



NORWOOD C350 STATION

SCALE 1:200
LAT: 38.178327° LONG: -84.464367°

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28	7179-501-001	STRUCTURAL - COMPONENT DETAILS
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36	7179-1200-00	GROUND PLAN - FLOW CONTROL SKID
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44	7180-202-021	P&ID - INSTRUMENT SUPPLY SYSTEM
45	7180-500-021	STRUCTURAL - SKID LAYOUT
46	7180-500-022	STRUCTURAL - DIAMOND PLATE LAYOUT
47	7180-501-021	STRUCTURAL - COMPONENT DETAILS
48	7180-501-022	STRUCTURAL - TUBING SUPPORT & FILTER POLE DETAILS
49	7180-600-021	MECHANICAL - SKID LAYOUT
50	7180-600-022	MECHANICAL - SKID SECTIONS
51	7180-700-021	MECHANICAL - SPOOL DETAIL (1)
52	7180-700-022	MECHANICAL - SPOOL DETAIL (2)
53	7180-700-023	MECHANICAL - INSTRUMENT PANEL DETAIL
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60	PNG-G-000-0001037	PIPE SUPPORTS
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64	20-4213-1	DUKE 8X8 SCADA SHELTER W/WMEDOR
65	20-4213-2	DUKE 8X8 SCADA SHELTER W/WMEDOR
66	20-4213-3	DUKE 8X8 SCADA SHELTER W/WMEDOR
67	20-4213-4	DUKE 8X8 SCADA SHELTER W/WMEDOR
68	20-4213-5	DUKE 8X8 SCADA SHELTER W/WMEDOR

ISSUED FOR
CONSTRUCTION

BURNS & MCDONNELL
ENGINEERING COMPANY, INC.
STATE LICENSE # 00420557



NO.	DATE	REVISIONS DESCRIPTION	BY	CHK	APPD	DESCRIPTION	APPROVALS
0	01-08-2021	ISSUED FOR CONSTRUCTION	RDC	JBF	CAB	AREA CODE	
						ACCOUNT NUMBER	AW2128
						PROJECT NUMBER	1880115
						DRAWING BY	RDC
						STATION ID	S066801
						CHECKER INITIALS	CAB
						DATE	01/08/2021
						INITIALS	CAB



C350 PROJECT
NORWOOD STATION
REFERENCE SHEET
HAMILTON COUNTY, OHIO

SHEET(S) 01 OF 68	DWG SCALE	AS NOTED
DWG DATE 11/10/2020	SUPERSEDED	
DRAWING NUMBER	REVISION	
PNG -G-004-0001045	0	
DISCIPLINE / RESOURCE CENTER / LINE NUMBER		



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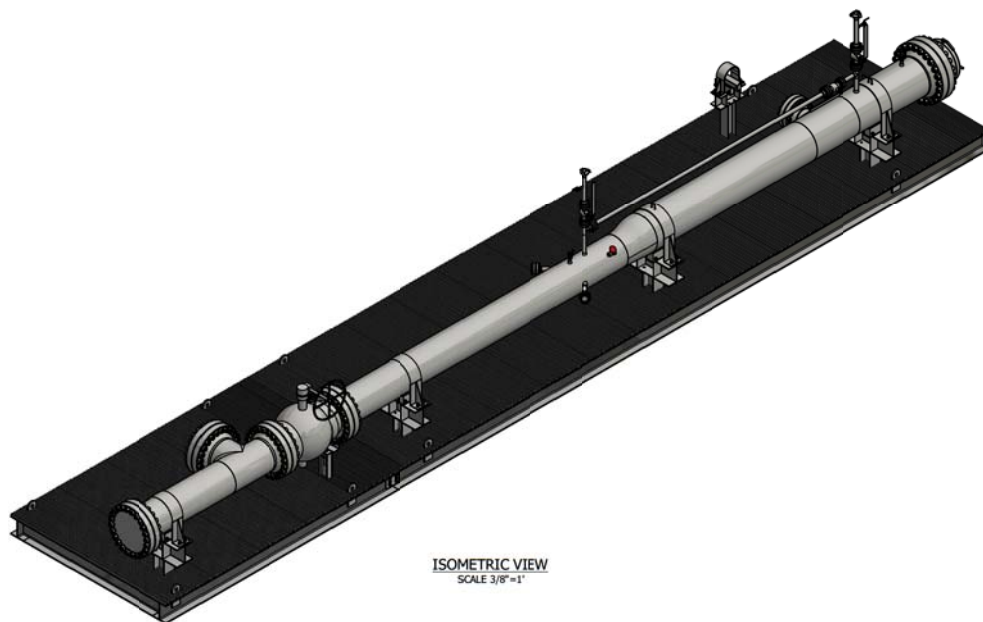
- REFERENCE

 CENERGY TURNKEY ENERGY SOLUTIONS PO BOX 455 MILTON, WV 25661 PHONE: 204-743-4250	CENERGY C-350 PIPELINE PROJECT HIGHPOINT PARK STATION CENERGY PROJECT NO: 7177 & 7182
 OHIO REGISTERED ENGINEERING FIRM #0611 WWW.MHES.COM	PIPING PLAN & SECTIONS MLV-105, MLV-106, MLV-107 AND MLV-201
DATE: 05/10/2016 BY: 20M/H058	DATE: 05/10/2016 BY: 20M/H058

ISSUED FOR
CONSTRUCTION

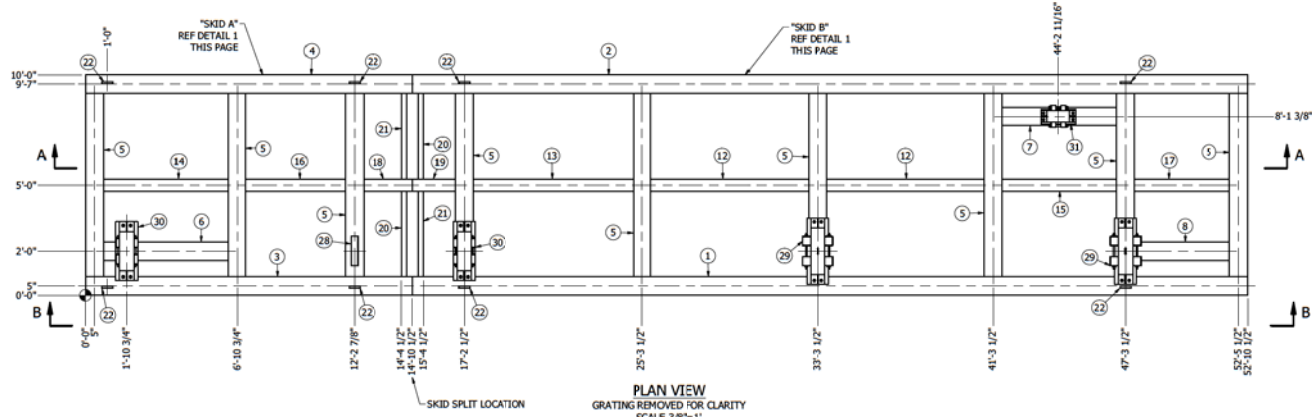
DUKE ENERGY, PR-201 RECEIVER SKID

ISSUED FOR CONSTRUCTION
04/02/2020

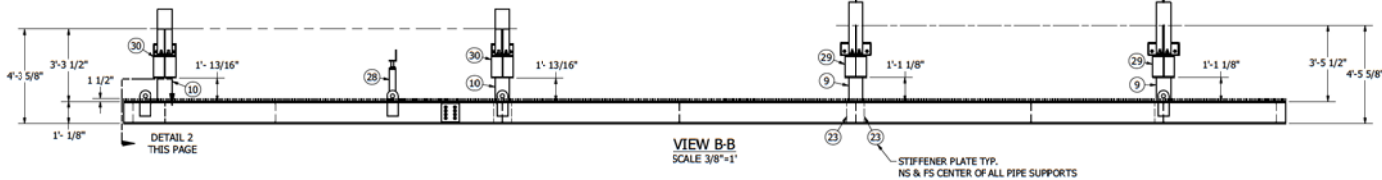


ISOMETRIC VIEW
SCALE 3/8"=1'

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DWG #	SIZE	NAME	REV	DATE
7181-500-001	ARCH D	LAUNCHER STRUCTURAL LAYOUT	0	04/02/2020
7181-501-001	ARCH D	GRATING DETAIL	0	04/02/2020
7181-501-002	ARCH D	STRUCTURAL DETAILS	0	04/02/2020
7181-600-001	ARCH D	LAUNCHER SKID LAYOUT	0	04/02/2020
7181-700-001	ARCH D	SPOOL DETAIL (1)	0	04/02/2020
7181-700-002	ARCH D	SPOOL DETAIL (2)	0	04/02/2020
DM-ST-2011	ARCH D	GUIDE BAR DETAILS	0	01/01/2017

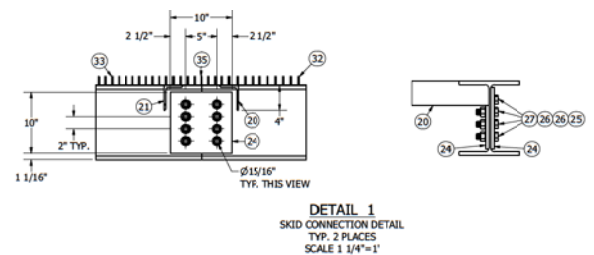


SECTION A-A
SCALE 3/8"=1'

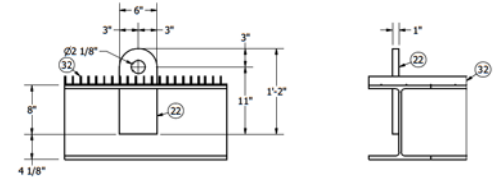


VIEW B-B
SCALE 3/8"=1'

ITEM		QTY	PARTS LIST DESCRIPTION	LENGTH
1	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		38'-0"
2	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		38'-0"
3	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		14'-10 1/2"
4	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		14'-10 1/2"
5	W 12x53 WIDE FLANGE BEAM, ASTM A992	9		9'-1 5/8"
6	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		6'-5 3/8"
7	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		5'-11 5/8"
8	W 12x53 WIDE FLANGE BEAM, ASTM A992	1		5'-11 5/8"
9	W 8x31 WIDE FLANGE BEAM, ASTM A992	2		1'-1 1/8"
10	W 8x31 WIDE FLANGE BEAM, ASTM A992	1		1'-13/16"
11	W 6x15 WIDE FLANGE BEAM, ASTM A992	1		2'-5 1/8"
12	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	2		7'-11 5/8"
13	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		8'-5 5/8"
14	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		6'-5 3/8"
15	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		5'-11 5/8"
16	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		5'-3 3/4"
17	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		5'-11 5/8"
18	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		2'-7 7/16"
19	WT 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992	1		2'-3 13/16"
20	L4 x 3 x 1/4 STRUCTURAL ANGLE, ASTM A36	2		4'-6 11/16"
21	L4 x 3 x 1/4 STRUCTURAL ANGLE, ASTM A36	2		4'-6 11/16"
22	LIFTING LUG, 1'-2" x 6" x 1" TK, ASTM A36	8		
23	PLATE, 10 15/16" x 4 3/4" x 3/8" TK, ASTM A36	9		
24	PLATE, 10 x 10 x 1/2" TK, ASTM A36	1		
25	NUT, 7/8-9 UNC, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325	16		
26	WASHER, 7/8" THREAD SIZE, TYPE 1 GALVANIZED, ASTM A325	16		
27	BOLT, 7/8-9 UNC, 3" LONG, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325	16		
28	1 24" E2-LINE FLANGE SUPPORT, FIGURE "A", BARE, 3'-3 1/2" TO PIPE CENTERLINE	1		
29	2 24" PIPE SUPPORT, E2 - LINE SHM - BLOCK, CLAMP, AND WIDE FLANGE ASSEMBLY, W5BC-01-NA, BARE	2		
30	2 20" PIPE SUPPORT, E2 - LINE SHM - BLOCK, CLAMP, AND WIDE FLANGE ASSEMBLY, W5BC-01-NA, BARE	2		
31	1 10" PIPE SUPPORT, E2 - LINE SHM - BLOCK, CLAMP, AND WIDE FLANGE ASSEMBLY, W5BC-01-NA, BARE	1		
32	16 WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1'-1/2" SERRATED, 2'-6" WIDE	1		10'-0"
33	1 WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1'-1/2" SERRATED, 2'-6" WIDE	1		10'-0"
34	1 WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1'-1/2" SERRATED, 1'-7 1/2" WIDE	1		10'-0"
35	1 WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1'-1/2" SERRATED, 9' WIDE	1		10'-0"



DETAIL 1
SKID CONNECTION DETAIL
TYP. 2 PLACES
SCALE 1 1/4"=1'



DETAIL 2
LIFTING LUG DETAIL
TYP. 8 PLACES
SCALE 1 1/4"=1'

- NOTES:
1. ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
 2. ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
 3. STRUCTURAL STEEL SHALL CONFORM TO:
 - WIDE FLANGE SHAPES - ASTM A992, GR50
 - PLATES AND ANGLES - ASTM A36
 - HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
 - WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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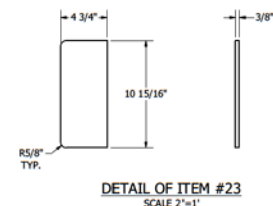
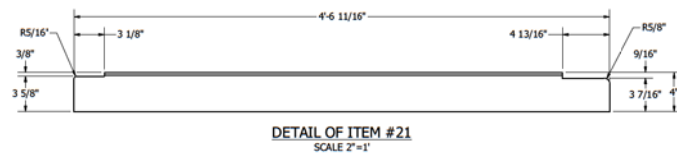
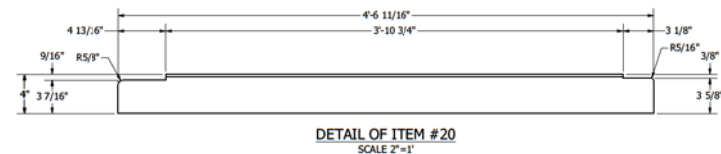
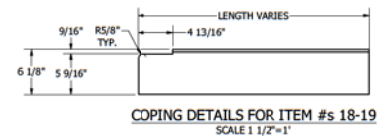
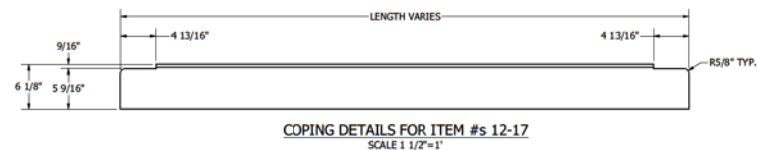
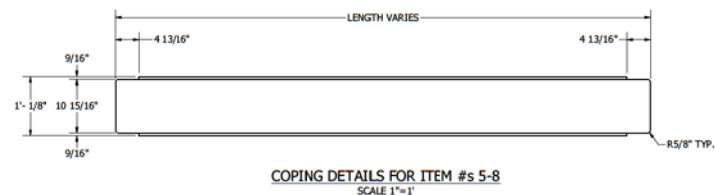
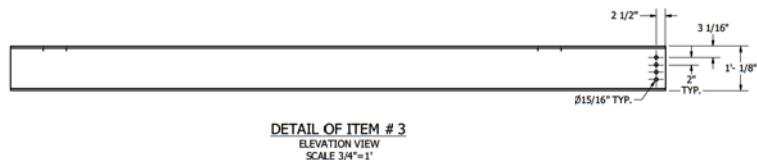
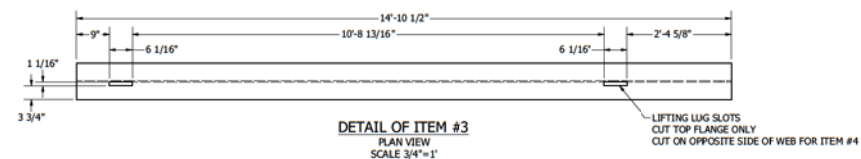
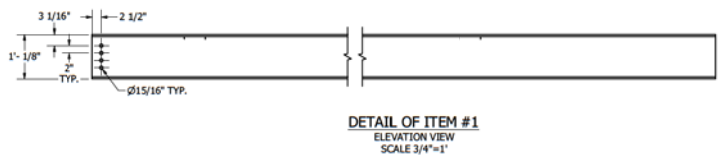
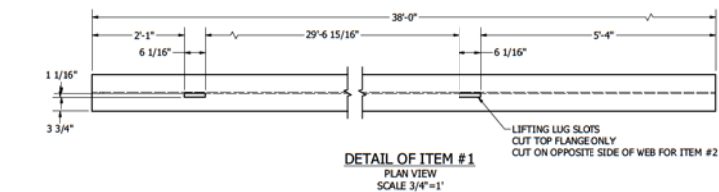


CENERGY
ENGINEERING | MANUFACTURING | CONSTRUCTION

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DUKE - PR 201
C350 PROJECT - NORWOOD STATION
20" RECEIVER SKID - STRUCTURAL
STRUCTURAL LAYOUT

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7181-500-001		0
DRAWING SCALE: AS NOTED	SHEET: 1 OF 1	



NOTE:
1. ALL ITEMS REF BORN ON DWG # 7181-500-001

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	BWM	ECW	ZAH	04/02/2020

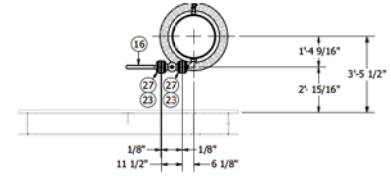
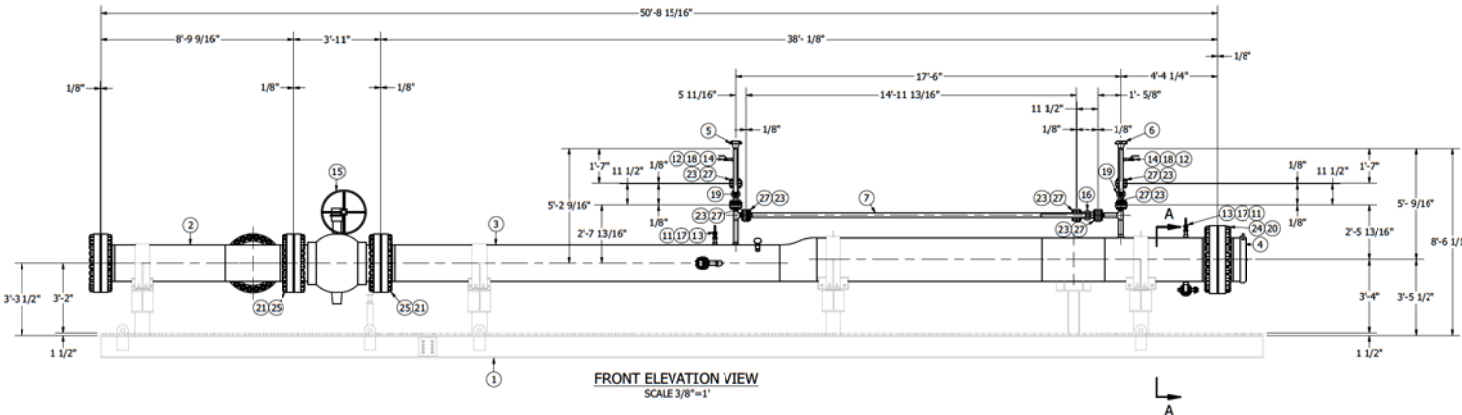
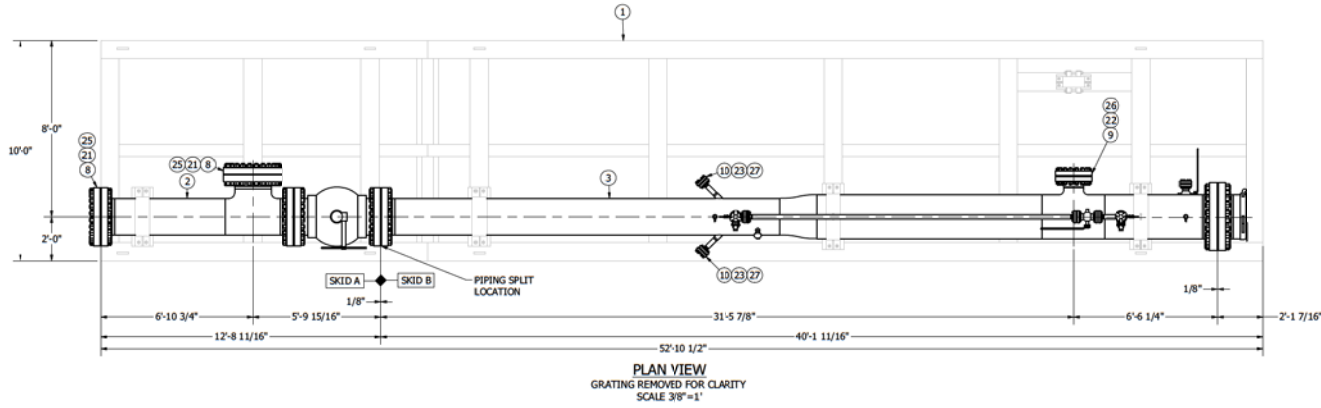


CENERGY
ENGINEERING | MANUFACTURING | CONSTRUCTION
PO BOX 455
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PHONE: 304-743-4200
WWW.CENERGYCO.COM

DUKE - PR 201
C350 PROJECT - NORWOOD STATION
20" RECEIVER SKID - STRUCTURAL
DETAILS

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7181-501-002		0
DRAWING SCALE: AS NOTED	SHEET: 1 OF 1	

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PARTS LIST	
ITEM	DESCRIPTION
1	1 LANCHER STRUCTURAL ASSEMBLY, REF DWG # 7181-500-001
2	1 SPOOL # 7181-1-1, REF DWG # 7181-700-001
3	1 SPOOL # 7181-1-2, REF DWG # 7181-700-001
4	1 SPOOL # 7181-1-3, REF DWG # 7181-700-002
5	1 SPOOL # 7181-1-4, REF DWG # 7181-700-002
6	1 SPOOL # 7181-1-5, REF DWG # 7181-700-002
7	1 SPOOL # 7181-1-6, REF DWG # 7181-700-002
8	2 20" BLIND FLANGE, RF, ANSI 600, ASME B16.5, ASTM A105 GR.3
9	1 10" BLIND FLANGE, RF, ANSI 600, ASME B16.5, ASTM A105 GR.3
10	2 2" BLIND FLANGE, RF, ANSI 600, ASME B16.5, ASTM A105 GR.3
11	2 1" PIPE NIPPLE, SCH 80, 3" LONG, SA/A-106, GR.3, ASTM A733, TBE
12	2 1/2" PIPE NIPPLE, SCH 80, 3" LONG, SA/A-106, GR.3, ASTM A733, TBE
13	2 1" FLUG, SQUARE HEAD, 3000#, ASTM A105, FORGED STEEL, ASME B16.11, SOLID
14	2 1/2" PLUG, SQUARE HEAD, 3000#, ASTM A105, ASME B16.11, FORGED STEEL, SOLID
15	1 20" BALL VALVE, RFFE, ANSI 600, FULL PORT W/ GEAR OPERATOR AND HANDWHEEL, REF ENGINEERED EQUIPMENT BOM
16	2 2" BALL VALVE, RFFE, ANSI 600, FULL PORT W/ LEVER OPERATOR, REF ENGINEERED EQUIPMENT BOM
17	2 1" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM
18	2 1/2" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM
19	2 2" FLUG VALVE, RFFE, ANSI 600, W/ LEVER OPERATOR, REF ENGINEERED EQUIPMENT BOM
20	1 24" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20
21	4 20" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20
22	1 10" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20
23	11 2" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20
24	24 1-7/8" STUD BOLT, 14" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED
25	96 1-5/8" STUD BOLT, 12-1/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED
26	16 1-1/4" STUD BOLT, 9-1/2" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED
27	88 5/8" STUD BOLT, 4-3/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED

ESTIMATED WEIGHT OF SKID "A": 11,000 LBS
ESTIMATED WEIGHT OF SKID "B": 17,000 LBS

GENERAL NOTES:

- BUILT TO DUKE STANDARD & SPECIFICATION
- ASME B31.8
- DOT CLASS 3 DESIGN
- DESIGN FACTOR 0.2
- CORROSION ALLOWANCE: 0.00
- 100% RADIOGRAPHIC INSPECTION
- DESIGN PRESSURE OF 500 PSIG
- DESIGN TEMPERATURE RANGE: -20° - 120°F
- HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS
- DESIGN FLOW: 12 - 228 MMSCFD
- OPERATING PRESSURE RANGE: 400 - 435 PSIG
- OPERATING TEMPERATURE OF 32° - 120°F
- SKIDS "A" & "B" SHOULD BE LIFTED INDEPENDENTLY, BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING.

DRAWING STATUS:

ISSUED FOR CONSTRUCTION

REVISION HISTORY					
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	BWM	ECW	NPF	04/02/2020

CENERGY
ENGINEERING | MANUFACTURING | CONSTRUCTION

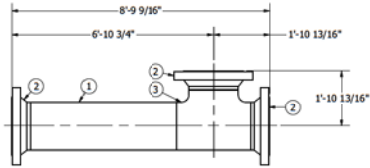
PO BOX 455
MILTON, WV 25541
PHONE: 304-743-4290
WWW.CENERGYCO.COM

DUKE - PR 201
C350 PROJECT - NORWOOD STATION
20" RECEIVER SKID - MECHANICAL SKID LAYOUT

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7181-600-001		0
DRAWING SCALE: AS NOTED	SHEET: 1 OF 1	

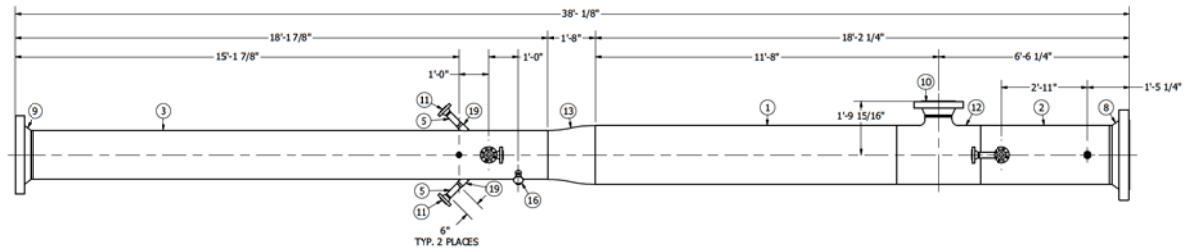
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SPOOL # 7181-1-1		
ITEM	QTY	DESCRIPTION
1	1	20" PIPE, 0.500"W, API5L PSL-2 X65, ERW, 5 FT LONG
2	3	20" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F65, MSS-SP-44, 125-250 MICROINCHES, AARH
3	1	20" BARRED STRAIGHT TEE, 0.500"W, WPHY65, MSS SP-75, REF STD DWG # DM-ST-2011

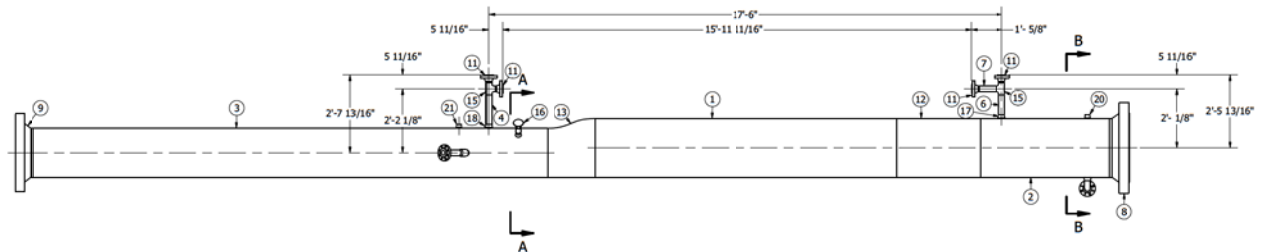


ELEVATION VIEW
SCALE 1/2"=1'

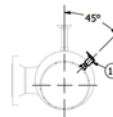
SPOOL # 7181-1-2		
ITEM	QTY	DESCRIPTION
1	1	24" PIPE, 0.500"W, API5L PSL-2 X65, LSAW, 11 FT LONG
2	1	24" PIPE, 0.500"W, API5L PSL-2 X65, LSAW, 5 FT LONG
3	1	20" PIPE, 0.500"W, API5L PSL-2 X65, ERW, 18 FT LONG
4	1	2" PIPE, 0.218"W, API5L PSL-2 X52, ERW, 2 FT LONG
5	2	2" PIPE, 0.218"W, API5L PSL-2 X52, ERW, 1 FT LONG
6	1	2" PIPE, 0.218"W, API5L PSL-2 X52, ERW, 1 FT LONG
7	1	2" PIPE, 0.218"W, API5L PSL-2 X52, ERW, 1 FT LONG
8	1	24" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F65, MSS SP-44, 250-500 MICROINCHES, AARH
9	1	20" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F65, MSS-SP-44, 125-250 MICROINCHES, AARH
10	1	10" FLANGE, RFWN, ANSI 600, 0.365"W, A694 F52, MSS SP-44, 125-250 MICROINCHES, AARH
11	7	2" FLANGE, RFWN, ANSI 600, 0.218"W, A694 F52, MSS SP-44, 125-250 MICROINCHES, AARH
12	1	24" x 10" BARRED REDUCING TEE, 0.500"W x 0.365"W, WPHY65, MSS SP-75, REF STD DWG # DM-ST-2011
13	1	24" x 20" ECCENTRIC REDUCER, 0.500"W x 0.500"W, WPHY65, MSS SP-75
14	1	2" ELBOW, 90°, L.R., 0.218"W, WPHY52, MSS SP-75
15	2	2" STRAIGHT TEE, 0.218"W, WPHY52, MSS SP-75
16	1	PIG SIG. REF ENGINEERED EQUIPMENT BOH
17	2	2" PIPET, BW, 0.218" WT, FOR 24" RUN PIPE, 0.500" WT, A694 F65, MSS SP-97
18	1	2" PIPET, BW, 0.218" WT, FOR 20" RUN PIPE, 0.500" WT, A694 F65, MSS SP-97
19	2	2" PIPET, LATERAL, BW, 0.218" WT, FOR 20" RUN PIPE, 0.500" WT, A694 F65, MSS SP-97
20	1	1" PIPET, THD, 6000#, FOR 24" RUN PIPE, A694 F65, MSS SP-97
21	1	1" PIPET, THD, 6000#, FOR 20" RUN PIPE, A694 F65, MSS SP-97



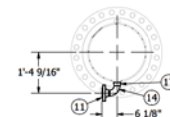
PLAN VIEW
SCALE 1/2"=1'



ELEVATION VIEW
SCALE 1/2"=1'



SECTION A-A
SCALE 1/2"=1'



SECTION B-B
SCALE 1/2"=1'

GENERAL NOTES:

- BUILT TO DUKE STANDARD & SPECIFICATION
- ASME B31.8
- DOT CLASS 3 DESIGN
- DESIGN FACTOR 0.2
- CORROSION ALLOWANCE: 0.00
- 100% RADIOGRAPHIC INSPECTION
- DESIGN PRESSURE OF 500 PSIG
- DESIGN TEMPERATURE RANGE: -20° - 120°F
- HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS
- DESIGN FLOW: 12 - 228 MMSCFD
- OPERATING PRESSURE RANGE: 400 - 435 PSIG
- OPERATING TEMPERATURE OF 32°F - 120°F
- SKIDS "K" & "P" SHOULD BE LIFTED INDEPENDENTLY, BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING.

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	BWM	ECW	NPF	04/02/2020

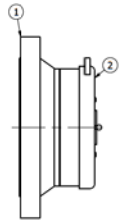


PO BOX 465
MILTON, WV 25541
PHONE: 304-743-4290
WWW.CENERGYCO.COM

DUKE - PR 201
C350 PROJECT - NORWOOD STATION
20" RECEIVER SKID - MECHANICAL
SPOOL DETAIL (1)

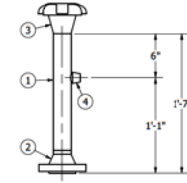
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7181-700-001		0
DRAWING SCALE: AS NOTED	SHEET: 1 OF 1	

SPOOL # 7181-1-3	
ITEM	QTY
1	1
2	1



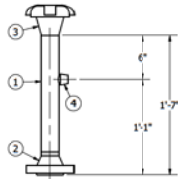
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7181-1-4	
ITEM	QTY
1	1
2	1
3	1
4	1



ELEVATION VIEW
SCALE 1 1/2"=1'

SPOOL # 7181-1-5	
ITEM	QTY
1	1
2	1
3	1
4	1



ELEVATION VIEW
SCALE 1 1/2"=1'

SPOOL # 7181-1-6	
ITEM	QTY
1	1
2	2



ELEVATION VIEW
SCALE 3/4"=1'

GENERAL NOTES:

- BUILT TO DUKE STANDARD & SPECIFICATION
- ASME B31.8
- DOT CLASS 3 DESIGN
- DESIGN FACTOR 0.2
- CORROSION ALLOWANCE: 0.00
- 100% RADIOGRAPHIC INSPECTION
- DESIGN PRESSURE OF 500 PSIG
- DESIGN TEMPERATURE RANGE: -20° - 120°F
- HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS
- DESIGN FLOW: 12 - 228 MMSCFD
- OPERATING PRESSURE RANGE: 400 - 435 PSIG
- OPERATING TEMPERATURE OF 32°F - 120°F
- SKIDS "K" & "P" SHOULD BE LIFTED INDEPENDENTLY, BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING.

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	BWM	ECW	NPF	04/02/2020

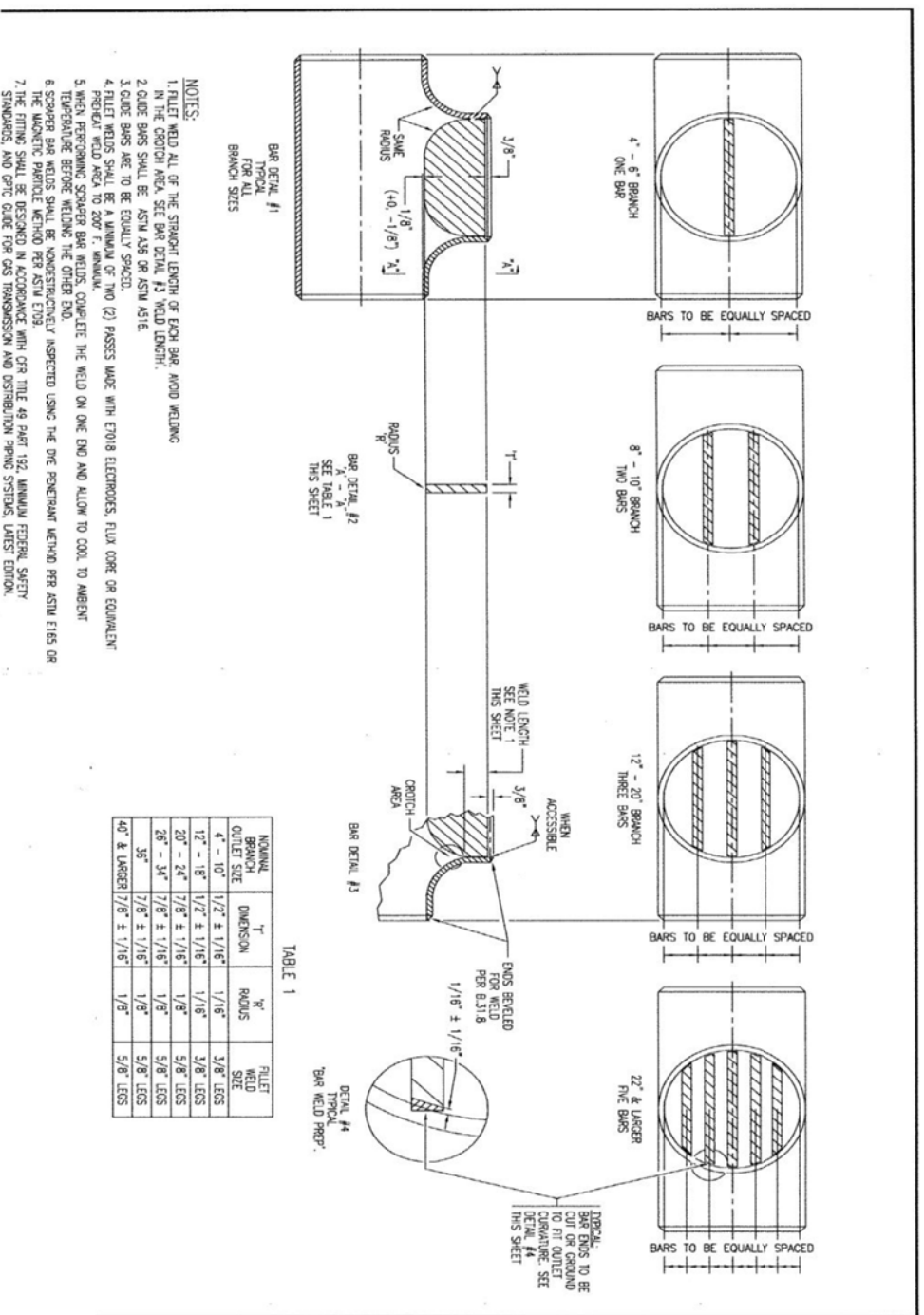


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MILTON, WV 25541
PHONE: 304-743-4280
WWW.CENERGYCO.COM

DUKE - PR 201
C350 PROJECT - NORWOOD STATION
20" RECEIVER SKID - MECHANICAL
SPOOL DETAIL (2)

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7181-700-002		0
DRAWING SCALE: AS NOTED	SHEET: 1 OF 1	

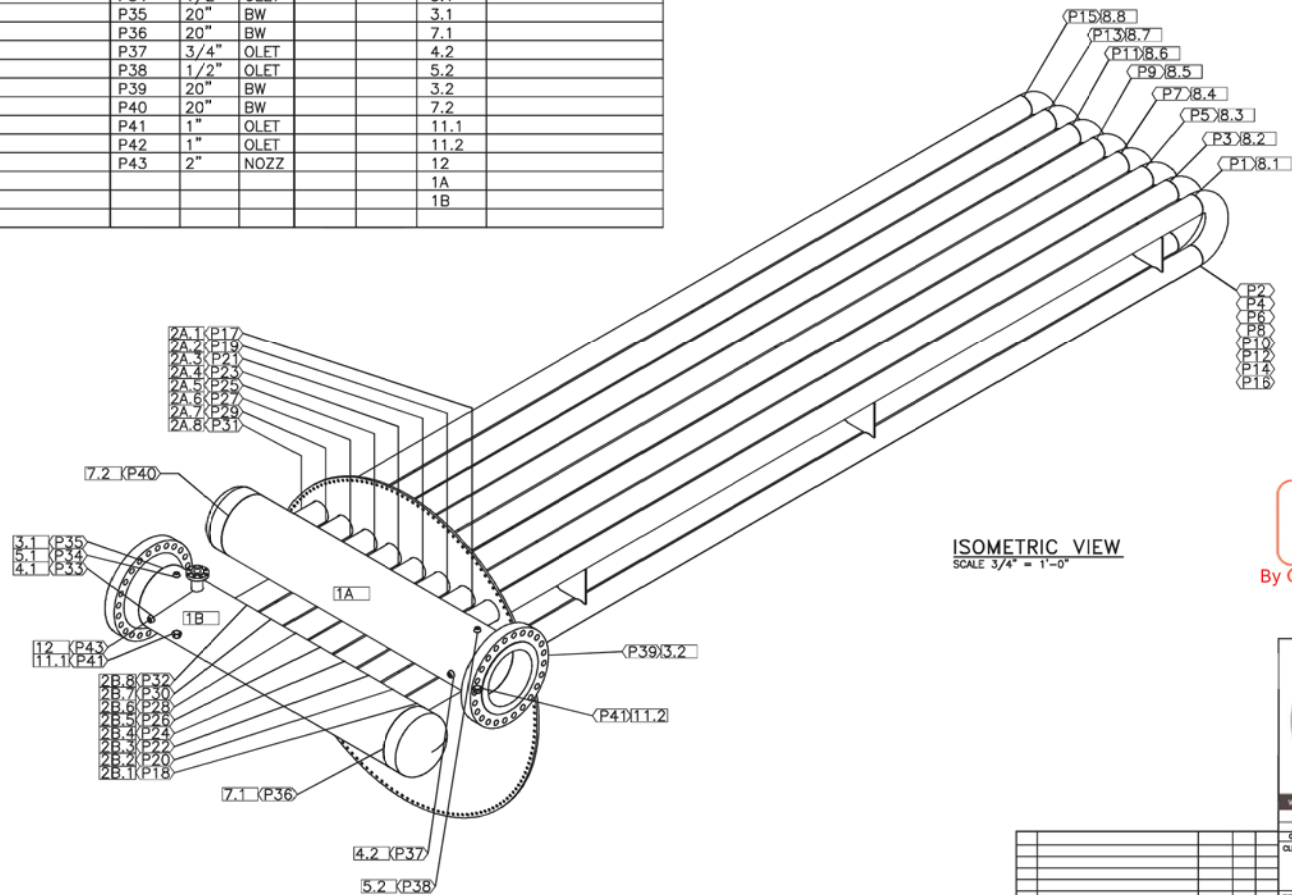
FIGURE III: Guide Bar Details for Piggable Drawn Nozzle and Weld Tee Fittings.



