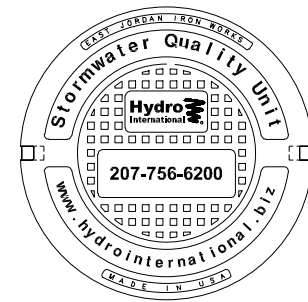
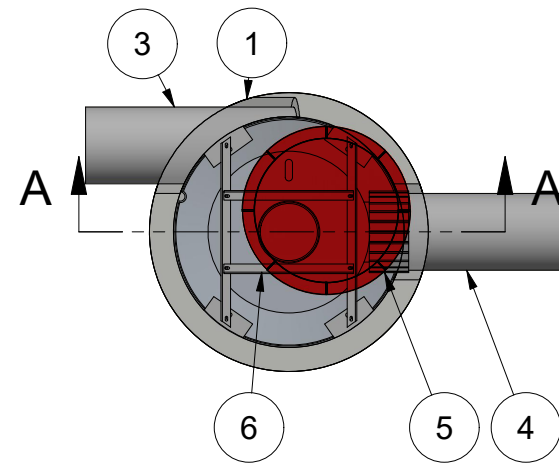
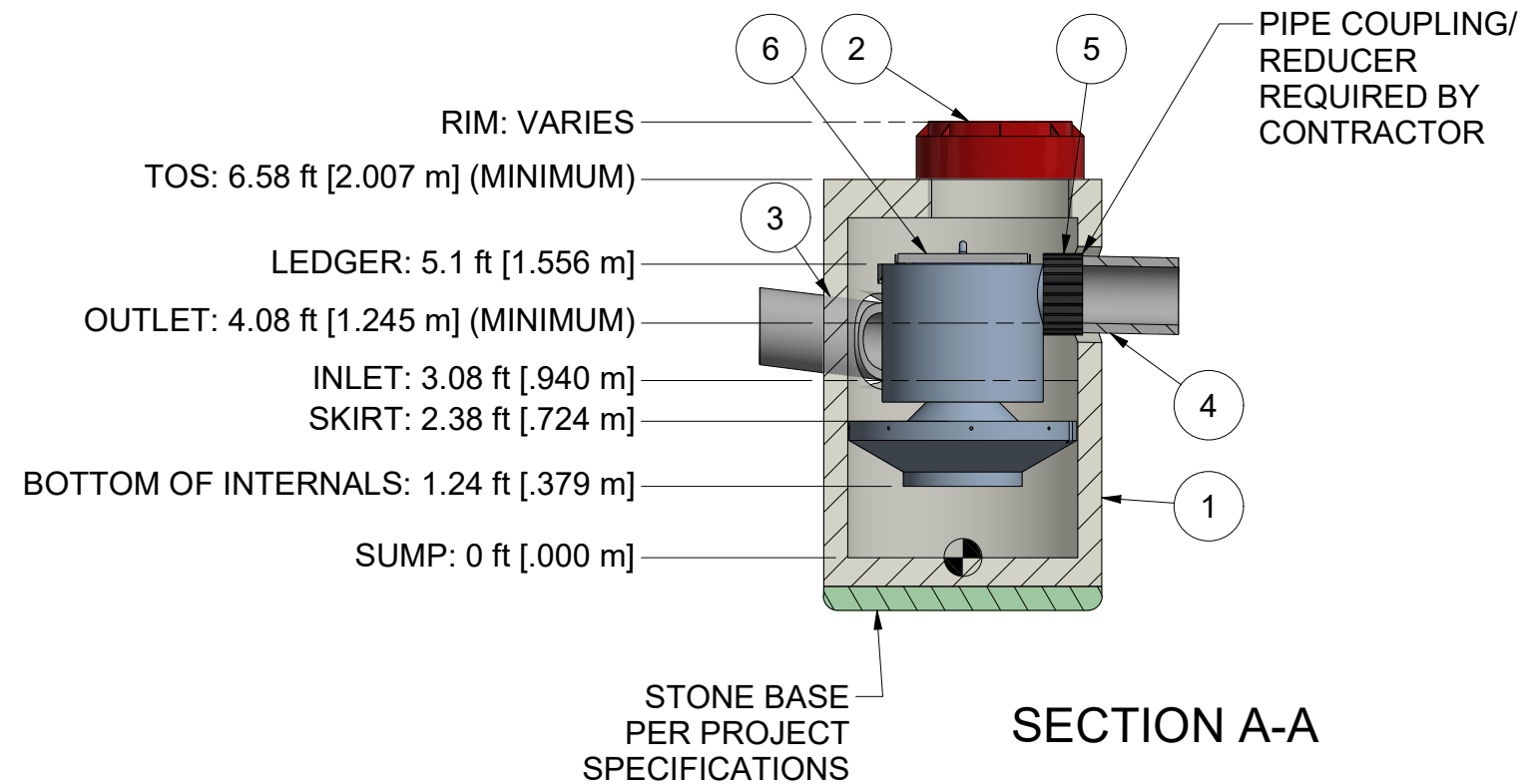


OUTLET STUB ID: 12" (300 mm)  
 OUTLET STUB OD: 12.5" (318 mm)



### HYDRO FRAME AND COVER (INCLUDED)

GRADE RINGS BY OTHERS  
 AS REQUIRED



1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.
2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.



