

**RENEWAL OF OPERATION PERMIT FOR
CENTRAL COUNTY SOLID WASTE DISPOSAL COMPLEX
C&D RECYCLING AND CLASS III MRF**

FDEP ID# 4058C02034



Prepared For:

**SARASOTA COUNTY
ENVIRONMENTAL SERVICES
SOLID WASTE OPERATION
4000 KNIGHTS TRAIL ROAD
NOKOMIS, FLORIDA**



Prepared By:

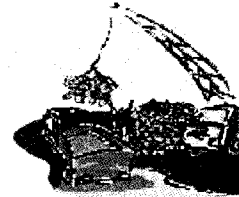
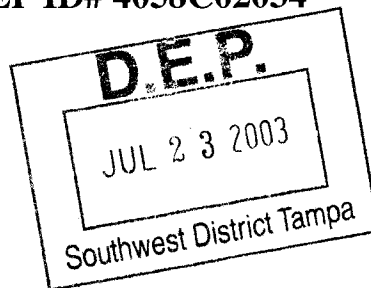
**PBS&J
482 S Keller Road
Orlando, Florida 32810
Project # 120499.10**

July 2003



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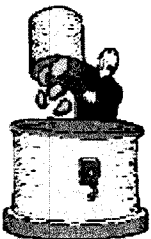
**SARASOTA COUNTY
ENVIRONMENTAL SERVICES
SOLID WASTE OPERATION
4000 KNIGHTS TRAIL ROAD
NOKOMIS, FLORIDA**



Prepared By:

**PBS&J
482 S Keller Road
Orlando, Florida 32810
Project # 120499.10**

July 2003





An employee-owned company

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JUL 08 2003

SOLID WASTE OPERATIONS

July 7, 2003

Kim Ford, P.E.
Solid Waste Section
Division of Waste Management
Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, FL 33619

RE: Renewal of Operation Permit for
CCSWDC Materials Recovery Facility
GMS ID No.: 4058C02034
Permit No.: 134912-001-SO

Dear Mr. Ford:

On-behalf of Sarasota County, PBS&J is submitting four copies of the application to renew the operation permit for the above referenced facility, and a check for \$1,000 as the permit application fee. There are no proposed modifications to this operation.

This facility is classified as a materials recovery facility (MRF) for sorting and recovery of construction and demolition debris and selected Class III materials for recycling. Sarasota County contracts with Meyer & Gabbert Inc. for processing the materials.
If you have any questions, please call me at 407-647-7275, ext. 153.

Sincerely,

Joe Miller, P.E. #39177
Senior Engineer IV

cc File 120499.10 0001

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**Central County Solid Waste Disposal Complex
Waste Processing Facility Materials Recovery Facility
Permit Application for Renewal of Operation Permit**

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Florida Department of Environmental Protection
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, FL 32399-2400

DEP Form # 62-701.900(4)
Form Title Application to Construct, Operate or
Modify a Waste Processing Facility
Effective Date 05-27-01
DEP Application No. 4058C02034
JUL 23 2003
Southwest District Tampa

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
APPLICATION FOR PERMIT TO CONSTRUCT, OPERATE
OR MODIFY A WASTE PROCESSING FACILITY

GENERAL REQUIREMENT: Solid Waste Management Facilities shall be permitted pursuant to Section 403.707, Florida Statutes, (F.S.) and in accordance with Florida Administrative Code (F.A.C.) Chapter 62-701. A minimum of four copies of the application shall be submitted to the Department District Office having jurisdiction over the facility. The appropriate fee in accordance with Rule 62-701.315(4), F.A.C., shall be submitted with the application by check made payable to the Department of Environmental Protection (DEP). Complete appropriate sections for the type of facility for which application is made and include all additional information, drawings, and reports necessary to evaluate the facility.

Please Type or Print in Ink

A. **GENERAL INFORMATION**

1. Type of facility (check all that apply):

☐ Transfer Station

☒ Materials Recovery Facility:

☒ C&D Recycling

☐ Class III MRF

☐ MSW MRF

☐ Other Describe: _____

☐ Volume Reduction Facility

☐ Pulverizer/Shredder

☐ Compactor/Baling

☐ Other Describe: _____

NOTE: C&D Disposal facilities that also recycle C&D, shall apply on DEP FORM 62-701.900(6), F.A.C.

2. Type of application:

☐ Construction/Operation

☒ Operation Without Additional Construction

3. Classification of application:

☐ New

☐ Substantial Modification

☒ Renewal

☐ Intermediate Modification

☐ Minor Modification

4. Facility name: Central County Solid Waste Disposal Complex

5. DEP ID number: 4058C02034 County: Sarasota

6. Facility location (main entrance): 4000 Knights Trail Road
Nokomis, Florida 34275

7. Location coordinates:

Section: 1-4 Township: 9-16 Range: 38S/19E

UTMs: Zone 17 161.2 km E 315.5 km N

Latitude: 27 ° 12 ' 00 " Longitude: 82 ° 23 ' 00 "

Northwest District
160 Governmental Center
Pensacola, FL 32501-5794
850-595-8360

Northeast District
7825 Baymeadows Way, Ste. B200
Jacksonville, FL 32256-7590
904-448-4300

Central District
3319 Maguire Blvd., Ste. 232
Orlando, FL 32803-3767
407-894-7555

Southwest District
3804 Coconut Palm Dr.
Tampa, FL 33619
813-744-6100

South District
2295 Victoria Ave., Ste. 364
Fort Myers, FL 33901-3881
941-332-6975

Southeast District
400 North Congress Ave.
West Palm Beach, FL 33401
561-681-6600

8. Applicant name (operating authority): Sarasota County
Mailing address: 4000 Knights Trail Road
Street or P.O. Box City State Zip
Contact person: Frank Coggins Telephone: (941) 861-1570
Title: Manager, Solid Waste Operations fcoggins@scgov.net
E-Mail address (if available)
9. Authorized agent/Consultant: PBS&J
Mailing address: 482 S Keller Road
Street or P.O. Box City State Zip
Contact person: Mr. Joe Miller Telephone: (407) 647-7275
Title: Project Manager jlmiller@pbsj.com
E-Mail address (if available)
10. Landowner (if different than applicant): N/A
Mailing address: _____
Street or P.O. Box City State Zip
Contact person: _____ Telephone: () _____
E-Mail address (if available)
11. Cities, towns and areas to be served: Sarasota County
12. Date site will be ready to be inspected for completion: N/A
13. Estimated costs:
Total Construction: \$ N/A Closing Costs: \$ N/A
14. Anticipated construction starting and completion dates:
From: N/A To: _____
15. Expected volume of waste to be received: 27,165 yds³/day 8,604 tons/day
16. Provide a brief description of the operations planned for this facility: _____
This facility sorts and recovers construction and demolition
debris and selected Class III materials for recycling.

B. ADDITIONAL INFORMATION

Please attach the following reports or documentation as required.

1. Provide a description of the solid waste that is proposed to be collected, stored, processed or disposed of by the facility, a projection of those waste types and quantities expected in future years, and the assumptions used to make the projections (Rule 62-701.710(2)(a), F.A.C.).
2. Attach a site plan, signed and sealed by a professional engineer registered under Chapter 471, F.S., with a scale not greater than 200 feet to the inch, which shows the facility location, total acreage of the site, and any other relevant features such as water bodies or wetlands on or within 200 feet of the site, potable water wells on or within 500 feet of the site and wells serving community water supplies on or within 1000 feet of the site (Rule 62-701.710(2)(b), F.A.C.).
3. Provide a description of the operation and functions of all processing equipment that will be used, with design criteria and expected performance. The description shall show the flow of solid waste and associated operations in detail, and shall include (Rule 62-701.710(2)(c), F.A.C.):
 - a. Regular facility operations as they are expected to occur;
 - b. Procedures for start up operations, and scheduled and unscheduled shut down operations; and
 - c. Potential safety hazards and control methods, including fire detection and control.
4. Provide a description of the design requirements for the facility which demonstrate how the applicant will comply with Rule 62-701.710(3), F.A.C.
5. Provide a description of the loading, unloading, storage and processing areas (Rule 62-701.710(2)(d), F.A.C.).
6. Provide the identification and capacity of any on-site storage areas for recyclable materials, non-processable wastes, unauthorized wastes, and residues (Rule 62-701.710(2)(e), F.A.C.).
7. Provide a plan for disposal of unmarketable recyclable materials and residue, and for waste handling capability in the event of breakdowns in the operations or equipment (Rule 62-701.710(2)(f), F.A.C.).
8. Provide a boundary survey, legal description, and topographic survey of the property (Rule 62-701.710(2)(g), F.A.C.).
9. Provide an operation plan which describes how the applicant will comply with Rule 62-701.710(4), F.A.C. (Rule 62-701.710(2)(h), F.A.C.).
10. Provide a closure plan which describes generally how the applicant will comply with Rule 62-701.710(6), F.A.C. (Rule 62-701.710(2)(i), F.A.C.).
11. Unless exempted by Rule 62-701.710(10)(a), F.A.C., provide the financial assurance documentation required by Rule 62-701.710(7), F.A.C. (Rule 62-701.710(2)(j), F.A.C.).
12. Provide documentation to show that stormwater will be controlled according to the requirements of Rule 62-701.710(8), F.A.C.
13. Provide documentation to show that the applicant will comply with the recordkeeping requirements of Rule 62-701.710(9), F.A.C.

C. CERTIFICATION BY APPLICANT AND ENGINEER OR PUBLIC OFFICER

1. Applicant:

The undersigned applicant or authorized representative of Sarasota County
Environmental Services is aware that statements made in this form and attached
information are an application for a Waste Processing Operation Permit from the
Florida Department of Environmental Protection and certifies that the information in
this application is true, correct and complete to the best of his/her knowledge and
belief. Further, the undersigned agrees to comply with the provisions of Chapter
403, Florida Statutes, and all rules and regulations of the Department. It is
understood that the Permit is not transferable, and the Department will be notified
prior to the sale or legal transfer of the permitted facility.

Frank Coggins
Signature of Applicant or Agent
Frank Coggins- Manager
Name and Title (please type)
fcoggins@scgov.net
E-Mail address (if available)

4000 Knights Trail Road
Mailing Address
Nokomis, FL 34275
City, State, Zip Code
(941) 861-1570
Telephone Number
Date: 7/07/03

Attach letter of authorization if agent is not a
governmental official, owner, or corporate officer.

2. Professional Engineer registered in Florida (or Public Officer if authorized under
Sections 403.707 and 403.7075, Florida Statutes):

This is to certify that the engineering features of this waste processing
facility have been designed/examined by me and found to conform to engineering
principles applicable to such facilities. In my professional judgment, this
facility, when properly maintained and operated, will comply with all applicable
statutes of the State of Florida and rules of the Department. It is agreed that the
undersigned will provide the applicant with a set of instructions of proper
maintenance and operation of the facility.

Joseph S. Miller
Signature
Joe Miller, Project Manager
Name and Title (please type)

39177
Florida Registration Number
(please affix seal)

482 South Keller Road
Mailing Address
Orlando, FL 32810
City, State, Zip Code
jlmiller@pbsj.com
E-Mail address (if available)
(407) 647-7275
Telephone Number
Date: 7/07/03

**ADDITIONAL INFORMATION REQUESTED BY
APPLICATION ON PAGE 3 OF 4 WITH
APPROPRIATE RESPONSES**

The following reports or documents are attached as required:

1. Provide a description of the solid waste that is proposed to be collected, stored, processed or disposed of by the facility, a projection of those waste types and quantities expected in future years, and the assumptions used to make the projections.

Response: See Section 3 – Chapter 1 Process Flow Narrative

2. Attach a site plan, signed and sealed by a professional engineer registered under Chapter 471, F.S., with a scale not greater than 200 feet to the inch, which shows the facility location, total acreage of the site, and any other relevant features such as water bodies or wetlands on or within 200 feet of the site, potable water wells on or within 500 feet of the site and wells serving community water supplies on or within 1000 feet of the site.

Response: No change.

3. Provide a description of the operation and functions of all processing equipment that will be used, with design criteria and expected performance. The description shows the flow of solid waste and associated operations in detail, and includes:
 - a. Regular facility operations as they are expected to occur;
 - b. Procedures for start up operations, and scheduled and unscheduled shut down operations; and
 - c. Potential safety hazards and control methods, including fire detection and control.

Response: See Section 3 Chapter 1 - Process Flow Narrative, Appendix B – Hazardous Waste Contingency Plan and Appendix D Operations Contingency Plan.

4. Provide a description of the design requirements for the facility that demonstrates how the applicant will comply with Rule 62-701.710(3), F.A.C.

Response: See Section 3 Chapter 1 – Process Flow Narrative and Chapter 3 – Leachate Control Narrative.

5. Provide a description of the loading, unloading, storage and processing areas.

Response: See Section 3 Chapter 1 – Process Flow Narrative, Chapter 4 – Load Rejection Policy and Chapter 5 – Waste Screening.

6. Provide the identification and capacity of any on-site storage areas for recyclable materials, non-processable wastes, unauthorized wastes, and residues.

Response: See Section 3: Chapter 1 – Process Flow Narrative, Table 1 – Storage Area Capabilities; Chapter 4 - Load Rejection Policy; and Chapter 5 – Waste Screening.

7. Provide a plan for disposal of unmarketable recyclable materials and residue, and for waste handling capability in the event of breakdowns in the operations or equipment.

Response:

Unmarketable recyclable materials and residue from C&D debris is disposed of at CR 692 Liberty Waste in Balm, Florida, which is a permitted C&D Landfill. Unmarketable recyclable materials and residue from Class III waste is disposed of in the CCSWDC Class I Landfill.

Waste handling capability in the event of breakdowns in the operations or equipment is addressed in Appendix D – Operations Contingency Plan.

8. Provide a boundary survey, legal description, and topographic survey of the property.

Response: No change.

9. Provide an operation plan that describes how the applicant will comply with Rule 62-701.710(4), F.A.C.

Response: See Section 3 Operations and Maintenance Manual

10. Provide a closure plan that describes generally how the applicant will comply with Rule 62-701.710(6).

Response: See Section 3 Chapter 7.0 Closure Plan

11. Unless exempted by Rule 62-701.710 (10(a)), F.A.C., the financial assurance documentation required by Rule 62-701.710(7), F.A.C.

Response: The facility is exempted. Financial assurance is provided through the Class I Landfill permit, which includes the closure cost for the MRF.

12. Provide documentation to show that stormwater will be controlled according to the requirements of Rule 62-701.710(8), F.A.C.

Response: No change.

13. A document that shows the applicant will comply with the recordkeeping requirements of Rule 62-701.710(9), F.A.C.

Response: See Section 3 - Chapter 8.0 Record Keeping

OPERATIONS AND MAINTENANCE MANUAL
FOR THE
CENTRAL COUNTY SOLID WASTE DISPOSAL COMPLEX
WASTE PROCESSING FACILITY
MATERIALS RECOVERY FACILITY
C& D RECYLING & CLASS III MRF

Sarasota Central County Solid Waste Disposal Complex
4000 Knights Trail Road
Nokomis, Florida 34275

Prepared October 1998

Revised July 2003
By
PBS&J
482 South Keller Road
Orlando, Florida 32810
407.467.7275

Project # 120499.10
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**Central County Solid Waste Disposal Complex
Waste Processing Facility Materials Recovery Facility
Operations and Maintenance Manual**

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Appendix G	Materials Specifications

1.0 Process Flow Narrative

This site is classified as a Waste Processing Facility in the category of Materials Recovery Facility (MRF) for sorting and recovery of construction and demolition debris and selected Class III materials for recycling. The facility was constructed and is operated in accordance with all applicable requirements of Chapters 62-701 of the Florida Administrative Code. The MRF is owned and operated by Sarasota County through a contract with Meyers & Gabbert Excavating Contractors Inc.

Customers arriving at the CCSWDC hauling construction and demolition debris (C&D) or C&D with selected Class III waste materials such as carpet, carpet padding and furniture enter the scales, pay the appropriate charge, receive a scalehouse ticket and are directed to the materials recovery facility (MRF).

Customers arriving at the MRF present the scalehouse ticket to the attendant. The customer is questioned regarding the load contents. The on-site manager or a spotter is notified if a load is suspected of containing unacceptable materials.

The materials flow schematic is shown on Figure 1. The process and leachate flow schematic is shown on Figure 2. The storage area capacities are shown in Table 1.

1.1 Concrete

Customers with loads of clean concrete are directed to the clean concrete processing, storage and loading area. Clean concrete is defined as only uncontaminated concrete and diminimus amounts of soil. The load is dumped in the unloading area. Once an adequate volume of material has been stockpiled, the clean concrete is processed using a densifier and then a crusher. The processed concrete is then stockpiled for market. The clean concrete processing and storage area is 150 feet long and 50 feet wide. The amount of clean concrete stockpiled for market will vary.

1.2 Wood

Customers with loads of clean wood are directed to the clean wood unloading and processing area. Clean wood is defined as only untreated and unpainted wood and diminimus amounts of soil. The load is dumped in the unloading area. Once an adequate volume of material has been stockpiled, the clean wood is processed using a grinder to produce mulch. The mulch is then stockpiled for market. As shown on the site plan, this area is 100 feet long and 120 feet wide. The amount of mulch stockpiled for market will vary.

1.3 Mixed Loads

Under direction of the spotter, customers with mixed loads proceed to the tipping area identified on Figure 2 and the site plan. The load is dumped into the tipping area for sorting. Unacceptable materials may be reloaded and the customer directed to other on-site facilities for disposal.

The material is then sorted and segregated for processing. Selected Class III materials are removed from the site for recycling or disposal at an approved site.

Remaining C & D material will be temporarily stockpiled within the leachate control pad area prior to the screening operation. When an adequate amount of material has been stockpiled, the material will be loaded onto the screen. The minus 2" material screenings will be transported to the landfill face for use as daily cover. The screen rejects will be loaded into transport trucks within the leachate control pad area and shipped to an approved C & D landfill.

Shingles are sorted and stored for recycling subject to market demand. Generally, they are shipped off site for disposal along with other C&D materials.

1.4 Non-Class III Waste Materials

Non-Class III waste materials are also manually removed. Non-Class III waste materials are loaded into roll-off containers located on the leachate containment area. These materials are then transported to the Class I landfill for disposal. Temporary storage of non-recyclable materials is performed in accordance with Rule 62-701.730(6), FAC. Specifically, putrescible waste will not be stored for more than one day, and non-putrescible waste will not be stored for longer than 30 days.

1.5 Recyclables

Recyclables removed during the sorting step will be stockpiled as shown on Figure 2 and the site plan. These recyclable materials are clean cardboard and clean metals. Clean is defined as materials that may contain diminimus amounts of waste included inadvertently. The processing areas are under cover. Cardboard is stored in a bin, and steel in a trailer. A roll-off container for metals is used to transfer metals removed during sorting to the processing and storage area. All recyclables other than those designated on Figure 2, such as carpet padding, will remain on the leachate containment pad until transported to market.

Recyclable materials will be transported via truck for market delivery. Material transported off-site is weighed at the scales enroute to market.

If in the future it becomes feasible to recycle other materials, the Department's approval will be requested, and recycling will not begin until the Department grants approval.

1.6 Hazardous Wastes

If unacceptable materials are encountered involving hazardous wastes (e.g. car batteries, thermostats, paint, etc.) the hazardous waste contingency plan in Appendix B will be implemented. An OSHA approved storage cabinet will be used for temporary storage of hazardous wastes found. The cabinet is a Justrite Mfg. Co. safety storage cabinet and is lockable. It is approved for acids and corrosives. This cabinet has a 45-gallon spill containment capacity. It is five feet tall, five feet wide and two feet deep. It is labeled for acids and corrosives. This cabinet is located as shown on sheet one the drawings.

Figure 1. Construction & Demolition Debris Materials Flow Schematic (Revised 7/7/03)

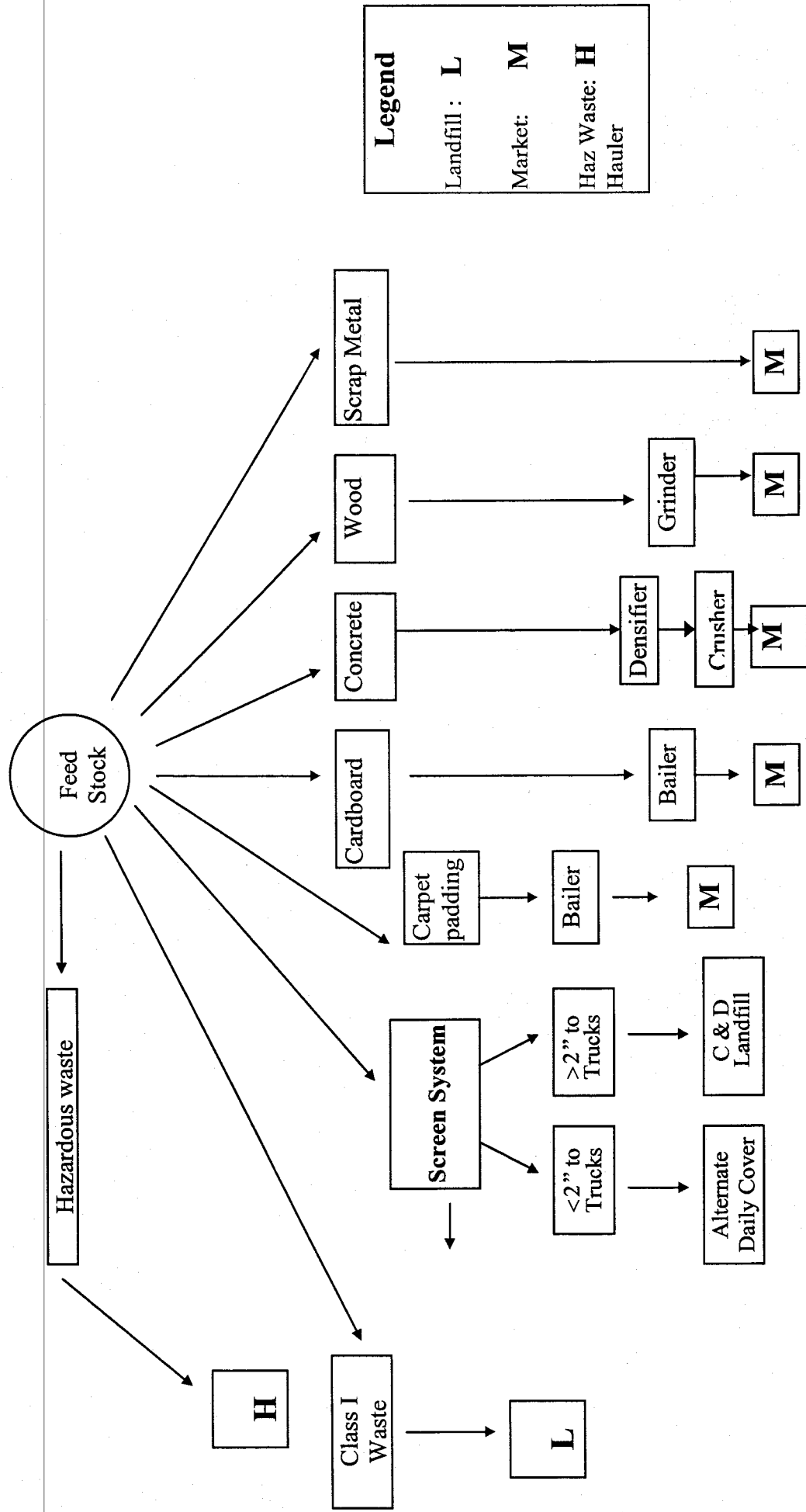


Figure 2. Process and Leachate Flow Schematic (Revised 7/7/03)

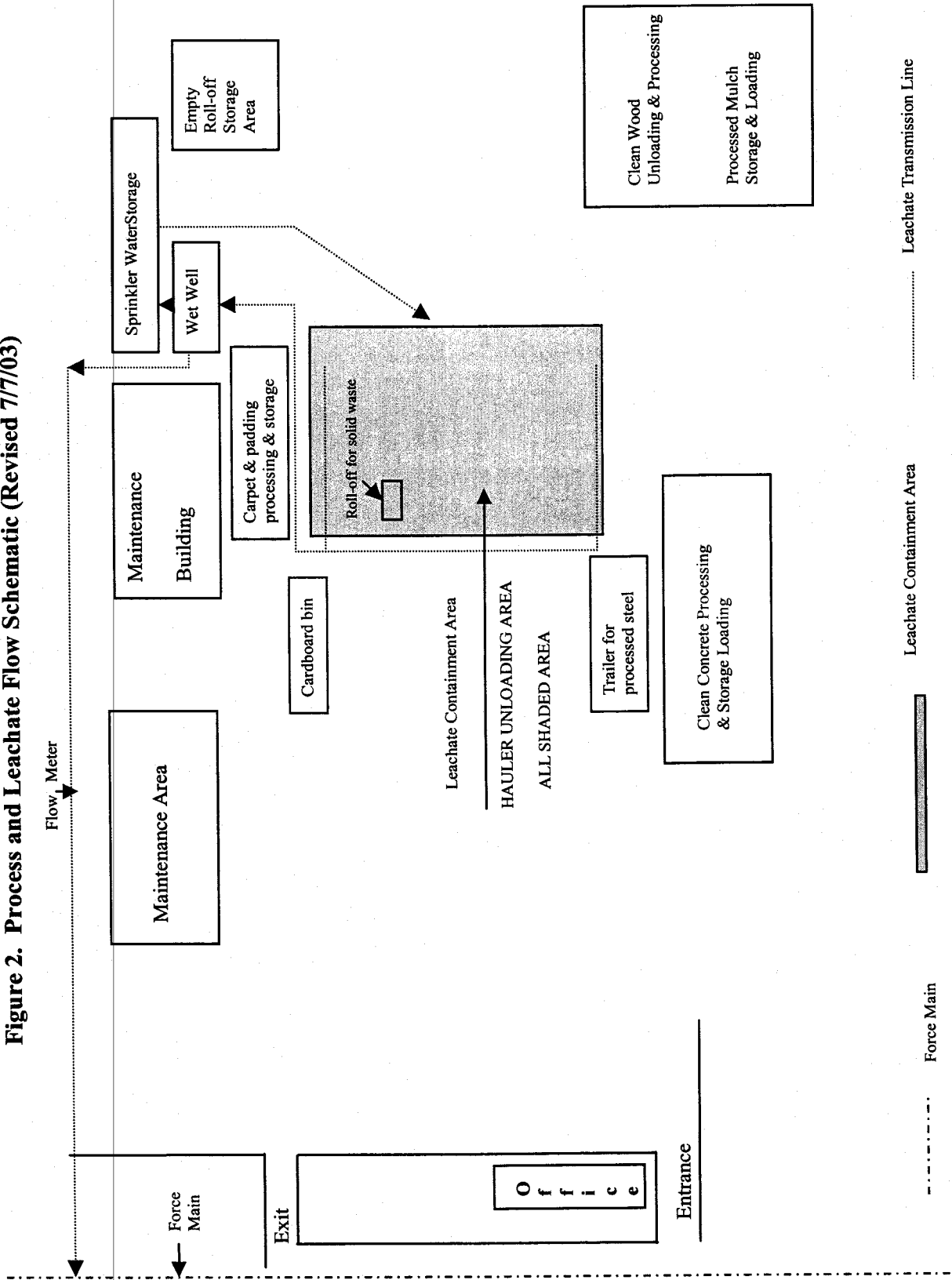


Table 1. Storage Area Capacities

Material	Dimensions ¹	Volume	Mass
Mixed Waste ²	75 ft. x 50 ft. x 15 ft.	2,085 cu. yds.	765 tons
Under-Roof Separation Area #1 ³	75 ft. x 50 ft. x 15 ft.	2,085 cu. yds.	765 tons
Under-Roof Separation Area #2 ³	75 ft. x 50 ft. x 15 ft.	2,085 cu. yds.	765 tons
Raw Product ⁴	225 ft. x 35 ft. x 15 ft.	4,375 cu. yds.	1,610 tons
Finished Product ⁵	225 ft. x 35 ft. x 15 ft.	4,375 cu. yds.	1,610 tons
Clean Cardboard ⁶	40 ft. x 30 ft. x 15 ft.	665 cu. yds.	48 tons
Clean Metals ⁷	40 ft. x 30 ft. x 15 ft.	665 cu. yds.	66 tons
Clean Concrete ⁸	150 ft. x 50 ft. x 15 ft.	4,165 cu. yds.	2,310 tons
Clean Wood ⁹	120 ft. x 100 ft. x 15 ft.	6,665 cu. yds.	665 tons
	Totals	27,165 cu. yds.	8,604 tons

Notes:

1. The 15-foot height is not the normal operating condition, but represents the maximum height at each location and is shown for financial assurance cost estimating purposes only. The actual operating condition will vary at each location from 0 – 15 feet.
2. Mixed waste = incoming waste materials (including carpet padding) (0.368 tons/cu. yd.); located between the under-roof separation areas and the push wall.
3. Mixed waste = incoming waste materials (including carpet padding) (0.368 tons/cu. yd.)
4. Raw Product = incoming waste materials (including carpet padding) (0.368 tons/cu. yd.); located between the under-roof separation areas and the edge of the leachate containment pad.
5. Finished Product = ground waste materials (including carpet padding) (0.368 tons/cu. yd.); located between the push wall and the edge of the leachate containment pad.
6. Clean Cardboard = 0.073 tons/cu. yd.
7. Clean Metals = 0.10 tons/cu. yd.
8. Clean Concrete = 0.555 tons/cu. yd.
9. Clean Wood = 0.10 tons/cu. yd.

2.0 Facility Signs and Fliers

The Materials Recovery Facility has signs installed on-site to notify all haulers about the site operation. This includes entrance and exit signs. A general welcome sign is located at the entrance to the facility. A hauler notification sign is located at the office ticket window to notify all haulers about the acceptable and non-acceptable materials. The load rejection policy is included on this sign. This sign and flyer is shown on Figure 3.

