

APPROVED DOCUMENT
Division of Waste Management
Solid Waste Section
Date September 15, 2009 By LY Frost

**STORMWATER CONVEYANCE
SYSTEM MODIFICATIONS**

**LINCOLN COUNTY LANDFILL
PERMIT NO. 55-03
LINCOLNTON, NORTH CAROLINA**
S&ME Project No. 1356-03-255B

Prepared for:
North Carolina Department of Environment and Natural Resources
Division of Waste Management – Solid Waste Section
2090 U.S. Highway 70
Swannanoa, North Carolina 28778

Prepared by:
S&ME, Inc.
9751 Southern Pine Blvd
Charlotte, North Carolina 28273

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April 3, 2009

SOLID WASTE SECTION
ASHEVILLE REGIONAL OFFICE

Permit No.	Date	Document ID No.
55-03	April 29, 2009	7341



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April 7, 2009

Solid Waste Section
Asheville Regional Office

APPROVED DOCUMENT

Division of Waste Management

Solid Waste Section

Date **September 15, 2009** By **LY Frost**

April 3, 2009

NC Department of Environment and Natural Resources
Division of Waste Management – Solid Waste Section
2090 U.S. Highway 70
Swannanoa, NC 28778

Attention: Larry Frost
Regional Engineer

Reference: Stormwater Conveyance System Modifications
Lincoln County Landfill, Permit No. 55-03
Lincolnton, North Carolina
S&ME Project No. 1356-03-255B

Dear Mr. Frost:

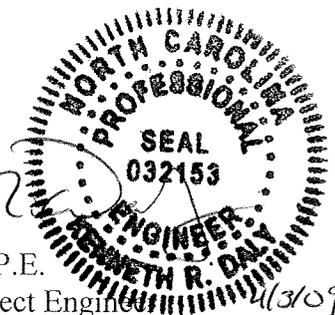
In response to the January 2009 Leachate Release at the Lincoln County Landfill, Lincoln County proposes to modify their existing stormwater conveyance system at the facility's leachate holding tanks. Please find attached descriptions of the leachate release, current stormwater conveyance system at the leachate holding tanks, proposed modifications to the stormwater conveyance system, and associated drawings. If you should have any questions or need additional information please contact us at (704)-523-4726.

Respectfully submitted,

S&ME, Inc.

Julie R. Petersen, P.G.
Project Manager

Ken Daly, P.E.
Senior Project Engineer



Senior Reviewed by Jason Reeves, P.E., Senior Project Engineer

cc: Nancy Rickard, Lincoln County (1 copy)
Central File, NCDENR – Division of Waste Management – Solid Waste Section (1 copy)

TABLE OF CONTENTS

1. INTRODUCTION.....	1
2. EXISTING CONDITIONS.....	1
3. PROPOSED FINAL CONDITIONS.....	2
4. AS-BUILTS AND REPORTING.....	3

FIGURES

Figure 1	Facility Layout
Figure 2A	Existing Conditions
Figure 2B	Existing Conditions Table
Figure 3	Proposed Final Conditions

APPENDICES

Appendix I	Product Information: Saddle Taps
Appendix II	Product Information: PVC/HDPE Pipe Fittings
Appendix III	Product Information: Low Flow Check Valves

1. INTRODUCTION

Lincoln County Landfill experienced a leachate release that occurred over the weekend leading up to Monday, January 19, 2009. On the morning of January 19, 2009, Lincoln County Landfill operations personnel returned to work and discovered that leachate levels in two above ground leachate storage tanks dropped noticeably. The leachate release was from an above ground pipe that froze and burst due to a heat trace failure.

Lincoln County personnel responded immediately by stopping the leachate flow from the leachate storage tanks by closing a valve in the secondary containment area. However, leachate had left the secondary containment area through a storm water sump, which was left open, traveled through a stormwater channel, and into a nearby sediment trap. As of January 30, 2009, the repairs to the heat trace and failed pipe within the leachate tank containment area had been completed.

Following the leachate release, Lincoln County personnel now keep the stormwater sump valve closed, and allow stormwater to accumulate in the secondary containment area. However, Lincoln County would like to modify their stormwater conveyance system in the vicinity of the leachate tanks. The modifications would redirect the stormwater collected in the secondary containment drop inlets and tanker truck loading pad drop inlet divert stormwater to the existing Leachate Conveyance System (LCS). The modifications would eliminate the potential for leachate to escape through the stormwater collection system if a pipe were to burst again.

2. EXISTING CONDITIONS

The leachate storage tanks are located on the southwestern portion of the site as depicted on *Figure 1, Facility Layout*. Two (2) 250,000-gallon tanks (Tanks A and B) are contained within a secondary containment wall approximately 109 feet in diameter and 5.5 feet tall. A gravel access road encircles the containment wall and a concrete tanker truck loading pad is located adjacent to the containment wall to the north as shown on *Figure 2A, Existing Conditions*.

Existing stormwater drainage facilities in the secondary containment wall consist of three (3) drop inlets. Two (2) drop inlets drain the area within the secondary containment wall and the third drop inlet drains a portion of the access road and the tanker truck loading pad.

The area within the secondary containment wall is divided into two drainage subareas which shed water to the north and south. Each drainage subarea flows to a stormwater conveyance system consisting of a 3'x3'x2.75' concrete drop inlet sump. The sump connects with a 4" diameter Schedule 80 PVC outlet pipe. The outlet pipe's flow is controlled with a 4" diameter gate valve.

Stormwater in the southern portion of the containment facility flows into a drop inlet, under the access road, and discharges into sediment trap ST-2 located south of the

leachate holding tanks. The sediment trap ultimately discharges to a lowland area on-site.

Stormwater in the northern portion of the containment facility flows into a drop inlet, underneath the access road, and discharges into a channel on the north side of the secondary containment area. The channel flows to the west and south adjacent to the perimeter road and discharges into a culvert. The culvert outlets into sediment trap ST-2 located south of the leachate holding tanks.

Two (2) drop inlets drain a portion of the perimeter access road and the tanker truck loading pad located to the north of the secondary containment wall. The drop inlets are located in series and are connected by a 6-inch diameter SDR 26 HDPE pipe. A wye and gate valve conveys the flow to either the leachate conveyance system to the east side of the leachate holding tanks or a stormwater channel to the north side of the leachate holding tanks.

The existing stormwater conveyance system in the vicinity of the Leachate Holding Tanks is detailed on *Figures 2A, Existing Conditions, and Figure 2B, Existing Conditions Table*.

3. PROPOSED FINAL CONDITIONS

In general, the proposed changes to the stormwater conveyance system consist of re-directing flow from the tanker truck loading pad and from within the secondary containment area to the existing Leachate Conveyance System (LCS). The existing LCS generally consists of 8" diameter SDR 26 HDPE pipe and HPDE manholes. The LCS begins at the landfill cells and flows by gravity southwards past the leachate holding tanks to a lift station. The lift station pumps the leachate to the leachate holding tanks located within the secondary containment area.

Stormwater from the southern portion of the secondary containment area will be rerouted to flow by gravity to the east into either the existing HDPE leachate conveyance pipe or existing HDPE manhole MH-4. The location will be determined in the field based on observed conditions and/or contractor preferences. In either case, the tie-in to the existing leachate conveyance pipe or manhole will be constructed by welding a saddle tap onto the existing HDPE structure. *Appendix I* provides product information on possible saddle taps considered for this project.

After the tap is welded on, a hole will be drilled into the existing HDPE structure centered on the stem of the tap to connect the proposed pipe to the HPDE structure. The proposed pipe will consist of HDPE pipe consistent with the existing leachate pipe. A PVC/HDPE pipe fitting will be necessary to provide a transition. *Appendix II* provides product information on possible PVC/HDPE pipe fittings considered for this project. The bypassed portion of the existing stormwater conveyance system will be removed or abandoned in place.

