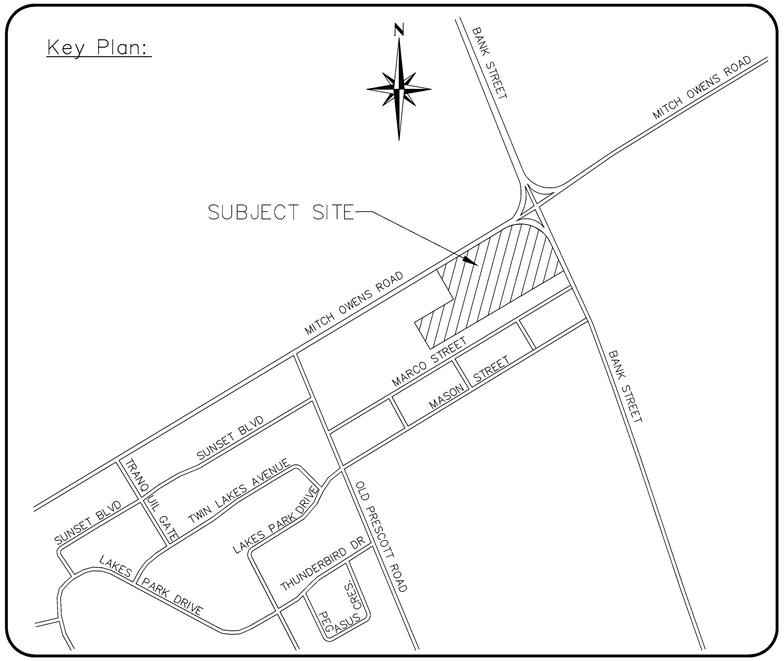
GREELY COMMERCIAL CENTER
THE VILLAGE OF GREELY

CITY OF OTTAWA
CARLETON COUNTY

Key Plan:



DRAWING #	DRAWING TITLE
GR	GRADING PLAN
SS	SITE SERVICING PLAN
SED	SEDIMENT & EROSION CONTROL PLAN
BIO1	BIOFILTER & AREA BED PLAN
BIO2	BIOFILTER & AREA BED DETAILS & NOTES 1
BIO3	BIOFILTER & AREA BED DETAILS & NOTES 2
WF	WATER FACILITY & FIRE STORAGE PLAN
SWM	STORMWATER MANAGEMENT PLAN
STM	STORM DRAINAGE PLAN
SAN	SANITARY DRAINAGE PLAN
DS1	DETAIL SHEET 1

MUNICIPALITY

City of Ottawa
110 Laurier Avenue West
Ottawa, Ontario
K1P 1J1
Ph 613-580-2424

PROJECT ENGINEER

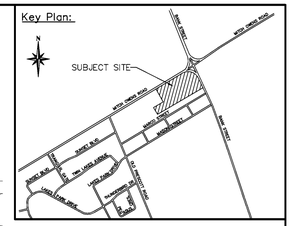
WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

PROJECT No. 11-183

MITCH OWENS ROAD

JOB BENCHMARK
001196530377
#3 Concrete Monument
Elev.=113.99

Key Plan:



CAUTION
CONTRACTOR TO DETERMINE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

PROPOSED CRU13
±1,180.2 m²
(±12,700 ft²)
FFE 106.80

PROPOSED CRU12
±372 m²
(±4,000 ft²)
FFE 106.55

PROPOSED CRU11
±743 m²
(±8,000 ft²)
FFE 106.10

PROPOSED CRU10
±1,859 m²
(±20,000 ft²)
FFE 106.15

PROPOSED CRU1
±2,920 m²
(±31,400 ft²)
FFE 106.65

PROPOSED CRU2-8
±1,499 m²
(±16,100 ft²)
FFE 106.65

PROPOSED CRU9
±933.5 m²
(±10,000 ft²)
FFE 106.65

FUTURE ADDITION
±465 m²
(±5,000 ft²)

HYDRO TOWER

EX. WELL

EXISTING TREE LINE

1.5m CURB CUT

3.0m DEPRESSED CURB

9.5m DEPRESSED CURB

0.40m EXTENDED CURB (SEE DETAIL ON DS1)

MAINTENANCE ACCESS

RETAINING WALL (TO BE DESIGNED BY OTHERS)

REFER TO SWM DWG FOR ADDITIONAL DETAILS

SWM FACILITY (DEPRESSED STORAGE BASIN)

(REFER TO BIO-1 DRAWING FOR BIOFILTER & AREA BED GRADING)

Top of Concrete Culvert, El=103.88
Bottom of Ditch at Concrete Culvert El=102.84

Top of Concrete Culvert, El=103.53
Bottom of Ditch at Concrete Culvert El=102.65

LOT 24 | LOT 23 | LOT 22 | LOT 21 | LOT 20 | LOT 5 | LOT 4 | LOT 3 | LOT 2 | LOT 1

MARCO STREET

Notes:

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Benchmark: 113.99

#3 CONCRETE MONUMENT (001196530377). NORTH SIDE OF MITCH OWENS ROAD APPROXIMATELY 250m WEST OF THE INTERSECTION OF MITCH OWENS ROAD AND BANK STREET.

REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	City Pre-Consultation Meeting	July 5, 2013
2	1st Submisson	Feb. 4, 2014

Greely Commercial Center

GRADING PLAN

Client:
Alium Investments Ltd.
3338 Dufferin Street
Toronto, Ontario
M6A 3A4

WMI & Associates Limited
119 Collier Street
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L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Drawing No.
TG	JWL	GR
Scale 1:500	Project No. 11-183	

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REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

SITE SERVICING PLAN

Client:
Alium Investments Ltd.
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Toronto, Ontario
M6A 3A4

WMI & Associates Limited
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L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	TG	Checked By	JWL	Drawing No.
Scale	1:500	Project No.	11–183	SS

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MITCH OWENS ROAD
BANK STREET
MARCO STREET
Key Plan:
SUBJECT SITE
CAUTION
CONTRACTOR TO DETERMINE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.
1.5mx1.5m FILTERCLOTH OVER CATCHBASIN
1.2mx1.2mx250mm DEPTH CLEARSTONE
CATCHBASIN INLET PROTECTION
N.T.S.
EXISTING ROAD
R=MATCH ENTRANCE
20.0m (min)
5.0m (min)
450mm DEPTH (min.) OF 50mm CLEAR STONE IN THE FIRST 10m OF THE PAD EXTENDED FROM THE STREET WITH THE REMAINDER CONSTRUCTED OF 150mm STONE
MUD MAT DETAIL
(CONSTRUCTION ACCESS)
N.T.S.
REFER TO DRAWING DS1 FOR EROSION/SILT CONTROL NOTES
MUD MAT SHALL BE INSTALLED PRIOR TO CONSTRUCTION AT ALL CONSTRUCTION ENTRANCES. (SEE DETAIL ON THIS DRAWING)
FOR ALL BOREHOLE INFORMATION REGARDING CLAY DEPTH AND WATER TABLE REFER TO "BOREHOLE INFORMATION CHART" ON DS1.
STORM SEWERS AND THE STORMWATER MANAGEMENT FACILITY (DEPRESSED STORAGE BASIN) ARE TO BE FLUSHED AND CLEANED UPON COMPLETION OF THE SITE SERVICING CONSTRUCTION.
ALL CATCHBASINS WILL REQUIRE CATCHBASIN INLET PROTECTION DURING CONSTRUCTION. (SEE DETAIL ON THIS SHEET)
PR. STRAW BALES PER OPSD 219.180 (SEE DETAIL ON DS1)
PR. SILT FENCE PER OPSD 219.130 (SEE DETAIL ON DS1)
PROPOSED CRU13 ±1,180.2 m² (±12,700 ft²)
PROPOSED CRU12 ±372 m² (±4,000 ft²)
PROPOSED CRU11 ±743 m² (±8,000 ft²)
PROPOSED CRU10 ±1,859 m² (±20,000 ft²)
PROPOSED CRU1 ±2,920 m² (±31,400 ft²)
PROPOSED CRU2-3 ±1,499 m² (±16,100 ft²)
PROPOSED CRU9 ±933.5 m² (±10,000 ft²)
FUTURE ADDITION ±465 m² (±5,000 ft²)
HYDRO TOWER
MAINTENANCE ACCESS
SWM FACILITY (DEPRESSED STORAGE BASIN)
3.0m DEPRESSED CURB
9.5m DEPRESSED CURB
1.5m CURB CUT
0.40m EXTENDED CURB (SEE DETAIL ON DS1)
RETAINING WALL (TO BE DESIGNED BY OTHERS)
Edge of Pavement
Painted Line and MTO Plan Centreline of Construction
Painted Line
Top of Slope
Bottom of Slope
LOT 24
LOT 23
LOT 22
LOT 21
LOT 20
LOT 5
LOT 4
LOT 3
LOT 2
LOT 1

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#3 CONCRETE MONUMENT (001196530377). NORTH SIDE OF MITCH OWENS ROAD APPROXIMATELY 250m WEST OF THE INTERSECTION OF MITCH OWENS ROAD AND BANK STREET.

REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submission	Feb. 4, 2014

Greely Commercial Center

SEDIMENT & EROSION CONTROL PLAN

Client:
Alium Investments Ltd.
3338 Dufferin Street
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M6A 3A4

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Drawn By	Checked By	Drawing No.
TG	JWL	SED
Scale 1:500	Project No. 11-183	

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BIOFILTER TANK	GROUND ELEV.	TOP OF STRUCTURE ELEV.	INLET ELEV.	OUTLET ELEV.
TRASH TANK	105.05	104.75	104.37	104.32
AERATION TANK	104.95	104.64	104.29	104.04
SEPTIC TANK #1	105.05	104.36	104.01 (G) 104.01 (F)	103.76
SEPTIC TANK #2	105.15	104.08	103.73	103.48
SEPTIC TANK #3	105.15	103.80	103.45 (G) 103.45 (F)	103.20
BALANCE TANK #1	105.00	103.55	103.17 (G) 103.17 (F)	101.26
BALANCE TANK #2	104.90	103.55	102.79	101.26 (G) 103.17 (F)
CLOSED LOOP (BULK FILLED) BIOFILTER TANK	104.85	104.55	104.58	102.82
NITRIFYING BIOFILTER TANK #4	104.90	104.60	104.63	101.81
NITRIFYING BIOFILTER TANK #3	104.87	104.57	101.78 (G) 104.60 (F)	101.78
NITRIFYING BIOFILTER TANK #2	104.83	104.54	101.75 (G) 101.78 (F)	101.75
NITRIFYING BIOFILTER TANK #1	104.80	104.51	101.72 (G) 104.54 (F)	104.16
WATERNOx BIOFILTER TANK	104.75	104.45	104.10	104.10
POLISHING BIOFILTER TANK #2	104.75	104.45	104.48	101.59
POLISHING BIOFILTER TANK #1	104.70	104.42	101.56 (G) 104.45 (F)	104.07

NOTES:

IF TANK HAS MULTIPLE INLETS AND/OR OUTLETS, ASSUME ALL INLETS ARE AT THE SAME ELEVATION AND ALL OUTLETS ARE AT THE SAME ELEVATION UNLESS OTHERWISE INDICATED.

(G) = GRAVITY SEWER
(F) = FORCEMAIN

Sewage Disposal Notes

All specifications shall conform with the OBC and the BMEC authorization report for the Waterloo Biofilter Area Bed System (BMEC # 99-08-236). The contractor shall be a licenced sewage system installer and be approved by Waterloo Biofilter Systems Inc.

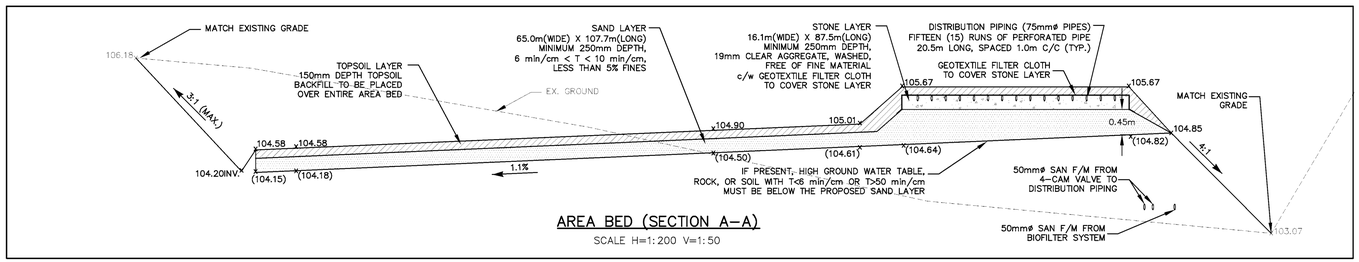
The system summary is as follows:
- Waterloo Biofilter treatment unit (See BIO 1-3)
- Design Flow: 69,212 L/day
- T time: 40min/cm
- Stone Area: Q/50 = 1384m² (min)
- Sand Area: QT/400 = 6921m² (min)

Established Ontario Building Code setbacks for Class 4 treatment units and distribution pipes (Tables 8.2.1.6.A. and 8.2.1.6.B., respectively):

Setback Description	Distance (m)
All tanks to structure	1.5
All tanks to lake, pond, spring	15
All tanks to any well	15
All tanks to property line	3
Distribution piping to structure	5
Distribution piping to lake, pond, spring	15
Distribution piping to well cased to > 6 m	15
Distribution piping to well without tight casing	30
Distribution piping to property line	3

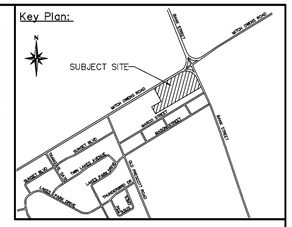
NOTES:

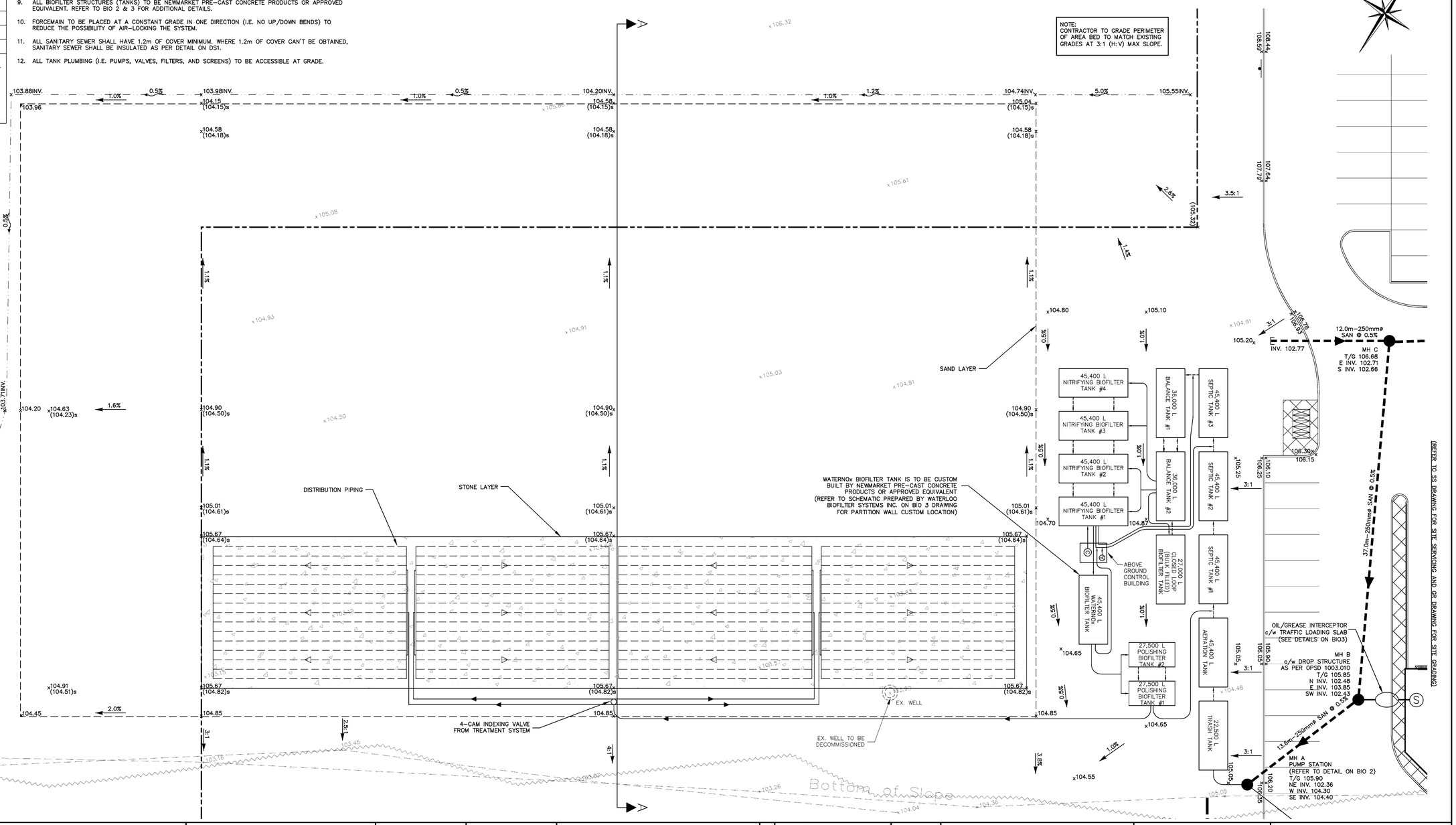
1. BIOFILTER AND AREA BED DESIGN PROVIDED BY WATERLOO BIOFILTER SYSTEMS INC.
2. REFER TO SHOP DRAWINGS PROVIDED BY WATERLOO BIOFILTER SYSTEMS INC. FOR ALL TANK INTERIOR COMPONENTS AND DETAILS.
3. REFER TO BIO 2 AND BIO 3 DRAWINGS FOR TYPICAL BIOFILTER TANK CROSS SECTIONS AND INTERIOR COMPONENTS.
4. WATERLOO BIOFILTER SYSTEMS INC. TO PROVIDE INSPECTION DURING CONSTRUCTION OF ALL BOIFILTER SYSTEM AND AREA BED.
5. ALL CONCRETE TANKS ARE TO BE INSULATED WITH STYROFOAM HIGHLOAD 40 INSULATION (BY OTHERS). STYROFOAM TO BE EXTENDED 1.0m BEYOND THE PERIMETER OF THE TANK AND EXTENDED 0.6m BELOW BOTTOM ON THE TANK. (REFER TO DETAIL ON BIO 2 DRAWING)
6. PROVIDE A MINIMUM OF 0.3m OF COVER OVER ALL BIOFILTER STRUCTURES.
7. ALL STRUCTURES THAT CONTAIN FILTERS, SCREENS, PUMPS, ETC. REQUIRE 0.75x0.75m ALUMINUM ACCESS HATCHES. ALL OTHER STRUCTURE REQUIRE A 0.6m MAINTENANCE HOLE ACCESS LID.
8. ALL GRAVITY SEWER TO BE 100mmø and 150mmø PVC SDR 28 SEWER PIPE AND ALL FORCEMAIN TO BE 50mmø (2.0ins) HDPE DR11 SANITARY PIPE (OR APPROVED EQUIVALENT) C/W CAUTION TAPE PLACED 300mm ABOVE THE PIPE FOR ALL BIOFILTER SERVICING. REFER TO TANK CROSS SECTION ON BIO 3 FOR PIPE SIZING.
9. ALL BIOFILTER STRUCTURES (TANKS) TO BE NEWMARKET PRE-CAST CONCRETE PRODUCTS OR APPROVED EQUIVALENT. REFER TO BIO 2 & 3 FOR ADDITIONAL DETAILS.
10. FORCEMAIN TO BE PLACED AT A CONSTANT GRADE IN ONE DIRECTION (I.E. NO UP/DOWN BENDS) TO REDUCE THE POSSIBILITY OF AIR-LOCKING THE SYSTEM.
11. ALL SANITARY SEWER SHALL HAVE 1.2m OF COVER MINIMUM. WHERE 1.2m OF COVER CAN'T BE OBTAINED, SANITARY SEWER SHALL BE INSULATED AS PER DETAIL ON DS1.
12. ALL TANK PLUMBING (I.E. PUMPS, VALVES, FILTERS, AND SCREENS) TO BE ACCESSIBLE AT GRADE.



AREA BED (SECTION A-A)

SCALE H=1:200 V=1:50





Legend:

- PR. FORCEMAIN
- PR. GRAVITY SEWER
- 104.90 PR. ELEVATION
- (104.90) MATCH EXISTING ELEVATIONS
- (104.50)s PR. ELEVATION OF NATIVE SOILS BELOW AREA BED

CAUTION
CONTRACTOR TO DETERMINE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.

