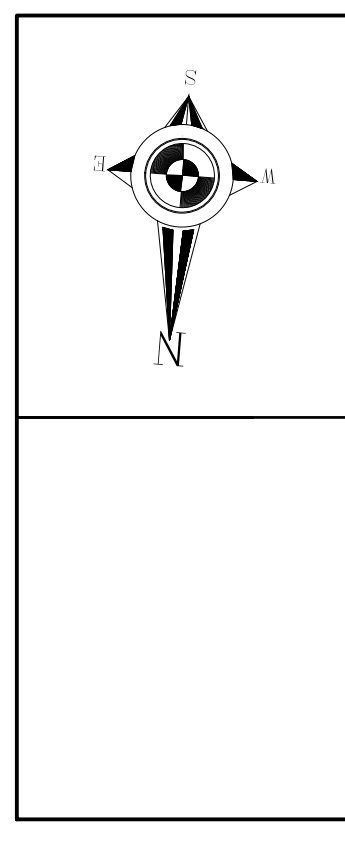


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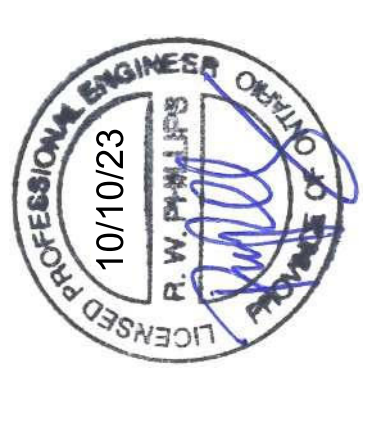


No.	Date	Version	Dwn.

PROJECT:
TOWNHOMES DEVELOPMENT
 5888 Dunn Street
 City Of Niagara Falls
 Canada

DRAWING TITLE:
SERVICING PLAN

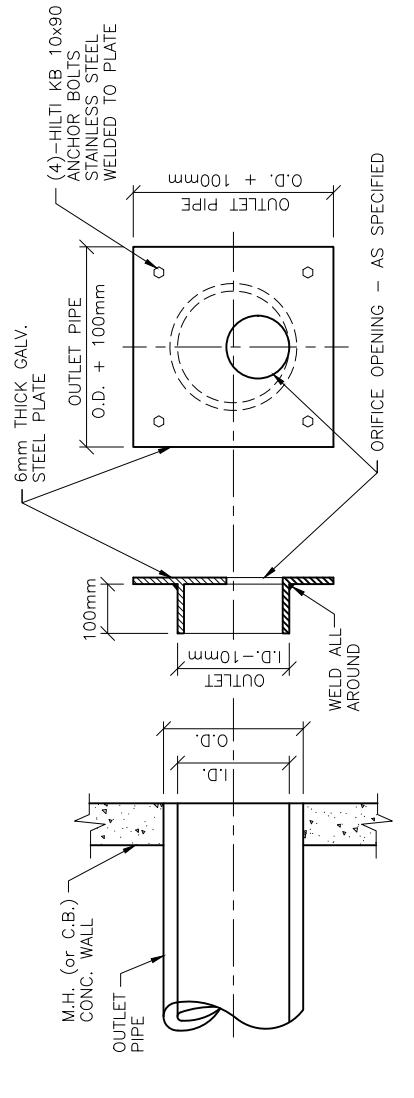
DRAWN BY: K.P.B. DATE: OCT. 10/23
 CHECKED BY: R.W.P. SCALE: 1:250
 PROJECT NO.: DRAWING NO.:
16363 C-02



T.B.M. No. 1 ELEV. = 193.10m
 AS SHOWN (EASTERN OF 2 POTENTIAL CROSSINGS)

C.B. ORIFICE PLATE SIZING

ORIFICE PLATE NUMBER	ORIFICE PLATE DIMENSIONS
	100mm



FLOW CONTROL DEVICE ORIFICE PLATE

SANITARY SYSTEM

MH No.	DESCRIPTION	T/C	INVERTS
S1	1.2m ² P/C MH	191.80	S 189.35
S2	1.2m ² P/C MH	192.15	N 189.71
S3	1.2m ² P/C MH	192.30	N 190.18