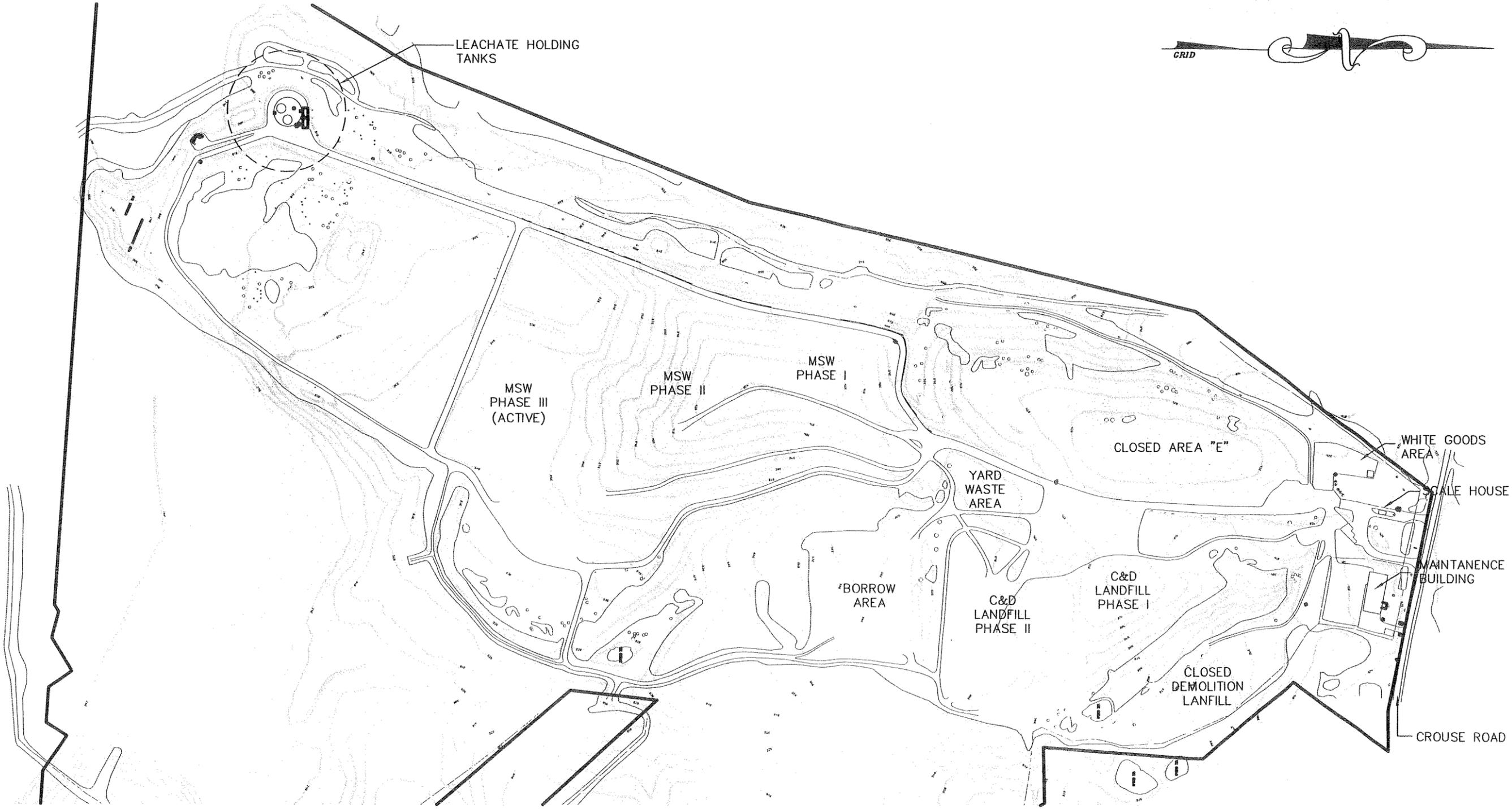
Stormwater from the northern portion of the containment area will be rerouted to flow by gravity to the east into the existing HDPE leachate conveyance pipe. The proposed pipe will tie-in to the existing HDPE leachate conveyance pipe by installing a saddle tap. The proposed pipe will consist of HDPE pipe consistent with the existing leachate pipe. A PVC/HDPE pipe fitting will be necessary to provide a transition. The unused portion of the existing stormwater conveyance system will be removed or abandoned in place.

The two drop inlets that drain a portion of the perimeter access road and the tanker truck loading pad will continue to flow by gravity through the existing leachate conveyance system via the existing wye. The branch of the wye discharging to the receiving channel will be removed or abandoned in place. A low-head check valve will be installed to prevent leachate from backing up onto the perimeter road or truck loading area. *Appendix III* provides product information on possible low-head check valves considered for this project.

The proposed modifications to the stormwater conveyance system in the vicinity of the leachate holding tanks is detailed on *Figure 3, Proposed Final Conditions*. We anticipate that the modifications to the Stormwater Conveyance system will be performed by a contractor experienced with HDPE fabrication and repair with the aid of Lincoln County personnel. S&ME anticipates being on-site during modifications for field inspections.

4. AS-BUILTS AND REPORTING

Following the stormwater conveyance system modifications, S&ME will perform a final engineering inspection of the completed modification. A certification report will be prepared after modification and will include a certification page, narrative summarizing the results of related field inspections, and as-built record drawings.



LEGEND

-  EXISTING GRADE CONTOUR
-  APPROXIMATE LANDFILL LIMITS
-  PROPERTY LINE

REFERENCE:
 TOPOGRAPHIC SURVEY FOR LINCOLN COUNTY LANDFILL BY SPATIAL
 DATA CONSULTANTS INC. DATED: JUNE 9, 2008.

DATE: 03-20-09
 DRAWN BY: JRP
 CHECKED BY:
 SCALE: 1" = 400'
 PROJECT NO. 1356-03-255B



FACILITY LAYOUT

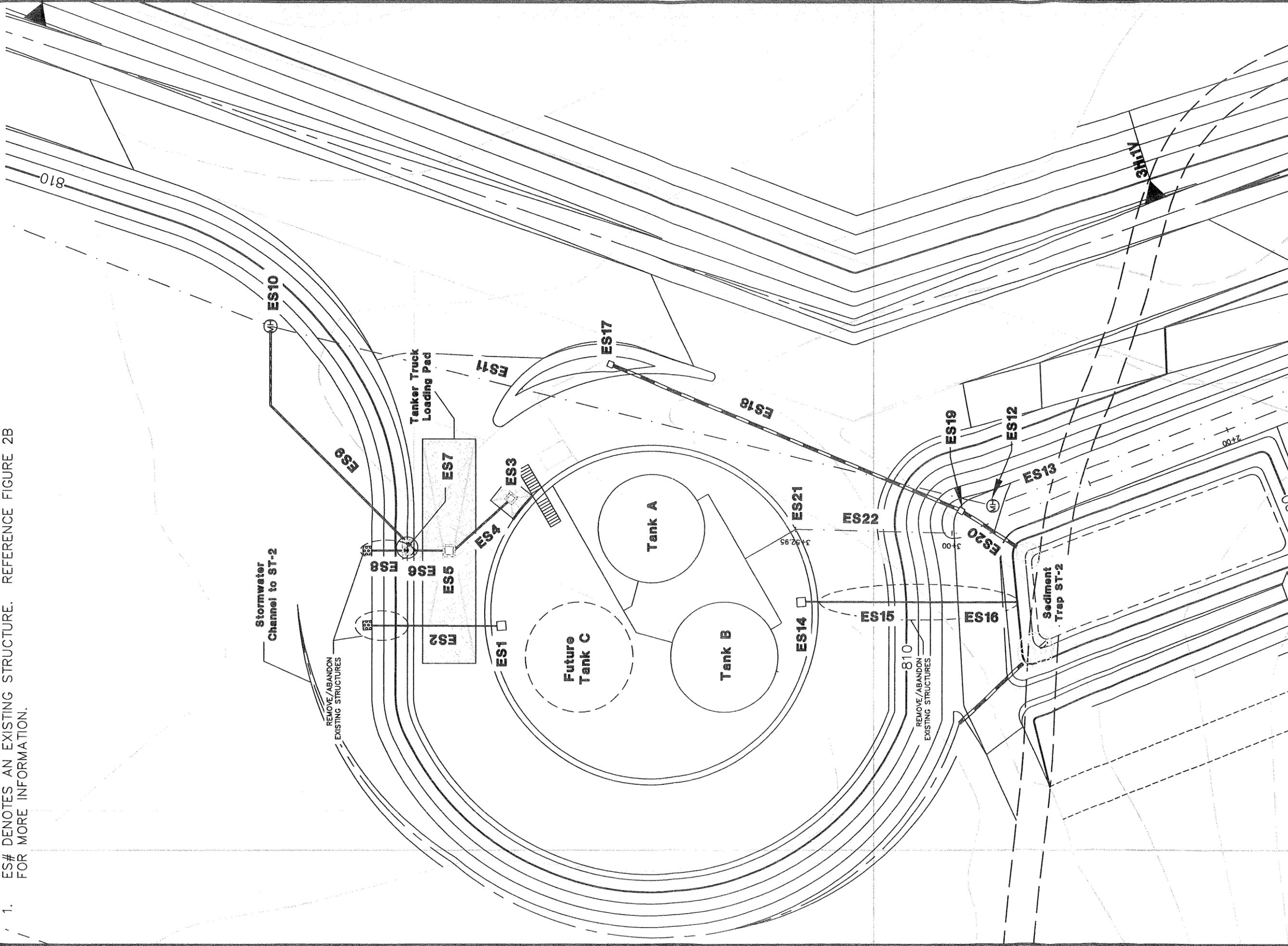
LINCOLN COUNTY LANDFILL
 CROUSE, NORTH CAROLINA

FIGURE NO.