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REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

BIOFILTER & AREA BED PLAN

Client:
Alium Investments Ltd.
3338 Dufferin Street
Toronto, Ontario
M6A 3A4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	TG	Checked By	JWL	Drawing No.
Scale	1:200	Project No.	11-183	BIO 1

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BIOFILTER SYSTEM NOTES PROVIDED BY WATERLOO BIOFILTER SYSTEMS INC.:

1. THE PEAK DESIGN FLOW FOR THIS SYSTEM IS 69,212 L/DAY.
2. ALL NON–DISHWASHER WASTEWATER FROM THE GROCERY STORE DELI/FOOD PRODUCTION SINK(S) FLOWS BY GRAVITY INTO AN EXTERIOR OIL/GREASE INTERCEPTOR(S) (SIZING BY OTHERS – GREEN TURTLE OR EQUIVALENT RECOMMENDED). EACH COMPARTMENT IN THE OIL/GREASE INTERCEPTOR(S) MUST BE VENTED AS PER MANUFACTURERS RECOMMENDATIONS.
3. ALL NON–DISHWASHER WASTEWATER FROM THE RESTAURANTS FLOWS BY GRAVITY INTO AN EXTERIOR OIL/GREASE INTERCEPTOR(S) (SIZING BY OTHERS – GREEN TURTLE OR EQUIVALENT RECOMMENDED). EACH COMPARTMENT IN THE OIL/GREASE INTERCEPTOR(S) MUST BE VENTED AS PER MANUFACTURERS RECOMMENDATIONS.
4. ANY DISHWASHER WASTEWATER, SANITARY WASTEWATER FROM ALL UNITS, AND THE OIL/GREASE INTERCEPTOR(S) EFFLUENT FLOWS BY GRAVITY INTO A 22,500 L TRASH TANK.
5. THE TRASH TANK EFFLUENT FLOWS BY GRAVITY INTO A 45,400 L AERATION TANK EQUIPPED WITH DIFFUSERS. THE DIFFUSERS ARE POWERED BY A BLOWER (NOT SHOWN) LOCATED IN A SMALL ABOVE GROUND CONTROL BUILDING.
6. THE AERATION TANK EFFLUENT FLOWS BY GRAVITY INTO THREE (3) 45,400 L TANKS INSTALLED IN SERIES. MULTIPLE, LONG, LINEAR TANKS ARE PREFERRED TO PREVENT SHORT–CIRCUITING AND IMPROVE TREATMENT. THE INLET OF SEPTIC TANK #2 & #3 IS TO BE EQUIPPED WITH ONE (1) SUBMERGED MEDIA CHAMBER. THE OUTLET OF SEPTIC TANK #2 & #3 IS TO BE EQUIPPED WITH TWO (2) EFFLUENT FILTERS.
7. THE WASTEWATER FLOWS THROUGH THE EFFLUENT FILTERS AND INTO TWO (2) 36,000 L BALANCE TANKS INSTALLED IN PARALLEL TO PROVIDE 72,000 L OF STORAGE. THE INLET TO BALANCE TANK #1 CONTAINS A DIRECTED FLOW ATTACHED MEDIA PIPE. BALANCE TANK #2 IS EQUIPPED WITH TWO (2) PAIRS OF SUBMERSIBLE EFFLUENT PUMPS OPERATING ON AN ALTERNATING QUADRUPLEX TIMED DOSING SCHEDULE AND A SUBMERSIBLE EFFLUENT PUMP OPERATING ON AN INDEPENDENT SIMPLEX TIMED DOSING SCHEDULE.
8. THE SIMPLEX PUMP IN BALANCE TANK #2 PUMPS A MAXIMUM OF 20,000 L/DAY TO A BELOW GROUND CLOSED LOOP BIOFILTER. THE CLOSED LOOP BIOFILTER CONSISTS OF A 27,000 L CONCRETE TANK BULK FILLED WITH BIOFILTER MEDIUM. THE TANK IS FILLED WITH APPROXIMATELY 26.8 m3/ CUBIC METRES OF BIOFILTER MEDIUM. THE WASTEWATER IS EVENLY DISTRIBUTED OVER THE SURFACE OF THE MEDIUM IN THE CLOSED LOOP TANK BY HELICAL SPRAY NOZZLES AND TREATED AS IT TRICKLES THROUGH THE INTERIOR OF THE MEDIUM. AIR FAN ASSEMBLIES LOCATED WITHIN THE ABOVE GROUND CONTROL BUILDING BLOW AIR INTO THE TANK, ENSURING AEROBIC CONDITIONS. THE CLOSED LOOP EFFLUENT COLLECTS ON THE FLOOR OF THE TANK AND DRAINS BY GRAVITY BACK TO BALANCE TANK #2.
9. THE TWO (2) PAIRS OF PUMPS IN THE BALANCE TANK EACH PUMP THE WASTEWATER TO TWO (2) BELOW GROUND NITRIFYING BIOFILTERS. EACH NITRIFYING BIOFILTER CONSISTS OF A 45,400 L CONCRETE TANK HOUSING THREE (3) NITRIFYING WIRE MESH BASKETS. EACH BASKET IS FILLED WITH APPROXIMATELY 9.68 CUBIC METRES (116.1 CUBIC METRES TOTAL) OF MEDIUM. THE WASTEWATER IS EVENLY DISTRIBUTED OVER THE SURFACE OF THE MEDIUM IN THE NITRIFYING BASKETS BY HELICAL SPRAY NOZZLES AND TREATED AS IT TRICKLES THROUGH THE INTERIOR OF THE MEDIUM. AIR FAN ASSEMBLIES LOCATED WITHIN THE ABOVE GROUND CONTROL BUILDING BLOW AIR INTO THE TANKS, ENSURING AEROBIC CONDITIONS. THE TANKS ARE CONNECTED BY BOTTOM DRAINS WITH THE TREATED EFFLUENT FROM TANK #4, TANK #3 & TANK #2 FLOWING INTO TANK #1. NITRIFYING BIOFILTER TANK #1 IS EQUIPPED WITH TWO (2) SUBMERSIBLE EFFLUENT PUMPS OPERATING ON AN ALTERNATING DUPLEX TIMED DOSING SCHEDULE AND A SUBMERSIBLE EFFLUENT PUMP OPERATING ON AN INDEPENDENT SIMPLEX TIMED DOSING SCHEDULE.
10. THE SIMPLEX PUMP IN NITRIFYING BIOFILTER TANK #1 RE–CIRCULATES A PORTION (PERCENTAGE TO BE DETERMINED DURING OPERATION) OF THE NITRIFIED EFFLUENT. THE RECIRCULATION FORCEMAIN IS SPLIT INSIDE THE TANK WITH A PORTION (PERCENTAGE IS VARIABLE) OF THE TOTAL RECIRCULATED EFFLUENT BEING PUMPED TO INLET OF SEPTIC TANK #3 AND A PORTION (PERCENTAGE IS VARIABLE) OF THE TOTAL RECIRCULATED EFFLUENT BEING PUMPED TO THE INLET OF BALANCE TANK #1. BOTH FORCEMAINS PASS THROUGH THE ABOVE GROUND CONTROL BUILDING. IF THERE IS INSUFFICIENT INITIAL ALKALINITY IN THE WASTEWATER FOR THOROUGH NITRIFICATION, ALKALINITY (A) IS ADDED TO THE SEPTIC TANK RECIRCULATION LINE. A CHEMICAL METERING PUMP AND THE ALKALINITY DOSING EQUIPMENT IS HOUSED IN THE ABOVE GROUND CONTROL BUILDING.
11. THE DUPLEX PUMPS IN NITRIFYING BIOFILTER TANK #1 PUMP THE NITRIFIED EFFLUENT TO THE FIRST COMPARTMENT OF A BELOW GROUND WATERNOx–S DENITRIFYING WATERLOO BIOFILTER. THE WATERNOx–S BIOFILTER CONSISTS OF A 45,400 L 2–COMPARTMENT CONCRETE TANK HOUSING EIGHT (8) WATERNOx–S DENITRIFYING CHAMBERS. THE FIRST COMPARTMENT IS ALSO EQUIPPED WITH TWO (2) SUBMERSIBLE EFFLUENT PUMPS OPERATING ON AN ALTERNATING DUPLEX TIMED DOSING SCHEDULE. THE PUMPS SEND THE WATER FROM THE BOTTOM OF THE CONCRETE TANK UP THROUGH SUBMERGED MEDIA IN EACH CHAMBER. IN THE EVENT OF LOW FLOW ONE (1) OR TWO (2) OF THE WATERNOx–S CHAMBERS CAN BE VALVED OFF. THE CONCRETE TANK IS SEALED TO ENSURE ANOXIC CONDITIONS. WHEN THE WATER IN THE CHAMBERS REACHES A CERTAIN HEIGHT IT FLOWS INTO THE SECOND COMPARTMENT OF THE CONCRETE TANK. THE SECOND COMPARTMENT IS EQUIPPED WITH TWO (2) SUBMERSIBLE EFFLUENT PUMPS OPERATING ON AN ALTERNATING DUPLEX TIMED DOSING SCHEDULE. THE OUTGOING FORCEMAIN IS PLUMBED TO ALLOW A PORTION OF THE DENITRIFIED EFFLUENT TO BE PUMPED THROUGH THE ABOVE GROUND CONTROL BUILDING AND ONTO THE SEPTIC TANK #3 INLET.
12. THE REMAINING DENITRIFIED EFFLUENT IS PUMPED TO TWO (2) BELOW GROUND POLISHING WATERLOO BIOFILTERS. EACH POLISHING BIOFILTER CONSISTS OF A 27,500 L CONCRETE TANK HOUSING TWO (2) POLISHING WIRE MESH BASKETS. EACH BASKET IS FILLED WITH APPROXIMATELY 9.07 CUBIC METRES (36.3 CUBIC METRES TOTAL) OF POLISHING MEDIUM. THE DENITRIFIED EFFLUENT IS EVENLY DISTRIBUTED OVER THE SURFACE OF THE MEDIUM IN THE POLISHING BASKETS BY HELICAL SPRAY NOZZLES AND POLISHED AS IT TRICKLES THROUGH THE INTERIOR OF THE MEDIUM. AIR FAN ASSEMBLIES LOCATED WITHIN THE ABOVE GROUND CONTROL BUILDING BLOW AIR INTO THE TANKS, ENSURING AEROBIC CONDITIONS. THE TANKS ARE CONNECTED BY BOTTOM DRAINS WITH THE POLISHED EFFLUENT FROM TANK #2 FLOWING INTO TANK #1. POLISHING TANK #1 IS EQUIPPED WITH TWO (2) SUBMERSIBLE EFFLUENT PUMPS OPERATING ON AN ALTERNATING DUPLEX DEMAND DOSING SCHEDULE. THE OUTGOING FORCEMAIN IS PLUMBED TO ALLOW A PORTION OF THE POLISHED EFFLUENT TO BE PUMPED TO THE THE SEPTIC TANK #1 INLET.
13. THE REMAINING POLISHED EFFLUENT IS PUMPED THROUGH A FLOW METER LOCATED INSIDE THE ABOVE GROUND CONTROL BUILDING (NOT SHOWN) AND ON TO SUBSURFACE DISPOSAL (BY OTHERS).
14. THE OUTSIDE OF ALL CONCRETE TANKS ARE TO BE INSULATED WITH HI–40 INSULATION (BY OTHERS). THE UNDERSIDE OF ALL LIDS ARE ALSO TO BE INSULATED.
15. BY ADHERING TO BEST MANAGEMENT PRACTICES (PERFORMING ROUTINE MAINTENANCE, LIMITING TOXINS ENTERING THE SYSTEM) THE WATERLOO BIOFILTER TREATMENT SYSTEM OUTLINED IN THIS SCHEMATIC IS EXPECTED TO PRODUCE EFFLUENT WITH THE FOLLOWING PARAMETERS BASED ON EXTENSIVE TESTING AND EXPERIENCE.

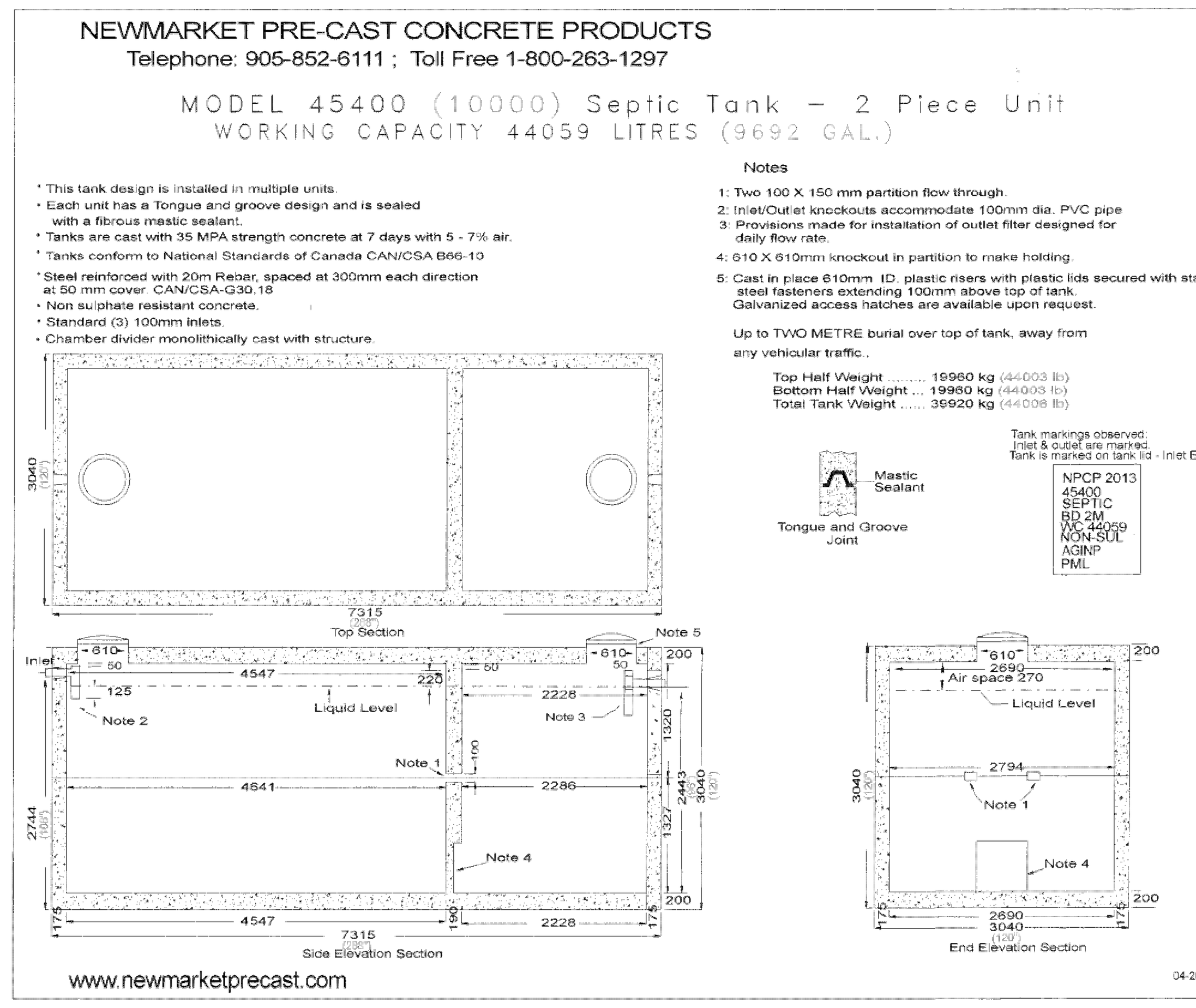
    cBOD = 10 mg/L
    TSS = 10 mg/L
    NITRATE = 0.22 kg/day

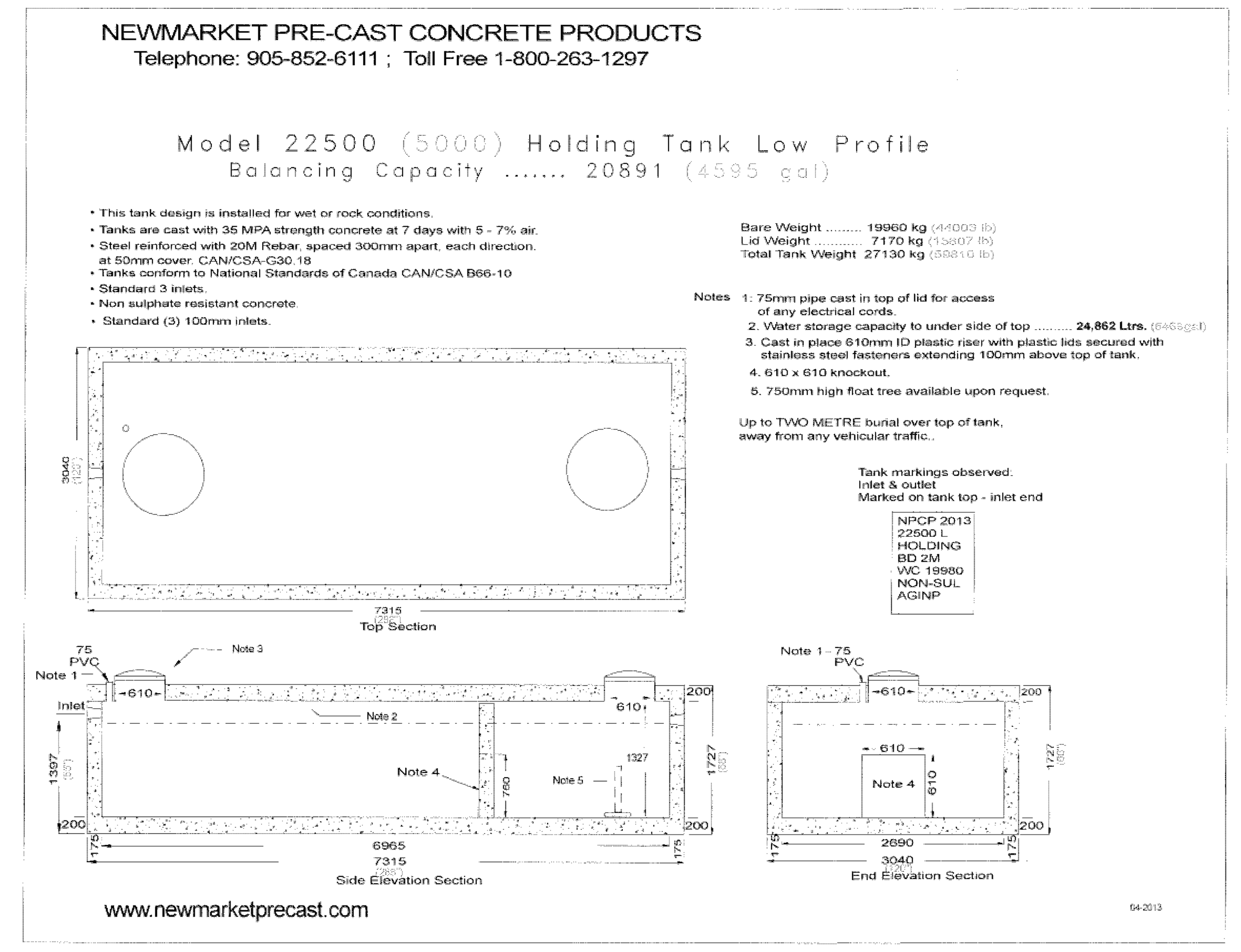
SEPTIC BED AREA NOTES PROVIDED BY WATERLOO BIOFILTER SYSTEMS INC.:

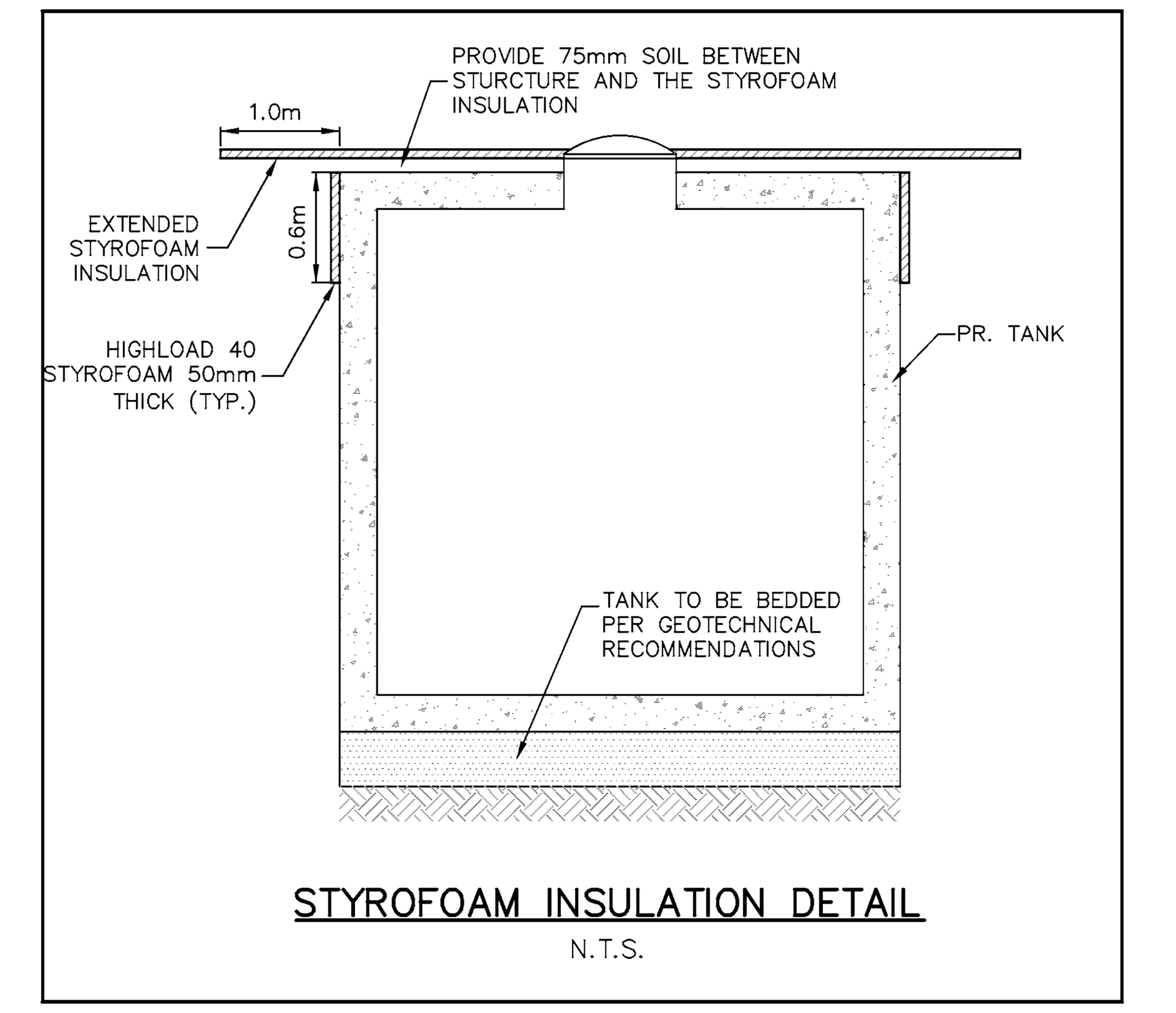
1. THE PEAK DESIGN FLOW FOR THIS SYSTEM IS 69,212 L/DAY.
2. THE OVERALL PERCOLATION RATE OF THE NATIVE SOILS IS 40 min/cm. NATIVE SOIL PERCOLATION RATE PROVIDED BY WILSON ASSOCIATES.
3. THE WATERLOO BIOFILTER AREA BED CONSISTS OF PERFORATED DISTRIBUTION PIPING WITHIN A LAYER OF STONE OVER TOP OF A LAYER OF SAND. THE STONE AND SAND LAYERS OF THE AREA BED ARE CALCULATED USING THE PEAK DESIGN FLOW, Q = 69,212 L/day, AND A PERCOLATION RATE OF THE NATIVE SOILS, T = 40 min/cm.