Needs to be Quoted			PO Generated and Sent to Vendor				PREVAILING AML: Duke		SECONDARY AML:									
Item Out for Quote			Issue with Item															
Design Status:			IFC		Project #:	7181	Project Name:	Duke PR-201 Receiver						DESIGN QTY.				
Item #	Vendor	Quote#	PO#	Date Quoted	PO Issued Date	ETA	Manufacturer	DESCRIPTION	IFR QTY	IFA QTY	IFA Rev. B QTY	IFB QTY	IFC QTY	IFC Rev. 1 QTY	QTY. ORDERED	Notes		
Flanges																		
FLG1								24" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F65, MSS SP-44, 250-500 MICROINCHES, AARH		2			2					
FLG2								20" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F65, MSS SP-44, 125-250 MICROINCHES, AARH		4			4					
FLG3								10" FLANGE, RFWN, ANSI 600, 0.365"W, A694 F52, MSS SP-44, 125-250 MICROINCHES, AARH		1			1					
FLG4								2" FLANGE, RFWN, ANSI 600, 0.218"W, A694 F52, MSS SP-44, 125-250 MICROINCHES, AARH		11			11					
FLG5								20" BLIND FLANGE, RF, ANSI 600, ASME B16.5, ASTM A105 GR.B		1			1					
FLG6								10" BLIND FLANGE, RF, ANSI 600, ASME B16.5, ASTM A105 GR.B		1			1					
FLG7								2" BLIND FLANGE, RF, ANSI 600, ASME B16.5, ASTM A105 GR.B		3			3					
Fittings																		
FTG1	MRC	4702637						24" CLOSURE, TDW PRO SERIES D2000, HORIZ., RH MOUNT, 0.500"W, WELD ON, CLAMP RING CLOSURE W/ O-RING SEAL, ASME B31.8, RATED FOR 500 PSIG MAWP @ 0.2 DF, PART # 12342039		1			1					
FTG2								2" VERTICAL CLOSURE w/BLEED VALVE INSTALLED, YALE, FIGURE 500, 0.218"W, ASME B31.8, RATED FOR 500 MAWP @ 0.2 DF, ASTM A350 GR LF2, WITH MANUFACTURER TAG		2			2					
FTG3								2" ELBOW, 90°, L.R., 0.218"W, WPHY52, MSS SP-75		1			1					
FTG4								2" STRAIGHT TEE, 0.218"W, WPHY52, MSS SP-75		2			2					
FTG5								24" x 10", BARRED REDUCING TEE, 0.500"W x 0.365"W, WPHY65, MSS SP-75, REF STD DWG # DM-ST-2011		1			1					
FTG6								20" BARRED STRAIGHT TEE, 0.500"W, WPHY65, MSS SP-75, REF STD DWG # DM-ST-2011		1			1					
FTG7								24" x 20" ECCENTRIC REDUCER, 0.500"W x 0.500"W, WPHY65, MSS SP-75		1			1					
FTG8								2" PIPET, BW, 0.218" WT, FOR 24" RUN PIPE, 0.500" WT, A694 F65, MSS SP-97		2			2					
FTG9								2" PIPET, BW, 0.218" WT, FOR 20" RUN PIPE, 0.500" WT, A694 F65, MSS SP-97		1			1					
FTG10								2" PIPET, LATERAL, BW, 0.218" WT, FOR 20" RUN PIPE, 0.500" WT, A694 F65, MSS SP-97		2			2					
FTG11								1" PIPET, THD, 6000#, FOR 24" RUN PIPE, A694 F65, MSS SP-97		1			1					
FTG12								1" PIPET, THD, 6000#, FOR 20" RUN PIPE, A694 F65, MSS SP-97		1			1					
FTG13								1/2" PIPET, THD, 6000#, FOR 2" RUN PIPE, A694 F52, MSS SP-97		2			2					
Threaded																		
TRD1								1" PIPE NIPPLE, SCH 80, 3" LONG, SA/A-106, GR.B, ASTM A733, TBE		2			2					
TRD2								1/2" PIPE NIPPLE, SCH 80, 3" LONG, SA/A-106, GR.B, ASTM A733, TBE		2			2					
TRD3								1" PLUG, SQUARE HEAD, 3000#, ASTM A105, FORGED STEEL, ASME B16.11, SOLID		2			2					
TRD4								1/2" PLUG, SQUARE HEAD, 3000#, ASTM A105, ASME B16.11, FORGED STEEL, SOLID		2			2					
Gaskets, Bolts, and Misc.																		
GBM1								24" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20		1			1					
GBM2								20" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20		3			4					
GBM3								10" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20		1			1					
GBM4								2" GASKET, ANSI 600, FLEXITALLIC CGI, SPIRAL WOUND, 304SS RIBBON WITH GRAPHITE FILLER, 304SS INNER & CS OUTER RING, TYPE F, 1/8" THK, ASME B16.20		11			11					
GBM5								1-7/8" STUD BOLT, 14" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA., ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED		24			24					
GBM6								1-5/8" STUD BOLT, 12-1/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA., ASTM A194, GR2H W/ QTY(2) WASHER, CADMIUM PLATED		72			96					
GBM7								1-1/4" STUD BOLT, 9-1/2" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA., ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED		16			16					
GBM8								5/8" STUD BOLT, 4-3/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA., ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED		88			88					
Pipe																		
P1								24" PIPE, 0.500"W, APISL PSL-2 X65, LS&W		16			16					
								24" PIPE, 0.500"W, APISL PSL-2 X65, LS&W, 11 FT LONG		1			1					
								24" PIPE, 0.500"W, APISL PSL-2 X65, LS&W, 5 FT LONG		1			1					
P2								20" PIPE, 0.500"W, APISL PSL-2 X65, ERW		23			23					
								20" PIPE, 0.500"W, APISL PSL-2 X65, ERW, 18 FT LONG		1			1					
								20" PIPE, 0.500"W, APISL PSL-2 X65, ERW, 5 FT LONG		1			1					
P3								2" PIPE, 0.218"W, APISL PSL-2 X52, ERW		25			25					
								2" PIPE, 0.218"W, APISL PSL-2 X52, ERW, 15 FT LONG		1			1					
								2" PIPE, 0.218"W, APISL PSL-2 X52, ERW, 2 FT LONG		3			3					
								2" PIPE, 0.218"W, APISL PSL-2 X52, ERW, 1 FT LONG		4			4					

Needs to be Quoted			PO Generated and Sent to Vendor				PREVAILING AML: Duke		SECONDARY AML:								QTY. ORDERED	Notes
Item Out for Quote			Issue with Item															
Design Status:			IFC		Project #:	7181	Project Name:	Duke PR-201 Receiver						DESIGN QTY.				
Item #	Vendor	Quote#	PO#	Date Quoted	PO Issued Date	ETA	Manufacturer	DESCRIPTION	IFR QTY	IFA QTY	IFA Rev. B QTY	IFB QTY	IFC QTY	IFC Rev. 1 QTY				
Components																		
CMP1								LIFTING LUG, 1'-2" x 6" x 1"TK, ASTM A36		8			8					
CMP2								PLATE, 10 15/16" x 4 3/4" x 3/8"TK, ASTM A36		7			7					
CMP3								PLATE, 10 x 10 x 1/2"TK, ASTM A36		4			4					
CMP4								NUT, 7/8-9 UNC, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A305		16			16					
CMP5								WASHER, 7/8" THREAD SIZE, TYPE 1 GALVANIZED, ASTM A325		32			32					
CMP6								BOLT, 7/8-9 UNC, 3" LONG, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325		16			16					
CMP7								24" EZ-LINE FLANGE SUPPORT, FIGURE "A", BARE, 3'-3 1/2" TO PIPE CENTERLINE		1			1					
CMP8								24" PIPE SUPPORT, EZ-LINE SHIM- BLOCK, CLAMP, AND WIDE FLANGE ASSEMBLY, W5BC-01-NA		2			2					
CMP9								20" PIPE SUPPORT, EZ-LINE SHIM- BLOCK, CLAMP, AND WIDE FLANGE ASSEMBLY, W5BC-01-NA		2			2					
CMP10								WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1-1/2" SERRATED, 3' WIDE x 10' LONG		16			16					
CMP11								WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1-1/2" SERRATED, 2'-6" WIDE x 10' LONG		1			1					
CMP12								WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1-1/2" SERRATED, 1'-7 1/2" WIDE x 10' LONG		1			1					
CMP13								WELDED BAR GRATING, GALVANIZED HOT DIPPED, 1-1/2" SERRATED, 9' WIDE x 10' LONG		1			1					
CMP14								PLATE, 10 15/16" x 4 3/4" x 3/8"TK, ASTM A36		9			9					
CMP15								10" PIPE SUPPORT, EZ-LINE SHIM- BLOCK, CLAMP, AND WIDE FLANGE ASSEMBLY, BARE, W5BC-01-NA		1			1					
Structural Steel																		
S1										210			210					
								W12x53 WIDE FLANGE BEAM, ASTM A992		2			2					
								W12x53 WIDE FLANGE BEAM, ASTM A992, 38'-0" LONG		2			2					
								W12x53 WIDE FLANGE BEAM, ASTM A992, 14'-10 1/2" LONG		2			2					
								W12x53 WIDE FLANGE BEAM, ASTM A992, 9'-1 5/8" LONG		9			9					
								W12x53 WIDE FLANGE BEAM, ASTM A992, 6'-5 3/8" LONG		1			1					
								W12x53 WIDE FLANGE BEAM, ASTM A992, 5'-11 5/8" LONG		1			1					
								W12x53 WIDE FLANGE BEAM, ASTM A992, 5'-1 5/8" LONG		1			1					
S2										5			5					
								W8x31 WIDE FLANGE BEAM, ASTM A992		2			2					
								W8x31 WIDE FLANGE BEAM, ASTM A992, 1'-1 1/8" LONG		2			2					
								W8x31 WIDE FLANGE BEAM, ASTM A992, 1'-13/16" LONG		2			2					
S3										54			54					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992		2			2					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 7'-11 5/16" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 8'- 5/8" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 6'-5 3/8" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 5'-11 5/16" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 5'-3 3/4" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 5'-1 5/8" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 2'-7 7/16" LONG		1			1					
								W7 6x13 STRUCTURAL TEE FROM W SHAPE, ASTM A992, 2'-9 13/16" LONG		1			1					
S4										20			20					
								L4 x 3 x 1/4 STRUCTURAL ANGLE, ASTM A36		4			4					
								L4 x 3 x 1/4 STRUCTURAL ANGLE, ASTM A36, 4'-6 11/16" LONG		4			4					
S5										3			3					
								W6x15 WIDE FLANGE BEAM, ASTM A992		1			1					
								W6x15 WIDE FLANGE BEAM, ASTM A992, 2'-5/16" LONG		1			1					

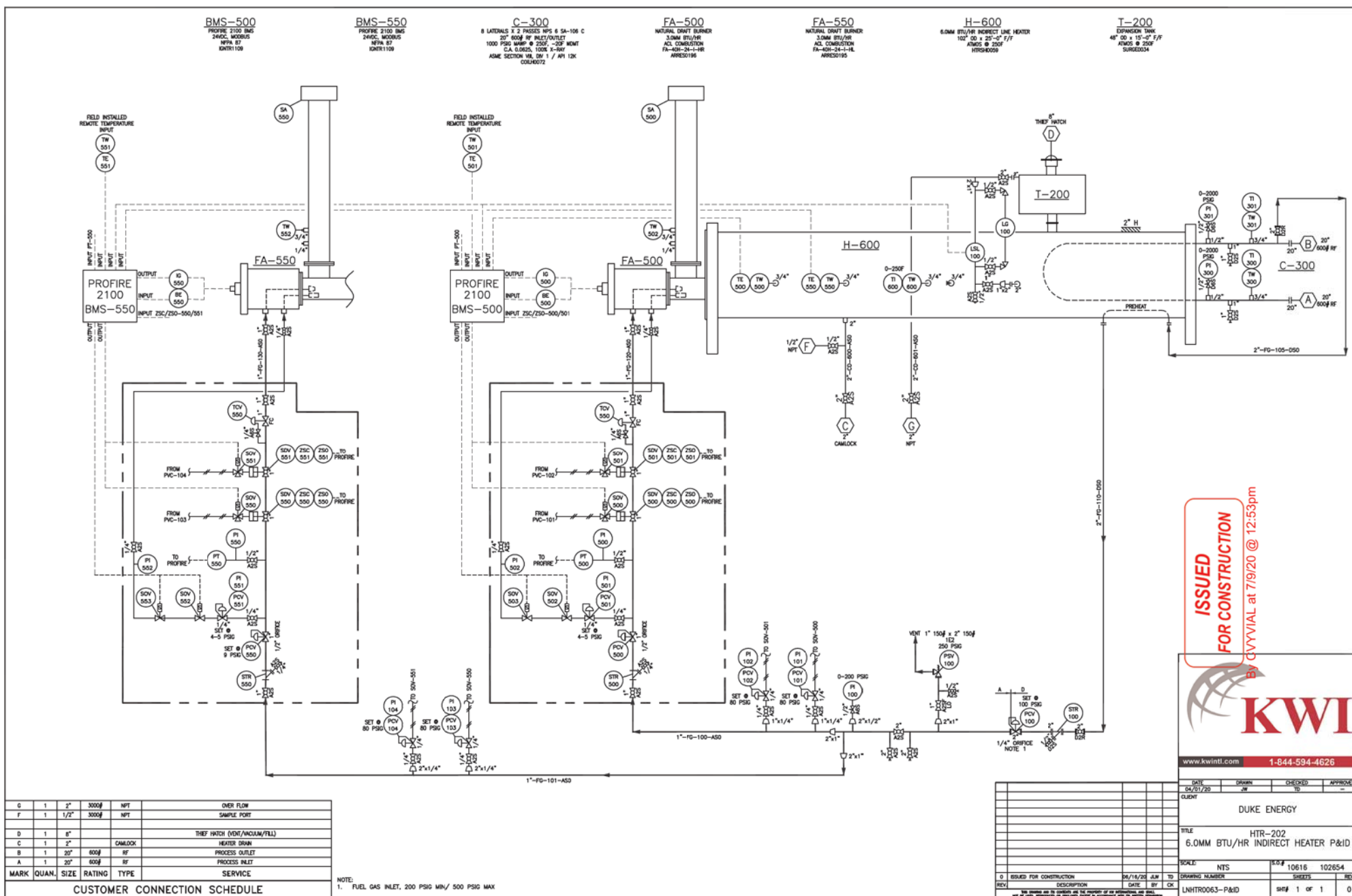
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WELDS					HEAT NUMBERS		WELDS					HEAT NUMBERS	
WELD No.	SIZE	TYPE	WELD ID	X-RAY ID	ITEM No.	HEAT NO.	WELD No.	SIZE	TYPE	WELD ID	X-RAY ID	ITEM No.	HEAT NO.
P1	6"	BW			8.1		P24	6"	BW			2B.4	
P2	6"	BW			—		P25	6"	BW			2A.5	
P3	6"	BW			8.2		P26	6"	BW			2B.5	
P4	6"	BW			—		P27	6"	BW			2A.6	
P5	6"	BW			8.3		P28	6"	BW			2B.6	
P6	6"	BW			—		P29	6"	BW			2A.7	
P7	6"	BW			8.4		P30	6"	BW			2B.7	
P8	6"	BW			—		P31	6"	BW			2A.8	
P9	6"	BW			8.5		P32	6"	BW			2B.8	
P10	6"	BW			—		P33	3/4"	OLET			4.1	
P11	6"	BW			8.6		P34	1/2"	OLET			5.1	
P12	6"	BW			—		P35	20"	BW			3.1	
P13	6"	BW			8.7		P36	20"	BW			7.1	
P14	6"	BW			—		P37	3/4"	OLET			4.2	
P15	6"	BW			8.8		P38	1/2"	OLET			5.2	
P16	6"	BW			—		P39	20"	BW			3.2	
P17	6"	BW			2A.1		P40	20"	BW			7.2	
P18	6"	BW			2B.1		P41	1"	OLET			11.1	
P19	6"	BW			2A.2		P42	1"	OLET			11.2	
P20	6"	BW			2B.2		P43	2"	NOZZ			12	
P21	6"	BW			2A.3							1A	
P22	6"	BW			2B.3							1B	
P23	6"	BW			2A.4								



**ISSUED
FOR CONSTRUCTION**

By CVYVIAL at 7/9/20 @ 12:52pm

		www.kwiintl.com		1-844-594-4626	
		DATE 06/17/2020	DRAWN AJW	CHECKED TJ	APPROVED
CLIENT		DUKE ENERGY			
TITLE		8 LATERAL 2 PASS COIL FOR 6.0MM BTU/HR LINE HEATER			
SCALE: AS SHOWN		S.O.#		10616 102714	
DRAWING NUMBER		SHEETS		REV	
COLH0072		SHEET 4 OF 4		0	



**ISSUED
FOR CONSTRUCTION**



KWI

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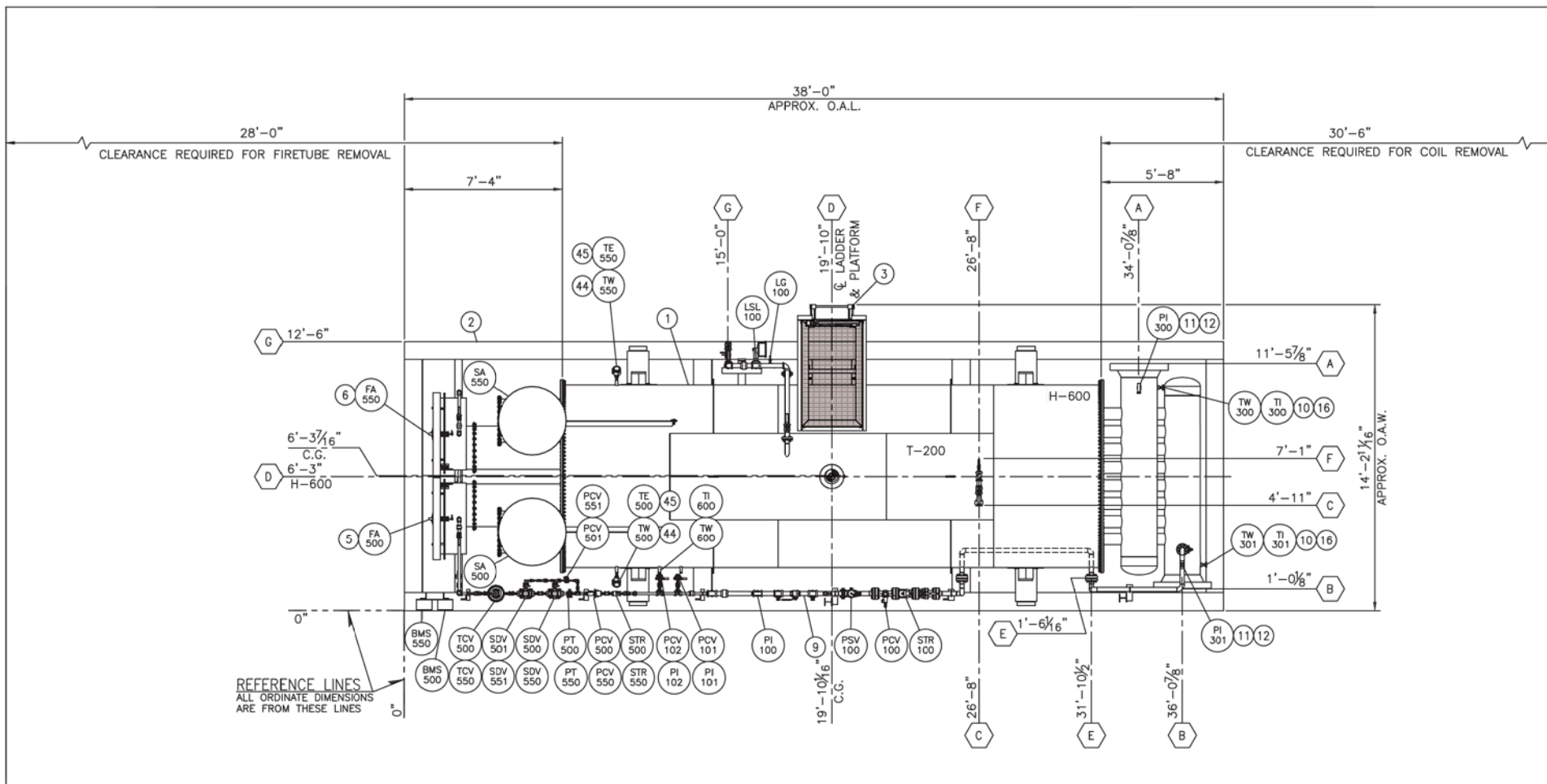
DATE	DRAWN	CHECKED	APPRO
04/01/20	JW	TD	--

DUKE ENERGY

TITLE	HTR-202
	6.0MM BTU/HR INDIRECT HEATER P&ID

SCALE:	NTS	50'	10616	102654
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NO	DRAWING NUMBER	SHEETS	
NO	LNHTR0063-P&ID	SHT# 1 OF 1	



PLAN VIEW
SCALE: 1/2" = 1'-0"

MARK	QUAN.	SIZE	RATING	TYPE	SERVICE
G	1	2"	3000#	NPT	OVER FLOW
F	1	1/2"	3000#	NPT	SAMPLE PORT
E	1	2"	600#	RF	FUEL GAS INLET (200 PSIG MIN/500 PSIG MAX)
D	1	8"			THIRD WASH (DHTS/VACUUM/FILL)
C	1	2"	600#	ORF	HEATER DOWN
B	1	20"	600#	RF	PROCESS OUTLET
A	1	20"	600#	RF	PROCESS INLET
					SERVICE

NOTES:
1. TUBE SDV-500,501,550,551 VENTS TO COIL END OF SKID.

ISSUED
FOR CONSTRUCTION
VIVAL at 7/9/20 @ 12:55pm

OPERATING WEIGHT = 138,000 LBS.
EMPTY WEIGHT = 70,000 LBS.

TOLERANCES:
PROCESS CONNECTIONS: ± 1/2"
UTILITY CONNECTIONS: ± 1"
STRUCTURAL: ± 1/4"
ANCHOR BOLTS: ± 1/4"



KWI

www.kwi.com 1-844-594-4626

DATE	DRAWN	CHECKED	APPROVED
04/23/20	FE	TD	

CLIENT: DUKE ENERGY

TITLE: 6.0MM BTU/HR
INDIRECT LINE HEATER
GENERAL ARRANGEMENT

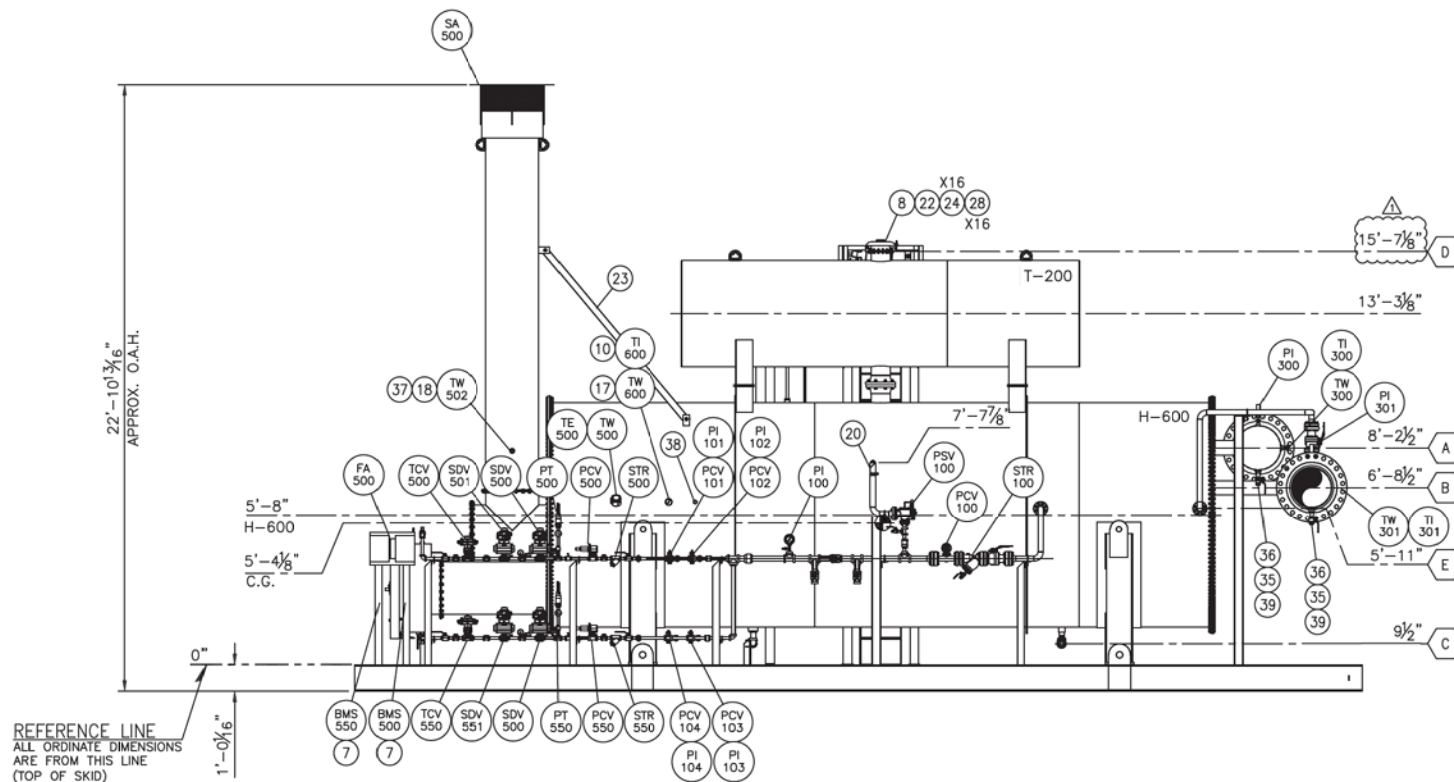
SCALE: 1/2" = 1'-0" K.S.# 10616 102654

REV. 1 CORRECT DIMENSIONS 07/09/20 A.M. TO

REV. 2 ISSUED FOR CONSTRUCTION 04/16/20 A.M. TO

REV. 3 CHANGING ISSUES DATE: BY: OK: LNHT0063

Sheet 1 of 7 1



FRONT ELEVATION
SCALE: 1/2" = 1'-0"

MARK	QUAN.	SIZE	RATING	TYPE	SERVICE
G	1	2"	3000#	NPT	OVER FLOW
F	1	1/2"	3000#	NPT	SAMPLE PORT
E	1	2"	600#	RF	FUEL GAS INLET (200 PSIG MIN/200 PSIG MAX)
D	1	8"			THIRD PARTY (OXY/ARGON/HELIUM)
C	1	2"		ORANGE	HEATED BURN
B	1	20"	600#	RF	PROCESS OUTLET
A	1	20"	600#	RF	PROCESS INLET
					SERVICE

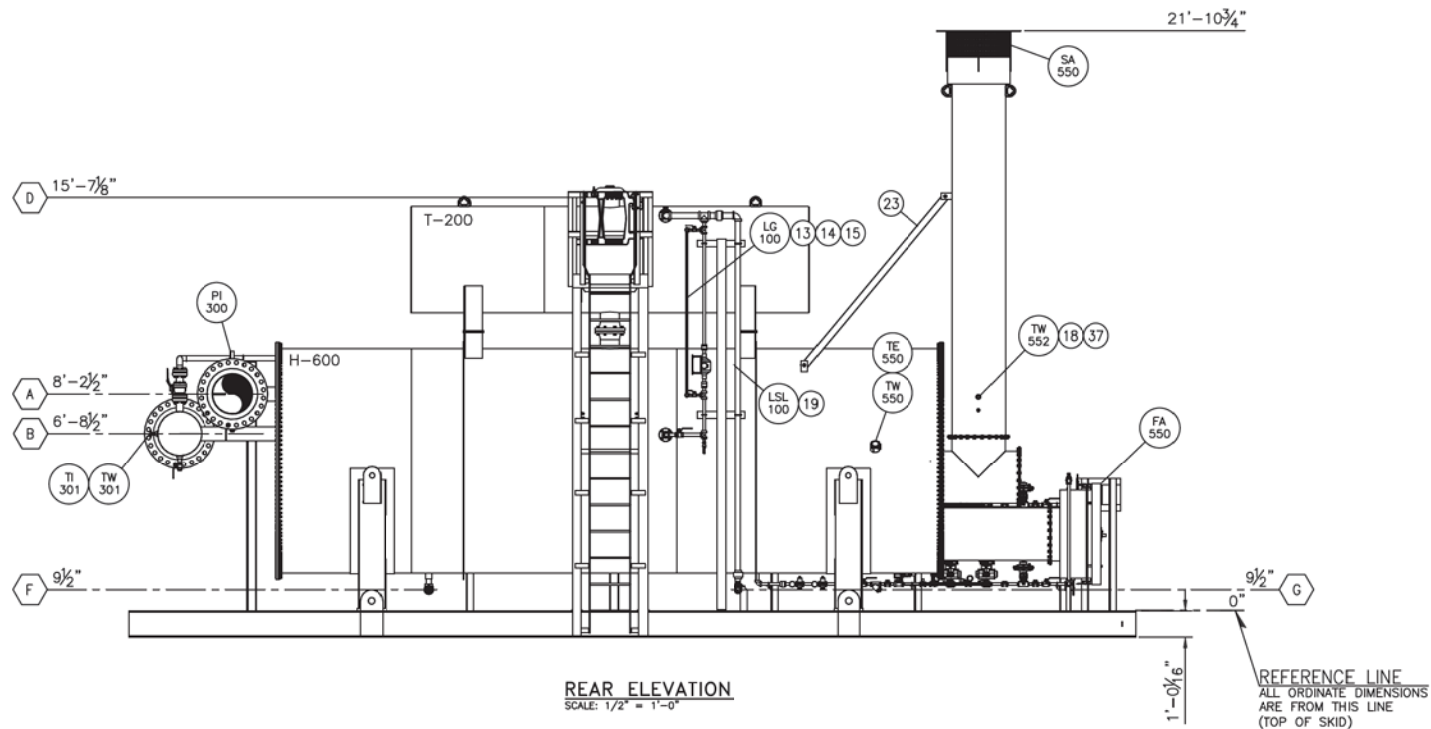
CUSTOMER CONNECTION SCHEDULE

ISSUED FOR CONSTRUCTION
VYVIAL at 7/9/20 @ 12:55pm

DATE	DESIGN	CHECKED	APPROVED
04/23/20	FE	FE	
CLIENT			
DUKE ENERGY			
TITLE			
6.0MM BTU/HR INDIRECT LINE HEATER GENERAL ARRANGEMENT			
SCALE: 1/2" = 1'-0"			
10616 102654			
DRAWING NUMBER			
LNHTR0063			
SHEET 2 OF 7			



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MARK	QUAN.	SIZE	RATING	TYPE	SERVICE
G	1	2"	3000#	NPT	OVER FLOW
F	1	1/2"	3000#	NPT	SAMPLE PORT
E	1	2"	600#	RF	FUEL GAS INLET (200 PSIG MIN/200 PSIG MAX)
D	1	8"			THIRD PARTY (OXY/ARGON/HELI)
C	1	2"		CHALCOCK	HEATED DOWN
B	1	20"	600#	RF	PROCESS OUTLET
A	1	20"	600#	RF	PROCESS INLET
					SERVICE

CUSTOMER CONNECTION SCHEDULE

ISSUED
FOR CONSTRUCTION
VIVAL at 7/9/20 @ 12:55pm

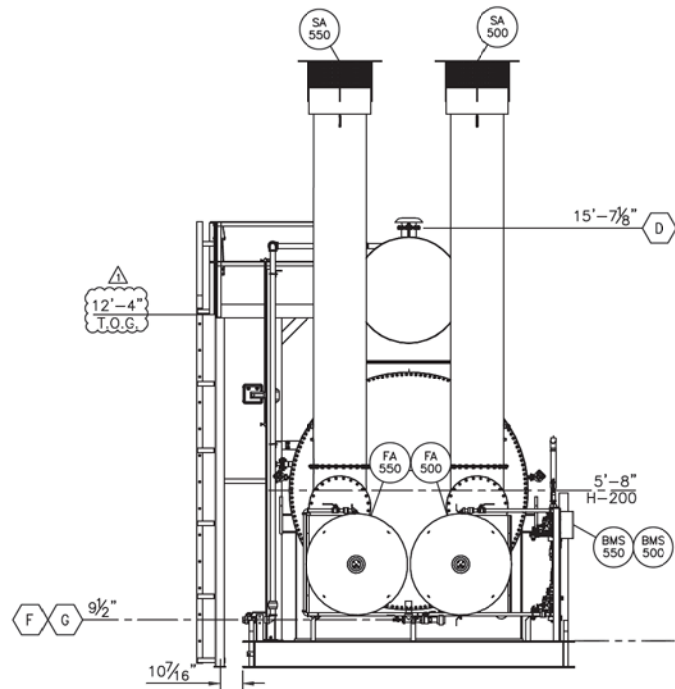
DATE	DRAWN	CHECKED	APPROVED
04/23/20	FE	TD	
CLIENT			
DUKE ENERGY			
TITLE			
6.0MM BTU/HR INDIRECT LINE HEATER GENERAL ARRANGEMENT			
SCALE: 1/2" = 1'-0"			
10616 102654			
1	CORRECT DIMENSIONS	07/09/20	ALW
2	ISSUED FOR CONSTRUCTION	04/16/20	ALW
REV	DESCRIPTION	DATE	BY
LNHTR0063			



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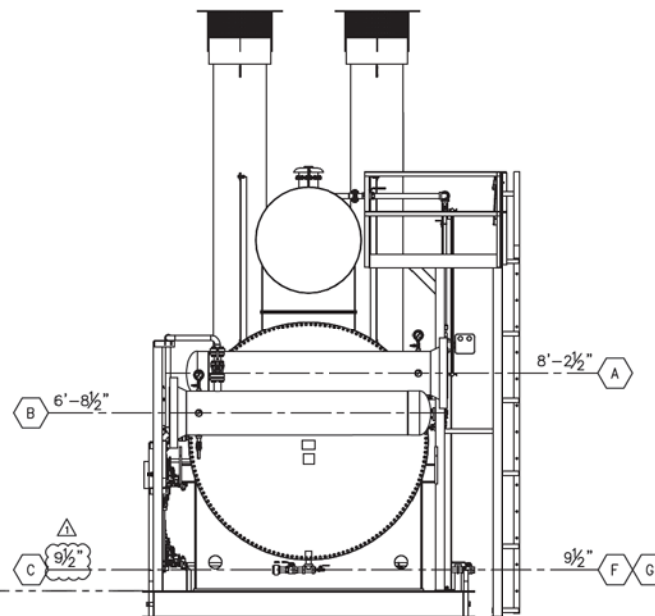
DATE	DRAWN	CHECKED	APPROVED
04/23/20	FE	TD	
CLIENT			
DUKE ENERGY			
TITLE			
6.0MM BTU/HR INDIRECT LINE HEATER GENERAL ARRANGEMENT			
SCALE: 1/2" = 1'-0"			
10616 102654			
1	CORRECT DIMENSIONS	07/09/20	ALW
2	ISSUED FOR CONSTRUCTION	04/16/20	ALW
REV	DESCRIPTION	DATE	BY
LNHTR0063			

sheet 3 of 7 1



FIRETUBE END VIEW
SCALE: 1/2" = 1'-0"

REFERENCE LINE
ALL ORDINATE DIMENSIONS
ARE FROM THIS LINE
(TOP OF SKID)



COIL END VIEW
SCALE: 1/2" = 1'-0"

MARK	QUAN.	SIZE	RATING	TYPE	SERVICE
G	1	2"	3000#	NPT	OVER FLOW
F	1	1/2"	3000#	NPT	SAMPLE PORT
E	1	2"	600#	RF	FUEL GAS INLET (200 PSIG MIN/200 PSIG MAX)
D	1	8"			THIRD WASH (OXY/ARGON/TEL)
C	1	2"		ORANGE	HEATED DOWN
B	1	20"	600#	RF	PROCESS OUTLET
A	1	20"	600#	RF	PROCESS INLET
					SERVICE

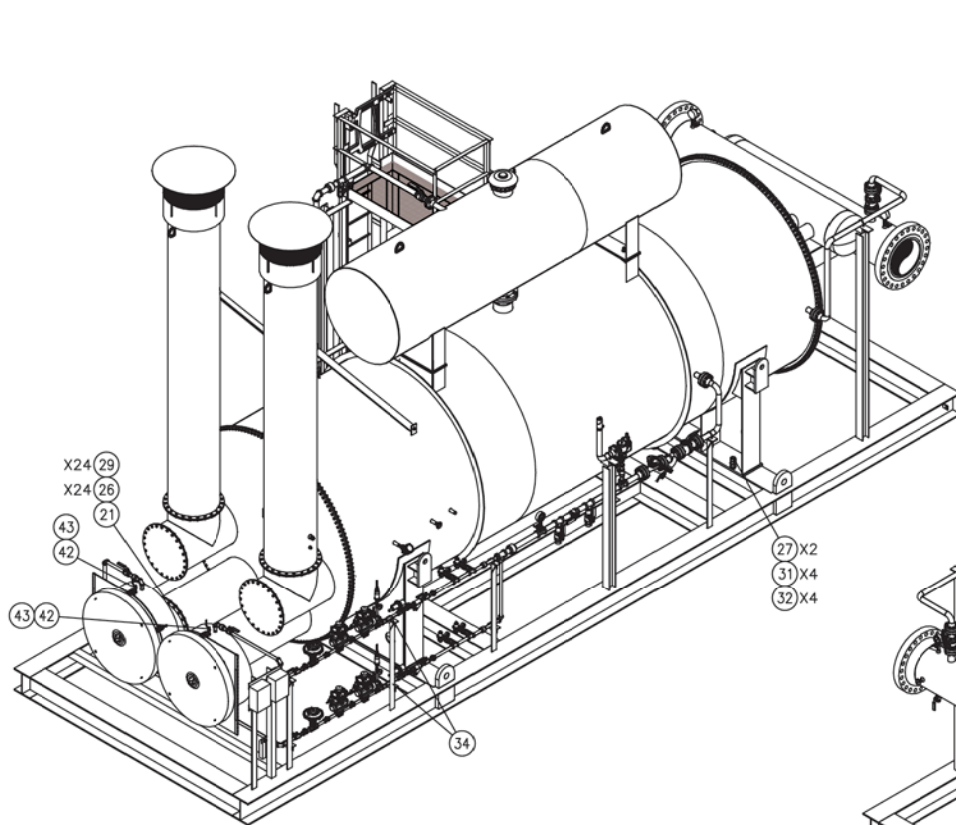
CUSTOMER CONNECTION SCHEDULE

**ISSUED
FOR CONSTRUCTION**
11/19/20 at 12:55pm

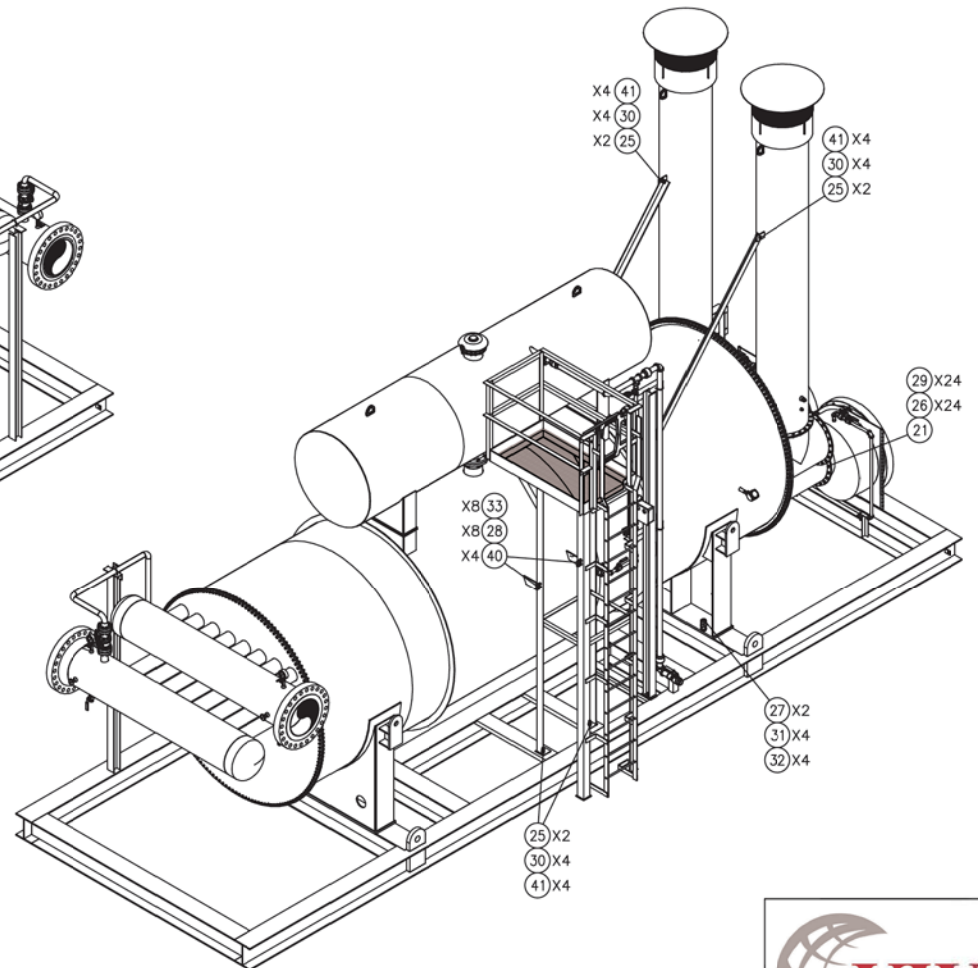
DATE	DRAWN	CHECKED	APPROVED
04/23/20	FE	TD	
CLIENT			
DUKE ENERGY			
TITLE			
6.0MM BTU/HR INDIRECT LINE HEATER GENERAL ARRANGEMENT			
SCALE			
1/2" = 1'-0"			
REV			
1	CORRECT DIMENSIONS	07/08/20	ALW
2	ISSUED FOR CONSTRUCTION	04/16/20	ALW
REV	DESCRIPTION	DATE	BY
LHTR0063			
SHEET 4 OF 7			



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ISOMETRIC VIEWS
SCALE: 1/2" = 1'-0"



ISSUED
FOR CONSTRUCTION
REVIVAL at 7/9/20 @ 12:55pm



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DATE	DRAWN	CHECKED	APPROVED
04/23/20	FE	TD	

CLIENT DUKE ENERGY

TITLE 6.0MM BTU/HR

INDIRECT LINE HEATER

GENERAL ARRANGEMENT

SCALE: 1/2" = 1'-0"

10616 102654

DESIGNED BY: JES

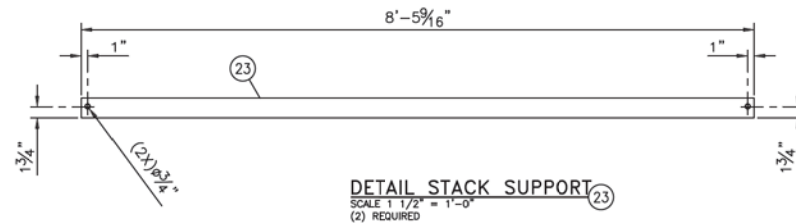
REV 1

sheet 5 of 7

REV	DESCRIPTION	DATE	BY	CHK
1	CORRECT DIMENSIONS	07/08/20	AJM	TD
2	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
3	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
4	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
5	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
6	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
7	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
8	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
9	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD
10	ISSUED FOR CONSTRUCTION	04/23/20	AJM	TD