1

NOTES:

1. ES# DENOTES AN EXISTING STRUCTURE. REFERENCE FIGURE 2B FOR MORE INFORMATION.



SCALE:

1" = 30'

PROJECT NO.

1356-03-255B

DATE:

02/20/09

DRAWN BY:

CHR

CHECKED BY:



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EXISTING CONDITIONS

LINCOLN COUNTY LANDFILL
LINCOLN COUNTY, NORTH CAROLINA

FIGURE NO.

2A

<u>EXISTING STRUCTURE</u>	<u>STRUCTURE DESCRIPTION</u>	<u>UPSTREAM</u>		<u>DOWNSTREAM</u>		<u>LENGTH</u>	<u>SLOPE</u>
		<u>INVERT</u>	<u>INVERT</u>	<u>INVERT</u>	<u>INVERT</u>		
ES1	SW/LEACHATE SUMP	813.25	810.5	N/A	N/A		N/A
ES2	4" DIA. SCH. 80 PVC SW PIPE	810.5	806	43	10.6%		
ES3	SW/LEACHATE DROP INLET	812.5	809.5	N/A	N/A		
ES4	6" DIA. SDR 26 HDPE LEACHATE/SW PIPE	809.5	809.25	25.5	1.0%		
ES5	SW/LEACHATE DROP INLET	812.25	809.25	N/A	N/A		
ES6	6" DIA. SDR 26 HDPE LEACHATE/SW PIPE	809.25	809.25	13	0.0%		
ES7	8" DIA. GATE VALVES	809.25	809.25	N/A	N/A		
ES8	6" DIA. SDR 17 HDPE SW PIPE	809.25	806	12	VARIABLES		
ES9	6" DIA. SDR 26 HDPE LEACHATE PIPE	809.25	802.4	90	VARIABLES		
ES10	MANHOLE MH-3	807.4	802.4	N/A	N/A		
ES11	8" DIA. SDR 26 HDPE LEACHATE PIPE	802.4	798.7	251.49	1.5%		
ES12	MANHOLE MH-4	801.96	798.7	N/A	N/A		
ES13	8: DIA. SDR 26 HDPE LEACHATE PIPE	798.7	796.3	240.11	1.0%		
ES14	SW/LEACHATE SUMP	813.25	810.5	N/A	N/A		
ES15	4" DIA. SCH. 80 PVC SW PIPE	810.5	800.2	52.6	20%		
ES16	4" DIA. SCH. 80 PVC SW PIPE	800.2	800	20	1%		
ES17	SW DROP INLET	?	807.42	N/A	N/A		
ES18	12" DIA. ADS N-12 HDPE SW PIPE	807.42	799.8	127	6.0%		
ES19	SW DROP INLET	801.8	799.8	N/A	N/A		
ES20	12" DIA. ADS N-12 HDPE SW PIPE	799.8	799.58	22	1.0%		
ES21	LEACHATE FORCE MAIN VERTICAL 90	806	806	N/A	N/A		
ES22	4" DIA. SDR 17 LEACHATE FORCE MAIN	806	<806	N/A	N/A		

REFERENCE: "LINCOLN COUNTY LANDFILL - PHASE 3" ENGINEERING PLAN DRAWINGS PREPARED BY S&ME SEPTEMBER 2004. AS-BUILT DIMENSIONS AND LOCATIONS MAY VARY FROM PLAN LOCATIONS AND DIMENSIONS.

SCALE:	N.T.S.	DATE:	02/20/09
PROJECT NO.	1356-03-255B	DRAWN BY:	CHR
		CHECKED BY:	

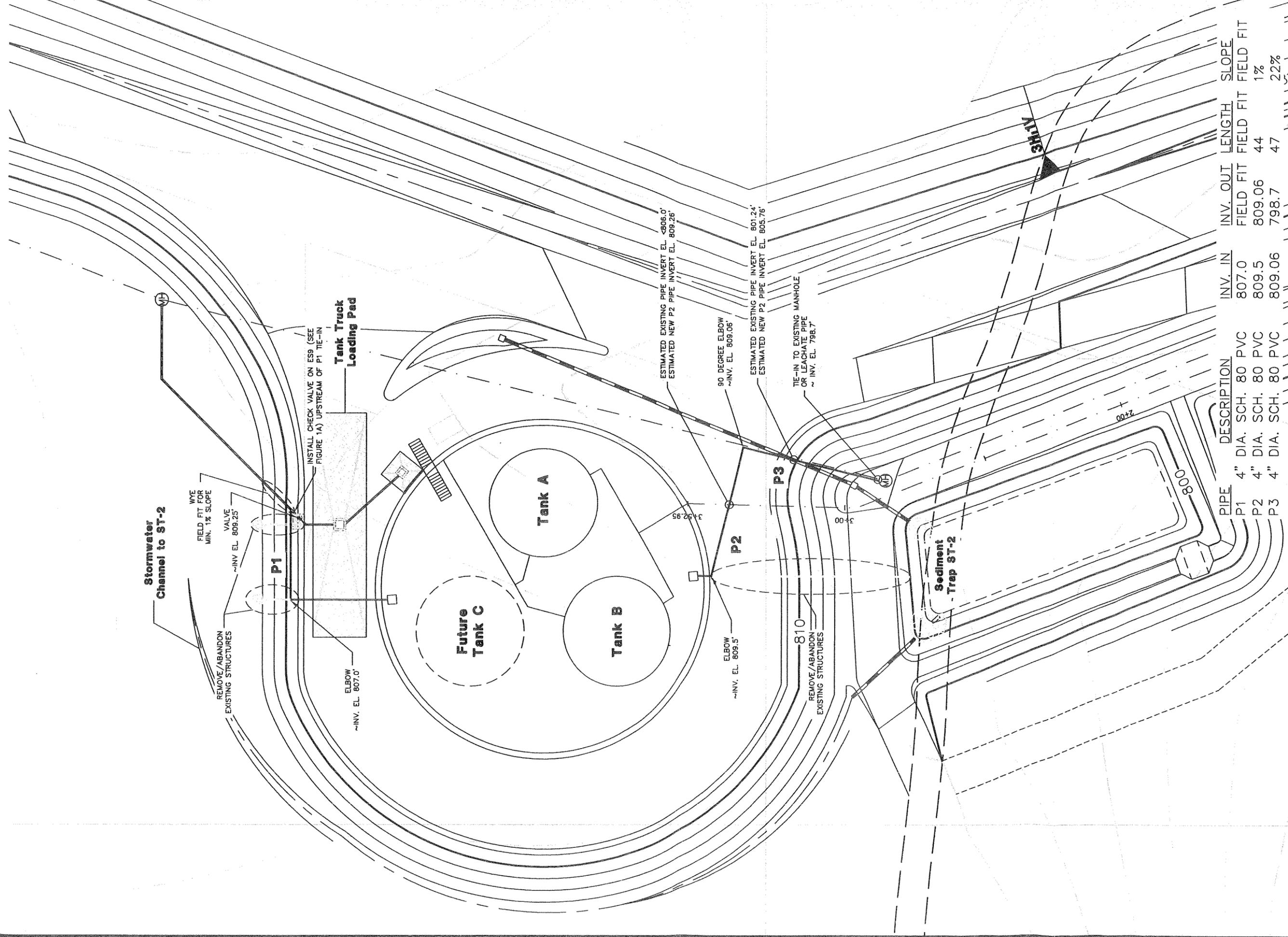


EXISTING CONDITIONS TABLE

LINCOLN COUNTY LANDFILL
LINCOLN COUNTY, NORTH CAROLINA

FIGURE NO.

2B



PIPE	DESCRIPTION	INV. IN	INV. OUT	LENGTH	SLOPE
P1	4" DIA. SCH. 80 PVC	807.0	809.06	44	1%
P2	4" DIA. SCH. 80 PVC	809.5	798.7	47	22%
P3	4" DIA. SCH. 80 PVC	809.06	798.7	47	22%

SCALE: 1" = 30'

DATE: 02/05/09

PROJECT NO. 1356-03-255B

DRAWN BY: CHR

CHECKED BY:

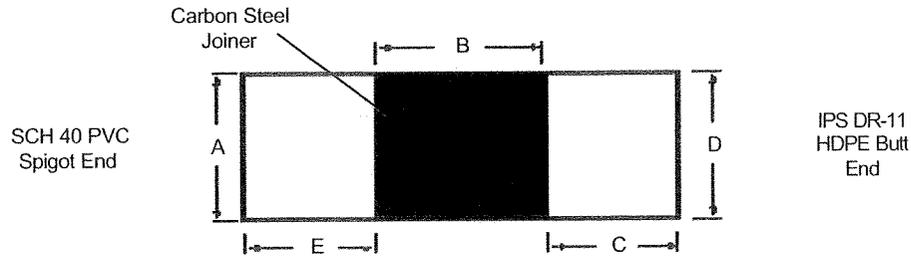
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PROPOSED FINAL CONDITIONS

LINCOLN COUNTY LANDFILL
LINCOLN COUNTY, NORTH CAROLINA

FIGURE NO. **3**

**IPS HDPE x SCH 40 PVC
Transition Fitting
Connects HDPE to PVC
(Dimensions in Inches)**



IPS Nom. Size	A Coupling Diameter	B Coupling Length	C HDPE Length	D HDPE Diameter	E PVC Length	Weight
1/2"	1.000	2.0	3.0	.840	3.0	.05
3/4"	1.250	2.0	3.0	1.050	3.0	1
1"	1.315	2.5	3.0	1.315	3.0	1
1-1/4"	1.660	3.5	4.0	1.660	4.0	1
1-1/2"	1.900	4.0	4.0	1.900	4.0	1.5
2"	2.375	4.5	4.0	2.375	4.0	1.5
3"	3.500	5.0	4.5	3.500	4.5	3
4"	4.500	6.0	4.5	4.500	4.5	5
6"	6.625	8.0	6.0	6.625	6.0	10
8"	8.625	9.0	6.0	8.625	6.0	18

Pressure rating is designated by PVC used in fitting.