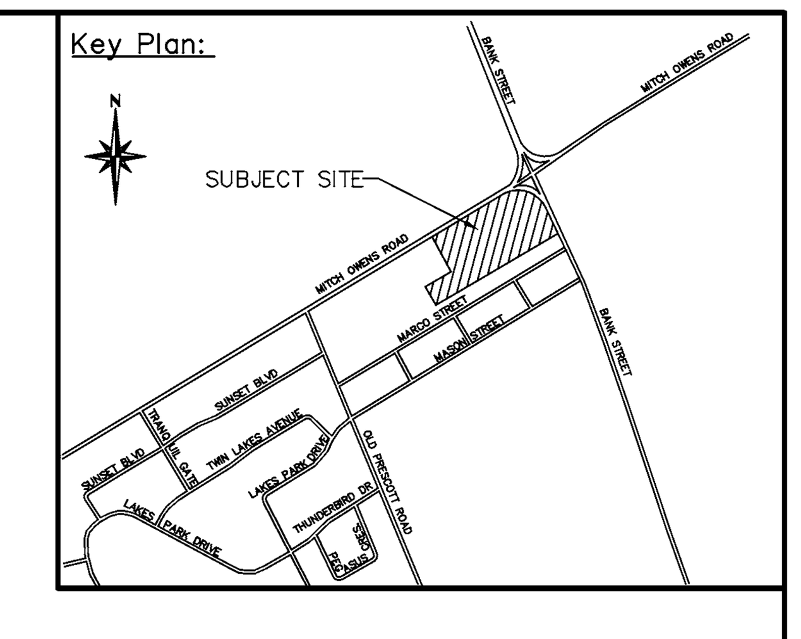
    MINIMUM STONE AREA = Q/50 = 69,212/50 = 1384 m^2
    PROPOSED DIMENSIONS: 87.5 m(W) x 16.1 m(L) x 0.25m(H)

    MINIMUM SAND AREA = QT/400 = (69,212)(40)/400 = 6921 m^2
    PROPOSED DIMENSIONS: 107.7 m(W) x 65 m(L) x 0.25 m (H)
4. THE PERFORATED DISTRIBUTION PIPING IS SPLIT INTO FOUR (4) PODS WITH EACH POD HAVING FIFTEEN (15) RUNS OF 20.5 m PIPE SPACED 1.0 m C/C. A 4–CAM INDEXING VALVE ALTERNATES DOSES BETWEEN THE PODS.
5. THE BASE OF THE SAND LAYER IS SLOPED 1–2% IN THE DIRECTION OF FLOW.
6. THE BOTTOM OF THE STONE LAYER MUST BE VERTICALLY SEPARATED AT LEAST 600 mm FROM THE HIGH GROUND WATER TABLE, ROCK OR SOIL WITH A T–TIME OF 6 min/cm OR LESS, OR GREATER THAN 50 min/cm. EXCEPT IF THE PERCOLATION RATE OF THE NATIVE SOILS IS BETWEEN 6 min/cm AND 50 min/cm THE BOTTOM OF THE STONE LAYER MUST BE VERTICALLY SEPARATED AT LEAST 450 mm TO ROCK, HIGH GROUND WATER TABLE, AND SOIL HAVING A T–TIME OF 50 min/cm.THE BOTTOM OF THE STONE LAYER MUST BE VERTICALLY SEPARATED AT LEAST 600 mm FROM THE HIGH GROUND WATER TABLE, ROCK OR SOIL WITH A T–TIME OF 6 min/cm OR LESS, OR
7. WHERE THE SAND LAYER IS INSTALLED IN OR ON SOIL HAVING A T–TIME > 15 min/cm, THE SAND LAYER SHALL BE EXTEND 15 m BEYOND THE PERIMETER OF THE DISTRIBUTION PIPING IN ANY DIRECTION THAT THE EFFLUENT ENTERING THE SOIL WILL MOVE HORIZONTALLY.
8. ESTABLISHED ONTARIO BUILDING CODE SETBACKS FOR CLASS 4 TREATMENT UNITS AND DISTRIBUTION PIPES (TABLES 8.2.1.6.A AND 8.2.1.6.B., RESPECTIVELY):


NEWMARKET PRE-CAST CONCRETE PRODUCTS
Telephone: 905-852-6111 ; Toll Free 1-800-263-1297
MODEL 45400 (10000) Septic Tank – 2 Piece Unit
WORKING CAPACITY 44059 LITRES (9692 GAL.)
Top Section
Side Elevation Section
End Elevation Section
www.newmarketprecast.com

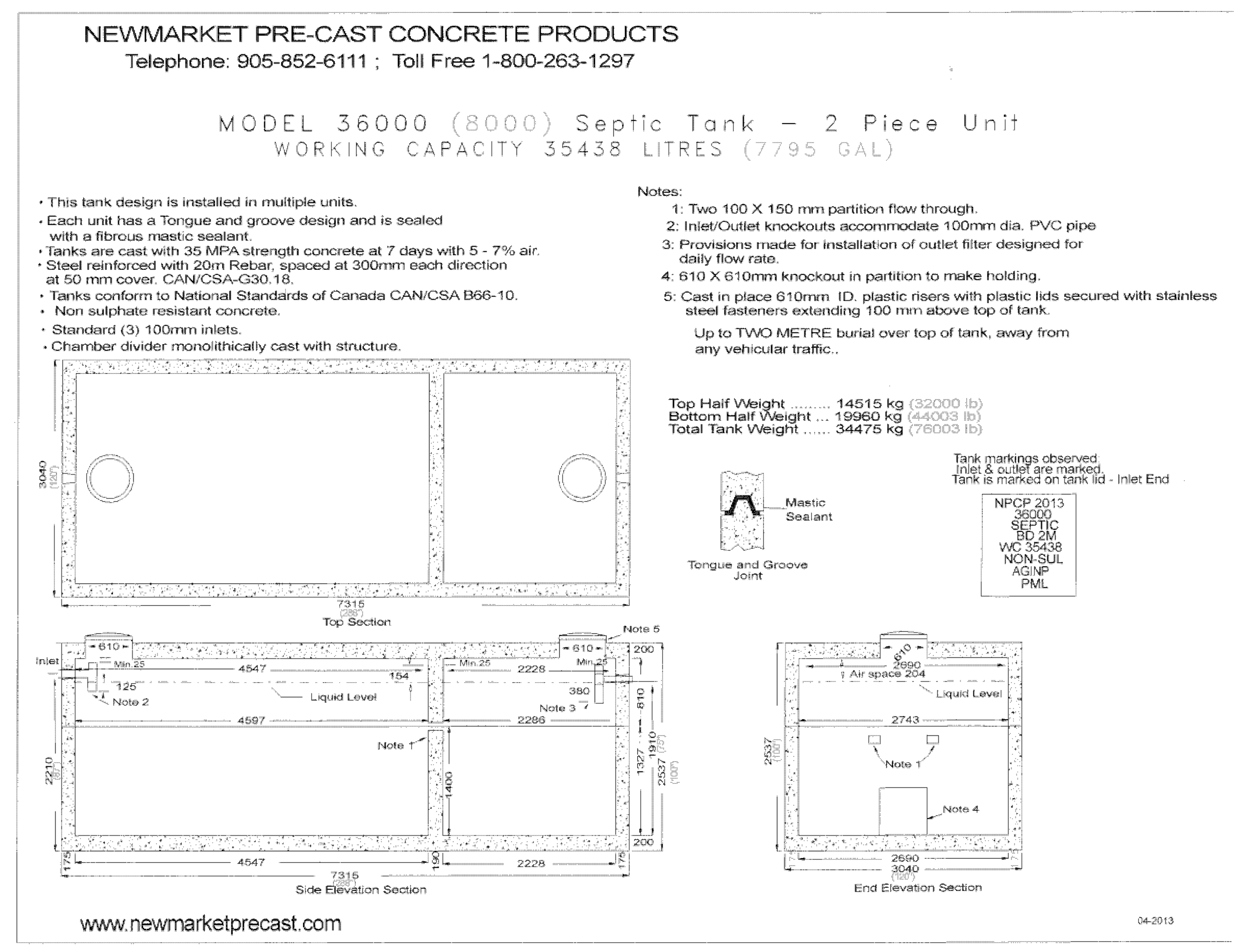

NEWMARKET PRE-CAST CONCRETE PRODUCTS
Telephone: 905-852-6111 ; Toll Free 1-800-263-1297
Model 22500 (5000) Holding Tank Low Profile
Balancing Capacity .... 20891 (4595 gal)
Top Section
Side Elevation Section
End Elevation Section
www.newmarketprecast.com

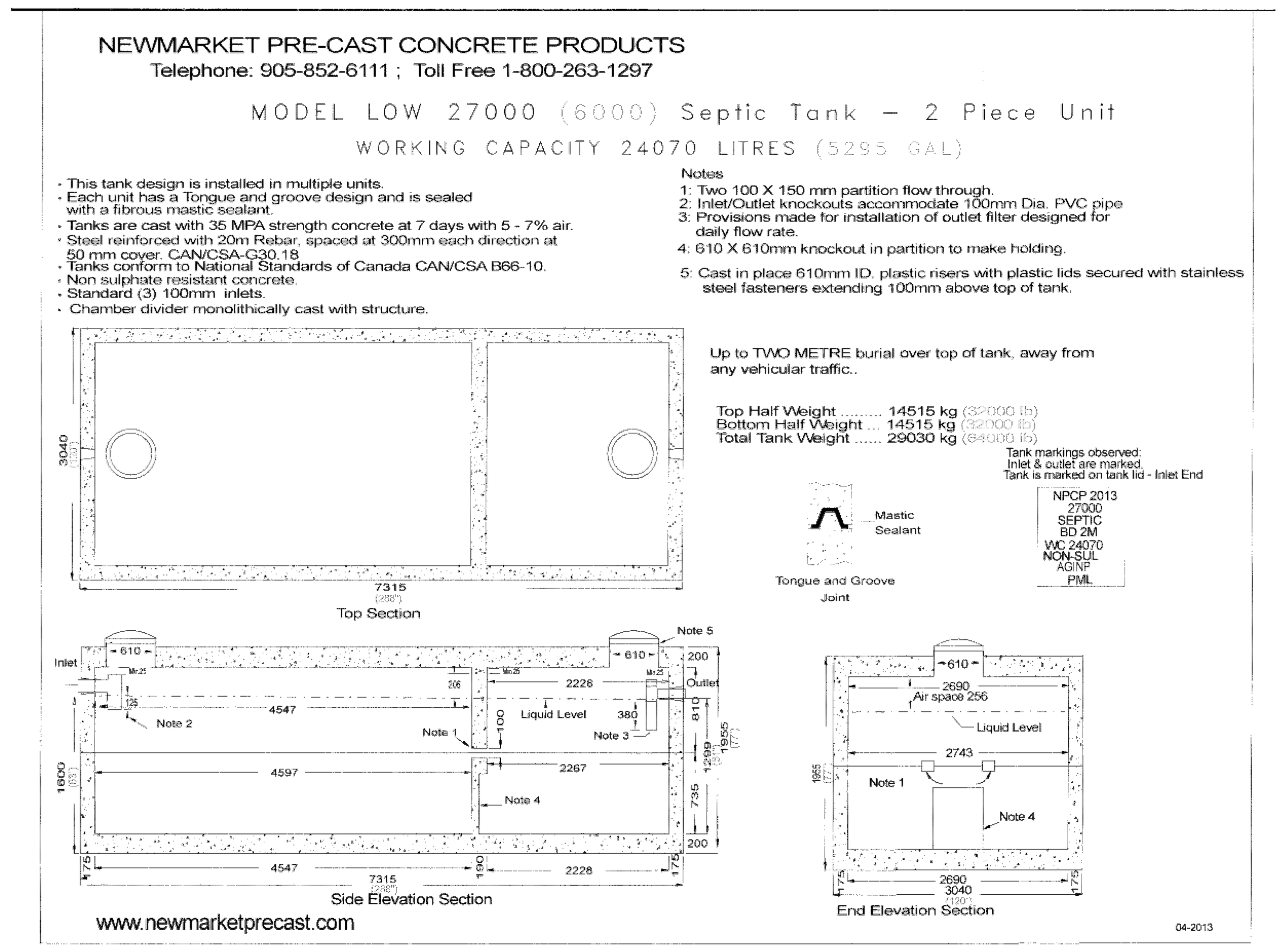


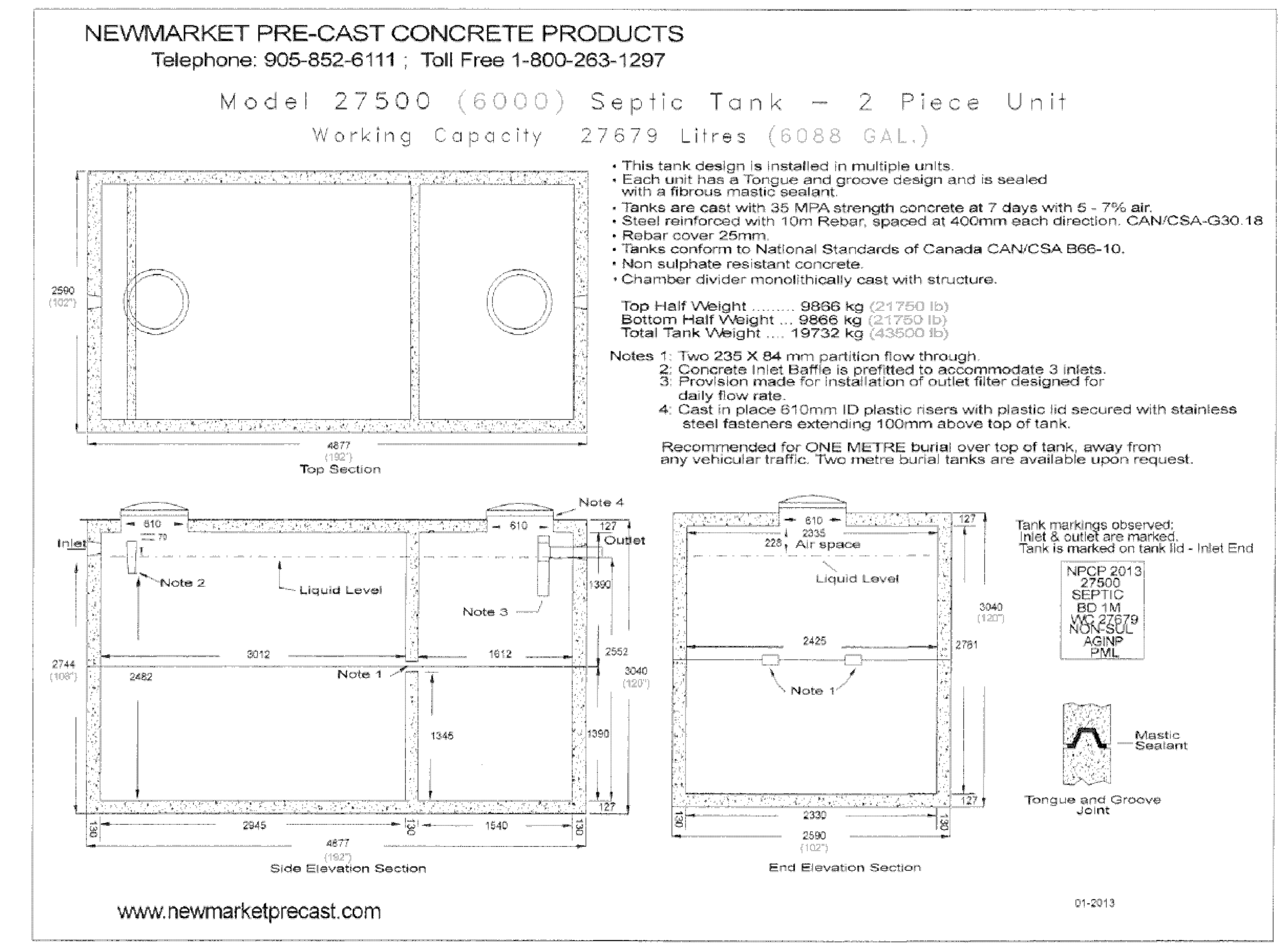


CAUTION

CONTRACTOR TO DETERMINE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.


NEWMARKET PRE-CAST CONCRETE PRODUCTS
Telephone: 905-852-6111 ; Toll Free 1-800-263-1297
MODEL 36000 (8000) Septic Tank – 2 Piece Unit
WORKING CAPACITY 35438 LITRES (7795 GAL)
Top Section
Side Elevation Section
End Elevation Section
www.newmarketprecast.com


NEWMARKET PRE-CAST CONCRETE PRODUCTS
Telephone: 905-852-6111 ; Toll Free 1-800-263-1297
MODEL LOW 27000 (6000) Septic Tank – 2 Piece Unit
WORKING CAPACITY 24070 LITRES (5295 GAL)
Top Section
Side Elevation Section
End Elevation Section
www.newmarketprecast.com


NEWMARKET PRE-CAST CONCRETE PRODUCTS
Telephone: 905-852-6111 ; Toll Free 1-800-263-1297
Model 27500 (6000) Septic Tank – 2 Piece Unit
Working Capacity 27679 Litres (6088 Gal.)
Top Section
Side Elevation Section
End Elevation Section
www.newmarketprecast.com

PUMP STATION NOTES:

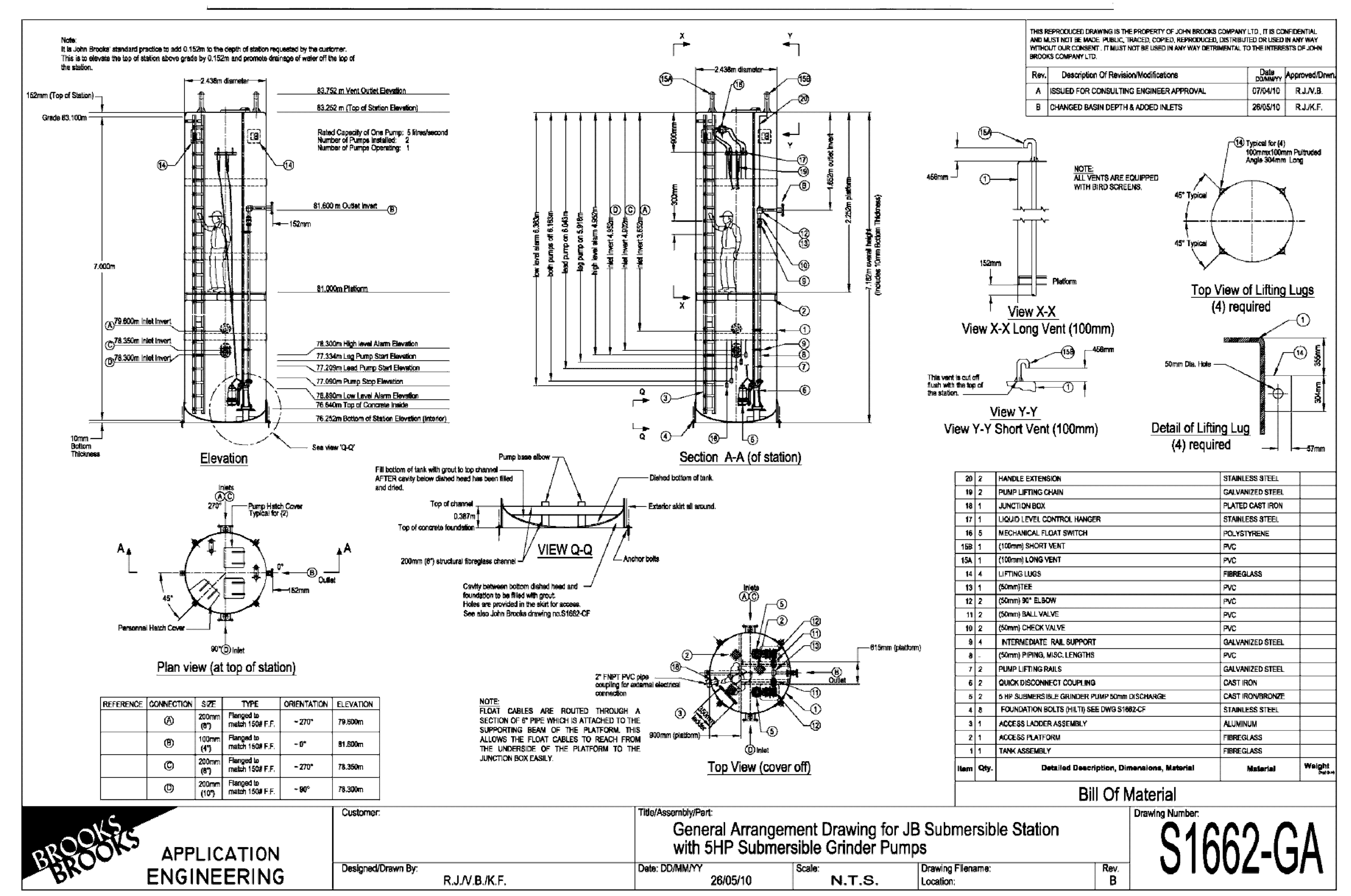
1. ALL DIMENSIONS FOR PUMP LOCATIONS, LIFTING RAILS & ACCESS DOOR TO BE CONFIRMED OR DETERMINED FROM MANUFACTURERS SHOP DRAWINGS.
2. LIFTING RAILS FOR PUMP SHALL BE SET PLUMB & SPACED SUCH THAT PUMPS LIFT W/O BINDING.
3. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT UPLIFT DURING CONSTRUCTION.
4. ELECTRICAL CONDUITS SHALL BE BURIED 0.9m MIN. BELOW FINISHED GRADE C/W TRACING WIRE.
5. DUTY : 2.4 L/S @ 2.88M – WE WILL BE LOOKING AT THE FOLLOWING:

ONE (1) JOHN BROOKS HIFLO DUPLEX SUBMERSIBLE GRINDER PUMP STATION WITH THE FOLLOWING COMPONENTS:

- (2) – JB SELECTED HIGH FLOW GRINDER PUMP 2HP/ 1PH / 230V / 2" DISCHARGE
- EACH PUMP WILL BE CAPABLE OF A PUMPING CAPACITY OF 2.4 L/S @ 2.9M OF TDH
- FOUR – MECHANICAL FLOAT ASSEMBLIES WITH 30FT CORDS.
- FOUR – FLOATATION WEIGHTS.
- TWO – SUITABLE LENGTHS OF GALVANIZED STEEL LIFTING CHAINS.
- TWO – JUNCTION BOX [WIRING BY OTHERS].
- ONE – DUPLEX CONTROLLER IN A NEMA 4 ENCLOSURE [POLE MOUNT STYLE _ (OUTDOOR), MOUNTING BY OTHERS.],
- LEVEL CONTROL BY 4 FLOATS. WITH PRESSURE
- HOUR METERS
- 6 FT DIAMETER X 96 " DEEP WET WELL
- UNLOADING AND INSTALLATION TO BE COMPLETED BY THE CONTRACTOR
- ****ANTI–FLOAT CONCRETE BLOCK REQUIRED**
  (PUMP STATION BALLAST TO BE DONE BY OTHERS)
- SUITABLE CONDUIT SEALS ARE TO BE SUPPLIED AND INSTALLED BETWEEN THE JUNCTION BOX AND THE PANEL AS REQUIRED BY THE CANADIAN ELECTRICAL CODE, THE ENGINEER OR THE AUTHORITY HAVING JURISDICTION

6. VENT PIPE ASSEMBLY AS PER DETAIL ON BROOKS DRAWING

7. ELECTRICAL WORK AND EQUIPMENT IN WET WELL TO COMPLY WITH THE CURRENT ONTARIO ELECTRICAL CODE


Elevation
Section A-A (of station)
VIEW Q-Q
Plan view (at top of station)
Top View (cover off)
View X-X
View X-X Long Vent (100mm)
View Y-Y
View Y-Y Short Vent (100mm)
Top View of Lifting Lugs (4) required
Detail of Lifting Lug (4) required
Bill Of Material
BROOKS BROOKS APPLICATION ENGINEERING
General Arrangement Drawing for JB Submersible Station with 5HP Submersible Grinder Pumps
Designed/Drawn By: R.J./V.B./K.F.
Date: DD/MM/YY 26/05/10
Scale: N.T.S.
Rev. B
S1662-GA

NOTE: CONTRACTOR TO ARRANGE WITH HYDRO RE: METERING REQUIREMENTS, METERING CABINET, MOUNTING & FINAL CONNECTION AT CONTROL PANEL. CONTRACTOR TO COORDINATE BELL CONNECTION FOR ALARM FOR PROPOSED SEWAGE PUMPING STATION

NOTE: FINAL SHOP DRAWINGS TO BE PROVIDED BY JOHN BROOKS COMPANY.