FIGURE 3. FLYER AND SIGN

**Meyer & Gabbert Recycling
Materials Recovery Facility For
Construction and Demolition Debris and Selected Class III Materials**

Hours of Operation: Monday - Saturday 8:00am - 5:00pm
 Sunday CLOSED

WASTES ACCEPTED AT THIS FACILITY

STEEL	GLASS	BRICK
CONCRETE	ASPHALT	PIPE
GYPSUM WALLBOARD	LUMBER	ROCK & SOIL
PALLETS	CARDBOARD	PAPER
WOOD WASTE	WOOD	METAL SCRAP
SHINGLES	PLASTICS	ALUMINUM
CARPET	CARPET & PADDING	FURNITURE

WASTES NOT ACCEPTED AT THIS FACILITY

HOUSEHOLD GARBAGE	HAZARDOUS WASTE
BIOMEDICAL WASTE	INDUSTRIAL WASTE
BATTERIES	TIRES
FLOURESCENT LIGHT BULBS & BALLIS	ASBESTOS
WHITE GOODS	PAINT
LOADS EXCLUSIVELY CONTAINING SOIL	OIL CONTAINERS
CONTAMINATED SOIL	LIQUIDS
ELECTRONIC DEVICES (COMPUTERS, TVs, ETC.)	

ALL VEHICLES WILL BE INSPECTED PRIOR TO TIPPING. IF MORE THAN 10% OF THE LOAD CONTAINS UNACCEPTABLE WASTE, TIPPING WILL BE DENIED. AFTER TIPPING, IF ANY UNACCEPTABLE WASTES ARE DISCOVERED, THEY MAY BE RETURNED TO THE HAULER FOR DISPOSAL AT A PROPERLY PERMITTED FACILITY.

3.0 Leachate Control Narrative

The leachate containment area is designed to collect the leachate that may be within a load or generated by a rain event. The entire leachate containment area is poured concrete and is sloped to drain into the collection system. The flow schematic is shown on Figure 2.

Liquid within the containment area flows by gravity to the trench drains. The trench drains are 12-inch wide rectangular concrete channels 85 feet in length. These drains are covered with a traffic-bearing grate as shown on the drawings.

Leachate flows from the trench drains into a 15-inch diameter HDPE pipe. This pipe conveys the leachate from the containment area to the wet well as shown on the drawings.

Leachate then enters the 5,000 gallon wet well/separator box. The separator section of the box has a 1,250-gallon capacity and is used to remove solids and reduce turbidity. The separator section is inspected weekly to ensure that the accumulation of solids and sediment settled out of the raw leachate discharge from the containment area do not restrict flow into the wet well section of the box. Accumulated solids and sediment are removed weekly.

Leachate then flows into the wet well pump station. The pump station has a 3,750-gallon capacity and contains two pumps, pump number one and pump number two.

Pump number one is used to discharge leachate to the four inch diameter force main that connects the wet well/separator box to the six inch diameter force main that conveys leachate from the Class I area to the leachate storage tank as shown on the drawings. A backflow prevention valve prevents leachate from the leachate force main from entering the wet well pump station. All leachate discharged to the leachate force main is recorded by a flowmeter installed in the four inch diameter discharge force main. This information is recorded daily and included with the leachate reports for the landfill.

Pump number two is used to transfer leachate to the sprinkler water storage facility. The sprinkler water storage facility consists of two interconnected 5,000-gallon tanks. These tanks are located within secondary containment as shown on the drawings. This tank system conforms to the requirements of Rule 62-701.400(6)(c) FAC as follows:

- The tanks are constructed of concrete, the foundation is well drained (two feet above the seasonal high groundwater level) and stable (an eight inch reinforced concrete slab);
- The interior of the tanks consist of a material resistant to the liquid being stored;
- Secondary containment is provided to hold 110 percent of the total volume of the interconnected tanks;
- The secondary containment system is constructed of a material compatible with the liquid being stored and is coated with a corrosion resistant coating;
- Stormwater will be pumped to the site's stormwater system using a portable pump within 24 hours of a precipitation event or when 10 percent of the storage capacity is reached (this will be indicated by the alarm float shown on sheet two of the drawings);

- The system is equipped with an overfill prevention system (see sheet 2 of the drawings) and is inspected weekly; and,
- Inspections of this system are in accordance with Rule 62-701.400(6)(c) 9. FAC.

Pump number three supplies leachate from the sprinkler water storage facility for use as dust control during operations within the leachate containment area. The leachate is conveyed by a three-inch diameter, Sch 40 PVC pipe. This liquid is used for dust control prior to and during grinding operations within the leachate control area. A hose will manually apply this dust control liquid with a spray nozzle directed to prevent overspray.

If the sprinkler storage facility is at maximum capacity and more leachate enters the wet well pump station, the leachate pump (pump number one) will activate. Pump number one, a Hydromatic SPGH500 will pump the leachate through a flow meter as shown on the drawings.

As shown on the drawings, pump number two may operate in series with pump number one or may be used as a backup to pump number one. At the end of each operating day and at other times if necessary, the valves will be reset manually to allow pump number two to discharge to the sprinkler water storage facility.

4.0 Load Rejection Policy

The following language is excerpted from the existing contract between Sarasota County Government and the facility operator. It describes the load rejection policy.

The County will make the sole determination of load content and will direct C&D Debris deliveries to the Recycling Facility. Contractor must accept all C&D Debris except as provided in Section 5.3.19.7 and Articles 16 and 17 of the contract.

The Contractor determines that there is too much mixed Solid Waste or non-recyclable material in a load delivered to its Recycling Facility. Contractor may appeal to the County by contacting the Director and requesting a re-inspection of the load. In practice, a landfill employee of the County will be authorized to work with the Contractor to make the determination of loads that should be re-directed to the County Landfill, the Director shall initial the scale ticket and the driver will be required to return to the scale house to re-weigh the load and pay the appropriate tipping fee for disposal of the re-directed load. All costs of redirecting loads, reloading loads and alternative disposal of loads shall be borne by the hauler. If a load is dumped at the Recycling Facility and the County agrees with the Contractor that the load should not be accepted at the Recycling Facility, or the load is prohibited from being delivered or accepted at the Recycling Facility, and the hauler is known, the Contractor may charge the hauler a reasonable fee for reloading the load, special handling and/or cleanup, or otherwise cleaning up the load.

The facility's sign and flier defines "too much mixed Solid Waste" as 10 percent of the load.

5.0 Waste Screening

Incoming loads of waste materials (including carpet padding) are identified at the scalehouse and directed to the materials recovery facility.

The hauler arrives at the materials recovery facility office and proceeds to the office window where the attendant/clerk receives the scale ticket and verbally questions the hauler about the loads' contents. The attendant/clerk explains the load rejection policy if the contents are suspect. The attendant/clerk also questions the hauler about any hazardous material/waste content within the load.

In the event hazardous materials are detected while the hauler is at the facility, the entire load may be rejected. For household hazardous waste, the hauler is redirected to a household hazardous waste site.

The hauler, after passing the initial verbal inspection at office, is directed to the on-site manager or a spotter who will direct the load to the respective unloading area. A spotter monitors the unloading activity checking for hazardous materials, unacceptable wastes and safety concerns.

If unacceptable materials are discovered after unloading, the hauler is notified. The spotter physically documents with film and/or provide written notice to the hauler and Sarasota County. If unacceptable materials are encountered involving hazardous wastes (e.g. car batteries, thermostats, paint, etc.) the hazardous waste contingency plan in Appendix B will be implemented.

If non-recyclable materials are the predominant materials within the load, the load will be inspected by a County supervisor and redirected to the landfill working face.

An OSHA approved storage cabinet will be used for temporary storage of hazardous wastes found. The cabinet is a Justrite Mfg. Co. safety storage cabinet and is lockable. It is approved for acids and corrosives. This cabinet has a 45-gallon spill containment capacity. It is five feet tall, five feet wide and two feet deep. It is labeled for acids and corrosives. This cabinet will be located as shown on the site plan.

Waste tires, white goods and yard waste are not accepted at the materials recovery facility and will be directed to the proper area for storage. Separate areas are located at the CCSWDC for these wastes.

C&D debris that cannot be recycled is disposed of at CR 672 Liberty Waste, Balm, Florida. Class III waste that cannot be recycled is taken to the working face of the CCSWDC Class I landfill.

6.0 Equipment Maintenance Procedures

The contractor provides complete maintenance on-site including preventative maintenance, normal wear, unscheduled downtime and major overhaul. Equipment presently maintained includes heavy equipment, six heavy trucks, two light trucks and a 5,000 square foot maintenance facility. All equipment is company owned and is maintained in job-ready condition at all times. The equipment is on a five-year minimum replacement schedule. Three full-time mechanics are employed and stationed at the on-site maintenance facility.

All equipment service (fuel and lubrication) is performed by utilizing a mobile equipment service unit. Fuel and lubricants used to service the equipment are stored on the mobile equipment service unit at the materials recovery facility. Small quantities of maintenance supplies are stored in manufacturers containers that are properly labeled in the maintenance building.

Waste oil from maintenance of equipment is stored in a 500-gallon waste oil tank located in the maintenance building. The oil is recycled by certified oil recycling company. All receipts for recycled oil will be kept on-site at all times. Used oil filters are stored in proper recycling drums to be collected by the used oil recycler. All records are available on-site at all times.

Safety Kleen Inc handles waste cleaning fluids. All records are available on-site at all times. The contractor is a participant in the Safety Kleen "We Care" program. Any spilled oil or fluids are collected by catch pans and deposited in the appropriate container.

An equipment list is included in Appendix F.

7.0 Closure Plan

Sarasota County will notify the Department in writing prior to ceasing operations, and will specify a closing date. No waste will be received by the facility after the closing date. Within 30 days after receiving the final solid waste shipment, the owner will remove or otherwise dispose of all solid waste or residue in accordance with the approved closure plan. No putrescible wastes will be stored. Closure will be completed within 180 days after receiving the final solid waste shipment. Closure will include removal all recovered materials from the site. When closure is completed, Sarasota County will certify in writing to the Department that closure is complete. The Department will be allowed to make an inspection within 30 days to verify the closure and advise Sarasota County of the closure status.

8.0 Record Keeping

Operational records are maintained to include a daily log of the quantity of solid waste received, processed, stored, and removed from the site for recycling or disposal by Sarasota County. These records include each type of solid waste, recovered materials, residuals, and unacceptable waste, which is processed, recycled, and disposed. Such records shall be compiled on a monthly basis and shall be available for inspection by the Department. Records are maintained for three years.

Sarasota County will submit an annual report to the Department on Form 62-701.900(7). The report will include a summary of the amounts and types of wastes disposed of or recycled. Sarasota County will state that they recycle their materials. Sarasota County will include a statement giving the origin of materials recycled. Only material from Sarasota County is accepted at this MRF. The report will be submitted no later than April 1 of each year and covers the preceding calendar year.

Appendix A

Containment Pad Capacity Calculations

Hydrograph Report

Page 1

Hyd. No. 1

25YR.-24HR.

Hydrograph type = SCS Runoff
Storm frequency = 25 yrs
Drainage area = .61 ac
Basin Slope = .36 %
Tc method = USER
Total precip. = 8.00 in
Storm duration = 24 hrs

Peak discharge = 3.58 cfs
Time interval = 5 min
Curve number = 96
Hydraulic length = 110 ft
Time of conc. (Tc) = 8 min
Distribution = Type II
Shape factor = 256

Total Volume = 16,516 cuft, 0.38 acft

Hydrograph Discharge Table

Time – Outflow
(hrs cfs)

11.58	0.52
11.67	0.75
11.75	1.14
11.83	1.76
11.92	2.77
12.00	3.58 <<
12.08	3.56
12.17	3.16
12.25	2.73
12.33	2.28
12.42	1.81
12.50	1.36
12.58	0.96
12.67	0.65
12.75	0.51

...End

Hydrograph Report

Page 1

Hyd. No. 2

100YR.-24HR.

Hydrograph type = SCS Runoff
Storm frequency = 100 yrs
Drainage area = .61 ac
Basin Slope = .36 %
Tc method = USER
Total precip. = 10.00 in
Storm duration = 24 hrs

Peak discharge = 4.49 cfs
Time interval = 5 min
Curve number = 96
Hydraulic length = 110 ft
Time of conc. (Tc) = 8 min
Distribution = Type II
Shape factor = 256

Total Volume = 20,899 cuft, 0.48 acft

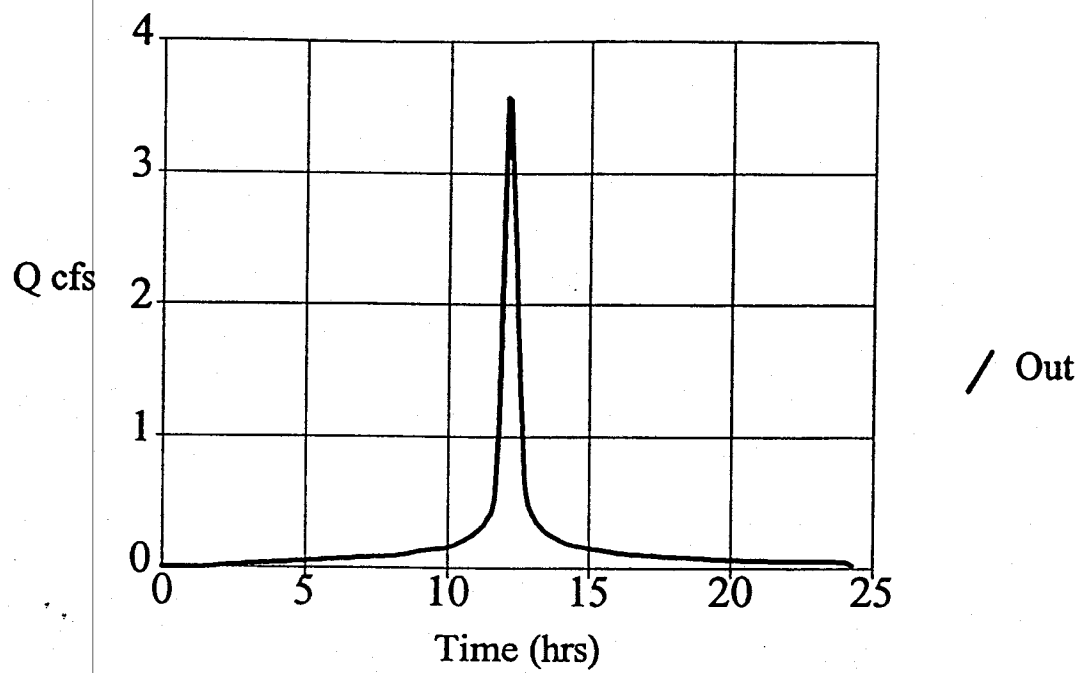
Hydrograph Discharge Table

Time – Outflow
(hrs cfs)

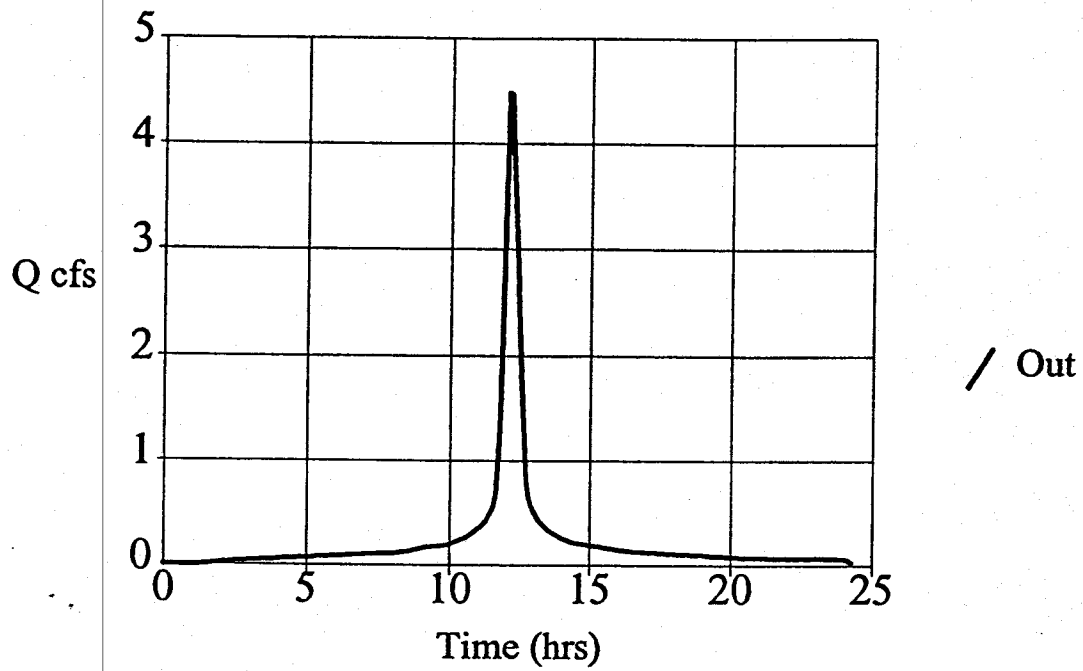
11.42	0.50
11.50	0.55
11.58	0.66
11.67	0.94
11.75	1.43
11.83	2.22
11.92	3.48
12.00	4.49 <<
12.08	4.47
12.17	3.97
12.25	3.43
12.33	2.85
12.42	2.27
12.50	1.71
12.58	1.20
12.67	0.81
12.75	0.64
12.83	0.58
12.92	0.52

...End

1 - SCS Runoff - 25 Yr - $Q_p = 3.57$ cfs



2 - SCS Runoff - 100 Yr - $Q_p = 4.49$ cfs



WEBER ENGINEERING
& SURVEYING, INC.
3932 SWIFT ROAD SUITE A
SARASOTA, FL 34231
(941) 921-3914

JOB CED RECYCLING FACILITY

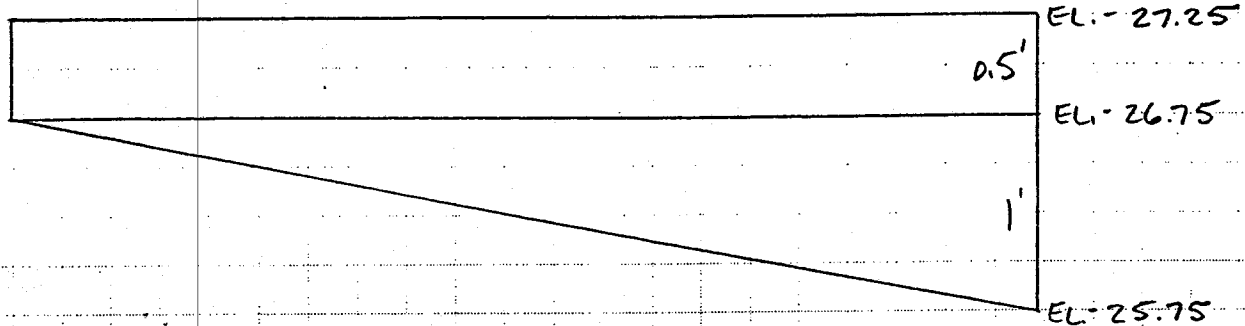
SHEET NO. _____ OF _____

CALCULATED BY CDJ DATE 5/12/98

CHECKED BY _____ DATE _____

SCALE _____

MATERIAL STORAGE AREA - 85' x 209'



STORAGE VOLUME

$$2 \times \left(\frac{1}{2}\right)(1)(104.5)(85) = 8,883 \text{ Ft}^3$$

$$2 \times (0.5)(104.5)(85) = 8,883 \text{ Ft}^3$$

$$17,766 \text{ Ft}^3$$

ASSUME 50% STORAGE LOST TO MATERIALS

$$17,766 \times 0.50 = 8,883 \text{ Ft}^3$$

STORAGE LOSS TO PUSH WALL

$$2 \times \left(\frac{1}{2}\right)(1)(104.5)(2) = 209 \text{ Ft}^3$$

$$2 \times (0.5)(104.5)(2) = 209 \text{ Ft}^3$$

$$418 \text{ Ft}^3$$

$$\text{TOTAL STORAGE VOLUME LOST} = 8,883 + 418 = \underline{9,301 \text{ Ft}^3}$$

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(941) 921-3914

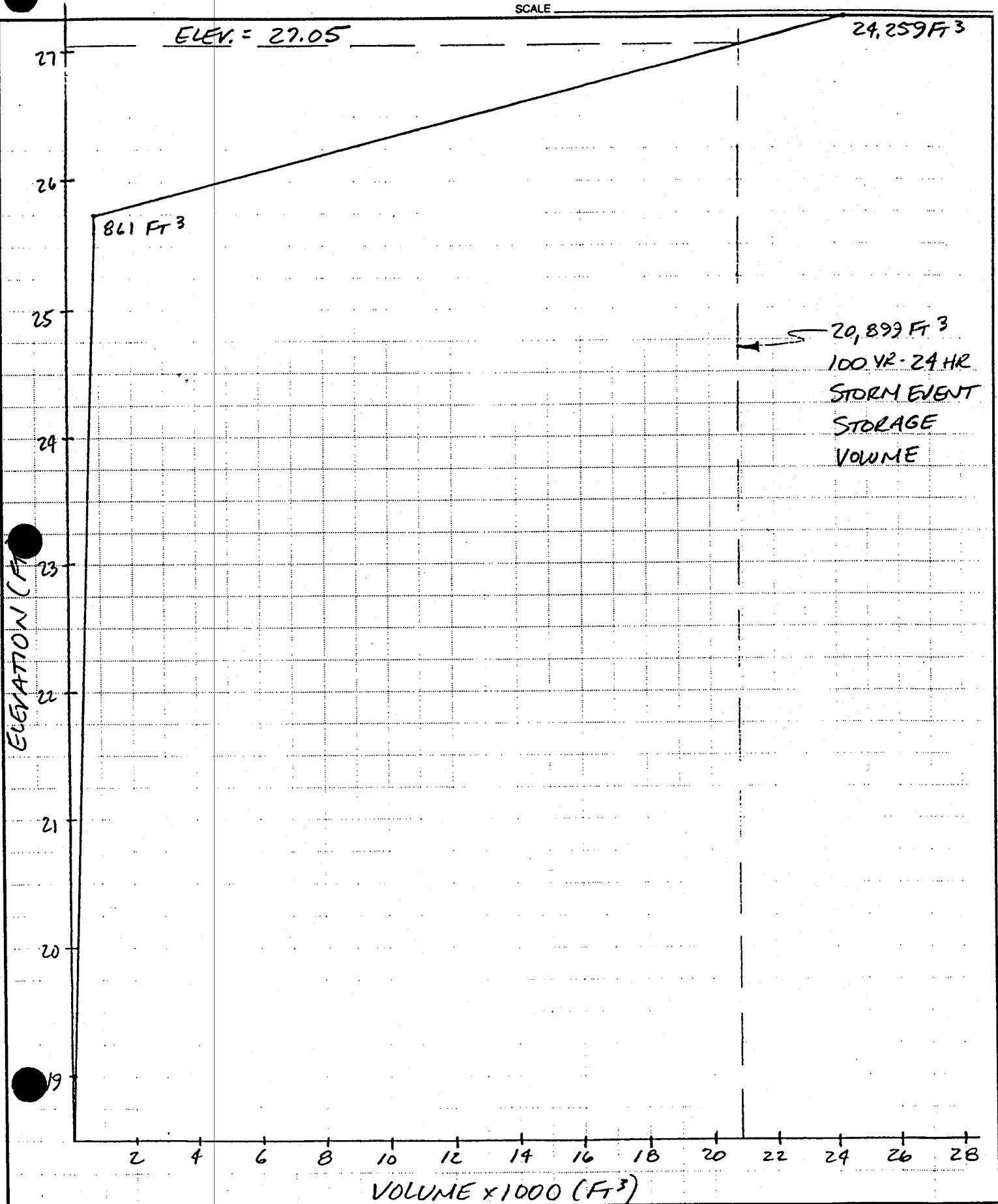
JOB C&D RECYCLING FACILITY

SHEET NO. _____ OF _____

CALCULATED BY CDJ DATE 5/12/98

CHECKED BY _____ DATE _____

SCALE _____



Reservoir Report

Page 1

Reservoir No. 1

STORAGE

Culvert / Orifice Structures

	[A]	[B]	[C]
Rise (in) =	0.0	0.0	0.0
Span (in) =	0.0	0.0	0.0
No. Barrels =	0	0	0
Invert El. (ft) =	0.00	0.00	0.00
Length (ft) =	0.0	0.0	0.0
Slope (%) =	0.00	0.00	0.00
N-Value =	.013	.013	.013
Orif. Coeff. =	0.60	0.60	0.60
Multi-Stage =	—	No	No

Weir Structures

	[A]	[B]	[C]
Crest Len (ft) =	0.0	0.0	0.0
Crest El. (ft) =	0.00	0.00	0.00
Weir Coeff. =	3.00	3.00	3.00
Eqn. Exp. =	1.50	1.50	1.50
Multi-Stage =	No	No	No

Tailwater Elevation = 0.00 ft

Note: All outflows have been analyzed under inlet and outlet control.

Stage / Storage / Discharge Table

Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
0.0	0.000	18.50	---	---	---	---	---	---	0.00
0.1	0.000	18.60	---	---	---	---	---	---	0.00
0.2	0.001	18.70	---	---	---	---	---	---	0.00
0.3	0.001	18.80	---	---	---	---	---	---	0.00
0.4	0.002	18.90	---	---	---	---	---	---	0.00
0.5	0.002	19.00	---	---	---	---	---	---	0.00
0.6	0.002	19.10	---	---	---	---	---	---	0.00
0.7	0.003	19.20	---	---	---	---	---	---	0.00
0.8	0.003	19.30	---	---	---	---	---	---	0.00
0.9	0.004	19.40	---	---	---	---	---	---	0.00
1.0	0.004	19.50	---	---	---	---	---	---	0.00
1.1	0.004	19.60	---	---	---	---	---	---	0.00
1.2	0.004	19.70	---	---	---	---	---	---	0.00
1.3	0.005	19.80	---	---	---	---	---	---	0.00
1.4	0.005	19.90	---	---	---	---	---	---	0.00
1.5	0.005	20.00	---	---	---	---	---	---	0.00
1.6	0.005	20.10	---	---	---	---	---	---	0.00
1.7	0.005	20.20	---	---	---	---	---	---	0.00
1.8	0.006	20.30	---	---	---	---	---	---	0.00
1.9	0.006	20.40	---	---	---	---	---	---	0.00
2.0	0.006	20.50	---	---	---	---	---	---	0.00
2.1	0.006	20.60	---	---	---	---	---	---	0.00
2.2	0.007	20.70	---	---	---	---	---	---	0.00
2.3	0.007	20.80	---	---	---	---	---	---	0.00

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Stage / Storage / Discharge Table

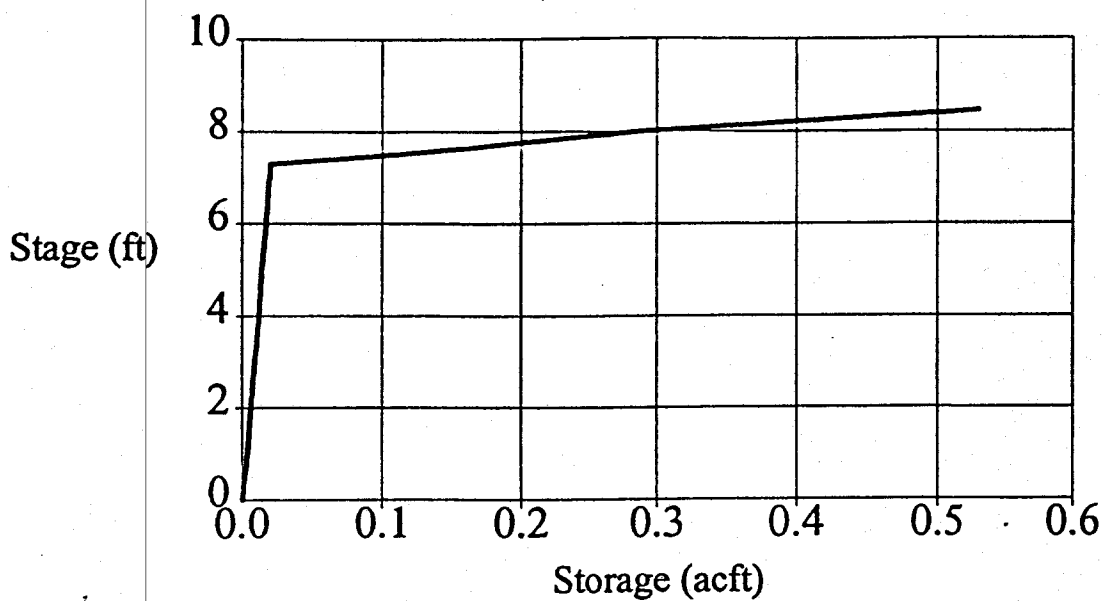
Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
2.4	0.007	20.90	---	---	---	---	---	---	0.00
2.5	0.007	21.00	---	---	---	---	---	---	0.00
2.6	0.008	21.10	---	---	---	---	---	---	0.00
2.7	0.008	21.20	---	---	---	---	---	---	0.00
2.8	0.008	21.30	---	---	---	---	---	---	0.00
2.9	0.009	21.40	---	---	---	---	---	---	0.00
3.0	0.009	21.50	---	---	---	---	---	---	0.00
3.1	0.009	21.60	---	---	---	---	---	---	0.00
3.2	0.010	21.70	---	---	---	---	---	---	0.00
3.3	0.010	21.80	---	---	---	---	---	---	0.00
3.4	0.010	21.90	---	---	---	---	---	---	0.00
3.5	0.010	22.00	---	---	---	---	---	---	0.00
3.6	0.011	22.10	---	---	---	---	---	---	0.00
3.7	0.011	22.20	---	---	---	---	---	---	0.00
3.8	0.011	22.30	---	---	---	---	---	---	0.00
3.9	0.012	22.40	---	---	---	---	---	---	0.00
4.0	0.012	22.50	---	---	---	---	---	---	0.00
4.1	0.012	22.60	---	---	---	---	---	---	0.00
4.2	0.012	22.70	---	---	---	---	---	---	0.00
4.3	0.013	22.80	---	---	---	---	---	---	0.00
4.4	0.013	22.90	---	---	---	---	---	---	0.00
4.5	0.013	23.00	---	---	---	---	---	---	0.00
4.6	0.013	23.10	---	---	---	---	---	---	0.00
4.7	0.013	23.20	---	---	---	---	---	---	0.00
4.8	0.014	23.30	---	---	---	---	---	---	0.00
4.9	0.014	23.40	---	---	---	---	---	---	0.00
5.0	0.014	23.50	---	---	---	---	---	---	0.00
5.1	0.014	23.60	---	---	---	---	---	---	0.00
5.2	0.015	23.70	---	---	---	---	---	---	0.00
5.3	0.015	23.80	---	---	---	---	---	---	0.00
5.4	0.015	23.90	---	---	---	---	---	---	0.00
5.5	0.015	24.00	---	---	---	---	---	---	0.00
5.6	0.016	24.10	---	---	---	---	---	---	0.00
5.7	0.016	24.20	---	---	---	---	---	---	0.00
5.8	0.016	24.30	---	---	---	---	---	---	0.00
5.9	0.017	24.40	---	---	---	---	---	---	0.00
6.0	0.017	24.50	---	---	---	---	---	---	0.00
6.1	0.017	24.63	---	---	---	---	---	---	0.02
6.3	0.018	24.76	---	---	---	---	---	---	0.04
6.4	0.018	24.89	---	---	---	---	---	---	0.05
6.5	0.018	25.02	---	---	---	---	---	---	0.07
6.7	0.019	25.15	---	---	---	---	---	---	0.09
6.8	0.019	25.28	---	---	---	---	---	---	0.11
6.9	0.019	25.41	---	---	---	---	---	---	0.13
7.0	0.019	25.54	---	---	---	---	---	---	0.14
7.2	0.020	25.67	---	---	---	---	---	---	0.16
7.3	0.020	25.75	---	---	---	---	---	---	0.18
7.3	0.029	25.77	---	---	---	---	---	---	0.18
7.3	0.038	25.79	---	---	---	---	---	---	0.18

