

APPENDIX A
EXTRACTION WELL
CONSTRUCTION RECORDS

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(WL-74)
Page 1 of 3

PROJECT NAME: FMC
PROJECT NUMBER: 2138
CLIENT: FMC AGRICULTURAL CHEMICAL CORPORATION
LOCATION: WEST OF EASTERN SURFACE IMPOUNDMENT
NORTHING: 1168870 EASTING: 530984

HOLE DESIGNATION: BC-752X
DATE COMPLETED: DECEMBER 7, 1987
DRILLING METHOD: CABLE TOOL
CRA SUPERVISOR: B. SANDBERG

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RGD %	WATER RETURN %
	REFERENCE POINT (Top of Vent Collar) GROUND SURFACE	554.58 545.00						
	CLAY CAP							
-2.5	SAND (FILL)	543.00						
	ML-SILT, sandy, little clay, dark brown	542.00						
-5.0								
-7.5								
-10.0								
-12.5								
-15.0	LIMESTONE: fractured, gray-blue	531.00						
-17.5								
-20.0								
-22.5								
-25.0								
-27.5								
-30.0								
-32.5	SHALE: red-brown, thin seams of limestone	513.00						

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

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STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(WL-74)
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PROJECT NAME: FMC
PROJECT NUMBER: 2138
CLIENT: FMC AGRICULTURAL CHEMICAL CORPORATION
LOCATION: WEST OF EASTERN SURFACE IMPOUNDMENT
NORTHING: 1168870 EASTING: 530984

HOLE DESIGNATION: BC-752X
DATE COMPLETED: DECEMBER 7, 1987
DRILLING METHOD: CABLE TOOL
CRA SUPERVISOR: B. SANDBERG

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION			BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
-37.5										
-40.0										
-42.5										
-45.0										
-47.5										
-50.0										
-52.5										
-55.0										
-57.5										
-60.0										
-62.5										
-65.0										
-67.5										

← 6" Ø
COREHOLE

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

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PROJECT NAME: FMC
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LOCATION: WEST OF EASTERN SURFACE IMPOUNDMENT
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DATE COMPLETED: DECEMBER 7, 1987
DRILLING METHOD: CABLE TOOL
CRA SUPERVISOR: B. SANDBERG

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
-72.5								
-75.0	LIMESTONE: fractured, gray-blue, more massive than top limestone unit	471.00						
-77.5								
-80.0	END OF HOLE @ 78.0ft BGS	467.00						
-82.5								
-85.0								
-87.5								
-90.0								
-92.5								
-95.0								
-97.5								
-100.0								
-102.5								

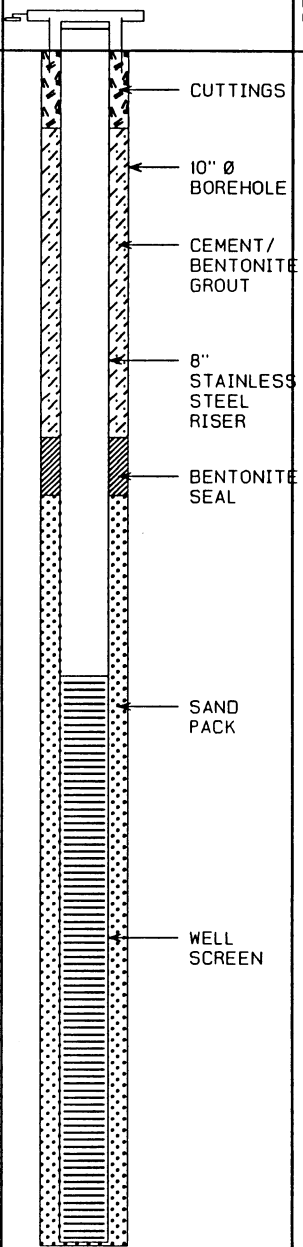
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(WL-75)
Page 1 of 2

PROJECT NAME: FMC-AICM
PROJECT NUMBER: 2788
CLIENT: FMC AGRICULTURAL CHEMICAL CORPORATION
LOCATION: TRENCH A
NORTHING: 1168705 EASTING: 531797

HOLE DESIGNATION: A-756X
DATE COMPLETED: FEBRUARY 22, 1994
DRILLING METHOD: 11 7/8" ID HSA
INSTALLED BY: H&A OF NEW YORK (S.DIXON)

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	REFERENCE POINT (Top of Vent Collar) GROUND SURFACE	544.38 542.10						
-2.5	Augered without sampling through 10.7ft of overburden							
-5.0								
-7.5								
-10.0	LIMESTONE (Reynales Formation): light to medium gray, moderately hard, argillaceous, occasional dark gray and soft weathered shale layer, highly fractured	532.10						
-12.5								
-15.0								
-17.5	SHALE (Neagha Formation): dark green-gray, soft, fissile, moderately calcareous	521.10						
-20.0								
-22.5								
-25.0	SANDSTONE (Kodak Formation): light to medium gray, moderately hard, fine grained, argillaceous, occasional worm burrows, occasional fractures	519.60						
-27.5								
-30.0								
-32.5	SILTSTONE (Cambria Formation): medium gray, moderately hard, massively bedded with occasional 0.5 to 1" green shale interbeds, no fractures, calcareous	512.10 511.10						
	END OF HOLE @ 31.0ft BGS NOTE: 1. Stratigraphy taken from C-1008.							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(WL-75)
Page 2 of 2

PROJECT NAME: FMC-AICM

PROJECT NUMBER: 2788

CLIENT: FMC AGRICULTURAL CHEMICAL CORPORATION

LOCATION: TRENCH A

NORTHING: 1168705 EASTING: 531797

HOLE DESIGNATION: A-756X

DATE COMPLETED: FEBRUARY 22, 1994

DRILLING METHOD: 11 7/8" ID HSA

INSTALLED BY: H&A OF NEW YORK (S.DIXON)

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
-37.5			SCREEN DETAILS Screened interval: 16.2 to 30.9ft BGS Length: 14.7ft Diameter: 8" Slot Size: #20 Material: Stainless Steel Sand Pack: 11.5 to 31.0ft BGS Material: #0 Morie Sand					
-40.0								
-42.5								
-45.0								
-47.5								
-50.0								
-52.5								
-55.0								
-57.5								
-60.0								
-62.5								
-65.0								
-67.5								

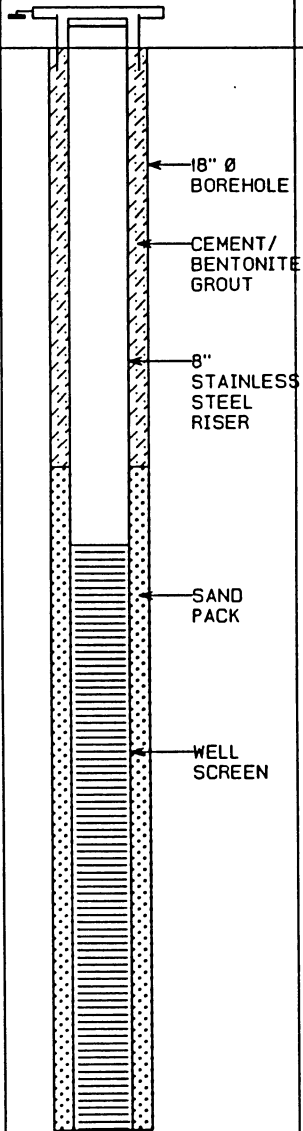
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(WL-69)
Page 1 of 1

PROJECT NAME: FMC-AICM
PROJECT NUMBER: 2788-10
CLIENT: FMC AGRICULTURAL CHEMICAL CORPORATION
LOCATION: TRENCH E
NORTHING: 1168825.85 EASTING: 531054.78

HOLE DESIGNATION: A-757X
DATE COMPLETED: SEPTEMBER 1995
DRILLING METHOD: 11 7/8" ID HSA
CRA SUPERVISOR: G. GILL/T. EDWARDS

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	REFERENCE POINT (Top of Riser) GROUND SURFACE	543.57 542.2						
-2.5	Augered without sampling through 10.7ft of overburden							
-5.0								
-7.5								
-10.0								
-12.5	LIMESTONE (Reynales Formation): light to medium gray, moderately hard, argillaceous, occasional dark gray and soft weathered shale layer, highly fractured	531.5						
-15.0								
-17.5								
-20.0								
-22.5								
-25.0	SHALE (Neagha Formation): dark green-gray, soft, fissile, moderately calcareous	519.5 518.7						
-27.5	SANDSTONE (Kodak Formation): light to medium gray, moderately hard, fine grained, argillaceous, occasional worm burrows, occasional fractures	515.2						
-30.0	SILTSTONE (Cambria Formation): medium gray, moderately hard, massively bedded with occasional 0.5 to 1" green shale interbeds, no fractures, calcareous	514.5						
-32.5	END OF HOLE @ 27.7ft BGS NOTE: 1. Stratigraphy taken from DE-1003.							

SCREEN DETAILS
Screened Interval:
12.7 to 27.7ft BGS
Length: 15ft
Diameter: 8"
Slot Size: #20
Material: Stainless Steel
Sand Pack:
10.7 to 27.7ft BGS
Material: #4 Morle Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (BEDROCK)

(WL-66)
Page 1 of 1

PROJECT NAME: FMC-AICM

HOLE DESIGNATION: A-758X

PROJECT NUMBER: 2788-10

DATE COMPLETED: SEPTEMBER 1995

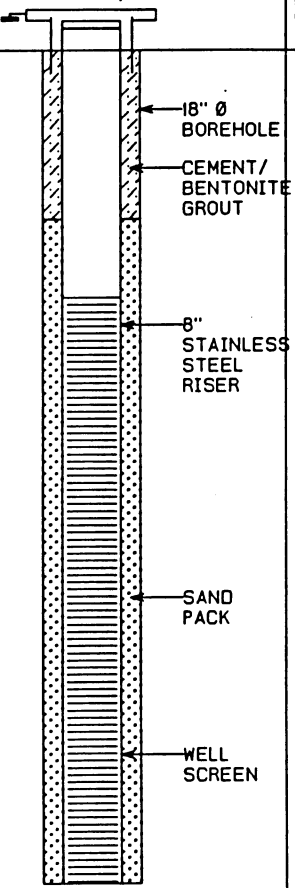
CLIENT: FMC AGRICULTURAL CHEMICAL CORPORATION

DRILLING METHOD: 11 7/8" ID HSA

LOCATION: TRENCH B

CRA SUPERVISOR: G. GILL/T. EDWARDS

NORTHING: 1169297.62 EASTING: 530447.64

DEPTH ft. BGS	DESCRIPTION OF STRATA	ELEV. ft. AMSL	MONITOR INSTALLATION	BEDROCK INTERVAL	RUN NUMBER	CORE RECOVERY %	RQD %	WATER RETURN %
	REFERENCE POINT (Top of Riser) GROUND SURFACE	535.12 533.8	 18" Ø BOREHOLE CEMENT/ BENTONITE GROUT 8" STAINLESS STEEL RISER SAND PACK WELL SCREEN SCREEN DETAILS Screened interval: 6.3 to 21.3ft BGS Length: 15ft Diameter: 8" Slot Size: #20 Material: Stainless Steel Sand Pack: 4.3 to 21.3ft BGS Material: #4 Mole Sand					
-2.5	Augered without sampling through 7.5ft of overburden							
-5.0								
-7.5	LIMESTONE (Reynales Formation): light to medium gray, moderately hard, argillaceous, occasional soft, dark gray shale interbeds, highly horizontally and vertically fractured	526.3						
-10.0								
-12.5	SHALE (Neagha Formation): dark gray-green, soft, fissile, moderately calcareous	522.3						
-15.0	SANDSTONE (Kodak Formation): light to medium gray, moderately hard, fine grained, argillaceous, occasional worm burrows, occasional fractures	520.8						
-17.5	SILTSTONE (Cambria Formation): medium gray, moderately hard, massively bedded with occasional 0.5 to 1" green shale interbeds, no fractures, calcareous	517.0						
-20.0								
-22.5	END OF HOLE @ 21.3ft BGS NOTE: 1. Stratigraphy taken from BC-1025.	512.5						
-25.0								
-27.5								
-30.0								
-32.5								

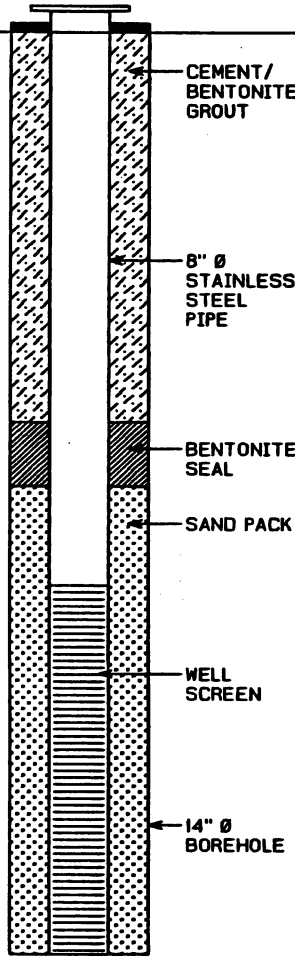
NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(WL101)
Page 1 of 1

PROJECT NAME: FMC-AICM PHASE III
PROJECT NUMBER: 2788-10
CLIENT: FMC
LOCATION: MIDDLE SECTION OF TRENCH C
NORTHING:1169216.04 EASTING:529733.77

HOLE DESIGNATION: A-759X
DATE COMPLETED: AUGUST 10, 1998
DRILLING METHOD: 14" OD HSA
CRA SUPERVISOR: D. GNAGE

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser) PAD SURFACE	531.17 529.5					
-2.5	(Original Ground Surface = 528.9ft) Augered through 13.9ft of overburden.						
-5.0							
-7.5							
-10.0							
-12.5							
-15.0		514.5					
-17.5	SANDSTONE (Kodak Formation): light grey, hard, highly fractured and weathered, some thin vertical burrows infilled with green shale, black iron stromatolite layer at base of formation	512.5					
-20.0	SILTSTONE (Cambria Formation): medium to light grey, moderately hard, moderately fractured, few black iron stromatolites - vertical fractures, green shale interbedding (20.9 to 21.2ft BGS) - becoming maroon, interbedded with green shale layers 1" to 3" thick, some vertical burrows						
-22.5							
-25.0	END OF HOLE @ 23.8ft BGS	505.1					
-27.5	NOTES: 1. Stratigraphic description taken from A-1087. 2. Bottom of trench 24.1ft BGS. 3. Well installed using 14" OD HSA by augering through overburden and pulverized bedrock, until competent rock encountered. 4. Ground surface at A-759X was 528.9ft AMSL. 5. Bottom of well at 505.1ft (26.05ft below top of casing, 23.8ft below ground surface).		SCREEN DETAILS Screened Interval: 13.8 to 23.8ft BGS Length: 10.0ft Diameter: 8" Slot Size: #20 Material: Stainless Steel Sand Pack: 12.0 to 23.8ft BGS Material: #00 Sand				
-30.0							
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(WL103)
Page 1 of 1

PROJECT NAME: FMC-AICM PHASE III

PROJECT NUMBER: 2788-10

CLIENT: FMC

LOCATION: WEST END OF TRENCH D

NORTHING:1169292.40 EASTING:530641.12

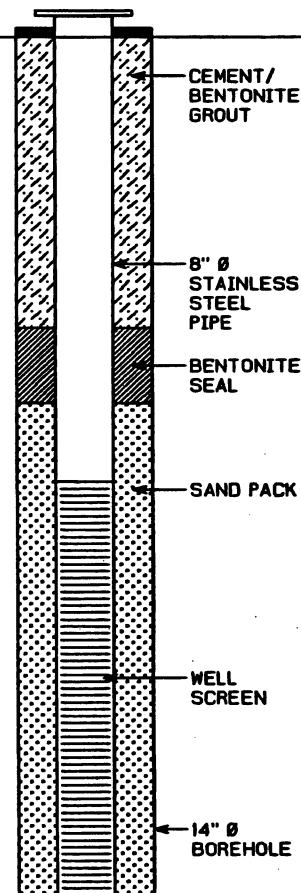
HOLE DESIGNATION: A-760X

DATE COMPLETED: AUGUST 14, 1998

DRILLING METHOD: 14" OD HSA

CRA SUPERVISOR: D. GNAGE

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	'N' VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser) PAD SURFACE	536.87 535.1					
	(Original Ground Surface = 534.3ft)						
-2.5	Augered through 10.5ft of overburden.						
-5.0							
-7.5							
-10.0							
-12.5	LIMESTONE (Reynales Formation): light to medium gray, moderately hard, argillaceous, interbedded with 1/2 to 2" soft, dark gray shale layers, highly horizontally and vertically fractured, some fractures infilled with clay	524.0 522.6 521.1					
-15.0	SHALE (Neagha Formation): dark green, soft, fissile, moderately calcareous						
-17.5	SANDSTONE (Kodak Formation): light to medium gray, hard, fine grained, numerous thin vertical burrows infilled with green shale, occasional fracture with black iron stromatalite layers near the base of the formation						
-20.0	SILTSTONE (Cambria Formation): gray and green, moderately hard, massive bedded with 1/2 to 2" green shale interbeds and occasional thin (~1") fine grained sandstone lenses, calcareous	516.1					
-22.5	END OF HOLE @ 22.0ft BGS	512.3					
-25.0	NOTES: 1. Stratigraphic description taken from original A-1027 well. 2. Bottom of trench @ 23.0ft BGS. 3. Well installed using 14" OD HSA by augering through overburden and pulverized rock until competent rock was encountered. 4. Original ground surface at A-760X was 534.3ft AMSL. 5. Bottom of well at 512.3ft (24.52ft below top of casing, 22.0ft below ground surface).						
-27.5							
-30.0							
-32.5							



SCREEN DETAILS
 Screened Interval:
 12.0 to 22.0ft BGS
 Length: 10.0ft
 Diameter: 8"
 Slot Size: #20
 Material: Stainless Steel
 Sand Pack:
 9.7 to 22.0ft BGS
 Material: #00 Sand

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
 WATER FOUND ▼ STATIC WATER LEVEL ▼

STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

(WL102)
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PROJECT NAME: FMC-AICM PHASE III

PROJECT NUMBER: 2788-10

CLIENT: FMC

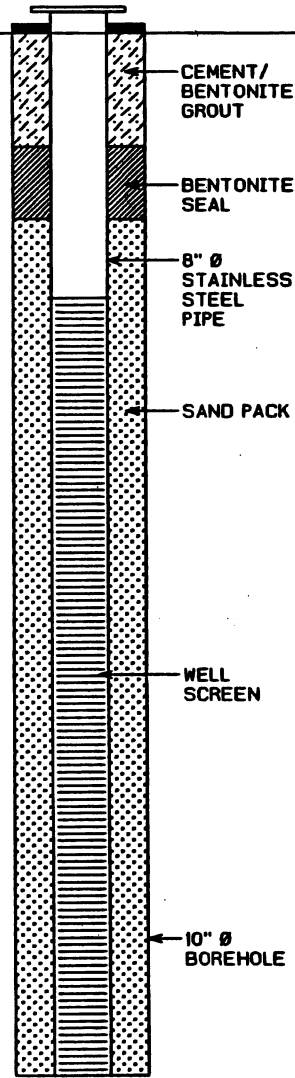
LOCATION: CENTER OF TRENCH F SPURS/UPGRADIENT OF FORMER CSI CRA SUPERVISOR: D. GNAGE

NORTHING:1168953.12 EASTING:530443.57

HOLE DESIGNATION: A-542RX

DATE COMPLETED: SEPTEMBER 10, 1998

DRILLING METHOD: 10M" TRICONE BIT - AR

DEPTH ft. BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft. AMSL	MONITOR INSTALLATION	SAMPLE			
				NUMBER	STATE	"N" VALUE	PID (ppm)
	REFERENCE POINT (Top of Riser) PAD SURFACE	537.82 535.4					
-2.5	(Original Ground Surface = 535.4ft) Augered through 6.0ft of overburden.						
-5.0							
-7.5	LIMESTONE (Reynales Formation): light to medium gray, moderately hard, argillaceous, occasional soft, dark gray shale interbeds, highly horizontally and vertically fractured	529.4					
-10.0							
-12.5							
-15.0							
-17.5	SHALE (Neagha Formation): dark green-gray, soft, fissile, moderately calcareous	519.9					
-20.0	SANDSTONE (Kodak Formation): light to medium gray, moderately hard, fine grained, argillaceous, occasional worm burrows, occasional fractures	518.6					
-22.5							
-25.0	SILTSTONE (Cambria Formation): medium gray, moderately hard, massively bedded with occasional 0.5 to 1" green shale interbeds, no fractures, calcareous	515.0					
-27.5	END OF HOLE @ 27.4ft BGS	507.9					
-30.0	NOTES: 1. Stratigraphic description taken from C-1001. 2. Bottom of trench 26.2ft BGS. 3. Well installed using 10" OD HSA by augering through overburden and pulverized bedrock, until competent rock encountered. 4. Ground (asphalt) surface at A-542RX was 535.4ft AMSL. 5. Bottom of well at 507.8ft (29.98ft below top of casing, 27.4ft below ground surface).		SCREEN DETAILS Screened Interval: 7.0 to 27.4ft BGS Length: 20.4ft Diameter: 8" Slot Size: #20 Material: Stainless Steel Sand Pack: 4.9 to 27.4ft BGS Material: #00 Sand				
-32.5							

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE
WATER FOUND ▼ STATIC WATER LEVEL ▼

Date Start/Finish: 4/22/2005 Drilling Company: Nothnagle Drilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169160.4069 Easting: 1177731.9527 Casing Elevation: 529.16' AMSL Borehole Depth: 22.3' below grade Surface Elevation: 526.14 AMSL Geologist: Michael Arlauckas	Well/Boring ID: C-EX1 Client: FMC Corporation Location: FMC Corporation Middleport, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/In/Type	Recovery (feet)	N - Value/RQD %	Geologic Column	Stratigraphic Description	Well/Boring Construction
0								Stick-up Protective Casing
525							Auger to 9.0' bgs without sampling.	Concrete Surface Seal (0 - 1.5' bgs)
5								Cement-Bentonite Grout (1.5' - 6.0' bgs)
520								Type 304 8" ID Stainless Steel Riser (3.1' ags - 12.3' bgs)
								Bentonite Seal (6.0' - 9.0' bgs)
10							Top of Bedrock at 9.0' bgs. Roller bit to 22.3' bgs without sampling.	#00N Silica Choker Sand Pack (9.0' - 9.6' bgs)
515								#0 Silica Sand Pack (9.6' - 22.3' bgs)
15								Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (12.3' - 22.3' bgs)

BBL
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 engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Client:

FMC Corporation

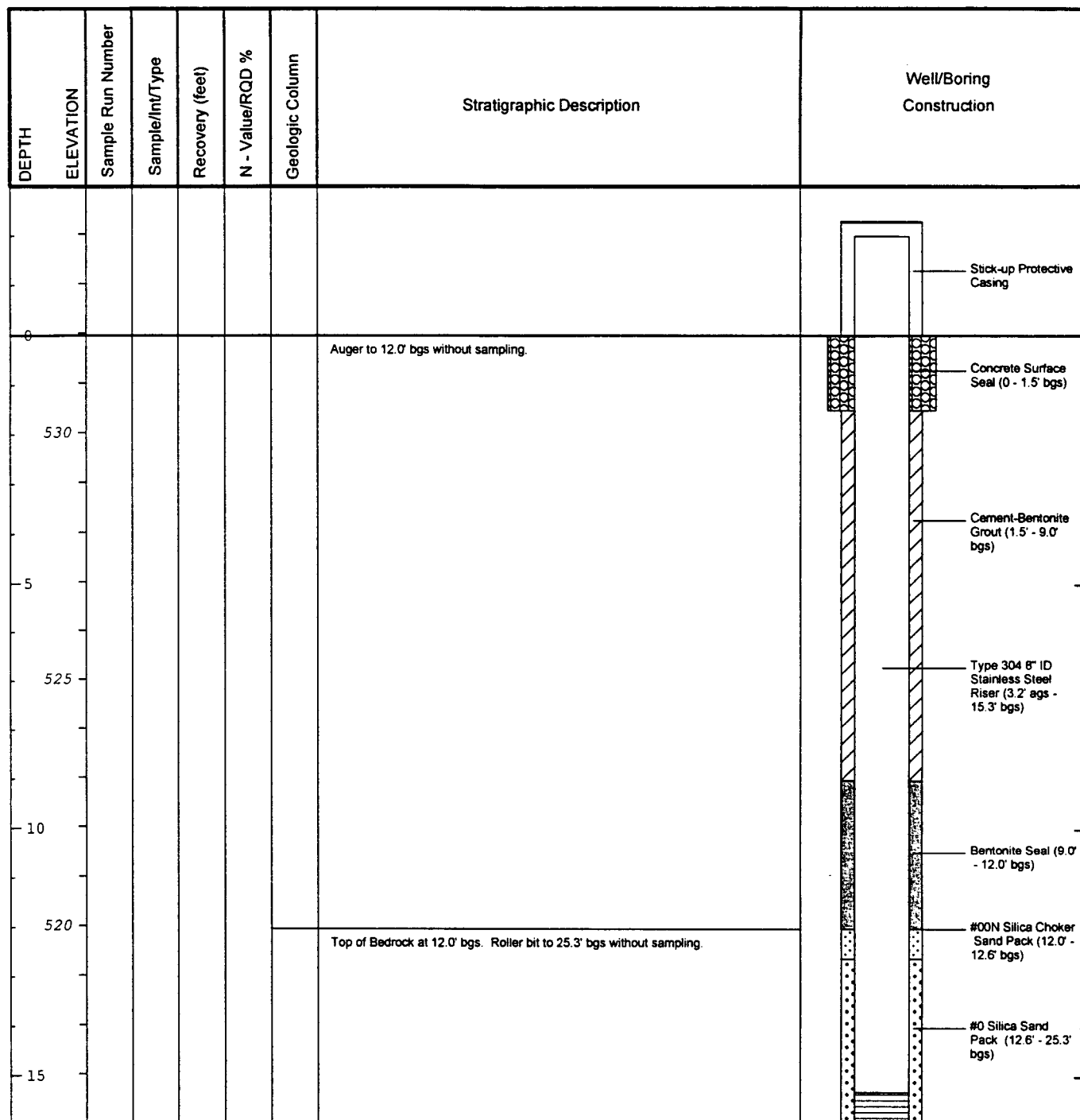
Well/Boring ID: C-EX1**Site Location:**FMC Corporation
Middleport, New York**Borehole Depth:** 22.3' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
510							Top of Bedrock at 9.0' bgs. Roller bit to 22.3' bgs without sampling.	 Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (12.3' - 22.3' bgs) #0 Silica Sand Pack (9.6' - 22.3' bgs)
20								
505								
25								
500								
30								
495								
35								

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Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Date Start/Finish: 4/20/2005 Drilling Company: Nothnagle Drilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169302.9034 Easting: 1178446.2706 Casing Elevation: 535.03' AMSL Borehole Depth: 25.3' below grade Surface Elevation: 531.95' AMSL Geologist: Michael Arlauckas	Well/Boring ID: C-EX2 Client: FMC Corporation Location: FMC Corporation Middleport, New York
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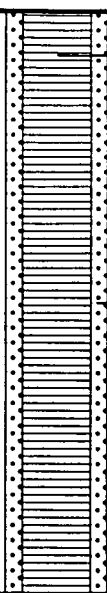


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Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Client:
FMC Corporation
Site Location:
FMC Corporation
Middleport, New York

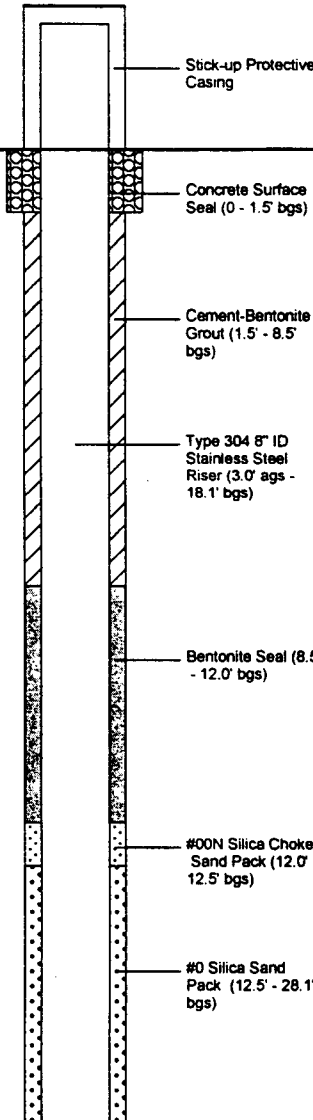
Well/Boring ID: C-EX2
Borehole Depth: 25.3' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/In/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
515							Top of Bedrock at 12.0' bgs. Roller bit to 25.3' bgs without sampling.	 Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (15.3' - 25.3' bgs) #0 Silica Sand Pack (12.6' - 25.3' bgs)
20								
510								
25								
505								
30								
500								
35								

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Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Date Start/Finish: 5/18/2005 Drilling Company: Nothnagle Drilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169388.4765 Easting: 1179279.4180 Casing Elevation: 538.51' AMSL Borehole Depth: 28.1' below grade Surface Elevation: 535.04' AMSL Geologist: Michael Artauckas	Well/Boring ID: D-EX1 Client: FMC Corporation Location: FMC Corporation Middleport, New York
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DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD %	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	535						Auger to 12.3' bgs without sampling.	 Stick-up Protective Casing Concrete Surface Seal (0 - 1.5' bgs) Cement-Bentonite Grout (1.5' - 8.5' bgs) Type 304 6" ID Stainless Steel Riser (3.0' ags - 18.1' bgs) Bentonite Seal (8.5' - 12.0' bgs) #00N Silica Choker Sand Pack (12.0' - 12.5' bgs) #0 Silica Sand Pack (12.5' - 28.1' bgs)
5	530							
10	525							
15	520						Top of Bedrock at 12.3' bgs. Roller bit to 28.1' bgs without sampling.	