Notes:

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Benchmark: 113.99

#3 CONCRETE MONUMENT (001196530377). NORTH SIDE OF MITCH OWENS ROAD APPROXIMATELY 250m WEST OF THE INTERSECTION OF MITCH OWENS ROAD AND BANK STREET.

REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

BIOFILTER & AREA BED DETAILS & NOTES 1

Client:
Alium Investments Ltd.
3338 Dufferin Street
Toronto, Ontario
M6A 3A4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	TG	Checked By	JWL	Drawing No.
Scale	N.T.S.	Project No.	11–183	BIO 2

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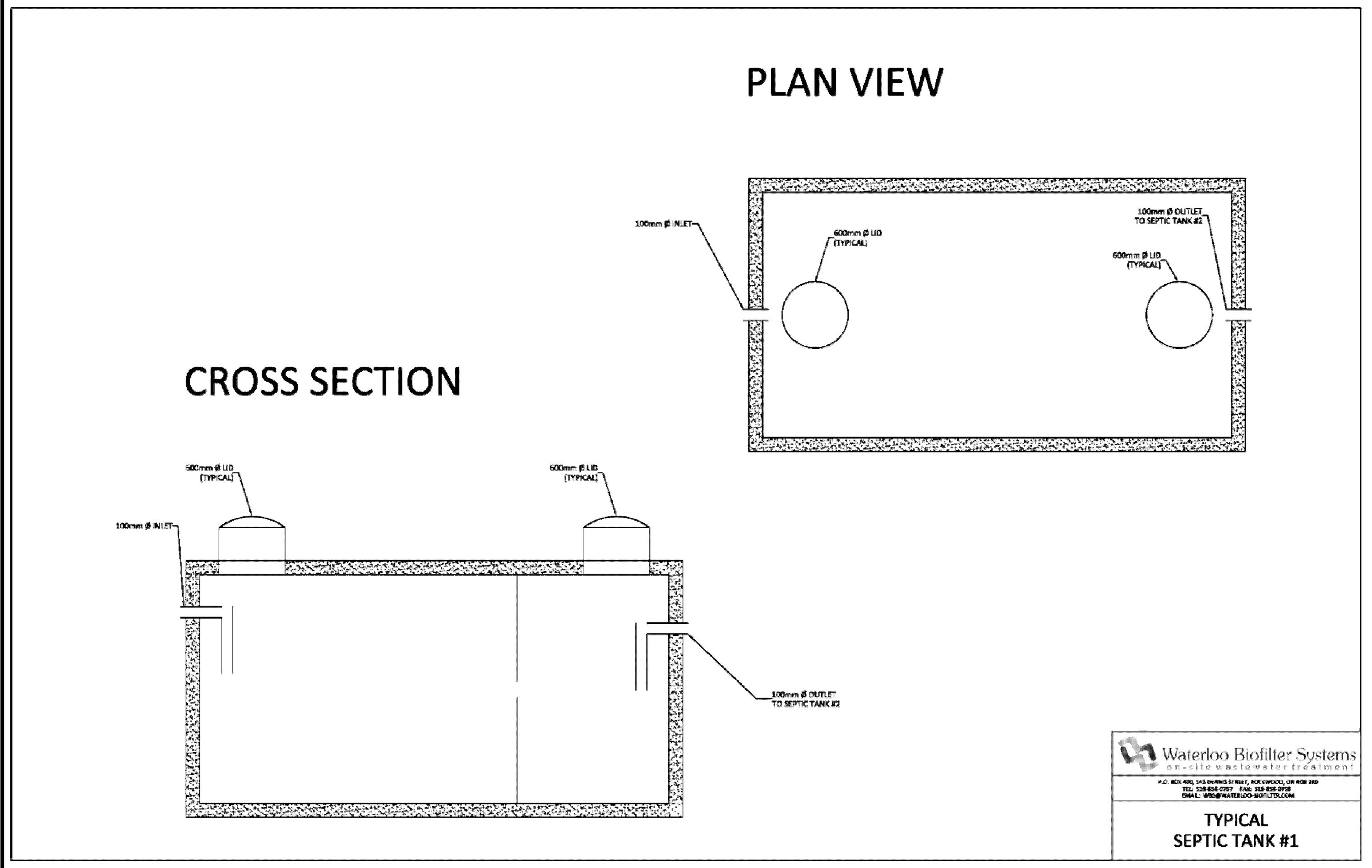

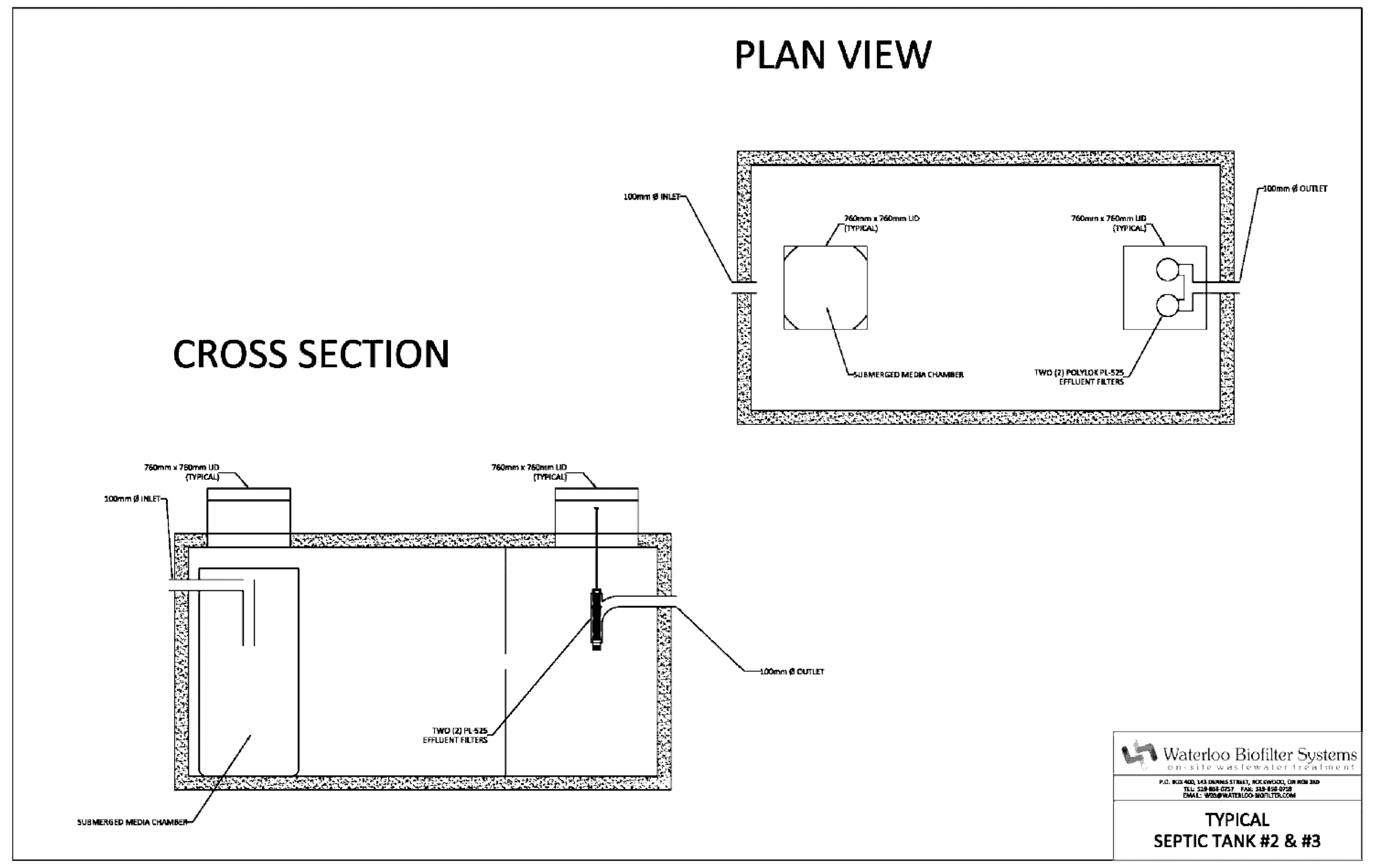

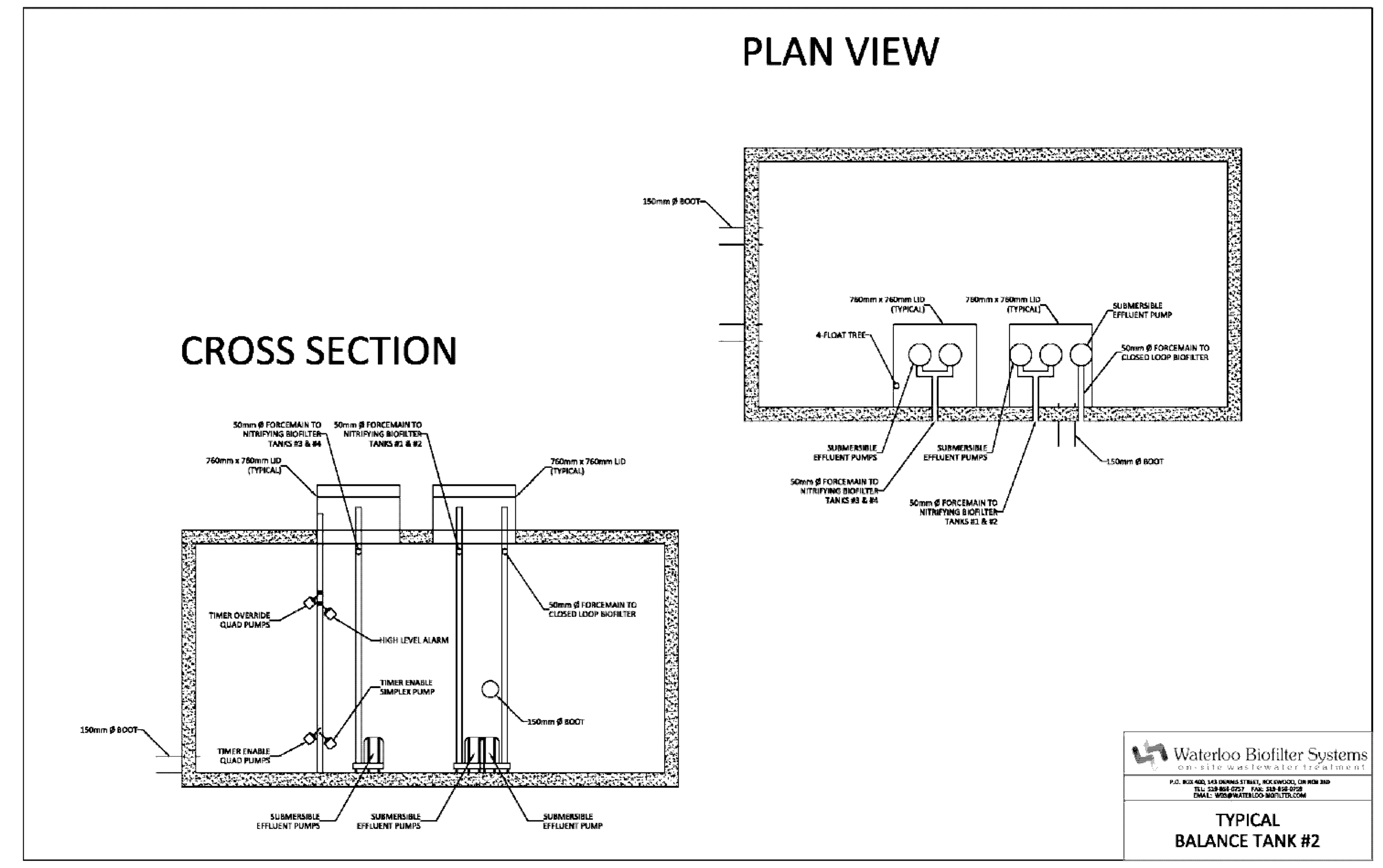

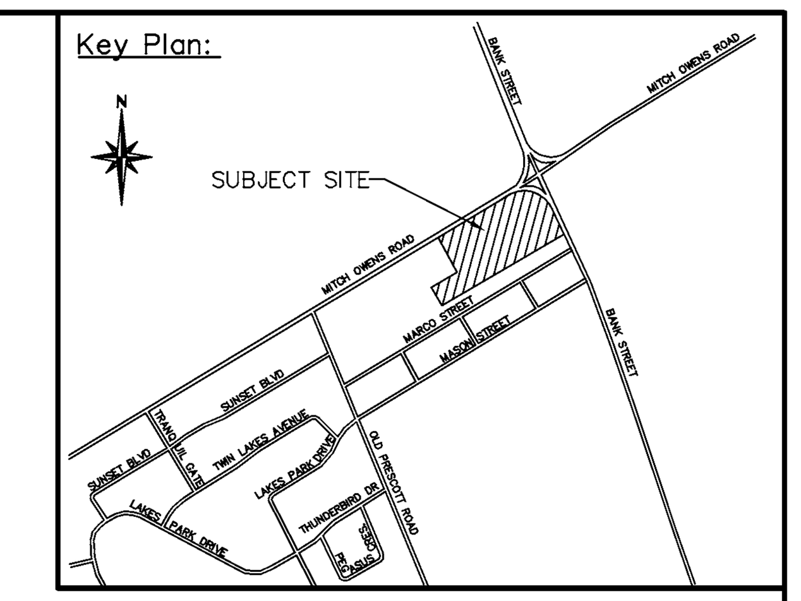

CAUTION

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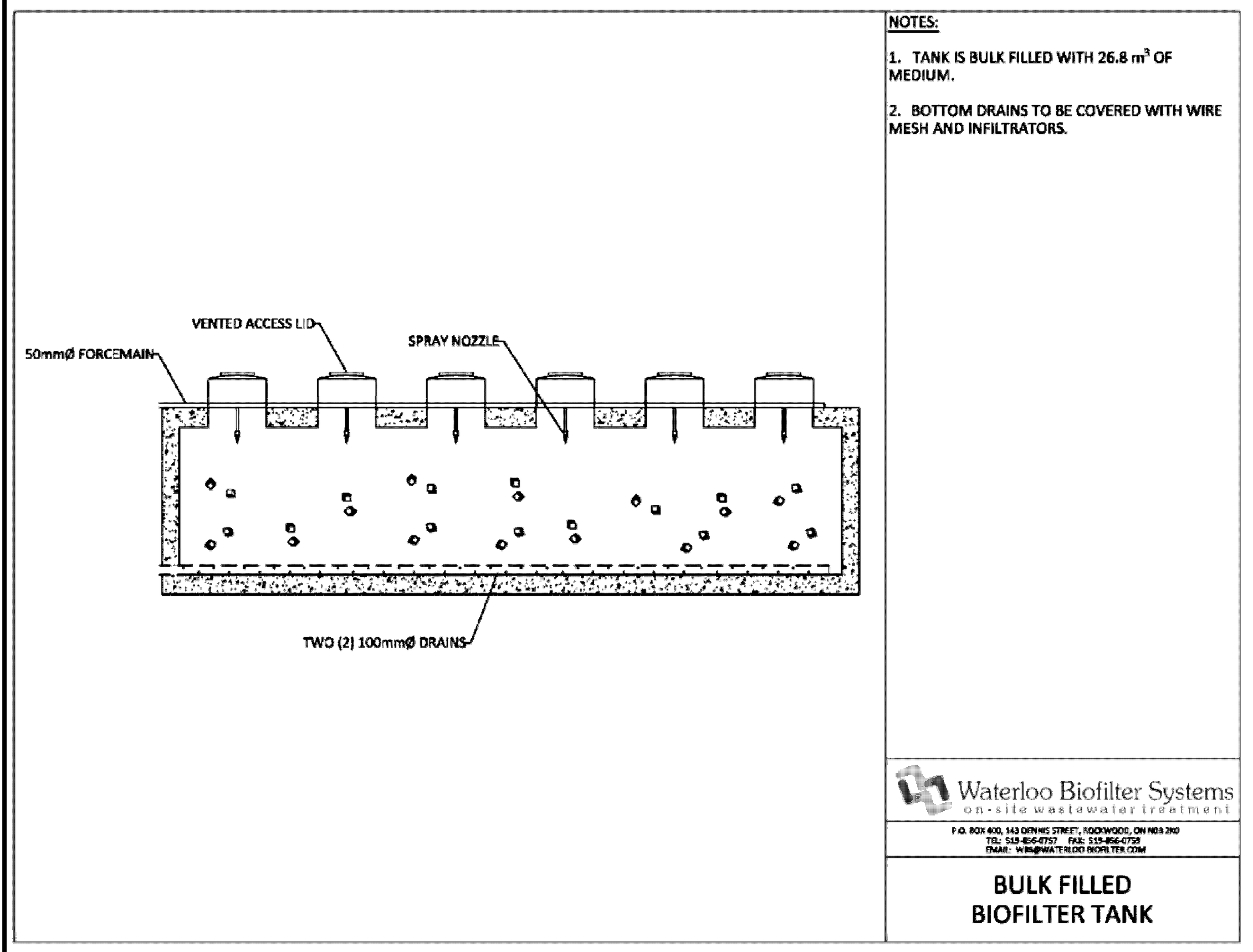