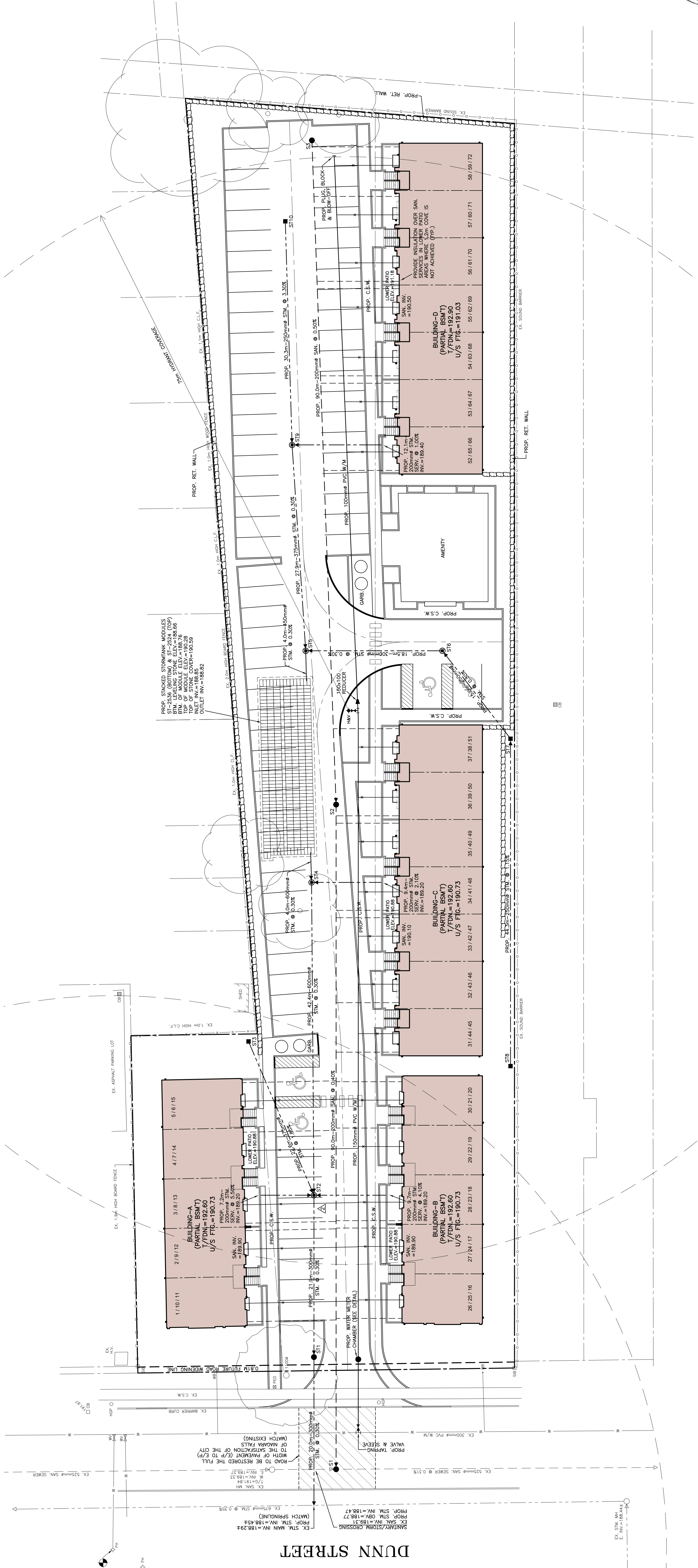
STORM SYSTEM

MH No.	DESCRIPTION	T/C	INVERTS
S11	1.5m ² P/C CB/MH	191.90	S 188.57
S12	1.5m ² P/C CB/MH	191.90	S 188.66
S13	1.5m ² P/C CB/MH	191.90	S 188.75
S14	1.5m ² P/C CB/MH	191.90	S 188.84
S15	1.5m ² P/C CB/MH	191.90	S 188.93
S16	1.5m ² P/C CB/MH	191.90	S 189.02
S17	1.5m ² P/C CB/MH	191.90	S 189.11
S18	1.5m ² P/C CB/MH	191.90	S 189.20
S19	1.5m ² P/C CB/MH	191.90	S 189.29
S20	1.5m ² P/C CB/MH	191.90	S 189.38

