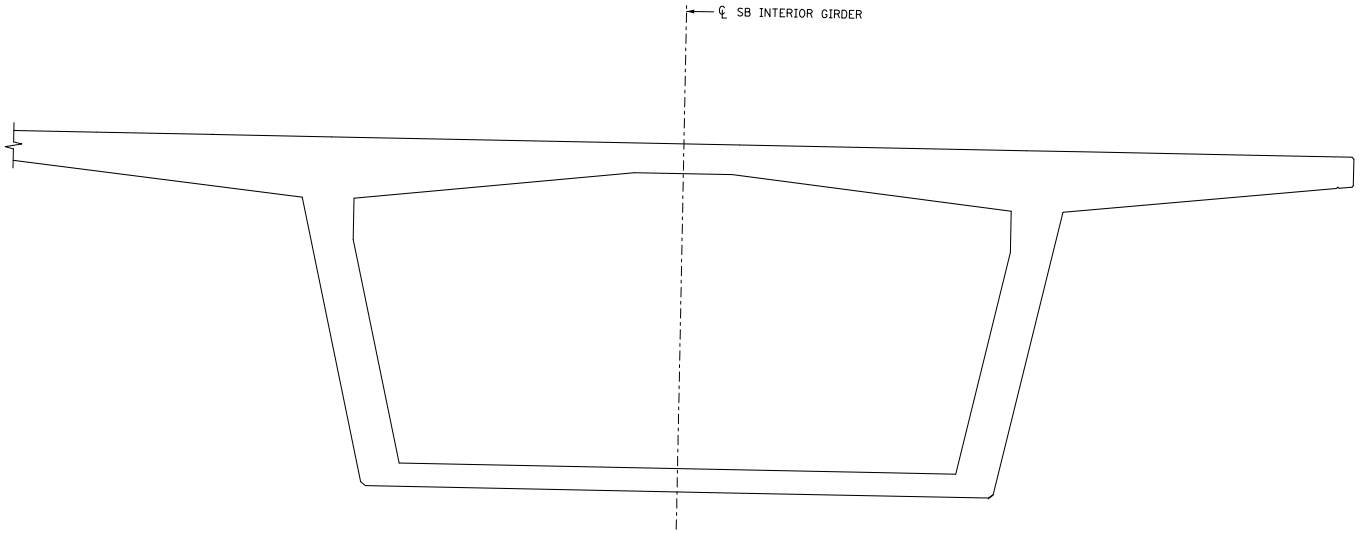

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 221+86.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7b

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114b

BRIDGE NOS.
27409(SB)
27410(NB)

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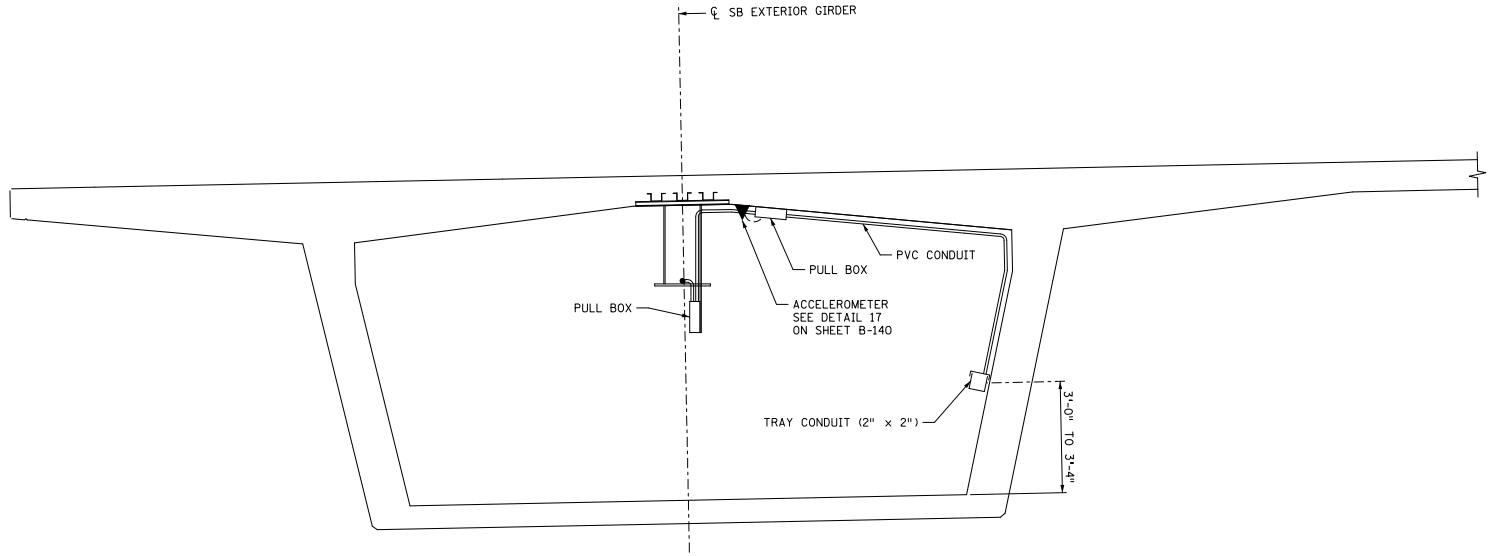

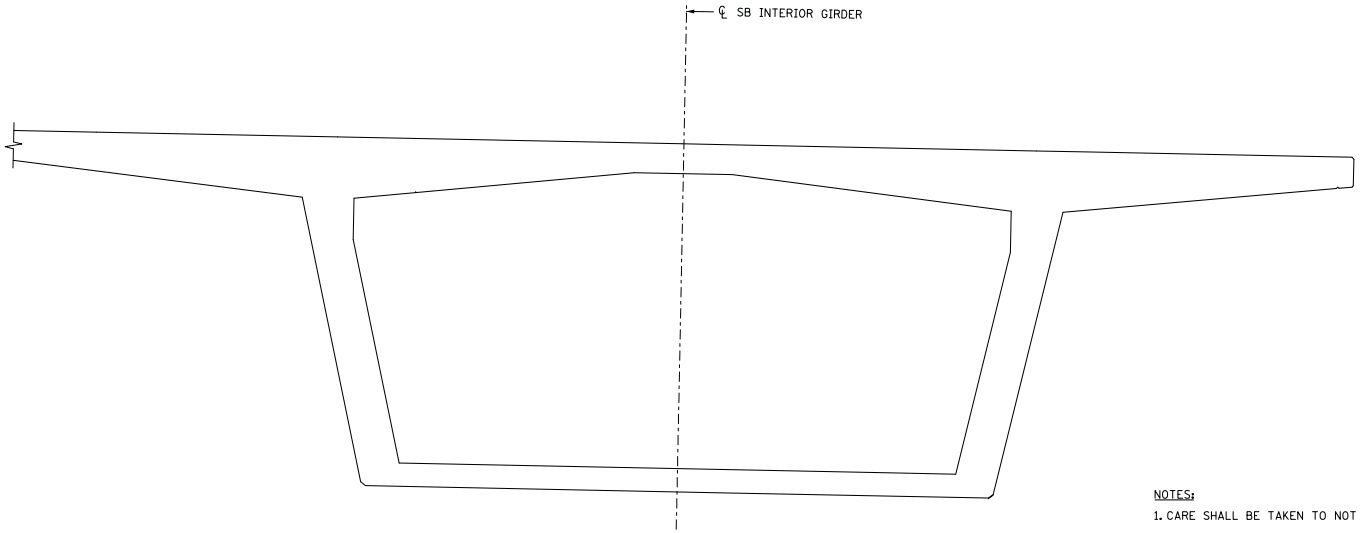

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 221+96.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7c

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114c

BRIDGE NOS.
27409(SB)
27410(NB)

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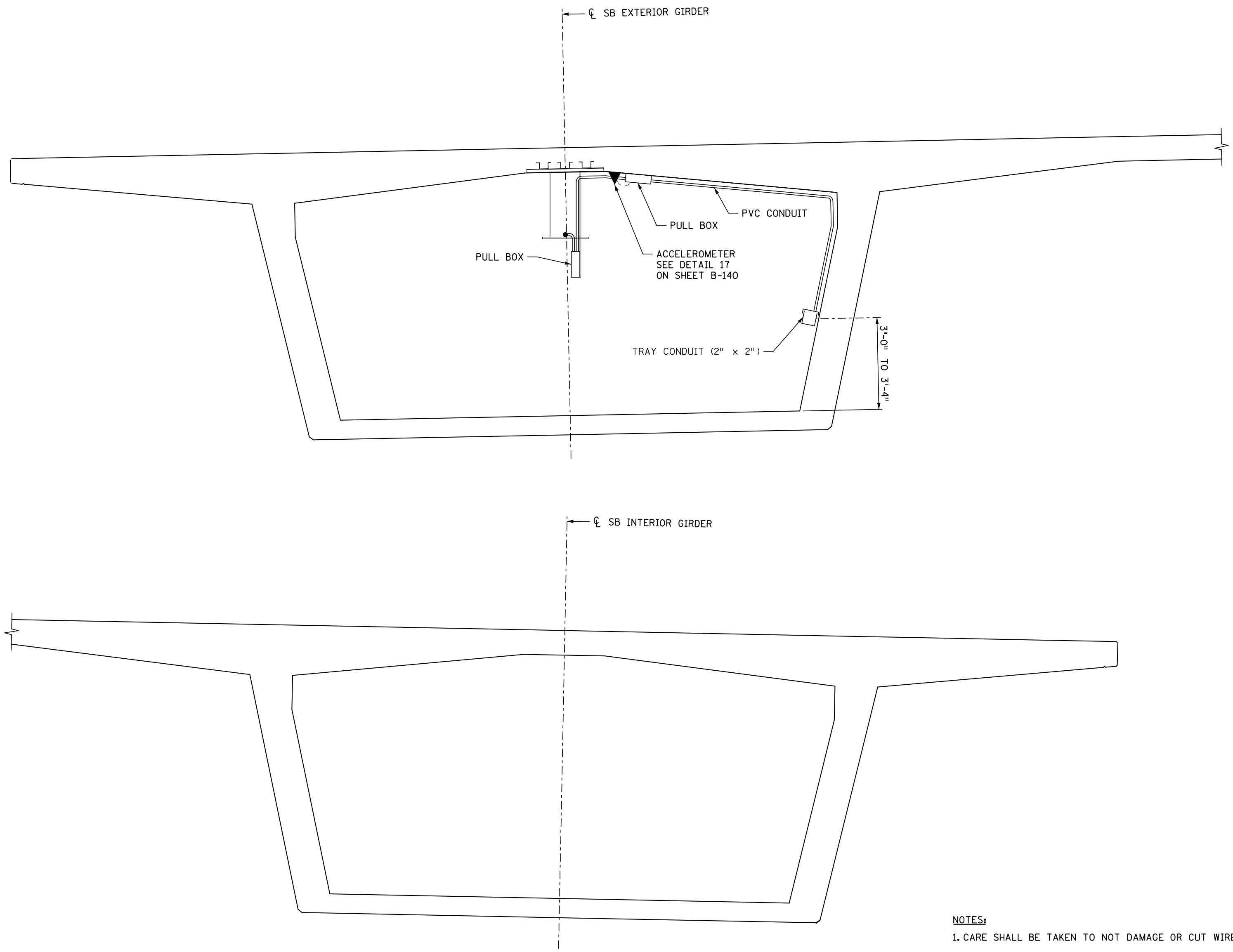

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 222+28.40 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE: HEALTH MONITORING SYSTEM LOCATION 7d

DES: ECJ DR: JMF APPROVED:
CHK: ADH CHK: DLS

B-114d

BRIDGE NOS. 27409(SB) 27410(NB)

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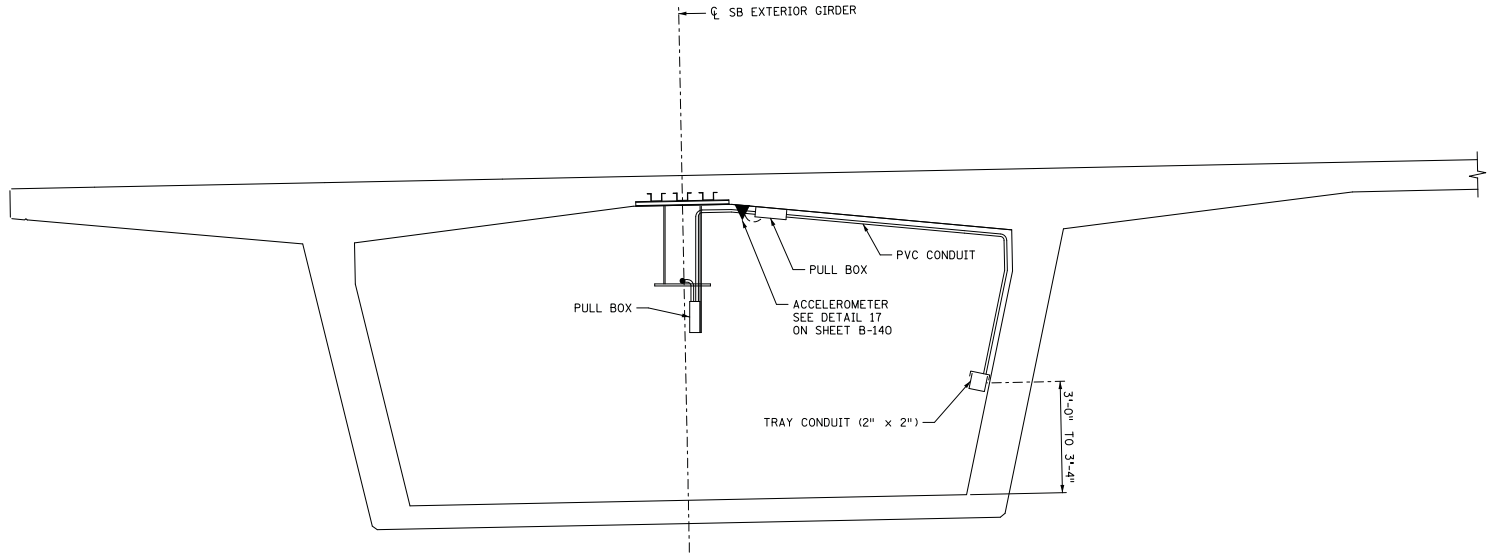

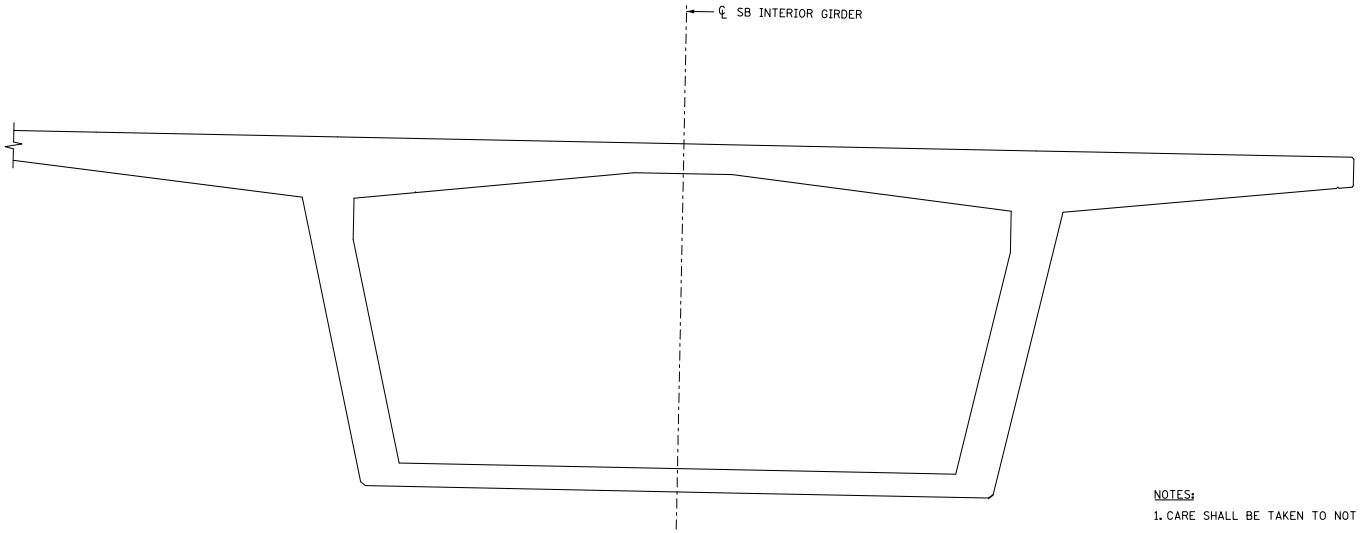

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 222+59.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7e

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114e

BRIDGE NOS.
27409(SB)
27410(NB)

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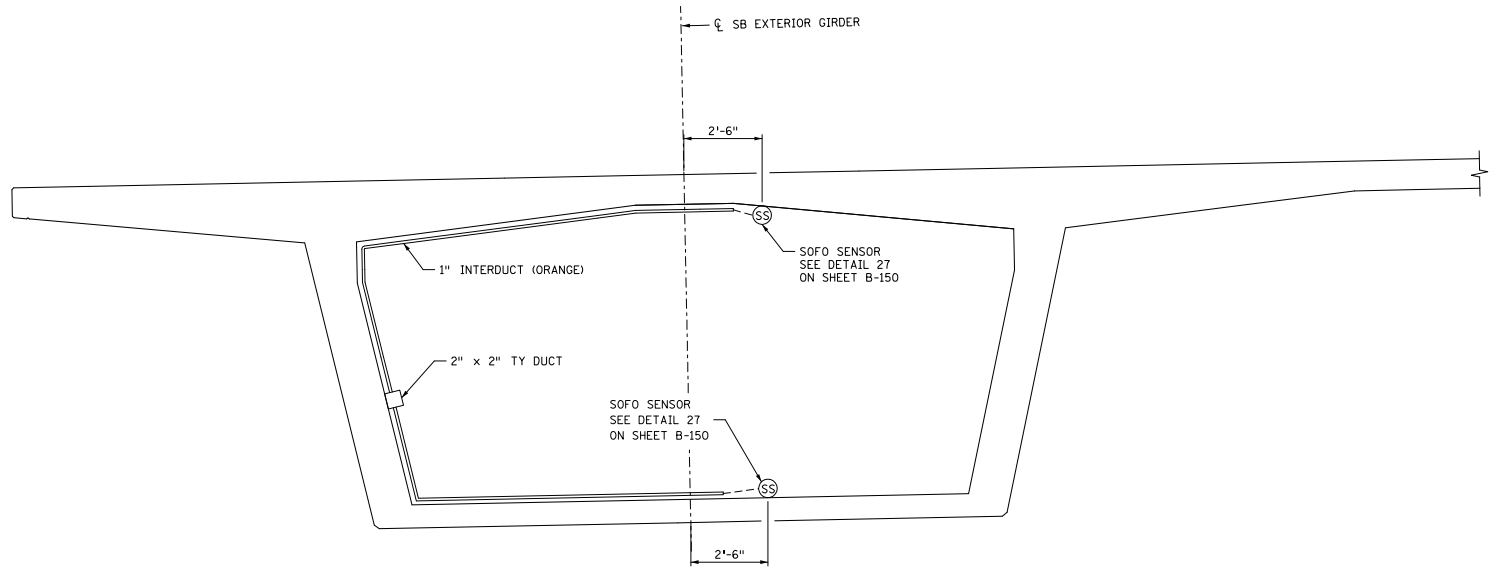

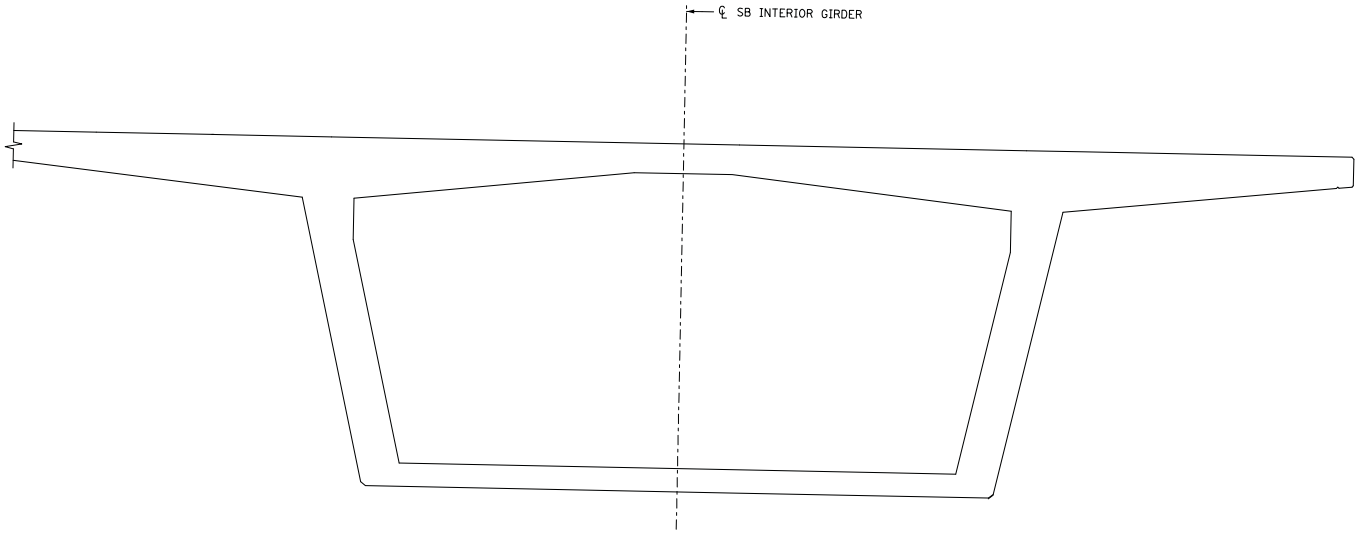

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 222+85.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7f

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114f

BRIDGE NOS.
27409(SB)
27410(NB)

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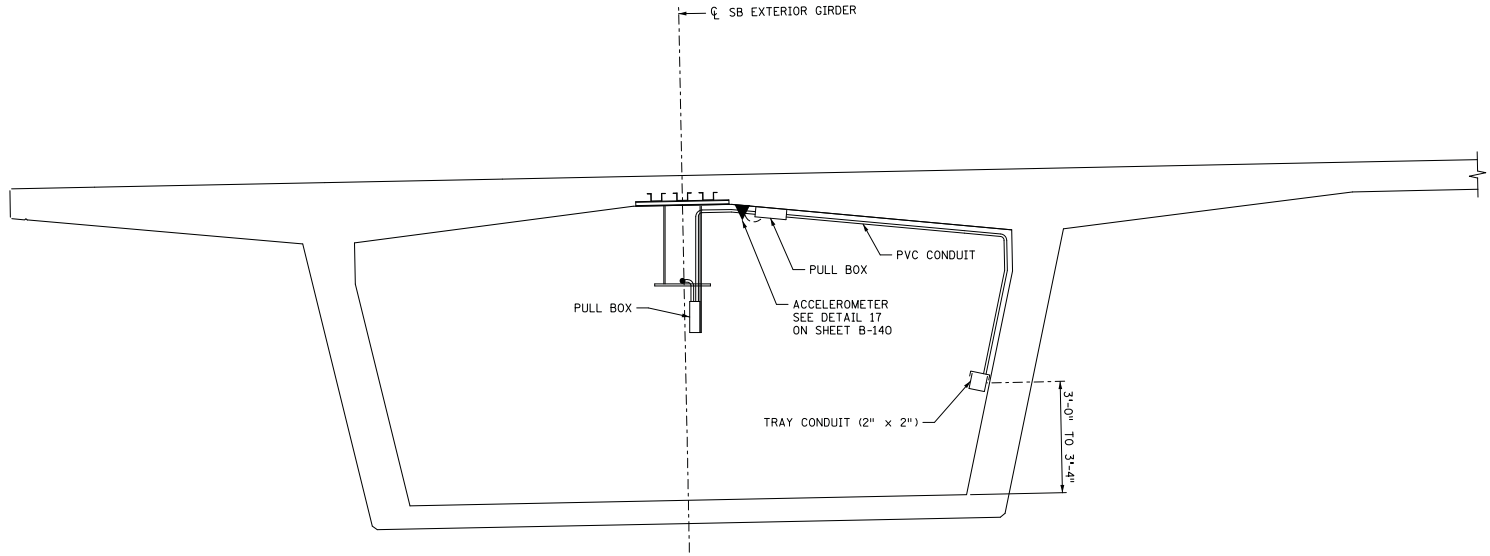

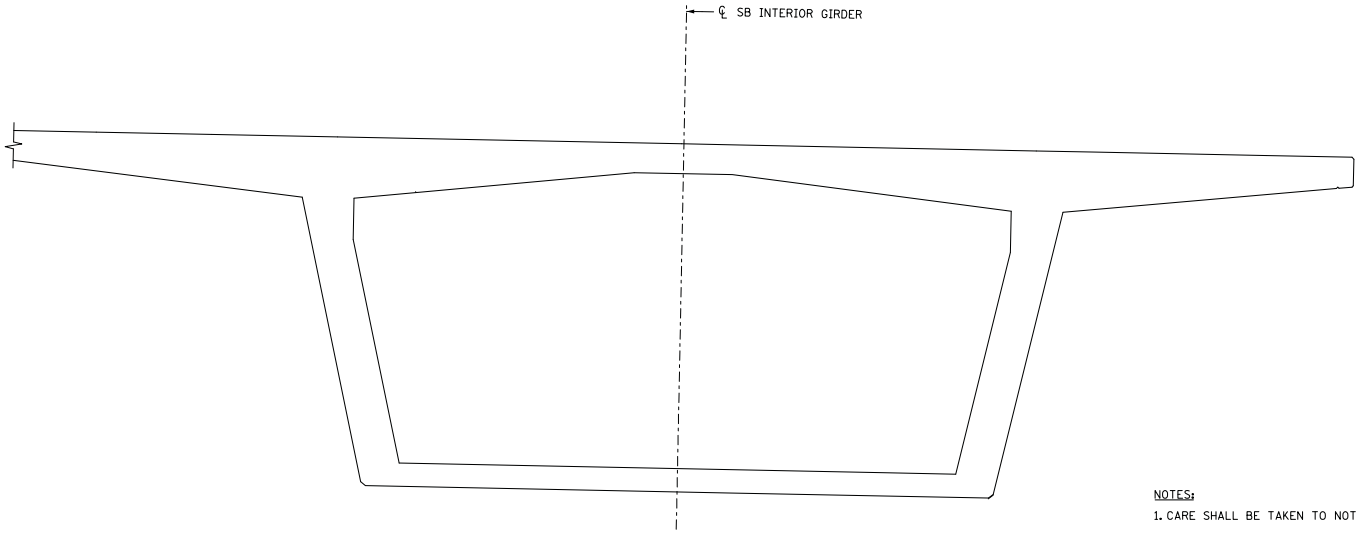

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 222+91.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7g

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114g

BRIDGE NOS.
27409(SB)
27410(NB)

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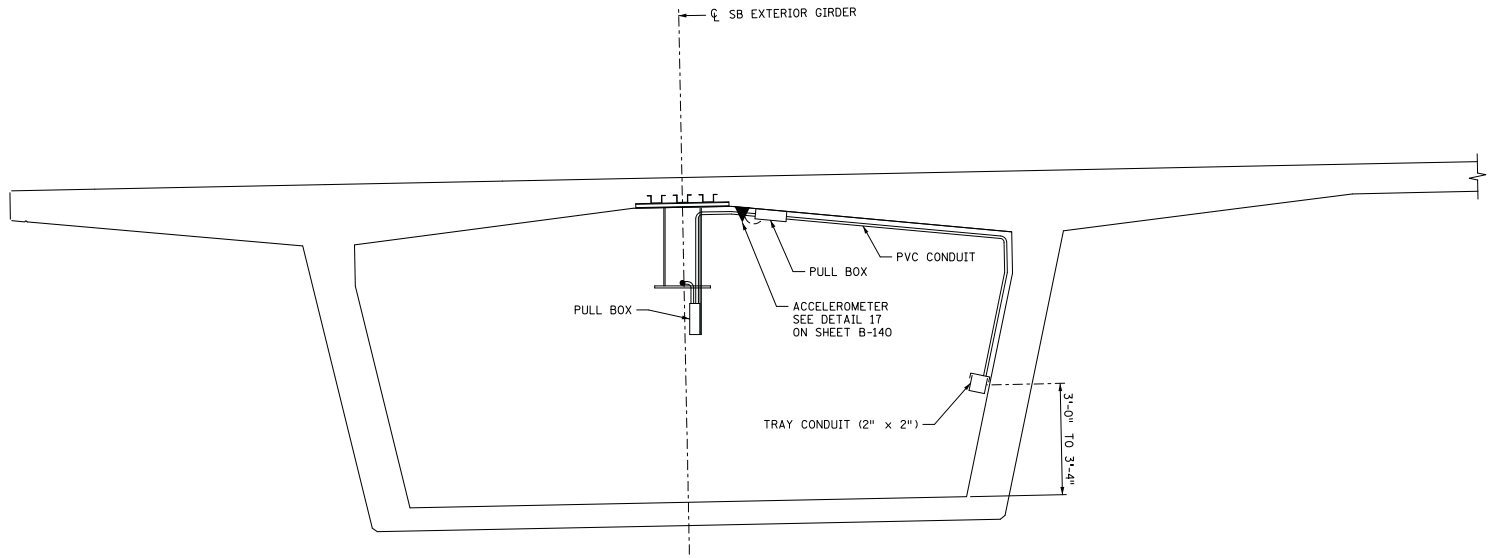

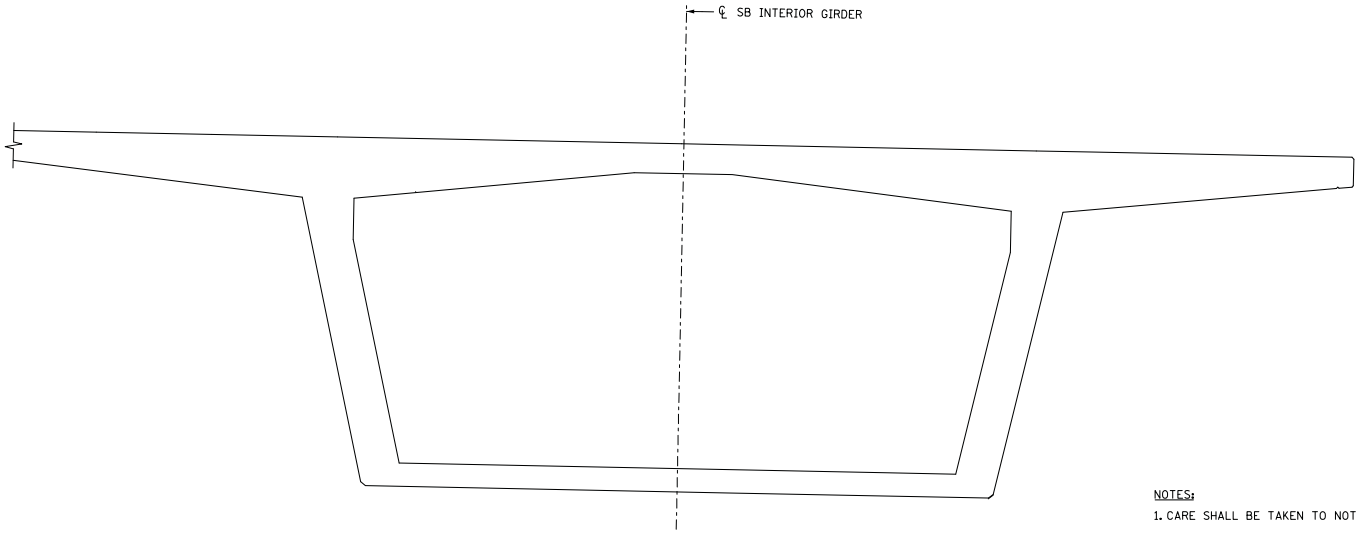

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 223+22.90 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7h

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114h

BRIDGE NOS.
27409(SB)
27410(NB)

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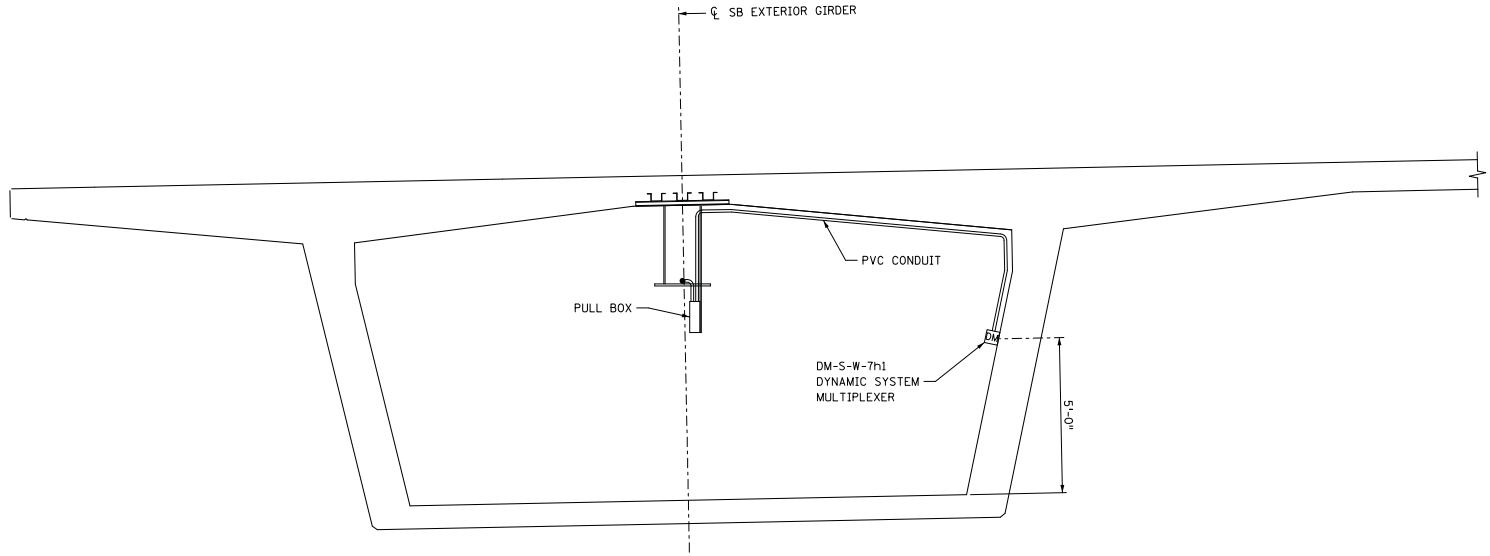

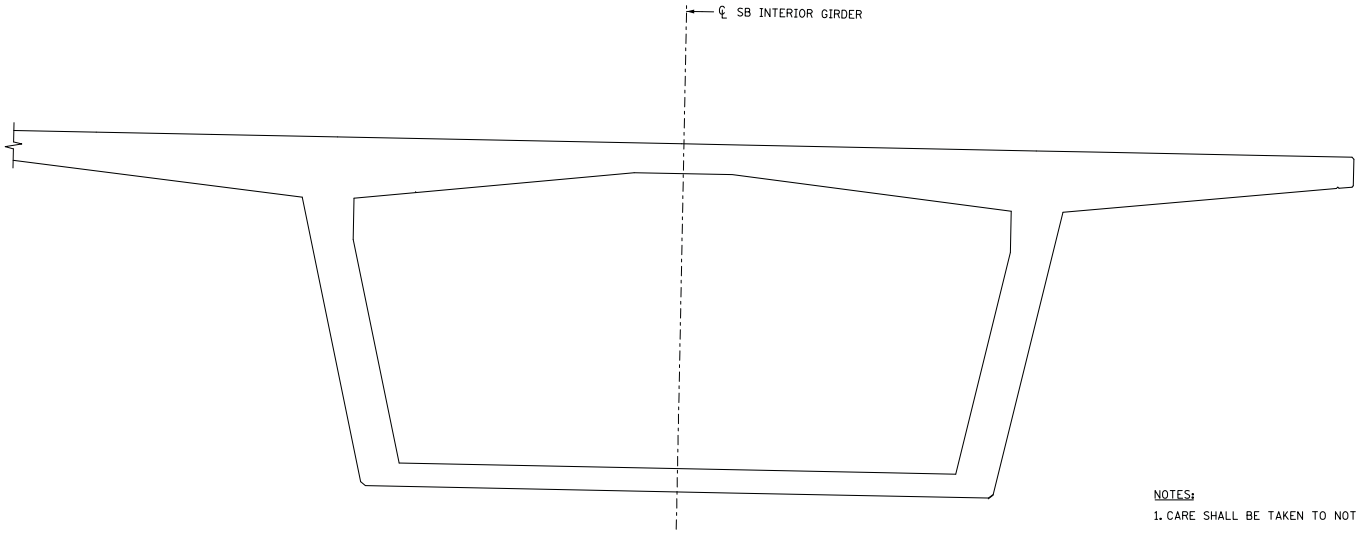

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 223+35.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 7h1

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-114h1

BRIDGE NOS.
27409(SB)
27410(NB)

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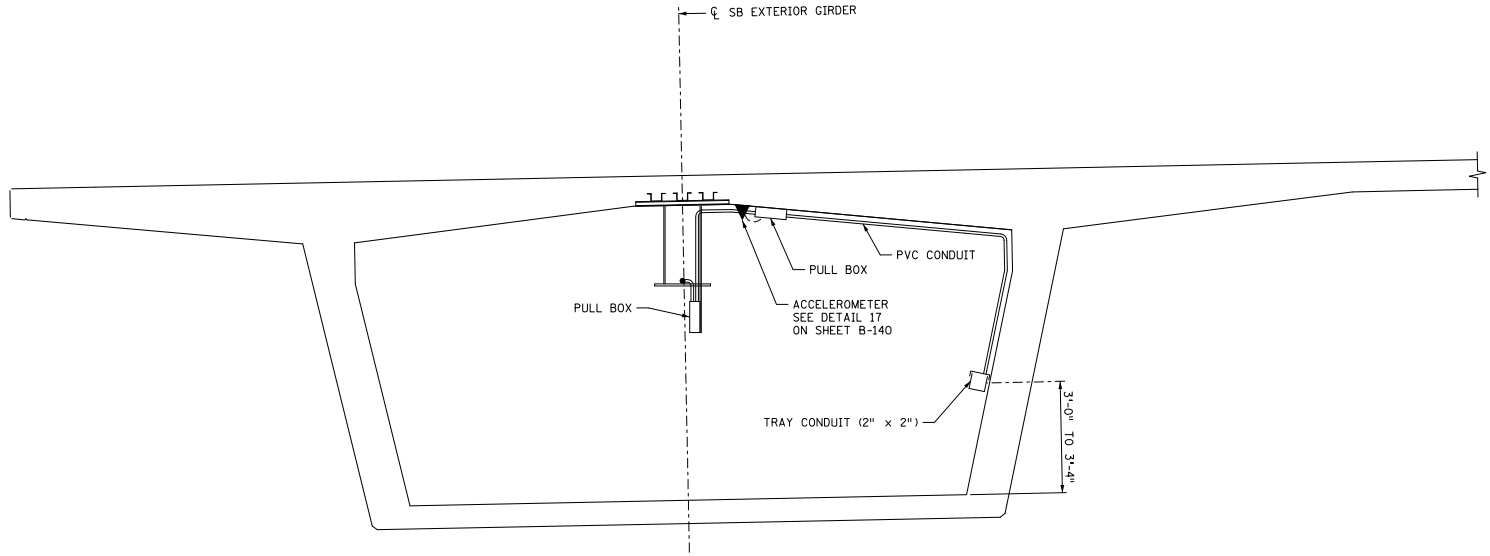

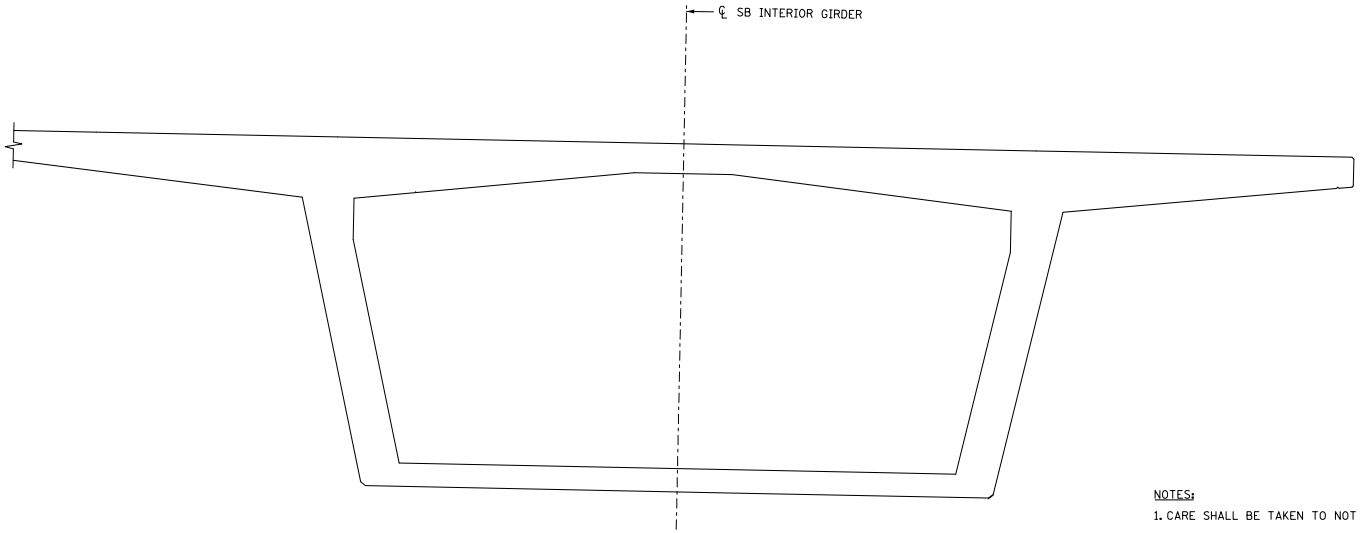

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 223+54.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

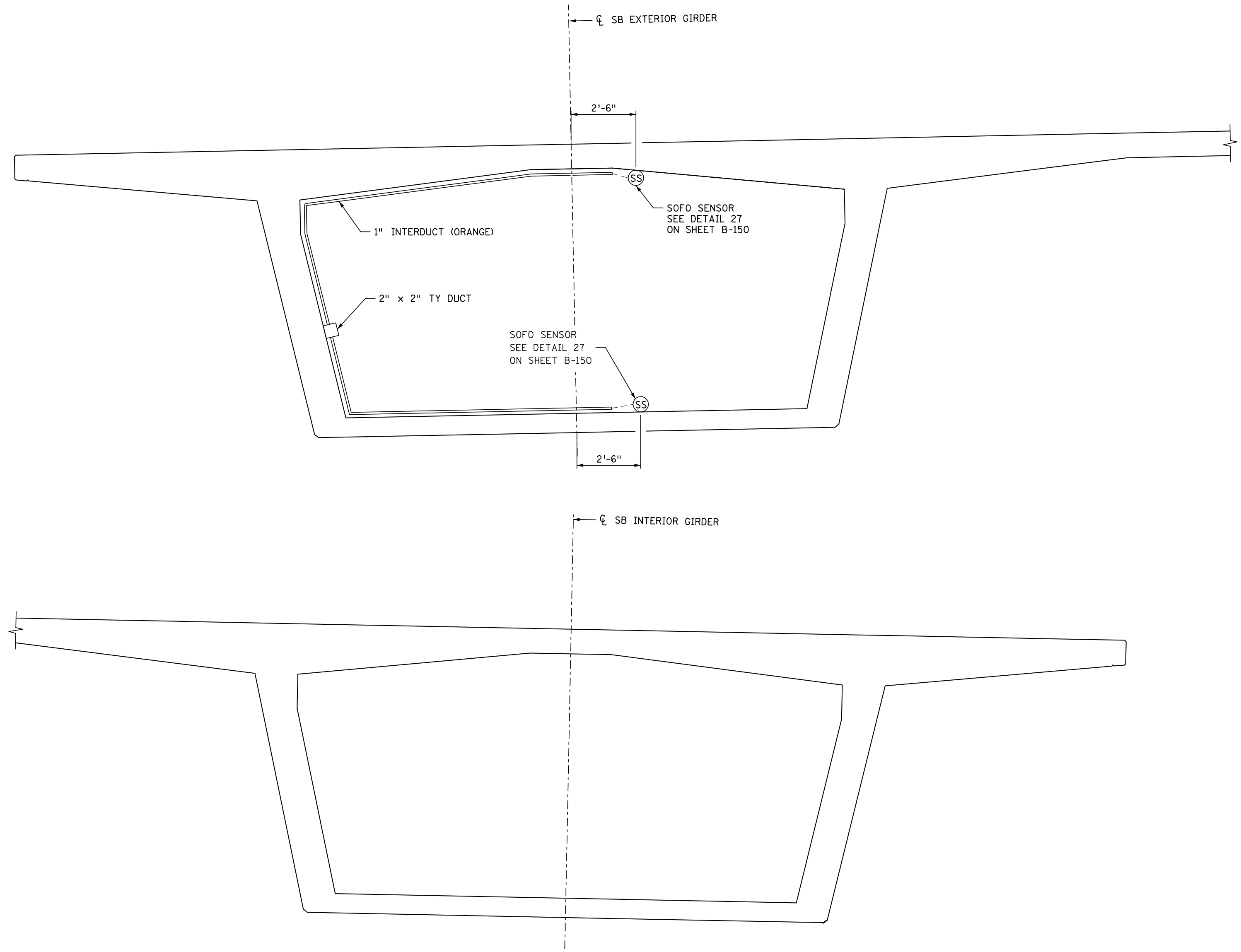
DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 71

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-1141

BRIDGE NOS.
27409(SB)
27410(NB)



SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 223+59.40 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED MN/DOT DATE	FIGG	CERTIFIED BY *Christopher J. Burgess* 10/07/08 LICENSED PROFESSIONAL ENGINEER DATE NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833	DRAWING REVISION	TITLE: HEALTH MONITORING SYSTEM LOCATION 7J	BRIDGE NOS. 27409(SB) 27410(NB)

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	
B-114J				

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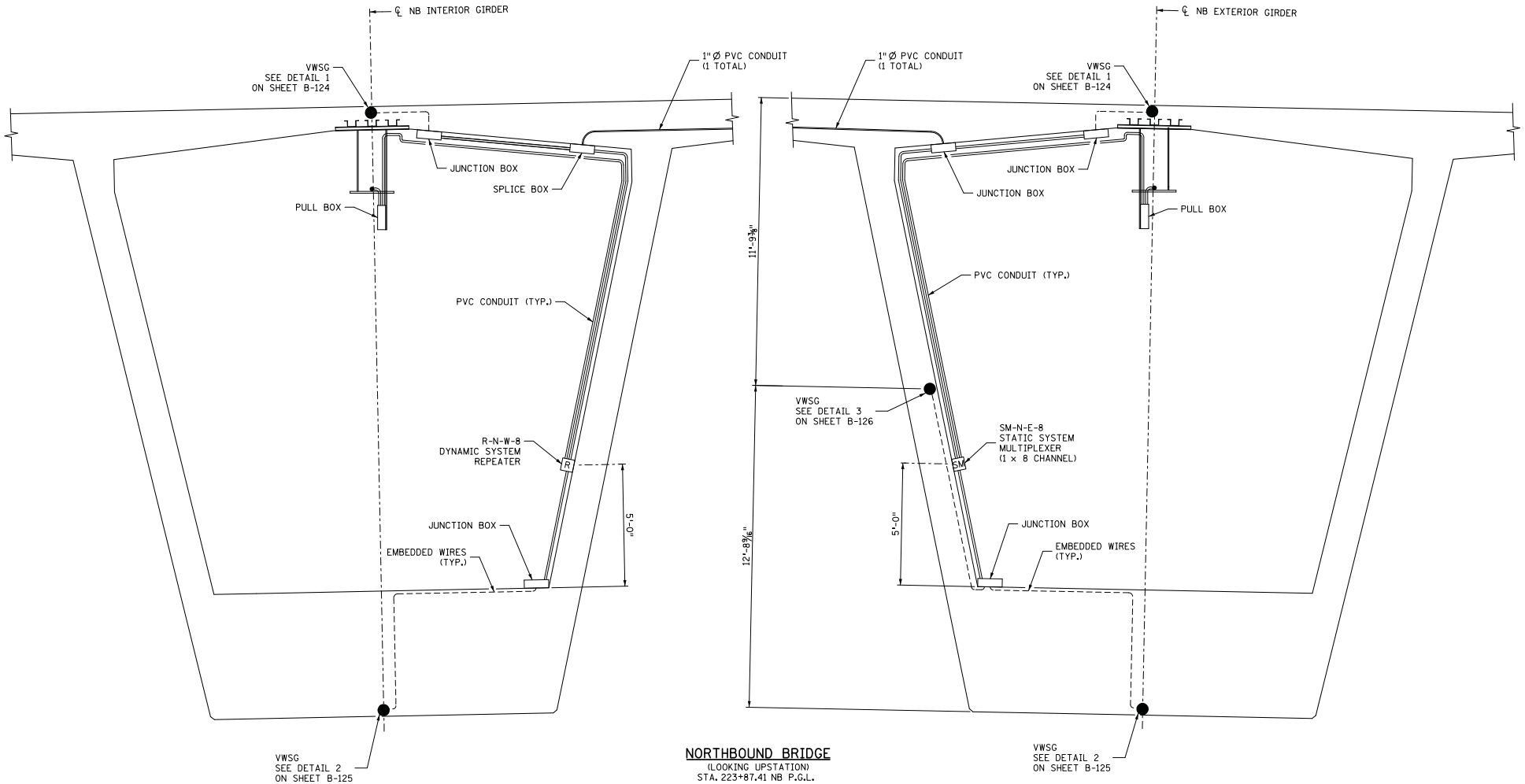

NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 223+87.41 NB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 8NB

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-115

BRIDGE NOS.
27409(SB)
27410(NB)

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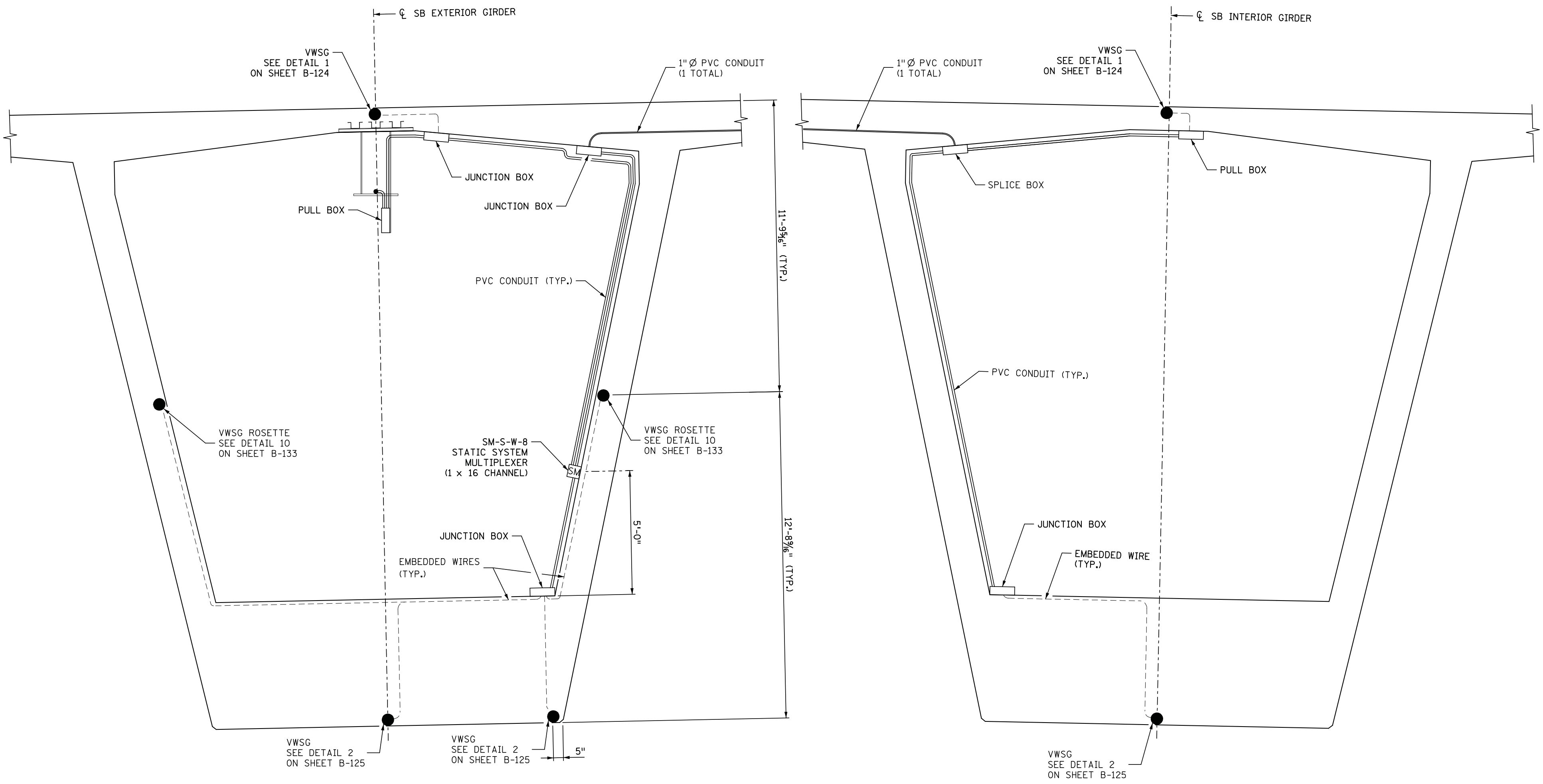

SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 223+75.40 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED	FIGG	CERTIFIED BY Christopher J. Burgess 10/07/08	DRAWING REVISION	TITLE:	DES: ECJ	DR: JMF	APPROVED:	BRIDGE NOS.
MN/DOT DATE		LICENSED PROFESSIONAL ENGINEER DATE		HEALTH MONITORING SYSTEM LOCATION 8SB	CHK: ADH	CHK: DLS		27409(SB) 27410(NB)
		NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833			B-116			

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

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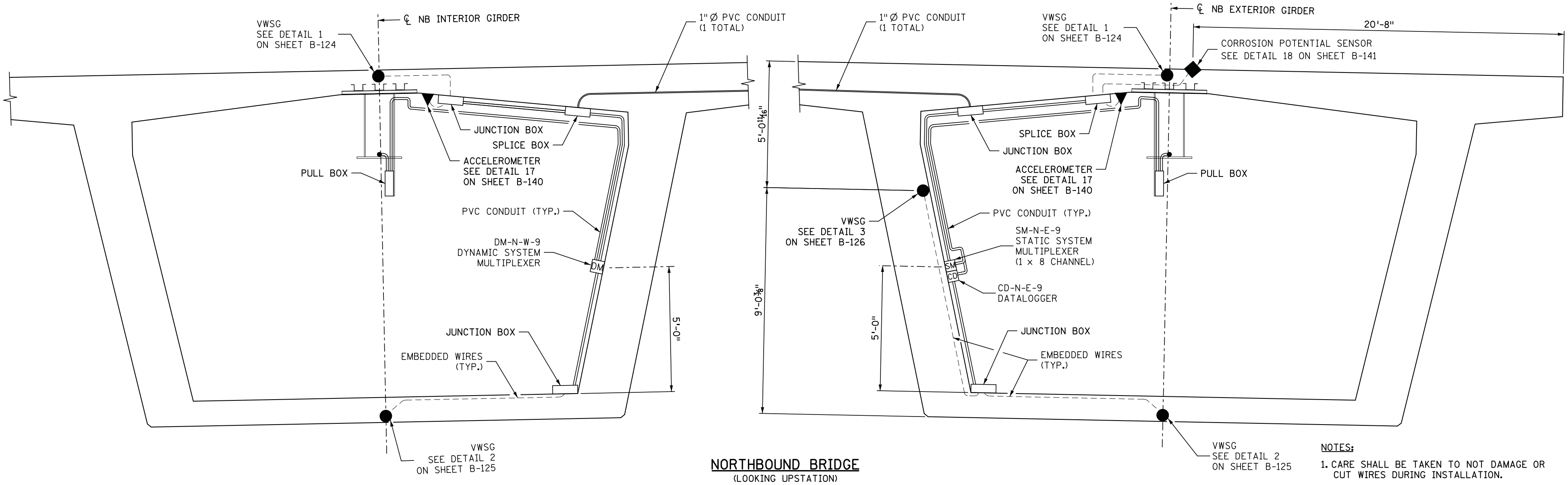
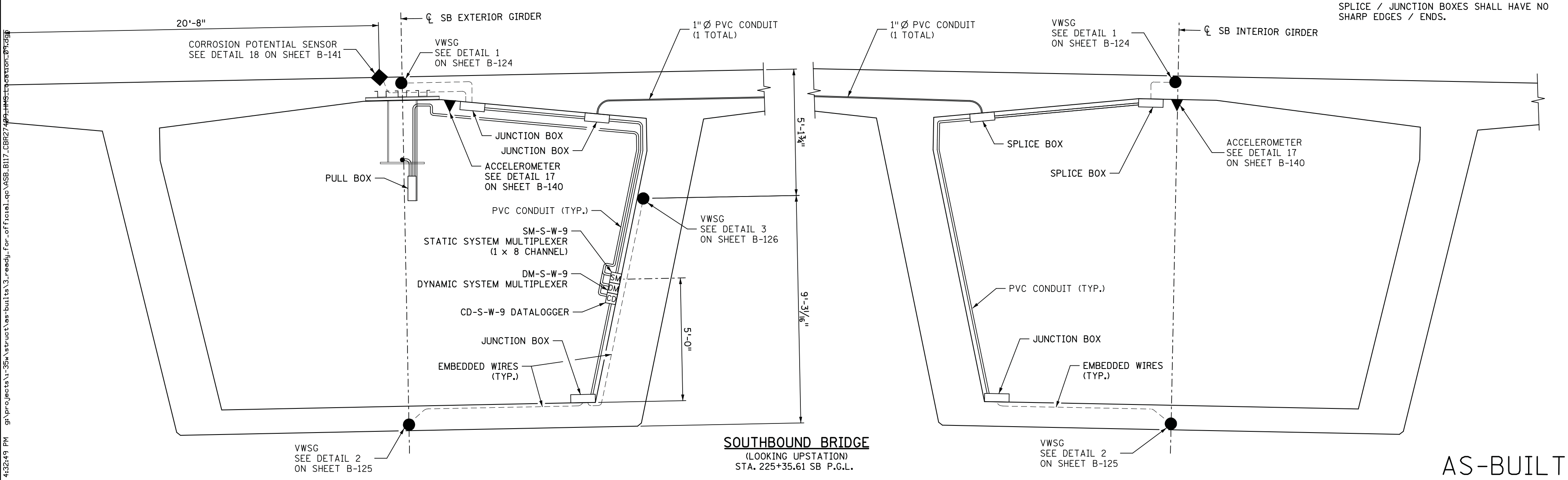


NORTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 225+53.17 NB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.



SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 225+35.61 SB P.G.L.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION

NO.	BY	DATE	DESCRIPTION
RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 9

DES: ECJ	DR: JMF	APPROVED:
CHK: ADH	CHK: DLS	

B-117

BRIDGE NOS.
27409(SB)
27410(NB)

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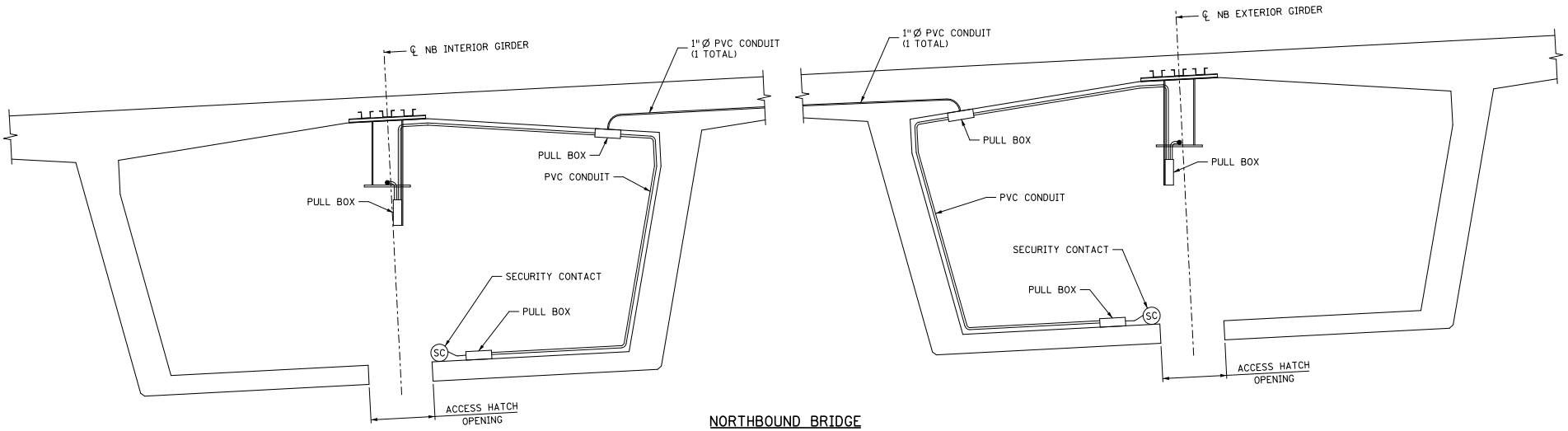
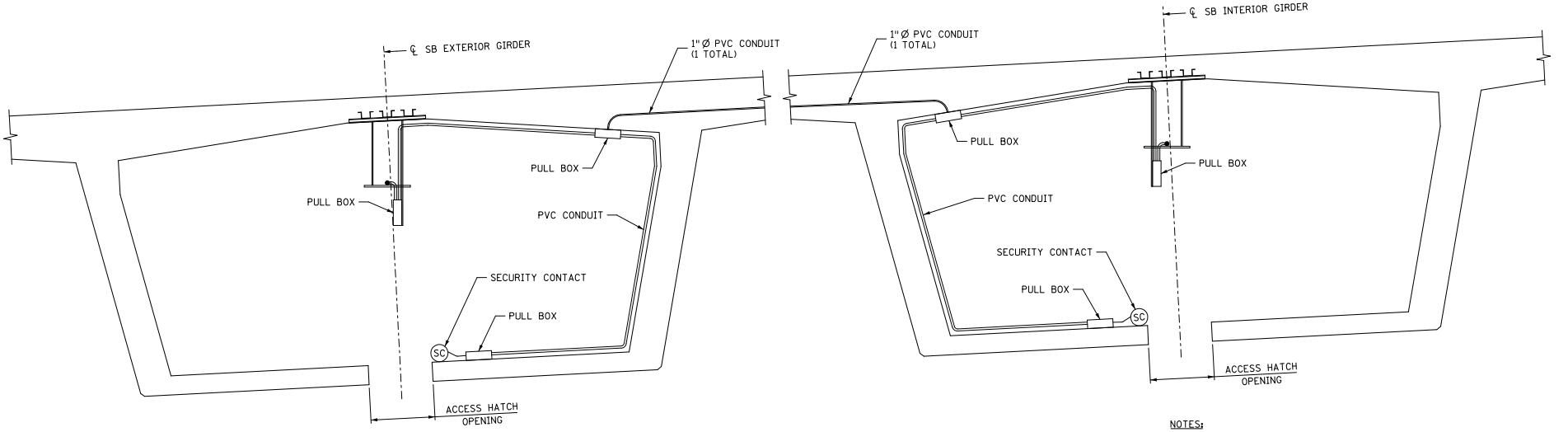


NORTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 226+00.00 NB P.G.L.



SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 226+00.00 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 9b

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-117b

BRIDGE NOS.
27409(SB)
27410(NB)

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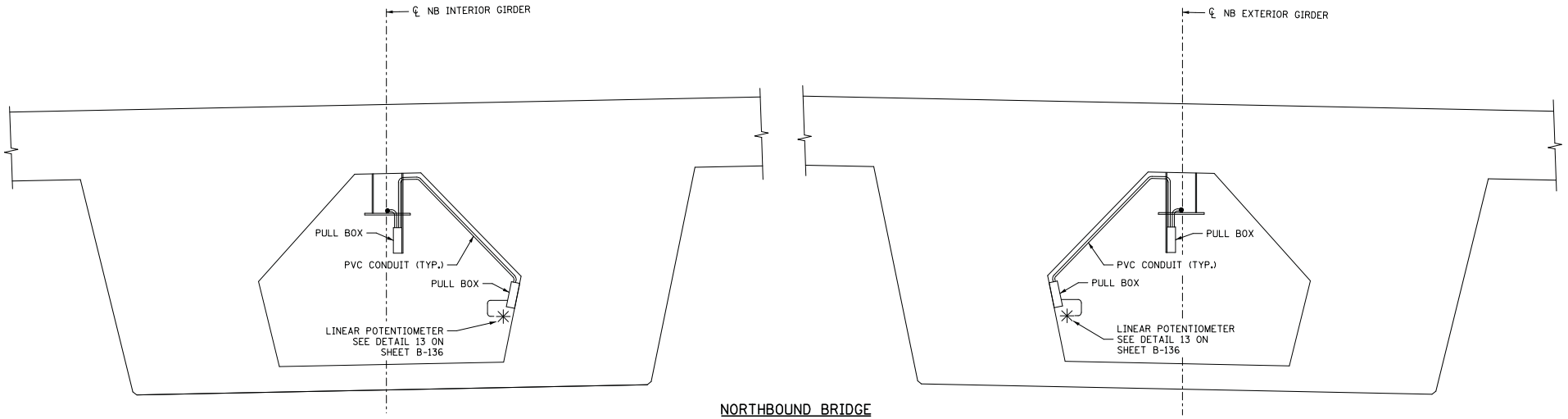
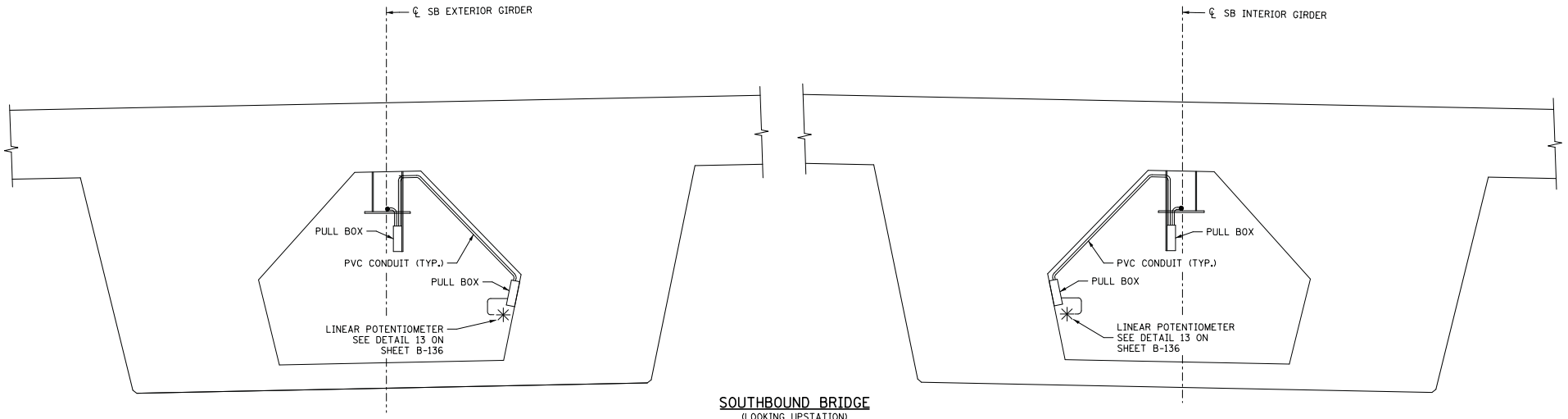


NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 226+31.57 NB P.G.L.



SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 226+31.57 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 11

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-119

BRIDGE NOS.
27409(SB)
27410(NB)

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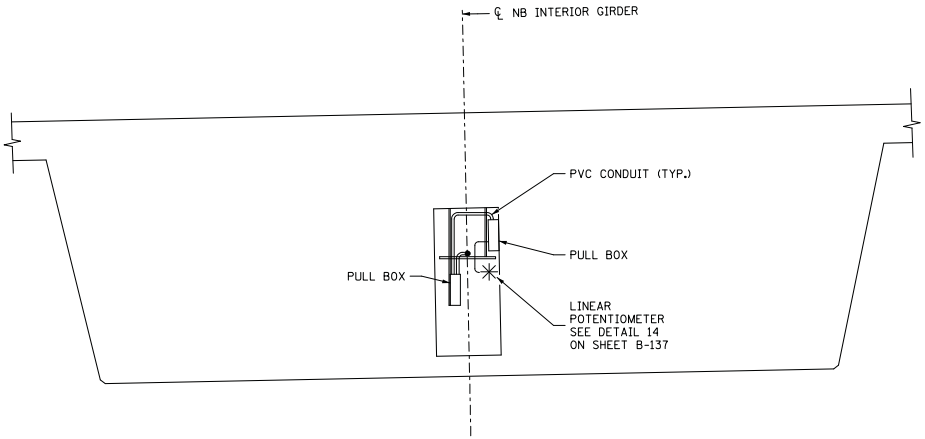
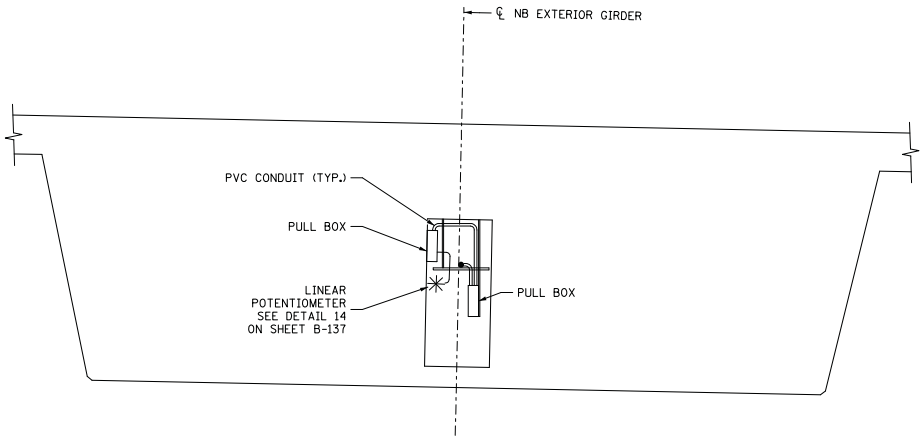
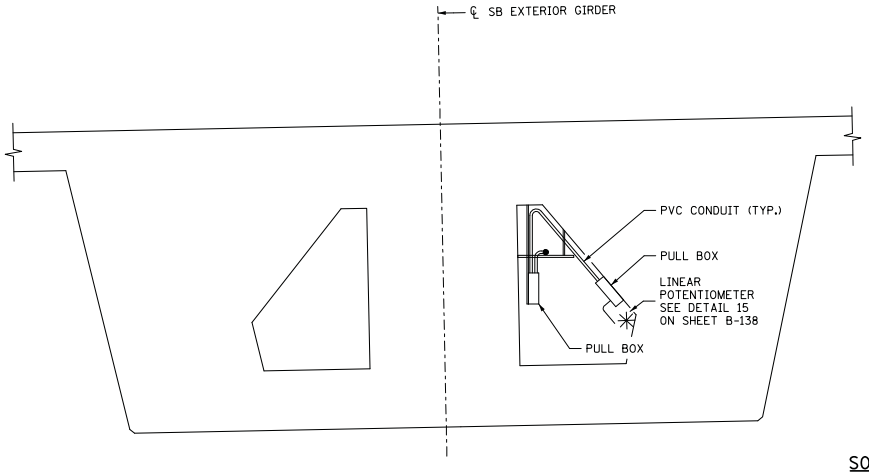
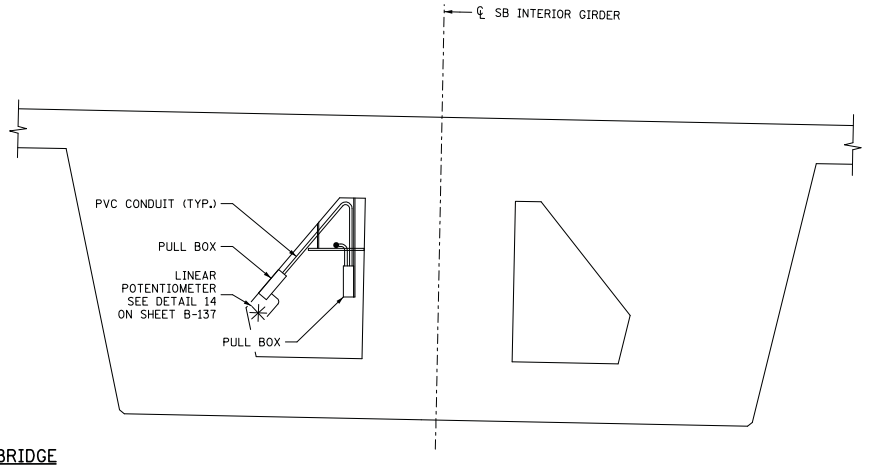




NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 226+37.66 NB P.G.L.





SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 226+37.66 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 12

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-120

BRIDGE NOS.
27409(SB)
27410(NB)

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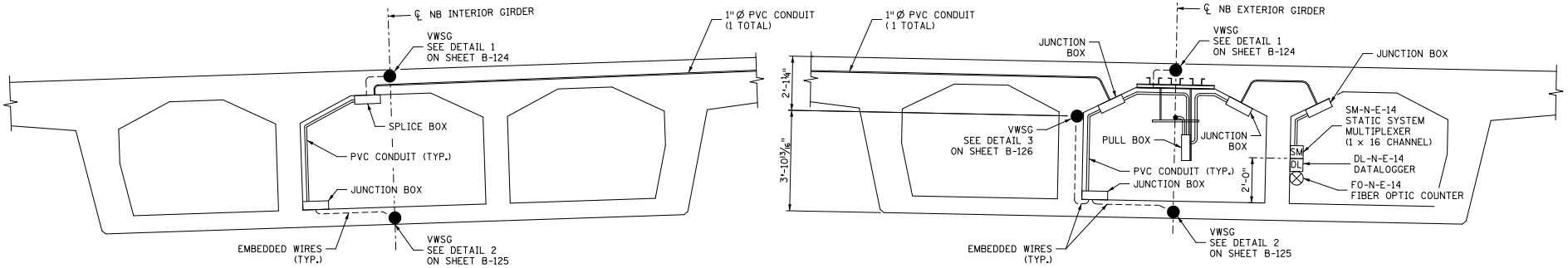
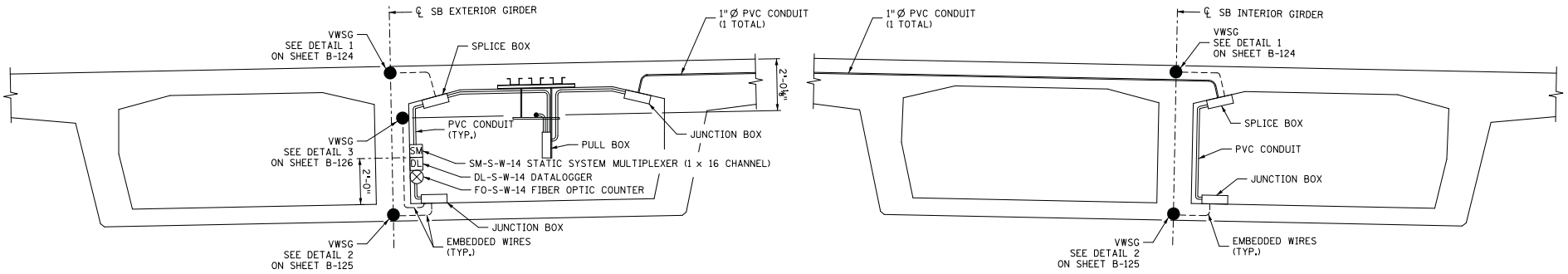


NORTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 227+11.75 NB P.G.L.



SOUTHBOUND BRIDGE

(LOOKING UPSTATION)
STA. 227+08.90 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 14

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-122

BRIDGE NOS.
27409(SB)
27410(NB)

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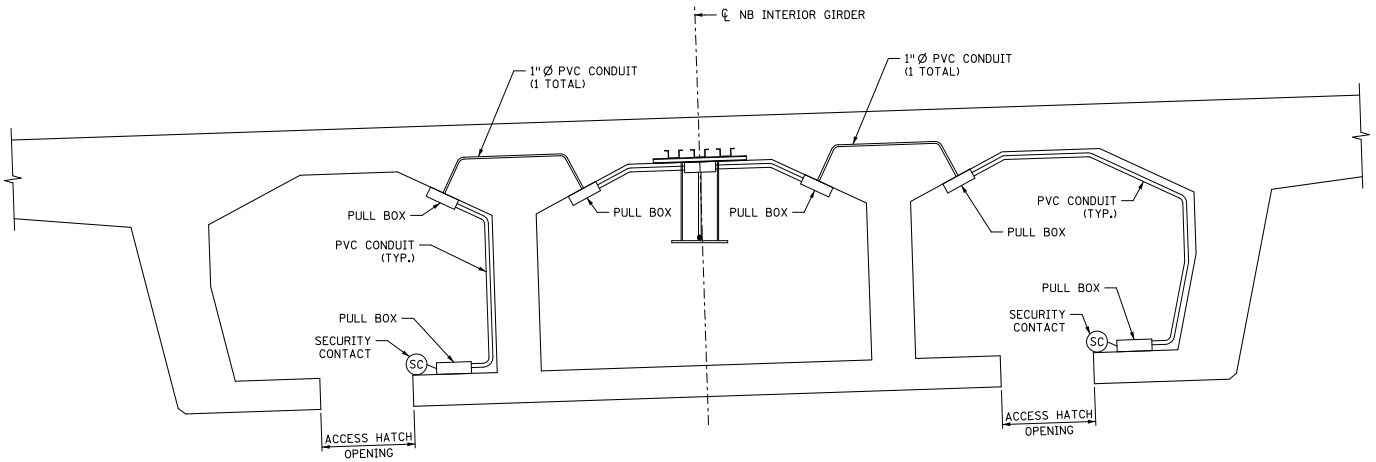

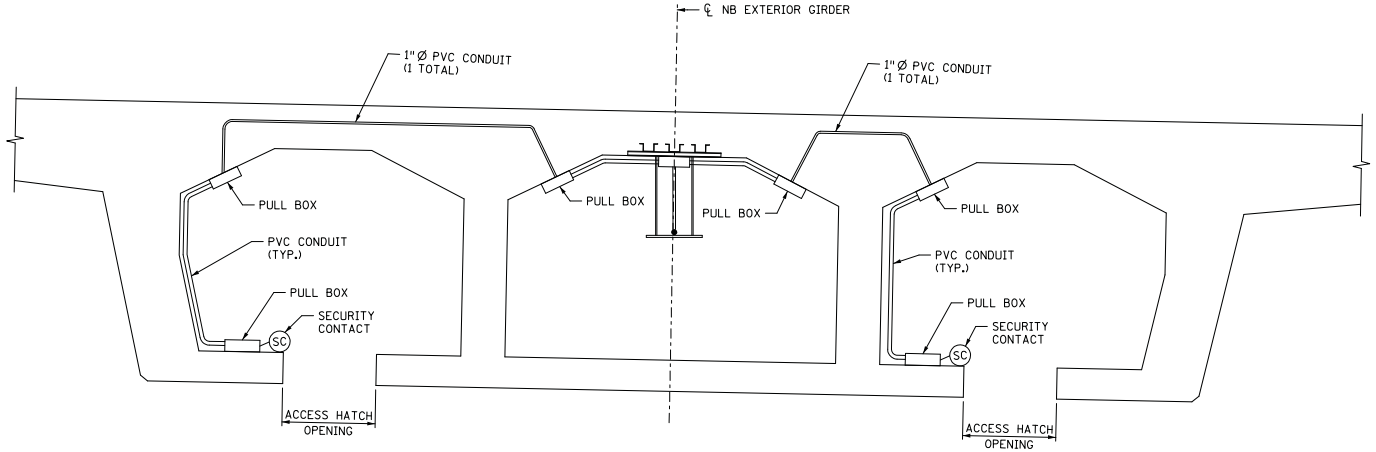

NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 227+26.50 NB P.G.L.

NOTES

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
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AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE
NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 14a

DES:	ECJ	DR:	JMG	APPROVED:
CHK:	ADH	CHK:	DLS	

B-122a

BRIDGE NOS.
27409(SB)
27410(NB)

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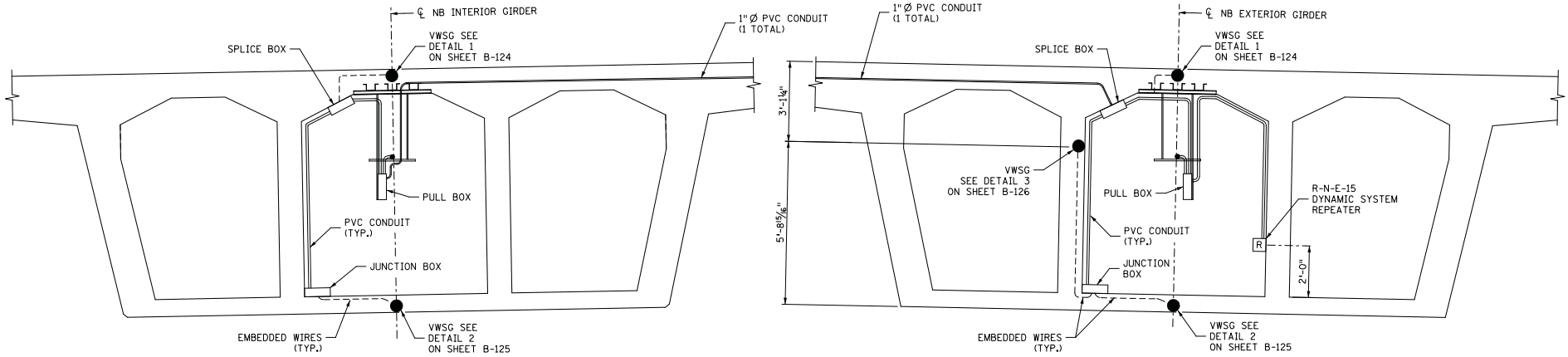
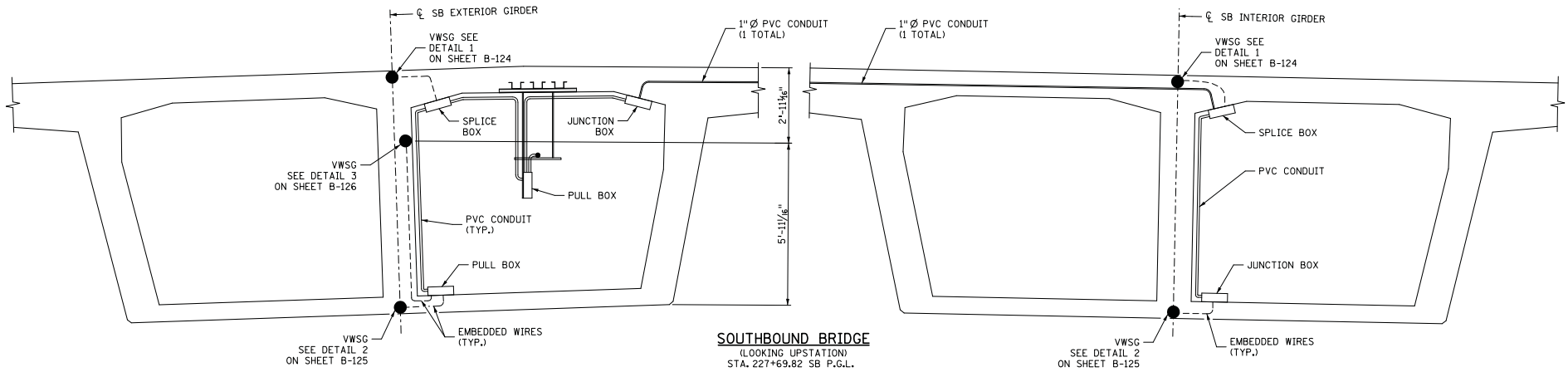


NORTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 227+69.82 NB P.G.L.



SOUTHBOUND BRIDGE
(LOOKING UPSTATION)
STA. 227+69.82 SB P.G.L.

NOTES:

1. CARE SHALL BE TAKEN TO NOT DAMAGE OR CUT WIRES DURING INSTALLATION.
2. ALL CONDUITS CONNECTING TO THE PULL / SPLICE / JUNCTION BOXES SHALL HAVE NO SHARP EDGES / ENDS.

AS-BUILT

AS-BUILT ACCEPTED

MN/DOT DATE

FIGG

CERTIFIED BY Christopher J. Burgess 10/07/08
LICENSED PROFESSIONAL ENGINEER DATE

NAME: CHRISTOPHER J. BURGESS LIC. NO. 45833

DRAWING REVISION	NO.	BY	DATE	DESCRIPTION
	RFC	ECJ	08/11/08	RELEASED FOR CONSTRUCTION

TITLE:
HEALTH MONITORING SYSTEM
LOCATION 15

DES:	ECJ	DR:	JMF	APPROVED:
CHK:	ADH	CHK:	DLS	

B-123

BRIDGE NOS.
27409(SB)
27410(NB)

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Appendix E

Miscellaneous Information

APPENDIX E – MISCELLANEOUS INFORMATION

- Sikadur® 52 (Epoxy Sealer / Repair Material)
- SikaRepair® 223 (Repair / Patch Material)
- SikaGrout® 300, PT (Post-Tensioning Element Grout)
- Sikadur® 32, Hi-Mod (Epoxy bonder)
- Sikadur® 42, GroutPak (Bearing Plinths)
- Sikadur® 55, SLV (Concrete Sealer)
- SikaTop® 111 PLUS
- BASF® Set 45 (General Repair Material)
- BASF® Sonoshield HLM 5000 Elastomeric System
- BASF® Degadeck Crack Sealer Plus
- Pilgrim CBC-6 (Segment Joint Epoxy)
- Pilgrim MAGMA Flow Grout Pak (Pourback Material)
- Pilgrim UWC LV Injection Epoxy Resin
- Pilgrim Uroflex 65 Elastomeric Urethane
- Intergard 475HS Epoxy
- Interthane 990HS Polyurethane
- TRI-SHEEN Concrete Surfacer
- TRI-SHEEN Acrylic
- TK-1450 Urethane Anti-Graffiti Primer
- TK-PERMACLEAN: Anti-Graffiti Coating
- Bearing and Expansion Joint Shop Drawings

Construction

Sikadur® 52

Advanced, very-low-viscosity, moisture-tolerant epoxy injection adhesive

Description	Sikadur 52 is a 2-component, 100% solids, moisture-tolerant, epoxy adhesive. It is a low-viscosity, high-strength adhesive formulated specifically for grouting both dry and damp cracks. It conforms to the current ASTM C-881 and AASHTO M-235 specifications.
Where To Use	■ Use neat for gravity feed or pressure injection of cracks in structural concrete, masonry, wood, etc. ■ Seal interior slabs and exterior above grade slabs from water, chlorides and mild chemical attack and to improve wearability.
Advantages	■ Tenacious crack-sealing grout. ■ Convenient easy mix ratio A:B = 2:1 by volume. ■ Advanced low-viscosity structural resin. ■ Unique, high-strength adhesive for 'can't dry' cracks.
Coverage	1 gal. yields 231 cu. in.
Packaging	3-gal. units.

Typical Data *(Material and curing conditions @ 73°F (23°C) and 50% R.H.)*

Shelf Life	2 years in original, unopened containers
Storage Conditions	Store dry at 40°-95°F (4°-35°C). **Condition to 65°-75°F (18°-24°C) before using.**
Color	Clear, pale yellow.
Mixing Ratio	Component 'A': Component 'B' = 2:1 by volume.
Viscosity (Mixed)	Approximately 200 cps.
Pot Life	Approximately 30 minutes. (60 gram mass)

Tensile Properties (ASTM D-638)

14 day	Tensile Strength	7,900 psi (54 MPa)
	Elongation at Break	3.1%
	Modulus of Elasticity	2.0 X 10^5 psi (1,400 MPa)

Flexural Properties (ASTM D-790)

14 day	Flexural Strength (Modulus of Rupture)	5,400 psi (37.2 MPa)
	Tangent Modulus of Elasticity in Bending	3.8 X 10^5 psi (2,620 MPa)

Shear Strength (ASTM D-732) **14 day** Shear Strength 4,300 psi (29.6 MPa)

Bond Strength (ASTM C-882): Hardened Concrete to Hardened Concrete

2 day (dry cure)	Bond Strength	3,000 psi (20.6 MPa)
14 day (moist cure)	Bond Strength	2,200 psi (15.1 MPa)

Heat Deflection Temperature (ASTM D-648)

14 day 122°F (50°C)
[fiber stress loading = 264 psi (1.8 MPa)]

Water Absorption (ASTM D-570) **7 day** (2 hour boil) 1.5%

Compressive Properties (ASTM D-695)
Compressive Strength, psi (MPa)

	40°F* (4°C)*	73°F* (23°C)*	90°F* (32°C)*
8 hour	-	-	90 (0.62)
16 hour	-	3,000 (20.6)	7,300 (50.3)
1 day	-	4,500 (31.0)	8,400 (57.9)
3 day	1,800 (12.4)	10,000 (68.9)	8,700 (60.0)
7 day	6,100 (42.0)	11,300 (77.9)	10,400 (71.7)
14 day	6,800 (46.8)	11,700 (80.6)	10,400 (71.7)
28 day	8,400 (57.9)	12,000 (82.7)	10,400 (71.7)

Compressive Modulus **28 days** 3.5 x 10^5 psi (2,400 MPa)

* Material cured and tested at the temperatures indicated.

Construction

How to Use

Surface Preparation

Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants.

Preparation Work: Concrete - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blastcleaning or equivalent mechanical means.

Steel - Should be cleaned and prepared thoroughly by blastcleaning.

Mixing

Proportion 1 part Component 'B' to 2 parts Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes with Sika Paddle on low-speed (400-600 rpm) drill until uniformly blended. Mix only that quantity that can be used within its pot life.

Application

To gravity feed cracks - Blow vee-notched crack clean wiith oil-free compressed air. Pour neat Sikadur 52 into vee-notched crack. Continue placement until cracks are completely filled. Prior to filling, seal underside of slab if cracks reflect through.

To pressure inject cracks - Use automated injection equipment or manual method. Set appropriate injection ports based on system used. Seal ports and cracks with Sikadur 31, Hi-Mod Gel, or Sikadur 33.

When the epoxy adhesive seal has cured, inject Sikadur 52 with steady pressure. Consult Technical Service for additional information.

To seal slabs - Spread neat mixture of Sikadur 52 over slab using a roller or squeegee, working material thoroughly into the substrate to ensure penetration. Coverage should be uniform. Coat interior slabs and above-grade exterior slabs only.

Limitations

- Minimum substrate and ambient temperature 40°F (4°C).
- Do not thin. Addition of solvents will prevent proper cure.
- Material is a vapor barrier after cure.
- Not for injection of cracks under hydrostatic pressure at the time of application.
- Do not inject cracks greater than 1/4 in. (6 mm) without consulting Technical Service.
- Do not seal exterior slabs on grade.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

Caution

Component 'A' - Irritant; Sensitizer - Contains epoxy resin. Can cause skin sensitization after prolonged or repeated contact. Skin and eye irritant. High concentrations of vapor may cause respiratory irritation. Avoid skin contact. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. In case of exceedance of PELs, use an appropriate, properly fitted NIOSH approved respirator. Remove contaminated clothing. Consult MSDS for more detailed information.

Component 'B' - Corrosive; Sensitizer Contains amines. Contact with eyes or skin may cause severe burns. Skin and eye irritant. High concentrations of vapor may cause respiratory irritation. Avoid skin contact. Use only with adequate ventilation. Use of safety goggles and chemical-resistant gloves is recommended. In case of exceedance of PELs, use an appropriate, properly fitted NIOSH approved respirator. Remove contaminated clothing. Consult MSDS for more detailed information.

First Aid

Eyes: Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin:** Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation:** Remove person to fresh air. **Ingestion:** Do not induce vomiting. **In all cases, contact a physician immediately if symptoms persist.**

Clean Up

Ventilate area. Confine spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state and federal regulations. Uncured material can be removed with approved solvent. Cured material can only be removed mechanically.

Visit our website at www.sikaconstruction.com **1-800-933-SIKA NATIONWIDE**

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

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Quebec H9R 4A9
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Sika Mexicana S.A. de C.V.
Carretera Libre Celaya Km. 8.5
Fracc. Industrial Balvanera
Corregidora, Queretaro
C.P. 76920
Phone: 52 442 2385800
Fax: 52 442 2250537

ISO 9000:2000

Product Data Sheet
Edition 6.2003
Identification no. 553
SikaRepair 223

Construction

SikaRepair® 223

One component, early strength gaining, cementitious patching material

Description	SikaRepair 223 is a one-component, early strength gaining, cementitious, patching material for vertical and overhead repair of concrete.
Where to Use	■ On grade, above, and below grade on concrete and mortar. ■ As a repair material for vertical and overhead concrete surfaces.
Advantages	■ Easy-to-use. ■ Suitable for exterior and interior applications. ■ Easily applied to clean, sound substrate. ■ High early strengths. ■ Increased abrasion resistance. ■ Increased freeze/thaw resistance. ■ Not a vapor barrier. ■ Not flammable.
Coverage	Approximately 0.41 cu. ft.
Packaging	SikaRepair 223 - 50 lb. multi-wall bag. SikaLatex R - 1 gal. plastic jug; 4/carton, 5 gal. pails

Typical Data *(Material and curing conditions @ 73°F (23°C) and 50% R.H.)*

Shelf Life	One year in original, unopened bags.	
Storage Conditions	Store dry at 40°-95°F (4°-35°C). **Condition material to 65°-75°F before using.**	
Color	Concrete gray	
Mixing Ratio	3/4 gal. to 1 gal. of liquid per 50 lb. bag	
Application Time	Approximately 15 min. after adding powder to Latex or Latex R. Application time is dependent on temperature and relative humidity.	
Finishing Time	20 to 60 min after combining powder and liquid: depends on temperature, relative humidity, and type of finish desired.	
Flexural Strength (ASTM C-293)		with undiluted Latex R
28 days	850 psi (5.9 MPa)	1,200 psi (8.2 MPa)
Splitting Tensile Strength (ASTM C-496)		
28 days	550 psi (3.8 MPa)	700 psi (4.8 MPa)
Bond Strength * (ASTM C-882 modified)		
28 days	1,800 psi (12.4 MPa)	2,000 psi (13.8 MPa)
Compressive Strength (ASTM C-109)		
1 day	3,000 psi (20.7 MPa)	3,300 psi (22.8 MPa)
7 days	6,000 psi (41.4 MPa)	6,200 psi (42.8 MPa)
28 days	7,000 psi (48.3 MPa)	7,500 psi (51.7 MPa)

*Mortar scrubbed into substrate

How to Use

Surface Preparation - Remove all deteriorated concrete, dirt, oil, grease, and all bond-inhibiting materials from surface. Be sure repair area is not less than 1/4 inch in depth. Preparation work should be done by scabbler or other appropriate mechanical means to obtain an exposed aggregate surface with a minimum surface profile of ±1/8 inch (CSP-6). Saturate surface with clean water. Substrate should be saturated surface dry (SSD) with no standing water during application.

Priming For priming of reinforcing steel use Sika Armatec 110 EpoCem (consult Technical Data Sheet).

Concrete Substrate: Prime the prepared substrate with a brush or sprayed applied coat of Sika Armatec 110 EpoCem (consult Technical Data Sheet). Alternately, a scrub coat of Sika Repair 223 can be applied prior to placement of the mortar. The repair mortar has to be applied into the wet scrub coat before it dries.

Construction

Mixing

With water: Wet down all tools and mixer to be used. Add approximately 3/4 gal. of water to mixing vessel. Slowly add 1 bag of SikaRepair 223 while continuing to mix. Mechanically mix with a low-speed drill (400-600 rpm) and SikaTop Gel paddle. 1/4 gal. of water may be added to achieve desired consistency. Do not overwater. Maintain a mix temperature of 65°-75°F for maximum performance by using hot or cold water as needed.

With Latex R: Pour 3/4 gallon of SikaLatex R into the mixing container. Slowly add powder while continuing to mix mechanically as above. Add remaining SikaLatex R (up to 1/4 gal.) to adjust the desired consistency.

note: SikaLatex R must be protected from freezing. If frozen, discard.

With diluted Latex R: Sika Latex R may be diluted up to 5:1 (water:Sika Latex R) for projects requiring minimal polymer-modification. Pour 3/4 gallon of the mixture into the mixing container. Slowly add powder and mix as above. Add remaining diluted SikaLatex R (up to 1/4 gal.) to adjust the desired consistency.

Application & Finish

At the time of application, surfaces should be saturated surface dry (SSD) with no standing water. Mortar must be scrubbed into the substrate, filling all pores and voids. Force material against edge of repair, working toward center. After filling repair, consolidate, then screed. Material may be applied in multiple lifts. The thickness of each lift not to be less than 1/2 inch minimum.

Where multiple lifts are required score top surface of each lift to produce a roughened surface for next lift. Allow preceding lift to reach final set, 30 minutes minimum before applying fresh material. Saturate surface of the lift with clean water. Scrub fresh mortar into preceding lift. Allow mortar to set to desired stiffness, then finish with wood or sponge float for a smooth surface, or texture as required.

For repairs greater than 1 inch in depth, the use of SikaRepair 222 extended with coarse aggregate, and appropriate formwork is also recommended.

Important: Maximum bond is achieved with application of a scrub coat on properly prepared, saturated surface dry (SSD) substrate.

Curing

As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water based compatible curing compound. Curing compounds adverely affect the adhesion of following lifts of mortar, leveling mortar or protective coatings. Moist curing should commence immediately after finishing. Protect freshly applied mortar from direct sunlight, wind, rain and frost.

Limitations

- Application thickness: (with water and diluted Latex R) Minimum 1/4 inch (6 mm). Maximum in one lift 1.5 inch (38 mm)
- Application thickness: (with undiluted Latex R) Minimum 1/8 inch (3 mm). Maximum in one lift 1.5 inch (38 mm)
- Minimum ambient and surface temperatures 45°F (7°C) and rising at time of application.
- Use only potable water.
- Do not use solvent-based curing compound.
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur Hi-Mod 32.

Caution

Suspect carcinogen - Contains portland cement and sand (crystalline silica). Skin and eye irritant.

Irritant

Avoid contact. Dust may cause respiratory tract irritation. Avoid breathing dust. Use only with adequate ventilation. May cause delayed lung injury (silicosis). IARC lists crystalline silica as having sufficient evidence of carcinogenicity in laboratory animals and limited evidence of carcinogenicity in humans. NTP also lists crystalline silica as a suspect carcinogen. Use of safety goggles and chemical resistant gloves is recommended. If PELs are exceeded, an appropriate, NIOSH approved respirator is required. Remove contaminated clothing.

First Aid

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes, and contact a physician. For respiratory problems, remove person to fresh air.

Clean Up

In case of spillage, scoop or vacuum into appropriate container, and dispose of in accordance with current, applicable local, state and federal regulations. Keep container tightly closed and in an upright position to prevent spillage and leakage. **Mixed components:** Uncured material can be removed with water. Cured material can only be removed mechanically.

KEEP CONTAINER TIGHTLY CLOSED
NOT FOR INTERNAL CONSUMPTION

KEEP OUT OF REACH OF CHILDREN
FOR INDUSTRIAL USE ONLY

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Visit our website at www.sikausa.com **1-800-933-SIKA NATIONWIDE**

Regional Information and Sales Centers. For the location of your nearest Sika sales office, contact your regional center.

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Carretera Libre Celaya Km. 8.5
Corregidora, Queretaro
C.P. 76920 A.P. 136
Phone: 52 42 25 0122
Fax: 52 42 25 0537

Construction

Product Data Sheet
Edition12.2003
Identification no. 528-500 Sand Free
SikaGrout 300 PT

SikaGrout® 300 PT

High performance, zero bleed, sand-free, cementitious grout

Description

SikaGrout 300 PT is a non-shrink, cementitious grout with a unique 2-stage shrinkage compensating mechanism. It is non-metallic and contains no chlorides. With a special blend of shrinkage-reducing and plasticizing/water-reducing agents, SikaGrout 300 PT compensates for shrinkage in both the plastic and hardened states.

Where to Use

- Use for horizontal and vertical grouting of ducts within bonded, post-tensioned structures.
- Use to grout and fill or repair voids within ducts of post-tensioning strands for corrosion protection.
- Use for grouting tight clearances.

Advantages

- Sand-free allows filling and repairing of voids within ducts of post-tensioned structures.
- Prepackaged by an ISO 9001/9002 approved company ensures consistency of manufactured material.
- Does not contain aluminum powder nor any components which generate hydrogen gas, carbon dioxide or oxygen.
- Silica fume enhanced for low permeability.
- For additional corrosion protection, 2.5 oz. of Sika FerroGard 901 may be substituted for 2.5 oz. of mixing water for each 50 lb. bag of SikaGrout 300 PT.
- Easy to use...just add water.
- Non-metallic, will not stain or rust.
- Zero bleed, even at high flow.
- Low heat build-up.
- Excellent for pumping: Does not segregate...even at high flow. No build-up on equipment hopper.
- Non-corrosive, does not contain chlorides.
- Superior freeze/thaw resistance.
- Meets CRD C-621.
- Meets ASTM C-1107 (Grade C).
- Shows positive expansion when tested in accordance with ASTM C-827.

Typical Data *(Material and curing conditions @ 73°F and 50% R.H. Water used: 12.5 pints per 50 lb. bag)*

Shelf Life Nine months in original, unopened bags.

Storage Conditions Store dry at 40°-95°F (4°-35°C). For best results, it is suggested to condition material to 65°-75°F before using.

Wet Density (ASTM C-138) Approximately 125 lbs. per cf.

Total Chloride Ions (ASTM C-1152) less than 0.04% by weight of cementitious material

Fine Aggregate contains none (sand-free)

Volume Change (ASTM C-1090)

24 hours	0.0% shrinkage
28 days	between 0 and +0.2% expansion

Expansion (ASTM C-940) **3 hours** between 0.0 and +2.0%

Compressive Strength (ASTM C-942)*

1 day	3,000 psi	(20.0 MPa)
3 days	5,000 psi	(33.3 MPa)
7 days	7,000 psi	(46.7 MPa)
28 days	8,000 psi	(53.3 MPa)

Initial Set (ASTM C-953) Approximately 3 to 12 hours

Fluidity Test (ASTM C-939 Modified per FL Dot Section 938 and PTI Section 4.4.5.2)

Immediately after mixing	7-20 seconds
30 minutes after mixing	7-20 seconds
	see Mixing section for clarification on flow testing

Bleeding (ASTM C-940 Modified per FL Dot Wick Induced Bleed Test) **4 hours** 0.0%

Gelmen Pressure Induced bleed test (PTI Specification Section 4.4.6.2 and Table 4-1 Grout Type C)
Less than 0.0% bleed at 100 psi for 5 minutes

Permeability (ASTM C-1202 modified per FL DOT section 938 and PTI section 4.4.3)

28 days	Less than 2500 Coulombs
90 days	In progress

Electrical Resistivity (ASTM C-1202) **28 days** Less than 10,000 ohm ·cm

W/C Less than 0.40

Accelerated corrosion test (reference FL DOT Specification Section 938-6) Time to Corrosion

Control	344 hours
SikaGrout 300 PT	greater than 1,000 hrs.

Independent lab results available upon request.
*Compressive Strengths' of material manufactured in California: 1 day=3,300 psi; 3 day=6,000 psi; 7 day=7,500 psi; 28 day=8,500 psi

Construction

Coverage Approximately 0.50 cu. ft./bag. Use between 11.5 and 13 pints of water per 50 lb. bag in order to achieve the proper flow.

Packaging 50-lb. multi-wall bags; 40 bags/pallet.

How to Use

Surface Preparation **Ducts:** Ensure that ducts, voids, openings, inlets and outlets are clean and free of debris, fuel, oils, other contaminants, and site trash at all times.

Other grouting applications: Remove all dirt, oil, grease, and other bond-inhibiting materials by mechanical means. Anchor bolts to be grouted must be de-greased with suitable solvent which will not inhibit grout bonding. Follow solvent manufacturer's instructions and warnings. Concrete must be sound and roughened to promote mechanical adhesion. Prior to pouring, surface should be brought to a saturated surface-dry condition.

Forming Ensure forms and ducts will retain grout without leakage.

Mixing For best results use a colloidal mixer similar to ChemGrout CG-600 series or other type of high shear mixer at approximately 1800 rpm. Mix for approximately 3 minutes after the addition of the last bag or until a homogeneous mix is achieved. Continue to agitate material in the holding hopper to achieve best flow. Alternately, for quantities less than 1 bag, such as when vacuum grouting voids, mechanically mix with high-speed drill (2500 rpm) and Sika jiffy paddle for a minimum of 6 minutes. Method of mixing may significantly affect the material properties, particularly flow. At higher temperatures and/or with higher water amounts, the grout will behave more non-thixotropically. Therefore, it may be more appropriate to measure the flow using the standard flow cone test (ASTM C-939). The preferred efflux time is between 15-30 seconds under these conditions. Project specific testing by the engineer is recommended to ensure that the mixing and placement methods result in the specified requirements.

Add appropriate quantity of clean water. Add bag of material to mixing vessel. Start by using 11.5 pints of water per 50 lb. bag of material. Add additional water as needed (a total maximum of 13 pints per 50 lb. bag) in order to achieve the flow specified on the technical data sheet. Ambient and material temperature should be as close as possible to 70°F. If higher, use cold water; if colder, use warm water.

Application Make sure all forming, mixing, placing, and clean-up materials are on hand. The grout shall be used within 60 minutes from the start of mixing. The method of pumping grout shall ensure complete filling of the ducts and complete surrounding of the strand or bar. A mock-up should be completed on-site and inspected by the engineer to ensure that the placement means and methods yield the specified results.

When grouting ducts or critical elements, it is highly recommended that experienced, certified technicians complete the work.

Limitations

- Minimum ambient and substrate temperature 40°F and rising at time of application. For lower temperatures, refer to the Post-Tensioning Institute (PTI) Guide Specification for Grouting of Post-Tensioned Structures dated February, 2001.
- Maximum ambient and substrate temperature is 100°F at the time of placement. For higher temperatures, refer to the PTI Guide Specification for Grouting of Post-Tensioned Structures dated February, 2001.
- Minimum application thickness: 1/8 in.
- Maximum application thickness (neat): comply with PTI specification for grouting of post-tensioned structures.
- Do not use as a patching or overlay mortar or in unconfined areas.
- Material must be placed within 60 minutes of mixing.
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur Hi-Mod 32.

Caution Irritant. Skin/Eye/Respiratory Irritant. Avoid breathing dust. Dust may cause respiratory tract irritation. May cause delayed lung injury (silicosis).
Warning: This product contains crystalline silica, which in the state of California, is known to cause cancer.

First Aid **Eyes-**rinse thoroughly with water a minimum of 15 minutes. Consult a physician. **Skin-**wash thoroughly with soap and water. Remove contaminated clothing. **Inhalation-**Remove person to fresh air. Consult a physician. **Ingestion-**Dilute with water. Consult a physician. In all cases, if symptoms persist contact a physician.

Handling and Storage Avoid contact. Wear suitable personal protective equipment (chemical resistant goggles/gloves/clothing). Remove contaminated clothing and launder before reuse. Use in the presence of adequate ventilation. In the absence of adequate ventilation, wear a properly fitted NIOSH respirator. Uncured material can be removed with water. Cured material can only be removed mechanically. Store in a cool, dry area. Keep bag tightly closed.

Clean Up In case of spill, wear protective equipment (chemical resistant gloves/goggles/clothing). Ventilate area. In the absence of adequate ventilation, use a properly fitted NIOSH respirator. Confine spill. Vacuum or scoop into an appropriate container. Dispose of in accordance with current applicable local, state and federal regulations.

In case of emergency, call CHEMTREC at 1-800-424-9300. 703-527-3887 (outside USA & Canada).

KEEP CONTAINER TIGHTLY CLOSED — KEEP OUT OF REACH OF CHILDREN
NOT FOR INTERNAL CONSUMPTION — FOR INDUSTRIAL USE ONLY
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Sika warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current technical data sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor.

NO OTHER WARRANTIES EXPRESSED OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEOR Y FOR SPECIAL OR CONSEQUENTIAL DAMAGES.

Visit our website at www.sikausa.com **1-800-933-SIKA NATIONWIDE**

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QUALITY ISO 9001 9002 ACHIEVEMENT

Construction

Product Data Sheet
Edition 7.1.2008
Identification no. 770
Sikadur 32, Hi-Mod

Sikadur® 32, Hi-Mod

High-modulus, high-strength, epoxy bonding/grouting adhesive

Description	Sikadur 32, Hi-Mod, is a multi-purpose, 2-component, 100% solids, moisture-tolerant structural epoxy adhesive. It conforms to the current ASTM C-881 and AASHTO M-235 specifications.
Where to Use	■ Bond fresh, plastic concrete to hardened concrete and steel. ■ Grout horizontal cracks in structural concrete and wood by gravity feed. ■ Machinery and 'robotic' base-plate grout. ■ Structural adhesive for concrete, masonry, metal, wood, etc.
Advantages	■ Super-strength bonding/grouting adhesive. ■ Tolerant to moisture before, during and after cure. ■ Excellent adhesion to most structural materials. ■ Convenient easy-to-mix ratio A:B = 1:1 by volume. ■ Easy-to-use for bonding/grouting applications. ■ Fast initial set; rapid gain to ultimate strengths. ■ USDA-certified for use in food plants.
Coverage	**Bonding Adhesive** - 1 gal. covers approximately 80 sq. ft. on smooth surface. **Base Plate Grout** - 1 gal. mixed with 1.5 parts oven-dried aggregate by loose volume yields approximately 420 cu. in. of grout. **Anchoring grout -** 1 gal. yields 231 cu. in. of grout.

Typical Data *(Material and curing conditions @ 73°F {23°C} and 50% R.H.)*

Shelf Life 2 years in original, unopened containers.

Storage Conditions Store dry at 40°-95°F (4°-35°C). **Condition material to 65°-75°F (18°-24°C) before using**.

Color Concrete gray

Mixing Ratio Component 'A': Component 'B' = 1:1 by volume.

Viscosity Approximately 3,000 cps.

Pot Life Approximately 30 minutes. (60 gram mass). Approximately 22 minutes. (350 gram mass, 8 oz.)

Contact Time **40°F (4°C)*:** 12 hrs. **73°F (23°C)*:** 3-4.5 hrs. **90°F (32°C)*:** 1.5-2 hrs

Compressive Modulus, psi **7 day** 2.1 X 10^5 psi (1,449 MPa)

Tensile Properties (ASTM D-638)

7 day	Tensile Strength	6,900 psi (48 MPa)
	Elongation at Break	1.9%
14 day	Modulus of Elasticity	5.4 X 10^5 psi (3,726 MPa)

Flexural Properties (ASTM D-790)

14 day	Flexural Strength (Modulus of Rupture)	7,000 psi (48.3 MPa)
	Tangent Modulus of Elasticity in Bending	6.9 X 10^5 psi (4,800 MPa)

Shear Strength (ASTM D-732) **14 day** Shear Strength 6,200 psi (43 MPa)

Water Absorption (ASTM D-570) **7 day** (24 hour immersion) 0.21%

Heat Deflection Temperature (ASTM D-648)
7 day [fiber stress loading 264 psi (1.8 MPa)] 122°F (50°C)

Bond Strength (ASTM C-882):

2 day (moist cure)	Plastic Concrete to Hardened Concrete	1,700 psi (11.7 MPa)
	Hardened Concrete to Hardened Concrete	2,000 psi (13.8 MPa)
	Hardened Concrete to Steel	1,900 psi (13.1 MPa)
14 day (moist cure)	Plastic Concrete to Hardened Concrete	2,200 psi (15.1 MPa)
	Plastic Concrete to Steel	2,000 psi (13.8 MPa)
	Hardened Concrete to Hardened Concrete	2,000 psi (13.8 MPa)

Compressive Properties (ASTM D-695)
Compressive Strength, psi (MPa)

	40°F* (4°C)	73°F* (23°C)	90°F* (32°C)
8 hour	-	140 (1.0)	1,700 (11.7)
16 hour	-	4,800 (33.1)	7,300 (50.3)
1 day	30.0 (0.2)	5,700 (39.3)	7,300 (50.3)
3 day	5,300 (36.6)	11,300 (77.9)	10,400(71.7)
7 day	9,600 (66.2)	11,800 (81.4)	10,400(71.7)
14 day	11,900 (82.1)	12,200 (84.1)	10,400(71.7)
28 day	12,600 (86.9)	12,200 (84.1)	10,500(72.4)

*Material cured and tested at the temperatures indicated.

Construction

Packaging	2 and 4 gal. units; 1kg. unit (25.6 fl.oz.), 6/case, 75/pallet; 2.5 kg. unit (63.8 fl.oz.), 2/case, 90/pallet
How to Use **Surface Preparation**	Surface must be clean and sound. It may be dry or damp, but free of standing water. Remove dust, laitance, grease, curing compounds, impregnations, waxes and any other contaminants. **Preparation Work: Concrete** - Should be cleaned and prepared to achieve a laitance and contaminant free, open textured surface by blastcleaning or other equivalent mechanical means. **Steel** - Should be cleaned and prepared thoroughly by blastcleaning.
Mixing	**Pre-mix each component.** Proportion equal parts by volume of Component 'A' and Component 'B' into clean pail. Mix thoroughly for 3 minutes with Sika paddle on low-speed (400-600 rpm) drill until blend is a uniform color. Mix only that quantity that can be applied within its pot life.
Application	**To bond fresh concrete to hardened concrete -** Apply by brush, roller, broom or spray. Place fresh concrete while Sikadur 32, Hi-Mod, is still tacky. If coating becomes glossy and loses tackiness, remove any surface contaminants then recoat with additional Sikadur 32 Hi-Mod, and proceed. **To grout baseplates -** Add up to 1 1/2 parts of oven-dried aggregate to 1 part of mixed Sikadur 32, Hi-Mod, by volume. Place grout under baseplate. Avoid contact with the underside of the plate. A 1/4 to 3/8 in. (6 to 10 mm) space should remain between the top of the grout and the bottom of the plate. Maximum thickness of grout per lift is 1.5 in. (38 mm) If multiple lifts are needed, allow preceding layer to cool to touch before applying additional layer. The remaining 1/4 to 3/8 in. (6 to 10 mm) space should be filled with neat Sikadur 32 Hi-Mod. Pour a sufficient quantity of neat epoxy to allow the level to rise slightly higher than the underside of the bearing plate. **To gravity feed cracks -** Pour neat material into vee-notched crack. Continue placement until completely filled. Seal underside of slab prior to filling if cracks reflect through.
Limitations	■ Minimum substrate and ambient temperature 40°F (4°C). ■ For spray applications, consult Technical Service at 800-933-7452. ■ Use only oven-dry aggregate. ■ Material is a vapor barrier after cure. ■ For applications on exterior, on-grade substrates, consult Technical Services at 800-933-7452. ■ Do not apply over wet, glistening surface. ■ Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.
Warning	**Component 'A' - IRRITANT; SENSITIZER -** Contains epoxy resin, nonyl phenol. Can cause skin sensitization after prolonged or repeated contact. Eye irritant. May cause respiratory irritation. Harmful if swallowed. **Component 'B' - CORROSIVE; IRRITANT; SENSITIZER -** Contains amines, silica (quartz), and benzylalcohol nonyl phenol. Contact with eyes or skin causes severe burns. Can cause skin sensitization after prolonged or repeated contact. Skin/respiratory/eye irritant. Harmful if swallowed. Deliberate concentration of vapors of Component A or B for purposes of inhalation is harmful and can be fatal. Cured material, if sanded, may result in exposure to a chemical known to the state of California to cause cancer.
First Aid	**Eyes:** Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin:** Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation:** Remove person to fresh air. **Ingestion:** Do not induce vomiting. **In all cases, contact a physician immediately if symptoms persist.**
Clean Up	Wear chemical resistant gloves/goggles/clothing. Ventilate area. In absence of adequate general and local exhaust ventilation, use a properly filled NIOSH respirator. Confine spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state and federal regulations. Uncured material can be removed with solvent. Strictly follow manufacturer's warnings and instructions for use. Cured material can only be removed mechanically.
Handling & Storage	Avoid direct contact with skin and eyes. Wear chemical resistant gloves/goggles/clothing. Use only with adequate ventilation. In absence of adequate general and local exhaust ventilation, use a properly filled NIOSH respirator. Wash thoroughly after handling product. Launder clothing before reuse. Store in a cool dry well ventilated area.

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ISO 9000:2000

Construction

Sikadur® 42, Grout-Pak

Pre-proportioned, epoxy, baseplate grouting system

Description	Sikadur 42, Grout-Pak is a 3-component, 100% solids, moisture-tolerant, epoxy baseplate grouting system.
Where to Use	■ Precision seating of baseplates. ■ Grouting under equipment, including heavy impact and vibratory machinery, reciprocating engines, compressors, pumps, presses, etc. ■ Grouting for “pour-back” anchorage on post tensioning projects (e.g. Segmental Bridge). ■ Grouting under crane rails.
Advantages	■ Ready to mix, pre-proportioned kit. ■ Moisture-tolerant. ■ Non-shrink. ■ Self-leveling. ■ Corrosion and impact resistant. ■ Stress and chemical resistant. ■ Low heat development. ■ High compressive strength. ■ Long working time. ■ High vibration resistance. ■ Fast strength gain. ■ Low peak exothermic system for large pours. ■ Minimal shrinkage/expansion. ■ High effective bearing area. ■ Excellent flowability. ■ USDA certifiable.
Packaging	0.5 cu. ft. kit: contains 0.9 gallons epoxy (Component ‘A’ and Component ‘B’) in a 5 gallon pail, separated with a topliner; and 50 lb.... aggregate (Component ‘C’) in a multi-wall bag.