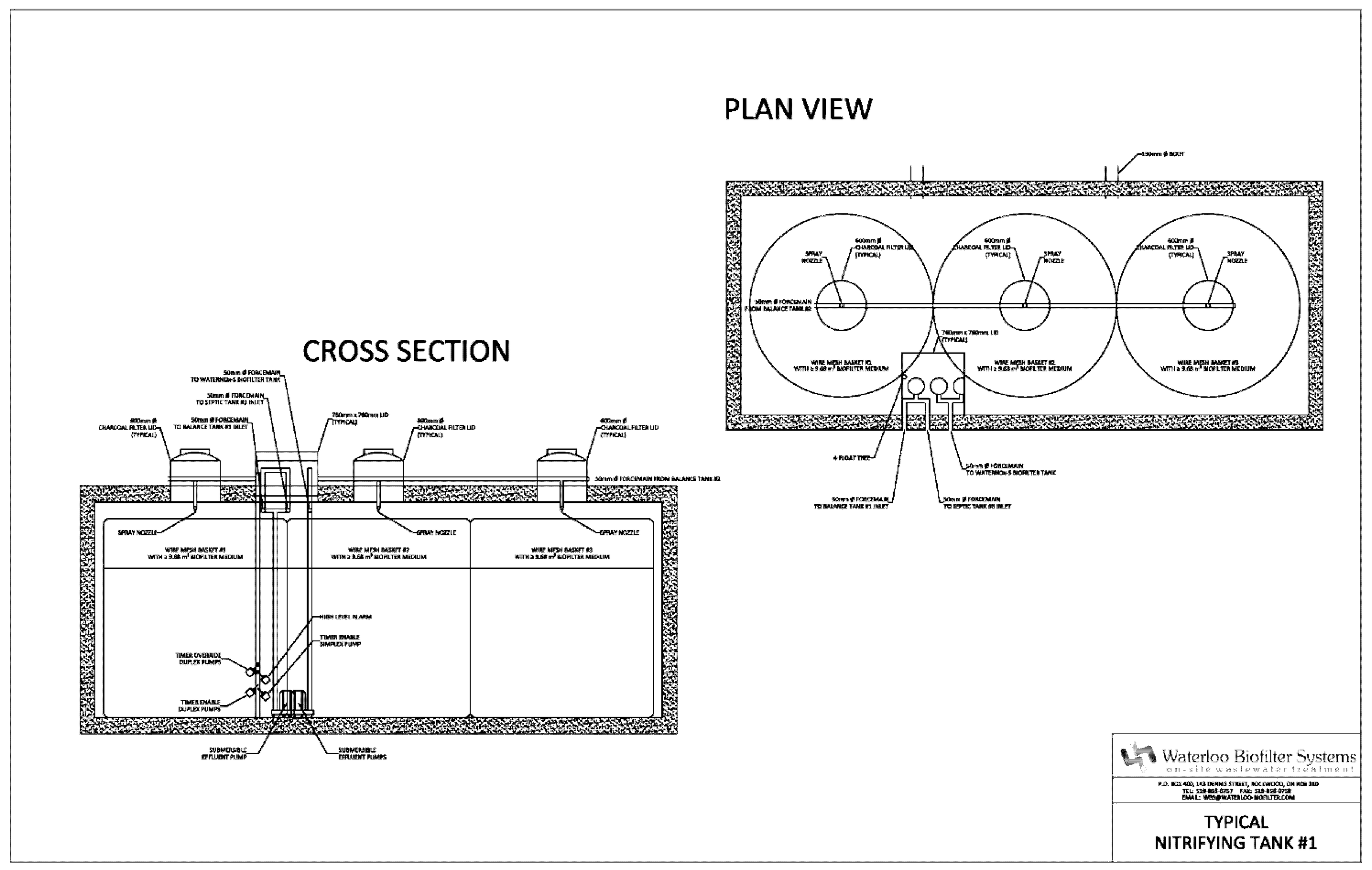

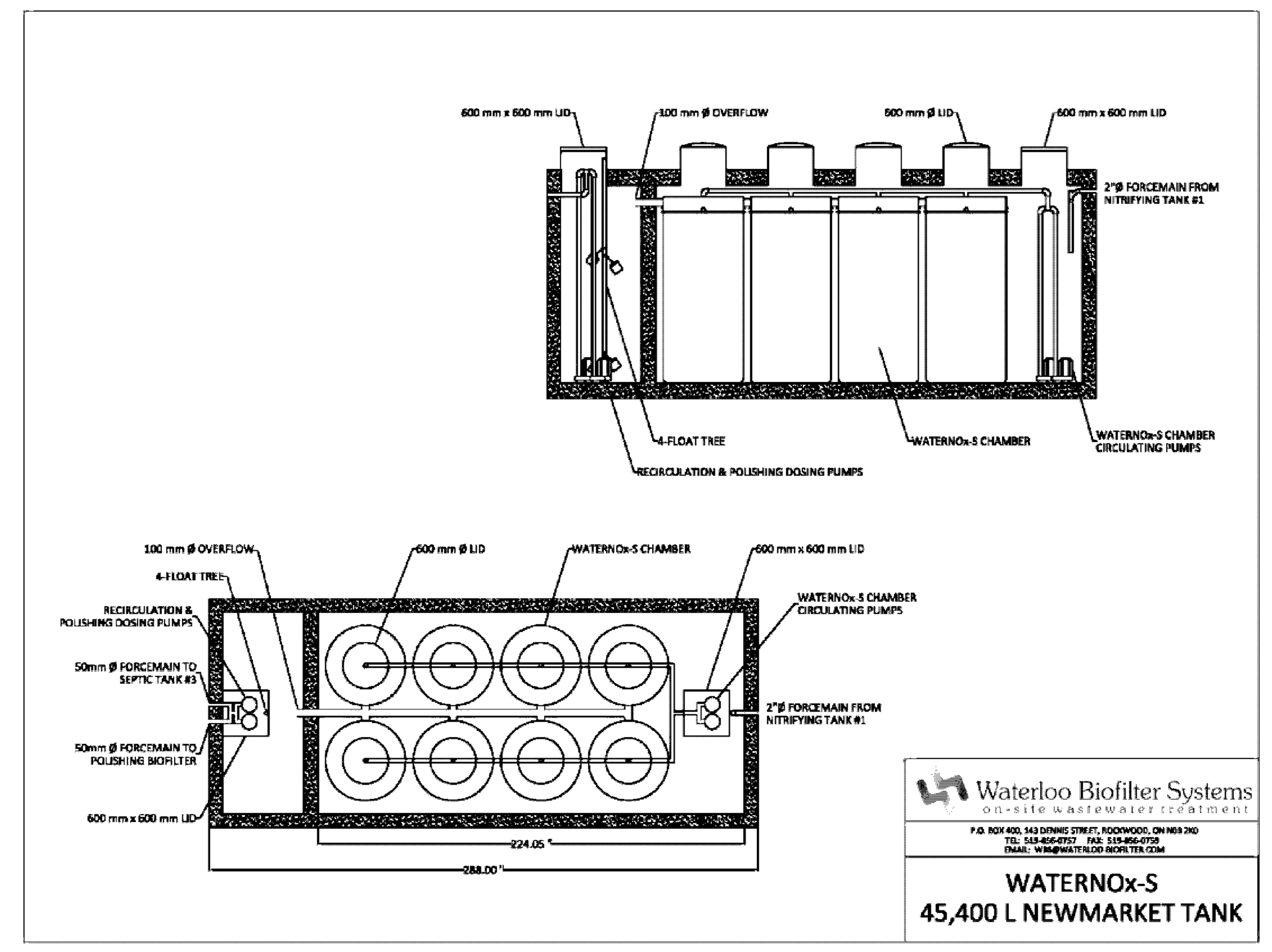

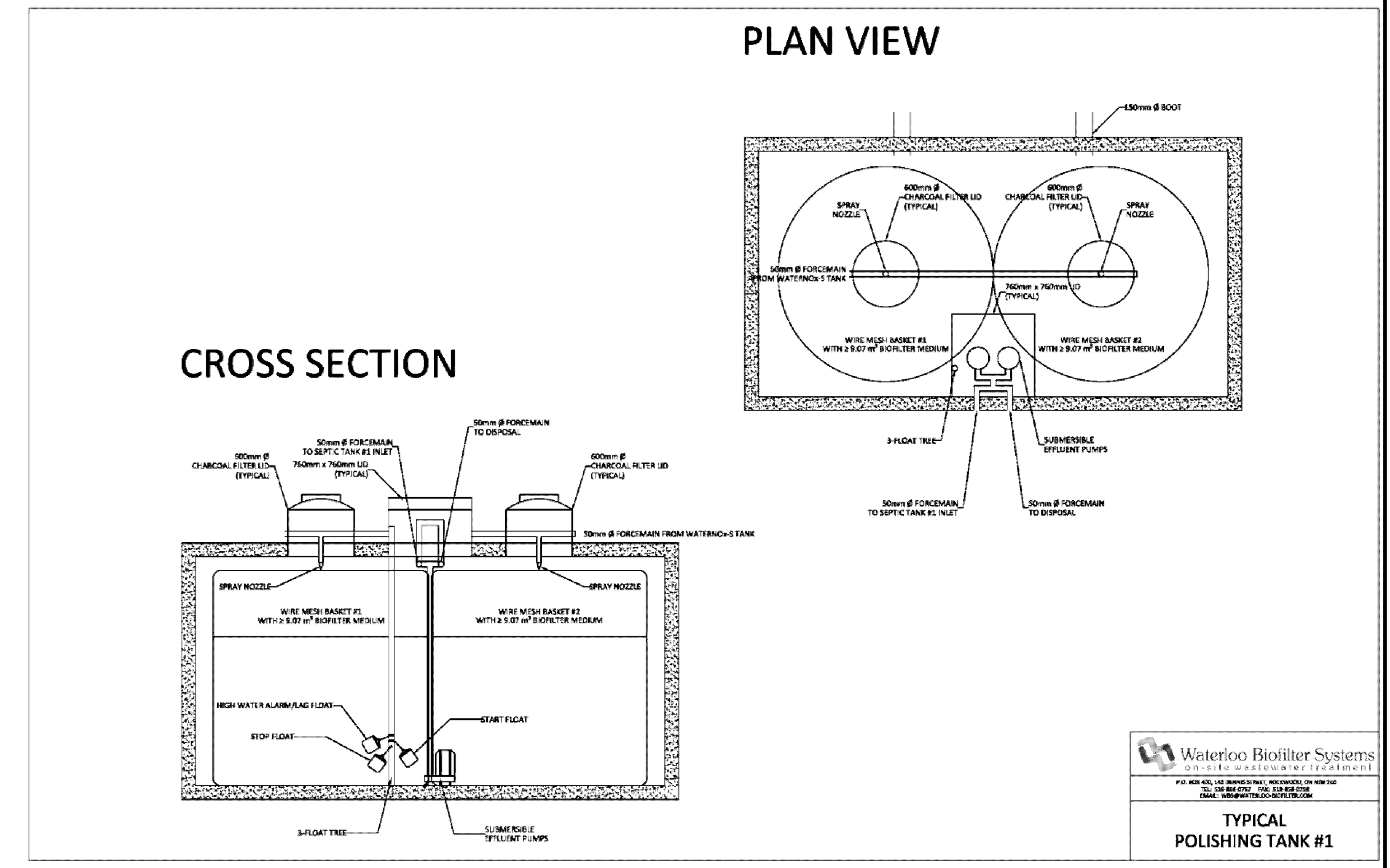

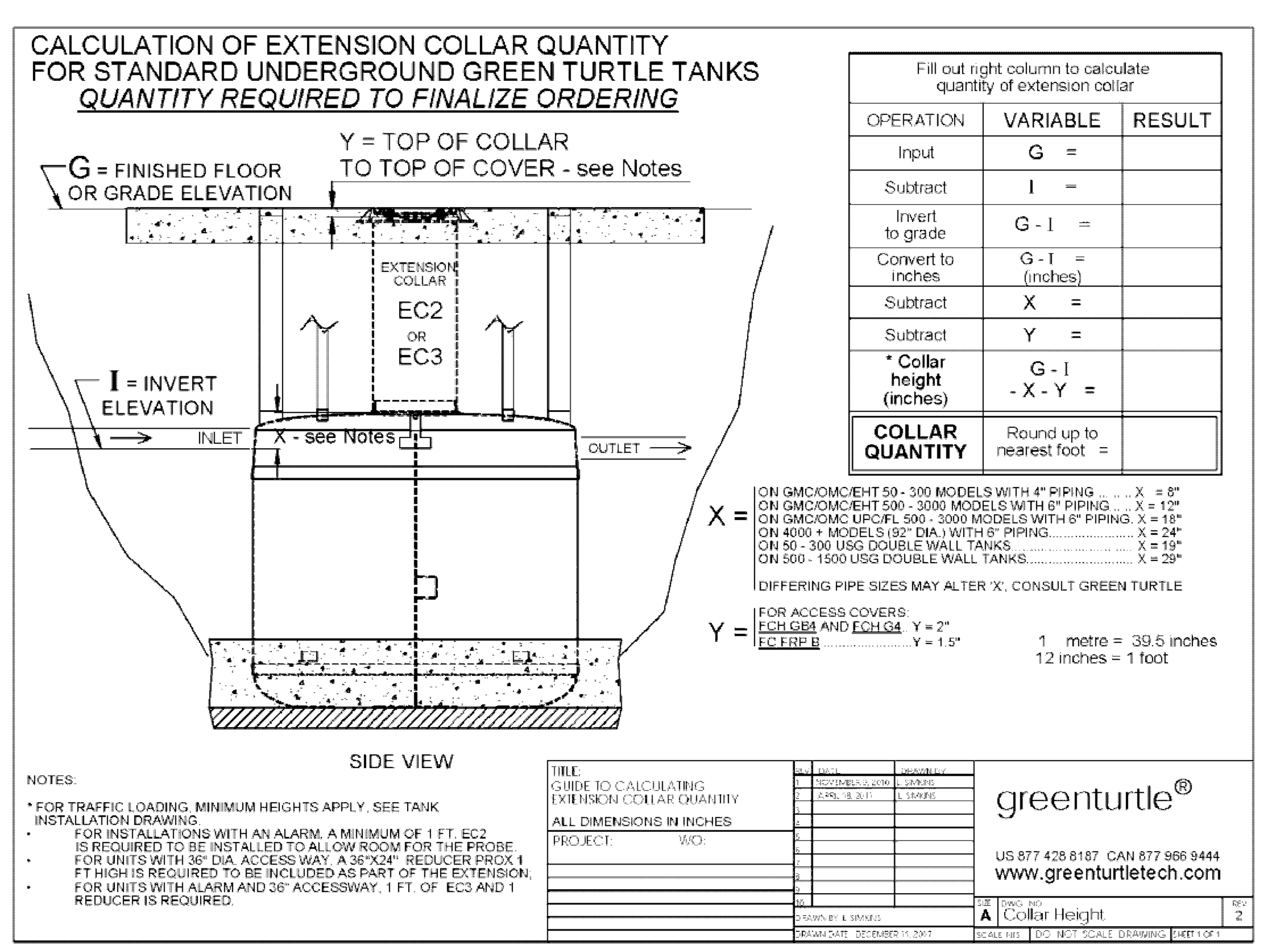

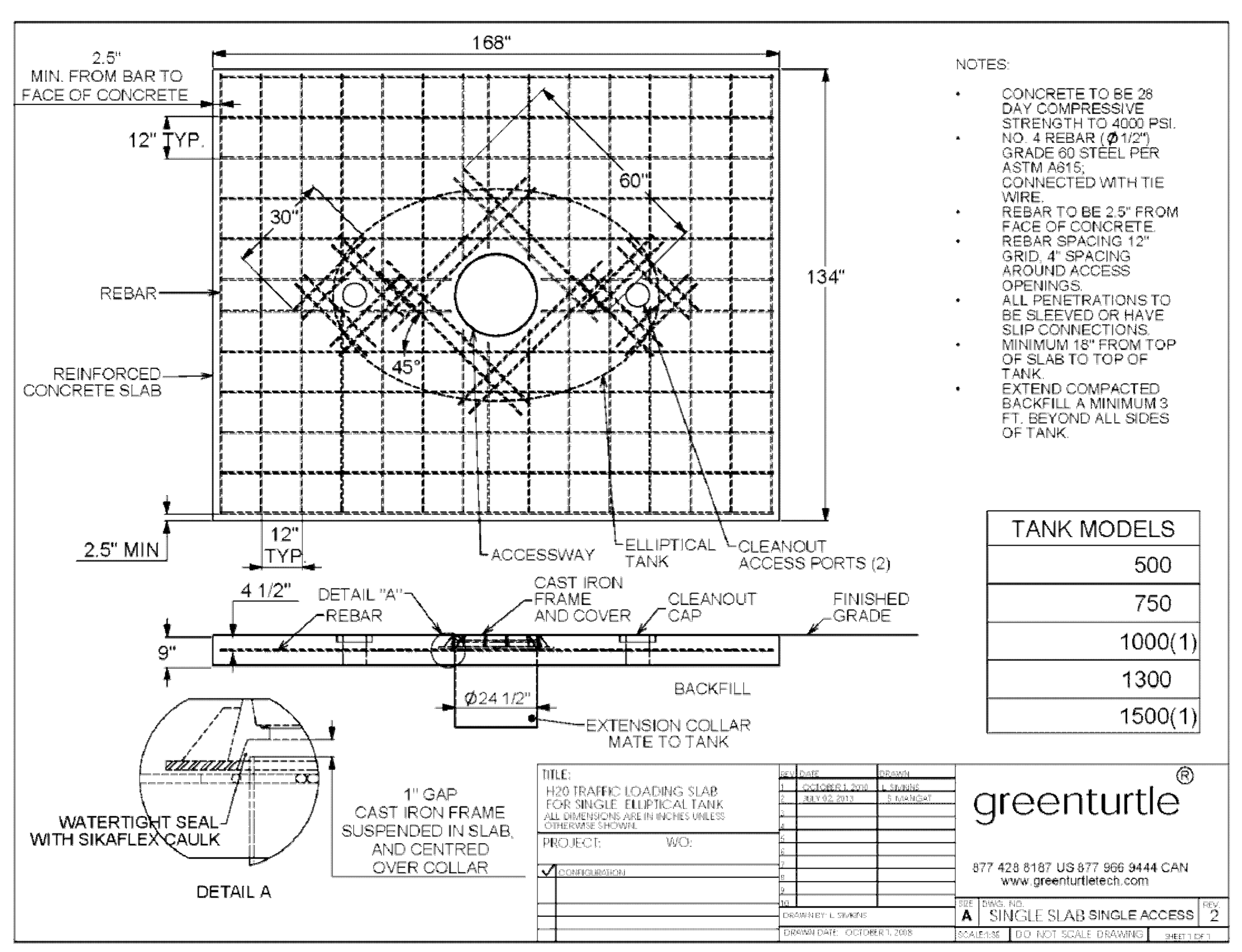

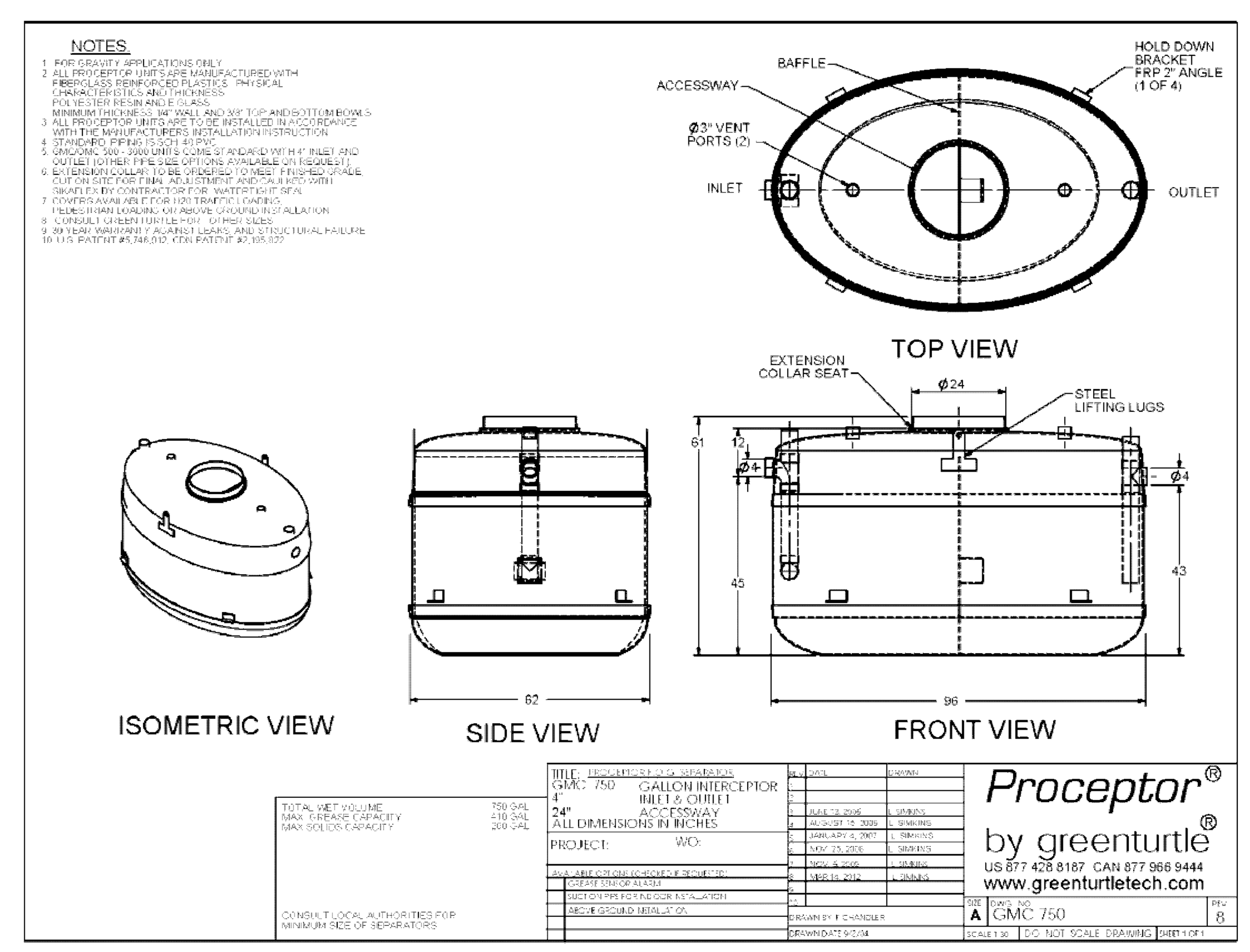

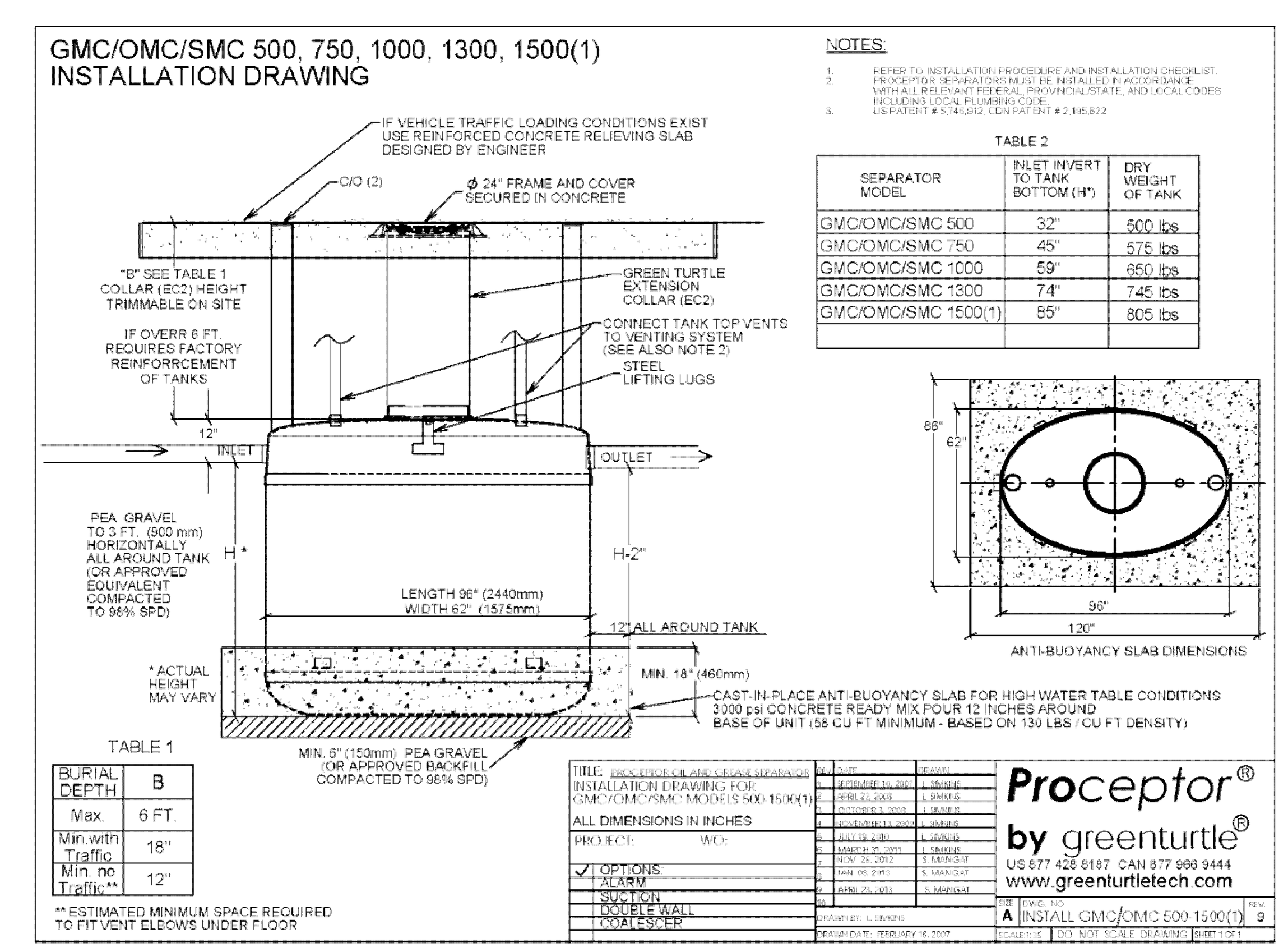

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REGISTERED PROFESSIONAL ENGINEER
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Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