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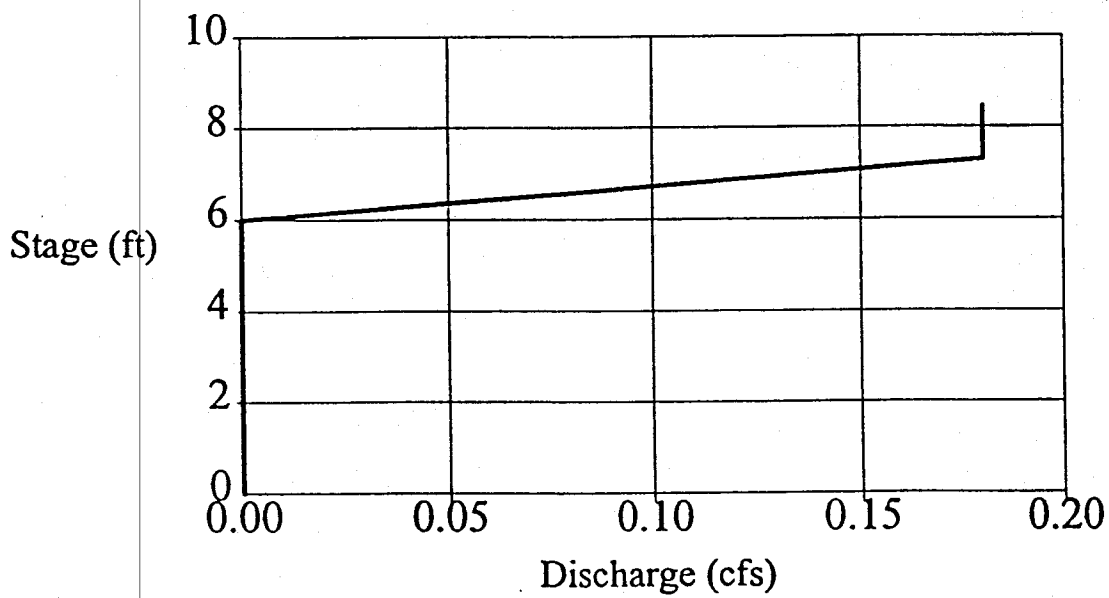
Stage / Storage / Discharge Table

Stage (ft)	Storage (acft)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Discharge (cfs)
7.4	0.046	25.81	—	—	—	—	—	—	0.18
7.4	0.055	25.83	—	—	—	—	—	—	0.18
7.4	0.064	25.85	—	—	—	—	—	—	0.18
7.4	0.073	25.87	—	—	—	—	—	—	0.18
7.4	0.082	25.89	—	—	—	—	—	—	0.18
7.5	0.090	25.91	—	—	—	—	—	—	0.18
7.5	0.099	25.93	—	—	—	—	—	—	0.18
7.5	0.108	26.00	—	—	—	—	—	—	0.18
7.6	0.126	26.05	—	—	—	—	—	—	0.18
7.6	0.144	26.10	—	—	—	—	—	—	0.18
7.7	0.162	26.15	—	—	—	—	—	—	0.18
7.7	0.180	26.20	—	—	—	—	—	—	0.18
7.8	0.197	26.25	—	—	—	—	—	—	0.18
7.8	0.215	26.30	—	—	—	—	—	—	0.18
7.9	0.233	26.35	—	—	—	—	—	—	0.18
7.9	0.251	26.40	—	—	—	—	—	—	0.18
8.0	0.269	26.45	—	—	—	—	—	—	0.18
8.0	0.287	26.50	—	—	—	—	—	—	0.18
8.1	0.314	26.55	—	—	—	—	—	—	0.18
8.1	0.341	26.60	—	—	—	—	—	—	0.18
8.2	0.368	26.65	—	—	—	—	—	—	0.18
8.2	0.395	26.70	—	—	—	—	—	—	0.18
8.3	0.422	26.75	—	—	—	—	—	—	0.18
8.3	0.449	26.80	—	—	—	—	—	—	0.18
8.4	0.476	26.85	—	—	—	—	—	—	0.18
8.4	0.503	26.90	—	—	—	—	—	—	0.18
8.5	0.530	26.95	—	—	—	—	—	—	0.18
8.5	0.557	27.25	—	—	—	—	—	—	0.18

Stage / Storage



Stage / Discharge



Hydrograph Report

Page 1

Hyd. No. 3

Res-Route

Hydrograph type = Reservoir
Storm frequency = 100 yrs
Inflow hyd. No. = 2
Max. Elevation = 26.49 ft

Peak discharge = 0.18 cfs
Time interval = 5 min
Reservoir name = STORAGE
Max. Storage = 0.28 acft

Storage indication method used.

Total Volume = 20,158 cuft, 0.46 acft

Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
9.33	0.18	25.72	---	---	---	---	---	---	0.17
9.42	0.18	25.73	---	---	---	---	---	---	0.18
9.50	0.18	25.75	---	---	---	---	---	---	0.18
9.58	0.19	25.75	---	---	---	---	---	---	0.18 <<
9.67	0.19	25.75	---	---	---	---	---	---	0.18 <<
9.75	0.19	25.75	---	---	---	---	---	---	0.18 <<
9.83	0.20	25.75	---	---	---	---	---	---	0.18 <<
9.92	0.20	25.75	---	---	---	---	---	---	0.18 <<
10.00	0.21	25.75	---	---	---	---	---	---	0.18 <<
10.08	0.22	25.75	---	---	---	---	---	---	0.18 <<
10.17	0.22	25.75	---	---	---	---	---	---	0.18 <<
10.25	0.23	25.75	---	---	---	---	---	---	0.18 <<
10.33	0.24	25.75	---	---	---	---	---	---	0.18 <<
10.42	0.25	25.75	---	---	---	---	---	---	0.18 <<
10.50	0.27	25.75	---	---	---	---	---	---	0.18 <<
10.58	0.28	25.75	---	---	---	---	---	---	0.18 <<
10.67	0.29	25.75	---	---	---	---	---	---	0.18 <<
10.75	0.31	25.75	---	---	---	---	---	---	0.18 <<
10.83	0.32	25.75	---	---	---	---	---	---	0.18 <<
10.92	0.34	25.75	---	---	---	---	---	---	0.18 <<
11.00	0.36	25.75	---	---	---	---	---	---	0.18 <<
11.08	0.37	25.75	---	---	---	---	---	---	0.18 <<
11.17	0.39	25.75	---	---	---	---	---	---	0.18 <<
11.25	0.42	25.75	---	---	---	---	---	---	0.18 <<
11.33	0.46	25.75	---	---	---	---	---	---	0.18 <<
11.42	0.50	25.75	---	---	---	---	---	---	0.18 <<
11.50	0.55	25.75	---	---	---	---	---	---	0.18 <<
11.58	0.66	25.75	---	---	---	---	---	---	0.18 <<
11.67	0.94	25.75	---	---	---	---	---	---	0.18 <<
11.75	1.43	25.75	---	---	---	---	---	---	0.18 <<
11.83	2.22	25.75	---	---	---	---	---	---	0.18 <<
11.92	3.48	25.75	---	---	---	---	---	---	0.18 <<
12.00	4.49 <<	25.75	---	---	---	---	---	---	0.18 <<
12.08	4.47	25.75	---	---	---	---	---	---	0.18 <<
12.17	3.97	25.75	---	---	---	---	---	---	0.18 <<
12.25	3.43	25.75	---	---	---	---	---	---	0.18 <<

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Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
12.33	2.85	25.75	---	---	---	---	---	---	0.18 <<
12.42	2.27	25.75	---	---	---	---	---	---	0.18 <<
12.50	1.71	25.75	---	---	---	---	---	---	0.18 <<
12.58	1.20	25.75	---	---	---	---	---	---	0.18 <<
12.67	0.81	25.75	---	---	---	---	---	---	0.18 <<
12.75	0.64	25.75	---	---	---	---	---	---	0.18 <<
12.83	0.58	25.75	---	---	---	---	---	---	0.18 <<
12.92	0.52	25.75	---	---	---	---	---	---	0.18 <<
13.00	0.48	25.75	---	---	---	---	---	---	0.18 <<
13.08	0.44	25.75	---	---	---	---	---	---	0.18 <<
13.17	0.41	25.75	---	---	---	---	---	---	0.18 <<
13.25	0.39	25.75	---	---	---	---	---	---	0.18 <<
13.33	0.37	25.75	---	---	---	---	---	---	0.18 <<
13.42	0.35	25.75	---	---	---	---	---	---	0.18 <<
13.50	0.34	25.75	---	---	---	---	---	---	0.18 <<
13.58	0.32	25.75	---	---	---	---	---	---	0.18 <<
13.67	0.31	25.75	---	---	---	---	---	---	0.18 <<
13.75	0.30	25.75	---	---	---	---	---	---	0.18 <<
13.83	0.28	25.75	---	---	---	---	---	---	0.18 <<
13.92	0.27	25.75	---	---	---	---	---	---	0.18 <<
14.00	0.26	25.75	---	---	---	---	---	---	0.18 <<
14.08	0.25	25.75	---	---	---	---	---	---	0.18 <<
14.17	0.24	25.75	---	---	---	---	---	---	0.18 <<
14.25	0.23	25.75	---	---	---	---	---	---	0.18 <<
14.33	0.23	25.75	---	---	---	---	---	---	0.18 <<
14.42	0.22	25.75	---	---	---	---	---	---	0.18 <<
14.50	0.22	25.75	---	---	---	---	---	---	0.18 <<
14.58	0.21	25.75	---	---	---	---	---	---	0.18 <<
14.67	0.21	25.75	---	---	---	---	---	---	0.18 <<
14.75	0.21	25.75	---	---	---	---	---	---	0.18 <<
14.83	0.20	25.75	---	---	---	---	---	---	0.18 <<
14.92	0.20	25.75	---	---	---	---	---	---	0.18 <<
15.00	0.20	25.75	---	---	---	---	---	---	0.18 <<
15.08	0.19	25.75	---	---	---	---	---	---	0.18 <<
15.17	0.19	25.75	---	---	---	---	---	---	0.18 <<
15.25	0.18	25.75	---	---	---	---	---	---	0.18 <<
15.33	0.18	25.75	---	---	---	---	---	---	0.18 <<
15.42	0.18	25.75	---	---	---	---	---	---	0.18 <<
15.50	0.17	25.75	---	---	---	---	---	---	0.18 <<
15.58	0.17	25.75	---	---	---	---	---	---	0.18 <<
15.67	0.17	25.75	---	---	---	---	---	---	0.18 <<
15.75	0.16	25.75	---	---	---	---	---	---	0.18 <<
15.83	0.16	25.75	---	---	---	---	---	---	0.18 <<
15.92	0.16	25.75	---	---	---	---	---	---	0.18 <<
16.00	0.15	25.75	---	---	---	---	---	---	0.18 <<
16.08	0.15	25.75	---	---	---	---	---	---	0.18 <<
16.17	0.15	25.75	---	---	---	---	---	---	0.18 <<
16.25	0.14	25.75	---	---	---	---	---	---	0.18 <<
16.33	0.14	25.75	---	---	---	---	---	---	0.18 <<

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Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
16.42	0.14	25.75	---	---	---	---	---	---	0.18 <<
16.50	0.14	25.75	---	---	---	---	---	---	0.18 <<
16.58	0.14	25.75	---	---	---	---	---	---	0.18 <<
16.67	0.13	25.75	---	---	---	---	---	---	0.18 <<
16.75	0.13	25.75	---	---	---	---	---	---	0.18 <<
16.83	0.13	25.75	---	---	---	---	---	---	0.18 <<
16.92	0.13	25.75	---	---	---	---	---	---	0.18 <<
17.00	0.13	25.75	---	---	---	---	---	---	0.18 <<
17.08	0.13	25.75	---	---	---	---	---	---	0.18 <<
17.17	0.13	25.75	---	---	---	---	---	---	0.18 <<
17.25	0.13	25.75	---	---	---	---	---	---	0.18 <<
17.33	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.42	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.50	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.58	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.67	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.75	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.83	0.12	25.75	---	---	---	---	---	---	0.18 <<
17.92	0.12	25.75	---	---	---	---	---	---	0.18 <<
18.00	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.08	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.17	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.25	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.33	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.42	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.50	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.58	0.11	25.75	---	---	---	---	---	---	0.18 <<
18.67	0.10	25.75	---	---	---	---	---	---	0.18 <<
18.75	0.10	25.75	---	---	---	---	---	---	0.18 <<
18.83	0.10	25.75	---	---	---	---	---	---	0.18 <<
18.92	0.10	25.75	---	---	---	---	---	---	0.18 <<
19.00	0.10	25.75	---	---	---	---	---	---	0.18 <<
19.08	0.10	25.75	---	---	---	---	---	---	0.18 <<
19.17	0.10	25.75	---	---	---	---	---	---	0.18 <<
19.25	0.10	25.75	---	---	---	---	---	---	0.18 <<
19.33	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.42	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.50	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.58	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.67	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.75	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.83	0.09	25.75	---	---	---	---	---	---	0.18 <<
19.92	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.00	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.08	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.17	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.25	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.33	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.42	0.08	25.75	---	---	---	---	---	---	0.18 <<

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Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
20.50	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.58	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.67	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.75	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.83	0.08	25.75	---	---	---	---	---	---	0.18 <<
20.92	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.00	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.08	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.17	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.25	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.33	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.42	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.50	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.58	0.08	25.75	---	---	---	---	---	---	0.18 <<
21.67	0.07	25.75	---	---	---	---	---	---	0.18 <<
21.75	0.07	25.75	---	---	---	---	---	---	0.18 <<
21.83	0.07	25.75	---	---	---	---	---	---	0.18 <<
21.92	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.00	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.08	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.17	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.25	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.33	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.42	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.50	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.58	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.67	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.75	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.83	0.07	25.75	---	---	---	---	---	---	0.18 <<
22.92	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.00	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.08	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.17	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.25	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.33	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.42	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.50	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.58	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.67	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.75	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.83	0.07	25.75	---	---	---	---	---	---	0.18 <<
23.92	0.07	25.75	---	---	---	---	---	---	0.18 <<
24.00	0.07	25.75	---	---	---	---	---	---	0.18 <<
24.08	0.06	25.75	---	---	---	---	---	---	0.18 <<
24.17	0.05	25.75	---	---	---	---	---	---	0.18 <<
24.25	0.04	25.75	---	---	---	---	---	---	0.18 <<
24.33	0.03	25.75	---	---	---	---	---	---	0.18 <<
24.42	0.02	25.75	---	---	---	---	---	---	0.18 <<
24.50	0.01	25.75	---	---	---	---	---	---	0.18 <<

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Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
24.58	0.01	25.75	---	---	---	---	---	---	0.18 <<
24.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
24.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
24.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
24.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
25.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
26.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
27.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.58	0.00	25.75	---	---	---	---	---	---	0.18 <<

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Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
28.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
28.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
29.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
30.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
31.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.67	0.00	25.75	---	---	---	---	---	---	0.18 <<

Continues on next page...

Hydrograph Discharge Table

Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
32.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
32.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
33.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
34.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
35.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.75	0.00	25.75	---	---	---	---	---	---	0.18 <<

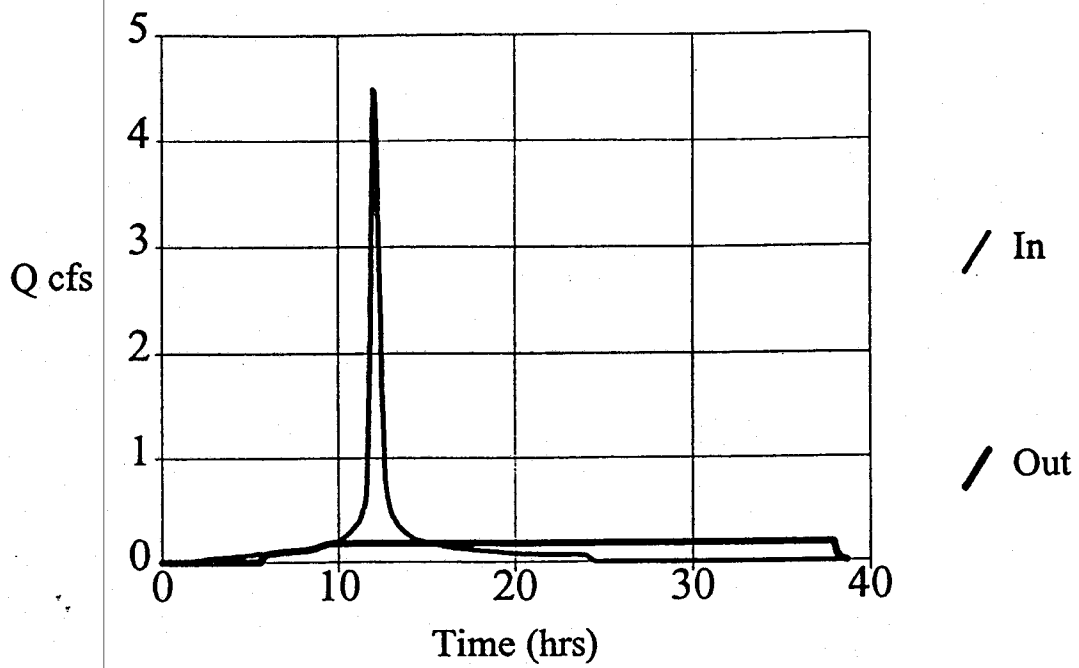
Continues on next page...

Hydrograph Discharge Table

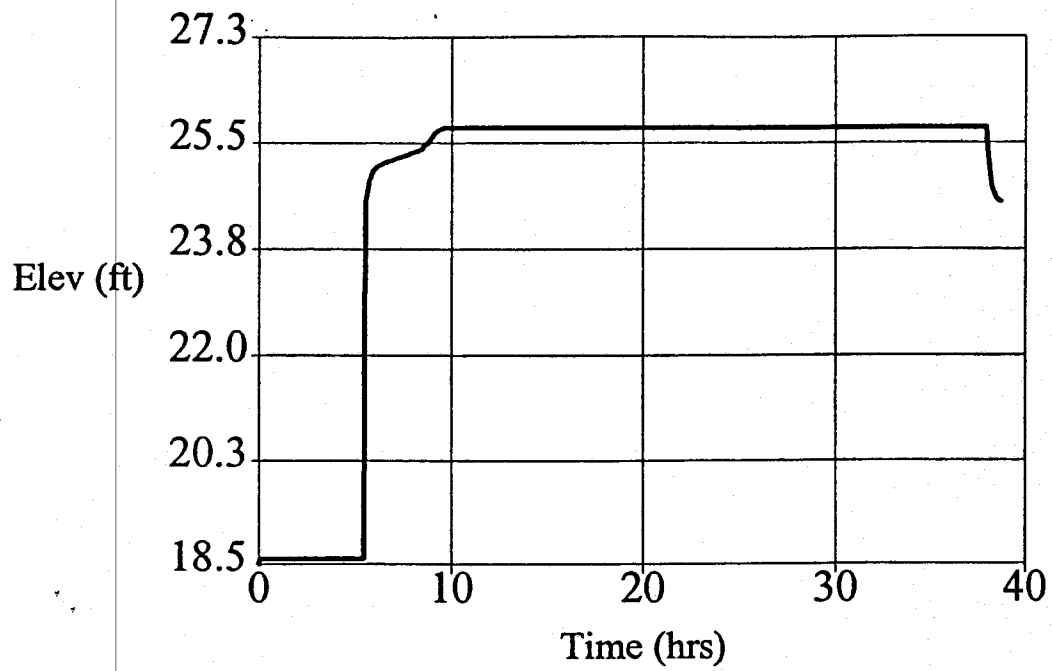
Time (hrs)	Inflow (cfs)	Elevation (ft)	Culv. A (cfs)	Culv. B (cfs)	Culv. C (cfs)	Weir A (cfs)	Weir B (cfs)	Weir C (cfs)	Outflow (cfs)
36.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
36.92	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.00	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.08	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.17	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.25	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.33	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.42	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.50	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.58	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.67	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.75	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.83	0.00	25.75	---	---	---	---	---	---	0.18 <<
37.92	0.00	25.75	---	---	---	---	---	---	0.18 <<

...End

3 - Reservoir - 100 Yr - $Q_p = .18$ cfs



3 - Reservoir - 100 Yr - Max. El. = 26.48 ft



Appendix B

Hazardous Waste Contingency Plan

CONTINGENCY PLANS

HAZARDOUS WASTE CONTINGENCY PLAN

I. Background and purpose

In accordance with Section 17 of the Contract the... "County shall not knowingly direct, deliver or send any Hazardous Wastes to the Recycling Facility. Contractor shall refuse to accept any Hazardous Waste delivered to the Recycling Facility which would have been revealed by proper inspection. If any Hazardous Waste is delivered in any load, the Contractor may reject the Hazardous Waste or the entire load. Contractor shall immediately notify the County of such load rejection."

II. Non-emergency Operations

Incidents which involve potential Hazardous Materials which are below reportable limits, and do not pose a threat to life or property are considered non-emergency. The facility manager shall be immediately notified of all Hazardous Materials incidents.

A. Non-emergency Operations-Hauler identified

If Hazardous Materials are identified, the load master shall attempt to determine the hauler and notify same of their responsibility to remove the material or clean up the site as required by law. The load master shall immediately notify the facility manager.

B. Non-emergency Operations - Hauler not identified

1. Hazardous Materials that are identified which are packaged in factory or approved containers may be placed at the County's approved Hazardous Materials collection site for that substance. Use of personal protection equipment is mandatory.

2. Hazardous Materials which are not in an approved or factory container shall be collected by trained personnel and placed in the Company's Hazardous Materials container for that substance. Personal protection equipment is mandatory.

III. Emergency operations

Emergency operations are those incidents which involve Hazardous Materials which are at or above reportable limits or involve a threat to life or property.

A. The facility manager shall be immediately notified and in turn shall notify the County Fire Department via 911 emergency communications.

B. All potential ignition sources shall be eliminated, i.e., machinery shut down or removal and electricity shut off.

- C. incident area will be isolated with evacuation as necessary.
- D. Secondary notifications shall be done by office staff to the Landfill Manager and Solid Waste Director.

IV, Supplies

Meyer & Gabbert will keep on hand approved containers, equipment, devices, and personal protection equipment in the amount necessary to handle the majority of incidents. This equipment shall include but not be limited to:

1. Spill kit and salvage drum(s).
2. Overpac salvage container(s) .\
3. Salvage drum lifter.
4. Chemical absorbents.
5. Petroleum absorbents.
6. Personal protection equipment to include Tyvek coveralls with hood, rubber gloves, filter mask/respirator, and eye protection.
7. Flagging/barrier tape.
8. DOT Hazardous Materials Guide Book.
9. First aid kit.

V. Training

Training in identification and handling of Hazardous Materials has been accomplished by key personnel. These include courses given by Sarasota County Technical Institute (FSCF 207 Hazardous Materials I and FSCF Hazardous Materials II) . These classes were forty contact hours each.

VI . Transportation

Meyer & Gabbert will contract with a licensed Hazardous Materials collector for transportation of Hazardous Materials to a licensed disposal facility. Receipts and invoices will be retained at the business office for review by the Director or will contract with a private hauler to remove the materials appropriately.

If unacceptable materials are encountered in a load not of hazardous nature, Meyer & Gabbert will request a County appointed supervisor to co-inspect the load. After this co-inspection, the County supervisor will make the final determination as to the disposition of the load. This may mean reloading on the haulers truck and redirecting to the scale house for a new ticket for another classification of waste; or, the load may be allowed to stay at the C&D site and be processed.

Appendix C

Hurricane Contingency Plan

HURRICANE CONTINGENCY PLAN

This plan is a cooperative effort with the Solid Waste Operations Division of Sarasota County.

I. Hurricane/Stormwater Phase I 12-24 hours prior to storm.

1. Ensure that sufficient supplies are on hand to support daily operations for at least one week (i.e., fuel, lubricates, paper, and sanitary goods).
2. Inspect office and equipment tie downs and anchors, adjusting as required.
3. Board up windows and doors on office and other structures.
4. Procure and check emergency generator for operation and service condition.
5. Top off all equipment with fuel and assure operational status.
6. Order any anticipated repair parts or consumable items required.
7. Back up all records on computer remove backup tape and send to main office.
8. Secure all loose items on C&D site.
9. Inventory items at site. Take photos if time permits.
10. Check employee notifications list.

II Hurricane warning Phase II 0-12 hours prior to storm.

1. Remove and secure all records, valuables and personal property. All records should be securely wrapped into a waterproof package.
2. Gather all mobile equipment on the leeward side of the earth berm adjoining the C&D site. Secure or remove all loose items on or in the equipment.
3. Advise key employees of post hurricane operational plan.
4. Double check key employee notification list; i.e., address and phone numbers of where they will be staying during the storm.

III. Post Hurricane Plan

1. Check condition of site and perform a damage assessment. Clean and repair structures and equipment as required.
2. Bypass MRF if the facilities are damaged to the point that contractor cannot operate within permit stipulations.
3. Contact rental agents for replacement equipment or structures as needed.
4. Contact key personnel for a report on personnel on the notification list. This report should include a damage assessment of their home, transportation, and phone as well as the physical condition of their family. Encourage employees to return to work as soon as possible.

IV Resume operations as conditions dictate:

- a. All equipment and building intact.
 - I. Normalize operations.
- b. All equipment intact buildings damaged or absent:
 - I. Bypass MRF until facility can be repaired to comply with permit stipulations.
 - 2. Bring in temporary office trailer/RV or other to serve as office and sanitary facility.
- c. All stationary equipment damaged or absent -buildings damaged or absent:
 - I. Rent or lease mobile equipment to perform manual recycling until replacement equipment and buildings are installed.
 - 2. Secure temporary employees to perform manual recycling as required.
 - 3. Remove any non-processed materials to landfill or other recycling facilities.
 - 4. Continue bypass of C&D to landfill until facility is repaired & inspected and certified to reopen.

Appendix D

Operations Contingency Plan

Operational Contingency Plan

This plan is a cooperative effort with the Solid Waste Operations Division of Sarasota County. The following procedures will be used in case of interruption of service due to explosion, fire, natural disaster, or prolonged down time of any equipment necessary to carry out the obligations of the contract between Sarasota County and Meyer & Gabbert for recycling of C&D and Class III waste materials.

Post Incident Procedure:

1. Check condition of site and perform a damage assessment. Bypass MRF if situation dictates.
2. Clean and repair structures and equipment as required.
3. Contact rental/lease agent for replacement equipment or structures as needed.
4. Contact all personnel on notification list if hurricane or natural disaster.
5. Resume operations as conditions dictate:
 - A. All buildings and equipment intact; normalize operations.
 - B. All equipment intact; buildings absent or damaged:
 - B1. Operate from concrete slab or bypass MRF until building is repaired
 - B2. Bring in field office trailer from other division, if office is damaged or destroyed.
 - C. Stationary equipment damaged or broken:
 - C1. Evaluate equipment in need of repair.
 - C2. Bypass MRF if necessary until permit specifications can be compiled with.
 - C3. Order repair/replacement parts as needed.
 - C4. Mechanics and a welder/fabricator are available from our shop to make necessary repairs. Warranty repairs will be done by manufacturer. Extended warranties were purchased.
 - C5. Rent or lease replacement stationary equipment if damage is beyond repair. Secure temporary employees to perform manual recycling as required.
 - D. Mobile equipment damaged or broken:
 - D1. Bring in mobile equipment from our excavation division as needed.
 - D2. Rent or lease mobile equipment, if not available from our company.
6. In the event of a major explosion or disaster, minimum technology recycling would be put in place with possible diversion of loads to the landfill face.

Appendix E

Training

Meyer & Gabbert Recycling Facility Training Plan

1) Operators

Meyer & Gabbert has at least (1) of the principals of the company trained as a C & D facility operator, and who also receives C.E.U. hours as required by the rule. The University of Florida TREEO Center provides this training.

Enclosed is a list of classes for the upcoming year which may be attended to assure the operator receives (15) hours of continuing education within (3) years of successful completion of the initial training requirement.

2) Spotters

Meyer & Gabbert has (2) supervisory employees trained as spotters for C&D facilities. Meyer & Gabbert has these spotters or their subsequent replacement continue their training and C.E.U. hours as stated by the rule. Meyer & Gabbert operators and spotters teach general labor employees the intent of the spotting requirements in day to day operations. This training provides as many as (6) assistant spotters to assume proper operations. Meyer & Gabbert contracts with the University of Florida TREEO Center for spotter training, and always has at least (1) spotter on duty at all times. Furthermore, Meyer & Gabbert assures that spotters complete at least (8) hours of continuing education with the University of Florida TREEO Center within (3) years of completion of the initial training.

Meyer & Gabbert has this training plan on file at the recycling facility along with training records and documentation of training.