UNHTR0063

BILL OF MATERIAL					BILL OF MATERIAL					BILL OF MATERIAL				
ITEM	QTY	TAG	PART NO	DESCRIPTION	ITEM	QTY	TAG	PART NO	DESCRIPTION	ITEM	QTY	TAG	PART NO	DESCRIPTION
1	1	HT-600	HTRSH0059	SHELL HEATER, 6.0MM, 102.X.300.F/F, WT.0.375, SA, 516.70, ATMOS, W/ SUPPORTS, BASE, PLATE, FLANGED, ENDS, CUSTOM	12	2	A6S	GAUGE0490	GAUGE, VALVE, 0.500, MNPT, X, 0.500, FNPT, 6000, PSIG, BLOCK, AND, BLEED, 316SS, BODY, PTFE, PACKING, ANDERSON, GREENWOOD, M25VIS-44	28	24		NUTHX159	NUT, HEX, 2H, 0.500, NC, 13, A194, ZINC
2	1		SKIDS0326	SKID, LINE, HEATER, 6.0MM, 120.W.X.540.L, NO, GRATING, 2, GROUNDING, LUGS, 4, LIFTING, LUGS, GALVANIZED, CUSTOM	13	1		STGLS0239	GAUGE, COCK, 0.500, MNPT, 0.375, DRAIN, 0.625, TUBE, CARBON, STEEL, MOD, RTA, PENBERTHY	29	48		NUTHX166	NUT, HEX, 2H, 0.5625, NC, 12, A194, ZINC
3	1		PLTFM0075	PLATFORM, LINE, HEATER, 6.0MM, 034.W.X.060.L, X, 157.H.W./, LADDER, GALVANIZED, CUSTOM	14	1	LG-100	STGLS0043	SIGHT, GLASS, REDLINE, 0.625, X, 72.00, DAL, MAWP, 250#	30	12		NUTHX173	NUT, HEX, 2H, 0.625, NC, 11, A194, ZINC
4	2	SA-500 SA-550	ARRES0103	ARRESTOR, EQUALIZED, STACK, HEAD, W/ BIRD, SCREEN, FLAMECO, MOD, 24ESHB	15	1		STGLS0307	SIGHT, GLASS, GUARD, EXPANDED, METAL, 72.00	31	8		NUTHX215	NUT, HEX, 2H, 1.375, UNB, A194, ZINC
5	1	FA-500	ARRES0196	ARRESTOR, FLAME, ACL, HINGED, STYLE, RIGHT, ORIENTATION, (1), 40,000, FLAME, CELL, FOR, UP, TO, 3.0, MMBTU/HR, 24,000,00, FIRE, TUBE, RUSH, 3000, SPOOL, W/ M150, 1,500, MIXER, W/ 1500, PILOT, MIXER, W/ IGNITOR, ROD, ASSMY, ACL, COMBUSTION, FA-40H-24"-I-HR	16	2	TW-300 TW-301	THRML0028	THERMOWELL, NPT, 0.750, MNPT, X, 0.500, FNPT, 316SST, 0.260, BORE, 09.00, L, STEM, TAPERED, NACE, ASHCROFT MOD. 75W0750HT260S	32	8		WASHR0101	WASHER, FLAT, USS, 1.375, ZINC
6	1	FA-550	ARRES0195	ARRESTOR, FLAME, ACL, HINGED, STYLE, LEFT, ORIENTATION, (1), 40,000, FLAME, CELL, FOR, UP, TO, 3.0, MMBTU/HR, 24,000,00, FIRE, TUBE, W/ M150, 1,500, MIXER, W/ 1500, PILOT, MIXER, W/ IGNITOR, ROD, ASSMY, ACL, COMBUSTION, FA-40H-24"-I-HL	17	1	TW-600	THRML0050	THERMOWELL, NPT, 0.750, MNPT, X, 0.500, FNPT, 316SST, 0.260, BORE, 07.50, U, 09.00, STEM, STEPPED, NACE, MR0175, CHEMOIL, MOD, TW32-95	33	8		WASHR0004	WASHER, FLAT, USS, 0.500, ZINC
7	2	BMS-500 BMS-550	IGNTR1109	ASSEMBLY, PROFIRE, BMS, ENGINEERED, TO, NFPA, 87, 24VDC, MOOBUS, 1.0, KIMRAY, TCV, (2), AT, CONTROLS, SDV, (1) FISHER, 627R, PILOT, FUEL, TRAIN, (2), FISHER, 67CFR, EXTERNAL, IGNITION, COIL, INSTALLATIO, KIT, APOLLO, VALVES PROFIRE, ESTIMATE, 30270	18	2	TW-502 TW-552	THRML0066	THERMOWELL, NPT, 0.750, MNPT, X, 0.500, FNPT, 304SST, 0.260, BORE, 10.50, U, 12.00, STEM, NACE, WKA, MOD, THZT, TW-15-HAINEUD1050017501A07500625, PN 55267378	34	2		UBOLT013	UBOLT, PIPE, 01.000, SHANK, 0.375, NC, ZINC, STD
8	1		HATCH0001	HATCH, THIEF, FLANGED, 08.00, ALUMINUM, PRESSURE, 40Z, VACUUM, 40Z, RELIEF, (16), 0.5625, BH, 10.375, BC, MODEL, JT-8.1, PN, 0054-01-0830	19	1	LSL-100	LEVNC0787	SWITCH, LEVEL, 1100A, 15C14-DRDF-BK, 1.0, NPT, 1480, MAWP, WCC, BODY, ELECTRIC, DPDT, LM, MOUNT, DIRECT, ACTING, VITON, SEAL, STANDARD, BRONZE, 0-60, GAUGE, SEALED, CASE, 304, NORRISEAL	35	2		BLVLV3843	VALVE, BALL, FP, 1.0, NPT, 3PC, FLOATING, ASTM A216-WCB, BODY, PTFE, 1500, CWP, LATCH, LOCK, APOLLO, 83A14501
9	1		SPOOL0255	PIPE, SPOOLS, LNHTR0063, DOMESTIC, MATERIAL	20	1		RAIN0004	CAP, RAIN, 50, 02.00, SOLID, STYLE	36	2		NIPPO640	NIPPLE, PIPE, TBE, 1.000, X, 03.00, WT, 0.179, S, 080, XH, SA, 106B, DOMESTIC, MATERIAL
10	3	TI-300 TI-301 TI-600	GAUGE0353	GAUGE, TEMPERATURE, 0.500, MNPT, 03.00, DIAL, EVERY, ANGLE, 00-250F, 09.00, STEM, SAFETY, GLASS, ASHCROFT, MODEL, 30E10E090XSG 0/250F	21	2		GASKT0141	GASKET, 28.00, X, 24.000, X, 0.1250, (24), 0.6250, BH, 26.00, BC, THERMOSEAL, C4300	37	2		FTNPN0948	FITTING, PLUG, NPT, 105, FS, HEX, HEAD, 0.500, SA, 105, DOMESTIC, MATERIAL
11	2	PI-300 PI-301	GAUGE0452	GAUGE, PRESS, LIQ, FILLED, NPT, 0.500, DIAL, 4.00, LOWER, MOUNT, 316, SS, X, 316, SS, 0-2000#, NACE, BLUE, RIBBON, MOD, BR301L-4020	22	1		GASKT0161	GASKET, 11.750, X, 08.625, X, 0.1250, (16), 0.5625, BH, 10.375, BC, THERMOSEAL, C4300	38	1		FTNPN0949	FITTING, PLUG, NPT, 105, FS, HEX, HEAD, 0.750, SA, 105, DOMESTIC, MATERIAL
					23	2		STLAND0070	STEEL, ANGLE, 0.375, X, 3.00, X, 3.00, SA, 36, DOMESTIC, MATERIAL	39	2		FTNPN0947	FITTING, PLUG, NPT, 105, FS, HEX, HEAD, 1.000, SA, 105, DOMESTIC, MATERIAL
					24	16		CSCRW0443	CAPSCREW, GR, 8, HEX, 0.500, X, 01.500, NC, 13, YLW ZINC	40	4		CSCRW0456	CAPSCREW, GR, 8, HEX, 0.500, X, 02.500, NC, 13, ZINC
					25	6		CSCRW0496	CAPSCREW, GR, 8, HEX, 0.625, X, 02.500, NC, 11, YLW ZINC	41	12		WASHR0007	WASHER, FLAT, USS, 0.625, ZINC
					26	48		CSCRW0788	CAPSCREW, GR, 8, HEX, 0.5625, X, 01.500, NC, 12, YLW ZINC	42	2		NIPPO642	NIPPLE, PIPE, TBE, 0.250, X, 02.00, WT, 0.119, S, 080, XH, SA, 106B, DOMESTIC, MATERIAL
					27	4		CSCRW0775	CAPSCREW, GR, 8, HEX, 1.375, X, 05.000, NC, 06, ZINC	43	2		BLVLV3842	VALVE, BALL, RP, 0.250, NPT, 2PC, FLOATING, A105, BODY, 2000, CWP, RPTFE, SEAT, RPTFE, SEAL, LATCH, LOCK, APOLLO, 73A10101A-27



ISSUED
FOR CONSTRUCTION
VYVIAL at 7/9/20 @ 12:55pm



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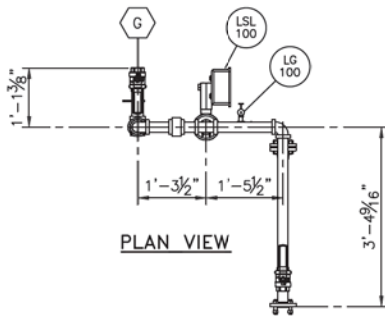
DATE	DRAWN	CHECKED	APPROVED
04/23/20	FE	TD	

CLIENT: DUKE ENERGY

TITLE: 6.0MM BTU/HR INDIRECT LINE HEATER GENERAL ARRANGEMENT

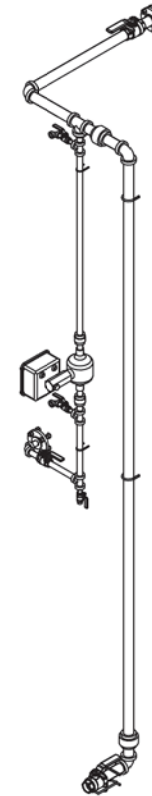
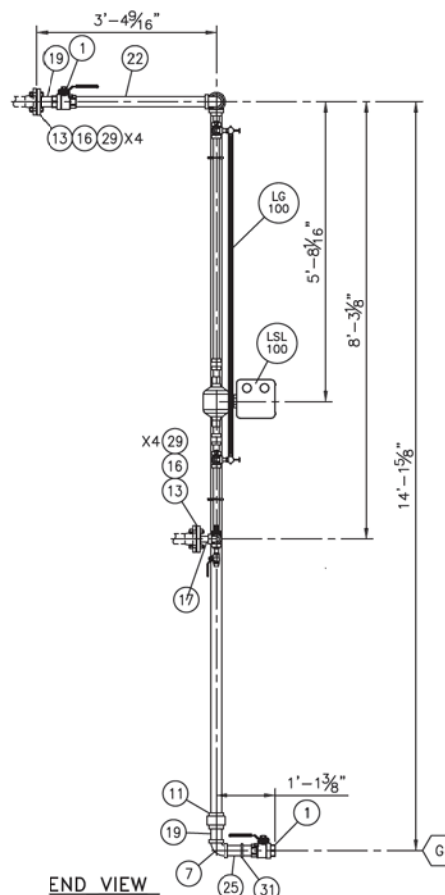
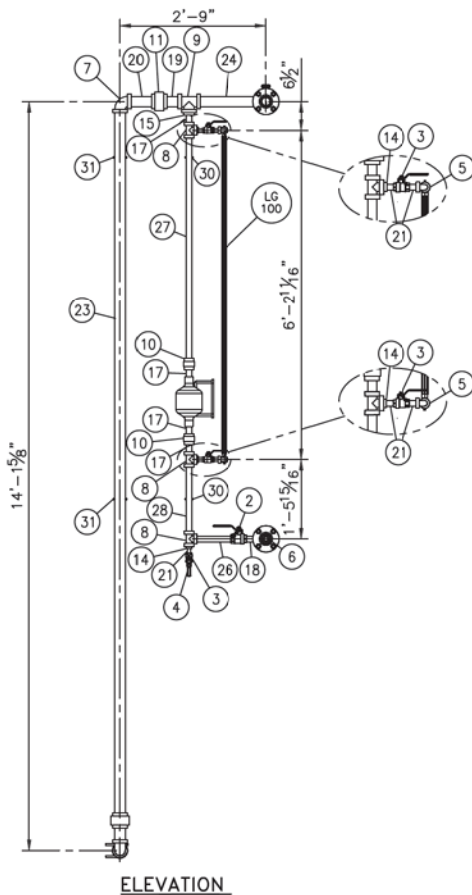
SCALE: 1 1/2"=1'-0" DES: 10616 102654

REV	DESCRIPTION	DATE	BY	CHK	INSET	REV
1	CORRECT DIMENSIONS	07/09/20	ALW	TD		
2	ISSUED FOR CONSTRUCTION	08/16/20	ALW	TD		
3	CHANGES INCORPORATED					
LNHTR0063					sheet 6 of 7	1



BILL OF MATERIAL			DESCRIPTION
ITEM	QTY	PART NO	
1	2	BLVLV3839	VALVE,BALL,RP,2.0,NPT,2PC,FLOATING,A105,BODY,1500,CWP,RPTFE,SEAT,RPTFE,SEAL,LATCH,LOCK,APOLLO,73A10801A-27
2	1	BLVLV3840	VALVE,BALL,RP,1.0,NPT,2PC,FLOATING,A105,BODY,2000,CWP,RPTFE,SEAT,RPTFE,SEAL,LATCH,LOCK,APOLLO,73A10501A-27
3	3	BLVLV3841	VALVE,BALL,RP,0.500,NPT,2PC,FLOATING,A105,BODY,2000,CWP,RPTFE,SEAT,RPTFE,SEAL,LATCH,LOCK,APOLLO,73A10301A-27
4	1	FTINP0948	FITTING,PLUG,NPT,105,FS,HEX,HEAD,0.500,SA,105,DOMESTIC,MATERIAL
5	2	FTINP0951	FITTING,NPT,ELBOW,90°105,FS,0.3M,0.500,SA,105,DOMESTIC,MATERIAL
6	1	FTINP0952	FITTING,NPT,ELBOW,90°105,FS,0.3M,1.000,SA,105,DOMESTIC,MATERIAL
7	3	FTINP0953	FITTING,NPT,ELBOW,90°105,FS,0.3M,2.000,SA,105,DOMESTIC,MATERIAL
8	3	FTINP0955	FITTING,NPT,TEE,105,FS,0.3M,1.000,SA,105,DOMESTIC,MATERIAL
9	1	FTINP0956	FITTING,NPT,TEE,105,FS,0.3M,2.000,SA,105,DOMESTIC,MATERIAL
10	2	FTINP0957	FITTING,NPT,UNION,HEX,105,FS,0.3M,1.000,SA,105,DOMESTIC,MATERIAL
11	2	FTINP0958	FITTING,NPT,UNION,HEX,105,FS,0.3M,2.000,SA,105,DOMESTIC,MATERIAL
12	1	FLGRF8417	FLANGE,RF,THREADED,ANSI,0150#,02.000,X,1.000,NPT,SA,105,DOMESTIC,MATERIAL
13	1	FLGRF8418	FLANGE,RF,THREADED,ANSI,0150#,02.000,X,2.000,NPT,SA,105,DOMESTIC,MATERIAL
14	3	FTGTH0191	FITTING,NPT,BUSHING,FS,0.3M,1.000,X,0.500,SA,105,DOMESTIC,MATERIAL
15	1	FTGTH0192	FITTING,NPT,BUSHING,FS,0.3M,2.000,X,1.000,SA,105,DOMESTIC,MATERIAL
16	2	GASKET0045	GASKET,SPRIL,WOUND,0150#,02.000,304,SS

BILL OF MATERIAL			DESCRIPTION
ITEM	QTY	PART NO	
17	5	NIPPO640	NIPPLE,PIPE,TBE,1.000,X,0.3,0.00,WT,0.179,S,080,XH,SA,106B,DOMESTIC,MATERIAL
18	1	NIPPO643	NIPPLE,PIPE,TBE,1.000,X,0.4,0.00,WT,0.179,S,080,XH,SA,106B,DOMESTIC,MATERIAL
19	3	NIPPO648	NIPPLE,PIPE,TBE,2.000,X,0.4,0.00,WT,0.218,S,080,XH,SA,106B,DOMESTIC,MATERIAL
20	1	NIPPO649	NIPPLE,PIPE,TBE,2.000,X,0.6,0.00,WT,0.218,S,080,XH,SA,106B,DOMESTIC,MATERIAL
21	5	NIPPO651	NIPPLE,PIPE,TBE,0.500,X,0.2,0.00,WT,0.187,S,160,SA,106B,DOMESTIC,MATERIAL
22	1	PIPE0898	PIPE,SA,106B,SMLS,02.000,WT,0.218,S,080,XH,DOMESTIC,MATERIAL
23	1	PIPE0898	PIPE,SA,106B,SMLS,02.000,WT,0.218,S,080,XH,DOMESTIC,MATERIAL
24	1	PIPE0898	PIPE,SA,106B,SMLS,02.000,WT,0.218,S,080,XH,DOMESTIC,MATERIAL
25	1	PIPE0898	PIPE,SA,106B,SMLS,02.000,WT,0.218,S,080,XH,DOMESTIC,MATERIAL
26	1	PIPE0902	PIPE,SA,106B,SMLS,01.000,WT,0.179,S,080,XH,DOMESTIC,MATERIAL
27	1	PIPE0902	PIPE,SA,106B,SMLS,01.000,WT,0.179,S,080,XH,DOMESTIC,MATERIAL
28	1	PIPE0902	PIPE,SA,106B,SMLS,01.000,WT,0.179,S,080,XH,DOMESTIC,MATERIAL
29	8	STUDS0008	STUD,B7,0.625,X,0.3,250,SA193,W/2H,NUTS,ZINC
30	3	UBOLT013	UBOLT,PIPE,01.000,SHANK,0.375,NC,ZINC,STD
31	2	UBOLT046	UBOLT,PIPE,02.000,SHANK,0.375,NC,ZINC,STD



LSL-100 & LG-100 DETAIL
SCALE 1" = 1'-0"

ISSUED
FOR CONSTRUCTION
3/11/20 at 7/9/20 @ 12:55pm

		www.kwiinc.com		1-844-594-4626	
		DATE	DRAWN	CHECKED	APPROVED
04/23/20		FE	TD		
CLIENT					
DUKE ENERGY					
TITLE					
6.0MM BTU/HR INDIRECT LINE HEATER GENERAL ARRANGEMENT					
SCALE: 1 1/2"=1'-0"		SHEET		10616 102654	
1 CORRECT DIMENSIONS		07/08/20		A.M. TO	
2 REVISION FOR CONSTRUCTION		04/16/20		A.M. TO	
REV		DATE		BY	
DESCRIPTION		DATE		BY	
LNHTR0063		04/16/20		A.M. TO	
SHEET 7 OF 7		REV		1	

ISSUED FOR
CONSTRUCTION

DUKE ENERGY, CV-203 & CV-204

16" x 8" FC SKID

ISSUED FOR CONSTRUCTION
05/13/2020

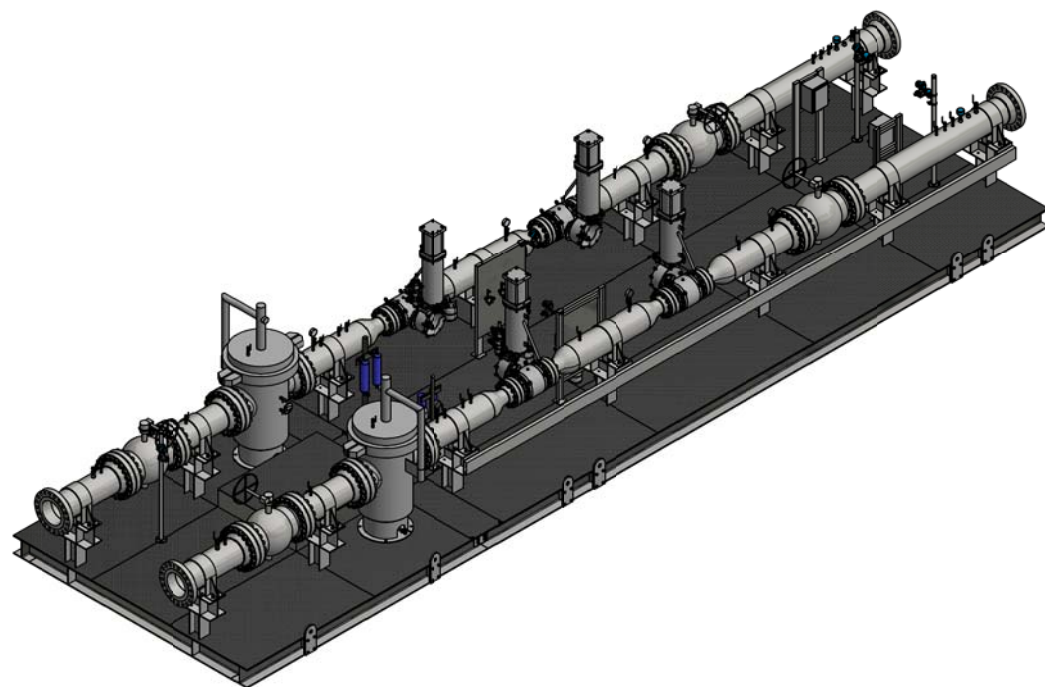
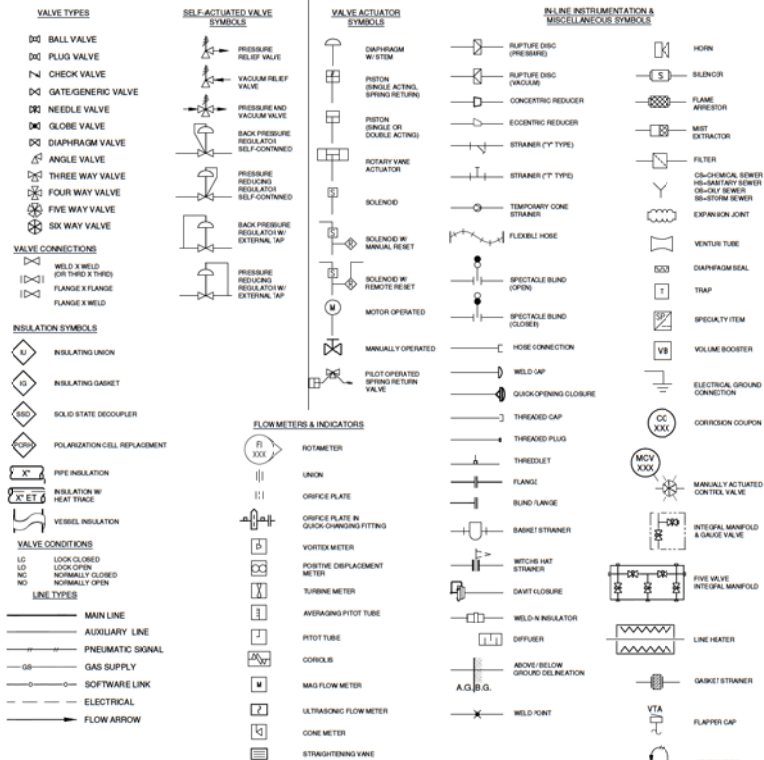


TABLE OF CONTENTS				
DWG #	SIZE	NAME	REV	DATE
7179-200-001	ARCH D	P&ID - STANDARD NOMENCLATURE	0	05/13/2020
7179-201-001	ARCH D	P&ID - CONTROL VALVE SKID CV-203 & CV-204	0	05/13/2020
7179-202-001	ARCH D	P&ID - INSTRUMENT SUPPLY SYSTEM	0	05/13/2020
7179-500-001	ARCH D	STRUCTURAL - SKID LAYOUT	0	05/13/2020
7179-500-002	ARCH D	STRUCTURAL - DIAMOND PLATE LAYOUT	0	05/13/2020
7179-501-001	ARCH D	STRUCTURAL - COMPONENT DETAILS	0	05/13/2020
7179-501-002	ARCH D	STRUCTURAL - TUBING SUPPORT & FILTER POLE DETAILS	0	05/13/2020
7179-600-001	ARCH D	MECHANICAL - SKID LAYOUT	0	05/13/2020
7179-600-002	ARCH D	MECHANICAL - SKID SECTIONS	0	05/13/2020
7179-700-001	ARCH D	MECHANICAL - SPOOL DETAIL (1)	0	05/13/2020
7179-700-002	ARCH D	MECHANICAL - SPOOL DETAIL (2)	0	05/13/2020
7179-700-003	ARCH D	MECHANICAL - INSTRUMENT PANEL DETAIL	0	05/13/2020
7179-1200-100	ARCH D	HAZARDOUS LOCATION - FLOW CONTROL SKID	0	05/12/2020
7179-1200-200	ARCH D	GROUND PLAN - FLOW CONTROL SKID	0	05/12/2020
7179-1300-100	ARCH D	DC CONDUIT LAYOUT - FLOW CONTROL SKID	0	05/12/2020
7179-1300-110	ARCH D	DC JUNCTION BOX LAYOUT - "RJB203"	0	05/12/2020
7179-1300-111	ARCH D	DC JUNCTION BOX LAYOUT - "RJB204"	0	05/12/2020
7179-1400-100	ARCH D	LOOP DIAGRAM - FLOW CONTROL SKID	0	05/12/2020

PIPING SYMBOLS



GENERAL INSTRUMENT OR FUNCTION SYMBOLS

LOCATION / ACCESSIBILITY	DISCRETE INSTRUMENTS	SHARED DISPLAY, SHARED CONTROL	INPUT TO COMPUTER OR TELEMETRY
		PRIMARY CONTROL SYSTEM / BASIC PROCESS CONTROL SYSTEM	SECONDARY CONTROL SYSTEM / SAFETY INSTRUMENT SYSTEM
FIELD MOUNTED			
PRIMARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR			
PRIMARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR			
AUXILIARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR			
AUXILIARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR			

DI - DISCRETE INPUT
DO - DISCRETE OUTPUT
AI - ANALOG INPUT
AO - ANALOG OUTPUT
MB - MODBUS CONNECTIVITY
ETH - ETHERNET
P - PULSE

IDENTIFICATION LETTERS

ANSI / ISA 5.1-2009, TABLE 4.1

COLUMN 1	COLUMN 2	COLUMN 3	COLUMN 4	COLUMN 5
MEASURED / INITIATING VARIABLE	VARIABLE MODIFIER	READOUT / PASSIVE FUNCTION	OUTPUT / ACTIVE FUNCTION	FUNCTION MODIFIER
A ANALYSIS		ALARM		
B BURNER, COMBUSTION				
C			CONTROL	CLOSE
D	DIFFERENCE, DIFFERENTIAL			DEVIATION
E VOLTAGE		SENSOR, PRIMARY ELEMENT		
F FLOW, FLOW RATE	RATIO			
G		GLASS, GAUGE, VIEWING DEVICE		
H HAND				HIGH
I CURRENT		INDICATE		
J POWER		SCAN		
K TIME, SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L LEVEL		LIGHT		LOW
M				MIDDLE, INTERMEDIATE
N				
O		ORIFICE, RESTRICTION		OPEN
P PRESSURE		POINT (TEST CONNECTION)		
Q QUANTITY	INTEGRATE, TOTALIZE	INTEGRATE, TOTALIZE		
R RADIATION	RELIEF	RECORD		RUN
S SPEED, FREQUENCY	SAFETY		SWITCH	STOP
T TEMPERATURE			TRANSMIT	
U MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V VIBRATION, MECHANICAL ANALYSIS	VACUUM		VALVE, DAMPER, LOUVER	
W WEIGHT, FORCE		WELL, PROBE		
X UNCLASSIFIED	X-AXIS	ACCESSORY DEVICES, UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y EVENT, STATE, PRESENCE	Y-AXIS	RELAY	AUXILIARY DEVICES	
Z POSITION, DIMENSION	Z-AXIS, SAFETY INSTRUMENTED SYSTEM		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TYPICAL INSTRUMENT ABBREVIATION INDEX

AAH ANALYZER ALARM HIGH	LS LEVEL SWITCH	PSE RUPTURE DISK
AAHH ANALYZER ALARM HIGH SHUTDOWN	LSHL LEVEL CONTROL SWITCH	PSH PRESSURE SWITCH HIGH ALARM
AAL ANALYZER ALARM LOW	LSH LEVEL SWITCH HIGH ALARM	PSHL PRESSURE SWITCH HIGH-LOW
AE ANALYZER ELEMENT	LSHH LEVEL SWITCH HIGH-HIGH ALARM	PSLL PRESSURE SWITCH LOW-ALARM
AP ANALYZER PROBE	LSL LEVEL SWITCH LOW ALARM	PRV PRESSURE RELIEF VALVE
AI ANALYZER INDICATOR	LT LEVEL TRANSMITTER	PTV PRESSURE TRANSMITTER
ASH ANALYZER SWITCH HIGH	LCV LEVEL CONTROL VALVE	PRY PRESSURE RELAY
ASL ANALYZER SWITCH LOW	MO MOISTURE GAUGE	SAH SPEED SWITCH HIGH ALARM
ATL ANALYZER TRANSMITTER	MCV MANUAL CONTROL VALVE	SC SPEED CONTROL
AY ANALYZER RELAY	PAH PRESSURE ALARM HIGH	SV SOLENOID VALVE
FA FLOW ALARM	PAL PRESSURE ALARM LOW	SVC SOLENOID VALVE CLOSED
FAH FLOW ALARM HIGH	PC PRESSURE CONTROLLER	SVO SOLENOID VALVE OPEN
FAL FLOW ALARM LOW	PCH PRESSURE CONTROL HIGH	TE TEMPERATURE ELEMENT
FCV FLOW CONTROL VALVE	PCL PRESSURE CONTROL LOW	TI TEMPERATURE INDICATOR
FE FLOW ELEMENT	PCV PRESSURE CONTROL VALVE	TTV TEMPERATURE INDICATING TRANSMITTER
FI FLOW INDICATOR	PDH DIFFERENTIAL PRESSURE ALARM HIGH	TSL TEMPERATURE SWITCH LOW ALARM
FIC FLOW INDICATOR CONTROLLER	PDAL DIFFERENTIAL PRESSURE ALARM LOW	TT TEMPERATURE TRANSMITTER
FS FLOW SWITCH	PDL DIFFERENTIAL PRESSURE ELEMENT	TV TEMPERATURE CONTROL VALVE
FR FLOW RELAY	PDI DIFFERENTIAL PRESSURE INDICATOR	TW THERMOWELL
FT FLOW TRANSMITTER	PDIC DIFFERENTIAL PRESSURE INDICATING CONTROLLER	UT MULTIVARIABLE TRANSMITTER
FY FLOW RELAY	PDS DIFFERENTIAL PRESSURE INDICATING SWITCH	UIT MULTIVARIABLE INDICATING TRANSMITTER
HIC HAND INDICATING CONTROL	PDS DIFFERENTIAL PRESSURE SWITCH	ZAC LIMIT SWITCH (CLOSED) ALARM
HS HAND SWITCH	PDSH DIFFERENTIAL PRESSURE SWITCH HIGH	ZAH EXCESSIVE LIMIT OR DEVIATION ALARM
HSH HAND SAFETY SWITCH	PDSL DIFFERENTIAL PRESSURE SWITCH LOW	ZAO LIMIT SWITCH (OPEN) ALARM
LAH LEVEL ALARM HIGH	PDT DIFFERENTIAL PRESSURE TRANSMITTER	ZIC POSITION INDICATOR CLOSED
LAL LEVEL ALARM LOW	PDT DIFFERENTIAL PRESSURE INDICATING TRANSMITTER	ZIO POSITION INDICATOR OPEN
LC LEVEL CONTROLLER	PE PRESSURE ELEMENT	ZS LIMIT SWITCH
LCV LEVEL CONTROL VALVE	PI PRESSURE INDICATOR	ZSC LIMIT SWITCH CLOSED
LG LEVEL GAUGE	PIC PRESSURE INDICATING CONTROLLER	ZSO LIMIT SWITCH OPEN
LI LEVEL INDICATOR	PIV PRESSURE INDICATING TRANSMITTER	ZT POSITION TRANSMITTER
LIC LEVEL INDICATING CONTROLLER	PS PRESSURE SWITCH	ZV TRAVEL POSITION ACTUATOR

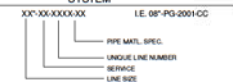
PIPE MATERIAL SPECIFICATIONS

WTR 285 PSIG	150 RF	WATER DRAIN
AC 285 PSIG	150 RF	HYDROCARBON GAS
CC 740 PSIG	300 RF	HYDROCARBON GAS
BC 1488 PSIG	600 RF	HYDROCARBON GAS
DC 2298 PSIG	900 RF	HYDROCARBON GAS
IA 200 PSIG	3000 NPT	INSTRUMENT AIR
SA 50 PSIG		SAMPLE SYSTEM

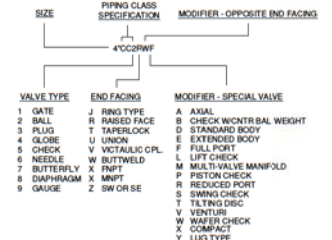
PIPING SERVICE DESIGNATION

AB BREATHING AIR	OH HYDRAULIC OIL
CA AMINE	OS SEAL OIL
CC CORROSION INHIBITOR	PG PROCESS GAS
CG CONTROL GAS	PL PROCESS LIQUID
CM METHANOL	PV PROCESS VAPOR
CWR COOLING WATER RETURN	PW PRODUCED WATER
CWS COOLING WATER SUPPLY	PX WELL FLOW LINE OF PRODUCTION
DC CLOSED DRAINS	SES EMERGENCY SHUTDOWN SIGNAL
DO OPEN DRAIN	TAW AUXILIARY WATER
ELW ENGINE JACKET WATER	UA UTILITY AIR
EG GAS EXHAUST	UG UTILITY GAS
EI ENGINE AIR INTAKE	UW UTILITY WATER
ET TURBINE EXHAUST	VA ATMOSPHERIC VENT
FG FUEL GAS	VB BLOWDOWN VENT
FW FIRE WATER	VF VENT TO FLAME
GL AMBITROL	VH HIGH PRESSURE VENT
HD HIGH PRESSURE DRAIN	VL LOW PRESSURE VENT
IA INSTRUMENT AIR	VR RELIEF VENT
IG INSTRUMENT GAS	WN DEMINERALIZED WATER
LO LUBE OIL	WP POTABLE WATER
NI INERT / PURGE GAS	WW WASTE WATER

LINE NUMBERING SYSTEM



VALVE IDENTIFICATION



GENERAL NOTES:

- BUILT TO DUKE STANDARDS & SPECIFICATION
- ASME B31.3
- DOT CLASS 4 DESIGN
- DESIGN FACTOR: 0.2
- CORROSION ALLOWANCE: 0.00
- 100% RADIOGRAPHIC INSPECTION
- DESIGN PRESSURE: 500 PSIG
- DESIGN TEMPERATURE RANGE: -20° TO 120°F
- DESIGN FLOW: 12 TO 228 MMSCFD
- HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

- INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
- OUTLET PRESSURE: 170 PSIG
- OPERATING TEMPERATURE: 32° - 120°F
- VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
- IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
- DUKE TO ROUTE LOW PRESSURE VENTS 10' AWAY FROM BUILDING EYE AND HIGH PRESSURE VENTS 5'-1' AWAY FROM BUILDING

DRAWING STATUS:

ISSUED FOR CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
1	ISSUED FOR CONSTRUCTION	WAT	TPR	NPF	05/13/2020



CENERGY
ENGINEERING (MANUFACTURING) CONSTRUCTION

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MILTON, WV 25841
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DUKE - CV203/204 C350 PROJECT - NORWOOD STATION PIPING & INSTRUMENTATION DIAGRAM STANDARD NOMENCLATURE	
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO
DRAWING NUMBER: 7179-200-001	REVISION: 0
DRAWING SCALE: NONE	SHEET 1 OF 1

XE-203A / XE-204A
PCO SERIES 30" H
3" DIAMETER SHELL
W/ 16" FLANGE CONNECTIONS
MODEL# 203A-010-300-000
EFFICIENCY: 99.98%
SOLIDS 5 MICRONS AND LARGER
INLINE 3"RY GAS
CARTRIDGE FILTER

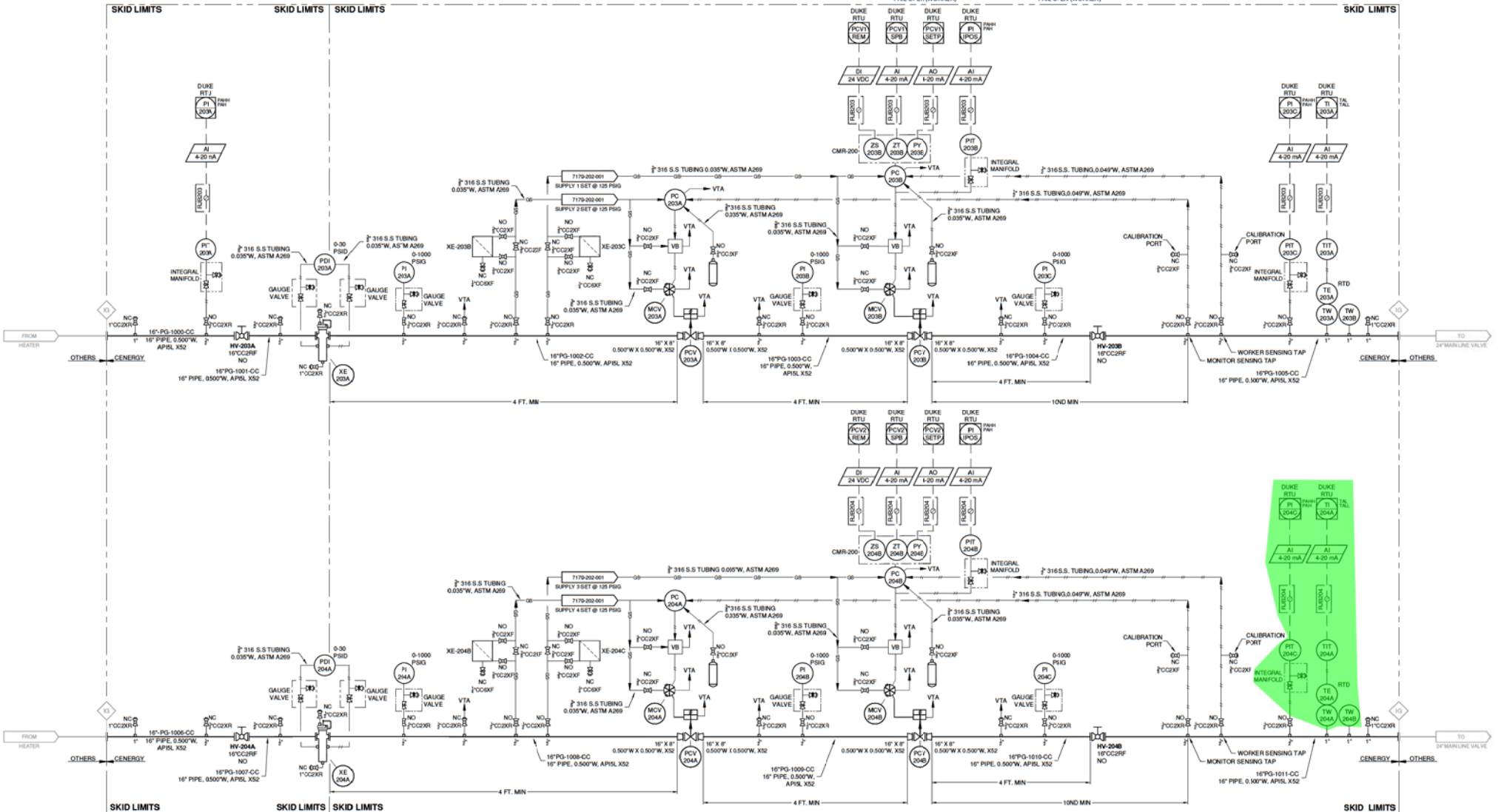
XE-203B / XSC / XE-204B / 204C
IMC FDS FILTER

PCV-203A
8" ANSI 600 ROTARY BALL VALVE
VRG PRCV-STIP, W/ RHPA ACTUATOR
(PC 203A) VRG VPC-700-SA-SV-ID PILOT
W/ ORANGE CONTROL SPRING 150-520 PSIG,
SET @ 175 PSIG
BIFOLD VOLUME BOOSTER
(MCV 203A) VMO MANUAL CONTROL
VALVE OVERRIDE
LEFT HAND MOUNTED
FAIL OPEN (MONITOR)

PCV-204A
8" ANSI 600 ROTARY BALL VALVE
VRG PRCV-STIP, W/ RHPA ACTUATOR
(PC 204A) VRG VPC-700-SA-SV-ID PILOT
W/ ORANGE CONTROL SPRING 150-520 PSIG,
SET @ 170 PSIG
(VB) BIFOLD VOLUME BOOSTER
(MCV 204A) VMO MANUAL CONTROL
VALVE OVERRIDE
RIGHT HAND MOUNTED
FAIL OPEN (MONITOR)

PCV-203B
8" ANSI 600 ROTARY BALL VALVE
VRG PRCV-STIP, W/ RHPA ACTUATOR
(PC 203B) VRG VPC-700-SA-SV-ID PILOT
W/ ORANGE CONTROL SPRING 150-520 PSIG,
SET @ 170 PSIG
(VB) BIFOLD VOLUME BOOSTER
CMR-200 ELECTRONIC SET POINT CONTROL
(MCV 203B) VMO MANUAL CONTROL
VALVE OVERRIDE
RIGHT HAND MOUNTED
FAIL OPEN (WORKER)

PCV-204B
8" ANSI 600 ROTARY BALL VALVE
VRG PRCV-STIP, W/ RHPA ACTUATOR
(PC 204B) VRG VPC-700-SA-SV-ID PILOT
W/ ORANGE CONTROL SPRING 150-520 PSIG,
SET @ 170 PSIG
(VB) BIFOLD VOLUME BOOSTER
CMR-200 ELECTRONIC SET POINT CONTROL
(MCV 204B) VMO MANUAL CONTROL
VALVE OVERRIDE
LEFT HAND MOUNTED
FAIL OPEN (WORKER)



- GENERAL NOTES:**
- BUILT TO DUKE STANDARDS & SPECIFICATION
 - ASME B31.8
 - DOT CLASS 4 DESIGN
 - DESIGN FACTOR: 0.2
 - CORROSION ALLOWANCE: 0.00
 - 100% RADIOGRAPHIC INSPECTION
 - DESIGN PRESSURE: 500 PSIG
 - DESIGN TEMPERATURE RANGE: -20° TO 120°F
 - DESIGN FLOW: 12 TO 220 MMSCFD
 - HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
PIPING & INSTRUMENTATION DIAGRAM
CONTROL VALVE SKID

COUNTY/PARISH: HAMILTON COUNTY STATE: OHIO

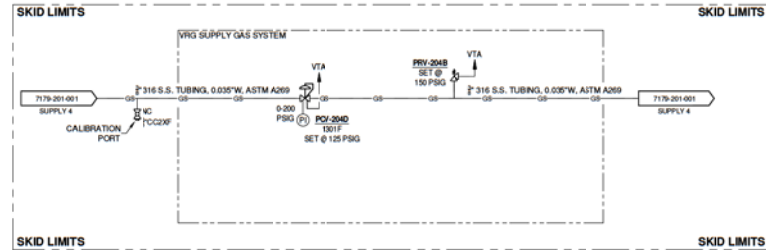
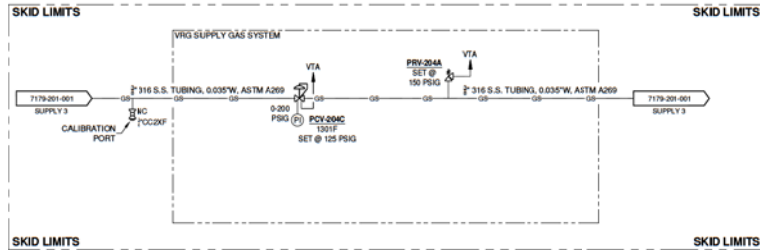
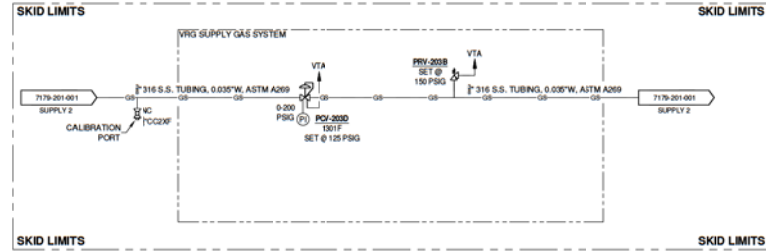
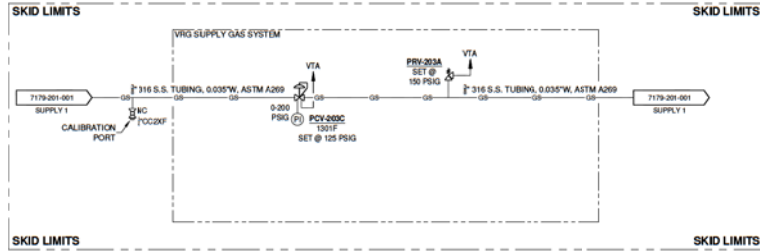
DRAWING NUMBER: 7179-201-001

DRAWING SCALE: NONE SHEET 1 OF 1

REVISION: 0

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VRG SUPPLY GAS SYSTEM
FISHER 1301F REGULATOR
REGO 9434 RELIEF VALVE - COLOR IDENTIFICATION: RED



- GENERAL NOTES:**
1. BUILT TO DUKE STANDARDS & SPECIFICATION
 2. ASME B31.8
 3. DOT CLASS 4 DESIGN
 4. DESIGN FACTOR: 0.2
 5. CORROSION ALLOWANCE: 0.00
 6. 100% RADIOGRAPHIC INSPECTION
 7. DESIGN PRESSURE: 500 PSIG
 8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
 9. DESIGN FLOW: 12 TO 228 MMSCFD
 10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
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15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 10' MIN AWAY FROM BUILDING EYE AND HIGH PRESSURE VENTS 5'-1' AWAY FROM BUILDING.