SCH 80 PVC and/or Stainless Steel design available for additional charge.

Other sizes and DR's not listed are available - Call For Quick Quote

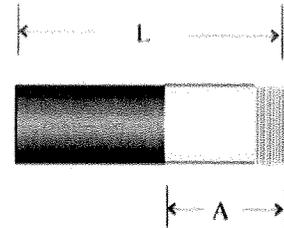
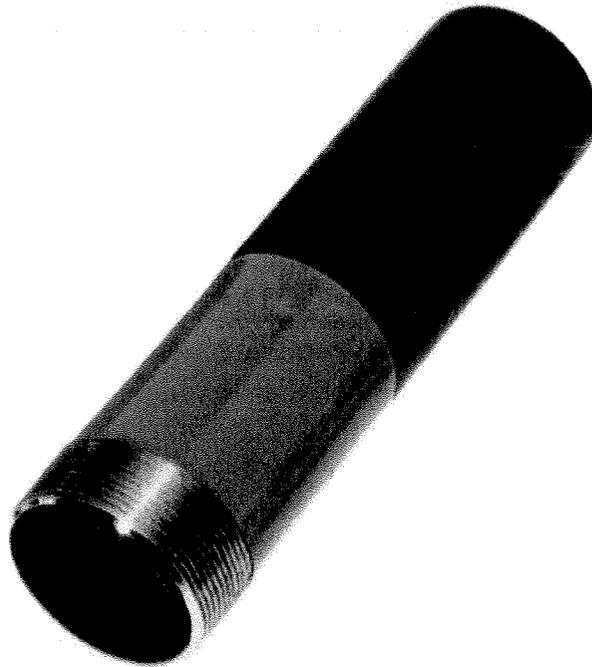
Note: End user to provide cathodic and/or corrosion protection of metal collar.

Transition Fittings

Full Bore

For Information Call (713) 645-2858
or fax (713) 645-1756

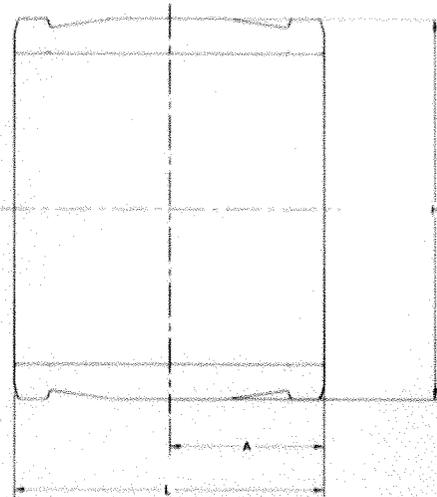
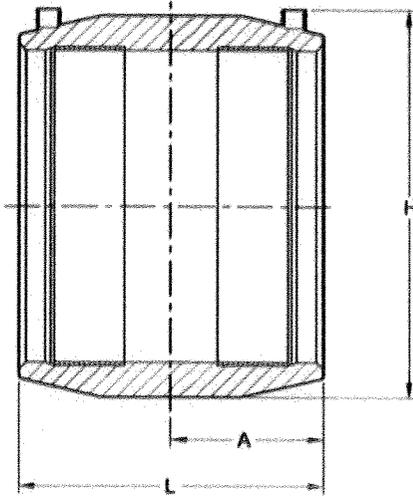
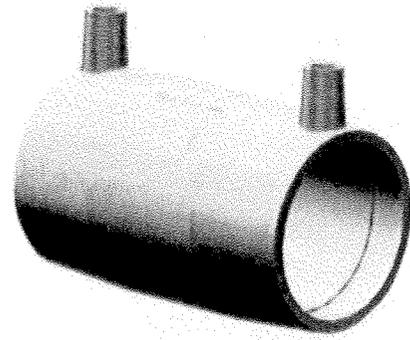
Carbon Steel - Epoxy Coated
All Poly I.D.
1" to 12" Stock, Larger Sizes on Request
SDR 11 Standard (Others Available)



Nom. Pipe Size	Sleeve Material	Stock	Dim. A	Dim. L	Weight	Part Number
1	CS - Coated	Yes	2.5	6	.5	FT010BC0010E000
1-1/4	CS - Coated	Yes	2.75	7	.5	FT012BC0012E000
1-1/2	CS - Coated	Yes	3.5	7.5	1	FT015BC0015E000
2	CS - Coated	Yes	4	9	1.5	FT020BC0020E000
3	CS - Coated	Yes	5	9	3	FT030BC0030E000
4	CS - Coated	Yes	4.5	9	4	FT040BC0040E000
6	CS - Coated	Yes	8	12	9	FT060BC0060E000
8	CS - Coated	Yes	8	14	20	FT080BC0080E000
10	CS - Coated	Yes	8	17	28	FT100BC0100E000
12	CS - Coated	Yes	8	17	44	FT120BC0120E000

Electrofusion Fittings: Couplings

NOTE: Operating Pressure is 200 psi for PE4710 Couplings in allowable applications.



EF COUPLING DIMENSIONS			
Nominal Size	H	L	A
1/2" CTS	2.01	3.15	1.57
1/2" IPS	2.15	2.98	1.42
3/4" CTS	2.15	2.98	1.42
3/4" IPS	2.48	3.46	1.73
1" CTS	2.52	3.46	1.73
1" IPS	2.63	3.46	1.73
1-1/4" CTS	2.56	3.30	1.57
*1-1/4" DUCT (CON.)	3.00	3.70	1.82
1-1/4" IPS	3.04	3.86	1.93
*1-1/4" SIDR 9 (CON.)	3.00	3.70	1.82
1-1/2" IPS	3.36	4.33	2.17
2" IPS	3.78	4.72	2.36
2" CTS	3.59	4.37	2.12
2" IPS	3.82	4.31	2.09
2" IPS CONDUIT	3.55	4.32	2.09
2-1/2" CONDUIT	4.17	4.25	2.06
3" IPS	5.18	5.59	2.72
4" IPS	6.51	6.14	3.00
4" DIPS	6.06	6.93	3.46
5" IPS	7.56	7.17	3.54
6" IPS	8.70	8.35	4.10
6" DIPS	8.74	8.19	4.09
7" IPS	8.93	8.19	4.09
8" IPS	11.20	9.48	4.70
8" DIPS	11.14	10.16	5.08
10" IPS	13.41	10.50	5.00
10" DIPS	13.70	10.90	5.50
12" IPS	15.84	11.50	5.50
12" DIPS	16.20	12.80	6.40



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The Right Connection

*Industrial Non-Compliant ASTM Fittings.
 Sizes not listed can be furnished on request.

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1-405-273-6302

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Electrofusion Fittings: Couplings

(PE2406/PE2708) ELECTROFUSION COUPLINGS						
Size	Description	Pin Type	Part Number	Pack. Qty.	Wt.	CSA
1/2" CTS	ASTM D2513/F1055	4.7 R	5760001	50	0.12	YES
3/4" CTS	ASTM D2513/F1055	4.7 R	5757042	40	0.12	-
1" CTS	ASTM D2513/F1055	4.7 R	5760005	25	0.19	YES
1 1/4" CTS	ASTM D2513/F1055	4.7 R	10001613	30	0.16	-
1/2" IPS	ASTM D2513/F1055	4.7 R	5757001	40	0.12	YES
3/4" IPS	ASTM D2513/F1055	4.7 R	5760004	25	0.16	YES
1" IPS	ASTM D2513/F1055	4.7 R	5760006	25	0.13	YES
1 1/4" IPS	ASTM D2513/F1055	4.7 R	5760008	50	0.23	YES
1 1/2" IPS	ASTM D2513/F1055	4.7 R	5760010	35	0.41	YES
2" IPS	ASTM D2513/F1055	4.7 R	5760012	25	0.38	YES
3" IPS	ASTM D2513/F1055	4.7 R	5757007	36	1.15	YES
4" IPS	ASTM D2513/F1055	4.7 R	5757008	10	1.57	YES
6" IPS	ASTM D2513/F1055	4.7 R	5757009	8	4.37	YES
8" IPS	ASTM D2513/F1055	4.7 R	5757010	4	8.43	YES



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Call for availability of other sizes and dimensions.