WATERMAIN CROSSINGS

LOCATION	STM. INV.	STM. GR.	SM. INV.	SM. GR.	W.M. INV. AT CROSSING ONLY	W.M. GR. AT CROSSING ONLY
1	189.05	189.25	189.34	189.34	190.45	190.45
2	189.14	189.34	189.34	189.34	190.45	190.45
3	188.80	189.10	189.34	189.34	190.45	190.45
4	189.35	189.55	189.34	189.34	190.55	190.70

• DENOTES LOCATION WHERE WATERMAIN IS TO BE LOWERED BELOW STORM SEWER (ONLY) OR SANITARY SEWER (ONLY) USING 45° VERT. BENDS (PROVIDE 0.50m MIN. CLEARANCE CROSSING LOCATIONS)



DUNN STREET

PRIMARY CONSULTANT & PROJECT MANAGER
RPDS
 INTEGRATED DESIGN FIRM
 SUITE 302, 305E FRANKER RD, MISSISSAUGA, ON L5S 1R9
 MAIL: PROJECT@RPDSINC.COM, CALL: 416-477-8636
 WEBSITE: WWW.RPDSINC.COM

ELECTRICAL CONSULTANT

CONSULTING CIVIL ENGINEERS
J.H. COHOON ENGINEERING LIMITED
 CONSULTING ENGINEERS
 2200 SHEPPARD AVENUE EAST, SUITE 200
 MISSISSAUGA, ONTARIO L4X 1L3
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PROJECT:
TOWNHOMES DEVELOPMENT
 5858 Dunn Street
 City of Niagara Falls
 Canada

DRAWING TITLE:
TYPICAL DETAILS AND NOTES

NO. Date Version DWN1

DRAWN BY: K.P.B. DATE: OCT. 10/23
 CHECKED BY: R.W.P. SCALE: AS SHOWN
 PROJECT NO.: 16363 DRAWING NO.: C-04

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 14
MAINTENANCE HOLE BENCHING AND PIPE OPENING ALTERNATIVES OPSD 701.021

Maintenance Hole Diameter	No. 1-4	No. 5 and 6	No. 8	Init Hole	Outlet Hole	No. 7
700	380	780	700	800	800	
1200	380	1180	1100	1200	1200	
1800	1220	1485	1220	1220	1485	
2400	1485	2020	1760	1485	2020	
3000	1930	2450	2300	1930	2450	
3600	2470	3085	2730	2470	3085	

NOTES:
 1 Slopes shall be maintained from the outlet hole opening for top of benching.
 2 Concrete for benching shall be 30mm.
 3 Concrete for benching shall be given steel toward finish.
 4 Benchings slope and height shall be as specified.
 5 All dimensions are in millimetres unless otherwise shown.
 6 All dimensions are nominal, unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2013 Rev 12
CAST IRON, SQUARE FRAME WITH SQUARE OVERFLOW TYPE DISHED GRATE FOR CATCH BASINS, HERRING BONE OPENINGS OPSD 400.010

NOTES:
 1 This OPSD shall be read in conjunction with OPSD 610.010 and 610.020.
 2 All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2015 Rev 3
RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 3 SOIL - EARTH EXCAVATION OPSD 802.031

LEGEND:
 D - Inside diameter
 OD - Outside diameter

NOTES:
 1 Height of fill is measured from the finished surface to top of pipe.
 2 Minimum bedding depth shall be 150mm, no case shall this dimension be less than 300mm.
 3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 5 Conditions of excavation is symmetrical about centreline of pipe.
 6 All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2015 Rev 3
RIGID PIPE BEDDING, COVER, AND BACKFILL TYPE 1 OR 2 SOIL - EARTH EXCAVATION OPSD 802.030

LEGEND:
 D - Inside diameter
 OD - Outside diameter

NOTES:
 1 Height of fill is measured from the finished surface to top of pipe.
 2 Minimum bedding depth shall be 150mm, no case shall this dimension be less than 300mm.
 3 The pipe bed shall be compacted and shaped to receive the bottom of the pipe.
 4 Pipe culvert frost treatment shall be according to OPSD 803.030 and 803.031.
 5 All dimensions are in metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2011 Rev 2
SEWER SERVICE CONNECTIONS FOR RIGID MAIN PIPE SEWER OPSD 1006.010