BIOFILTER & AREA BED DETAILS & NOTES 2

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Drawn By	Checked By	Drawing No.
TG	JWL	BIO 3
Scale: N.T.S.	Project No. 11-183	

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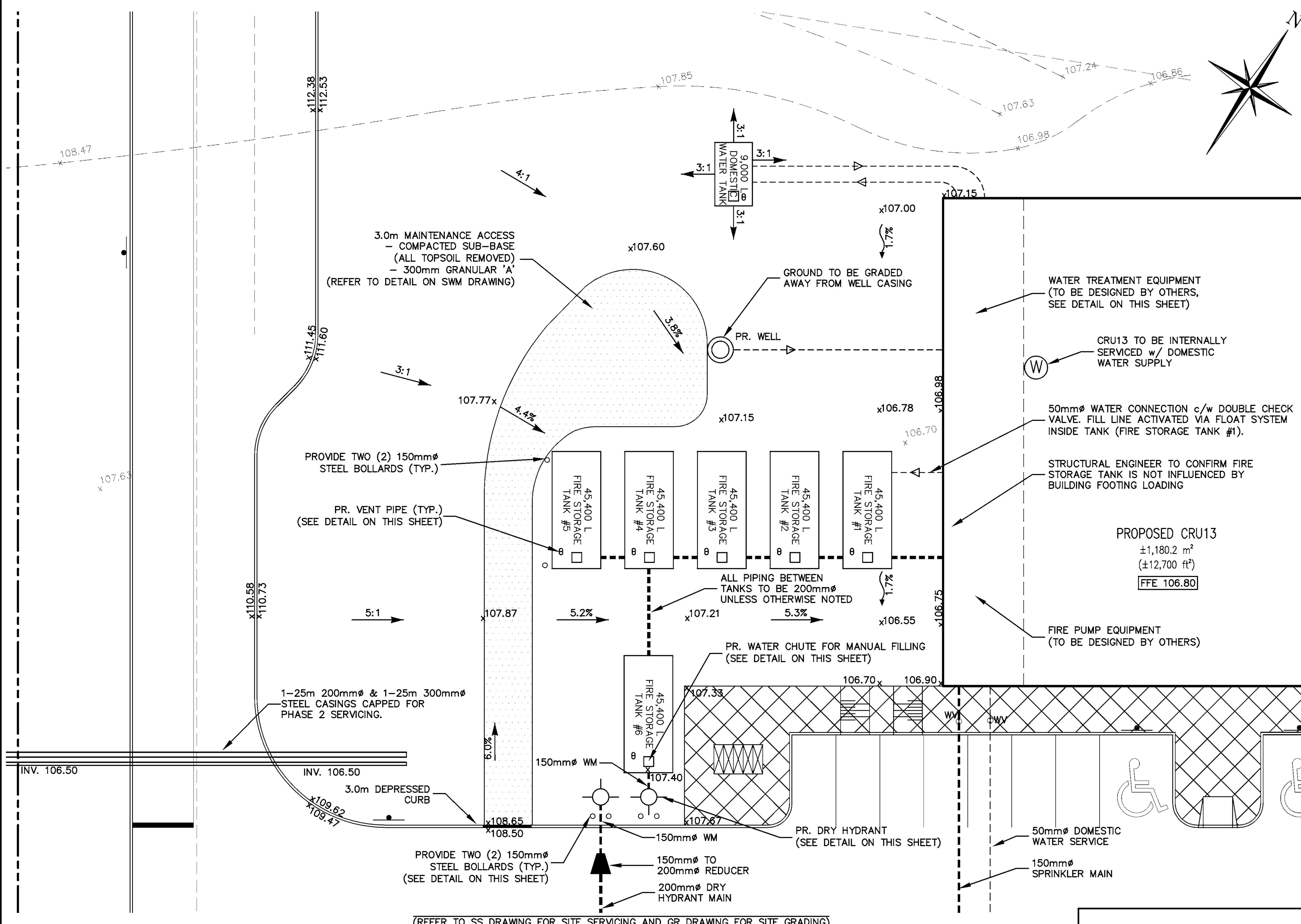
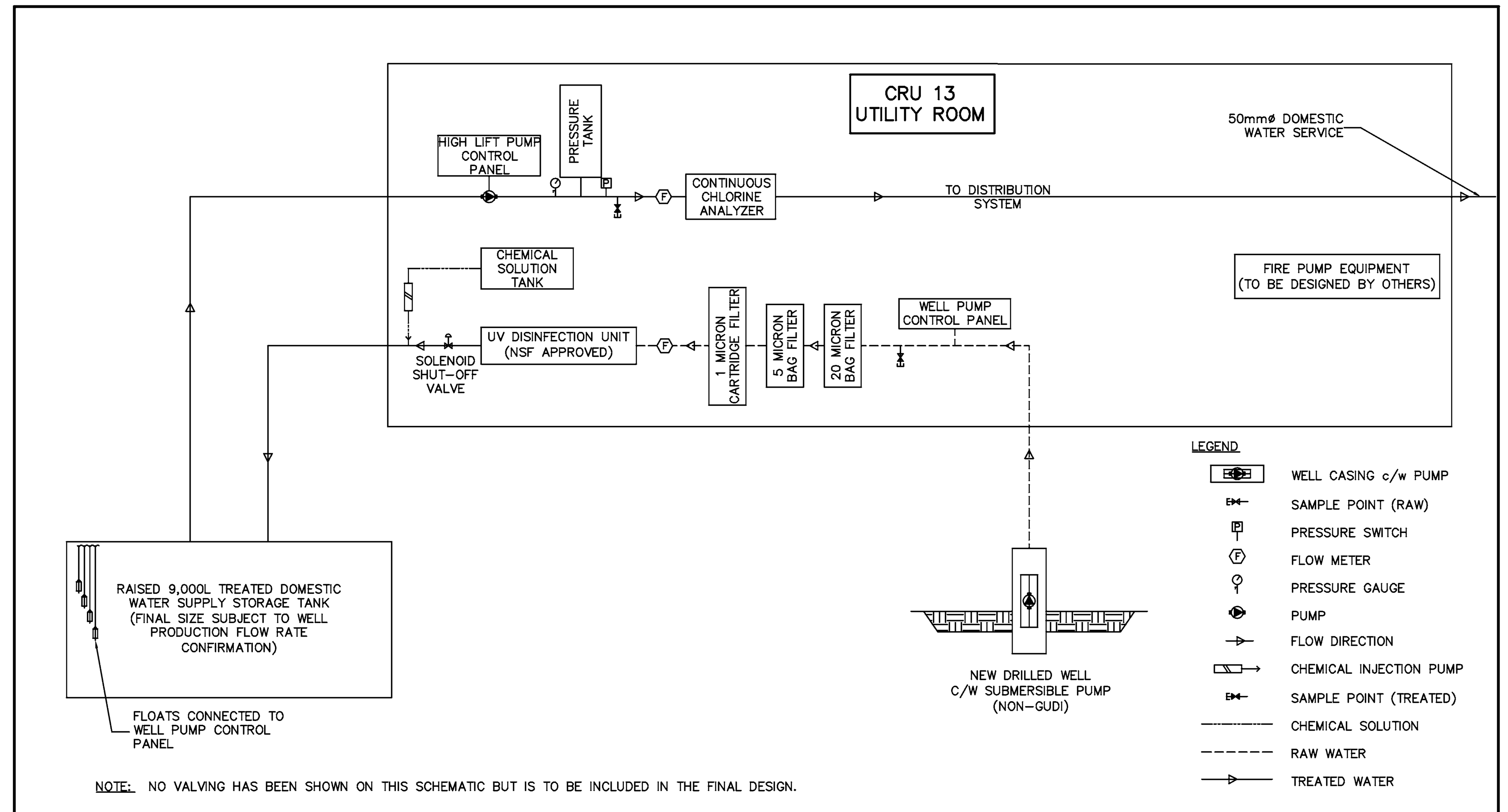


N
3.0m MAINTENANCE ACCESS – COMPACTED SUB-BASE (ALL TOPSOIL REMOVED) – 300mm GRANULAR 'A' (REFER TO DETAIL ON SWM DRAWING)
GROUND TO BE GRADED AWAY FROM WELL CASING
PR. WELL
9,000 L DOMESTIC WATER TANK
WATER TREATMENT EQUIPMENT (TO BE DESIGNED BY OTHERS, SEE DETAIL ON THIS SHEET)
CRU13 TO BE INTERNALLY SERVICED w/ DOMESTIC WATER SUPPLY
50mmø WATER CONNECTION c/w DOUBLE CHECK VALVE. FILL LINE ACTIVATED VIA FLOAT SYSTEM INSIDE TANK (FIRE STORAGE TANK #1).
STRUCTURAL ENGINEER TO CONFIRM FIRE STORAGE TANK IS NOT INFLUENCED BY BUILDING FOOTING LOADING
PROVIDE TWO (2) 150mmø STEEL BOLLARDS (TYP.)
PR. VENT PIPE (TYP.) (SEE DETAIL ON THIS SHEET)
45,400 L FIRE STORAGE TANK #5
45,400 L FIRE STORAGE TANK #4
45,400 L FIRE STORAGE TANK #3
45,400 L FIRE STORAGE TANK #2
45,400 L FIRE STORAGE TANK #1
45,400 L FIRE STORAGE TANK #6
PROPOSED CRU13
±1,180.2 m²
(±12,700 ft²)
FFE 106.80
ALL PIPING BETWEEN TANKS TO BE 200mmø UNLESS OTHERWISE NOTED
PR. WATER CHUTE FOR MANUAL FILLING (SEE DETAIL ON THIS SHEET)
FIRE PUMP EQUIPMENT (TO BE DESIGNED BY OTHERS)
1–25m 200mmø & 1–25m 300mmø STEEL CASINGS CAPPED FOR PHASE 2 SERVICING.
INV. 106.50
INV. 106.50
3.0m DEPRESSED CURB
150mmø WM
PROVIDE TWO (2) 150mmø STEEL BOLLARDS (TYP.) (SEE DETAIL ON THIS SHEET)
150mmø WM
150mmø TO 200mmø REDUCER
200mmø DRY HYDRANT MAIN
PR. DRY HYDRANT (SEE DETAIL ON THIS SHEET)
50mmø DOMESTIC WATER SERVICE
150mmø SPRINKLER MAIN
(REFER TO SS DRAWING FOR SITE SERVICING AND GR DRAWING FOR SITE GRADING)

NOTES:

1. TANK ACCESS MUST BE PROVIDED VIA LOCKED WATER CHUTE ACCESS HATCH COMPLETE WITH LADDER RUNGS AND CONCRETE RISERS PER APPLICABLE OPSD REQUIREMENTS.
2. ALL CONNECTIONS TO THE STORAGE TANKS ARE TO BE WATER TIGHT (REFER TO TYPICAL WATER STORAGE TANK WALL PENETRATION WITH LINK–SEAL DETAIL ON THIS SHEET).
3. TANK IS TO BE BEDDED AS PER GEOTECHNICAL RECOMMENDATIONS.
4. REFER TO BIO 2 DRAWING FOR 45,400L TANK CROSS SECTION DETAILS. FOR 9,000L TANK CROSS SECTION SEE DETAIL ON THIS SHEET.
5. ALL CONCRETE TANKS ARE TO BE INSULATED (REFER TO DETAIL ON BIO 2 DRAWING)
6. ALL STRUCTURES (TANKS) TO BE NEWMARKET PRE–CAST CONCRETE PRODUCTS OR APPROVED EQUIVALENT. REFER TO BIO 2 DRAWING FOR TANK DETAILS.

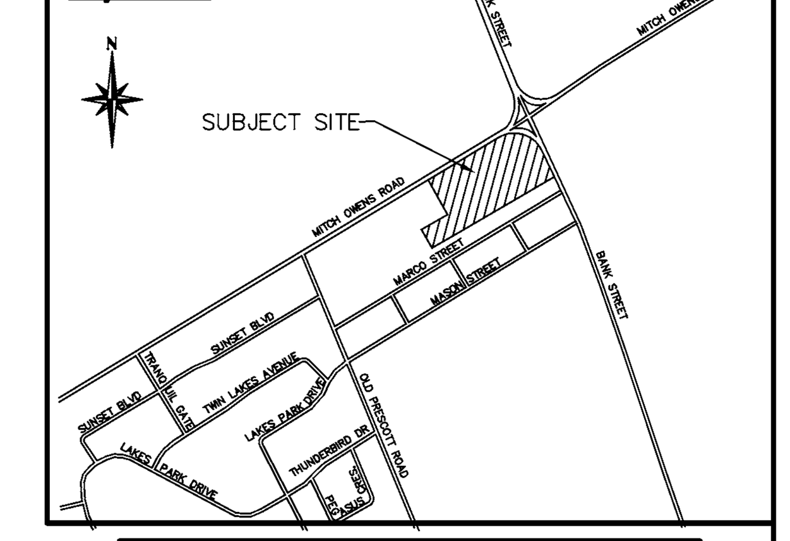
WATER TANK	GROUND ELEV.	TOP OF STRUCTURE ELEV.	INLET ELEV.	OUTLET ELEV.
DOMESTIC WATER TANK	109.57	108.57	108.30	107.00
FIRE STORAGE TANK #1	106.67	106.07	103.26	103.26
FIRE STORAGE TANK #2	106.85	106.07	103.26	103.26
FIRE STORAGE TANK #3	107.16	106.07	103.26	103.26
FIRE STORAGE TANK #4	107.27	106.07	103.26	103.26
FIRE STORAGE TANK #5	107.42	106.07	103.26	103.26
FIRE STORAGE TANK #6	107.40	106.07	103.26	103.26



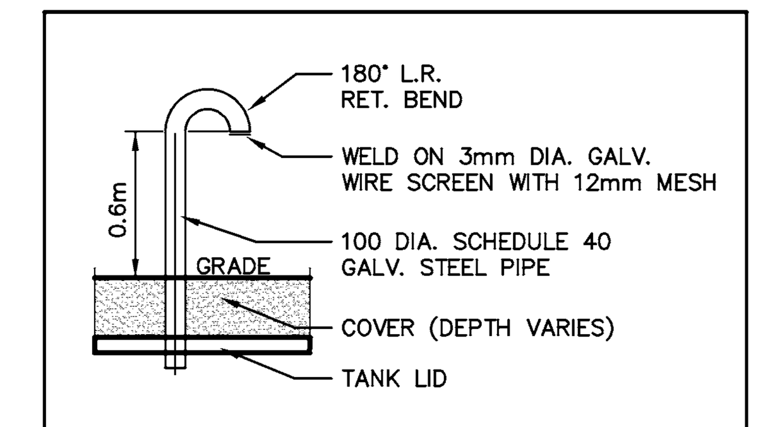
CRU 13 UTILITY ROOM
HIGH LIFT PUMP CONTROL PANEL
PRESSURE TANK
CONTINUOUS CHLORINE ANALYZER
TO DISTRIBUTION SYSTEM
50mmø DOMESTIC WATER SERVICE
CHEMICAL SOLUTION TANK
UV DISINFECTION UNIT (NSF APPROVED)
SOLENOID SHUT–OFF VALVE
1 MICRON CARTRIDGE FILTER
5 MICRON BAG FILTER
20 MICRON BAG FILTER
WELL PUMP CONTROL PANEL
FIRE PUMP EQUIPMENT (TO BE DESIGNED BY OTHERS)
RAISED 9,000L TREATED DOMESTIC WATER SUPPLY STORAGE TANK (FINAL SIZE SUBJECT TO WELL PRODUCTION FLOW RATE CONFIRMATION)
FLOATS CONNECTED TO WELL PUMP CONTROL PANEL
NEW DRILLED WELL C/W SUBMERSIBLE PUMP (NON–GUDI)
LEGEND
WELL CASING c/w PUMP
SAMPLE POINT (RAW)
PRESSURE SWITCH
FLOW METER
PRESSURE GAUGE
PUMP
FLOW DIRECTION
CHEMICAL INJECTION PUMP
SAMPLE POINT (TREATED)
CHEMICAL SOLUTION
RAW WATER
TREATED WATER
NOTE: NO VALVING HAS BEEN SHOWN ON THIS SCHEMATIC BUT IS TO BE INCLUDED IN THE FINAL DESIGN.

WATER TREATMENT EQUIPMENT
N.T.S.

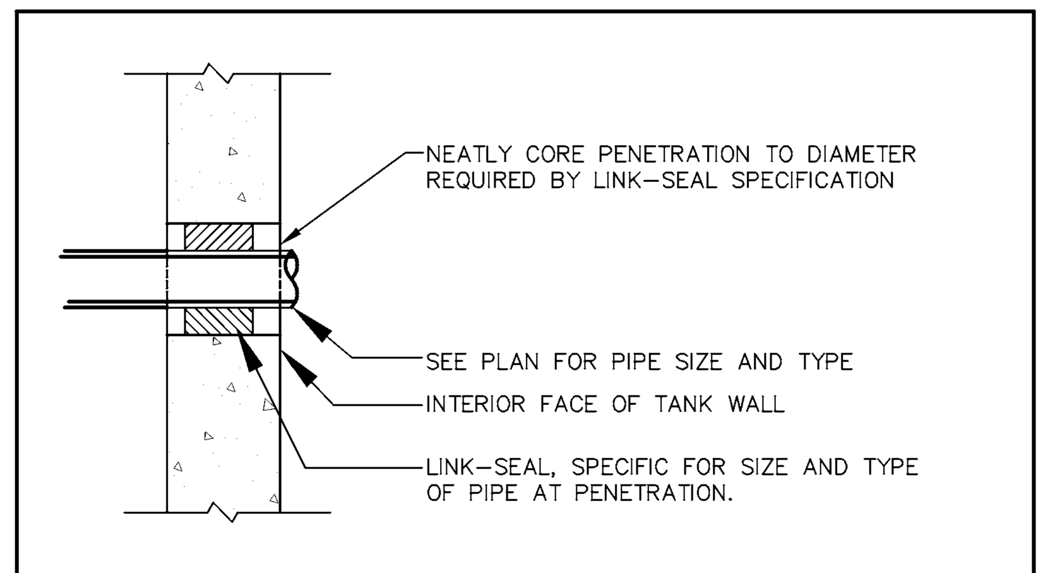
Key Plan:



CAUTION
CONTRACTOR TO DETERMINE LOCATION OF EXISTING UTILITIES PRIOR TO CONSTRUCTION.



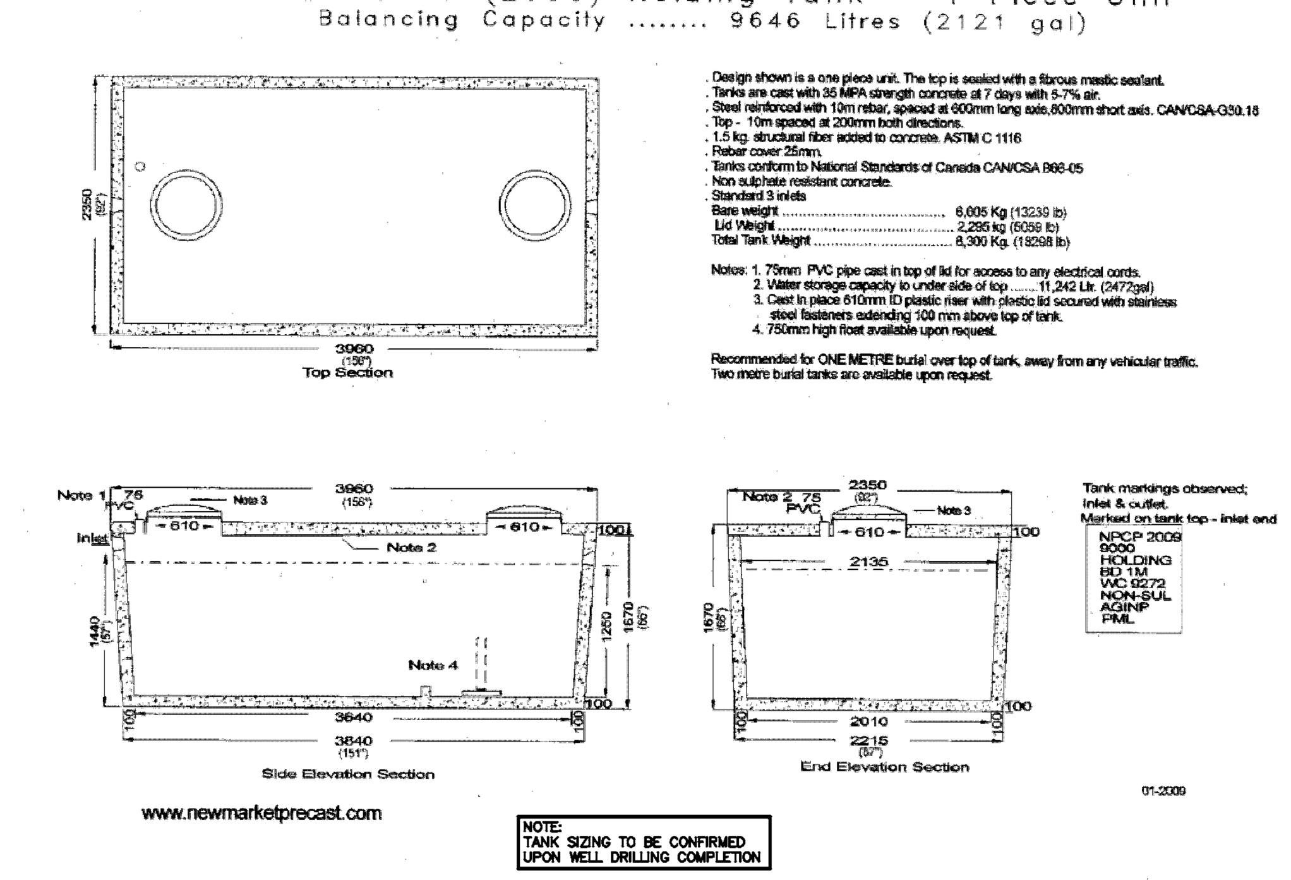
VENT DETAIL
N.T.S.