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 engineers & scientists

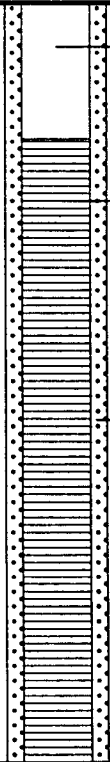
Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Client:
FMC Corporation

Site Location:
FMC Corporation
Middleport, New York

Well/Boring ID: D-EX1

Borehole Depth: 28.1' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
20515							Top of Bedrock at 12.3' bgs. Roller bit to 28.1' bgs without sampling.	 Type 304 8" ID Stainless Steel Riser (3.0' ags - 18.1' bgs) Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (18.1' - 28.1' bgs) #0 Silica Sand Pack (12.5' - 28.1' bgs)
25510								
30505								
35500								

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Date Start/Finish: 5/12/2005 Drilling Company: Nothnagle Drilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169396.9557 Easting: 1179423.7845 Casing Elevation: 540.01' AMSL Borehole Depth: 28.1' below grade Surface Elevation: 536.49' AMSL Geologist: Michael Arlauckas	Well/Boring ID: D-EX2 Client: FMC Corporation Location: FMC Corporation Middleport, New York
--	---	--

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD %	Geologic Column	Stratigraphic Description	Well/Boring Construction
0								Stick-up Protective Casing
535							Auger to 11.3' bgs without sampling.	Concrete Surface Seal (0 - 1.5' bgs)
5								Cement-Bentonite Grout (1.5' - 8.0' bgs)
530								Type 304 8" ID Stainless Steel Riser (3.5' ags - 18.1' bgs)
10								Bentonite Seal (8.0' - 11.0' bgs)
525								#00N Silica Choker Sand Pack (11.0' - 11.3' bgs)
15							Top of Bedrock at 11.3' bgs. Roller bit to 28.1' bgs without sampling.	#0 Silica Sand Pack (11.3' - 28.1' bgs)

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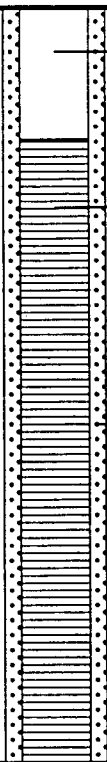
Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Client:
FMC Corporation

Site Location:
FMC Corporation
Middleport, New York

Well/Boring ID: D-EX2

Borehole Depth: 28.1' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
520							Top of Bedrock at 11.3' bgs. Roller bit to 28.1' bgs without sampling.	 Type 304 8" ID Stainless Steel Riser (3.5' ags - 18.1' bgs) Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (18.1' - 28.1' bgs) #0 Silica Sand Pack (11.3' - 28.1' bgs)
20								
515								
25								
510								
30								
505								
35								

BBL
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engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Date Start/Finish: 5/20/2005 Drilling Company: Nothnagle Dilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169477.6206 Easting: 1179610.7877 Casing Elevation: 540.84' AMSL Borehole Depth: 28.2' below grade Surface Elevation: 537.75' AMSL Geologist: Michael Arlauckas	Well/Boring ID: G-EX1 Client: FMC Corporation Location: FMC Corporation Middieport, New York
---	---	--

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD %	Geologic Column	Stratigraphic Description	Well/Boring Construction
540								Stick-up Protective Casing
0							Auger to 15.2' bgs without sampling. Top of Bedrock at 15.0' bgs.	Concrete Surface Seal (0 - 1.0' bgs)
535								Cement-Bentonite Grout (1.0' - 7.0' bgs)
5								Type 304 8" ID Stainless Steel Riser (3.0' ags - 18.2' bgs)
530								Bentonite Seal (7.0' - 10.8' bgs)
10								#00N Silica Choker Sand Pack (10.8' - 11.5' bgs)
525								#0 Silica Sand Pack (11.5' - 28.2' bgs)
15							Roller bit to 28.2' bgs without sampling.	

 BLASLAND, BOUCK & LEE, INC. <i>engineers & scientists</i>	Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.
--	---

Client:

FMC Corporation

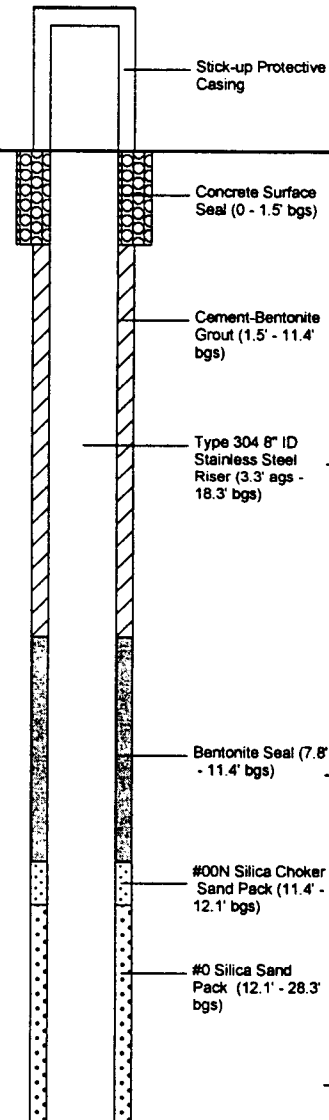
Well/Boring ID: G-EX1**Site Location:**FMC Corporation
Middleport, New York**Borehole Depth:** 28.2' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/In/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
520							Roller bit to 28.2' bgs without sampling.	 Type 304 8" ID Stainless Steel Riser (3.0' ags - 18.2' bgs) Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (18.2' - 28.2' bgs) #00 Silica Sand Pack (11.5' - 28.2' bgs)
20								
515								
25								
510								
30								
505								
35								

BBL
 BLASLAND, BOUCK & LEE, INC.
 engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Date Start/Finish: 5/9/2005 Drilling Company: Nothnagle Drilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169500.4173 Easting: 1179872.5437 Casing Elevation: 542.57' AMSL Borehole Depth: 28.3' below grade Surface Elevation: 539.77' AMSL Geologist: Michael Arlauckas	Well/Boring ID: G-EX2 Client: FMC Corporation Location: FMC Corporation Middleport, New York
---	---	--

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD %	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	540						Auger to 11.4' bgs without sampling.	 Stick-up Protective Casing Concrete Surface Seal (0 - 1.5' bgs) Cement-Bentonite Grout (1.5' - 11.4' bgs) Type 304 8" ID Stainless Steel Riser (3.3' ags - 18.3' bgs) Bentonite Seal (7.8' - 11.4' bgs) #00N Silica Choker Sand Pack (11.4' - 12.1' bgs) #0 Silica Sand Pack (12.1' - 28.3' bgs)
5	535							
10	530							
15	525						Top of Bedrock at 11.4' bgs. Roller bit to 28.3' bgs without sampling.	

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 BLASLAND, BOUCK & LEE, INC.
 engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

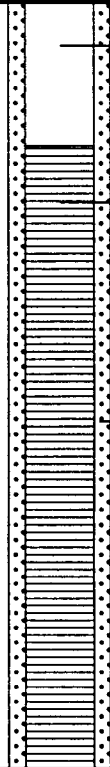
Client:

FMC Corporation

Well/Boring ID: G-EX2

Site Location:FMC Corporation
Middleport, New York

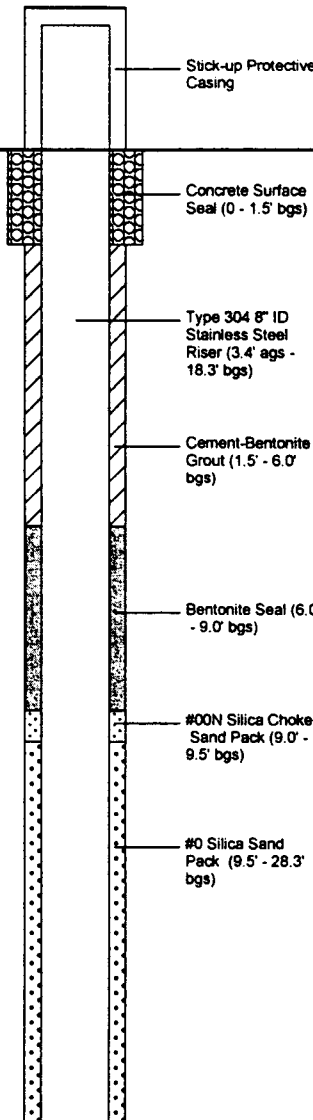
Borehole Depth: 28.3' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/In/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
20	520						Top of Bedrock at 11.4' bgs. Roller bit to 28.3' bgs without sampling.	 Type 304 8" ID Stainless Steel Riser (3.3' ags - 18.3' bgs) Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (18.3' - 28.3' bgs) #0 Silica Sand Pack (12.1' - 28.3' bgs)
25	515							
30	510							
35	505							

BBL
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 engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Date Start/Finish: 5/4/2004 Drilling Company: Nothnagle Drilling Driller's Name: Kevin Busch Drilling Method: Hollow Stem Auger/Roller Bit Bit Size: 11 7/8" Auger Size: 12 1/4" Rig Type: BK-81 Truck-Mount Sampling Method: NA	Northing: 1169518.6779 Easting: 1180132.4749 Casing Elevation: 544.80' AMSL Borehole Depth: 28.3' below grade Surface Elevation: 541.68' AMSL Geologist: Michael Arlauckas	Well/Boring ID: G-EX3 Client: FMC Corporation Location: FMC Corporation Middleport, New York
---	---	--

DEPTH	ELEVATION	Sample Run Number	Sample/Int/Type	Recovery (feet)	N - Value/RQD %	Geologic Column	Stratigraphic Description	Well/Boring Construction
0	540						Auger to 9.0' bgs without sampling.	 Stick-up Protective Casing Concrete Surface Seal (0 - 1.5' bgs) Type 304 8" ID Stainless Steel Riser (3.4' ags - 18.3' bgs) Cement-Bentonite Grout (1.5' - 6.0' bgs) Bentonite Seal (6.0' - 9.0' bgs) #00N Silica Choker Sand Pack (9.0' - 9.5' bgs) #0 Silica Sand Pack (9.5' - 28.3' bgs)
5	535						Top of Bedrock at 9.0' bgs. Roller bit to 28.3' bgs without sampling.	
10	530							
15								

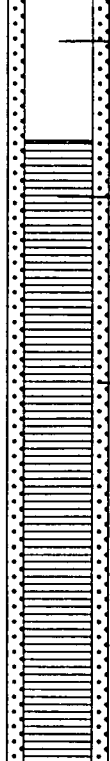
BBL
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 engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

Client:

FMC Corporation

Well/Boring ID: G-EX3**Site Location:**FMC Corporation
Middleport, New York**Borehole Depth:** 28.3' below grade

DEPTH	ELEVATION	Sample Run Number	Sample/In/Type	Recovery (feet)	N - Value/RQD%	Geologic Column	Stratigraphic Description	Well/Boring Construction
525							Top of Bedrock at 9.0' bgs. Roller bit to 28.3' bgs without sampling.	 Type 304 8" ID Stainless Steel Riser (3.4' ags - 18.3' bgs) Type 304 8" ID 0.020" Slot Stainless Steel Wire-Wrapped Screen (18.3' - 28.3' bgs) #0 Silica Sand Pack (9.5' - 28.3' bgs)
20								
520								
25								
515								
30								
510								
35								

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

Remarks: ags = above ground surface; bgs = below ground surface; AMSL = Above Mean Sea Level; NA = Not Available/Not Applicable.

APPENDIX B
GROUNDWATER EXTRACTION SYSTEM
TYPICAL DETAILS AND P&IDS

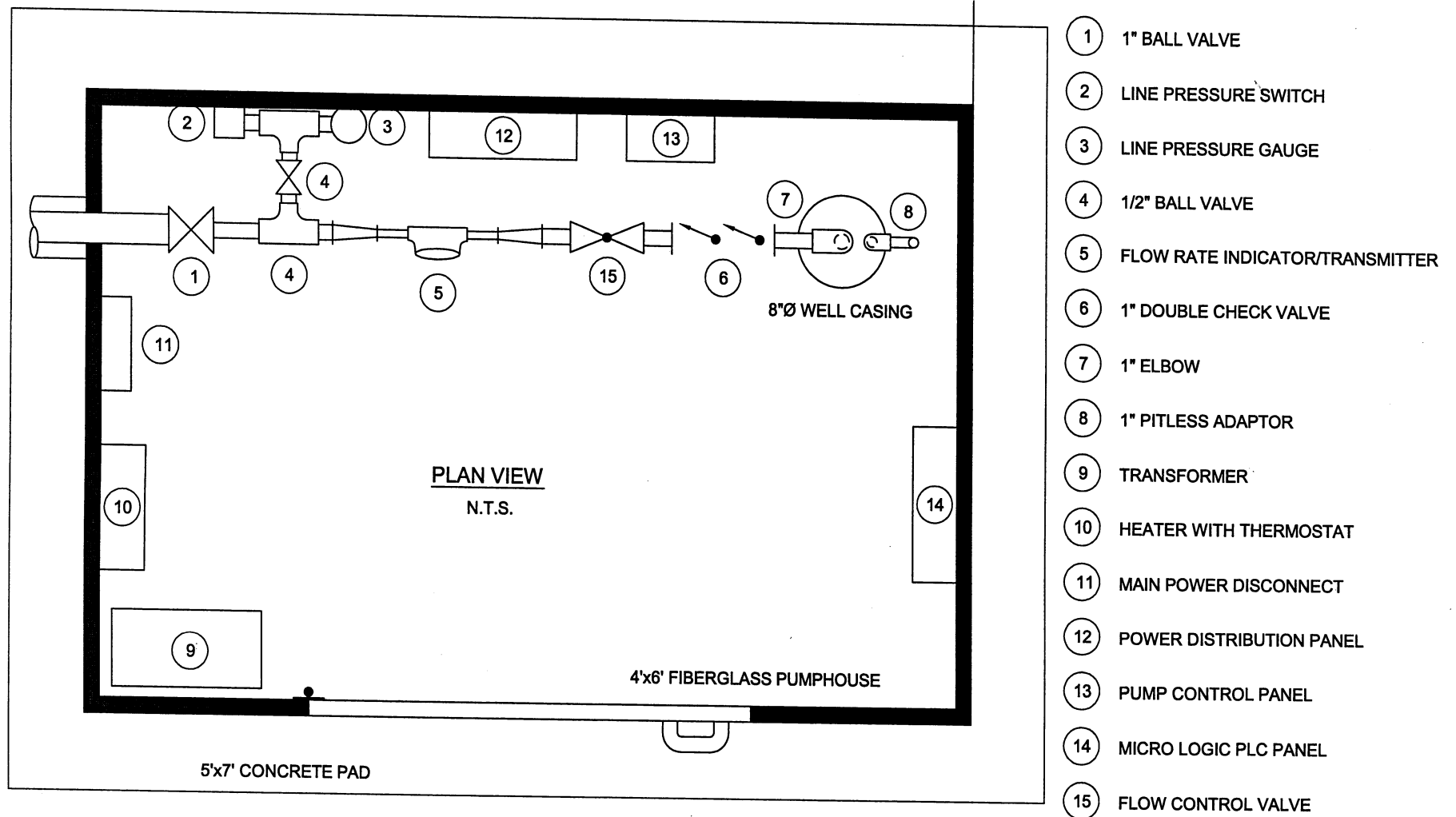


figure 2.3
TYPICAL PUMPHOUSE PLAN - EXTRACTION WELL A-759X
OPERATION AND MAINTANANCE MANUAL
FMC - Middleport, New York



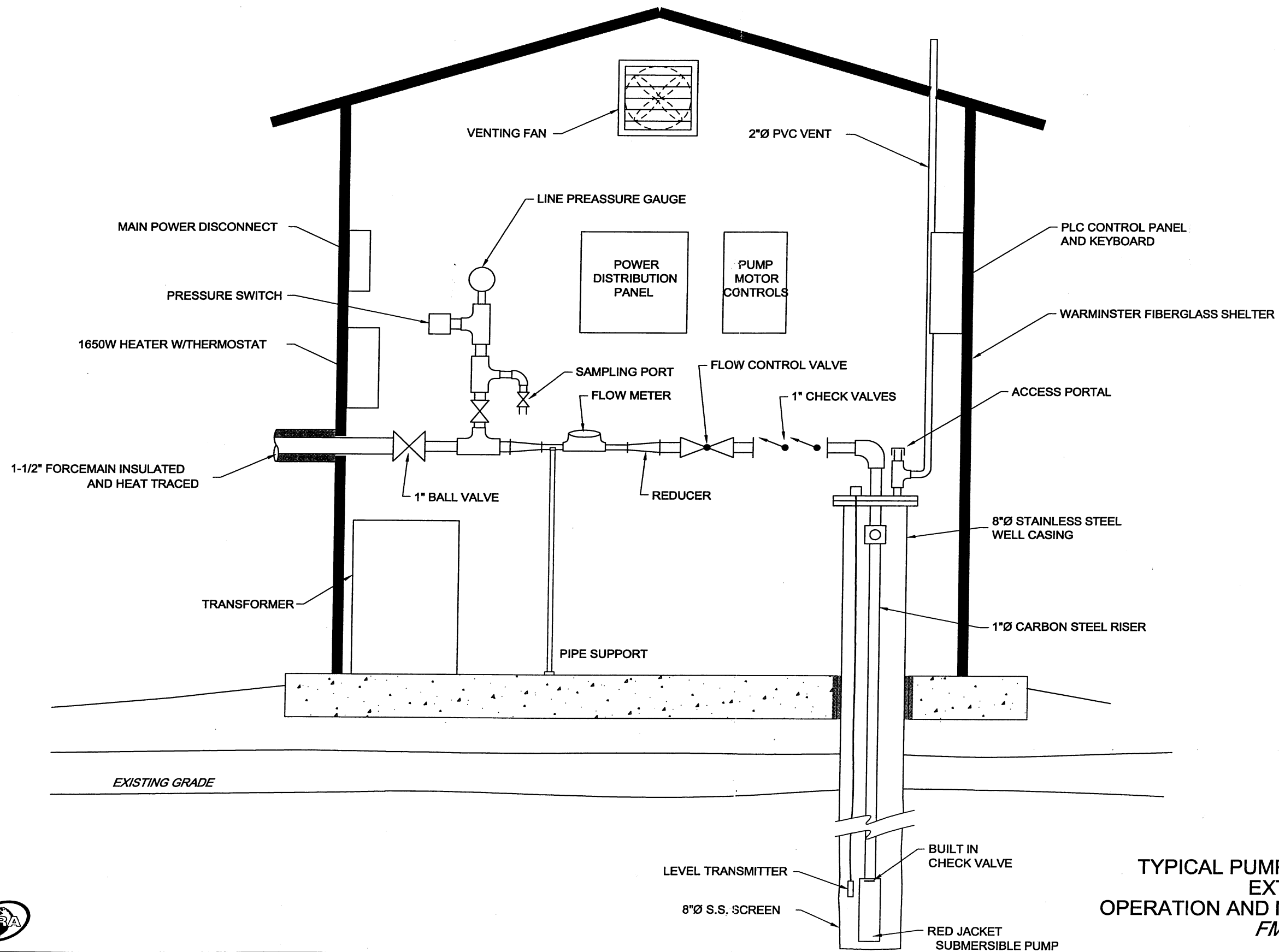


figure 2.4
TYPICAL PUMPHOUSE SECTION VIEW
EXTRACTION WELL A-759X
OPERATION AND MAINTENANCE MANUAL
FMC - Middleport, New York



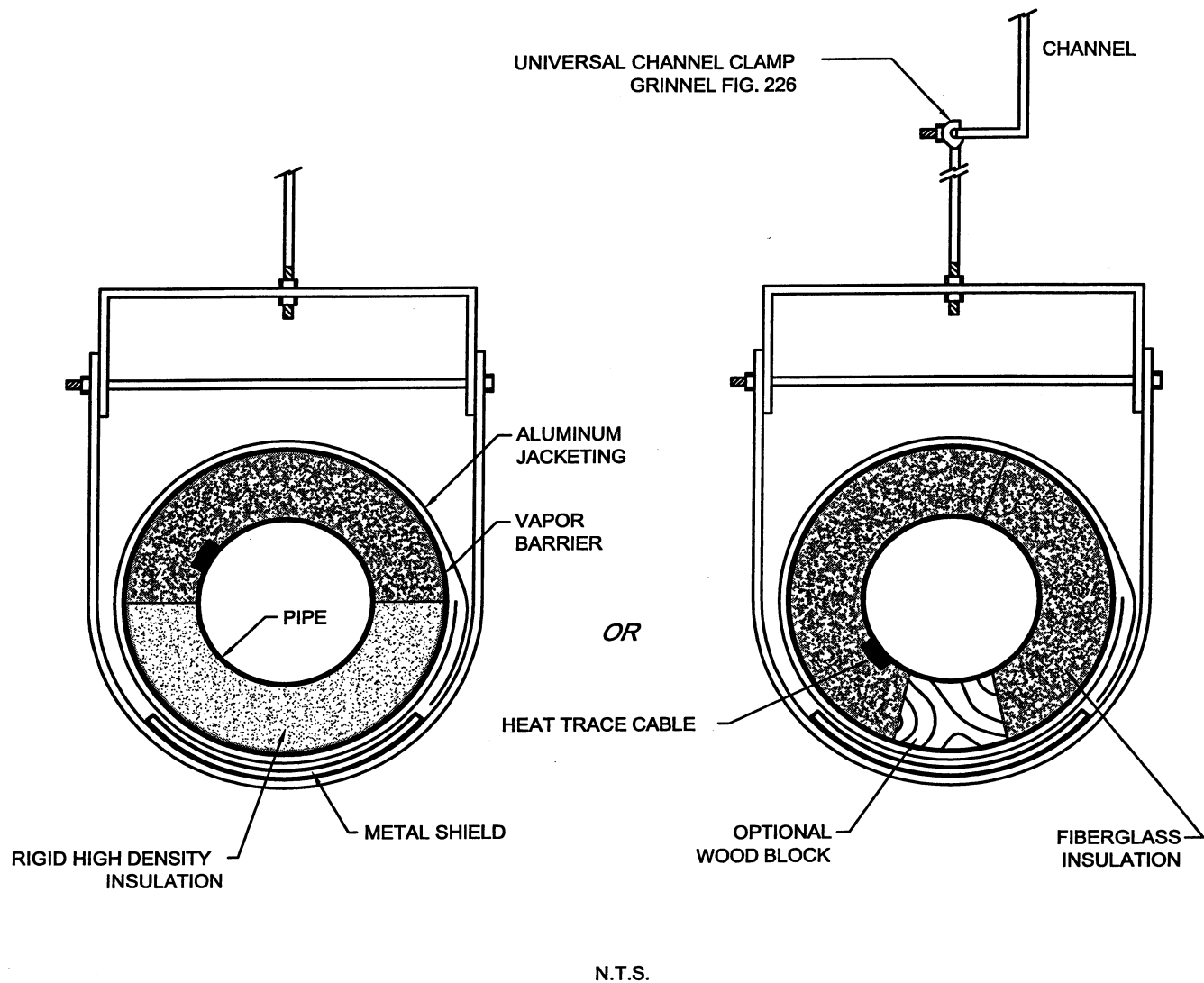
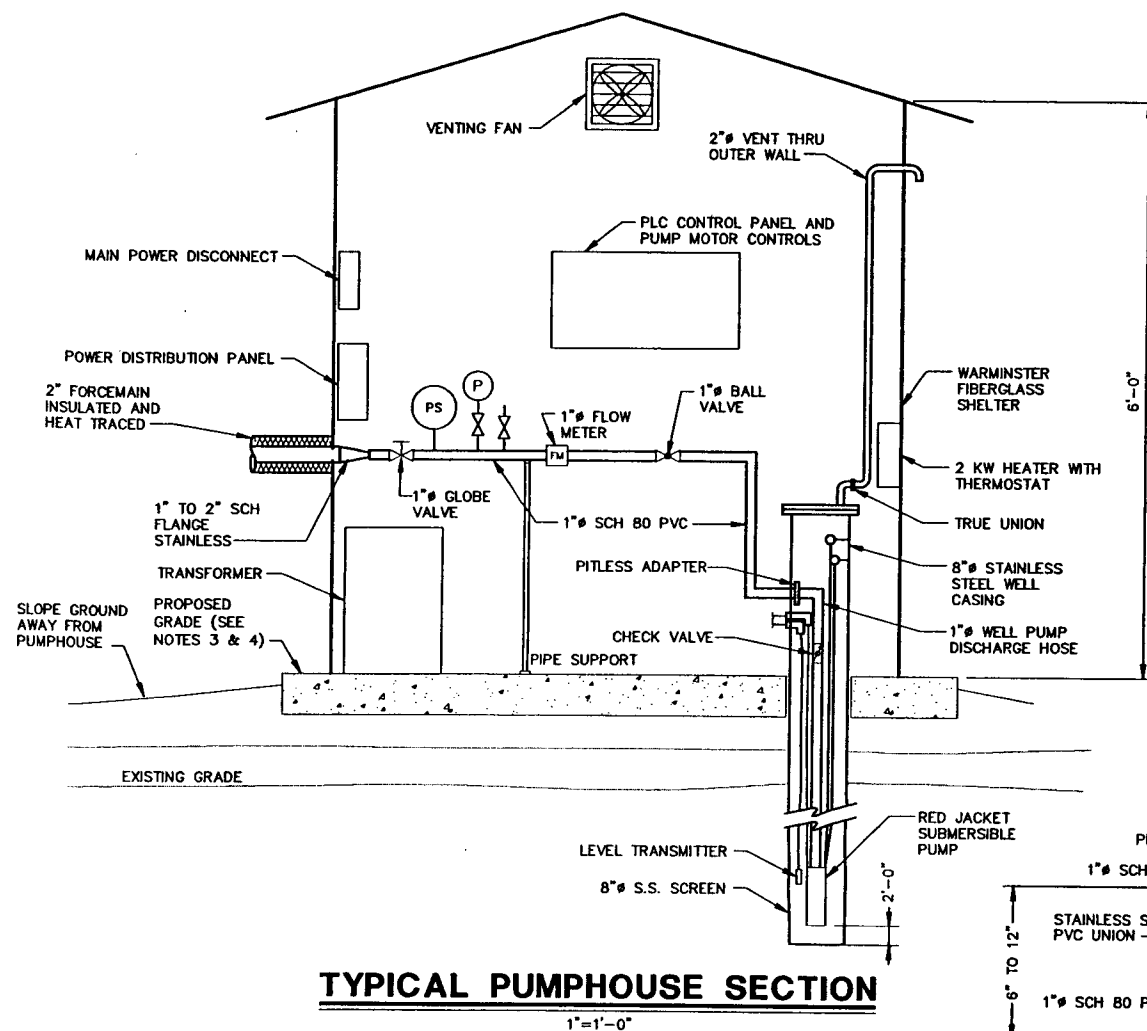