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- » [Pollution Prevention](#)
- » [Solid Waste](#)
- » [Stormwater Management](#)
- » [Train-the-Trainer](#)
- » [Water Quality \(W/WW\)](#)
- [Continuing Education Credit Information](#)
- [Press Releases](#)

Solid Waste

[Introduction](#)

[Courses-at-a-Glance](#)

[16-Hour Initial Training Course for Transfer Station Operators](#)

- Certification Credit Type: Initial

[19-Hour Initial Training Course for Transfer Station Operators and MI Operators](#)

- CEU: 1.9
- Solid Waste I II III/C&D : 10.0
- SWANA CEU: 2.50
- Solid Waste TS/MRF: 8.0
- Solid Waste Spotter: 4.0
- FBPE PDH (EXP00074): 19.0
- Solid Waste Initial: 19.0
- Times: Day One and Two: 7:30 am - 6:30 pm

[24-Hour Initial Training Course for Landfill Operators \(Class I, II, III Sites\)](#)

- Certification Credit Type: Initial
- CEU: 2.4
- FBPE PDH (EXP00074): 24.0
- Solid Waste I,II,III/C&D: 16.0
- SWANA CEU: Pending
- Times: Day One & Two: 7:30 am - 5:30 pm
- Time Day Three: 7:30 am - 1:30 pm

[8-Hour Initial Training Course for Spotters at Class I, II, III Facilities, Processing Facilities and C&D Facilities](#)

- Certification Credit Type: Initial
- CEU: 0.8
- Solid Waste Spotter Initial: 8.0
- Solid Waste I II III/C&D: 8.0
- Solid Waste Spotter: 8.0
- Solid Waste TS/MRF: 8.0
- SWANA CEU: 3.0
- FBPE PDHs (EXP 00074): 8.0
- Time: 8:00 a.m. - 5:00 p.m.

[Asbestos Awareness Course for Landfill Operators](#)

- Certification Credit Type: Refresher
- On-site training is available.
- CEU: 0.4
- FBPE PDHs (EXP 00074): 4.0
- Solid Waste I II III/C&D: 4.0
- Solid Waste Spotter : 4.0
- Solid Waste TS/MRF: 4.0
- SWANA CEU: 2.5
- Time: 8:00 am - 12:00 pm

[Bird and Wildlife Management at Solid Waste Management Facilities](#)

- Certification Credit Type: Refresher

[Chemical Compatibility and Storage](#)

- CEU: 0.8
- FBPE PDHs: 8
- FBPE Provider No.: EXP00074
- FDEP OCP Course No.: 4255
- FDEP OCP DW/WW CEUs: 0.8
- FDEP OCP Level: Intermediate
- Time: 8:00 a.m. - 5:00 p.m.

Construction and Demolition Debris Landfills: A Short Course for Ope 24 Hours

- Certification Credit Type: Initial
- CEU: 2.4
- Solid Waste Initial C&D: 24.0
- Solid Waste I II III/C&D: 16.0
- SWANA CEU: 2.4
- FBPE PDHs (EXP 00074): 24.0
- Time: Day One: 7:30 a.m. - 6:00 p.m.
- Time: Day Two: 7:30 a.m. - 5:30 p.m.
- Time: Day Three: 8:00 a.m. - 3:00 p.m.

Construction and Demolition Waste Recycling

- Certification Credit Type: Refresher
- CEU: 0.7
- SWANA CEU: 1.50
- Solid Waste I II III/C&D: 7.0
- Solid Waste MRF: 7.0
- Solid Waste Spotter: 7.0
- FBPE PDHs (EXP 00074): 7.0
- Time: 8:00am-4:00pm

DOT Hazardous Materials 126-F Online

- CEU: 0.7
- FBPE PDHs: 7.0
- FBPE Provider No.: EXP 00074

Environmental Management Systems - Overview

- Certification Credit Type: Refresher
- CEU: 0.7
- FBPE PDHs: 7.0
- FBPE Provider No.: 00074
- Solid Waste I II III/C&D: 4.0
- Solid Waste TS/MRF: 4.0
- SWANA CEUs: 5.5
- Time: 8:30 am - 5:00 pm

Environmental Management Systems Internal Audit Procedures

- CEU: 1.5
- FBPE PDHs: 15
- FBPE Provider No.: EXP 00074
- Solid Waste I II III/C&D: 4.0
- Solid Waste TS/MRF: 4.0
- SWANA CEU: 10.0
- Time: 8:00 am - 5:00 pm

Environmental Management Systems: An Introduction

- Certification Credit Type: Refresher
- CEU: 0.4
- FBPE PDHs: 4.0
- FBPE Provider No.: EXP 00074
- Times: 8:00 am - 12:00 pm
- SWANA CEUs: 4.0
- Solid Waste I, II, III, C & D: 2.0
- Solid Waste, TS, MRF: 2.0

Excavation and Trenching: Competent Person Training

- CEU: 0.8
- FBPE PDHs: 8.0
- FBPE Provider No.: 00074
- FDEP OCP Course No.: 4201
- FDEP OCP DW/WW CEUs: 8.0
- FDEP OCP Level: Intermediate
- Solid Waste I II III/C&D: 8.0
- SWANA CEU: Pending
- Time: 8:00 am - 5:00 pm

Fundamentals of Slope Stability

- CEU: 1.6
- SWANA CEU: 14.75
- Solid Waste I, II, III/C&D: 16.0
- FBPE PDHs (EXP 00074): 16.0
- Time Day 1: 1:00 pm-5:00 pm
- Time Day 2: 8:00 am-5:00 pm
- Time Day 3: 8:00 am-12:00 pm

Groundwater Issues for Landfill Operators

- Certification Credit Type: Refresher
- CEU: 0.6
- SWANA CEU: 4.0
- Solid Waste I II III/C&D: 6.0
- FBPE PDHs (EXP 00074): 6.0
- Time: 8:00 am - 4:00 pm

Hazardous Materials Chemistry for the Non-Chemist

- CEU: 0.8
- FBPE PDHs: 8
- FBPE Provider No.: EXP 00074
- FDEP OCP Course No.: 4254
- FDEP OCP DW/WW CEUs: 0.6
- FDEP OCP Level: Intermediate
- Times: 8:00 a.m. - 5:00 p.m.

Hazardous Waste Regulations for Generators

- CEU: 0.8
- FBPE: 8 PDHs
- Solid Waste I II III/C&D: 4.0
- Solid Waste Spotter: 4.0
- Solid Waste TS/MRF: 4.0
- SWANA CEUs: 3.0
- Time: 8:00 am - 5:00 pm

HazCom Standard Right to Know Online

- CEU: 0.2
- FBPE PDHs: 2.0
- FBPE Provider No.: EXP 00074

HazWoper 40-Hour Health & Safety Online

- Certification Credit Type: Refresher
- CEU: 4.0
- FBPE PDHs: 40.0
- FBPE Provider No.: EXP 00074
- FDEP OCP Course No.: 4205
- FDEP OCP DW/WW CEUs: 3.0
- FDEP OCP Level: Advanced
- Solid Waste I II III/C&D: 8.0
- Solid Waste TS/MRF: 8.0

HazWoper 8-Hour Refresher Online

- CEU: 0.8
- FBPE PDHs: 8.0
- FBPE Provider No.: EXP 00074

- FDEP OCP Course No.: 4212
- FDEP OCP DW/WW CEUs: .6
- FDEP OCP Level: Advanced

Health and Safety for Solid Waste Workers

- Certification Credit Type: Refresher

Health and Safety Training for Hazardous Materials Activities: 40-hour Course

- CEU: 4
- FBPE PDHs: 40.0
- FBPE Provider No.: EXP 00074
- FDEP OCP Course No.: 4209
- FDEP OCP DW/WW CEUs: 3.0
- FDEP OCP Level: Advanced
- Solid Waste I II III/C&D: 8.0
- Solid Waste TS/MRF: 8.0
- SWANA CEU: 27.5
- Times (Day 1-4): 8:00 am - 5:00 pm
- Times (Day 5): 8:00 am - 12:00 noon

Health and Safety Training for Hazardous Materials Activities: 8-hour Refresher

- Certification Credit Type: Refresher
- CEU: 0.8
- FBPE PDHs: 8.0
- FBPE Provider No.: EXP 00074
- FDEP OCP Course No.: 4210
- FDEP OCP DW/WW CEUs: 0.6
- FDEP OCP Level: Advanced
- Solid Waste I II III/C&D: 4.0
- Solid Waste Spotter: 2.0
- Solid Waste TS/MRF: 4.0
- SWANA CEU: 4.5
- Time: 8:00 am - 5:00 pm

Health and Safety Training for Landfill Operations OnLine

- Certification Credit Type: Refresher
- CEU: 0.5
- Solid Waste I II III/C&D: 5.0
- Solid Waste TS/MRF: 5.0
- Solid Waste Spotter: 2.0
- FBPE PDHs (EXP 00074): 5.0

Introduction to Electrical Maintenance

- Certification Credit Type: Refresher
- FDEP OCP DW/WW CEU: 2.0
- FDEP OCP Course No.: 4552
- FDEP OCP Level: Intermediate
- CEU: 2.0
- Solid Waste I II III/C&D: 16.0
- Solid Waste TS/MRF: 16.0
- FBPE PDH (EXP00074): 20
- Time:: 8:30 a.m. - 5 p.m.

Landfill Gas and Leachate Systems

- Certification Credit Type: Refresher
- CEU: 0.8
- SWANA CEU: 5.5
- Solid Waste I II III/C&D: 8.0
- FBPE PDHs (EXP 00074): 8.0
- Time: 8:00 am - 5:00 pm

Management of Leachate, Gas, Stormwater and Odor at Class I, II, a

Landfills

- Certification Credit Type: Refresher
- CEU: 0.8
- SWANA CEU: 5.0
- Solid Waste I II III/C&D: 8.0
- FBPE PDHs (EXP 00074): 8.0
- Time: 8:00 am - 5:00 pm

Management of Special Waste for SWM Facilities Operators

- Certification Credit Type: Refresher
- FBPE PDHs: 4.0
- Solid Waste I II III/C&D: 4.0
- Solid Waste TS/MRF: 4.0
- Solid Waste Spotter: 4.0
- SWANA CEUs: Pending
- Time: 8:00 am - noon

Measurements and Calculations for Landfill Operators

- Certification Credit Type: Refresher
- CEU: 0.5
- SWANA CEU: 2.5
- Solid Waste I II III/C&D: 5.0
- FBPE PDHs (EXP 00074) : 5.0
- Time: 8:00 a.m. - 1:00 p.m.

Permit Required Confined Space Training

- CEU: 0.8
- FBPE PDHs: 8.0
- FBPE Provider No.: 00074
- FDEP OCP Course No.: 4215
- FDEP OCP DW/WW CEUs: 0.8
- FDEP OCP Level: Intermediate
- Solid Waste I II III/C&D: 8.0
- Solid Waste TS/MRF: 8.0
- Time: 8:00 am - 5:00 pm

Pumps and Pumping

- CEU: 2.2
- FBPE PDHs: 22.0
- FBPE Provider No.: EXP 00074
- FDEP OCP Course No.: 4551
- FDEP OCP DW/WW CEUs: 2.20
- FDEP OCP Level: Intermediate
- Solid Waste I II III/C&D: 16
- Solid Waste TS/MRF: 16
- Time: Day One: 8:15 a.m. - 5:00 p.m.
- Time: Day Two and Three: 8:30 a.m. - 5:00 p.m.

Spotter Training for Solid Waste Facilities

- Certification Credit Type: Initial
- CEUs: 0.8
- Solid Waste Spotter Initial : 8.0
- Solid Waste I II III/C&D: 8.0
- Solid Waste TS/MRF: 8.0
- FBPE PDHs (EXP 00074) : 8.0
- Time: 8:00 am - 5:00 pm

SWANA-Manager of Landfill Operations (MOLO)

- Certification Credit Type: Initial
- Solid Waste I II III/C&D: 16
- CEU: 3.0
- Solid Waste TS/MRF: 8.0
- SWANA CEU: 30.0
- Time: Day 1: 7:30 am - 6:15 pm
- Time: Day 2: 8:00 am - 5:15 pm

- Time: Day 3: 7:30 am - 5:00 pm
- Time: Day 4: 8:00 am - 11:30 am

SWANA-Manager of Landfill Operations (MOLO) - Exam Only

- Certification Credit Type: Initial
- CEU: 0.0
- Time: 8:00 am - 11:30 pm
- Time April Class: 1:00 pm - 4:00 pm

SWANA-Managing MSW Recycling Systems - Exam Only

- CEU: 0.0
- Time : 8:00 am - 11:30 am
- Time April Class: 1:00 pm - 4:00 pm

The Old Landfills Seminar

- Certification Credit Type: Refresher
- CEU: 0.5
- SWANA CEU: 3.5
- Solid Waste I II III/C&D: 5.0
- FBPE PDHs (EXP 00074): 5.0
- Time: 10:00 am - 4:00 pm

Train-the-Trainer For Environmental Occupations

- CEU: 2.8
- FBPE PDHs: 28.0
- FBPE Provider No.: EXP 00074
- FDEP OCP Course No.: 4357
- FDEP OCP DW/WW CEUs: 0.8
- FDEP OCP Level: Intermediate and Advanced
- Solid Waste I II III: 7.0
- Time - Days 1-3: 8:30 am - 5:00 pm
- Time Day 4: 8:00 am - noon

Train-the-Trainer Refresher

- Certification Credit Type: Refresher
- CEU: 1.2
- FBPE PDHs: 12
- FBPE Provider No.: EXP00074
- Time Day One: 8:00 a.m. - 5:00 p.m.
- Time Day Two: 8:00 a.m. - 12:00 noon

Training for Spotters at Construction and Demolition Sites, Landfills and Transfer Stations

- Certification Credit Type: Initial
- CEU: 0.8
- Solid Waste Spotter Initial: 8.0
- Solid Waste I II III/C&D: 8.0
- Solid Waste TS/MRF: 8.0
- FBPE PDHs (EXP 00074): 8.0
- Time: 8:00 am - 5:00 pm

Two-hour Spotter Refresher Training OnLine

- Certification Credit Type: Refresher
- CEU: 0.2
- SWANA CEU: 1.0
- Solid Waste I II III/C&D: 2.0
- Solid Waste TS/MRF: 2.0

U.S. DOT Hazardous Materials/Waste Transportation

- CEU: 0.75
- FBPE: 7.5 PDHs
- Solid Waste I,II,III/C & D: 6.0
- Solid Waste TS/MRF: 6.0
- SWANA CEU: 5.0

- Time: 8:00 am - 4:30 pm

Waste Screening and Identification for Landfill Operators and Spotter

- Certification Credit Type: Initial
- CEU: 0.8
- Solid Waste Spotter Initial: 8.0
- Solid Waste I II III/C&D: 8.0
- Solid Waste TS/MRF: 8.0
- Time: 8:00 am - 5:00 pm

Wildlife and Wetland Training for Solid Waste Facilities

- Certification Credit Type: Refresher
- CEUs: 0.8
- FBPE PDH (EXP00074): 4.0 hours
- SWANA: 5.0
- Solid Waste I,II,III/C&D: 8.0
- Time: 8:00 a.m. - 5:00 p.m.

TREEO Center • Division of Continuing Education • University of Florida

3900 SW 63rd Blvd.
Gainesville, FL 32608

tel: (352) 392-9570
fax: (352) 392-6910

train@treeo.ufl.edu

**APPROVED TRAINING COURSES FOR
CONSTRUCTION & DEMOLITION DEBRIS
OPERATORS & SPOTTERS
(Updated March 26, 1998)**

APPROVED INITIAL TRAINING COURSES FOR C&D OPERATORS •

Course Title	Provider	Hours
Solid Waste Landfill: Operators Short School	TREEO	20
C&D Disposal: Operators Short School	TREEO	20
SWANA International Course	SWANA	20
Landfill University (Waste Management Of North America)	Waste Management	20

*APPROVED CONTINUING EDUCATION TRAINING COURSES FOR C&D OPERATORS •
AND SPOTTERS Δ*

Course Title	Provider	Hours
1. Waste Screening at MSW Mgmt Facilities Δ•	SWANA-FL	10
2. Introduction to Groundwater Contamination, Investigation, & Remediation Assessment •	TREEO	13
3. Groundwater Monitoring, Analysis and Data Interpretation •	TREEO	12
4. Waste Screening and Identification For Landfill Operators and Spotters Δ•	TREEO	8
5. Stormwater Management For Landfills •	TREEO	8
6. Inspection Procedures for Agrichemical Containers Offered for Recycling [Pesticide] •	IFAS	1
7. Eight Hour Spotter Training for C&D Sites Δ•	TREEO	8
8. What Can I Accept & How Can I Keep It From Blowing Around •	TREEO	2
9. Asbestos Awareness Course for Landfill Operators Δ•	TREEO	4
10. Landfill Compliance Inspections Δ•	TREEO	2
11. Groundwater Monitoring Requirements and Techniques for Landfills •	TREEO	2
12. Wet Weather Operations Δ•	TREEO	4
13. Operational Issues for Landfill Managers •	SWANA-Int'l	17
14. Landfill Gas Management •	SWANA-Int'l	4
15. Solid Waste Landfills Correspondence Course Δ• Univ. Of Wisconsin		10
16. Basic Landfill Operations •	Kohl Training	8
17. Excavation, Trenching and Soil Mechanics •	TREEO	8
18. Hazard Communications Course Δ•	Escambia County	4
19. Hazardous Materials in Construction and Demolition Waste Δ•	TREEO	4
20. Construction and Demolition Waste Recycling Δ•	TREEO	7
21. Permit Required Confined Space Training •	TREEO	7
22. Developing a Usable Operations Plan •	Kohl Training	4
23. Measures and Calculations for Landfill Operators •	Kohl Training	5
24. Fires at Landfills Δ•	Kohl Training	2

For further information on how to register for these and other approved courses please call Dawn Jenkins at the TREEO Center, (352) 392-9570 ext. 127 or SunCom 622-9570, Fax: (352) 392-6910, E-mail: djenkin@treeo.doce.ufl.edu

file:C&DTRNF1.DOC

Appendix F
Equipment List

Motorized Equipment Specifications Listing

Komatsu: PC 180 LC3 Trackhoe

- 1 Equipped with Pemberton quick coupler
- Attachments:
- 1 2x3 demolition grapple
- 1 52" excavating bucket
- 1 concrete densifier
- 1 60" ditch cleaning bucket
- 1 24" Esco rock bucket

Komatsu: PC 300 LC3 Trackhoe

- 1 Equipped with Pemberton quick coupler
- Attachments:
- 1 3x4 demolition grapple
- 1 52' excavating bucket
- 1 concrete densifier
- 1 24" Esco rock bucket

Komatsu: WA 320 Payloader

- 1 Equipped with Pemberton quick coupler L series
- Attachments
- 1 3 cubic yard excavating bucket
- 1 48 " forks
- 1 clearing rake

Komatsu: WA 300 Payloader

- 1 Equipped with Pemberton quick coupler L series
- Attachments:
- 1 3 cubic yard excavating bucket
- 1 5 cubic yard light materials bucket
- 1 48" forks
- 1 15' telescoping boom
- 1 clearing rake

Komatsu: WA 180 Payloader

1 Equipped with Pemberton quick coupler (L) series

Attachments:

- 1 2 cubic yard excavating bucket
- 1 3 cubic yard excavating bucket
- 1 60" forks
- 1 15' telescoping boom
- 1 Clearing rake

(Two) 1984 Mack roll off trucks (RD 685-S)

Specifications

- 1 300 hp Mack engine
- 1 Equipped with 20k front axle and 44k rear axles
- 1 2090 9 speed transmission
- 1 60K Galbreth roll off hoist
- 25 Roll off containers in sizes 20-30-40 cubic yards

Mack: 1993 and 1994 RD 690S Dump Trucks

Specifications

- 1 F7 300 hp Mack engine
- 1 2070 7 speed transmission
- 1 11 x 22.5 rear tires
- 1 385R, 22.5 front tires
- 1 20 cubic yard Hardee dump body
- 1 175 gallon fuel capacity

Komatsu HA 270 Articulated Truck

Specifications

- 1 Rated payload 20 tons
- 1 Body capacity 144 cubic yards
- 1 3116 CAT engine @ 180 hp
- 1 OAW 8'11"

Eagle Jumbo 1200 Concrete Crusher

Specifications:

- 1 300 hp Caterpillar
- 1 100 tons per hour production

Mack: 1985 and Lube Service Truck

Chassis specifications:

- 1 285hp Mack 6 cylinder diesel engine
- 1 5 speed Mack transmission
- 1 38k rear axles
- 1 11x22.5 rear tires
- 1 385R 22.5 front tires
- 1 175 gallon fuel capacity

Service body specifications:

- 1 Custom designed and built by EWI of Orlando
- 1 750 gallon diesel fuel tank
- 1 5, 125 gallon product tanks
- 1 40W tank
- 1 hydraulic fluid tank
- 1 10 W tank
- 1 gear lube tank
- 1 waste oil tank
- 1 120 lb grease keg
- 1 air compressor/pressure cleaner
- 1 water pump with 3" misc. hose

1980 Chevrolet C-60 Water truck

Specifications:

- 1 2500 gallon water tank
- 1 454 cu. Inch V-8 Chevrolet engine
- 1 Kubota pressure pump (100 GPM)
- 1 16' rear mounted spray bar
- miscellaneous hoses and nozzles

Appendix G
Materials Specifications

TECHNICAL
DATA

BUTYL-LOK

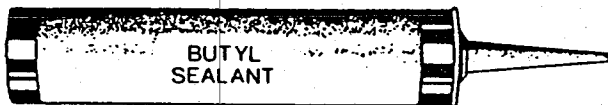
BUTYL SEALANT SYSTEMS for the PRECAST CONCRETE INDUSTRY

- PREFORMED TAPES

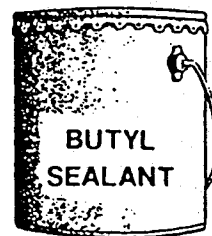


STANDARD SIZES IN STOCK
(CUSTOM SIZES AVAILABLE)

- CARTRIDGES



- TROWELABLE-PUMPABLE
GRADE



- ADHESIVE-PRIMER SYSTEMS
 - Water Emulsion Type (non flammable)
 - Solvent Type (flammable)



• LOK[®]

The Company

with Connections

P.O. BOX 1647
TULLYTOWN, PA 19007
1-800-822-ALOK

697 MAIN STREET
TULLYTOWN, PA 19007
(215) 547-3366

GENERAL PRODUCT DESCRIPTION

BUTYL-LOK sealant systems are custom engineered and manufactured to comply with current standards and specifications required by Federal, State and local regulatory agencies for use by the precast concrete industry and its contractors.

BUTYL-LOK sealants are supplied in ready-to-apply forms for all weather installations and conditions. Specific applications are:

- SANITARY AND STORM SEWER MANHOLES
- PIPE - (ROUND, OVAL, FLATBASE, ELIPTICAL AND ARCH TYPES)
- BOX CULVERTS
- UTILITY VAULTS
- BURIAL VAULTS
- SEPTIC TANKS AND SEWAGE TREATMENT PLANTS
- WET WELLS
- PRECAST CONCRETE WALL PANEL SYSTEMS

BUTYL-LOK sealants remain permanently flexible and form permanent bonds to a wide variety of substrates including concrete, metals and plastics. These products are designed not to shrink or oxidize and have excellent resistance to environmental temperature extremes, acid and alkaline conditions. Adhesion and cohesion actually improves after joint has been formed and placed in service.

BUTYL-LOK meets or exceeds all basic requirements of Federal Specification SS-S-210-A and AASHTO M-198.

SURFACE PREPARATION

Joint surfaces should be clean and dry. Due to the high adhesive quality of BUTYL-LOK priming of the joint surfaces is not normally required. However, should wet or unusual application conditions exist, it is recommended that either BUTYL-LOK Emulsion (non flam) or Solvent (flammable) Adhesive-Primer be coated on the joint surface and allowed to dry a minimum of 10 minutes before application of joint sealant.

APPLICATION

BUTYL-LOK bonds instantly to joint surfaces and to itself. Always butt ends of preformed sealant together - never overlap. Leave protective release paper on sealant during application and remove only after structure is ready for coupling. The joint should then be coupled with sufficient pressure for proper joint completion. The resulting annular space after structure is properly coupled determines the volume (cross-section size) of BUTYL-LOK required.

CHEMICAL COMPOSITION

	TEST METHOD	REQUIREMENTS	BUTYL-LOK
Butyl Rubber-Hydrocarbon (% by wt.)	ASTM D-297	50 - 70	57.1
Inert Mineral Filler (% by wt.)	SS-S-210-A	30 - 50	42.0
Volatile Matter (% by wt.)	ASTM D-6	2.0 Max.	below 1%

*Note: Contains no asbestos fibers or asphaltics.

PHYSICAL PROPERTIES

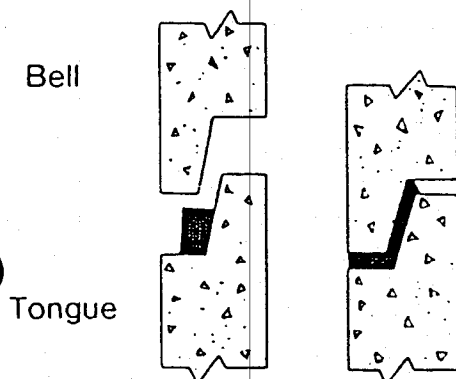
Specific Gravity @ 77°F.	ASTM D-71	1.2 - 1.35	1.244
Ductility @77°F.	ASTM D-113	5.0 Min.	100 +
Softening Point (°F.)	ASTM D-36	320 Min.	385
Penetration @77°F	ASTM D-217	50 - 120	90
Flash Point C.O.C. (°F.)	ASTM D-92	600 Min.	625
Fire Point C.O.C. (°F.)	ASTM D-92	625 Min.	638
Accelerated Aging (Mechanical Oven - 4 hours @ 212°F.)			Maintained 99 + % Solids (Flexibility not effected)
UV Resistance (Direct Florida Exposure - 365 days)			No Visible Damage
Elongation Initial @ 77°F.			300% Min.
Two Weeks @ 195°F.			300% Min.
Two Weeks - Total Water Immersion			300% Min.
Flow Resistance (1" wide overhead joint exposed to 135°F. for 7 days)			No Flow
Storage Life			Indefinite
Application Temperature Range			10 to 125°F.
Service Temperature Range			-40° to 215°F.

CHEMICAL RESISTANCE (Total Immersion - 30 Days)

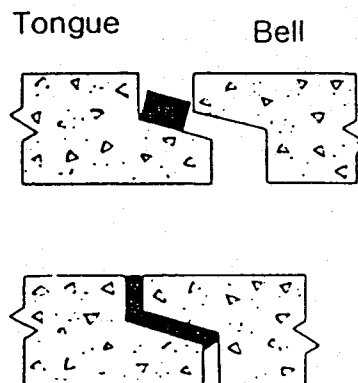
5% Sulfuric Acid	No Visible Damage
5% Hydrochloric Acid	No Visible Damage
5% Potassium Hydroxide	No Visible Damage
Saturated Hydrogen Sulfide Solution	No Visible Damage

TYPICAL JOINT CONFIGURATIONS

VERTICAL INSTALLATION



HORIZONTAL INSTALLATION



BUTYL-LOK SEALANT SYSTEMS

PREFORMED TAPES

PRODUCT NO.	DIAMETER EQUIVALENT	CROSS SECTION SIZE	ROLL LENGTH	ROLLS PER CARTON	FEET PER CARTON	CARTON WEIGHT	CARTONS PER PALLET*
FS-2050	1/2"	.45" x .45"	21.75'	12	261	35 lbs.	24
FS-2075	3/4"	.675" x .675"	14.5'	6	87	25	24
FS-2100	1"	.89" x .89"	14.5'	6	87	42	24
FS-2125	1 1/4"	1.0" x 1.123"	14.5'	4	58	44	24
FS-2150	1 1/2"	1.187" x 1.5"	10.75'	4	43	47	24
FS-2200	2"	1.875" x 1.675"	7.00'	4	28	52	24

*Note: All pallets shrink wrapped - suitable for outside storage.

Custom sizes available on request - Call us with your special requirements.

FM-3000 TROWELABLE - PUMPABLE GUIDE Available in 5 Gallon pails

FR-900 1/10 Gallon CARTRIDGES Packaged 10 tubes/case - 120 cases/pallet

FP-2000 ADHESIVE-PRIMER: EMULSION (non flammable) 5 Gallon pails - 55 Gallon drums

FP-4000 ADHESIVE-PRIMER: SOLVENT TYPE (flammable) 5 Gallon pails - 55 Gallon drums

HORIZONTAL JOINTS

PIPE SIZE (ID)	RECOMMENDED SIZES		
	1/64" to 1/4"	5/16" to 1/2"	9/16" to 1 1/16"
12"	1/2"	3/4"	1"
15"	1/2"	3/4"	1"
18"	1/2"	3/4"	1"
21"	1/2"	3/4"	1"
24"	3/4"	1"	1-1/4"
27"	3/4"	1"	1-1/4"
30"	3/4"	1"	1-1/4"
33"	3/4"	1"	1-1/4"
36"	3/4"	1"	1-1/4"
39"	1"	1-1/4"	1-1/4"
42"	1"	1-1/4"	1-1/2"
45"	1"	1-1/4"	1-1/2"
48"	1"	1-1/4"	1-1/2"
54"	1-1/4"	1-1/2"	1-3/4"
60"	1-1/4"	1-1/2"	1-3/4"
66"	1-1/4"	1-1/2"	1-3/4"
72"	1-1/4"	1-1/2"	2"
78"	1-1/4"	1-1/2"	2"
84"	1-1/2"	1-3/4"	2"
90"	1-1/2"	1-3/4"	2"
96"	1-1/2"	1-3/4"	2"
102"	1-1/2"	2"	2"
108"	1-1/2"	2"	2"

VERTICAL JOINTS

ID OF STRUCTURE	RECOMMENDED SIZES		
	1/64" to 1/4"	5/16" to 1/2"	9/16" to 1 1/16"
42"	3/4"	1"	1-1/4"
48"	3/4"	1"	1-1/4"
54"	1"	1"	1-1/2"
60"	1"	1-1/2"	1-1/2"
66"	1"	1-1/2"	1-1/2"
72"	1"	1-1/2"	1-1/2"
84"	1"	1-1/2"	1-3/4"
96"	1"	1-1/2"	1-3/4"

*The annular space of the joint is calculated by subtracting the tongue O.D. from the bell I.D. and dividing by 2.