DRAWING STATUS:

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CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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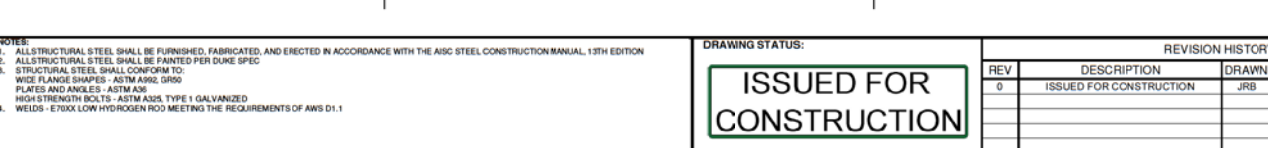
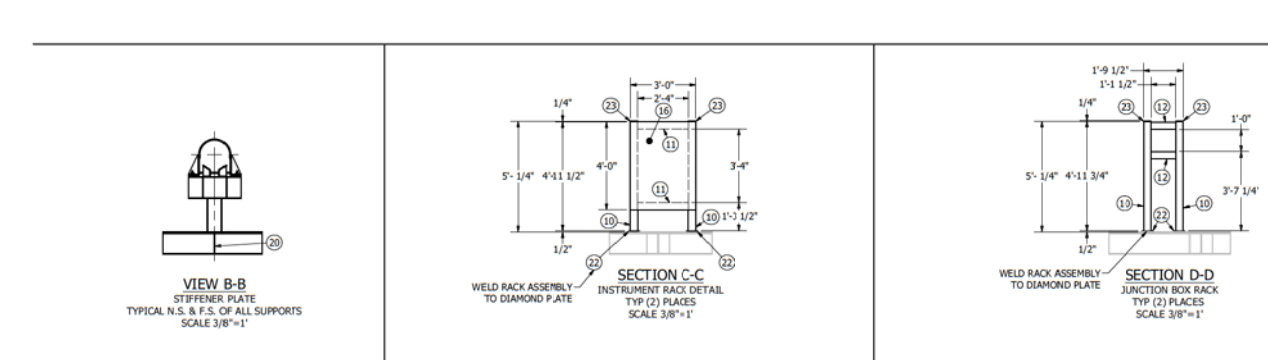
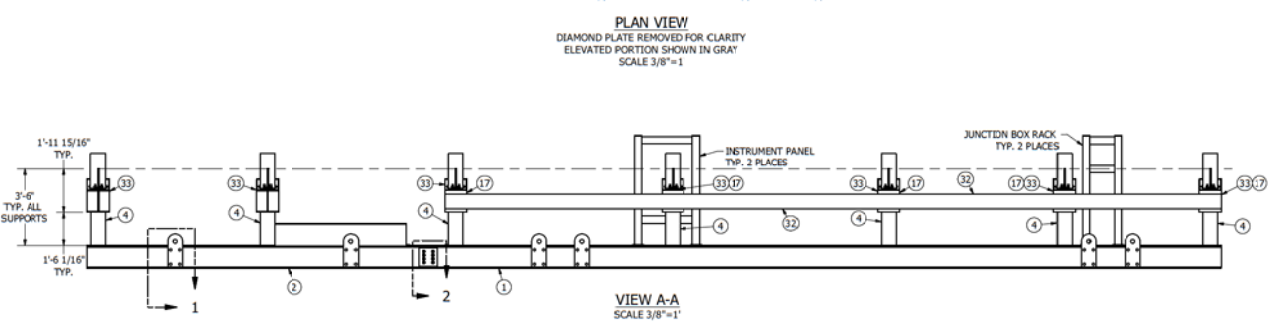
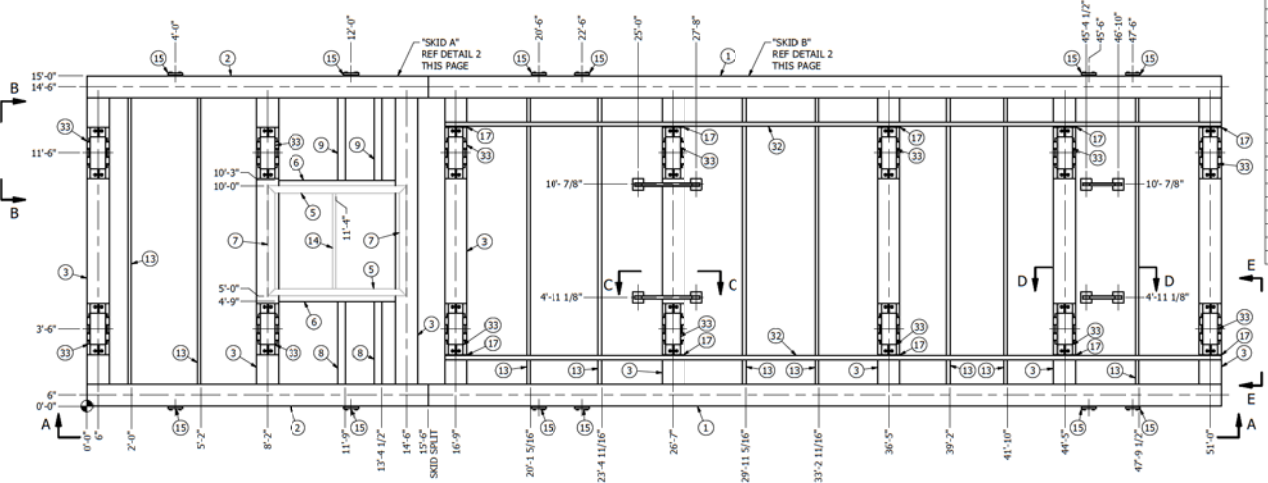
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
PIPING & INSTRUMENTATION DIAGRAM
INSTRUMENT SUPPLY SYSTEM

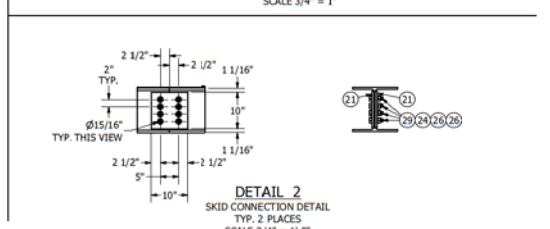
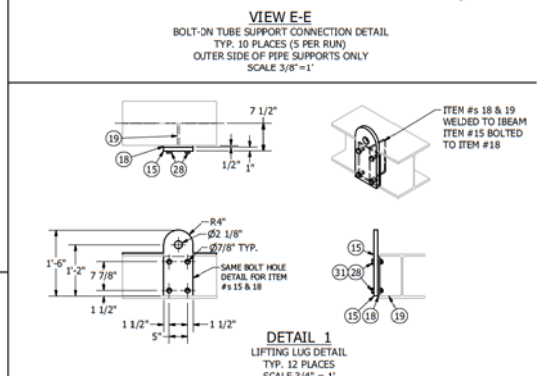
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-202-001		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	

SKIDS "A" & "B" SHOULD BE LIFTED INDEPENDENTLY, BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	2	W 12x65 WIDE FLANGE BEAM, ASTM A992
2	2	W 12x65 WIDE FLANGE BEAM, ASTM A992
3	8	W 12x65 WIDE FLANGE BEAM, ASTM A992
4	14	W 8x31 WIDE FLANGE BEAM, ASTM A992
5	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A36
6	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A992
7	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A36
8	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A992
9	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A992
10	8	C4 @ 7.25 LB/FT STRUCTURAL CHANNEL, ASTM A992
11	4	C4 @ 7.25 LB/FT STRUCTURAL CHANNEL, ASTM A992
12	4	C4 @ 7.25 LB/FT STRUCTURAL CHANNEL, ASTM A992
13	9	L2x2x1/8", STRUCTURAL ANGLE, ASTM A36
14	1	L2x2x1/8", STRUCTURAL ANGLE, ASTM A36
15	12	LIFTING LUG, 1'-6" x 8" x 1" TK, ASTM A36
16	2	PLATE, 4'-0" x 3'-0" x 1/8" TK, ALUMINUM 3003 GRADE
17	10	PLATE, 12 1/8" x 12" x 1/4" TK, ASTM A36
18	12	PLATE, 10 7/8" x 8" x 1/2" TK, ASTM A36
19	12	PLATE, 10 7/8" x 5 13/16" x 1/2" TK, ASTM A36
20	28	PLATE, 10 7/8" x 5 13/16" x 3/8" TK, ASTM A36

PARTS LIST		
ITEM	QTY	DESCRIPTION
21	4	PLATE, 10" x 10" x 1/2" TK, ASTM A36
22	8	PLATE, 6" x 6" x 1/2" TK, ASTM A36
23	8	PLATE, 4" x 1 3/4" x 1/4" THICK, ASTM A36
24	2C	NUT, 7/8-9 UNC, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
25	2C	NUT, 1/2-13 UNC, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
26	36	WASHER, 7/8" THREAD SIZE, TYPE 1 GALVANIZED, ASTM A325
27	4C	WASHER, 1/2" THREAD SIZE, TYPE 1 GALVANIZED, ASTM A325
28	48	ANSI B18.2.1 - 3/4-10 UNC - 3" HEX HEAD BOLT
29	16	BOLT, 7/8-9 UNC, 3" LONG, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
30	2C	BOLT, 1/2-13 UNC, 1 1/2" LONG, FULLY THREADED, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
31	12	DIAMOND PLATE FASTENER, DISC (X-PCP-FS/10) W/ QTY (1) DIX460 GR STUD (X-ST-GR M8/5 P8)
32	2	BOLT-ON TUBING SUPPORT ASSEMBLY, REF DWG # 7179-501-002
33	14	16" PIPE SUPPORT, EZ - LINE - WIDE FLANGE, SHIM BLOCK AND CLAMP, BARE, WSBC-01-NA
34	6	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 10' LONG
35	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 8'-2" LONG
36	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 8' LONG
37	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 7'-1" LONG
38	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 6'-4" LONG
39	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 1'-11" LONG



NOTES:
1. ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERRECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
2. ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
3. STRUCTURAL STEEL SHALL CONFORM TO:
WIDE FLANGE SHAPES - ASTM A992, GR50
PLATES AND ANGLES - ASTM A36
HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
4. WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1

DRAWING STATUS:

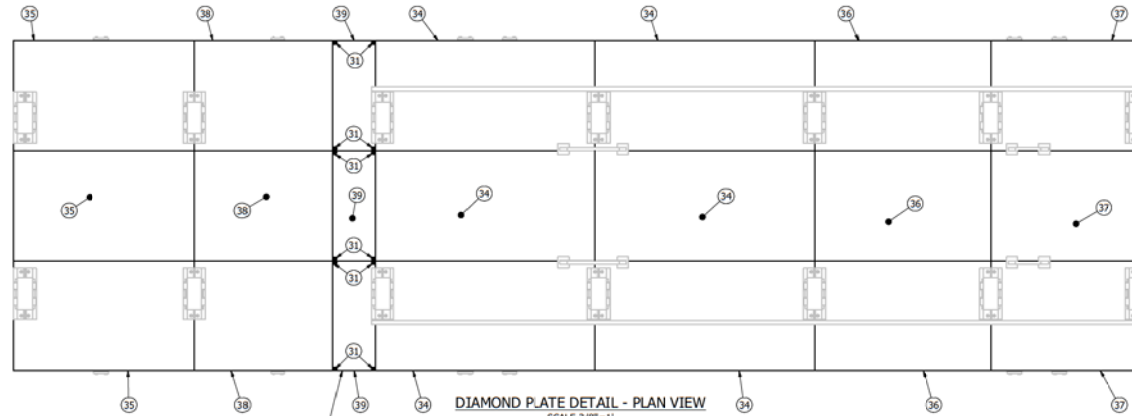
ISSUED FOR CONSTRUCTION

REVISION HISTORY					
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	ZAH	05/13/2020

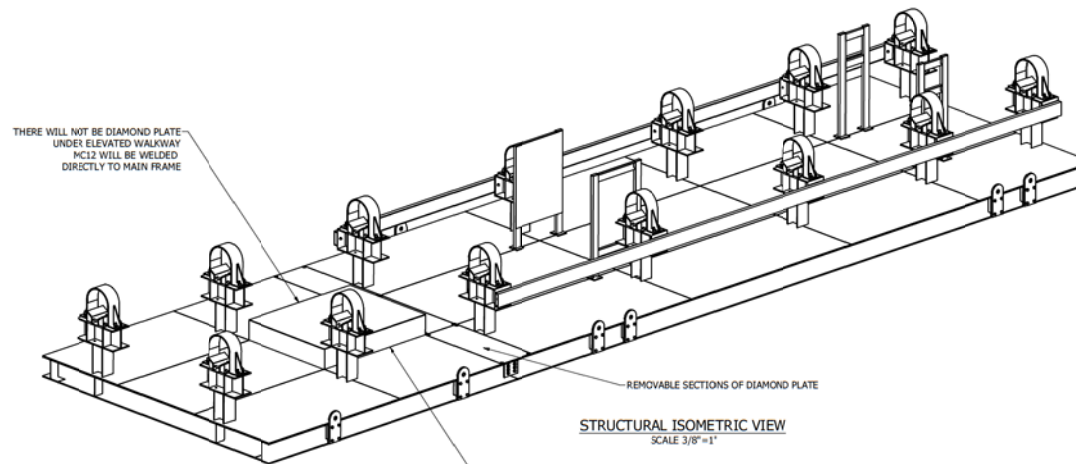
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PO BOX 455
MILTON, WV 25541
PHONE: 304-743-4200
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - STRUCTURAL
SKID LAYOUT
COUNTY/PARISH: HAMILTON COUNTY | STATE: OHIO
DRAWING NUMBER: 7179-500-001
DRAWING SCALE: 3/8"=1' | SHEET: 1 OF 1
REVISION: 0

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ITEM # 39
WILL BE SCREWED INTO PLACE
AFTER BOTH SKIDS HAVE BEEN SET



THERE WILL NOT BE DIAMOND PLATE
UNDER ELEVATED WALKWAY
MC12 WILL BE WELDED
DIRECTLY TO MAIN FRAME

REMOVABLE SECTIONS OF DIAMOND PLATE

WELD MAIN FRAME DIAMOND PLATE
TO MC12 AT ALL DIAMOND PLATE/MC12 INTERSECTIONS
EXCEPT ON REMOVABLE PORTION

- NOTES:
1. ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
 2. ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
 3. STRUCTURAL STEEL SHALL CONFORM TO:
WIDE FLANGE SHAPES - ASTM A992, GR50
PLATES AND ANGLES - ASTM A588
HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
 4. WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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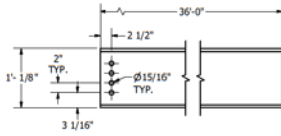
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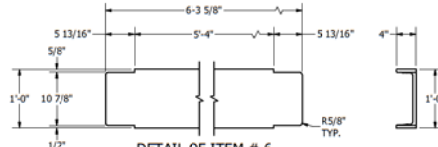
DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - STRUCTURAL
DIAMOND PLATE LAYOUT

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-500-002		0
DRAWING SCALE: 3/8"=1"	SHEET: 1 OF 1	

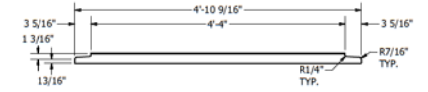
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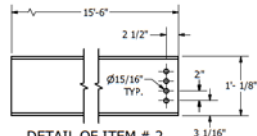
DETAIL OF ITEM # 1
ELEVATION VIEW
SCALE 1"=1'



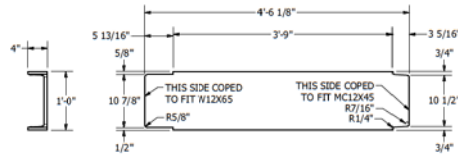
DETAIL OF ITEM # 6
ELEVATION VIEW
SCALE 1"=1'



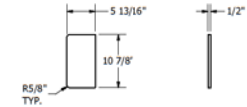
DETAIL OF ITEM # 14
SCALE 1"=1'



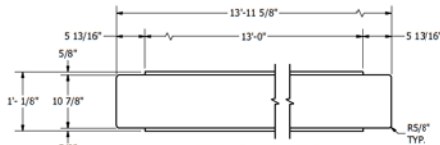
DETAIL OF ITEM # 2
ELEVATION VIEW
SCALE 1"=1'



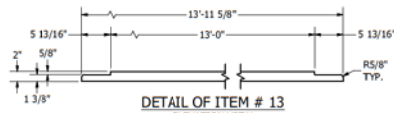
DETAIL OF ITEM # 9
ELEVATION VIEW
ITEM # 8 OPP. HAND
SCALE 1"=1'



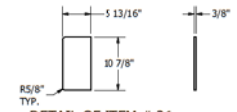
DETAIL OF ITEM # 20
ELEVATION VIEW
SCALE 1"=1'



DETAIL OF ITEM # 3
ELEVATION VIEW
SCALE 1"=1'



DETAIL OF ITEM # 13
ELEVATION VIEW
SCALE 1"=1'



DETAIL OF ITEM # 21
ELEVATION VIEW
SCALE 1"=1'

- NOTES**
1. ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
 2. ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
 3. STRUCTURAL STEEL SHALL CONFORM TO:
WIDE FLANGE SHAPES - ASTM A992, GR50
PLATES AND ANGLES - ASTM A572, TYPE 1 GALVANIZED
HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
 4. WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1
 5. ALL DETAILS THIS PAGE REF BOH ON DWG # 7175-500-001

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	ZAH	05/13/2020



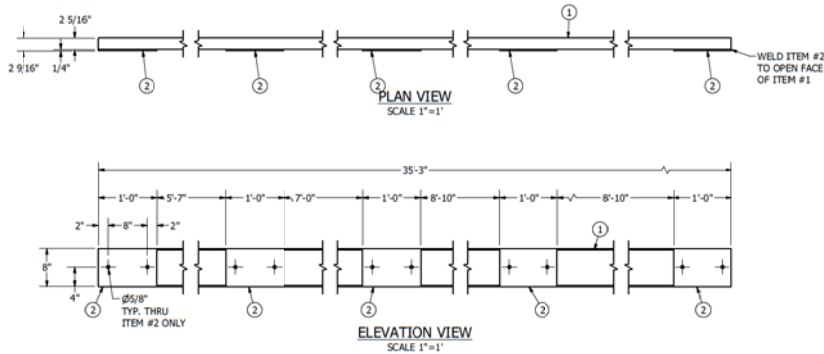
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - STRUCTURAL
STRUCTURAL COMPONENT DETAILS

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-501-001		0
DRAWING SCALE: 1"=1'	SHEET: 1 OF 1	

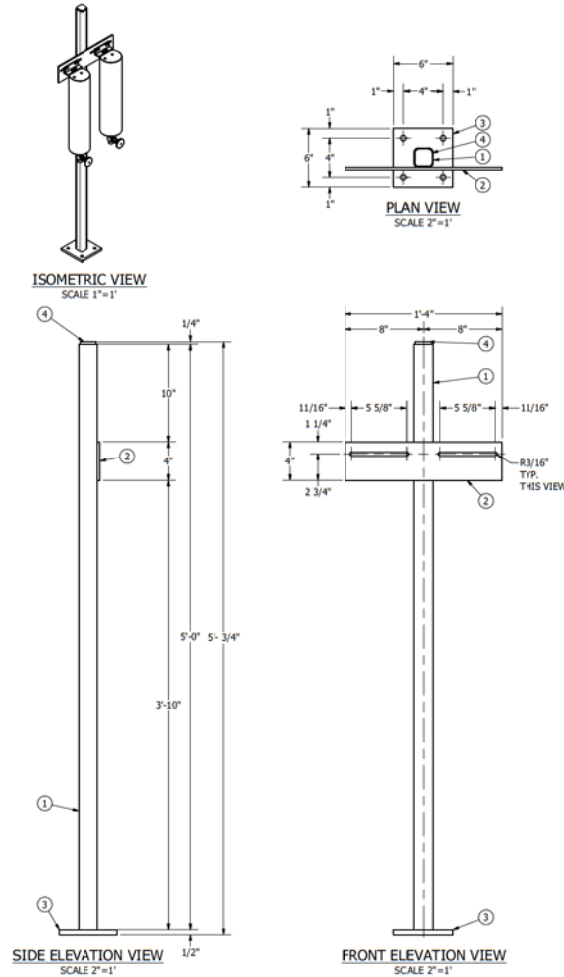
BOLT-ON TUBING SUPPORT		
ITEM	QTY	DESCRIPTION
1	1	CB @ 13.75 LB/FT STRUCTURAL CHANNEL, ASTM A992, 35'-3" LONG
2	5	PLATE, 8" x 12" x 1/4" THK, ASTM A36

QTY (2) REQUIRED



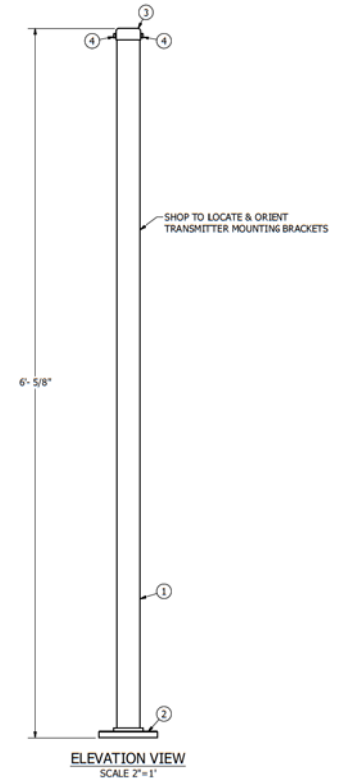
FILTER MOUNTING POLE		
ITEM	QTY	DESCRIPTION
1	1	AISC - 2 x 2 x 1/4 SQUARE TUBE - 60" LONG, ASTM A36
2	1	4" x 1/4" FLAT BAR STEEL, 16" LONG, SLOTTED PER DETAIL, ASTM A36
3	1	6" x 6" x 1/2", PLATE, ASTM A36
4	1	1-3/4" x 1-3/4" x 1/4" ASTM A36 STEEL PLATE

QTY (2) REQUIRED



TRANSMITTER MOUNTING POLE		
ITEM	QTY	DESCRIPTION
1	1	2" PIPE, 0.218" W, ASTM A106 GRB, GALVANIZED, TOE x POE, 6 FT LONG
2	1	2" FLANGE, FF, NPT, GALVANIZED
3	1	2" CAP, SLP ON
4	2	1/4" HEX HEAD SELF TAPPING SCREW, 3/4" LONG

QTY (3) REQUIRED



- NOTES:
- ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
 - ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
 - STRUCTURAL STEEL SHALL CONFORM TO:
 - WIDE FLANGE SHAPES - ASTM A992, GR50
 - PLATES AND ANGLES - ASTM A36
 - HIGH-STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
 - WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

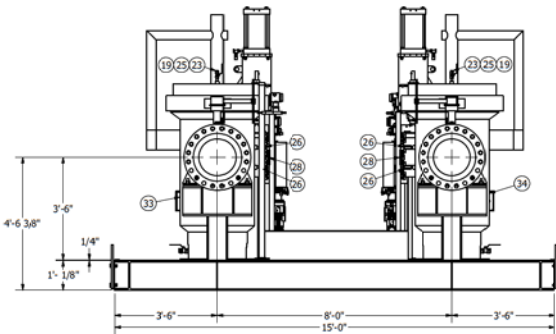
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	ZAH	05/13/2020



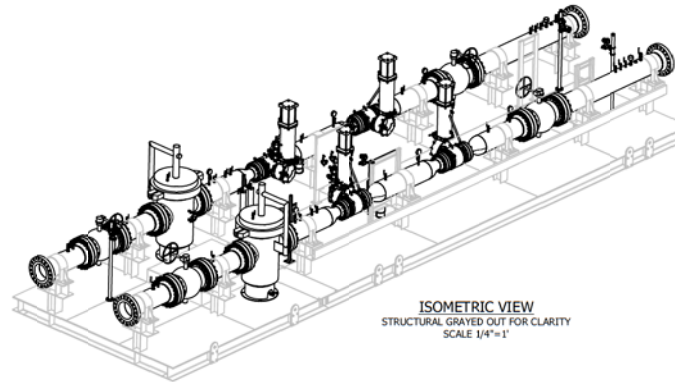
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DUKE - CV203/204 C350 PROJECT - NORWOOD STATION 16" x 8" FC SKID - STRUCTURAL TUBING SUPPORT & FILTER POLE DETAILS		
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-501-002		0
DRAWING SCALE: 2"=1'	SHEET: 1 OF 1	

SKIDS "A" & "B" SHOULD BE LIFTED INDEPENDENTLY. BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING. ESTIMATED SKID WEIGHT OF SKID "A": 31,000 LBS. ESTIMATED SKID WEIGHT OF SKID "B": 46,000 LBS.

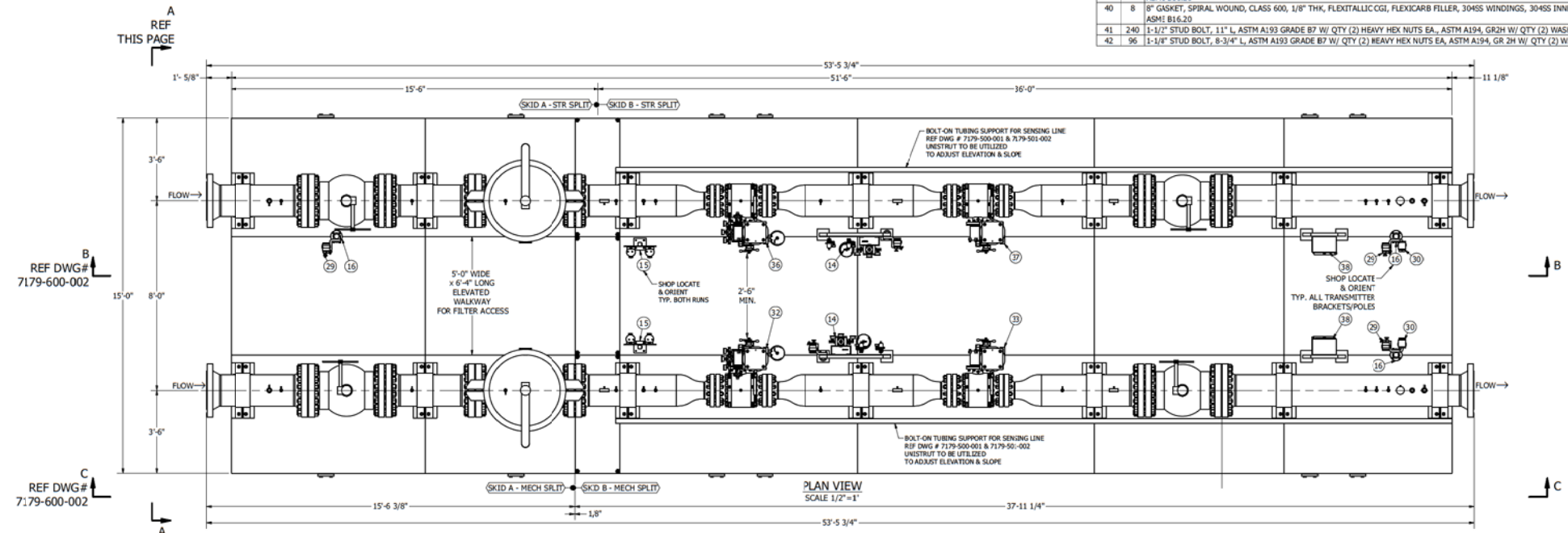


VIEW A-A
SCALE 1/2"=1'



ISOMETRIC VIEW
STRUCTURAL GRADED OUT FOR CLARITY
SCALE 1/4"=1'

ITEM		QTY		PARTS LIST	
				DESCRIPTION	
1	1	1	1	SPOOL # 7179-2-1, REF DWG # 7179-700-001	
2	1	1	1	SPOOL # 7179-2-2, REF DWG # 7179-700-001	
3	1	1	1	SPOOL # 7179-2-3, REF DWG # 7179-700-001	
4	1	1	1	SPOOL # 7179-2-5, REF DWG # 7179-700-001	
5	1	1	1	SPOOL # 7179-2-5, REF DWG # 7179-700-001	
6	1	1	1	SPOOL # 7179-2-6, REF DWG # 7179-700-001	
7	1	1	1	SPOOL # 7179-2-7, REF DWG # 7179-700-002	
8	1	1	1	SPOOL # 7179-2-8, REF DWG # 7179-700-002	
9	1	1	1	SPOOL # 7179-2-9, REF DWG # 7179-700-002	
10	1	1	1	SPOOL # 7179-2-10, REF DWG # 7179-700-002	
11	1	1	1	SPOOL # 7179-2-11, REF DWG # 7179-700-002	
12	1	1	1	SPOOL # 7179-2-12, REF DWG # 7179-700-002	
13	1	1	1	FC SKID STRUCTURAL ASSEMBLY, REF DWG # 7179-500-001	
14	2	2	2	INSTRUMENT PANEL ASSEMBLY, REF DWG # 7179-700-003	
15	2	2	2	FILTER STAND, REF DWG # 7179-501-002	
16	3	3	3	TRANSMITTER MOUNTING POLE, POLE TO BE SHOP FABRICATED, GALVANIZED, REF DWG # 7179-501-002	
17	2	2	2	1" PIPE NIPPLE, SCH 160, 8" LONG, SA/A-106, GRB, ASTM A733, TBE	
18	6	6	6	1" PIPE NIPPLE, SCH 160, 3" LONG, SA/A-106, GRB, ASTM A733, TBE	
19	28	28	28	1/2" PIPE NIPPLE, SCH 160, 3" LONG, SA/A-106, GRB, ASTM A733, TBE	
20	2	2	2	1" COUPLING, FNPT, 3000#, SA/A-105, ASME B16.11	
21	2	2	2	1" THREADED 90 ELBOW, FNPT, 3000#, SA/A-105, ASME B16.11	
22	6	6	6	1" HEX PLUG, 3000#, ASTM A105, FORGED STEEL, ASME B16.11, SOLID	
23	22	22	22	1/2" HEX PLUG, 3000#, ASTM A105, ASME B16.11, FORGED STEEL, SOLID	
24	6	6	6	1" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM	
25	28	28	28	1/2" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM	
26	10	10	10	GAUGE VALVE, 1/2" MNPT x 1/2" FNPT, REF ENGINEERED EQUIPMENT BOM	
27	6	6	6	1/2" PRESSURE GAUGE, REF ENGINEERED EQUIPMENT BOM	
28	2	2	2	DIFFERENTIAL PRESSURE INDICATOR, REF ENGINEERED EQUIPMENT BOM	
29	3	3	3	PRESSURE TRANSMITTER & POLE MOUNT, REF ENGINEERED EQUIPMENT BOM	
30	2	2	2	TEMPERATURE TRANSMITTER & PIPE MOUNT, REF ENGINEERED EQUIPMENT BOM	
31	2	2	2	TEMPERATURE THERMOWELL WITH RTD ROSE MOUNT, 1" NPT, REF ENGINEERED EQUIPMENT BOM	
32	2	2	2	1" THERMOWELL, REF ENGINEERED EQUIPMENT BOM	
33	1	1	1	VERTICAL FILTER, CV203, REF ENGINEERED EQUIPMENT BOM	
34	1	1	1	VERTICAL FILTER, CV204, REF ENGINEERED EQUIPMENT BOM	
35	4	4	4	16" BALL VALVE, RFFE, ANSI 600, FULL PORT W/ GEAR OPERATOR AND HANDWHEEL, REF ENGINEERED EQUIPMENT BOM	
36	2	2	2	8" CONTROL VALVE, ANSI 600, MONITOR, REF ENGINEERED EQUIPMENT BOM	
37	2	2	2	8" CONTROL VALVE, ANSI 600, WORKER, REF ENGINEERED EQUIPMENT BOM	
38	2	2	2	16" x 12" JUNCTION BOX	
39	12	12	12	16" GASKET, SPIRAL WOUND, CLASS 600, 1/8" THK, FLEXITALLIC CGI, FLEXICARB FILLER, 304SS WINDINGS, 304SS INNER RING, CS OUTER RING, ASME B16.20	
40	8	8	8	8" GASKET, SPIRAL WOUND, CLASS 600, 1/8" THK, FLEXITALLIC CGI, FLEXICARB FILLER, 304SS WINDINGS, 304SS INNER RING, CS OUTER RING, ASME B16.20	
41	240	240	240	1-1/2" STUD BOLT, 11" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR2H W/ QTY (2) WASHER, CADMIUM PLATED	
42	96	96	96	1-1/8" STUD BOLT, 8-3/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED	



GENERAL NOTES:

1. BUILT TO DUKE STANDARDS & SPECIFICATION
2. ASME B31.8
3. DDT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -32° - 120°F
14. VITA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VITA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

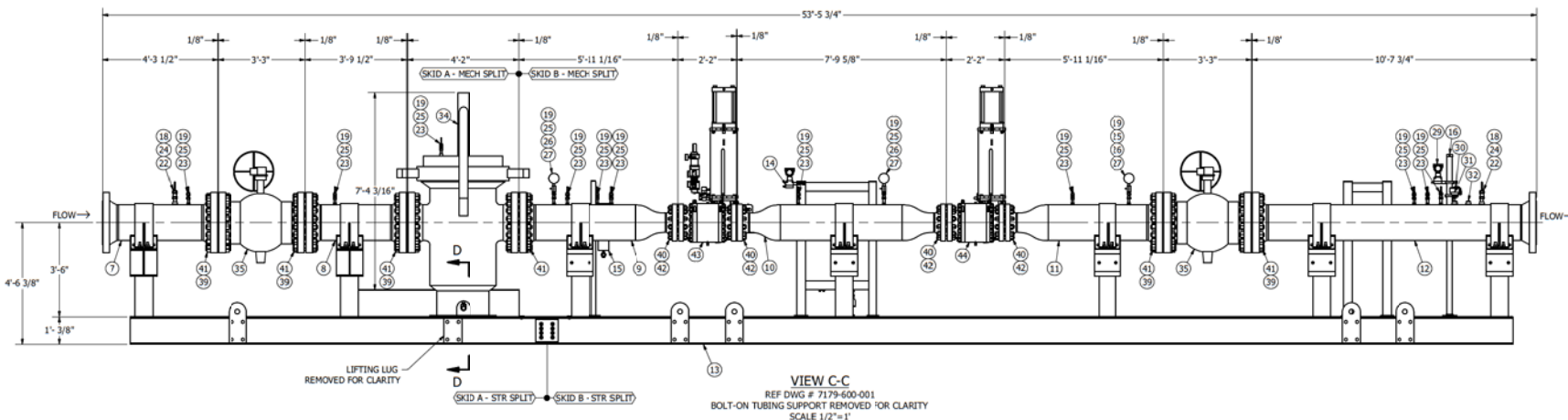
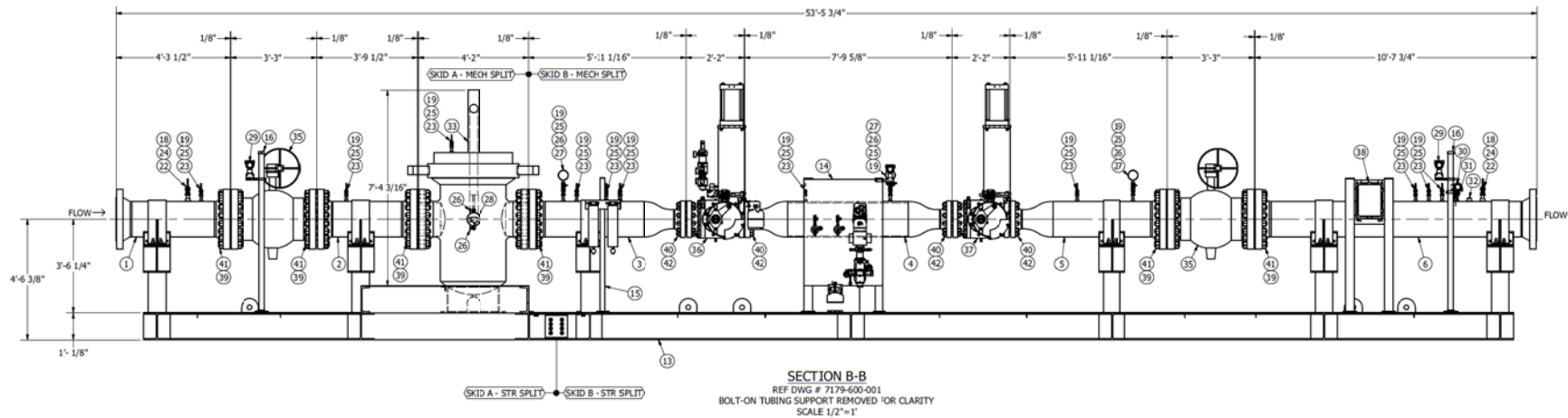
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SKID LAYOUT

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-600-001		0
DRAWING SCALE: 1/2"=1'	SHEET: 1 OF 1	



GENERAL NOTES:
1. BUILD TO DUKE STANDARDS & SPECIFICATION
2. ASME B31.8
3. DOT CLASS 4 DESIGN
4. DESIGN FACTOR 0.2
5. CORROSION ALLOWANCE 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -30° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

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REVISION HISTORY

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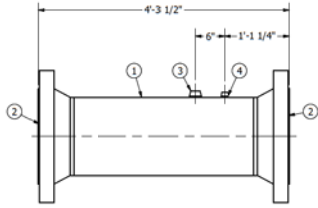


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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SKID SECTIONS

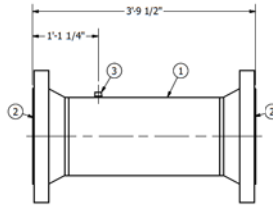
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-600-002		0
DRAWING SCALE: 1/2"=1'	SHEET: 1 OF 1	

SPOOL # 7179-2-1		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 4 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



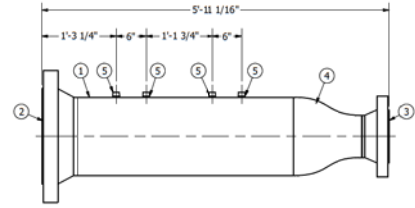
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-2		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 3 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



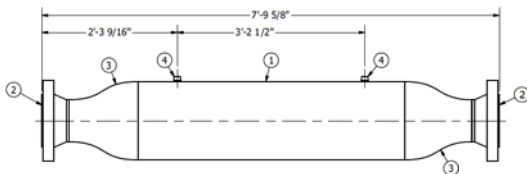
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-3		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 4 FT LONG
2	1	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	8" FLANGE, RFWN, ANSI 600, 1.500"W, A694 F52, MSS SP-44
4	1	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
5	4	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



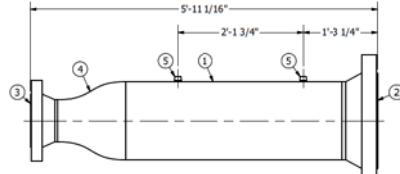
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-4		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 5 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	2	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
4	2	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



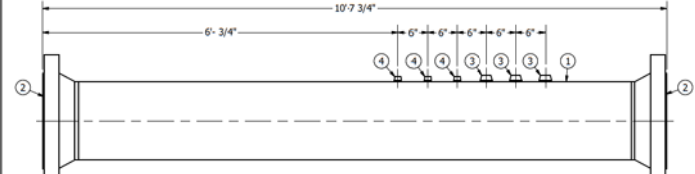
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-5		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 4 FT LONG
2	1	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	8" FLANGE, RFWN, ANSI 600, 1.500"W, A694 F52, MSS SP-44
4	1	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
5	2	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-6		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 10 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	3	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

- GENERAL NOTES:**
1. BUY TO DUE STANDARDS & SPECIFICATION
 2. ASME B31.8
 3. DIT CLASS 4 DESIGN
 4. DESIGN FACTOR: 0.2
 5. CORROSION ALLOWANCE: 0.00
 6. 100% RADIOGRAPHIC INSPECTION
 7. DESIGN PRESSURE: 500 PSI
 8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
 9. DESIGN FLOW: 12 TO 228 MMSCFD
 10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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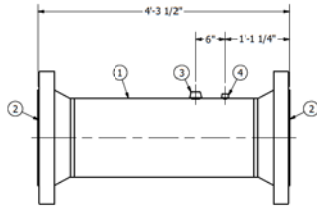


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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SPOOL DETAIL (1)

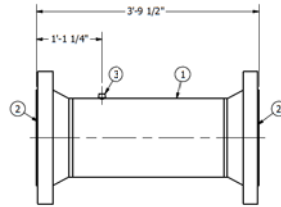
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-700-001		0
DRAWING SCALE: 1"=1'	SHEET: 1 OF 1	

SPOOL # 7179-2-7		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 4 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



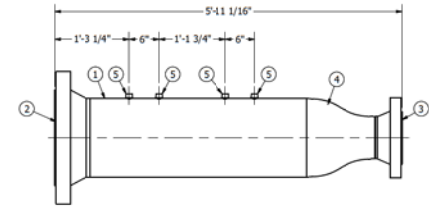
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-8		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 3 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



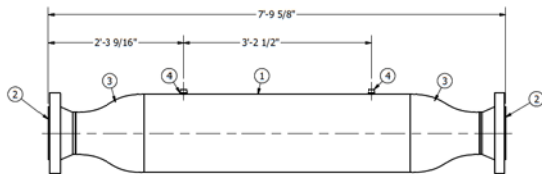
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-9		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 4 FT LONG
2	1	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	8" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
4	1	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
5	4	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



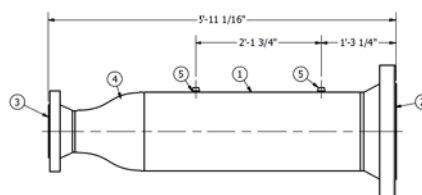
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-10		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 5 FT LONG
2	2	8" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	2	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
4	2	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



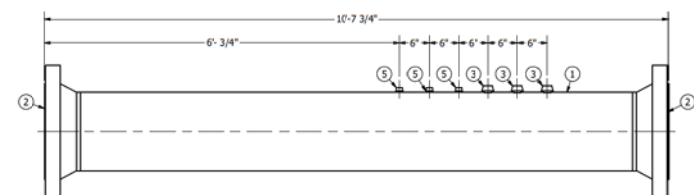
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-11		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 4 FT LONG
2	1	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	8" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
4	1	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
5	2	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7179-2-12		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 10 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	3	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
5	3	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

GENERAL NOTES:
1. BUILD TO DUKES STANDARDS & SPECIFICATION
2. ASME B31.8
3. DDT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -30° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