#### IF IN DOUBT ASK

DATE: 12/7/2020 SCALE: 1:1  
 DRAWN BY: ER CHECKED BY: MRJ APPROVED BY:

Title  
 4ft-DIAMETER  
 DOWNSTREAM DEFENDER

GENERAL ARRANGEMENT



WEIGHT: N/A MATERIAL:  
 STOCK NUMBER:  
 DRAWING NO.: DD GA-4  
 SHEET SIZE: B SHEET: 1 OF 1 Rev: A

NOTE: NOT FOR CONSTRUCTION.  
 CONTACT HYDRO FOR SITE  
 SPECIFIC DETAIL

#### EQUIPMENT PERFORMANCE

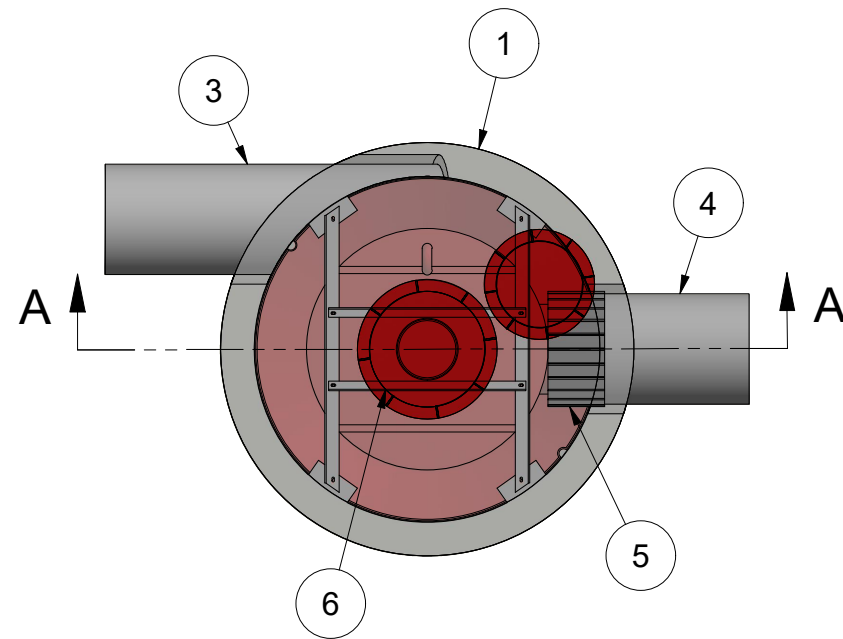
The stormwater treatment unit shall adhere to the hydraulic parameters given in the chart below and provide the removal efficiencies and storage capacities as follows:

1. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
2. Peak Hydraulic Capacity: 3.0 cfs (85 l/s)
3. Sediment Storage Capacity: 0.70 cu. yd. (0.53 cu. m)
4. Continuous Oil Storage Capacity: 70 gal. (265 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reentrainment by a benching skirt.
6. For more product information including regulatory acceptances, please visit <https://hydro-int.com/en/products/downstream-defender>