** For Use with Bar-Code Processor Only

4.7R = 4.7 Pin with Resistor

4.7S = 4.7 Solid Pin

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Electrofusion Fittings: Couplings

NOTE: Operating Pressure is 200 psi for PE4710 Couplings in allowable applications.

(PE3408/PE4710) ELECTROFUSION COUPLINGS

Size	Description	Pin Type	Part Number	Pack. Qty.	Wt.	AWWA
1/2" CTS	ASTM D2513/F1055	4.7 R	5760019	50	0.09	YES
3/4" CTS	ASTM D2513/F1055	4.7 R	10004578	40	0.10	YES
1" CTS	ASTM D2513/F1055	4.7 R	5760023	25	0.18	YES
1 1/4" CTS	ASTM D2513/F1055	4.7 R	10004573	30	0.16	YES
2" CTS	ASTM D2513/F1055	4.7 S	10004580	30	0.46	-
1/2" IPS	ASTM D2513/F1055	4.7 R	10004627	40	0.13	YES
3/4" IPS	ASTM D2513/F1055	4.7 R	5760022	25	0.29	YES
1" IPS	ASTM D2513/F1055	4.7 R	5760024	25	0.14	YES
1 1/4" IPS	ASTM D2513/F1055	4.7 R	5760026	50	0.28	YES
1 1/2" IPS	ASTM D2513/F1055	4.7 R	5760028	35	0.34	YES
2" IPS	ASTM D2513/F1055	4.7 R	5760030	25	0.38	YES
2 1/2" IPS	CONDUIT PSI=0	3 Pin	5754047	20	0.55	-
3" IPS	ASTM D2513/F1055	4.7 R	10000358	36	1.57	YES
4" IPS	ASTM D2513/F1055	4.7 R	10000360	10	1.67	YES
6" IPS	ASTM D2513/F1055	4.7 R	10000359	8	4.37	YES
7" IPS	ASTM F1055	4.7 S	10003970	4	7.86	-
8" IPS	ASTM D2513/F1055	4.7 R	10000361	4	8.43	YES
10" IPS	ASTM D2513/F1055	4.7 R	10004579	1	15.40	YES
10" IPS **	ASTM D2513/F1055	4.7 S	10000362	1	15.24	YES
12" IPS	ASTM D2513/F1055	4.7 R	10004571	1	23.10	YES
12" IPS **	ASTM D2513/F1055	4.7 S	10000363	1	23.90	YES
1-1/4" SIDR 7	1.488 OD CONDUIT PSI=0	4.7 R	10004575	40	0.29	-
1-1/4" SIDR 9	1.580 OD CONDUIT PSI=0	4.7 R	10002826	30	0.24	-
4" DIPS	ASTM D2513/ F1055	4.7 S	10000353	10	2.34	YES
6" DIPS	ASTM D2513/ F1055	4.7 S	10000354	8	4.59	YES
8" DIPS	ASTM D2513/ F1055	4.7 S	10000355	4	8.37	YES
10" DIPS	ASTM D2513/ F1055	4.7 S	10000356	1	17.43	YES
12" DIPS	ASTM D2513/F1055	4.7 S	10000357	1	25.67	YES



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Call for availability of other sizes and dimensions.

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4.7R = 4.7 Pin with Resistor

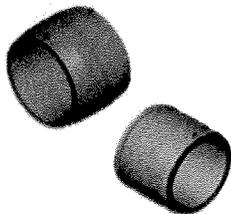
4.7S = 4.7 Solid Pin

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1-405-273-6302

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Electrofusion Products



MOLDED ELECTROFUSION COUPLINGS

Available Size Range:

½" CTS - 1 ¼" CTS
½" IPS - 12" IPS
4" DIPS - 12" DIPS *

* Available in PE 3408 only

At Central Plastics we are proud to be recognized as the company that pioneered and introduced to industries within the United States to the concept of joining polyethylene piping systems together via the process of electrofusion. As an International leader in the world of manufactured Polyethylene (PE) Electrofusion fittings and with manufacturing facilities located around the world, Central Plastics has been actively involved since the early 1960's in the research and promotion of innovative joining methods for polyethylene piping systems for the natural gas, potable water, wastewater, oilfield, mining landfill, telecommunications and geothermal industries.

With unparalleled expertise focusing on the design and manufacturing of polyethylene electrofusion fittings, Central Plastics offers the largest, most complete line of electrofusion products, manufactured from a variety of common virgin resins, available in the market. Our substantial vertically integrated manufacturing capabilities allow Central Plastics to exercise complete control of our manufactured products. From design, to "state of the art" manufacturing, to shipping; Central Plastics maintains a high level of product consistency and quality throughout our manufacturing processes.

Central Plastics Electrofusion Couplings are designed and manufactured in accordance with ASTM F-1055 for use with pipe conforming to ASTM D2513/3035, F-714 and with Butt fittings conforming to ASTM D3261 as applicable. These fittings can be supplied with an integral identification resistor which is recognized by all Central Plastic's processors to automatically set the proper fusion parameters. Electrofusion fittings are supplied with a 24 digit ISO compliant barcode label which facilitates the fusion of the Central Plastic electrofusion fitting with other manufacturer's processors.

PE2406 Electrofusion Couplings are produced from a pre-blended virgin resin that has a PPI listing of PE2406 which complies with ASTM D3350.

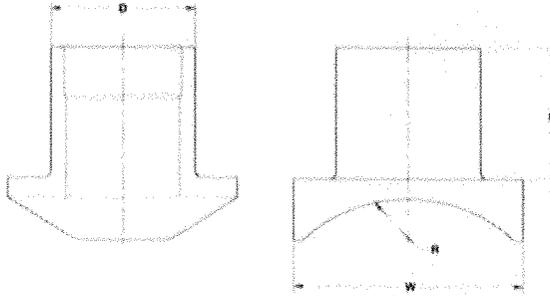
PE3408 Electrofusion Couplings are produced from a pre-blended virgin resin that has a PPI listing of PE3408 which complies with ASTM D3350. This resin carries a NSF Standard 61 listing for use with potable water.

AVAILABLE FEATURES:

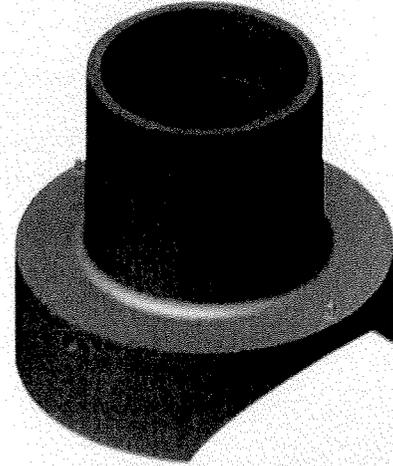
- PE2406 fittings are engineered for use on MDPE Pipe
- PE3408 fittings are engineered for use on HDPE Pipe
- Compatible for fusion to either PE2406 or PE3408 pipe materials without special fusion procedures.
- Pressure rated for natural gas and potable water* applications (* only in some sizes)
- PE3408 fittings utilize NSF listed Resin
- PE3408 fittings are tested to the requirements of AWWA C906
- PE3408 fittings are FM Approved (4" - 24")
- CSA Certification
- Available in metric sizes
- Manufactured in U.S.A.

Electrofusion Fittings: Branch Saddles

NOTE: These have a restricted pressure rating limited to 50 psi.



Branch Saddle Drawing 4: w/6" & 8" Butt Outlet



Electrofusion Products

BRANCH SADDLE DIMENSIONS: 6" & 8" BUTT OUTLET

Nominal Base Size	A	D	H	W	L
6" IPS DR 17	*	6.62	6.00	10.60	*
8" IPS DR 11	*	8.62	6.00	10.60	*

(PE3408/PE4710) ELECTROFUSION BRANCH SADDLES

Outlet Size	Main Size	Pin Type	Clamp Type	Part Number	Pack. Qty.	Wt.	AWWA
4" IPS	Multi-Base 8"-10"	3 Pin Resistor	J	5750808	1	2.90	-
6" IPS	14" IPS	4.7 S	K	5758410	1	5.60	-
6" IPS	16" IPS	4.7 S	K	5758411	1	5.07	-
6" IPS	18" IPS	4.7 S	K	5758412	1	5.99	-
6" IPS	20" IPS	4.7 S	K	5758413	1	4.99	-
6" IPS	22" IPS	4.7 S	K	10002815	1	5.62	-
6" IPS	24" IPS	4.7 S	K	5758414	1	5.62	-
6" IPS	30" IPS	4.7 S	K	5758415	1	5.60	-
6" IPS	32" IPS	4.7 S	K	5758416	1	5.78	-
6" IPS	36" IPS	4.7 S	K	5758418	1	5.50	-
6" IPS	42" IPS	4.7 S	K	5758419	1	5.36	-
6" IPS	48" IPS	4.7 S	K	5758420	1	5.30	-



The Right Connection

Clamp Information can be found on starting on page 171
Call for availability of other sizes and dimensions.