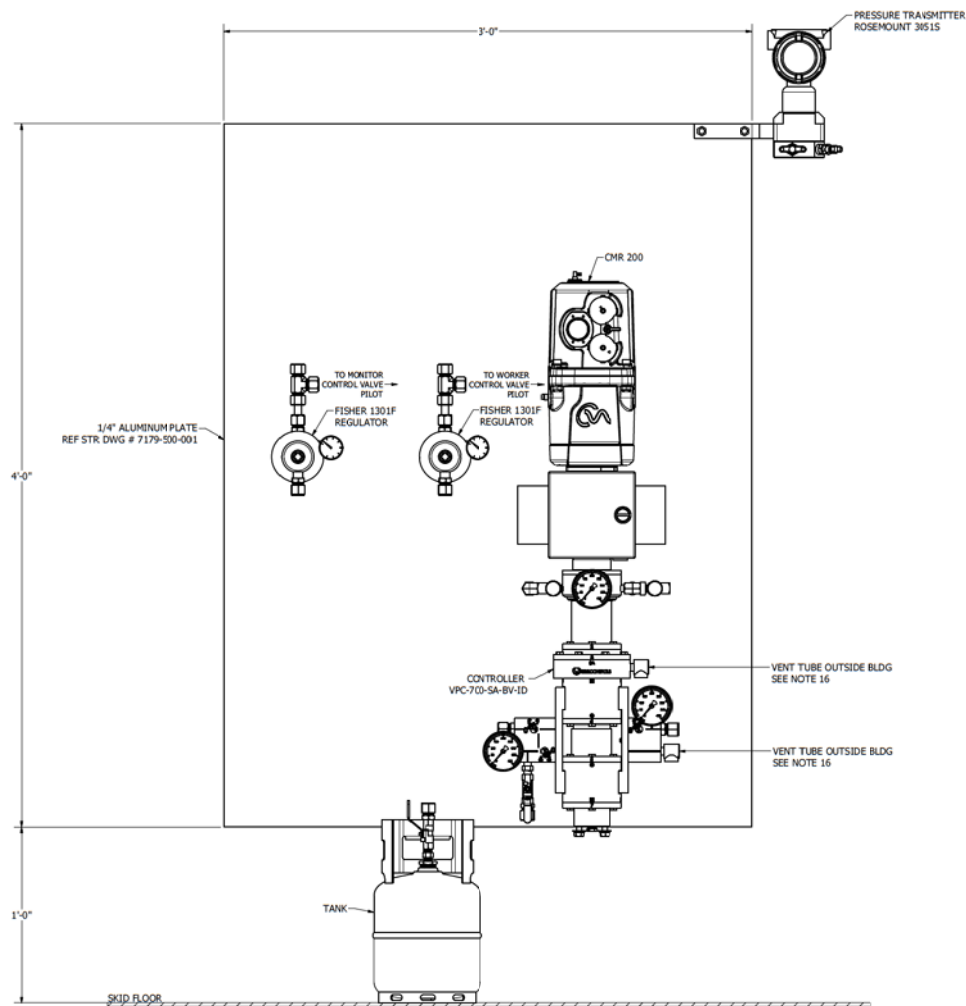
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	NPF	05/13/2020



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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SPOOL DETAIL (2)

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-700-002		0
DRAWING SCALE: 1"=1'	SHEET: 1 OF 1	



ELEVATION VIEW
FOR LAYOUT REFERENCE ONLY
FINAL PANEL ASSEMBLY MAY VARY
REF ENGINEERED EQUIPMENT BOM
FOR ALL INSTRUMENTATION
SCALE 3"=1'

GENERAL NOTES:

1. BUY TO DUKES STANDARDS & SPECIFICATION
2. ASME B31.8
3. DOT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	NPF	05/13/2020

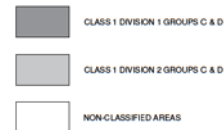


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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
INSTRUMENT PANEL DETAIL

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-700-003		0
DRAWING SCALE: 3"=1'	SHEET: 1 OF 1	

AREA CLASSIFICATIONS CLASSIFICATIONS ARE BASED ON RECOMMENDATIONS FROM THE AMERICAN GAS ASSOCIATION #XL1001



GENERAL CLASSIFICATION NOTES:

CLASS 1 DIVISION 1 AREAS

5' RADIUS AROUND ALL BLOWDOWN VENTS RELIEF VALVES AS CONSIDERED NORMAL OPERATIONS

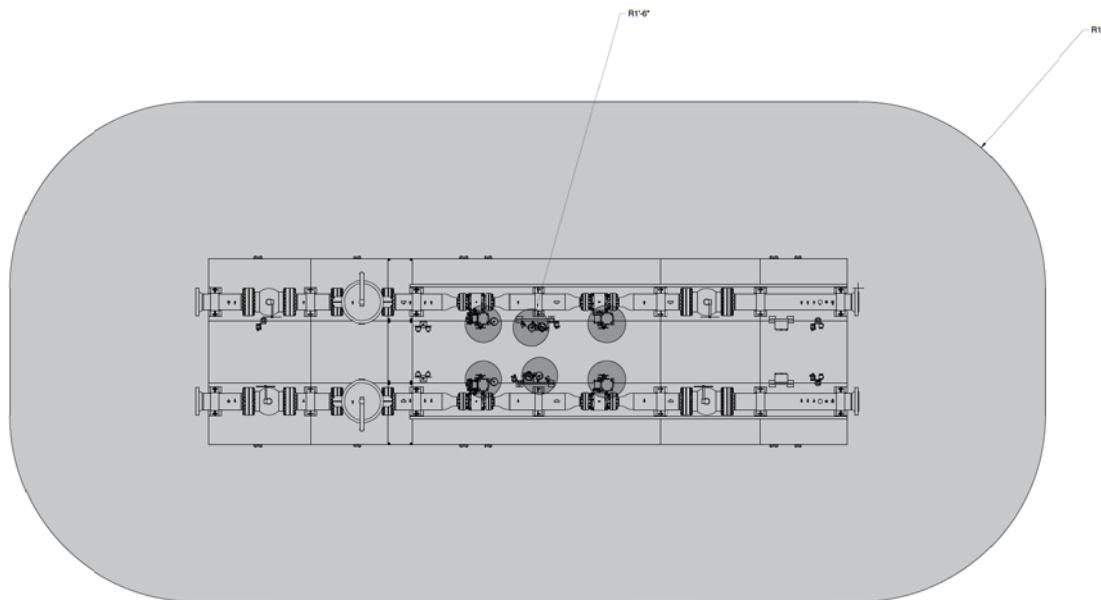
1.5' RADIUS AROUND ALL INSTRUMENT VENTS FOR THOSE CONSIDERED NORMAL OPERATIONS

FOR OPERATION/MAINTENANCE CONDITIONS CONSIDERED "NON-NORMAL" THE AREA SURROUNDING IS CLASSIFIED AS C102 WITH SPECIAL PRECAUTIONS TO BE TAKEN DURING THE TIME OF THAT OPERATION/MAINTENANCE

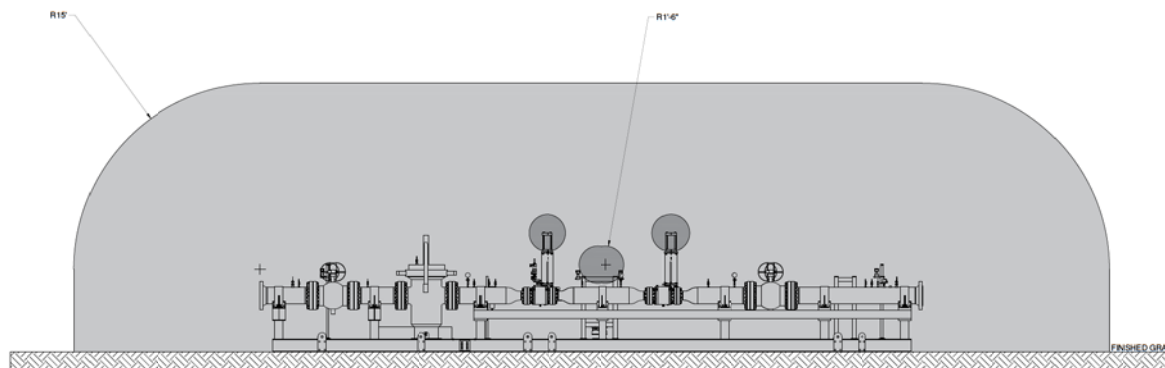
CLASS 1 DIVISION 2 AREAS

15' RADIUS AROUND ALL BLOWDOWN VENTS, RELIEF VALVES, CLOSURES, FLANGES, VALVES, HEADER PIPING AND LOUVERS

7' RADIUS AROUND INSTRUMENT VENTS



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES:

- FOR CLASSIFICATION LOCATIONS FOR ELECTRICAL INSTALLATION REFERENCE - AGA XL1001 "CLASSIFICATION OF LOCATIONS FOR ELECTRICAL INSTALLATIONS IN GAS UTILITY AREAS"

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JSA	05/12/2020



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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
HAZARDOUS LOCATION
FLOW CONTROL SKID

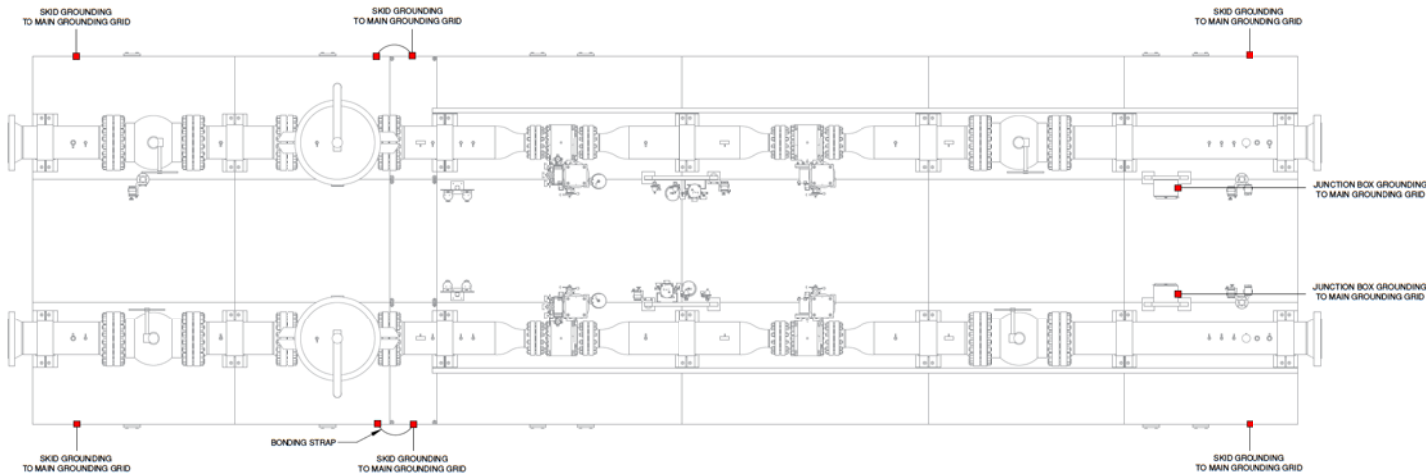
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-1200-100		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	

GROUNDING LEGEND

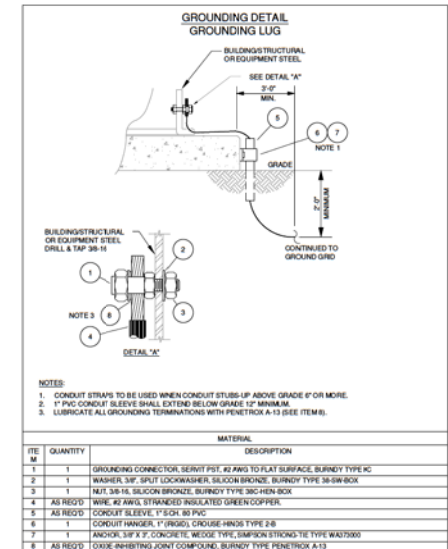
■ BOLTED MECHANICAL CONNECTION

GROUNDING NOTES:

- THE RESPECTIVE REGULATOR SKIDS SHALL BE PROVIDED WITH (4) ATTACHMENTS FOR ELECTRICAL GROUNDING PROVISIONS. THE GROUNDING ATTACHMENTS SHALL BE LOCATED ON OPPOSITE CORNERS ON THE OUTSIDE OF THE EQUIPMENT AND SHALL BE NOTED ON THE DRAWINGS.
- VENDOR SHALL PROPERLY GROUND ALL EQUIPMENT, ENCLOSURES, CONDUITS AND ANY SERVICE CONDUIT THAT IS TO BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250 AND IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 501.30(A) AND 501.30(B)
- SKIDS ARE TO BE BONDED TOGETHER UTILIZING BONDING STRAP



PLAN VIEW



GENERAL NOTES:

- CONTRACTOR TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE TO THE LATEST VERSION OF THE NEC
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY LABOR, EQUIPMENT AND MATERIAL, TO PROVIDE COMPLETE INSTALLATION

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JSA	05/12/2020

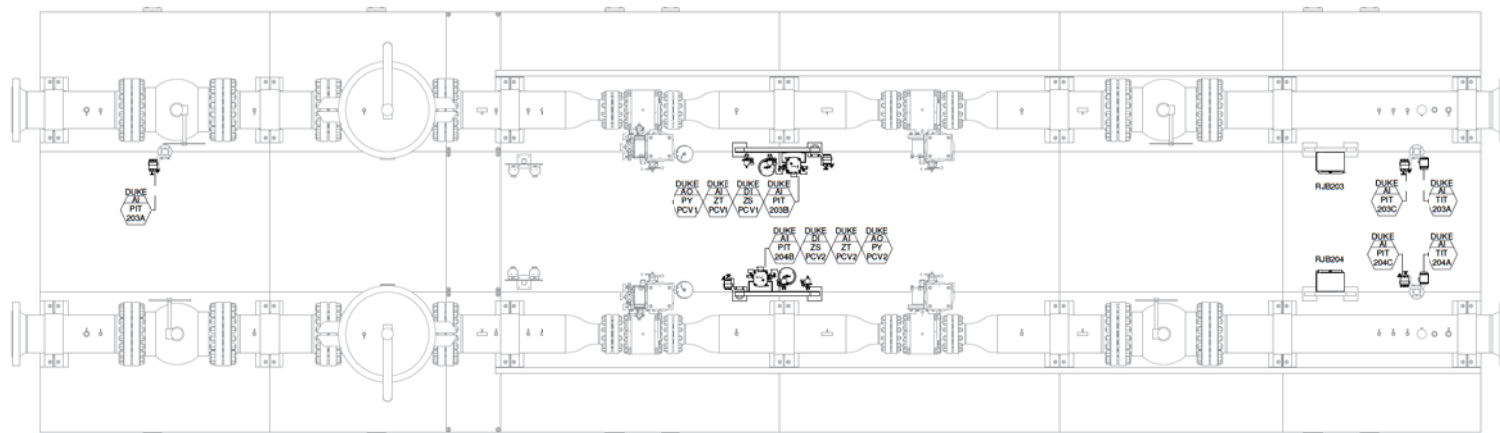


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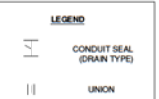
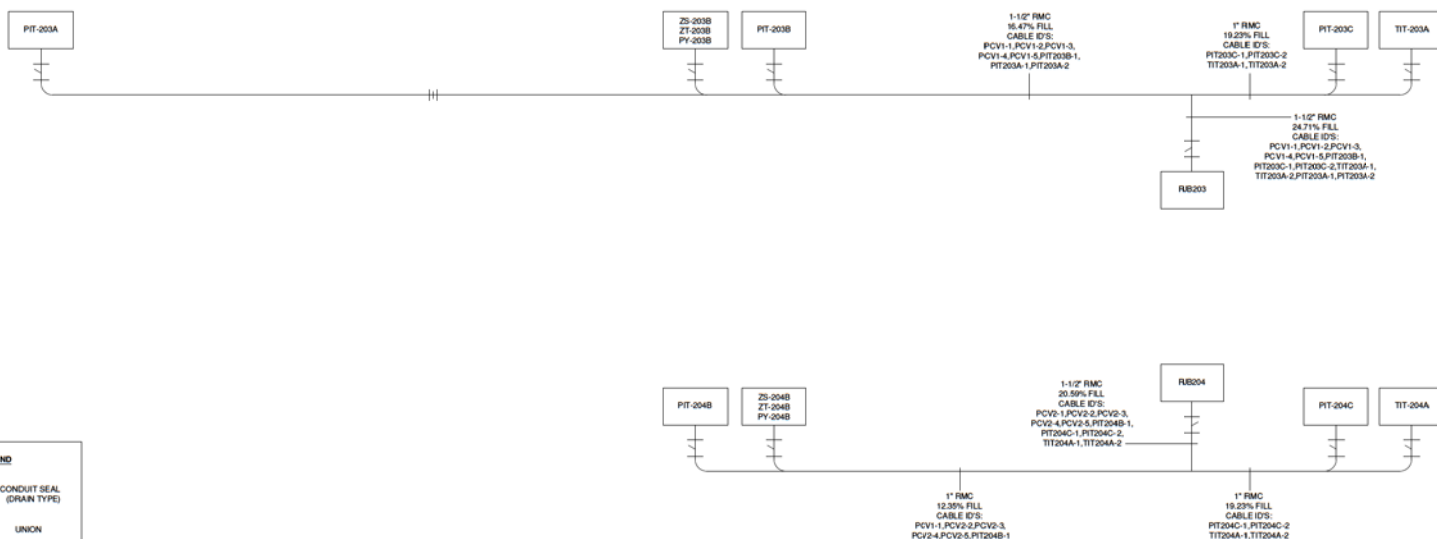
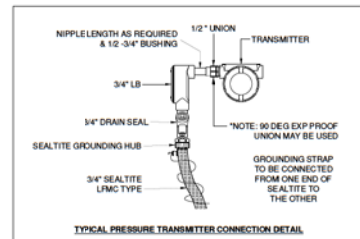
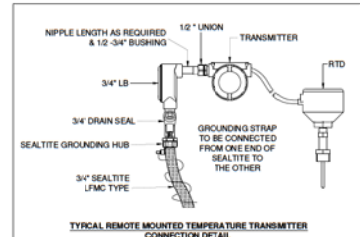
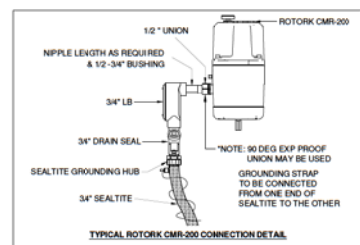
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
GROUNDING PLAN
FLOW CONTROL SKID

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-1200-200		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	



- GENERAL NOTES:
- MAIN HOME RUN CONDUITS ARE TO BE SIZED AS SHOWN
 - UNIONS MUST BE USED AT EACH INSTRUMENT HOUSING
 - FLEX CONNECTORS MUST BE USED AT INSTRUMENTS TO ALLOW FOR EASE OF REMOVAL OF INSTRUMENTS
 - DRAWING IS DEPICTION ONLY. CONDUIT TO BE FIELD ROUTED. ROUTING MUST BE MADE IN A CLEAN AND DECISIVE MANNER AS TO NOT BLOCK ANY WALK WAYS, VALVES, FLANGES, ETC. ROUTING MAY UTILIZE PIPE SUPPORTS BUT MUST REMAIN CLOSE TO FLOOR LEVEL.
 - ALL INSTALLATIONS MUST MEET THE REQUIREMENTS OF THE LATEST REVISION OF THE N.E.C.
 - CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL NECESSARY FITTINGS, HARDWARE, ETC TO PROVIDE A COMPLETE INSTALLATION.



GENERAL NOTES:

- CONTRACTOR TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE TO THE LATEST VERSION OF THE NEC
- CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY LABOR, EQUIPMENT AND MATERIAL, TO PROVIDE COMPLETE INSTALLATION
- SHD WILL NOT BE CONNECTED DURING THE MANUFACTURING STAGE. VERIFY THE CONDUIT IS ABLE TO BE CONNECTED AT THE UNION

DRAWING STATUS:

ISSUED FOR CONSTRUCTION

REVISION HISTORY					
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JA	05/12/2020

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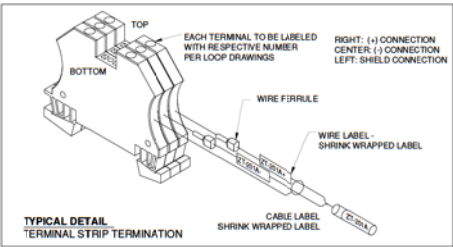
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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
DC CONDUIT LAYOUT
FLOW CONTROL SKID

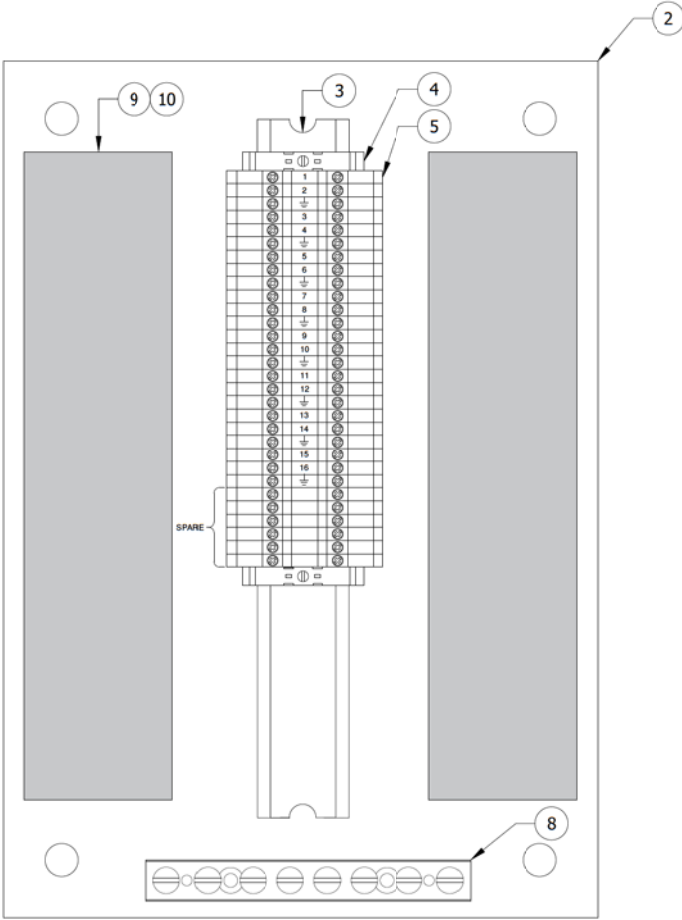
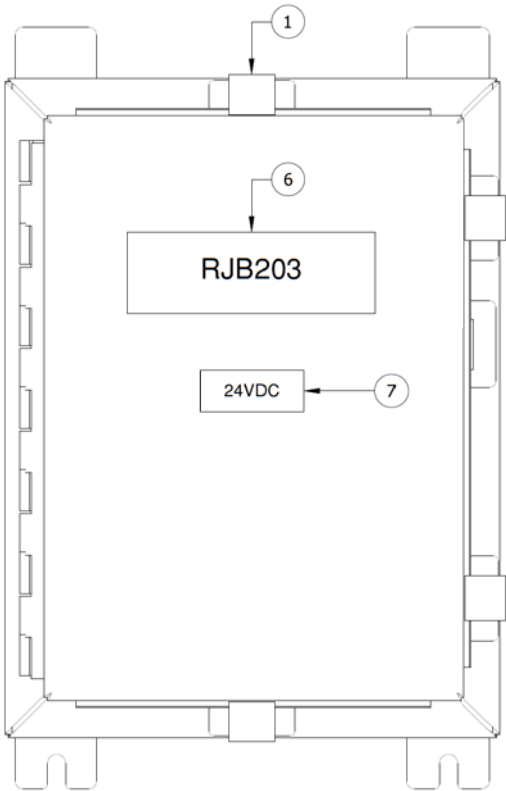
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-1300-100		
DRAWING SCALE: NONE	SHEET: 1 OF 1	0

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FLOW CONTROL SKID ELECTRICAL DC JUNCTION BOX "RJB203" BILL OF MATERIAL				
ITEM	QTY	MANUFACTURER	CATALOG NUMBER	DESCRIPTION
1	1	HOFFMAN	A19H1208SLP	NEMA 4X JUNCTION BOX 16X12X8
2	1	HOFFMAN	A16P12	ENCLOSURE BACKPLANE
3	1	AB	1492-DR8	ALUMINUM RAISED DIN RAIL (35mm x 57.4mm HIGH x 1M LONG) 35mm x 7.5mm
4	2	AB	1492-EAH25	HEAVY DUTY ANCHOR
5	30	AB	1492-J3	FEEDTHROUGH TERMINAL, GREY
6	1			JUNCTION BOX PHENOLIC TAG - 2" x 6" WITH 1/2" LETTERING "RJB203"
7	1			JUNCTION BOX PHENOLIC TAG - 1" x 2.5" WITH 1/2" LETTERING "24VDC"
8	1	PANDUIT	UGB20-4146	UNIVERSAL GROUND BAR, #14-4#1 WIRE, 6 PORTS
9	1	PANDUIT	G2X4LG8	2" X 4" WIRE DUCT - GREY
10	1	PANDUIT	C2LG8	2" WIRE DUCT COVER



- NOTES:
- CONTRACTOR SHALL COMPLY WITH THE LATEST VERSION OF THE NEC
 - TERMINALS ARE RATED FOR 50AMP MAX AT 600VAC/DC
 - ALL WIRE AND CABLE LABELING IS TO BE VISIBLE FROM FRONT OF PANEL
 - LABEL ROTATION SHALL BE PAID ATTENTION TO FOR EASE OF VIEWING
 - JUNCTION BOX AND TERMINAL STRIP ARE TO BE ATTACHED WITH 2 PART EPOXY



- GENERAL NOTES:
- CONTRACTOR TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE TO THE LATEST VERSION OF THE NEC
 - CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY LABOR, EQUIPMENT AND MATERIAL, TO PROVIDE COMPLETE INSTALLATION

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JSR	05/12/2020

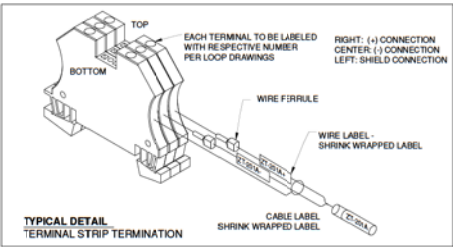


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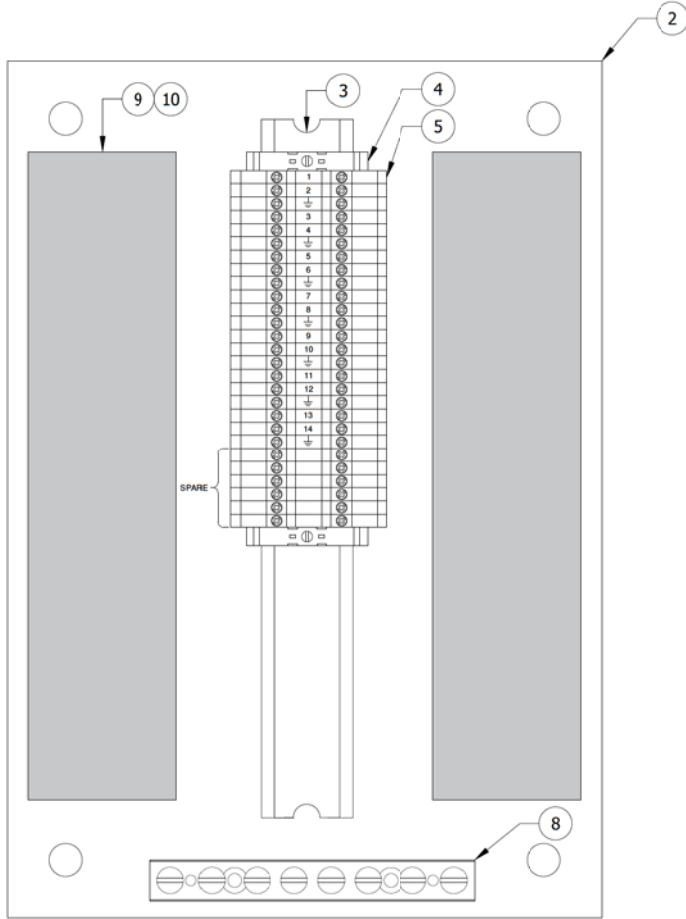
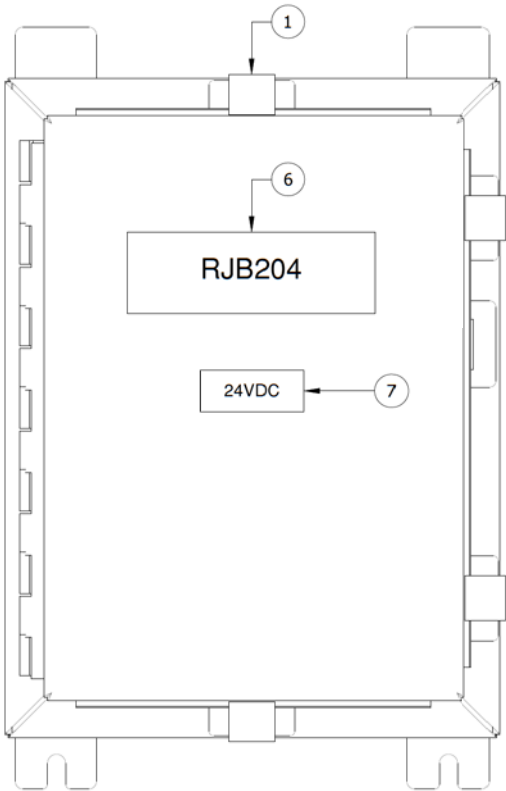
DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
DC JUNCTION BOX LAYOUT
"RJB203"

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-1300-110		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	

FLOW CONTROL SKID ELECTRICAL DC JUNCTION BOX "RJB204" BILL OF MATERIAL				
ITEM	QTY	MANUFACTURER	CATALOG NUMBER	DESCRIPTION
1	1	HOFFMAN	A19H1208SLP	NEMA 4X JUNCTION BOX 16X12X8
2	1	HOFFMAN	A16P12	ENCLOSURE BACKPLANE
3	1	AB	1492-DR8	ALUMINUM RAISED DIN RAIL (35mm x 57.4mm HIGH x 1M LONG) 35mm x 7.5mm
4	2	AB	1492-EAHJ25	HEAVY DUTY ANCHOR
5	27	AB	1492-J3	FEEDTHROUGH TERMINAL, GREY
6	1			JUNCTION BOX PHENOLIC TAG - 2" x 6" WITH 1/2" LETTERING "RJB204"
7	1			JUNCTION BOX PHENOLIC TAG - 1" x 2.5" WITH 1/2" LETTERING "24VDC"
8	1	PANDUIT	UG820-4146	UNIVERSAL GROUND BAR, #14-4#1 WIRE, 6 PORTS
9	1	PANDUIT	G2XLG6	2" X 4" WIRE DUCT - GREY
10	1	PANDUIT	C2LG6	2" WIRE DUCT COVER



- NOTES:
- CONTRACTOR SHALL COMPLY WITH THE LATEST VERSION OF THE NEC
 - TERMINALS ARE RATED FOR 50AMP MAX AT 600VAC/DC
 - ALL WIRE AND CABLE LABELING IS TO BE VISIBLE FROM FRONT OF PANEL
 - LABEL ROTATION SHALL BE PAID ATTENTION TO FOR EASE OF VIEWING
 - JUNCTION BOX AND TERMINAL STRIP ARE TO BE ATTACHED WITH 2 PART EPOXY



- GENERAL NOTES:
- CONTRACTOR TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE TO THE LATEST VERSION OF THE NEC
 - CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY LABOR, EQUIPMENT AND MATERIAL, TO PROVIDE COMPLETE INSTALLATION

DRAWING STATUS:

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CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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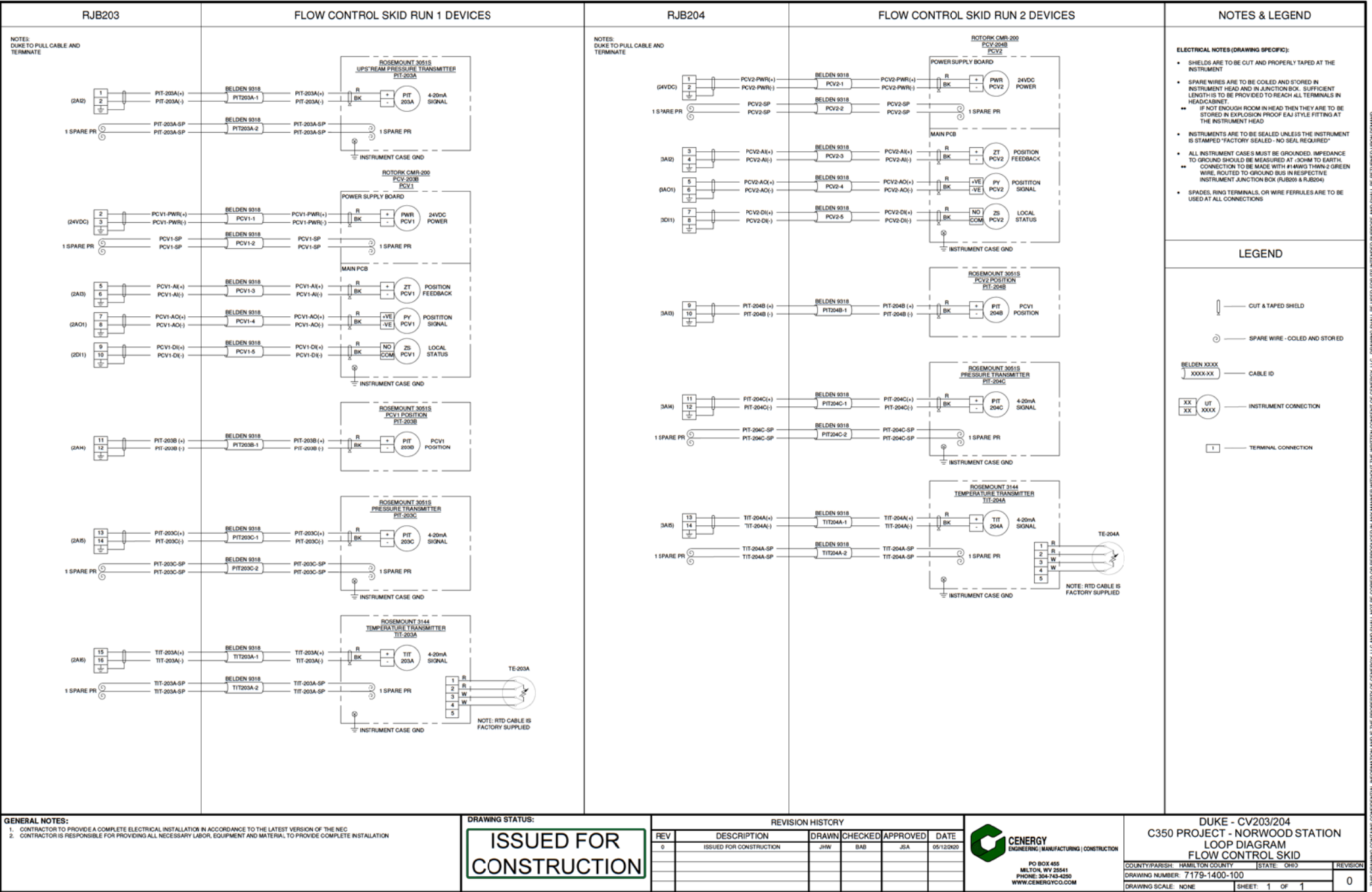


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DUKE - CV203/204
C350 PROJECT - NORWOOD STATION
DC JUNCTION BOX LAYOUT
"RJB204"

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7179-1300-111		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	



ISSUED FOR
CONSTRUCTION

DUKE ENERGY, CV-205
16" x 8" FC SKID
ISSUED FOR CONSTRUCTION
05/15/2020

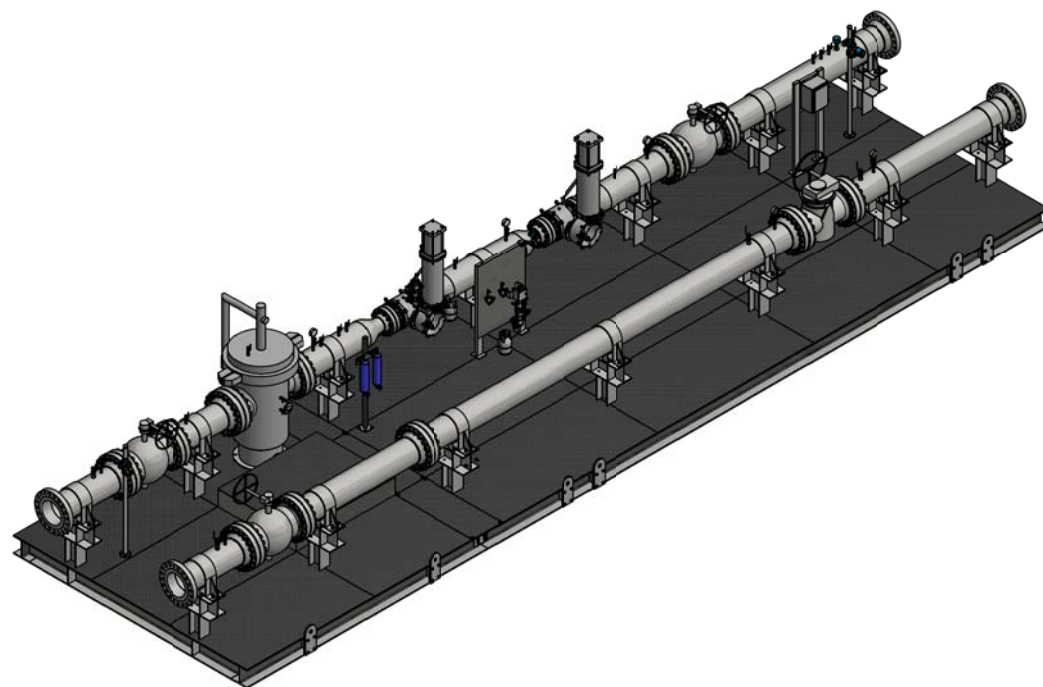
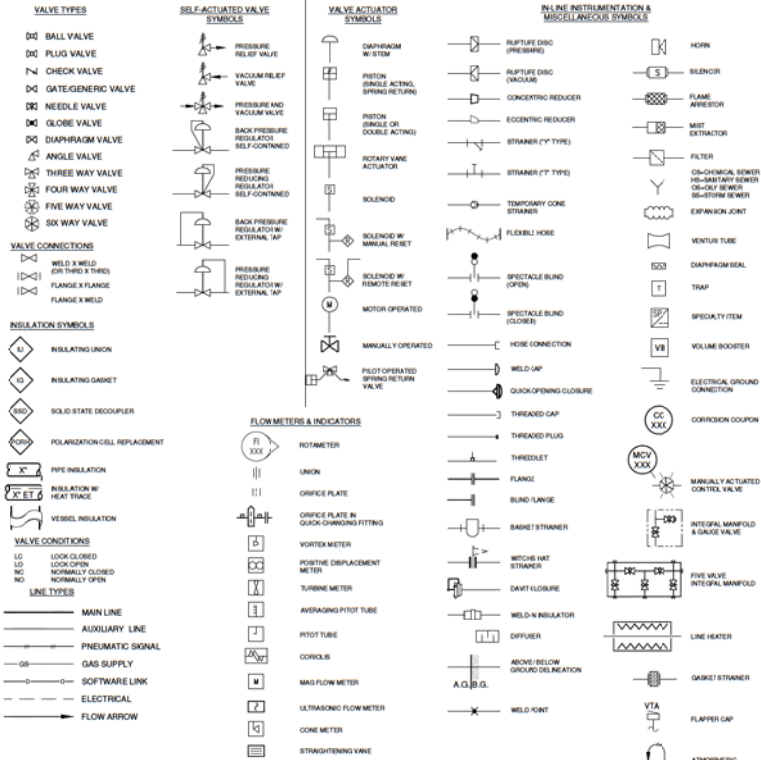


TABLE OF CONTENTS				
DWG #	SIZE	NAME	REV	DATE
7180-200-001	ARCH D	P&ID - STANDARD NOMENCLATURE	0	05/15/2020
7180-201-001	ARCH D	P&ID - CONTROL VALVE SKID CV-205	0	05/15/2020
7180-202-001	ARCH D	P&ID - INSTRUMENT SUPPLY SYSTEM	0	05/15/2020
7180-500-001	ARCH D	STRUCTURAL - SKID LAYOUT	0	05/15/2020
7180-500-002	ARCH D	STRUCTURAL - DIAMOND PLATE LAYOUT	0	05/15/2020
7180-501-001	ARCH D	STRUCTURAL - COMPONENT DETAILS	0	05/15/2020
7180-501-002	ARCH D	STRUCTURAL - TUBING SUPPORT & FILTER POLE DETAILS	0	05/15/2020
7180-600-001	ARCH D	MECHANICAL - SKID LAYOUT	0	05/15/2020
7180-600-002	ARCH D	MECHANICAL - SKID SECTIONS	0	05/15/2020
7180-700-001	ARCH D	MECHANICAL - SPOOL DETAIL (1)	0	05/15/2020
7180-700-002	ARCH D	MECHANICAL - SPOOL DETAIL (2)	0	05/15/2020
7180-700-003	ARCH D	MECHANICAL - INSTRUMENT PANEL DETAIL	0	05/15/2020
7180-1200-100	ARCH D	HAZARDOUS LOCATION - FLOW CONTROL SKID	0	05/15/2020
7180-1200-200	ARCH D	GROUND PLAN - FLOW CONTROL SKID	0	05/15/2020
7180-1300-100	ARCH D	DC CONDUIT LAYOUT - FLOW CONTROL SKID	0	05/15/2020
7180-1300-110	ARCH D	DC JUNCTION BOX LAYOUT - "RJB205"	0	05/15/2020
7180-1400-100	ARCH D	LOOP DIAGRAM - FLOW CONTROL SKID	0	05/15/2020

PIPING SYMBOLS



GENERAL INSTRUMENT OR FUNCTION SYMBOLS

LOCATION / ACCESSIBILITY	DISCRETE INSTRUMENTS	SHARED DISPLAY, SHARED CONTROL		INPUT TO COMPUTER OR TELEMETRY
		PRIMARY CONTROL SYSTEM / BASIC PROCESS CONTROL SYSTEM	SECONDARY CONTROL SYSTEM / SAFETY INSTRUMENT SYSTEM	
FIELD MOUNTED				
PRIMARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR				AI 4-20 MA
PRIMARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR				
AUXILIARY LOCATION NORMALLY ACCESSIBLE TO AN OPERATOR				
AUXILIARY LOCATION NORMALLY INACCESSIBLE TO AN OPERATOR				

DI - DISCRETE INPUT
DO - DISCRETE OUTPUT
AI - ANALOG INPUT
AO - ANALOG OUTPUT
MB - MODBUS CONNECTIVITY
ETH - ETHERNET
P - PULSE

IDENTIFICATION LETTERS

ANSI / ISA 5.1-2009, TABLE 4.1

MEASURED / INITIATING VARIABLE	COLUMN 2 VARIABLE MODIFIER	COLUMN 3 READOUT / PASSIVE FUNCTION	COLUMN 4 OUTPUT / ACTIVE FUNCTION	COLUMN 5 FUNCTION MODIFIER
A ANALYSIS		ALARM		
B BURNER, COMBUSTION				
C			CONTROL	CLOSE
D	DIFFERENCE, DIFFERENTIAL			DEVIATION
E VOLTAGE		SENSOR, PRIMARY ELEMENT		
F FLOW, FLOW RATE	RATIO			
G		GLASS, GAUGE, VIEWING DEVICE		
H HAND				HIGH
I CURRENT		INDICATE		
J POWER		SCAN		
K TIME, SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L LEVEL		LIGHT		LOW
M				MIDDLE, INTERMEDIATE
N				
O		ORFICE, RESTRICTION		OPEN
P PRESSURE		POINT (TEST CONNECTION)		
Q QUANTITY	INTEGRATE, TOTALIZE	INTEGRATE, TOTALIZE		
R RADIATION	RELIEF	RECORD		RUN
S SPEED, FREQUENCY	SAFETY		SWITCH	STOP
T TEMPERATURE			TRANSMIT	
U MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V VIBRATION, MECHANICAL ANALYSIS	VACUUM		VALVE, DAMPER, LOUVER	
W WEIGHT, FORCE		WELL, PROBE		
X UNCLASSIFIED	X-AXIS	ACCESSORY DEVICES, UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y EVENT, STATE, PRESENCE	Y-AXIS	RELAY	AUXILIARY DEVICES	
Z POSITION, DIMENSION	Z-AXIS, SAFETY INSTRUMENTED SYSTEM		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