figure 2.5

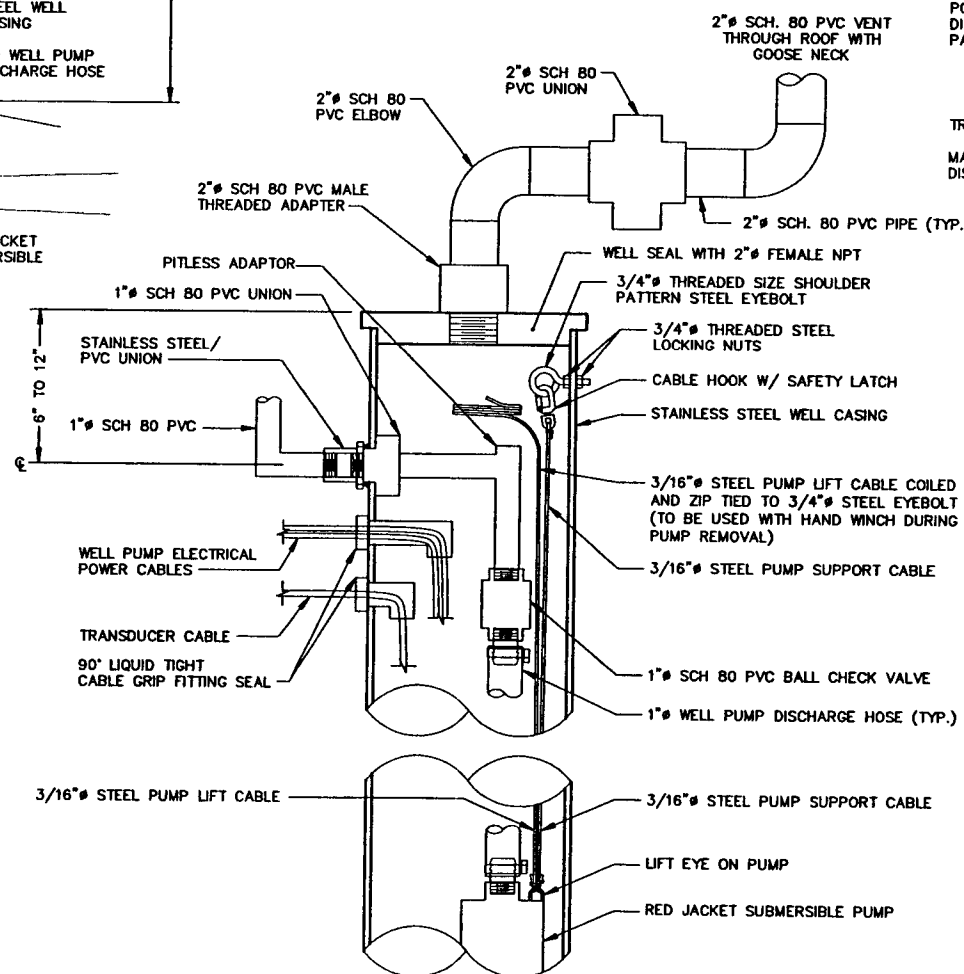
TYPICAL ABOVE GROUND FORCEMAIN DETAIL
OPERATION AND MAINTENANCE MANUAL
FMC - Middleport, New York





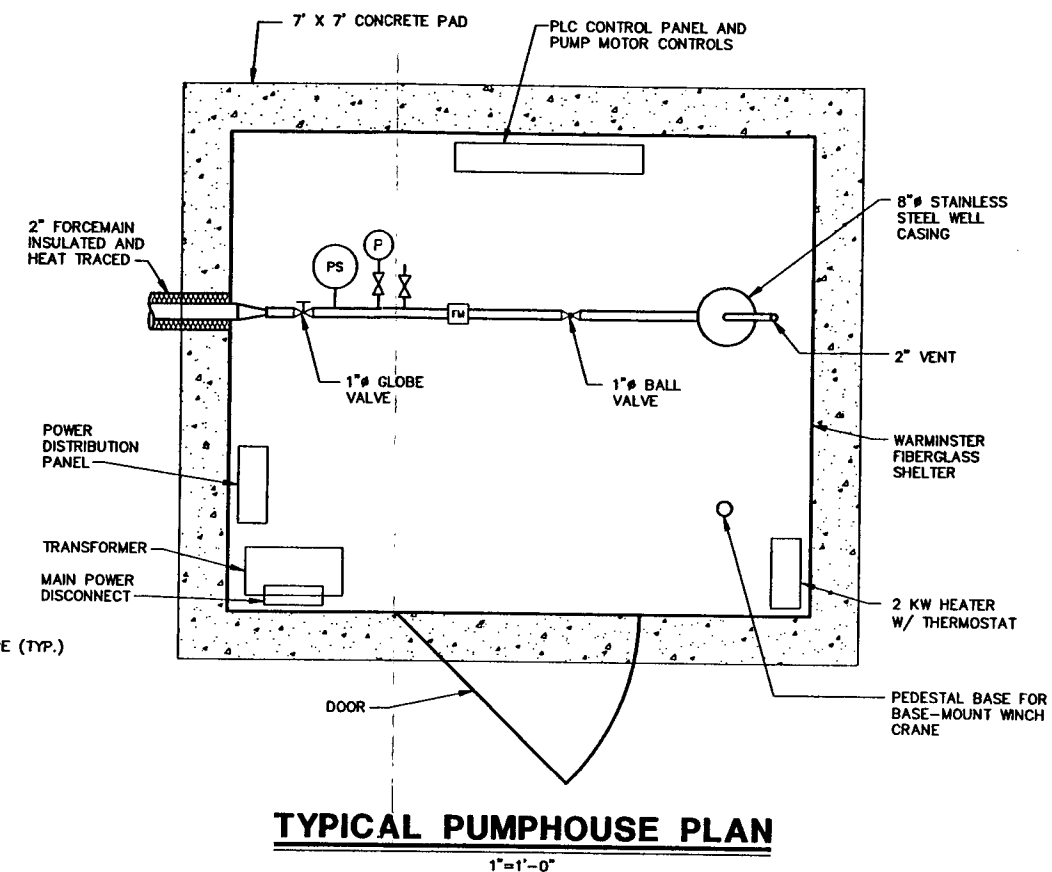
TYPICAL PUMPHOUSE SECTION

1"=1'-0"



TYPICAL EXTRACTION WELL DETAIL

N.T.S.



TYPICAL PUMPHOUSE PLAN

1"=1'-0"

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. EXISTING GRADE OF PUMPHOUSES WITHIN TRENCH G ARE 536 FEET (G-EX1), 537 FEET (G-EX2), AND 540 FEET (G-EX3).
3. FINAL ELEVATION OF TRENCH G PUMPHOUSES SHALL BE 537 FEET (G-EX1), 538.5 FEET (G-EX2), AND 540.5 FEET (G-EX3) TO CORRESPOND WITH FINAL GRADING ELEVATIONS WITHIN THE AREA.
4. ALL FLOW METERS SHALL HAVE STRAIGHT PIPE AT A MINIMUM OF 10 PIPE DIAMETERS PRECEDING AND 5 PIPE DIAMETERS FOLLOWING THE METER.

L: ON=*, OFF=REF*
P: PAGESET/PLT-COL
10/12/05 SYR-B5-LAF SOL
48116004/RECORD/48116M01.DWG

Graphic Scale
NOT TO SCALE

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

Professional Engineer's Name DAVID R. GERBER	State NY	Date Signed
Professional Engineer's No. 073001	Project Mgr. DFS	Designed by MAM/WKD
	Drawn by LAF	

BBL
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

(RECORD DRAWING: MADE FROM DRAWING NO. 5, TRACER NO. 48116002/48116M02.DWG, DATED 5/5/05) DATE _____ BY _____

FMC CORPORATION • MIDDLEPORT, NEW YORK
GROUNDWATER MIGRATION CONTROL TRENCHES UPGRADE

PUMPHOUSE DETAILS

MECHANICAL

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

BBL Project No.
481.16

Date
OCTOBER 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

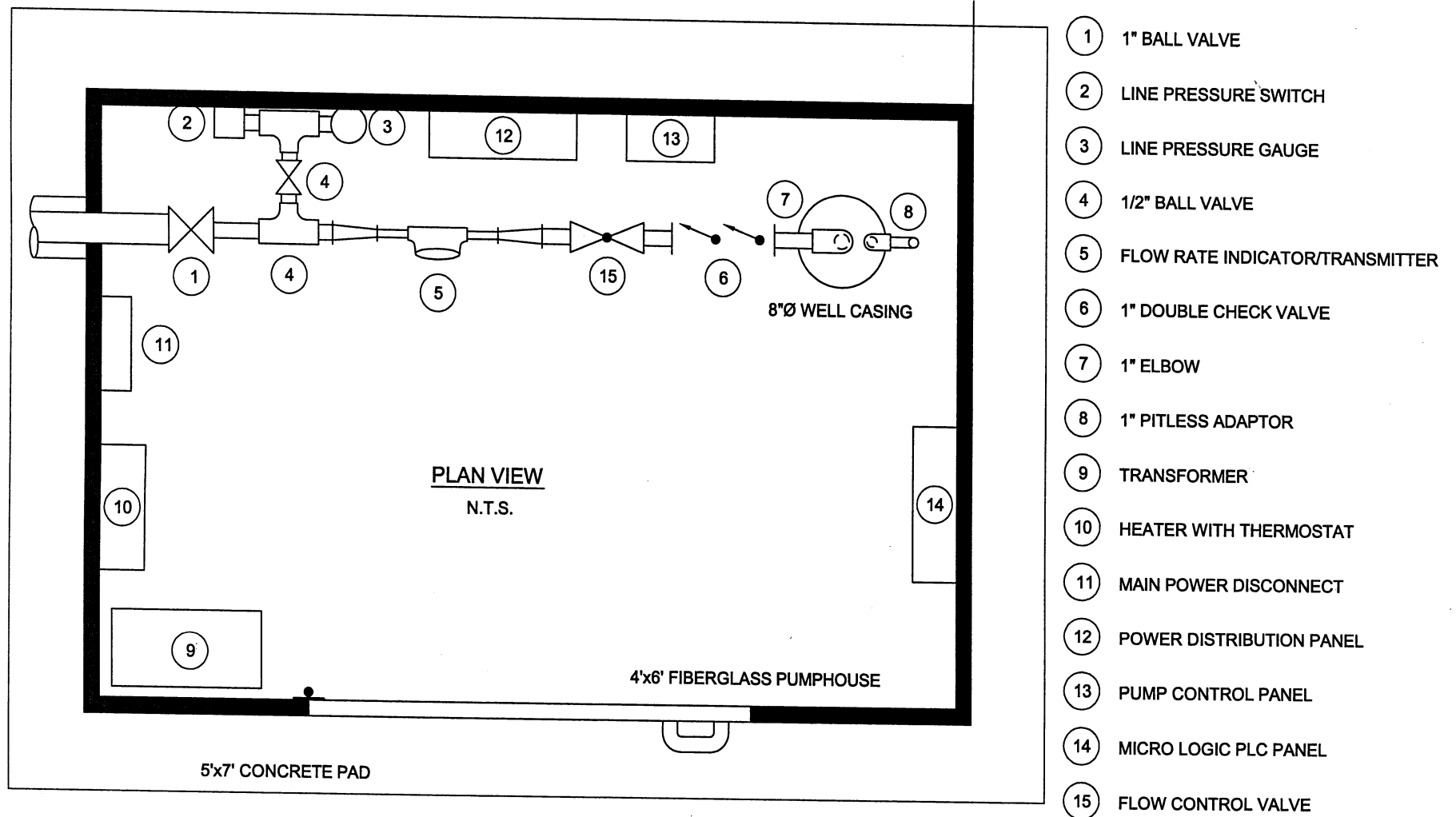


figure 2.3
TYPICAL PUMPHOUSE PLAN - EXTRACTION WELL A-759X
OPERATION AND MAINTANANCE MANUAL
FMC - Middleport, New York



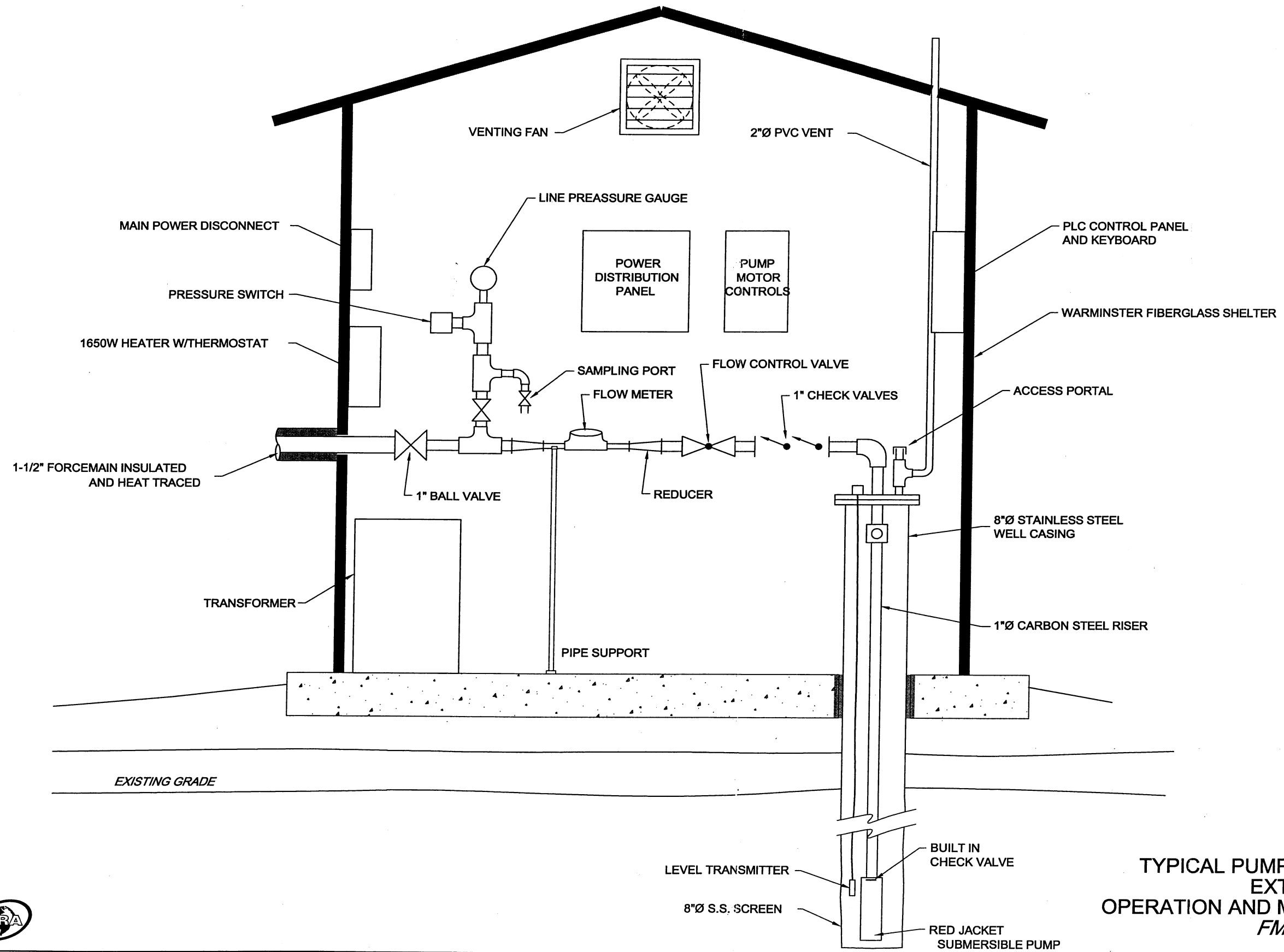
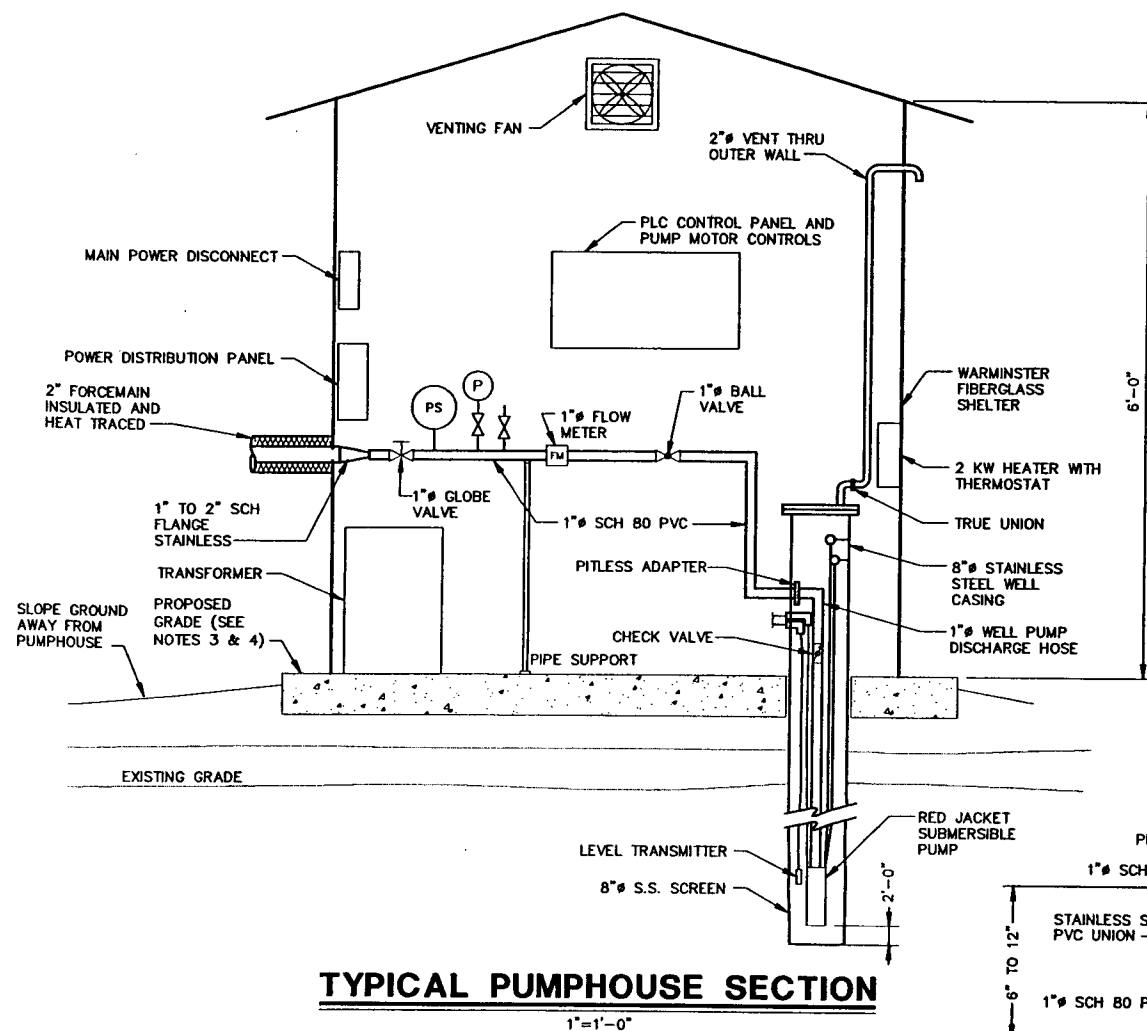


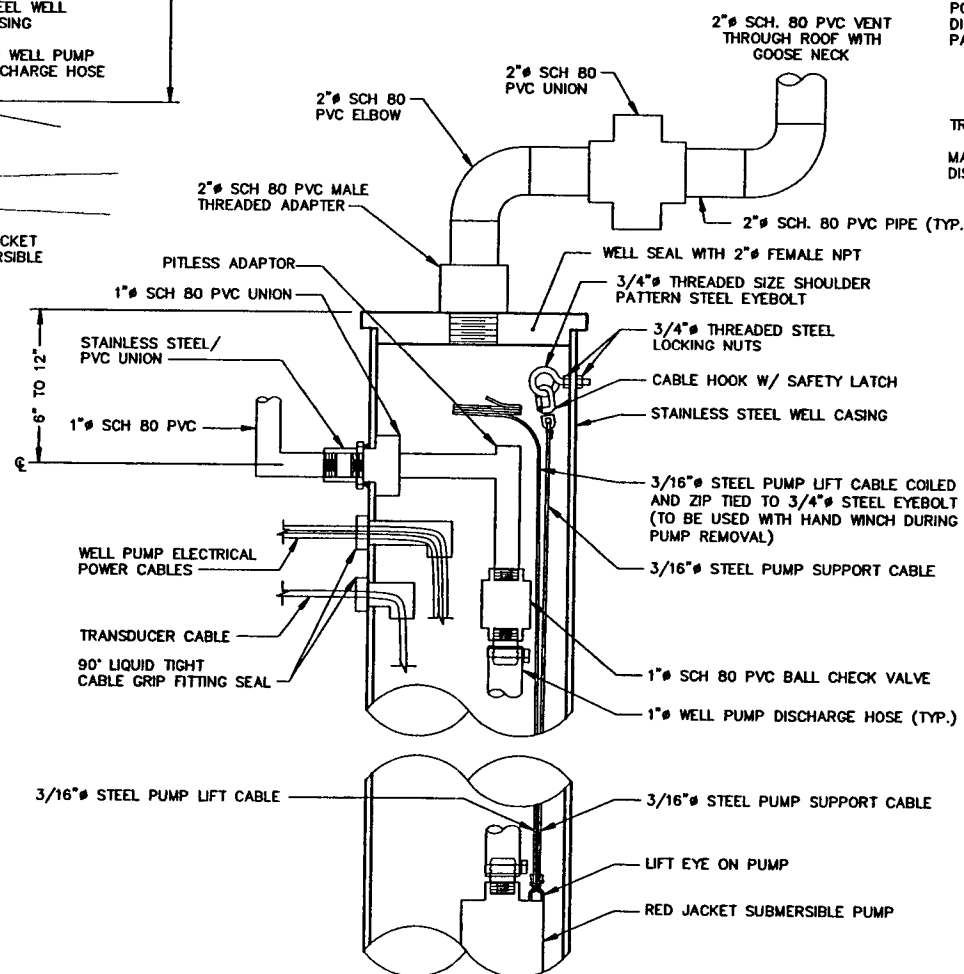
figure 2.4
 TYPICAL PUMPHOUSE SECTION VIEW
 EXTRACTION WELL A-759X
 OPERATION AND MAINTENANCE MANUAL
FMC - Middleport, New York





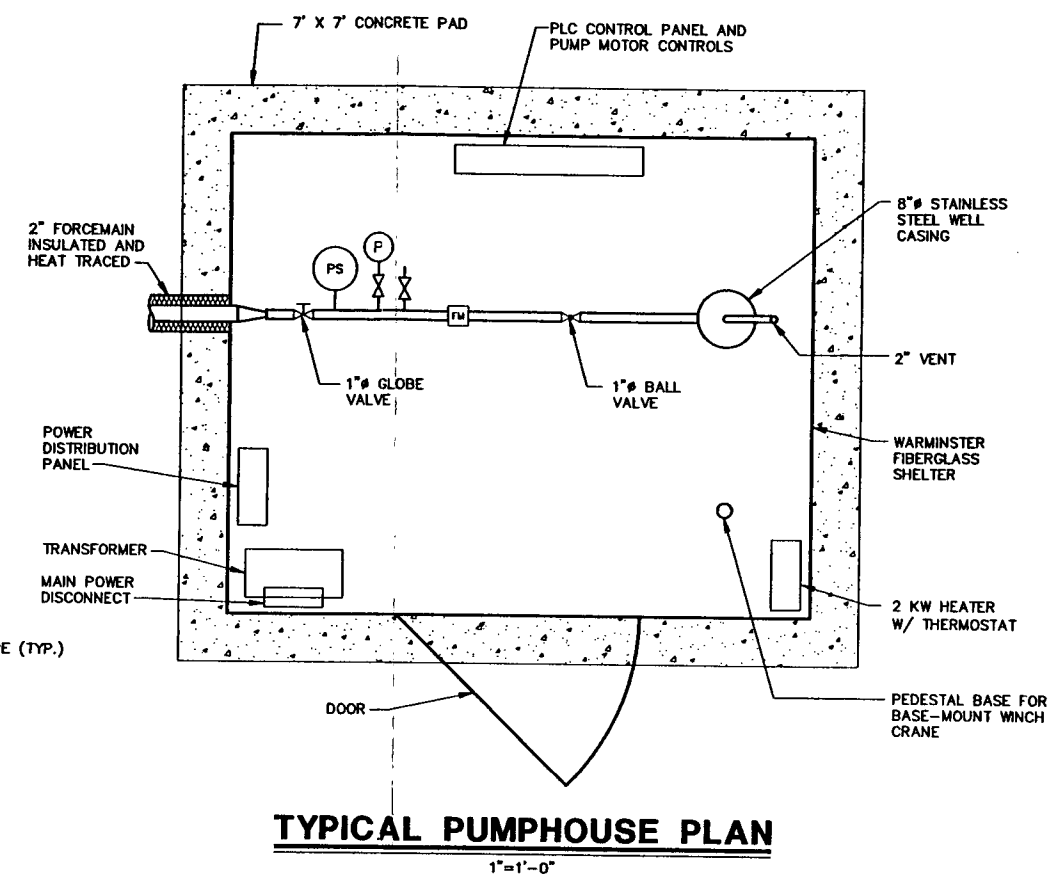
TYPICAL PUMPHOUSE SECTION

1"=1'-0"



TYPICAL EXTRACTION WELL DETAIL

N.T.S.



TYPICAL PUMPHOUSE PLAN

1"=1'-0"

NOTES:

1. ALL LOCATIONS ARE APPROXIMATE.
2. EXISTING GRADE OF PUMPHOUSES WITHIN TRENCH G ARE 536 FEET (G-EX1), 537 FEET (G-EX2), AND 540 FEET (G-EX3).
3. FINAL ELEVATION OF TRENCH G PUMPHOUSES SHALL BE 537 FEET (G-EX1), 538.5 FEET (G-EX2), AND 540.5 FEET (G-EX3) TO CORRESPOND WITH FINAL GRADING ELEVATIONS WITHIN THE AREA.
4. ALL FLOW METERS SHALL HAVE STRAIGHT PIPE AT A MINIMUM OF 10 PIPE DIAMETERS PRECEEDING AND 5 PIPE DIAMETERS FOLLOWING THE METER.