4.7R = 4.7 Pin with Resistor
4.7S = 4.7 Solid Pin

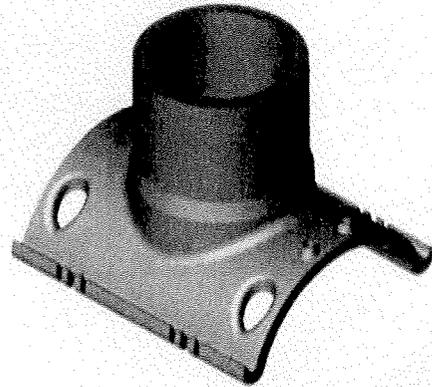
1-800-654-3872

1-405-273-6302

www.centralplastics.com

Electrofusion Fittings: Branch Saddles

** Provided with bottom underclamps.



(PE3408/PE4710) ELECTROFUSION BRANCH SADDLES (full pressure)

Outlet Size	Main Size	Pin Type	Clamp Type	Part Number	Pack. Qty.	Wt.	AWWA
4" IPS	4" IPS	4.7 R	D	10004529	8	0.12	YES
4" IPS	6" IPS	4.7 R	E	10004539	8	3.85	YES
4" IPS	8" IPS	4.7 S	**	call	-	-	YES
4" IPS	10" IPS	4.7 S	**	call	-	-	YES
4" IPS	12" IPS	4.7 S	**	call	-	-	YES
4" DIPS	8" DIPS	4.7 S	**	call	-	-	YES
4" DIPS	10" DIPS	4.7 S	**	call	-	-	YES
4" DIPS	12" DIPS	4.7 S	**	call	-	-	YES
6" IPS	8" IPS	4.7 S	**	call	-	-	YES
6" IPS	10" IPS	4.7 S	**	call	-	-	YES
6" IPS	12" IPS	4.7 S	**	call	-	-	YES
6" DIPS	8" DIPS	4.7 S	**	call	-	-	YES
6" DIPS	10" DIPS	4.7 S	**	call	-	-	YES
6" DIPS	12" DIPS	4.7 S	**	call	-	-	YES
8" IPS	10" IPS	4.7 S	**	call	1	-	YES
8" IPS	12" IPS	4.7 S	**	call	1	-	YES



The connection since 1955

The Right Connection

Clamp Information can be found on starting on page 171

Call for availability of other sizes and dimensions.

4.7R = 4.7 Pin with Resistor

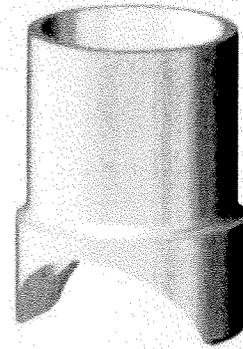
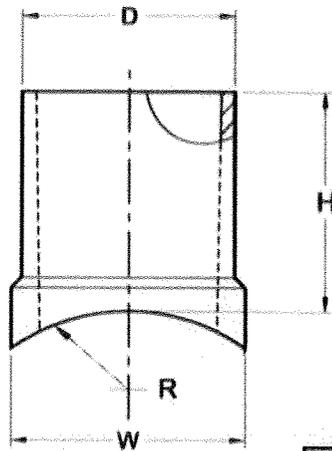
4.7S = 4.7 Solid Pin

1-800-654-3872

1-405-273-6302

www.centralplastics.com

Saddle Fittings: Round Base Branch Saddles



ROUND BASE BRANCH SADDLES DIMENSIONS

Nominal Outlet Size	H	W	D	L
2" IPS Butt	3.00	2.63	2.37	*
3" IPS Butt	4.00	3.88	3.50	*
4" IPS Butt	4.00	4.80	4.50	*
6" IPS Butt	5.13	6.81	6.62	*
8" IPS Butt	7.97	9.00	8.62	*
12" IPS Butt	9.47	13.35	12.75	*

(PE2406/PE2708) IPS x IPS ROUND BASE BRANCH SADDLES

Outlet Size	Main Size	SDR	Part Number	Pack. Qty.	Wt.	CSA	IAPMO
2" IPS	2" IPS	DR 11	6920344	30	0.23	-	-
2" IPS	3" IPS	DR 11	6920330	30	0.21	-	-
2" IPS	4" IPS	DR 11	6920342	30	0.20	-	-
2" IPS	6" IPS	DR 11	6920337	30	0.26	-	-
2" IPS	8" IPS	DR 11	6920407	30	0.26	-	-
2" IPS	10" IPS	DR 11	6921046	30	0.25	-	-
2" IPS	12" IPS	DR 11	6920689	30	0.26	-	-



The connection since 1955

The Right Connection

Fittings are standard sizes.
Call for availability of other sizes and dimensions.

1-800-654-3872

1-405-273-6302

www.centralplastics.com

Saddle Fittings: Round Base Branch Saddles

(PE2406/PE2708) IPS x IPS ROUND BASE BRANCH SADDLES							
Outlet Size	Main Size	SDR	Part Number	Pack. Qty.	Wt.	CSA	IAPMO
3" IPS	3" IPS	DR 11	6920398	18	0.94	-	-
3" IPS	4" IPS	DR 11	692040320000	18	0.55	-	-
3" IPS	6" IPS	DR 11	692060320000	18	0.70	-	-
3" IPS	8" IPS	DR 11	6920399	18	0.69	-	-
3" IPS	10" IPS	DR 11	call	-	-	-	-
3" IPS	12" IPS	DR 11	6930912	18	0.62	-	-
4" IPS	4" IPS	DR 11	6920343	10	1.20	-	-
4" IPS	6" IPS	DR 11	692060420000	10	1.06	-	-
4" IPS	8" IPS	DR 11	6920211	10	1.88	-	-
4" IPS	10" IPS	DR 11	call	-	-	-	-
4" IPS	12" IPS	DR 11	6920690	10	1.00	-	-
6" IPS	8" IPS	DR 11 / 11.5	10000301	5	1.88	-	-
6" IPS	10" IPS	DR 11	call	-	-	-	-
6" IPS	12" IPS	DR 11	6920913	5	2.90	-	-

(PE3408/PE4710) IPS x IPS ROUND BASE BRANCH SADDLES						
Outlet Size	Main Size	SDR	Part Number	Pack. Qty.	Wt.	AWWA
2" IPS	2" IPS	DR 11	10004876	30	0.27	YES
2" IPS	3" IPS	DR 11	10005086	30	0.27	YES
2" IPS	4" IPS	DR 17	10005096	30	0.19	YES
2" IPS	4" IPS	DR 11	10005094	30	0.25	YES
2" IPS	6" IPS	DR 11	10005102	30	0.21	YES
2" IPS	6" IPS	DR 9.3	10004880	30	0.21	YES
2" IPS	8" IPS	DR 11	10005108	30	0.20	YES
2" IPS	8" IPS	DR 9.3	10005110	30	0.23	YES
2" IPS	10" IPS	DR 11	10005025	30	0.20	YES
2" IPS	12" IPS	DR 11	10005037	30	0.20	YES
2" IPS	14" IPS	DR 11	10005045	30	0.19	YES
2" IPS	16" IPS	DR 11	10005054	30	0.21	YES
2" IPS	18" IPS	DR 11	10005064	30	0.21	YES
2" IPS	18" IPS	DR 9.3	10005065	30	0.21	YES



The connection since 1955

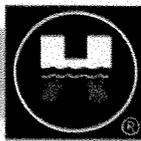
The Right Connection

Call for availability of other sizes and dimensions.

