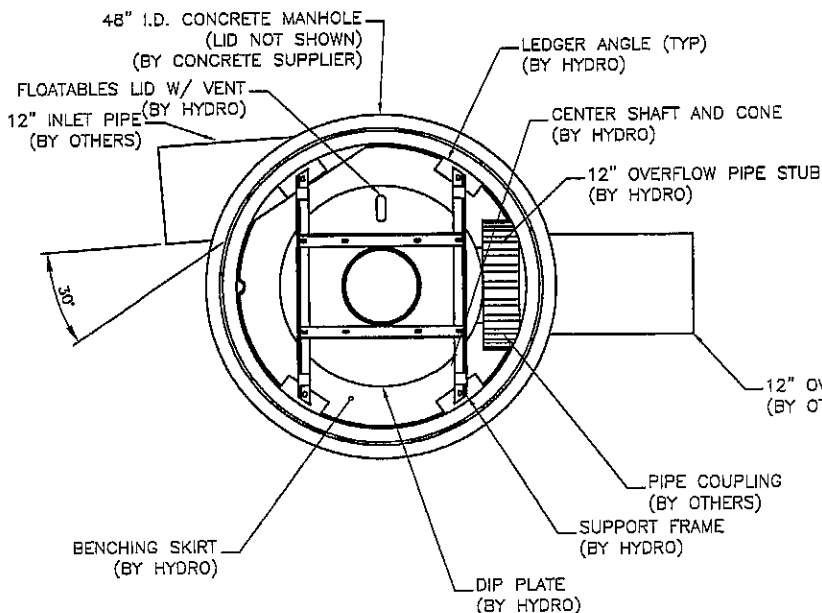


EQUIPMENT PERFORMANCE

The stormwater treatment unit shall adhere to the hydraulic parameters given in the chart below and provide the removal efficiencies and storage capacities as follows:

- Performance objectives:** To remove at least 80% of particles with specific gravity of 2.65 based on a particle size gradation similar to typical D.O.T. road sand having greater than 20% of all particles finer than 300 microns. Additionally, the treatment chamber must be capable of removing greater than 50% of all particles in the range of 300-425 microns at the peak treatment flow rate listed below.
- Frequent storm flow: 0.75 cfs
- Peak treatment flow: 3.0 cfs
- Sediment Storage capacity: 0.7 Cu. yd.
- Continuous Oil storage capacity: 70 Gal.
- Sediment shall be stored in a zone that is isolated from the main flow path and protected from reentrainment by a benching skirt.