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ASSOCIATE MEMBER

XP INSTALLATION INSTRUCTIONS

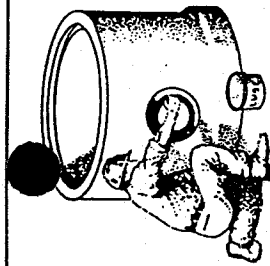
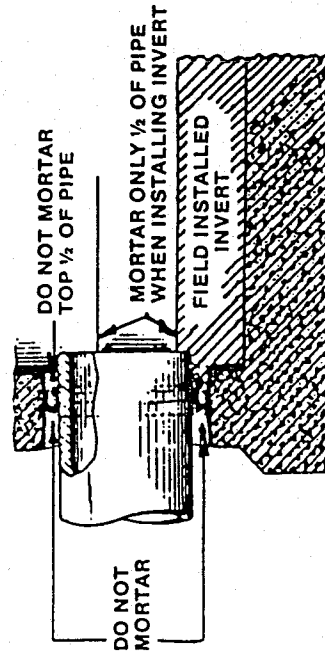
The XP connector is sized to fit the pipe barrel. Entry pipe should have a smooth outside surface and the correct diameter. Clean and lubricate XP connector and the pipe end to be inserted. Care should be taken to lube the entire portion of pipe which will slide through the connector. If pipe is cut, care should be taken to allow no sharp edges. A slight bevel is preferred as a lead and this should also be lubricated. After inserting pipe, stainless steel clamp should be fastened directly behind inner rubber "O" Ring. Pipe bedding on outside of manhole is critical as non-rigid pipe may ovate if not bedded properly.

WARNING

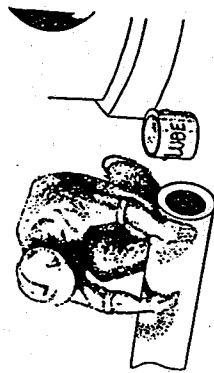
Because of the XP connector's ability to insure a flexible, watertight joint, it is our strong recommendation that no mortar be placed around the connector at all on the outside of the structure and that no mortar be placed around the top half of the connector on the inside when completing the invert work. The use of mortar in either of these areas would eliminate the flexibility for which the connector is designed, and cause problems of shear.

★ CAUTION ★

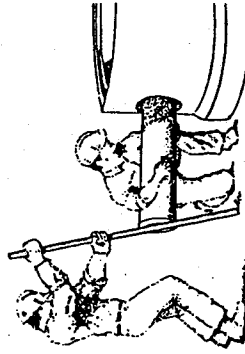
WHEN INSTALLING PIPE STUBS FOR FUTURE PIPELINE, INSTALLATION OF ALL STUBS SHOULD BE PROPERLY RESTRAINED TO PREVENT ANY MOVEMENT.



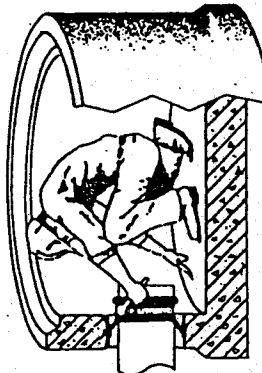
CLEAN & LUBRICATE GASKET



CLEAN AND COAT PIPE WITH LUBRICANT



CENTER PIPE & INSERT



INSTALL SS CLAMP & TIGHTEN

XP PIPE TO MANHOLE
CONNECTOR INSTALLATION

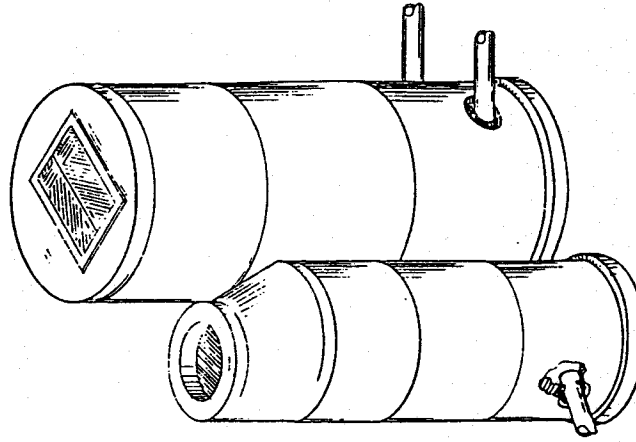
A·LOK® PRODUCTS
INC.

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TULLYTOWN, PA 19007
1-800-822-A·LOK
(215) 547-3366

C-109

XP

MANHOLE
PIPE
CONNECTOR
FOR
SANITARY SYSTEMS



US PATENTS
4,746,127 4,387,900 5,054,794
4,711,455 4,903,970 4,890,863
CANADIAN PATENTS PENDING
1,296,872

A·LOK® PRODUCTS
INC.

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697 MAIN STREET
TULLYTOWN, PA 19007
(215) 547-3366

DESCRIPTION:

The XP series is a high performance flexible connector designed to be hydraulically expanded into a cored or preformed opening to provide a watertight connection for pipe penetrations into the manhole wall. The connector assembly consist of:

- 1) A Rigid Adjustable Expansion Ring 304 Stainless Steel
- 2) A 50 Durometer E.P.D.M. Gasket
- 3) A 302 Grade Stainless Steel Compression Clamp

All three components offer excellent chemical and corrosion resistance to materials that may be found in a sanitary sewer environment.

Installation of the XP connector into the concrete wall is accomplished by placing the connector and expansion ring into the center third of the concrete opening. The band is then expanded and locked by utilization of an expansion jack and porta-power unit to transmit the force required to seal the rubber connector against the concrete wall.

Field installation is achieved by inserting the pipe through the inner rubber o-ring and then fastening the stainless steel compression clamp to 60 inch pounds directly behind the o-ring.

SPECIFICATIONS:

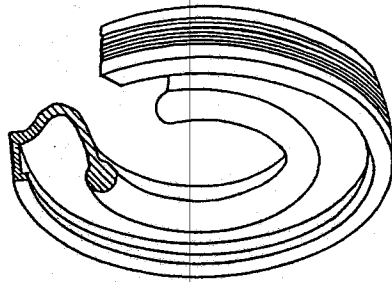
The XP meets all the material and performance requirements of A.S.T.M. Standard C-923 titled "Resilient Connectors Between Concrete Manhole Structures and Pipes". Some requirements are given in the table below.

RESILIENT TEST REQUIREMENTS OF A.S.T.M. C-923

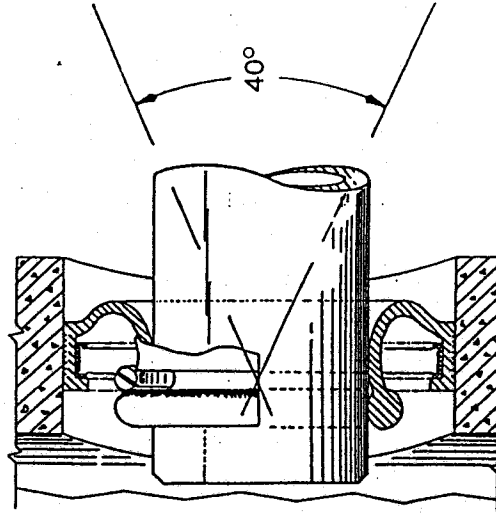
Test	Test Requirements	ASTM Method	Median Test Results
Chemical resistance: 1 N sulfuric acid 1 N hydrochloric acid Tensile strength Elongation at break Hardness	no weight loss no weight loss 1200 psi or 8.5 MPa, min 350%, min +5 from the manufacturer's specified hardness	D 543, at 22°C for 48 h D 412 D 2140 (Shore A durometer)	+0.15% +0.24% 1870 psi 670% 50
Accelerated oven-aging	decrease of 15%, max. of original tensile strength, decrease of 20%, max. of elongation	D 573, 70 ± 1°C for 7 days	1880 psi +0.53% 640% -4.48%
Compression set	decrease of 25%, max. of original deflection	D 395, Method B, at 70°C for 22 h	19.42%
Water absorption	increase of 10%, max. of original by weight	D 471, immerse 0.75 by 2-in. or 19 by 25-mm specimen in distilled water at 70°C for 48 h	+0.87%
Ozone resistance Low-temperature brittle point Tear resistance	rating 0 no fracture at -40°C 200 lbf/in. or 34 kN/m	D 1171 D 716 D 624, Method B	0 pass 299

ADVANTAGES:

- 1) Depending on outside diameter of pipe the connector has the ability to allow up to 20 degrees omnidirectional deflection to permit for line adjustment.
- 2) A vertical or horizontal movement of .50 inch without loss of seal.
- 3) The inner rubber o-ring is designed to eliminate rubber wrinkling, compensate for pipe eccentricity and reduce the number of connectors required to cover all sizes of pipe.
- 4) The XP connector assures a positive watertight connection that eliminates infiltration due to shear or ground movement.
- 5) Immediate backfill is permitted enhancing project safety and overcoming problems encountered with unstable trench conditions.



CROSS SECTION
OF XP



CROSS SECTION
OF XP AFTER
INSTALLATION

SPARLING

INSTRUMENTS CO., INC.

SERIES 600 MAGNETIC FLOWMETERS

MODEL 655 TIGERMAG™ FLANGED ELECTROMAGNETIC FLOWMETER

PDS-655
Issue Date: July 1996
Supersedes: December 1995

DESCRIPTION

The Model 655 is a microprocessor-based electromagnetic flowmeter utilizing the latest bi-polar pulsed DC technology. It is designed to measure the flow of conductive liquids in full pipes. The sensor liner may be polyurethane, neoprene, hard rubber, soft rubber or Teflon. In sizes through 4" ceramic (aluminum oxide) is offered as an optional liner material. The electrodes are 316 stainless steel (others are optional). The Model 655 is available in sizes 1/2" - 72", combining technically advanced circuitry with ease of installation, setup and maintenance-free operation.

APPLICATIONS

Potable Water, Process Chemicals, Wastewater, Raw Sewage, Polymers, Acids, Sludges, Slurries, Recirculating Water, Cooling Water, Wastewater Treatment Plant Flows.

PRINCIPLE OF OPERATION

The Model 655 magnetic flowmeter operates in accordance with Faraday's Law which states that the voltage induced in a conductor moving through a magnetic field is proportional to the velocity of that conductor. The magnetic meter utilizes liquid as the conductor.

STANDARD FEATURES

- Two year warranty
- Bi-polar pulsed DC coils
- Auto Zero
- FM Approved for Class I, Division 1 & 2 Groups B, C, D., Class II, Groups E, F, G
- CE Approved
- CSA Approved for Class 1, Division 2
- Cenelec Approved (optional)
- Proven TIGERMAG™ Electronics with MAG-COMMAND™
- NEMA-4X and NEMA-7 explosion proof enclosures
- NIST-Traceable Calibration
- Flanged Design
- Low Flow Cut-off
- Built-in Noise Rejection
- Field Programmable
- Selectable Damping.
- User-defined Engineering Units
- Bi-directional Flow



- Positive Zero Return
- Isolated Analog Output
- Scaled Pulse Output.
- Self-test Function
- Password Protection
- 16 Digit Display, Rate and Total

INSTALLATION

The Model 655 can be installed in any orientation from vertical to horizontal. Exposure to excess vibration should be avoided.

The meter must be mounted at a point in the line which is always full of process liquid under flowing conditions. A vertical installation with liquid flowing up is ideal in that it assures a full pipe.

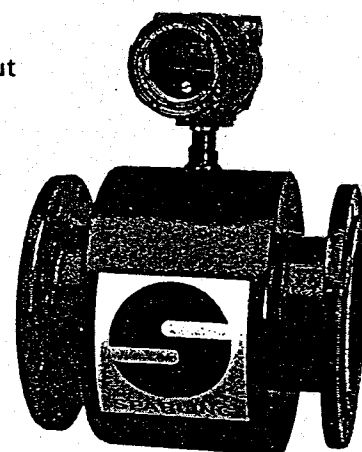
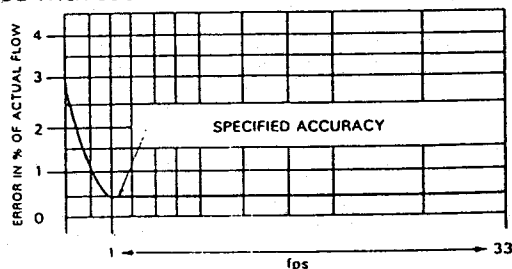
Only three diameters of straight pipe length are required from the center of the meter to normal obstructions to obtain specified accuracies. Partially open valves, 45° elbows, thermocouple wells and pump discharges will require longer straight pipe lengths.

Proper grounding is important. The use of grounding rings is recommended to obtain rated accuracy.

The FM655 utilizes an advanced switching power supply that accommodates voltages from 77-265 Vac 50/60 Hz (12-60 Vdc optional).

CERTIFIED ACCURACY

Each TIGERMAG™ is wet-flow calibrated in Sparling's Primary Flow Lab traceable to the National Institute of Standards and Technology. A certificate of accuracy is furnished with each meter.



Sparling Instruments Co., Inc.

4097 N. Temple City Blvd. • El Monte, CA 91731 USA
Phone (818) 444-0571 • Fax (818) 444-2314

MEMBER
MEASUREMENT CONTROL & AUTOMATION ASSOCIATION



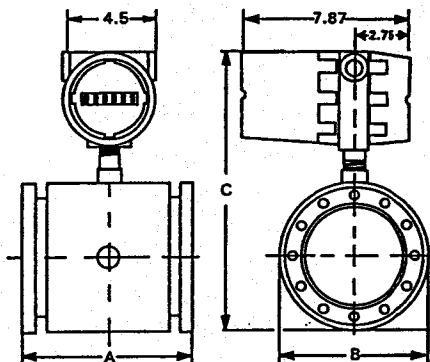
FLOW AND DIMENSIONAL DATA

NOMINAL METER SIZE (mm) (in.)		Accuracy at 1 FPS	FULL SCALE GPM		DIMENSIONS IN INCHES			APPROX. WEIGHT	
			MIN 3 FPS	MAX 33 FPS	A	B	C	(lbs.)	(kg.)
12	0.5	0.9 ± 1.0%	2.7	29	4.06	3.50	9.60	15	7
25	1	2.3 ± 0.5%	6.9	76	4.06	4.25	10.00	15	7
40	1.5	5.5 ± 0.5%	16.5	182	4.06	5.00	11.10	20	10
50	2	9.8 ± 0.5%	29.4	323	4.06	6.00	12.00	20	10
80	3	22.9 ± 0.5%	68.8	757	6.06	7.50	14.00	30	14
100	4	40.4 ± 0.5%	121	1333	6.06	9.00	15.10	35	16
150	6	85 ± 0.5%	254	2800	13.00	11.75	18.25	75	24
200	8	145 ± 0.5%	436	4800	13.00	14.25	20.75	105	48
250	10	236 ± 0.5%	709	7800	17.75	17.13	23.63	155	70
300	12	333 ± 0.5%	1000	11000	19.00	20.13	26.63	235	107
350	14	409 ± 0.5%	1227	13500	20.88	22.88	29.38	365	166
400	16	545 ± 0.5%	1636	18000	22.88	24.63	31.13	460	209
450	18	667 ± 0.5%	2000	22000	26.75	26.13	32.63	555	252
500	20	879 ± 0.5%	2636	29000	27.13	28.63	35.13	625	284
600	24	1273 ± 0.5%	3818	42000	32.25	33.13	39.63	860	391
750	30	1909 ± 0.5%	5727	63000	43.00	39.88	46.38	1325	602
900	36	3175 ± 0.5%	9630	95255	47.25	45.00	51.50	1800	818
1050	42	4350 ± 0.5%	13000	142650	51.25	53.25	59.75	2280	1036
1200	48	5600 ± 0.5%	16900	186000	51.63	59.50	64.75	3500	1590
1350	54	7144 ± 0.5%	21433	235800	53.00	67.50	74.00	4000	1818
1500	60	8500 ± 0.5%	25500	280500	65.00	74.00	79.75	5200	2364
1650	66	10300 ± 0.5%	31000	341000	65.00	81.00	86.25	6500	2955
1800	72	12700 ± 0.5%	38100	419100	72.00	88.00	94.50	9000	4091

Special Construction (High temperature coils required when temperature exceeds 266°F)

NOTE:

1. Dimensions for 150 lb. flanges. Allow 1/8" to 1/4" for liner. Allow 1/4" for grounding rings (1/2" - 6" meters). Allow 1/2" for 8" meters and larger.
2. For wafer-style meters, see Product Data Sheet 625 (sizes 1/10" - 4").
3. Special length Carbon steel mounting bolts and gaskets are furnished for meter sizes 1/2", 1".
4. Flow rates shown for meter sizes 1/2" - 4" are for meters with Teflon liners. See PDS 625 for flow rates for ceramic-lined sensors.



HOW TO ORDER A MODEL 655

Base Model Number

FM655 - Table 1 Magnetic Flowmeter

Size - Table 2

OD = 1/2", OF = 1", OG = 1-1/2", O2 = 2", O3 = 3", O4 = 4", etc. :

Table 3 - Liner Material

1 Hard Rubber	(6" to 72")	5 Polyurethane	(6" to 48")
2 Soft Rubber	(6" to 72")	6 Ceramic liner (*)	(0.5 to 4")
3 Teflon® PTFE	(0.5" to 36")	9 Neoprene	(6" to 72")

Table 4 - Electrode Material

1 316SS	4 Titanium	8 Zirconium
2 Hastelloy C	5 Tantalum	6 Fused Platinum(*) ceramic only
3 316SS Bullet Nosed	7 Platinum (*)	9 Monel

Table 5 - Flange Rating

1 150 lb.
3 300 lb.

Table 6 - Transmitter and Mounting

0 Integral NEMA-4X/NEMA-7 enclosure
1 Remote enclosure, 15' cable
3 Same as 1, with accidental submergence proof sensor
4 Same as 1, with permanent submergence proof sensor

Table 7 - Other Options (Ceramic models only)

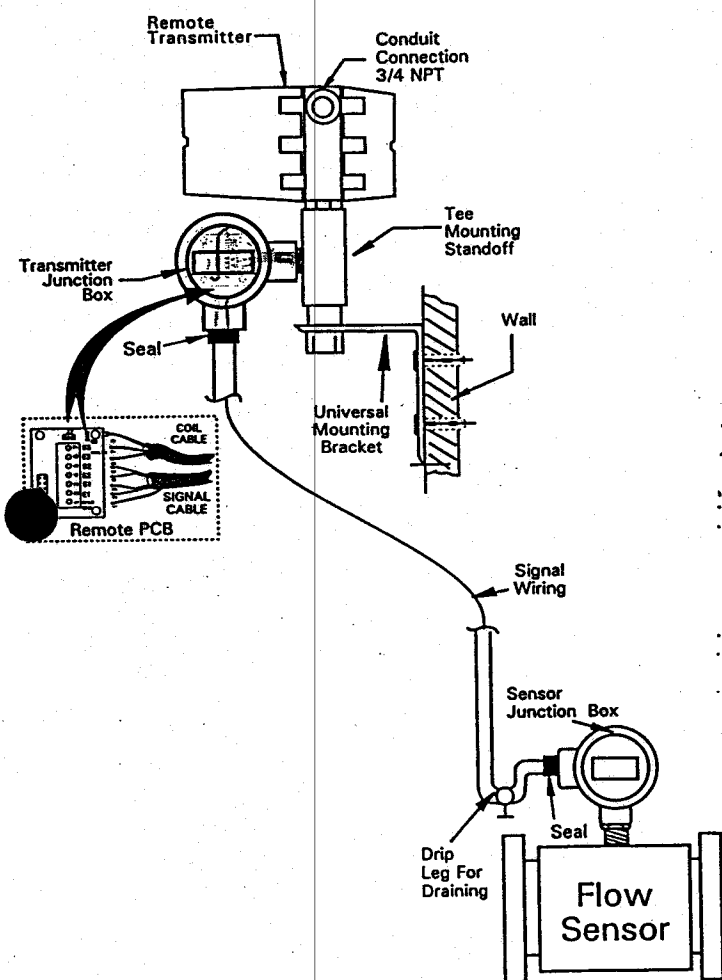
0 Standard O-rings (ceramic liners only)
1 EPR O-rings only (ceramic liners only)
2 Kalrez O-rings only (ceramic liners only)

Special Notes for Construction

- ___ Hart® protocol
- ___ High temperature coils - required for temperatures over 266°F (Must be ordered with a remote mount option from Table 6)
- ___ Ceramic liner - max temp 420°F (includes Kalrez O-Rings)
- ___ Ceramic liner/fused electrodes - max temp: 420°F (O-Rings not req'd.)
- ___ Teflon® liner - max temp: 300°F
- ___ Special cable length (over 15 feet = \$5.00/ft. - Max. 100 ft.)
- ___ Hot Tap removable electrode design (6" and above only)
- ___ Removable electrode design (6" and above only)
- ___ Empty Pipe Detection
- ___ Cenelec Approval

REMOTE MOUNTED TRANSMITTER

Remote mounting of the electronics is required for high temperature operation (over 212°F or 100°C), when pipe vibration is excessive, or when flooding is possible. Connections for power and signal are made in the transmitter housing. A bracket for wall/pipe mounting is furnished as part of the optional remote mounting kit. Interconnecting cable is supplied between the sensor and transmitter enclosure. Also supplied is a sensor mounted NEMA-7 rated junction box in which coil and electrode connections are made.



Remote Mounted Transmitter
Figure 1

PZR – Positive Zero Return

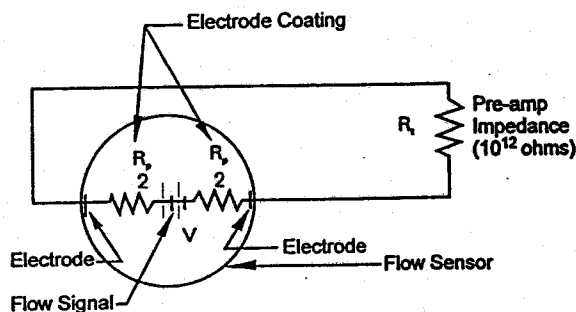
PZR is activated by closing a contact which drives the meters 4-20 mA output to zero. This is useful when process lines are empty or the flow to the meter is shut off.

EMPTY PIPE DETECTION (optional)

The Sparling TIGERMAG™ is designed to detect absence or inadequate volume of process fluid in the pipe and will hold the output signal to 4 mA or zero. One of the most important values of this feature is that it prevents false totalization possible with other meters under partially filled pipe conditions.

HI-Z CIRCUITRY

The Sparling TIGERMAG™ provides superior performance in liquids which tend to deposit non-conductive coatings. The TIGERMAG™ incorporates Hi-Z circuitry which utilizes a high input impedance in the transmitter's pre-amplifier (10^{12} ohms). (See Fig. 2). If the impedance of the coating is negligible as compared to the impedance of the receiving instrument, then the voltage drop across the electrode coating will also be negligible. This eliminates the need for electrode cleaners.

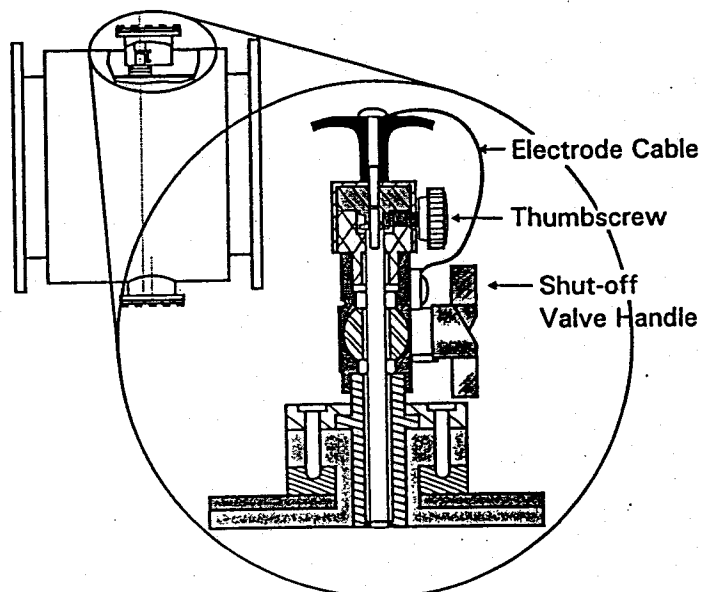


Hi-Z Circuitry
Figure 2

REMOVABLE ELECTRODES (option)

Two configurations of removable electrodes are available in sizes 6" or greater for all FM655 meters. The first is removable after the line has been depressurized and drained. Removal is performed with an 1 1/32" nut driver and a 3/4" socket wrench.

The second is the "hot-tap" electrode which allows electrode replacement while system is still under pressure, without disturbing the process flow. Removal can be easily performed with a phillips screwdriver and a crescent wrench. Special locking catches were designed to prevent high pressure accidents during electrode removal. The shut-off valve must be closed before the electrode may be removed.



Hot-tap Electrode
Figure 3

SPECIFICATIONS

Accuracy: (Frequency Output)	±0.5% of rate (1-33 fps) 1"-4" ±0.01 ft/sec. below 1.0 ft/sec. ± 0.01 fps below 1.0 fps ±1.0% of rate (1-33 fps) for units smaller than 1"
Temperature Effect:	±0.025 % FS/°C
Full Scale Velocity Ranges:	From 0-3 to 0-33 fps (0-1 to 0-10 mps)
Minimum Velocity:	0.3 fps (0.1 mps)
Repeatability:	Within ±0.1% full scale
Electrodes:	Stainless steel standard (others available)
Liner:	Polyurethane, hard rubber, soft rubber, Teflon, Ceramic (Teflon or Ceramic 1/2" - 4" only)
Outputs:	Simultaneous isolated analog and digital Analog: 0 to 20 (standard) or 4-20 mAdc (optional) into 800 ohms max. Digital: Scaled pulse or frequency (selectable) a. Scaled, 24 Vdc pulse with 25/50/100ms on-time width, 0-10 Hz max (up to 50ms on time) into 150 ohm impedance min. b. Scaled frequency, 15 Vdc square wave, 50/50 duty cycle, 0-1000 Hz max.
Mag-Command™:	Selection and change of meter parameters by magnetic probe without opening the enclosure
Display:	16 Digit alphanumeric LCD (rate and total)
Conductivity:	Minimum 5 micromho/cm
Power Requirements:	77 - 265 Vac 50/60 Hz (12-60 Vdc optional)
Power Consumption:	Less than 11 VA
Enclosures:	
Transmitter:	Cast aluminum epoxy coated. Integral or remote mounted (NEMA-4X and NEMA-7)
Sensor:	304SS flow tube. Carbon Steel flanges and welded coil enclosures. Epoxy coated
Electrical Rating ¹ :	FM Approved for Class I, Division 1 Groups B, C, D; Class II Groups E, F, G CSA Approved for Class 1, Division 2 CE Approved
Pre-amp Impedance:	10 ¹² ohms minimum
Ambient Temp:	-20° to 140°F (-30° to 60°C) ¹
Process Temp:	
Integral Mount:	Hard rubber, Soft rubber, Neoprene and Polyurethane -40 - 180°F Teflon, Ceramic -40 - 212°F
Remote Mount(opt)	Teflon, Ceramic -40 - 266°F
High Temp Coils (opt)	Teflon -40 - 350°F Ceramic -40 - 420°F
Selectable Damping:	0-99 sec
End Connections:	150 lb. or 300 lb. ²
Low Flow Cut-off:	Selectable 0 - 9% FS
Options:	<ul style="list-style-type: none"> Remote Mounted Enclosure Empty Pipe Detection Electrode materials: Hastelloy C, Zirconium, Platinum, Monel, Tantalum & Titanium 12-60 Vdc operation High Temperature Coils Digital Communications (HART Protocol) Accidental or Permanent Submergence-proof Removable Electrodes (6" & up) Hot-Tap Removable Electrodes (6" & up) ±0.5% of rate accuracy on 1/2" meters Hookup for 48 Vdc battery backup available for 77-265 Vac Service Cenelec approval

MODEL FM-655 SPECIFICATIONS

1.0.0	The magnetic flowmeter shall be microprocessor-based, and flanged. It shall indicate, totalize, and transmit flow in full pipes.
1.1.0	The magnetic flowmeter shall utilize DC bi-polar pulsed coil excitation, automatically re-zeroing after every cycle.
1.1.1	The accuracy shall be ± 1% on size 1/2" and ± 0.5% of rate on sizes 1"-72" of rate over a 33:1 turndown at all flow rates above 1 fps. Accuracy shall be verified by calibration in a flow laboratory traceable to the NIST.
1.1.2	The flow sensor liner shall be Polyurethane, Hard Rubber, Soft Rubber, Neoprene, Teflon or Ceramic.
1.1.3	The integrally mounted flow sensor and transmitter shall be FM approved for Class I, Division 1, Groups B,C,D and Class II, Division 1, Groups E,F,G environments without use of air purge. CSA approved for Class I, Division 2. Optional Cenelec approval available.
1.1.4	The electronics shall be integrally or remote mounted.
1.1.5	If remote mounted, the flow sensor and transmitter shall retain NEMA-4X and NEMA-7 ratings. The transmitter shall be furnished with integral universal wall/pipe stand mounting bracket and 15 feet of cable (standard).
1.1.6	The remote mounted flowsensor may be either accidental submergence-proof 30ft/48 hours or permanent submergence proof and retain NEMA-4X and NEMA-7 ratings
1.2.0	The flowmeter electrodes shall be 316SS, titanium, tantalum, zirconium, platinum, fused platinum, monel or hastelloy C.
1.3.0	The meter shall incorporate HI-Z circuitry. The preamplifier input impedance shall not be less than 10 ¹² ohms. External ultrasonic electrode cleaners shall not be acceptable.
1.4.0	Available outputs shall be 1) Isolated analog 4-20 mAdc into 800 ohms standard; 2) scaled pulse 24 Vdc with selectable 25/50/100 ms on time, maximum frequency 10 Hz or 0-1000 Hz frequency, for 0-100% flowrate, 15 Vdc; 3) fault, with open collector; 4) flow direction with open collector; 5) Positive Zero Return (PZR) for external relay contacts. Output 2 can be open collector if required.
1.5.0	Low flow cutoff shall be adjustable from 0 - 9% FS.
1.6.0	A 16-character alphanumeric display shall indicate user-defined flow units and total flow. All menu advice and commands shall be viewed on this display.
1.6.1	The flowmeter shall incorporate the MAG-COMMAND feature allowing menu selection and changes to be made from outside the housing via hall-effect sensors. It shall not be necessary to remove covers, panels or fasteners to accomplish calibration or program changes.
1.6.2	The meter shall have an output current check function exercised by MAG-COMMAND or communicator which will increment the current from 4 to 20mA to allow the checking of attached instruments without the running of liquids thru the process pipes.
1.6.3	The meter shall incorporate a built-in input simulator to allow the simulation of a fixed flowtube signal to the front-end of the electronics without externally connected devices or the running of liquids thru the process pipes.
1.6.4	The meter software shall incorporate a password feature preventing inadvertent program changes.
1.7.0	The flowmeter shall have a switching power supply having an operating range from 77 - 265 Vac 50/60 Hz or 12-60 Vdc option.
1.8.0	All printed circuit boards shall be contained in a plug-in module and be interchangeable for any size without requiring test equipment.
1.9.0	The flowmeter shall be inherently bi-directional.
2.0.0	The flowmeter manufacturer shall have meters of the DC pulse type in similar flowing mediums for a minimum of five years.
2.1.0	The manufacturer shall provide an application performance guarantee with submittals.
2.2.0	The flowmeter shall be warranted against defective workmanship or materials for a period of two years from shipment date.
3.0.0	Totalized flow and programmed configuration shall be maintained in memory for up to 10 years.
4.0.0	The flowmeter shall be MODEL 655 TIGERMAG™ as manufactured by Sparling Instruments Co.