Typical Data *(Material and curing conditions @ 73°F (23°C) and 50% R.H.)*

Shelf Life 2 years in original, unopened containers.

Storage Conditions Store dry at 40°-95°F (4°-35°C). **Condition material to 65°-85°F (18°-29°C) before using.** Component ‘C’ must be kept dry.

Color Concrete gray

Consistency Flowable

Application Life Approximately 90 minutes

Tensile Properties (ASTM C-307) **7 day** Tensile Strength 2,300 psi (15.8 MPa)

Flexural Properties (ASTM C-580)

7 day	Flexural Strength (Modulus of Rupture)	4,000 psi (27.6 MPa)
	Tangent Modulus of Elasticity	1.30 x 10^6 psi (8,963 MPa)

Water Absorption (ASTM C-413) **7 day** (2-hour boil) 0.04%

Bond Strength (ASTM C-882 modified)

7 day	Bond Strength to Concrete	4,200 psi (29.0 MPa)
	Bond Strength to Steel	3,800 psi (26.2 MPa)

Coefficient of Thermal Expansion (ASTM C-531) 24.5 x 10^{-6} in./in./°F (13.7x10^{-6} mm/mm/°C)

Thermal Compatibility (ASTM C-884) passes test

Effective Bearing Area[1] >95%

Compressive Properties (ASTM C-579B): Compressive Strength, psi (MPa)

	40°F* (4°C)	73°F* (23°C)	90°F* (32°C)
8 hour	-	-	5,500 (37.9)
16 hour	-	9,600 (66.2)	9,800 (67.6)
1 day	-	12,200 (84.1)	11,500 (79.3)
3 day	4,800 (33.1)	14,000 (96.6)	14,000 (96.6)
7 day	13,700 (94.5)	14,900 (102.8)	14,800 (102.1)
14 day	13,900 (95.9)	15,000 (103.4)	15,200 (104.8)
28 day	13,900 (95.9)	15,200 (104.8)	15,600 (107.6)

* Material cured and tested at the temperatures indicated.

[1] Percent final surface area of grout in contact with bearing plate

Construction

How to Use

Surface Preparation

Substrate and baseplate contact area must be clean, sound, and free of standing water. Remove dust, laitance, oils, grease, curing compounds, waxes, impregnations, foreign particles, coatings and disintegrated materials by mechanical means (i.e., sandblasting, bush hammering). Sandblast metal baseplates to a commercial white finish for maximum adhesion. Apply grout immediately to prevent re-oxidizing. Concrete substrate shall have reached its desired strength (3,000 psi minimum), and must be dimensionally stable.

Forming

The flowable consistency of the epoxy adhesive grout system requires the use of forms to contain the material around the baseplates. In order to prevent leakage or seepage, completely seal all forms. Apply polyethylene film or wax to all forms to prevent adhesion of the grout. Prepare form work to maintain a 2 in. (50 mm) liquid head to facilitate placement. A grout box that can be attached to the form will enhance the grout flowability. Projected anchor bolts should be wrapped with neoprene foam rubber (or similar) to prevent grout from adhering to the bolts. The use of expansion joints is recommended on large pours to minimize the potential for cracking in the epoxy grout (maximum 3-4 ft. spacing in each direction).

Mixing

Pour the entire contents of Components 'A' & 'B' into an appropriate mixing vessel (e.g. 5 gal. bucket) and mix for **30 seconds** with a 1/2 in. Jiffy mixing paddle (5 in. blade diameter) on a **low-speed** (400 - 600 rpm) 3/4 in. drive rotary drill, taking care not to entrain air during mixing. **It is critical to the performance of the grout that there be no appreciable air bubbles in the resin.** Slowly add the **entire** contents of Component 'C' and mix until uniformly blended (approx. 5 minutes).

Application

Pour the mixed grout into the prepared forms from one side only to eliminate air entrapment. Baseplate should have vent holes around periphery to prevent air pockets from developing. Maintain the liquid head to ensure intimate contact with the base plate. Plungers may be used to ease placement. Place sufficient epoxy adhesive grout in the forms to rise slightly above the underside of the base plate. Grout depth of 1 in. (25 mm) minimum required.

Limitations

- Minimum substrate and ambient temperature 40°F (4°C).
- Do not thin. Addition of solvents will prevent proper cure.
- Material is a vapor barrier after cure.
- Minimum grout depth 1 in. (25 mm).
- Baseplate should be shielded from direct sunlight and rain for a minimum of 24 hours before epoxy grouting, and 48 hours after grouting.
- Maximum grout depth 4 in./lift (101 mm).
- Component 'C' must be kept dry.
- Cold material may require chaining, rodding, and pushing during placement.
- For proper seating, allow grout to rise above the bottom of the base plate.
- **DO NOT BATCH. MIX COMPLETE UNITS.**
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.

Caution

Component 'A' - Irritant; Sensitizer - Contains epoxy resin. Can cause skin sensitization after prolonged or repeated contact. Skin and eye irritant. High concentrations of vapor may cause respiratory irritation. Avoid skin contact. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. Remove contaminated clothing.

Component 'B' - Corrosive; Sensitizer- Contains amines. Contact with eyes or skins may cause severe burns. Can cause skin and/or respiratory sensitization after prolonged or repeated contact. Skin and eye irritant. Vapors may cause respiratory irritation. Use only with adequate ventilation. Use of safety goggles and chemical resistant gloves is recommended. Remove contaminated clothing.

Component 'C': Irritant; Suspect Carcinogen - Contains sand (crystalline silica 14808-60-7); NJTSRN 02944800-5011p. Skin and eye irritant. Avoid contact. Dust may cause respiratory tract irritation. Avoid breathing dust. Use only with adequate ventilation. May cause delayed lung injury (silicosis). IARC listed crystalline silica as having sufficient evidence of carcinogenicity in laboratory animals and listed evidence of carcinogenicity in humans. NTP also lists crystalline silica as a suspect carcinogen. Use of safety goggles and chemical resistant gloves is recommended. If PELs are exceeded, an appropriate, properly fitted NIOSH approved respirator is required. Remove contaminated clothing.

First Aid

In case of skin contact, wash immediately and thoroughly with soap and water. If symptoms persist, consult a physician. For eye contact, flush immediately with plenty of water for at least 15 minutes, contact a physician. For respiratory problems, remove person to fresh air; if symptoms persist, contact a physician. In case of ingestion, dilute with water and consult physician. Remove contaminated clothing.

Clean Up

In case of spills or leaks, wear suitable protective equipment, contain spill, collect with absorbent material, and transfer to suitable container. Ventilate area. Avoid contact. Dispose of in accordance with current, applicable local, state and federal regulations.

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Construction

Product Data Sheet
Edition 7.1.2008
Identification no. 389-35N
Sikadur 55 SLV

Sikadur S

Super low-viscosity, moisture-tolerant epoxy resin, crack healer/penetrating sealer

Description	Sikadur 55 SLV is a 2-component, 100% solids, moisture-tolerant, epoxy crack healer / penetrating sealer, having a fast tack-free time to minimize downtime. It is a super low-viscosity, high-strength adhesive formulated specifically for sealing both dry and damp cracks. It conforms to the current ASTM C-881 and AASHTO M-235 specifications.
Where to Use	■ Sikadur 55 SLV structurally repairs cracked concrete. ■ For interior slabs and exterior above-grade slabs. ■ For elevated horizontal decks, parking garages and other structures exposed to foot and pneumatic tire traffic.
Advantages	■ Super low viscosity/low surface tension for excellent penetration into cracks. ■ Penetrates cracks by gravity down to 2 mils (0.002" / 0.05 mm) in width. ■ Prolongs life of cracked concrete. ■ Penetrates/seals surface of slabs from water absorption, chloride-ion intrusion, and chemical attack. ■ **Structurally** improves concrete surface. ■ Can be open to traffic in 6 hours at 73°F (23°C). ■ High bond strength, even in damp cracks. ■ **U.S. Patent No. (pending)** for ultra low viscosity healer/sealer to strengthen cracked concrete.
Coverage	1 gal. (3.8 Liters) yields 231 cu. in. (3,785 cm^3) Typical coverage is 150-175 sq. ft./gal. (3.7-4.3 m^2/L) for surface sealing. Coverage varies with porosity and surface profile of substrate. Higher porosity concrete will reduce coverage. For crack healing, follow Application instructions and allow to pond over cracks.
Packaging	3 gal. (11.35 l) unit = 'A' = 2 gal. (7.6 l) + 'B' = 1 gal. (3.8 l)

Typical Data *[Material and curing conditions @ 73°F (23°C) and 50% R.H.]*

Shelf Life	2 years in original, unopened containers			
Storage Conditions	Store dry at 40°-95°F (4°-35°C). **Condition material to 65°-75°F (18°-24°C) before using.**			
Color	Clear, amber			
Mixing Ratio	Component 'A' : Component 'B' = 2:1 by volume			
Viscosity (Mixed)	Approximately 105 cps			
Pot Life	Approximately 20 minutes			
Tack-Free Time	**40°F (4°C)***	**60°F (15°C)***	**73°F (23°C)***	**90°F (32°C)***
	> 11 hrs.	11 hrs.	6 hrs.	2.5 hrs.

Tensile Properties (ASTM D-638) **73°F (23°C)**

7 day	Tensile Strength	7,100 psi (48.9 MPa)
	Elongation at break	10%

Bond Strength (ASTM C-882)

Hardened Concrete to Hardened Concrete	**2 day (moist cure)**	2,500 psi (17.2 MPa)
	14 day (moist cure)	2,500 psi (17.2 MPa)
Hardened Concrete to Steel	**2 day (moist cure)**	1,500 psi (10.3 MPa)
	14 day (moist cure)	1,600 psi (11.0 MPa)

Flexural Properties (ASTM D-790)

7 day	Flexural Strength	8,500 psi (58.6 MPa)
	Tangent Modulus of Elasticity	3.2 x 10^5 psi (2,206 MPa)

Shear Strength (ASTM D-732) **7 day** 5,800 psi (40.0 MPa)

Heat Deflection Temperature (ASTM D-648) **7 day**

[fiber stress loading = 264 psi (1.8 MPa) 110°F (43°C)

Water Absorption (ASTM D-570) **7 day** (24 hour immersion) 0.60%

Compressive Properties (ASTM D-695)

Compressive Strength, psi (MPa)

	40°F (4°C)*	**60°F (15°C)***	**73°F (23°C)***	**90°F (32°C)***
1 day	-	320 (2.2)	1,100 (7.6)	4,800 (33.1)
3 day	2,000 (13.8)	6,500 (44.8)	8,300 (57.2)	8,000 (55.2)
7 day	7,800 (53.8)	10,400 (71.7)	10,900 (75.1)	8,300 (57.2)
14 day	9,600 (66.2)	11,000 (75.8)	11,800 (81.4)	10,000 (68.9)
28 day	11,700 (80.7)	12,000 (82.7)	12,000 (82.7)	10,000 (68.9)

Compressive Modulus **7 day** **3.0 x 10^5 psi (2,068 MPa)**

*Material cured and tested at the temperature indicated.

Construction

How to Use

Surface Preparation

Substrate must be clean, sound and free of surface moisture. Remove dust, laitance, grease, oils, curing compounds, waxes, impregnations, foreign particles, coatings and disintegrated materials by mechanical means (i.e. shotblasting, sandblasting, etc.). For best results, substrate should be dry. Surfaces prepared by Low Pressure Water Cleaning or High Pressure Water Jetting methods should be allowed to dry for 24 hrs. minimum [at 73°F (23°C)].

Mixing

Mix 1 part Component 'B' to 2 parts Component 'A' by volume into a clean pail. Mix thoroughly for 3 minutes with Sika paddle or jiffy mixer on a low-speed (400-600 rpm) drill until uniformly blended. Mix only that quantity which can be used within its pot life.

Application

To gravity feed cracks: Sikadur 55 SLV is applied to horizontal surfaces by flat squeegee or broom. Spread material over area and allow to pond over cracks. Let material penetrate into cracks and substrate. Remove excess epoxy with roller leaving no visible surface film. For cracks greater than 1/8 in. (3 mm) wide, fill crack with oven-dried sand before applying Sikadur 55 SLV. Seal cracks from underside, when accessible, to prevent leakage.

A second treatment may be required on very porous substrates. Apply second treatment before broadcasting

After treatment, wait at least 20 minutes at 73°F (23°C). Cover with broadcast of an oven-dried 20/40 silica sand or similar sand. Distribute evenly over the surface to excess at a rate of 30-40 lbs./100 sq. ft.. Allow to cure 6 hours minimum at 73°F (23°C). Remove any loose sand and open to traffic once epoxy has cured. Consult Sika Technical Service at 1-800-933-SIKA for additional information.

To pressure inject cracks: Use automated injection equipment. Set appropriate injection ports. Seal ports and cracks with Sikadur 31, Hi-Mod Gel, Sikadur Injection Gel or Sikadur AnchorFix-3/4. When the epoxy adhesive has cured, inject Sikadur 55 SLV with steady pressure. Consult Technical Service at 1-800-933-SIKA for additional information.

Limitations

- Do not thin. Addition of solvents will prevent proper cure.
- Material is a vapor barrier after cure.
- Do not apply if rain is imminent. Water exposure or humidity will affect surface appearance and may cause surface whitening.
- Not an aesthetic product. Color may alter due to variations in lighting and/or UV exposure.
- Sealed concrete surface may appear blotchy due to differential absorption.
- Allow sufficient time for the substrate to dry after rain or other inclement conditions.
- Application temperature of substrate must be minimum 5°F (3°C) above the dew point.
- Minimum ambient and substrate temperature 40°F (4°C). Maximum application temperature 95°F (35°C).
- Do not inject cracks greater than 1/4 in. (6 mm) Consult Technical Service at 1-800-933-SIKA.
- Minimum age of concrete is 21-28 days, depending on curing and drying conditions.
- Not designed to seal or inject cracks under hydrostatic pressure during application.

WARNING

Component 'A' - IRRITANT; SENSITIZER. Avoid direct contact. Contains modified epoxy resin and Diglycidyl Ether of Bisphenol A (CAS 25085-99-8). Causes eye irritation. May cause skin/respiratory irritations. Prolonged and/or repeated contact with skin may cause allergic reaction/sensitization. May be harmful if swallowed. **HMIS:H-2, F-1, R-0, PPE-C.**

Component 'B' - CORROSIVE, IRRITANT, SENSITIZER. Contains 2,4,6-Tri(Dimethylamino methyl) phenol (90-72-2), Amines (Mixture) and Benzyl Alcohol (100-51-6). Contact with skin and eyes causes severe burns. Causes eye/skin/respiratory irritation. Prolonged and/or repeated skin contact may cause an allergic reaction/sensitization. Harmful if swallowed. **HMIS:H-3, F-1, R-0, PPE-D.**

Deliberate concentrations of vapors of 'A' and/or 'B' Components for purposes of inhalation is harmful and can be fatal.

First Aid

Eyes: Hold eyelids apart and flush thoroughly with water for 15 minutes. **Skin:** Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water. **Inhalation:** Remove person to fresh air. **Ingestion:** Do not induce vomiting. Contact physician. **In all cases, contact a physician immediately if symptoms persist.**

Handling and Storage

Avoid direct contact with eyes and skin. Wear chemical resistant clothing/gloves/goggles. Avoid breathing vapors. Use with adequate general and local ventilation. If ventilation is poor, use a properly fitted, NIOSH-approved respirator. Wash thoroughly after handling product. Remove contaminated clothing and launder before reuse.

Clean Up

In case of spills ventilate area and contain spill. Collect with absorbent material. Ventilate area. Avoid contact. Dispose of in accordance with current, applicable local, state and federal regulations. Uncured material can be removed with approved solvent. Follow solvent manufacturer's instructions for use and warnings. Cured material (when component 'A' combined with Component 'B') can only be removed by mechanical means.

Visit our website at www.sikaconstruction.com **1-800-933-SIKA NATIONWIDE**

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Construction

Product Data Sheet
Edition 8.2003
Identification no. 184
SikaTop 111 *PLUS*

SikaTop® 111 *PLUS*

Two-component, polymer-modified, cementitious, screed mortar plus FerroGard 901 penetrating corrosion inhibitor

Description

SikaTop 111 *PLUS* is a two-component, polymer-modified, portland-cement, fast-setting, screed mortar. It is a performance repair mortar for horizontal, vertical and overhead applications or form and pour application. It offers the additional benefit of FerroGard 901, a penetrating corrosion inhibitor.

Where to Use

- On grade, above, and below grade on concrete and mortar.
- On horizontal, vertical and overhead surfaces.
- As a structural repair material for parking facilities, industrial plants, walkways, bridges, tunnels, and dams.
- Free-flowing repair mortar for hard-to-reach areas.
- Filler for voids and cavities.
- Overlay in cathodic protection systems.

Advantages

- High compressive and flexural strengths.
- High early strengths.
- Opens to traffic fast; foot in 4-6 hours, pneumatic tire in 8-12 hours (73°F).
- Superior abrasion resistance over conventional portland cement mortar.
- Increased freeze/thaw durability and resistance to deicing salts.
- Compatible with coefficient of thermal expansion of concrete - Passes ASTM C-884 (modified).
- Increased density - improved carbon dioxide resistance (carbonation) without adversely affecting water vapor transmission (not a vapor barrier).
- Enhanced with FerroGard 901, a penetrating corrosion inhibitor - reduces corrosion even in the adjacent concrete.
- Not flammable, non-toxic.
- USDA approved.
- ANSI/NSF Standard 61 potable water approved.

Yield

Approximately 0.5 cu. ft./unit. Approximately 0.75 cu. ft./unit (SikaTop 111 + 42 lbs. of 3/8" pea gravel).

Packaging

Component 'A' - 1-gal. plastic jug; 4/carton. **Component 'B'** - 61.5-lb. multi-wall bag.

Typical Data *(Material and curing conditions @ 73°F and 50% R.H.)*

Shelf Life	One year in original, unopened packaging.
Storage Conditions	Store dry at 40°-95°F (4°-35°C). **Condition material to 65°-75°F before using.** Protect Component 'A' from freezing. If frozen, discard.
Color	Concrete gray when mixed.
Mixing Ratio	Plant-proportioned kit, mix entire unit.
Application Time	Approximately 30 minutes.
Finishing Time	50-120 minutes. **Note:** All times start after adding Component 'B' to Component 'A' and are highly affected by temperature, relative humidity, substrate temperature, wind, sun, and other job site conditions.

Flexural Strength (ASTM C-293) **28 days** 1,500 psi (10.3 MPa)

Splitting Tensile Strength (ASTM C-496) **28 days** 700 psi (4.8 MPa)

Bond Strength* (ASTM C-882 modified) **28 days** 2,500 psi (17.2 MPa)

Compressive Strength (ASTM C-109) (mortar)

1 day	2,500 psi (17.2 MPa)
7 days	5,500 psi (37.9 MPa)
28 days	7,000 psi (48.3 MPa)

Permeability (AASHTO T-277) **28 days** Approx. 500 Coulombs Electrical resistivity (ohm-cm) 35,000

Freeze/Thaw Resistance (ASTM C-666) 300 cycles 98%

Corrosion Testing for FerroGard 901
Cracked Beam Corrosion Tests: Reduced corrosion rates 63% versus control specimens ASTM G109 modified after 400 days

* Mortar scrubbed into substrate.

How to Use

Substrate

Concrete, mortar, and masonry products.

Surface Preparation - **Concrete/Mortar:** Remove all deteriorated concrete, dirt, oil, grease, and all bond-inhibiting materials from surface. Be sure repair area is not less than 1/2 in. in depth. Preparation work should be done by high pressure water blast, scabbler or other appropriate mechanical means to obtain an exposed aggregate surface with a minimum surface profile of ±1/16 (CSP-6) in for neat ST III PLUS (1/8 in. for extended ST III PLUS). Saturate surface with clean water. Substrate should be saturated surface dry (SSD) with no standing water, during application.

Reinforcing Steel: Steel reinforcement should be thoroughly prepared by mechanical cleaning to remove all traces of rust. Where corrosion has occurred due to the

Construction

presence of chlorides, the steel should be high-pressure washed with clean water after mechanical cleaning. For priming of reinforcing steel, use Sika Armatec 110 EpoCem (consult Technical Data Sheet).

Priming

Concrete Substrate: Prime the prepared substrate with a brush or sprayed applied coat of Sika Armatec 110 EpoCem (consult Technical Data Sheet). Alternately, a scrub coat of SikaTop 111 Plus can be applied prior to placement of the mortar. The repair mortar has to be applied into the wet scrub coat before it dries.

Mixing

Pour approximately 7/8 of Component 'A' into the mixing container. Add Component 'B' (powder) while mixing continuously. Mix mechanically with a low speed drill (400-600 rpm) and mixing paddle or mortar mixer. Add remaining Component 'A' (liquid) to mix if a more loose consistency is desired. Mix to a uniform consistency, maximum 3 minutes. Manual mixing can be tolerated only for less than a full unit. Thorough mixing and proper proportioning of the two components is necessary.

For SikaTop 111 *PLUS* concrete: Pour all of Component 'A' into mixing container. Add all of Component 'B' while mixing, then introduce 3/8 inch coarse aggregate at desired quantity. Mix to uniform consistency, maximum 3 minutes. Addition rate is 42 lbs. per bag (approx. 3.0 to 3.5 gal. by loose volume). The aggregate must be non-reactive (reference ASTMC1260, C227 and C289), clean, well-graded, saturated surface dry, have low absorption and high density, and comply with ASTM C33 size number 8 per Table 2.

note: Variances in the quality of the aggregate will affect the physical properties of SikaTop 111 *PLUS*. The yield is increased to 0.75 cu. ft./unit with the addition of the aggregate (42 lbs.). Do not use limestone aggregate.

Application & Finish

Horizontal: Mortar or concrete **must be scrubbed** into the substrate, filling all pores and voids. After filling repair, screed the material. Allow mortar or concrete to set to desired stiffness, then finish with wood or sponge float for a smooth surface, or broom or burlap-drag for a rough finish.

Form and pour or pump applications: Pre-wet surface to SSD. Vibrate form while pouring or pumping. Pump with a variable pressure pump. Continue pumping until a 3 to 5 psi increase in normal line pressure is evident then STOP pumping. Form should not deflect. Vent to be capped when steady flow is evident, and forms stripped when appropriate.

Curing

As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water based* compatible curing compound. Curing compounds adversely affect the adhesion of following layers of mortar, leveling mortar or protective coatings. Moist curing should commence immediately after finishing. Protect newly applied material from direct sunlight, wind, rain and frost.

*Pretesting of curing compound is recommended.

Limitations

- **Application thickness:**

	Min.	Max. inches one lift
Neat	1/2 inch (12 mm)	1 inch (25 mm)
Extended	1 inch (25 mm)	6 inches (150 mm)

- Minimum ambient and surface temperatures 45°F (7°C) and rising at time of application.
- Addition of coarse aggregates may result in variations of the physical properties of the mortar.
- Do not use solvent-based curing compound.
- As with all cement based materials, avoid contact with aluminum to prevent adverse chemical reaction and possible product failure. Insulate potential areas of contact by coating aluminum bars, rails, posts etc. with an appropriate epoxy such as Sikadur Hi-Mod 32.

Caution

Component 'A' - Irritant - May cause skin/eye/respiratory irritation. Avoid breathing vapors. Use with adequate ventilation. Avoid skin and eye contact. Safety goggles and rubber gloves are recommended.

Component 'B' - Irritant; suspect carcinogen - Contains portland cement and sand (crystalline silica). Skin and eye irritant. Avoid contact. Dust may cause respiratory tract irritation. Avoid breathing dust. Use only with adequate ventilation. May cause delayed lung injury (silicosis). IARC lists crystalline silica as having sufficient evidence of carcinogenicity in laboratory animals and limited evidence of carcinogenicity in humans. NTP also lists crystalline silica as a suspect carcinogen. Use of safety goggles and chemical resistant gloves is recommended. If PELs are exceeded, use an appropriate NIOSH approved respirator. Remove contaminated clothing.

First Aid

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water for at least 15 minutes, and contact a physician. For respiratory problems, remove person to fresh air.

Clean Up

In case of spillage, scoop or vacuum into appropriate container, and dispose of in accordance with current, applicable local, state, and federal regulations. Keep container tightly closed and in an upright position to prevent spillage and leakage.

Mixed components: Uncured material can be removed with water. Cured material can only be removed mechanically.

KEEP CONTAINER TIGHTLY CLOSED — KEEP OUT OF REACH OF CHILDREN
NOT FOR INTERNAL CONSUMPTION — FOR INDUSTRIAL USE ONLY
CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

Visit our website at www.sikausa.com — **1-800-933-SIKA NATIONWIDE**

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QUALITY ISO 9001 9002 ACHIEVEMENT

BASF
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EMACO® T545 (Emaco Set-45)

Rapid setting trafficable repair mortar

DESCRIPTION

Emaco T545 is a one component concrete repair and anchoring material which sets in 15 minutes and will accommodate rubber-tyre traffic 45 minutes after placement. This product bonds to both concrete and masonry and can be used indoors and outdoors for highway and heavy industrial repair jobs. There are two grades: Emaco T545 Normal for use in ambient temperatures below 29°C; and Emaco T545 Hot Weather for use in ambient temperatures ranging from 29°-38°C.

Note: Regardless of the temperature, Emaco T545 Hot Weather formula with aggregate should be used for large placements.

RECOMMENDED FOR

- Bridge deck and highway overlays
- Concrete pavement joint repairs
- Airport runway light installations
- Full depth structural repairs
- Expansion device nosings
- Anchoring iron or steel bridge and balcony railings
- Commercial freezer room repairs
- Loading dock repairs
- Parking deck and ramp repairs
- Heavy industrial repairs

FEATURES AND BENEFITS

- *Easy-to-use – just add water*
- *Wide temperature use range – from below freezing to hot weather exposures*
- *Rapid, high-early strength*
- *Superior bonding – no bonding agent is needed*
- *Resistant to freeze/thaw cycles and deicing chemicals*
- *Thermal expansion/contraction rate similar to Portland cement concrete*
- *Virtually no drying shrinkage*
- *Only air-curing required*

ESTIMATING DATA

Note: WATER CONTENT IS CRITICAL.

A 20kg bag of Emaco T545 concrete mixed with a maximum 1.4 litres of water produces a volume of approximately 0.01m³. A 60% extension (12kg/bag) using 14mm, rounded, sound aggregate produces a volume of approximately 0.014m³.

APPLICATION DIRECTIONS

Substrate condition

Surface to be repaired should be sound and free from oils and grease and other contaminants. To obtain permanent type repairs the edge of the patch should be square cut and to a depth of not less than 10mm. Flush the area with clean water to remove all debris and dust①.

Mixing Instructions

Use neat material for patches less than 25mm in depth or width. For deeper patches, 20kg bag Emaco T545 Hot Weather concrete must be extended by adding up to 12kg of properly graded, dust-free, hard, rounded aggregate②. (Do not use calcareous aggregate made from soft limestone. Test aggregate for fizzing with 10% HCl. If fizzing occurs, aggregate is unsuitable for use with Emaco T545). Mix for approximately 1 to 1½ minutes and place. Emaco T545 Normal will not freeze at temperatures above -7°C.

Note: Consult the product bag for detailed preparation and application information.

CURING

Emaco T545 should air dry for proper cure. Liquid membrane curing compounds or plastic sheeting may be used to give the surface early protection from rain, but never wet cure Emaco T545.

COLOUR

Emaco T545 dries to the colour of Portland cement mortar.

PRECAUTIONS

- Do not add sand, fine aggregate or Portland cement to Emaco T545 concrete.
- Do not use Emaco T545 for patches less than 13mm deep. For deep patches, Emaco T545 Hot Weather formula, extended with aggregate, should be used.
- WATER CONTENT IS CRITICAL. Do not deviate from the recommended water content printed on the bag.
- When mixing or placing Emaco T545 in a closed area, provide adequate ventilation.
- Do not use Emaco T545 as a precision, nonshrink grout.
- Never featheredge. For best results, always sawcut the edges of a patch.
- Moisture loss during the first three hours after placement must be avoided. Protect Emaco T545 with plastic sheeting or curing compound in the event of rapid evaporation conditions. Do NOT wet cure.
- Do not place Emaco T545 on a hot (32°C) dry substrate.
- When used in contact with galvanised steel or aluminum, consult your local BASF Construction Chemicals technical representative.

CLEANING

Tools should be cleaned with water before material hardens.

SHELF LIFE

Emaco T545 can be stored in tightly sealed original bags for 12 months if kept dry and at moderate temperature.

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EMACO® T545 (Emaco Set-45)

PACKAGING

Emaco T545 is packaged in 20kg moisture resistant bags.

PERFORMANCE DATA

Typical Compressive Strengths – MPa (Materials and curing times at specified temperatures)
AS2073 Part 10 (Modified) [All tests were performed with neat (no aggregate) material.]

	Plain Concrete @ 22°C	Emaco T545 Normal @ 22°C	Emaco T545 Normal @ 2°C	Emaco T545 Hot Weather @ 35°C
1 hour	-	20	-	-
3 hours	-	-	-	20
1 day	3.5	40	10	40
28 days	27.6	48	48	48

Modulus of Elasticity (ASTM C469)		7 days / 28 days
	Emaco T545 Normal	28.8 GPa / 31.4 GPa
	Emaco T545 Hot Weather	33.8 GPa / 36.2 GPa
Freeze/Thaw Durability Test[3] **(ASTM C 666, Procedure A modified)**	**Both Normal and Hot Weather** Emaco T545 **achieved a Relative Dynamic Modulus greater than 80% after 300 cycles.**	
Sulfate Resistance (ASTM C 1012)	**Emaco T545** length change after 52 weeks – 0.9%.	
Typical Setting Times (Gilmore ASTM C 266 modified)	**Emaco T545 Normal** at 22°C and **Emaco T545 Hot Weather** at 35°C had the following typical setting times: Initial – 10 to 15 minutes Final – 12 to 20 minutes.	
Coefficient of Thermal Expansion[4] (CRD-C 39-81)	Both **Emaco T545 Normal** and **Emaco T545 Hot Weather** had coefficients which equated 12.8 x 10^{-6}/°C.	
Flexural Strength (ASTM C 78 modified)	75mm x 100mm x 406mm prisms at 1 day strength **Emaco T545** mortar – 3.8MPa **Emaco T545** mortar with (10mm) pea gravel – 4.2MPa **Emaco T545** mortar with (10mm) crushed angular non-calcareous hard aggregate – 4.5MPa	

[1] Surface carbonation inhibits chemical bond. Apply an indicator to the prepared surface to determine if carbonation is present.
[2] Special procedures must be followed when angular aggregate is used. Consult you local BASF Construction Chemicals technical representative for more information.
[3] Method states that test is discontinued when 300 cycles or an RDM of 60% is reached.
[4] Determined using 25mm x 25mm x 279mm bars. Test was run with neat mixes (no aggregate). Lower coefficient of thermal expansion results are obtained when extended mixes (with aggregate) are used.

All BASF Construction Chemicals Australia & New Zealand data sheets are updated on a regular basis, it is the user's responsibility to obtain the most recent issue AEmacoT545/8/1206

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SONOSHIELD® HLM 5000

Liquid cold-applied waterproofing membrane system

DESCRIPTION

Sonoshield HLM 5000 is a single component, bitumen modified, polyurethane based waterproofing membrane that cures by reaction with atmospheric moisture to form a tough membrane. Sonoshield HLM 5000 protects structures from water penetration while remaining flexible to handle the nominal expansion and contraction of substrates.

COMPLIANCES

- ASTM C 836
- National standard of Canada 37.58-M86 developed by CGSB

RECOMMENDED FOR

Waterproofing exterior below grade concrete and between concrete slab applications.

FEATURES AND BENEFITS

- *Standard and high-build systems*
  Degrees of protection available
- *Waterproofs concrete*
  Protection of structure from water penetration
- *Flexible*
  Permits nominal expansion and contraction
- *Wide service temperature range*
  Suitable for all climates
- *Chemical resistant*
  Resists bacterial attack and many acids, alkalis, and salts
- *Monolithic liquid-applied membrane*
  Eliminates lapping, seaming, and precutting
- *Single pack and one coat finish*
  Very easy to apply
- *Tough and durable*
  Long-term protection

PERFORMANCE DATA (Typical)

Self leveling grade

Property	Results	Test Method
Shore OO hardness	85	ASTM C 836
Tensile strength – MPa	1.0	ASTM D 412
Average elongation %	600	ASTM D 412
100% modulus - MPa	0.6	ASTM D 412
Moisture vapor permeability, dry perms	0.1	ASTM E 96
Crack bridging test, cycled 10 times per 24 hours at –9°C	Passed @1.5mm	ASTM C 836
Extensibility after heat ageing	No cracking	ASTM C 836
Weight loss (20% max)	16%	ASTM C 836

SPECIFICATIONS

Supply form	Liquid
Colour	Black
Viscosity in poise of various grades, Brookfield	Self Level - 125, Spray - 450, Roller - 800, Trowel - 4000
Application temperature	5°C to 35°C
Single Pack	Yes
Minimum recovery	90%
Swelling in water	Nil
Service temp, range	-40°C to 120°C

APPLICATION

For information on application, curing and protection boards, refer to *"Application Guide for Sonoshield HLM5000"* available from your local BASF Construction Chemicals representative.

FOR BEST PERFORMANCE

- Apply Sonoshield HLM 5000 when substrates are dry and air temperatures are between 5°C and 35°C.
- Avoid application when inclement weather is present or imminent.
- Use Sonolastic NP 1 or Ultra in internal corners to break bond.
- Do not apply to reinforcing bars or to wet or contaminated surfaces.
- Carefully work material over irregular concrete to avoid pinholes and holidays.
- Do not apply to surfaces treated with curing and bond-breaking compounds unless they have been removed or are compatible.
- Protect Sonoshield HLM 5000 coated surfaces from puncture until required topping or backfill is placed.
- Cold temperatures influence viscosity and handling characteristics of Sonoshield HLM 5000. Heat increases and cold decreases the flow; keep Sonoshield HLM 5000 cool in hot weather and warm in cold weather.
- Fill all voids and deep depressions in substrates before applying Sonoshield HLM 5000.
- Do not apply Sonoshield HLM 5000 over silicone sealants that are not cured completely, e.g. corners of wet areas.
- Sonoshield HLM 5000 is not intended as an exposed or wearing surface.
- Do not use where a solvent odor is objectionable.

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SONOSHIELD® HLM 5000

ESTIMATING DATA

Wet Film Thickness @ 1.65mm = 0.6m²/litre.
Coverage per 18.93 litres is approximately 11.6m²

PACKAGING

Sonoshield HLM 5000 comes in a variety of grades for different applications, dependant on surface profile, texture and horizontal or vertical.

- Sonoshield HLM 5000SL (self leveling) is formulated for application by squeegee or trowel to horizontal areas.
- Sonoshield HLM 5000S (spray or roller) is a versatile formulated version for spray application and or rolled onto horizontal or vertical surfaces.
- Sonoshield HLM 5000R (roller) is formulated for application by roller to vertical and some horizontal surfaces.
- Sonoshield HLM 5000T (trowel) is formulated for application by trowel to any surfaces.

All grades are available in 18.93 litre pails.

SHELF LIFE

Shelf life is 18 months in unopened containers when stored under dry conditions between +4°C and 30°C. During storage, an easily removed skin of Sonoshield HLM 5000 may form, which does not affect use of the product.

PRECAUTIONS

KEEP OUT OF REACH OF CHILDREN. Use only with adequate ventilation. Prevent contact with skin, eyes, and clothing. Wash thoroughly after handling. Use impervious gloves and eye protection. If the TLV is exceeded or Sonoshield HLM 5000 is used in a poorly ventilated area, use approved respiratory protection.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, seek medical attention. Remove and wash contaminated clothing. If inhalation effects occur, remove to fresh air. If discomfort persists or any breathing difficulty occurs, or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION. Refer to Material Safety Data Sheet (MSDS) for further information.

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PRODUCT DATA

7 07 18 00 **Concrete Rehabilitation**

DEGADECK® CRACK SEALER PLUS

Reactive methacrylate resin for sealing cracks and concrete decks

Description

Degadeck® Crack Sealer Plus is a very low viscosity, low surface tension, solvent free, rapid curing reactive methacrylate resin formulated to penetrate, repair and seal cracks in concrete substrates.

POWDER HARDENER is 50% dibenzoyl peroxide (BPO) in granulated powder form to initiate the cure of the Degadeck® resin.

Yield

100 ft²/gallon (2.5 m²/L), depending on number and volume of cracks as well as porosity of concrete.

Powder Hardener:
See mixing charts for the appropriate products.

Packaging

Degadeck® Crack Sealer Plus is sold by weight and packaged in 38 lb (17.3 kg) pails and 396 lb (180 kg) drums. This is equivalent to 4.7 gallons (17.8 L) and 49 gallons (185.5 L) respectively.

Powder Hardener:
2.5 lb bottle
50 lb box

Color

Clear liquid

Shelf Life

1 year when properly stored

Storage

Store in cool, clean, dry area.
Keep out of direct sunlight. Maximum storage temperature is 86° F (30° C).
Store in original and unopened container.

Features	Benefits
• Fast curing (1 hour)	On highway and bridge projects, allows fast return of traffic flow, contributing directly to worker and driver safety
• UV resistance	Exposure to sunlight does not affect product performance
• Weather and aging resistant	Provides long-lasting service life
• 2 component	User friendly; ease of installation; shelf life stable
• Compatible with other Degadeck® methacrylate systems	Provides complete systems approach to concrete protection
• Protects against water and chloride ion ingress	Prevents premature deterioration
• Can be can be applied with cold weather additive to surface temperatures down to 10˚ F. (Please contact technical services for detailed information.)	Extended application season

Where to Use

APPLICATION

- Bridge decks
- Parking structures
- Civil engineering applications
- Penetrating flood coat sealer to prevent moisture and ion ingress into substrate

LOCATION

- Exterior
- Horizontal

SUBSTRATE

- Concrete

How to Apply

Surface Preparation

1. Inspect the concrete substrate before preparation. Note the location of surface cracks and the presence of contaminants. Concrete surfaces must be dry and free of dust, dirt, oil, wax, curing compounds, efflorescence, laitance, and all other bondbreaking materials.
2. Inspect the underside of the deck for signs of leakage due to full depth cracks.
3. Check weather forecast to ensure dry conditions. Wet substrates must be allowed to dry prior to beginning work.
4. Using a dust-free, mobile shotblaster or gritblaster, brush-blast the substrate to expose surface cracking.
5. Do not use wet preparation methods.
6. Perform a second inspection, noting newly-found surface cracks. Mark these for pre-treatment. Clean out cracks and the deck surface with oil-free compressed air.

Protection and Repair

Technical Data

Composition

Degadeck® Crack Sealer Plus is a reactive methacrylate resin.

Compliances

- Degadeck Crack Sealer Plus is classified under DOT regulations as Resin Solution, UN 1866, Class 3, PG II.

Test Data

PROPERTY	RESULTS	TEST METHODS
Appearance	Liquid	
Specific gravity	0.97	DIN 51757
Viscosity, cP (mPa-sec), at 73° F (23° C)	5-15	ASTM D 2393
Flash point, ° F (° C)	48 (9)	DIN 51755
Tensile strength, psi (MPa)	8,100 (56.4)	ASTM D 638
Compressive, psi (MPa)	12,800 (88.2)	ASTM D 638
Flexural Strength, psi (MPa)	11,550 (79.6)	
Elongation at break, %	5.5	ASTM D 638
Hardness, Shore D	> 80	ASTM D 2240
Water absorption, % / 24 hrs	0.60	ASTM D 570

Mixing

Degadeck® Crack Sealer Plus must be mixed with the appropriate amount of Powder Hardener just prior to application. Air/substrate temperature determines the amount as follows:

DEGADECK CRACK SEALER (1 GALLON)

TEMPERATURE ° F (° C)	WEIGHT %	VOLUME OUNCES
41 (5)	5	11
50 (10)	4	8.5
59 (15)	3	6.5
68 (20)	2	4
86 (30)	1	2

* Please consult BASF Technical Services for applications outside this temperature range.

Using clean, dry plastic buckets, add Powder Hardener to Degadeck® Crack Sealer Plus and mix until dissolved (approximately 1 minute). Mixed Degadeck® Crack Sealer Plus must be applied immediately. Do not exceed 5-gallon (20 L) batch mixes.

Application

1. Degadeck® Crack Sealer Plus is applied as a flood coat in a gravity-fed process by broom or roller.

2. The contents of the mixed batch should be immediately poured onto the substrate and worked into cracks by distributing with 1/2" to 3/4" (13 – 20 mm) nap solvent grade rollers or broom. Do not allow material to pond. Application rate is 100 ft^2/gal (2.5 m^2/L).

3. Do not allow the mixed batch to remain in the mixing vessel. It is advisable to randomly broadcast a 30 mesh (600 µm), dry aggregate into the wet, uncured resin at the rate of approximately 4 lb/100 ft^2 (200 g/m^2).

4. Working time for Degadeck® Crack Sealer Plus is between 10 and 15 minutes once it has been applied to the substrate. Full cure to specification will be between 45 minutes and 1 hour.

Pre-Treat Wide Cracks

Cracks over 1/8" (3 mm) should be treated individually prior to deck application. Full depth cracks may require alternative treatment to prevent runoff of resin. Fill wider cracks with dry, 30 mesh silica sand. Mix a small amount of Degadeck® Crack Sealer Plus, pour into cracks and distribute with a paint brush. Squeeze bottles can also be used.

Drying Time

Allow one hour for Degadeck® Crack Sealer Plus to gain full mechanical properties. Check for dry-to-touch condition. End result should be a darker-colored, matte finish with a minimal surface film and some loose broadcast aggregate. Open to traffic.

Clean Up

Clean tools as needed with MMA, acetone, ethyl acetate or similar solvents.

For Best Performance

- Application temperature range of substrate is between 41 and 104° F (5 and 40° C).
- Degadeck® Crack Sealer Plus is NOT a high molecular weight methacrylate (HMWM).
- DO NOT use for vertical surface treatments.
- Degadeck® Crack Sealer Plus is a sacrificial film that will wear out over time, however the cracks will continue to be protected.
- Periodically inspect the applied material and repair localized areas as needed. Consult a BASF representative for additional information.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and not for supervising or providing quality control on the jobsite.

Health and Safety

DEGADECK CRACK SEALER PLUS

Warning

Degadeck® Crack Sealer Plus contains methyl methacrylate; acrylic polymer; and methacrylic acid ester.

Risks

FLAMMABLE LIQUID AND VAPOR. May cause skin and eye irritation. Ingestion may cause irritation. Inhalation of vapors may cause irritation and intoxication with headaches, dizziness and nausea. Repeated exposure may cause injury to the kidneys and liver. Repeated or prolonged overexposure may cause central nervous system damage. May cause dermatitis and allergic responses. Repeated or prolonged contact with skin may cause sensitization.

Precautions

KEEP AWAY FROM HEAT, FLAME AND SOURCES OF IGNITION. Heat, aging, or contamination may lead to violent rupture of sealed containers. Vapors are heavier than air. Keep container closed. Check periodically for warm or bulging containers. Use only with adequate ventilation. DO NOT get in eyes, on skin or on clothing. Wash thoroughly after handling. DO NOT breathe vapors. DO NOT take internally. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH approved respiratory protection in accordance with applicable Federal, state and local regulations. Empty container may contain hazardous residues. All label warnings must be observed until container is commercially cleaned or reconditioned.

First Aid

FIRST AID MEASURES: In case of eye contact, flush thoroughly with water for at least 15 minutes. SEEK IMMEDIATE MEDICAL ATTENTION. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation effects occur, remove to fresh air. If discomfort persists or any breathing difficulty occurs, or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

VOC Content

< 250 g/L or 2.09 lbs/gallon, less water and exempt solvents.

POWDER HARDENER

Danger - Organic Peroxide

Powder Hardener contains dibenzoyl peroxide; and dicyclohexyl phthalate.

Risks

May cause skin, eye and respiratory irritation. May cause dermatitis and allergic responses. Repeated or prolonged contact with skin may cause sensitization. May cause dermatitis and allergic responses. Ingestion may cause irritation.

Precautions

KEEP AWAY FROM HEAT, FLAME AND SOURCES OF IGNITION. Use only with adequate ventilation. Avoid contact with skin, eyes and clothing. Keep container closed when not in use. Wash thoroughly after handling. DO NOT take internally. Prevent inhalation of dust. Use impervious gloves, eye protection and if the TLV is exceeded or used in a poorly ventilated area, use NIOSH/MSHA approved respiratory protection in accordance with applicable Federal, state and local regulations. Empty container may contain hazardous residues. All label warnings must be observed until container is commercially cleaned or reconditioned.

First Aid

In case of eye contact, flush thoroughly with water for at least 15 minutes. In case of skin contact, wash affected areas with soap and water. If irritation persists, SEEK MEDICAL ATTENTION. Remove and wash contaminated clothing. If inhalation causes physical discomfort, remove to fresh air. If discomfort persists or any breathing difficulty occurs or if swallowed, SEEK IMMEDIATE MEDICAL ATTENTION.

Refer to Material Safety Data Sheet (MSDS) for further information.

VOC Content

0 g/L or 0 lbs/gallon, less water and exempt solvents when components are mixed and applied per manufacturer's instructions.

For medical emergencies only,
Call ChemTrec (1-800-424-9300).

BASF Construction Chemicals, LLC – Building Systems

889 Valley Park Drive
Shakopee, MN, 55379

www.BuildingSystems.BASF.com

Customer Service 800-433-9517
Technical Service 800-243-6739

Form No. 1031118 4/08
Printed on recycled paper including 10% post-consumer fiber.

CBC 6

SEGMENTAL EPOXY

FLORIDA PRESTRESSED CONCRETE ASSOCIATION INC.

TYPE: **Pilgrim CBC 6** is a solvent free, 2 component thermosetting, sealing and bonding system for matched cast faces of joints between precast concrete segments. Two Formulations Normal & Slow-Set.

Florida DOT Section 453 & Type A,B,F1
Texas DOT Special Specification Item 8706
ASTM C881 TYPE VI & VII

DESCRIPTION: **Pilgrim CBC 6** is a moisture insensitive high strength paste adhesive ideally suited for vertical and overhead bonding. Like all Pilgrim liquid epoxy formulations, it is distinguished by 100% solids. No solvents. Good water resistivity, low-creep characteristics and tensile strength greater than concrete. In addition CBC 6 functions as a lubricant during the joining of match cast segments. The cured CBC 6 provides intimate contact for stress transfer by filling all interstitial space between the match cast segment faces..

ADVANTAGES:

- Pre-proportioned units.
- Adheres to most materials used in construction.
- Non-sag consistency
- High tensile and compressive strength
- Good UV stability
- Resistant to the action of weathering, moisture, acids, alkalis

PROPERTIES OF CURED STATE: (*minimums*)

	Normal-Set	Slow-Set
Open Time	1000 psi	1000 psi
Shear Strength	6000 psi	6000 psi
Compressive Strength	6000 psi	4000 psi
Temperature Deflection	122°F	122°F

HANDLING PROPERTIES:

Consistency, sag	0.0	0.0
Gel Time,1 gallon.	30 min.	30 min.
Contact Time	60 min.	8 hrs.
Max. Exotherm, 100 grams @ 77°F	315°	122°F
Color, mixed	Gray	Gray

PACKAGING: 3 gallon units.

PILGRIM PERMOCOAT, INC.
Main office and factory: 402 S. 22nd Street, Tampa, Fl 33605 (813) 248-3328 FAX# (813) 248-1076
Distribution : USA, Canada & Caribbean

Normal-Set Epoxy formulated for three application temperatures:

1: For application at substrate temperatures from 75°F to 105°F
2: For application at substrate temperatures from 55°F to 75°F
3: For application at substrate temperatures from 40°F to 55°F

Slow-Set Epoxy formulated for two application temperature:

1. For application at substrate temperatures from 70°F to 105°F
2. For application at substrate temperatures from 40°F to 70°F

SURFACE PREPARATION: The interfaces of the units shall be lightly sandblasted or waterblasted before erection to remove the laitance. Before applying **CBC 6**, the interfaces must be clean and free from laitance and any bond breaking material. The surfaces shall have no free moisture on them. Free moisture shall be considered to be present if a rag wiped over the surface gathers any dampness.

MIXING: Units are preproportioned in proper reacting ratio in ready to use containers. Pour entire contents of container B into container A. Mix thoroughly with mechanical Jiffy mixer (or equivalent) at 400-600 rpm for 3 to 4 minutes or until a uniform color and consistency is achieved. Mix only complete units.

APPLICATION: Application shall begin immediately after batch has been mixed. Application shall be to a nominal thickness of 1/16" applied with a spatula, trowel or gloved hand.

COVERAGE: 1 gallon of **CBC 6** yields 231 cu. in. of epoxy and at 1/16" will cover 25.5 sq. ft.

LIMITATIONS: Do not thin **CBC 6**--Solvents will prevent proper cure. Exposure to temperatures (after cure) above 200°F dry and 140°F wet not recommended. Substrate temperature must not be below 40°F.

STORAGE: Store inside at moderate temperatures. Shelf life of **CBC 6** is 2 years from date listed on containers.

HANDLING PRECAUTIONS: May produce skin irritations. Skin contact should be avoided by the use of protective clothing such as rubber gloves and eye protection. Consult Material Safety Data Sheets.

CLEAN-UP: Pilgrim #5 CLEANER is formulated to remove uncured material from tools and equipment. Do not allow material to harden on tools. #5 Cleaner is Flammable, consult Material Safety Data Sheets before use.

CBC 6 COVERAGE

Thickness (1000 mils = 1in.)	Coverage / gallon
1/4" = 250 mils	6.4 sq. ft.
3/16" = 187 mils	8.5 sq. ft.
1/8" = 125 mils	12.8 sq. ft.
1/16" = 62.5 mils	25.5 sq. ft.

PILGRIM

Civil Engineering

Magmaflow Grout-Pak

Magmaflow Grout-Pak a 3 component, 100% solids, modified epoxy system formulated to produce a moisture-insensitive, chemical resistant epoxy grout. Meets requirements of Florida DOT Section 926, Type Q - Compounds to protect the anchorages of post-tensioning tendons or bars.

Advantages

- Pre-proportioned units
- High Flowability and fill characteristics
- Good chemical, corrosion and impact resistance
- Excellent Adhesion
- Long working time
- Low exotherm
- Excellent bearing area for even distribution of loads

Packaging

1/2 cu. Ft. unit - Component A (Resin) Component B (Curing agent) Component C (Aggregate).

Color – Concrete Gray

Property	Test Value	Test Method
Compressive Strength Cubes 7 day Cure @ 73°F	17,700 psi	ASTM C 579B
Tensile Strength @ 7 Day	2140 psi	ASTM C 307
Flexural Strength @ 7 Day Cure @ 77°F	3790 psi	ASTM C 580
Modulus of Elasticity @ 7 Day Cure @ 77°F	1,800,000 psi	ASTM C 580
Coefficient of Thermal Expansion @ 74° to 210°F	14.8 X 10^{-6} in./in./°F	ASTM C 531
Peak Exotherm, Specimen 12” X 12” X 3”	140° F	ASTM D 2471
Slant Shear @ 7 days Bond Strength to Concrete	7600 psi	ASTM C 882
Thermal Compatibility	Passed	ASTM C 884
Linear Shrinkage @ 7 days	< 0.025%	ASTM C 531
Flowability and Bearing	> 90 % Contact area	ASTM C 1339
Gel Time Specimen 12” X 12” X 3”	63 min.	ASTM D 2471

Pilgrim Permocoat, Inc.
402 South 22nd Street, Tampa, Florida 33605
(813) 248-3328 , (800) 637-3328

Compressive Properties	ASTM C-579		
Compressive Strength, psi	40°F	73°F	90°F
8 hour	-	-	8,500
16 hour	-	9,500	10,200
24 hour	-	11,900	13,400
3 day	5,600	17,000	17,000
7 day	8,000	17,700	17,800

SURFACE PREPARATION

Substrate must be clean, sound, and free of standing water. Remove dust, laitance, oils, grease, curing compounds and any foreign substances that may interfere with adhesion. Remove by mechanical means (i.e., sandblasting, grinding, bush hammering). Sandblast metal surfaces for maximum adhesion. Minimum surface preparation for steel is grinding or mechanical wire brushing. Mix and apply grout ASAP to prevent oxidizing.

LIMITATIONS

Minimum application and substrate temperature 40°F. Condition all components to 70°+ to assure good flow properties. Minimum grout depth is 1 inch. Maximum grout depth is 12 inches. If more than 12 inches is required, pour in lifts after first lift has developed initial cure. Cold material has reduced flow properties. Mix only complete units.

FORMING

Magma flow Grout-Pak has a tenacious bond to most materials. Forms must be coated with a bond breaking polyethylene or a paste wax. Seal forms with putty, caulking or foam – forms must be liquid tight. Prepare forms with a 2" head to facilitate placement. Attaching a grout box to the form can enhance flowability.

MIXING

Aggregate must be completely dry.

Precondition all components to 70°F+ for 24 hours before using. Remove from the pail all three components. Pour the A & B Component into the pail & mix with a "Jiffy Mixer" blade attached to a 3/4 drill motor for two minutes. Immediately add entire contents of the aggregate component. Mix again for 3 minutes. Pour the mixed grout into forms without delay.

CLEAN-UP

Clean tools and equipment with Pilgrim #5 Cleaner.

STORAGE

Store inside in tightly closed containers at moderate temperatures. Shelf life is two years in original packaging.

HANDLING PRECAUTIONS

For Industrial Use Only! Warning! May produce skin irritation and on prolonged contact may cause serious skin dermatitis. Skin contact should be avoided by use of protective clothing such as rubber gloves and eye protection. Any skin coming in contact with resin should be washed thoroughly with soap and water. Eye contact should be avoided; should it occur, flush thoroughly with water for at least 15 minutes.

WEAR PROTECTIVE CLOTHING, GOGGLES, GLOVES, etc.

Consult Material Safety Data Sheets.

Pilgrim Permocoat, Inc.
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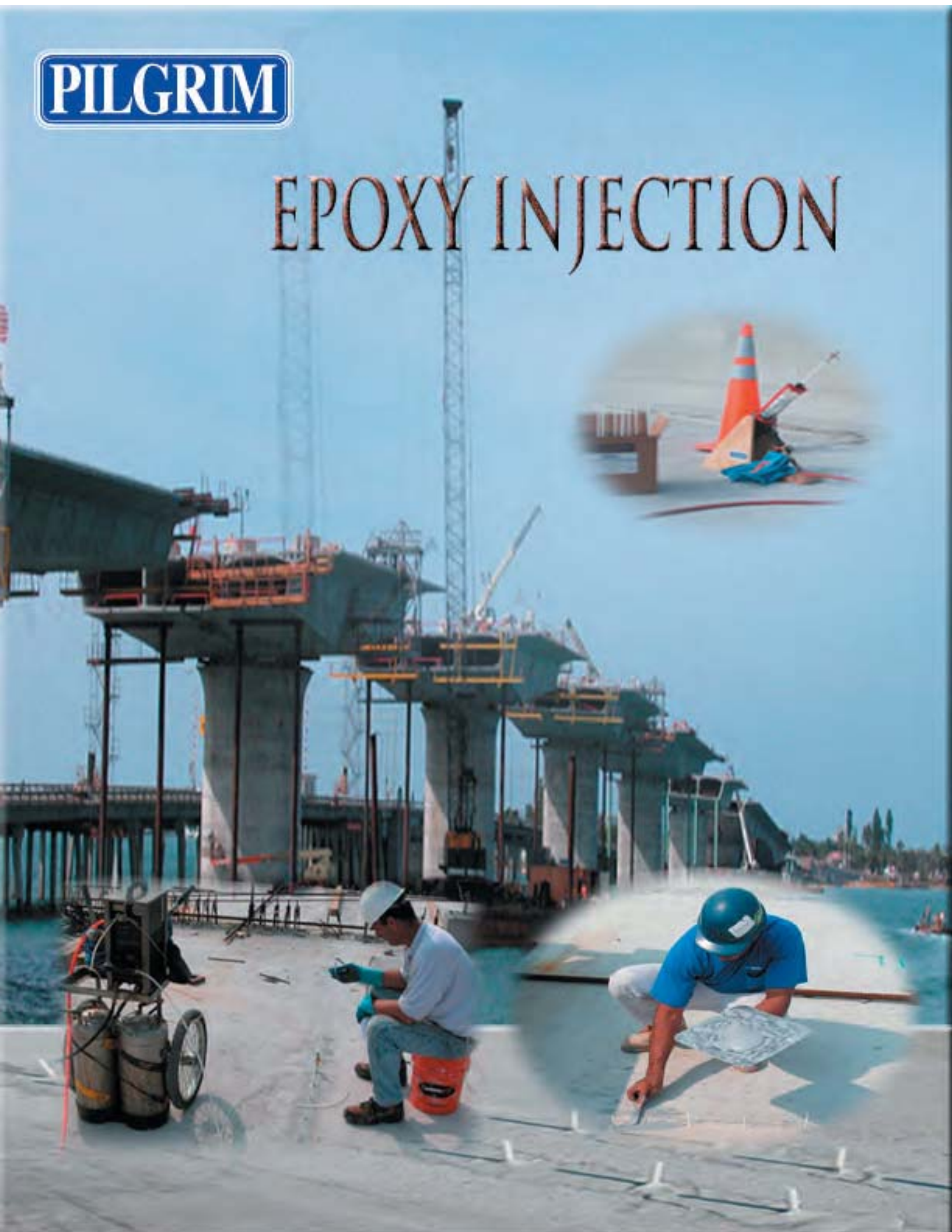
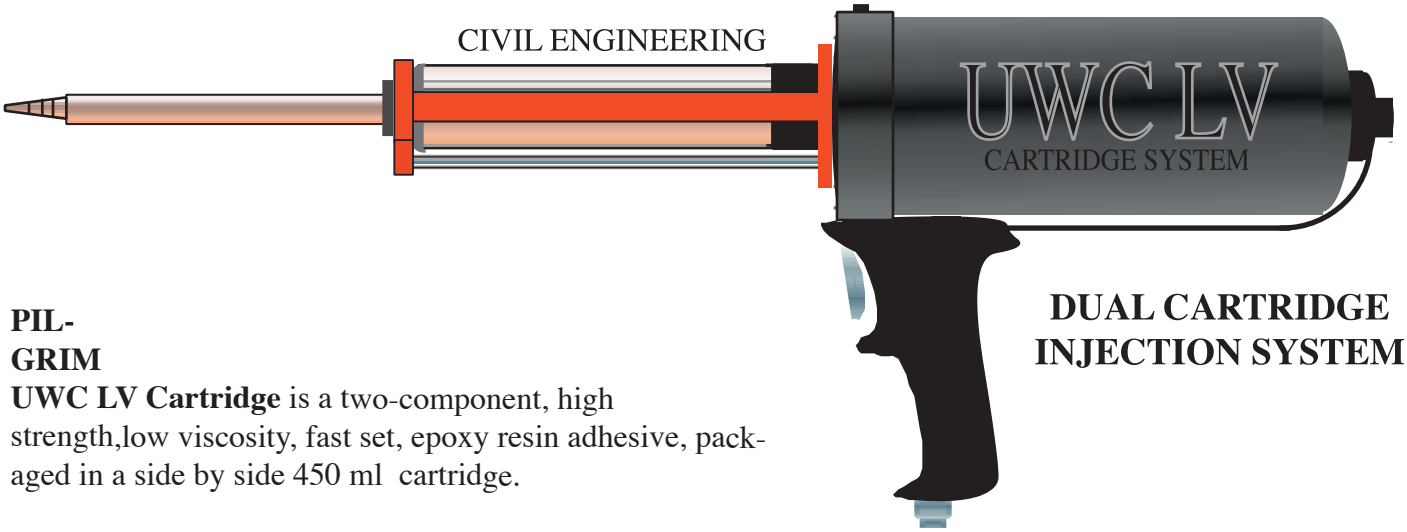
(813) 248-3328 , (800) 637-3328

PILGRIM

EPOXY INJECTION



CIVIL ENGINEERING



DUAL CARTRIDGE INJECTION SYSTEM

PIL-
GRIM
UWC LV Cartridge is a two-component, high strength,low viscosity, fast set, epoxy resin adhesive, packaged in a side by side 450 ml cartridge.