1-800-654-3872

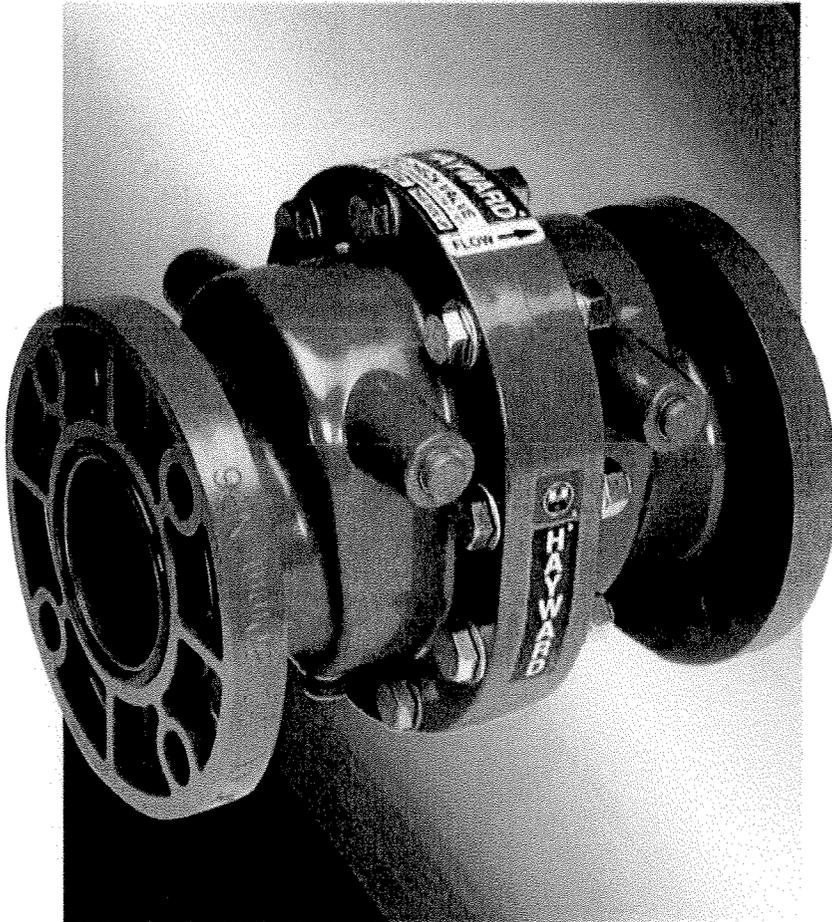
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www.centralplastics.com



All-Plastic Swing Check Valves

3", 4", 6" and 8" • PVC, PPL and Corzan® CPVC



Twice The Temperature/Pressure Rating Of Other Plastic Swing Check Valves

Hayward swing check valves have up to twice the temperature/pressure rating of other plastic swing check valves...and can often replace metal valves in many applications. Compare the temperature/pressure rating of Hayward Swing Check Valves to others – and see the difference.

Unique Two-In-One Seat™ Design

Swing check valves are often used with slurries or other liquids that can damage the valve seat. A damaged seat in an ordinary swing check results in a useless, destroyed valve. But not with Hayward Swing Check Valves. They feature a unique *Two-In-One Seat™* design that doubles the valve's service life. The valve body is constructed from two identical halves. If one seat is damaged, simply re-position the clapper so that it seats against the other body seat. Then, reverse the valve in the pipeline. The valve is again ready for service.

Built-In O-Ring Flange Seals

Hayward Swing Check Valves are furnished ready for installation with two built-in O-ring flange seals. There is no need to purchase additional, expensive flange gaskets.

Self-Aligning Clapper Seal

Bubble-tight checking, with a minimum of only 3 PSI back pressure, is assured with Hayward's rugged, self-aligning clapper seal design.

No Corrosion – Ever!

Because of their all-plastic construction, Hayward Swing Check Valves will never stick or jam as a result of rust or corrosion. And they can survive corrosive environments and harsh weather conditions, places where a metal check valve has to be painted or epoxy-coated just to survive.

Features

- FPM or EPDM Seals
- Flanged Connections
- Two Drain Ports
- Horizontal or Vertical Installation (counterweight recommended)
- No Flange Gaskets Required

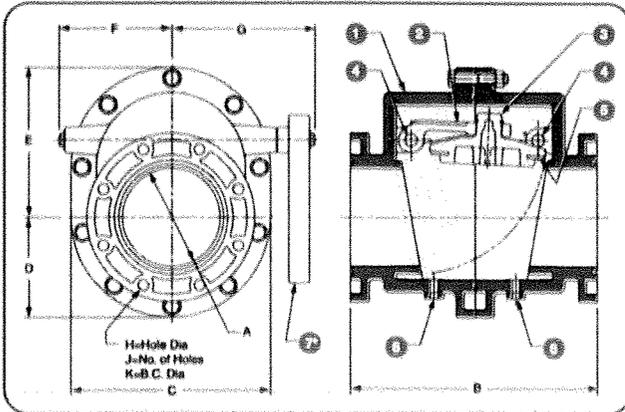
Corzan® is a registered trademark of Noveon, Inc.

Options

- Counterweight for Closing Assistance
- Limit Switch for Position Indication
- Spring Assist Closure



Technical Information



Parts List

- | | |
|--------------|------------------------------|
| 1. Body | 5. Seal |
| 2. Swing Arm | 6. Drain Plug (2) |
| 3. Clapper | 7. Counter Weight (Optional) |
| 4. Shaft* | *PVC with PVC valves |
| | PVDF with PPL valves |
| | CPVC with CPVC valves |

Selection Chart

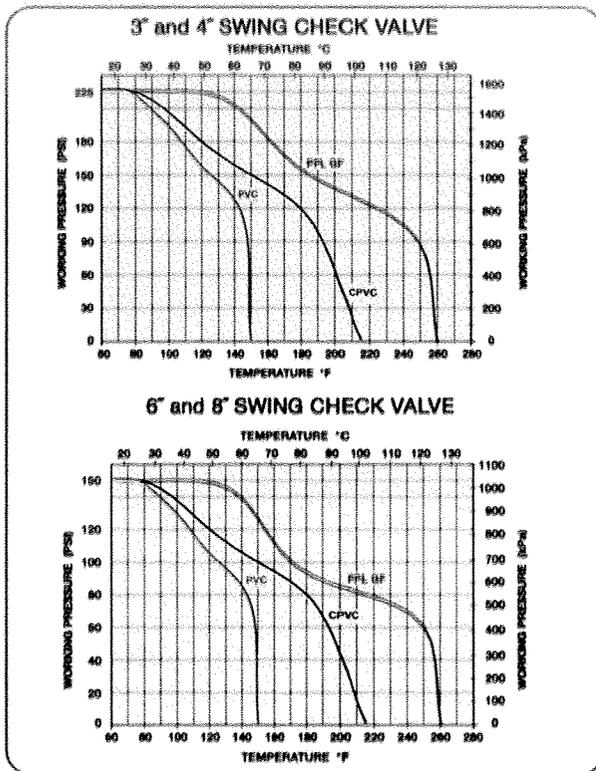
Sizes	Material	End Conn.	Seals	Pressure Rating
3" and 4"	PVC, Glass	Flanged	Viton® or EPDM	225 PSI @ 70°F
6" and 8"	Reinforced PPL or CPVC			150 PSI @ 70°F

Dimensions - Inches / Millimeters

Size	A	B	C	D	E	F	G	H	J	K	Minimum Back Pressure To Close - PSI	Weight (lb / kg)
3 / 75	3.00 / 76	10.24 / 260	7.50 / 190	3.75 / 95	5.21 / 132	3.90 / 99	4.91 / 48	0.625 / M16	4	6.00 / 150	3	10 / 4.5
4 / 100	3.90 / 99	11.81 / 300	9.25 / 235	4.63 / 117	6.75 / 171	4.80 / 122	6.15 / 156	0.625 / M16	8	7.50 / 180	3	21 / 9.5
6 / 150	5.91 / 150	15.75 / 400	12.75 / 323	6.38 / 162	9.25 / 235	6.47 / 164	8.30 / 210	0.75 / M20	8	9.50 / 240	3	47 / 21.4
8 / 200	7.87 / 199	19.69 / 500	16.00 / 406	8.00 / 203	12.00 / 304	8.96 / 227	11.54 / 293	0.75 / M20	8	11.75 / 295	3	90 / 41.0

DIN metric flange standard

Operating Temperature/Pressure



Viton® is a registered trademark of DuPont

Cv Factors

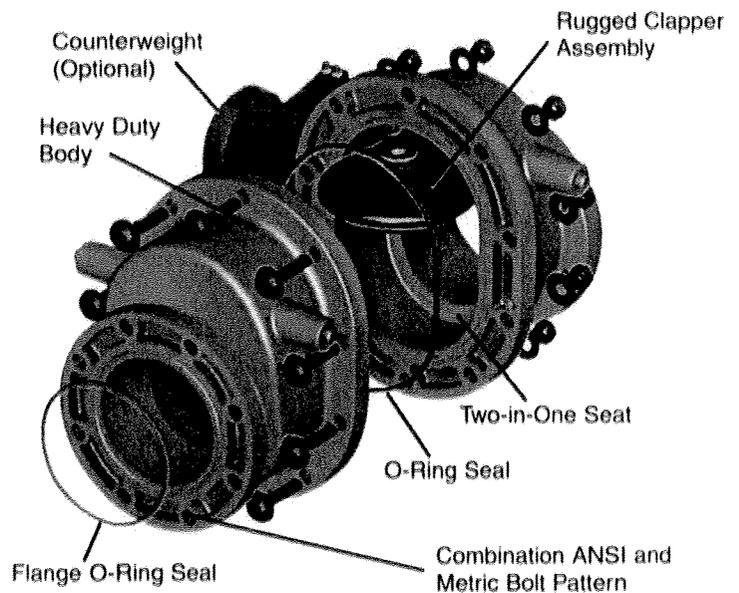
Valve Size	Factor
3"	328
4"	514
6"	1278
8"	2549