L: ON=*, OFF=REF*
P: PAGESET/PLT-COL
10/12/05 SYR-B5-LAF SOL
48116004/RECORD/48116M01.DWG

Graphic Scale
NOT TO SCALE

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

No.	Date	Revisions	Init

NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW

Professional Engineer's Name DAVID R. GERBER	State NY	Date Signed
Professional Engineer's No. 073001	Project Mgr. DFS	Designed by MAM/WKD
	Drawn by LAF	

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(RECORD DRAWING: MADE FROM DRAWING NO. 5, TRACER NO. 48116002/48116M02.DWG, DATED 5/5/05) DATE _____ BY _____

FMC CORPORATION • MIDDLEPORT, NEW YORK
GROUNDWATER MIGRATION CONTROL TRENCHES UPGRADE

PUMPHOUSE DETAILS

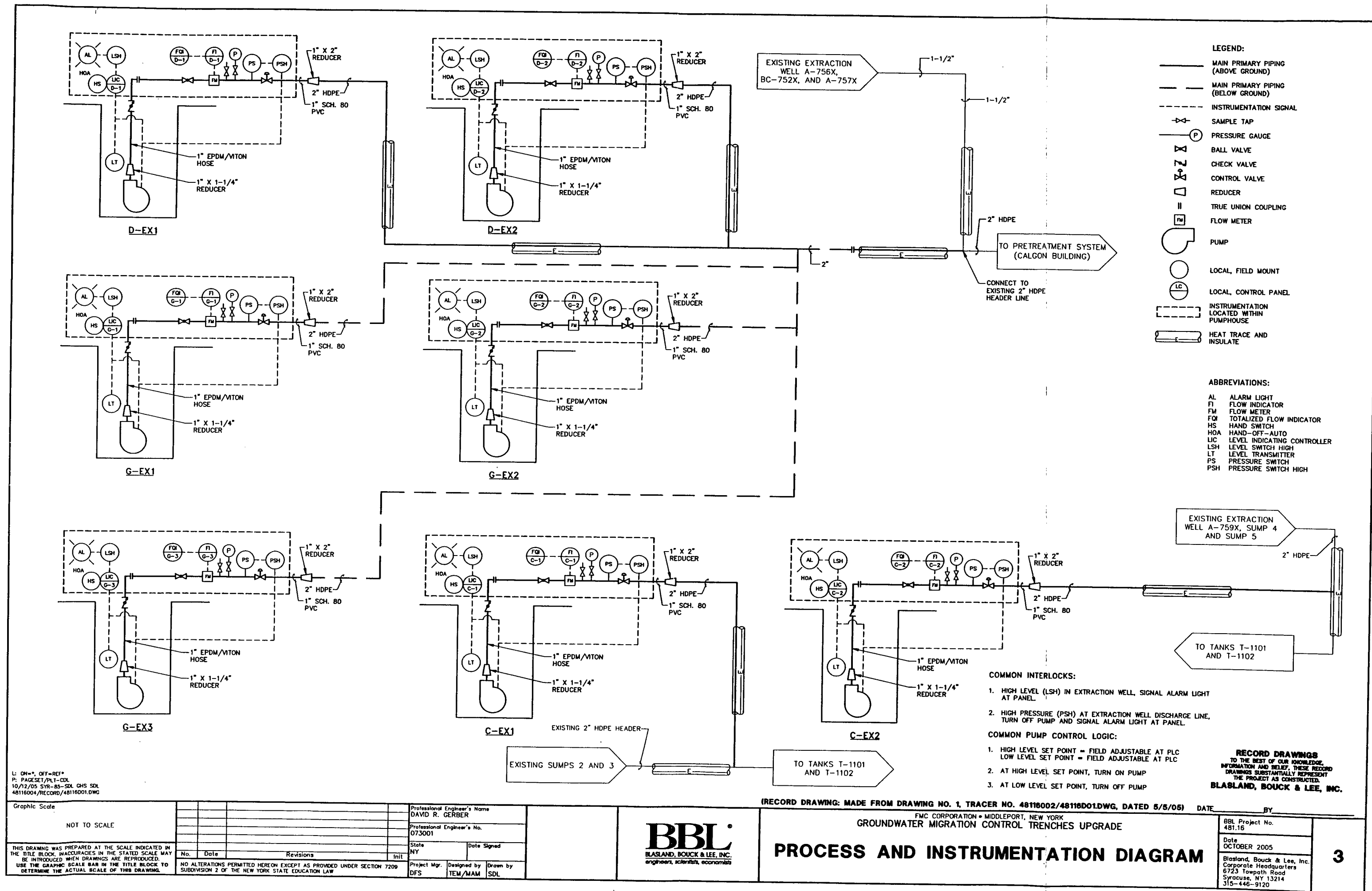
MECHANICAL

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

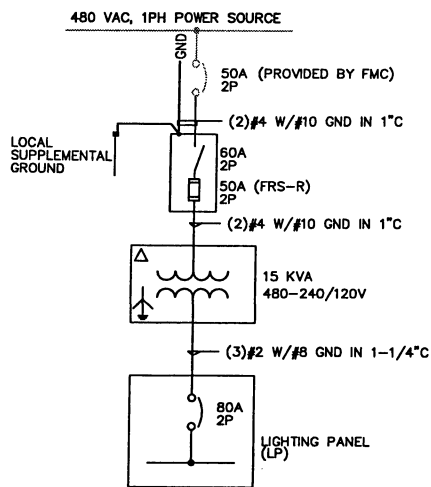
BBL Project No.
481.16

Date
OCTOBER 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120

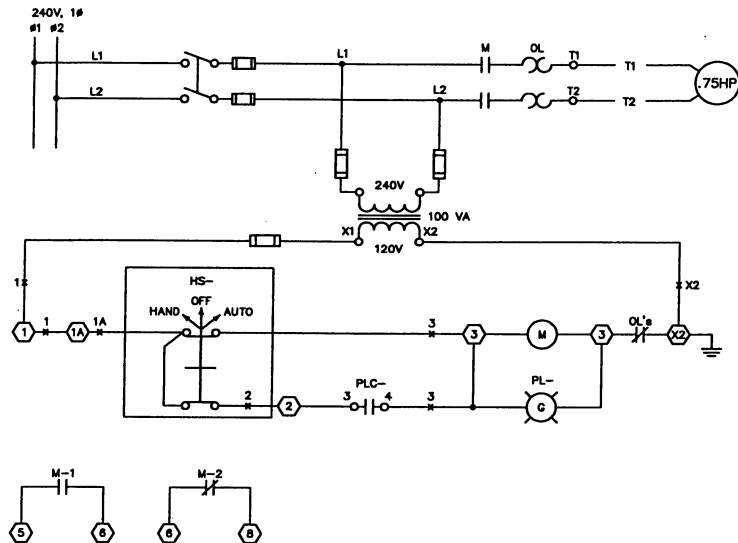


APPENDIX C
GROUNDWATER EXTRACTION SYSTEM
ELECTRICAL DRAWINGS

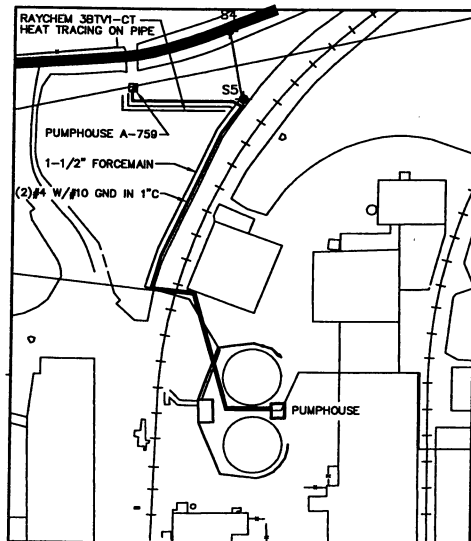


SINGLE LINE DIAGRAM

LIGHTING PANEL "LP" SCHEDULE 240/120V, 60Hz, 1Ø, 3 WIRE											
SERVICE DESCRIPTION	#	WATTS	WIRE SIZE	CUT. NO.	BRANCH CB	A B C	BRANCH CB	CUT. NO.	WIRE SIZE	WATTS	#
UNIT HEATER	1	1500	12	1				2	12	1800	
BUILDING LIGHTING	2	1000	12	3				4	12	1800	
BUILDING RECEPTACLES	2	1000	12	7				8	12	*	
HEAT TRACING	2	550	12	9				10	10	*	
SPARE	*	-	-	11				12	-	*	
PANEL MTD.: SURFACE ENCLOSURE: NEMA 12 MANUFACTURER: SQUARE-D TYPE: NQ00 MAIN BREAKER: 80A (GCB) MAIN LUGS: 100A FEEDER SIZE: 2/Ø & 1/Ø GND FEEDER ENTRY: BOTTOM											
1. # - NO. OF FIXTURES OR RECEPTACLES 2. * - DETAILS NOT AVAILABLE 3. RECEPTACLE CIR. LOADING BASED ON 500W/OUTLET											

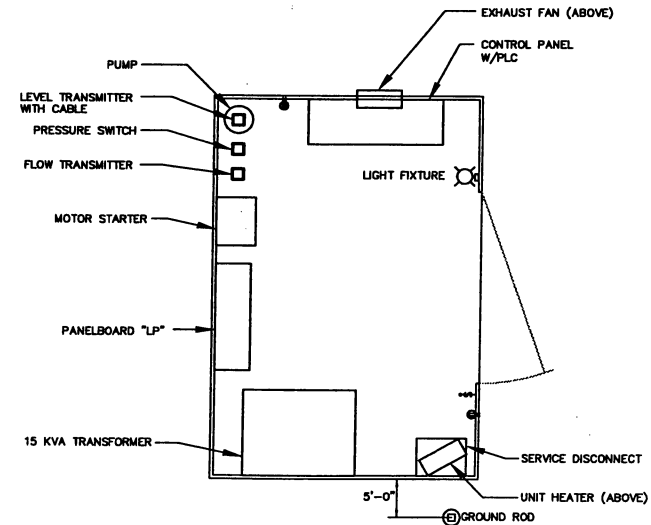


MOTOR SCHEMATIC DIAGRAM

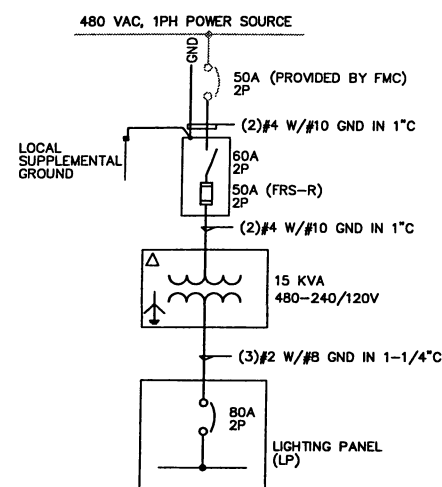


SITE PLAN
SCALE: 1"=80'

PUMPHOUSE A-759

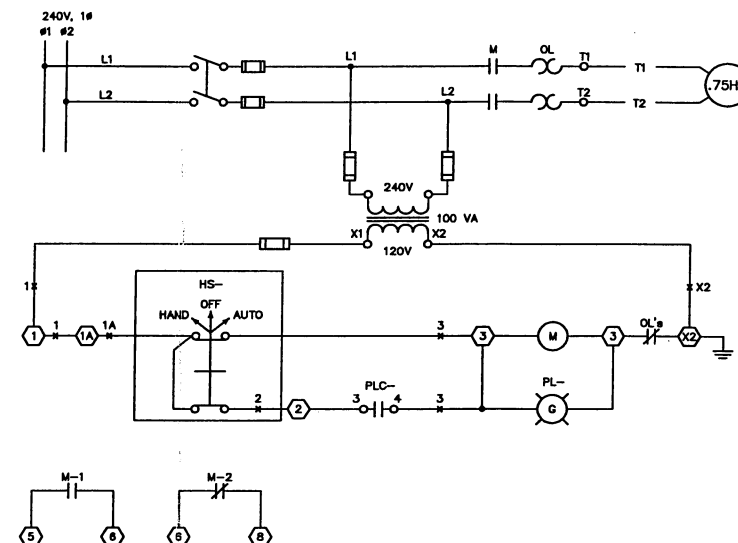


BUILDING ELECTRICAL PLAN
3/4"=1'-0"

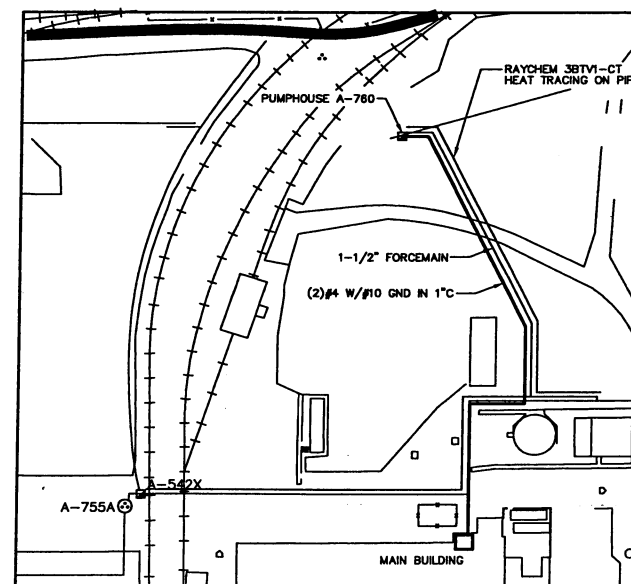


SINGLE LINE DIAGRAM

LIGHTING PANEL "LP" SCHEDULE 240/120V, 60Hz, 1Ø, 3 WIRE											
SERVICE DESCRIPTION	#	WATTS	WIRE SIZE	CUT. NO.	BRANCH CB	A B C	BRANCH CB	CUT. NO.	WIRE SIZE	WATTS	#
UNIT HEATER	1	1500	12	1				2	12	1800	
BUILDING LIGHTING	2	1000	12	3				4	12	1800	
BUILDING RECEPTACLES	2	1000	12	7				8	12	*	
HEAT TRACING	2	550	12	9				10	10	*	
SPARE	*	-	-	11				12	-	*	
PANEL MTD.: SURFACE ENCLOSURE: NEMA 12 MANUFACTURER: SQUARE-D TYPE: NQ00 MAIN BREAKER: 80A (GCB) MAIN LUGS: 100A FEEDER SIZE: 2/Ø & 1/Ø GND FEEDER ENTRY: BOTTOM											
1. # - NO. OF FIXTURES OR RECEPTACLES 2. * - DETAILS NOT AVAILABLE 3. RECEPTACLE CIR. LOADING BASED ON 500W/OUTLET											

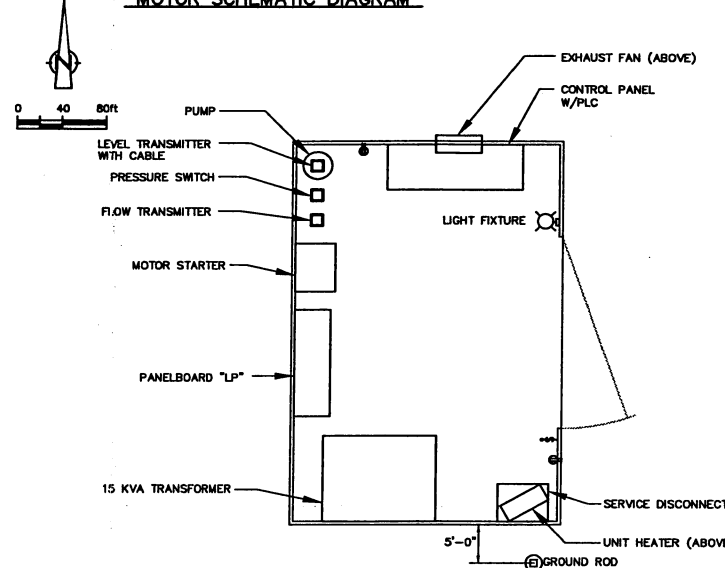


MOTOR SCHEMATIC DIAGRAM



SITE PLAN
SCALE: 1"=80'

PUMPHOUSE A-760



BUILDING ELECTRICAL PLAN
3/4"=1'-0"

1	ISSUED FOR CONSTRUCTION	10/16/98	BME
2	Revision	Date	Initial

Approved

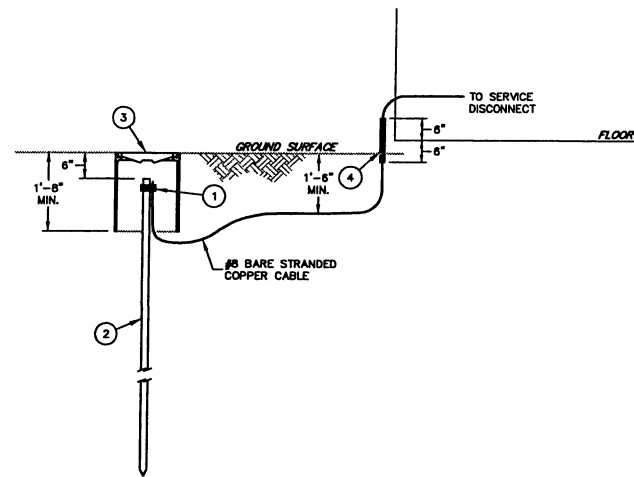
FMC FMC Corporation
Agricultural Chemical Division
Middleport, New York

ELECTRICAL CONSTRUCTION
PUMPHOUSE A-759 AND A-760
ELECTRICAL PLAN AND DETAILS

CONESTOGA-ROVERS & ASSOCIATES

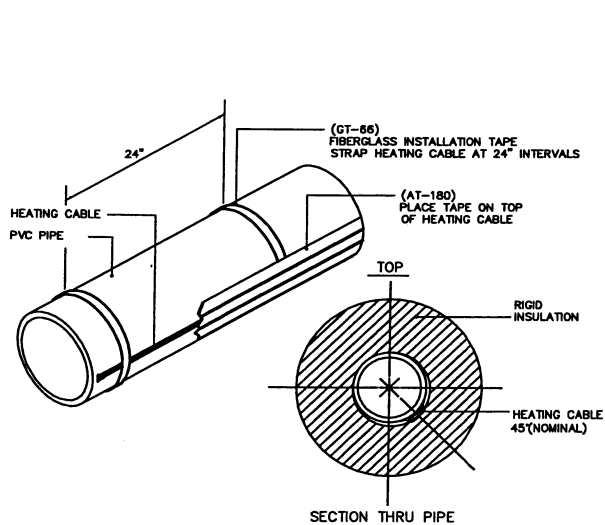
Drawn by: DLS
Designed by: BME
Checked by: BME
Scale: AS SHOWN
Date: OCTOBER 1998
Field book: Project N°: 09981
File N°: NF001
Rev. N°: 1
Drawing N°: E-1

MARCH 14, 2002

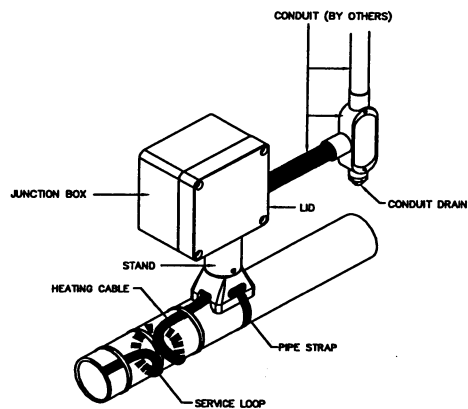


- 1 CONNECTOR: BURNBY CAT. No. GAR-8426 (1 CABLE)
OR GP8426 (2 CABLES)
- 2 GROUND ROD: COPPERWELD, 3/4" DIA. x 10' LG.
- 3 INSPECTION WELL: KISTNER PULL-BOX W/CAST IRON FRAME & COVER
15" DIA. x 20" LG., PART No. PB-155
- 4 SLEEVE: PVC SCH. 80 CONDUIT, 1" DIA. MIN.

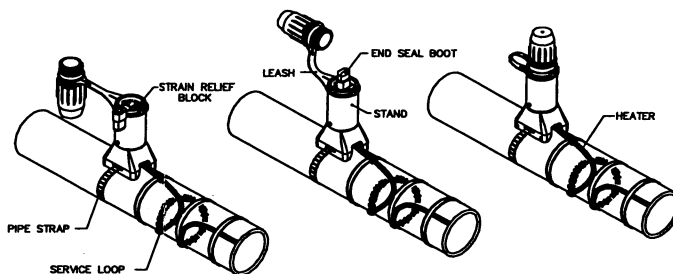
DETAIL
GROUNDING ROD INSTALLATION
— INSPECTION TYPE
N.T.S.



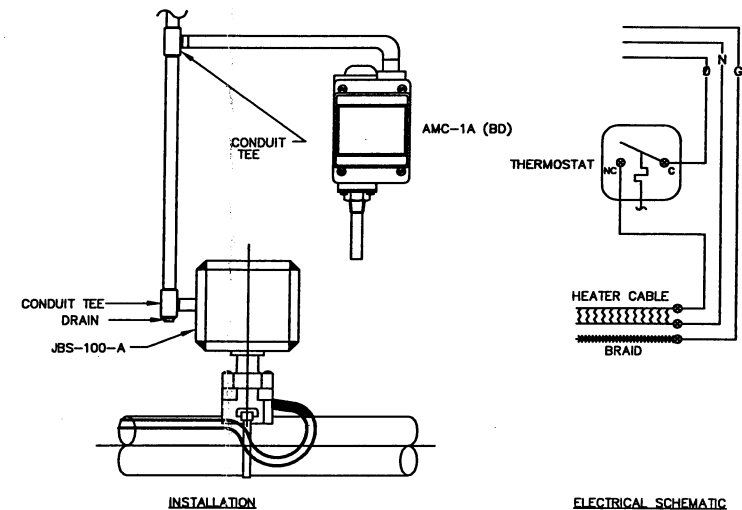
DETAIL
TYPICAL PLACEMENT OF
TAPE OVER HEATING CABLE
N.T.S.



DETAIL
JBS-100-A
POWER CONNECTION KIT
N.T.S.



DETAIL
E-100-A END SEAL KIT
N.T.S.



DETAIL
AMBIENT THERMOSTAT
N.T.S.

SCOPE OF WORK

Contractor shall complete installation of all electrical equipment as shown and specified herein.

Work Included

Contractor's work includes supply (except as noted as being supplied by owner) and installation of the following:

1. Two 240vac power services for pumphouses A-759 and A-760, one for each pumphouse. This shall include cable, conduit, conduit mounting hardware and pull-boxes. The services shall be run on the existing pipe bridges and supporting structures.

2. Installation and wiring of the following equipment in pumphouses A-759 and A-760. Each location:

- one owner-supplied service disconnect
- one owner-supplied 15kva transformer
- one owner-supplied lighting panel (LP)
- one owner-supplied control panel (CP)
- one owner-supplied surge suppression device (inside of CP)
- one owner-supplied exhaust fan
- one owner-supplied unit heater
- one owner-supplied motor starter (Contractor shall supply disconnect fuses and overload heaters)
- one owner-supplied light
- one light switch
- two convenience outlets

3. Wiring of the following owner-supplied and -installed instruments in pumphouses A-759 and A-760. Each location:

- one level transmitter (factory-supplied with cable)
- one pressure switch
- one flow transmitter

4. Supply of two inspection type ground rods, one at each pumphouse location.

5. Installation of owner-supplied electrical heat tracing.

Material Specifications

- Power and control cable :
 - Voltage: 600V
 - Temperature: 75C/90C
 - Type: NEC single conductor, THWN/THWN
 - Conductor : stranded copper, sizes as shown
 - Approved Manufacturer: Romex, General Cable
- Control cable for flow transmitter:
 - Voltage: 300v
 - Temperature: 105C
 - Type: NEC multi-conductor
 - Conductor: stranded copper, #18AWG twisted and shielded pair
 - Approved Manufacturer: Dukoron, 1882

- Conduit:
 - Type: Outdoor - rigid galvanized steel, indoor - rigid galvanized steel and liquidtight flexible metal conduit (outer liquidtight non-metallic jacket over a flexible metal core)
 - Size: NEC, if not specified, minimum 3/4".