TYPICAL INSTRUMENT ABBREVIATION INDEX

AAH ANALYZER ALARM HIGH	LS LEVEL SWITCH	PSE RUPTURE DISK
AAHH ANALYZER ALARM HIGH SHUTDOWN	LSHL LEVEL CONTROL SWITCH	PSH PRESSURE SWITCH HIGH ALARM
AAL ANALYZER ALARM LOW	LSH LEVEL SWITCH HIGH ALARM	PSHL PRESSURE SWITCH HIGH-LOW
AE ANALYZER ELEMENT	LSHH LEVEL SWITCH HIGH-HIGH ALARM	PSL PRESSURE SWITCH LOW ALARM
AP ANALYZER PROBE	LSL LEVEL SWITCH LOW ALARM	PRV PRESSURE RELIEF VALVE
AI ANALYZER INDICATOR	LT LEVEL TRANSMITTER	PT PRESSURE TRANSMITTER
ASH ANALYZER SWITCH HIGH	LCV LEVEL CONTROL VALVE	PRY PRESSURE RELAY
ASL ANALYZER SWITCH LOW	MO MOISTURE GAUGE	SAH SPEED SWITCH HIGH ALARM
AT ANALYZER TRANSMITTER	MCV MANUAL CONTROL VALVE	SC SPEED CONTROL
AY ANALYZER RELAY	PAH PRESSURE ALARM HIGH	SV SOLENOID VALVE
FA FLOW ALARM	PAL PRESSURE ALARM LOW	SVC SOLENOID VALVE CLOSED
FAH FLOW ALARM HIGH	PC PRESSURE CONTROLLER	SVO SOLENOID VALVE OPEN
FAL FLOW ALARM LOW	PCH PRESSURE CONTROL HIGH	TE TEMPERATURE ELEMENT
FCV FLOW CONTROL VALVE	PCL PRESSURE CONTROL LOW	TI TEMPERATURE INDICATOR
FE FLOW ELEMENT	PCV PRESSURE CONTROL VALVE	TIH TEMPERATURE INDICATING TRANSMITTER
FI FLOW INDICATOR	PDH DIFFERENTIAL PRESSURE ALARM HIGH	TSL TEMPERATURE SWITCH LOW ALARM
FIC FLOW INDICATOR CONTROLLER	PDAL DIFFERENTIAL PRESSURE ALARM LOW	TT TEMPERATURE TRANSMITTER
FS FLOW SWITCH	PDE DIFFERENTIAL PRESSURE ELEMENT	TV TEMPERATURE CONTROL VALVE
FR FLOW RELAY	PDI DIFFERENTIAL PRESSURE INDICATOR	TW THERMOWELL
FT FLOW TRANSMITTER	PDIC DIFFERENTIAL PRESSURE INDICATING CONTROLLER	UT MULTIVARIABLE TRANSMITTER
FY FLOW RELAY	PDS DIFFERENTIAL PRESSURE INDICATING SWITCH	UIT MULTIVARIABLE INDICATING TRANSMITTER
HIC HAND INDICATING CONTROL	PDS DIFFERENTIAL PRESSURE SWITCH	ZAC LIMIT SWITCH (CLOSED) ALARM
HS HAND SWITCH	PDSH DIFFERENTIAL PRESSURE SWITCH HIGH	ZAH EXCESSIVE LIMIT OR DEVIATION ALARM
HSH HAND SAFETY SWITCH	PDSL DIFFERENTIAL PRESSURE SWITCH LOW	ZAO LIMIT SWITCH (OPEN) ALARM
LAH LEVEL ALARM HIGH	PDT DIFFERENTIAL PRESSURE TRANSMITTER	ZIC POSITION INDICATOR CLOSED
LAL LEVEL ALARM LOW	PDT DIFFERENTIAL PRESSURE INDICATING TRANSMITTER	ZIO POSITION INDICATOR OPEN
LC LEVEL CONTROLLER	PE PRESSURE ELEMENT	ZS LIMIT SWITCH
LCV LEVEL CONTROL VALVE	PI PRESSURE INDICATOR	ZSC LIMIT SWITCH CLOSED
LG LEVEL GAUGE	PIC PRESSURE INDICATING CONTROLLER	ZSO LIMIT SWITCH OPEN
LI LEVEL INDICATOR	PIH PRESSURE INDICATING TRANSMITTER	ZT POSITION TRANSMITTER
LIC LEVEL INDICATING CONTROLLER	PS PRESSURE SWITCH	ZV TRAVEL POSITION ACTUATOR

PIPE MATERIAL SPECIFICATIONS

WTR 285 PSIG	150 RF	WATER DRAIN
AC 285 PSIG	150 RF	HYDROCARBON GAS
CC 740 PSIG	300 RF	HYDROCARBON GAS
BC 1488 PSIG	600 RF	HYDROCARBON GAS
DC 2298 PSIG	900 RF	HYDROCARBON GAS
IA 200 PSIG	3000 NPT	INSTRUMENT AIR
SA 50 PSIG	TUBE	SAMPLE SYSTEM

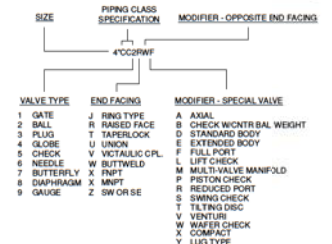
PIPING SERVICE DESIGNATION

AB BREATHING AIR	OH HYDRAULIC OIL
CA AMINE	OS SEAL OIL
CC CORROSION INHIBITOR	PG PROCESS GAS
CG CONTROL GAS	PL PROCESS LIQUID
CM METHANOL	PV PROCESS VAPOR
CWR COOLING WATER RETURN	PW PRODUCED WATER
CWS COOLING WATER SUPPLY	PX WELL FLOW LINE OF PRODUCTION
DC CLOSED DRAINS	SES EMERGENCY SHUTDOWN SIGNAL
ELW ENGINE JACKET WATER	TAW AUXILIARY WATER
EE ENGINE EXHAUST	UA UTILITY AIR
EG GAS EXHAUST	UG UTILITY GAS
EI ENGINE AIR INTAKE	UW UTILITY WATER
ET TURBINE EXHAUST	VA ATMOSPHERIC VENT
FG FUEL GAS	VB BLOWDOWN VENT
FW FIRE WATER	VF VENT TO FLARE
GL AMBITROL	VH HIGH PRESSURE VENT
HD HIGH PRESSURE DRAIN	VN LOW PRESSURE VENT
IA INSTRUMENT AIR	VR RELIEF VENT
IG INSTRUMENT GAS	WN DEMINERALIZED WATER
LO LUBE OIL	WP POTABLE WATER
NI INERT / PURGE GAS	WW WASTE WATER

LINE NUMBERING SYSTEM



VALVE IDENTIFICATION



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DUKE C350 PROJECT - NORWOOD STATION
PIPING & INSTRUMENTATION DIAGRAM
STANDARD NOMENCLATURE

COUNTRY/PARISH: HAMILTON COUNTY STATE: OHIO
DRAWING NUMBER: 7180-200-001
DRAWING SCALE: NONE SHEET 1 OF 1

REVISION 0

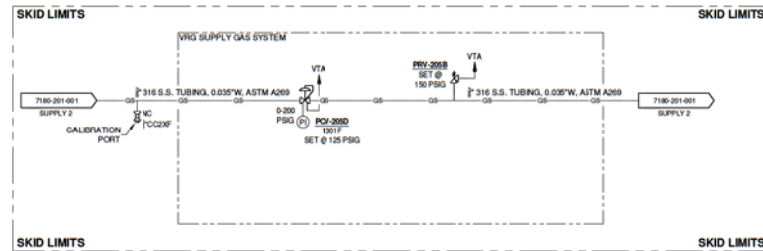
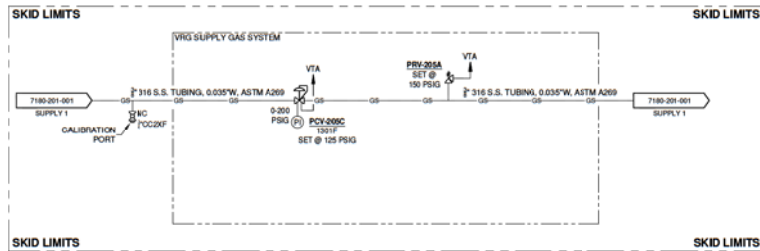
GENERAL NOTES:
1. BUILD TO DUKE STANDARDS & SPECIFICATION
2. ASME B31.9
3. DOT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSIG
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 1,500 PSIG / MAX 1,550 FOR EIGHT (8) HOURS
11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: 32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT

DRAWING STATUS:
ISSUED FOR CONSTRUCTION

REVISION HISTORY				
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED
1	ISSUED FOR CONSTRUCTION	WAT	TPR	NPF
				05/15/2020

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VRQ SUPPLY GAS SYSTEM
FISHER 1301F REGULATOR
REGO 9434 RELIEF VALVE - COLOR IDENTIFICATION: RED



GENERAL NOTES:

1. BUILT TO DUKE STANDARDS & SPECIFICATION
2. ASME B31.8
3. DOT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. DESIGN PRESSURE: 500 PSIG
7. 100% RADIOGRAPHIC INSPECTION
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
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DRAWING STATUS:

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REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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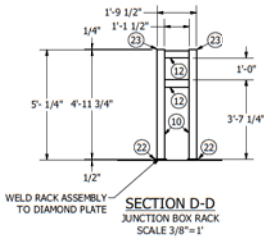
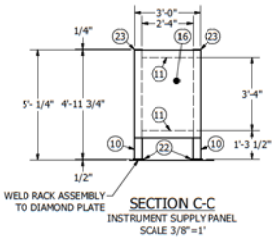
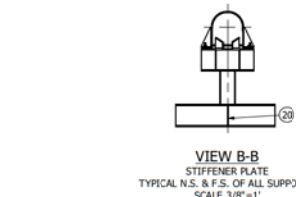
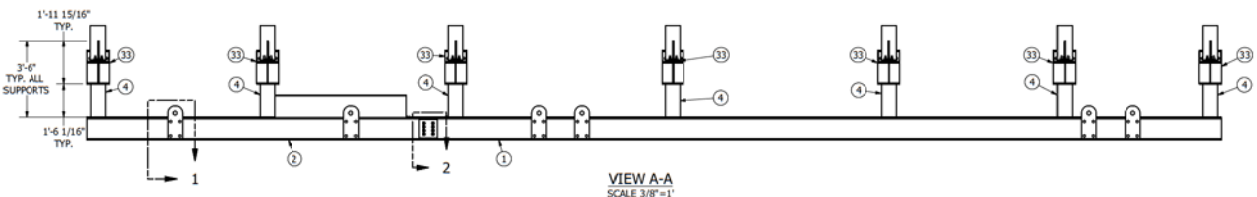
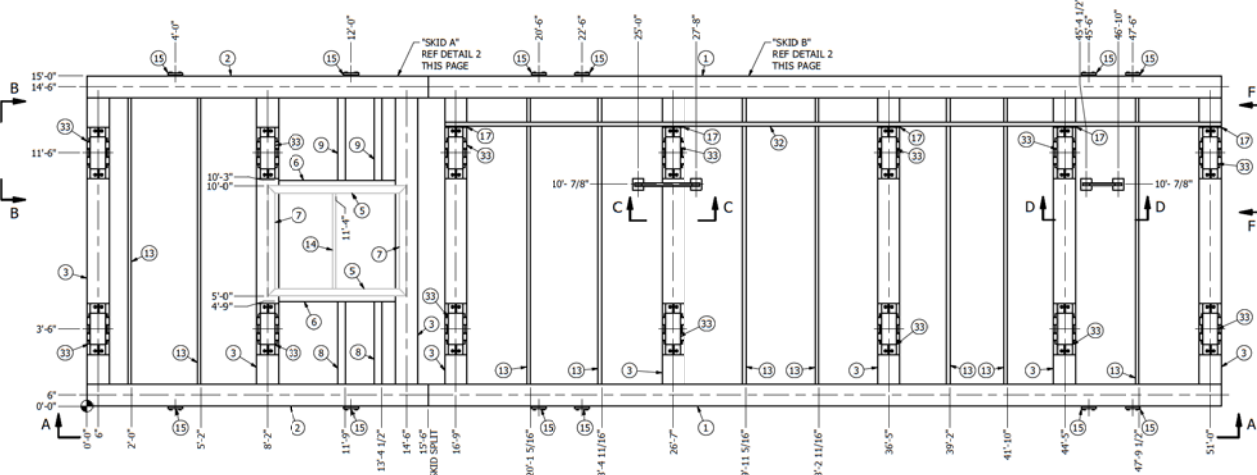
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DUKE - CV205
C350 PROJECT - NORWOOD STATION
PIPING & INSTRUMENTATION DIAGRAM
INSTRUMENT SUPPLY SYSTEM

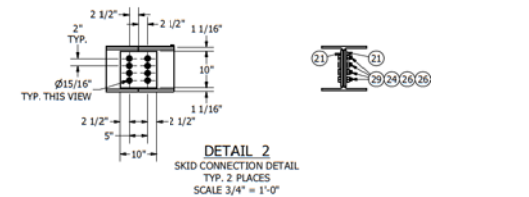
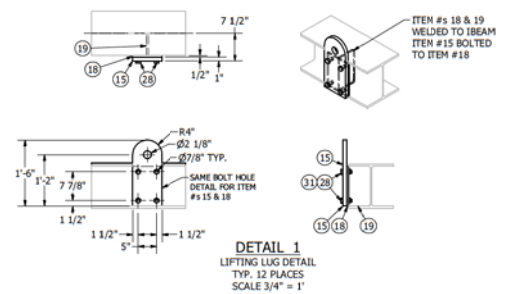
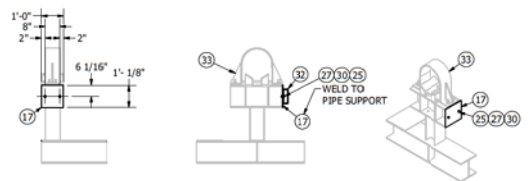
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-202-001		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	

SKIDS "A" & "B" SHOULD BE LIFTED INDEPENDENTLY, BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	2	W 12x65 WIDE FLANGE BEAM, ASTM A992
2	2	W 12x65 WIDE FLANGE BEAM, ASTM A992
3	8	W 12x65 WIDE FLANGE BEAM, ASTM A992
4	14	W 8x31 WIDE FLANGE BEAM, ASTM A992
5	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A36
6	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A36
7	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A992
8	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A992
9	2	MC12x45 LB/FT STRUCTURAL CHANNEL, ASTM A992
10	4	C4 @ 7.25 LB/FT STRUCTURAL CHANNEL, ASTM A992
11	2	C4 @ 7.25 LB/FT STRUCTURAL CHANNEL, ASTM A992
12	2	C4 @ 7.25 LB/FT STRUCTURAL CHANNEL, ASTM A992
13	9	L2x2x1/8" STRUCTURAL ANGLE, ASTM A36
14	1	L2x2x1/8" STRUCTURAL ANGLE, ASTM A36
15	12	LIFTING LUG, 1'-6" x 3'-0" x 1" TK, ASTM A36
16	1	PLATE, 4'-0" x 3'-0" x 1/8" TK, ALUMINUM 3003 GRADE
17	5	PLATE, 12 1/8" x 12" x 1/4" TK, ASTM A36
18	12	PLATE, 10 7/8" x 8" x 1/2" TK, ASTM A36
19	12	PLATE, 10 7/8" x 5 13/16" x 1/2" TK, ASTM A36
20	28	PLATE, 10 7/8" x 5 13/16" x 3/8" TK, ASTM A36
21	4	PLATE, 10" x 10" x 1/2" TK, ASTM A36
22	8	PLATE, 6" x 6" x 1/2" TK, ASTM A36

PARTS LIST		
ITEM	QTY	DESCRIPTION
23	4	PLATE, 4" x 1 3/4" x 1/4" THICK, ASTM A36
24	20	NUT, 7/8-9 UNC, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
25	10	NUT, 1/2-13 UNC, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
26	36	WASHER, 7/8" THREAD SIZE, TYPE 1 GALVANIZED, ASTM A325
27	40	WASHER, 1/2" THREAD SIZE, TYPE 1 GALVANIZED, ASTM A325
28	48	ANSI B18.2.1 - 3/4-10 UNC - 3" HEX HEAD BOLT
29	16	BOLT, 7/8-9 UNC, 3" LONG, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
30	10	BOLT, 1/2-13 UNC, 1 1/2" LONG, FULLY THREADED, HIGH STRENGTH, TYPE 1 GALVANIZED, ASTM A325
31	12	DIAMOND PLATE FASTENER, DISC (X-FCP-F5/10) W/ QTY (1) DX460 GR STUD (X-ST-GR M8/5 P8)
32	1	BOLT-ON TUBING SUPPORT ASSEMBLY, REF DWG # 7180-501-002
33	14	16" PIPE SUPPORT, E2 - LINE - WIDE FLANGE, 54MM BLOCK AND CLAMP, BARE, W58C-01-NA
34	6	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 10' LONG
35	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 8'-2" LONG
36	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 8' LONG
37	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 7'-7" LONG
38	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 6'-4" LONG
39	3	1/4" DIAMOND PLATE, ASTM-A36, 5' WIDE x 1'-11" LONG



NOTES:
1. ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
2. ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
3. STRUCTURAL STEEL SHALL CONFORM TO:
WIDE FLANGE SHAPES - ASTM A992, GR50
PLATES AND ANGLES - ASTM A36
HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
4. WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1

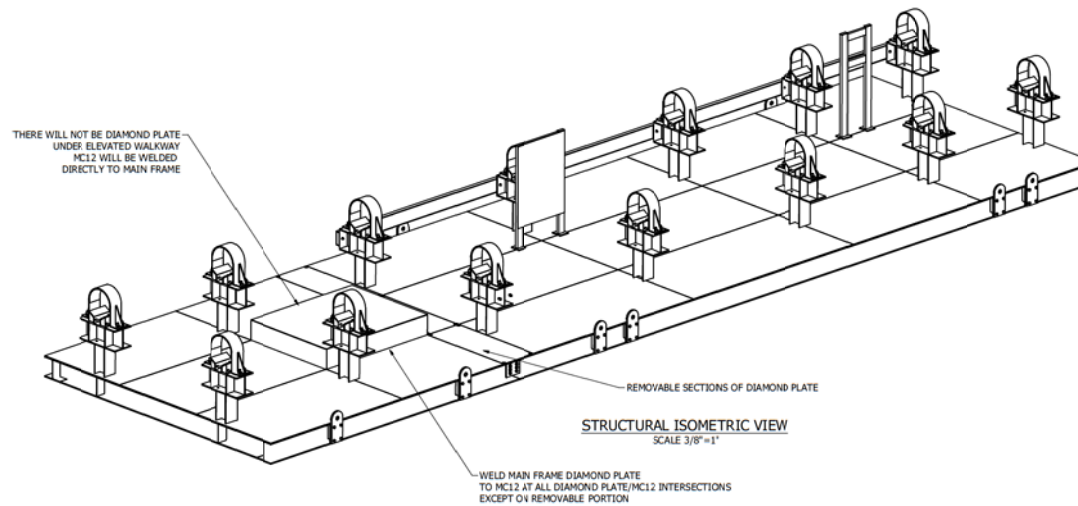
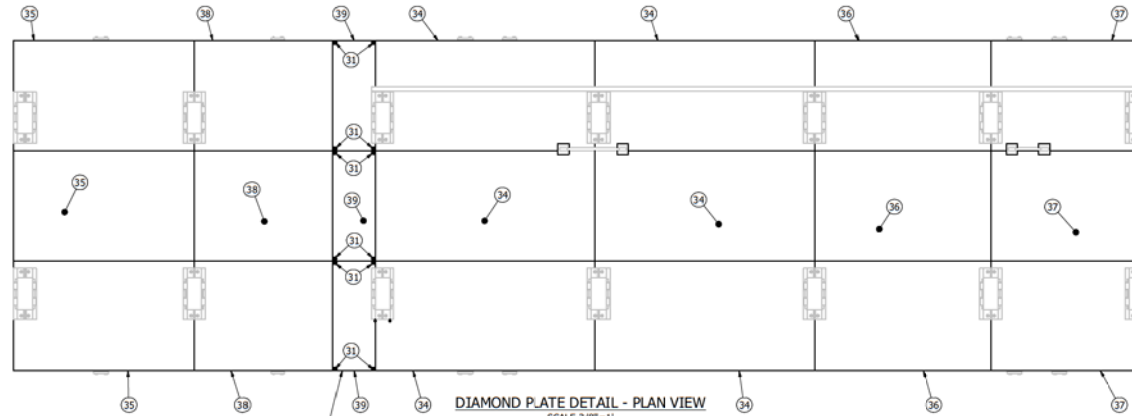
DRAWING STATUS:
ISSUED FOR CONSTRUCTION

REVISION HISTORY					
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	ZAH	05/15/2020

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DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - STRUCTURAL
SKID LAYOUT
COUNTY/PARISH: HAMILTON COUNTY | STATE: OHIO
DRAWING NUMBER: 7180-500-001
DRAWING SCALE: 3/8"=1' | SHEET: 1 OF 1
REVISION: 0

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- NOTES:
1. ALL STRUCTURAL STEEL SHALL BE FURNISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
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 3. STRUCTURAL STEEL SHALL CONFORM TO:
WIDE FLANGE SHAPES - ASTM A992, GR50
PLATES AND ANGLES - ASTM A588
HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
 4. WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
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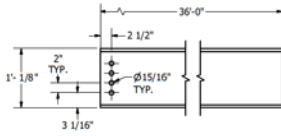


CENERGY
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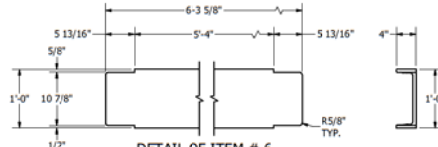
PO BOX 455
MILTON, WV 25541
PHONE: 304-743-4290
WWW.CENERGYCO.COM

DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - STRUCTURAL
DIAMOND PLATE LAYOUT

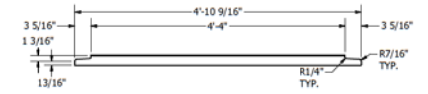
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DRAWING SCALE: 3/8"=1'	SHEET: 1 OF 1	



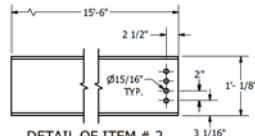
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ELEVATION VIEW
SCALE 1"=1'



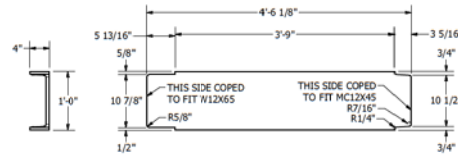
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ELEVATION VIEW
SCALE 1"=1'



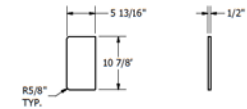
DETAIL OF ITEM # 14
SCALE 1"=1'



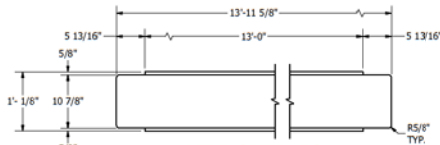
DETAIL OF ITEM # 2
ELEVATION VIEW
SCALE 1"=1'



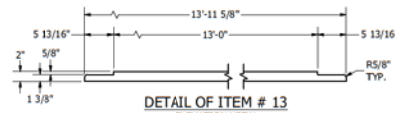
DETAIL OF ITEM # 9
ELEVATION VIEW
ITEM # 8 OPP. HAND
SCALE 1"=1'



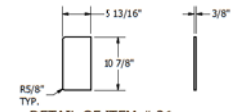
DETAIL OF ITEM # 20
ELEVATION VIEW
SCALE 1"=1'



DETAIL OF ITEM # 3
ELEVATION VIEW
SCALE 1"=1'



DETAIL OF ITEM # 13
ELEVATION VIEW
SCALE 1"=1'



DETAIL OF ITEM # 21
ELEVATION VIEW
SCALE 1"=1'

- NOTES**
1. ALL STRUCTURAL STEEL SHALL BE FINISHED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE AISC STEEL CONSTRUCTION MANUAL, 13TH EDITION
 2. ALL STRUCTURAL STEEL SHALL BE PAINTED PER DUKE SPEC
 3. STRUCTURAL STEEL SHALL CONFORM TO:
WIDE FLANGE SHAPES - ASTM A992, GR50
PLATES AND ANGLES - ASTM A572, TYPE 1 GALVANIZED
HIGH STRENGTH BOLTS - ASTM A325, TYPE 1 GALVANIZED
 4. WELDS - E70XX LOW HYDROGEN ROD MEETING THE REQUIREMENTS OF AWS D1.1
 5. ALL DETAILS THIS PAGE REF BOH ON DWG # 7175-500-001

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	ZAH	05/15/2020

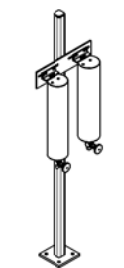
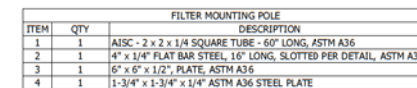


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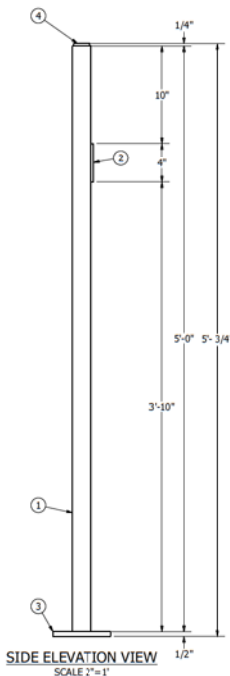
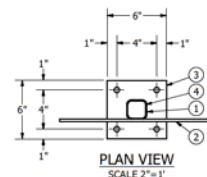
DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - STRUCTURAL
STRUCTURAL COMPONENT DETAILS

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-501-001		0
DRAWING SCALE: 1"=1'	SHEET: 1 OF 1	

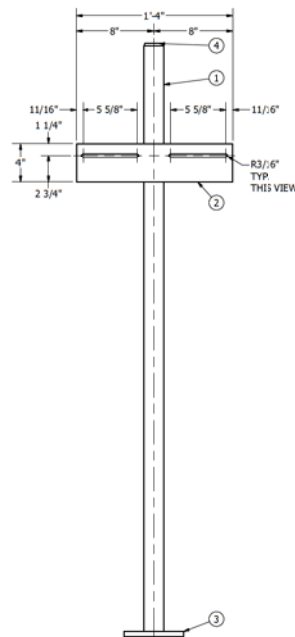
QTY (1) REQUIRED



ISOMETRIC VIEW
SCALE 1"=1'



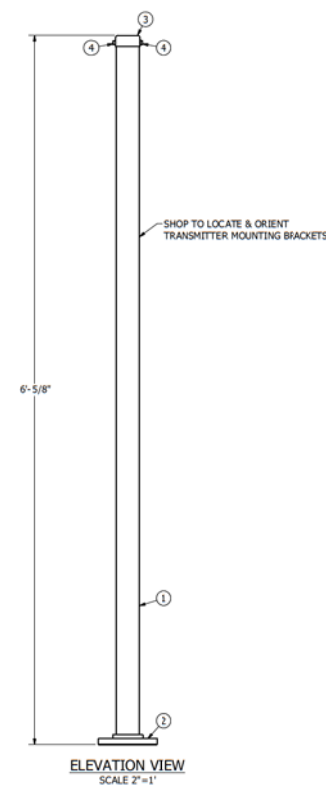
SIDE ELEVATION VIEW
SCALE 2"=1'



FRONT ELEVATION VIEW
SCALE 2"=1'

TRANSMITTER MOUNTING POLE		
ITEM	QTY	DESCRIPTION
1	1	2" PIPE, 0.218"W, ASTM A106 GRB, GALVANIZED, TOE x POE, 6 FT LONG
2	1	2" FLANGE, FF, NPT, GALVANIZED
3	1	2" CAP, SLP ON
4	2	1/4" HEX HEAD SELF TAPPING SCREW, 3/4" LONG

QTY (2) REQUIRED



ELEVATION VIEW
SCALE 2"=1'

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY						
REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE	
0	ISSUED FOR CONSTRUCTION	JRB	ECW	ZAH	05/15/20	



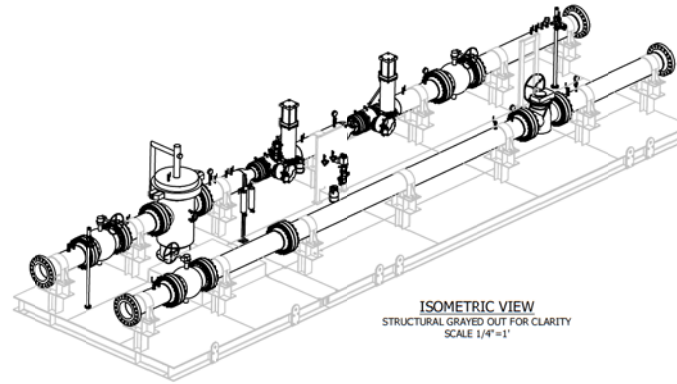
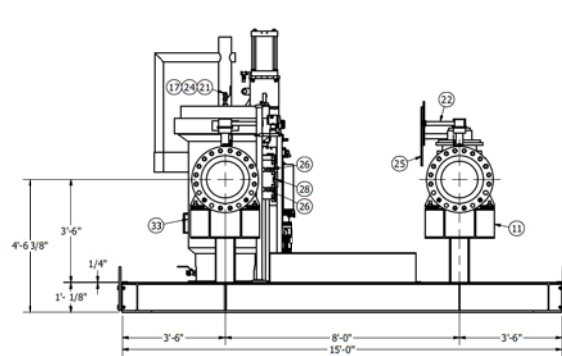
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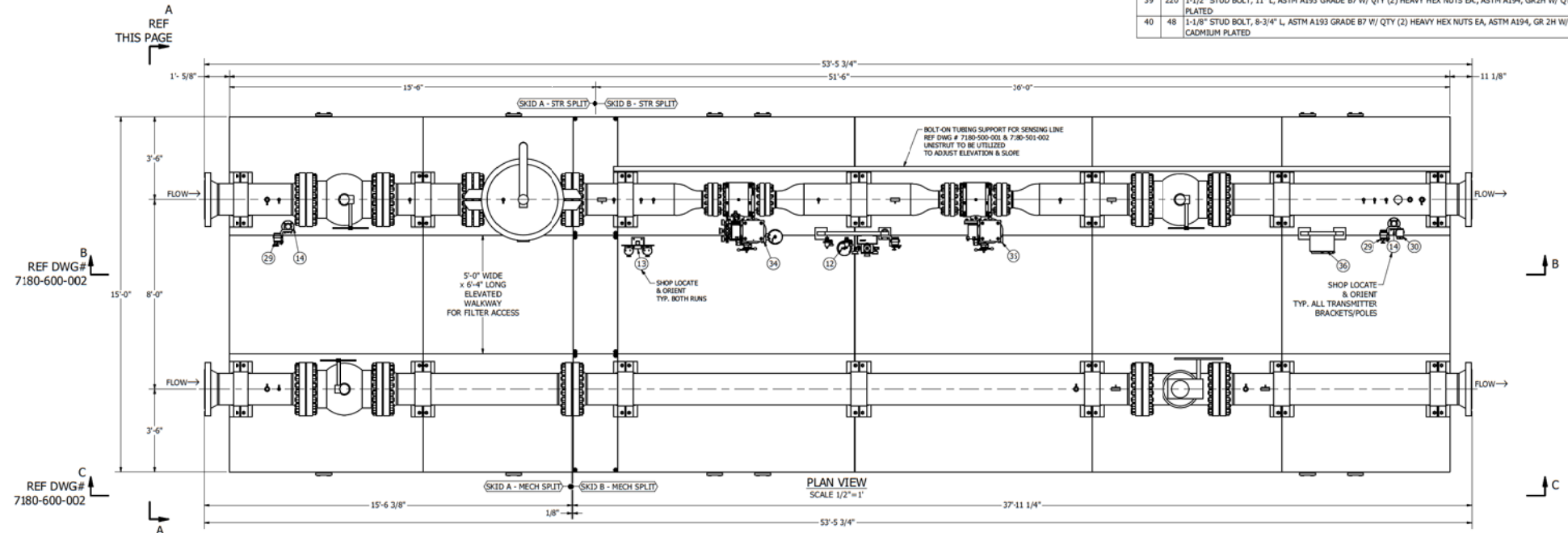
DUKE - CV205		
C350 PROJECT - NORWOOD STATION		
16" x 8" FC SKID - STRUCTURAL		
TUBING SUPPORT & FILTER POLE DETAILS		
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION:
DRAWING NUMBER: 7180-501-002		0
DRAWING SCALE: 3/4" = 1'	SHEET: 1 OF 1	

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SKIDS "A" & "B" SHOULD BE LIFTED INDEPENDENTLY. BOLTED CONNECTION IS NOT DESIGNED TO SUPPORT FULLY ASSEMBLED LIFTING.
ESTIMATED SKID WEIGHT OF SKID "A": 26,000 LBS
ESTIMATED SKID WEIGHT OF SKID "B": 42,000 LBS



ITEM QTY		PARTS LIST	
		DESCRIPTION	
1	1	SPOOL # 7180-2-1, REF DWG # 7180-700-001	
2	1	SPOOL # 7180-2-2, REF DWG # 7180-700-001	
3	1	SPOOL # 7180-2-3, REF DWG # 7180-700-001	
4	1	SPOOL # 7180-2-4, REF DWG # 7180-700-001	
5	1	SPOOL # 7180-2-5, REF DWG # 7180-700-001	
6	1	SPOOL # 7180-2-6, REF DWG # 7180-700-001	
7	1	SPOOL # 7180-2-7, REF DWG # 7180-700-002	
8	1	SPOOL # 7180-2-8, REF DWG # 7180-700-002	
9	1	SPOOL # 7180-2-9, REF DWG # 7180-700-002	
10	1	SPOOL # 7180-2-10, REF DWG # 7180-700-002	
11	1	PC SKID STRUCTURAL ASSEMBLY, REF DWG # 7180-500-001	
12	1	INSTRUMENT PANEL ASSEMBLY, REF DWG # 7180-700-003	
13	1	FILTER STAND, REF DWG # 7180-501-002	
14	2	TRANSMITTER MOUNTING POLE, POLE TO BE SHOP FABRICATED, GALVANIZED, REF DWG # 7180-501-002	
15	1	1" PIPE NIPPLE, SCH 160, 8" LONG, SA/A-106, GRB, ASTM A733, TBE	
16	7	1" PIPE NIPPLE, SCH 160, 3" LONG, SA/A-106, GRB, ASTM A733, TBE	
17	17	1/2" PIPE NIPPLE, SCH 160, 3" LONG, SA/A-106, GRB, ASTM A733, TBE	
18	1	1" THREADED 90 ELBOW, FNPT, 3000#, SA/A-105, ASME B16.11	
19	1	1" COUPLING, FNPT, 3000#, SA/A-105, ASME B16.11	
20	6	1" HEX PLUG, 3000#, ASTM A105, FORGED STEEL, ASME B16.11, SOLID	
21	12	1/2" HEX PLUG, 3000#, ASTM A105, ASME B16.11, FORGED STEEL, SOLID	
22	3	16" BALL VALVE, RFFE, ANSI 600, FULL PORT W/ GEAR OPERATOR AND HANDWHEEL, REF ENGINEERED EQUIPMENT BOM	
23	6	1" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM	
24	17	1/2" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM	
25	1	16" PLUG VALVE, RFFE, ANSI 600, W/ GEAR OPERATOR AND HANDWHEEL, REF ENGINEERED EQUIPMENT BOM	
26	7	GAUGE VALVE, 1/2" MNPT x 1/2" FNPT, REF ENGINEERED EQUIPMENT BOM	
27	5	1/2" PRESSURE GAUGE, REF ENGINEERED EQUIPMENT BOM	
28	1	DIFFERENTIAL PRESSURE INDICATOR, REF ENGINEERED EQUIPMENT BOM	
29	2	PRESSURE TRANSMITTER & POLE MOUNT, REF ENGINEERED EQUIPMENT BOM	
30	1	TEMPERATURE TRANSMITTER & PIPE MOUNT, REF ENGINEERED EQUIPMENT BOM	
31	1	TEMPERATURE THERMOWELL WITH RTD ROSENDALE, 1" NPT, REF ENGINEERED EQUIPMENT BOM	
32	1	1" THERMOWELL, REF ENGINEERED EQUIPMENT BOM	
33	1	VERTICAL FILTER, CV203, REF ENGINEERED EQUIPMENT BOM	
34	1	8" CONTROL VALVE, ANSI 600, MONITOR, REF ENGINEERED EQUIPMENT BOM	
35	1	8" CONTROL VALVE, ANSI 600, WORKER, REF ENGINEERED EQUIPMENT BOM	
36	1	16" x 12" JUNCTION BOX	
37	11	16" GASKET, SPIRAL WOUND, CLASS 600, 1/8" THK, FLEXITALLIC CGL, FLEXICARB FILLER, 304SS WINDINGS, 304SS INNER RING, CS OUTER RING, ASME B15.20	
38	4	8" GASKET, SPIRAL WOUND, CLASS 600, 1/8" THK, FLEXITALLIC CGL, FLEXICARB FILLER, 304SS WINDINGS, 304SS INNER RING, CS OUTER RING, ASME B15.20	
39	220	1-1/2" STUD BOLT, 11" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR2H W/ QTY (2) WASHER, CADMIUM PLATED	
40	48	1-1/8" STUD BOLT, 8-3/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS EA, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED	



GENERAL NOTES:

1. INLET TO DUKE STANDARDS & SPECIFICATION
2. ASME B31.8
3. DOT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

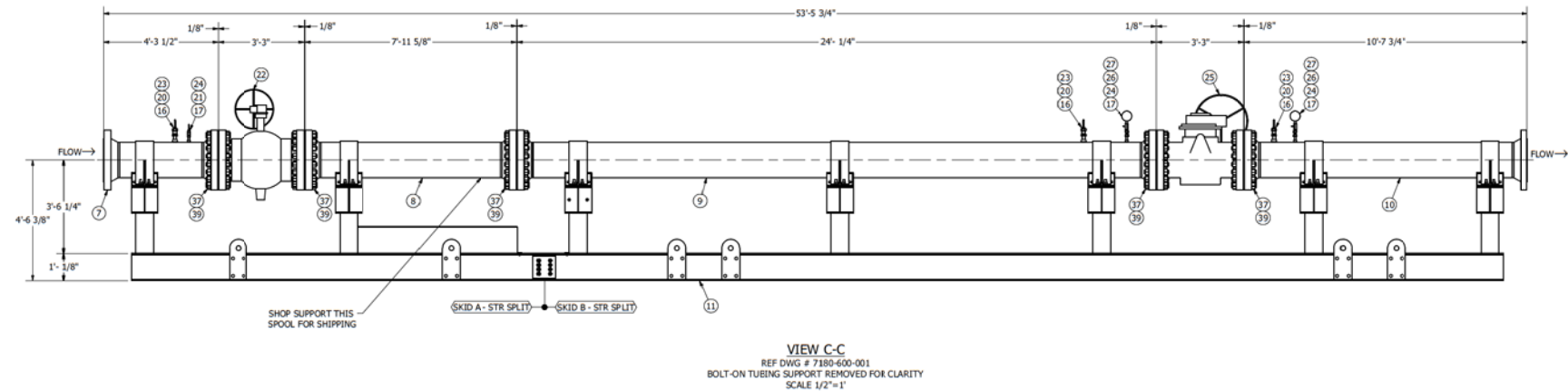
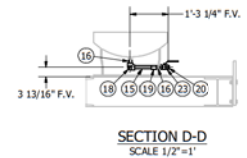
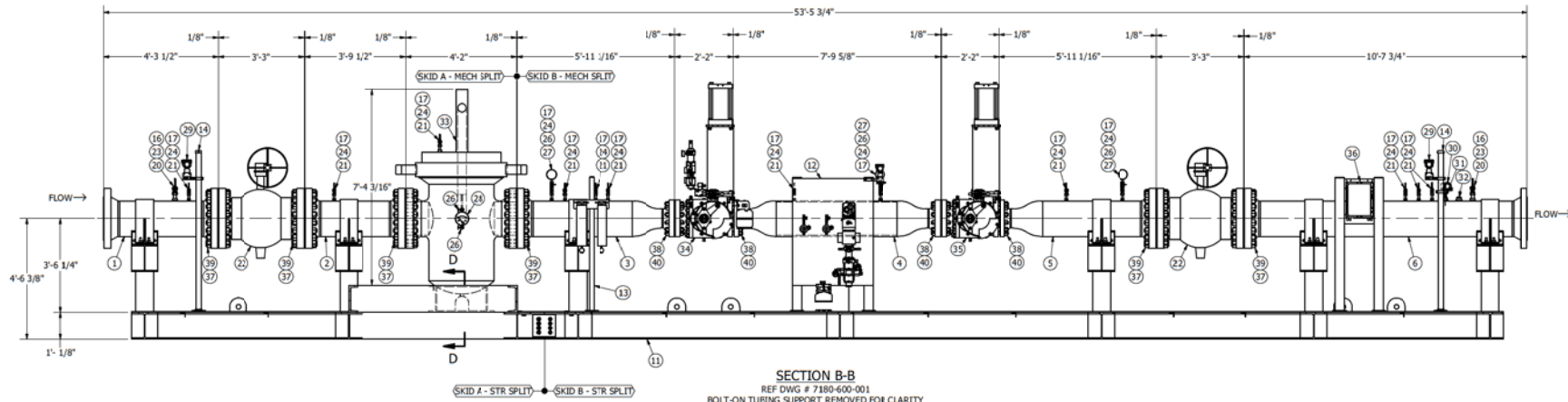
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DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SKID LAYOUT

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-600-001		0
DRAWING SCALE: 1/2"=1'	SHEET: 1 OF 1	



GENERAL NOTES:

1. BUILT TO DUKE STANDARDS & SPECIFICATION
2. ASME B31.8
3. DOT CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: 32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	NPF	05/15/2020



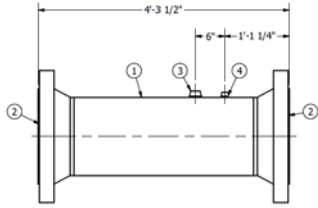
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**DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SKID SECTIONS**

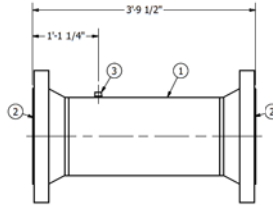
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-600-002		0
DRAWING SCALE: 1/2"=1'	SHEET: 1 OF 1	

SPOOL # 7180-2-1		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 4 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



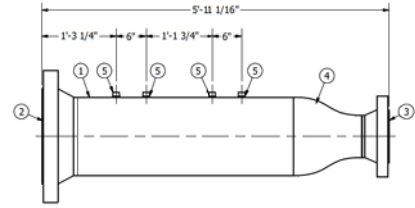
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-2		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 3 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



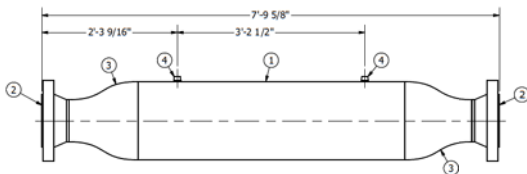
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-3		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 4 FT LONG
2	1	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	8" FLANGE, RFWN, ANSI 600, 1.500"W, A694 F52, MSS SP-44
4	1	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
5	4	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