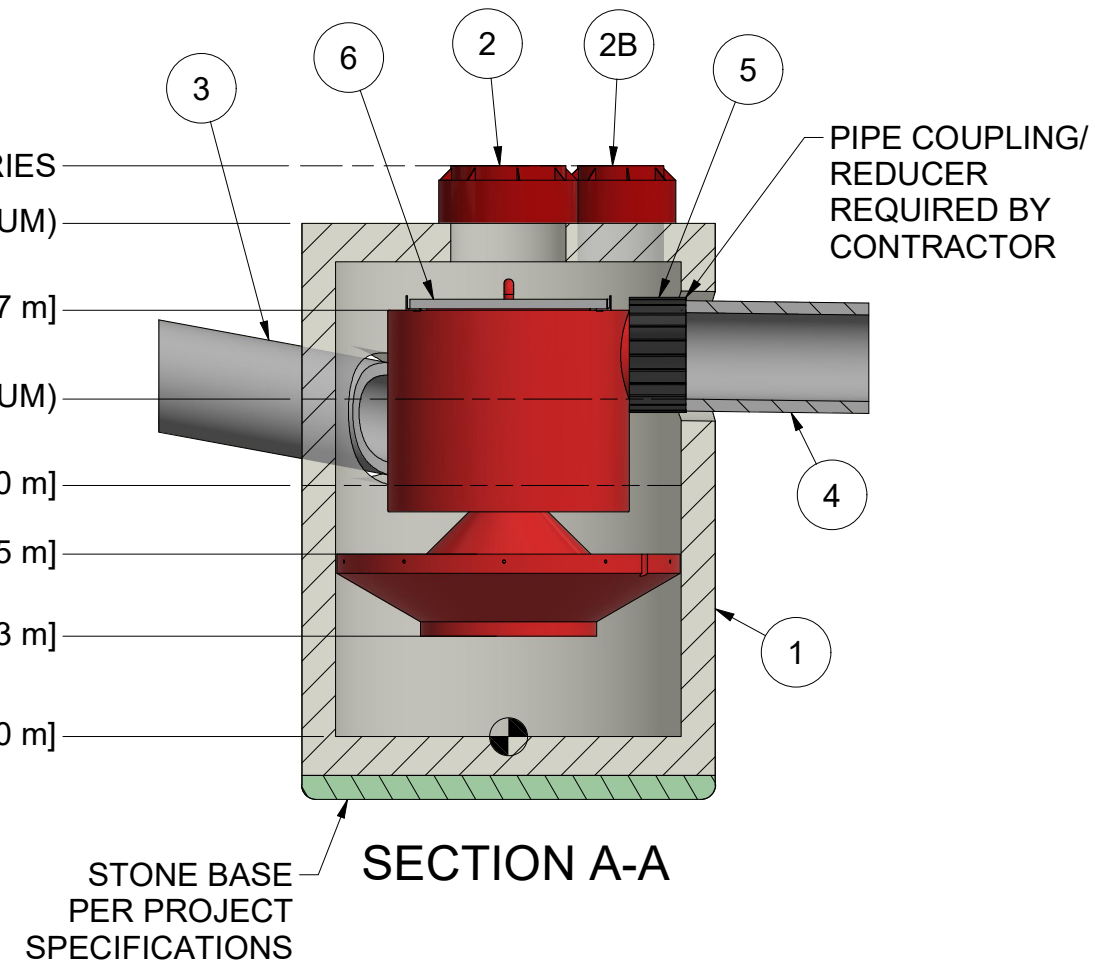
#### PARTS LIST

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	48	1200	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)
2	1	30	750	FRAME AND COVER
3	1	12 (MAX)	300 (MAX)	INLET PIPE (BY OTHERS)
4	1	12 (MAX)	300 (MAX)	OUTLET PIPE (BY OTHERS)
5	1			PIPE COUPLING (BY OTHERS)
6	1			INTERNAL COMPONENTS (PRE-INTALLED)

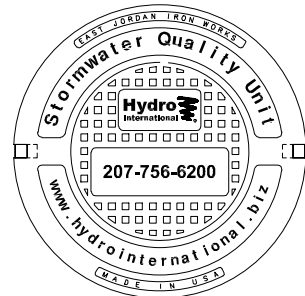
OUTLET STUB ID: 18" (450 mm)  
 OUTLET STUB OD: 18.7" (475 mm)



RIM: VARIES  
 T.O.S.: 8.9 ft [2.717 m] (MINIMUM)  
 LEDGER: 7.41 ft [2.257 m]  
 OUTLET: 5.86 ft [1.788 m] (MINIMUM)  
 INLET: 4.36 ft [1.330 m]  
 SKIRT: 3.17 ft [.965 m]  
 BOTTOM OF INTERNALS: 1.75 ft [.533 m]  
 SUMP: 0 ft [.000 m]



1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.  
 2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.



**HYDRO FRAME AND COVER (INLCUDED)**  
 GRADE RINGS BY OTHERS AS REQUIRED

**SECTION A-A**

NOTE: NOT FOR CONSTRUCTION.  
 CONTACT HYDRO FOR SITE SPECIFIC DETAIL



**IF IN DOUBT ASK**

DATE: 10/8/2019	SCALE: 1 / 50	
DRAWN BY: ER	CHECKED BY: MRJ	APPROVED BY:
Title 6ft-DIAMETER		

**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:

1. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
2. Peak Hydraulic Capacity: 8.0 cfs (227 l/s)
3. Sediment Storage Capacity: 2.10 cu. yd. (1.59 cu. m)
4. Continuous Oil Storage Capacity: 216 gal. (818 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reentrainment by a benching skirt.
6. For more product information including regulatory acceptances, please visit <https://hydro-int.com/en/products/downstream-defender>