4. Pull-Boxes: NEMA 4X with stainless steel hardware

Installation - General

- All work shall be in accordance with NEC and OSHA requirements
- All equipment shall be secured in place, level and plumb
- Cable installation :
 - Cable shall be installed in continuous runs only, no splices will be allowed.
 - All power cables shall be 500vdc megger tested. All control wires shall be checked for continuity only.
- Conduit installation :
 - Use only conduit manufacturer recommended tools and installation methods
 - Metal conduit shall be installed electrically continuous (bonded)
 - Galvanized conduit surfaces scratched during installation shall be repaired with two coats of zinc rich paint
- Heat Trace Installation:
 - Install heat trace cable and accessories as shown and recommended by the heat trace manufacturer
 - Upon completion, megger each circuit with 1000vdc megger both prior to and after installing thermal insulation
 - After thermal insulation is applied install heat trace warning signs

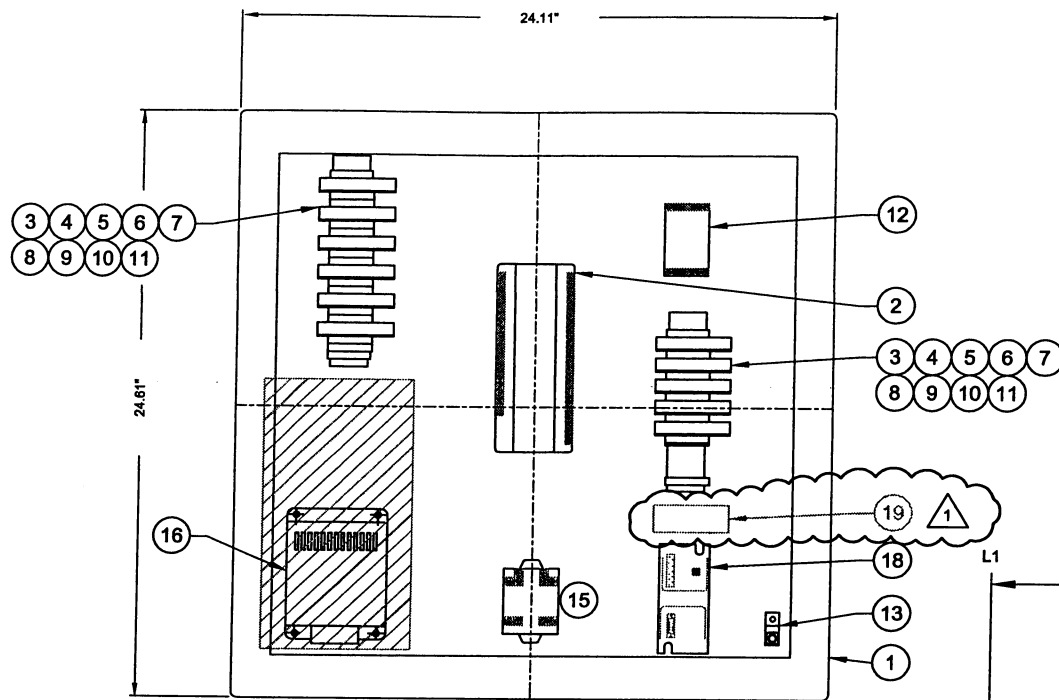
Approved

FMC FMC Corporation
Agricultural Chemical Division
Middleport, New York

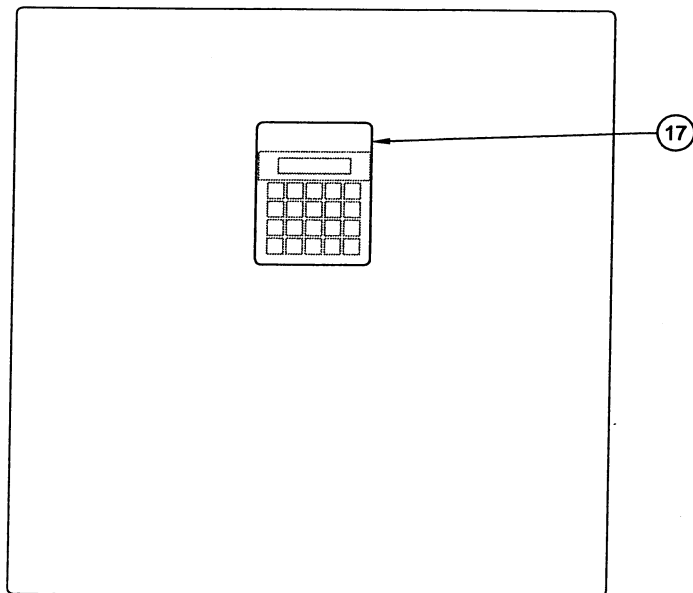
CONESTOGA-ROVERS & ASSOCIATES

ELECTRICAL CONSTRUCTION
PUMPHOUSE A-759 AND A-760
ELECTRICAL DETAILS

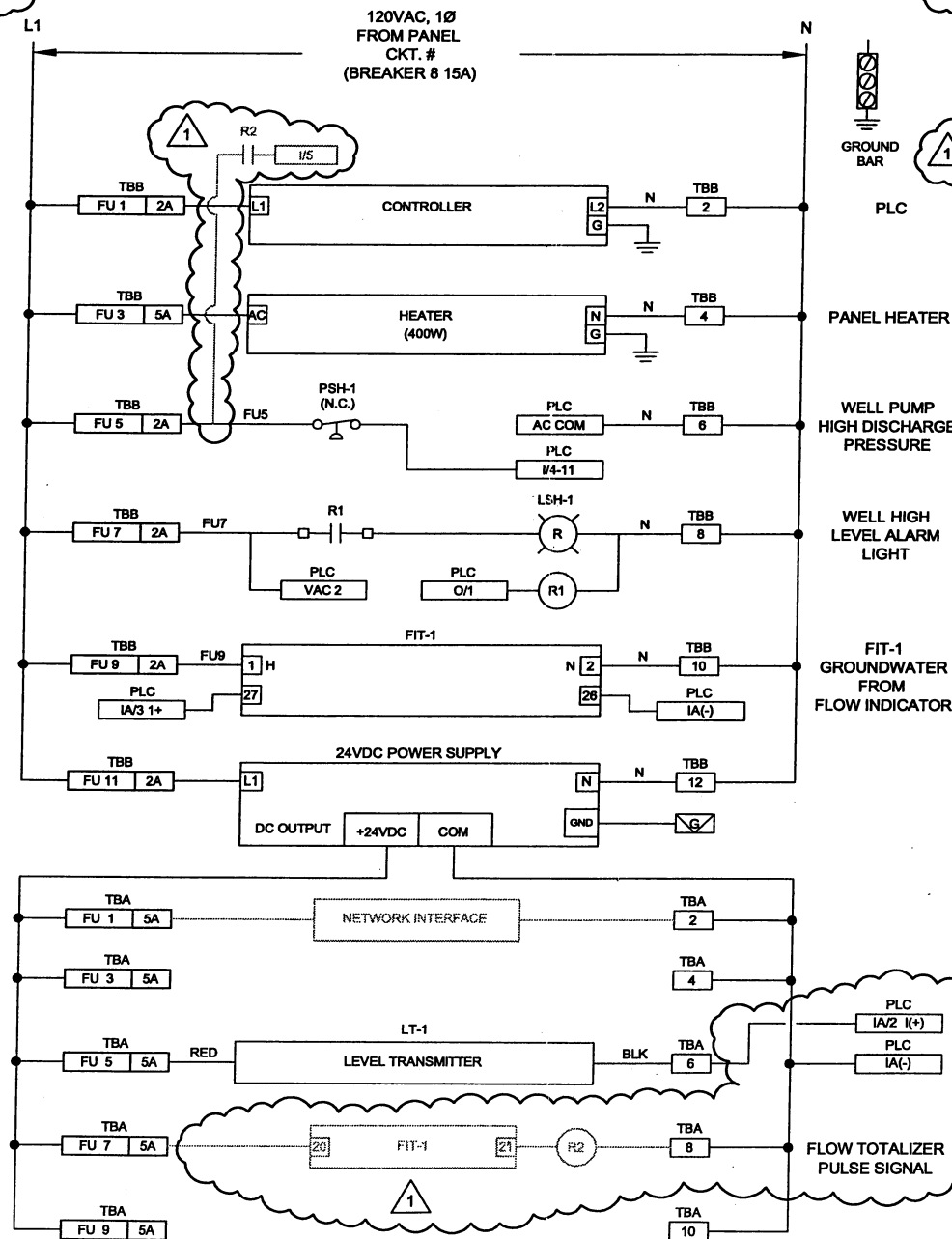
Drawn by: DLS
Designed by: BME
Checked by: BME
Scale: AS SHOWN
Date: OCTOBER 1998
Project No: 09981
File No: NFO02
Rev. No: 1
Drawing No: E-2



FRONT VIEW
DOOR REMOVED



FRONT VIEW



BILL OF MATERIAL

ITEM	NO.	DESCRIPTION
1	1	HOFFMAN NEMA 4 ENCLOSURE CAT.#U-606020 WITH BACK PANEL #A-24P24 & PADLOCK KIT #U-UHPL
2	1	ALLEN-BRADLEY MICROLOGIX 1000 PLC CAT. #1781-L20AWA-5A
3	10	ENTRELEC M 6/8 TERMINAL BLOCK CAT. #115 118.11
4	5	ENTRELEC FEM6 TERMINAL END SECTION CAT. #118 368.16
5	5	ENTRELEC M 6/8 P GROUND TERMINAL BLOCK CAT. #185 114.17
6	10	ENTRELEC ML 10/13.SF FUSE HOLDER TERMINAL BLOCK CAT. #199 095.13
7	10	ENTRELEC FEM13U TERMINAL END SECTION CAT. #199 635.24
8	10	FUSE ELEMENTS - LITTLEFUSE OR EQUAL SEE SCHEMATIC DIAGRAMS FOR FUSE SIZE
9	1'-0"	ENTRELEC PR5 TERMINAL BLOCK MOUNTING RAIL CAT. #101 598.26
10	4	ENTRELEC BADH TERMINAL BLOCK END STOP CAT. #118 900.27
11	4	ENTRELEC RC810 (1-100) TERMINAL MARKING STRIP CAT. #234 060.05
12	1	ENTRELEC SWITCHING POWER SUPPLY 120VAC INPUT/24VDC OUTPUT CAT. #2 423 418.00
13	1	BURNDY GROUND LUG CAT. #2ARC-8
14	1	ALLEN-BRADLEY BULLETIN 700 TYPE P CONTROL RELAY CAT. #700-P400B11 (120VAC COIL - 4 POLE)
15	1	HOFFMAN ELECTRIC HEATER 400W 115 VAC CAT. #D-AH4001B
16	1	ALLEN-BRADLEY MICROVIEW OPERATOR INTERFACE CAT. #2707-MVP232
17	1	ALLEN-BRADLEY AIC+ ADVANCED INTERFACE CONVERTER CAT. #1781-NET-AIC
18	1	24V CONTROL RELAY
19	1	

NOTE

NOT INCLUDED - SURGE SUPPRESSION

GENERAL NOTES

1. ALL WIRING SHALL BE AS DIRECTED ON DWG. E-2 AND AS FOLLOWS:

120VAC - #14 AWG MTW
24VDC (POWER) - #18 AWG MTW
24VDC (ANALOG) - 2/C#16 SHLD
24VDC (DIGITAL) - 2/C#16 TW

N2	Revision	Date	Initial

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

DRAWING STATUS

Status	Date	Initial

FMC
MIDDLEPORT, N.Y.

FORCEMAIN/TRENCH INSTALLATION

CONTROL PANEL LAYOUT - WELLS A-759X,
BC-752X,A-756X,A-757X,A-758X,A-760X,A-542RX



CONESTOGA-ROVERS & ASSOCIATES

Source Reference:

Project Manager: RJP	Reviewed By:	Date: 9/7/98
Scale: 1-1/2"=1'-0"	Project N°: 09981-00	Report N°: 000
		Drawing N°: E-3

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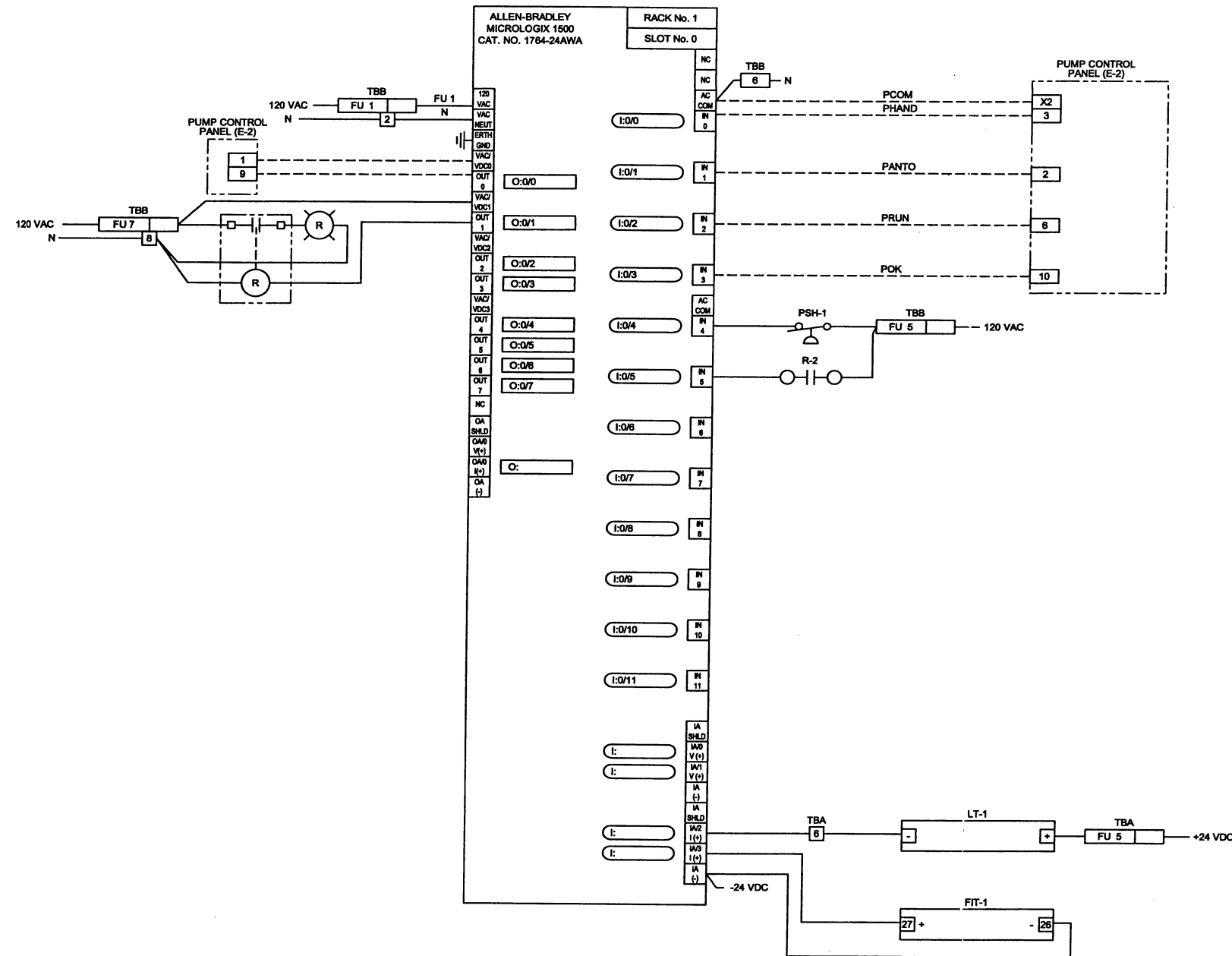
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N2	Revision	Date	Initial
1	AS BUILT	7/19/00	DLS

LEGEND

- INDICATES FIELD WIRING
- O INDICATES FIELD DEVICE TERMINAL
- INDICATES PLC CABINET TERMINAL

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

Approved

Date: _____

DRAWING STATUS			

FMC
MIDDLEPORT, N.Y.

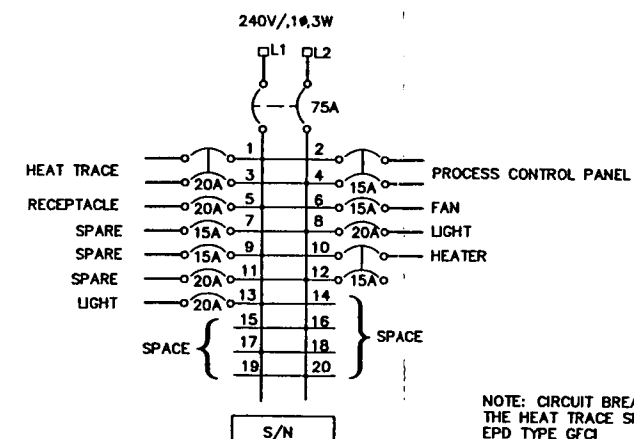
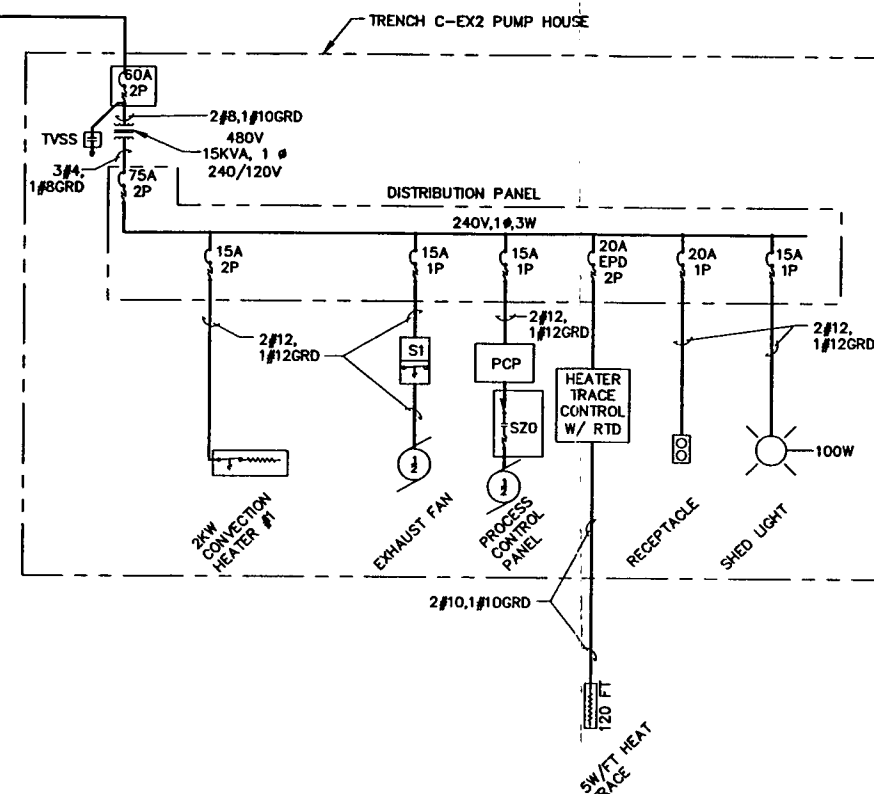
FORCEMAIN/TRENCH INSTALLATION

CONTROL PANEL PLC WIRING DIAGRAM

WELLS A-742RX, BC-752X, A-756X, A-757X, A-758X, A-759X, A-760X

CONESTOGA-ROVERS & ASSOCIATES

Source Reference:			
Project Manager:	Reviewed By:	Date:	
ML	ML	JULY 2000	
Scale:	Project N°:	Report N°:	Drawing N°:
NONE	09981-00	000	E-4



C TRENCH EX2 PUMPHOUSE DISTRIBUTION PANEL LAYOUT

NOTE: CIRCUIT BREAKERS FOR THE HEAT TRACE SHALL BE EPD TYPE GFCI

NOT TO SCALE

NOT TO SCALE

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

(RECORD DRAWING: MADE FROM DRAWING NO. 1, TRACER NO. 48116002/48116E05.DWG, DATED 5/5/05) DATE _____ BY _____

X: NONE
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P: STD-PCP/DL
10/11/05 JE/BBL-54-MJD SYR-85-GHS SOL
48116002/RECORD/48116E05.DWG

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No.	Date	Revisions	In
NO ALTERATIONS PERMITTED HEREON EXCEPT AS PROVIDED UNDER SECTION 7209 SUBDIVISION 2 OF THE NEW YORK STATE EDUCATION LAW			

Professional Engineer's Name DAVID R. GERBER		
Professional Engineer's No. 073001		
State NEW YORK	Date Signed	
Project Mgr. DES	Designed by MC	Drawn by M.D

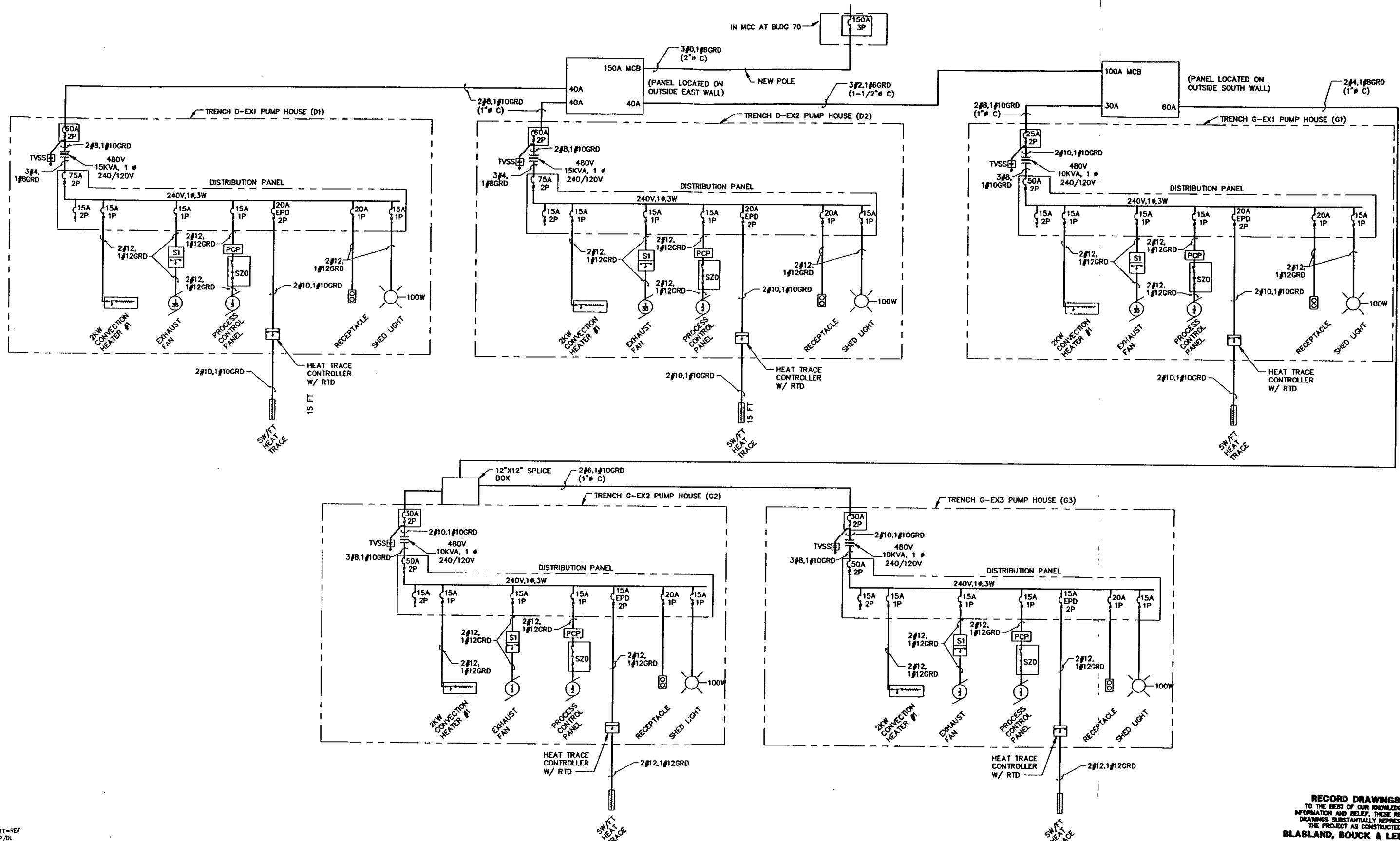
BBL
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

FMC CORPORATION • MIDDLEPORT, NEW YORK
GROUNDWATER MIGRATION CONTROL TRENCHES UPGRADE
**TRENCH C ONE LINE DIAGRAM
AND PANEL LAYOUT**

BBL Project No.
481.16

Date
OCTOBER 2005

Blastand, Bouck & Lee, Inc.
Corporate Headquarters
6723 Towpath Road
Syracuse, NY 13214
315-446-9120



X: NONE
L: ON-A, OFF-REF
P: STD-PCP/DL
10/12/05 JE/BBL-54-MJD SYR-85-GHS SCL
48116004/RECORD/48115E06.DWG

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No.	Date	Revisions	Init

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Professional Engineer's Name DAVID R. GERBER	Date Signed
Professional Engineer's No. 073001	
State NEW YORK	
Project Mgr. DFS	Designed by MC
	Drawn by MJD

BBL
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

(RECORD DRAWING: MADE FROM DRAWING NO. 1, TRACER NO. 48118002/48118E08.DWG, DATED 5/5/05) DATE BY

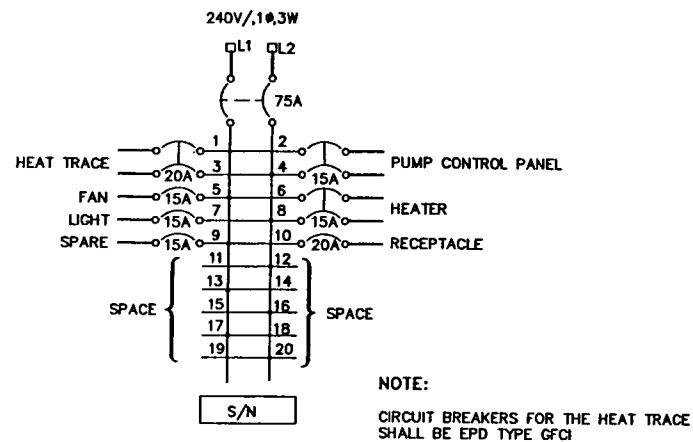
FMC CORPORATION • MIDDLEPORT, NEW YORK
GROUNDWATER MIGRATION CONTROL TRENCHES UPGRADE

TRENCHES D AND G ONE LINE DIAGRAM

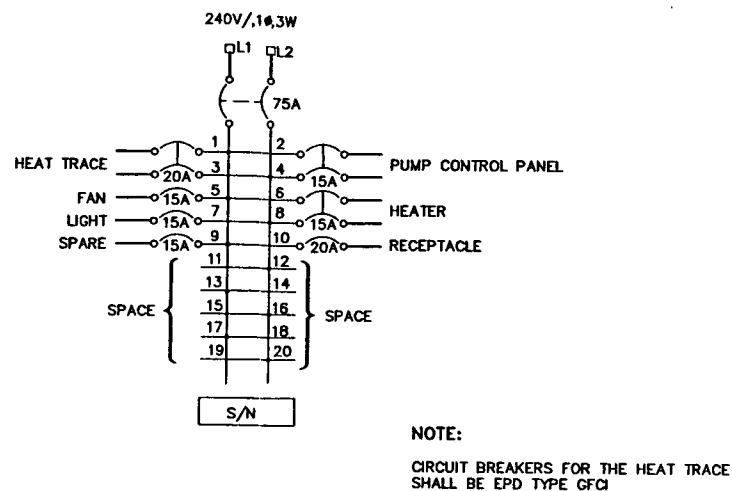
ELECTRICAL

RECORD DRAWINGS
TO THE BEST OF OUR KNOWLEDGE,
INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

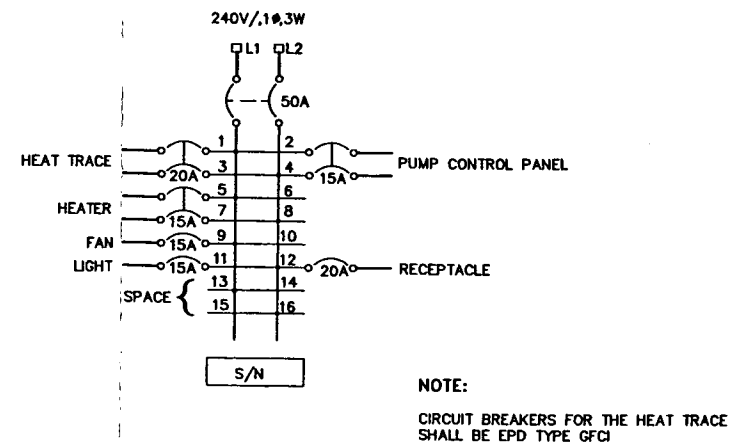
BBL Project No.
481.16
Date
OCTOBER 2005
Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Townsho Road
Syracuse, NY 13214
315-446-9120



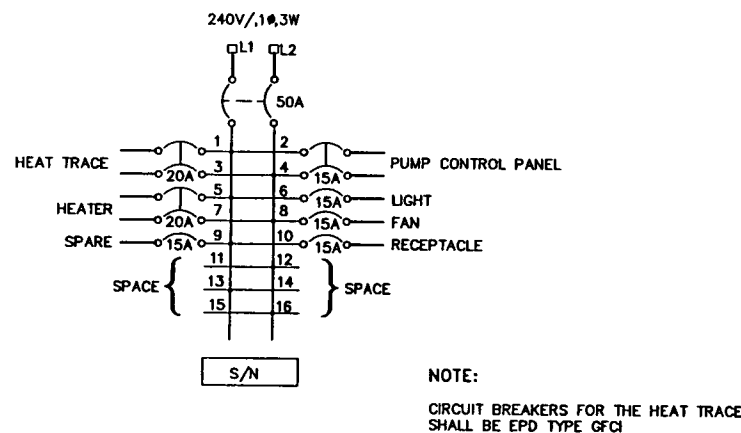
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DISTRIBUTION PANEL LAYOUT
NOT TO SCALE



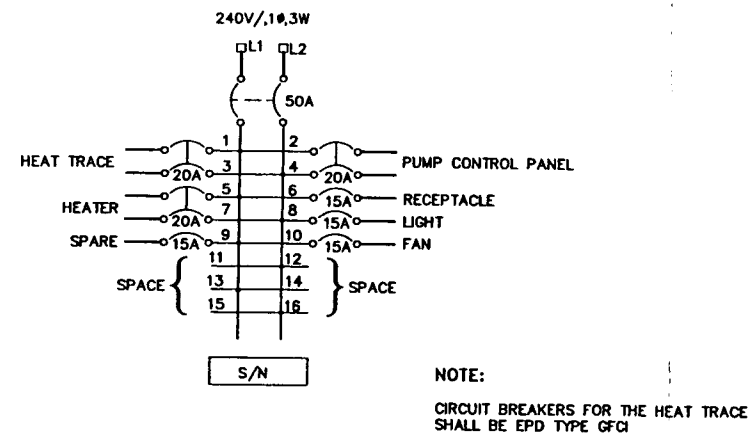
D TRENCH PUMPHOUSE D-EX2
DISTRIBUTION PANEL LAYOUT
NOT TO SCALE



G TRENCH PUMPHOUSE G-EX1
DISTRIBUTION PANEL LAYOUT
NOT TO SCALE



GTRENCH PUMPHOUSE G-EX2
DISTRIBUTION PANEL LAYOUT
NOT TO SCALE



G TRENCH PUMPHOUSE G-EX3
DISTRIBUTION PANEL LAYOUT
NOT TO SCALE

X: NONE
L: ON=*, OFF=REF
P: STD-PCP/DL
10/11/05 JE/BBL-54-MJD SYR-B5-GHS SCL
48116002/RECORD/48116E04.DWG

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Professional Engineer's Name
DAVID R. GERBER
Professional Engineer's No.
073001
State
NEW YORK
Date Signed
Project Mgr.
DFS
Designed by
MC
Drawn by
MJD

BBL
BLASLAND, BOUCK & LEE, INC.
engineers, scientists, economists

(RECORD DRAWING: MADE FROM DRAWING NO. 1, TRACER NO. 48116002/48116E04.DWG, DATED 5/5/05) DATE _____ BY _____

FMC CORPORATION • MIDDLEPORT, NEW YORK
GROUNDWATER MIGRATION CONTROL TRENCHES UPGRADE

TRENCH D AND G PANEL LAYOUT

ELECTRICAL

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INFORMATION AND BELIEF, THESE RECORD
DRAWINGS SUBSTANTIALLY REPRESENT
THE PROJECT AS CONSTRUCTED.
BLASLAND, BOUCK & LEE, INC.