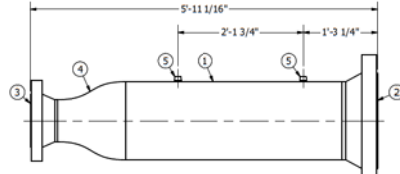
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-4		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 5 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	2	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
4	2	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



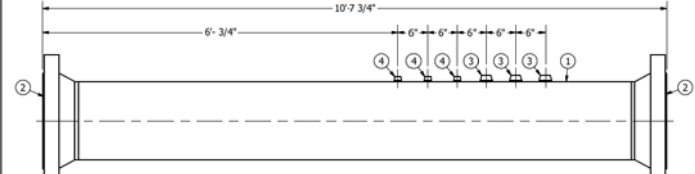
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-5		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 4 FT LONG
2	1	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	8" FLANGE, RFWN, ANSI 600, 1.500"W, A694 F52, MSS SP-44
4	1	16" x 8" CONCENTRIC REDUCER, 0.500"W X 0.500"W, WPHY52, MSS SP-75
5	2	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-6		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, APISL PSL-2 X52, ERW/LSAW, 10 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	3	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

- GENERAL NOTES:**
1. BUY TO DUKES STANDARDS & SPECIFICATION
 2. ASME B31.8
 3. DIT CLASS 4 DESIGN
 4. DESIGN FACTOR: 0.2
 5. CORROSION ALLOWANCE: 0.00
 6. 100% RADIOGRAPHIC INSPECTION
 7. DESIGN PRESSURE: 500 PSI
 8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
 9. DESIGN FLOW: 12 TO 228 MMSCFD
 10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: 32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	NPF	05/15/2020

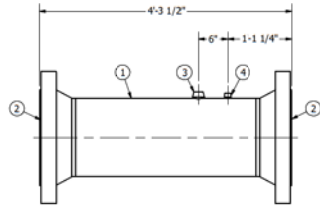


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DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SPOOL DETAIL (1)

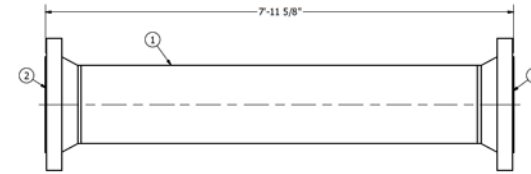
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-700-001		0
DRAWING SCALE: 1"=1'	SHEET: 1 OF 1	

SPOOL # 7180-2-7		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 4 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



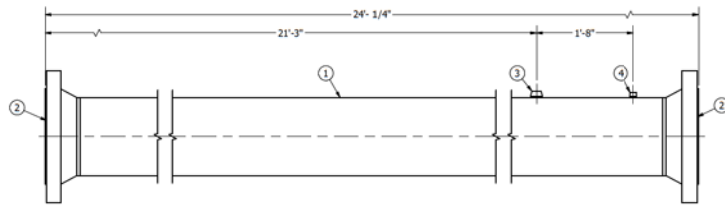
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-8		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 7 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44



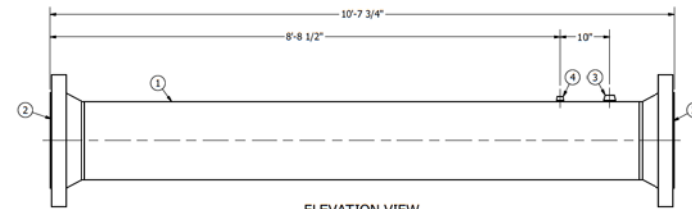
ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-9		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 13 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

SPOOL # 7180-2-10		
ITEM	QTY	DESCRIPTION
1	1	16" PIPE, 0.500"W, API5L PSL-2 X52, ERW/LSAW, 10 FT LONG
2	2	16" FLANGE, RFWN, ANSI 600, 0.500"W, A694 F52, MSS SP-44
3	1	1" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97
4	1	1/2" THREDOLET, 3000#, FOR 16" RUN PIPE, A694 F52, MSS SP-97



ELEVATION VIEW
SCALE 1"=1'

GENERAL NOTES:

1. BUY TO DUE STANDARDS & SPECIFICATION
2. ASME B31.8
3. D01 CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18" MN AWAY FROM BUILDING EYE & HIGH PRESSURE VENTS 5'-1" AWAY FROM BUILDING

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	NPF	05/15/2020

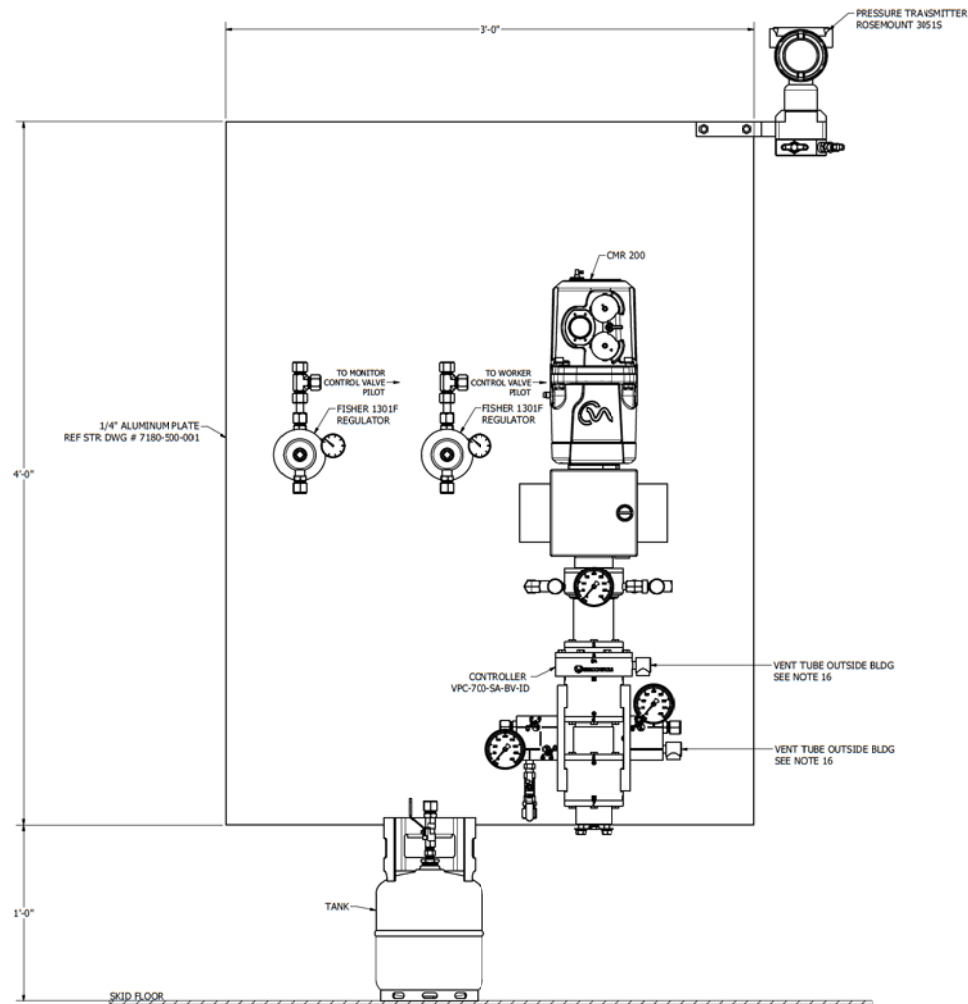


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DUKE - CV205
C350 PROJECT - NORWOOD STATION
16" x 8" FC SKID - MECHANICAL
SPOOL DETAIL (2)

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-700-002		0
DRAWING SCALE: 1"=1'	SHEET: 1 OF 1	



ELEVATION VIEW
FOR LAYOUT REFERENCE ONLY
FINAL PANEL ASSEMBLY MAY VARY
REF ENGINEERED EQUIPMENT BOM
FOR ALL INSTRUMENTATION
SCALE 3\"/>

GENERAL NOTES:

1. BUILD TO DUKES STANDARDS & SPECIFICATION
2. ASME B31.8
3. D01 CLASS 4 DESIGN
4. DESIGN FACTOR: 0.2
5. CORROSION ALLOWANCE: 0.00
6. 100% RADIOGRAPHIC INSPECTION
7. DESIGN PRESSURE: 500 PSI
8. DESIGN TEMPERATURE RANGE: -20° TO 120°F
9. DESIGN FLOW: 12 TO 228 MMSCFD
10. HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS

11. INLET OPERATING PRESSURE RANGE: 210 - 500 PSIG
12. OUTLET PRESSURE: 170 PSIG
13. OPERATING TEMPERATURE: -32° - 120°F
14. VTA DESIGNATES A NORMALLY OPERATED CLASS 1 DIVISION 1 SOURCE
15. IF NOT LABELED VTA, SOURCE IS DEEMED NOT NORMALLY OPERATED OR MUST BE PIPED AWAY A MINIMUM OF 10' FROM ANY CLASS 1 DIVISION 2 EQUIPMENT
16. DUKE TO ROUTE LOW PRESSURE VENTS 18\"/>

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JRB	ECW	NPF	05/15/2020



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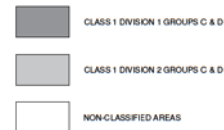
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PHONE: 304-743-4290
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DUKE - CV205
C350 PROJECT - NORWOOD STATION
16\"/>

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-700-003		0
DRAWING SCALE: 3"=1'	SHEET: 1 OF 1	

SHEET: 1 OF 1

AREA CLASSIFICATIONS CLASSIFICATIONS ARE BASED ON RECOMMENDATIONS FROM THE AMERICAN GAS ASSOCIATION #XL1001



GENERAL CLASSIFICATION NOTES:

CLASS 1 DIVISION 1 AREAS

5' RADIUS AROUND ALL BLOWDOWN VENTS RELIEF VALVES AS CONSIDERED NORMAL OPERATIONS

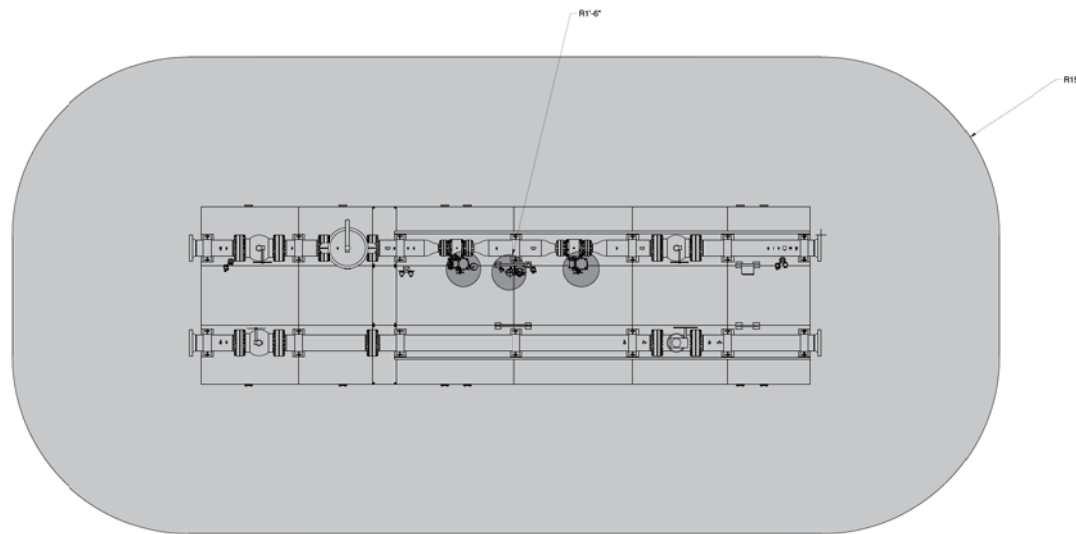
1.5' RADIUS AROUND ALL INSTRUMENT VENTS FOR THOSE CONSIDERED NORMAL OPERATIONS

FOR OPERATION/MAINTENANCE CONDITIONS CONSIDERED "NON-NORMAL" THE AREA SURROUNDING IS CLASSIFIED AS C102 WITH SPECIAL PRECAUTIONS TO BE TAKEN DURING THE TIME OF THAT OPERATION/MAINTENANCE

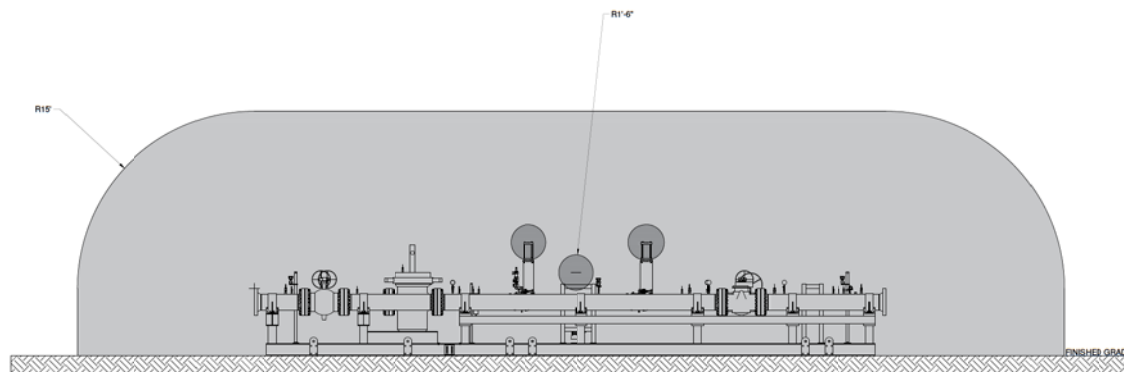
CLASS 1 DIVISION 2 AREAS

15' RADIUS AROUND ALL BLOWDOWN VENTS, RELIEF VALVES, CLOSURES, FLANGES, VALVES, HEADER PIPING AND LOUVERS

7' RADIUS AROUND INSTRUMENT VENTS



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES:

- FOR CLASSIFICATION LOCATIONS FOR ELECTRICAL INSTALLATION REFERENCE - AGA XL1001 "CLASSIFICATION OF LOCATIONS FOR ELECTRICAL INSTALLATIONS IN GAS UTILITY AREAS"

DRAWING STATUS:

**ISSUED FOR
CONSTRUCTION**

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JSA	05/15/2020



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DUKE - CV205
C350 PROJECT - NORWOOD STATION
HAZARDOUS LOCATION
FLOW CONTROL SKID

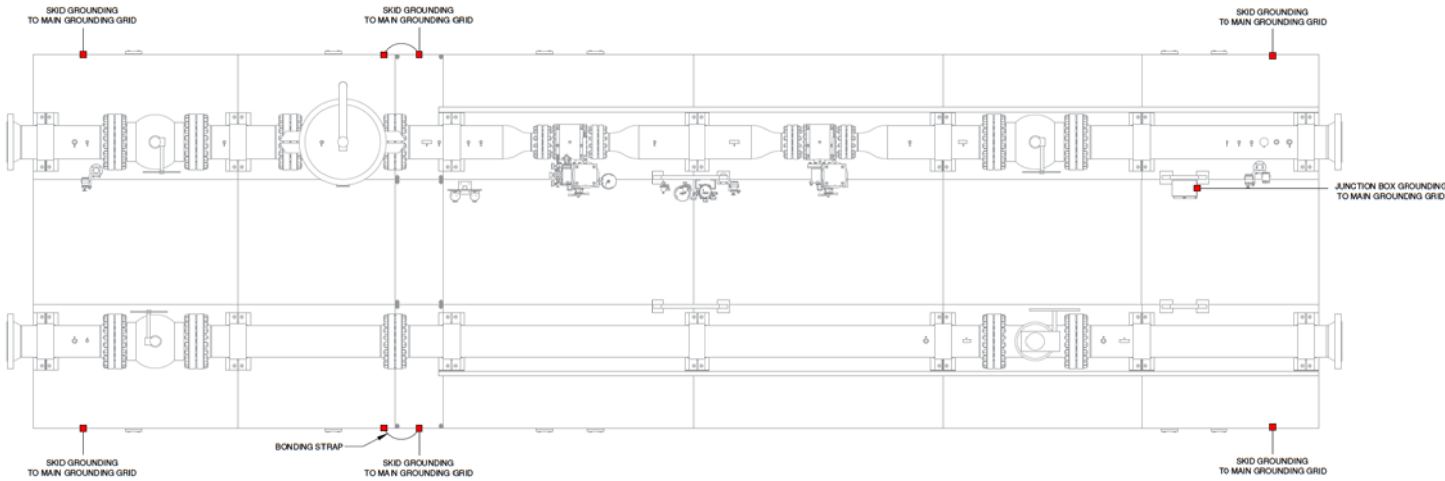
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-1200-100		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	

GROUNDING LEGEND

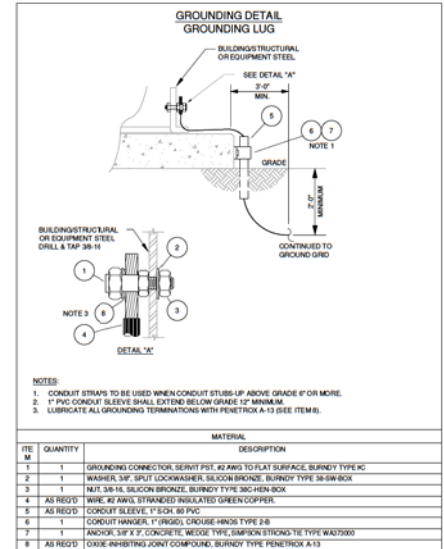
■ BOLTED MECHANICAL CONNECTION

GROUNDING NOTES:

- THE RESPECTIVE REGULATOR SKIDS SHALL BE PROVIDED WITH (4) ATTACHMENTS FOR ELECTRICAL GROUNDING PROVISIONS. THE GROUNDING ATTACHMENTS SHALL BE LOCATED ON OPPOSITE CORNERS ON THE OUTSIDE OF THE EQUIPMENT AND SHALL BE NOTED ON THE DRAWINGS.
- VENDOR SHALL PROPERLY GROUND ALL EQUIPMENT, ENCLOSURES, CONDUITS AND ANY SERVICE CONDUCTOR THAT IS TO BE GROUNDED IN ACCORDANCE WITH NEC ARTICLE 250 AND IN ACCORDANCE WITH THE REQUIREMENTS OF NEC 501.30(A) AND 501.30(B).
- SKIDS ARE TO BE BONDED TOGETHER UTILIZING BONDING STRAP



PLAN VIEW



GENERAL NOTES:

1. CONTRACTOR TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE TO THE LATEST VERSION OF THE NEC
2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY LABOR, EQUIPMENT AND MATERIAL, TO PROVIDE COMPLETE INSTALLATION

DRAWING STATUS:

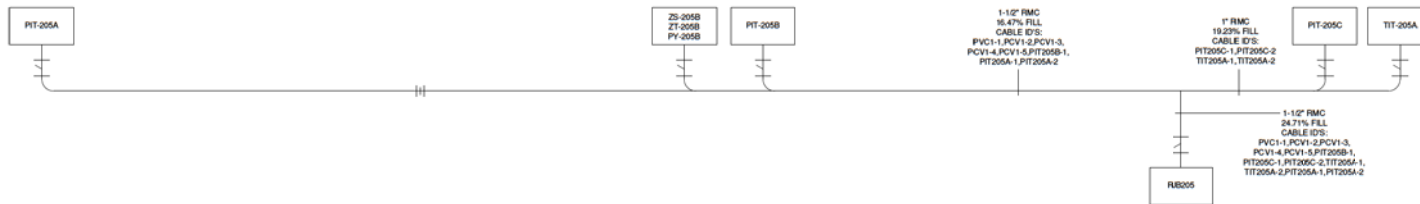
ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JA	05/15/2020

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PHONE: 304-743-4200
WWW.CENERGYCO.COMDUKE - CV205
C350 PROJECT - NORWOOD STATION
GROUNDING PLAN
FLOW CONTROL SKID

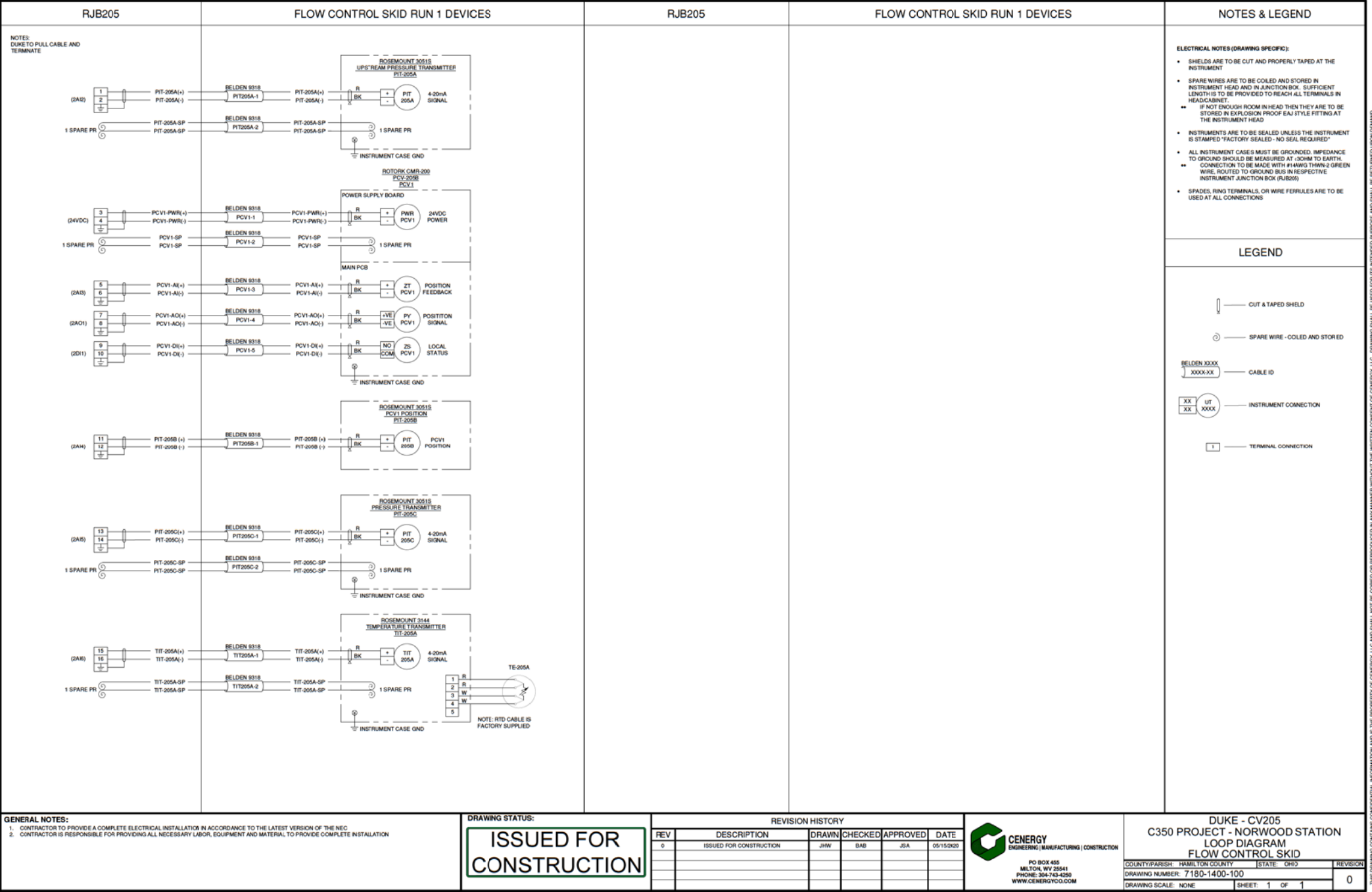
COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7180-1200-200		0
DRAWING SCALE: NONE	SHEET: 1 OF 1	



-
- Diagram illustrating the typical pressure transmitter connection detail. The components shown include:
- NIPPLE LENGTH AS REQUIRED & 1/2-3/4" BUSHING
 - 1/2" UNION
 - TRANSMITTER
 - 3/4" LB
 - 1/4" DRAIN SEAL
 - SEALTITE GROUNDING HUB
 - 3/4" SEALTITE LMC TYPE
- NOTE: NO DEG EXP PROOF UNION MAY BE USED
- GROUNDING STRAP TO BE CONNECTED FROM ONE END OF SEALTITE TO THE OTHER
- TYPICAL PRESSURE TRANSMITTER CONNECTION DETAIL**

COUNTY/PARISH: HAMILTON COUNTY		STATE: OHIO	REVISION
DRAWING NUMBER: 7180-1300-100			0
DRAWING SCALE: NONE		SHEET: 1 OF 1	

THE PARTIES HERETO SHALL, IN THE EVENT OF A DISPUTE, FIRST ATTEMPT TO RESOLVE THE DISPUTE THROUGH NEUTRAL DISPUTE RESOLUTION. IF THE DISPUTE IS NOT RESOLVED THROUGH NEUTRAL DISPUTE RESOLUTION, THE PARTIES SHALL, AT THE OPTION OF EITHER PARTY, BRING THE DISPUTE TO THE ATTENTION OF THE BOARD OF DIRECTORS OF THE COMPANY, OR TO THE ATTENTION OF THE STOCKHOLDERS OF THE COMPANY, OR TO THE ATTENTION OF THE CREDITORS OF THE COMPANY, OR TO THE ATTENTION OF THE DEBTHOLDERS OF THE COMPANY, OR TO THE ATTENTION OF THE EMPLOYEES OF THE COMPANY, OR TO THE ATTENTION OF THE CUSTOMERS OF THE COMPANY, OR TO THE ATTENTION OF THE SUPPLIERS OF THE COMPANY, OR TO THE ATTENTION OF THE Vendors OF THE COMPANY, OR TO THE ATTENTION OF THE DISTRIBUTORS OF THE COMPANY, OR TO THE ATTENTION OF THE RETAILERS OF THE COMPANY, OR TO THE ATTENTION OF THE WHOLESALE DEALERS OF THE COMPANY, OR TO THE ATTENTION OF THE MANUFACTURERS OF THE COMPANY, OR TO THE ATTENTION OF THE SERVICE PROVIDERS OF THE COMPANY, OR TO THE ATTENTION OF THE OTHER PARTIES TO THE DISPUTE.



13

14

2A15

1

2

PIT-205C(+)

PIT-205C(-)

BELDEN 9318

PIT205C-1

PIT-205C(+)

PIT-205C(-)

R

BK

PIT 205C

4-20mA SIGNAL

1 SPARE PR

1

2

PIT-205C-SP

PIT-205C-SP

BELDEN 9318

PIT205C-2

PIT-205C-SP

PIT-205C-SP

R

BK

1 SPARE PR

INSTRUMENT CASE GND

15

16

2A16

1

2

TIT-205A(+)

TIT-205A(-)

BELDEN 9318

TIT205A-1

TIT-205A(+)

TIT-205A(-)

R

BK

TIT 205A

4-20mA SIGNAL

1 SPARE PR

1

2

TIT-205A-SP

TIT-205A-SP

BELDEN 9318

TIT205A-2

TIT-205A-SP

TIT-205A-SP

R

BK

1 SPARE PR

INSTRUMENT CASE GND

TE-205A

1

2

3

4

5

NOTE: RTD CABLE IS
FACTORY SUPPLIED

FLOW CONTROL SKID RUN 1 DEVICES

ROSEMOUNT 3011S
UPSTREAM PRESSURE TRANSMITTER
PIT-205A

ROSEMOUNT 3011S
PCV1 POSITION
PIT-205B

ROSEMOUNT 3011S
PRESSURE TRANSMITTER
PIT-205C

ROSEMOUNT 3144
TEMPERATURE TRANSMITTER
TIT-205A

RJB205

FLOW CONTROL SKID RUN 1 DEVICES

NOTES & LEGEND

ELECTRICAL NOTES (DRAWING SPECIFIC):

• SHIELDS ARE TO BE CUT AND PROPERLY TAPED AT THE INSTRUMENT

• SPARE WIRES ARE TO BE COILED AND STORED IN INSTRUMENT HEAD AND IN JUNCTION BOX. SUFFICIENT LENGTH IS TO BE PROVIDED TO REACH ALL TERMINALS IN HEAD/CABINET.

• IF NOT ENOUGH ROOM IN HEAD THEN THEY ARE TO BE STORED IN EXPLOSION PROOF EAJ STYLE FITTING AT THE INSTRUMENT HEAD

• INSTRUMENTS ARE TO BE SEALED UNLESS THE INSTRUMENT IS STAMPED "FACTORY SEALED - NO SEAL REQUIRED"

• ALL INSTRUMENT CASES MUST BE GROUNDED. IMPEDANCE TO GROUND SHOULD BE MEASURED AT .30MM TO EARTH.

• CONNECTION TO BE MADE WITH #14AWG THWN-2 GREEN WIRE. ROUTED TO GROUND BUS IN RESPECTIVE INSTRUMENT JUNCTION BOX (RJB205)

• SPADES, RING TERMINALS, OR WIRE FERRULES ARE TO BE USED AT ALL CONNECTIONS

LEGEND

CUT & TAPED SHIELD

SPARE WIRE - COILED AND STORED

BELDEN XXXX

XXXX-XX

CABLE ID

XX

XX

UT

XXXX

INSTRUMENT CONNECTION

1

TERMINAL CONNECTION

GENERAL NOTES:

1. CONTRACTOR TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION IN ACCORDANCE TO THE LATEST VERSION OF THE NEC

2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL NECESSARY LABOR, EQUIPMENT AND MATERIAL, TO PROVIDE COMPLETE INSTALLATION

DRAWING STATUS:

ISSUED FOR CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	JHW	BAB	JA	05/15/2020

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DUKE - CV205

C350 PROJECT - NORWOOD STATION

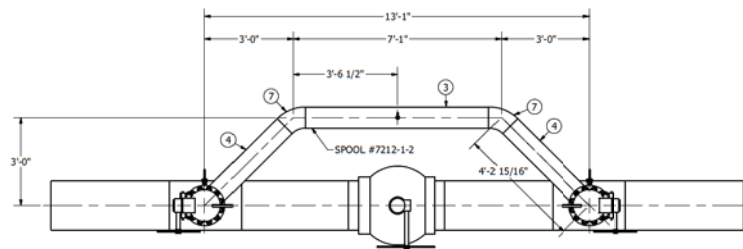
LOOP DIAGRAM

FLOW CONTROL SKID

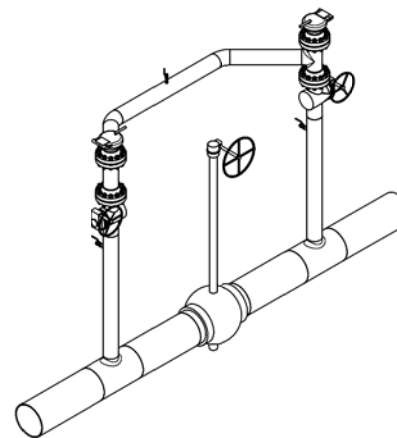
COUNTY/PARISH: HAMILTON COUNTY | STATE: OHIO | REVISION

DRAWING NUMBER: 7180-1400-100 | SHEET: 1 OF 1 | 0

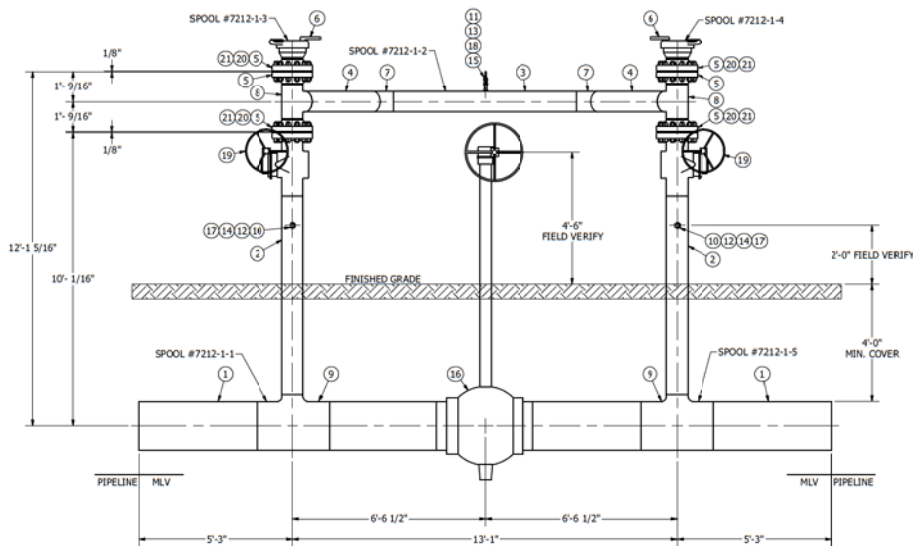
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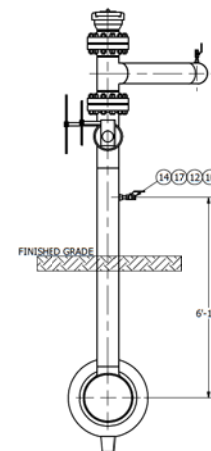
PLAN VIEW
SCALE 1/2"=1'



ISOMETRIC VIEW
SCALE 3/8"=1'



FRONT ELEVATION VIEW
SCALE 1/2"=1'



SIDE ELEVATION VIEW
SCALE 1/2"=1'

PARTS LIST	
ITEM	DESCRIPTION
1	20" PIPE, LSAW/ERW, 0.500" W, API5L PSL-2 X65, 4 FT LONG, FBE COATED
2	8" PIPE, ERW, 0.322" W, API5L PSL-2 X52, 7 FT LONG, FBE COATED
3	8" PIPE, ERW, 0.322" W, API5L PSL-2 X52, 7 FT LONG
4	8" PIPE, ERW, 0.322" W, API5L PSL-2 X52, 4 FT LONG
5	8" FLANGE, RFWN, ANSI 600, 0.322" W, A694 F52, MSS SP-44
6	8" CLOSURE, TDW D2000, 0.322" W, VERTICAL, ASME B31.8, RATED FOR 500 MAWP @ 0.2 DF, A694 F52, W/ MANUFACTURER TAG
7	8" WELD ELBOW, 45°, L, 0.322" W, WPHY52, MSS SP-75
8	8" STRAIGHT TEE, 0.322" W, WPHY52, MSS SP-75
9	20" x 8" REDUCING TEE, 0.500" W x 0.322" W, WPHY52, MSS SP-75
10	1" THREDOLET, 3000#, FOR 8" RUN PIPE, A694 F52, MSS SP-97
11	1/2" THREDOLET, 3000#, FOR 8" RUN PIPE, A694 F52, MSS SP-97
12	1" PIPE NIPPLE, SCH 80, 3" LONG, SA/A-106, GRB, ASTM A733, TBE
13	1/2" PIPE NIPPLE, SCH 80, 3" LONG, SA/A-106, GRB, ASTM A733, TBE
14	1" HEX PLUG, 3000#, ASTM A105, FORGED STEEL, ASME B16.11, SOLID
15	1/2" HEX PLUG, 3000#, ASTM A105, ASME B16.11, FORGED STEEL, SOLID
16	20" BALL VALVE, WE x WE, ANSI 600, FULL PORT W/ GEAR OPERATOR AND HANDWHEEL, REF ENGINEERED EQUIPMENT BOM
17	2" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM
18	1/2" BALL VALVE, 2000#, FNPT, REDUCED PORT, W/ LOCKING LEVER, REF ENGINEERED EQUIPMENT BOM
19	8" PLUG VALVE, WE x RFE, ANSI 600, W/ GEAR OPERATOR AND HANDWHEEL, RE1 ENGINEERED EQUIPMENT BOM
20	4" GASKET, SPIRAL WOUND, CLASS 600, 1/8" THK, FLEXITALLIC CGI, FLEXICARB FILLER, 304SS WINDINGS, 304SS INNER RING, CS OUTER RING, ASME B16.20
21	48 1-1/8" STUD BOLT, 8-3/4" L, ASTM A193 GRADE B7 W/ QTY (2) HEAVY HEX NUTS 1A, ASTM A194, GR 2H W/ QTY (2) WASHER, CADMIUM PLATED

GENERAL NOTES:

- BUILT TO DUKE STANDARD & SPECIFICATION
- ASME B31.8
- DOT CLASS 3 DESIGN
- DESIGN FACTOR 0.2
- CORROSION ALLOWANCE: 0.00
- 100% RADIOGRAPHIC INSPECTION
- DESIGN PRESSURE OF 500 PSIG
- DESIGN TEMPERATURE RANGE: -20° - 120°F
- HYDROSTATIC TEST WITH WATER AT MIN 750 PSIG / MAX 800 FOR EIGHT (8) HOURS
- DESIGN FLOW 12 - 228 MMSCFD
- PRESSURE RANGE: 215 - 500 PSIG

12. OPERATING TEMPERATURE OF 32°F - 120°F

DRAWING STATUS:

ISSUED FOR
CONSTRUCTION

REVISION HISTORY

REV	DESCRIPTION	DRAWN	CHECKED	APPROVED	DATE
0	ISSUED FOR CONSTRUCTION	BWM	ECW	TPR	07/21/2020

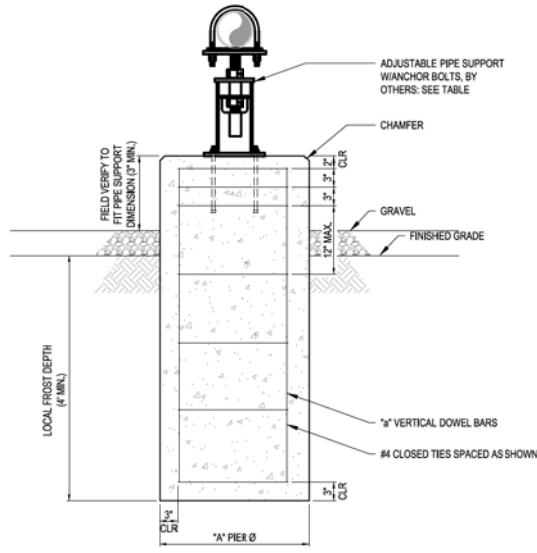


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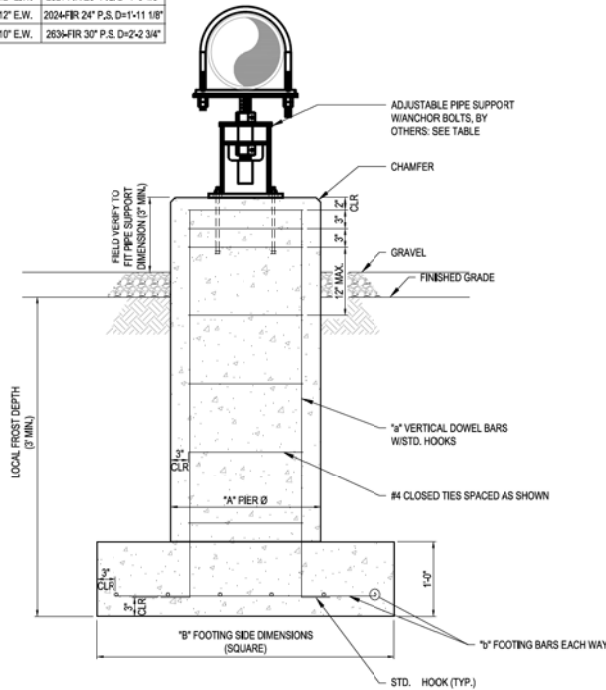
DUKE ENERGY
NORWOOD STATION
MECHANICAL
MLV LAYOUT

COUNTY/PARISH: HAMILTON COUNTY	STATE: OHIO	REVISION
DRAWING NUMBER: 7212-300-001		0
DRAWING SCALE: AS NOTED	SHEET: 1 OF 1	

PIER DIMENSIONS FOR ABOVE GRADE VALVES								
NOMINAL VALVE SIZE (IN.)	NOMINAL RISER SIZE (IN.)	DETAIL	PIER DIAMETER "A" (IN.)	PIER VERTICAL BARS "a"	PIER CLOSED TIES	FOOTING SIDE DIMENSION "B" (FT)	FOOTING BARS "b"	EZ LINE ADJUSTABLE PIPE SUPPORT OR EQUIV.
6	2	1	24	(8) #5	SEE DETAIL	N/A	N/A	510-FIR 6" P.S. D=1'-5 7/16"
8	4	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	3	#5 @ 12" E.W.	510-FIR 8" P.S. D=1'-6 7/16"
10	4	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	3	#5 @ 12" E.W.	510-FIR 10" P.S. D=1'-7 1/2"
12	4	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	3	#5 @ 12" E.W.	1218-FIR 12" P.S. D=1'-9 1/2"
16	6	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	5	#5 @ 12" E.W.	1218-FIR 16" P.S. D=1'-11 1/8"
20	8	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	6	#5 @ 12" E.W.	2024-FIR 20" P.S. D=1'-9 1/8"
24	8	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	6	#5 @ 12" E.W.	2024-FIR 24" P.S. D=1'-11 1/8"
30	8	2	24	(8) #5 W/STD. HOOK	SEE DETAIL	6	#5 @ 10" E.W.	2634-FIR 30" P.S. D=2'-2 3/4"



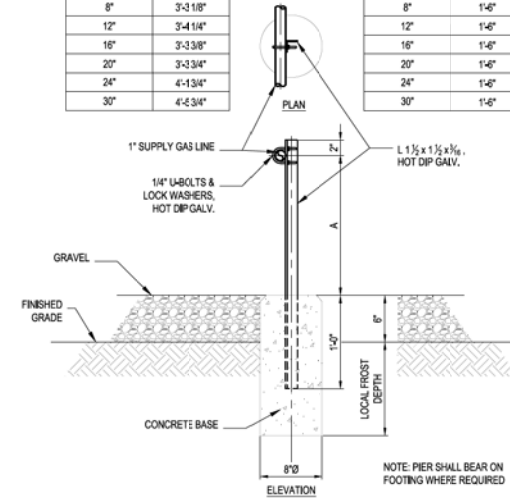
DETAIL 1
SCALE: NTS



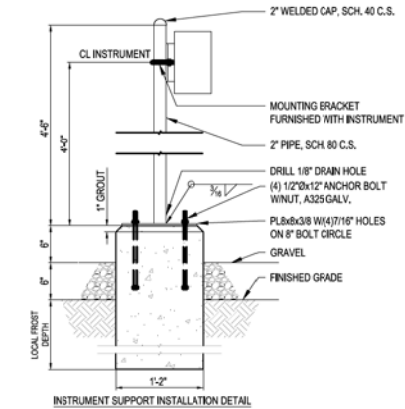
DETAIL 2
SCALE: NTS

FOR ABOVE GROUND VALVE SETTINGS (DETAIL 3)	
MAINLINE NOMINAL VALVE SIZE (IN.)	A
6"	3'-3 7/8"
8"	3'-3 1/8"
12"	3'-4 1/4"
16"	3'-3 3/8"
20"	3'-3 3/4"
24"	4'-1 3/4"
30"	4'-2 3/4"

FOR BELOW GROUND VALVE SETTINGS (DETAIL 3)	
MAINLINE NOMINAL VALVE SIZE (IN.)	A
6"	1'-4"
8"	1'-4"
12"	1'-4"
16"	1'-4"
20"	1'-4"
24"	1'-4"
30"	1'-4"



1" SUPPLY GAS PIPE SUPPORT 3
SCALE: NTS



DETAIL 4
SCALE: NTS

- CIVIL AND STRUCTURAL NOTES:**
- ADDITIONAL EXCAVATION BELOW FOOTINGS MAY BE NECESSARY TO REACH UNDISTURBED SOIL. SHOULD THIS OCCUR, THE EXCAVATION SHALL BE BROUGHT TO THE BOTTOM OF THE FOOTING ELEVATION WITH COMPACTED SAND FILL MEETING THE REQUIREMENTS OF MODIFIED PROCTOR COMPACTION TEST (ASTM D 1557) TO 95% IN SIX INCH LIFTS.
 - ALL EXPOSED CONCRETE EDGES SHALL HAVE A 1" X 1/4" CHAMFER.
 - CONCRETE SHALL BE MIXED AND POURED PER PERTINENT PIEDMONT DESIGN AND CONSTRUCTION STANDARDS. TESTING SHALL CONFORM TO ACI 318. INSTALLER TO SUPPLY ALL CONCRETE AND TESTING.
 - ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 SPECIFICATION. STEEL REINFORCING BAR SHALL CONFORM TO ASTM A615 GRADE 60 AND WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. TIE WIRE SHALL CONFORM TO ASTM A62.
 - UNDESIRABLE OR EXCESS EARTH SPOIL SHALL BE DISPOSED OF AT AN APPROVED WASTE LOCATION. SOIL BEING TRANSPORTED ONTO THE JOB SITE SHALL BE APPROVED BY EITHER THE PROJECT MANAGER OR CONSTRUCTION MANAGER.
 - ROCKSHIELD OR SIMILAR COMPANY APPROVED PRODUCT MUST BE INSTALLED BETWEEN ALL PIPE AND FITTINGS THAT COME INTO CONTACT WITH CONCRETE. A LAYER OF NON ABRASIVE MATERIAL SUCH AS FRP SHALL BE INSTALLED BETWEEN ALL PIPE SUPPORTS AND PIPING.
- ALL FIELD BENDING OF REBAR SHALL BE DONE COLD.
- NOTE:**
FOUNDATION DESIGN IS BASED ON ALLOWABLE BEARING PRESSURE OF SOIL OR STRUCTURAL FILL EQUAL TO OR GREATER THAN 1500 PSF. CONTRACTOR SHALL VERIFY BEARING PRESSURE CAPACITY PRIOR TO INSTALLING FOUNDATION.