**PARTS LIST**

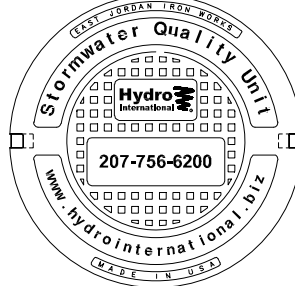
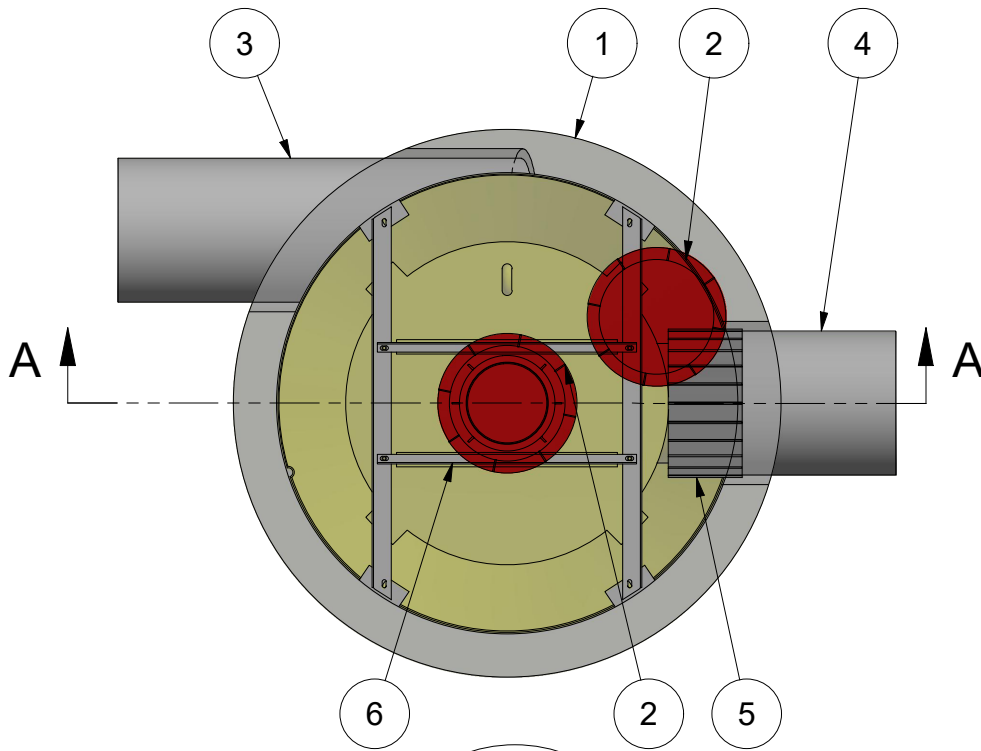
ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	72	1800	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)
2	3	24	600	FRAME AND COVER
2B	1	18	450	FRAME AND COVER
3	1	18 (MAX)	450 (MAX)	MAX INLET PIPE (BY OTHERS)
4	1	18 (MAX)	450 (MAX)	MAX OUTLET PIPE (BY OTHERS)
5	1			PIPE COUPLING (BY OTHERS)
6	1			INTERNAL COMPONENTS (PRE-INTALLED)

GENERAL ARRANGEMENT



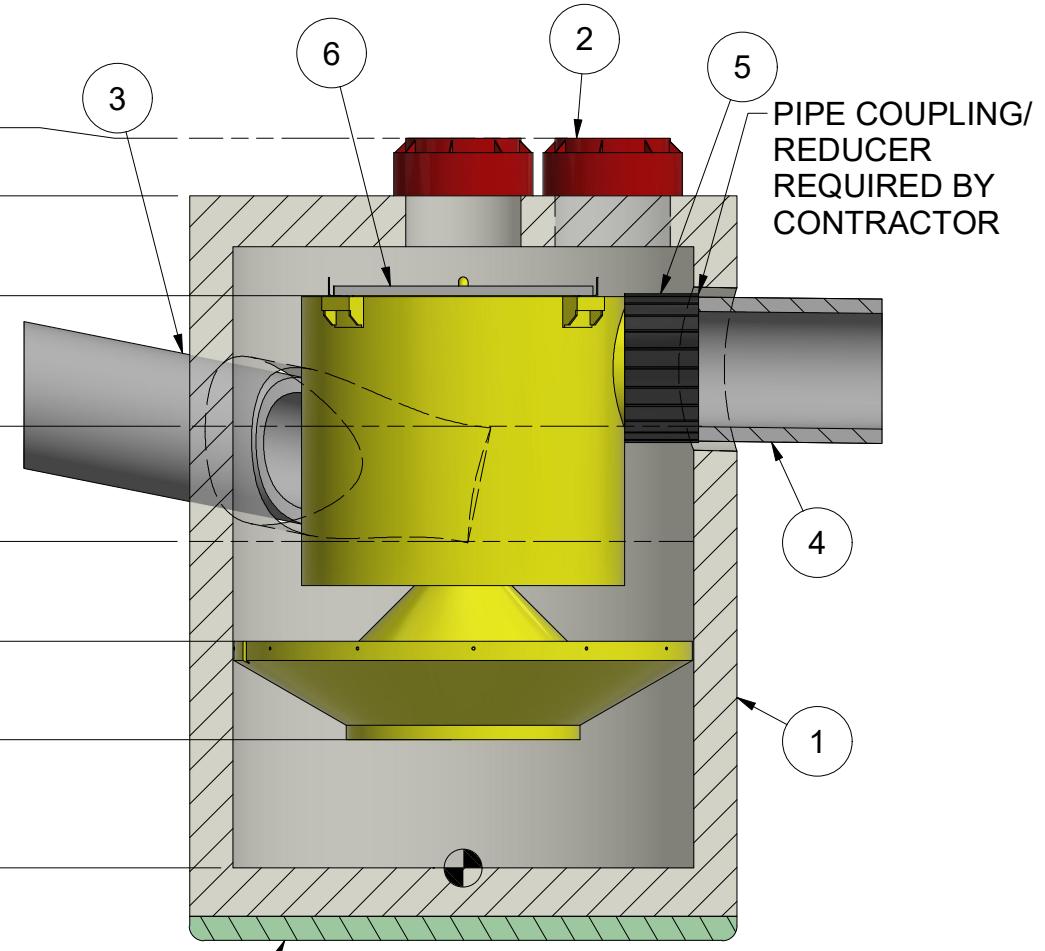
WEIGHT: N/A	MATERIAL:	
STOCK NUMBER: NEXT ASSY		
DRAWING NO.: DD GA-10		
SHEET SIZE: B	SHEET: 1 OF 1	Rev: A