Specifications subject to change without notice.

1. High Temperature Display 158°F (70°C)

2. FM Approval applies to 150 psi only.

CHARLOTTE

PIPE AND FOUNDRY COMPANY

LIST PRICE SCHEDULE P-188-PVC

P.O. Box 35430 • Telephone 704/372-5030

CHARLOTTE, NORTH CAROLINA 28235

ASTM D-1785

PVC

ASTM D-2665

SCHEDULE-40 DWV

AND

TYPE I PVC

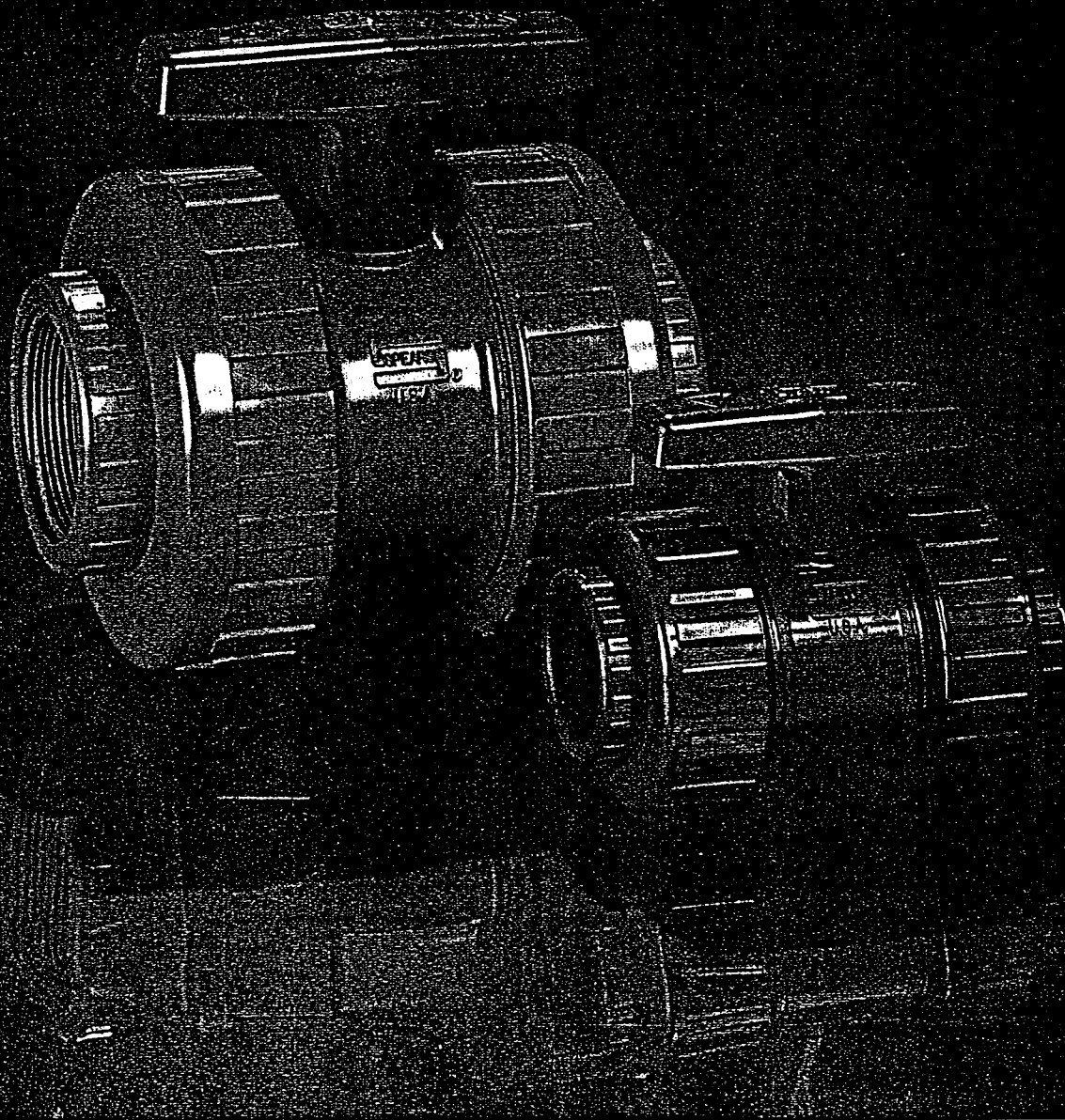
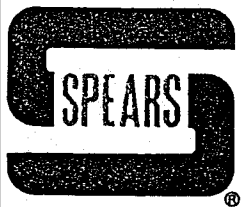
PIPE



Nom. Size	Part No.	Truck Load Percent Per Skid	Skid Qty.	Outside Diameter	Min. Wall	Max. Work Pressure At 23° C	Wt. Per 100 Ft.	List Price Per 100 Ft.
1¼"	7100	1.780 3.570	10'—2120' 20'—4240'	1.660	.140	370 PSI	42.0	\$ 106.00
1½"	7112	1.780 3.570	10'—1720' 20'—3440'	1.900	.145	330 PSI	50.4	\$ 124.00
2"	7200	1.780 3.570	10'—990' 20'—1980'	2.375	.154	280 PSI	67.6	\$ 162.00
3"	7300	4.160 3.570	10'—1040' 20'—920'	3.500	.216	260 PSI	141.0	\$ 326.00
4"	7400	4.160 7.144	10'—600' 20'—1200'	4.500	.237	220 PSI	200.0	\$ 460.00
5"	7500	7.144	20'—760'	5.563	.258	190 PSI	272.5	\$ 630.00
6"	7600	4.160 7.144	10'—280' 20'—560'	6.625	.280	180 PSI	352.0	\$ 816.00
8"	7800	4.165 8.330	10'—180' 20'—360'	8.625	.322	160 PSI	539.0	\$1240.00
10"	7910	7.144	20'—220'	10.750	.365	140 PSI	755.0	\$1900.00
12"	7912	8.928	20'—160'	12.750	.406	130 PSI	1001.0	\$2778.00
14"	7914	4.160	20'—60'	14.000	.437	130 PSI	1180.1	\$3281.00
16"	7916	—	20'—40'	16.000	.500	130 PSI	1543.1	\$4290.00

Weights are approximate and are for shipping purposes only.

Charlotte Sch. 40 PVC-DWV Pipe listed in this section meets or exceeds the requirements of ASTM D-2665, ASTM D-1785, and is NSF listed. Pipe is NSF listed for potable water use. PVC pipe is not recommended for use with compressed air or gases.



Safe-T-Shear[®] TRUE UNION



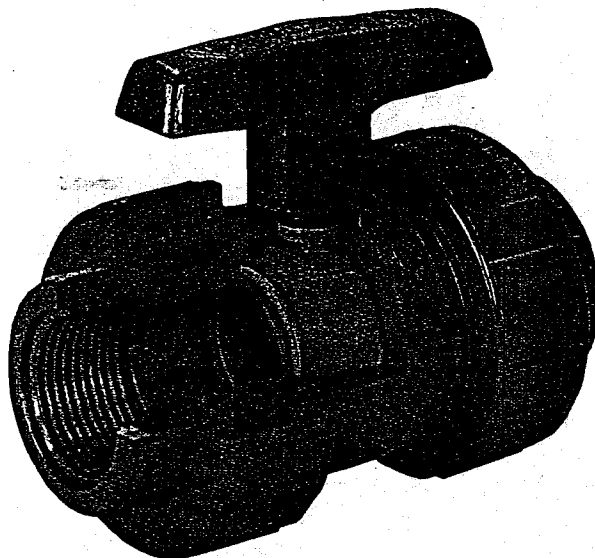
BALL VALVES

SPEARS TRUE UNION BALL VALVE — *the right connection*

Spears True Union Ball valves are precision designed for use in applications where fast-action shut off is required. They are suitable for most fluid handling systems. These high-quality valves come in either PVC or CPVC material and in sizes ranging from 1/2 inch through 4 inches ASTM IPS. All sizes will be available in POLYPROPYLENE materials in the near future.

Spears ball valves feature:

- Superior chemical and corrosion resistance
- 1/2" through 2" rated at 200 PSI, non-shock, maximum operating pressure at 73° F
- 2-1/2" through 4" rated at 150 PSI, non-shock, maximum operating pressure at 73° F
- Schedule 80 bore for full flow
- Leak tight shut-off, each valve individually tested
- Quick disconnect for maintenance or modification of piping system
- Dry construction - no lubricants or graphite seals used in assembly of the valve



(NSF) S.E. - National Sanitation Foundation; Specially Engineered

• HANDLE

Valve handles are molded from high-quality, virgin PVC material . . . the same material used in the body and components. (CPVC valves have PVC handles)

• SAFE-T-SHEAR® STEM

This important SAFETY FEATURE prevents dangerous line fluids from leaking out in the event of stem damage. A special shear point controls breakage caused by heavy impact or overtorquing so it occurs above the stem "O" ring. The stem seal then remains intact until repair or replacement can be made.

• STEM MATERIAL

Ball valve stems are molded from CPVC material that provides high durability and long service life.

• "O" RING SEALS

"O" ring seals are offered in either of two elastomers:

VITON® (Fluorocarbon) resists wide range of chemicals, including salts, mineral acids, and chlorinated hydrocarbons.

EPDM (Terpolymer) stands up to a variety of oxidizing chemicals, bases, alcohols, and acids.

• SEAL CARRIER

A heavy ACME thread design ensures positive engagement of the seal carrier into the valve body. This solid containment allows safe down-

stream loosening of the union nut, when the valve is in the closed position, thus blocking upstream line pressure.

Adjustment of the seal carrier can easily be made with our unique tool designed to fit 1/2 in. through 4 in. ball valves.

• BALL MATERIAL

The ball itself is made from high quality virgin CPVC material and precision molded to provide long service life.

• BALL SEALS

Ball seals are made from Teflon®, a fluorocarbon material that is almost totally insoluble and chemically inert. Teflon® seals provide both extremely high mechanical strength and lubricity to make valve operation smooth, with minimal wear.

• END CONNECTORS

Spears True Union Ball Valves are furnished with a pair of threaded and a pair of socket end connectors for simplification of distributor and end-user inventories. **WITH SPEARS TRUE UNION BALL VALVES YOU ALWAYS HAVE THE RIGHT CONNECTION.**

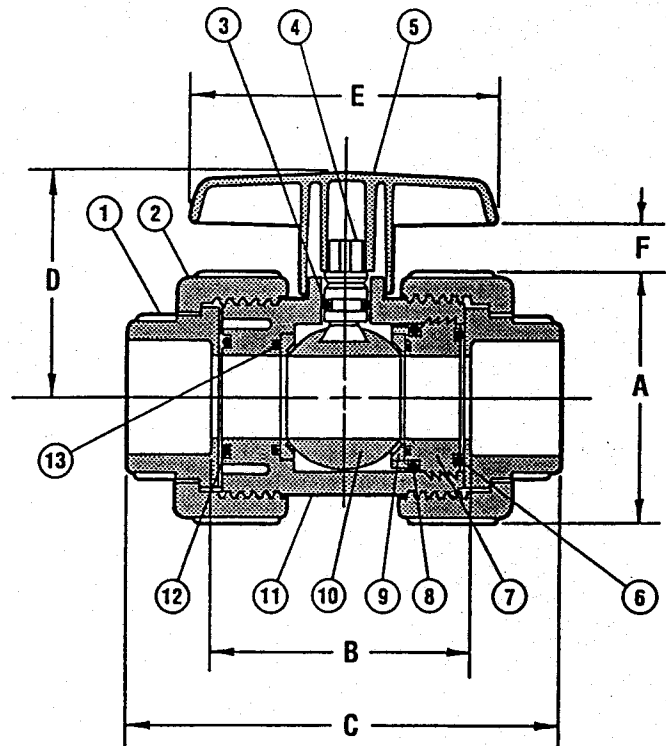
NOTE: 2 1/2", 3" and 4" True Union Ball Valves will NOT be furnished with dual end connectors.

ALL SPEARS PIPING PRODUCTS ARE READILY AVAILABLE FOR PROMPT SHIPMENT FROM AMPLE INVENTORIES MAINTAINED AT SPEARS REGIONAL WAREHOUSES IN KEY LOCATIONS THROUGHOUT THE COUNTRY

PARTS

No.	PART	QTY	MATERIAL
1	Union End	2	PVC/CPVC
2	Union Nut	2	PVC/CPVC
3	Stem "O" Ring	1	EPDM/Viton®
4	Stem	1	CPVC
5	Handle	1	PVC
6	Seal Carrier "O" Ring	1	EPDM/Viton®
7	Seal Carrier	1	PVC/CPVC
8	Body "O" Ring	1	EPDM/Viton®
9	Seat	2	Teflon®
10	Ball	1	CPVC
11	Body	1	PVC/CPVC
12	Solid End "O" Ring	1	EPDM/Viton®
13	Secondary Carrier "O" Ring	2	EPDM/Viton®

* CHEMICAL RESISTANCE - All materials used in the construction of the valve should be taken into consideration by the end user when determining chemical resistance suitability for a particular application.



DIMENSIONS

SIZE†	A	B*	C	D	E	F	Approx. Weight Each (Lbs.)	
							PVC	CPVC
1/2 in.	2-1/64	2-7/32	3-21/32	1-29/64	2-1/2	13/32	.35	.38
3/4 in.	2-7/16	2-45/64	4-17/64	2-7/32	2-3/4	13/32	.59	.64
1 in.	2-49/64	3-1/32	4-31/64	2-9/16	3-1/2	5/8	.88	.95
1-1/4 in.	3-31/32	3-9/16	5-9/16	3-9/32	3-3/4	5/8	1.85	1.97
1-1/2 in.	3-31/32	3-3/4	5-15/16	3-3/32	4	35/64	2.03	2.21
2 in.	5-3/32	4-9/16	6-15/16	4-7/32	5	27/64	3.71	3.99
2-1/2 in.	6-7/8	6-17/32	10-1/32	5-5/16	8-27/32	7/8	8.60	9.20
3 in.	6-7/8	6-7/16	10-11/64	5-5/16	8-27/32	7/8	8.75	9.30
4 in.	8-15/32	7-23/32	12-1/4	6-1/8	8-27/32	7/8	14.70	15.20

† Metric sizing available on special order basis. * Valve laying length

SAMPLE ENGINEERING SPECIFICATION

All thermoplastic True Union Ball Valves, are to be SPEARS produced from virgin;

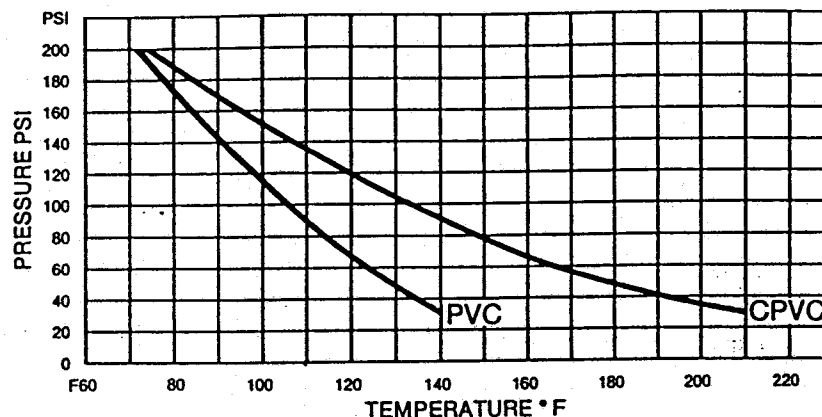
(Select one) — PVC TYPE I GRADE I MATERIAL — CPVC TYPE IV GRADE I MATERIAL
with;

(Select one) — VITON® "O" RINGS — EPDM "O" RINGS

Valves are to contain all of the following design features: SAFE-T-SHEAR® stem, adjustable ACME thread for seal carrier, and CPVC stem and ball regardless of body material selection.

* Viton and Teflon are trademarks of E.I. DuPont.

PRESSURE VS TEMPERATURE



Operating pressures are dependent upon temperature conditions. These curves show the operating pressures of the PVC, CPVC Valves at 73° F, and the reduced operating pressures at higher temperatures.

NOTE: Maximum operating temperatures for threaded PVC Piping Systems should not exceed 110° F. Maximum operating temperatures for threaded CPVC Piping Systems should not exceed 150° F.

PHYSICAL PROPERTIES OF MATERIAL

CHARACTERISTIC	PVC	CPVC
Specific Gravity, ± 0.02	1.41	1.53
Hardness - Rockwell "R"	112	119
Tensile Strength PSI	7,100	8,050
Tensile Modulus PSI	435,000	387,000
Flexural Strength PSI	13,580	15,300
Izod Impact Strength ft-lbs / in. notch @ 73° F	1.03	1.60
Heat Deflection Temperature °F at 264 PSI	162	212

Cv VALUES

Cv Values are not given because of the full-flow bore feature of the valves. Pressure drop will be the same as for the equivalent length of Schedule 80 pipe.

NOTE — SOLVENT WELD CONNECTIONS — Use a quality grade of primer and solvent cement formulated for the type of connection, with the **CORRECT SIZE APPLICATOR**. Read and follow all of the solvent cement **MANUFACTURER'S APPLICATION INSTRUCTIONS**.

THREADED CONNECTIONS — Use a quality grade of **TEFLON TAPE** recommended by the manufacturer for use with plastic. **DO NOT USE OIL BASE PIPE JOINT COMPOUND or TEFLON PASTE —** they may contain substances that could cause **STRESS CRACKING** to plastics.

1 to 1½ turns beyond finger tight is generally all that is required to make a sound plastic threaded connection. Unnecessary **OVERTIGHTENING** will cause **DAMAGE TO BOTH PIPE AND FITTING**.

WATER HAMMER — Spears Manufacturing Company, Inc., recommends that all PVC and CPVC plastic piping systems be designed and constructed to **AVOID EXCESSIVE WATER HAMMER**. Water hammer can cause damage, and failure to pipe, valves, and fittings with the piping system.

Spears Manufacturing Company **DOES NOT RECOMMEND** the use of thermoplastic piping products for systems to transport or store compressed air or gases, or the testing of thermoplastic piping systems with compressed air or gases in above & below ground locations. The use of our product in exposed, compressed air or gas systems automatically voids our warranty for such products and its use against our recommendation is entirely the responsibility and liability of the installer.

Spears Manufacturing Company will not accept responsibility for damage or impairment of its products, or other consequential or incidental damages caused by misapplication, incorrect assembly, and / or exposure to harmful substances or conditions.

The procedures and information contained herein are based on the best available information. Due to the variations in methods, conditions, and equipment used in application of these products, no warranties, express or implied, or guarantees of suitability for a particular application are made by Spears Manufacturing Co. Full scale testing and end product performance are the responsibility of the user.



SPEARS® MANUFACTURING CO.

CORPORATE OFFICE AND INTERNATIONAL SALES
15853 OLDEN STREET, P.O. BOX 4428, SYLMAR, CALIFORNIA 91342 (818) 364-1611
Telex#6972762 Fax#818 367-3014

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1 (800) 821-1057
Fax# 717 938-6547

WASHINGTON
3902 "B" ST. NW
AUBURN, 98002
(206) 939-4433
Fax #206 939-7557

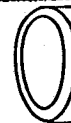
TEXAS
1838 FORMS DRIVE
CARROLLTON 75007
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OUTSIDE TEXAS
1 (800) 527-0650
INSIDE TEXAS
1 (800) 441-1437
Fax # 214 245-4205

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ORLANDO 32811
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INSIDE FLORIDA
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OUTSIDE FLORIDA
1 (800) 327-6390
Fax # 305 425-3563

COLORADO
4800 NOME ST.
DENVER 80239
(303) 371-9430
OUTSIDE COLORADO
1 (800) 525-1119
Fax# 303 375-9546



INDEPENDENT PIPE PRODUCTS



I. P. P.

Better by Design

To : Carl Bennett
Hughes Supply
Sarasota, Florida

From : Harvey Svetlik, P.E.

Re : Ductile Iron Mechanical Joint Anchor Fitting

Dear Mr. Bennett,

Independent Pipe Products is pleased to provide more information on the DIMJA fitting. This fitting design is basically a piece of pipe with a flange in the middle of it. Structurally it is very simple. The forces it endures are axial tension due to thermal contraction, hoop-stress in tension due to internal pressure, beam-bending as in pipeline settlement, compression on the back and front face of the flange ring due to axial gasket load, radial compression between the gasket and stiffener, and axial shear across the flange ring under thermal contraction.

In all cases, the fitting is designed to be stronger than the pipe to which it is attached in all conditions of stress. The pipe will fail before the fitting does. This is the criteria of a fully pressure rated fitting.

For fitting sizes 4" to 12" : The fitting has been quick-burst to exceed four times its working pressure rating. It has been tested to double its working pressure rating for 10,000 hours. It has been fatigue tested to 50% over-pressurization for over 3,000,000 cycles without failure. It has been loaded in tension to the yield strength of the DR11 pipe, such that the flange ring never sheared before the pipe pulled in half or the ductile-iron back-up ring or end cap fractured.

For fitting sizes 14" to 24", the same design criteria was applied on a ratio basis so that the design stress in 24" fittings was the same as the design stress as in 12" fittings. Hence, the design basis proven and validated in the 12" and smaller diameter fittings is the same as for the larger diameters. All these fittings have the same design stress and the same performance capability.

Respectfully,

Harvey Svetlik

INDEPENDENT PIPE PRODUCTS

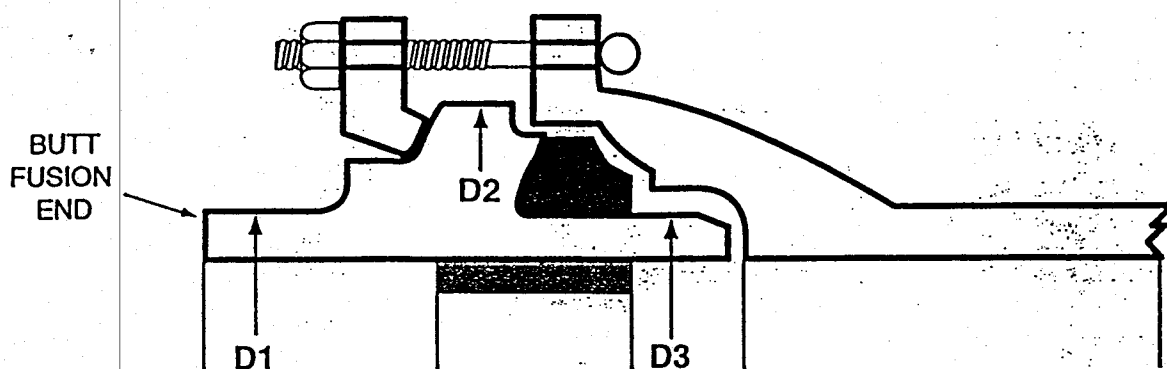
I. P. P.

“BETTER BY DESIGN”®

DIMJA-KIT (4" - 12" DIPS & IPS)

(Ductile-Iron Mechanical Joint Anchoring Kit)

- Kit design based on DI Hydrant-Tee Anchoring Tee Outlet.
- Kit includes HDPE anchor fitting, metal drive ring, longer tee-bolts, standard rubber gasket, stiffener.
- Stocked in DR11; rebored to DR as ordered.



Nominal Size	IPS	D ₁ DIPS	D ₂	D ₃	List Price
3	3.5	3.96	5.37	3.96	..
4	4.50	4.80	6.63	4.80	..
6	6.63	6.90	8.63	6.90	..
8	8.63	9.05	10.75	9.05	..
10	10.75	11.10	13.2	11.10	..
12	12.75	13.20	15.38	13.20	..

Order information needed:
Butt-fusion end exact D₁ and DR

Fusion instructions: Grip on surface D₁ or D₃, align, face, and fuse butt-end to pipe main per pipe mfg. recommended procedures, trim fusion bead as required, install gasket.



Plexco

AWWA C906 BLUESTRIPE[®] NSF Ductile Iron Pipe Sizes and Weights

Nom. Pipe Size	Nom. O.D. (in)	SDR	Min. Wall (in.)	Avg. I.D. (in.)	Weight (lbs./ft.)
4" DI	4.800	9*	0.533	3.669	3.11
		11	0.436	3.875	2.61
		13.5	0.356	4.046	2.17
		15.5	0.310	4.143	1.91
		17	0.282	4.201	1.75
		21	0.229	4.315	1.44
6" DI	6.900	9*	0.767	5.275	6.43
		11	0.627	5.570	5.39
		13.5	0.511	5.816	4.48
		15.5	0.445	5.956	3.94
		17	0.406	6.040	3.62
		21	0.329	6.203	2.97
8" DI	9.050	9*	1.006	6.918	11.06
		11	0.823	7.306	9.27
		13.5	0.670	7.629	7.70
		15.5	0.584	7.812	6.78
		17	0.532	7.921	6.23
		21	0.431	8.136	5.10
10" DI	11.100	9*	1.233	8.485	16.64
		11	1.009	8.961	13.95
		13.5	0.822	9.357	11.59
		15.5	0.716	9.582	10.21
		17	0.653	9.716	9.37
		21	0.529	9.979	7.68
12" DI	13.200	9*	1.467	10.091	23.54
		11	1.200	10.656	19.73
		13.5	0.978	11.127	16.39
		15.5	0.852	11.395	14.43
		17	0.776	11.554	13.24
		21	0.629	11.867	10.86

AWWA Technical Bulletin
No. 7

3 Paired Blue Stripes

*NSF 61 Standard;
NSF 14 Available*

*Note: Feedstock for SDR 9 fittings may not be available.

MECHANICAL JOINT SSB-DUCTILE IRON CLASS 350 FITTINGS

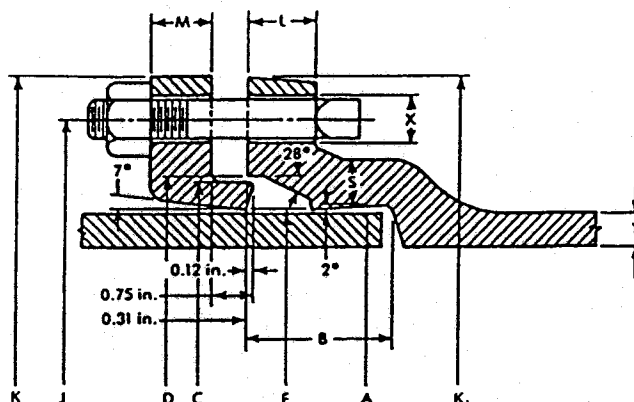
Tyler Pipe
Subsidiary of
Tyler Corporation



SAMPLE SPECIFICATIONS

3" THRU 24" MECHANICAL JOINT DUCTILE IRON FITTINGS shall be produced in accordance with all applicable terms and provisions of ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/A21.11.

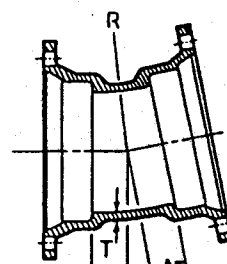
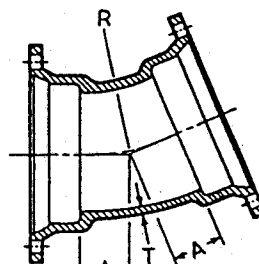
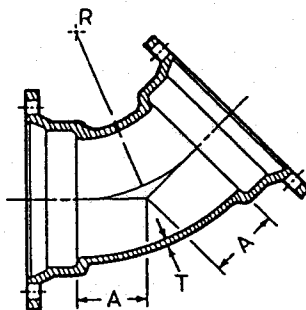
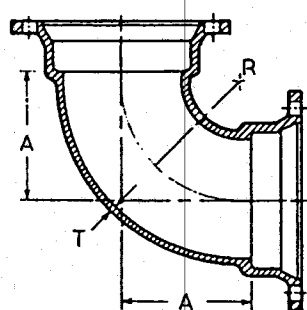
NOTE: Fittings are cement-lined and seal-coated in accordance with ANSI/AWWA C104/A21.4; also available double cement-lined or bare. See list price sheet for details.