BBL Project No.
481.16

Date
OCTOBER 2005

Blasland, Bouck & Lee, Inc.
Corporate Headquarters
6723 Tawpath Road
Syracuse, NY 13214
315-446-9120

APPENDIX D

MANUFACTURER LITERATURE

Appendix D
Manufacturer's Literature
Table of Contents

APPENDIX D-1	EXTRACTION PUMPS - ITT / Goulds 5GS Series
APPENDIX D-2	LEVEL CONTROL - GE Druck PTX 1280 Series Transducer
APPENDIX D-3	PRESSURE INDICATORS - NOSHOCK 300 Series
APPENDIX D-4	PRESSURE SWITCH - United Controls Series 100 - NOSHOCK Series 300 - AllenBradley Bulletin 836
APPENDIX D-5	FLOW TRANSMITTER AND CONTROL - Endress+Hauser Promag 30 Series - Endress+Hauser Promag 50 Series
APPENDIX D-6	RADIO TRANSMITTERS - ELPRO 905U
APPENDIX D-7	TRANSFORMERS - Westinghouse Single-Phase Step-down Transformer
APPENDIX D-8	FIBERGLASS ENCLOSURE - Warminster Fiberglass Enclosure – pumphouse
APPENDIX D-9	VALVES - WILKINS Model 550 AND 575 - SHARPE Series 40276
APPENDIX D-10	VACUUM BREAKERS - Johnson Series 768
APPENDIX D-11	HEAT TRACE - CHROMALOX 3290 Multiple Loop Temperature Controller - Digitrace JBS-100-ECW-A
APPENDIX D-12	PITLESS ADAPTER - Maas
APPENDIX D-13	SURGE PROTECTION - Square D
APPENDIX D-14	MOTOR STARTER - Eaton

APPENDIX D-15

WELL HOUSE HEATER

- QMark

APPENDIX D-16

WELL HOUSE FAN

- Airmaster

APPENDIX D-17

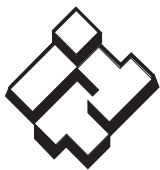
PUMP CONTROLS

- Allen Bradley Micrologix
- Allen-Bradley Microview Operator Interface

APPENDIX D-1

EXTRACTION PUMPS

- ITT / Goulds 5GS Series



ITT

B5-25GS

Residential Water Systems

Goulds Pumps

5GS, 7GS, 10GS,
13GS, 18GS & 25GS

5-25 GPM, ½ – 5 HP, 60 Hz,
Submersible Pumps



 **GOULDS PUMPS**

Goulds Pumps is a brand of ITT Corporation.

www.goulds.com

Engineered for life

FEATURES

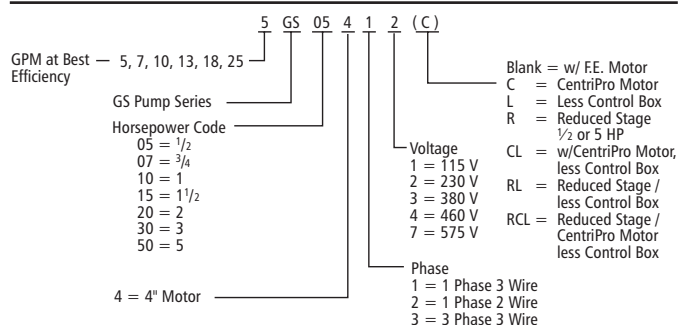
- **Powered for Continuous Operation:** All ratings are within the working limits of the motor as recommended by the motor manufacturer. Pump can be operated continuously without damage to the motor.
- **Field Serviceable:** Units have left hand threads and are field serviceable with common tools and readily available repair parts.
- **Sand Handling Design:** Our face clearance, floating impeller stack has proven itself for over 40 years as a superior sand handling, durable pump design.
- **FDA Compliant Non-Metallic Parts:** Impellers, diffusers and bearing spiders are constructed of glass filled engineered composites. They are corrosion resistant and non-toxic.
- **Discharge Head/Check Valve:** Cast 303 stainless steel for strength and durability. Two cast-in safety line loops for installer convenience. The built-in check valve is constructed of stainless steel and FDA compliant BUNA rubber for abrasion resistance and quiet operation.
- **Motor Adapter:** Cast 303 stainless steel for rigid, accurate alignment of pump and motor. Easy access to motor mounting nuts using standard open end wrench.
- **Stainless Steel Casing:** Polished stainless steel is strong and corrosion resistant.
- **Hex Shaft Design:** Six sided shafts for positive impeller drive.
- **Engineered Polymer Bearings:** The proprietary, engineered polymer bearing material is strong and resistant to abrasion and wear. The enclosed upper bearing is mounted in a durable Noryl® bearing spider for excellent abrasion resistance.

WATER END DATA

Series	Model	Required H.P.	Stages	Water End	
				Length (in)	Wt (lbs)
5GS	5GS05R	.5	9	12.9	8
	5GS05	.5	12	15.0	9
	5GS07	.75	15	17.0	11
	5GS10	1	20	21.7	13
	5GS15	1.5	26	25.8	15
	5GS20	2	33	31.6	19
7GS	7GS05R	.5	7	11.7	6
	7GS05	.5	10	13.8	7
	7GS07	.75	13	16.0	8
	7GS10	1	17	18.8	9
	7GS15	1.5	22	23.6	12
	7GS20	2	27	27.2	13
	7GS30	3	34	33.2	18
10GS	10GS05R	.5	5	10.1	6
	10GS05	.5	7	11.5	7
	10GS07	.75	10	13.6	8
	10GS10	1	12	15.0	9
	10GS15	1.5	17	18.4	12
	10GS20	2	20	21.7	13
	10GS30	3	27	27.5	18
	10GS50R	5	35	33.0	21
	10GS50	5	42	40.2	24
13GS	13GS05	.5	5	10.1	6
	13GS07	.75	7	11.5	7
	13GS10	1	10	13.6	8
	13GS15	1.5	12	15.0	9
	13GS20	2	17	18.4	12
	13GS30	3	21	22.3	15
18GS	18GS07	.75	6	11.8	7
	18GS10	1	8	13.5	8
	18GS15	1.5	11	16.1	10
	18GS20	2	14	18.6	11
	18GS30	3	19	24.1	15
	18GS50R	5	24	28.3	17
	18GS50	5	30	34.4	21
25GS	25GS10	1	7	13.4	8
	25GS15	1.5	9	15.3	9
	25GS20	2	11	17.2	10
	25GS30	3	15	20.9	14
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	25GS50	5	26	33.4	21

NOMENCLATURE

See price book for complete order numbers.



SPECIFICATIONS

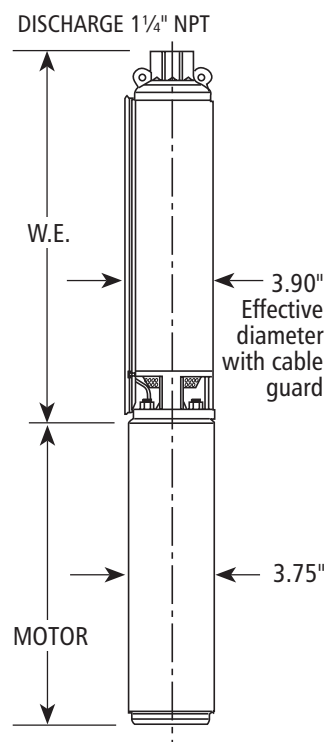
Model	Flow Range GPM	Horsepower Range	Best Efficiency GPM	Discharge Connection	Minimum Well Size	Rotation®
5GS	1.2 – 7.5	1/2 – 2	5	1 1/4	4"	CCW
7GS	1.5 – 10	1/2 – 3	7	1 1/4	4"	CCW
10GS	3 – 16	1/2 – 5	10	1 1/4	4"	CCW
13GS	4 – 20	1/2 – 3	13	1 1/4	4"	CCW
18GS	6 – 28	3/4 – 5	18	1 1/4	4"	CCW
25GS	8 – 33	1 – 5	25	1 1/4	4"	CCW

① Rotation is counterclockwise when observed from pump discharge end.

"GS" SERIES MATERIALS OF CONSTRUCTION

Part Name	Material
Discharge Head	AISI 303 SS
Check Valve Poppet	AISI 304 SS
Check Valve Seal	BUNA, FDA compliant
Check Valve Seat	AISI 304 SS
Check Valve Retaining Ring	AISI 302 SS
Bearing Spider – Upper	Noryl® GFN2
Bearing	Proprietary Engineered Polymer
Klipring	AISI 301 SS
Diffuser	Lexan®
Impeller	Noryl®
Bowl	AISI 304 SS
Intermediate Sleeve*	AISI 304 SS, Powder Metal
Intermediate Shaft Coupling*	AISI 304 SS, Powder Metal
Intermediate Bearing Spider*	Glass Filled Engineered Composite
Intermediate Bearing Spider*	AISI 303 SS
Shim	AISI 304 SS
Screws – Cable Guard	AISI 304 SS
Motor Adapter	AISI 303 SS
Casing	AISI 304 SS
Shaft	
Coupling	AISI 304 SS, Powder Metal
Cable Guard	AISI 304 SS
Suction Screen	AISI 304 SS

*See repair parts for where used.



CENTRIPRO 4" SINGLE-PHASE MOTORS

Order No.	Type	HP	Volts	Length in. (mm)	Weight lb. (kg.)
M05421	2-wire PSC	1/2	115	11.0 (279)	20 (9.1)
M05422		1/2		11.0 (279)	20 (9.1)
M07422		3/4	230	12.4 (314)	23 (10.4)
M10422		1		13.3 (337)	25 (11.3)
M15422		1.5		14.9 (378)	29 (13.2)
M05411	3-wire	1/2	115	10.0 (253)	19 (8.6)
M05412		1/2	230	9.7 (246)	18 (8.2)
M07412		3/4	230	10.8 (275)	22 (10)
M10412		1	230	11.7 (297)	23 (10.4)
M15412		1.5	230	13.6 (345)	28 (12.7)
M20412		2	230	15.1 (383)	31 (14.1)
M30412		3	230	18.3 (466)	40 (18.1)
M50412		5	230	27.7 (703)	70 (31.8)

NEMA MOTOR

- Corrosion resistant stainless steel construction.
- Built-in surge arrestor is provided on single phase motors through 5 HP.
- Stainless steel splined shaft.
- Hermetically sealed windings.
- Replaceable motor lead assembly.
- CSA certified.
- UL 778 recognized.
- NEMA mounting dimensions.
- Control box is required with 3 wire single phase units.
- Three phase units require a magnetic starter with three leg Class 10 overload protection.

CENTRIPRO 4" THREE-PHASE MOTORS

Order No. by Voltage			HP	Length In. (mm)	Weight Lb. (Kg.)
200V	230V	460V			
M05430	M05432	M05434	1/2	10.8 (275)	22 (9.7)
M07430	M07432	M07434	3/4	10.8 (275)	22 (9.7)
M10430	M10432	M10434	1	11.7 (297)	23 (10.4)
M15430	M15432	M15434	1.5	11.7 (297)	23 (10.4)
M20430	M20432	M20434	2	13.8 (351)	28 (12.7)
M30430	M30432	M30434	3	15.3 (389)	32 (14.5)
M50430	M50432	M50434	5	21.7 (550)	55 (24.9)
M75430	M75432	M75434	7.5	27.7 (703)	70 (1.8)

AGENCY LISTINGS

All factory assembled, complete pump/motor assemblies are UL778 and CSA listed. All pumps and motors comply with ANSI/NSF 61-1992. Motors are UL778 recognized.



Canadian Standards Association

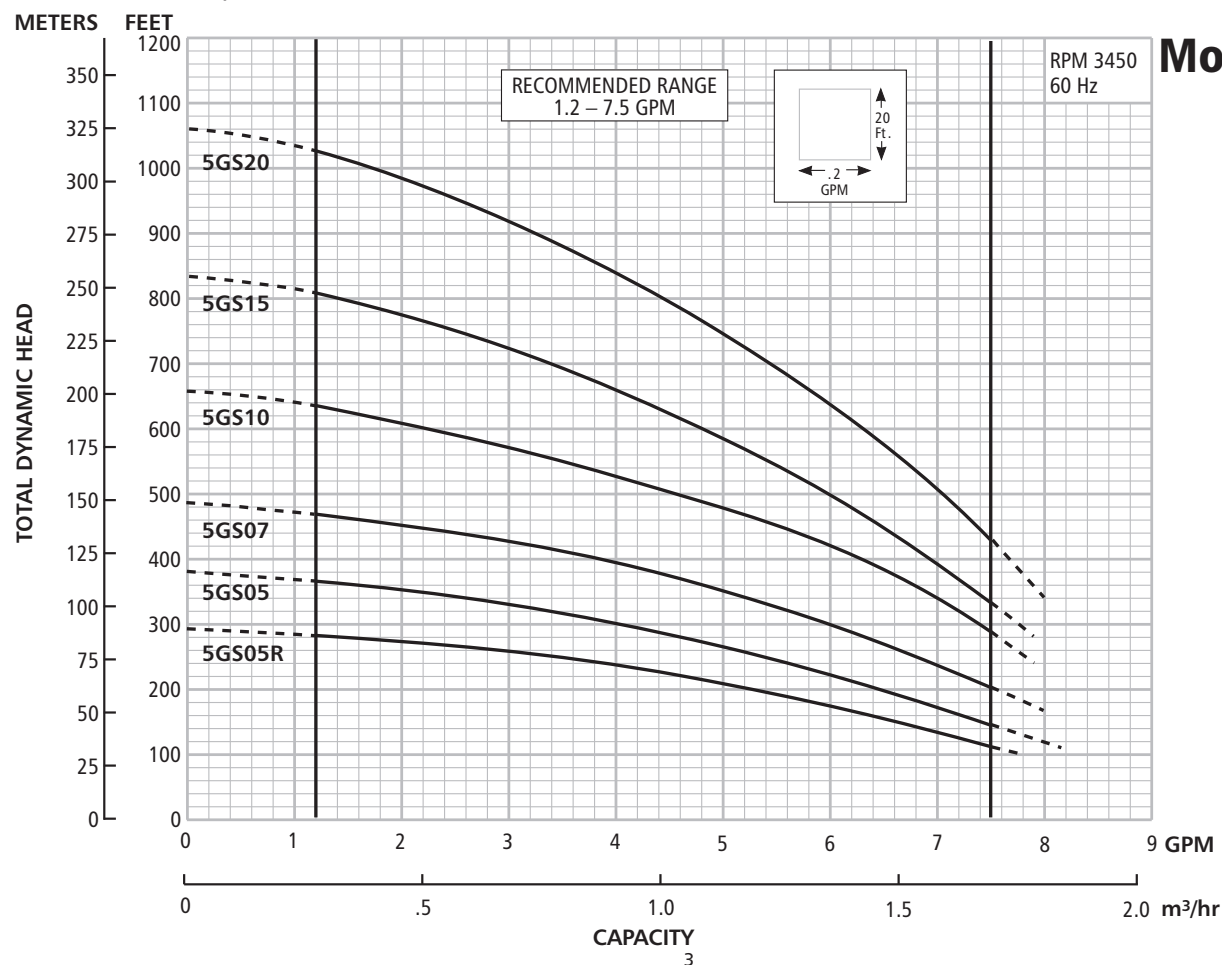


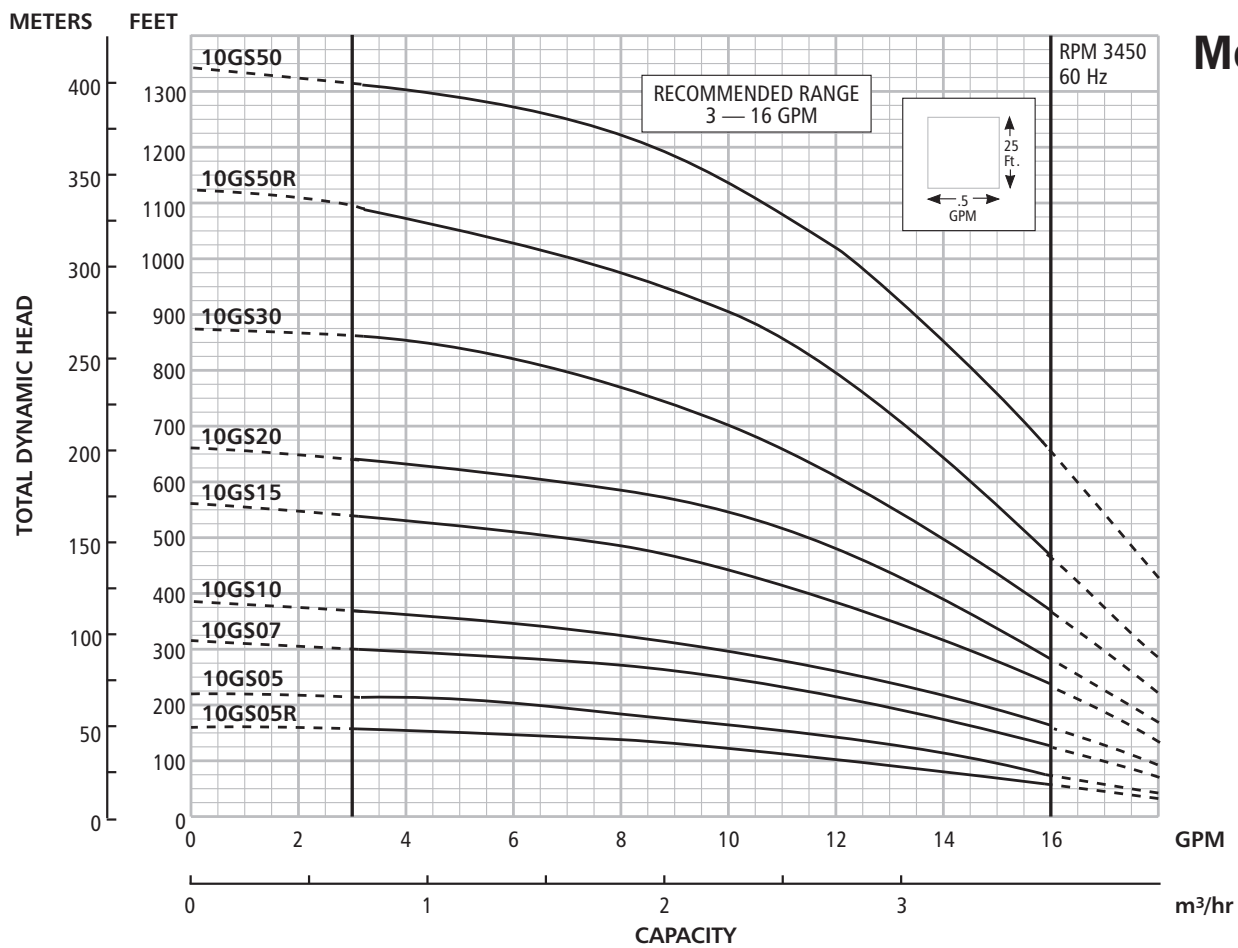
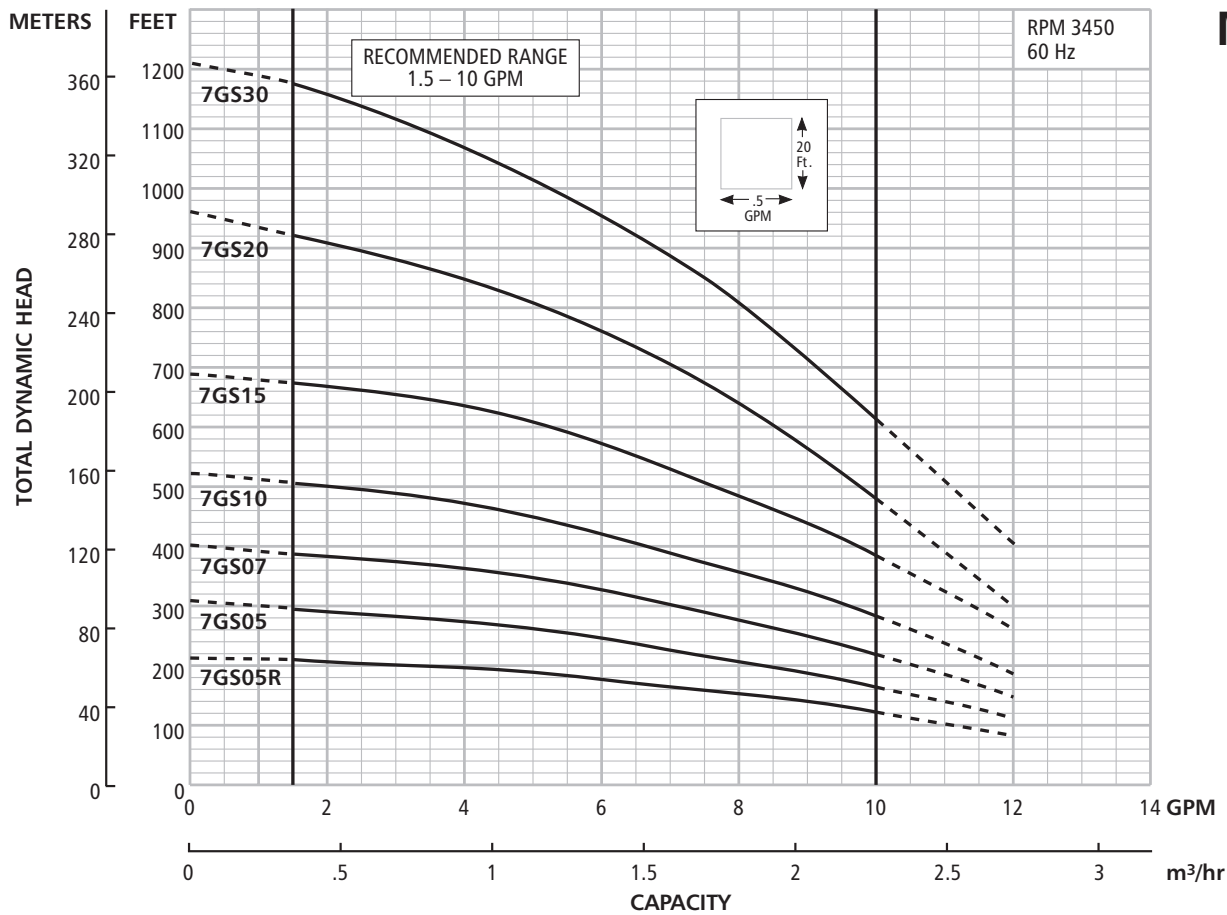
Underwriters Laboratories



ANSI/NSF 61 - Drinking Water System Components 4P49

Goulds Pumps is ISO 9001 Registered.





Model 5GS

SELECTION CHART

Horsepower Range ½ – 2, Recommended Range 1.2 – 7.5 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																																			
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	340	380	420	460	500	540	580	620	660	700	740	780	820	860	900	940	980	1020			
5GS05R	½	0						7.4	6.9	6.3	5.8	5.3	4.7	4.0	3.0	1.4																						
		20				7.3	6.7	6.2	5.6	5.1	4.5	3.8	2.6																									
		30			7.2	6.6	6.1	5.6	5.0	4.4	3.6	2.3																										
		40		7.1	6.6	6.0	5.5	4.9	4.3	3.4	2.1																											
		50	7.0	6.5	5.9	5.4	4.9	4.2	3.3	1.8																												
		60	6.4	5.8	5.3	4.8	4.1	3.1	1.6																													
Shut-off PSI			118	109	101	92	83	75	66	57	49	40	31	23	14	5																						
5GS05	½	0							7.7	7.3	6.9	6.4	6.0	5.6	5.1	4.7	4.1	2.6																				
		20					7.5	7.1	6.7	6.3	5.9	5.4	5.0	4.5	3.9	3.2	2.3																					
		30				7.5	7.1	6.7	6.2	5.8	5.4	4.9	4.4	3.8	3.1	2.1																						
		40			7.4	7.0	6.6	6.2	5.7	5.3	4.9	4.3	3.7	2.9	1.9																							
		50	7.7	7.4	6.9	6.5	6.1	5.7	5.2	4.8	4.2	3.6	2.8	1.8																								
		60	7.3	6.9	6.5	6.0	5.6	5.2	4.7	4.2	3.5	2.6	1.6																									
Shut-off PSI			156	147	138	130	121	112	104	95	86	78	69	60	52	43	34	17																				
5GS07	¾	0										7.6	7.3	7.0	6.6	6.3	5.9	5.2	4.4	3.3	1.6																	
		20								7.5	7.2	6.9	6.5	6.2	5.8	5.5	5.1	4.2	3.1	1.3																		
		30							7.5	7.2	6.8	6.5	6.1	5.8	5.4	5.0	4.6	3.6	2.1																			
		40					7.4	7.1	6.8	6.4	6.1	5.7	5.4	5.0	4.6	4.1	2.8																					
		50					7.4	7.1	6.7	6.4	6.0	5.7	5.3	4.9	4.5	4.0	3.4	1.8																				
		60				7.6	7.3	7.0	6.7	6.3	6.0	5.6	5.3	4.9	4.4	3.9	3.3	2.6																				
Shut-off PSI					184	175	167	158	149	141	132	123	115	106	97	89	80	63	45	28	11																	
5GS10	1	0														7.5	7.0	6.5	5.9	5.3	4.6	3.8	2.8	1.6														
		20												7.6	7.4	7.2	7.0	6.4	5.9	5.2	4.5	3.7	2.6															
		30											7.6	7.4	7.2	6.9	6.7	6.1	5.5	4.8	4.0	3.1	1.9															
		40										7.6	7.4	7.1	6.9	6.6	6.3	5.8	5.1	4.4	3.5	2.5																
		50									7.5	7.3	7.1	6.8	6.6	6.3	6.0	5.4	4.7	3.9	2.9	1.7																
		60							7.5	7.3	7.1	6.8	6.5	6.3	6.0	5.7	5.0	4.3	3.4	2.3																		
Shut-off PSI										214	206	197	188	180	171	162	154	136	119	102	84	67	50	32	15													
5GS15	1½	0															7.5	7.2	6.8	6.3	5.9	5.5	5.1	4.6	4.1	3.5	2.8	1.8										
		20														7.6	7.5	7.1	6.7	6.3	5.8	5.4	5.0	4.5	4.0	3.4	2.6	1.6										
		30													7.6	7.5	7.3	6.9	6.5	6.0	5.6	5.2	4.7	4.2	3.7	3.0	2.1											
		40												7.6	7.4	7.3	7.1	6.6	6.2	5.8	5.3	4.9	4.5	3.9	3.3	2.5	1.4											
		50											7.6	7.4	7.2	7.0	6.8	6.4	6.0	5.5	5.1	4.7	4.2	3.6	2.9	1.9												
		60										7.6	7.4	7.2	7.0	6.8	6.6	6.1	5.7	5.3	4.8	4.4	3.8	3.2	2.4													
Shut-off PSI												274	265	257	248	239	231	213	196	179	162	144	127	110	92	75	58	40	23									
5GS20	2	0																	7.4	7.1	6.8	6.4	6.1	5.7	5.4	5.0	4.7	4.3	3.9	3.3	2.7							
		20																	7.4	7.1	6.7	6.4	6.0	5.7	5.3	5.0	4.6	4.2	3.8	3.3	2.6	1.9						
		30																	7.5	7.2	6.9	6.5	6.2	5.8	5.5	5.1	4.8	4.4	4.0	3.5	2.9	2.2						
		40																	7.3	7.0	6.7	6.3	6.0	5.6	5.3	4.9	4.6	4.2	3.7	3.2	2.5	1.7						
		50																	7.5	7.2	6.8	6.5	6.1	5.8	5.4	5.1	4.7	4.3	3.9	3.4	2.8	2.1						
		60															7.6	7.3	7.0	6.6	6.3	5.9	5.6	5.2	4.9	4.5	4.1	3.6	3.1	2.4	1.6							
Shut-off PSI																	328	311	293	276	259	242	224	207	190	172	155	138	120	103	86	68	51					