OUTLET STUB ID: 24" (600 mm)  
 OUTLET STUB OD: 24.8" (630 mm)



**HYDRO FRAME AND COVER (INLCUDED)**  
 GRADE RINGS BY OTHERS  
 AS REQUIRED

RIM: VARIES  
 T.O.S.: 11.67 ft [3.556 m]  
 (MINIMUM)  
 LEDGER: 9.94 ft [3.030 m]  
 OUTLET: 7.67 ft [2.337 m]  
 (MINIMUM)  
 INLET: 5.67 ft [1.727 m]  
 SKIRT: 3.94 ft [1.200 m]  
 BOTTOM OF INTERNALS 2.23 ft [.680 m]  
 SUMP: 0 ft [.000 m]



STONE BASE  
 PER PROJECT  
 SPECIFICATIONS

**SECTION A-A**

NOTE: NOT FOR CONSTRUCTION.  
 CONTACT HYDRO FOR SITE  
 SPECIFIC DETAIL

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.  
 2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.



**IF IN DOUBT ASK**

DATE: 12/8/2020 SCALE: 1 / 50  
 DRAWN BY: ER CHECKED BY: MRJ APPROVED BY:

Title  
 8ft DIAMETER  
 DOWNSTREAM DEFENDEER

**GENERAL ARRANGEMENT**



WEIGHT: N/A MATERIAL:  
 STOCK NUMBER:  
 DRAWING NO.: DD GA-8  
 SHEET SIZE: B SHEET: 1 OF 1 Rev: B

**EQUIPMENT PERFORMANCE**

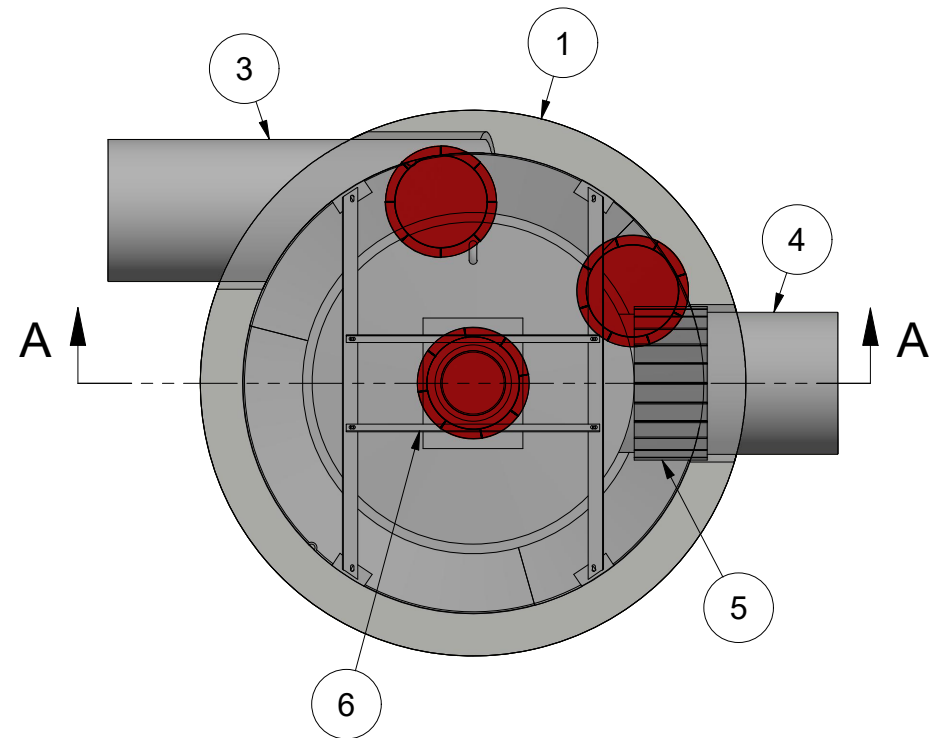
The stormwater treatment unit shall adhere to the hydraulic parameters given in the chart below and provide the removal efficiencies and storage capacities as follows:

1. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
2. Peak Hydraulic Capacity: 15.0 cfs 425 l/s)
3. Sediment Storage Capacity: 4.65 cu. yd. (3.56 cu. m)
4. Continuous Oil Storage Capacity: 540 gal. (2044 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reentrainment by a benching skirt.
6. For more product information including regulatory acceptances, please visit <https://hydro-int.com/en/products/downstream-defender>