Provides point-of-use application to save time, material and minimize health hazards. The **PILGRIM UWC LV Cartridge** provides a unique method of handling, storing and dispensing of two component materials. Ideal for low to medium volume material users that wish to eliminate problems associated with the use of two component epoxy adhesive.

USES:
Specifically designed for crack injection, **UWC LV** provides degree of convenience, ease and speed of use, affords the contractor maximum efficiency. Recap cartridges for later use - only a new static mixing tip will need to be replaced. UWC LV is moisture insensitive; use on dry, damp or wet surfaces.

BENEFITS:

- No large capital expense
- Eliminates material waste
- Saves time
- Rapid physical properties development
- Eliminates aerated mix
- No clean up solvent needed
- Little operator skill needed
- Low maintenance
- Increased productivity
- Unlimited, low cost dispense points

TYPICAL PROPERTIES

Gel Time, min.	20
Viscosity, cps	180
Water absorption, 24hr.	0.4%
Heat Deflection Temp., °F	133
Tensile Strength, ASTM D638	5,660 psi
Tensile Modulus, ASTM D 638	567,00psi
Shore D hardness, ASTM D2240	81
Flexural Strength, ASTM D790	8,700 psi
Flexural Modulus,psi	567,000
Compressive Strength, ASTM D695	9540 psi (72 hrs.)
Bond Strength, ASTM C882	2775 psi
2 day (moist Cure), 60°F	

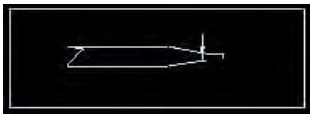
Florida DOT Type E
Louisiana Type 11A
Georgia DOT Type V

GENERAL RECOMMENDATION: Consult Pilgrim "Crack Injection Procedure" bulletin.

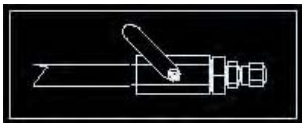
SURFACE PREPARATION:

Concrete substrates must be - sound, clean, free from, dust, curing or parting compounds, oil, waxes, impregnations and foreign particles. Substrate temperature must not be below 40°F.

DISPENSE INSTRUCTIONS (HP™ Pneumatic Gun)



CUT STATIC TIP AT POINT SHOWN



TIGHTLY SCREW ON SHUT OFF COCK

1. Load cartridge into air gun
2. Hold cartridge and gun at 45° angle (cartridge threaded end up)
3. Remove protective nose caps from cartridges. (Black)
4. Attach air hose (regulate to 5 psi only, while equalizing pistons)
5. Activate trigger to equalize pistons. Discard first 10 cc's of material or continue equalizing pistons until no air is apparent in either A or B cartridge.
6. Close valve and regulate to 30 - 125 psi. Attach static mixer and back flow valve. Refer to Supply Pressure Chart for injection input and output pressures.
7. Attach "shut off cock" and "connect-it" to static tip
8. Activate trigger to dispense material.
9. Close valve, leave mixer on and put back on the shelf. Allow mixer to act as a seal. Replace with new static mixer before reusing cartridge.

NOTE: Flush line assembly with Pilgrim #5 Cleaner

Either air powered or manual, trigger-operated guns are available, specifically designed for use with the **PILGRIM UWC LV.** Note: Air powered is preferred when dispensing large volumes. Air power dispensing is required to meet florida DOT injection requirements.

PACKAGING:

12 cartridges/carton
One 1/8" diameter 18 element mixer with retaining collar/cartridge
protective nose cap installed on each cartridge.

CAUTION: Contains epoxy resins, organic amines. Toxic before cure. Avoid vapor inhalation, contact with skin, eyes. Consult Material Safety Data Sheets for complete information on safety and handling.

WARNING! Improper cartridge pressure may force material out of rear of cartridge!
Use safety eye wear!

PILGRIM

GENERAL CRACK INJECTION PROCEDURE

IDENTIFY CRACKS

Cracks are classified as structural and nonstructural. No sealing or repair of structural cracks shall be accomplished by the contractor without having a repair procedure approved in advance by the Engineer. Nonstructural cracks shall be sealed according to the criteria listed below. Structural cracks are those which are induced by external forces which produce internal stresses exceeding the tensile strength of the concrete, commonly referred to as working cracks and those caused by overloads. Nonstructural cracks are those which appear as a result of component materials characteristics, atmospheric effects and localized constraint effects, commonly called shrinkage cracks. In any case, the Engineer shall determine the classification of cracks. Mark cracks to be injected with colored chalk or marker.

SURFACE PREPARATION

Prior to injection, concrete surfaces adjacent to the cracks shall be prepared to expose clean, sound concrete.

INSTALLING INJECTION PORTS

Injection ports may be installed as surface mount or ports may be installed in 1/2" drilled holes. Ensure ports are positioned directly over cracks that are to be injected. Surface mount ports can be anchored to concrete surfaces with EM 5-2 Gel or a "Crazy Glue Gel". Care must be taken to ensure port anchoring material does not block path of injection resin to crack.

Install ports to both sides of a wall, that is cracked all the way through. Ports at the back of the wall should be halfway between those in the front. Seal both sides of crack, with EM 5-2 Gel . Install ports 8 to 20 inches apart depending on depth & width of crack.

Apply approximately 3-5 mm of surface sealing compound (5-2 Gel) to the outer edge of injection port base flanges. Ensure the surface sealing compound is applied to the base of the flange, as close to the outer edge of base as possible. Allow surface sealing compound to cure.

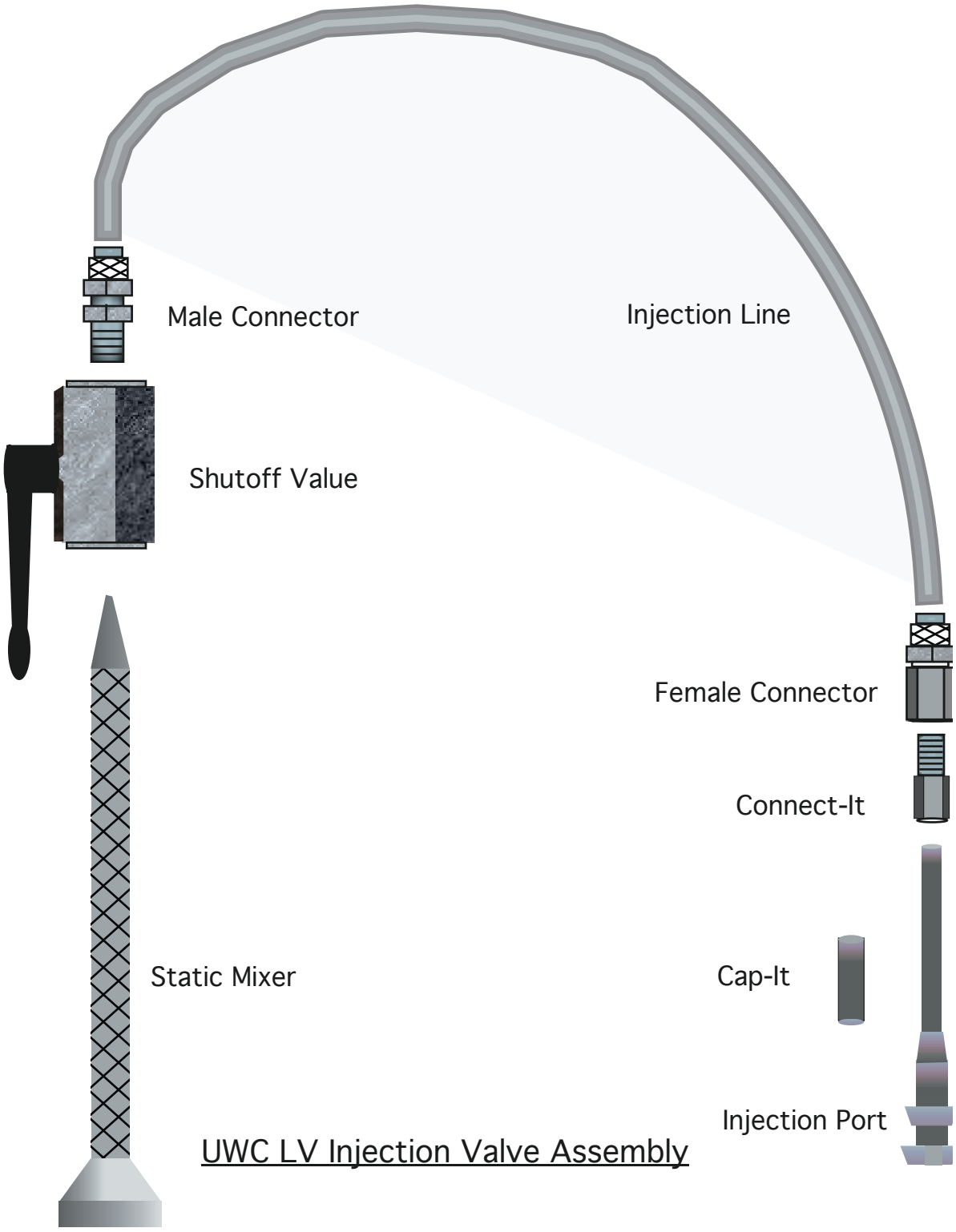
SURFACE SEALING (CRACKS)

EM 5-2 Gel is designed as a surface sealing crack compound, supplied in quart and gallon units (mix ratio, 1 to 1 by vol.) or in a two-component cartridge dispensed either manually or by air. Seal the surface of the cracks. EM 5-2 Gel can be applied either with a spatula or putty knife. The width of the surface sealing epoxy when applied, should extend a minimum .5 inches from the edge of each side of the crack. Thorough sealing of the ports and crack surface is very important.

INJECTION

Always start injecting at the lowest point. This is particularly important when treating vertical cracks. Attach valve with "Connect-it" Assembly to static mixer. Lock "Connect-it" to port to begin injecting. Pump PILGRIM UWC LV into injection port via manual or pneumatic gun until resin begins to flow out of adjacent port. Port sealing plugs may then be installed before proceeding to next port. Repeat the process until all of the ports have been injected, and closed off.

If necessary and time permits, re-inject previously injected ports by re-opening the port. This will ensure as much injection compound as possible, has been injected into the crack. This is particularly worthwhile doing, as injection compound initially injected, passes through the substrate via capillary action.



UWC LV Injection Valve Assembly

Environment [4]	Crack Width "	Location [2]	Treatment [3, 1]
Extremely Aggressive	Less than .006	Substructure and Superstructure	Coat with penetrant sealer
	Greater than .006 and less than .012	Substructure including Super-structure less than 18ft. above existing ground or high water elevation.	Epoxy injection
		Superstructure including those portions of the substructure more than 18 ft. above existing ground or high water elevation.	Coat with penetrant sealer
	Greater than .012 and less than .025	Substructure and Superstructure	Epoxy injection
Moderately Aggressive	Less than .006	Substructure and Superstructure	No treatment
	Greater than .006 and less than .012	Substructure including superstructure less than 18ft. above ground or high water elevation.	Coat with penetrant sealer
		Superstructure more than 18ft, above existing ground or high water elevation.	No treatment
	Greater than .012 and less than 0.25	Substructure and Superstructure	Coat with penetrant sealer
Slightly Aggressive	Less than .025	All locations	No treatment

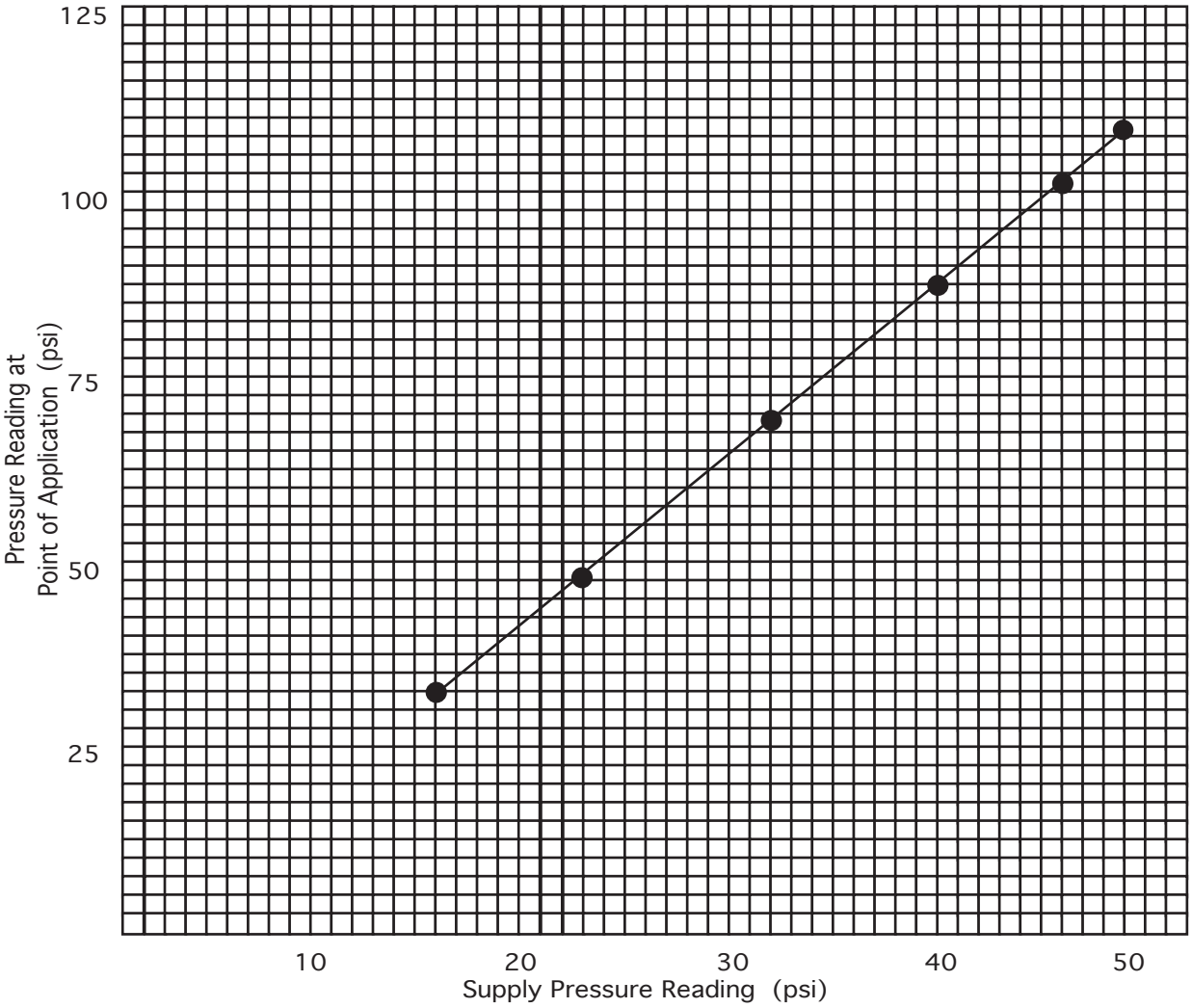
Make: Cox

Model: PPA 300A

Test Range

Supply: 26 - 48

Applicator: 32 - 115



Supply Pressure vs. tip Pressure

The test range at supply point was 26 - 48 psi resulting in a tip pressure 32 -115 psi. The Cox gun is rated to 125 psi supply pressure. The following supply pressure resulting in tip pressures has been extrapolated from Test lab's report to demonstrate that with 75 psi air supplied, the resulting pressure is 200 psi.

Supply Pressure	Tip Pressure
20	38
30	70
40	95
50	120
60	145
70	190
80	220

Urocel 65

2 component Aliphatic Urethane

Product Description

Urocel 65 is a high solids chemical resistant two-component saturated polyester aliphatic urethane coating having exceptional resistance to most chemicals and excellent anti-soil properties. Displays excellent gloss retention on extended exterior exposures.

Recommended Uses

Use as a decorative and protective finish coat for metal, wood, and concrete in severe industrial, marine and process environments. Very good in environments exposed to acids, alkalis, salts and solvents. Recommended in heavy industrial and marine atmospheres where long maintenance free life is required. Use as a sealer (clear) to protect and provide depth of gloss for urethane coated transportation equipment. Especially useful on floors in such areas as aircraft hangers, service bays, and warehouse floors where light reflectance, chemical and abrasion resistance are required. Because of **Urocel 65**'s high crosslink density and non-toxic cured state it is an acceptable coating for food and beverage process plants and hospital facilities.

Physicals	Volume Solids	65%
	VOC	3.21 lbs./gal.
	Weight/gal.	8 lbs.
	Temp. Res.	250°F
Color/Gloss	Color	Clear, Std. Colors, Custom
	Sheen	Gloss & Satin

Recommended Thickness	10 mils wet--6.5 mils dry
Theoretical Coverage	160 sq. ft./gal.
Method	Brush, roller, spray
Induction Time	none
Thinner	Urethane Lacquer Thinner

Drying Time (hrs)	50°F*	75°F*	90°F*
• to touch	4	2	1
• to handle	8	4	2
• to recoat (max.)	12*	8*	6*
• Pot Life	24	12	4

* @ 50% relative humidity, higher humidity will require shorter recoat times.

Unit Size	1 Gallon Unit	5 Gallon Unit
Part A	1 Gallon (short filled)	5 Gallon (short filled)
Part B	1 Quart (short filled)	1 Gallon (short filled)

Storage	Shelf Life	One year minimum from mfg date.

PILGRIM PERMOCOAT, INC.
402 S. 22nd Street, Tampa, Fl 33605 (813) 248-3328 FAX# (813) 248-1076
(800) 637-3328

Consult Pilgrim representative for system best suited to environment.

Limitations:
Apply in good weather when air and surface temperatures are above 40°F. For optimum application properties, bring material to 70-80°F temperature range prior to mixing and application.

Surface Preparation:
Paint only clean dry surfaces. Remove all grease, oil, dirt or other foreign matter by solvent or detergent washing.

Unpainted Surfaces:
Prepare surface and prime, seal, fill or otherwise coat.

Previously Painted Surfaces:
Remove all rust, rust scale, other corrosion products, loose or heavy chalk and loose or scaling paint by "Hand or Power Tool Cleaning" (SSPC-SP2 or 3 respectively). "Sand or Brush Blast" (SSPC-SP7) any glossy areas until dull. Spot prime bare areas as recommended. To check compatibility apply coating to representative area of at least 25 sq. ft. and allow to cure and age several weeks. Then inspect for adhesion failure, wrinkling, lifting, blistering or any other sign of incompatibility present. Coating with **Urocel 65** can then proceed.

Concrete:
(1) "Brush-Blast Cleaning (SSPC-SP7) can be used to prepare the concrete by removing all foreign matter and provide tooth for bonding. Remove all dust from surface before starting the application of the coating. Modern B1 is recommended to prime and seal concrete.
(2) "Acid-Etching" All surfaces shall be acid etched with Muriatic Acid solution (1 part acid to 2 parts water). Apply solution by brush or spray until surface is thoroughly wetted. When bubbling ceases (5-10 minutes), wash down surface with fresh water and scrub with a stiff brush. Rinse with plenty of fresh water. If surface is acidic (ph below 7), neutralize surface by washing with 1-2% ammonia solution.

Mixing:
Material is supplied in 2 containers as a unit. Always mix a complete unit in the proportions supplied. Combine entire contents of Part B with Part A and mix thoroughly with a power agitator.

Thinning:
Material is supplied at application viscosity and normally needs no thinning. If thinning is necessary thin with Pilgrim Thinner up to one pint/gallon.

Application:
Apply by brush, roller, or spray. Apply at 10 mils wet.

Equipment:
Brush: Good quality 4" wide brush with short hair bristle.
Roller: 1/8" mohair or Dynel roller.
Conventional Spray: DeVilbiss MBC-510 gun; E tip and 704 air cap; 3/8" ID material hose; double regulated pressure tank with oil and moisture separator.

Work Stoppages:
Do not allow material to remain in hoses. Release pressure from pressure tank and disconnect material hose. Thoroughly flush hose and spray gun with #5 Cleaner.

Cleanup:
Clean all equipment immediately after use with Pilgrim #5 Cleaner or PM Acetate. Spray equipment requires flushing with either of these solvents. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency should depend upon amount sprayed, temperature, elapsed time including delay, etc.

Welding:
In the event welding or flame cutting is performed on metal coated with this product, do so in accordance with instructions in ANSI/ASC Z 49.1, "Safety in Welding and Cutting." All welded, burned, or otherwise damaged areas should be reprepared to base metal and recoated as specified.

Safety:
This product (and any recommended thinners) contains solvents and/or other chemical ingredients. Adequate health and safety precautions should be observed during all storage, handling, use and drying periods. For safe usage, user is specifically directed to consult the current "Material Safety Data Sheet" for this product. When using this product in a confined space or closed area, consult the current OSHA, or ANSI bulletins on safety requirements.

Physical Performance Properties of Urocel-65 - Dry Film

Tests conducted on 1.5 mil films, air dried for seven days at room temperature.

Hardness	
Pencil	3H
Taber Abrasion (mg loss per 1000 cycles, CS-17 wheel, 1000g load)	39.4
Impact resistance, in. lbs	
Direct	50
Reverse	10
QUV weatherometer	
Oxidation	no effect
Loss of gloss	no effect
Blistering	no effect
Yellowing	no effect
Crosshatch adhesion	
Untreated cold rolled steel`	5B
Polycarbonate	5B
ABS	OB
PVC	OB
Film Properties	
Tensile strength, psi	5600
Elongation, %	150

Chemical and Solvent Resistance

Skydrol B-4	No Effect
Hydraulic Fluid	No Effect
25% Nitric Acid	Blistered
37% Hydrochloric Acid	Blistered
50% Sulfuric	Down Gloss
50% Sodium Hydroxide	No Effect
10% Acetic Acid	No Effect
30% NH_3OH	No Effect
Gasoline	No Effect
MEK	Slight Swelling
Xylene	No Effect

Intergard® 475HS

Epoxy

International Protective Coatings

WORLD WIDE PRODUCT RANGE

PRODUCT DESCRIPTION

A low VOC, high solids, high build, two component epoxy coating. Available with conventional pigmentation, or alternatively can be pigmented with micaceous iron oxide to provide enhanced overcoating properties.

INTENDED USES

For use as a high build epoxy coating to improve barrier protection for a range of anti-corrosive coating systems in a wide range of environments including offshore structures, petrochemical plants, pulp and paper mills and bridges. Suitable for use in both maintenance and new construction situations as part of an anti-corrosive coating system. The micaceous iron oxide variant improves long term overcoating properties, better facilitating application in the fabrication shop, prior to shipping, with final overcoating on site.

PRACTICAL INFORMATION FOR INTERGARD 475HS

Color Light gray MIO and a selected range of colors

Gloss Level Matte

Volume Solids 80%

Typical Thickness 4-8 mils (100-200 microns) dry equivalent to 5-10 mils (125-250 microns) wet

Theoretical Coverage 257 sq.ft/US gallon at 5 mils d.f.t and stated volume solids
6.40 m²/liter at 125 microns d.f.t and stated volume solids

Practical Coverage Allow appropriate loss factors

Method of Application Airless Spray, Air Spray, Brush, Roller

Drying Time

			Overcoating Interval with recommended topcoats	
Temperature	**Touch Dry**	**Hard Dry**	*Minimum*	*Maximum*
23°F (-5°C)	150 minutes	48 hours	48 hours	Extended[1]
41°F (5°C)	90 minutes	16 hours	16 hours	Extended[1]
59°F (15°C)	75 minutes	10 hours	10 hours	Extended[1]
77°F (25°C)	60 minutes	5 hours	5 hours	Extended[1]

[1] See International Protective Coatings Definitions & Abbreviations
Maximum overcoating intervals are shorter when using polysiloxane topcoats. Consult International Protective Coatings for further details.

REGULATORY DATA

Flash Point Part A 93°F (34°C); Part B 88°F (31°C); Mixed 91°F (33°C)

Product Weight 17.5 lb/gal (2.10 kg/l)

VOC 1.72 lb/gal (207 g/lt) EPA Method 24
92 g/kg EU Solvent Emissions Directive (Council Directive 1999/13/EC)

See Product Characteristics section for further details

ECOTECH

Ecotech is an initiative by International Protective Coatings, a world leader in coating technology, to promote the use of environmentally sensitive products across the globe.

Intergard® 475HS

Epoxy

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Primed Surfaces

Intergard 475HS should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination, and Intergard 475HS must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. SSPC-SP6 or Sa2½ (ISO 8501 -1:2007), Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Intergard 475HS.

Zinc Primed Surfaces

Ensure that the surface of the primer is clean, dry and free from contamination and zinc salts before application of Intergard 475HS. Ensure zinc primers are fully cured before overcoating.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

3 part(s) : 1 part(s) by volume

Working Pot Life

23°F (-5°C)	41°F (5°C)	59°F (15°C)	77°F (25°C)
60 minutes	60 minutes	60 minutes	60 minutes

Airless Spray

Recommended

Tip Range 21-25 thou (0.53-0.63 mm)
Total output fluid pressure at spray tip not less than 2702 psi (190 kg/cm²)

Air Spray (Pressure Pot)

Recommended

Gun	DeVilbiss MBC or JGA
Air Cap	704 or 765
Fluid Tip	E

Brush

Suitable

Typically 3.0 mils (75 microns) can be achieved

Roller

Suitable

Typically 3.0 mils (75 microns) can be achieved

Thinner

International GTA007

Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA822 (or International GTA415)

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA822. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA822. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation

Intergard® 475HS

Epoxy

PRODUCT CHARACTERISTICS

Intergard 475HS is primarily designed for use as a high build barrier coat to impart barrier protection to a coating system. It is recommended that it should be overcoated with a durable finish from the Interfine or Interthane range when appearance is important.

Maximum film build in one coat is best attained by airless spray. When applying by methods other than airless spray, the required film build is unlikely to be achieved. Application by air spray may require a multiple cross spray pattern to attain maximum film build. Lower or high temperatures may require specific application techniques to achieve maximum film build.

When applying Intergard 475HS by brush or roller, it may be necessary to apply multiple coats to achieve the total specified system dry film thickness.

Surface temperature must always be a minimum of 5°F (3°C) above dew point.

When applying Intergard 475HS in confined spaces ensure adequate ventilation.

Exposure to unacceptably low temperatures and/or high humidities during, or immediately after, application may result in incomplete cure and surface contamination that could jeopardize subsequent intercoat adhesion.

For further details regarding cure times and overcoatability, please contact International Protective Coatings.

Interchanging standard and elevated temperature curing agents during application to a specific structure will give rise to an observable color change due to the difference in the yellowing/discoloration process common to all epoxies on exposure to UV light.

In common with all epoxies Intergard 475HS will chalk and discolor on exterior exposure. However, these phenomena are not detrimental to anti-corrosive performance.

Intergard 475HS is not designed for continuous water immersion.

The micaceous iron oxide variant of this product is frequently used as a "travel coat" prior to final overcoating on site. To ensure best extended overcoating properties, ensure overapplication does not occur and that the surface is fully cleaned of any contamination which may be present in the surface texture due to the coarse nature of the micaceous iron oxide pigmentation.

When applying Intergard 475HS at temperatures less than 59°F (15°C) or wet film thicknesses of 6 mils (150 microns) or less, addition of around 5% International GTA007 thinners will improve film appearance, sprayability and aid film thickness control.

Note: VOC values are typical and are provided for guidance purpose only. These may be subject to variation depending on factors such as differences in color and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

Intergard 475HS is designed for use over correctly primed steel. Suitable primers are:

Intercure 200	Interzinc 22 (mist coat or tie coat recommended)*
Intergard 251	Interzinc 315
Intergard 269	Interzinc 52

Suitable topcoats are:

Intergard 740	Interfine 629HS
Interthane 990	Intergard 475HS

For alternative primers and finishes, consult International Protective Coatings.

* See relevant product data sheet for details.

Intergard® 475HS

Epoxy

ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

PACK SIZE

Unit Size	Part A		Part B	
	Vol	Pack	Vol	Pack
20 liter	15 liter	20 liter	5 liter	5 liter
5 US gal	3 US gal	5 US gal	1 US gal	1 US gal

For availability of other pack sizes contact International Protective Coatings

SHIPPING WEIGHT

Unit Size	Part A	Part B
20 liter	35.4 kg	9.3 kg
5 US gal	57.1 lb	8.4 lb

STORAGE

Shelf Life	12 months minimum at 77°F (25°C). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.

Important Note

Issue date: 4/14/2008

www.international-pc.com

AKZO NOBEL

Interthane® 990HS

Polyurethane

International Protective Coatings

PRODUCT DESCRIPTION

A low VOC, two component acrylic polyurethane high performance finish coat with excellent gloss and color retention on exterior exposure for use over correctly prepared and primed surfaces.

INTENDED USES

As a durable high gloss finish coat for exposed steelwork in a wide range of aggressive environments including chemical and petrochemical plants, offshore structures, bridges, pulp and paper mills, power plants and refineries.

For use over correctly prepared primed steel and masonry surfaces in both new construction and maintenance situations.

Exhibits superior application properties, environmental durability and chemical resistance. Gives excellent gloss and color retention on exterior exposure.

PRACTICAL INFORMATION FOR INTERTHANE 990HS

Color	Wide range via the Chromascan® system
Gloss Level	High gloss
Volume Solids	68% ± 3% (depends on color)
Typical Thickness	2-3 mils (50-75 microns) dry equivalent to 2.9-4.4 mils (74-110 microns) wet
Theoretical Coverage	545 sq.ft./US gallon at 2 mils d.f.t. and stated volume solids 13.6 m^2/liter at 50 microns d.f.t. and stated volume solids
Practical Coverage	Allow appropriate loss factors
Method of Application	Airless spray, Air spray, Brush, Roller

Drying Time

Temperature	Touch Dry	Hard Dry	Overcoating Interval Interthane 990HS with Self *Minimum*	*Maximum*
50°F (10°C)	3.5 hours	30 hours	30 hours	30 days
59°F (15°C)	3 hours	22 hours	22 hours	30 days
77°F (25°C)	2 hours	12 hours	12 hours	30 days
104°F (40°C)	1 hour	4 hours	4 hours	30 days

REGULATORY DATA

Flash Point	Base (Part A) 100°F (38°C)	Curing Agent (Part B) 135°F (57°C)	Mixed 103°F (39°C)

Product Weight	12.5 lb/gal (1.5 kg/l)	
VOC	2.73 lb/gal (327 g/l)	USA - EPA Method 24
	330 g/l	UK - PG6/23(04), Appendix 3

See Product Characteristics section for further details

Interthane® 990HS
Polyurethane

SURFACE PREPARATION

All surfaces to be coated should be clean, dry and free from contamination. Prior to paint application all surfaces should be assessed and treated in accordance with ISO 8504:2000.

Primed Surfaces

Interthane 990HS should always be applied over a recommended anti-corrosive coating scheme. The primer surface should be dry and free from all contamination, and Interthane 990HS must be applied within the overcoating intervals specified (consult the relevant product data sheet).

Areas of breakdown, damage etc., should be prepared to the specified standard (e.g. SSPC-SP6 or Sa2.5 (ISO 8501-1:1988), Abrasive Blasting, or SSPC-SP11, Power Tool Cleaning) and patch primed prior to the application of Interthane 990HS.

APPLICATION

Mixing

Material is supplied in two containers as a unit. Always mix a complete unit in the proportions supplied. Once the unit has been mixed it must be used within the working pot life specified.

(1) Agitate Base (Part A) with a power agitator.
(2) Combine entire contents of Curing Agent (Part B) with Base (Part A) and mix thoroughly with power agitator.

Mix Ratio

9 parts : 1 part by volume

Working Pot Life

50°F (10°C)	59°F (15°C)	77°F (25°C)	104°F (40°C)
7 hours	6 hours	3 hours	1 hour

Airless Spray

Recommended

- Tip range 15-19 thou (0.38-0.48 mm)
- Total output fluid pressure at spray tip not less than 2,000 p.s.i. (141 kg/cm^2)

Air Spray (Pressure Pot)

Recommended

Gun	DeVilbiss MBC or JGA
Air Cap	704 or 765
Fluid Tip	E

Brush

Suitable

Typically 1.5-2.0 mils (40-50 microns) can be achieved

Roller

Suitable

Typically 1.5-2.0 mils (40-50 microns) can be achieved

Thinner

International GTA056 (or GTA713)

Do not thin more than allowed by local environmental legislation.

Cleaner

International GTA056 (or GTA713)

Work Stoppages

Do not allow material to remain in hoses, gun or spray equipment. Thoroughly flush all equipment with International GTA056. Once units of paint have been mixed they should not be resealed and it is advised that after prolonged stoppages work recommences with freshly mixed units.

Clean Up

Clean all equipment immediately after use with International GTA056. It is good working practice to periodically flush out spray equipment during the course of the working day. Frequency of cleaning will depend upon amount sprayed, temperature and elapsed time, including any delays.

All surplus materials and empty containers should be disposed of in accordance with appropriate regional regulations/legislation.

Interthane® 990HS

Polyurethane

PRODUCT CHARACTERISTICS

Level of sheen and surface finish is dependent on application method. Avoid using a mixture of application methods whenever possible. Best results in terms of gloss and appearance will always be obtained with air spray application.

For brush and roller application, and in some colors, two coats of Interthane 990HS may be required to give uniform coverage, especially when applying Interthane 990HS over dark undercoats, and when using certain lead free bright colors such as yellows and oranges. Best practice is to use a color compatible intermediate or anti-corrosive coating under the Interthane 990HS.

Application at high film thickness, i.e.greater than 4 mils (100 microns) is likely to detract from appearance, due to surface defects. At low film build 1.5 mils (40 microns) dry film thickness opacity will be insufficient to give good coverage, with a number of colors resulting in an uneven finish appearance.

Over-application of Interthane 990HS will extend both the minimum overcoating periods and handling times, and may be detrimental to long term overcoating properties.

When surface temperatures are greater than 104°F (40°C) for periods of greater than 72 hours then pretreatment may be required before application of a further coat of Interthane 990HS. When recoating beyond 30 days at any surface temperature additional surface preparation may be required. Contact International Protective Coatings for recommendations.

Application at excessively high relative humidity, or under conditions where condensation is likely to occur, may result in immediate or premature loss of gloss. Best results will always be obtained by applying with RH less than 85% and with surface temperatures at least 5°F (3°C) above dew point.

Condensation occurring during or immediately after application may result in a matt finish and an inferior film.

Premature exposure to ponding water will cause a color change, especially in dark colors.

This product has the following specification approvals:

USDA approval for incidental food contact surface in federally inspected meat and poultry plants. Subject to Inspector-in-charge approval.

Note: VOC values are typical and are provided for guidance purposes only. These may be subject to variation depending on factors such as differences in color and normal manufacturing tolerances.

Low molecular weight reactive additives, which will form part of the film during normal ambient cure conditions, will also affect VOC values determined using EPA Method 24.

SYSTEMS COMPATIBILITY

The following primers/intermediate coats are recommended for Interthane 990HS:

Intercure 200	Interplus 770
Intercure 420	Interplus 880
Intergard 251	Interseal 670HS
Intergard 269	Interzinc 42
Intergard 270	Interzinc 52
Intergard 401	Interzinc 315
Intergard 475HS	Interzone 505
Interplus 256	Interzone 954
Interplus 356	Interzone 1000

Interthane 990HS is designed to be topcoated with itself.

For other suitable primers/intermediate coats/topcoats, consult International Protective Coatings.

Interthane® 990HS
Polyurethane

ADDITIONAL INFORMATION

Further information regarding industry standards, terms and abbreviations used in this data sheet can be found in the following documents available at www.international-pc.com:

- Definitions & Abbreviations
- Surface Preparation
- Paint Application
- Theoretical & Practical Coverage

Individual copies of these information sections are available upon request.

SAFETY PRECAUTIONS

This product is intended for use only by professional applicators in industrial situations in accordance with the advice given on this sheet, the Material Safety Data Sheet and the container(s), and should not be used without reference to the Material Safety Data Sheet (MSDS) which International Protective Coatings has provided to its customers.

All work involving the application and use of this product should be performed in compliance with all relevant national, Health, Safety & Environmental standards and regulations.

In the event welding or flame cutting is performed on metal coated with this product, dust and fumes will be emitted which will require the use of appropriate personal protective equipment and adequate local exhaust ventilation.

If in doubt regarding the suitability of use of this product, consult International Protective Coatings for further advice.

Warning: Contains isocyanate. Wear air-fed hood for spray application.

PACK SIZE	5 gallon unit	Interthane 990HS Base Interthane 990HS Curing Agent	4.5 gallons in a 5 gallon container 0.5 gallons in a 1 gallon container
	20 liter unit	Interthane 990HS Base Interthane 990HS Curing Agent	18 liters in a 20 liter container 2 liters in a 2.5 liter container
	For availability of other pack sizes contact International Protective Coatings		
SHIPPING WEIGHT	U.N. Shipping No.	1263	
	5 gallon unit	61.2 lb (27.7 kg) Base (Part A)	4.5 lb (2.0 kg) Curing Agent (Part B)
	20 liter unit	65.5 lb (29.7 kg) Base (Part A)	5.5 lb (2.5 kg) Curing Agent (Part B)
STORAGE	Shelf Life	12 months minimum at 77°F (25°C). Subject to re-inspection thereafter. Store in dry, shaded conditions away from sources of heat and ignition.	

Important Note

AKZO NOBEL

TRI-SHEEN CONCRETE SURFACER

FINE / MEDIUM / COARSE

Meets Federal EPA's VOC Requirements

PRODUCTS

Division of Sierra Corporation

Technical Data

1. **PRODUCT NAME**
TRI-SHEEN
CONCRETE SURFACER
TK-5319 FINE / TK-5301 MEDIUM
TK-5691 COARSE

2. MANUFACTURER
TK PRODUCTS, DIVISION OF
SIERRA CORPORATION
11400 West 47th Street
Minnetonka, MN 55343
952-938-7223
952-938-8084 (FAX)
e-mail: tkproduct@aol.com
Website: http://www.tkproduct.com

3. PRODUCT DESCRIPTION

TRI-SHEEN CONCRETE SURFACER is a non-cementitious protective texture coating designed for all above grade vertical surfaces. TRI-SHEEN CONCRETE SURFACER can be used either for exterior or interior applications on the following substrates: poured or precast concrete, block, brick, stone or stucco. Any properly prepared above grade vertical cementitious type surface.

TRI-SHEEN CONCRETE SURFACER is an excellent alternative to multiple component dry plaster mixed products. Being a one-component ready mixed texture coating, eliminates the possibility of on site mixing and measuring errors, resulting in an uneven textured appearance and possible film failure.

TRI-SHEEN CONCRETE SURFACER is blended using high performance 100% acrylic copolymers and advanced adhesion monomers. The grade of texture is achieved using various sizes of siliceous volcanic rock, silicas, and siliceous powders. All of which are suspended in an aquas dispersion.

With the use of advanced technology, TRI-SHEEN CONCRETE SURFACER offers the following advantages:

- A one package ready to use product.
- Will not chip, crack, or peel.
- Long term color retention throughout the film.
- Helps control efflorescence or salt leaching.
- Will not support mildew growth.
- High resistance to road or deicing salts.
- A breathable film eliminating trapped moisture vapors.
- Ability to be applied over a variety of silanes or siloxanes such as TK-590 or TK-290.
-

TRI-SHEEN CONCRETE SURFACER'S pigmentation is carried throughout the film thickness resulting in uniform color should surface damage occur.

When enhanced protection or accent colors are desired, a topical coat of TRI-SHEEN ACRYLIC may be applied. While still maintaining a breathable film, this two coat system enhances not only the performance characteristics but also offers the architect an endless choice of colors.

4. TECHNICAL DATA

TRI-SHEEN CONCRETE SURFACER is a non-cementitious 100% acrylic coating. A one package ready to use coating that needs no addition of bonding agents or dry plaster mix products. Offered in a wide variety of standard colors or can be made to match custom color specifications.

TRI-SHEEN CONCRETE SURFACER conforms to the following specifications:

- Fed. Spec. TTP #19
- MN DOT Spec. #3584

TRI-SHEEN CONCRETE SURFACER has been tested in accordance with the following:

TEST	METHOD	RESULTS
Water Vapor Transmission	ASTM E96-80	14.7+ grams/ meter2/ 24 hour
Freeze/Thaw	ASTM C666-84	50 Plus Cycles Passed
Fungus Resistance	Federal 141,6271-1	After 21 Days No Fungal Support
Dry Time	Normal Humidity Conditions	1-4 Hours
Topcoat	TRI-SHEEN ACRYLIC	24 Hours

- A.I.M. Category: Flat Coatings-Exterior
- A.I.M. Definition: A coating that is not defined under any other definition in this section and that registers gloss less than 15 on an 85-degree meter or less than 5 on a 60-degree meter according to the American Society for Testing and Materials (ASTM) Method D 523-89, Standard Test Method for Specular Gloss.
- Related Definitions:
  Exterior Coatings: An architectural coating formulated and recommended for use in conditions exposed to the weather.
- VOC Content Limit: 250 grams per liter

5. APPLICATION PROCEDURES
Preparation:

Remove all loose and/or crumbled laitance and dust from the surface. Power washing is advisable, however if the surface to be coated is highly contaminated and cannot be cleaned sufficiently with power washing, sandblasting will become necessary. Grease, oil, and any form release agents should be removed with TK-101 chemical cleaner or other suitable cleaner. Do not apply over any pooling or puddling water. Apply only to fully cured concrete. Any patching or repairs should also be fully cured (see manufacturers' instructions).

TRI-SHEEN CONCRETE SURFACER should only be applied to structurally sound, properly prepared surfaces, for technical assistance contact your nearest TK/ Sierra distributor.

PRODUCTS 9
TRI-SHEEN CONCRETE SURFACER
Fine / Medium / Coarse

Application:

TRI-SHEEN CONCRETE SURFACER may be applied by spray, brush or roller. A slight dampening of the surface may be required if hot or windy conditions persist. It is important that a wet edge or open film be maintained. This practice will eliminate uneven application and allow the film to properly coalesce. When applying by roller a one inch nap cover is suggested. With a fully saturated roller, apply in one direction only, either vertical or horizontal. Work new material back into previous areas and out again achieving a uniform rate of application. Never start or stop in the middle of a plane, work from edge to edge, (i.e.: mortar joint, corner, control joint, pilaster or any natural break point.) back rolling if necessary. DO NOT EXCEED THE MAXIMUM OF 100 SFPG.

When applying by spray, a hopper type texture gun may be used. On larger scale jobs a non-pulsating positive displacement pump with a minimum 1" material line should be used. Tip size will be determined by the output of the chosen pump.

Coverage:

Coverage will be greatly determined by the porosity of the substrate, weather conditions at time of application, method of application. etc. The following chart is to be consulted only as an approximate guideline. TRI-SHEEN CONCRETE SURFACER will yield the following SFPG on:

Surface	Coverage
Lightweight or Break-off block	40-50 SFPG
Normal Precast Panels	50-60 SFPG
Stone, Brick or Steel Troweled Concrete	60 plus SFPG

A test of 200 SF should be applied duplicating application procedure using the equipment to be used, etc. to determine the exact square footage per gallon.

TRI-SHEEN CONCRETE SURFACER is packaged ready to use. Stir well or agitate before using. Any thinning to be done, should not exceed one pint of clear potable water per gallon. Thinning should only be considered to facilitate ease of application due to various typed of equipment or weather conditions. Never thin for the purpose of extending the material.

TRI-SHEEN CONCRETE SURFACER should be applied only when the ambient are temperature has been 45°F. or above for a period of no shorter than 48 hours prior to application. Avoid application when the chance of mist, rain or temperatures below 45°F. could result sooner than 48 hours after application. DO NOT apply TRI-SHEEN CONCRETE SURFACER to frost filled block or any frozen surfaces.

6. AVAILABILITY & PACKAGING:

TRI-SHEEN CONCRETE SURFACER is available in three grades of texture: Fine, Medium or Coarse. All are packaged ready to use in 5 or 55 gallon containers.

Custom colors are available upon request. Please submit color standards for pricing. Contact TK/ Sierra for the nearest distributor.

7. LIMITED WARRANTY

TK Products, a division of The Sierra Corporation, warrants that its products conform to their label descriptions, are free from manufacturing defects, and are fit for the ordinary purposes for which such goods are used. Inasmuch as the use of its products by others and other factors affecting product performance are beyond TK Products' control, TK Products does not guarantee the results to be obtained. SHOULD ANY OF ITS PRODUCTS FAIL TO GIVE SATISFACTORY RESULTS, TK PRODUCTS WILL REPLACE THE PRODUCTS OR, AT ITS OPTION, REFUND THE PURCHASE PRICE. THIS IS THE SOLE AND EXCLUSIVE REMEDY FOR ANY FAILURE OF THE PRODUCTS OF TK PRODUCTS TO PERFORM AS WARRANTED AND SHALL ALSO CONSTITUTE LIQUIDATED DAMAGES IN CASE OF LOSS. UNDER NO CIRCUMSTANCES SHALL THE BUYER BE ENTITLED TO ANY OTHER REMEDY OR DAMAGES. REMEDIES FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE SPECIFICALLY EXCLUDED. TK Products does not authorize any person to assume for it any other liability in connection with the sale or use of its products unless specifically authorized by TK Products in writing. See also TK PRODUCTS DISCLAIMER section below.

8. TECHNICAL SERVICES

The TK office offers assistance with specifications, performance test data and field services.

9. FILING SYSTEMS

Information Handling Services
PO BOX 1213
Englewood, CO 80150
Information Marketing Services
13271 Northend
Oak Park, MI 48237

TK DISCLAIMER:

Every effort has been made to ensure the accuracy of the above information and to avoid infringement of any patent or copyright. The information is based on field test by government and private agencies, as well as lab tests, and on technical data from raw material manufacturers. The person(s) specifying or requesting the use of these products is responsible for assuring their suitability for a specific use, as well as the proper application of the products. Where there is any question as to the suitability of a particular product, a small test patch is recommended. See also LIMITED WARRANTY (Section 7) above.

FOR INDUSTRIAL USE ONLY

12/99

TRI-SHEEN ACRYLIC

Meets Federal EPA's VOC Requirements

PRODUCTS

Division of Sierra Corporation

Technical Data

1. PRODUCT NAME:
TRI-SHEEN ACRYLIC

2. MANUFACTURER
TK PRODUCTS, DIVISION
OF SIERRA CORPORATION
11400 West 47th Street
Minnetonka, MN 55343
952-938-7223
952-938-8084 (FAX)
E-mail: tkproduct@AOL.com
Website: http://www.tkproduct.com

3. PRODUCT DESCRIPTION:

TRI-SHEEN ACRYLIC is a 100% acrylic breathable masonry coating. With the use of specially designed acrylic polymers and advanced adhesion monomers, TRI-SHEEN ACRYLIC offers the following advantages over standard multipurpose paint coatings:

- Will not fade, chip, crack or peel.
- Resistant to ultraviolet degregation.
- Will not support mildew growth.
- Stays cleaner longer, sheds dirt easily.
- A breathable film resulting in no internal entrapment of moisture vapors.
- Long term color retention.
- For use on exterior or interior surfaces.
- Brush, roll, or spray application.
- Custom colors available.

TRI-SHEEN ACRYLIC can be used by itself or can be incorporated in the TRI-SHEEN Concrete Surfacer or the TRI-CON System. TRI-SHEEN ACRYLIC is designed to be used on all cementitious surfaces as well as on properly prepared wood or metal.

TRI-SHEEN ACRYLIC is an excellent topcoat for use over TRI-SHEEN Concrete Surfacer or the TRI-CON System. TRI-SHEEN ACRYLIC can also be intermixed with the TRI-CON System to aid in color stability and further promote adhesion.

With addition of the TRI-SHEEN ACRYLIC over textured surfaces a more uniform color will be achieved. This type of system also offers the architect an endless choice of accent colors for graphic uses.

TRI-SHEEN ACRYLIC has been formulated to maintain a completely breathable film when used in conjunction with TRI-SHEEN Concrete Surfacer or the TRI-CON System.

The proper breathability (or perm factor) of a concrete coating is an essential performance factor that must be incorporated in the formulation process through the careful selection of polymers and resins.

The ability of a coating to properly breath allows any trapped moisture vapors to pass through the film successfully, without loosening or peeling any of the coating from the substrate.

4. TECHNICAL DATA:

TRI-SHEEN ACRYLIC's polymers have been tested in accordance to:

	Test Method	Results
Water Vapor Transmission	ASTM E96	9.75 grams/ meter2/24hr.
Fungus Resistance	Federal 1416271-1	no fungus @ 21 days
Freeze Thaw Cycles	ASTM C666-84	50 Cycles No Changes

TRI-SHEEN ACRYLIC conforms to the following specifications:

- FED. SPEC. #TTP 19
- MN DOT #3584
- V.O.C. Complaint
- V.O.C. Content 250 g/l
- A.I.M. Category: Flat Coatings-Exterior
- A.I.M. Definition: A coating that is not defined under any other definition in this section and that registers gloss less than 15 on an 85-degree meter or less than 5 on a 60-degree meter according to the American Society for Testing and Materials (ASTM) Method D 523-89, Standard Test Method for Specular Gloss.
  Related Definitions: Exterior coatings: An architectural coating formulated and recommended for use in conditions exposed to the weather.

5. APPLICATION PROCEDURES AND INSTRUCTIONS

Preparation:

Remove all loose and or crumbled laitance and dust from the surface. Power washing advisable. Grease, oil and any form release agents should be removed with TK-101 chemical cleaner or other suitable cleaner. Do not leave pooling or pockets of water on the surface. If the surface needs repair, TK Concrete Patch is recommended, allow to fully cure (48-72 hrs.). If other patching materials are to used consult the manufacturers application instructions for cure and recoat times.

Application:

TRI-SHEEN ACRYLIC may be applied by spray, roller or brush methods. Slight dampening of the surface may be required if applied during hot or windy conditions.

TRI-SHEEN ACRYLIC is packaged ready to use, no thinning is required. DO NOT THIN. TRI-SHEEN ACRYLIC should be applied only when ambient air temperature has been 45°F. or above for a period of no shorter than 48 hours prior to application. Avoid application when the chance of mist, rain or temperatures below 45°F. could result within a 48 hour period.

TRI-SHEEN ACRYLIC should be applied using approved application methods on sound, clean properly prepared surfaces. Contact TK Products for additional technical assistance.

PRODUCTS 3
TRI-SHEEN ACRYLIC
Concrete & Masonry Coatings

Coverage:

Coverage will be greatly determined by the substrate porosity, application procedures and weather conditions. The square footages listed below are for reference only. A 150 square foot test area should be applied for color and yield approval.

SURFACE	COVERAGE
Light weight or break-off block	100-150 SFPG
Smooth precast panels	300-400 SFPG
Over TRI-SHEEN Concrete Surfacer or the TRI-CON System type textures	125-175 SFPG

Precautions:

TRI-SHEEN ACRYLIC contains acrylic resins and a minimal amount of ammonia. excessive prolonged inhalation may result in headache, nausea and eye or lung irritation.

First Aid:

Ingestion: Induce vomiting; call a physician immediately. *Eye Contact:* Do not rub, flush with clean water for 15 minutes. *Skin Contact:* Remove by washing thoroughly with soap and water. If eye or skin irritation continues, obtain medical assistance.

6. AVAILABILITY:

TRI-SHEEN ACRYLIC is available in 1, 5 and 55 gallon containers. TRI-SHEEN ACRYLIC is available in standard colors or can be ordered to match various colors on a custom basis. Please submit color standards for pricing. Contact TK Products for the nearest distributor.

7. LIMITED WARRANTY

TK Products, a division of The Sierra Corporation, warrants that its products conform to their label descriptions, are free from manufacturing defects, and are fit for the ordinary purposes for which such goods are used. Inasmuch as the use of its products by others and other factors affecting product performance are beyond TK Products' control, TK Products does not guarantee the results to be obtained. SHOULD ANY OF ITS PRODUCTS FAIL TO GIVE SATISFACTORY RESULTS, TK PRODUCTS WILL REPLACE THE PRODUCTS OR, AT ITS OPTION, REFUND THE PURCHASE PRICE. THIS IS THE SOLE AND EXCLUSIVE REMEDY FOR ANY FAILURE OF THE PRODUCTS OF TK PRODUCTS TO PERFORM AS WARRANTED AND SHALL ALSO CONSTITUTE LIQUIDATED DAMAGES IN CASE OF LOSS. UNDER NO CIRCUMSTANCES SHALL THE BUYER BE ENTITLED TO ANY OTHER REMEDY OR DAMAGES. REMEDIES FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE SPECIFICALLY EXCLUDED. TK Products does not authorize any person to assume for it any other liability in connection with the sale or use of its products unless specifically authorized by TK Products in writing. See also TK PRODUCTS DISCLAIMER section below.

8. TECHNICAL SERVICES

The TK office offers assistance with specifications, performance test data and field services.

9. FILING SYSTEMS

Information Handling Services
PO BOX 1213
Englewood, CO 80150
Information Marketing Services
13271 Northend
Oak Park, MI 48237

TK DISCLAIMER:

Every effort has been made to ensure the accuracy of the above information and to avoid infringement of any patent or copyright. The information is based on field tests by government and private agencies, as well as lab tests, and on technical data from raw material manufacturers. The person(s) specifying or requesting the use of these products is responsible for assuring their suitability for a specific use, as well as the proper application of the products. Where there is any question as to the suitability of a particular product, a small test patch is recommended. See also LIMITED WARRANTY (Section 7) above.

FOR INDUSTRIAL USE ONLY

3/00

TK PRODUCTS
DIVISION OF SIERRA CORPORATION

Product Data

TK-1450
URETHANE ANTI-GRAFFITI PRIMER

Color	CLEAR	
Packaging	ONE GALLON, 5 GALLON AND 55 GALLON CONTAINERS	
Vehicle Type	WATERBORNE ALIPHATIC POLYURETHANE DISPERSION	
Solvent Type	AQUEOUS	
Gloss at 60° angle	N/A	
% Solids by Weight	17 – 18	
Viscosity at 77° F	N/A	
Desired Dry Film	1 – 1.5 MIL	
Recommended Coverage Rate*	225 – 335 FT²/GALLON	
Average Dry Time at 70° F	Tack Free	1 – 2 HOURS
	Recoat	4 HOURS
	Full Cure	8 HOURS
Catalyst	N/A	
Thinner	WATER	
Mix Ratio	N/A	
Pot Life	N/A	
Recommended Primer	Steel	N/A
	Galvanized	N/A
	Concrete	SELF
Flash Point	N/A AQUEOUS SYSTEM	
V.O.C.	347 GRAMS PER LITER	
A.I.M. Category V.O.C. Limit	PRIMERS AND UNDERCOATERS, 350 G/L MAX.	

*Coverage: Theoretical coverage rates are a laboratory calculation based on the solids content and the desired dry film thickness. It does not take into consideration substrate porosity, application procedures, weather conditions over-spray and wind loss.

It is always advisable to apply a test panel or mock up prior to the project start up. This will help to determine proper coverage, appearance and equipment requirements.

General Description:

TK-1450 IS A WATERBORNE URETHANE PRIMER FOR USE UNDER PERMACLEAN ANTI-GRAFFITI COATING. TK-1450 WILL REDUCE OR ELIMINATE THE DARKENING OR COLOR CHANGE WHICH OCCURS WHEN PERMACLEAN IS APPLIED TO CONCRETE OR MASONRY SURFACES. IT CAN ALSO REDUCE OR ELIMINATE BLEEDING OF SOME PIGMENTS.

Resistance to:

Abrasion	GOOD
Acid	FAIR
Alkali	EXCELLENT
Humidity	EXCELLENT
Petroleum Products	EXCELLENT
Salt Spray	GOOD
Weather	EXCELLENT

Mixing Detail:

PRODUCT IS SUPPLIED READY TO USE BUT SHOULD BE STIRRED PRIOR TO USE TO ELIMINATE ANY PHASE SEPARATION OR SETTLING WHICH MAY OCCUR UPON SHIPPING AND STORAGE. IF THINNING IS REQUIRED, THIN SPARINGLY WITH WATER.

Surface Preparation:

SURFACE MUST BE CLEAN AND DRY, FREE OF OIL, GREASE, DUST, EFFLORESCENCE, ETC. MAKE ANY REPAIRS BEFORE APPLYING COATING. TEMPERATURE SHOULD BE BETWEEN 45^{O} F AND 90^{O} F .

Application Procedure:

APPLY MATERIAL EVENLY AVOIDING PUDDLES OR RUNS. MAINTAIN A WET EDGE TO AVOID LAP MARKS. CAN BE APPLIED BY AIRLESS OR CONVENTIONAL SPRAYER, ROLLER OR BRUSH.

Clean Up:

CLEAN EQUIPMENT WITH WARM WATER AND SOAP.

Safety Information:

ALTHOUGH THIS IS A WATER BORNE PRODUCT, IT DOES CONTAIN CO-SOLVENTS AND AMINES. THEREFORE CARE SHOULD BE TAKEN TO MINIMIZE CONTACT AND BREATHING VAPORS. ALWAYS WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT. DISPOSE OF EMPTY CONTAINER IN ACCORDANCE TO ALL APPLICABLE REGULATIONS. KEEP OUT OF REACH OF CHILDREN.

FIRST AID:

INHALATION: REMOVE FROM EXPOSURE TO FRESH AIR, TREAT SYMPTOMATICALLY, CALL A PHYSICIAN.

EYE CONTACT: IMMEDIATELY IRRIGATE WITH WATER FOR AT LEAST 15 MINUTES; GET MEDICAL ATTENTION.

SKIN CONTACT: WIPE OFF MATERIAL AND WASH THOROUGHLY WITH SOAP AND WATER.

INGESTION: DRINK 1 0R 2 GLASSES OF WATER TO DILUTE. DO NOT INDUCE VOMITING GET MEDICAL ATTENTION.