NOTES:
 1 Sewer service connections to the main pipe sewer shall be made using factory made tees.
 2 Vertical riser shall be as specified.
 3 Top or end of property line shall be conspicuously marked.
 4 Cop or plug of property line shall be used on the main sewer to connect service connections greater than 240 kPa for PVC pipe.
 5 All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 15
PRECAST CONCRETE MAINTENANCE HOLE 1500mm DIAMETER OPSD 701.011

NOTES:
 1 For sump detail, see OPSD 701.010.
 2 Granular backfill shall be placed to a minimum thickness of 300mm all around the riser section.
 3 Precast concrete components shall be according to OPSD 701.030, 701.031, 701.032, 701.033, or 701.034.
 4 Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.021.
 5 For benching, and pipe opening details, see OPSD 704.010.
 6 All dimensions are nominal, unless otherwise shown.
 7 All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 15
PRECAST CONCRETE MAINTENANCE HOLE 1200mm DIAMETER OPSD 701.010

NOTES:
 1 The sump is measured from the lowest invert.
 2 Granular backfill shall be placed to a minimum thickness of 300mm all around the riser section.
 3 Precast concrete components shall be according to OPSD 701.030, 701.031, or 701.032.
 4 Structures exceeding 5.0m in depth shall include safety platform according to OPSD 404.020.
 5 For benching, and pipe opening details, see OPSD 704.010.
 6 All dimensions are nominal, unless otherwise shown.
 7 All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2014 Rev 13
PRECAST CONCRETE CATCH BASIN 600x600mm OPSD 705.010

NOTES:
 1 Maximum depth of excavation shall be 1500mm.
 2 200mm diameter product to accommodate 150mm diameter pipe.
 3 Centre reinforcing in base slab and walls shall be 10mm diameter bars at 200mm spacing.
 4 All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2013 Rev 12
CONCRETE THRUST BLOCKS FOR TEES, PLUGS, AND HORIZONTAL BENDS OPSD 1103.010

SOILS WITH TYPICAL BEARING STRENGTH OF 150 kPa (3300 lbs/ft²)

PIPE DIA.	A	B	C	D
100	150	250	200	200
150	250	400	250	300
200	400	500	400	400
250	500	600	500	500
300	600	800	600	600
350	700	900	700	700
400	800	1000	800	800

SOILS WITH TYPICAL BEARING STRENGTH OF 200 TO 299 kPa (4500 to 6600 lbs/ft²)

PIPE DIA.	A	B	C	D
100	150	150	150	150
150	250	200	200	200
200	400	300	250	250
250	500	400	350	350
300	600	500	450	450
350	700	600	550	550
400	800	700	650	650

SOILS WITH TYPICAL BEARING STRENGTH OF 300 kPa AND OVER

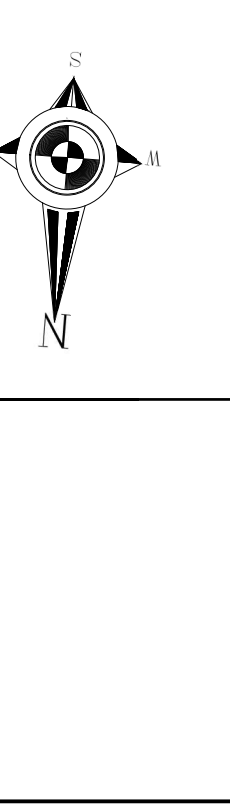
PIPE DIA.	A	B	C	D
100	150	150	150	150
150	250	200	200	200
200	400	300	250	250
250	500	400	350	350
300	600	500	450	450
350	700	600	550	550
400	800	700	650	650

NOTES:
 A - Tee shall be placed to within 50mm of the face of the wall.
 B - Bond breaker shall be used between concrete and fittings.
 C - The MCE Waterman Design Criteria for Future Alterations Authorized Under a Drinking Water Works Permit.
 D - Maximum operating pressure of 850 kPa.
 E - Maximum surge pressure with a flow velocity change of 2.40 m/s for Class 2 D1 pipe and 2.40 kPa for PVC pipe.
 F - The tables apply to both ductile iron and PVC pipe. The longer length was used.