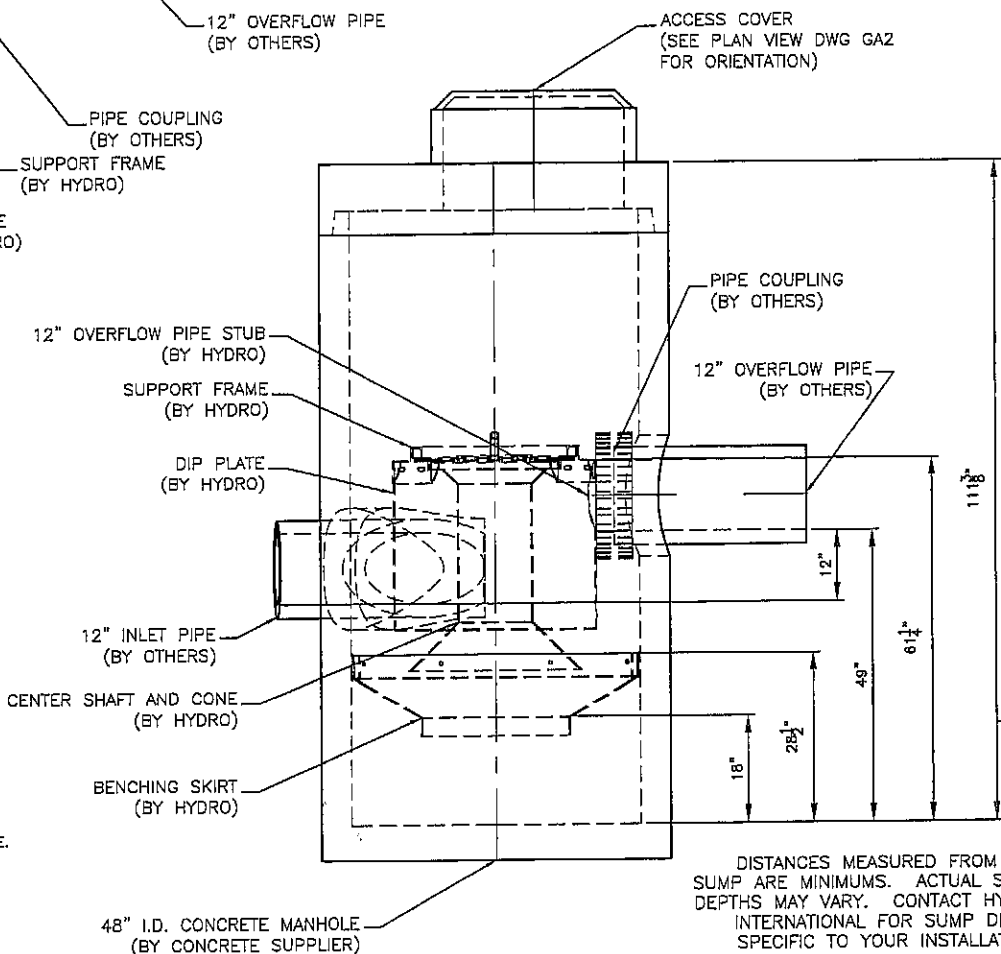


HYDRAULIC PARAMETERS

INLET PIPE $\phi=12"$
 OVERFLOW PIPE $\phi=12"$
 OVERFLOW PIPE SLOPE=1.00%
 MANNING COEFFICIENT=0.012
 10 YR DESIGN STORM FLOW=2.8 cfs

DEPTH OF FLOW IN OVERFLOW PIPE AT 2.8 cfs	8.0	INCHES
ESTIMATED HEADLOSS* AT 2.8 cfs	5.0	INCHES

* HEADLOSS IS DEFINED AS THE DIFFERENCE BETWEEN STATIC WATER LEVEL AT THE INLET OF THE DOWNSTREAM DEFENDER TO THE FREE WATER SURFACE IN THE OVERFLOW PIPE, ASSUMING FREE DISCHARGE.



DISTANCES MEASURED FROM THE SUMP ARE MINIMUMS. ACTUAL SUMP DEPTHS MAY VARY. CONTACT HYDRO INTERNATIONAL FOR SUMP DEPTH SPECIFIC TO YOUR INSTALLATION.

JBF	9/20/04	SUBMITTAL
Rev	By	Date
9/20/04		
Date		Scale
		3/8"=1'0"
Drawn by		Checked Eng.
JBF		
Checked Prod.		Approved by
		<i>[Signature]</i>