HMIS:

HEALTH	2
FLAMMABILITY	0
REACTIVITY	0
PERSONAL PROTECTION	E

Conditions Of Sale:

The TK Products Corp. warrants that this product conforms to label descriptions, is free from manufacturing defects and is fit for the ordinary purposes for which such goods are used. Inasmuch as the use of this product by others and factors affecting product performance are beyond TK Product's control, TK Products does not guarantee the results to be obtained. SHOULD THIS PRODUCT FAIL TO GIVE SATISFACTORY RESULTS, TK PRODUCTS WILL REPLACE THE PRODUCT OR, AT ITS OPTION, REFUND THE PURCHASE PRICE. THIS IS THE SOLE AND EXCLUSIVE REMEDY FOR ANY FAILURE OF THIS PRODUCT TO PERFORM AS WARRANTED AND SHALL ALSO CONSTITUTE LIQUIDATED DAMAGES IN THE CASE OF LOSS. UNDER NO CIRCUMSTANCES SHALL THE BUYER BE ENTITLED TO ANY OTHER REMEDY OR DAMAGES. REMEDIES FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE SPECIFICALLY EXCLUDED.

11400 West 47th Street, Minnetonka, MN 55343
1-800-441-2129 • FAX 952-938-8084

TK-PERMACLEAN: ANTI-GRAFFITI COATING

Meets Federal EPA's VOC Requirements

TK PRODUCTS
Division of Sierra Corporation
ISO 9001:2000 Certified

Technical Data

1. PRODUCT NAME

PERMACLEAN
1495 High Gloss
1496 Matte Gloss

2. MANUFACTURER

TK PRODUCTS, DIVISION OF
SIERRA CORPORATION
11400 West 47th Street
Minnetonka, MN 55343
952-938-7223
952-938-8084 (FAX)
e-mail: tksales@tkproduct.com
Website: http://www.tkproduct.com

3. PRODUCT DESCRIPTION

The Permaclean Anti-Graffiti Products feature unique blends of aliphatic urethane resins specifically formulated to protect various surfaces from graffiti vandalism.

All Permaclean products are single component, non-yellowing permanent coatings. No recoating after removal of the various types of products used to deface the surface is necessary. Spray paint, or lipstick, marker, nail polish or multiple component paint products will not adhere to the Permaclean protected surface.

USES:

All Permaclean products will work on a wide variety of surfaces: Masonry, brick, block, stucco, all types of wood, steel or previously painted surfaces. Areas prone to repeated tagging such as barrier walls, bridges, signs, parking ramps, transit facilities or any area that would require frequent removal of graffiti would greatly benefit from Permaclean's ability to withstand numerous cleaning. Harsh solvent, power washing or graffiti removal agents will not harm the Permaclean protective coating.

No further coatings are required after graffiti removal thus eliminating the additional cost of reapplying further protection.

Most types of graffiti can be removed by power washing, solvent cleaning or the use of graffiti removal agents.

Porous surfaces may require a scrubbing action to clean the graffiti out of the pores. Permaclean is most effective, if allowed to cure for 14 days.

4. TECHNICAL DATA

Permaclean	1495	1496
Solids by weight	37.5	40.8
Solvent Type	Aromatic Blend	
Flash Point	40°F	40°F
V.O.C.	596 GPL	574 GPL
	4.97 PPG	4.78 PPG
Shelf Life	Six Months Closed Containers	
Desired Film Thickness-Dry	1 to 2 DFT	

- A.I.M. Category: Anti-Graffiti Coatings, Maximum VOC (See above chart).
- A.I.M. Definition: A clear or opaque high performance coating formulated and recommended for application to interior and exterior walls, doors, partitions, fences, signs and murals to deter adhesion of graffiti and to resist repeated scrubbing and exposure to harsh solvent, cleansers, or scouring agents used to remove graffiti.

5. APPLICATION

Before using this product, read the MSDS for complete safety information. Material Safety Data Sheets are available from TK Distributors, the TK Office and the TK web site.

All surfaces to be coated should be free of any foreign matter. Loose paint, oil, grease, dirt, etc. must be removed before application.

Ambient air temperature should not fall below 35°F or exceed 95°F for a period of 12 hours before and after application. The higher the relative humidity, the faster Permaclean will cure. Dry, low humidity conditions will prolong cure times.

It is recommended that TK-1450 Urethane Primer be used as a primer before application of either TK-1495 or TK-1496 Permaclean Anti-Graffiti Coatings. If not used, the substrate WILL magnify the differences in porosity of the substrate. TK-1450 Urethane Prime seals the surface, which allows the matte finish to be uniform in appearance. If the surface is coated with TK Tri-Sheen Concrete Surfacer, Tri-Sheen Acrylic or Tri-Sheen Pigmented Stain, TK-1450 Urethane Primer does not need to be applied.

On unsealed, raw substrates, TK-1450 Primer must be used to prevent excessive absorption of Permaclean into the substrate and allow a protective film to form on the surface. When used over previous coated surfaces TK-1450 Primer may also be required to eliminate lifting or discoloring of the existing coating.

Due to the wide variety of surfaces requiring protection, a test application must be performed. Permaclean may alter the original appearance or color; obtain approval before continuing.

All Permaclean products may be applied by brush, roller or spray. Generally no thinning is required. When using airless spray equipment, tip sizes of .011 to .013 are recommended. All spray equipment should be flushed prior to use with xylene eliminating any moisture or foreign matter from the application equipment. A new material hose is recommended.

Once a container's seal is broken, that container must be used. Complete the entire job or plane without stopping and starting.

One thin coat not exceeding 4 wet mils will provide the proper protection required. Too heavy a coating may result in down glossing, sagging or runs. If a porous surface is encountered, a cross-hatch spray application may be required.

Coverage Rates:

	Actual
1495	300-400 sq. ft. per gal.
1496	350-450 sq. ft. per gal.

Coverage rates are provided as a guideline only. Surface texture, porosity, weather conditions, etc. will determine coverage rates.

TK-PERMACLEAN
Anti-Graffiti Coating
7&9 PRODUCTS

A test panel mock-up should be applied prior to project start up to determine coverage rates, appearance and proper results.

Clean Up:
Clean up all equipment or spills immediately with Xylene. Do not use water.

Precautions:
Danger! Extremely flammable Liquid and Vapor. Vapor and spray harmful. Overexposure may cause lung damage. May cause allergic skin and respiratory reaction, effects may be permanent. May affect the brain or nervous system causing dizziness, headache or nausea. Causes eye, skin, nose and throat irritation. Flammable liquid and vapor.

Notice: Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Intentional misuse by deliberately concentrating and inhaling the contents may be harmful or fatal. See MSDS for further information.

Individuals with lung or breathing problems or prior reaction to isocyanates must not be exposed to vapor or spray mist. Do not breath vapor or spray mist. Wear appropriate, properly fitted respirator (NIOSH approved) during application unless air monitoring demonstrates vapor/ mist levels are below applicable limits. An airline respirator (NIOSH) approved is recommended. A vapor particulate respirator (NIOSH approved) may be appropriate where airborne monitoring demonstrates vapor levels below ten times the applicable solvent exposure limits. Follow respirator manufacturer's directions for respirator use. Do not get in eyes, on skin or on clothing. Wash thoroughly after handling. Keep away from heat, sparks, and flame. Vapor may cause flash fire. Use only with adequate ventilation.

First Aid:
If affected by inhalation of vapor or spray mist, remove to fresh air. If breathing difficulty persists or occurs later, consult a physician and have label information available. In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. If swallowed, get medical attention immediately.

6. AVAILABILITY

TK-Permaclean Anti-Graffiti Coatings are available through TK Distributors. Contact TK Products for the nearest distributor. Packaged in one and five gallon containers.

7. CONDITIONS OF SALE/ LIMITED WARRANTY

TK Products, division of the Sierra Corporation, warrants that its products conform to the label descriptions, are free from manufacturing defects, and are fit for the ordinary purposes for which such goods are used. Inasmuch as the use of TK Products' product by others and other factors affecting product performance are beyond TK Products' control, TK Products does not guarantee the results to be obtained. There are no warranties except as stated herein, either express of implied, including implied warranties of merchantability or fitness for a particular purpose. SHOULD ANY TK PRODUCTS' PRODUCT FAIL TO GIVE SATISFACTORY RESULTS, TK PRODUCTS WILL REPLACE THE PRODUCT, OR AT ITS OPTION, REFUND THE PURCHASE PRICE. THIS IS THE SOLE AND EXCLUSIVE REMEDY FOR ANY FAILURE OF TK PRODUCTS' PRODUCTS TO PERFORM AS WARRANTED AND SHALL ALSO CONSTITUTE LIQUIDATED DAMAGES IN CASE OF LOSS. UNDER NO CIRCUMSTANCES SHALL THE BUYER BE ENTITLED TO ANY OTHER REMEDY OR DAMAGES. REMEDIES FOR INCIDENTAL AND CONSEQUENTIAL DAMAGES ARE SPECIFICALLY EXCLUDED. TK Products does not authorize any person to assume for it any other liability in connection with the sale or use of its products unless specifically authorized by TK Products in writing.

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FOR INDUSTRIAL USE ONLY

09/07

NOTES:

GENERAL

1. MARK CENTERLINES ON EXPANSION BEARING SLIDE PLATE AND LOWER BEARING PLATE EDGES. THESE IDENTIFICATION MARKS WILL BE USED TO MEASURE OFFSETS IN THE FIELD. USE INDELIBLE INK TO PLACE THESE MARKS.
2. DISKTRON BEARINGS ARE DESIGNED, FABRICATED, AND TESTED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN AND CONSTRUCTION SPECIFICATIONS AND CONTRACT SPECIAL PROVISION DBSB-2402.7.
3. (△) DESIGN LOADS, MOVEMENTS, AND ROTATIONS BASED ON FIGG DISC BEARING SCHEMATIC DATED OCTOBER 30, 2007 AND REV. 0 SHOP DRAWING COMMENTS.

MATERIALS

1. ALL STEEL FOR BEARINGS SHALL BE ASTM A709 GR. 50 OR 50W, UNLESS NOTED OTHERWISE.
2. ALL STAINLESS STEEL SHALL BE 12 GAUGE AND HAVE A NO.8 BRIGHT MIRROR FINISH.
3. THE POLYTRON DISC SHALL BE SUPPLIED IN ACCORDANCE WITH TABLE 18.3.2.8-1, OF THE AASHTO LRFD CONSTRUCTION SPECIFICATIONS. THE TOP AND BOTTOM SURFACES OF THE POLYTRON DISC SHALL BE ROUGHENED.
4. ALL SHEET PTFE SHALL BE ETCHED ON ONE SIDE PRIOR TO BONDING. A UNIFORM LAYER OF CHEMGRIP ADHESIVE SHALL BE APPLIED FOR EFFECTIVE BONDING.

WELDING

1. ALL WELDING SHALL BE PERFORMED IN ACCORDANCE WITH ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE AND APPLICABLE SECTIONS OF Mn/DOT STANDARD SPECIFICATION.
2. NO WELDING OTHER THAN THAT INDICATED ON THE APPROVED SHOP DRAWINGS IS ALLOWED ON THE BEARINGS OR ANY STEEL IN CONTACT WITH THE BEARINGS. THE AREAS IMMEDIATELY ADJACENT AND IN CONTACT WITH THE POLYTRON DISC AND PTFE SHALL NOT EXCEED 225°F, AS DETERMINED BY USE OF TEMPERATURE INDICATING WAX PENCILS. PROTECTIVE MATERIAL SHALL BE PLACED OVER THE BEARING ASSEMBLY TO PROTECT AGAINST SPARKS AND FLASH.

COATINGS

1. THE ENTIRE BEARING ASSEMBLY SHALL BE GALVANIZED AS PER Mn/DOT SPEC. 3394 WITH THE EXCEPTION OF THE FOLLOWING:
   - ALL PTFE, POLYETHER URETHANE, AND STAINLESS STEEL SURFACES
   - SRM AND SRM HOLE

△ △

SHIPPING & HANDLING

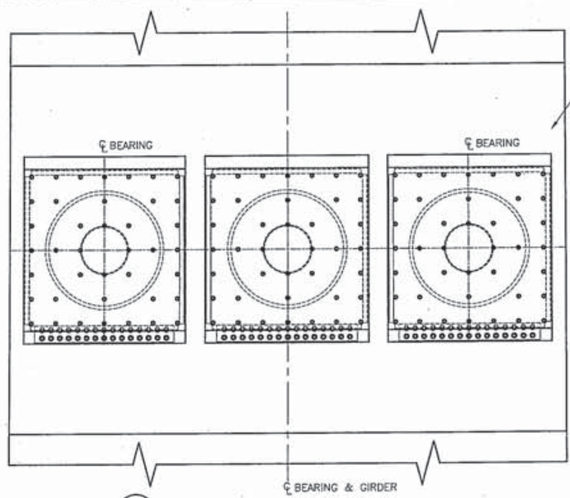
1. COMPLETED BEARINGS SHALL BE INDIVIDUALLY BANDED IN THE UPRIGHT POSITION.
2. BEARINGS SHALL BE STORED IN A CLEAN, DRY, AND UPRIGHT POSITION. AT NO TIME PRIOR TO THE COMPLETION OF THE PROJECT MAY ANY BEARING BE DISASSEMBLED WITHOUT AUTHORIZATION FROM RJ WATSON, INC.
3. BEARING ASSEMBLIES SHALL BE HANDLED BY THEIR BOTTOM SURFACES ONLY AND SHALL NOT BE LIFTED BY THEIR TOPS, SIDES, AND/OR SHIPPING BANDS. SHIPPING BANDS SHALL NOT BE REMOVED PRIOR TO INSTALLATION. SIGNIFICANT DAMAGE TO THE BEARING MAY RESULT FROM UNCONTROLLED MOVEMENT OR SHIFTING OF BEARING COMPONENTS.
4. PTFE AND STAINLESS STEEL SHALL BE PROTECTED FROM DAMAGE, AIRBORNE DEBRIS AND CONTAMINANTS AT ALL TIMES. THESE SURFACES SHALL BE INSPECTED FOR SUCH DAMAGE AND DEBRIS PRIOR TO FINAL ASSEMBLY.

INSTALLATION

1. THE CONTRACTOR SHALL ADJUST BEARING PEDESTAL ELEVATIONS TO ACCOMMODATE FINAL BEARING HEIGHTS.
2. INSTALL BEARINGS ACCORDING TO THE BEARING LOCATION PLAN SHOWN ON SHEET 2, THE LONGITUDINAL AND UPSTATION ARROWS INDICATED ON THE BEARING SOLE PLATES, AND APPLICABLE CONTRACT PLAN SHEETS.
3. BEARINGS ARE TO BE SET LEVEL.

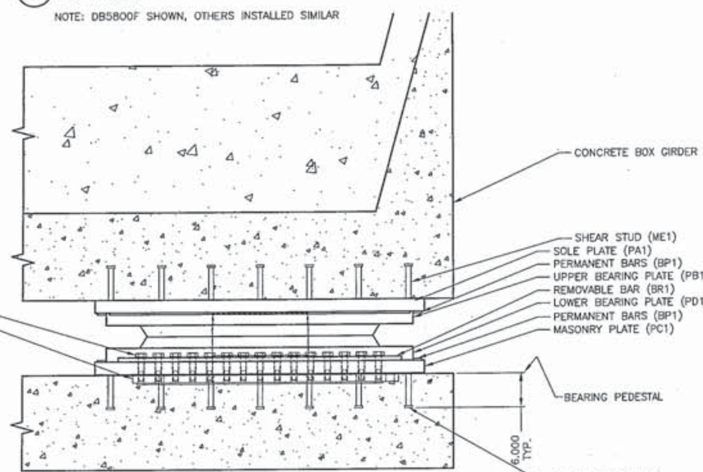
FABRICATION

1. MANUFACTURER: R.J. WATSON INC.
   78 JOHN GLENN DRIVE
   AMHERST, N.Y. 14228
   PH. (716) 691-3301
2. FABRICATOR: NATIONAL BRIDGE CO. INC
   1060 MILITARY ROAD
   BUFFALO, N.Y. 14217
   PH. (716) 876-1600
3. PRODUCTION AND INSPECTION COORDINATOR:
   SAL MILITELLO
   R.J. WATSON, INC.
4. SAMPLING AND TESTING COORDINATOR:
   JAY C. CONKLIN, P.E.
   R.J. WATSON INC.



PLAN INSTALLATION DETAIL
NOT TO SCALE

NOTE: DB5800F SHOWN, OTHERS INSTALLED SIMILAR



ELEV INSTALLATION DETAIL
NOT TO SCALE

NOTE: DB5800F SHOWN, OTHERS INSTALLED SIMILAR

RELEASED FOR CONSTRUCTION

DRAWING INDEX

SHEET NO	DESCRIPTION
1	INSTALLATION DETAILS AND NOTES
2	BEARING LOCATIONS
3	DB5800F & DB2200U ASSEMBLIES
4	DB2200M & DB1400MR & DB1400UR ASSEMBLIES
5	DB1200F ASSEMBLY
6	SOLE PLATE ASSEMBLIES
7	SLIDE PLATE ASSEMBLIES
8	UPPER BEARING PLATE AND SRM DETAILS
9	LOWER BEARING PLATE DETAILS
10	MASONRY PLATE ASSEMBLIES-1
11	MASONRY PLATE ASSEMBLIES-2

SHOP DRAWING REVIEW

___ FOR INFORMATION ONLY
X ACCEPTED
___ ACCEPTED AS NOTED
___ ACCEPTED AS NOTED & RESUBMIT
___ NOT ACCEPTED

This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements. The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:
Firm:
By: ______ Date: ______

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

ALL DIMENSIONS IN INCHES

Mn/DOT has reviewed this deliverable and determined that it appears to meet the requirements of the Contract Documents.

Kevin Western 2/7/08
Mn/DOT Representative **Date**

LEGEND

(##) — DENOTES QUANTITY
CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
ATCP=ACCORDING TO CONTRACT PLANS
TYP=TYPICAL
TPI=THREADS PER INCH
THDS=THREADS
HDG=HOT-DIP GALVANIZING
(⊗) —DENOTES THICK END

VIEW PROJECTION

TOLERANCING: AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED — DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
△ OWNER COMMENTS	12/11/07	RLT	JCC
△ CONTRACTOR COMMENTS	12/20/07	RLT	JCC
△ OWNER COMMENTS	01/31/08	RLT	JCC
△ OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

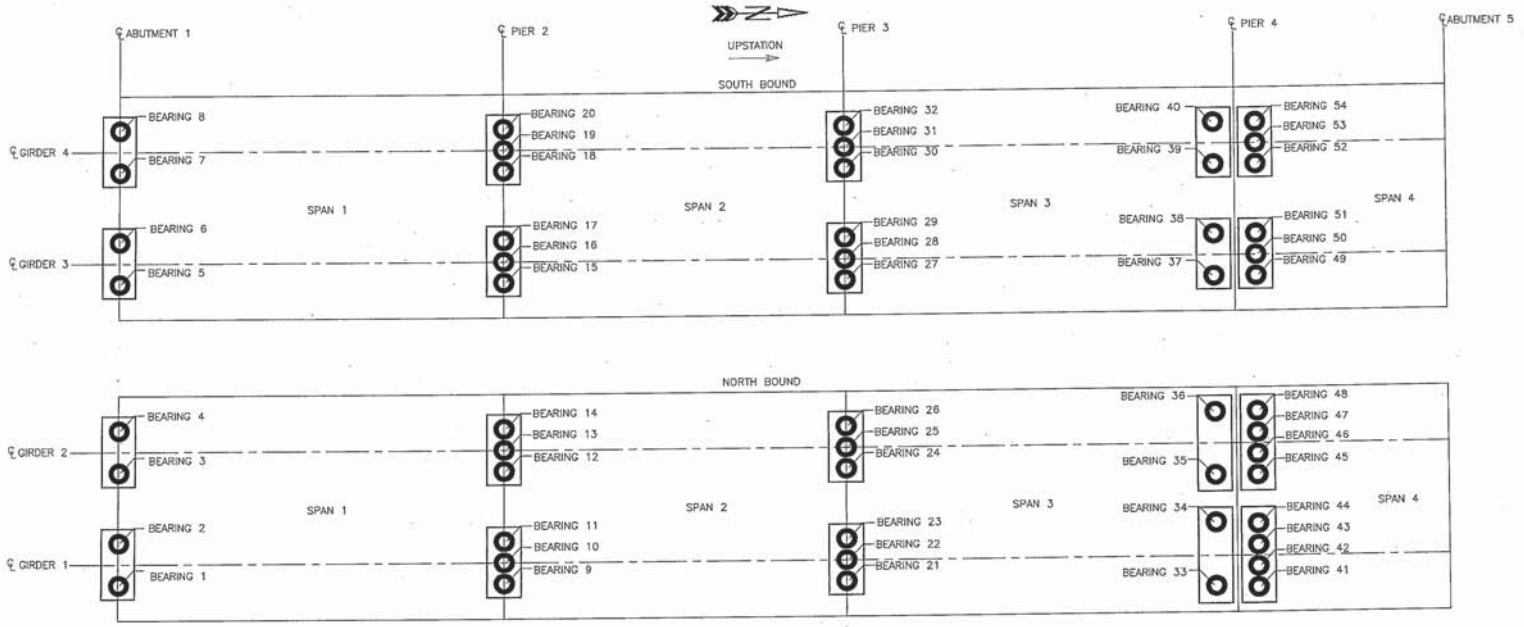
R. J. WATSON, INC.
78 JOHN GLENN DRIVE AMHERST, NEW YORK 14228

TITLE: INSTALLATION DETAILS & NOTES

DTL'D BY: RLT — DATE: 10/30/07 — RJW PO No. 2599
CHK'D BY: JCC — DATE: 11/8/07
BEARING TYPE: DISKTRON — SHEET: 1 OF 11

BEARING NUMBER	MODEL NUMBER	BEARING LOCATION	BEARING TYPE
1	DB2200M	ABUT 1	MULTI
2	DB2200U	ABUT 1	GUIDED
3	DB2200U	ABUT 1	GUIDED
4	DB2200M	ABUT 1	MULTI
5	DB2200M	ABUT 1	MULTI
6	DB2200U	ABUT 1	GUIDED
7	DB2200U	ABUT 1	GUIDED
8	DB2200M	ABUT 1	MULTI
9	DB5800F	PIER 2	FIXED
10	DB5800F	PIER 2	FIXED
11	DB5800F	PIER 2	FIXED
12	DB5800F	PIER 2	FIXED
13	DB5800F	PIER 2	FIXED
14	DB5800F	PIER 2	FIXED
15	DB5800F	PIER 2	FIXED
16	DB5800F	PIER 2	FIXED
17	DB5800F	PIER 2	FIXED
18	DB5800F	PIER 2	FIXED
19	DB5800F	PIER 2	FIXED
20	DB5800F	PIER 2	FIXED
21	DB5800F	PIER 3	FIXED
22	DB5800F	PIER 3	FIXED
23	DB5800F	PIER 3	FIXED
24	DB5800F	PIER 3	FIXED
25	DB5800F	PIER 3	FIXED
26	DB5800F	PIER 3	FIXED
27	DB5800F	PIER 3	FIXED
28	DB5800F	PIER 3	FIXED
29	DB5800F	PIER 3	FIXED
30	DB5800F	PIER 3	FIXED
31	DB5800F	PIER 3	FIXED
32	DB5800F	PIER 3	FIXED
33	DB1400MR	PIER 4S3	MULTI
34	DB1400UR	PIER 4S3	GUIDED
35	DB1400UR	PIER 4S3	GUIDED
36	DB1400MR	PIER 4S3	MULTI
37	DB1400MR	PIER 4S3	MULTI
38	DB1400UR	PIER 4S3	GUIDED
39	DB1400UR	PIER 4S3	GUIDED
40	DB1400MR	PIER 4S3	MULTI
41	DB1200F	PIER 4S4	FIXED
42	DB1200F	PIER 4S4	FIXED
43	DB1200F	PIER 4S4	FIXED
44	DB1200F	PIER 4S4	FIXED
45	DB1200F	PIER 4S4	FIXED
46	DB1200F	PIER 4S4	FIXED
47	DB1200F	PIER 4S4	FIXED
48	DB1200F	PIER 4S4	FIXED
49	DB1200F	PIER 4S4	FIXED
50	DB1200F	PIER 4S4	FIXED
51	DB1200F	PIER 4S4	FIXED
52	DB1200F	PIER 4S4	FIXED
53	DB1200F	PIER 4S4	FIXED
54	DB1200F	PIER 4S4	FIXED

SERIAL NO.: 08-2599-* ; *= BEARING NUMBER



BEARING LOCATIONS
NOT TO SCALE

ALL DIMENSIONS IN INCHES

SHOP DRAWING REVIEW

X FOR INFORMATION ONLY
ACCEPTED
ACCEPTED AS NOTED
ACCEPTED AS NOTED & RESUBMIT
NOT ACCEPTED

This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements. The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:
Firm:
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

RELEASED FOR CONSTRUCTION

Kevin Western
2/7/08

VIEW PROJECTION

LEGEND
(H) DENOTES QUANTITY
CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN LOCATIONS SHOWN ON DETAILS
ATCP=ACCORDING TO CONTRACT PLANS
TYP=TYPICAL
TPI=THREADS PER INCH
THDS=THREADS
HDG=HOT-DIP GALVANIZING
(X) —DENOTES THICK END

TOLERANCING:
AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED DO NOT SCALE DRAWING

REVISION	DATE	DT'L'D	CHK'D
1 OWNER COMMENTS	12/11/07	RLT	JCC
2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
3 OWNER COMMENTS	01/31/08	RLT	JCC
4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
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PROJECT No: S.P.2783-120, E.R.MN07(300)
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BRIDGE No: 27409(SB) 27410(NB)

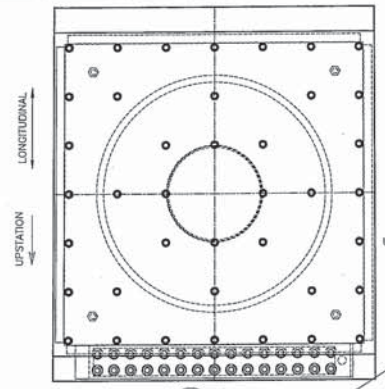
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

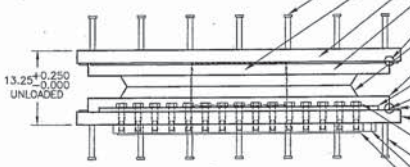
TITLE: BEARING LOCATIONS

DT'L'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

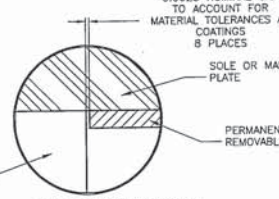
RJW PO No. 2599
SHEET: 2 OF 11



PLAN DB5800F
24 SCALE: 1:10



ELEV DB5800F
24 SCALE: 1:10



DET A GAP DETAIL FOR PERMANMENT AND REMOVABLE BARS
NOT TO SCALE
TYP. ALL ASSEMBLIES
EXCEPT DB1400MR AND DB1400UR ⚠

SHEAR STUD (ME1)
SRM (BA1)
SOLE PLATE (PA1)
UPPER BEARING PLATE (PB1)
SEE DETAIL A (TYP. OF ALL ASSEMBLIES)
POLYTRON DISC (MA1)
LOWER BEARING PLATE (PD1)
REMOVABLE BAR (BR1)
SEE DETAIL A (TYP. OF ALL ASSEMBLIES)
PERMANENT BAR (BP1)
MASONRY PLATE (PC1)
CONNECTION BOLT (MH1)
WASHER (MK1)
SHEAR STUD (ME1)
CONNECTION PLATE (PJ1)
SHEET STEEL COVER PLATE

DB5800F		24	LOCATION: PIERS 2 & 3 BRG. NO. 9-32						
MARK	QTY UNIT	QTY TOTAL	DESCRIPTION(INCHES) DIM 1	DIM 2	DIM 3	PIECE	COATING	MATERIAL	REMARKS
PA1	1	24	58.000	58.000	2.250	SOLE PLATE	GALVANIZE	ASTM A709 GR. 50	
PB1	1	24	54.000	54.000	2.250	UPPER BEARING PLATE	GALVANIZE	ASTM A709 GR. 50	
PC1	1	24	67.000	58.000	2.250	MASONRY PLATE	GALVANIZE	ASTM A709 GR. 50	
PD1	1	24	54.000	54.000	2.500	LOWER BEARING PLATE	GALVANIZE	ASTM A709 GR. 50	
BA1	1	24	17.000	Ø	7.750	SRM	NONE	AISI 4000 SERIES	Fymin=75 KSI
MA1	1	24	42.500	Ø	4.000	POLYTRON DISC	NONE	AASHTO LRFD TABLE 18.3.2.8-1	ID= 17.125
ME1	80	1920	0.875	Ø	6.000	SHEAR STUD	GALVANIZE	ASTM A108 GR 1015	Fymin=50 KSI Fumin= 60 KSI
BP1	7	168	53.000	1.500	0.313	PERMANENT BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BR1	1	24	50.000	6.000	0.750	REMOVABLE BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
MH1	30	720	1.000	Ø	4.250	CONNECTION BOLT	GALVANIZE	ASTM A325	
PJ1	1	24	47.000	6.000	1.500	CONNECTION PLATE	GALVANIZE	ASTM A709 GR. 50	
MK1	30	720	1.000	Ø	–	WASHER	GALVANIZE	ASTM F436	
⚠ MN1	4	96	1.000	Ø	–	HEAVY HEX NUT	GALVANIZE	ASTM A563	

NOTE: DIMENSIONS IN BILL OF MATERIALS REFLECT THE DIMENSIONS OF RAW MATERIALS TO BE ORDERED. SEE DETAIL SHEETS FOR FINAL DIMENSIONS OF FABRICATED INDIVIDUAL PARTS.

DB5800F FIXED	
CAPACITY TABLE	
VERTICAL LOAD AT SERVICE LIMIT STATE(kips)	5800
VERTICAL LOAD AT STRENGTH LIMIT STATE(kips)	8200
⚠ HORIZONTAL LOAD AT SERVICE LIMIT STATE(kips)	475
⚠ HORIZONTAL LOAD AT STRENGTH LIMIT STATE(kips)	820
TOTAL LONGITUDINAL DISPLACEMENT(IN)	0
TOTAL TRANSVERSE DISPLACEMENT(IN)	0
ROTATION (rad)	0.02

APPROXIMATE DEAD LOAD DEFLECTION = 0.250"

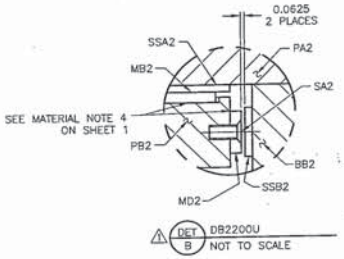
RELEASED FOR CONSTRUCTION

⚠ DB2200U		4	LOCATION: ABUTMENT 1 BRG NO. 2,3,6,7						
MARK	QTY UNIT	QTY TOTAL	DESCRIPTION(INCHES) DIM 1	DIM 2	DIM 3	PIECE	COATING	MATERIAL	REMARKS
PA2	1	4	52.000	36.000	2.000	SOLE PLATE	GALVANIZE	ASTM A709 GR 50	
PB2	1	4	28.000	28.000	2.250	UPPER BEARING PLATE	GALVANIZE	ASTM A709 GR 50	
⚠⚠ PC2	1	4	39.000	36.000	2.000	MASONRY PLATE	GALVANIZE	ASTM A709 GR 50	
PD2	1	4	32.000	32.000	2.250	LOWER BEARING PLATE	GALVANIZE	ASTM A709 GR 50	
PE2	1	4	48.000	32.000	1.750	SLIDE PLATE	NONE	ASTM A240 TYPE 304	
SSA2	1	4	47.500	28.000	12 GA	TOP STAINLESS STEEL	NONE	ASTM A240 TYPE 304	
⚠ SSB2	2	8	46.500	2.125	12 GA	SIDE STAINLESS STEEL	NONE	AISI 4000 SERIES	Fymin=75 KSI
BA2	1	4	6.000	Ø	6.125	SRM	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BB2	2	8	47.500	2.750	1.500	GUIDE BAR	NONE	AASHTO LRFD TABLE 18.3.2.8-1	ID= 6.125
MA2	1	4	24.500	Ø	2.500	POLYTRON DISC	NONE	AASHTO LRFD TABLE 18.8.2.6-1	UNFILLED SHEET, DIMPLED LUBRICATED
MB2	1	4	27.500	Ø	0.250	TOP PTFE	NONE	AASHTO LRFD TABLE 18.8.2.6-1	15% GLASS FILLED SHEET
⚠ MD2	2	8	26.500	2.000	0.188	SIDE PTFE	GALVANIZE	ASTM A108 GR 1015	Fymin=50 KSI Fumin= 60 KSI
ME2	32	128	0.875	Ø	6.000	SHEAR STUD	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BP2	5	20	31.000	1.500	0.313	PERMANENT BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BQ2	2	8	47.000	1.500	0.313	PERMANENT BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BR2	1	4	33.000	3.000	0.750	REMOVABLE BAR	GALVANIZE	ASTM A325	
MH2	11	44	1.000	Ø	4.000	CONNECTION BOLT	GALVANIZE	ASTM A709 GR. 50	
PJ2	1	4	33.000	3.000	1.500	CONNECTION PLATE	GALVANIZE	ASTM F436	
MK2	11	44	1.000	Ø	–	WASHER	ZINC/CADMIUM	ASTM F835 OR A574	
SA2	12	48	0.250	20 TPI	0.500	CAP SCREW	YELLOW DICHROMATE	TRANSPORT CHAIN GR. 70 TC7	
⚠ RC2	14	56	0.500	–	–	RESTRAINT CHAIN	GALVANIZE	ASTM A563	
⚠ MN2	4	18	1.000	Ø	–	HEAVY HEX NUT			

NOTE: DIMENSIONS IN BILL OF MATERIALS REFLECT THE DIMENSIONS OF RAW MATERIALS TO BE ORDERED. SEE DETAIL SHEETS FOR FINAL DIMENSIONS OF FABRICATED INDIVIDUAL PARTS.

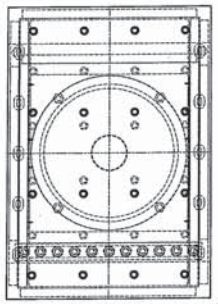
DB2200U UNIDIRECTIONAL		
CAPACITY TABLE		
VERTICAL LOAD AT SERVICE LIMIT STATE(kips)	2200	⚠
VERTICAL LOAD AT STRENGTH LIMIT STATE(kips)	3080	⚠⚠
HORIZONTAL LOAD AT SERVICE LIMIT STATE(kips)	290	⚠⚠
HORIZONTAL LOAD AT STRENGTH LIMIT STATE(kips)	430	⚠⚠
TOTAL LONGITUDINAL DISPLACEMENT(IN)	20	
TOTAL TRANSVERSE DISPLACEMENT(IN)	0.125	
ROTATION (rad)	0.02	

APPROXIMATE DEAD LOAD DEFLECTION = 0.125"

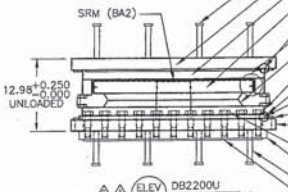


⚠ DET B DB2200U
NOT TO SCALE

ALL DIMENSIONS IN INCHES



⚠ PLAN DB2200U
4 SCALE: 1:10



⚠⚠ ELEV DB2200U
4 SCALE: 1:10

SHEAR STUD (ME2)
SOLE PLATE (PA2)
SLIDE PLATE (PE2)
UPPER BEARING PLATE (PB2)
SEE DETAIL A (TYP. OF ALL ASSEMBLIES)
SEE DETAIL B
POLYTRON DISC (MA2)
LOWER BEARING PLATE (PD2)
REMOVABLE BAR (BR2)
SEE DETAIL A (TYP. OF ALL ASSEMBLIES)
PERMANENT BAR (BP2)
MASONRY PLATE (PC2)
CONNECTION BOLT (MH2)
WASHER (MK2)
CONNECTION PLATE (PJ2)
SHEAR STUD (ME2)
SHEET STEEL COVER PLATE

SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

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FIGG Subconsultant:
Firm:
By: Date:

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

2/7/08
Kevin Western

VIEW PROJECTION

LEGEND
DENOTES QUANTITY
CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
ATCP=ACCORDING TO CONTRACT PLANS
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⊗ —DENOTES THICK END

TOLERANCING: AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE
SCALE: AS NOTED DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
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⚠ CONTRACTOR COMMENTS	12/20/07	RLT	JCC
⚠ OWNER COMMENTS	01/31/08	RLT	JCC
⚠ OWNER COMMENTS	02/01/08	RLT	JCC

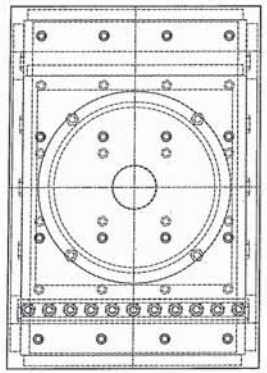
PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, F.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

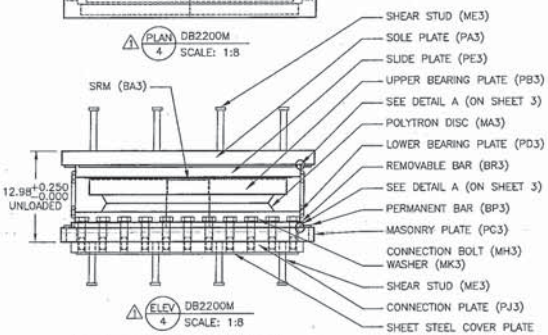
TITLE: ⚠ DB5800F AND DB2200U ASSEMBLIES

DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

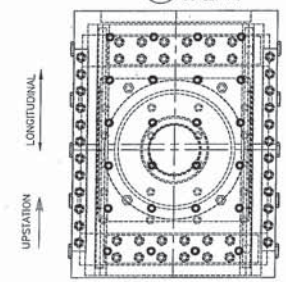
RJW PO No. 2599
SHEET: 3 OF 11



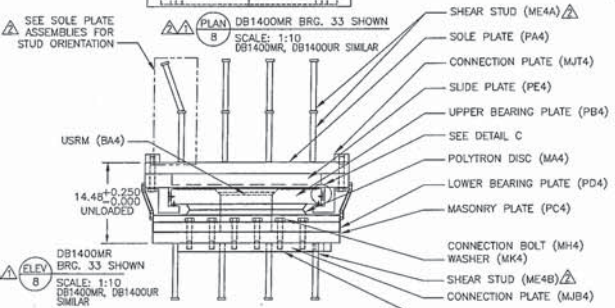
PLAN 4 DB2200M
SCALE: 1:8



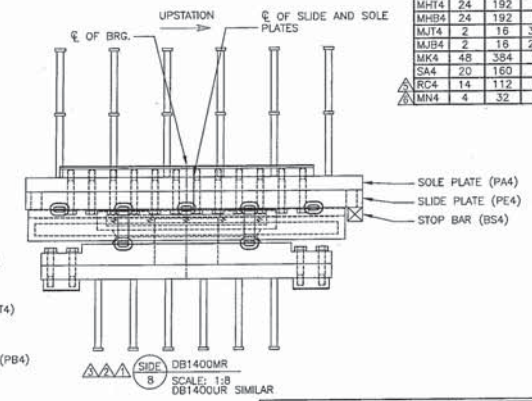
ELEV 4 DB2200M
SCALE: 1:8



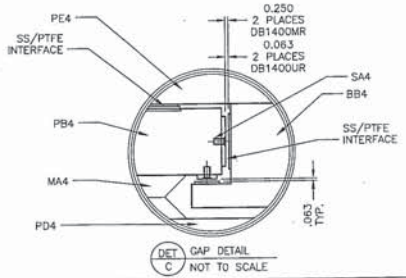
PLAN 8 DB1400MR BRG. 33 SHOWN
SCALE: 1:10
DB1400MR, DB1400UR SIMILAR



ELEV 8 DB1400MR
BRG. 33 SHOWN
SCALE: 1:10
DB1400MR, DB1400UR SIMILAR



SIDE 8 DB1400MR
SCALE: 1:8
DB1400UR SIMILAR



DET C GAP DETAIL
NOT TO SCALE

VIEW PROJECTION

SHOP DRAWING REVIEW

X FOR INFORMATION ONLY
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ACCEPTED AS NOTED
ACCEPTED AS NOTED & RESUBMIT
NOT ACCEPTED

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FIGG Subconsultant:
Firm:
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

DB2200M
MULTIDIRECTIONAL

CAPACITY TABLE

⚠1 VERTICAL LOAD AT SERVICE LIMIT STATE(kips)	2200
⚠1 VERTICAL LOAD AT STRENGTH LIMIT STATE(kips)	3080
⚠2⚠3 HORIZONTAL LOAD AT SERVICE LIMIT STATE(kips)	290
⚠2⚠3 HORIZONTAL LOAD AT STRENGTH LIMIT STATE(kips)	430
TOTAL LONGITUDINAL DISPLACEMENT(IN)	20
TOTAL TRANSVERSE DISPLACEMENT(IN)	2
ROTATION (rad)	0.02

APPROXIMATE DEAD LOAD DEFLECTION = 0.125"

⚠1 DB2200M 4 LOCATION: ABUTMENT 1 BRG. NO. 1,4,5,8

MARK	QTY UNIT	QTY TOTAL	DESCRIPTION(INCHES) DIM 1	DIM 2	DIM 3	PIECE	COATING	MATERIAL	REMARKS
PA3	1	4	52.000	36.000	2.000	SOLE PLATE	GALVANIZE	ASTM A709 GR 50	
PB3	1	4	28.000	28.000	2.250	UPPER BEARING PLATE	GALVANIZE	ASTM A709 GR 50	
⚠4⚠4 PC3	1	4	39.000	36.000	2.000	MASONRY PLATE	GALVANIZE	ASTM A709 GR 50	
PD3	1	4	32.000	32.000	2.250	LOWER BEARING PLATE	GALVANIZE	ASTM A709 GR 50	
PE3	1	4	48.000	32.000	1.750	SLIDE PLATE	GALVANIZE	ASTM A709 GR 50	
SSA3	1	4	47.500	29.500	12 GA	TOP STAINLESS STEEL	NONE	ASTM A240 TYPE 304	
BA3	1	4	6.000	Ø	6.125	SRM	NONE	AISI 4000 SERIES	Fymin=75 KSI
MA3	1	4	24.500	Ø	2.500	POLYTRON DISC	NONE	AASHTO LRFD TABLE 18.3.2.8-1	ID= 6.125
MB3	1	4	27.500	Ø	0.250	TOP PTFE	NONE	AASHTO LRFD TABLE 18.8.2.6-1	UNFILLED SHEET, DIMPLED LUBRICATED
ME3	32	128	0.875	Ø	6.000	SHEAR STUD	GALVANIZE	ASTM A108 GR 1015	Fymin=50 KSI Fumin= 60 KSI
BP3	5	20	31.000	1.500	0.313	PERMANENT BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BQ3	2	8	47.000	1.500	0.313	PERMANENT BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BR3	1	4	33.000	3.000	0.750	REMOVABLE BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
MH3	11	44	1.000	Ø	4.000	CONNECTION BOLT	GALVANIZE	ASTM A325	
PJ3	1	4	33.000	3.000	1.500	CONNECTION PLATE	GALVANIZE	ASTM A709 GR. 50	
MK3	11	44	1.000	Ø	–	WASHER	GALVANIZE	ASTM F436	
⚠RC3	14	56	0.500	–	–	RESTRAINT CHAIN	YELLOW DICHROMATE	TRANSPORT CHAIN GR. 70 TC7	
⚠MN3	4	16	1.000	Ø	–	HEAVY HEX NUT	GALVANIZE	ASTM A563	

NOTE: DIMENSIONS IN BILL OF MATERIALS REFLECT THE DIMENSIONS OF RAW MATERIALS TO BE ORDERED. SEE DETAIL SHEETS FOR FINAL DIMENSIONS OF FABRICATED INDIVIDUAL PARTS.

RELEASED FOR CONSTRUCTION

DB1400MR & DB1400UR
MULTIDIRECTIONAL & UNIDIRECTIONAL

CAPACITY TABLE

VERTICAL LOAD AT SERVICE LIMIT STATE(kips)	1400
VERTICAL LOAD AT STRENGTH LIMIT STATE(kips)	1960
⚠1 UPLIFT LOAD AT STRENGTH LIMIT STATE(kips)	275
⚠2⚠3 HORIZONTAL LOAD AT SERVICE LIMIT STATE(kips)	205
⚠2⚠3 HORIZONTAL LOAD AT STRENGTH LIMIT STATE(kips)	300
TOTAL LONGITUDINAL DISPLACEMENT(IN)	20
⚠2 STOP BAR CAPACITY AT SERVICE LIMIT(kips)	325
⚠3 MR TOTAL TRANSVERSE DISPLACEMENT(IN)	0.500
⚠3 UR TOTAL TRANSVERSE DISPLACEMENT(IN)	0.125
ROTATION (rad)	0.02

APPROXIMATE DEAD LOAD DEFLECTION = 0.125"

⚠1 DB1400MR & UR 8 LOCATION: PIER 4 – SPAN 3 BRG. NO. 33–40

MARK	QTY UNIT	QTY TOTAL	DESCRIPTION(INCHES) DIM 1	DIM 2	DIM 3	PIECE	COATING	MATERIAL	REMARKS
PA4	1	8	47.500	36.000	2.000	SOLE PLATE	GALVANIZE	ASTM A709 GR 50	
PB4	1	8	25.500	26.500	2.750	UPPER BEARING PLATE	GALVANIZE	ASTM A709 GR 50	
⚠4⚠4 PC4	1	8	41.000	33.000	2.000	MASONRY PLATE	GALVANIZE	ASTM A709 GR 50	
PD4	1	8	41.000	33.000	3.000	LOWER BEARING PLATE	GALVANIZE	ASTM A709 GR 50	
PE4	1	8	47.500	36.000	2.500	SLIDE PLATE	GALVANIZE	ASTM A709 GR 50	
SSA4	1	8	44.750	25.750	12 GA	TOP STAINLESS STEEL	NONE	ASTM A240 TYPE 304	
SSB4	2	16	42.750	1.750	12 GA	SIDE STAINLESS STEEL	NONE	ASTM A240 TYPE 304	
SSC4	2	16	42.750	1.375	12 GA	LOWER STAINLESS STEEL	NONE	ASTM A240 TYPE 304	
BA4	1	8	10.000	Ø	7.125	USRM	NONE	AISI 4000 SERIES	Fymin=75 KSI, Fumin= 100 KSI
BB4A	2	8	44.750	4.500	3.750	GUIDE BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	SEE DETAIL
BB4B	2	8	44.750	4.500	3.563	GUIDE BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	SEE DETAIL
MA4	1	8	21.250	Ø	2.000	POLYTRON DISC	NONE	AASHTO LRFD TABLE 18.3.2.8-1	ID= 9.125
MB4	1	8	24.750	Ø	0.250	TOP PTFE	NONE	AASHTO LRFD TABLE 18.8.2.6-1	ID= 12.000, UNFILLED SHEET, DIMPLED LUBRICATED
⚠4 MD4A	2	8	22.750	1.500	0.188	SIDE PTFE	NONE	AASHTO LRFD TABLE 18.8.2.6-1	15% GLASS FILLED SHEET DB1400MR
⚠4 MD4B	2	8	22.750	1.625	0.188	SIDE PTFE	NONE	AASHTO LRFD TABLE 18.8.2.6-1	15% GLASS FILLED SHEET DB1400UR
MDL4	2	16	22.750	0.875	0.188	LOWER PTFE	NONE	AASHTO LRFD TABLE 18.8.2.6-1	15% GLASS FILLED SHEET
⚠4 ME4A	48	384	0.875	Ø	9.000	SHEAR STUD	GALVANIZE	ASTM A108 GR 1015	Fymin=50 KSI Fumin= 60 KSI
⚠4 ME4B	24	192	0.875	Ø	10.000	SHEAR STUD	GALVANIZE	ASTM A108 GR 1015	Fymin=50 KSI Fumin= 60 KSI
BS4	1	8	26.500	2.000	2.000	STOP BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
MHT4	24	192	0.875	Ø	5.750	CONNECTION BOLT---TOP	GALVANIZE	ASTM A325	
MHB4	24	192	0.875	Ø	5.000	CONNECTION BOLT---BOTTOM	GALVANIZE	ASTM A325	
MJT4	2	16	36.000	2.500	1.500	CONNECTION PLATE--TOP	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
MJB4	2	16	27.000	5.000	1.500	CONNECTION PLATE--BOTTOM	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
MK4	48	384	0.875	Ø	–	WASHER	GALVANIZE	ASTM F436	
SA4	20	160	0.250	20 TPI	0.500	CAP SCREW	ZINC/CADMIUM	ASTM F835 OR A574	
⚠RC4	14	112	0.500	–	–	RESTRAINT CHAIN	YELLOW DICHROMATE	TRANSPORT CHAIN GR. 70 TC7	
⚠MN4	4	32	1.000	Ø	–	HEAVY HEX NUT	GALVANIZE	ASTM A563	

ALL DIMENSIONS IN INCHES

Kevin Western 2/7/08

LEGEND
# DENOTES QUANTITY
CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
ATCP=ACCORDING TO CONTRACT PLANS
TYP=TYPICAL
TPI=THREADS PER INCH
THDS=THREADS
HDG=HOT-DIP GALVANIZING
⊗ —DENOTES THICK END

TOLERANCING:
AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
⚠1 OWNER COMMENTS	12/11/07	RLT	JCC
⚠2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
⚠3 OWNER COMMENTS	01/31/08	RLT	JCC
⚠4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

TITLE:
⚠4 DB2200M AND DB1400MR & DB1400UR ASSEMBLIES

DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

RJW PO No. 2599
SHEET: 4 OF 11

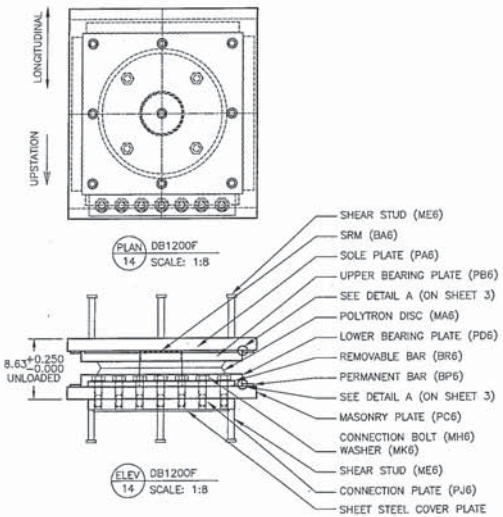
SHOP DRAWING REVIEW

- ___ FOR INFORMATION ONLY
- X ACCEPTED
- ___ ACCEPTED AS NOTED
- ___ ACCEPTED AS NOTED & RESUBMIT
- ___ NOT ACCEPTED

This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements.
The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:
Firm: _____
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08



DB1200F FIXED	
CAPACITY TABLE	
VERTICAL LOAD AT SERVICE LIMIT STATE(kips)	1200
VERTICAL LOAD AT STRENGTH LIMIT STATE(kips)	1680
⚠1 HORIZONTAL LOAD AT SERVICE LIMIT STATE(kips)	155
HORIZONTAL LOAD AT STRENGTH LIMIT STATE(kips)	238
TOTAL LONGITUDINAL DISPLACEMENT(IN)	0
TOTAL TRANSVERSE DISPLACEMENT(IN)	0
ROTATION (rad)	0.02

APPROXIMATE DEAD LOAD DEFLECTION = 0.125"

DB1200F 14 LOCATION: PIER 4 – SPAN 4 BRG. NO. 41–54

MARK	QTY UNIT	QTY TOTAL	DESCRIPTION(INCHES) DIM 1	DIM 2	DIM 3	PIECE	COATING	MATERIAL	REMARKS
PA6	1	14	27.000	27.000	1.750	SOLE PLATE	GALVANIZE	ASTM A709 GR. 50	
PB6	1	14	23.000	23.000	1.500	UPPER BEARING PLATE	GALVANIZE	ASTM A709 GR. 50	
⚠3⚠4 PC6	1	14	30.000	27.000	1.750	MASONRY PLATE	GALVANIZE	ASTM A709 GR. 50	
PD6	1	14	23.000	23.000	1.750	LOWER BEARING PLATE	GALVANIZE	ASTM A709 GR. 50	
BA6	1	14	6.000	Ø	4.375	SRM	NONE	AISI 4000 SERIES	Fymin=75 KSI
MA6	1	14	18.500	Ø	1.875	POLYTRON DISC	NONE	AASHTO LRFD TABLE 18.3.2.8-1	ID= 6.125
ME6	18	252	0.875	Ø	6.000	SHEAR STUD	GALVANIZE	ASTM A108 GR 1015	Fymin=50 KSI Fumin= 60 KSI
BP6	7	98	22.000	1.500	0.313	PERMANENT BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
BR6	1	14	21.000	3.000	0.750	REMOVABLE BAR	GALVANIZE	ASTM A709 GR. 50 OR EQUIV. BAR	
MH6	7	98	1.000	Ø	3.750	CONNECTION BOLT	GALVANIZE	ASTM A325	
PJ6	1	14	21.000	3.000	1.500	CONNECTION PLATE	GALVANIZE	ASTM A709 GR. 50	
MK6	7	98	1.000	Ø	–	WASHER	GALVANIZE	ASTM F436	
⚠2 MN6	4	56	1.000	Ø	–	HEAVY HEX NUT	GALVANIZE	ASTM A563	

NOTE: DIMENSIONS IN BILL OF MATERIALS REFLECT THE DIMENSIONS OF RAW MATERIALS TO BE ORDERED. SEE DETAIL SHEETS FOR FINAL DIMENSIONS OF FABRICATED INDIVIDUAL PARTS.