Pressure Loss Calculation Formula

$$\Delta P = \left[\frac{Q}{Cv} \right]^2$$

ΔP = Pressure drop
Q = Flow in GPM
Cv = Flow coefficient

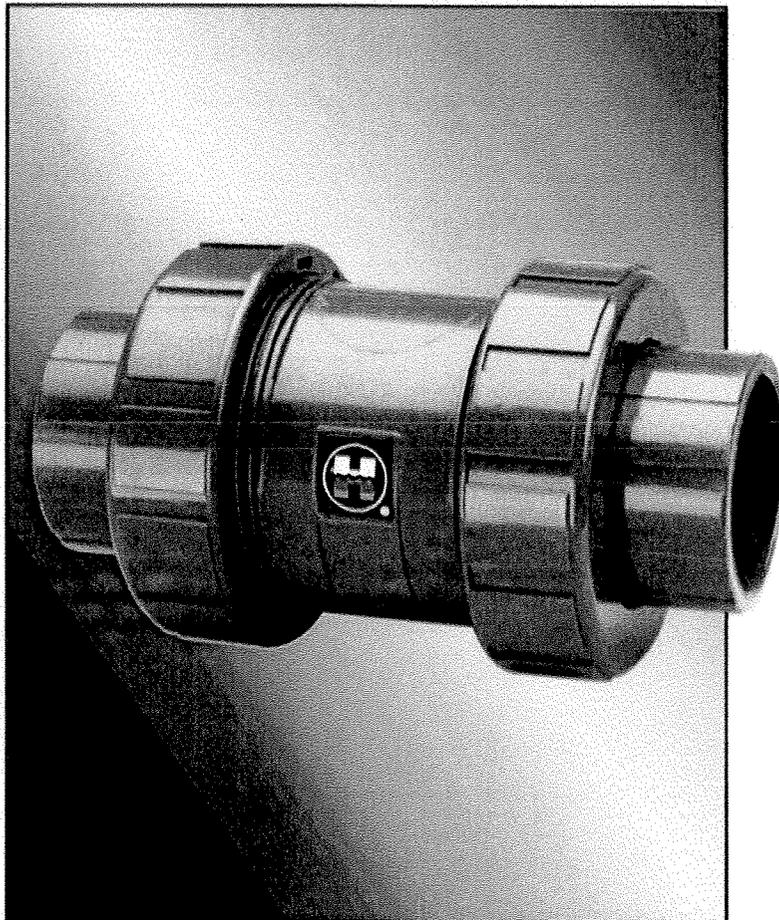
Features





True Union Ball Check Valves

1/4" to 6" PVC, Corzan® CPVC, PPL



Backflow Prevention

Hayward True Union Ball Check Valves prevent reversal of flow in piping systems. They are ideal where backflow could potentially cause damage to pumps, filters, or process equipment.

Automatic Operation

Hayward True Union Ball Check Valves operate without the need for any adjustments or settings. Line pressure moves the solid plastic ball off the elastomer seat, opening the valve. When the inlet flow stops, back pressure moves the ball back onto the seat – stopping the flow. Additionally, this valve features a unique square-cut elastomer seat to seal at low back pressures.

True Union Design

Sizes 1/2" to 6" feature a true union design. This allows for easy removal from a piping system without breaking down piping connections. Just unscrew the two assembly nuts and lift the valve body out of the line. A Trim Check design is used for the 1/4" and 3/8" sizes. While not true union, the valves are fully repairable, unlike some other smaller check valves.

No Corrosion Failures

Because of their all-plastic construction, these valves will never jam or stick as a result of rust or corrosion. Also they will not contaminate sensitive fluids that come into contact with them.

Features

- Full Port Design to 4"
- True Union Design
- Easy Maintenance
- FPM or EPDM Seals
- Unique Square Cut Seat
- Works in Any Position
Except Downflow

Options

- Foot Valve Screens

Corzan® is a registered trademark of Noveon, Inc.



Technical Information

Parts List
True Union Ball Check Valves

1. Body
2. O-Ring Seals
3. Square Cut O-Ring Seat
4. Seal Retainer
5. End Connector
6. Union Nut

Dimensions - Inches / Millimeters

Size	A	B	C	D	E	F	G	Weight - (lb / kg)	
								Socket/Threaded	Flanged
1/4"	3.06 / 78	0.31 / 8	1.38 / 35	0.50 / 13	N/A	N/A	N/A	0.13 / .06	N/A
3/8"	3.06 / 78	0.31 / 8	1.38 / 35	0.50 / 13	N/A	N/A	N/A	0.13 / .06	N/A
1/2" / 20*	4.63 / 118	0.50 / 13	2.25 / 57	0.75 / 19	6.75 / 171	4.88 / 124	2.32 / 59	0.75 / .34	1.00 / .45
3/4" / 25*	4.75 / 121	0.75 / 19	2.63 / 67	1.0 / 25	7.13 / 181	5.00 / 127	2.60 / 66	0.75 / .34	1.38 / .63
1" / 32*	5.25 / 133	1.00 / 25	3.00 / 76	1.25 / 32	7.75 / 197	5.88 / 14	2.88 / 73	1.25 / .57	2.13 / .97
1-1/4" / 40*	6.30 / 160	1.25 / 32	4.00 / 102	1.75 / 44	9.19 / 233	6.94 / 17	3.75 / 95	2.00 / .90	3.75 / 1.70
1-1/2" / 50*	6.75 / 171	1.50 / 38	4.00 / 102	1.75 / 44	9.75 / 248	7.06 / 17	3.75 / 95	2.00 / .90	3.75 / 1.70
2" / 63*	8.00 / 203	1.94 / 49	4.75 / 121	2.25 / 57	11.25 / 286	8.56 / 217	4.50 / 114	3.75 / 1.70	5.75 / 2.60
2-1/2"	10.68 / 271	2.88 / 73	6.56 / 167	3.25 / 83	14.38 / 365	11.25 / 286	2.50 / 64	10.00 / 4.54	14.00 / 6.36
3" / 90*	10.56 / 268	2.88 / 73	6.56 / 167	3.25 / 83	14.38 / 365	11.25 / 286	2.50 / 64	10.00 / 4.54	14.00 / 6.36
4" / 110*	12.94 / 329	4.00 / 102	8.56 / 217	4.25 / 108	17.00 / 432	14.63 / 372	4.25 / 108	17.00 / 7.72	25.00 / 11.36
6"	N/A	4.00 / 102	N/A	4.25 / 108	19.19 / 487	N/A	N/A	N/A	30.20 / 13.73

* Metric End Connections Available In: BSP - Straight Thread, BSP TR - Tapered Thread and Metric Socket

Selection Chart

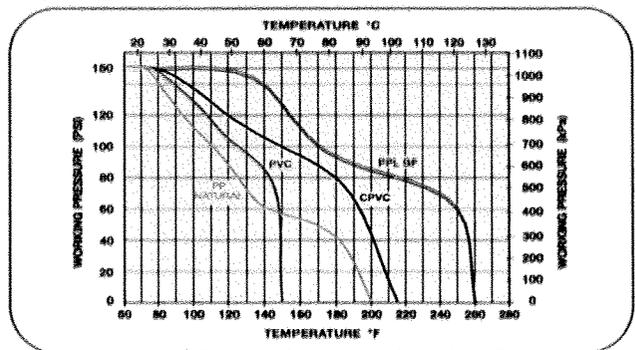
Size	Material	End. Conn.	Seals	Pressure Rating
1/4" - 3/8"*	PVC	Socket or Threaded	FPM	150 PSI @ 70°F Non-Shock
1/2" - 4"	PVC or CPVC	Socket, Threaded, or Flanged	FPM or EPDM	
1/2" - 2"	NAT. PPL***	Threaded	FPM	
6"***	PVC or CPVC	Flanged	FPM	

* Trim Check Design

** 4" Valve Venturied to 6"

*** 2" Rated at 100 PSI

Operating Temperature/Pressure



Cv Factors

Size	Factor	Size	Factor
1/4"	1.0	1-1/2"	45
3/8"	3.0	2"	130
1/2"	4.8	2-1/2"	170
3/4"	7.7	3"	250
1"	11	4"	400
1-1/4"	25	6"	340

Pressure Loss Calculation Formula

$$\Delta P = \left[\frac{Q}{Cv} \right]^2$$

ΔP = Pressure Drop
Q = Flow in GPM
Cv = Flow Coefficient