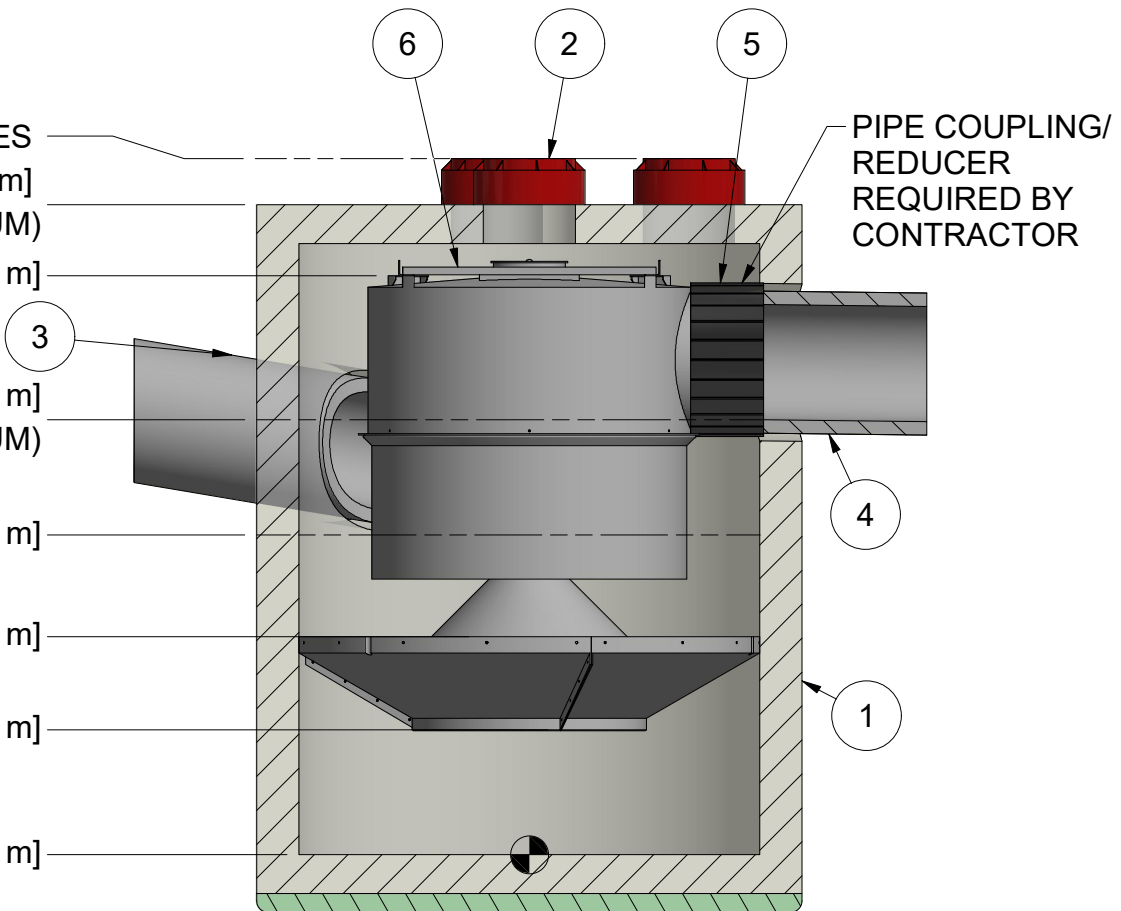
**PARTS LIST**

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	96	2400	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)
2	2	24	600	FRAME AND COVER
3	1	24 (MAX)	600 (MAX)	INLET PIPE (BY OTHERS)
4	1	24 (MAX)	600 (MAX)	OUTLET PIPE (BY OTHERS)
5	1			PIPE COUPLING (BY OTHERS)
6	1			INTERNAL COMPONENTS (PRE-INTALLED)

OUTLET STUB ID: 30" (750 mm)  
 OUTLET STUB OD: 36" (900 mm)



RIM: VARIES  
 T.O.S.: 14.1 ft [4.299 m]  
 (MINIMUM)  
 LEDGER: 12.56 ft [3.829 m]  
 OUTLET: 9.44 ft [2.877 m]  
 (MINIMUM)  
 INLET: 6.94 ft [2.115 m]  
 SKIRT: 4.73 ft [1.441 m]  
 BOTTOM OF INTERNALS: 2.71 ft [.826 m]  
 SUMP: 0 ft [.000 m]

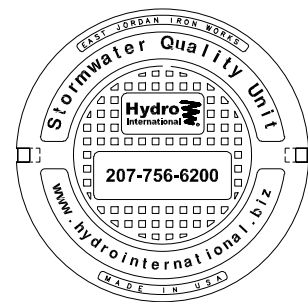


PIPE COUPLING/  
 REDUCER  
 REQUIRED BY  
 CONTRACTOR

STONE BASE  
 PER PROJECT  
 SPECIFICATIONS

**SECTION A-A**

NOTE: NOT FOR CONSTRUCTION.  
 CONTACT HYDRO FOR SITE  
 SPECIFIC DETAIL



**HYDRO FRAME AND COVER (INLCUDED)**  
 GRADE RINGS BY OTHERS  
 AS REQUIRED

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.  
 2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.