ALL DIMENSIONS IN INCHES

RELEASED FOR CONSTRUCTION

Kevin Western
2/7/08

VIEW PROJECTION

LEGEND
- ## DENOTES QUANTITY
- CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
- ATCP=ACCORDING TO CONTRACT PLANS
- TYP=TYPICAL
- TPI=THREADS PER INCH
- THDS=THREADS
- HDG=HOT-DIP GALVANIZING
- (⊗) =DENOTES THICK END

TOLERANCING: AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
⚠1 OWNER COMMENTS	12/11/07	RLT	JCC
⚠2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
⚠3 OWNER COMMENTS	01/31/08	RLT	JCC
⚠4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

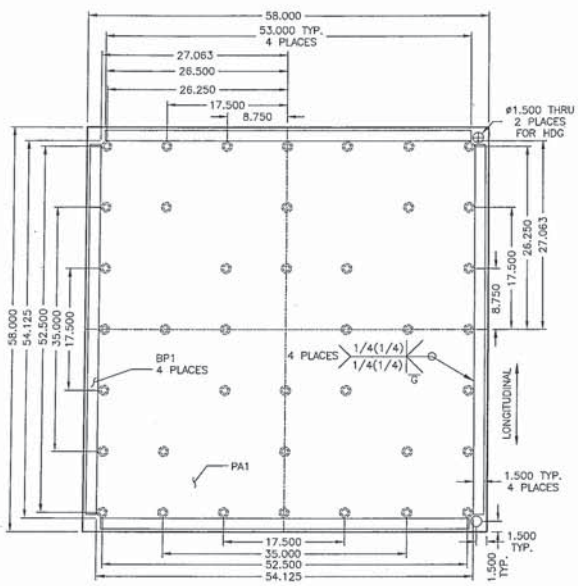
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

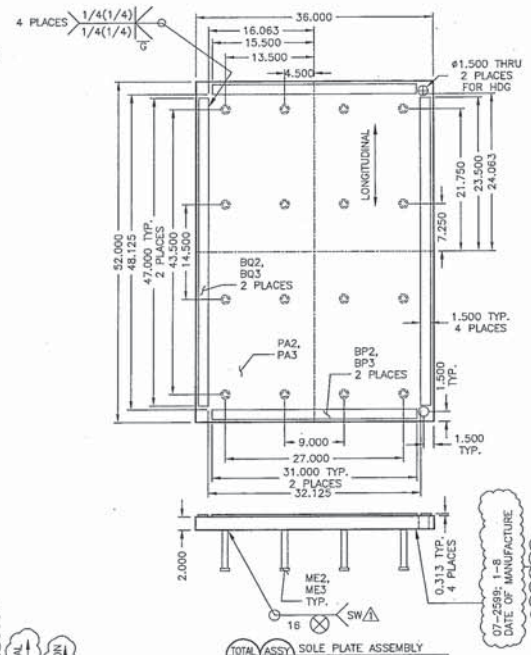
R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

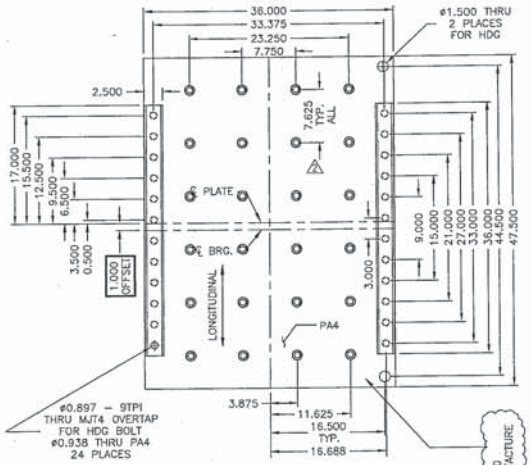
TITLE: ⚠DB1200F ASSEMBLY

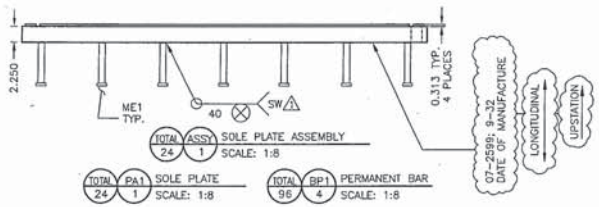
DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

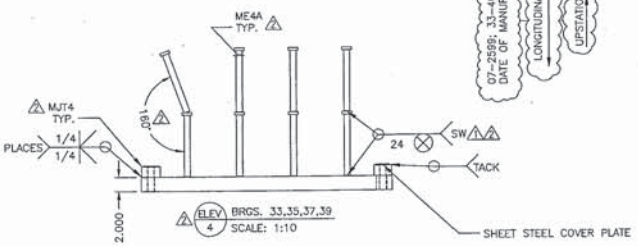
RJW PO No. 2599
SHEET: 5 OF 11











TOTAL 24 | ASSY 1 SOLE PLATE ASSEMBLY SCALE: 1:8

TOTAL 24 | PA1 1 SOLE PLATE SCALE: 1:8

TOTAL 96 | BP1 4 PERMANENT BAR SCALE: 1:8

TOTAL 960 | ME1 40 SHEAR STUD SCALE: 1:8

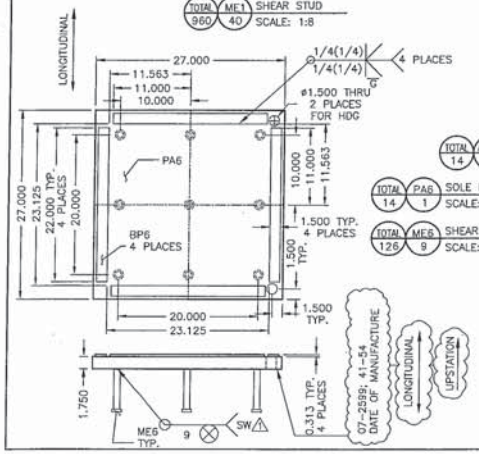
TOTAL 8 | ASSY 1 SOLE PLATE ASSEMBLY SCALE: 1:8

TOTAL 8 | PA2 4 | PA3 4 SOLE PLATE SCALE: 1:8

TOTAL 16 | BQ2 2 | BQ3 2 PERMANENT BAR SCALE: 1:8

TOTAL 128 | ME2 16 | ME3 16 SHEAR STUD SCALE: 1:8

TOTAL 16 | BP2 2 | BP3 2 PERMANENT BAR SCALE: 1:8



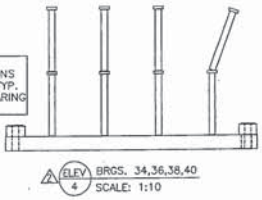
TOTAL 14 | ASSY 1 SOLE PLATE ASSEMBLY SCALE: 1:8

TOTAL 14 | PA6 1 SOLE PLATE SCALE: 1:8

TOTAL 56 | BP6 4 PERMANENT BAR SCALE: 1:8

TOTAL 126 | ME6 9 SHEAR STUD SCALE: 1:8

NOTE:
ALL DIMENSIONS AND WELDS TYP. OF SAME BEARING TYPE



ELEV 4 BRGS. 34,36,38,40 SCALE: 1:10

TOTAL 8 | ASSY 1 SOLE PLATE ASSEMBLY SCALE: 1:8

TOTAL 8 | PA4 1 SOLE PLATE SCALE: 1:8

TOTAL 384 | ME4A 48 SHEAR STUD SCALE: 1:8

TOTAL 16 | MJT4 2 CONNECTION PLATE SCALE: 1:8

ALL DIMENSIONS IN INCHES

RELEASED FOR CONSTRUCTION

Kevin Western 2/4/08

VIEW PROJECTION

LEGEND
H DENOTES QUANTITY
CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
ATCP=ACCORDING TO CONTRACT PLANS
TYP=TYPICAL
TPI=THREADS PER INCH
THDS=THREADS
HDG=HOT-DIP GALVANIZING
⊗ —DENOTES THICK END

TOLERANCING:
AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
1 OWNER COMMENTS	12/11/07	RLT	JCC
2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
3 OWNER COMMENTS	01/31/08	RLT	JCC
4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

TITLE: SOLE PLATE ASSEMBLIES

DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

RJW PO No. 2599
SHEET: 6 OF 11

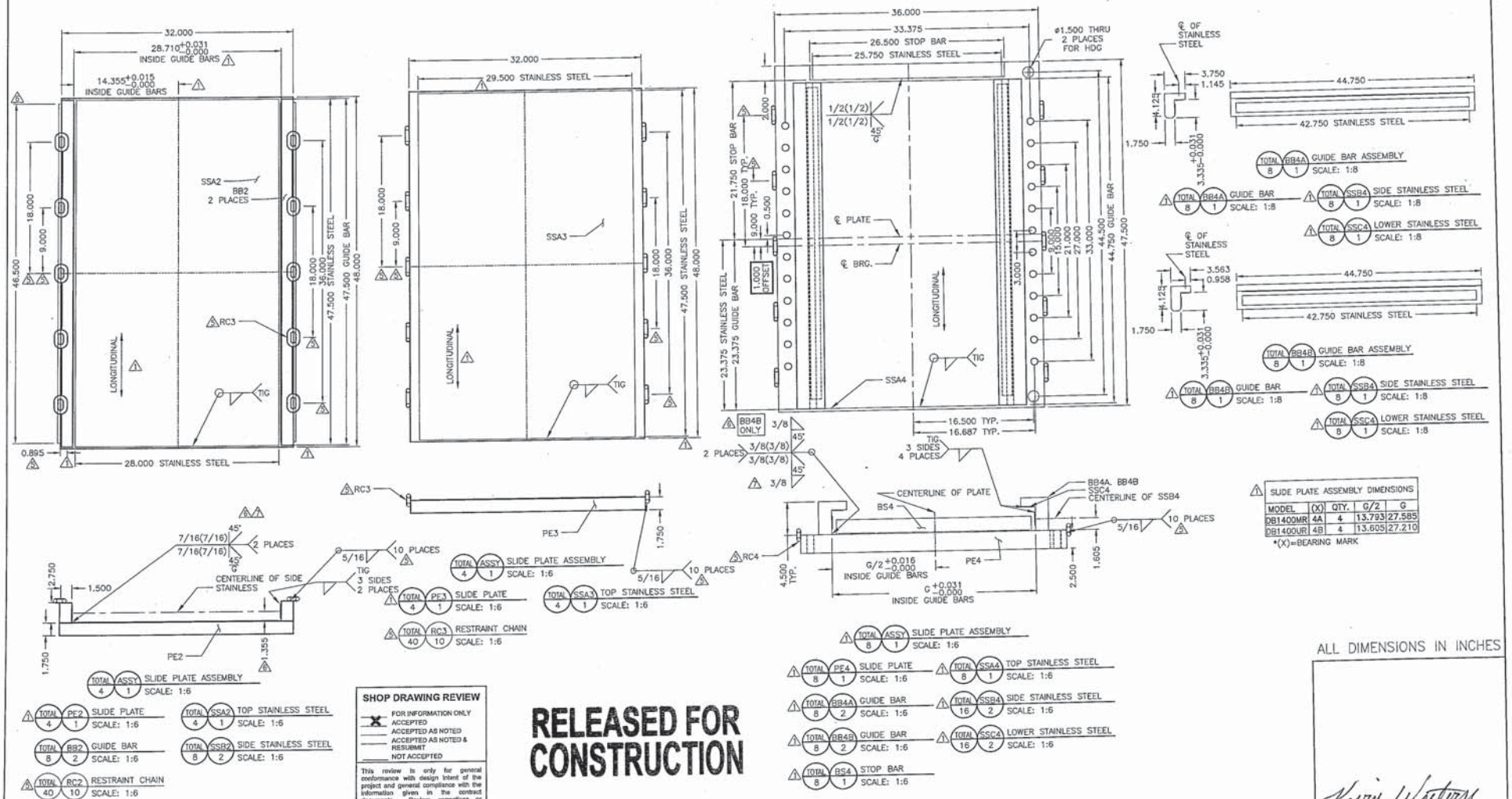
SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- X ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements. The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:
Firm:
By: Date:

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08



SLIDE PLATE ASSEMBLY DIMENSIONS				
MODEL	(X)	QTY.	G/2	G
DB1400MR	4A	4	13.793	27.585
DB1400UR	4B	4	13.605	27.210

*(X)=BEARING MARK

ALL DIMENSIONS IN INCHES

Kevin Western 2/7/08

SHOP DRAWING REVIEW

- ___ FOR INFORMATION ONLY
- X ACCEPTED
- ___ ACCEPTED AS NOTED
- ___ ACCEPTED AS NOTED & RESUBMIT
- ___ NOT ACCEPTED

This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements. The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant: Firm: ___ By: ___ Date: ___

FIGG BRIDGE ENGINEERS, Inc. By: MSK Date: 02/06/08

RELEASED FOR CONSTRUCTION

VIEW PROJECTION

LEGEND
- # DENOTES QUANTITY
- CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
- ATCP=ACCORDING TO CONTRACT PLANS
- TYP=TYPICAL
- TPI=THREADS PER INCH
- THDS=THREADS
- HDG=HOT-DIP GALVANIZING
- (X) DENOTES THICK END

TOLERANCING: AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED — DO NOT SCALE DRAWING

REVISION	DATE	DT'L'D	CHK'D
1 OWNER COMMENTS	12/11/07	RLT	JCC
2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
3 OWNER COMMENTS	01/31/08	RLT	JCC
4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION: ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT PROJECT No: S.P.2783-120, E.R.MN07(300) I-35W OVER THE MISSISSIPPI RIVER BRIDGE No: 27409(SB) 27410(NB)

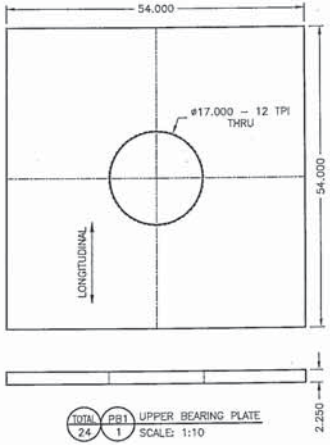
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

R. J. WATSON, INC.
78 JOHN GLENN DRIVE AMHERST, NEW YORK 14228

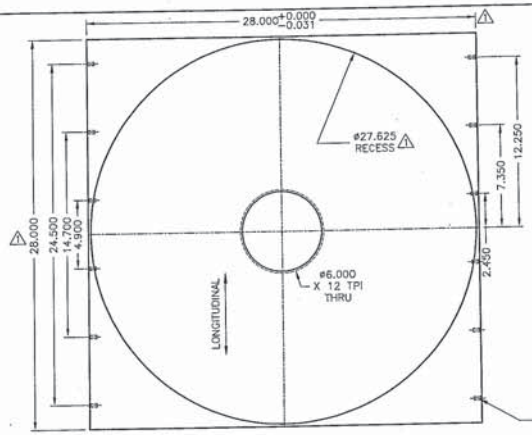
TITLE: SLIDE PLATE ASSEMBLIES

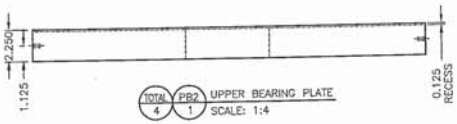
DT'L'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

RJW PO No. 2599
SHEET: 7 OF 11

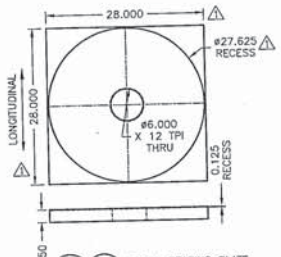


TOTAL 24 | PB1 1 UPPER BEARING PLATE
SCALE: 1:10

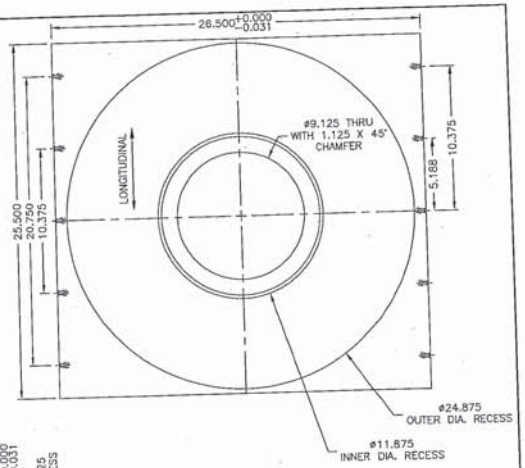


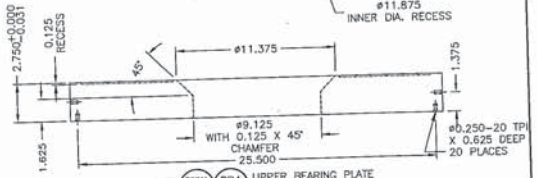


TOTAL 4 | PB2 1 UPPER BEARING PLATE
SCALE: 1:4



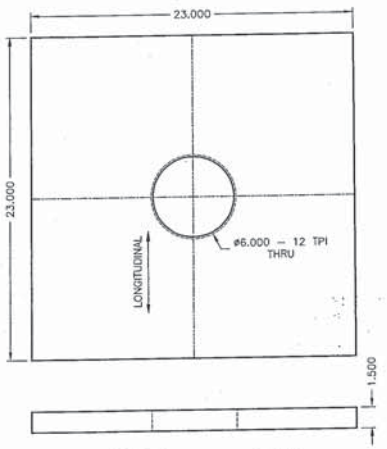
TOTAL 4 | PB3 1 UPPER BEARING PLATE
SCALE: 1:10



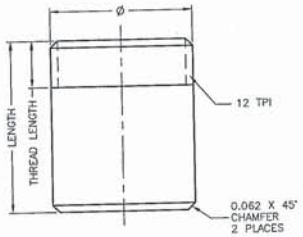


TOTAL 8 | PB4 1 UPPER BEARING PLATE
SCALE: 1:4

RELEASED FOR CONSTRUCTION

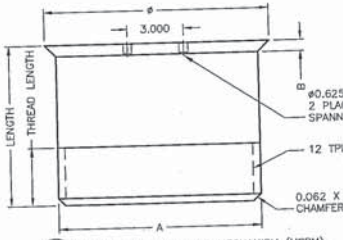


TOTAL 14 | PB6 1 UPPER BEARING PLATE
SCALE: 1:4



SHEAR RESISTING MECHANISM (SRM)
NOT TO SCALE

MARK	QTY	ø	THREAD LENGTH	LENGTH
BA1	24	17.000	2.250	7.750
BA2	4	6.000	2.125	6.125
BA3	4	6.000	2.125	6.125
BA6	14	6.000	1.500	4.375
2				
1				



UPLIFT SHEAR RESISTING MECHANISM (USRM)
NOT TO SCALE

MARK	QTY	ø	A	THREAD LENGTH	LENGTH	B
BA4	8	10.000	9.000	3.000	7.125	0.500

ALL DIMENSIONS IN INCHES

Kevin Watson
2/7/08

SHOP DRAWING REVIEW

- X FOR INFORMATION ONLY
- ___ ACCEPTED
- ___ ACCEPTED AS NOTED
- ___ ACCEPTED AS NOTED & RESUBMIT
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FIGG Subconsultant:
Firm: ___
By: ___ Date: ___

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

VIEW PROJECTION

LEGEND
DENOTES QUANTITY
(CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS)
ATCP=ACCORDING TO CONTRACT PLANS
TYP=TYPICAL
TPI=THREADS PER INCH
THDS=THREADS
HDG=HOT-DIP GALVANIZING
(X) —DENOTES THICK END

TOLERANCING:
AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE.

SCALE: AS NOTED DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
1 OWNER COMMENTS	12/11/07	RLT	JCC
2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
3 OWNER COMMENTS	01/31/08	RLT	JCC
4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

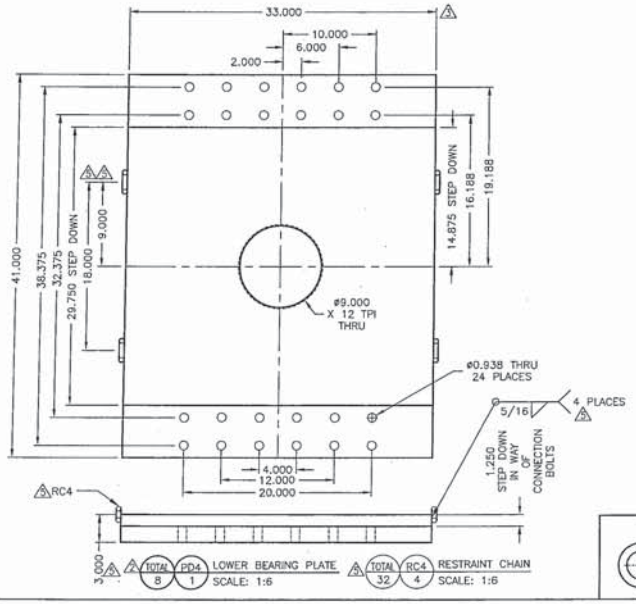
R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

TITLE: UPPER BEARING PLATE AND SRM DETAILS

DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

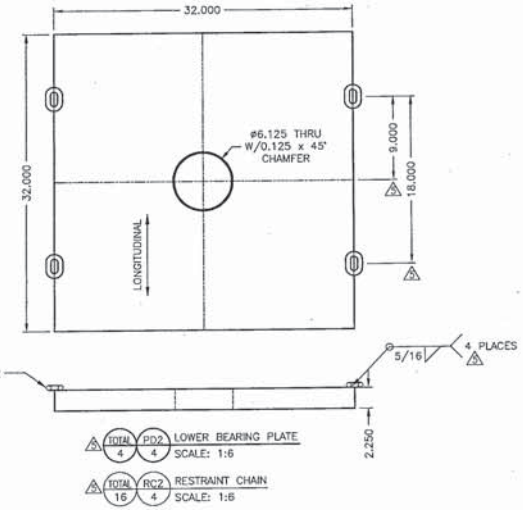
RJW PO No. 2599
SHEET: 8 OF 11

TOTAL 24 / PD1 — LOWER BEARING PLATE
SCALE: 1:6



TOTAL 8 / PD4 — LOWER BEARING PLATE
SCALE: 1:6

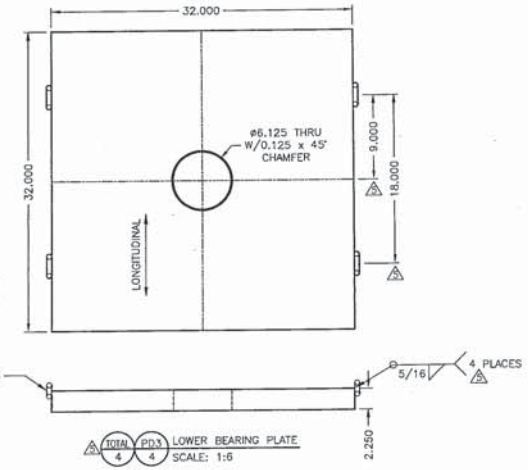
TOTAL 32 / RC4 — RESTRAINT CHAIN
SCALE: 1:6



TOTAL 4 / PD2 — LOWER BEARING PLATE
SCALE: 1:6

TOTAL 16 / RC2 — RESTRAINT CHAIN
SCALE: 1:6

TOTAL 14 / PD6 — LOWER BEARING PLATE
SCALE: 1:6



TOTAL 4 / PD3 — LOWER BEARING PLATE
SCALE: 1:6

TOTAL 16 / RC3 — RESTRAINT CHAIN
SCALE: 1:6

VIEW PROJECTION

RELEASED FOR CONSTRUCTION

SHOP DRAWING REVIEW

- X FOR INFORMATION ONLY
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FIGG Subconsultant:
Firm: _____
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

ALL DIMENSIONS IN INCHES

Kevin Western 2/7/08

LEGEND
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- TPI=THREADS PER INCH
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- HDG=HOT-DIP GALVANIZING
- ⊗ —DENOTES THICK END

TOLERANCING: AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

SCALE: AS NOTED — DO NOT SCALE DRAWING

REVISION	DATE	DTL'D	CHK'D
1 OWNER COMMENTS	12/11/07	RLT	JCC
2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
3 OWNER COMMENTS	01/31/08	RLT	JCC
4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

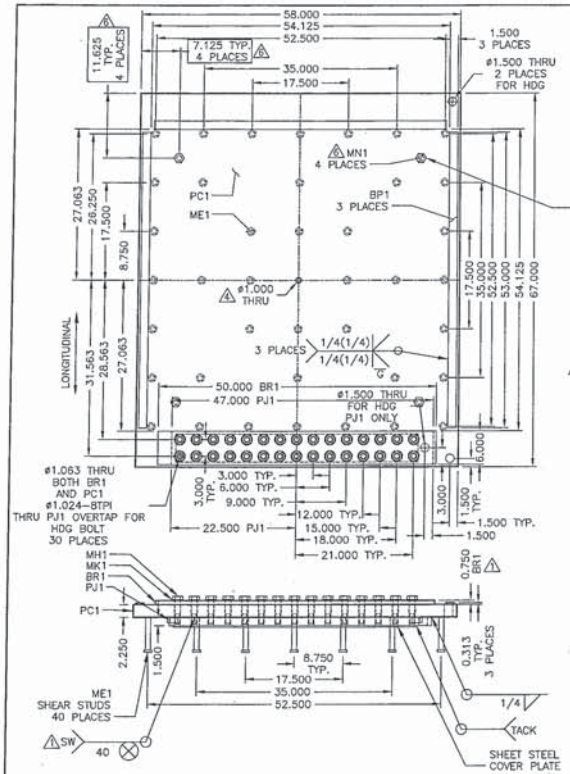
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

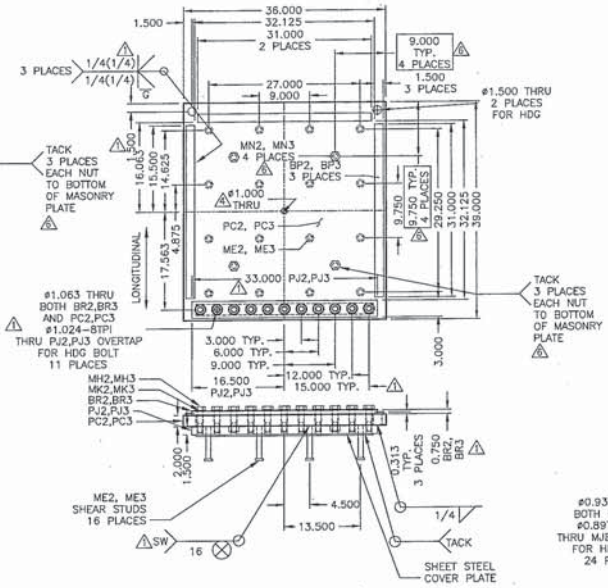
R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

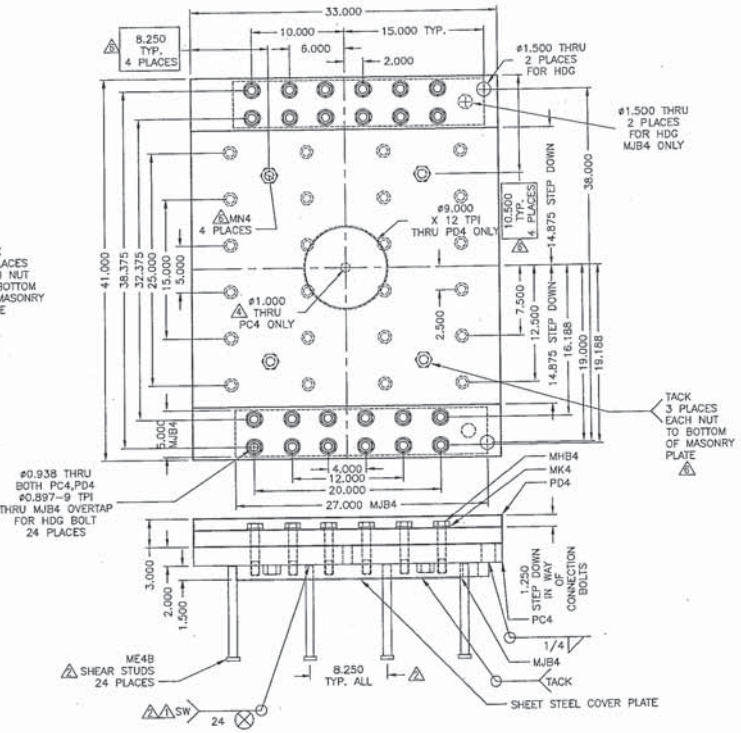
TITLE: LOWER BEARING PLATE DETAILS

DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

RJW PO No. 2599
SHEET: 9 OF 11







TOTAL 24 | ASSY 1 — MASONRY PLATE ASSEMBLY — SCALE: 1:10

TOTAL 24 / PC1 1 — MASONRY PLATE — SCALE: 1:10		TOTAL 72 / BP1 3 — PERMANENT BAR — SCALE: 1:10	
TOTAL 960 / ME1 40 — SHEAR STUD — SCALE: 1:10		TOTAL 24 / BR1 1 — REMOVABLE BAR — SCALE: 1:10	
TOTAL 720 / MH1 30 — CONNECTION BOLT — SCALE: 1:10		TOTAL 24 / PJ1 1 — CONNECTION PLATE — SCALE: 1:10	
TOTAL 720 / MK1 30 — WASHER — SCALE: 1:10		TOTAL 96 / MN1 4 — HEAVY HEX LEVELING NUT — SCALE: 1:10	

TOTAL 8 | ASSY 1 — MASONRY PLATE ASSEMBLY — SCALE: 1:10

TOTAL 8 / PC2 1 / PC3 1 — MASONRY PLATE — SCALE: 1:10		TOTAL 24 / BP2 3 / BP3 3 — PERMANENT BAR — SCALE: 1:10	
TOTAL 128 / ME2 16 / ME3 16 — SHEAR STUD — SCALE: 1:10		TOTAL 8 / BR2 1 / BR3 1 — REMOVABLE BAR — SCALE: 1:10	
TOTAL 88 / MH2 11 / MH3 11 — CONNECTION BOLT — SCALE: 1:10		TOTAL 8 / PJ2 1 / PJ3 1 — CONNECTION PLATE — SCALE: 1:10	
TOTAL 88 / MK2 11 / MK3 11 — WASHER — SCALE: 1:10		TOTAL 32 / MN2 4 / MN3 4 — HEAVY HEX LEVELING NUT — SCALE: 1:10	

TOTAL 8 | ASSY 1 — MASONRY PLATE ASSEMBLY — SCALE: 1:6

TOTAL 8 / PC4 1 — MASONRY PLATE — SCALE: 1:6		TOTAL 8 / PD4 1 — LOWER BEARING PLATE — SCALE: 1:6	
TOTAL 192 / ME4B 24 — SHEAR STUD — SCALE: 1:6		TOTAL 16 / MJB4 2 — CONNECTION PLATE — SCALE: 1:6	
TOTAL 192 / MTB4 24 — CONNECTION BOLT — SCALE: 1:6			
TOTAL 192 / MK4 24 — WASHER — SCALE: 1:6			
TOTAL 32 / MN4 4 — HEAVY HEX LEVELING NUT — SCALE: 1:10			

ALL DIMENSIONS IN INCHES

SHOP DRAWING REVIEW

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FIGG Subconsultant:
Firm:
By: Date:

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

RELEASED FOR CONSTRUCTION

Kevin Western 2/7/08

VIEW PROJECTION

LEGEND
— DENOTES QUANTITY
CLOUDED NOTES ARE TO BE PERMANENTLY MARKED IN POSITIONS SHOWN ON DETAILS
ATCP=ACCORDING TO CONTRACT PLANS
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⊗ —DENOTES THICK END

TOLERANCING: AS PER AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS, TABLE 18.1.4.2-1, UNLESS NOTED OTHERWISE

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2 CONTRACTOR COMMENTS	12/20/07	RLT	JCC
3 OWNER COMMENTS	01/31/08	RLT	JCC
4 OWNER COMMENTS	02/01/08	RLT	JCC

PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, E.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

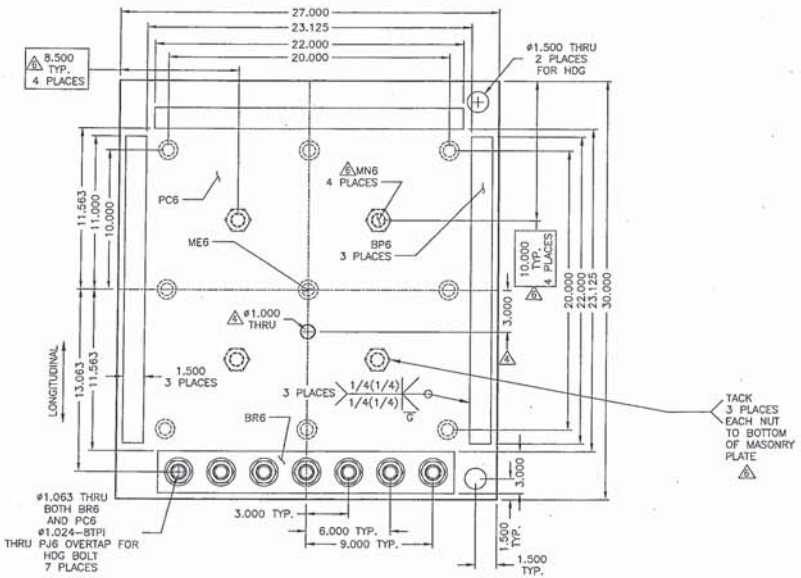
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

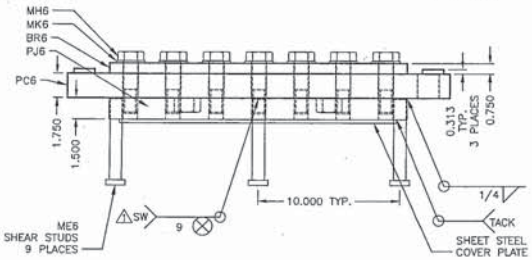
R. J. WATSON, INC.
75 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

TITLE: MASONRY PLATE ASSEMBLIES-1

DTL'D BY: RLT — DATE: 10/30/07
CHK'D BY: JCC — DATE: 11/6/07
BEARING TYPE: DISKTRON

RJW PO No. 2599
SHEET: 10 OF 11





TOTAL 14 / ASSY 1 — MASONRY PLATE ASSEMBLY — SCALE: 1:10

TOTAL 14 / PC6 1 — MASONRY PLATE — SCALE: 1:4

TOTAL 126 / ME6 9 — SHEAR STUD — SCALE: 1:4

TOTAL 98 / MH6 7 — CONNECTION BOLT — SCALE: 1:4

TOTAL 98 / MK6 7 — WASHER — SCALE: 1:4

TOTAL 42 / BP6 3 — PERMANENT BAR — SCALE: 1:4

TOTAL 14 / BR6 1 — REMOVABLE BAR — SCALE: 1:4

TOTAL 14 / PJ6 1 — CONNECTION PLATE — SCALE: 1:4

TOTAL 56 / MN6 4 — HEAVY HEX LEVELING NUT — SCALE: 1:10

RELEASED FOR CONSTRUCTION

SHOP DRAWING REVIEW

- X FOR INFORMATION ONLY
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FIGG Subconsultant:
Firm: _____
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 02/06/08

ALL DIMENSIONS IN INCHES

Kevin Western 2/7/08

VIEW PROJECTION

LEGEND
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REVISION	DATE	DTL'D	CHK'D
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PROJECT INFORMATION:
ST. ANTHONY FALLS (I-35W) BRIDGE REPLACEMENT
PROJECT No: S.P.2783-120, F.R.MN07(300)
I-35W OVER THE MISSISSIPPI RIVER
BRIDGE No: 27409(SB) 27410(NB)

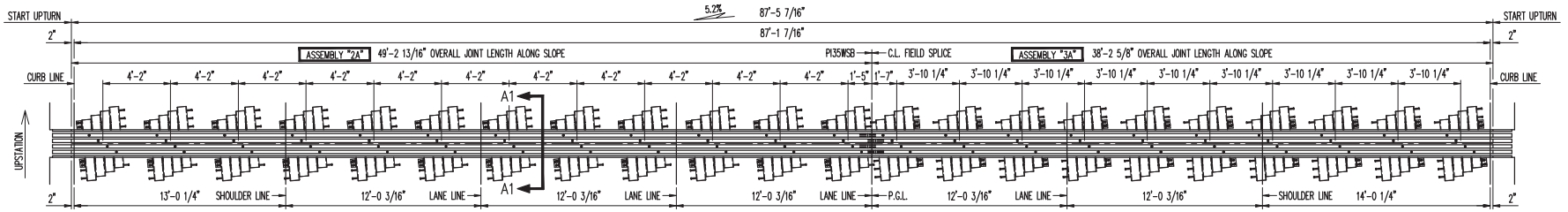
OWNER: STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSULTANT: FIGG
CONTRACTOR: FLATIRON-MANSON, JV

R. J. WATSON, INC.
78 JOHN GLENN DRIVE
AMHERST, NEW YORK 14228

TITLE: MASONRY PLATE ASSEMBLIES-2

DTL'D BY: RLT DATE: 10/30/07
CHK'D BY: JCC DATE: 11/8/07
BEARING TYPE: DISKTRON

RJW PO No. 2599
SHEET: 11 OF 11



FASCIA BARRIER COVER PLATE ASSEMBLY

MEDIAN BARRIER COVER PLATE ASSEMBLY

'D-400' MODULAR EXPANSION JOINT PLAN VIEW

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINTS LOCATED ON BRIDGE 27409 AND 27410 AT ABUTMENT 1
SOUTHBOUND – LOOKING UPSTATION (SHOWN)
NORTHBOUND – LOOKING DOWNSTATION (SIMILAR)
(2) JOINTS REQUIRED – TOTAL

GENERAL NOTES

STANDARD SPECIFICATIONS:

THE 2005 EDITION OF THE MINNESOTA D.O.T. "STANDARD SPECIFICATIONS FOR CONSTRUCTION"

EDGE BEAMS AND CENTER BEAMS AND SUPPORT BARS SHALL BE AASHTO M270, GRADE 50W (ASTM A588) STEEL.

SUPPORT BOXES SHALL BE ASTM A500B STEEL.

STAINLESS STEEL SLIDING SURFACES SHALL BE ASTM A240, TYPE 304, WITH A #8 MIRROR FINISH.

STUD ANCHORS SHALL BE ASTM A108 STEEL AND AUTOMATICALLY END WELDED WITH COMPLETE FUSION. REPAIR STUDS USING WELD PROCEDURE A-(MC)GF-STUD-REP-01, A-FF-STUD-REP-01 OR A-SM-STUD-REP-01.

ALL STEEL IN THE EXPANSION JOINT DEVICES SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. (EXCEPT STAINLESS STEEL) REPAIR DAMAGED GALVANIZING IN ACCORDANCE WITH ASTM A780, ANNEX A1.

REMOVABLE PLATE HARDWARE (ITEM 7p2, 7p3, 7p4 & 7p5) SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695, CLASS 50 (MINIMUM).

and MnDOT 3394

and MnDOT 3392

Please include straightening tolerance as stated in note 16 of plan sheet E.J. Details I

NEOPRENE STRIP SEAL SHALL BE CONTINUOUS AND SHOP INSTALLED WITH A LUBRICANT ADHESIVE IN ASSEMBLY "2A". THE REMAINDER OF THE SEAL SHALL BE ROLLED UP ON THE FIELD SPLICED END. THE SEAL SHALL THEN BE FIELD INSTALLED IN ASSEMBLY "3A" WITH A LUBRICANT ADHESIVE AFTER THE FIELD SPLICE IS COMPLETE

NEOPRENE STRIP SEAL SHALL EXTEND PAST ENDS OF UPTURNS AT LEAST 2".

WELDING SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE FOR MAJOR MEMBERS AND AWS D1.1 FOR ANCILLARY MEMBERS.

SHOP SHALL PREPARE ENDS OF RAILS FOR FIELD SPLICES.

25% OF THE FULL PENETRATION WELDS THAT CONNECT THE CENTER BEAMS TO THE SUPPORT BARS SHALL BE ULTRASONICALLY INSPECTED IN ACCORDANCE WITH SECTION 2471 OF THE STATE STANDARD SPECIFICATIONS, AWS D1.1 AND THE SPECIAL PROVISIONS. REPAIR DEFECTS USING F-REP(NDT)01.

ANY TIGHTLY ADHERENT WELD SPATTER NEED NOT BE REMOVED IN COATED AREAS TO BE CAST IN CONCRETE.

MODULAR JOINTS SHALL BE EQUIPPED WITH TEMPERATURE ADJUSTMENT DEVICES TO ALLOW FOR ADJUSTMENTS PER FIELD ENGINEERS RECOMMENDATIONS.

ALL STEEL SURFACES IN CONTACT WITH THE NEOPRENE SEAL SHALL BE CLEANED PRIOR TO THE INSTALLATION OF THE STRIP SEAL.

PRIOR TO SHIPMENT, SEAL GROOVES IN RAILS SHALL BE PROTECTED WITH A STYROFOAM DOWEL UNLESS SEAL IS INSTALLED.

CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING MOVING AND SHIPPING OF JOINTS.

MODULAR JOINTS SHALL FOLLOW ROADWAY SLOPE AND GRADE.

MODULAR JOINTS SHALL BE MARKED SHOWING JOINT TYPE AND PROPER LOCATION. MARKINGS SHALL BE VISIBLE AFTER JOINTS HAVE BEEN COMPLETELY INSTALLED.

MODULAR EXPANSION JOINTS SHALL BE DESIGNED TO ACCOMMODATE FATIGUE LOADING.

EXPANSION JOINT ASSEMBLIES SHALL BE INSPECTED BY DS BROWN QC DEPARTMENT AND BY A MINNESOTA D.O.T. REPRESENTATIVE (IF REQUIRED).

CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AS PER THE SPECIAL PROVISIONS.

INSTALLATION PROCEDURES

1) FIELD ENGINEER SHALL DETERMINE JOINT OPENING ON DAY OF INSTALLATION.

2) PLACE JOINT IN BLOCKOUT AND PROPERLY ALIGN BOTH HORIZONTALLY AND VERTICALLY. (JOINT MUST FOLLOW ROADWAY GRADE)

3) MODIFY REBAR TO RECEIVE MODULAR EXPANSION JOINT.

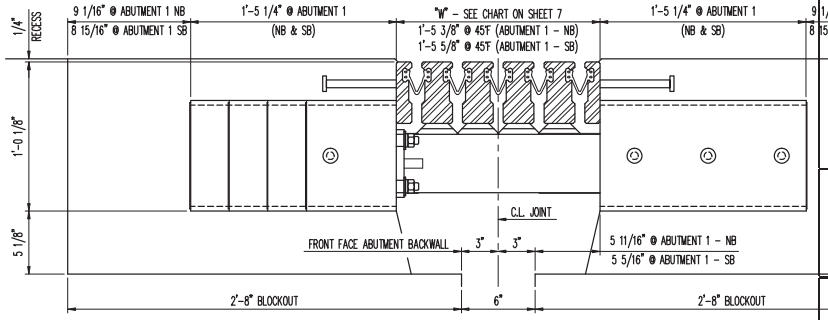
4) FIELD LOCATE AND DRILL HOLES IN DIAPHRAGMS AND ABUTMENT FOR JOINT SUPPORT HARDWARE.

5) AFTER SETTING JOINT TO GRADE, TIGHTEN ALL CONNECTIONS TO ANCHORS, THREADED STUDS, AND SUPPORT ANGLES. TACK WELD SUPPORT ANGLES TO SUPPORT BOXES AS INDICATED ON SHEET 5.

6) AFTER JOINT IS SECURED, REMOVE TEMPORARY ADJUSTMENT DEVICES AS DIRECTED.

7) CONTRACTOR TO PLACE FORMWORK SO THAT NO CONCRETE FLOWS INTO BOXES AND JOINT GAP OPENINGS.

8) POUR AND VIBRATE CONCRETE INTO BLOCKOUT TO ENSURE PROPER CONSOLIDATION AROUND ALL EMBEDDED COMPONENTS. THEN REMOVE FORMWORK AFTER CURE TIME, AS DETERMINED BY FIELD ENGINEER.



SECTION A1

ALL DIMENSIONS ARE AT 45°F
ASSUMING NO CREEP OR SHRINKAGE HAS OCCURRED
SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 7

SHOP NOTES:
- SEE GENERAL PLAN VIEW ON SHEET 1
- SEE GENERAL NOTES ON SHEET 1
- SEE INSTALLATION PROCEDURES ON SHEET 1
- SEE ASSEMBLY PLAN VIEW "2A" ON SHEET 2
- SEE ASSEMBLY PLAN VIEW "3A" ON SHEET 3
- SEE SPLICE DETAILS ON SHEET 4
- SEE JOINT SUPPORT DETAILS ON SHEET 5
- SEE SUPPORT BOX DETAILS ON SHEET 5
- SEE SUPPORT BAR DETAILS ON SHEET 6
- SEE REMOVABLE PLATE DETAILS ON SHEET 7
- SEE TEMPERATURE ADJUSTMENT DETAILS ON SHEET 7
- SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 7
- COVER PLATES NOT SHOWN FOR CLARITY PURPOSES COVER PLATES SHALL BE DETAILED AND SUBMITTED SEPARATELY

SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
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X ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
_____ NOT ACCEPTED

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FIGG Subconsultant:

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: KRM Date: 2/19/08

REV.	DESCRIPTION	DATE	DET.	CKD.
1	REVISED NOTES	2/8/08	BLB	JLW

D.S. BROWN
THE D.S. BROWN COMPANY
300 E. CHERRY STREET
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419.257.3561
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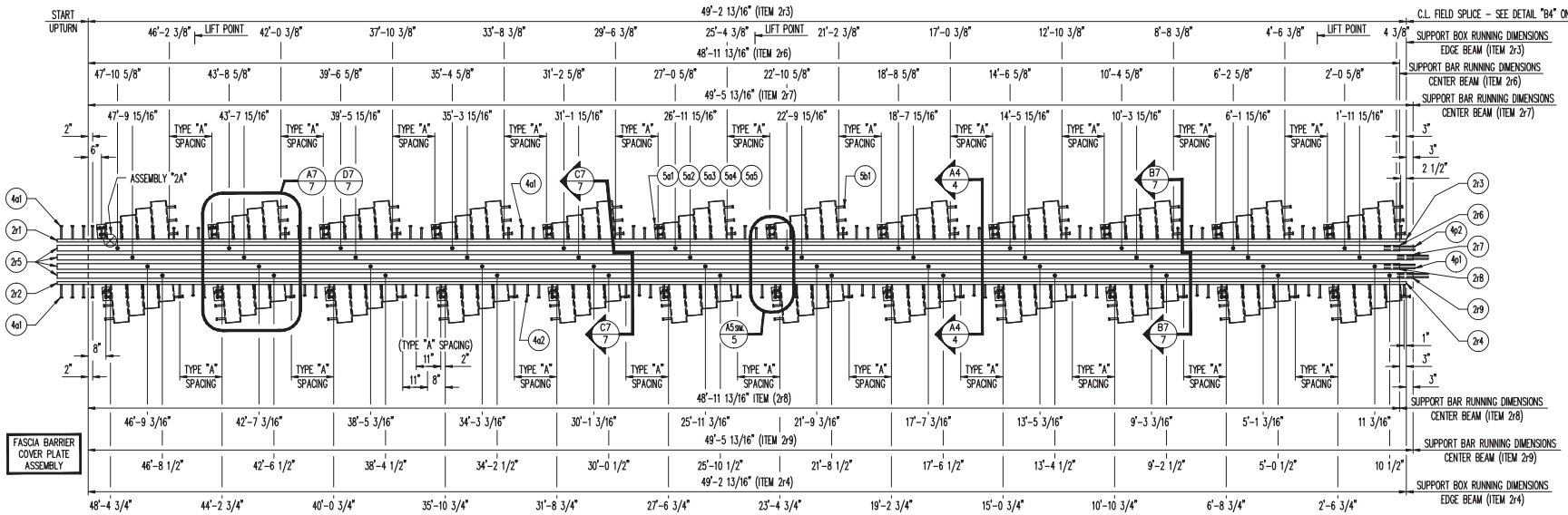
	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	DBSB 2402.5	365 LF
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	–	–
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–

DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS HENNEPIN COUNTY, MINNESOTA

SCALE:	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/4/07	1 OF 7
PROJECT NUMBER: 22051	PRODUCT CODE: 1021	RELEASE: 1	SHEET: 1	



MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
2A	2	"D-400" MODULAR EXPANSION JOINT			50'-7 11/16"	
2r1	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
2r2	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
2r3	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	49'-4 1/8	UPTURN CUT; A123-HDG	
2r4	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	49'-4 1/8	UPTURN CUT; A123-HDG	
2r5	8	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
2r6	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	49'-1 1/8	UPTURN CUT; A123-HDG	
2r7	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	49'-7 1/8	UPTURN CUT; A123-HDG	
2r8	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	49'-1 1/8	UPTURN CUT; A123-HDG	
2r9	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	49'-7 1/8	UPTURN CUT; A123-HDG	
4a1	250	5/8Ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE; A123-HDG	
4a2	94	5/8Ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE (BEND 45° @ 2"); A123-HDG	
5a1	96	5/8Ø X 11 1/2 THREADED STUD	M169 (A108)			
5b1	192	5/8Ø X 4 WELD STUD	M169 (A108)		SUPPORT BOX ANCHORAGE; A123-HDG	
5b2	48	HSS 9 X 7 X 3/8	A500 GR B	0'-7 11/16	SKEW CUT SHORT BOX; A123-HDG	
5b3	48	HSS 9 X 7 X 3/8	A500 GR B	0'-10 7/8	SKEW CUT INNER BOX; A123-HDG	
5b4	48	HSS 9 X 7 X 3/8	A500 GR B	1'-2 1/16	SKEW CUT INNER BOX; A123-HDG	
5b5	48	HSS 9 X 7 X 3/8	A500 GR B	1'-5 1/4	SKEW CUT LONG BOX; A123-HDG	
5b6	96	HSS 1 X 1 X 1/8	A53 GR B SCH 40	0'-11 1/2	A123-HDG	
5b7	192	SUPPORT BOX END CAP	A606 TYPE 4 OR HDPE			
6h1	48	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-11 1/8	EXTERIOR SUPPORT BAR; A123-HDG	
6h2	48	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-11 1/8	INTERIOR SUPPORT BAR; A123-HDG	
6h3	96	16 GA. X 2 3/8	A240 T304, J3 & 2B	0'-6 1/4	SS SHIM;	
6h4	96	16 GA. X 2 3/8	A240 T304, J3 & 2B	0'-9 5/8	SS SHIM;	
6h5	96	16 GA. X 2 3/8	A240 T304, J3 & 2B	1'-0 3/4	SS SHIM;	
6h6	96	16 GA. X 2 3/8	A240 T304, J3 & 2B	1'-4	SS SHIM;	
6h7	48	5/8 X 2 1/2	M270 GR 36 (A709)	0'-2 7/8	EXTERIOR SPRING STOP; A123-HDG	
6h8	144	5/8 X 2 1/2	M270 GR 36 (A709)	0'-3 9/16	INTERIOR SPRING STOP; A123-HDG	
6h9	96	SQUARE BAR 1/2	M270 GR 50W (A709)	0'-3 3/8	CONNECTION BAR STOCK; A123-HDG	
7p1	48	5/8 X 3 1/4	M270 GR 36 (A709)	0'-5 1/2	REMOVABLE PLATE; A123-HDG	
7p2	96	5/8Ø X 3 1/2 SQUARE HEAD CUP SCREW	A307		5/8"-11UNC; B695-MG CLASS 50	
7p3	96	5/8Ø HEX NUT	M291-A (A563 GR A)		B695-MG CLASS 50	
7p4	96	5/8Ø FLAT WASHER	F844		B695-MG CLASS 50 ⚠	
7p5	96	5/8Ø LOCK WASHER	F844		B695-MG CLASS 50	
7t1	48	L7 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
7t2	48	L6 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
7t3	48	1 1/4Ø X 35 THREADED ROD	M270 GR 36 (A709)		1 1/4"-7UNC; ZINC PLATED	
7t4	192	1 1/4Ø HEX NUT	M291-A (A563 GR A)		ZINC PLATED	
7t5	192	1 1/4Ø FLAT WASHER	F844		ZINC PLATED	
7v1	120	CONTROL SPRING (80MM)	–		ASTM D3574;	
7v2	120	NYLON PIN (80MM)	–			
7v3	240	HITCH PIN	–			
7v4	192	PRECOMPRESSED SPRING (NEOPRENE)	–			
7v5	192	SLIDE BEARING (NEOPRENE)	–			
7w1	5	LUBRICANT ADHESIVE (1 GAL. UNIT)	D4070			
7w2	10	KX-73 GLAND	NEOPRENE	89'-0	890'-0" TOTAL;	

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

'D-400' MODULAR JOINT PLAN VIEW (ASSEMBLY "2A")

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINTS LOCATED AT ABUTMENT 4
SOUTHBOUND SHOWN – LOOKING UPSTATION
NORTHBOUND SIMILAR – LOOKING DOWNSTATION
(2) JOINTS REQUIRED – TOTAL

FABRICATION NOTE:
SHOP SHALL LOCATE SPLICES IN EDGE & CENTER BEAMS. MINIMUM SPLICE LENGTH SHALL BE 2'-0" FOR EDGE BEAMS AND 4'-0" FOR CENTER BEAMS.

SHOP NOTES:
– SEE BILL OF MATERIAL FOR LOOSE ITEMS ON SHEET 3

SHOP NOTES:
– SEE GENERAL PLAN VIEW ON SHEET 1
– SEE GENERAL NOTES ON SHEET 1
– SEE INSTALLATION PROCEDURES ON SHEET 1
– SEE ASSEMBLY PLAN VIEW "2A" ON SHEET 2
– SEE ASSEMBLY PLAN VIEW "3A" ON SHEET 3
– SEE SPLICE DETAILS ON SHEET 4
– SEE JOINT SUPPORT DETAILS ON SHEET 5
– SEE SUPPORT BOX DETAILS ON SHEET 5
– SEE SUPPORT BAR DETAILS ON SHEET 6
– SEE REMOVABLE PLATE DETAILS ON SHEET 7
– SEE TEMPERATURE ADJUSTMENT DETAILS ON SHEET 7
– SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 7
– COVER PLATES NOT SHOWN FOR CLARITY PURPOSES COVER PLATES SHALL BE DETAILED AND SUBMITTED SEPARATELY

SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- X ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

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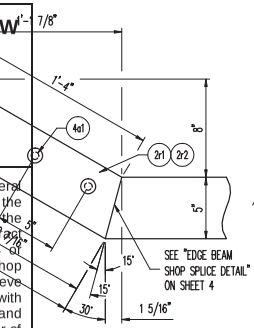
The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:

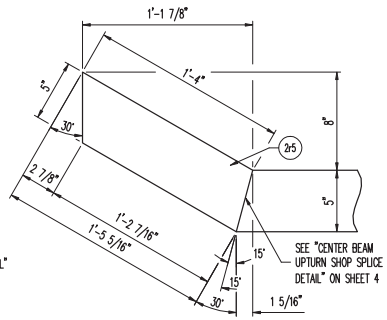
Firm:

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: KRM Date: 2/19/08



EDGE BEAM UPTURN DETAIL



CENTER BEAM UPTURN DETAIL

REV.	DESCRIPTION	DATE	DET.	CKD.
⚠	REVISED B.O.M.	2/8/08	BLB	JLW

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	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER		
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5	365 LF
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE:	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/4/07	2 OF 7

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	2

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
3A	2	D-400' MODULAR EXPANSION JOINT			39'-7 1/2"	
3r1	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
3r2	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
3r3	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	38'-3 15/16	UPTURN CUT; A123-HDG	
3r4	2	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	38'-3 15/16	UPTURN CUT; A123-HDG	
3r5	8	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
3r6	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	38'-0 15/16	UPTURN CUT; A123-HDG	
3r7	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	38'-6 15/16	UPTURN CUT; A123-HDG	
3r8	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	38'-0 15/16	UPTURN CUT; A123-HDG	
3r9	2	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	38'-6 15/16	UPTURN CUT; A123-HDG	
4a1	210	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE; A123-HDG	
4a2	42	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE (BEND 45° @ 2"); A123-HDG	
5a1	80	5/8ø X 1 1/2 THREADED STUD	M169 (A108)			
5b1	160	5/8ø X 4 WELD STUD	M169 (A108)		SUPPORT BOX ANCHORAGE; A123-HDG	
5b2	40	HSS 9 X 7 X 3/8	A500 GR B	0'-7 11/16	SKEW CUT SHORT BOX; A123-HDG	
5b3	40	HSS 9 X 7 X 3/8	A500 GR B	0'-10 7/8	SKEW CUT INNER BOX; A123-HDG	
5b4	40	HSS 9 X 7 X 3/8	A500 GR B	1'-2 1/16	SKEW CUT INNER BOX; A123-HDG	
5b5	40	HSS 9 X 7 X 3/8	A500 GR B	1'-5 1/4	SKEW CUT LONG BOX; A123-HDG	
5b6	80	HSS 1 X 1 X 1/8	A53 GR B SCH 40	0'-1 1/2	A123-HDG	
5b7	160	SUPPORT BOX END CAP	A606 TYPE 4 OR HDPE			
6h1	40	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-11 1/8	EXTERIOR SUPPORT BAR; A123-HDG	
6h2	40	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-11 1/8	INTERIOR SUPPORT BAR; A123-HDG	
6h3	80	16 GA. X 2 3/8	A240 T304, §8 & 2§	0'-6 1/4	SS SHIM;	
6h4	80	16 GA. X 2 3/8	A240 T304, §8 & 2§	0'-9 5/8	SS SHIM;	
6h5	80	16 GA. X 2 3/8	A240 T304, §8 & 2§	1'-0 3/4	SS SHIM;	
6h6	80	16 GA. X 2 3/8	A240 T304, §8 & 2§	1'-4	SS SHIM;	
6h7	40	5/8 X 2 1/2	M270 GR 36 (A709)	0'-2 7/8	EXTERIOR SPRING STOP; A123-HDG	
6h8	120	5/8 X 2 1/2	M270 GR 36 (A709)	0'-3 9/16	INTERIOR SPRING STOP; A123-HDG	
6h9	80	SQUARE BAR 1/2	M270 GR 50W (A709)	0'-3 3/8	CONNECTION BAR STOCK; A123-HDG	
7p1	40	5/8 X 3 1/4	M270 GR 36 (A709)	0'-5 1/2	REMOVABLE PLATE; A123-HDG	
7p2	80	5/8ø X 3 1/2 SQUARE HEAD CAP SCREW	A307		5/8"-11UNC; B695-MG CLASS 50	
7p3	80	5/8ø HEX NUT	M291-A (A563 GR A)		B695-MG CLASS 50	
7p4	80	5/8ø FLAT WASHER	F844		B695-MG CLASS 50 ⚠	
7p5	80	5/8ø LOCK WASHER	F844		B695-MG CLASS 50	
7t1	40	L7 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
7t2	40	L6 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
7t3	40	1 1/4ø X 35 THREADED ROD	M270 GR 36 (A709)		1 1/4"-7UNC; ZINC PLATED	
7t4	160	1 1/4ø HEX NUT	M291-A (A563 GR A)		ZINC PLATED	
7t5	160	1 1/4ø FLAT WASHER	F844		ZINC PLATED	
7v1	100	CONTROL SPRING (80MM)	–		ASTM D3574;	
7v2	100	NYLON PIN (80MM)	–			
7v3	200	HITCH PIN	–			
7w4	160	PRECOMPRESSED SPRING (NEOPRENE)	–			
7v5	160	SLIDE BEARING (NEOPRENE)	–			

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
4AA	8	CENTER BEAM SPLICE PLATE			CTSK HOLES	
4p1	8	5/8 X 3	M270 GR 50W (A709)	0'-11 1/4	SHAPE CUT; M111-HDG (A123)	
4AB	8	CENTER BEAM SPLICE PLATE			DRILLED & TAPPED HOLES	
4p2	8	5/8 X 3	M270 GR 50W (A709)	0'-11 1/4	SHAPE CUT; M111-HDG (A123)	
4AC	32	CTSK BOLT FOR FIELD SPLICE				
4p3	32	7/8ø X 2 1/4 FLAT HD CTSK SCKT CAP SCREW	F835		B695-MG	

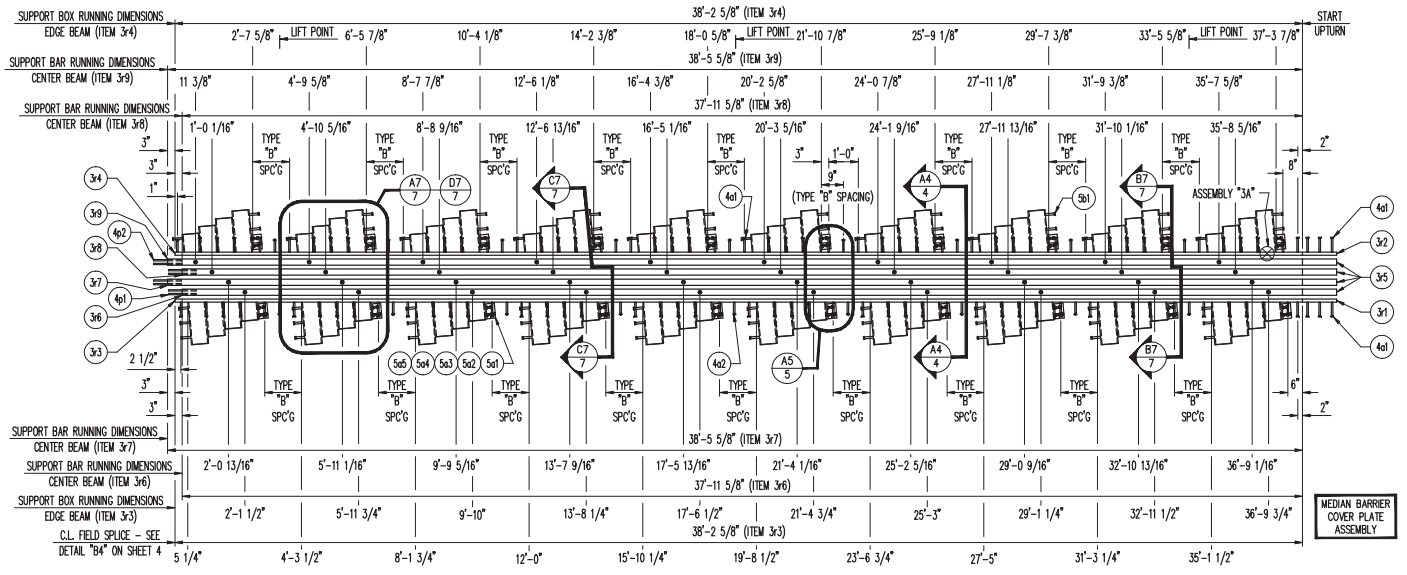
NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
5BA	176	SUPPORT NUTS				
5a2	176	5/8ø HEX NUT	M291-A (A563 GR A)		A153-HDG	
5BB	176	SUPPORT WASHERS				
5a3	176	5/8ø FLAT WASHER	F844		A153-HDG	
5BC	88	SUPPORT BENT PLATE ANGLE			JOINT SUPPORT	
5a4	88	1/2 X 6	M183 (A36)	1'-0	BENT; A153-HDG	
5BD	176	EXPANSION ANCHOR			RAMSET/REDHEAD	
5a5	176	5/8ø X 4 1/4 EXPANSION ANCHOR	CONCRETE INSERT		HN5842 OR EQUAL; ZINC PLATED	

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

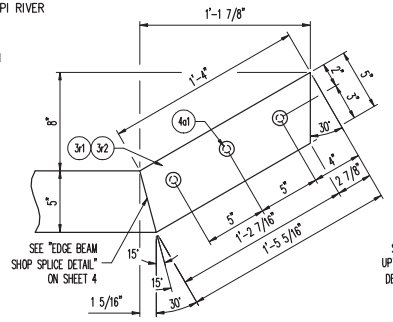
7WA	4	LUBRICANT ADHESIVE				
7w1	4	LUBRICANT ADHESIVE (1 GAL. UNIT)	D4070			
7XA	2	STRIP SEAL SAMPLE				
7x1	2	KX-73 GLAND	NEOPRENE	1'-0	NEOPRENE SAMPLE;	
7XB	2	PTFE SAMPLE				
7x2	2	1/8 X 2	PTFE	0'-3	PURE VIRGIN UNFILLED; PTFE SAMPLE	

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

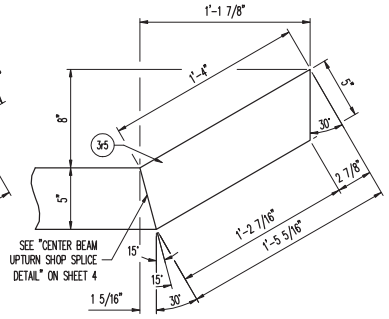


D-400' MODULAR JOINT PLAN VIEW (ASSEMBLY "3A")

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINTS LOCATED AT ABUTMENT 1
SOUTHBOUND SHOWN – LOOKING UPSTATION
NORTHBOUND SIMILAR – LOOKING DOWNSTATION
(2) JOINTS REQUIRED – TOTAL



EDGE BEAM UPTURN DETAIL



CENTER BEAM UPTURN DETAIL

SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
X ACCEPTED
_____ ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
_____ NOT ACCEPTED

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FIGG Subconsultant:

Firm:

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: KRM Date: 2/19/08

FABRICATION NOTE:
SHOP SHALL LOCATE SPLICES IN EDGE & CENTER BEAMS. MINIMUM SPLICE LENGTH SHALL BE 2'-0" FOR EDGE BEAMS AND 4'-0" FOR CENTER BEAMS.