ONTARIO PROVINCIAL STANDARD DRAWING Nov 2011 Rev 2
SEWER SERVICE CONNECTIONS FOR RIGID MAIN PIPE SEWER OPSD 1006.010

NOTES:
 1 Sewer service connections to the main pipe sewer shall be made using factory made tees.
 2 Vertical riser shall be as specified.
 3 Top or end of property line shall be conspicuously marked.
 4 Cop or plug of property line shall be used on the main sewer to connect service connections greater than 240 kPa for PVC pipe.
 5 All dimensions are in millimetres unless otherwise shown.





No.	Date	Version	Dwnl.

PROJECT:
TOWNHOMES DEVELOPMENT
 5858 Dunn Street
 City Of Niagara Falls
 Canada

DRAWING TITLE:
TITAN DETAILS

DRAWN BY: K.P.B. DATE: OCT. 10/23
 CHECKED BY: R.W.P. SCALE: AS SHOWN
 PROJECT NO.:
16363
 DRAWING NO.:
C-09



TITAN
 ENVIRONMENTAL CONTAINMENT
 WWW.TITANENVIRO.CA
 888-327-1877

1 CROSS SECTION
 S-02

3 SIDE PANEL DETAIL
 S-03

MODEL	HEIGHT (MM)	CAPACITY (M ³)	% SERIES MODULE	NOMINAL VOID	NOMINAL WEIGHT (KG)
2512	12" (304.8)	4.216 CF (0.1194)	93.70%	17.84 LBS. (7.86)	22.31 LBS. (10.12)
2518	18" (457.2)	6.324 CF (0.1782)	96.30%	26.74 LBS. (12.12)	33.41 LBS. (15.15)
2530	24" (609.6)	8.432 CF (0.2368)	96.50%	29.81 LBS. (13.38)	37.91 LBS. (17.20)
2536	30" (762.0)	10.540 CF (0.2954)	96.80%	32.88 LBS. (14.91)	42.41 LBS. (19.23)
2538	36" (914.4)	12.648 CF (0.3540)	97.00%	35.95 LBS. (16.31)	46.91 LBS. (21.27)

2 MODULE DETAIL
 S-02

NOT FOR CONSTRUCTION. THIS LAYOUT DRAWING WAS PREPARED TO SUPPORT THE ENGINEER OF RECORD FOR THE PROPOSED SYSTEM. IT IS THE RESPONSIBILITY OF THE ENGINEER OF RECORD TO VERIFY THE INFORMATION AND DIMENSIONS SHOWN IN THIS DRAWING. THE INFORMATION SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.

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1 SMALL DIAMETER PIPE DETAIL
 S-04

2 LARGE DIAMETER PIPE DETAIL
 S-04

PIPE DETAIL

MODULE	MAX. OPENING HEIGHT (MM)	MAX. OPENING WIDTH (MM)	DOUBLE PANEL MAX. OPENING WIDTH (MM)
25 SERIES	12" (304.8)	15" (381.0)	30" (762.0)
2518	18" (457.2)	15" (381.0)	30" (762.0)
2530	24" (609.6)	15" (381.0)	30" (762.0)
2536	27" (685.8)	15" (381.0)	30" (762.0)
2538	30" (762.0)	15" (381.0)	30" (762.0)

3 OBSERVATION PORT DETAIL
 S-03

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1 STORMWATER LAYOUT
 S-01

ELEVATIONS		QUANTITIES		GROUNDWATER LEVEL REVIEW	
MAXIMUM FINISHED GRADE	192.1000	TOTAL STORAGE VOLUME	241.18 m ³	GROUNDWATER ELEVATION (AS PROVIDED BY XXXX)	N/A
MINIMUM FINISHED GRADE (MSD)	190.9946	MODULE STORAGE VOLUME	241.18 m ³	HAS THE FINAL DESIGN INCLUDED A REVIEW FOR W/P/F	N/A
TOP OF STONE BACKFILL	190.2000	ACTIVE STORAGE VOLUME	18.92 m ³	ALLOWABLE LOADS	MS25
TOP OF FINISH FLOOR	188.8544	PERCENTAGE OF STORAGE VOLUME	7.85%	PERCENTAGE OF STORAGE VOLUME	7.85%
LEVEL AND STONE BOTTOM	187.5000				
TOP MODULE	S724				
BOTTOM MODULE	S724				

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1 DEBRIS ROW DETAIL
 S-03

2 OBSERVATION PORT DETAIL
 S-03

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