**IF IN DOUBT ASK**

DATE: 12/7/2020 SCALE: 1 / 50  
 DRAWN BY: ER CHECKED BY: MRJ APPROVED BY:

Title: 10ft-DIAMETER  
 DOWNSTREAM DEFENDER

GENERAL ARRANGEMENT



WEIGHT: N/A MATERIAL:  
 STOCK NUMBER: NEXT ASSY  
 DRAWING NO.: DD GA-10  
 SHEET SIZE: B SHEET: 1 OF 1 Rev: A

**EQUIPMENT PERFORMANCE**

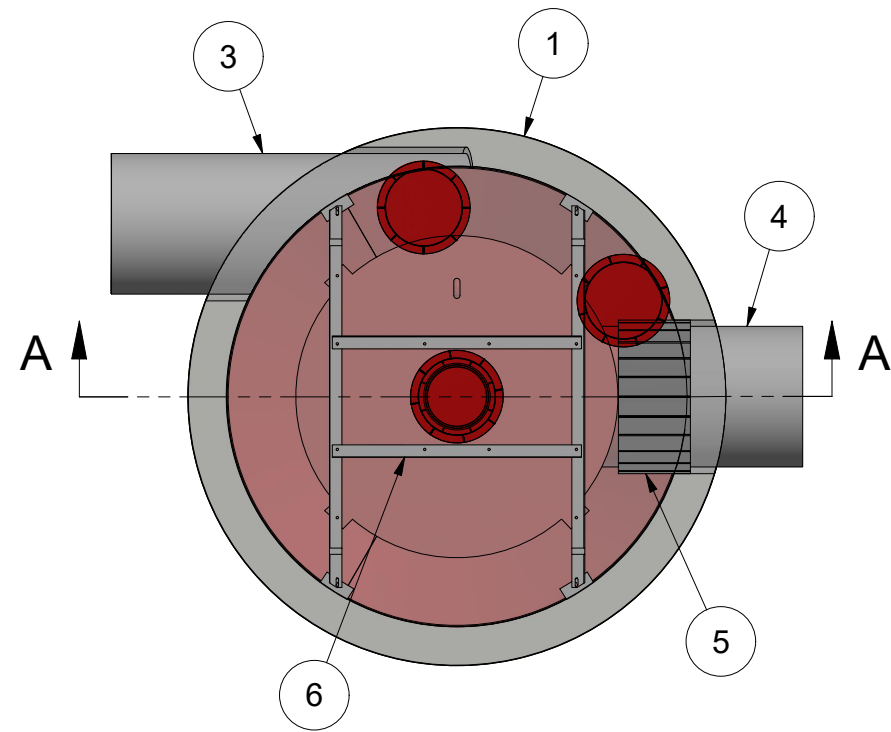
The stormwater treatment unit shall adhere to the hydraulic parameters given in the chart below and provide the removal efficiencies and storage capacities as follows:

1. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
2. Peak Hydraulic Capacity: 25.0 cfs (708 l/s)
3. Sediment Storage Capacity: 8.70 cu. yd. (6.65 cu. m)
4. Continuous Oil Storage Capacity: 1050 gal. (3975 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reentrainment by a benching skirt.
6. For more product information including regulatory acceptances, please visit <https://hydro-int.com/en/products/downstream-defender>