SHOP NOTES:
- SEE GENERAL PLAN VIEW ON SHEET 1
- SEE GENERAL NOTES ON SHEET 1
- SEE INSTALLATION PROCEDURES ON SHEET 1
- SEE ASSEMBLY PLAN VIEW "2A" ON SHEET 2
- SEE ASSEMBLY PLAN VIEW "3A" ON SHEET 3
- SEE SPLICE DETAILS ON SHEET 4
- SEE JOINT SUPPORT DETAILS ON SHEET 5
- SEE SUPPORT BOX DETAILS ON SHEET 5
- SEE SUPPORT BAR DETAILS ON SHEET 6
- SEE REMOVABLE PLATE DETAILS ON SHEET 7
- SEE TEMPERATURE ADJUSTMENT DETAILS ON SHEET 7
- SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 7
- COVER PLATES NOT SHOWN FOR CLARITY PURPOSES. COVER PLATES SHALL BE DETAILED AND SUBMITTED SEPARATELY

REV.	DESCRIPTION	DATE	DET.	CKD.
⚠	REVISED B.O.M.	2/8/08	BLB	JLW

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	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER		
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5	365 LF
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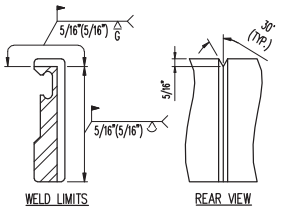
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–

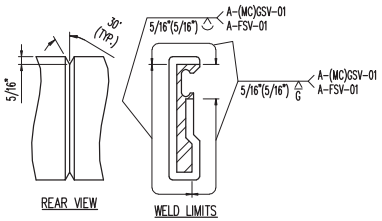
DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS HENNEPIN COUNTY, MINNESOTA

SCALE:	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/4/07	3 OF 7
PROJECT NUMBER: 22051	PRODUCT CODE: 1021	RELEASE: 1	SHEET: 3	

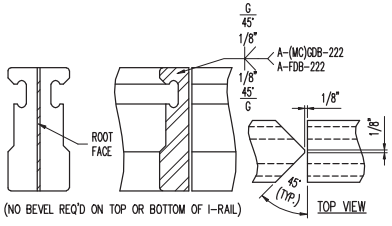


EDGE BEAM FIELD SPLICE DETAIL

SHOP SHALL PREPARE ENDS OF RAILS FOR FIELD SPLICE

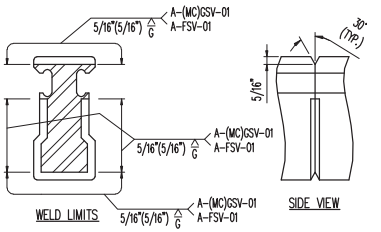


EDGE BEAM SHOP SPLICE DETAIL



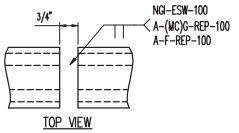
CENTER BEAM SHOP SPLICE DETAIL

COMPLETE PENETRATION WELD



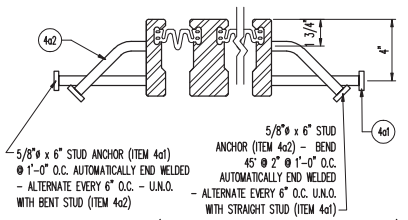
CENTER BEAM UPTURN SHOP SPLICE DETAIL

PARTIAL PENETRATION WELD (@ UPTURNS ONLY)

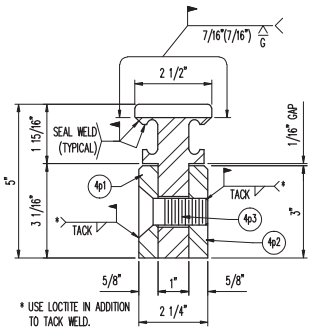


OPTIONAL CENTER BEAM SHOP SPLICE DETAIL

COMPLETE PENETRATION WELD

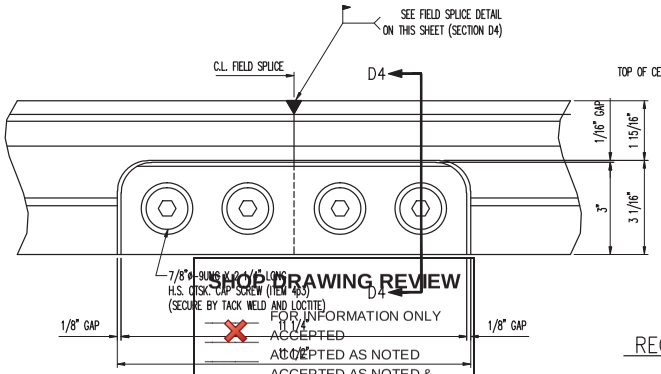


SECTION A4 (EDGE BEAM ANCHORAGE)

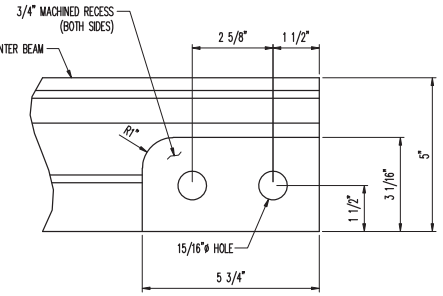


SECTION D4

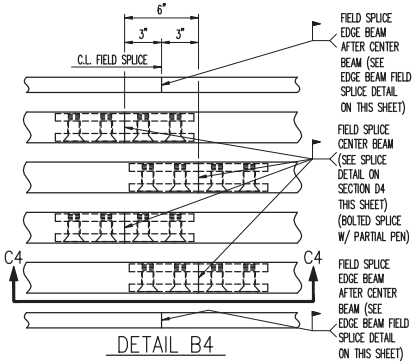
SHOP SHALL PREPARE ENDS OF RAILS FOR FIELD SPLICE



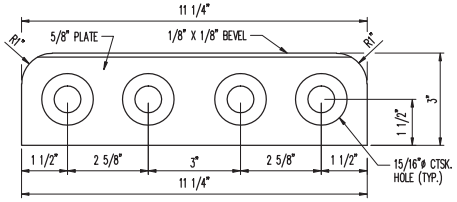
SECTION C4



RECESS IN CENTER BEAM AT FIELD CONNECTION (SHOP PREPARED)



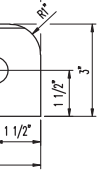
DETAIL B4



ITEM NO. 4p1

(8) REQ'D.

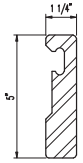
SPLICE PLATE – ASSEMBLY 4AA



ITEM NO. 4p2

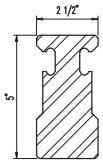
(8) REQ'D.

SPLICE PLATE – ASSEMBLY 4AB



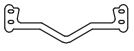
EDGE BEAM DETAIL

AASHTO M270, GRADE 50W
ASTM A709, GRADE 50W (A588)



CENTER BEAM DETAIL

AASHTO M270, GRADE 50W
ASTM A709, GRADE 50W (A588)



'KX' SERIES STRIP SEAL

KX-73 SEAL

SHOP DRAWING REVIEW

FOR INFORMATION ONLY

X ACCEPTED

ACCEPTED AS NOTED

ACCEPTED AS NOTED & RESUBMIT

NOT ACCEPTED

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FIGG Subconsultant:

Firm:

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: KRM Date: 2/19/08

REV.	DESCRIPTION	DATE	DET.	CKD.
1	REVISED PAGE NUMBER	2/8/08	BLB	JLW

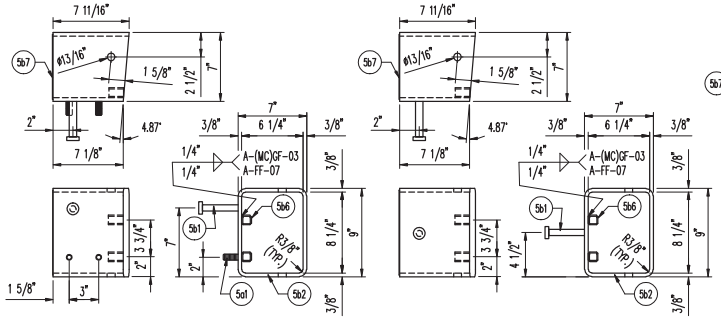
THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	DBSB 2402.5	365 LF
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	–	–
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–

DESCRIPTION: 'D-400' SPLICE DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER:
N.T.S.	BLB	JLW	12/4/07	4 OF 7

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	4

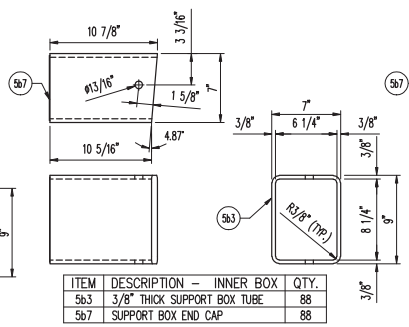


ITEM	DESCRIPTION – SHORT BOX	QTY.
5a1	5/8"ø X 1 1/2" THREADED STUD	88
5b1	5/8"ø X 4" STUD ANCHOR	44
5b2	3/8" THICK SUPPORT BOX TUBE	44
5b6	1" SQUARE X 1 1/2" LONG TUBING	88
5b7	SUPPORT BOX END CAP	44

'D–400' SHORT SUPPORT BOX DETAIL
WITH SUPPORT ANCHORS
(44) REQUIRED

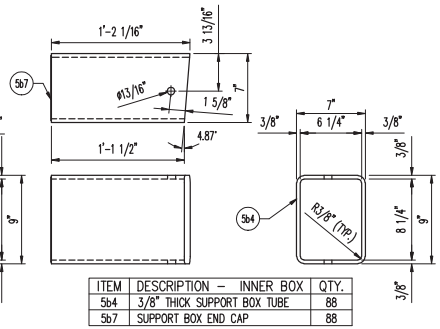
ITEM	DESCRIPTION – SHORT BOX	QTY.
5b1	5/8"ø X 4" STUD ANCHOR	44
5b2	3/8" THICK SUPPORT BOX TUBE	44
5b6	1" SQUARE X 1 1/2" LONG TUBING	88
5b7	SUPPORT BOX END CAP	44

'D–400' SHORT SUPPORT BOX DETAIL
WITHOUT SUPPORT ANCHORS
(44) REQUIRED



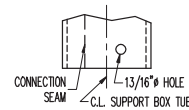
ITEM	DESCRIPTION – INNER BOX	QTY.
5b3	3/8" THICK SUPPORT BOX TUBE	88
5b7	SUPPORT BOX END CAP	88

'D–400' INNER SUPPORT BOX DETAIL
(88) REQUIRED



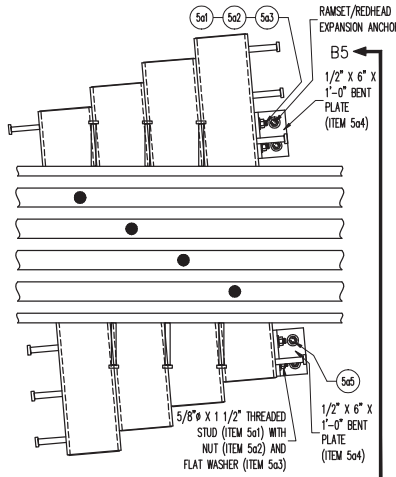
ITEM	DESCRIPTION – INNER BOX	QTY.
5b4	3/8" THICK SUPPORT BOX TUBE	88
5b7	SUPPORT BOX END CAP	88

'D–400' INNER SUPPORT BOX DETAIL
(88) REQUIRED

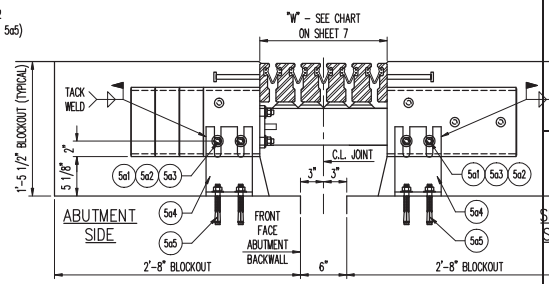


SHOP NOTE:

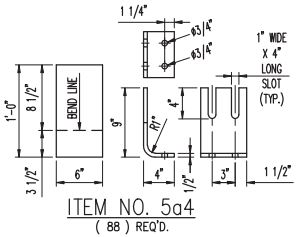
WHEN DRILLING 13/16"ø HOLES INTO SUPPORT BOX TUBE, BE SURE THE SEAM OF THE TUBE IS ON THE OPPOSITE SIDE IN RELATIONSHIP TO THE C.L. OF BOX.



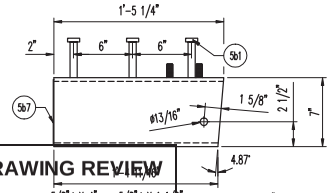
DETAIL A5
EDGE BEAM ANCHORS NOT SHOWN FOR CLARITY



SECTION B5
ALL DIMENSIONS ARE AT 45°F

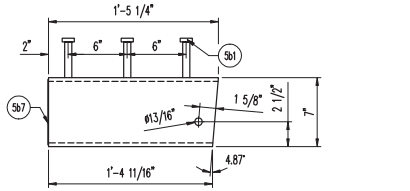


ITEM NO. 5a4
(88) REQ'D.



ITEM	DESCRIPTION – LONG BOX	QTY.
5a1	5/8"ø X 1 1/2" THREADED STUD	88
5b1	5/8"ø X 4" STUD ANCHOR	132
5b5	3/8" THICK SUPPORT BOX TUBE	44
5b7	SUPPORT BOX END CAP	44

'D–400' LONG SUPPORT BOX DETAIL
WITH SUPPORT ANCHORS
(44) REQUIRED



ITEM	DESCRIPTION – LONG BOX	QTY.
5b1	5/8"ø X 4" STUD ANCHOR	132
5b5	3/8" THICK SUPPORT BOX TUBE	44
5b7	SUPPORT BOX END CAP	44

'D–400' LONG SUPPORT BOX DETAIL
WITHOUT SUPPORT ANCHORS
(44) REQUIRED

SHOP DRAWING REVIEW

- [x] FOR INFORMATION ONLY
- [ ] ACCEPTED
- [ ] ACCEPTED AS NOTED
- [ ] ACCEPTED AS NOTED & RESUBMIT
- [ ] NOT ACCEPTED

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FIGG Subconsultant:

Firm:

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: KRM Date: 2/19/08

REV.	DESCRIPTION	DATE	DET.	CK'D.

THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

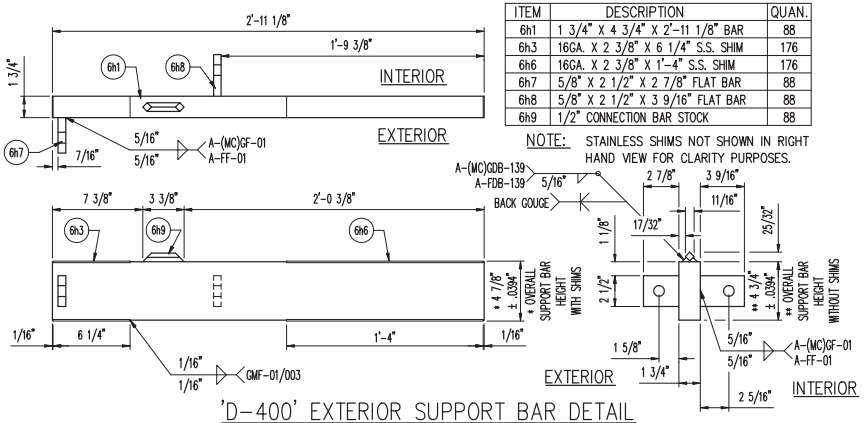
	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	DBSB 2402.5	365 LF
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	–	–
PROJECT — S.P. 2783–120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON–MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

DESCRIPTION: SUPPORT DETAILS & BOX DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE:	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/4/07	5 OF 7

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	5

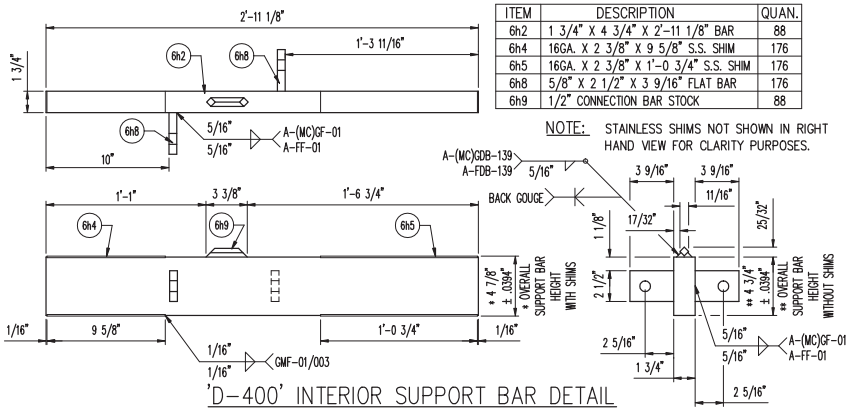
ITEM	DESCRIPTION	QUAN.
6h1	1 3/4" X 4 3/4" X 2'-11 1/8" BAR	88
6h3	16GA. X 2 3/8" X 6 1/4" S.S. SHIM	176
6h6	16GA. X 2 3/8" X 1'-4" S.S. SHIM	176
6h7	5/8" X 2 1/2" X 2 7/8" FLAT BAR	88
6h8	5/8" X 2 1/2" X 3 9/16" FLAT BAR	88
6h9	1/2" CONNECTION BAR STOCK	88



'D-400' EXTERIOR SUPPORT BAR DETAIL

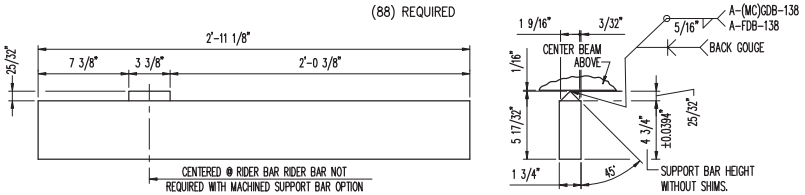
(88) REQUIRED

ITEM	DESCRIPTION	QUAN.
6h2	1 3/4" X 4 3/4" X 2'-11 1/8" BAR	88
6h4	16GA. X 2 3/8" X 9 5/8" S.S. SHIM	176
6h5	16GA. X 2 3/8" X 1'-0 3/4" S.S. SHIM	176
6h8	5/8" X 2 1/2" X 3 9/16" FLAT BAR	176
6h9	1/2" CONNECTION BAR STOCK	88

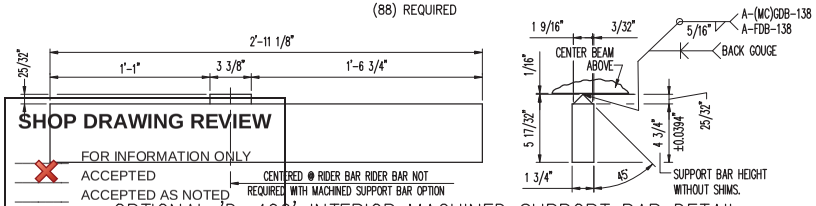


'D-400' INTERIOR SUPPORT BAR DETAIL

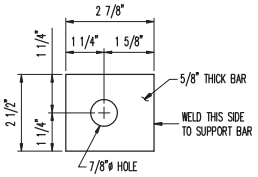
(88) REQUIRED



OPTIONAL 'D-400' EXTERIOR MACHINED SUPPORT BAR DETAIL



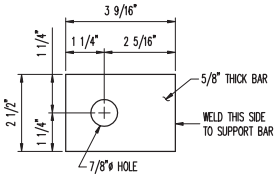
OPTIONAL 'D-400' INTERIOR MACHINED SUPPORT BAR DETAIL



ITEM NO. 6h7
(88) REQ'D.

SPRING STOP DETAIL

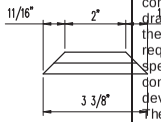
QUANTITY FOR ASSEMBLY "2A" & "3A" ONLY



ITEM NO. 6h8
(264) REQ'D.

SPRING STOP DETAIL

QUANTITY FOR ASSEMBLY "2A" & "3A" ONLY



ITEM NO. 6h9
(176) REQ'D.

TYPICAL RIDER BAR DETAIL

QUANTITY FOR ASSEMBLY "2A" & "3A" ONLY

SHOP DRAWING REVIEW

- ____ FOR INFORMATION ONLY
- X ACCEPTED
- ____ ACCEPTED AS NOTED
- ____ ACCEPTED AS NOTED & RESUBMIT
- ____ NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: KRM Date: 2/19/08

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300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
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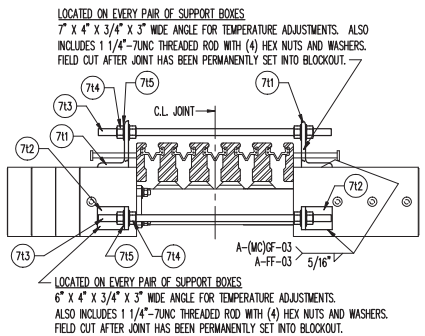
REV.	DESCRIPTION	DATE	DET.	CK'D.

	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER		
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5	365 LF
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

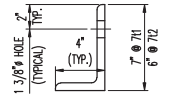
DESCRIPTION: SUPPORT BAR DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/4/07	6 OF 7

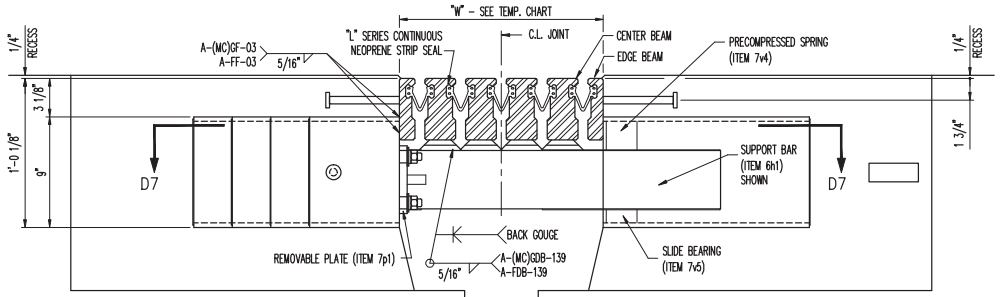
PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	6



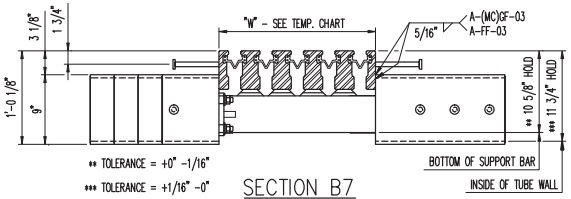
'D-400' TEMPERATURE ADJUSTMENT DETAIL



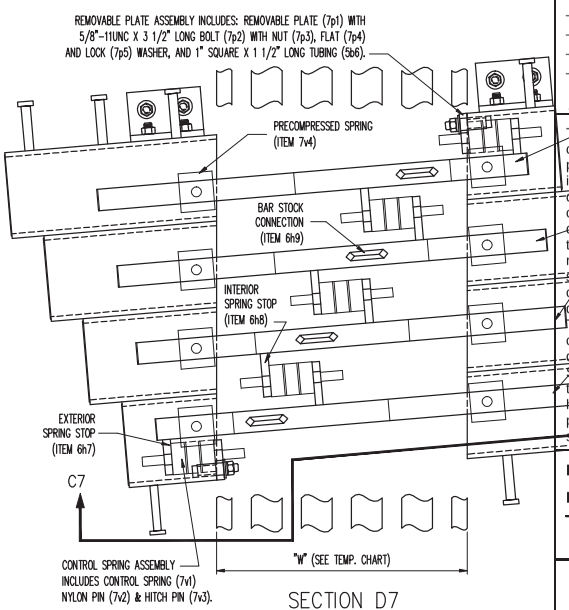
ADJUSTMENT ANGLE DETAIL



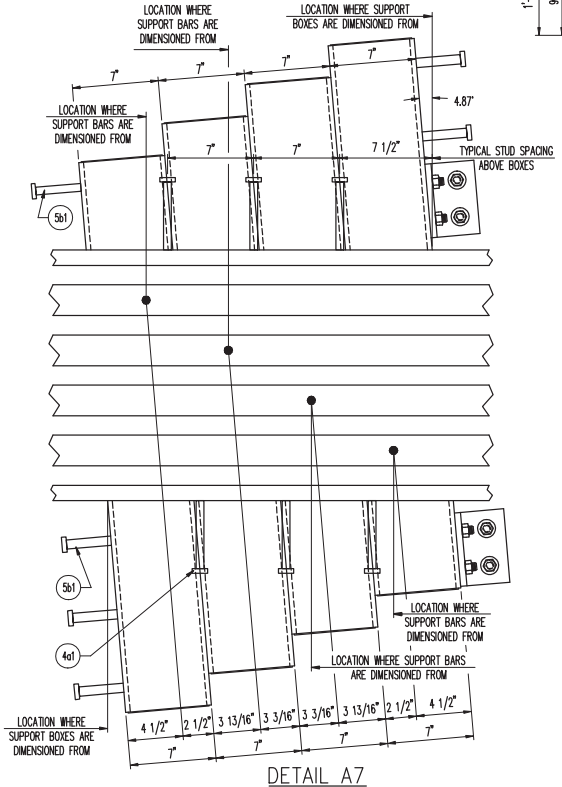
DETAIL C7
DRAWN AT MID. TEMP.



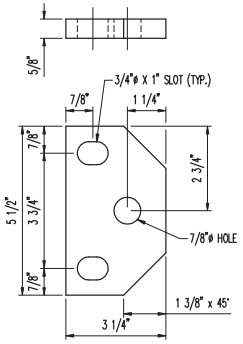
SECTION B7



SECTION D7



DETAIL A7



ITEM NO. 7p1
(88) REQ'D.

REMOVABLE PLATE DETAIL

'D-400' OPERATING DIMENSIONS ("W")		
STRUCT. TEMP.	ABUTMENT 1 (NB)	ABUTMENT 1 (SB)
MAX.	1'-0 1/2"	1'-0 1/2"
95°	1'-2 7/8"	1'-3 1/8"
85°	1'-3 3/8"	1'-3 5/8"
75°	1'-3 7/8"	1'-4 1/8"
65°	1'-4 3/8"	1'-4 5/8"
55°	1'-4 7/8"	1'-5 1/8"
45°F MID. TEMP.	1'-5 3/8"	1'-5 5/8"
35°	1'-5 7/8"	1'-6 1/8"
25°	1'-6 3/8"	1'-6 5/8"
15°	1'-6 7/8"	1'-7 1/8"
5°	1'-7 3/8"	1'-7 5/8"
-5°	1'-7 7/8"	1'-8 1/8"
MIN.	2'-3 1/2"	2'-3 1/2"

TEMPERATURE ADJUSTMENT CHART

DIMENSIONS ASSUME NO CREEP OR SHRINKAGE HAS OCCURRED. ALL OPENINGS AND DIMENSION SHALL BE VERIFIED BY FIELD ENGINEER ON DAY OF INSTALLATION.

SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

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The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:

Firm:

By: ANCHOR (ITEM 5b1) Date:

FIGG BRIDGE ENGINEERS, Inc.

By: KRM Date: 2/19/08

REV.	DESCRIPTION	DATE	DET.	CKD.

D.S. BROWN

THE D.S. BROWN COMPANY
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419.257.3561
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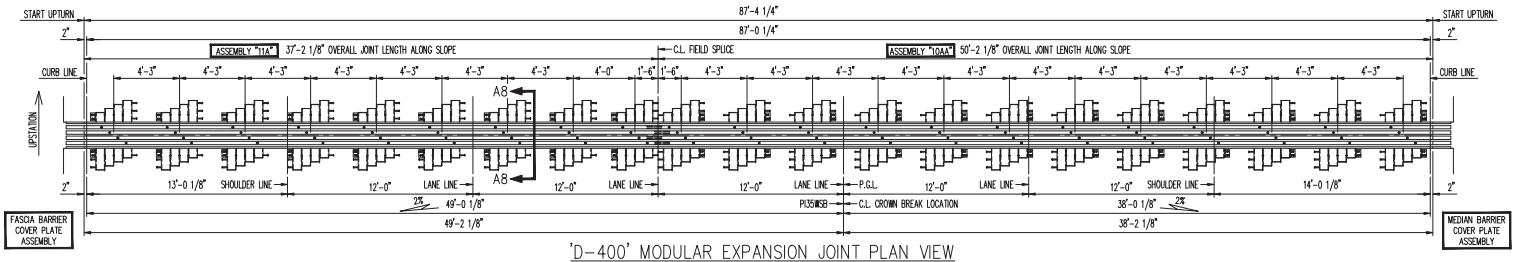
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT
PROJECT — S.P. 2783-120 DESIGN BUILD
— E.R. MN 07(300) PROGRAM
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)
— IN CONJUNCTION WITH JOHNSON BROTHERS

ITEM	QUANTITY
DBSB 2402.5	365 LF
–	–
–	–
–	–
–	–
–	–
–	–
–	–

DESCRIPTION: SECTIONS AND DETAILS
HENNEPIN COUNTY, MINNESOTA

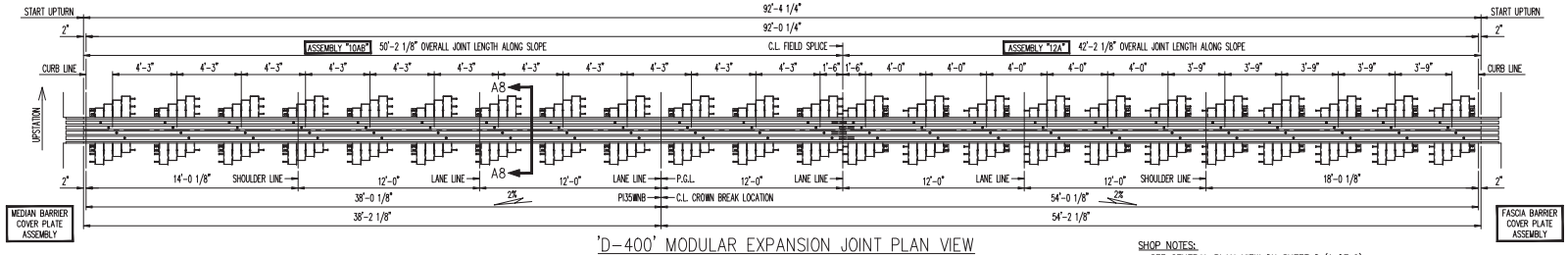
SCALE:	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/4/07	7 OF 7

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	7



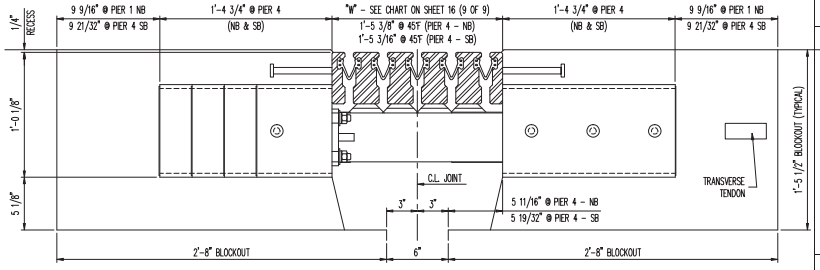
'D-400' MODULAR EXPANSION JOINT PLAN VIEW

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINT LOCATED ON BRIDGE 27409 AT PIER 4 (SOUTHBOUND) – LOOKING UPSTATION
(1) JOINT REQUIRED – TOTAL



'D-400' MODULAR EXPANSION JOINT PLAN VIEW

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINT LOCATED ON BRIDGE 27410 AT PIER 4 (NORTHBOUND) – LOOKING UPSTATION
(1) JOINT REQUIRED – TOTAL



SECTION A8

ALL DIMENSIONS ARE AT 45°F
ASSUMING NO CREEP OR SHRINKAGE HAS OCCURRED
SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 16 (9 OF 9)

SHOP DRAWING REVIEW

- X FOR INFORMATION ONLY
- _____ ACCEPTED
- _____ ACCEPTED AS NOTED
- _____ ACCEPTED AS NOTED & RESUBMIT
- _____ NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

SHOP NOTES:
- SEE GENERAL PLAN VIEW ON SHEET 8 (1 OF 9)
- SEE GENERAL NOTES ON SHEET 9 (2 OF 9)
- SEE INSTALLATION PROCEDURES ON SHEET 9 (2 OF 9)
- SEE ASSEMBLY PLAN VIEW "10A" ON SHEET 10 (3 OF 9)
- SEE ASSEMBLY PLAN VIEW "11A" ON SHEET 11 (4 OF 9)
- SEE ASSEMBLY PLAN VIEW "12A" ON SHEET 12 (5 OF 9)
- SEE SPLICE DETAILS ON SHEET 13 (6 OF 9)
- SEE JOINT SUPPORT DETAILS ON SHEET 14 (7 OF 9)
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- COVER PLATES NOT SHOWN FOR CLARITY PURPOSES
  COVER PLATES SHALL BE DETAILED
  AND SUBMITTED SEPARATELY

REV.	DESCRIPTION	DATE	DET.	CKD.

D.S. BROWN
THE D.S. BROWN COMPANY
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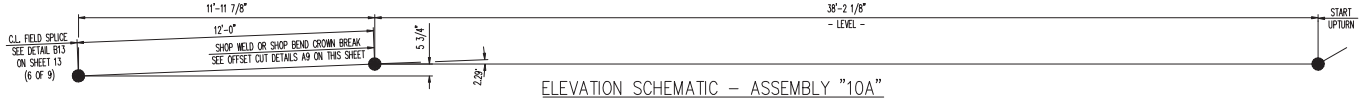
FAX: 419.257.0332
WWW.DSBROWN.COM

	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER		
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5	365 LF
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	1 OF 9

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	8



ELEVATION SCHEMATIC – ASSEMBLY "10A"

SEE PLAN VIEW ON SHEET 10

GENERAL NOTES

STANDARD SPECIFICATIONS:

THE 2005 EDITION OF THE MINNESOTA D.O.T. "STANDARD SPECIFICATIONS FOR CONSTRUCTION"

EDGE BEAMS AND CENTER BEAMS AND SUPPORT BARS SHALL BE AASHTO M270, GRADE 50W (ASTM A588) STEEL.

SUPPORT BOXES SHALL BE ASTM A500B STEEL.

STAINLESS STEEL SLIDING SURFACES SHALL BE ASTM A240, TYPE 304, WITH A #8 MIRROR FINISH.

STUD ANCHORS SHALL BE ASTM A108 STEEL AND AUTOMATICALLY END WELDED WITH COMPLETE FUSION. REPAIR STUDS USING WELD PROCEDURE A-(MC)GF-STUD-REP-01, A-FF-STUD-REP-01 OR A-SM-STUD-REP-01.

ALL STEEL IN THE EXPANSION JOINT DEVICES SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. (EXCEPT STAINLESS STEEL) REPAIR DAMAGED GALVANIZING IN ACCORDANCE WITH ASTM A780, ANNEX A1.

REMOVABLE PLATE HARDWARE (ITEM 16p2, 16p3, 16p4 & 16p5) SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695, CLASS 50 (MINIMUM).

NEOPRENE STRIP SEAL SHALL BE CONTINUOUS AND SHOP INSTALLED WITH A LUBRICANT ADHESIVE IN ASSEMBLY "2A". THE REMAINDER OF THE SEAL SHALL BE ROLLED UP ON THE FIELD SPLICED END. THE SEAL SHALL THEN BE FIELD INSTALLED IN ASSEMBLY "3A" WITH A LUBRICANT ADHESIVE AFTER THE FIELD SPLICE IS COMPLETE

NEOPRENE STRIP SEAL SHALL EXTEND PAST ENDS OF UPTURNS AT LEAST 2".

WELDING SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE FOR MAJOR MEMBERS AND AWS D1.1 FOR ANCILLARY MEMBERS.

SHOP SHALL PREPARE ENDS OF RAILS FOR FIELD SPLICES.

25% OF THE FULL PENETRATION WELDS THAT CONNECT THE CENTER BEAMS TO THE SUPPORT BARS SHALL BE ULTRASONICALLY INSPECTED IN ACCORDANCE WITH SECTION 2471 OF THE STATE STANDARD SPECIFICATIONS, AWS D1.1 AND THE SPECIAL PROVISIONS. REPAIR DEFECTS USING F-REP(NDT)01.

ANY TIGHTLY ADHERENT WELD SPATTER NEED NOT BE REMOVED IN COATED AREAS TO BE CAST IN CONCRETE.

MODULAR JOINTS SHALL BE EQUIPPED WITH TEMPERATURE ADJUSTMENT DEVICES TO ALLOW FOR ADJUSTMENTS PER FIELD ENGINEERS RECOMMENDATIONS.

ALL STEEL SURFACES IN CONTACT WITH THE NEOPRENE SEAL SHALL BE CLEANED PRIOR TO THE INSTALLATION OF THE STRIP SEAL.

PRIOR TO SHIPMENT, SEAL GROOVES IN RAILS SHALL BE PROTECTED WITH A STYROFOAM DOWEL UNLESS SEAL IS INSTALLED.

CARE SHALL BE TAKEN TO PREVENT DAMAGE DURING MOVING AND SHIPPING OF JOINTS.

MODULAR JOINTS SHALL FOLLOW ROADWAY SLOPE AND GRADE.

MODULAR JOINTS SHALL BE MARKED SHOWING JOINT TYPE AND PROPER LOCATION. MARKINGS SHALL BE VISIBLE AFTER JOINTS HAVE BEEN COMPLETELY INSTALLED.

MODULAR EXPANSION JOINTS SHALL BE DESIGNED TO ACCOMMODATE FATIGUE LOADING.

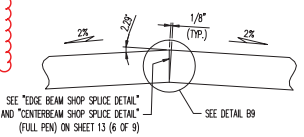
EXPANSION JOINT ASSEMBLIES SHALL BE INSPECTED BY DS BROWN QC DEPARTMENT AND BY A MINNESOTA D.O.T. REPRESENTATIVE (IF REQUIRED).

CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AS PER THE SPECIAL PROVISIONS.

Please include straightening tolerance as stated in note 16 of plan sheet E.J. Details I

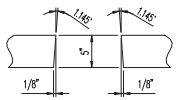
and MnDOT 3394

and MnDOT 3392



OFFSET DETAIL A9

N.T.S.



DETAIL B9

N.T.S.

INSTALLATION PROCEDURES

1) FIELD ENGINEER SHALL DETERMINE JOINT OPENING ON DAY OF INSTALLATION.

2) PLACE JOINT IN BLOCKOUT AND PROPERLY ALIGN BOTH HORIZONTALLY AND VERTICALLY. (JOINT MUST FOLLOW ROADWAY GRADE.)

3) MODIFY REBAR TO RECEIVE MODULAR EXPANSION JOINT.

4) FIELD LOCATE AND DRILL HOLES IN DIAPHRAGMS AND ABUTMENT FOR JOINT SUPPORT HARDWARE.

5) AFTER SETTING JOINT TO GRADE, TIGHTEN ALL CONNECTIONS TO ANCHORS, THREADED STUDS, AND SUPPORT ANGLES. TACK WELD SUPPORT ANGLES TO SUPPORT BOXES AS INDICATED ON SHEET 14 (7 OF 9).

6) AFTER JOINT IS SECURED, REMOVE TEMPORARY ADJUSTMENT DEVICES AS DIRECTED.

7) CONTRACTOR TO PLACE FORMWORK SO THAT NO CONCRETE FLOWS INTO BOXES AND JOINT GAP OPENINGS.

8) POUR AND VIBRATE CONCRETE INTO BLOCKOUT TO ENSURE PROPER CONSOLIDATION AROUND ALL EMBEDDED COMPONENTS. THEN REMOVE FORMWORK AFTER CURE TIME, AS DETERMINED BY FIELD ENGINEER.

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- COVER PLATES NOT SHOWN FOR CLARITY PURPOSES
  COVER PLATES SHALL BE DETAILED AND SUBMITTED SEPARATELY

SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
_____ ACCEPTED
__X__ ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
_____ NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

REV.	DESCRIPTION	DATE	DET.	CKD.
1	REVISED NOTES	2/8/08	BLB	JLW

D.S. BROWN

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LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT
PROJECT — S.P. 2783-120 DESIGN BUILD
— E.R. MN 07(300) PROGRAM
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)
— IN CONJUNCTION WITH JOHNSON BROTHERS

ITEM	QUANTITY
DBSB 2402.5	365 LF
–	–
–	–
–	–
–	–
–	–
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DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	2 OF 9

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	9

SHOP NOTES:
- SEE GENERAL PLAN VIEW ON SHEET 8 (1 OF 9)
- SEE GENERAL NOTES ON SHEET 9 (2 OF 9)
- SEE INSTALLATION PROCEDURES ON SHEET 9 (2 OF 9)
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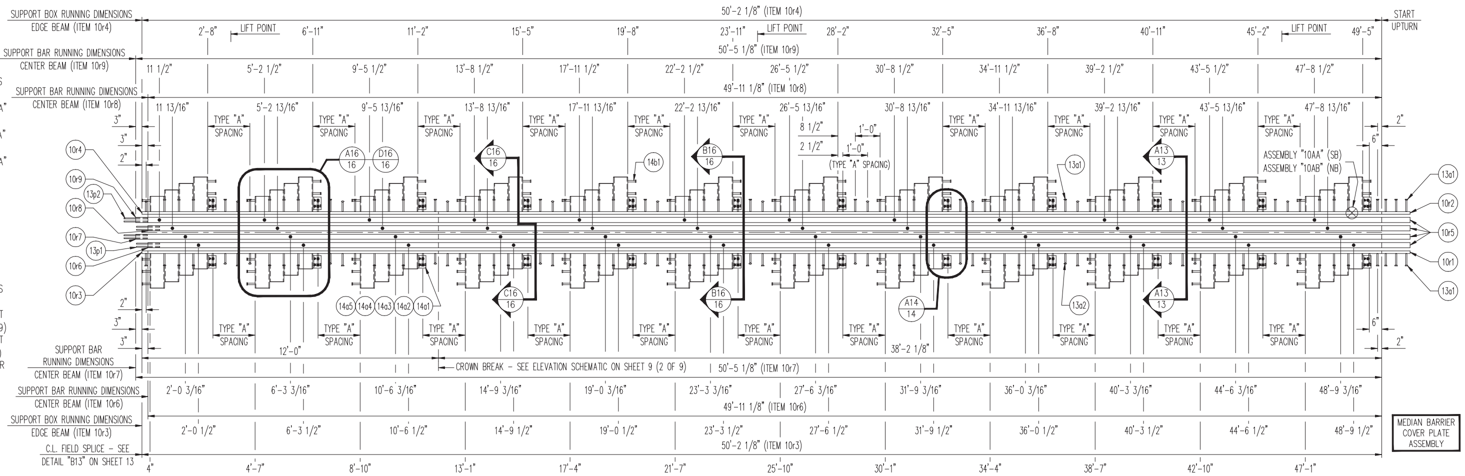


MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
10AA	1	'D-400' MODULAR EXPANSION JOINT			51'-7"	
10r1	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
10r2	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
10r3	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	50'-3 7/16	UPTURN CUT; A123-HDG	
10r4	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	50'-3 7/16	UPTURN CUT; A123-HDG	
10r5	4	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
10r6	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-0 7/16	UPTURN CUT; A123-HDG	
10r7	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-6 7/16	UPTURN CUT; A123-HDG	
10r8	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-0 7/16	UPTURN CUT; A123-HDG	
10r9	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-6 7/16	UPTURN CUT; A123-HDG	
13a1	125	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE; A123-HDG	
13a2	47	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE (BEND 45° @ 2"); A123-HDG	
14a1	48	5/8ø X 1 1/2 THREADED STUD	M169 (A108)			
14b1	96	5/8ø X 4 WELD STUD	M169 (A108)		SUPPORT BOX ANCHORAGE; A123-HDG	
14b2	24	HSS 9 X 7 X 3/8	A500 GR B	0'-7 3/8	SHORT BOX; A123-HDG	
14b3	24	HSS 9 X 7 X 3/8	A500 GR B	0'-10 1/2	INNER BOX; A123-HDG	
14b4	24	HSS 9 X 7 X 3/8	A500 GR B	1'-1 5/8	INNER BOX; A123-HDG	
14b5	24	HSS 9 X 7 X 3/8	A500 GR B	1'-4 3/4	LONG BOX; A123-HDG	
14b6	48	HSS 1 X 1 X 1/8	A53 GR B SCH 40	0'-1 1/2	A123-HDG	
14b7	96	SUPPORT BOX END CAP	A606-T4 OR HDPE			
15h1	24	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	EXTERIOR SUPPORT BAR; A123-HDG	
15h2	24	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	INTERIOR SUPPORT BAR; A123-HDG	
15h3	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	0'-6 1/4	SS SHIM;	
15h4	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	0'-9 5/8	SS SHIM;	
15h5	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	1'-0 3/4	SS SHIM;	
15h6	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	1'-4	SS SHIM;	
15h7	24	5/8 X 2 1/2	M270 GR 36 (A709)	0'-2 7/8	EXTERIOR SPRING STOP; A123-HDG	
15h8	72	5/8 X 2 1/2	M270 GR 36 (A709)	0'-3 9/16	INTERIOR SPRING STOP; A123-HDG	
15h9	48	SQUARE BAR 1/2	M270 GR 50W (A709)	0'-3 3/8	CONNECTION BAR STOCK; A123-HDG	
16p1	24	5/8 X 3 1/4	M270 GR 36 (A709)	0'-5 1/2	REMOVABLE PLATE; A123-HDG	
16p2	48	5/8ø X 3 1/2 SQUARE HEAD CAP SCREW	A307		5/8"-11UNC; B695-MG CLASS 50	
16p3	48	5/8ø HEX NUT	M291-A (A563 GR A)		B695-MG CLASS 50	
16p4	48	5/8ø FLAT WASHER	F844		B695-MG CLASS 50 (A)	
16p5	48	5/8ø LOCK WASHER	F844		B695-MG CLASS 50	
16t1	24	L7 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	M111-HDG (A123)	
16t2	24	L6 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	M111-HDG (A123)	
16t3	24	1 1/4ø X 35 THREADED ROD	M270 GR 36 (A709)		1 1/4"-7UNC; ZINC PLATED	
16t4	96	1 1/4ø HEX NUT	M291-A (A563 GR A)		ZINC PLATED	
16t5	96	1 1/4ø FLAT WASHER	F844		ZINC PLATED	
16v1	60	CONTROL SPRING (80MM)	–		ASTM D3574;	
16v2	60	NYLON PIN (80MM)	–			
16v3	120	HITCH PIN	–			
16v4	96	PRECOMPRESSED SPRING (NEOPRENE)	–			
16v5	96	SLIDE BEARING (NEOPRENE)	–			
16w1	2	LUBRICANT ADHESIVE (1 GAL. UNIT)	D4070			
16w2	5	KX-73 GLAND	NEOPRENE	89'-0	445'-0" TOTAL;	

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
10AB	1	'D-400' MODULAR EXPANSION JOINT			51'-7"	
10r1	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
10r2	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
10r3	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	50'-3 7/16	UPTURN CUT; A123-HDG	
10r4	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	50'-3 7/16	UPTURN CUT; A123-HDG	
10r5	4	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
10r6	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-0 7/16	UPTURN CUT; A123-HDG	
10r7	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-6 7/16	UPTURN CUT; A123-HDG	
10r8	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-0 7/16	UPTURN CUT; A123-HDG	
10r9	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	50'-6 7/16	UPTURN CUT; A123-HDG	
13a1	125	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE; A123-HDG	
13a2	47	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE (BEND 45° @ 2"); A123-HDG	
14a1	48	5/8ø X 1 1/2 THREADED STUD	M169 (A108)			
14b1	96	5/8ø X 4 WELD STUD	M169 (A108)		SUPPORT BOX ANCHORAGE; A123-HDG	
14b2	24	HSS 9 X 7 X 3/8	A500 GR B	0'-7 3/8	SHORT BOX; A123-HDG	
14b3	24	HSS 9 X 7 X 3/8	A500 GR B	0'-10 1/2	INNER BOX; A123-HDG	
14b4	24	HSS 9 X 7 X 3/8	A500 GR B	1'-1 5/8	INNER BOX; A123-HDG	
14b5	24	HSS 9 X 7 X 3/8	A500 GR B	1'-4 3/4	LONG BOX; A123-HDG	
14b6	48	HSS 1 X 1 X 1/8	A53 GR B SCH 40	0'-1 1/2	A123-HDG	
14b7	96	SUPPORT BOX END CAP	A606-T4 OR HDPE			
15h1	24	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	EXTERIOR SUPPORT BAR; A123-HDG	
15h2	24	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	INTERIOR SUPPORT BAR; A123-HDG	
15h3	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	0'-6 1/4	SS SHIM;	
15h4	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	0'-9 5/8	SS SHIM;	
15h5	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	1'-0 3/4	SS SHIM;	
15h6	48	16 GA. X 2 3/8	A240 T304, #8 & 2B	1'-4	SS SHIM;	
15h7	24	5/8 X 2 1/2	M270 GR 36 (A709)	0'-2 7/8	EXTERIOR SPRING STOP; A123-HDG	
15h8	72	5/8 X 2 1/2	M270 GR 36 (A709)	0'-3 9/16	INTERIOR SPRING STOP; A123-HDG	
15h9	48	SQUARE BAR 1/2	M270 GR 50W (A709)	0'-3 3/8	CONNECTION BAR STOCK; A123-HDG	
16p1	24	5/8 X 3 1/4	M270 GR 36 (A709)	0'-5 1/2	REMOVABLE PLATE; A123-HDG	
16p2	48	5/8ø X 3 1/2 SQUARE HEAD CAP SCREW	A307		5/8"-11UNC; B695-MG CLASS 50	
16p3	48	5/8ø HEX NUT	M291-A (A563 GR A)		B695-MG CLASS 50	
16p4	48	5/8ø FLAT WASHER	F844		B695-MG CLASS 50 (A)	
16p5	48	5/8ø LOCK WASHER	F844		B695-MG CLASS 50	
16t1	24	L7 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
16t2	24	L6 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
16t3	24	1 1/4ø X 35 THREADED ROD	M270 GR 36 (A709)		1 1/4"-7UNC; ZINC PLATED	
16t4	96	1 1/4ø HEX NUT	M291-A (A563 GR A)		ZINC PLATED	
16t5	96	1 1/4ø FLAT WASHER	F844		ZINC PLATED	
16v1	60	CONTROL SPRING (80MM)	–		ASTM D3574;	
16v2	60	NYLON PIN (80MM)	–			
16v3	120	HITCH PIN	–			
16v4	96	PRECOMPRESSED SPRING (NEOPRENE)	–			
16v5	96	SLIDE BEARING (NEOPRENE)	–			
16w1	2	LUBRICANT ADHESIVE (1 GAL. UNIT)	D4070			
16w3	5	KX-73 GLAND	NEOPRENE	94'-0	470'-0" TOTAL;	

'D-400' MODULAR JOINT PLAN VIEW

ST. ANTHONY FALLS (35W) BRIDGE
OVER THE MISSISSIPPI RIVER
JOINTS LOCATED AT PIER 4
SOUTHBOUND SHOWN –
ASSEMBLY "10AA" –
LOOKING UPSTATION
NORTHBOUND SIMILAR –
ASSEMBLY "10AB" –
LOOKING DOWNSTATION
(2) ASSEMBLIES REQUIRED – TOTAL

FABRICATION NOTE:
SHOP SHALL LOCATE SPLICES OF EDGE & CENTER BEAMS. MINIMUM SPLICE LENGTH SHALL BE 2'-0" FOR EDGE BEAMS AND 4'-0" FOR CENTER BEAMS.

SHOP DRAWING REVIEW

___ FOR INFORMATION ONLY
_X_ ACCEPTED
___ ACCEPTED AS NOTED
___ ACCEPTED AS NOTED & RESUBMIT
___ NOT ACCEPTED

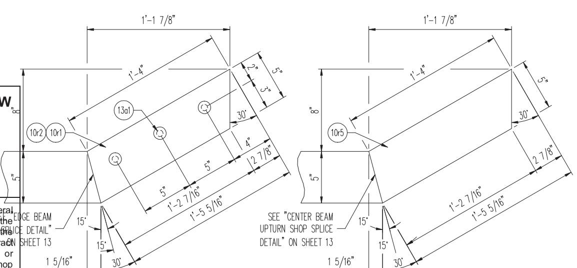
This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements. The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:
Firm:

By: ___________ Date: ___________

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 3/05/08

SHOP NOTES:
- SEE BILL OF MATERIAL FOR LOOSE ITEMS ON SHEET 11 (4 OF 9)



EDGE BEAM UPTURN DETAIL

CENTER BEAM UPTURN DETAIL

REV.	DESCRIPTION	DATE	DET.	CKD.
A	REVISED B.O.M.	2/8/08	BLB	JLW

THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT
PROJECT — S.P. 2783-120 DESIGN BUILD
— E.R. MN 07(300) PROGRAM
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)
— IN CONJUNCTION WITH JOHNSON BROTHERS

ITEM	QUANTITY
DBSB 2402.5	365 LF
–	–
–	–
–	–
–	–
–	–
–	–
–	–
–	–

DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS, HENNEPIN COUNTY, MINNESOTA

SCALE:	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	3 OF 9

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	10

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
11A	1	D-400' MODULAR EXPANSION JOINT			38'-7"	
11r1	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
11r2	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
11r3	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	37'-3 7/16	UPTURN CUT; A123-HDG	
11r4	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	37'-3 7/16	UPTURN CUT; A123-HDG	
11r5	4	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
11r6	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	37'-0 7/16	UPTURN CUT; A123-HDG	
11r7	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	37'-0 7/16	UPTURN CUT; A123-HDG	
11r8	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	37'-0 7/16	UPTURN CUT; A123-HDG	
11r9	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	37'-6 7/16	UPTURN CUT; A123-HDG	
13a1	95	5/8Ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE; A123-HDG	
13a2	35	5/8Ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE (BEND 45° @ 2"); A123-HDG	
14a1	36	5/8Ø X 1 1/2 THREADED STUD	M169 (A108)			
14b1	72	5/8Ø X 4 WELD STUD	M169 (A108)		SUPPORT BOX ANCHORAGE; A123-HDG	
14b2	18	HSS 9 X 7 X 3/8	A500 GR B	0'-7 3/8	SHORT BOX; A123-HDG	
14b3	18	HSS 9 X 7 X 3/8	A500 GR B	0'-10 1/2	INNER BOX; A123-HDG	
14b4	18	HSS 9 X 7 X 3/8	A500 GR B	1'-1 5/8	INNER BOX; A123-HDG	
14b5	18	HSS 9 X 7 X 3/8	A500 GR B	1'-4 3/4	LONG BOX; A123-HDG	
14b6	36	HSS 1 X 1 X 1/8	A53 GR B SCH 40	0'-1 1/2	A123-HDG	
14b7	72	SUPPORT BOX END CAP	A606-T4 OR HDPE			
15h1	18	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	EXTERIOR SUPPORT BAR; A123-HDG	
15h2	18	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	INTERIOR SUPPORT BAR; A123-HDG	
15h3	36	16 GA. X 2 3/8	A240 T304, J3 & 2B	0'-6 1/4	SS SHIM;	
15h4	36	16 GA. X 2 3/8	A240 T304, J3 & 2B	0'-9 5/8	SS SHIM;	
15h5	36	16 GA. X 2 3/8	A240 T304, J3 & 2B	1'-0 3/4	SS SHIM;	
15h6	36	16 GA. X 2 3/8	A240 T304, J3 & 2B	1'-4	SS SHIM;	
15h7	18	5/8 X 2 1/2	M270 GR 36 (A709)	0'-2 7/8	EXTERIOR SPRING STOP; A123-HDG	
15h8	54	5/8 X 2 1/2	M270 GR 36 (A709)	0'-3 9/16	INTERIOR SPRING STOP; A123-HDG	
15h9	36	SQUARE BAR 1/2	M270 GR 50W (A709)	0'-3 3/8	CONNECTION BAR STOCK; A123-HDG	
16p1	18	5/8 X 3 1/4	M270 GR 36 (A709)	0'-5 1/2	REMOVABLE PLATE; A123-HDG	
16p2	36	5/8Ø X 3 1/2 SQUARE HEAD CUP SCREW	A307		5/8"-11UNC; B695-MG CLASS 50	
16p3	36	5/8Ø HEX NUT	M291-A (A563 GR A)		B695-MG CLASS 50	
16p4	36	5/8Ø FLAT WASHER	F844		B695-MG CLASS 50 ⚠	
16p5	36	5/8Ø LOCK WASHER	F844		B695-MG CLASS 50	
16t1	18	L7 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
16t2	18	L6 X 4 X 3/4	M270 GR 36 (A709 OR A992)	0'-3	A123-HDG	
16t3	18	1 1/4Ø X 35 THREADED ROD	M270 GR 36 (A709)		1 1/4"-7UNC; ZINC PLATED	
16t4	72	1 1/4Ø HEX NUT	M291-A (A563 GR A)		ZINC PLATED	
16t5	72	1 1/4Ø FLAT WASHER	F844		ZINC PLATED	
16v1	45	CONTROL SPRING (80MM)	–		ASTM D3574;	
16v2	45	NYLON PIN (80MM)	–			
16v3	90	HITCH PIN	–			
16v4	72	PRECOMPRESSED SPRING (NEOPRENE)	–			
16v5	72	SLIDE BEARING (NEOPRENE)	–			

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
13AA	8	CENTER BEAM SPLICE PLATE			CTSK HOLES	
13p1	8	5/8 X 3	M270 GR 50W (A709)	0'-11 1/4	SHAPE OUT; M111-HDG (A123)	
13AB	8	CENTER BEAM SPLICE PLATE			DRILLED & TAPPED HOLES	
13p2	8	5/8 X 3	M270 GR 50W (A709)	0'-11 1/4	SHAPE OUT; M111-HDG (A123)	
13AC	32	CTSK BOLT FOR FIELD SPLICE				
13p3	32	7/8Ø X 2 1/4 FLAT HD CTSK SOCT CAP SCREW	F835		B695-MG	

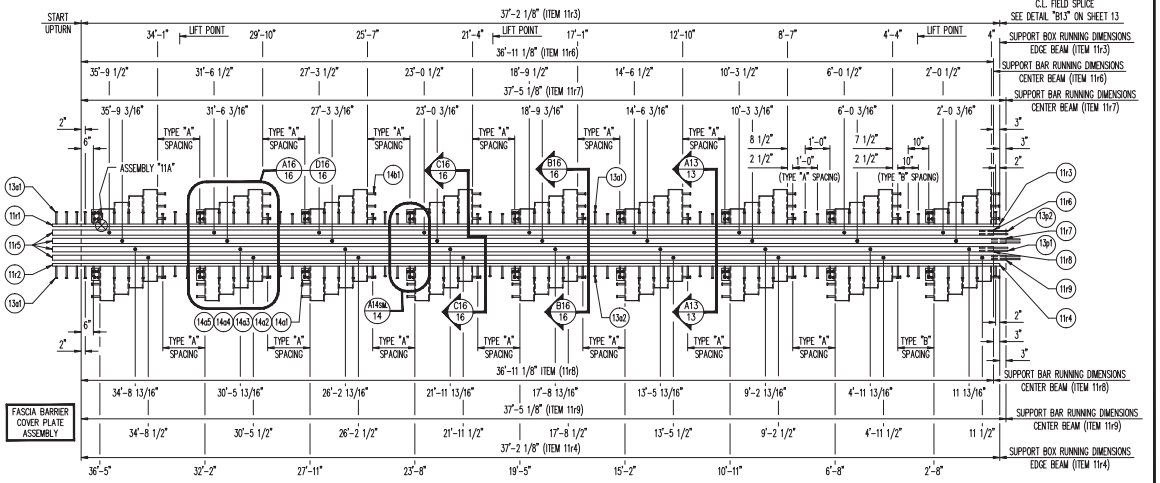
NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
14BA	176	SUPPORT NUTS				
14a2	176	5/8Ø HEX NUT	M291-A (A563 GR A)		A153-HDG	
14BB	176	SUPPORT WASHERS				
14a3	176	5/8Ø FLAT WASHER	F844		A153-HDG	
14BC	88	SUPPORT BENT PLATE ANGLE			JOINT SUPPORT	
14a4	88	1/2 X 6	M183 (A36)	1'-0	BENT; A153-HDG	
14BD	176	EXPANSION ANCHOR			RAMSET/REDHEAD	
14a5	176	5/8Ø X 4 1/4 EXPANSION ANCHOR	CONCRETE INSERT		HN5842 OR EQUAL; ZINC PLATED	

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

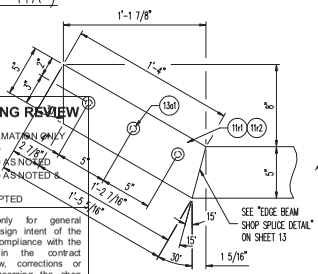
MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
16WA	4	LUBRICANT ADHESIVE				
16w1	4	LUBRICANT ADHESIVE (1 GAL. UNIT)	D4070			
16XA	2	STRIP SEAL SAMPLE				
16x1	2	KX-73 GLAND	NEOPRENE	1'-0	NEOPRENE SAMPLE;	
16XB	2	PTFE SAMPLE				
16x2	2	1/8 X 2	PTFE	0'-3	PURE VIRGIN UNFILLED; PTFE SAMPLE	

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

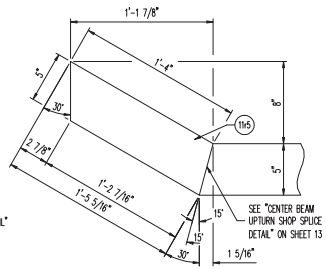


'D-400' MODULAR JOINT PLAN VIEW (ASSEMBLY "11A")

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINT LOCATED AT PIER 4
SOUTHBOUND – LOOKING UPSTATION
(1) ASSEMBLY REQUIRED – TOTAL



EDGE BEAM UPTURN DETAIL



CENTER BEAM UPTURN DETAIL

SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- X ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

This review is only for general conformance with design intent of the project and general compliance with the information given in the contract documents. Review, corrections or comments made concerning the shop drawings during this review do not relieve the contractor from compliance with requirements of the drawings and specifications, nor relieve the contractor of contractual responsibility for any error or deviation from contract requirements. The contractor is responsible for confirming and correlating all quantities, dimensions and structural capabilities - Selecting fabrication processes and techniques of construction - Coordinating his work with that of all other trades - and performing his work in a safe and satisfactory manner.