JOINT DIMENSIONS IN INCHES

Size	A Dia.	B	C Dia.	D Dia.	F Dia.	J Dia.	K' Dia.	K'' Dia.	L	M	S	T	X Dia.	Size	No.
3	3.96	2.50	4.84	4.94	4.06	6.19	7.62	7.69	.58	.62	.39	.33	3/4	5/8x3	4
4	4.80	2.50	5.92	6.02	4.90	7.50	9.06	9.12	.60	.75	.39	.34	7/8	3/4x3 1/2	4
6	6.90	2.50	8.02	8.12	7.00	9.50	11.06	11.12	.63	.88	.43	.36	7/8	3/4x3 1/2	6
8	9.05	2.50	10.17	10.27	9.15	11.75	12.31	13.37	.66	1.00	.45	.38	7/8	3/4x3 1/2	6
10	11.10	2.50	12.22	12.34	11.20	14.00	15.62	15.62	.70	1.00	.47	.40	7/8	3/4x3 1/2	8
12	13.20	2.50	14.32	14.44	13.30	16.25	17.88	17.88	.73	1.00	.49	.42	7/8	3/4x3 1/2	8
14	15.30	3.50	16.40	16.54	15.44	18.75	20.31	20.25	.79	1.25	.56	.47	7/8	3/4x4	10
16	17.40	3.50	18.50	18.64	17.54	21.00	22.56	22.50	.85	1.31	.57	.50	7/8	3/4x4	12
18	19.50	3.50	20.60	20.74	19.64	23.25	24.83	24.75	1.00	1.38	.68	.54	7/8	3/4x4	12
20	21.60	3.50	22.70	22.84	21.74	25.50	27.08	27.08	1.02	1.44	.69	.57	7/8	3/4x4	14
24	25.80	3.50	26.90	27.04	25.94	30.00	31.58	31.50	1.02	1.56	.75	.61	7/8	3/4x4 1/2	16

BENDS



90° Bends (1/4)

45° Bends (1/8)

22 1/2° Bends (1/16)

11 1/4° (1/32)

Size	Dimensions			Weight	Dimensions			Weight	Dimensions			Weight	Dimensions			Weight
	T	A	R		A	R	A		R	A	R		A	R		
3	.34	4.5	4.0	20	2.00	3.62	16	1.50	4.98	15	1.25	7.62	15			
4	.35	5.0	4.5	26	2.49	4.81	22	1.82	6.66	21	1.55	10.70	20			
6	.37	6.5	6.0	48	3.50	7.25	38	2.59	10.50	37	1.81	13.26	33			
8	.39	7.5	7.0	68	4.00	8.44	59	2.85	11.80	51	2.06	15.80	48			
10	.41	9.5	9.0	107	5.01	10.88	81	3.35	14.35	67	2.32	18.36	61			
12	.43	10.5	10.0	141	5.98	13.25	111	3.86	16.90	80	2.56	20.90	79			
14	.51	12.0	11.5	220	5.50	12.06	164	3.93	17.25	148	2.59	21.25	131			
16	.52	13.0	12.5	264	5.98	13.25	202	3.98	17.50	179	2.62	21.50	159			
18	.59	15.5	14.0	410	7.50	14.50	289	7.50	30.19	292	7.50	60.94	287			
20	.60	17.0	15.5	505	8.00	16.88	348	8.50	35.19	364	8.50	71.07	346			
24	.62	20.0	18.5	695	9.00	18.12	475	9.00	37.69	460	9.00	76.12	457			

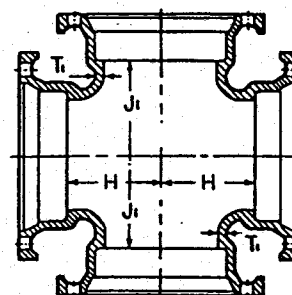
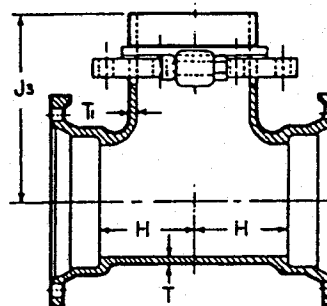
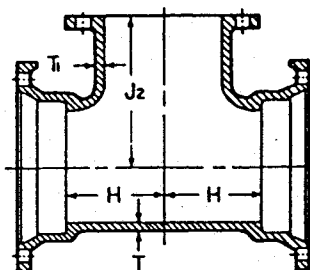
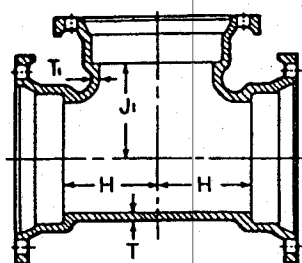
MECHANICAL JOINT SSB-DUCTILE IRON CLASS 350 FITTINGS

Tyler Pipe
Subsidiary of
Tyler Corporation



TEES

CROSS



MJ Tee

MJ x FE Tee

MJ x Swivel Tee

Cross

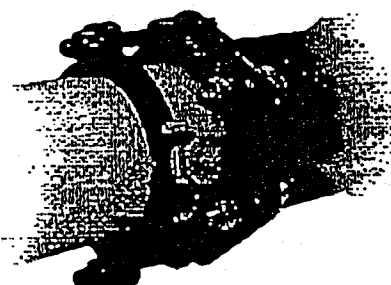
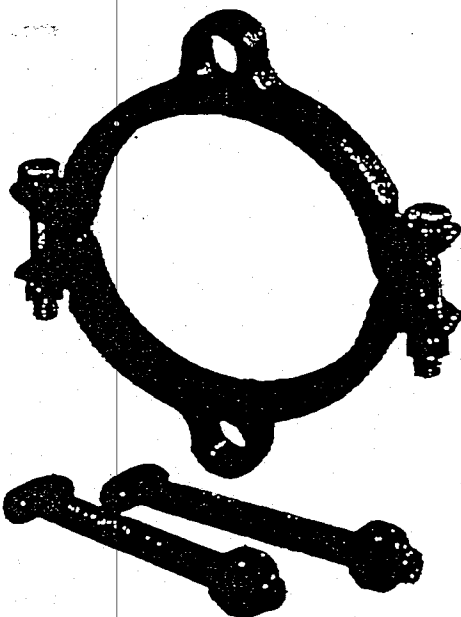
Size	T	T ¹	H	Dimensions		J ³	MJ	Weights		Cross
				J ¹	J ²			MJxFE	MJxS†	
3	.34	.34	3.5	3.50	5.5	...	26	28	...	33
4x3	.35	.34	3.5	4.00	6.5	...	32	34	...	38
4	.35	.35	4.0	4.00	6.5	...	35	38	...	42
6x3	.37	.34	3.5	5.00	8.0	...	47	51
6x4	.37	.35	4.0	5.00	8.0	...	51	54	...	62
6	.37	.37	5.0	5.00	8.0	10.50	60	64	77	80
8x3	.39	.34	4.0	6.50	9.0	...	68	72
8x4	.39	.35	4.5	6.50	9.0	...	71	72	...	84
8x6	.39	.37	5.5	6.50	9.0	11.50	80	83	89	108
8	.39	.39	6.5	6.50	9.0	11.50	90	94	116	120
10x3	.41	.34	4.0	7.50	11.0	...	83	88
10x4	.41	.35	4.5	7.50	11.0	...	83	89	...	98
10x6	.41	.37	5.5	7.50	11.0	13.00	93	107	113	118
10x8	.41	.39	6.5	7.50	11.0	13.00	111	115	129	138
10	.41	.41	7.5	7.50	11.0	...	120	130	...	155
12x3	.43	.34	4.0	8.75	12.0	...	100	104
12x4	.43	.35	4.5	8.75	12.0	...	104	115	...	123
12x6	.43	.37	5.5	8.75	12.0	14.25	115	120	128	140
12x8	.43	.39	6.5	8.75	12.0	14.25	123	146	149	162
12x10	.43	.41	7.5	8.75	12.0	...	153	174	...	187
12	.43	.43	8.75	8.75	12.0	...	178	198	...	212
14x6	.51	.44	6.5	10.50	14.0	16.00	183	205	211	210
14x8	.51	.45	7.5	10.50	14.0	...	206	227	...	231
14x10	.51	.46	8.5	10.50	14.0	...	229	244	...	255
14x12	.51	.47	9.5	10.50	14.0	...	235	276	...	269
14	.51	.51	10.5	10.50	14.0	...	281	302	...	344
16x6	.52	.45	6.5	11.50	15.0	17.00	229	213	248	250
16x8	.52	.46	7.5	11.50	15.0	...	248	260	...	264
16x10	.52	.47	8.5	11.50	15.0	...	265	287	...	286
16x12	.52	.48	9.5	11.50	15.0	...	281	312	...	310
16x14	.52	.51	10.5	11.50	15.0	...	317	348	...	363
16	.52	.52	11.5	11.50	15.0	...	323	374	...	410

† Weights include swivel gland

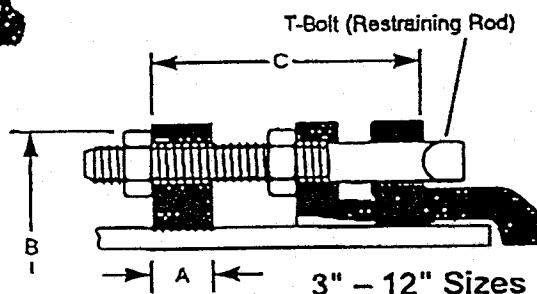
Uni-Flange® Block Buster Pipe Restraint

Style 1300 for HDPE Pipe and Mechanical Joint Fittings

Uni-Flange Style 1300 Block Buster Pipe Restraints are recommended for use on 3" through 12" High Density Polyethylene Pipe with outside diameters that correspond to either steel or ductile iron sizes. The 1300 pipe restraint conforms to the pipe O.D. without placing undue stress on the PE pipe. The 1300 may safely be used on PE pipe with SDR's from 9 through 17, provided a solid insert that extends fully under the restraint is installed in the pipe. The 1300 will restrain pipe to pressures up to the rated pressure of the pipe, if properly installed.



3" - 12 Series 1300
Restraining MJ Fitting



NOM. PIPE SIZE	PVC PIPE WITH STEEL PIPE O.D. STYLE 1300-S		PVC PIPE WITH DUCTILE IRON PIPE O.D. STYLE 1300-C		A	B APPROX.	C MAX.	RESTRAINT Bolts / Rods		CLAMPING BOLTS		APPROX. WT. LBS.
	O.D.	CATALOG NUMBER	O.D.	CATALOG NUMBER				No.	SIZE	No.	SIZE	
3"	3.500	UFR1300-S-3	N/A	-	1-1/8"	7-11/16"	4.0	2	5/8" x 5"	2	5/8" x 3-1/2"	5.8
4"	4.500	UFR1300-S-4	4.80	UFR1300-C-4	1-1/8"	9-1/8"	6.0	2	3/4" x 7"	2	5/8" x 3-1/2"	8.0
6"	6.625	UFR1300-S-6	6.90	UFR1300-C-6	1-1/8"	11-1/8"	6.0	2	3/4" x 7"	2	5/8" x 3-1/2"	9.0
8"	8.625	UFR1300-S-8	9.05	UFR1300-C-8	1-1/4"	13-7/8"	6.0	2	3/4" x 7"	2	3/4" x 4"	14.7
10"	10.750	UFR1300-S-10	11.10	UFR1300-C-10	1-3/8"	16-5/8"	6.0	4	3/4" x 7"	2	7/8" x 5"	25.3
12"	12.750	UFR1300-S-12	13.20	UFR1300-C-12	1-3/8"	19-1/4"	6.0	4	3/4" x 7"	2	7/8" x 5"	28.5

Caution: The Uni-Flange 1300 series has been tested on PE pipe to insure that it will provide restraint to pressures up to the rated pressure of the pipe. Other Uni-Flange restraint products are not recommended for HDPE pipe. Ford/Uni-Flange has no opinion as to the suitability of its products, or of their effect, on PE pipe over the service life-time of the PE pipe. Please consult the manufacturer of the PE pipe concerning its long term performance.

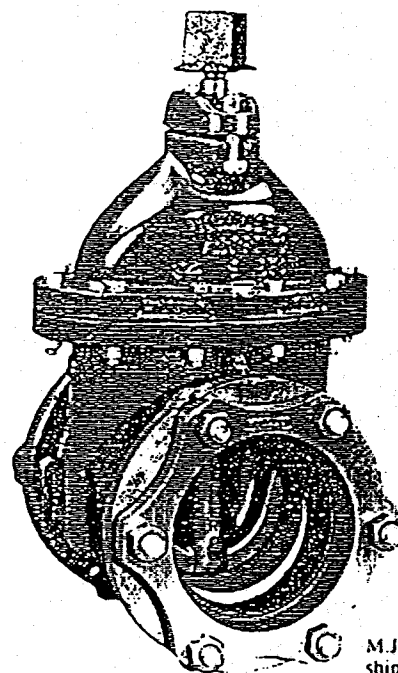


The Ford Meter Box Co., Inc. 775 Manchester Avenue, P.O. Box 443, Wabash, Indiana, USA 46992-0443
Telephone: 219/563-3171 FAX: 1-800-826-3487 Overseas FAX: 219/563-0167

MUELLER® A-2360 RESILIENT WEDGE GATE VALVES WITH M.J. x M.J. ENDS

4-95

- ☐ Catalog number---
 - A-2360-20 Mechanical joint ends (with mechanical joint unassembled accessories)
 - A-2360-23 Mechanical joint ends (less mechanical joint accessories)
- ☐ Sizes---2", 3", 4", 6", 8", 10", 12"
- ☐ Meets or exceeds all applicable requirements of ANSI/AWWA C509 Standard
- ☐ Standard mechanical joint ends comply with ANSI/AWWA C111
- ☐ Iron body with nominal 10 mils MUELLER® Pro-Gard™ Fusion Epoxy Coated interior and exterior surfaces
- ☐ Epoxy coating meets or exceeds all applicable requirements of ANSI/AWWA C550 Standard and is certified to ANSI/NSF 61
- ☐ Iron wedge, symmetrical & fully encapsulated with molded rubber; no exposed iron
- ☐ Non-rising stem (NRS)
- ☐ Triple O-ring seal stuffing box (2 upper & 1 lower O-rings)
- ☐ 2" square wrench nut (optional handwheel available)---open left or open right
- ☐ 2"-12" sizes---250 psig (1723 kPa) maximum working pressure, 500 psig (3447 kPa) static test pressure



M.J. accessories
shipped unassembled

A-2360-20

Options

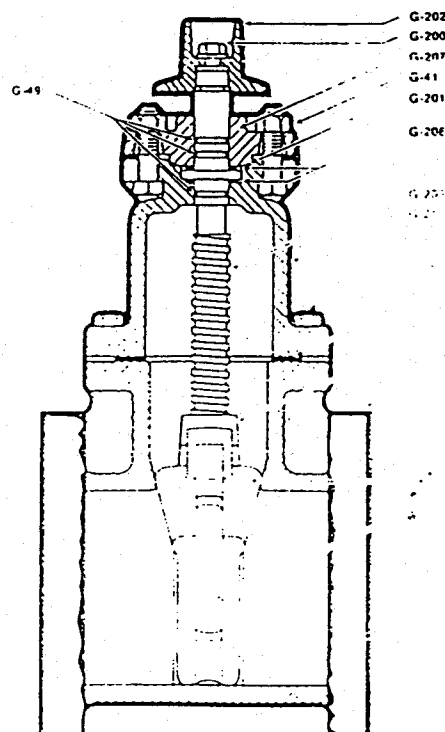
See pages 10.54 and 10.55 for more information on Resilient Wedge Gate Valve options

- ☐ Position indicators
- ☐ Stainless steel fasteners: Type 304, Type 316
- ☐ ASTM B98-C66100/H04 stem
- ☐ Handwheel

Resilient wedge gate valve parts

Catalog Part No.	Description	Material	Material standard
G-16	Bonnet Bolts & Nuts	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-41	Stuffing Box Bolts & Nuts	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-49	Stem O-rings (3)	Rubber	ASTM D2000
G-200	Wrench Nut Cap Screw	Carbon Steel	ASTM A307 Grade B, Zinc Plated
G-201	Stuffing Box Seal	Rubber	ASTM D2000
G-202	Wrench Nut	Cast Iron	ASTM A126 C1-B
G-203	Stem	Bronze	ASTM B148
G-204	Hand Wheel (not shown)	Cast Iron	ASTM A126 C1-B
G-205	Stem Nut	Bronze	ASTM B62
G-206	Guide Cap Bearings	Ceramic	
G-207	Stuffing Box	Cast Iron	ASTM A126 C1-B
G-208	Anti-friction Washers (2)	Ceramic	
G-209	Wedge Rubber Encapsulated	Cast Iron	ASTM A126 C1-B
G-210	Bonnet	Cast Iron	ASTM A126 C1-B
G-211	Bonnet Gasket	Rubber	ASTM D2000
G-212	Body	Cast Iron	ASTM A126 C1-B

*1. Fully encapsulated in molded rubber with no iron exposed

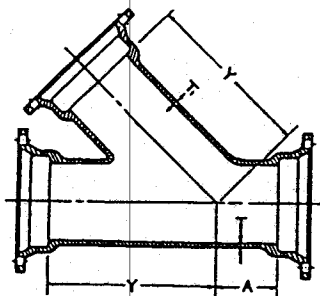


MECHANICAL JOINT SSB-DUCTILE IRON CLASS 350 FITTINGS

Tyler Pipe
Subsidiary of
Tyler Corporation



WYES

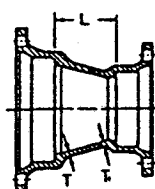


*Wyes

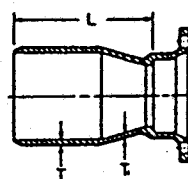
Size	A	Dimensions		T'	Weights
		Y	T		
3	2.0	8.5	.34	.34	36
4x3	1.0	9.0	.35	.34	40
4	2.5	9.5	.35	.35	45
6x4	1.5	11.0	.37	.35	67
6	3.0	13.0	.37	.37	93
8x4	0.5	13.0	.39	.35	93
8x6	2.0	14.5	.39	.37	113
8	3.5	16.0	.39	.39	136
10x4	0.0	15.0	.41	.35	118
10x6	1.0	16.0	.41	.37	136
10x8	2.5	17.0	.41	.39	170
10	3.5	19.0	.41	.41	199
12x4	0.0	16.5	.43	.35	150
12x6	1.5	18.5	.43	.37	186
12x8	1.5	18.5	.43	.39	188
12x10	3.0	20.0	.43	.41	223
12	4.5	22.5	.43	.43	272
14x6	0.0	19.5	.51	.44	256
14x8	1.5	21.0	.51	.45	286
14x10	3.0	22.5	.51	.46	322
14x12	4.5	24.0	.51	.47	387
14	6.0	25.0	.51	.51	465
16x6	0.0	21.0	.52	.45	300
16x8	0.5	22.5	.52	.46	327
16x10	2.0	24.0	.52	.47	375
16x12	3.5	25.0	.52	.48	465
16x14	5.0	26.5	.52	.51	492
16	6.5	28.0	.52	.52	575

* Not included in AWWA C153.

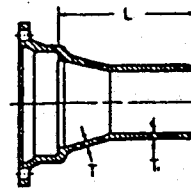
REDUCERS



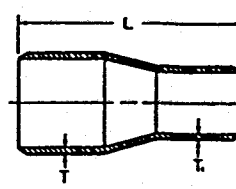
MJ x MJ



MJ x SEB



MJ x LEB



PE x PE

Size	T	T'	Dimensions		LEB L	PE L	MJ	Weights		PE
			MJ L	SEB L				SEB	LEB	
4x3	.35	.34	4.0	9.5	9.5	15.0	18	17	18	17
6x3	.37	.34	5.0	10.5	10.5	16.0	26	25	27	20
6x4	.37	.35	4.0	9.5	9.5	15.0	27	26	27	25
8x4	.39	.35	5.0	10.5	10.5	16.0	36	34	36	33
8x6	.39	.37	4.0	9.5	9.5	15.0	40	37	39	36
10x4	.41	.35	7.0	12.5	12.5	18.0	47	46	43	49
10x6	.41	.37	5.0	10.5	10.5	16.0	47	48	52	48
10x8	.41	.39	4.0	9.5	9.5	15.0	54	52	52	47
12x4	.43	.35	9.0	14.5	14.5	20.0	67	61	68	60
12x6	.43	.37	7.0	12.5	12.5	18.0	67	58	66	58
12x8	.43	.39	5.0	10.5	10.5	16.0	64	62	65	60
12x10	.43	.41	4.0	9.5	9.5	15.0	78	62	65	59
14x6	.51	.44	9.0	17.0	14.5	22.5	108	107	112	109
14x8	.51	.45	7.0	15.0	12.5	20.5	104	107	108	101
14x10	.51	.46	5.0	13.0	10.5	18.5	100	102	100	96
14x12	.51	.47	4.0	12.0	9.5	17.5	100	101	100	99
16x6	.52	.45	11.0	19.0	16.5	24.5	132	131	144	128
16x8	.52	.46	9.0	17.0	14.5	22.5	132	128	136	132
16x10	.52	.47	7.0	15.0	12.5	20.5	128	124	128	123
16x12	.52	.48	5.0	13.0	10.5	18.5	125	123	119	113
16x14	.52	.51	4.0	12.0	12.0	20.0	140	139	138	133
18x8	.59	.45	14.0	22.0	19.5	27.5	194	180	195	170
18x10	.59	.47	12.0	20.0	17.5	25.5	196	180	185	175
18x12	.59	.49	10.0	18.0	15.5	23.5	185	170	190	181
18x14	.59	.56	8.0	16.0	16.0	24.0	190	181	200	185
18x16	.59	.57	7.0	15.0	15.0	23.0	196	180	190	188
20x10	.60	.47	14.0	22.0	19.0	27.5	225	210	210	185
20x12	.60	.49	12.0	20.0	17.5	25.5	210	200	210	195
20x14	.60	.56	10.0	18.0	18.0	26.0	208	198	205	195
20x16	.60	.57	8.0	16.0	16.0	24.0	225	215	222	212
20x18	.60	.59	7.0	15.0	15.0	23.0	233	220	225	210
24x12	.62	.49	16.0	24.0	21.5	29.5	310	300	310	290
24x14	.62	.56	14.0	22.0	22.0	30.0	315	325	335	310
24x16	.62	.57	12.0	20.0	20.0	28.0	325	319	310	304
24x18	.62	.59	10.0	18.0	18.0	26.0	312	310	315	300
24x20	.62	.60	8.0	16.0	16.0	24.0	315	305	307	304

HANCOR Hi-Q[®] Sure-Lok[™] 10.8 PIPE SPECIFICATIONS

Scope

This specification describes 12- to 24-inch Hancor Hi-Q Sure-Lok 10.8 pipe for use in gravity flow drainage applications.

Pipe Requirements

Hi-Q Sure-Lok 10.8 shall meet the requirements of AASHTO M294 Type S. The pipe shall have a smooth interior and annular-corrugated exterior. Manning's "n" value for use in design shall not exceed 0.010.

Joint Performance

Pipe shall be joined with the Hi-Q Sure-Lok (bell-and-spigot) joint meeting the requirements of AASHTO M294. The bell shall be an integral part of the pipe and provide a minimum pull-apart strength of 400 lbs.

The joint shall be watertight according to the requirements of ASTM D3212. Gaskets shall be made of polyisoprene meeting the requirements of ASTM F477 with the addition that the gaskets shall not have any visible cracking when tested according to ASTM D1149 after 72 hour exposure in 50 PPHM ozone at 104° Fahrenheit. Gaskets shall be installed by the pipe manufacturer and covered with a removable wrap to ensure the gasket is free from debris. Joints shall remain watertight when subjected to a 1.5° axial misalignment. A joint lubricant supplied by the manufacturer shall be used on the gasket and bell during assembly.

Fittings

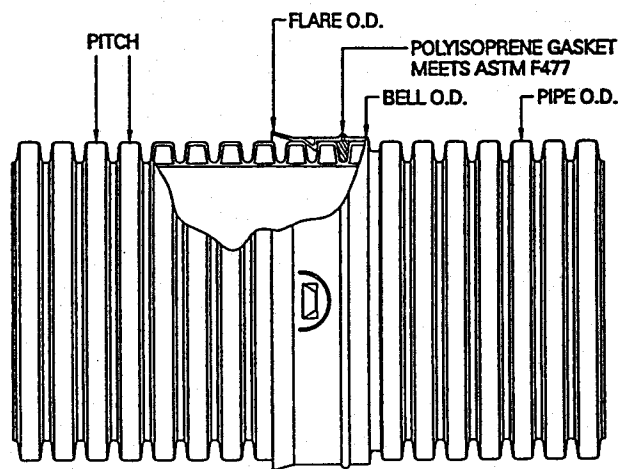
Fittings shall conform to AASHTO M294. Fabricated fittings shall be welded on the interior and exterior at all junctions.

Material Properties

Pipe and fitting material shall be high density polyethylene meeting the requirements of ASTM D3350 Cell Classification 324420C; or ASTM D1248 Type III, Class C, Category 4, Grade P33.

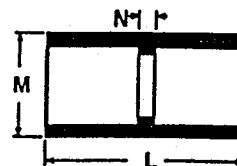
Installation

Installation shall be in accordance with ASTM D2321 with the exception that minimum cover in trafficked areas shall be one foot.



	Nominal Diameter (in.)			
Pipe I.D. (in.)	12	15	18	24
Pipe O.D. (in.)	14.2	17.7	21.5	28.4
Bell O.D. (in.)	14.8	18.4	22.1	29.2
Flare O.D. (in.)	15.4	19.6	23.9	29.9
Pitch (in.)	2.0	2.4	3.0	4.0
Weight (lb./ft.)	3.3	4.7	6.7	12.0
Corrugation	Annular	Annular	Annular	Annular

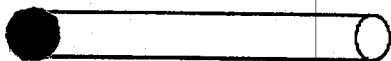
DEEP SOCKET COUPLING (Slip x Slip)



Part Number	Size	M	N	L	Approx. Wt (Lbs.)
479-005N	1/2	1-1/16	1/8	2-1/2	.04
479-015	1-1/2	2-1/4	1/8	4-5/8	.25
479-020	2	2-3/4	1/8	5-1/16	.35
479-025	2-1/2	3-5/16	1/4	7-1/2	.78
479-030	3	4	1/4	8	1.1
479-040	4	5	1/4	8-3/16	1.5

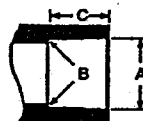
ASTM STANDARD DIMENSIONS

SCHEDULE 40 PIPE DIMENSIONS ASTM D 1785



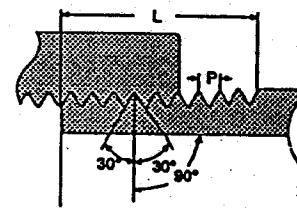
Nominal Pipe Size In.	Mean Outside Diameter In.	O.D. Tolerance In.	Minimum Wall Thickness In.
1/8	0.405	± 0.004	0.068
1/4	0.540	± 0.004	0.088
3/8	0.675	± 0.004	0.091
1/2	0.840	± 0.004	0.109
3/4	1.050	± 0.004	0.113
1	1.315	± 0.005	0.133
1-1/4	1.660	± 0.005	0.140
1-1/2	1.900	± 0.006	0.145
2	2.375	± 0.006	0.154
2-1/2	2.875	± 0.007	0.203
3	3.500	± 0.008	0.216
4	4.500	± 0.009	0.237
5	5.563	± 0.010	0.258
6	6.625	± 0.011	0.280
8	8.625	± 0.015	0.322
10	10.750	± 0.015	0.365
12	12.750	± 0.015	0.406

SCHEDULE 40 SOCKET DIMENSIONS ASTM D 2466



Nominal Size In.	Diameter			Socket Length Minimum C
	Entrance A	Bottom B	Tolerance In.	
1/8	0.417	0.401	± 0.004	0.500
1/4	0.552	0.536	± 0.004	0.500
3/8	0.687	0.671	± 0.004	0.594
1/2	0.848	0.836	± 0.004	0.688
3/4	1.058	1.046	± 0.004	0.719
1	1.325	1.310	± 0.005	0.785
1-1/4	1.670	1.655	± 0.005	0.938
1-1/2	1.912	1.894	± 0.006	1.094
2	2.387	2.369	± 0.006	1.156
2-1/2	2.889	2.868	± 0.007	1.750
3	3.516	3.492	± 0.008	1.875
4	4.518	4.491	± 0.009	2.000
5	5.583	5.553	± 0.010	3.000
6	6.647	6.614	± 0.011	3.000
8	8.655	8.610	± 0.015	4.000
10	10.780	10.735	± 0.015	5.000
12	12.780	12.735	± 0.015	6.000

AMERICAN NATIONAL STANDARD TAPER PIPE THREADS (NPT) ANSI B1.20.1 ASTM D 2466



Nominal Size In.	Threads Per Inch	Effective Thread Length L	Pitch Of Thread P
1/8	27	0.2639	0.03704
1/4	18	0.4018	0.05556
3/8	18	0.4078	0.05556
1/2	14	0.5337	0.07143
3/4	14	0.5457	0.07143
1	11-1/2	0.6828	0.08696
1-1/4	11-1/2	0.7068	0.08696
1-1/2	11-1/2	0.7235	0.08696
2	11-1/2	0.7565	0.08696
2-1/2	8	1.1375	0.12500
3	8	1.2000	0.12500
4	8	1.3000	0.12500
5	8	1.4063	0.12500
6	8	1.5125	0.12500
8	8	1.7125	0.12500

Working Pressures and Solder

The table of maximum working pressures below must be understood to reflect what is generally considered as good engineering practice under reasonably constant and favorable conditions; i.e., pressures which are fairly steady, absence of particularly corrosive media, etc. Unusual conditions require increased safety factors and therefore lower working pressures should be used.

Rated Internal Working Pressures of Piping System Made of Copper Water Tube and Soldered Fittings

Solder Used in Joints	Service Temp. Deg. F.	POUNDS PER SQUARE INCH Water (a)			
		Copper Water Tube-Nominal Sizes			
		1/8" to 1" Incl.	1 1/4" to 2" Incl.	2 1/2" to 4" Incl.	5" to 8" Incl.
*50-50 Tin-Lead (b)	100	200	175	150	135
	150	150	125	100	90
	200	100	90	75	70
	250	85	75	50	45
95-5 Tin-Antimony or 95-5 Tin-Lead (c)	100	500	400	300	270
	150	400	350	275	250
	200	300	250	200	180
Brazing Alloys (Melting at or above 1000° F.)	Temperature and pressure ratings consistent with the materials and procedures employed.				

*The data given for 50% tin-50% lead applies also for the 40% tin-60% lead alloy.

The values in this table are based on data in the National Bureau of Standards Publications, "Building Materials and Structures Reports BMS 58 and BMS 83."

(a) Including other noncorrosive liquids and gases
(b) ASTM B32, Alloy Grade 50A
(c) ASTM B32, Alloy Grade 5A

NOTE: The table at left is from data published by the Copper and Brass Research Association.

Estimated Quantity of 50-50 Solder Required to Make 100 Joints

Size	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	3 1/2"	4"	5"	6"	8"
Quantity in Pounds	.5	.75	1.0	1.4	1.7	1.9	2.4	3.2	3.9	4.5	5.5	8.	15.	32.