Title
 4-FT DIA.
 DOWNSTREAM DEFENDER
 GRANDVIEW ESTATES
 SUPERIOR, WI
 GENERAL ARRANGEMENT



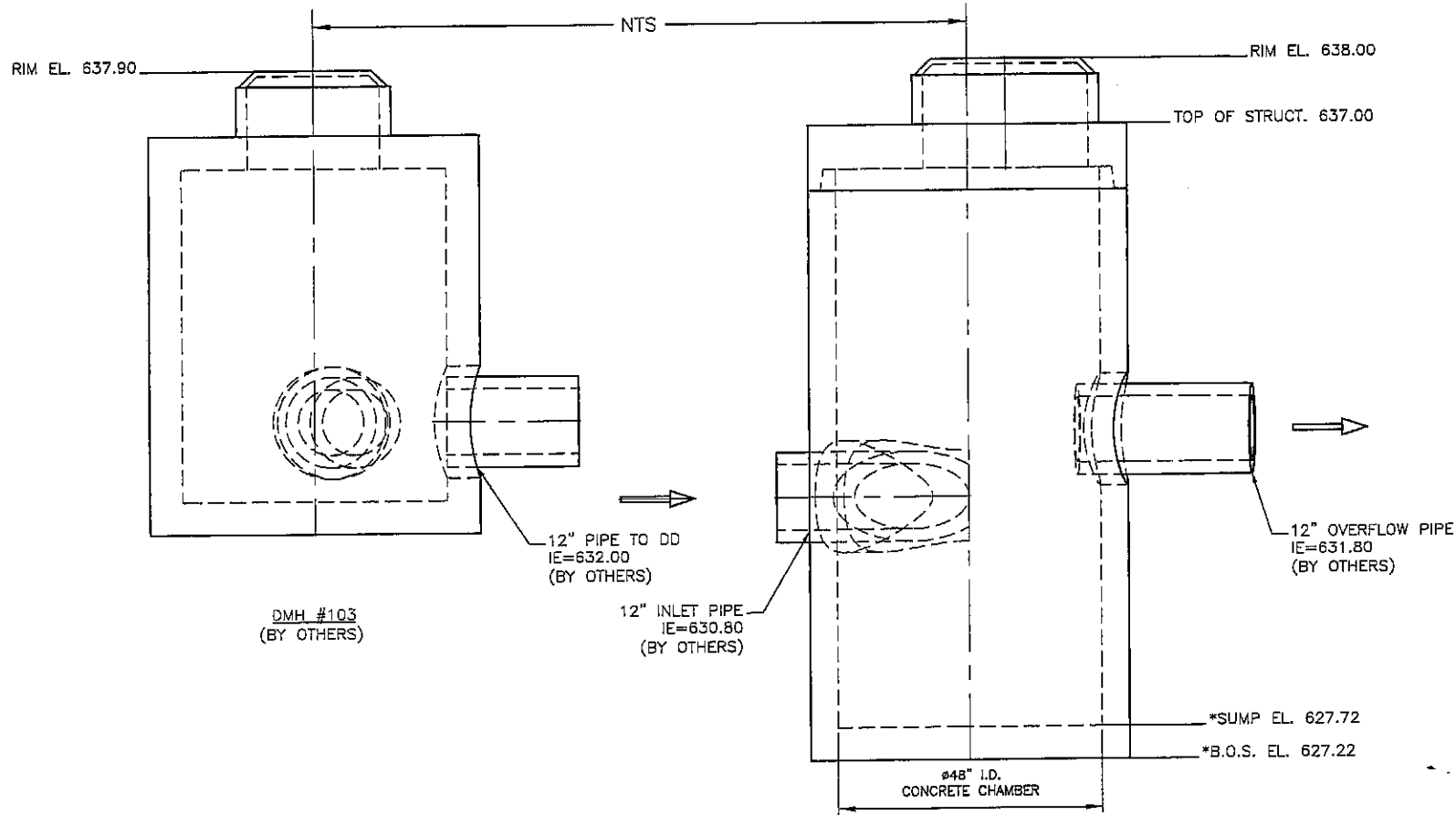
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CAD Ref:	GA1
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Drawing No.	GA1 Rev.

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DEFENDER PIPE CONNECTIONS:

1. RECOMMEND RCP OR PVC OVERFLOW PIPE.
2. LARGE DIAMETER COUPLING REQUIRED TO CONNECT OVERFLOW PIPE TO OVERFLOW PIPE STUB.
OVERFLOW PIPE STUB DIMENSIONS: O.D.=12 1/2", I.D.=12", STUB LENGTH=3"
3. INLET PIPE ENTERS UNIT TANGENT TO INSIDE OF DEFENDER MANHOLE.
CUT PIPE OFF AT 30° ANGLE. (SEE INSTALLATION INSTRUCTIONS.)
4. GROUT INLET AND OVERFLOW PIPES WITH NON-SHRINK GROUT TO ENSURE A WATERTIGHT CONNECTION.



*SUMP ELEVATION MAY VARY SLIGHTLY FROM THE ELEVATION SHOWN BY THIS DRAWING. USE THE INVERT OF THE OVERFLOW PIPE STUB AS A REFERENCE WHEN SETTING THE MANHOLE.

DOWNSTREAM DEFENDER
INTERNAL COMPONENTS
NOT SHOWN

Rev	By	Date	Description
	JBF	9/20/04	SUBMITTAL
Date		9/20/04	Scale 3/8"=1'0"
Drawn by	JBF	Checked Eng.	
Checked Prod.		Approved by	

Title
4-FT DIA.
DOWNSTREAM DEFENDER
GRANDVIEW ESTATES
SUPERIOR, WI
ELEVATION VIEW



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Project No.	2004-358
Drawing No.	GA3
Rev.	