FIGG Subconsultant:
Firm:
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: MSK Date: 3/05/08

FABRICATION NOTE:
SHOP SHALL LOCATE SPLICES IN EDGE & CENTER BEAMS. MINIMUM SPLICE LENGTH SHALL BE 2'-0" FOR EDGE BEAMS AND 4'-0" FOR CENTER BEAMS.

SHOP NOTES:
- SEE GENERAL PLAN VIEW ON SHEET 8 (1 OF 9)
- SEE GENERAL NOTES ON SHEET 9 (2 OF 9)
- SEE INSTALLATION PROCEDURES ON SHEET 9 (2 OF 9)
- SEE ASSEMBLY PLAN VIEW "10A" ON SHEET 10 (3 OF 9)
- SEE ASSEMBLY PLAN VIEW "11A" ON SHEET 11 (4 OF 9)
- SEE ASSEMBLY PLAN VIEW "12A" ON SHEET 12 (5 OF 9)
- SEE SPLICE DETAILS ON SHEET 13 (6 OF 9)
- SEE JOINT SUPPORT DETAILS ON SHEET 14 (7 OF 9)
- SEE SUPPORT BOX DETAILS ON SHEET 14 (7 OF 9)
- SEE SUPPORT BAR DETAILS ON SHEET 15 (8 OF 9)
- SEE REMOVABLE PLATE DETAILS ON SHEET 16 (9 OF 9)
- SEE TEMPERATURE ADJUSTMENT DETAILS ON SHEET 16 (9 OF 9)
- SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 16 (9 OF 9)
- COVER PLATES NOT SHOWN FOR CLARITY PURPOSES
  COVER PLATES SHALL BE DETAILED AND SUBMITTED SEPARATELY

REV.	DESCRIPTION	DATE	DET.	CKD.
⚠	REVISED B.O.M.	2/8/08	BLB	JLW

THE D.S. BROWN COMPANY
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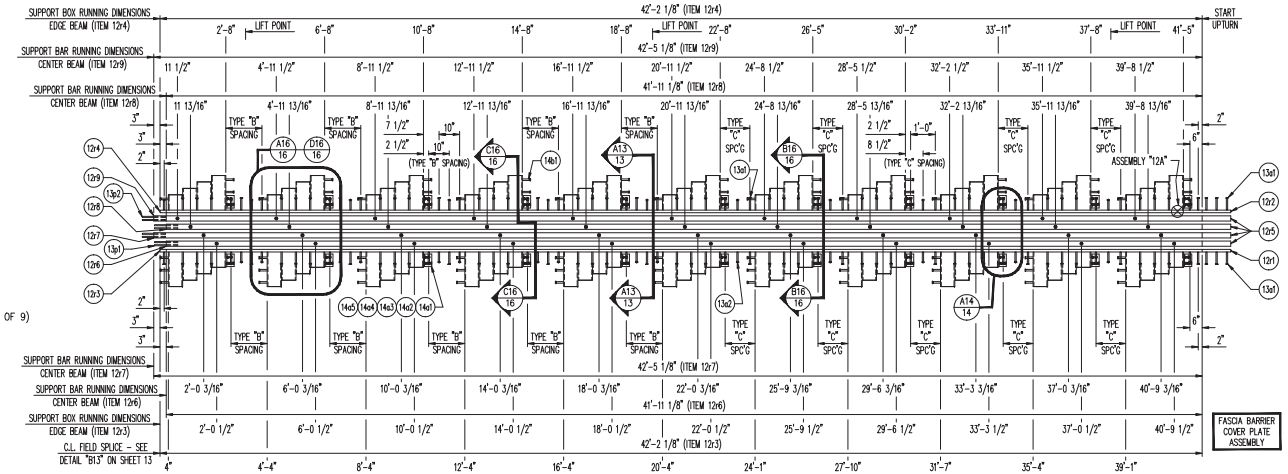
	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER		
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5	365 LF
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

DESCRIPTION	SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
"D-400" PLAN VIEW AND DETAILS	N.T.S.	BLB	JLW	12/17/07	4 OF 9
HENNEPIN COUNTY, MINNESOTA	PROJECT NUMBER 22051	PRODUCT CODE 1021	RELEASE 1	SHEET 11	

FABRICATION NOTE:

SHOP SHALL LOCATE SPLICES IN EDGE & CENTER BEAMS. MINIMUM SPLICE LENGTH SHALL BE 2'-0" FOR EDGE BEAMS AND 4'-0" FOR CENTER BEAMS.



SHOP NOTES:
- SEE BILL OF MATERIAL FOR LOOSE ITEMS ON SHEET 11 (4 OF 9)

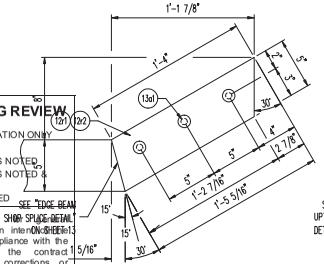
MK	QTY.	DESCRIPTION	MATERIAL	LENGTH	REMARKS	PART NO.
12A	1	'D-400' MODULAR EXPANSION JOINT			43'-7"	
12r1	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
12r2	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
12r3	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	42'-3 7/16	UPTURN CUT; A123-HDG	
12r4	1	EDGE BEAM 1.25"X5"	M270 GR 50W (A709)	42'-3 7/16	UPTURN CUT; A123-HDG	
12r5	4	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	1'-5 5/16	UPTURN; A123-HDG	
12r6	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	42'-0 7/16	UPTURN CUT; A123-HDG	
12r7	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	42'-6 7/16	UPTURN CUT; A123-HDG	
12r8	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	42'-0 7/16	UPTURN CUT; A123-HDG	
12r9	1	CENTER BEAM 2.5"X5"	M270 GR 50W (A709)	42'-6 7/16	UPTURN CUT; A123-HDG	
13a1	115	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE; A123-HDG	
13a2	33	5/8ø X 6 WELD STUD	M169 (A108)		EDGE BEAM ANCHORAGE (BEND 45 @ 7"); A123-HDG	
14a1	44	5/8ø X 1 1/2 THREADED STUD	M169 (A108)			
14b1	88	5/8ø X 4 WELD STUD	M169 (A108)		SUPPORT BOX ANCHORAGE; A123-HDG	
14b2	22	HSS 9 X 7 X 3/8	A500 GR B	0'-7 3/8	SHORT BOX; A123-HDG	
14b3	22	HSS 9 X 7 X 3/8	A500 GR B	0'-10 1/2	INNER BOX; A123-HDG	
14b4	22	HSS 9 X 7 X 3/8	A500 GR B	1'-1 5/8	INNER BOX; A123-HDG	
14b5	22	HSS 9 X 7 X 3/8	A500 GR B	1'-4 3/4	LONG BOX; A123-HDG	
14b6	44	HSS 1 X 1 X 1/8	A53 GR B SCH 40	0'-1 1/2	A123-HDG	
14b7	88	SUPPORT BOX END CAP	A606-TY OR HDPE			
15h1	22	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	EXTERIOR SUPPORT BAR; A123-HDG	
15h2	22	1 3/4 X 4 3/4	M270 GR 50W (A709)	2'-10 3/4	INTERIOR SUPPORT BAR; A123-HDG	
15h3	44	16 GA. X 2 3/8	A240 T304, @1 & 2@	0'-6 1/4	SS SHIM;	
15h4	44	16 GA. X 2 3/8	A240 T304, @1 & 2@	0'-9 5/8	SS SHIM;	
15h5	44	16 GA. X 2 3/8	A240 T304, @1 & 2@	1'-0 3/4	SS SHIM;	
15h6	44	16 GA. X 2 3/8	A240 T304, @1 & 2@	1'-4	SS SHIM;	
15h7	22	5/8 X 2 1/2	M270 GR 36 (A709)	0'-2 7/8	EXTERIOR SPRING STOP; A123-HDG	
15h8	66	5/8 X 2 1/2	M270 GR 36 (A709)	0'-3 9/16	INTERIOR SPRING STOP; A123-HDG	
15h9	44	SQUARE BAR 1/2	M270 GR 50W (A709)	0'-3 3/8	CONNECTION BAR STOCK; A123-HDG	
16p1	22	5/8 X 3 1/4	M270 GR 36 (A709)	0'-5 1/2	REMOVABLE PLATE; A123-HDG	
16p2	44	5/8ø X 3 1/2" SQUARE HEAD CAP SCREW	A307		5/8"-11UNC; B695-MG CLASS 50	
16p3	44	5/8ø HEX NUT	M291-A (A563 GR A)		B695-MG CLASS 50	
16p4	44	5/8ø FLAT WASHER	F844		B695-MG CLASS 50	
16p5	44	5/8ø LOCK WASHER	F844		B695-MG CLASS 50	
16t1	22	L7 X 4 X 3/4	M270 GR 36 (A709) OR A992	0'-3	A123-HDG	
16t2	22	L6 X 4 X 3/4	M270 GR 36 (A709) OR A992	0'-3	A123-HDG	
16t3	22	1 1/4ø X 35 THREADED ROD	M270 GR 36 (A709)		1 1/4"-7UNC; ZINC PLATED	
16t4	88	1 1/4ø HEX NUT	M291-A (A563 GR A)		ZINC PLATED	
16t5	88	1 1/4ø FLAT WASHER	F844		ZINC PLATED	
16v1	55	CONTROL SPRING (80MM)	–		ASTM D3574;	
16v2	55	NYLON PIN (80MM)	–			
16w3	110	HITCH PIN	–			
16v4	88	PRECOMPRESSED SPRING (NEOPRENE)	–			
16v5	88	SLIDE BEARING (NEOPRENE)	–			

NOTE: ALL MATERIAL SPECIFICATION DESCRIPTIONS ARE ASTM, UNLESS OTHERWISE NOTED.

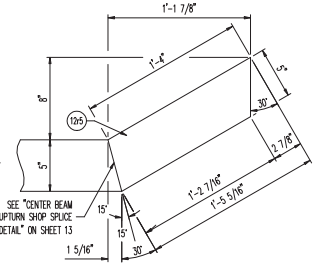
'D-400' MODULAR JOINT PLAN VIEW (ASSEMBLY "12A")

ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
JOINT LOCATED AT PIER 4
NORTHBOUND SHOWN – LOOKING UPSTATION
(1) ASSEMBLY REQUIRED – TOTAL

SHOP NOTES:
- SEE GENERAL PLAN VIEW ON SHEET 8 (1 OF 9)
- SEE GENERAL NOTES ON SHEET 9 (2 OF 9)
- SEE INSTALLATION PROCEDURES ON SHEET 9 (2 OF 9)
- SEE ASSEMBLY PLAN VIEW "10A" ON SHEET 10 (3 OF 9)
- SEE ASSEMBLY PLAN VIEW "11A" ON SHEET 11 (4 OF 9)
- SEE ASSEMBLY PLAN VIEW "12A" ON SHEET 12 (5 OF 9)
- SEE SPLICE DETAILS ON SHEET 13 (6 OF 9)
- SEE JOINT SUPPORT DETAILS ON SHEET 14 (7 OF 9)
- SEE SUPPORT BOX DETAILS ON SHEET 14 (7 OF 9)
- SEE SUPPORT BAR DETAILS ON SHEET 15 (8 OF 9)
- SEE REMOVABLE PLATE DETAILS ON SHEET 16 (9 OF 9)
- SEE TEMPERATURE ADJUSTMENT DETAILS ON SHEET 16 (9 OF 9)
- SEE TEMPERATURE ADJUSTMENT CHART ON SHEET 16 (9 OF 9)
- COVER PLATES NOT SHOWN FOR CLARITY PURPOSES
  COVER PLATES SHALL BE DETAILED AND SUBMITTED SEPARATELY



EDGE BEAM UPTURN DETAIL



CENTER BEAM UPTURN DETAIL

SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- X ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

REV.	DESCRIPTION	DATE	DET.	CK'D.

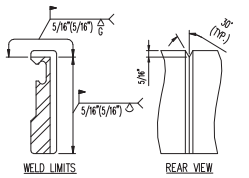
D.S. BROWN
THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	DBSB 2402.5	365 LF
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	–	–
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

DESCRIPTION: 'D-400' PLAN VIEW AND DETAILS
HENNEPIN COUNTY, MINNESOTA

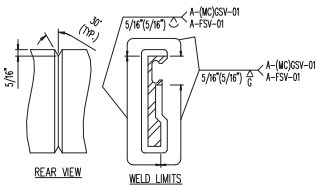
SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	5 OF 9

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	12

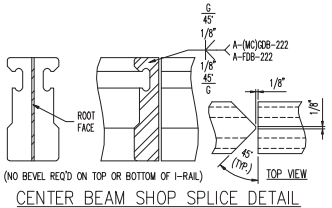


EDGE BEAM FIELD SPLICE DETAIL

SHOP SHALL PREPARE ENDS OF RAILS FOR FIELD SPLICE

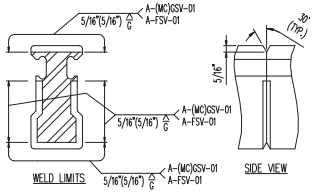


EDGE BEAM SHOP SPLICE DETAIL



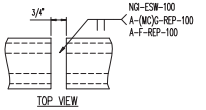
CENTER BEAM SHOP SPLICE DETAIL

COMPLETE PENETRATION WELD



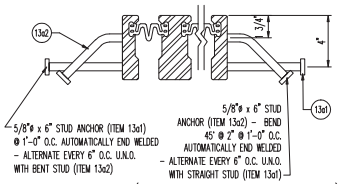
CENTER BEAM UPTURN SHOP SPLICE DETAIL

PARTIAL PENETRATION WELD (@ UPTURNS ONLY)

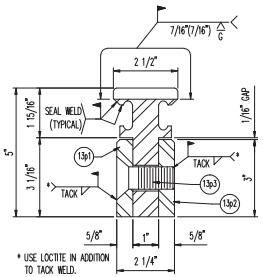


OPTIONAL CENTER BEAM SHOP SPLICE DETAIL

COMPLETE PENETRATION WELD

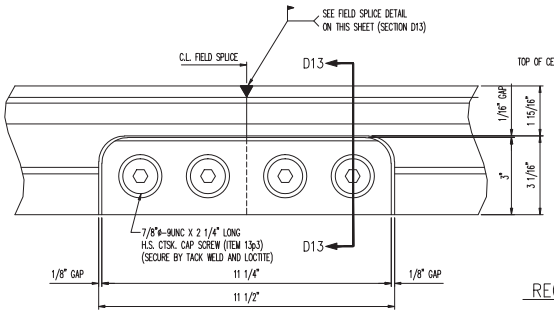


SECTION A13 (EDGE BEAM ANCHORAGE)

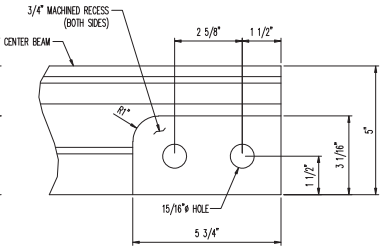


SECTION D13

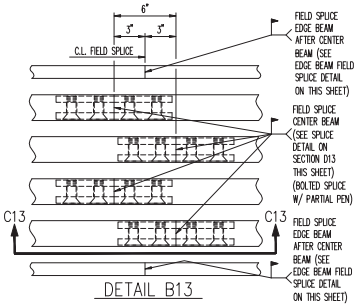
SHOP SHALL PREPARE ENDS OF RAILS FOR FIELD SPLICE



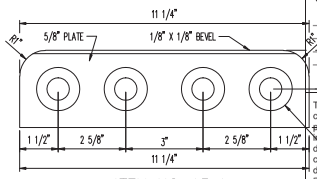
SECTION C13



RECESS IN CENTER BEAM AT FIELD CONNECTION (SHOP PREPARED)



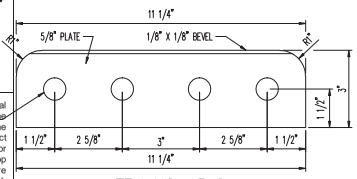
DETAIL B13



ITEM NO. 13p1

(8) REQ'D.

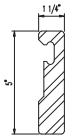
SPLICE PLATE – ASSEMBLY 13AA



ITEM NO. 13p2

(8) REQ'D.

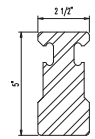
SPLICE PLATE ASSEMBLY 13AB



EDGE BEAM DETAIL

AASHTO M270, GRADE 50W

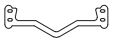
ASTM A709, GRADE 50W (A588)



CENTER BEAM DETAIL

AASHTO M270, GRADE 50W

ASTM A709, GRADE 50W (A588)



'KX' SERIES STRIP SEAL

KX-73 SEAL

SHOP DRAWING REVIEW

FOR INFORMATION ONLY

ACCEPTED

ACCEPTED AS NOTED

ACCEPTED AS NOTED & RESUBMIT

NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

REV.	DESCRIPTION	DATE	DET.	CKD.

D.S. BROWN

THE D.S. BROWN COMPANY
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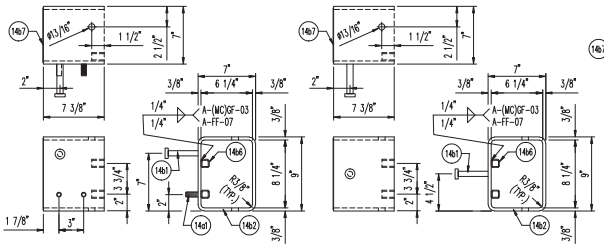
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5 / 365 LF
PROJECT — S.P. 2783-120 DESIGN BUILD	– / –
— E.R. MN 07(300) PROGRAM	– / –
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	– / –
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	– / –
— IN CONJUNCTION WITH JOHNSON BROTHERS	– / –

DESCRIPTION: 'D-400' SPLICE DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	6 OF 9

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	13

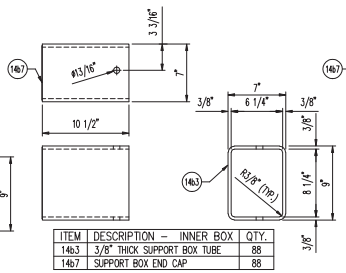


ITEM	DESCRIPTION – SHORT BOX	QTY.
14a1	5/8"ø X 1 1/2" THREADED STUD	88
14b1	5/8"ø X 4" STUD ANCHOR	44
14b2	3/8" THICK SUPPORT BOX TUBE	44
14b6	1" SQUARE X 1 1/2" LONG TUBING	88
14b7	SUPPORT BOX END CAP	44

'D-400' SHORT SUPPORT BOX DETAIL
WITH SUPPORT ANCHORS
(44) REQUIRED

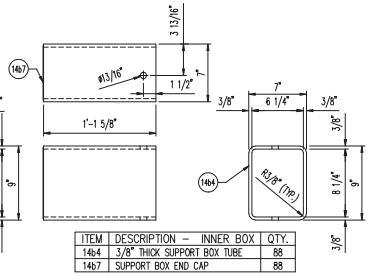
ITEM	DESCRIPTION – SHORT BOX	QTY.
14b1	5/8"ø X 4" STUD ANCHOR	44
14b2	3/8" THICK SUPPORT BOX TUBE	44
14b6	1" SQUARE X 1 1/2" LONG TUBING	88
14b7	SUPPORT BOX END CAP	44

'D-400' SHORT SUPPORT BOX DETAIL
WITHOUT SUPPORT ANCHORS
(44) REQUIRED



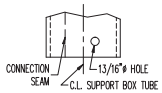
ITEM	DESCRIPTION – INNER BOX	QTY.
14b3	3/8" THICK SUPPORT BOX TUBE	88
14b7	SUPPORT BOX END CAP	88

'D-400' INNER SUPPORT BOX DETAIL
(88) REQUIRED

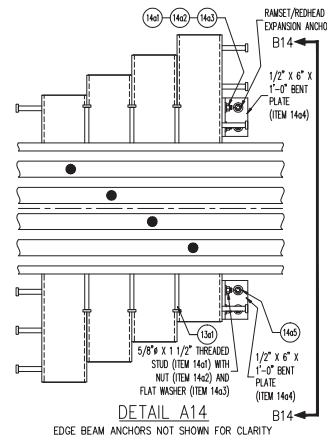


ITEM	DESCRIPTION – INNER BOX	QTY.
14b4	3/8" THICK SUPPORT BOX TUBE	88
14b7	SUPPORT BOX END CAP	88

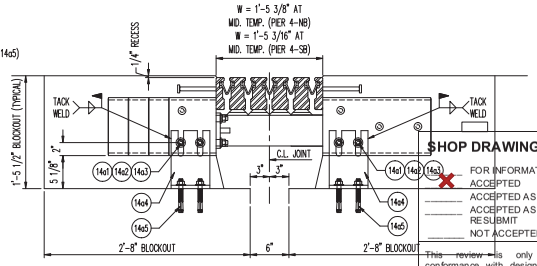
'D-400' INNER SUPPORT BOX DETAIL
(88) REQUIRED



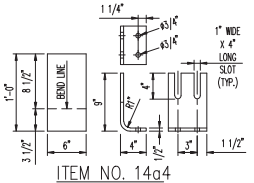
SHOP NOTE:
WHEN DRILLING 13/16"ø HOLES INTO SUPPORT BOX TUBE, BE SURE THE SEAM OF THE TUBE IS ON THE OPPOSITE SIDE IN RELATIONSHIP TO THE C.L. OF BOX.



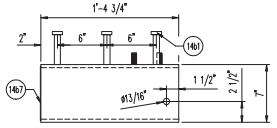
DETAIL A14
EDGE BEAM ANCHORS NOT SHOWN FOR CLARITY

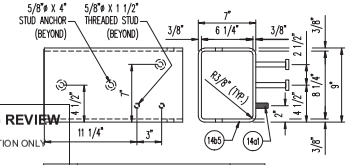


SECTION B14
ALL DIMENSIONS ARE AT 45°F



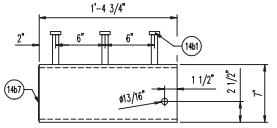
ITEM NO. 14a4
(88) REQ'D.

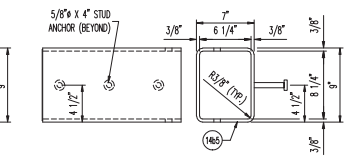




ITEM	DESCRIPTION – LONG BOX	QTY.
14a1	5/8"ø X 1 1/2" THREADED STUD	88
14b1	5/8"ø X 4" STUD ANCHOR	132
14b5	3/8" THICK SUPPORT BOX TUBE	44
14b7	SUPPORT BOX END CAP	44

'D-400' LONG SUPPORT BOX DETAIL
WITH SUPPORT ANCHORS
(44) REQUIRED





ITEM	DESCRIPTION – LONG BOX	QTY.
14b1	5/8"ø X 4" STUD ANCHOR	132
14b5	3/8" THICK SUPPORT BOX TUBE	44
14b7	SUPPORT BOX END CAP	44

'D-400' LONG SUPPORT BOX DETAIL
WITHOUT SUPPORT ANCHORS
(44) REQUIRED

SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
_____ ACCEPTED
_____ ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
X NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

REV.	DESCRIPTION	DATE	DET.	CK'D.

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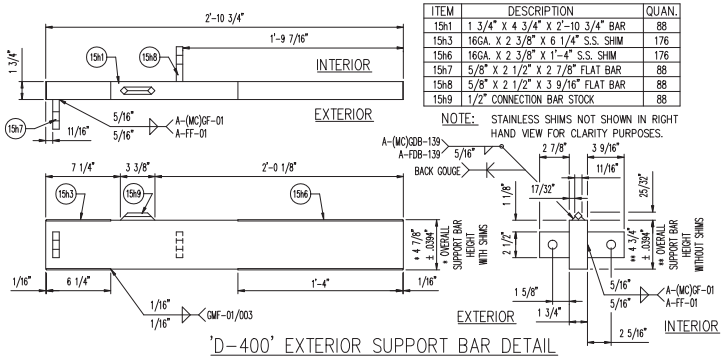
THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	DBSB 2402.5	365 LF
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	–	–
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–

DESCRIPTION: SUPPORT DETAILS & BOX DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	7 OF 9

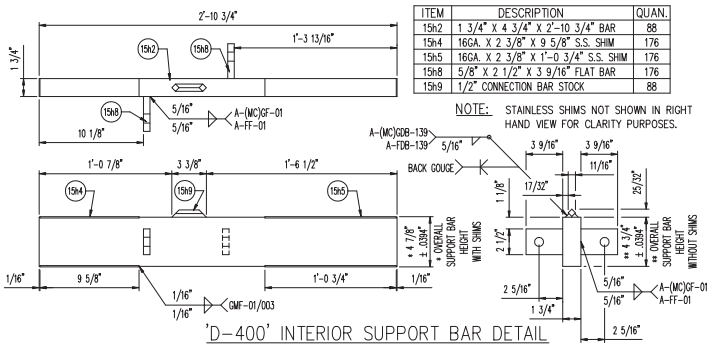
PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	14



ITEM	DESCRIPTION	QUAN.
15h1	1 3/4" X 4 3/4" X 2'-10 3/4" BAR	88
15h3	16GA. X 2 3/8" X 6 1/4" S.S. SHIM	176
15h6	16GA. X 2 3/8" X 1'-4" S.S. SHIM	176
15h7	5/8" X 2 1/2" X 2 7/8" FLAT BAR	88
15h8	5/8" X 2 1/2" X 3 9/16" FLAT BAR	88
15h9	1/2" CONNECTION BAR STOCK	88

'D-400' EXTERIOR SUPPORT BAR DETAIL

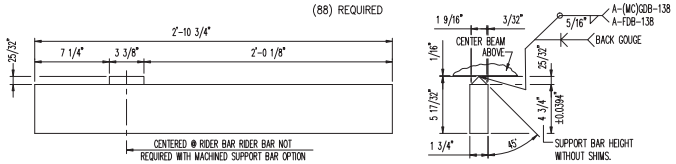
(88) REQUIRED



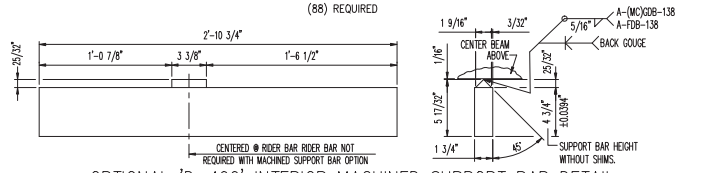
ITEM	DESCRIPTION	QUAN.
15h2	1 3/4" X 4 3/4" X 2'-10 3/4" BAR	88
15h4	16GA. X 2 3/8" X 9 5/8" S.S. SHIM	176
15h5	16GA. X 2 3/8" X 1'-0 3/4" S.S. SHIM	176
15h8	5/8" X 2 1/2" X 3 9/16" FLAT BAR	176
15h9	1/2" CONNECTION BAR STOCK	88

'D-400' INTERIOR SUPPORT BAR DETAIL

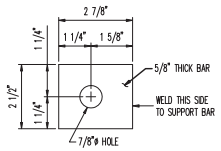
(88) REQUIRED



OPTIONAL 'D-400' EXTERIOR MACHINED SUPPORT BAR DETAIL

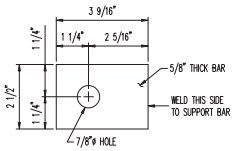


OPTIONAL 'D-400' INTERIOR MACHINED SUPPORT BAR DETAIL



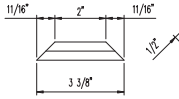
ITEM NO. 15h7
(88) REQ'D.

SPRING STOP DETAIL
QUANTITY FOR ASSEMBLY "10A", "11A" & "12A" ONLY



ITEM NO. 15h8
(264) REQ'D.

SPRING STOP DETAIL
QUANTITY FOR ASSEMBLY "10A", "11A" & "12A" ONLY



ITEM NO. 15h9
(176) REQ'D.

TYPICAL RIDER BAR DETAIL
QUANTITY FOR ASSEMBLY "10A", "11A" & "12A" ONLY

SHOP DRAWING REVIEW

- X FOR INFORMATION ONLY
- _____ ACCEPTED
- _____ ACCEPTED AS NOTED
- _____ ACCEPTED AS NOTED & RESUBMIT
- _____ NOT ACCEPTED

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FIGG Subconsultant:

Firm: _____

By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

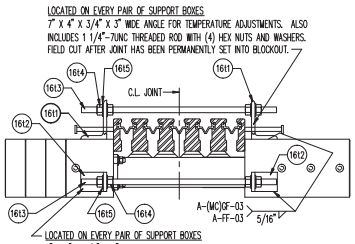
D.S. BROWN
THE D.S. BROWN COMPANY
390 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

REV.	DESCRIPTION	DATE	DET.	CK'D.

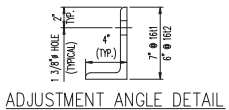
	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER		
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	DBSB 2402.5	365 LF
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–
	–	–

DESCRIPTION: SUPPORT BAR DETAILS
HENNEPIN COUNTY, MINNESOTA

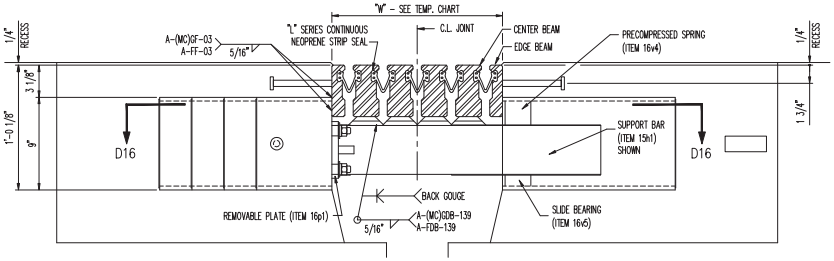
SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	8 OF 9
PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET	
22051	1021	1	15	



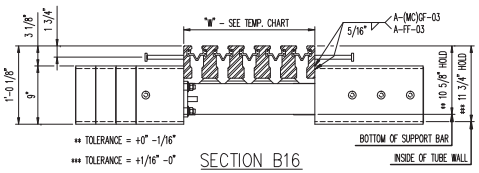
'D-400' TEMPERATURE ADJUSTMENT DETAIL



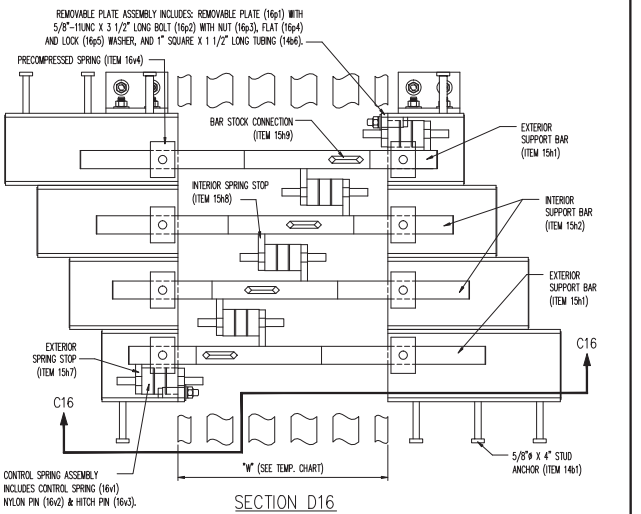
ADJUSTMENT ANGLE DETAIL



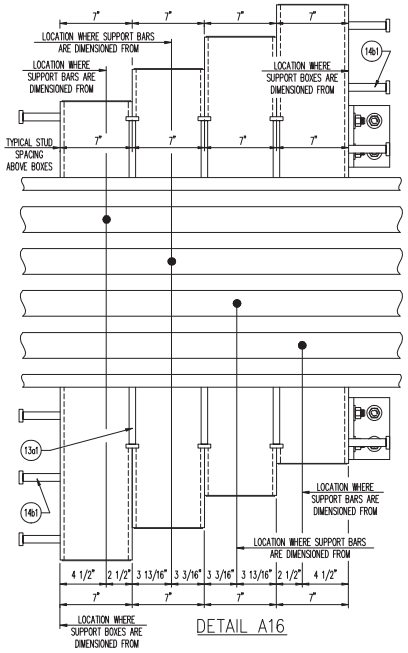
DETAIL C16
DRAWN AT MID. TEMP.



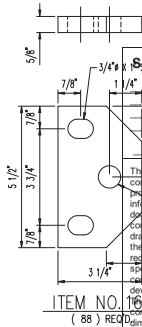
SECTION B16



SECTION D16



DETAIL A16



ITEM NO. 16p1
(88) REQD.

REMOVABLE PLATE DETAIL

'D-400' OPERATING DIMENSIONS ("W")		
STRUCT. TEMP.	PIER 4 (NB)	PIER 4 (SB)
MAX.	1'-0 1/2"	1'-0 1/2"
95°	1'-2 11/16"	1'-2 1/2"
85°	1'-3 1/4"	1'-3 1/16"
75°	1'-3 3/4"	1'-3 9/16"
65°	1'-4 5/16"	1'-4 1/8"
55°	1'-4 13/16"	1'-4 5/8"
45° MID. TEMP.	1'-5 3/8"	1'-5 3/16"
35°	1'-5 13/16"	1'-5 3/4"
25°	1'-6 7/16"	1'-6 1/4"
15°	1'-7"	1'-6 13/16"
5°	1'-7 1/2"	1'-7 5/16"
-5°	1'-8 1/16"	1'-7 7/8"
MIN.	2'-3 1/2"	2'-3 1/2"

TEMPERATURE ADJUSTMENT CHART

DIMENSIONS ASSUME NO CREEP OR SHRINKAGE HAS OCCURRED. ALL OPENINGS AND DIMENSION SHALL BE VERIFIED BY FIELD ENGINEER ON DAY INSTALLATION.

SHOP DRAWING REVIEW

- FOR INFORMATION ONLY
- X ACCEPTED
- ACCEPTED AS NOTED
- ACCEPTED AS NOTED & RESUBMIT
- NOT ACCEPTED

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FIGG Subconsultant:

Firm:

By:_____ Date:_____

FIGG BRIDGE ENGINEERS, Inc.

By: MSK Date: 3/05/08

REV.	DESCRIPTION	DATE	DET. CKD.

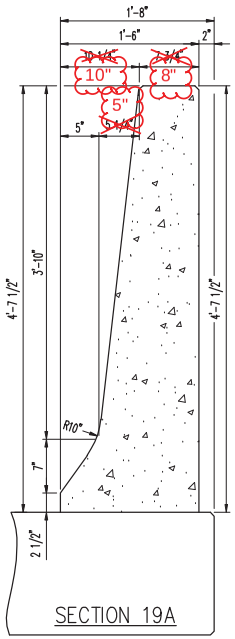
D.S. BROWN
THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

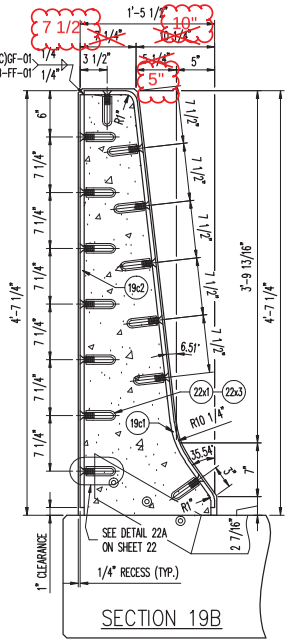
	ITEM	QUANTITY
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER	DBSB 2402.5	365 LF
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT	–	–
PROJECT — S.P. 2783-120 DESIGN BUILD	–	–
— E.R. MN 07(300) PROGRAM	–	–
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA	–	–
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)	–	–
— IN CONJUNCTION WITH JOHNSON BROTHERS	–	–

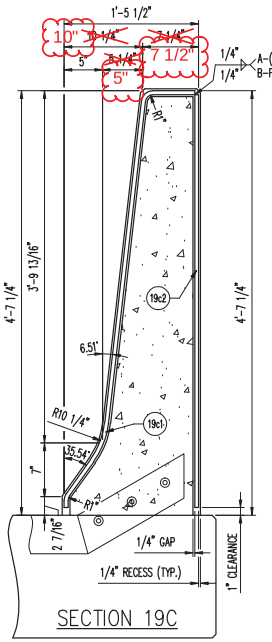
DESCRIPTION: SECTIONS AND DETAILS
HENNEPIN COUNTY, MINNESOTA

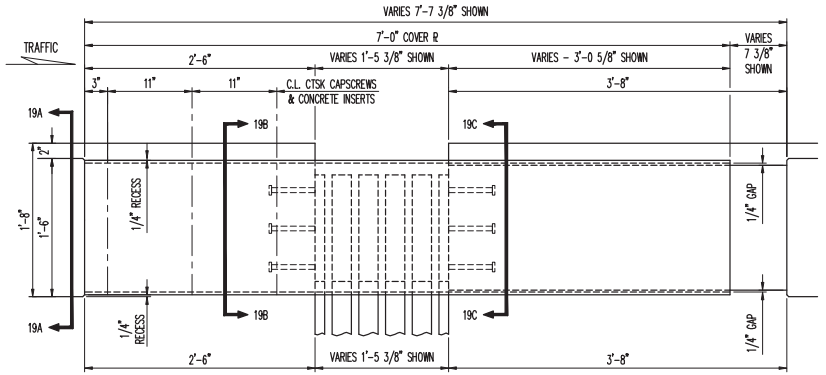
SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	12/17/07	9 OF 9

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	16



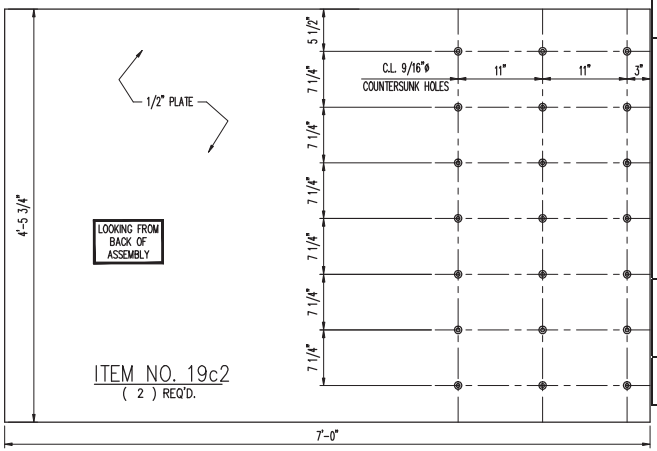


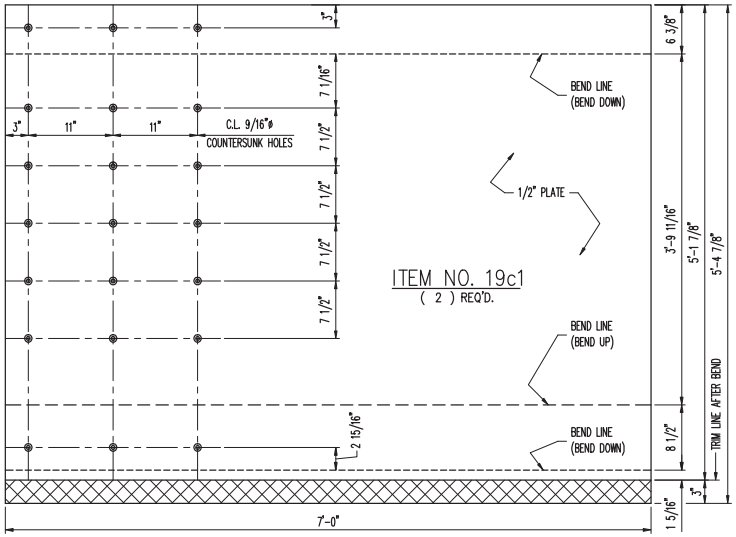




ASSEMBLY 19A – LH COVER PLATE ASSEMBLY

ASSEMBLIES LOCATED AT PIER 4 (NB & SB)
2 ASSEMBLIES REQUIRED – TOTAL
DIMENSIONS SHOWN ARE AT 45°F – BEFORE
ANY CREEP OR SHRINKAGE HAS OCCURRED.
(SEE TEMP. CHARTS ON SHEETS 7 & 16)





SHOP NOTES:
- SEE COVER PLATE BILL OF MATERIALS ON SHEET 22
- SEE COVER PLATE GENERAL NOTES ON SHEET 22

SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
X ACCEPTED
_____ ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
_____ NOT ACCEPTED

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FIGG Subconsultant:
Firm:
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: _____ Date: _____

REV.	DESCRIPTION	DATE	DET.	CKD.
1	REVISED ENTIRE SHEET	6/23/08	BLB	JLW

THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

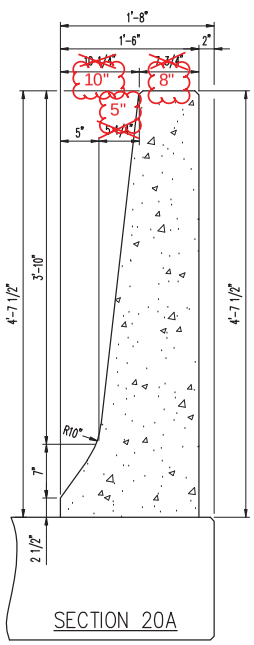
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT
PROJECT — S.P. 2783-120 DESIGN BUILD
— E.R. MN 07(300) PROGRAM
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)
— IN CONJUNCTION WITH JOHNSON BROTHERS

ITEM	QUANTITY
DBSB 2402.5	365 LF
–	–
–	–
–	–
–	–
–	–
–	–
–	–
–	–

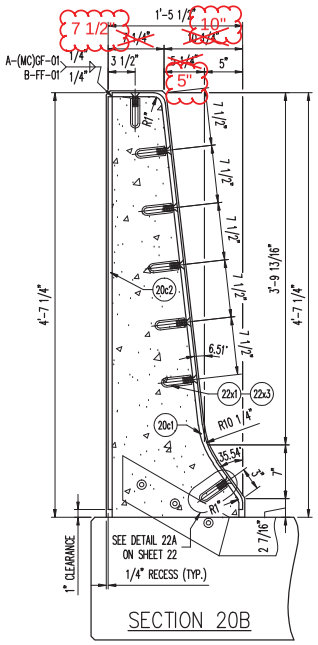
DESCRIPTION: MEDIAN BARRIER COVER PLATE DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	1/31/08	3 OF 6

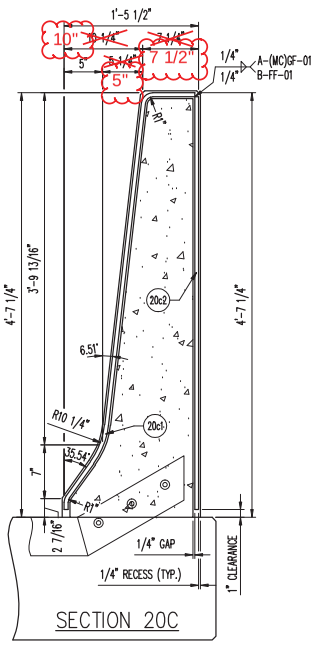
PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	19



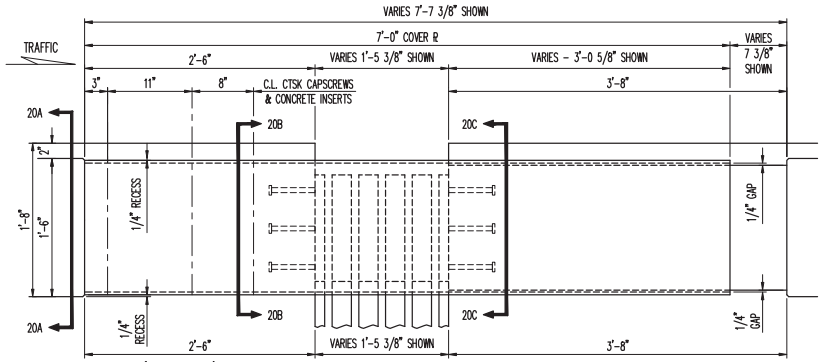
SECTION 20A



SECTION 20B

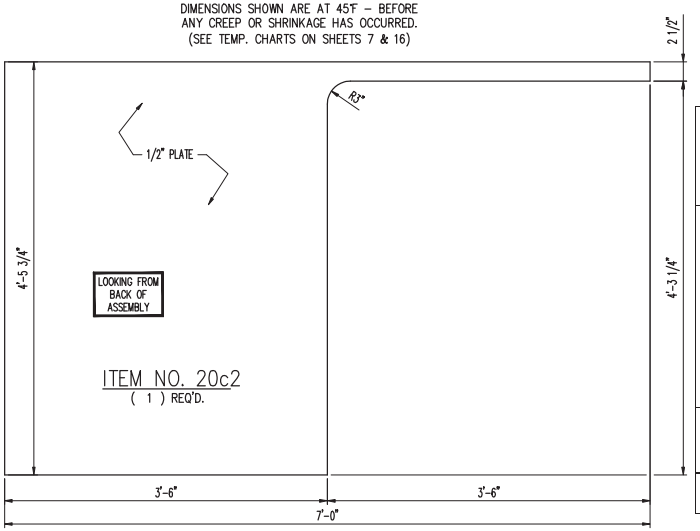


SECTION 20C

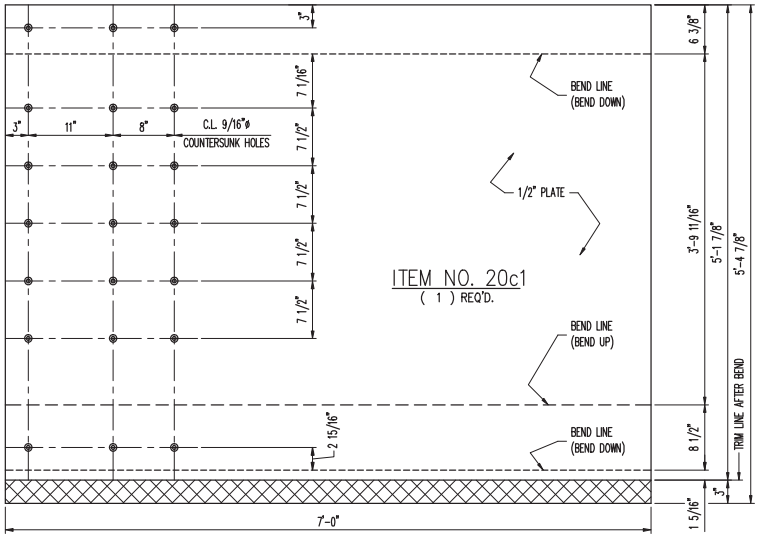


'D-400' FASCIA BARRIER COVER PLATE PLAN VIEW

ASSEMBLY 20A – LH COVER PLATE ASSEMBLY
ASSEMBLY LOCATED AT ABUTMENT 1 (NB)
1 ASSEM REQUIRED – TOTAL
DIMENSIONS SHOWN ARE AT 45°F – BEFORE ANY CREEP OR SHRINKAGE HAS OCCURRED.
(SEE TEMP. CHARTS ON SHEETS 7 & 16)



ITEM NO. 20c2
(1) REQ'D.



ITEM NO. 20c1
(1) REQ'D.

SHOP NOTES:
- SEE COVER PLATE BILL OF MATERIALS ON SHEET 22
- SEE COVER PLATE GENERAL NOTES ON SHEET 22

SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
_____ ACCEPTED
X ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
_____ NOT ACCEPTED

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FIGG Subconsultant:
Firm: _____
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: _____ Date: _____

REV.	DESCRIPTION	DATE	DET.	CKD.
1	ADDED ENTIRE SHEET	6/23/08	BLB	JLW

THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

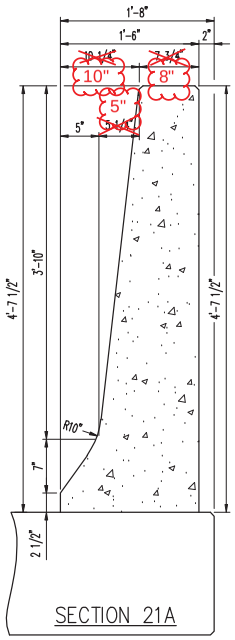
LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT
PROJECT — S.P. 2783-120 DESIGN BUILD
— E.R. MN 07(300) PROGRAM
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)
— IN CONJUNCTION WITH JOHNSON BROTHERS

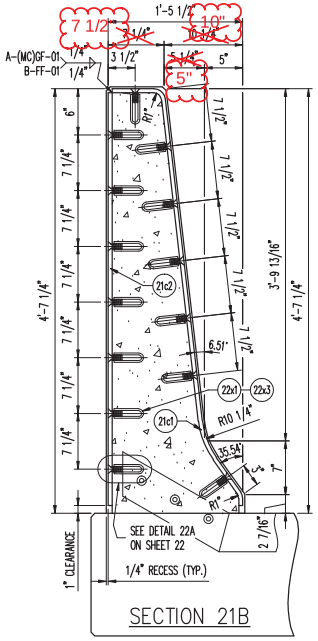
ITEM	QUANTITY
DBSB 2402.5	365 LF
–	–
–	–
–	–
–	–
–	–
–	–
–	–
–	–

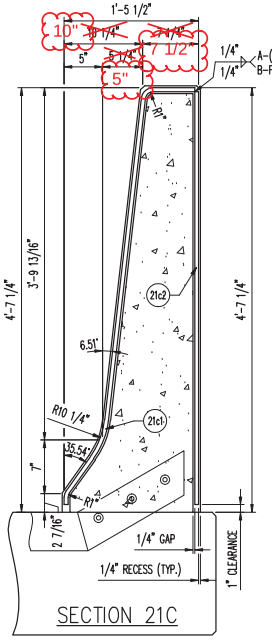
DESCRIPTION: MEDIAN BARRIER COVER PLATE DETAILS
HENNEPIN COUNTY, MINNESOTA

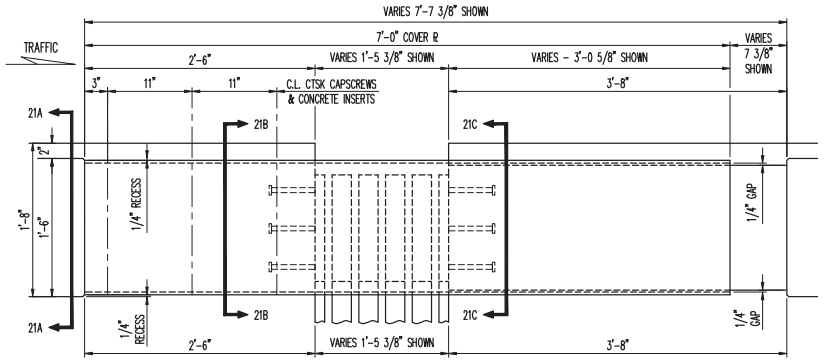
SCALE	DRAWN BY	CHECKED BY	DATE	DRAWING NUMBER
N.T.S.	BLB	JLW	1/31/08	4 OF 6

PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET
22051	1021	1	20

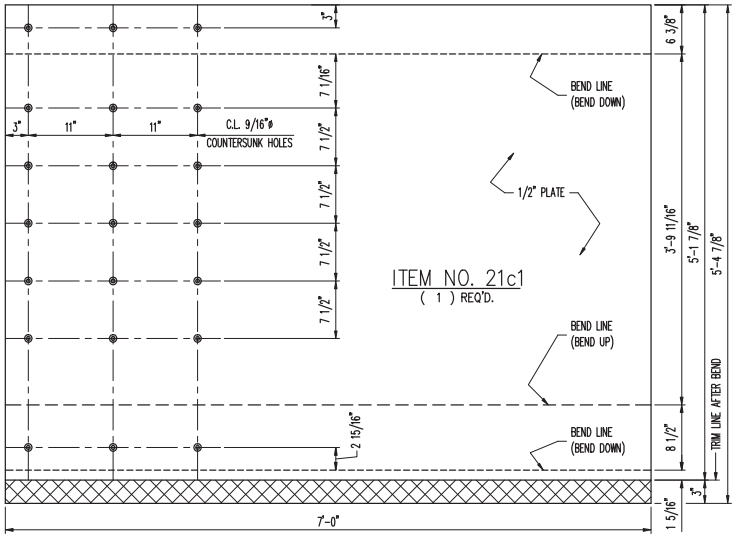




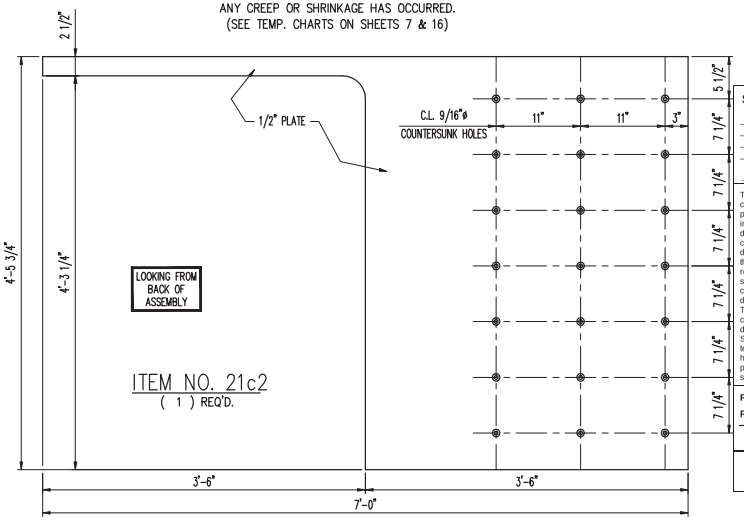




ASSEMBLY 21A – LH COVER PLATE ASSEMBLY
ASSEMBLY LOCATED AT ABUTMENT 1 (SB)
1 ASSEM REQUIRED – TOTAL
DIMENSIONS SHOWN ARE AT 45°F – BEFORE ANY CREEP OR SHRINKAGE HAS OCCURRED.
(SEE TEMP. CHARTS ON SHEETS 7 & 16)



SHOP NOTES:
- SEE COVER PLATE BILL OF MATERIALS ON SHEET 22
- SEE COVER PLATE GENERAL NOTES ON SHEET 22



SHOP DRAWING REVIEW

_____ FOR INFORMATION ONLY
_____ ACCEPTED
X ACCEPTED AS NOTED
_____ ACCEPTED AS NOTED & RESUBMIT
_____ NOT ACCEPTED

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FIGG Subconsultant:
Firm: _____
By: _____ Date: _____

FIGG BRIDGE ENGINEERS, Inc.
By: _____ Date: _____

REV.	DESCRIPTION	DATE	DET.	CKD.
1	ADDED ENTIRE SHEET	6/23/08	BLB	JLW

THE D.S. BROWN COMPANY
300 E. CHERRY STREET
NORTH BALTIMORE, OHIO 45872
419.257.3561
FAX: 419.257.0332
WWW.DSBROWN.COM

LOCATION — ST. ANTHONY FALLS (35W) BRIDGE OVER THE MISSISSIPPI RIVER
BRIDGE — 27409 (SB) & 27410 (NB) MN/DOT
PROJECT — S.P. 2783-120 DESIGN BUILD
— E.R. MN 07(300) PROGRAM
DESIGNER — FIGG BRIDGE ENGINEERS / TKDA
CUSTOMER — FLATIRON-MANSON CONSTRUCTION CO. (JOINT VENTURE)
— IN CONJUNCTION WITH JOHNSON BROTHERS

ITEM	QUANTITY
DBSB 2402.5	365 LF

DESCRIPTION: MEDIAN BARRIER COVER PLATE DETAILS
HENNEPIN COUNTY, MINNESOTA

SCALE	DRAWN BY:	CHECKED BY:	DATE:	DRAWING NUMBER
N.T.S.	BLB	JLW	1/31/08	5 OF 6
PROJECT NUMBER	PRODUCT CODE	RELEASE	SHEET	
22051	1021	1	21	

FIGG

INTERSTATE
35W