REF. DWG(S) PNG-G-000-0001035

SHEET(S) 6 OF 21	DWG SCALE AS NOTED
DWG DATE 01/10/2017	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -G-000-0001037	0
DISCIPLINE / RESOURCE CENTER / LINE NUMBER	

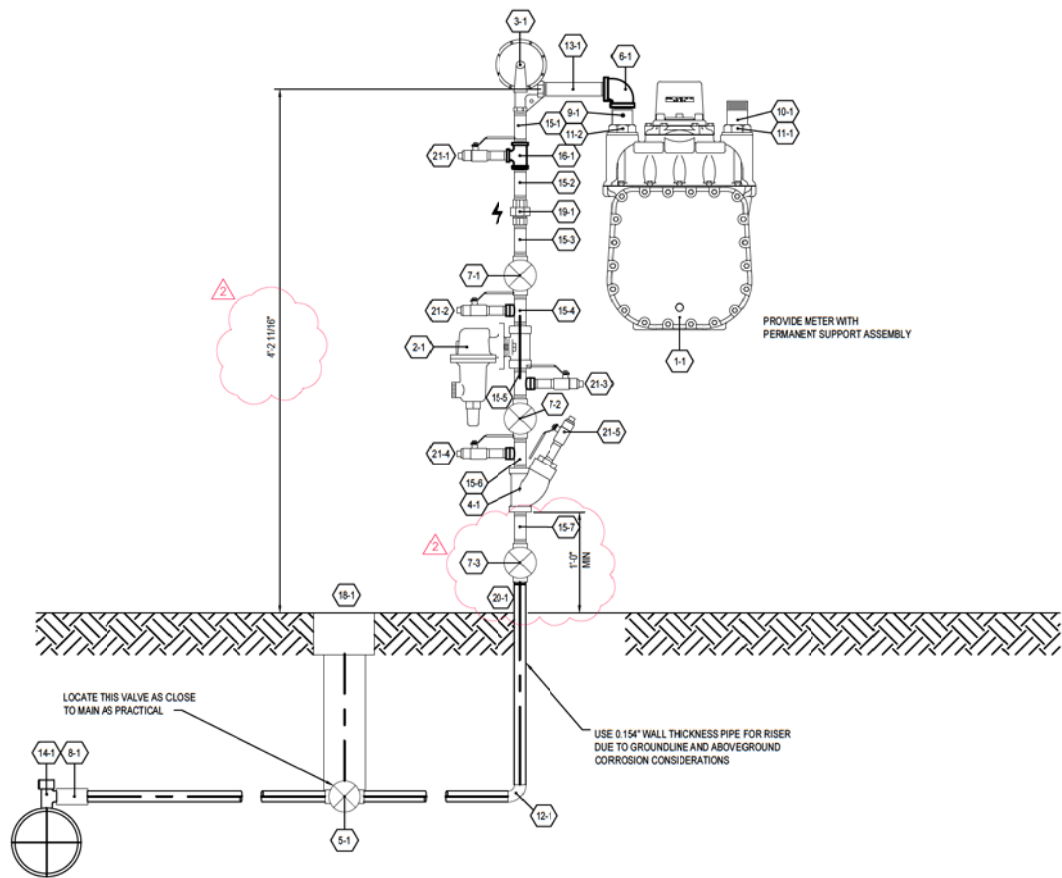
PROPRIETARY & CONFIDENTIAL ALL RIGHTS RESERVED * DO NOT SCALE THIS DRAWING * USE DIMENSIONS ONLY
PIEDMONT'S NATURAL GAS FACILITY DRAWINGS ARE CONSIDERED CONFIDENTIAL (DM-185) * DRAWING IS CURRENT ONLY THROUGH THE LATEST REVISED DATE * TO INSURE THERE IS NO RISK OF INAPPROPRIATE DISCLOSURE ALL PREVIOUS PAPER COPIES OF THIS DRAWING MUST BE DESTROYED IN ACCORDANCE WITH RECORDS & INFO. MANAGEMENT (RIM) POLICY 1001

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPRO	DESCRIPTION	DATE	INITIALS	APPROVALS
0	01/10/17	FINAL SUBMITTAL	FGI	-	-	AREA CODE	XX/XX/20XX	XXX	REGIONAL ENGINEER
						ACCOUNT NUMBER	XX/XX/20XX	XXX	MGR TECH REC & STD
						PROJECT NUMBER	00000000	XXX	PRINCIPAL ENGINEER
						DRAWING BY	MCM	XXX	
						STATION ID	XXX-XX-XXX-XXXX	XXX	
						CHECKER INITIALS	XXX	XXX	

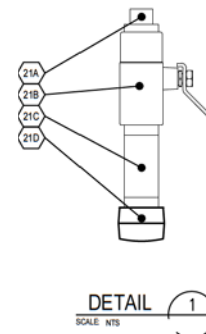


STANDARD DRAWING MAINLINE VALVE PIPE SUPPORTS

PROFESSIONAL ENGINEER STAMP



SEE DETAIL 1, ITEM #21 TYP TEST CONNECTION AND STRAINER BLOWDOWN DETAIL



DESIGN INFORMATION				
1,000 PSIG	DESIGN PRESSURE			
1,000 PSIG	MAXIMUM ALLOWABLE OPERATING PRESSURE			
1,000 PSIG	MAXIMUM ACTUAL WORKING PRESSURE OF MAIN			
250 PSIG	MIN EXPECTED OPERATING PRESSURE OF MAIN			
75 PSIG	DOWNSTEAM MAOP			
15 PSIG	REQUIRED DELIVERY PRESSURE			
1.275 CFH	ANTICIPATED LOAD			
-	RATE SCHEDULE			
METER: 000	CFH CAPACITY @ 000	000	PSIG INLET	
FIRST OUT REGULATOR:				
2,358	CFH CAPACITY @ 250	INLET 15	OUTLET	
9,029	CFH CAPACITY @ 1,000	INLET 15	OUTLET	
MONITOR PILOT SET PRESSURE: N/A				
AUTOMATIC SHUT-OFF SETTING: N/A				
FIRST CUT RELIEF SET PRESSURE: 000				
RELIEF: 000,000	CFH CAPACITY @ 000	PSIG INLET		
SECOND OUT REGULATOR:				
425	CFH CAPACITY @ 15	INLET 7" VAC	OUTLET	
425	CFH CAPACITY @ 15	INLET 7" VAC	OUTLET	
AUTOMATIC SHUT-OFF SETTING: N/A				
SECOND CUT RELIEF SET PRESSURE: 0				
RELIEF: 425	CFH CAPACITY @ 21"	W.C. INLET		

- NOTES:**
- ANY CHANGES REQUIRED DUE TO FIELD CONDITIONS MUST BE APPROVED BY THE ENGINEERING DEPARTMENT.
 - METER SET LOCATIONS NOT TO BE INSTALLED NEAR INTAKE VENTS.
 - CUSTOMER TO TIE IN AT THIS POINT PER DOT SPECIFICATION 192.355.
 - UNDERGROUND STEEL INLET PIPING AND RISER TO BE CATHODICALLY PROTECTED AND MONITORED IF NOT ELECTRICALLY CONTINUOUS WITH A PROTECTED STEEL SERVICE OR MAIN.

⚡ INDICATES ELECTRICALLY ISOLATED.

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NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD	DESCRIPTION	DATE	INITIALS	APPROVALS
0	05-21-2018	ISSUE FOR CONSTRUCTION - ECO-000592	AA	JDG	JAB	AREA CODE	-	05/21/2018	JAB
1	12/27/2018	CHANGED REGULATOR & UPDATED TABLE - ECO-000986	JCN	JAB	JDG	ACCOUNT NUMBER	10700		REGIONAL ENGINEER
2	07/29/2020	MODIFIED 1'-0" MIN & WAS 5'-0 1/8" - ECO-001475	JCN	MKL	JAW	PROJECT NUMBER	-		MANAGER, TECH REG & STD
						DRAWING BY	AA		
						STATION ID	-		
						CHECKER INITIALS	JDG		PRINCIPAL ENGINEER



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HIGH PRESSURE SERVICE CONNECT
STANDARD DRAWING
CITY, STATE
 Resource Center City, State

SHEET(S) 1 OF 3	DWG SCALE 2"=1'-0"
DWG DATE 1/19/2018	SUPERSEDED
DRAWING NUMBER PNG -G-000-0001204	REVISION 2
DISCIPLINE / RESOURCE CENTER / LINENUMBER	

BOM #	Catalog Number	Maximo Part #	Retired Cat #?	Qty	Surplus Qty	Description	Ordering Instructions	Ordering Specifications	Manuf.	Model	Manuf. Part #
1	07282	1553630		1		DIAPHRAGM METER, 45 LT INLET 45 LT OUTLET, 1000 SCFH CLASS, ALUMINUM BODY, . PAINTED ANSI 49 GRAY, TOP INLET, TOP OUTLET, MARK WITH PIEDMONT NATURAL GAS COMPANY BADGE AND METER NUMBER, SUPPLY WITH PLASTIC CAPS ON INLET AND OUTLET CONNECTIONS, TYPE 343 FIVE CIRCLE POINTER INDEX WITH WHITE FACE, WITH 7" WC, PRESSURE COMPENSATION, 5" TEST HAND.			AMERICAN METER	AL-1000	
2	12587	1555748		1		REGULATOR, DIRECT OPERATED, NPS 3/4 FPT, INCLUDES INTERNAL RELIEF, MAIN VALVE INCLUDES (1) DUCTILE IRON BODY (2) DUCTILE IRON SPRING CASE AND DIAPHRAGM CASE (3) NITRILE (NBR) DIAPHRAGM (4) ALUMINUM TRIM (5) NITRILE (NBR) VALVE DISK, INCLUDES SCREENED VENT ASSEMBLY, FOR NATURAL GAS USE, .PAINTED ANSI 49 GRAY, .302" ORIFICE, SPRING RANGE: 5 TO 20 PSIG (SPRING 1083076 X012 YELLOW).	SPECIFY SETPOINT. SPECIFY INTERNAL RELIEF SETPOINT. SPECIFY ORIFICE SIZE. SPECIFY MAIN VALVE SPRING (OUTLET PRESSURE RANGE, PART NUMBER, COLOR). UNLESS OTHERWISE SPECIFIED, BODY SPRING CASE ORIENTATION AND SPRING CASE VENT LOCATION TO BE STANDARD POSITION.	SET POINT @ 15 PSIG	FISHER	627R	
3	12077	1556235		1		REGULATOR, DIRECT OPERATED, NPS 3/4 FPT X 1 FPT, INCLUDES INTERNAL RELIEF, . PAINTED ANSI 49 GRAY, 1/8" ORIFICE, SPRING RANGE: 6.5" WC TO 9.25" WC PSIG (SPRING 762003 DARK GREEN).	SPECIFY SETPOINT. SPECIFY INTERNAL RELIEF SETPOINT. SPECIFY ASSEMBLY POSITION.	SET POINT @ 7" WC	ITRON (ACTARIS, SPRAGUE)	832R	
4	10516	1552468		1		STRAINER, WYE, NPS 3/4 FPT X 3/4 FPT, . . 81 MESH, 502" BASKET.			MUELLER	861	
5	14579	1556441		1		VALVE, BALL, NPS 3/4 WE X 3/4 WE, . REDUCED PORT, . DM-ST-2080, . 316 STAINLESS STEEL SOLID BALL AND STEM, REINFORCED PTFE SEATS, SUPPLY WITH LOCKABLE COMPONENTS, FLOATING BALL VALVE			WKM		8103-CS-28-CS 3/4
6	11441	1553235		1		ELBOW, THREADED, BML 90 DEG, NPS 1 1/2 NPT X 1 NPT, CLASS 150, ASTM A197 ASME B16.3, . REDUCING			ENLUN / BOTHWELL		
7	16367	1556271		3		VALVE, BALL, NPS 3/4 FPT X 3/4 FPT, . FULL PORT, . APV607, DM-ST-2080, LEVER, LOCKABLE, CS BODY, ACETAL SEAT, 316 SS TRIM			WKM	DYNASEAL 310	3/4-F-813B-CS2-4 3-S2-WR
8	15608	1554641		1		VALVE, EXCESS FLOW, NPS 3/4 WE X 3/4 WE, DM-ST-2080, .			UMAC		40002
9	15905	1551858		1		METER SWIVEL, BML, 45 LT X 1 1/2 NPT, LENGTH = . STRAIGHT			RICHARDS		55-45LT-1-1/2-IP
10	13048	1551652		1		METER SWIVEL, BML, 45 LT X 1 1/2 NPT, LENGTH = . STRAIGHT			GEORGE FISCHER CENTRAL PLASTICS		
11	16918	1553469		2		METER SWIVEL NUT, SS, 45 LT, .			ADVANCE ENGINEERING		SW050055
12	13063	1553075		1		ELBOW, WELD, NPS 3/4 X 0.154 WT. (XS), 91 DEG, .ASTM A234 MSS SP-75, DM-ST-2010, . PAINTED PREFERRED, BARE ACCEPTABLE, MACHINE BEVEL ENDS PER ASME B31.8 APPENDIX I, FIG 1-4			HACKNEY LADISH, TFA		
13	16384	1551460		1		NIPPLE, NPS 1, XS (SCH 80), 6 INCH LENGTH, TBE, .ASTM A106 Gr. B, . SMLS,					
14	15590	1557657		1		TEE, TAPPING, FORGED STEEL, NPS 3/4 WE X 3/4 WE, .ASTM A105, NO-BLO SERVICE, BARE, CAP, ASTM A105			MUELLER	H-17501	250H17501
15	15086	1551908		7		NIPPLE, NPS 3/4, STD (SCH 40), 1 INCH LENGTH, TBE, .ASTM A106 Gr. B,			WESTBROOK		
16	11446	1556058		1		TEE, THREADED, FORGED STEEL, NPS 3/4 FPT X 3/4 FPT X 1/2 FPT, CLASS 3000, ASTM A105 ASME B16.11,			BONNEY FORGE		
17						NOT USED					
18	11334	1555033		1		VALVE BOX, . 5-1/4" DIA WHITE PLASTIC BOX, 27"-39" SCREW TYPE ADJUSTABLE DEPTH, CAST IRON LID PAINTED YELLOW AND MARKED "GAS"			BINGHAM & TAYLOR		PS820105GLSKW
19	11322	1553333		1		UNION, INSULATED, THREADED FORGED STEEL, NPS 3/4 FPT, CLASS 3000, ASTM A105 MSS SP-83, O-RING TYPE, FLAT FACE.			GEORGE FISCHER CENTRAL PLASTICS		108757510000
20	17102	1552789		3		PIPE, NPS 3/4 X 0.154 WT. (SCH 80 (XS)), ASTM A106 Gr. B, FBE, SMLS, SQUARED ENDS, DM-ST-2000,					
21						MATERIALS FOR TEST CONNECTIONS					
21A	10994	1553205		5		PLUG, THREADED, FORGED STEEL, NPS 1/2 NPT, . . SQUARE HEAD			BONNEY FORGE		
21B	1570324	1570324		5		VALVE BALL, FLOATING, 1/2", 2-WAY, 2000 PSIG, FULL PORT, FPT, LOCKING LEVER OPERATED, CS BODY, 316 SS BALL &			APOLLO INDUSTRIES		73A-143-24-27A
21C	16382	1551461		5		NIPPLE, NPS 1/2, XS (SCH 80), 2 INCH LENGTH, TBE, .ASTM A106 Gr. B, . SMLS,					
21D	16826	1554008		3		OLET, THREADED, PIPE, 1/2 FPT X 3/4 ME, . CLASS 6000, ASTM A105 MSS SP-97, BARE			WFI		

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NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPD	DESCRIPTION	DATE	INITIALS	APPROVALS	REGIONAL ENGINEER	MOD. TECH REG & STD	DISCIPLINE / RESOURCE CENTER / LINENUMBER
0	05-21-2018	ISSUE FOR CONSTRUCTION - ECO-000592	AA	JG	JB	AREA CODE	-	05/21/2018	JB			
1	12/27/2018	CHANGED REGULATOR - ECO-000686	JCN	JAB	JDG	ACCOUNT NUMBER	10700		N/A			
						PROJECT NUMBER			N/A			
						DRAWING BY	AA		N/A			
						STATION ID	-		N/A			
						CHECKER INITIALS	JG					



HIGH PRESSURE SERVICE CONNECT
 STANDARD DRAWING
 CITY, STATE
 Resource Center City, State

SHEET(S) 2 OF 3	DWG SCALE AS NOTED
DWG DATE 1/19/2018	SUPERSEDED
DRAWING NUMBER	REVISION
PNG -G-000-0001204	1
DISCIPLINE / RESOURCE CENTER / LINENUMBER	

PROFESSIONAL ENGINEER'S STAMP

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BOM #	Item #	Catalog Number	Manuf	Model	Manuf Part #	TRACEABILITY					PRESSURE TESTING	
						Serial #	Heat #	Lot #	Document Type	Document	Date	Test #
1	1	07232	AMERICAN METER	AL-1000								
2	1	12567	FISHER	627R								
3	1	12077	ITRON (ACTARIS, SPRAGUE)	B31R								
4	1	10516	MUELLER	861								
5	1	14519	WKM		8103-CS-28-CS 3/4							
6	1	11441	ENLIN / BOTHWELL									
7	1	16367	WKM	DYNASEAL 310	3/4-F-8138-CS2-43-S2-WR							
7	2	16367	WKM	DYNASEAL 310	3/4-F-8138-CS2-43-S2-WR							
7	3	16367	WKM	DYNASEAL 310	3/4-F-8138-CS2-43-S2-WR							
8	1	15968	UMAC		40002							
9	1	15965	RICHARDS		SS-4SLT-1-1/2-1P							
10	1	13048	GEORGE FISCHER CENTRAL PLASTICS									
11	1	10918	ADVANCE ENGINEERING		SW050055							
11	2	10918	ADVANCE ENGINEERING		SW050055							
12	1	13063	HACKNEY LADISH, TFA									
13	1	16344										
14	1	15960	MUELLER	H-17501	3/4"-H-17501							
15	1	10066	WESTBROOK									
15	2	10066	WESTBROOK									
15	3	10066	WESTBROOK									
15	4	10066	WESTBROOK									
15	5	10066	WESTBROOK									
15	6	10066	WESTBROOK									
15	7	10066	WESTBROOK									
16	1	11446	BONNEY FORGE									
18	1	11314	BINGHAM & TAYLOR		P5820105GLSKW							
19	1	11322	GEORGE FISCHER CENTRAL PLASTICS		108757510000							
20	1	17142										
21A	1	10994	BONNEY FORGE									
21A	2	10994	BONNEY FORGE									
21A	3	10994	BONNEY FORGE									
21A	4	10994	BONNEY FORGE									
21A	5	10994	BONNEY FORGE									
21B	1	1570124	APOLLO		73A-143-24-27A							
21B	2	1570124	APOLLO		73A-143-24-27A							
21B	3	1570124	APOLLO		73A-143-24-27A							
21B	4	1570124	APOLLO		73A-143-24-27A							
21B	5	1570124	APOLLO		73A-143-24-27A							
21C	1	16362										
21C	2	16362										
21C	3	16362										
21C	4	16362										
21C	5	16362										
21D	1	16826	WFI									
21D	2	16826	WFI									
21D	3	16826	WFI									

PIEDMONT'S NATURAL GAS FACILITY DRAWINGS ARE CONSIDERED CONFIDENTIAL (DM-1095) * DRAWING IS CURRENT ONLY THROUGH THE LATEST REVISED DATE * TO INSURE THERE IS NO RISK OF INAPPROPRIATE DISCLOSURE ALL PREVIOUS PAPER COPIES OF THIS DRAWING MUST BE DESTROYED IN ACCORDANCE WITH RECORDS & INFO. MANAGEMENT (RIM) POLICY 1001

NO.	DATE	REVISION(S) DESCRIPTION	BY	CHK	APPRO	DESCRIPTION	DATE	INITIALS	APPROVALS
0	05-21-2018	ISSUE FOR CONSTRUCTION - ECO-000592	AA	JG	JB	AREA CODE	-		REGIONAL ENGINEER
1	12/27/2018	ADDED TRACEABILITY DOCUMENT - ECO-000986	JCN	JAB	JDG	ACCOUNT NUMBER	10700	05/21/2018	JB
						PROJECT NUMBER	-		INITIALS
						DRAWING BY	AA		N/A
						STATION ID	-		N/A
						CHECKER INITIALS	JG		PRINCIPAL ENGINEER



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STANDARD DRAWING
CITY, STATE
Resource Center City, State

SHEET(S)	3 OF 3	DWG SCALE	AS NOTED
DWG DATE	1/19/2018	SUPERSEDED	---
DRAWING NUMBER			REVISION
PNG -G-000-0001204			1
DISCIPLINE / RESOURCE CENTER / LINENUMBER			

DUKE ENERGY: NORWOOD

8x8 SCADA SHELTER W/eMEDOR

CAS PROJECT# 20.4213

JULY 2020 REV.B

DRAWING / SUBMITTAL REVIEW

- ☐ APPROVED
- ☐ APPROVED WITH CHANGES NOTED
- ☐ REVISE AND RESUBMIT
- ☐ REJECTED

SUBMITTAL WAS REVIEWED FOR DESIGN CONFORMITY INCLUDING LAYOUT AND COMPONENT SELECTION

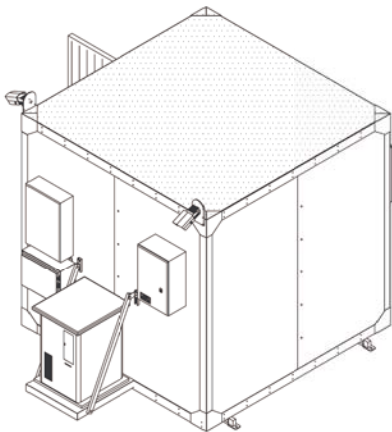
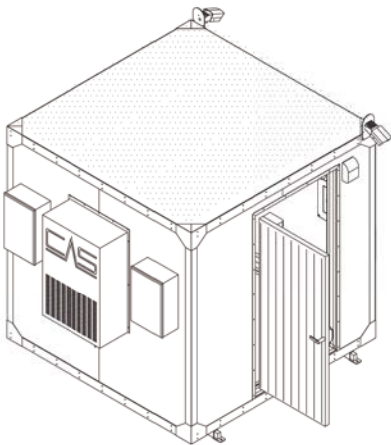
BY: _____ DATE: _____

CONSOLIDATED ANALYTICAL SYSTEMS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	9001:LC	100A 1PH 120/240V LOAD CENTER	1
2	EL-3043BE	120V 20A DUPLEX RECEPTACLE	3
3	SW-01-008 (HVAC 1 Ton)	240V 1TON w/3Kw HEATER	1
4	SW-03-012	POWER CONDITIONER, 1500VA	1
5	EL-LIGHT	48IN. LED LIGHT	2
6	EXTERIOR LIGHT	EXTERIOR LED LIGHT (18W) W/PHOTOCELL	1
7	HF.002	HOFFMAN SPD ENCLOSURE	1
8	BX-12128	SIGNAL ENCLOSURE 24X16X10 W/3 1-1/2" PASSTHROUGHS	2
9	SW.01.003V	SS VALVE ENCLOSURE (24x16x8)	1
10	CAB-3DR	3DRAWER CABINET	1
11	SW-01-007 (Security Cam assy)	STANDARD RANGE CAMERA	2
12	MEDOR	WALL MOUNT MEDOR	1
13	DR-SEN	C1D2 DOOR SENSOR	1
14	SW-04-003 (LEL)	C1D2 LEL DISPLAY	1
15	SW-04-004 (Strobe)	C1D2 BLUE STROBE ST-1	1
16	9001:TD	BASE TIE DOWN	4
17	9001:THERMOSTAT	THERMOSTAT	1
18	WKR8-01	WORKBENCH	1
19	B&S 040375	10 kW NATURAL GAS GENERATOR	1
20	SW-03-010	240V 100A TRANSFER SWITCH	1

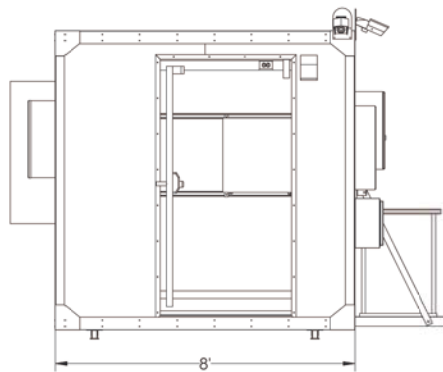
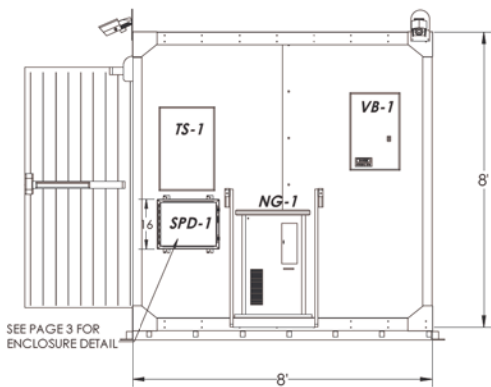
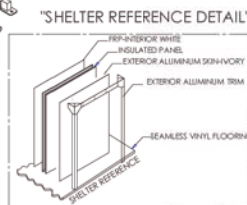
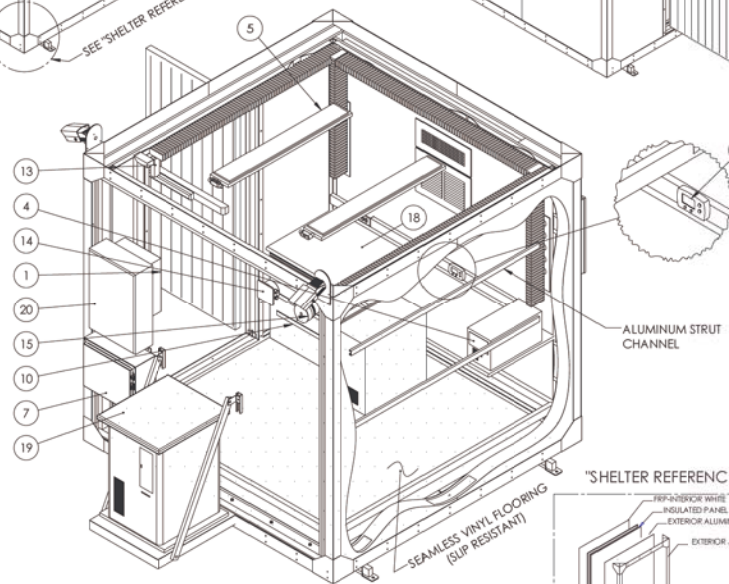
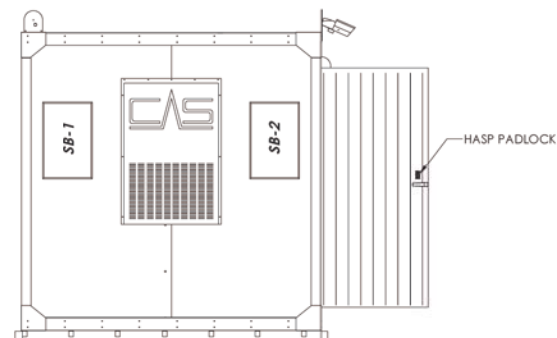
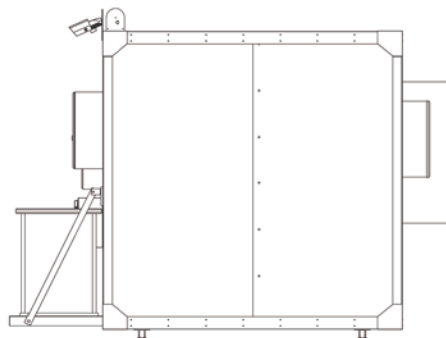
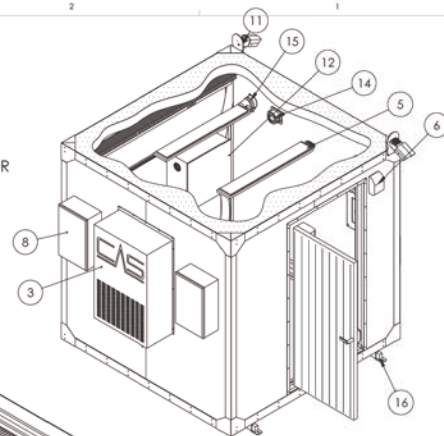
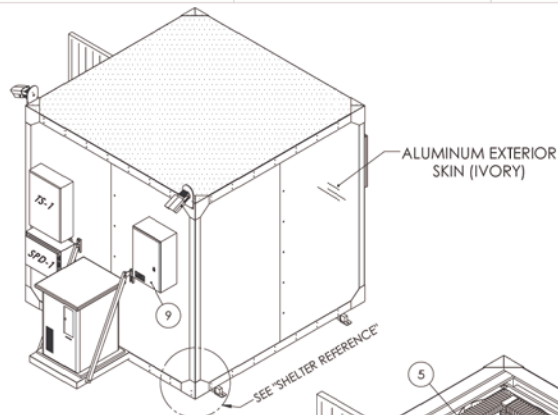
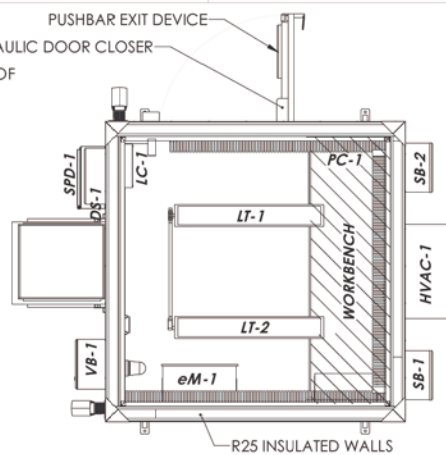
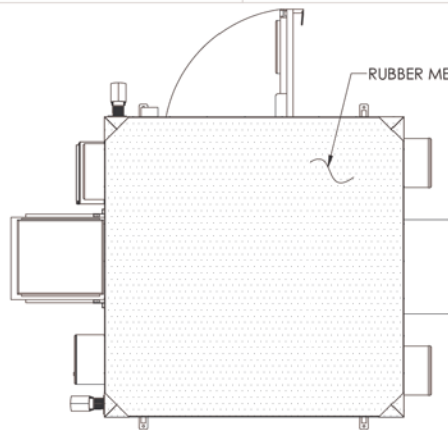
TAG#	DESCRIPTION	QTY.
SPD	SURGE SUPPRESSION ENCLOSURE	1
SB	SIGNAL BOX	2
GN	GENERATOR	1
RTU	CUSTOMER SUPPLIED RTU	1
PC	POWER CONDITIONER	1
TRW	TRANSFER SWITCH	1
eM	eMEDOR	1
TS	TRANSFER SWITCH	1
VB	VALVE ENCLOSURE	1

REVISIONS		
REV.	DESCRIPTION	DATE
B	ADDED GENERATOR	7/8/2020



**ESTIMATED WEIGHT: 5000LBS





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STOCK NO. NAME: DATE: 2013 MAR 04
2013 MAR 04
2013 MAR 04

PROJECTED: DRAWN BY: ETL: CHECKED: DATE: 2013 MAR 04

CONSOLIDATED ANALYTICAL SYSTEMS

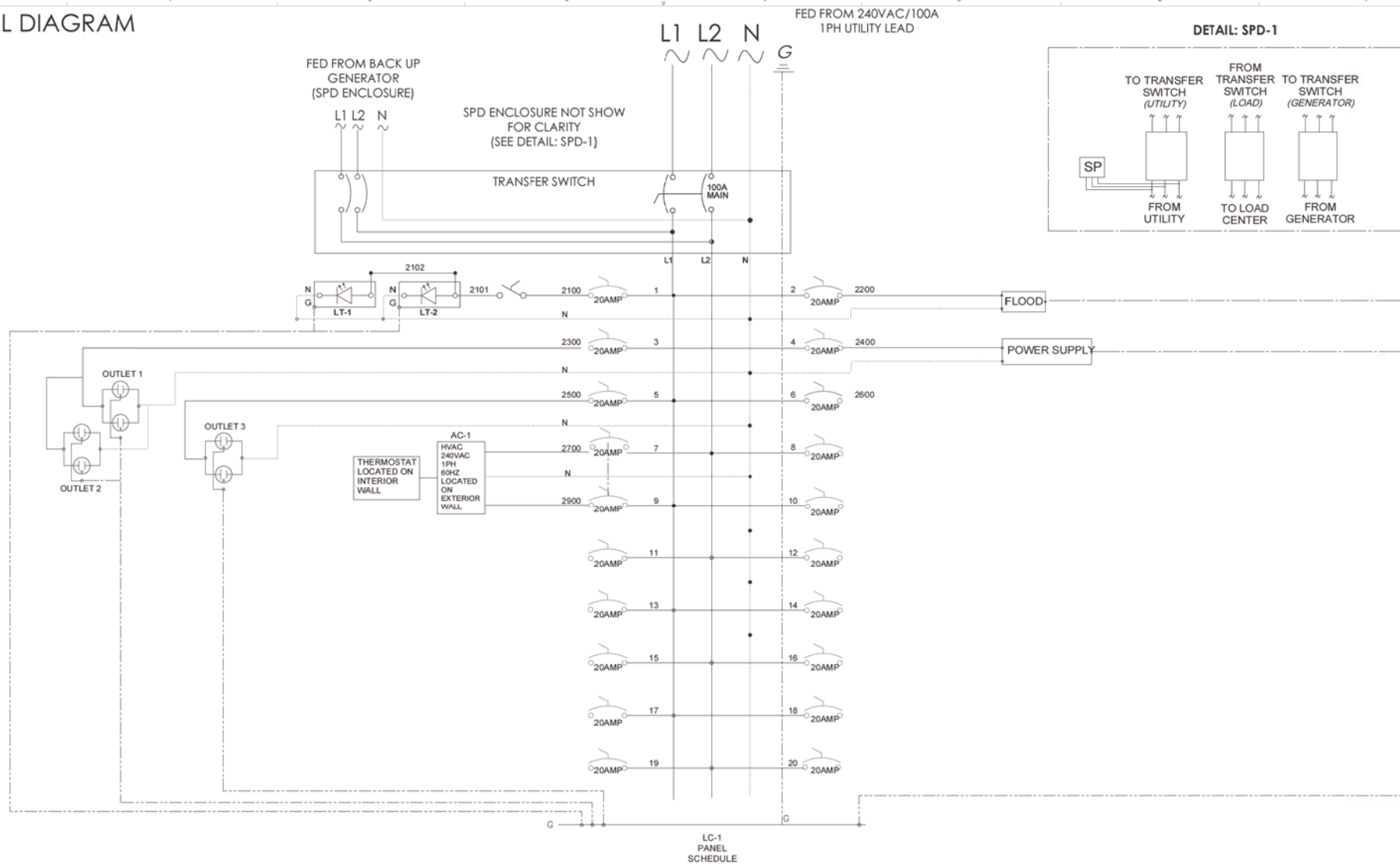
20.4213
DUKE (8X8)

SIZE: DWG. NO.: 20.4213
SCALE: NTS WEIGHT: REV B

CONSOLIDATED ANALYTICAL SYSTEMS

SHEET 2 OF 5

ELECTRICAL DIAGRAM



LIGHTS 1-2 :CKT 1	o	o	CKT 2: FLOOD LIGHT
OUTLETS 1-2 :CKT 3	o	o	CKT 4: POWER SUPPLY
OUTLET 3 :CKT 5	o	o	CKT 6:
HVAC 1 :CKT 7	o	o	CKT 7:
HVAC 1 :CKT 9	o	o	CKT 10:
:CKT 11	o	o	CKT 12:
:CKT 13	o	o	CKT 14:
:CKT 15	o	o	CKT 16:
:CKT 17	o	o	CKT 18:
:CKT 19	o	o	CKT 20:

FOOTNOTES AND REVISIONS: THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF CAS INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF CAS INC. IS PROHIBITED.

PROJECT NO. _____

DRAWN BY _____ DATE _____

CHECKED BY _____ DATE _____

CONSOLIDATED ANALYTICAL SYSTEMS

201 S MAIN AVE
CHICAGO, ILL. 60602

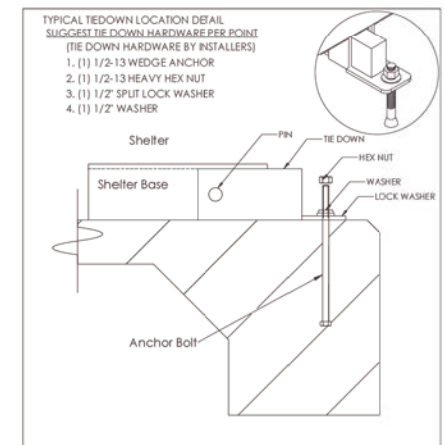
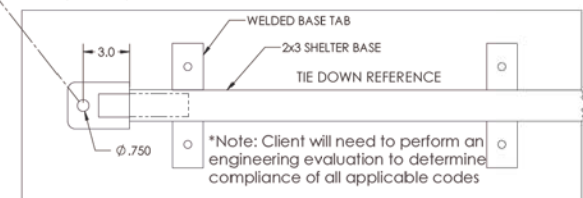
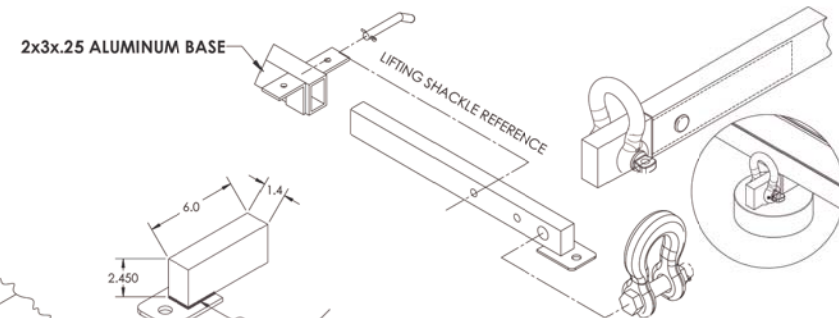
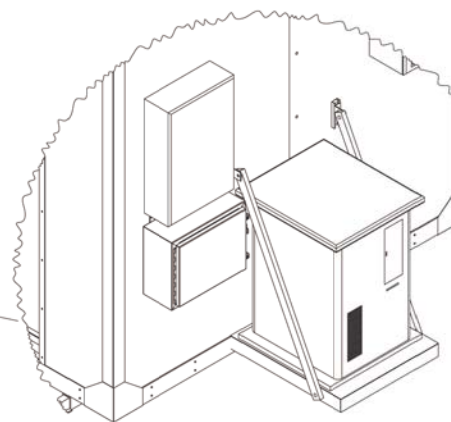
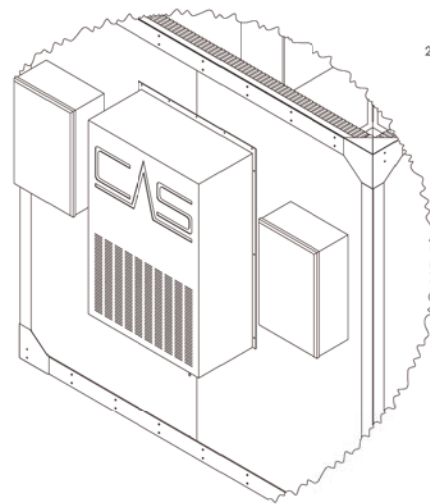
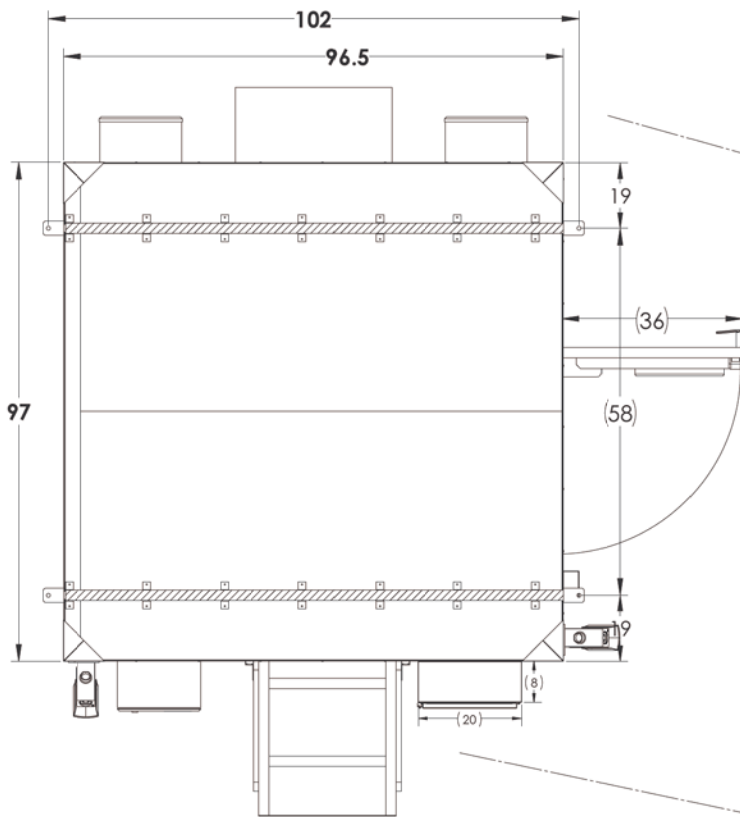
PROJECT NO. _____

CONSOLIDATED ANALYTICAL SYSTEMS

ELECTRICAL

SIZE DWG. NO. 20.4213 REV B

SCALE: NTS WEIGHT: SHEET 4 OF 5



(Drawing not to Scale)
For Concrete Installation - Typical Use with 1/2" Wedge Anchors
For Ground Installation - Use with Ground Anchors

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PROJECT NO. DATE SCALE	NAME DATE SCALE	CONSIDERED ANALYTICAL SYSTEMS 201 S. MAIN AVE. CLEVELAND, OH 44102	REV B
PROJECT NO. 20.4213 DUKE (8X8)	SIZE D	DWG. NO. SCALE: NTS	REV B
CONSOLIDATED ANALYTICAL SYSTEMS			