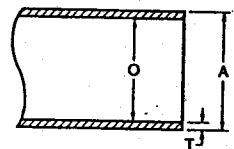
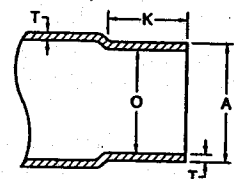
1. The quantity of hard solder used is dependent on the skill of the operator, but for estimating purposes, 75% of the above figures may be used.
2. Two ounces of Solder Flux will be required for each pound of solder.

Wrot Copper and Bronze Solder-Joint Pressure Fittings

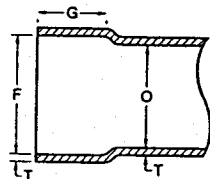
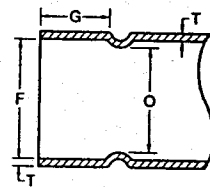
Dimensions of Soldered-Joint Ends (in inches)

Standard Water Tube Size	Male End			Female End			Metal Thickness T	Inside Diameter of Fitting O
	Outside Diameter A		Length K	Inside Diameter F		Depth G		
	Min.	Max.		Min.	Max.		Min.	Min.
1/8	0.248	0.251	0.38	0.252	0.256	0.31	0.022	0.18
1/4	0.373	0.376	0.38	0.377	0.381	0.31	0.026	0.30
3/8	0.497	0.501	0.44	0.502	0.506	0.38	0.031	0.39
1/2	0.622	0.626	0.56	0.627	0.631	0.50	0.036	0.52
5/8	0.747	0.751	0.69	0.752	0.756	0.62	0.038	0.63
3/4	0.872	0.876	0.81	0.877	0.881	0.75	0.041	0.74
1	1.122	1.127	0.97	1.128	1.132	0.91	0.046	0.98
1 1/4	1.372	1.377	1.03	1.378	1.382	0.97	0.050	1.23
1 1/2	1.621	1.627	1.16	1.628	1.633	1.09	0.055	1.47
2	2.121	2.127	1.41	2.128	2.133	1.34	0.064	1.94
2 1/2	2.621	2.627	1.53	2.628	2.633	1.47	0.074	2.42
3	3.121	3.127	1.72	3.128	3.133	1.66	0.083	2.89
3 1/2	3.621	3.627	1.97	3.628	3.633	1.91	0.093	3.37
4	4.121	4.127	2.22	4.128	4.133	2.16	0.101	3.84
5	5.121	5.127	2.72	5.128	5.133	2.66	0.115	4.70
6	6.121	6.127	3.22	6.128	6.133	3.09	0.130	5.72
8	8.119	8.127	4.09	8.128	8.133	3.97	0.186	7.55

Male End



Female End

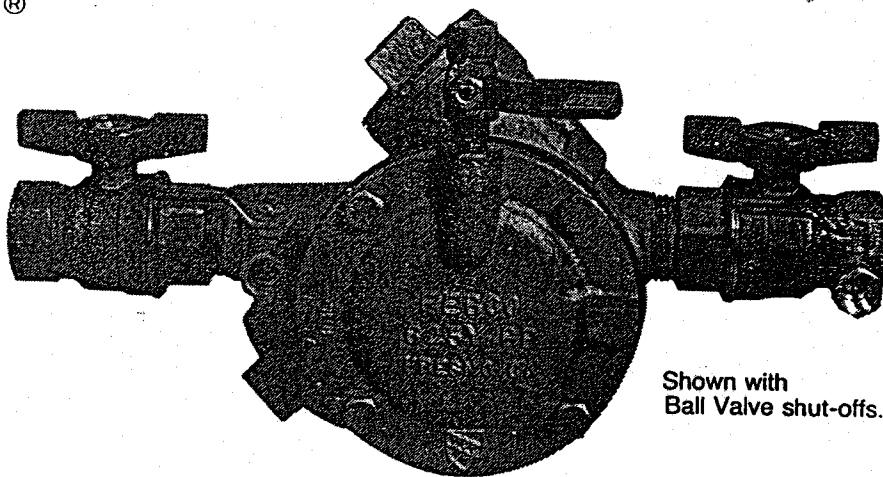


Extracted from American National Standard Wrought Copper and Copper Alloy Solder-Joint Pressure Fittings (ANSI B16.22) with the permission of the publisher. The American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y.



SPECIFICATION SHEET NO. 825Y (3/4" - 2")

Model 825Y (3/4" through 2") Reduced Pressure Backflow Preventer For High Hazard Service



Shown with
Ball Valve shut-offs.

Features

- Ultimate mechanical protection of potable water, against hazards of cross connection contamination.
- Meets all specifications of AWWA, ASSE and USC Foundation for Cross Connection Control and Hydraulic Research.
- Documented flow curves established by University of Southern California Foundation for Cross Connection Control and Hydraulic Research.
- Modular relief valve for ease of maintenance.
- Simple Service procedures. All internal parts serviceable in line.
- Low head loss.
- Spring loaded "Y" type check valves.
- Internal relief valve pressure sensing passages.
- Replaceable relief valve seat ring on 3/4", 1", 1 1/2" and 2".

Operation

In a flow condition the check valves are open with the pressure between the checks, called the zone, being maintained at least 5.0 PSI lower than the inlet pressure and the relief valve is maintained closed.

Should abnormal conditions arise under no flow or reversal of flow, the differential relief valve will open and discharge to maintain the zone at least 2 PSI lower than the supply.

In resumption of normal flow, the zone's differential pressure will resume and the relief valve will close.

Typical Specifications

The reduced pressure backflow preventer shall consist of two independently operating, spring loaded, "Y" pattern check valves and one hydraulically dependent differential relief valve. The assembly shall automatically reduce the pressure in the "zone" between the check valves to at least 5 PSI lower than inlet pressure. Should the differential between the upstream and the zone of the unit drop to 2 PSI, the differential relief valve shall open and maintain the proper differential.

Mainline valve body and caps including relief valve body and cover shall be bronze. Check valve moving member shall be center stem guided. All hydraulic sensing passages shall be internally located within the mainline and relief valve

bodies and relief valve cover. Diaphragm to seat area ratio shall be 10:1 minimum. Relief valve shall have removable seat ring. Check valve and relief valve components shall be constructed so they may be serviced without removing the valve body from the line. All seat discs shall be reversible. Shut-off valves and test cocks shall be full ported ball valves.

The assembly shall be rated to 175 PSI water working pressure and water temperature range from 32°F to 140°F

The assembly shall meet the requirements of ASSE Standard 1013; AWWA Standard Code C506-78; and USC Foundation of Cross Connection Control and Hydraulic Research, Sixth Edition.

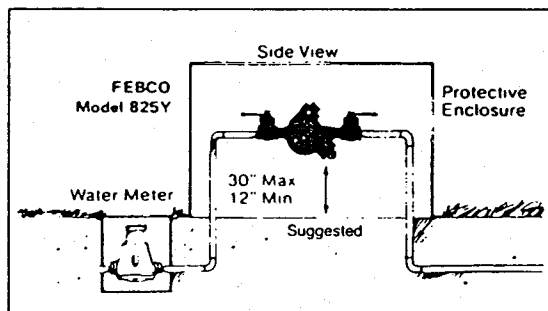
Typical Applications

Reduced Pressure assemblies are used to protect against high hazard (toxic) fluids in water services to industrial plants, hospitals, morgues, mortuaries, and chemical plants. They are also used in irrigation systems, boiler feed, water lines and other installations requiring maximum protection.

Installation

Reduced Pressure Backflow preventers should be installed with minimum clearance of 12" between port and floor or grade. They must be installed where discharge will not be objectionable and can be positively drained away. They should be installed where easily accessible for testing and maintenance and must be protected from freezing. Thermal water expansion and/or water hammer downstream of the backflow preventer can cause excessive pressure. Excessive pressure situations should be eliminated to avoid possible damage to the system and assembly.

Refer to local codes for specific installation requirements. Some codes may prohibit vertical installation.



Wrot Copper Solder-Joint Drainage Fittings

Dimensions of Soldered-Joint Ends (in inches) See Diagram Page 39

Size	Male End			Female End			Metal Thickness T	Inside Diameter of Fitting O
	Outside Diameter A		Length K	Inside Diameter F		Depth G		
	Min.	Max.		Min.	Min.		Max.	Min.
1¼	1.372	1.377	0.56	1.378	1.382	0.50	0.040	1.29
1½	1.621	1.627	0.62	1.628	1.633	0.56	0.042	1.53
2	2.121	2.127	0.69	2.128	2.133	0.62	0.042	2.01
3	3.121	3.127	0.81	3.128	3.133	0.75	0.045	2.98
4	4.121	4.127	1.06	4.128	4.133	1.00	0.058	3.93

Extracted from American National Standard Wrought Copper and Bronze Solder-Joint Drainage Fittings (ANSI B16.29) with permission of the publisher. The American Society of Mechanical Engineers, 345 East 47th St., New York, N.Y.

Wrot Copper Fittings Large Diameter Welded Design - 5", 6" & 8"

Fitting Material:

Copper Alloy #122, Phosphorus
Deoxidized-High Residual Phosphorus (DHP).
Composition: 99% Copper; .015-.040% Phosphorus.

Weld Material:

Silicon Bronze. Meets specification
American Welding Society (AWS) A5.7-69
American Metals Society (AMS) 4616 B.

Weld Specifications:

Tensile Strength—Up to 58,000 PSI
Yield Strength—Up to 25,000 PSI
Elongation in 2"—53% to 55%
Hardness—80 to 100 Brinell (500kg. Load)
Temperature—Melt 1832° F, Flow 1931° F.

Method of Joining:

Electric Weld.

Dimensions & Specifications:

EPC welded fittings are produced in accordance with specifications shown in American National Standard (ANSI) B16.22 for wrought copper, and copper alloy solder-joint pressure fittings.

Testing:

Each fitting is individually tested with air under water. The burst pressure of EPC welded fittings exceeds the recommended working pressure of comparable diameter, annealed, straight, seamless ASTM B88-88 type "L" copper water tube by a safety factor of 4:1 or more.

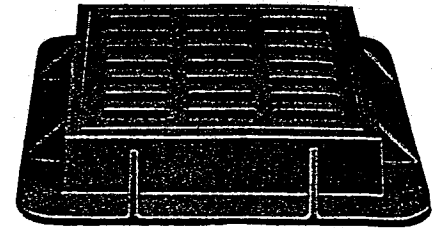
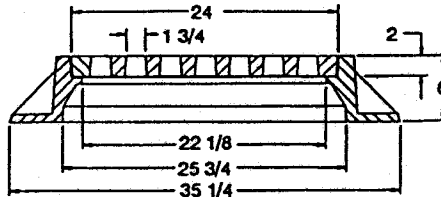
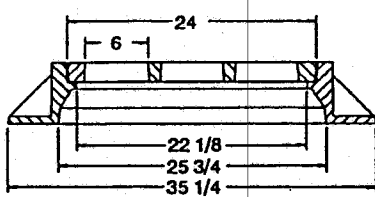
Copper Water Tube-Standard Dimensions and Weights

Nominal Tube Size Inches	Outside Dia., In.	Inside Diameter, Inches				Wall Thickness, Inches				†Pounds per Linear Foot			
	Types K-L-M-DWV	Type K	Type L	Type M	Type DWV	Type K	Type L	Type M	Type DWV	Type K	Type L	Type M	Type DWV
¼	.375	.305	.315	-	-	.035	.030	.025	-	.145	.126	.106	-
⅜	.500	.402	.430	-	-	.049	.035	.025	-	.269	.198	.145	-
½	.625	.527	.545	-	-	.049	.040	.028	-	.344	.285	.204	-
⅝	.750	.652	.666	-	-	.049	.042	.030	-	.418	.362	.263	-
¾	.875	.745	.785	-	-	.065	.045	.032	-	.641	.455	.328	-
1	1.125	.995	1.025	-	-	.065	.050	.035	-	.839	.655	.465	-
1¼	1.375	1.245	1.265	1.291	1.295	.065	.055	.042	.040	1.04	.884	.682	.650
1½	1.625	1.481	1.505	1.527	1.541	.072	.060	.049	.042	1.36	1.14	.940	.809
2	2.125	1.959	1.985	2.009	2.041	.083	.070	.058	.042	2.06	1.75	1.46	1.07
2½	2.625	2.435	2.465	2.495	-	.095	.080	.065	-	2.93	2.48	2.03	-
3	3.125	2.907	2.945	2.981	3.035	.109	.090	.072	.045	4.00	3.33	2.68	1.69
3½	3.625	3.385	3.425	3.459	-	.120	.100	.083	-	5.12	4.29	3.58	-
4	4.125	3.857	3.905	3.935	4.009	.134	.110	.095	.058	6.51	5.38	4.66	2.87
5	5.125	4.805	4.875	4.907	4.981	.160	.125	.109	.072	9.67	7.61	6.66	4.43
6	6.125	5.741	5.845	5.881	5.959	.192	.140	.122	.083	13.9	10.2	8.92	6.10
8	8.125	7.583	7.725	7.785	-	.271	.200	.170	-	25.9	19.3	16.5	-

†Slight variations from these weights must be expected in practice.

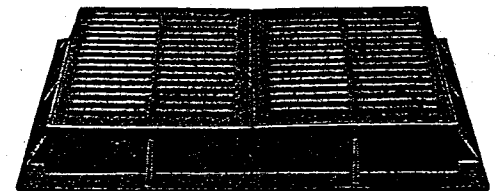
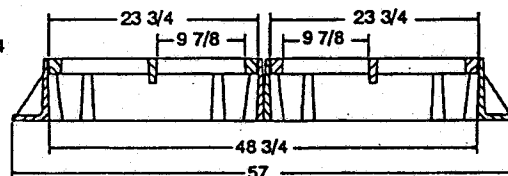
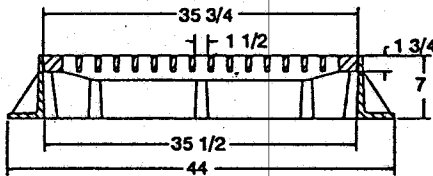
USF 4140 FRAME AND 6160 GRATE

Restricted grate opening.

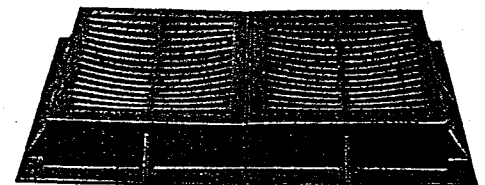
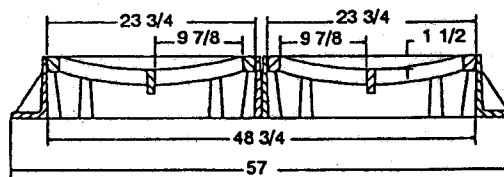
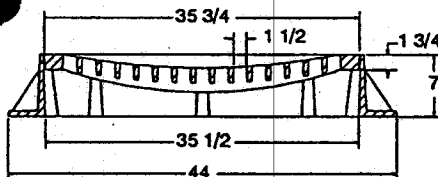


GRATE NUMBER	LOAD RATING	FLOW AREA	GRATE WEIGHT	TOTAL WEIGHT
6160	MEDIUM DUTY	220	150	465

USF 4141 FRAME AND GRATE SERIES



USF 4141-6236



USF 4141-6211

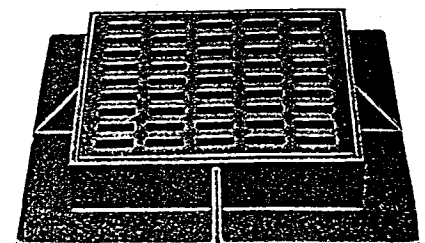
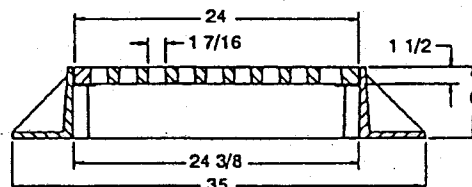
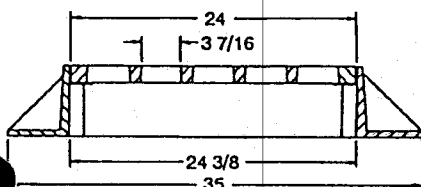
CONCAVE GRATES

GRATE NUMBER	LOAD RATING	FLOW AREA	GRATE WEIGHT	TOTAL WEIGHT
6236	HEAVY DUTY	890	340	770
6211	HEAVY DUTY	890	340	770

TO ORDER 1 PC. OF USF 6236 SPECIFY USF 6237
TO ORDER 1 PC. OF USF 6211 SPECIFY USF 6238
TO ORDER 1 PC. OF USF 4141 SPECIFY USF 4136

USF 4150 FRAME AND 6155 GRATE

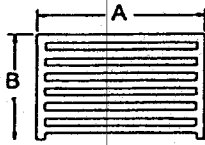
Restricted grate opening.



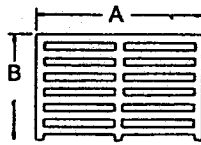
GRATE NUMBER	LOAD RATING	FLOW AREA	GRATE WEIGHT	TOTAL WEIGHT
6155	LIGHT DUTY	220	120	350

USF GRATES 6015 THROUGH 6190

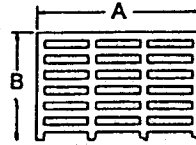
GRATE STYLES



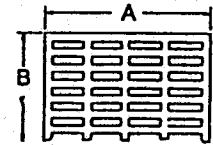
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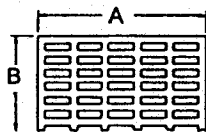
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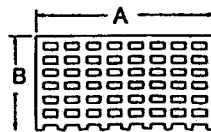
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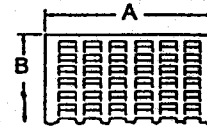
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55



56

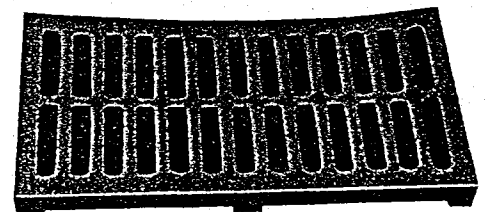
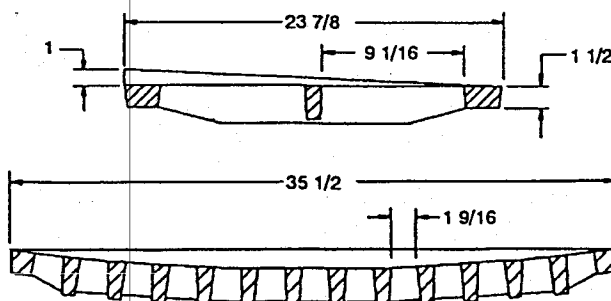


57

GRATE NO.	GRATE STYLE	WIDTH "A"	LENGTH "B"	SEAT HEIGHT	SLOT SIZE	FLOW AREA	WEIGHT	LOAD RATING*			GRATE NO.	GRATE STYLE	WIDTH "A"	LENGTH "B"	SEAT HEIGHT	SLOT SIZE	FLOW AREA	WEIGHT	LOAD RATING*		
								2-Sided SHORT SPAN	2-Sided LONG SPAN	4-Sided BEARING									2-Sided SHORT SPAN	2-Sided LONG SPAN	4-Sided BEARING
6015	51	21 1/4	33 1/4	2 1/4	1 1/4 x 19	260	245	H	-	H	6142	52	20 1/4	14 1/2	1 1/4	1 1/4 x 7 1/4	120	30	-	L	L
6016	57	17 1/4	35 1/4	2	1 1/4 x VAR	230	155	L	L	H	6145	52-R	16 1/4	24	1 1/2	1 1/4 x 5	130	80	H	-	H
6100	51-R	18 1/4	24	1 1/2	1 1/4 x 5 1/2	70	40	H	-	H	*6147	52-R	16 1/4	21 1/4	1 1/4	1 1/4 x 6 1/4	135	95	H	-	H
6105	52-R	10 1/4	24	2 1/4	1 x 3 1/2	75	70	H	-	H	*6148	52	22 1/4	22	1 1/4	1 1/4 x 8 1/4	175	120	H	-	H
6106	51	12 1/4	24	1 1/4	1 1/4 x 9	105	75	H	-	H	6150	55-R	13 1/4	18	2	1 1/4 x 6 1/4	270	205	L	L	H
6110	51	11 1/4	11 1/4	1 1/4	7/8 x 10	45	15	L	-	L	6151	51	21 1/4	28 1/4	2 1/2	1 x 17	220	200	H	-	H
6115	56-R	17 1/4	48 1/2	1 1/4	1 1/4 x 4 1/2	160	160	H	-	H	6152	51	21 1/4	33 1/4	2 1/4	1 1/2 x 19	370	230	H	-	H
6118	52-R	12 1/4	24	1 1/2	1 x 4 1/2	100	60	H	-	H	6153	54-R	24 1/4	14	2 1/4	1 1/4 x 4 1/4	220	110	H	H	H
6120	52-R	12 1/4	24	2 1/4	1 x 4 1/2	100	80	H	-	H	6155	55-R	24 1/4	24	1 1/4	1 1/4 x 3 1/4	220	120	L	-	M
6125	53-R	13 1/4	13	1 1/2	1 x 3	55	15	L	-	L	6160	53-R	24 1/4	24	2	1 1/4 x 6	220	150	L	-	M
6127	52-R	14 1/4	18	1 1/2	1 1/4 x 5 1/4	90	55	M	-	H	6165	55-R	26 1/4	32 1/4	4	3 1/4 x 3 1/4	430	345	H	H	H
6130	52-R	14 1/4	25 1/4	2	1 1/4 x 5 1/4	140	90	H	-	H	6170	53	25 1/4	24	1 1/4	2 x 8 1/2	355	220	L	L	M
6131	52	16 1/4	26 1/4	2	1 1/4 x 6 1/4	175	115	H	-	H	6172	53	26 1/4	24	1 1/4	1 1/4 x 10 1/4	460	155	L	L	H
6133	52	20 1/4	23 1/4	1 1/4	1 1/4 x 8 7/8	215	80	L	L	L	6175	56-R	36 1/4	36 1/4	4 1/2	3 1/4 x 3 1/4	675	650	H	H	H
6135	51	14 1/4	36	2	1 x 11 1/4	200	120	L	-	L	6178	51	37 1/4	17 1/4	3 1/2	1 1/4 x 35 1/4	370	240	-	H	H
6137	51	26 1/4	23	1 1/2	2 1/4 x 21 1/4	290	105	-	L	L	6179	54-R	26 1/4	26	1	1/2 x 5 1/4	220	110	L	-	L
6138	51	33 1/4	27 1/4	2	2 x 10	160	90	H	-	H	6180	55-R	39 1/4	24	2 1/4	1 1/4 x 6	270	400	H	H	H
6140	52-R	14 1/4	24	2 1/4	1 x 5 1/2	120	90	H	-	H	6185	52-R	13 1/4	24	1 1/4	1 x 4 1/2	100	85	H	-	-
6141	52-R	14 1/4	24	2	1 x 5 1/2	120	90	H	-	H	6190	52	24 1/4	36	1 1/2	1 1/4 x 9 1/2	285	270	H	-	H

* CONCAVE GRATE

USF 6191 CURB INLET GRATE



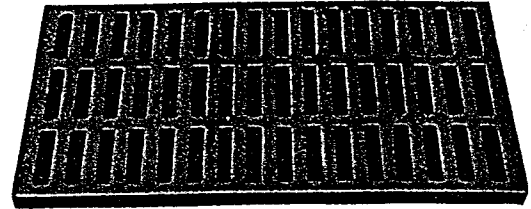
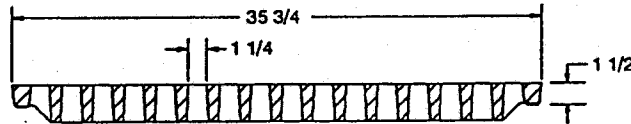
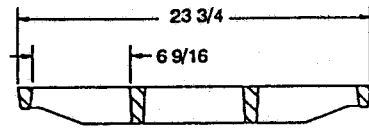
CITY OF JACKSONVILLE, FLORIDA
STANDARD

LOAD RATING*			FLOW AREA	TOTAL WEIGHT
2-SIDED LONG SPAN	2-SIDED LONG SPAN	3-SIDED BEARING		
-	-	L	365	200

NOTE: See Page 126 for Load Rating Configuration.

USF 6429 CATCH BASIN GRATE

Specify steel frame, if required.

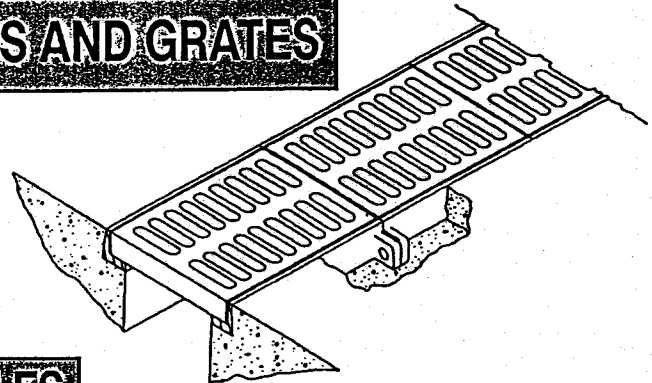
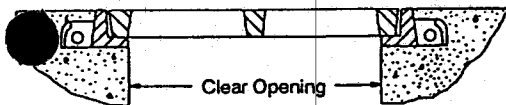


LOAD RATING*			FLOW AREA	TOTAL WEIGHT
2-SIDED SHORT SPAN	2-SIDED LONG SPAN	4-SIDED BEARING		
H	L	H	395	210

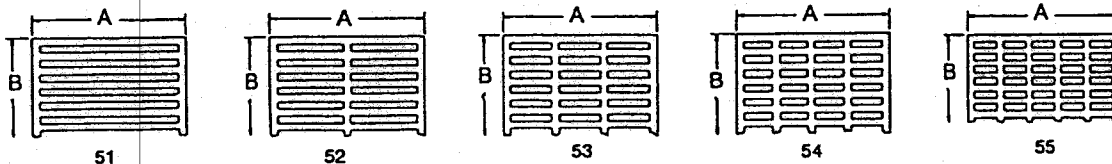
FOR FRAME AND GRATE COMBINATION, REFER TO USF 4139

USF RECTANGULAR TRENCH FRAMES AND GRATES

1. Specify bolting, if required.
2. Specify overall length of trench.



GRATE STYLES



LISTED IN ORDER OF SHORTEST BEARING BAR DIMENSION "A". LENGTH "B", AND SEAT HEIGHT.

FRAME-GRATE NUMBER	GRATE TYPE	WIDTH A	LENGTH B	SEAT HEIGHT	CLEAR OPENING	SLOT SIZE	FLOW AREA	LOAD RATING	GRATE WEIGHT
6515-6100	51-R	8	24	1 1/2	6	1 1/2 x 5 1/2	70	HEAVY DUTY	40
6500-6105	52-R	10	24	2 1/4	8	1 x 3 1/2	75	HEAVY DUTY	70
6515-6118	52-R	12	24	1 1/2	10	1 x 4 1/2	100	HEAVY DUTY	60
6500-6120	52-R	12	24	2 1/4	10	1 x 4 1/2	100	HEAVY DUTY	80
6510-6185	52-R	13	24	1 1/2	11	1 x 4 1/2	100	HEAVY DUTY	85
6505-6141	52-R	14	24	2	12	1 x 5 1/2	120	HEAVY DUTY	90
6500-6140	52-R	14	24	2 1/4	12	1 x 5 1/2	120	HEAVY DUTY	90
6515-6145	52-R	16	24	1 1/2	14	1 1/2 x 5	130	HEAVY DUTY	80
6515-6226	52	19	24	1 1/2	17	1 1/2 x 7 1/2	180	HEAVY DUTY	120
6545-6227	52	20	24	2 1/2	18	1 1/2 x 7 1/2	160	HEAVY DUTY	165
6515-6235	54-R	24	24	1 1/2	22	1 1/2 x 4 1/2	225	HEAVY DUTY	155
6530-6195	53-R	26	36	1 1/2	24	1 1/2 x 6 1/2	340	HEAVY DUTY	300
6500-6250	52	27	24	2 1/2	25	1 1/2 x 10 1/2	220	HEAVY DUTY	200
6535-6212	53	27 1/2	35 1/2	2	24 1/2	1 1/2 x 7 1/2	455	HEAVY DUTY	265
6525-6180	55-R	39	24	2 1/2	37	1 1/2 x 6	270	HEAVY DUTY	400

R=Restricted Grate Openings.

NOTE: For overall frame length, add 1/8" clearance between grates.

SPECIFICATIONS

CAST IRON CONSTRUCTION CASTINGS

- MATERIAL:** Casting material shall conform to specification ASTM-A48 Class 30, Gray Cast Iron, unless otherwise specified.
- APPEARANCE:** Castings shall be free from blowholes, shrinkages or other imperfections not true to pattern.
- MANUFACTURING:** Castings shall be manufactured with critical dimensions conforming to those specified on respective data sheets and drawings. Critical dimensions are defined as those which affect the load bearing capacity, interchangeability and drainage opening where applicable. Noncritical dimensions may change slightly to facilitate proper molding and casting technique. We reserve the right to make modifications to these products as required without notification.
- TOLERANCES:** Casting tolerances, unless otherwise specified, shall be plus or minus 1/16 inch, and an additional plus or minus 1/16 inch per foot of dimension. Notwithstanding these tolerances, all frames, covers and grates of the same nominal size shall be interchangeable.
- MACHINING:** Bearing surfaces of circular heavy and medium duty manhole rings, covers and grates are machined to insure proper fit and prevent rattling.
- WEIGHTS:** Casting weights are approximate and shall be within plus or minus 5% of catalog published weight.
- PAINT:** Casting are supplied unpainted. For special paint applications, contact our customer service department.

LOAD DESIGNATIONS

CLASSIFICATION	LOAD APPLICATIONS	PROOF LOAD TEST
HEAVY DUTY	Highway traffic loads or 16,000 lb. wheel loads	25,000 lbs. * (Ref: Fed. Spec. RR-F-621 E)
MEDIUM DUTY	Driveways, parking lots, ramps and other similar applications where wheel loads do not exceed 12,000 lbs.	18,000 lbs. *
LIGHT DUTY	Areas such as sidewalks, terraces and other areas which do not receive vehicular traffic.	

* Proof load is applied over 9" x 9" area in center of the casting and held for one minute without failure or permanent deflection.

For special load requirements consult our office or representative.