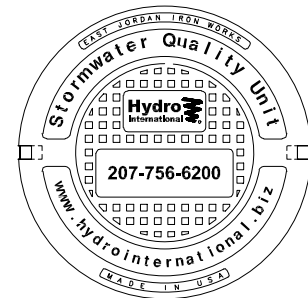
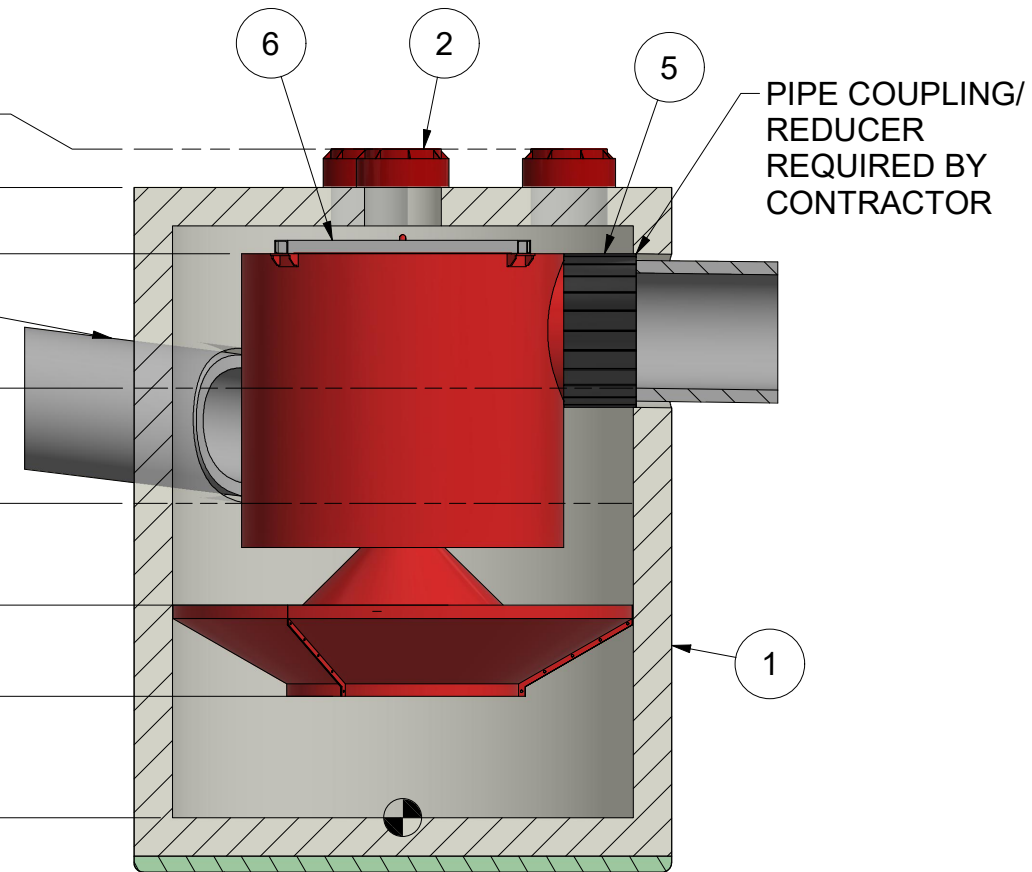
**PARTS LIST**

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	120	3000	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)
2	3	24	600	FRAME AND COVER (QTY 3)
3	1	30 (MAX)	750 (MAX)	INLET PIPE (BY OTHERS)
4	1	30 (MAX)	750 (MAX)	OUTLET PIPE (BY OTHERS)
5	1			PIPE COUPLING (BY OTHERS)
6	1			INTERNAL COMPONENTS (PRE-INTALLED)

OUTLET STUB ID: 36" (900 mm)  
 OUTLET STUB OD: 42" (1050 mm)



RIM: VARIES  
 T.O.S.: 16.42 ft [5.004 m]  
 (MINIMUM)  
 LEDGER: 14.68 ft [4.475 m]  
 OUTLET: 11.18 ft [3.408 m]  
 (MINIMUM)  
 INLET: 8.18 ft [2.494 m]  
 SKIRT: 5.54 ft [1.688 m]  
 BOTTOM OF INTERNALS: 3.17 ft [.965 m]  
 SUMP: 0 ft [.000 m]



**HYDRO FRAME AND COVER (INLCUDED)**  
 GRADE RINGS BY OTHERS  
 AS REQUIRED

STONE BASE  
 PER PROJECT  
 SPECIFICATIONS

**SECTION A-A**

NOTE: NOT FOR CONSTRUCTION.  
 CONTACT HYDRO FOR SITE  
 SPECIFIC DETAIL

1. MANHOLE WALL AND SLAB THICKNESSES ARE NOT TO SCALE.  
 2. CONTACT HYDRO INTERNATIONAL FOR A BOTTOM OF STRUCTURE ELEVATION PRIOR TO SETTING DOWNSTREAM DEFENDER MANHOLE.



**IF IN DOUBT ASK**

DATE: 12/7/2020 SCALE: 1 / 50  
 DRAWN BY: ER CHECKED BY: MRJ APPROVED BY:

Title  
 12ft-DIAMETER  
 DOWNSTREAM DEFENDER

GENERAL ARRANGEMENT



WEIGHT: N/A MATERIAL:  
 STOCK NUMBER:  
 DRAWING NO.: DD GA-12  
 SHEET SIZE: B SHEET: 1 OF 1 Rev: A

**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:

1. The treatment system shall use an induced vortex to separate pollutants from stormwater runoff.
2. Peak Hydraulic Capacity: 38.0 cfs (1076 l/s)
3. Sediment Storage Capacity: 14.70cu. yd. (11.24 cu. m)
4. Continuous Oil Storage Capacity: 1770 gal. (6700 liters)
5. Sediment shall be stored in a zone that is isolated from the main flow path and protected from reintraintment by a benching skirt.
6. For more product information including regulatory acceptances, please visit <https://hydro-int.com/en/products/downstream-defender>

**PARTS LIST**

ITEM	QTY	SIZE (in)	SIZE (mm)	DESCRIPTION
1	1	144	3700	PRECAST MANHOLE (BY HYDRO VIA PRECASTER)
2	3	24	600	FRAME AND COVER (QTY 3)
3	1	36 (MAX)	900 (MAX)	INLET PIPE (BY OTHERS)
4	1	36 (MAX)	900 (MAX)	OUTLET PIPE (BY OTHERS)
5	1			PIPE COUPLING (BY OTHERS)
6	1			INTERNAL COMPONENTS (PRE-INTALLED)