Model 7GS

SELECTION CHART

Horsepower Range ½ – 1, Recommended Range 1.5 – 10 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																												
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	320	340	360	380	400	420	440	460	480	500	540	580	620	
7GS05R	½	0						10.2	8.9	7.5	5.9	3.6																			
		20				9.8	8.5	7.0	5.3	2.5																					
		30			9.6	8.3	6.8	4.9	1.9																						
		40		9.4	8.1	6.5	4.6	1.2																							
		50	9.2	7.8	6.3	4.2	0.5																								
		60	7.6	6.0	3.8																										
Shut-off PSI			85	77	68	59	51	42	33	25	16	7																			
7GS05	½	0								10.1	9.2	8.3	7.4	6.3	5.0	3.4															
		20						9.8	9.0	8.1	7.1	6.0	4.6	2.7																	
		30					9.7	8.8	7.9	6.9	5.8	4.3	2.4																		
		40			10.4	9.6	8.7	7.8	6.7	5.6	4.1	2.0																			
		50		10.3	9.4	8.5	7.6	6.6	5.4	3.8	1.7																				
		60	10.2	9.3	8.4	7.5	6.4	5.1	3.5																						
Shut-off PSI			125	116	107	99	90	81	73	64	55	47	38	29	21	12															
7GS07	¾	0											10.0	9.3	8.6	7.9	7.1	6.2	5.2	4.0	2.4										
		20								10.4	9.8	9.1	8.4	7.7	6.9	6.0	4.9	3.5	1.8												
		30							10.3	9.7	9.0	8.3	7.5	6.7	5.8	4.7	3.3	1.5													
		40						10.2	9.5	8.9	8.2	7.4	6.6	5.6	4.5	3.1															
		50					10.1	9.4	8.8	8.1	7.3	6.5	5.5	4.3	2.8																
		60				10.0	9.3	8.7	7.9	7.2	6.3	5.3	4.1	2.5																	
Shut-off PSI					140	131	122	114	105	96	88	79	70	62	53	44	36	27	18	10											
7GS10	1	0													10.1	9.6	9.0	8.5	7.9	7.3	6.7	6.0	5.3	4.4	3.4	2.1					
		20											10.4	9.9	9.4	8.9	8.3	7.7	7.1	6.5	5.8	5.0	4.1	3.0	1.6						
		30									10.3	9.9	9.3	8.8	8.2	7.6	7.0	6.4	5.7	4.9	4.0	2.8									
		40								10.3	9.8	9.2	8.7	8.1	7.5	6.9	6.3	5.6	4.8	3.8	2.6										
		50								10.2	9.7	9.2	8.6	8.0	7.4	6.8	6.2	5.4	4.6	3.7	2.4										
		60							10.1	9.6	9.1	8.5	7.9	7.3	6.7	6.0	5.3	4.5	3.5	2.2											
Shut-off PSI								166	158	149	140	132	123	114	106	97	88	80	71	62	54	45	36	28	19	10					

Horsepower Range 1½ – 3, Recommended Range 1.5 – 10 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																											
			200	220	240	260	280	300	340	380	420	460	500	540	580	620	660	700	740	780	820	860	900	940	980	1020	1060	1100	1140	
7GS15	1½	0								10.2	9.3	8.5	7.6	6.8	5.9	4.7	2.6													
		20							10.1	9.2	8.3	7.5	6.7	5.8	4.5	2.1														
		30						10.4	9.6	8.7	7.8	7.0	6.2	5.1	3.3															
		40					10.3	9.9	9.1	8.2	7.4	6.6	5.6	4.2	1.6															
		50				10.3	9.9	9.4	8.6	7.7	6.9	6.0	4.9	2.9																
		60			10.2	9.8	9.4	8.9	8.1	7.2	6.4	5.4	3.9																	
Shut-off PSI					194	186	177	168	151	134	116	99	82	64	47	30	12													
7GS20	2	0										9.8	9.3	8.7	8.4	7.8	7.1	6.3	5.4	4.5	3.5	2.2								
		20									9.8	9.3	8.7	8.4	7.7	6.9	6.2	5.3	4.3	3.2	2.8									
		30								9.9	9.5	9.0	8.5	7.9	7.2	6.4	5.7	4.4	3.7											
		40							10.0	9.7	9.2	8.7	8.3	7.5	6.7	6.0	5.2	4.1	3.0											
		50								9.9	9.4	8.9	8.5	7.8	7.2	6.3	5.5	4.7	3.5											
		60							10.0	9.6	9.1	8.7	8.2	7.4	6.6	5.8	5.0	4.0												
Shut-off PSI									268	251	234	216	199	182	165	147	130	113	95	80	61	43	26							
7GS30	3	0													9.8	9.5	9.2	8.7	8.3	7.9	7.4	6.8	6.2	5.4	4.7	3.9	3.0	2.0		
		20												9.8	9.4	9.2	8.7	8.3	7.8	7.2	6.7	6.2	5.3	4.5	3.7	3.3	1.7			
		30											10.0	9.6	9.2	8.8	8.5	8.0	7.5	6.9	6.3	5.7	4.8	4.1	3.2	2.3				
		40										10.0	9.7	9.4	9.0	8.6	8.2	7.7	7.2	6.6	5.9	5.2	4.4	3.6	2.7	1.7				
		50										9.9	9.5	9.2	8.7	8.4	7.9	7.4	6.8	6.3	5.5	4.8	3.9	3.1	2.2					
		60										10.0	9.7	9.3	9.0	8.6	8.1	7.6	7.0	6.5	5.8	5.1	4.2	3.4	2.5	1.5				
Shut-off PSI											320	303	286	268	251	234	216	199	182	165	147	130	113	95	78	61	43	27		

Model 10GS

SELECTION CHART

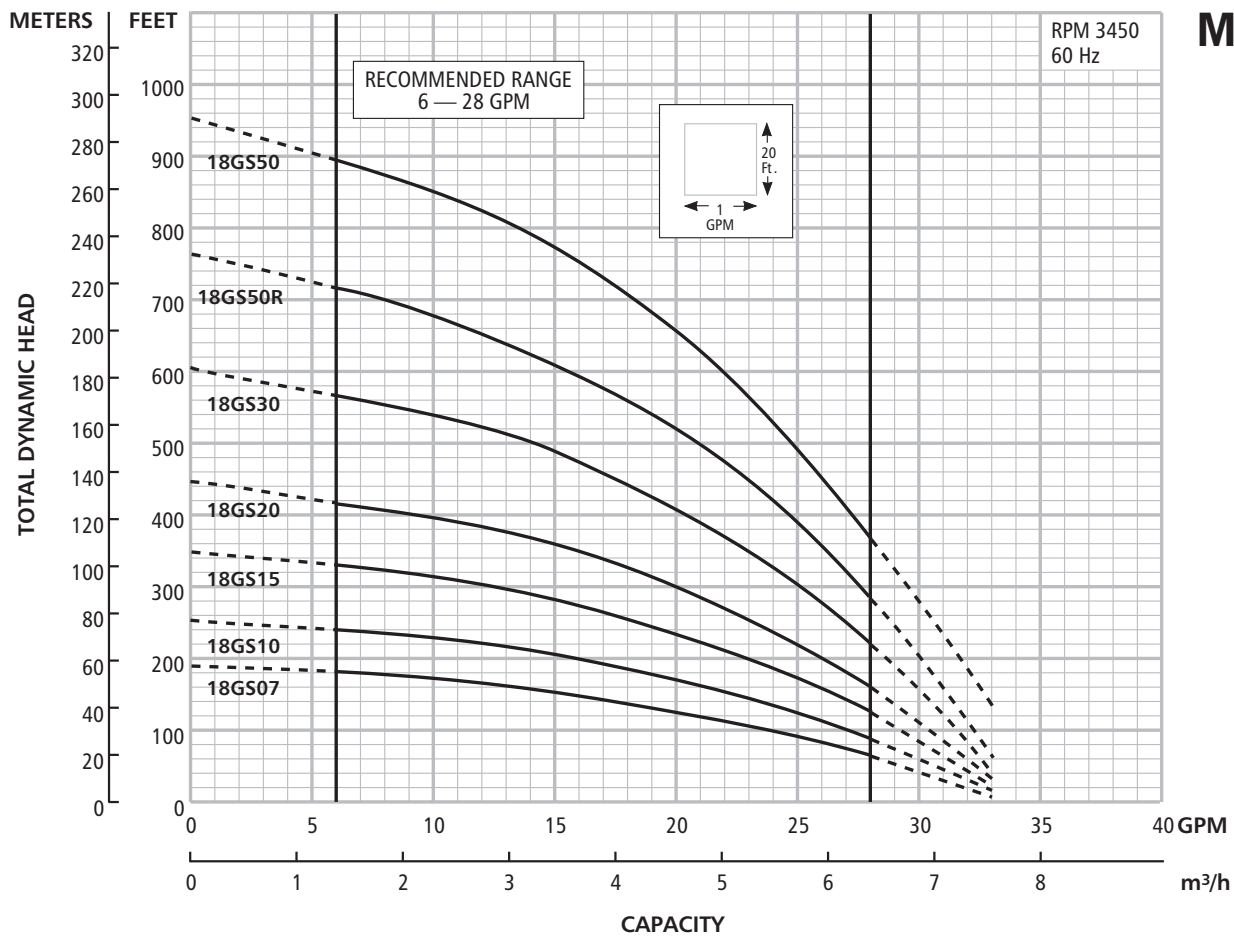
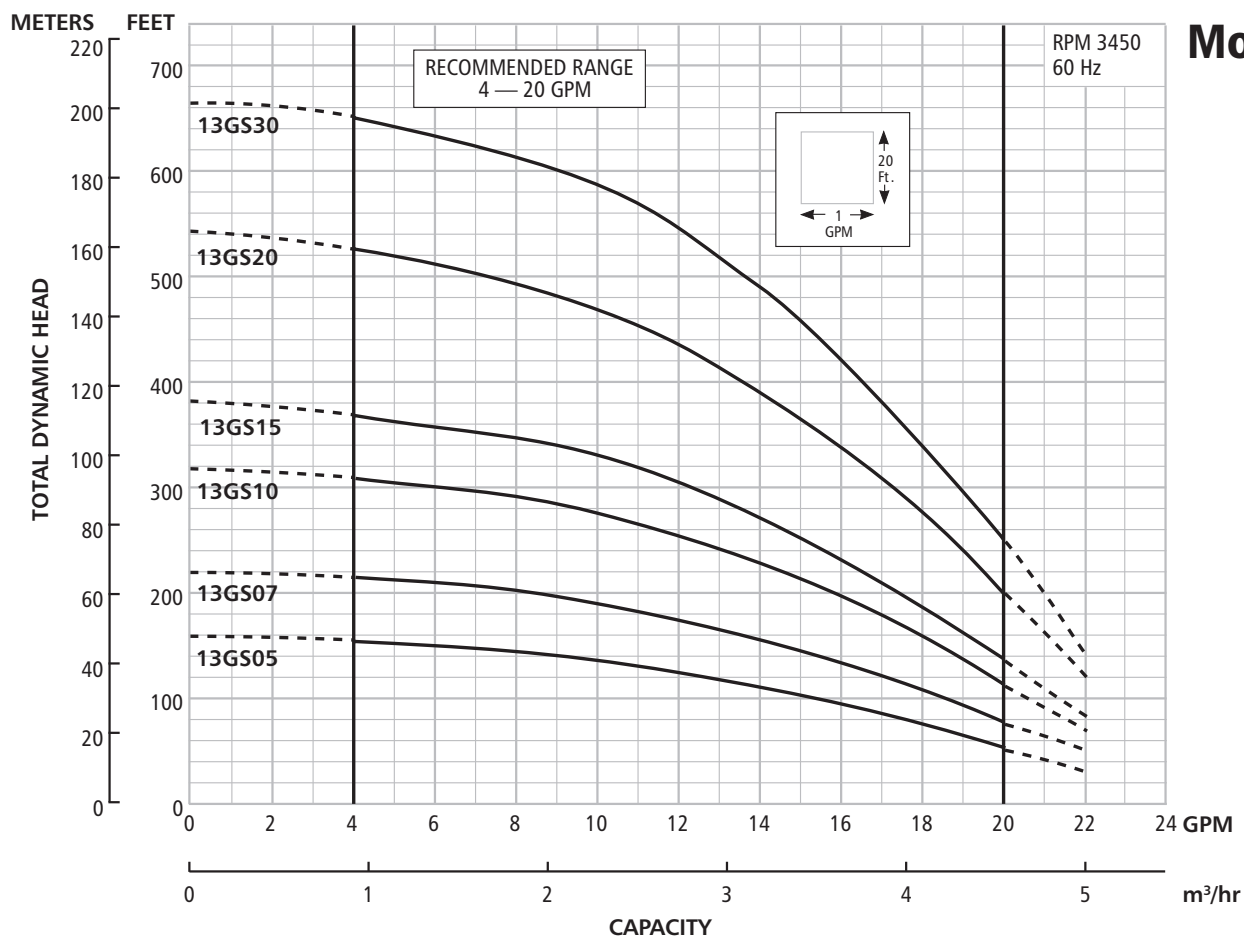
Horsepower Range ½ – 3, Recommended Range 3 – 16 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																											
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	340	380	420	460	500	540	580	620	660	700	740	780	820
10GS05R	½	0			15.6	14.0	12.4	10.4	6.5																					
		20	15.4	13.5	11.5	9.2	6.0																							
		30	13.0	11.1	8.0	4.0																								
		40	11.0	7.9	3.0																									
		50	7.0																											
		60																												
Shut-off PSI			61	53	44	34	26	18	10																					
10GS05	½	0				16.0	15.3	14.3	12.8	11.3	9.0	6.4																		
		20		15.9	14.9	13.8	12.5	10.8	8.3	4.8																				
		30	15.7	14.6	13.5	12.3	10.5	7.8	4.0																					
		40	14.5	13.4	12.0	10.3	7.5	3.0																						
		50	13.0	11.5	9.8	7.2																								
		60	11.3	9.0	6.4																									
Shut-off PSI			89	81	72	63	55	46	37	29	20	11																		
10GS07	¾	0					16.0	15.2	14.3	13.4	12.5	11.5	10.3	9.0	7.0	4.0														
		20				15.8	15.0	14.0	13.0	12.3	11.2	10.2	8.5	6.0																
		30			15.7	14.8	13.9	12.8	12.0	11.0	9.8	8.2	5.5																	
		40		15.6	14.7	13.8	12.7	11.9	10.8	9.7	8.1	5.2																		
		50	15.3	14.4	13.5	12.6	11.6	10.5	9.4	7.5	4.8																			
		60	14.3	13.4	12.5	11.5	10.3	9.0	7.0	4.0																				
Shut-off PSI			130	121	113	104	95	87	78	69	61	52	43	35	26	17	9													
10GS10	1	0							15.8	15.2	14.5	13.7	12.8	12.0	11.0	10.0	6.7													
		20						15.7	14.9	14.3	13.5	12.7	11.7	10.6	9.6	8.1	6.5													
		30				16.0	15.6	14.8	14.2	13.3	12.5	11.6	10.4	9.4	7.8	5.5	3.0													
		40			16.0	15.5	14.7	14.1	13.2	12.4	11.5	10.3	9.1	7.4	5.0	3.0														
		50			15.3	14.6	13.9	13.0	12.3	11.3	10.1	8.9	7.0	4.3																
		60	15.8	15.2	14.5	13.7	12.8	12.0	11.0	10.0	8.6	6.7	4.0																	
Shut-off PSI			158	150	141	132	124	115	106	98	89	81	72	63	55	46	37	20												
10GS15	1½	0											15.7	15.3	14.8	14.4	13.3	12.2	10.9	9.3	7.1	3.0								
		20									16.0	15.6	15.2	14.7	14.3	13.7	13.2	11.9	10.6	9.0	6.5									
		30							15.9	15.5	15.2	14.6	14.2	13.5	13.1	12.6	11.3	9.7	7.6	4.0										
		40						15.8	15.5	15.1	14.6	14.2	13.5	13.0	12.5	11.8	10.3	8.8	6.0											
		50					15.7	15.4	14.9	14.5	14.0	13.4	12.8	12.3	11.7	11.0	9.4	7.4	3.4											
		60				15.7	15.3	14.8	14.4	13.9	13.3	12.8	12.2	11.6	10.9	10.1	8.1	5.6												
Shut-off PSI						197	188	180	171	162	154	144	136	128	119	110	93	76	58	41	24	6								
10GS20	2	0												16.0	15.7	14.9	14.2	13.4	12.4	11.4	10.0	8.2	5.8							
		20												15.9	15.5	15.3	14.8	14.1	13.2	12.2	11.0	9.9	8.0	5.2						
		30										15.8	15.4	15.1	14.7	14.4	13.5	12.7	11.7	10.3	8.8	6.5								
		40								15.8	15.4	15.1	14.7	14.4	14.0	12.9	12.2	10.9	9.5	7.8	3.9									
		50						16.1	15.7	15.3	15.0	14.6	14.2	14.0	13.4	12.5	11.5	10.1	8.5	6.0										
		60					16.0	15.7	15.3	14.9	14.5	14.2	13.8	13.4	12.8	11.8	10.7	9.1	7.2	3.4										
Shut-off PSI							225	216	208	199	190	182	173	164	156	139	121	104	87	69	52	35	17							
10GS30	3	0															15.8	15.2	14.6	14.0	13.3	12.6	11.9	11.0	10.0	9.0	7.5	5.8		
		20															15.7	15.1	14.5	13.9	13.2	12.5	11.8	10.9	9.9	8.8	7.2	5.4		
		30																15.9	15.4	14.8	14.2	13.4	12.8	12.0	11.3	10.3	9.3	8.1	6.2	3.8
		40														15.9	15.6	15.0	14.4	13.8	13.1	12.4	11.5	10.8	9.7	8.6	7.1	4.7		
		50											16.0	15.8	15.6	15.3	14.7	14.1	13.3	12.7	11.9	11.0	10.2	9.1	7.8	6.0	3.0			
		60										16.0	15.8	15.5	15.2	14.8	14.3	13.7	12.9	12.3	11.4	10.6	9.6	8.3	6.8	4.5				
Shut-off PSI											284	275	267	258	249	232	215	197	180	163	145	128	111	94	76	59	42	24		

Horsepower Range 5, Recommended Range 3 – 16 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																		
			340	380	420	460	500	540	580	620	660	700	740	780	820	860	900	940	980	1020	1060
10GS50R	5	0					15.6	15.1	14.6	14.2	13.7	13.3	12.8	12.3	11.7	11.0	10.2	9.2	7.9	6.3	4.3
		20			16.0	15.5	15.0	14.6	14.1	13.6	13.2	12.7	12.2	11.6	10.9	10.1	9.0	7.6	6.0	3.9	
		30			15.7	15.3	14.8	14.3	13.8	13.4	12.9	12.4	11.9	11.2	10.4	9.5	8.2	6.7	4.9		
		40		16.0	15.5	15.0	14.5	14.0	13.6	13.1	12.6	12.1	11.5	10.8	9.9	8.8	7.4	5.7	3.6		
		50		15.7	15.2	14.7	14.2	13.8	13.3	12.9	12.4	11.8	11.1	10.3	9.3	8.0	6.5	4.5			
		60	15.9	15.4	14.9	14.4	14.0	13.5	13.0	12.6	12.0	11.4	10.7	9.7	8.6	7.2	5.4	3.2			
Shut-off PSI			341	324	306	289	272	255	237	220	203	185	168	151	133	116	99	81	64	47	29

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																						
			440	480	520	560	600	640	680	720	760	800	840	880	920	960	1000	1040	1080	1120	1160	1200	1240	1280	1320
10GS50	5	0						16	15.5	15.2	14.9	14.5	14	13.5	13	12.5	12	11.5	10.8	10.2	9.5	8.5	7	5.2	
		20					15.9	15.4	15.1	14.8	14.5	13.9	13.4	12.9	12.4	11.9	11.3	10.7	10.1	9.4	8.2	6.8	4.3		
		30				15.6	15.2	14.9	14.6	14.2	13.7	13.1	12.6	12.1	11.6	11.0	10.4	9.8	8.8	7.5	6.0	3.0			
		40			15.8	15.3	15.1	14.7	14.4	13.8	13.3	12.8	12.3	11.8	11.2	10.6	10.0	9.2	7.9	6.6	4.1				
		50			15.5	15.2	14.9	14.6	14.1	13.6	13.0	12.5	12.1	11.5	10.9	10.3	9.7	8.6	7.3	5.6					
		60		15.7	15.3	15.0	14.7	14.3	13.7	13.2	12.7	12.2	11.7	11.1	10.5	9.9	9.0	7.7	6.5	3.2					
Shut-off PSI				346	329	312	294	277	260	242	225	208	191	173	156	139	121	104	87	69	52	35	17		



Model 13GS

SELECTION CHART

Horsepower Range ½ – 3, Recommended Range 4 – 20 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																											
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	340	380	420	460	500	540	580	620	660	700	740	780	820
13GS05	½	0			19.0	17.5	15.3	12.5	8.2																					
		20	18.8	16.5	14.5	12.0	8.0																							
		30	16.0	13.4	11.0	4.1																								
		40	13.3	10.6	4.0																									
		50	9.8																											
		60																												
Shut-off PSI			60	52	43	35	26	17	9																					
13GS07	¾	0				19.7	18.5	17.0	15.0	13.2	11.5	8.5																		
		20		19.4	18.0	16.4	14.8	12.9	10.5	6.0																				
		30	18.9	17.5	16.0	14.6	12.5	10.0	5.0																					
		40	17.4	15.9	14.4	12.4	9.7	4.0																						
		50	15.4	13.8	12.0	9.5																								
		60	13.2	11.5	8.5																									
Shut-off PSI			86	78	69	61	52	43	35	26	17	8																		
13GS10	1	0						19.6	18.4	17.6	16.6	15.4	14.1	12.8	11.4	9.5	6.0													
		20			20.0	19.4	18.5	17.2	16.3	15.0	13.8	12.5	11.0	8.5	4.0															
		30		20.0	19.2	18.2	17.1	15.8	14.7	13.6	12.2	10.5	7.5																	
		40	19.9	19.0	18.0	17.0	15.7	14.6	13.5	12.0	10.1	7.3																		
		50	18.8	17.8	16.8	15.5	14.5	13.0	11.6	9.9	7.0																			
		60	17.6	16.6	15.4	14.1	12.8	11.4	9.5	6.0																				
Shut-off PSI			128	119	110	102	93	84	76	67	58	50	41	32	24	15	6													
13GS15	1½	0							19.7	18.9	18.2	17.3	16.3	15.2	14.2	13.2	12.1	8.7												
		20					19.5	18.4	17.9	17.0	16.0	15.1	14.1	12.9	11.8	10.2	8.8													
		30			20.2	19.4	18.6	17.6	16.8	15.8	14.9	14.0	12.6	11.5	9.9	7.9	4.0													
		40		20.0	19.3	18.5	17.5	16.6	15.7	14.8	13.9	12.5	11.4	9.5	7.3	4.0														
		50	20.0	19.1	18.3	17.4	16.4	15.5	14.5	13.6	12.3	11.0	9.2	6.3																
		60	18.9	18.2	17.3	16.3	15.2	14.2	13.3	12.1	11.0	8.7	5.6																	
Shut-off PSI			156	147	139	130	121	113	104	95	87	78	69	61	52	43	35	17												
13GS20	2	0										20.0	19.5	19.0	18.3	17.9	17.2	15.8	14.4	12.6	10.5	7.7								
		20								19.8	19.4	18.8	18.2	17.6	17.0	16.3	15.6	14.1	12.4	10.2	6.8									
		30							19.7	19.3	18.7	18.2	17.4	16.8	16.2	15.5	14.8	13.1	11.1	8.8										
		40						19.6	19.2	18.6	18.1	17.3	16.7	16.1	15.4	14.7	13.8	12.0	9.8	6.0										
		50				20.1	19.5	19.1	18.4	18.0	17.2	16.6	16.0	15.2	14.6	13.7	12.9	10.8	8.5											
		60			20.0	19.5	19.0	18.3	17.9	17.2	16.5	15.8	15.1	14.4	13.6	12.6	11.5	9.2	5.0											
Shut-off PSI					206	198	189	180	172	163	155	146	137	129	120	111	103	85	68	51	33	16								
13GS30	3	0													19.8	19.4	18.9	18.0	17.1	16.0	14.6	13.5	11.9	10.0	7.3					
		20												19.6	19.2	18.9	18.3	17.9	17.0	15.9	14.7	13.3	11.8	9.7	6.9					
		30										20.0	19.5	19.1	18.8	18.2	17.8	17.4	16.4	15.2	13.9	12.3	10.5	8.3	4.0					
		40									20.0	19.4	19.1	18.7	18.2	17.8	17.3	16.8	15.6	14.5	13.0	11.4	9.5	6.0						
		50								19.9	19.5	19.0	18.6	18.1	17.7	17.2	16.7	16.1	14.9	13.7	12.0	10.1	7.9							
		60						19.8	19.4	18.9	18.5	18.0	17.5	17.1	16.6	16.0	15.4	14.2	12.9	11.0	9.0	5.0								
Shut-off PSI								235	226	217	209	200	191	183	174	165	157	139	122	104	87	70	53	35	18					

Model 18GS

SELECTION CHART

Horsepower Range $\frac{3}{4}$ – 5, Recommended Range 6 – 28 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																												
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	340	380	420	460	500	540	580	620	660	700	740	780	820	860
18GS07	¾	0			28.2	26.5	24.0	21.0	17.9	13.5																					
		20	27.7	25.9	23.0	20.0	16.5	10.8																							
		30	25.0	22.0	18.8	15.7	9.5																								
		40	22.2	18.9	15.1	9.0																									
		50	18.4	15.0	7.5																										
		60	13.5	5.0																											
Shut-off PSI			74	66	58	49	40	32	23	14																					
18GS10	1	0					27.0	25.5	23.6	21.2	18.8	15.9	12.0																		
		20		28.0	26.6	25.1	22.7	20.0	17.6	14.0	10.0																				
		30	27.9	26.1	24.3	22.2	19.8	17.1	13.8	8.3																					
		40	26.0	24.1	22.0	19.7	17.0	13.1	8.0																						
		50	24.0	22.0	19.1	16.5	13.0	7.1																							
		60	21.0	18.6	15.8	12.0																									
Shut-off PSI			103	94	86	77	68	60	51	42	34	25	16																		
18GS15	1½	0						28.4	27.2	26.0	24.8	23.0	21.4	19.6	17.5	15.0	12.1														
		20					27.8	26.8	25.4	24.0	22.2	20.6	18.8	16.7	14.0	10.0															
		30				27.7	26.5	25.3	23.8	22.0	20.2	18.5	16.1	13.5	10.0																
		40		27.5	26.3	25.0	23.6	22.0	20.1	18.1	16.0	13.1	9.5																		
		50	27.6	26.4	25.0	23.4	21.8	20.0	18.0	15.5	13.0	9.2																			
		60	26.0	24.6	23.0	21.2	19.5	17.5	15.0	12.0	7.9																				
Shut-off PSI			143	134	126	117	108	100	91	82	74	65	56	48	39	30	22														
18GS20	2	0								28.0	27.1	26.2	25.1	24.0	22.9	21.4	20.0	16.8	12.8												
		20							27.8	26.8	25.8	24.6	23.7	22.6	21.0	19.5	18.0	16.0	11.6												
		30						27.5	26.5	25.5	24.5	23.3	22.1	20.6	19.0	17.5	15.8	13.6	6.5												
		40				28.5	27.4	26.4	25.4	24.4	23.2	22.0	20.5	18.9	17.4	15.7	13.5	11.0													
		50			28.0	27.2	26.2	25.3	24.3	23.0	21.8	20.3	18.7	17.0	15.3	13.1	10.5	6.0													
		60	28.0	27.1	26.2	25.1	24.0	22.9	21.4	20.0	18.3	16.8	14.8	12.8	9.5																
Shut-off PSI			183	174	165	157	148	139	131	122	113	105	96	87	79	70	61	44	27												
18GS30	3	0											28.0	27.4	26.7	26.0	25.0	23.5	21.5	19.2	16.9	14.2	10.5								
		20										27.7	27.0	26.3	25.8	24.9	24.0	23.0	21.0	18.9	16.5	13.5	9.0								
		30									27.6	26.9	26.2	25.5	24.8	23.9	22.9	21.9	19.8	17.5	14.9	11.2									
		40								27.5	26.9	26.2	25.4	24.6	23.8	22.8	21.8	20.9	18.5	16.0	13.3	8.0									
		50							27.4	26.8	26.0	25.2	24.5	23.6	22.6	21.7	20.6	19.5	17.3	14.5	11.0										
		60				28.0	27.4	26.7	26.0	25.0	24.3	23.5	22.5	21.5	20.5	19.2	18.0	15.7	12.8	7.0											
Shut-off PSI						225	216	208	199	190	182	173	164	156	147	139	130	113	95	78	61	43	26								
18GS50R	5	0															27.7	26.6	25.4	24.0	22.5	20.8	19.0	16.9	14.5	11.7	8.1				
		20														27.6	27.0	26.4	25.2	23.8	22.2	20.5	18.7	16.6	14.1	11.2	7.4				
		30												28.0	27.5	26.9	26.3	25.7	24.4	22.9	21.3	19.5	17.5	15.2	12.5	9.1					
		40											27.9	27.4	26.8	26.2	25.6	25.0	23.5	22.0	20.3	18.4	16.2	13.7	10.6	6.7					
		50										27.9	27.3	26.7	26.1	25.5	24.8	24.1	22.7	21.0	19.2	17.2	14.8	12.0	8.5						
		60								27.8	27.2	26.7	26.1	25.4	24.7	24.0	23.3	21.7	20.0	18.1	15.9	13.3	10.1	6.0							
Shut-off PSI										261	252	244	235	226	218	209	200	183	166	148	131	114	96	79	62	44	27				
18GS50	5	0																	27.9	26.8	25.8	24.8	23.7	22.6	21.2	19.9	18.4	16.8	14.8	12.4	9.7
		20																	27.5	26.6	25.6	24.5	23.3	22.2	21.0	19.8	18.0	16.2	14.3	12.0	8.8
		30																28.0	26.9	26.0	25.0	23.9	22.9	21.6	20.3	18.6	17.0	15.0	13.0	10.2	6.2
		40															28.0	27.4	26.3	25.3	24.4	23.2	22.1	20.1	19.4	17.9	16.0	14.0	11.6	8.0	
		50														27.9	27.3	26.8	25.9	24.9	23.8	22.7	21.3	20.1	18.5	16.9	14.9	12.8	10.0	6.0	
		60												27.9	27.2	26.8	26.2	25.2	24.1	23.0	21.9	20.7	19.2	17.5	15.8	13.6	11.0	7.8			
Shut-off PSI														307	298	290	281	264	246	229	212	195	177	160	143	125	108	91	73	56	39

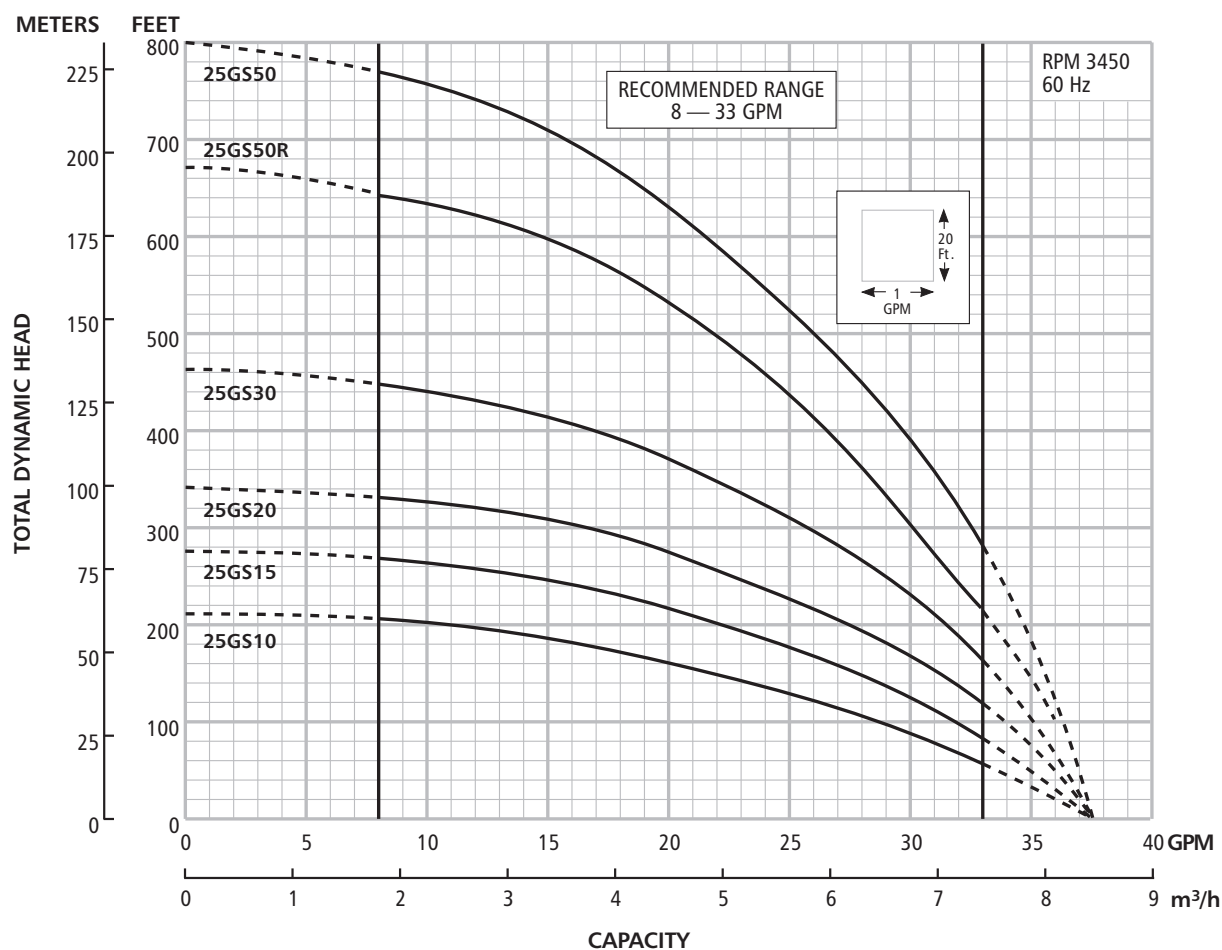
Model 25GS

SELECTION CHART

Horsepower Range 1 – 5, Recommended Range 8 – 33 GPM, 60 Hz, 3450 RPM

Pump Model	HP	PSI	Depth to Water in Feet/Ratings in GPM (Gallons per Minute)																											
			20	40	60	80	100	120	140	160	180	200	220	240	260	280	300	340	380	420	460	500	540	580	620	660	700	740		
25GS10	1	0			32.8	30.8	28.6	26.2	23.5	20.0	16.2	11.0																		
		20	31.8	30.0	27.5	25.2	22.0	19.0	15.0	8.0																				
		30	29.6	27.2	25.0	21.6	18.0	14.0																						
		40	27.1	24.9	21.5	17.9	13.9																							
		50	24.3	21.0	17.5	13.0																								
		60	20.0	16.2	11.0																									
Shut-off PSI			82	74	65	56	48	39	30	22	13	4																		
25GS15	1½	0				33.0	31.8	30.3	28.8	26.9	24.8	22.0	19.8	16.5	11.0															
		20		32.6	31.2	29.6	28.0	26.0	23.8	21.0	18.1	14.8	8.0																	
		30	32.5	31.0	29.5	27.6	25.6	23.2	20.9	17.9	14.0																			
		40	30.9	29.4	27.5	25.5	23.1	20.8	17.7	13.6																				
		50	29.0	27.2	25.1	22.9	20.4	17.2	13.0																					
		60	26.9	24.8	22.0	19.8	16.5	11.0																						
Shut-off PSI			111	103	94	85	77	68	59	51	42	33	25	16	7															
25GS20	2	0						33.0	31.8	30.4	29.0	27.4	25.7	22.6	21.5	19.3	15.4													
		20				32.7	31.3	30.0	28.6	26.8	25.0	22.9	20.9	18.3	14.3	9.0														
		30			32.3	31.0	29.6	28.5	26.4	24.5	22.6	20.5	18.0	14.0	8.0															
		40			30.9	29.5	28.2	26.3	24.3	22.4	20.4	17.8	13.6	8.0																
		50		30.5	29.4	28.0	26.0	24.1	22.1	20.0	17.2	13.2																		
		60	30.4	29.0	27.4	25.7	22.6	21.5	19.3	15.4	12.2																			
Shut-off PSI			139	130	121	113	104	95	87	78	69	61	52	43	35	26	17													
25GS30	3	0								33.0	32.2	31.5	30.5	29.6	28.3	27.1	25.8	22.6	19.0	14.0										
		20						32.8	32.0	31.0	30.0	29.0	27.9	26.6	25.0	23.8	21.9	20.0	12.6											
		30					32.6	31.8	30.9	30.0	28.8	27.6	26.5	24.9	23.4	21.6	19.9	15.2	8.0											
		40				32.5	31.7	30.9	29.9	28.8	27.5	26.2	24.7	23.3	21.5	19.9	17.8	11.9												
		50			32.3	31.6	30.8	29.8	28.5	27.3	26.0	24.5	23.0	21.2	19.5	17.4	11.5													
		60	33.0	32.2	31.5	30.5	29.6	28.3	27.1	25.8	24.1	22.6	20.9	19.0	16.9	14.0	10.0													
Shut-off PSI			191	183	174	165	157	148	139	131	122	113	105	96	87	79	70	53	35	18										
25GS50R	5	0											32.7	32.2	31.7	31.2	30.5	29.1	27.3	25.3	23.3	21.4	19.3	16.5	11.7					
		20								33.0	32.5	32.1	31.5	31.0	30.3	29.6	28.8	27.0	25.0	23.0	21.1	18.9	15.9	10.6						
		30							32.9	32.5	32.0	31.5	30.9	30.2	29.5	28.7	27.8	25.9	23.9	21.9	19.9	17.4	13.3							
		40						32.9	32.4	31.9	31.4	30.8	30.1	29.4	28.5	27.6	26.7	24.7	22.7	20.8	18.6	15.3								
		50					32.8	32.3	31.8	31.3	30.7	30.0	29.2	28.4	27.5	26.5	25.6	23.6	21.6	19.6	16.9									
		60				32.7	32.2	31.7	31.2	30.6	29.9	29.1	28.3	27.4	26.4	25.4	24.4	22.4	20.4	18.2	14.6									
Shut-off PSI						252	243	234	226	217	208	200	191	182	174	165	156	139	122	104	87	70	52	35	18					
25GS50	5	0													33.0	32.5	31.5	30.2	29.0	27.6	26.0	24.2	22.4	20.5	18.3	15.8	12.0			
		20												32.9	32.3	31.8	31.3	30.0	28.8	27.2	25.8	23.9	22.0	20.0	17.8	15.0	11.0			
		30												32.8	32.2	31.8	31.2	30.5	29.3	27.9	26.4	24.8	22.9	21.0	18.9	16.2	13.0	8.0		
		40											32.7	32.1	31.7	31.1	30.4	29.9	28.5	27.1	25.4	23.7	21.9	19.9	17.5	14.5	10.5			
		50										32.6	32.1	31.6	31.0	30.3	29.9	29.2	27.8	26.3	24.5	22.6	21.8	18.7	16.0	12.7				
		60							33.0	32.5	32.0	31.5	30.8	30.2	29.8	29.0	28.3	26.9	25.1	23.3	21.5	19.5	17.0	14.0	9.5					
Shut-off PSI									286	277	268	260	251	242	234	225	216	199	182	165	147	130	113	95	78	61	43	26		

Model 25GS

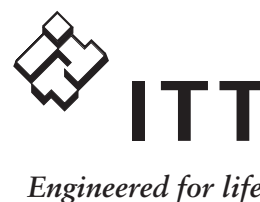


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APPENDIX D-2 LEVEL CONTROL

- GE Druck PTX 1280 Series Transducer

Features

- All-welded titanium construction backed by five-year corrosion warranty
- Accuracy:
 - 1880: $< \pm 0.1\%$ full scale (FS) best fit straight line (BSL)
 - 1280: $< \pm 0.25\%$ FS BSL
- Ideally suited for underground fuel tanks
- FM, CSA intrinsically safe, CE marked
- Fluoropolymer™ cable

The PTX/PDCR 1280/1880 Series submersible/depth pressure transducers are specifically designed for depth/level measurements in the groundwater, well water, canals, rivers and other similar applications. The all-titanium construction ensures excellent life in the most hostile environments, including corrosive and hazardous chemical applications. GE backs its titanium construction

with a five year corrosion warranty. standard vented cable is fluoropolymer. Polyurethane cable is available on the Series 1230 or 1830.

The PTX/PDCR 1280/1880 Series sensors are ideal for use in applications where smaller size is an advantage, such as municipal water supply wells, leachate wells, irrigation projects, etc. The titanium construction also makes the devices suitable for seawater and chemical tank measurement applications.

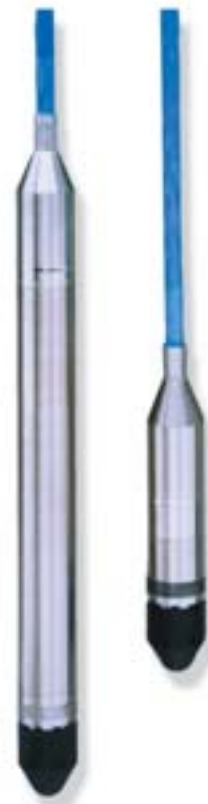
An advanced micromachined silicon piezoresistive pressure sensor provides excellent performance and resistance to shock and vibration. A tough, fluoropolymer cable is attached to the transducer body, providing a high integrity, waterproof assembly. The cable is strengthened with Kevlar® so that there is no measurable elongation when the cable is lowered into deep wells.

The fully isolated, all titanium design ensures long term reliable measurements in water and wastewater management, industrial, process and marine applications.

PTX/PDCR 1280/ 1880 Series

Druck Submersible Depth/Level Pressure Transmitters/Transducers

PTX/PDCR 1280/1880 is a Druck product. Druck has joined other GE high-technology sensing businesses under a new name—GE Industrial, Sensing.



PTX/PDCR 1280/1880 Specifications

General

Standard Operating Ranges

- 1, 2.5 psi (0.75, 1.5 mH₂O) gauge
- 5, 10, 15, 20, 30, 50, 75, 100, 150, 200, 300, 500, 900 psi (3.5, 7, 10, 15, 20, 35, 50, 70, 100, 150, 200, 350, 600 mH₂O) gauge or absolute

Other ranges and pressure units may be specified.

Overpressure

- 10X for range 1 psig (0.75 mH₂O)
- 8X for 2.5 psi (1.5 mH₂O)
- 6X for 5 psi (1.5 to 3.5mH₂O)
- 4X for ranges above 5 psi (3.5 mH₂O)
- 2000 psi (1400 mH₂O) maximum

Pressure Media

Fluids compatible with titanium and Fluoropolymer

Transduction Principal

Piezoresistive micromachined silicon strain gauge

Combined Error (Non-Linearity, Hysteresis and Repeatability)

Series 1880

±0.1% FS BSL; ±0.06% FS BSL available (consult factory)

Series 1280

±0.25% FS BSL

Temperature Effects Over Compensated Range of 30°F to 86°F (-1°C to 30°C)

Series 1880

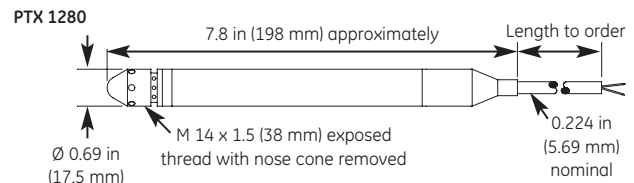
±0.3% FS TEB; ±0.6% for ranges below 5 psi (3.5 mH₂O)

Series 1280

±1% FS TEB; ±2% FS for ranges below 5 psi (3.5 mH₂O)

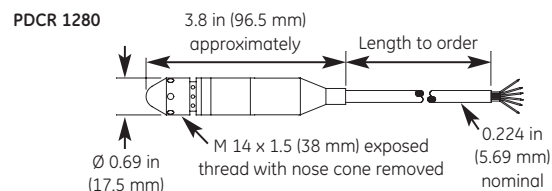
Resolution

Infinite



Electrical Connection

Vented polyurethane cable
 Red-Positive supply
 White-Negative supply
 Yellow-Positive output
 Blue-Negative output
 Shield-connected to case
Any other conductors not connected.
Optional monitor leads: Orange and Black.



Electrical Connection

Vented polyurethane cable
 Red-Positive supply
 Black-Negative supply
 Shield-connected to case
Any other conductors not connected.

Installation Drawings

Insulation Resistance

100 MΩ @ 50 VDC

Relative Humidity

0 to 100%

Compensated Temperature Range

30 to 86°F (-2°C to 30°C)

Operating Temperature Range

-5°F to 140°F (-20°C to 60°C)

Electrical Characteristics

Output

PDCR 1880/1280 Series

- 2.5 mV/V for range 1 psi (0.75 mH₂O)
- 5 mV/V for range 2.5 psi (1.5 and 3.5 mH₂O)
- 10 mV/V for ranges 10 psi and above (7 mH₂O)

PTX 1880/1280 Series

Two-wire, 4 to 20 mA

Output is ratiometric to power supply (2.5 VDC minimum)

PTX/PDCR 1280/1880 Specifications

Mechanical Characteristics

Sensor Body
Titanium

Measurement Diaphragm
Titanium

Pressure Connection
Open face with protective titanium and fluoreopolymer

Electrical Connection
Vented fluoreopolymer cable (specify length)

Diameter
0.69 inches (17.5 mm)

Weight
5 oz (142 g) nominally (excluding cable)

Compatible Fluids
Any fluid compatible with titanium and fluoreopolymer

Safety

- FM, CSA Intrinsically safe
- Class I, Division 1, Groups A,B,C,&D
- EMC Emissions EN50081-1
- EMC Immunity EN50082-2
- Certification CE marked

Ingress Protection
Type 6/IP68

Options

- Sink-weight (P/N: DA2608-1-01)
- Monitor leads (PDCR version only)
- FM, CSA or ATEX intrinsically safe certification
- ABS certification
- Threaded pressure port (welded)
 - 1/4 in NPT male
 - 1/8 in NPT male
 - 7/16 UNF male
 - G 1/4 male
 - G 1/8 male

Accessories

- STE 110 terminal enclosure with desiccant and waterproof vent
- SCU 220 terminal enclosure with desiccant and waterproof vent with 4-20mA signal conditioning (for all millivolt sensors)
- Cable clamp (P/N: 192-373-01)
- Two-wire lightning arrestor (P/N TAS 140-1);
Four-wire lightning arrestor (P/N: TAS 140-4)
- Descaling kit (P/N: DA2906-1-01)
- DPI 280 digital indicator
- DPI 610 portable field calibrator (specify range)

Ordering Information

Please State the Following:

- (1) Type number
- (2) Pressure range
- (3) Cable length
- (4) Options required

For non-standard requirements please specify in detail.

Shipping, Storage and Handling

Each transmitter is purged with clean dry nitrogen and shipped with desiccant to prevent moisture ingress during transit.

GE
Sensing



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920-119B

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APPENDIX D-3

PRESSURE INDICATORS

- NOSHOCK 300 Series

NOSHOK Installation & Maintenance Guide

Pressure Gauge Series 100, 200, 300, 400, 500, 600, 700, 800 and 900

Installation

Prior to pressure gauge installation, the following conditions should be considered: temperature, humidity, vibration, pulsation, shock, and other climatic and environmental conditions of the application, as well as the potential need for protective accessories and/or special installation requirements.

Always use a wrench on the gauge socket when installing a NOSHOK pressure gauge into position; never use force on the gauge case to tighten into position. This may result in a loss of accuracy, excessive friction and/or mechanical damage to the measuring element and case of the NOSHOK pressure gauge. When surface or panel mounting a gauge, be sure the surface is flat and the panel cutout and/or the mounting hole configuration is correct (please refer to the NOSHOK Pressure Gauge catalog NK95G for these specifications). If the surface is uneven or the panel cutout is larger than the gauge diameter, use an adapter ring to remove mounting strain and/or adapt the gauge to the larger diameter panel cutout. When connecting a gauge to a rigid pipe service, use flexible tubing where possible as a connector to eliminate plumbing strain. Rapid pressure pulsation and extreme mechanical vibration may be damaging to some NOSHOK pressure gauge movement gearing, bushings, and linkage. In extreme cases, steps should be taken to dampen these forces. In pressure ranges over 600 psi, a NOSHOK orifice is recommended for pulsation dampening, but in extreme pulsation applications a NOSHOK Piston Type Pressure Shubber may be required.

When installing a gauge into a corrosive situation be sure to select a pressure gauge or pressure gauge and diaphragm seal combination suitable for your application. Gauges to be used on high temperature service should have a five foot or longer leg of pipe or tubing connecting the gauge to dissipate heat and protect the gauge measuring element from damage. A gauge to be used on steam pressure service should be installed with a water

filled NOSHOK pigtail steam syphon between the gauge and the steam line.

Maintenance

Apart from occasional calibration, NOSHOK pressure gauges require little or no maintenance. Some applications may be more aggressive than others, resulting in an increased frequency in the need for calibration. The environmental limitations for the specific NOSHOK pressure gauge series should be observed in all cases, and gauges applied in situations outside these requirements may result in premature wear and/or failure of the gauge.

Warranty

All NOSHOK pressure gauges carry a one or three year warranty. NOSHOK warrants for three years our 300, 500, 600, and 700 series liquid filled pressure gauges to be free from defects in materials and workmanship, to remain within the cataloged accuracy and performance specifications, and to maintain the integrity of the hermetically sealed case preventing leakage. NOSHOK warrants for one year our 100, 200, 400, 600, 700, 800, and 900 series non-liquid filled pressure gauge. Certain limitations do apply; for more information please consult page three of the NOSHOK Pressure Gauges catalog (NK95G).

Please do not hesitate to contact us with any additional questions.

*The
Instrumentation
Company*



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CAUTION:

Operating conditions including, but not limited to, system pressure, media compatibility and ambient conditions must be considered when selecting gauges and accessories. Improper selections and use of gauges could possibly cause gauge failure and lead to possible property damage or person injury. Refer to American National Standard ANSI B40.1 for the correct selection and use of gauges. A copy of this standard may be obtained from the American Society of Mechanical Engineers, United Engineering Center, 345 East 47th Street, New York, NY 10017.

WARNING:

Glycerine or silicone could result in a spontaneous chemical reaction or explosion when combined with strong oxidizing agents including (but not limited to) chlorine, hydrochloric or nitric acid and hydrogen peroxide. Do not use glycerine or silicone filled gauges or accessories in these types of service. Consult factory for application assistance.

In keeping with and for the purposes of product and/or manufacturing improvements, NOSHOK, INC. reserves the right to make design changes without prior notice.

	SERIES	SPECIFICATIONS
Pressure ranges	400/500 Series (all)	Vacuum and compound ranges through 0 psi to 100,000 psi
Accuracy	15-401, 15-411	± 2.5% full scale
	25-400, 25-410, 25-406, 25-500, 25-506, 25-510	± 1.6% full scale
	40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	± 1% full scale
Temperature ranges*	15-401, 15-411, 25-400, 25-406, 25-410	Media -40 °F to 212 °F (-40 °C to 100 °C) Ambient -40 °F to 140 °F (-40 °C to 60 °C)
	40-400, 40-410, 60-400, 60-410	Media -40 °F to 392 °F (-40 °C to 200 °C) Ambient -40 °F to 140 °F (-40 °C to 60 °C)
	500 Series (all)	Media -4 °F to 212 °F (-20 °C to 100 °C) Glycerine fill -40 °F to 212 °F (-40 °C to 100 °C) Special fill Ambient -4 °F to 140 °F (-20 °C to 60 °C) Glycerine fill -40 °F to 140 °F (-40 °C to 60 °C) Special fill
Measuring element	15-401, 15-411, 25-400, 25-406, 25-410, 25-500, 25-506, 25-510, 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510 (up to 600 psi)	316 stainless steel C-Type Bourdon tube
	25-400, 25-406, 25-410, 25-500, 25-506, 25-510, 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510 (greater than 600 psi)	Coiled safety tube
Connection	15-401, 15-411	1/8" NPT, 316 stainless steel
	25-406, 25-506	1/4" NPT, nickel-plated brass
	25-400, 25-410, 25-500, 25-510	1/4" NPT, 316 stainless steel
	40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	1/2" NPT, 316 stainless steel. 9/16"- 18 high pressure connections are standard on 0 - 30,000 psi and higher
Case	15-401, 15-411, 40-400, 40-410, 60-400, 60-410, 60-500, 60-510	304 stainless steel (Optional 316 stainless steel) with safety relief plug
	25-400, 25-406, 25-410, 25-500, 25-506, 25-510, 40-500, 40-510	Polished 304 stainless steel with safety relief plug
Cover ring	15-401, 15-411, 25-400, 25-406, 25-410, 25-500, 25-506, 25-510, 40-400, 40-410, 40-500, 40-510	Polished 304 stainless steel
	60-400, 60-410, 60-500, 60-510	Polished 304 stainless steel bayonet ring
Lens	15-401, 15-411, 40-400, 40-410, 40-500, 40-510	Instrument glass
	25-400, 25-406, 25-410, 25-500, 25-506, 25-510	Trogamide
	60-400, 60-410, 60-500, 60-510	Laminated safety glass
Pointer	115-401, 15-411	Black finished aluminum
	25-400, 25-410, 25-500, 25-510, 40-400, 40-410, 40-500, 40-510	Balanced aluminum, black finish
	60-400, 60-410, 60-500, 60-510	Balanced micro-adjustable aluminum, black finish
Dial	15-401, 15-411	Aluminum, white background with black scale. Single scale psi. UV resistant
	25-400, 25-406, 25-410, 25-500, 25-506, 25-510, 40-400, 40-410, 40-500, 40-510, 60-400, 60-410, 60-500, 60-510	Aluminum, white background with black scale. UV resistant.
Movement	15-401, 15-411, 25-400, 25-406, 25-410, 25-500, 25-506, 25-510	Stainless steel with highly polished bearing surfaces
	40-400, 40-410, 40-500, 40-510	All stainless steel with internal zero stop and highly polished bearing surfaces
	60-400, 60-410, 60-500, 60-510	Stainless steel with highly polished bearing surfaces An internal zero stop is standard
Fill liquid**	25-500, 25-510, 40-500, 40-510, 60-500, 60-510	Glycerine