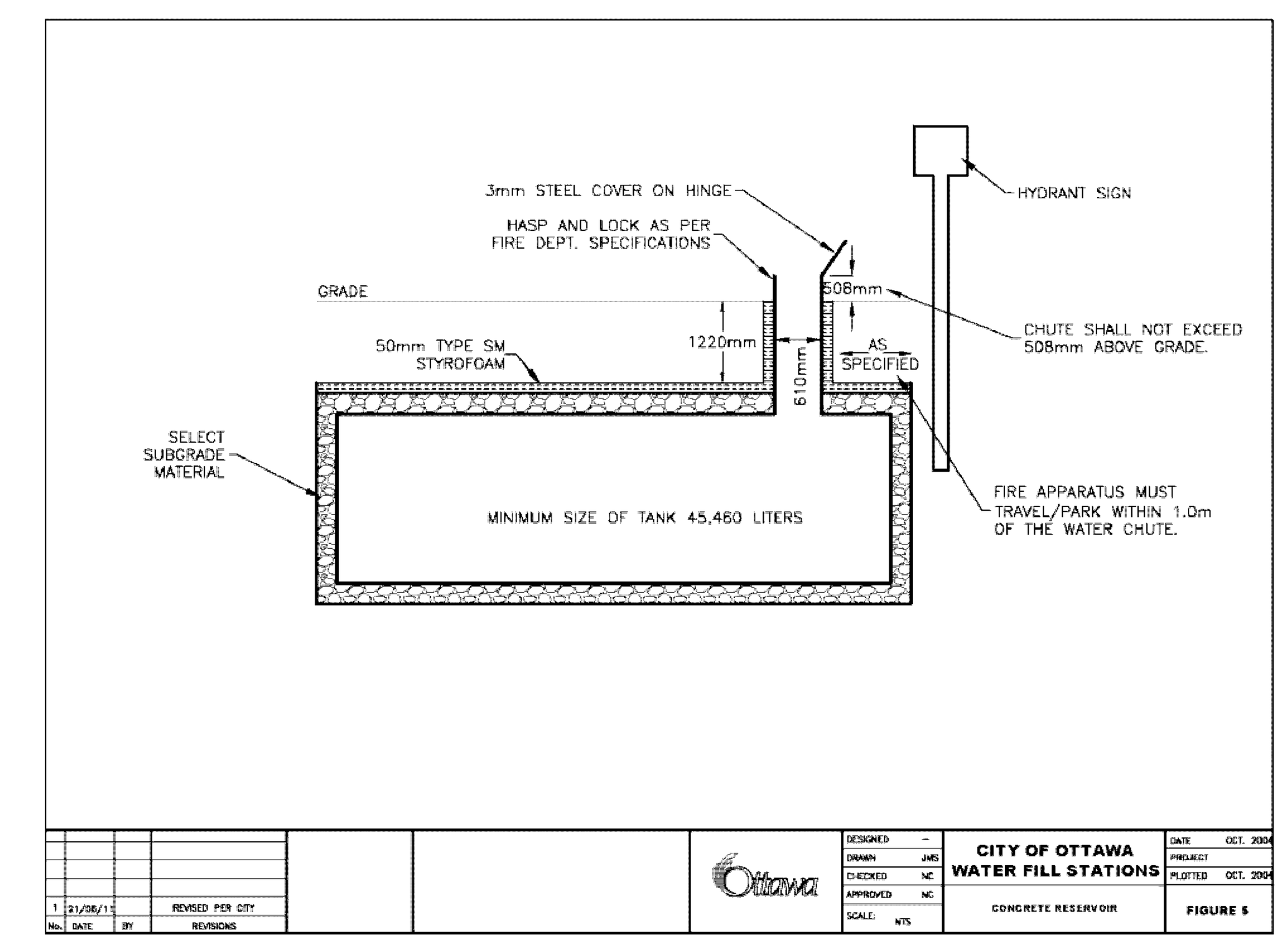


TYPICAL WATER STORAGE TANK WALL PENETRATION WITH LINK–SEAL
N.T.S.

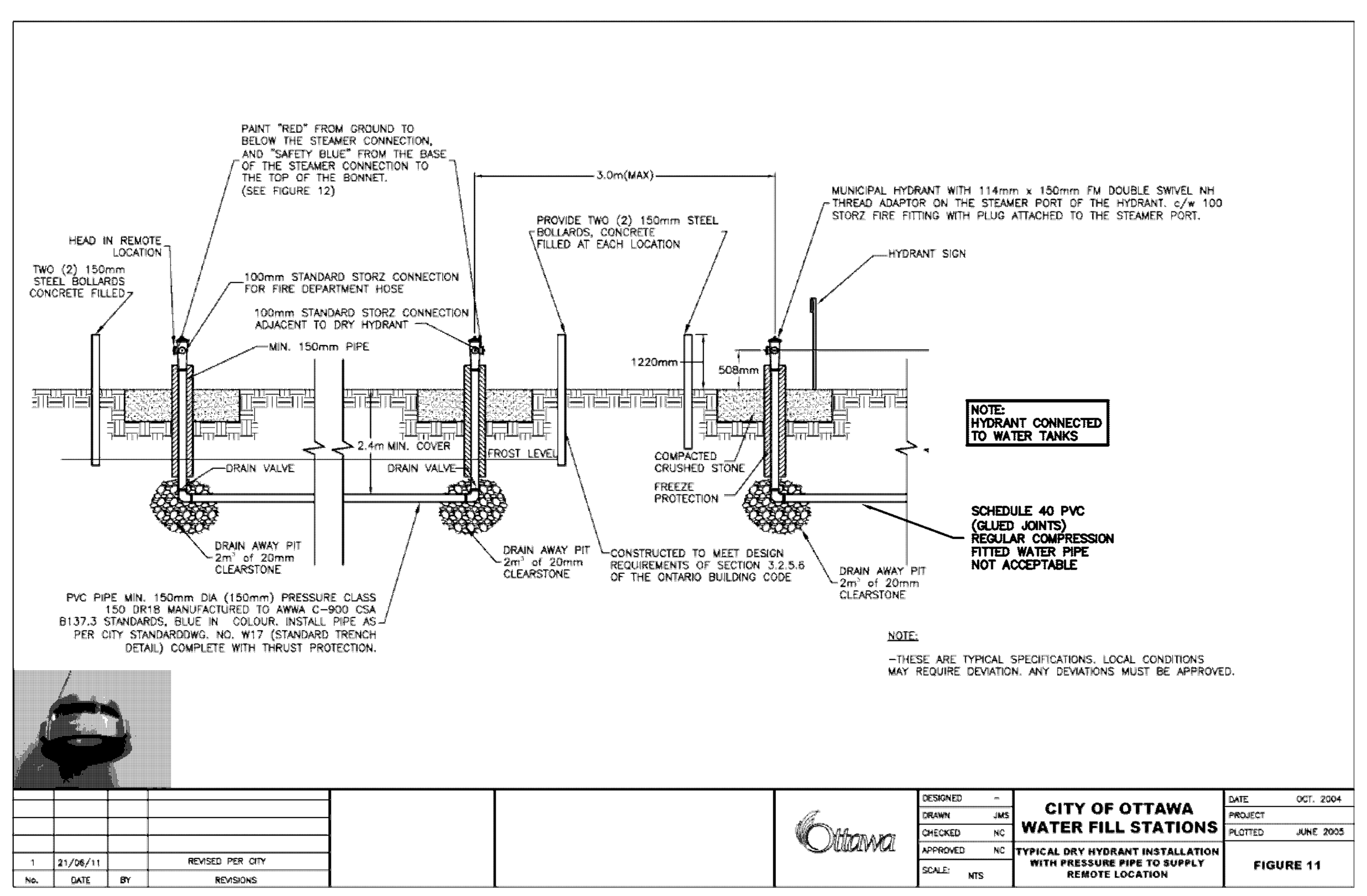
NEWMARKET PRE-CAST CONCRETE PRODUCTS
Telephone: 905-852-6111 ; Toll Free 1-800-263-1297

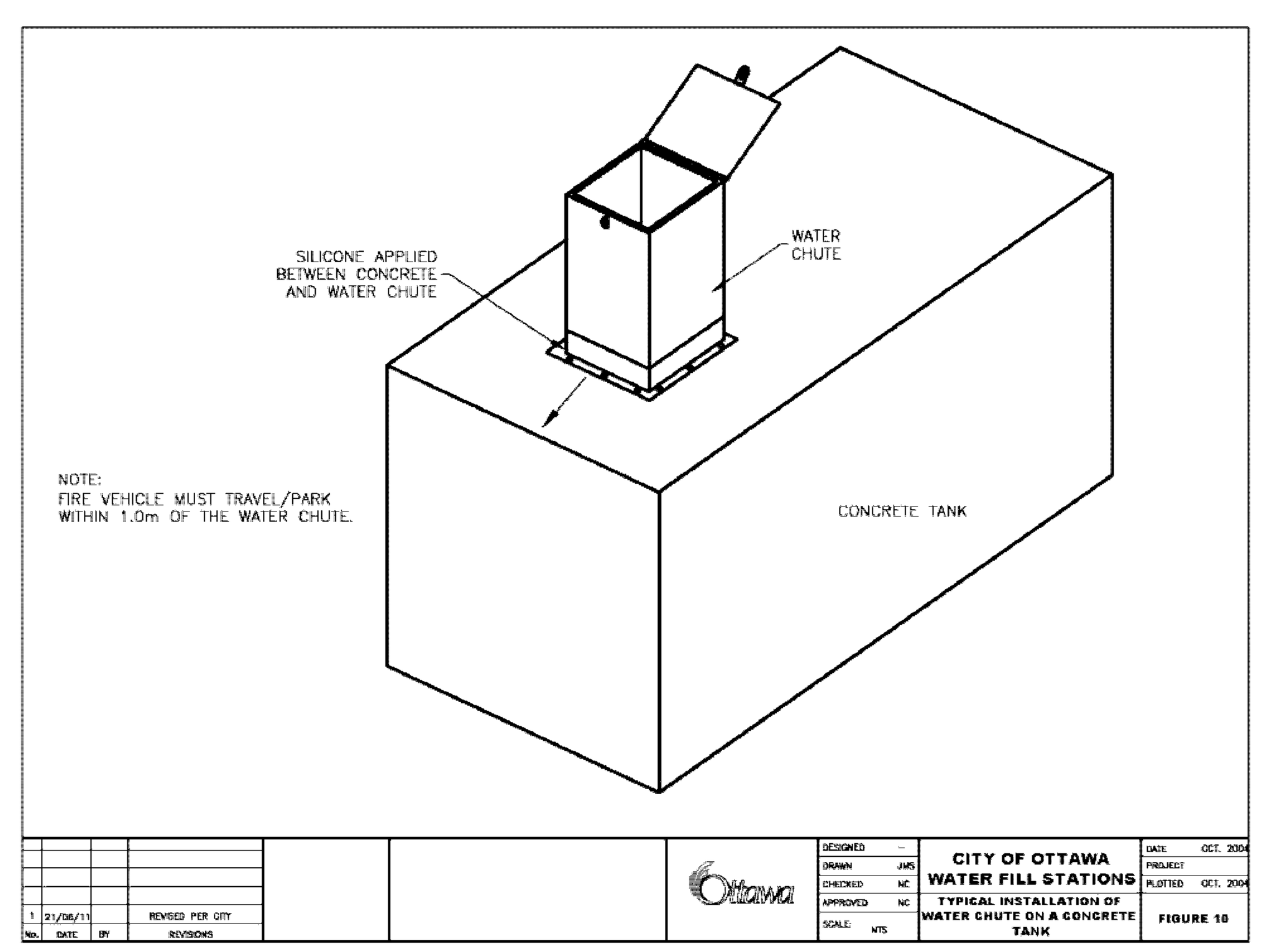
Model 9000 (2000) Holding Tank – 1 Piece Unit
Balancing Capacity .... 9646 Litres (2121 gal)



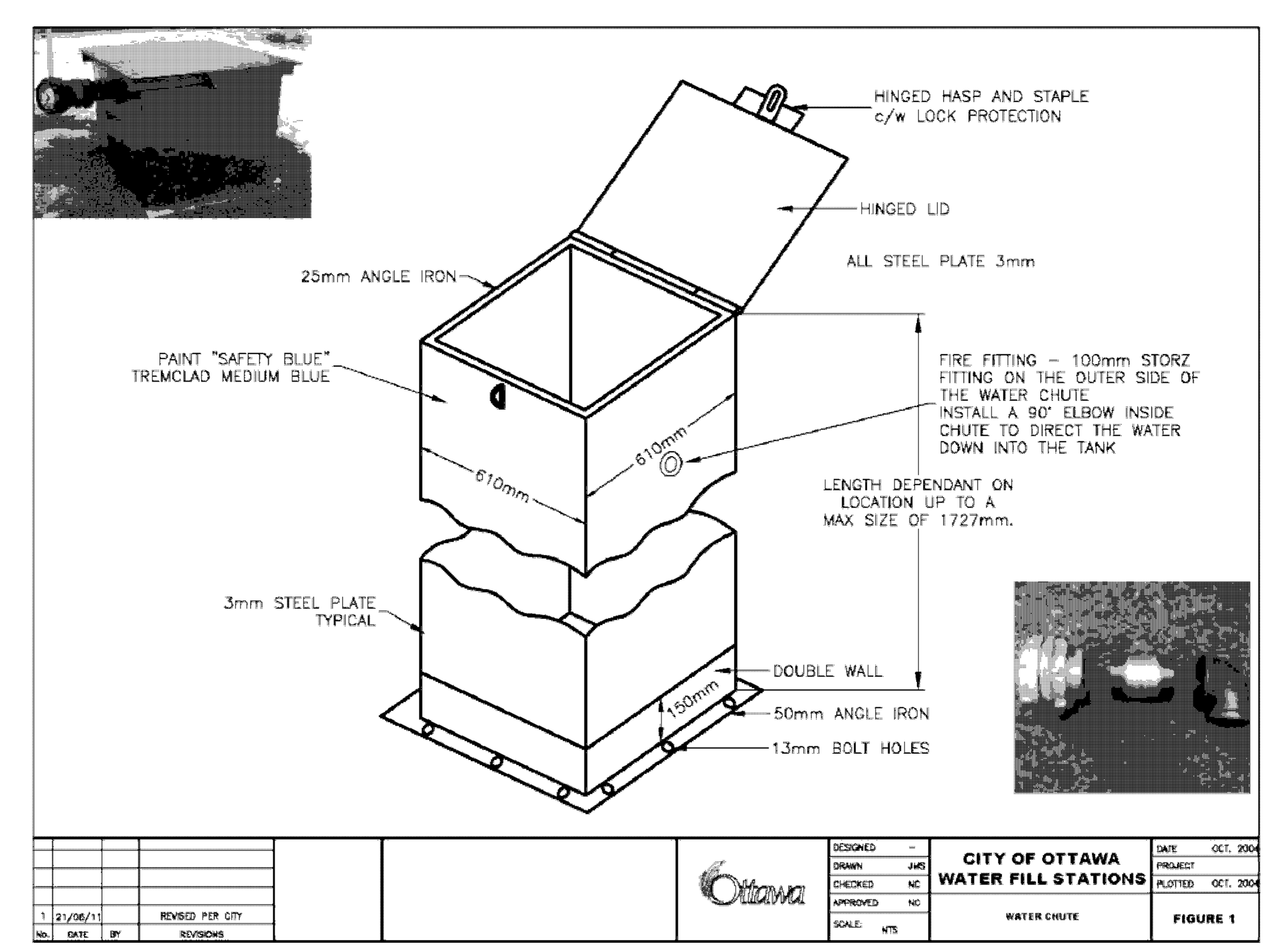


HYDRANT SIGN
3mm STEEL COVER ON HINGE
HASP AND LOCK AS PER FIRE DEPT. SPECIFICATIONS
GRADE
50mm TYPE SM STYROFOAM
SELECT SUBGRADE MATERIAL
MINIMUM SIZE OF TANK 45,460 LITERS
CHUTE SHALL NOT EXCEED 508mm ABOVE GRADE
FIRE APPARATUS MUST TRAVEL/PARK WITHIN 1.0m OF THE WATER CHUTE.
CITY OF OTTAWA
WATER FILL STATIONS
CONCRETE RESERVOIR
FIGURE 5

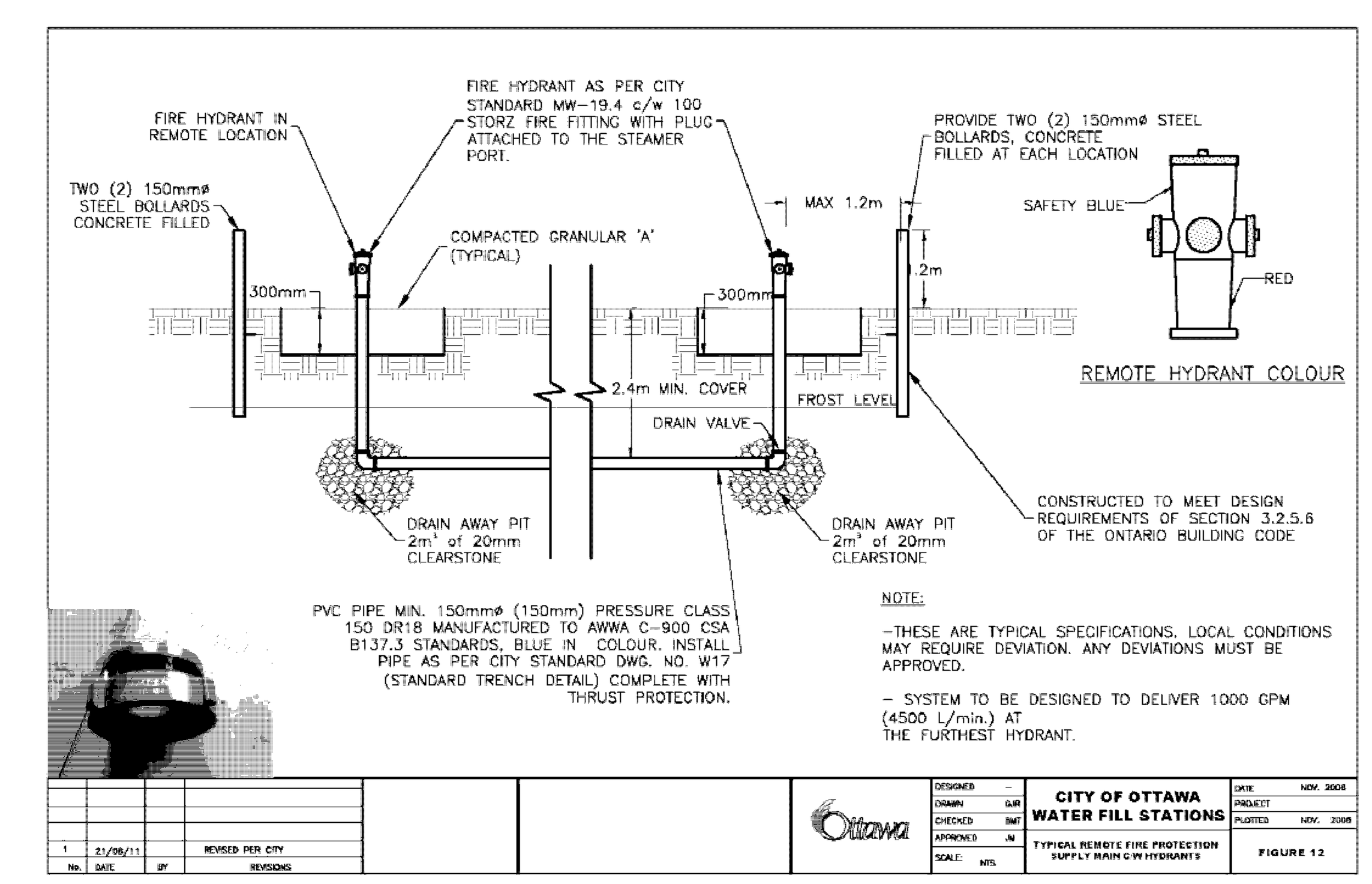




SILICONE APPLIED BETWEEN CONCRETE AND WATER CHUTE
WATER CHUTE
CONCRETE TANK
NOTE: FIRE VEHICLE MUST TRAVEL/PARK WITHIN 1.0m OF THE WATER CHUTE.
CITY OF OTTAWA
WATER FILL STATIONS
TYPICAL INSTALLATION OF WATER CHUTE ON A CONCRETE TANK
FIGURE 10



HINGED HASP AND STAPLE c/w LOCK PROTECTION
HINGED LID
ALL STEEL PLATE 3mm
20mm ANGLE IRON
PAINT "SAFETY BLUE" TREMCLAD MEDIUM BLUE
3mm STEEL PLATE TYPICAL
DOUBLE WALL
50mm ANGLE IRON
13mm BOLT HOLES
CITY OF OTTAWA
WATER FILL STATIONS
WATER CHUTE
FIGURE 1



FIRE HYDRANT IN REMOTE LOCATION
TWO (2) 150mmø STEEL BOLLARDS CONCRETE FILLED
COMPACTED GRANULAR 'A' (TYPICAL)
DRAIN VALVE
FROST LEVEL
2.4m MIN. COVER
DRAIN AWAY PIT 2m³ of 20mm CLEARSTONE
REMOTE HYDRANT COLOUR
SAFETY BLUE
RED
CITY OF OTTAWA
WATER FILL STATIONS
FIGURE 12

Notes:

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Benchmark: 113.99

#3 CONCRETE MONUMENT (001196530377). NORTH SIDE OF MITCH OWENS ROAD APPROXIMATELY 250m WEST OF THE INTERSECTION OF MITCH OWENS ROAD AND BANK STREET.

REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submission	Feb. 4, 2014

Greely Commercial Center

WATER FACILITY & FIRE STORAGE PLAN

Client:
Alium Investments Ltd.
3338 Dufferin Street
Toronto, Ontario
M6A 3A4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	Checked By	Drawing No.
TG	JWL	WF
Scale 1:200	Project No. 11-183	

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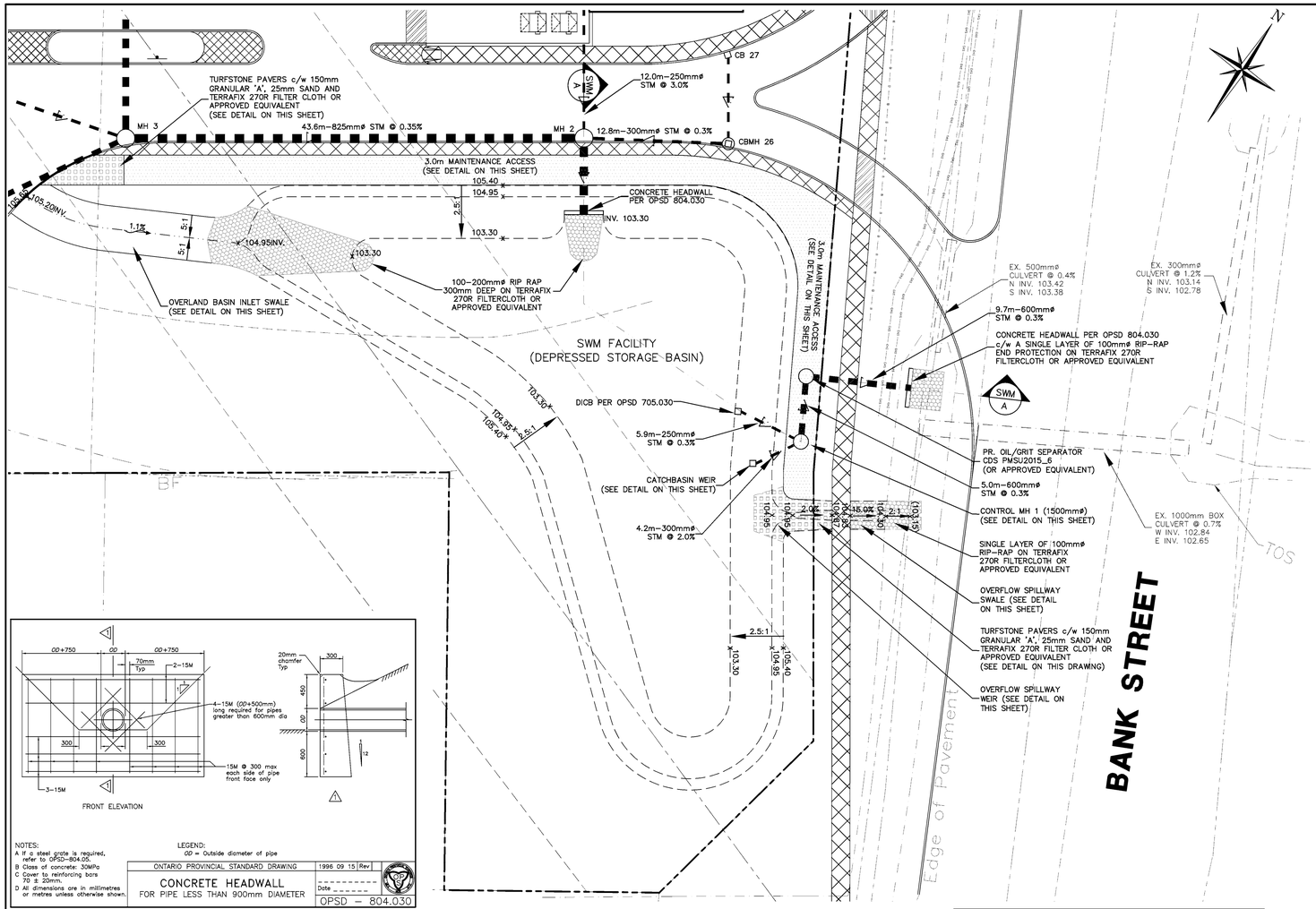
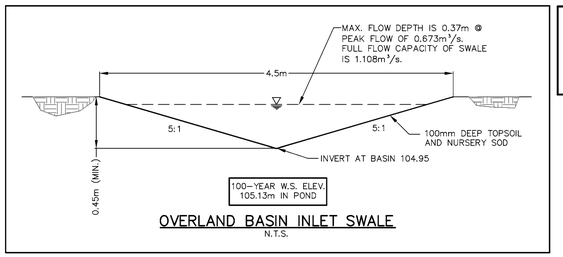
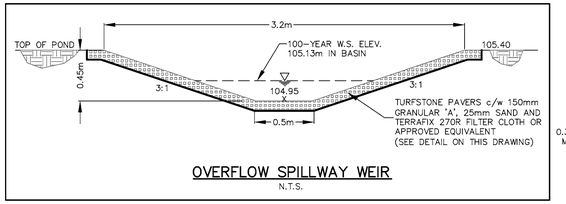
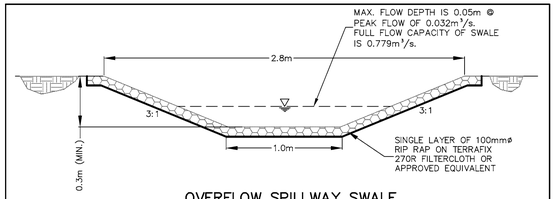




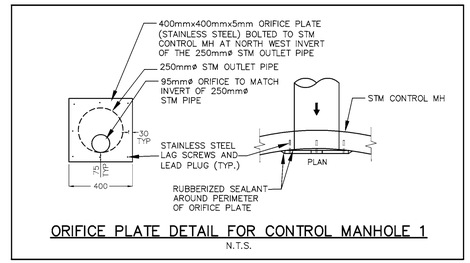
OVERLAND BASIN INLET SWALE
N.T.S.



OVERFLOW SPILLWAY WEIR
N.T.S.



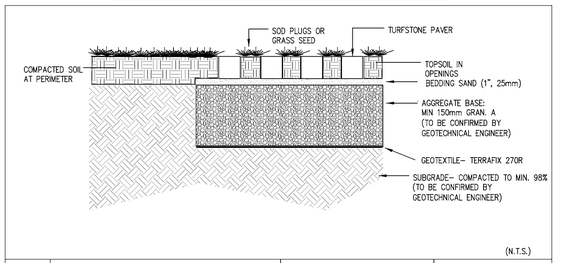
OVERFLOW SPILLWAY SWALE
N.T.S.



ORIFICE PLATE DETAIL FOR CONTROL MANHOLE 1
N.T.S.

NOTE:
GEOTECHNICAL ENGINEER TO CONFIRM MATERIAL THICKNESS AND COMPACTION REQUIREMENTS.

3.0m MAINTENANCE ACCESS
N.T.S.



(N.T.S.)

PAVER DETAIL Cross Section

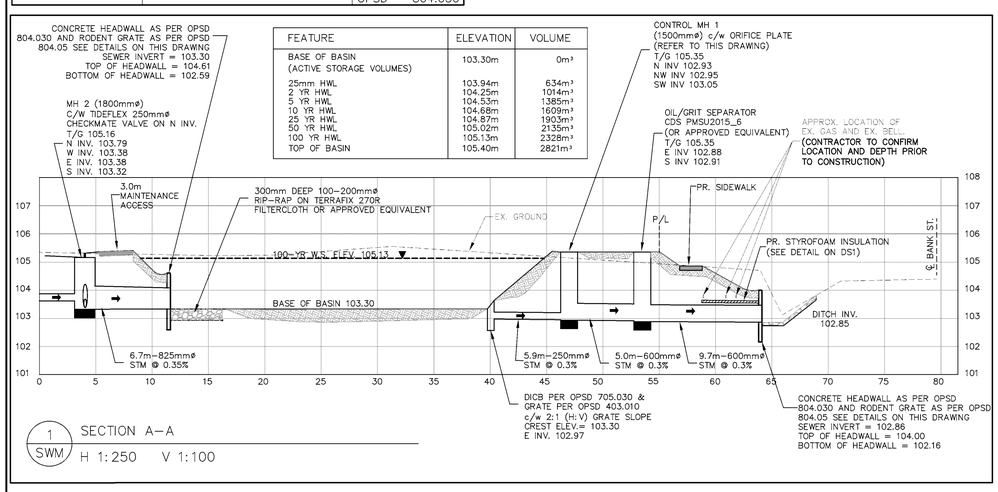
UNILOCK® Designed to be a step ahead
1•800•UNILOCK
www.unilock.com

SWM.DWG

NOTES:
A If a steel grate is required, refer to OPSD–804.05
B Class of concrete: 30MPa
C Cover to reinforcing bars 70 ± 20mm.
D All dimensions are in millimetres or metres unless otherwise shown.

LEGEND:
OD = Outside diameter of pipe

ONTARIO PROVINCIAL STANDARD DRAWING	1996 09 15	Rev
CONCRETE HEADWALL FOR PIPE LESS THAN 900mm DIAMETER	Date	
OPSD – 804.030		



FEATURE	ELEVATION	VOLUME
BASE OF BASIN (ACTIVE STORAGE VOLUMES)	103.30m	0m³
25mm HWL	103.94m	634m³
2 YR HWL	104.25m	1014m³
5 YR HWL	104.53m	1385m³
10 YR HWL	104.68m	1609m³
25 YR HWL	104.87m	1903m³
50 YR HWL	105.02m	2135m³
100 YR HWL	105.13m	2328m³
TOP OF BASIN	105.40m	2821m³

1 SWM — SECTION A–A
H 1:250 V 1:100

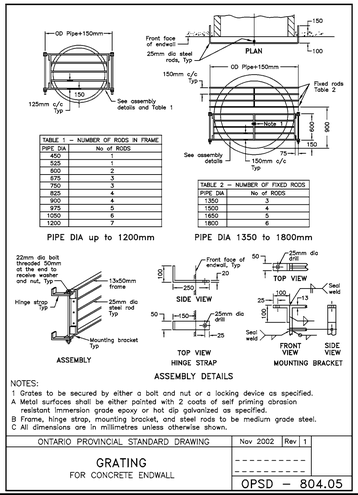
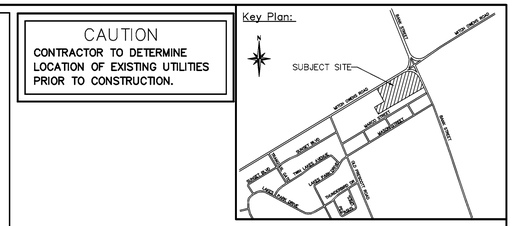


TABLE 1 – NUMBER OF RODS IN FRAME	
PIPE DIA	No. of RODS
450	1
525	1
600	2
675	3
750	3
825	4
900	4
975	5
1050	6
1200	7

TABLE 2 – NUMBER OF FIXED RODS	
PIPE DIA	No of RODS
1350	3
1500	4
1650	5
1800	6

NOTES:
1 Grates to be secured by either a bolt and nut or a locking device as specified.
A Metal surfaces shall be either painted with 2 coats of self priming abrasion resistant immersion grade epoxy or hot dip galvanized as specified.
B Frame, hinge strap, mounting bracket, and steel rods to be medium grade steel.
C All dimensions are in millimetres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	Nov 2002	Rev 1
GRATING FOR CONCRETE ENDWALL		
OPSD – 804.05		



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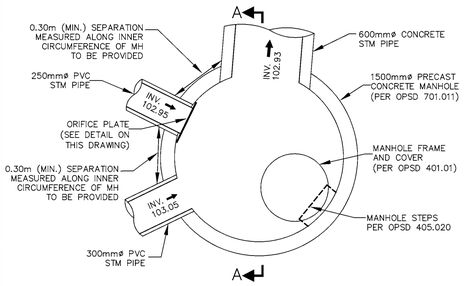
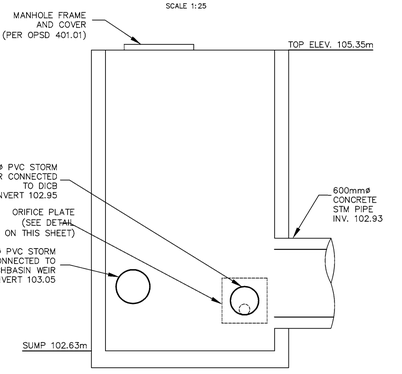
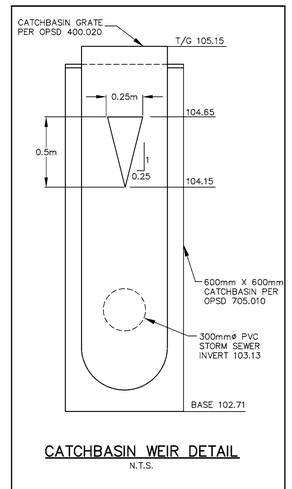


CONTROL MANHOLE 1 PLAN VIEW
SCALE 1:25



CONTROL MANHOLE 1 PROFILE VIEW
SCALE 1:25



CATCHBASIN WEIR DETAIL
N.T.S.

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Benchmark: 113.99

#3 CONCRETE MONUMENT (001196530377). NORTH SIDE OF MITCH OWENS ROAD APPROXIMATELY 250m WEST OF THE INTERSECTION OF MITCH OWENS ROAD AND BANK STREET.

REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
(Feb. 4, 2014)
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

STORMWATER MANAGEMENT PLAN

Client:
Alium Investments Ltd.
3338 Dufferin Street
Toronto, Ontario
M6A 3A4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By	TG	Checked By	JWL	Drawing No.
Scale	1:250	Project No.	11–183	SWM

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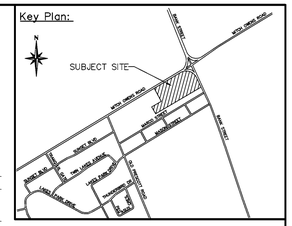
Legend:

0.55 / 0.38 — RUNOFF COEFFICIENT / DRAINAGE AREA (ha)

DRAINAGE BOUNDARY

Key Plan:



MITCH OWENS ROAD

Edge of Pavement

Painted Line and MTO Plan Centreline of Construction

Edge of Pavement

Painted Line

EXISTING (SOUTH) STORM SEWER SYSTEM HAS BEEN DESIGNED TO ACCOUNT FOR THE 5-YEAR DESIGN STORM PEAK FLOW (CONTROLLED TO A RATE EQUIVALENT TO THAT BASED ON A RUNOFF COEFFICIENT OF 0.20, EXISTING CONDITION) FROM A PORTION OF THE FUTURE LANDS WEST OF THE PROPOSED DEVELOPMENT (PHASE 1)

0.20 / 2.26

0.90 / 0.01

0.90 / 0.05

0.55 / 0.38

TRENCH DRAIN

PROPOSED CRU13
±1,180.2 m²
(±12,700 ft²)

0.55 / 0.26

HYDRO TOWER

PROPOSED CRU12
±372 m²
(±4,000 ft²)

0.90 / 0.16

PROPOSED CRU11
±743 m²
(±8,000 ft²)

0.55 / 0.35

MAINTENANCE ACCESS

CB 18

CBMH 17

DCBMH 16

CB 13

Top of Slope

0.90 / 0.15

CBMH 12

CBMH 8

CBMH 9

0.90 / 0.33

0.55 / 0.38

0.55 / 0.37

MH 14

DCBMH 11

CBMH 10

CBMH 7

CB 6

DCBMH 15

0.90 / 0.31

PROPOSED CRU10
±1,859 m²
(±20,000 ft²)

CB 25

CBMH 24

0.90 / 0.13

CBMH 5

0.90 / 0.37

TRENCH DRAIN

PROPOSED CRU1
±2,920 m²
(±31,400 ft²)

PROPOSED CRU2-8
±1,499 m²
(±16,100 ft²)

PROPOSED CRU9
±933.5 m²
(±10,000 ft²)

0.90 / 0.09

0.90 / 0.10

CB 27

0.75 / 0.47

CBMH 23

CBMH 4

MH 3

MH 21

CBMH 26

TRENCH DRAIN

EXISTING TREE LINE

FUTURE ADDITION
±465 m²
(±5,000 ft²)

MAINTENANCE ACCESS

HEADWALL

Bottom of Slope

0.75 / 0.40

MH 22

CBMH 21

CBMH 20

CBMH 19

SWM FACILITY (DEPRESSED STORAGE BASIN)

EX. 300mmø CULVERT @ 1.2%
N INV. 103.14
S INV. 102.78

EX. 500mmø CULVERT @ 0.4%
N INV. 103.42
S INV. 103.38

OIL/GRIT SEPARATOR CONTROL MH 1

C/L Ditch

EX. 1000mm BOX CULVERT @ 0.7%
W INV. 102.84
E INV. 102.65

0.75 / 0.12

RETAINING WALL (TO BE DESIGNED BY OTHERS)

LOT 1

LOT 24 | LOT 23 | LOT 22 | LOT 21 | LOT 20 | LOT 5 | LOT 4 | LOT 3 | LOT 2

MARCO STREET

BANK STREET

Notes:

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Benchmark: 113.99

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REGISTERED PROFESSIONAL ENGINEER
J.W.LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

STORM DRAINAGE PLAN

Client:
Alium Investments Ltd.
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WMI & Associates Limited
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Barrie, Ontario
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Drawn By	Checked By	Drawing No.
TG	JWL	STM
Scale 1:500	Project No. 11-183	

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Notes:

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REGISTERED PROFESSIONAL ENGINEER
J.W. LIGHTHEART
100140403
Feb. 4, 2014
PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

SANITARY DRAINAGE PLAN

Client:
Alium Investments Ltd.
3338 Dufferin Street
Toronto, Ontario
M6A 3A4

WMI & Associates Limited
119 Collier Street
Barrie, Ontario
L4M 1H5
Ph 705-797-2027
www.wmiengineering.ca

Drawn By TG	Checked By JWL	Drawing No.
Scale 1:500	Project No. 11–183	SAN

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GENERAL – CONSTRUCTION

1. ALL MEASUREMENTS ARE IN METRES, PIPE SIZES IN MILLIMETRES, UNLESS OTHERWISE NOTED.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH CURRENT ONTARIO PROVINCIAL STANDARD DRAWINGS AND SPECIFICATIONS UNLESS NOTED OTHERWISE.
3. LOCATIONS OF EXISTING SERVICES ARE NOT GUARANTEED. CONTRACTOR TO CONFIRM EXISTING UTILITY LOCATIONS AND ELEVATIONS PRIOR TO CONSTRUCTION. THE CONTRACTOR IS REQUIRED TO NOTIFY THE VARIOUS UTILITY COMPANIES 48 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK.
4. ALL WORK WITHIN THE ROAD ALLOWANCE IS TO BE IN ACCORDANCE WITH THE MINISTRY OF TRANSPORTATION (M.T.O.) AND/OR THE CITY OF OTTAWA STANDARDS AND SPECIFICATIONS.
5. ALL DIMENSIONS AND ELEVATIONS ARE TO BE CHECKED AND VERIFIED BY THE CONTRACTOR. ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.
6. TRAFFIC CONTROLS TO CONFORM TO THE LATEST REVISION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AND ONTARIO TRAFFIC MANUAL TEMPORARY CONDITIONS (BOOK 7).
7. STREET AND TRAFFIC SIGNS – M.T.O. STANDARDS
8. PERFORATED PIPE SUB-DRAINS – 100mmø BIG 'O' WITH FILTER COVERING OR APPROVED EQUAL.
9. FILTER FABRIC – TERRAFIX 270R OR APPROVED EQUAL.
10. TRENCH BACKFILL (TO OPSD-802.010) 98% SPMDD TO BE SELECT NATIVE SAND OR IMPORTED SELECT SUB-GRADE.
11. PIPE COVER TO BE SELECT NATIVE SAND OR IMPORTED SELECT SUB-GRADE WITH NO AGGREGATE LARGER THAN 25mm.
12. CLEAR STONE WRAPPED FILTER FABRIC CAN BE SUBSTITUTED FOR BEDDING MATERIAL IF APPROVED BY THE ENGINEER.
13. DEWATERING TO BE CARRIED OUT IN ACCORDANCE WITH OPSS-517 AND 518 TO MAINTAIN ALL TRENCHES IN A DRY CONDITION, CONTRACTOR IS RESPONSIBLE FOR OBTAINING NECESSARY PERMITS FOR DEWATERING.
14. ALL EXISTING TREES ON-SITE ARE TO BE REMOVED (NOT INCLUDING THOSE ALONG THE SOUTH PROPERTY BOUNDARY ON THE SLOPE). REFER TO SITE PLAN FOR EXISTING TREE LOCATIONS.
15. ALL DISTURBED AREAS WITHIN EXISTING CITY RIGHT-OF-WAYS ARE TO BE REINSTATED TO THEIR ORIGINAL CONDITION OR BETTER AS DETERMINED BY THE CITY OF OTTAWA (MIN 100mm TOPSOIL AND SEED).
16. ALL SEWER SYSTEMS INCLUDING SERVICE CONNECTIONS TO THE MANHOLES AND CATCHBASINS SHALL BE THOROUGHLY FLUSHED AND/OR CLEANED OF DEBRIS AND ALL PIPES SHALL BE TESTED IN ACCORDANCE WITH OPS AND SHALL BE INSPECTED BY AN APPROVED VIDEO CAMERA TESTING COMPANY AND THE ENGINEER SHALL BE PROVIDED A COPY OF APPROPRIATE DATA UPON COMPLETION OF CONSTRUCTION AND PRIOR TO FINAL APPROVAL. ANY SECTIONS OF SEWER OR SERVICE CONNECTIONS THAT FAIL TO MEET THE REQUIREMENTS SHALL BE REPAIRED OR REPLACED AT THE DIRECTION OF THE ENGINEER. ONLY CHEMICAL PRESSURE GROUTING REPAIR TECHNIQUES WILL BE CONSIDERED ACCEPTABLE.
17. THESE ENGINEERING DRAWINGS ARE TO BE READ IN CONJUNCTION WITH THE GEOTECHNICAL INVESTIGATION PREPARED BY BAE & ASSOCIATES ENVIRONMENTAL INC. DATED AUG. 9, 2013. GEOTECHNICAL INSPECTION TO BE PROVIDED DURING ALL SERVICING AND PARKING LOT SUB-GRADE AND PAVEMENT WORKS.
18. FOR SPECIFIC DIMENSIONS AND BUILDING INFORMATION REFER TO SITE PLAN/ARCHITECTURAL DRAWINGS PREPARED BY ADA ARCHITECT INC.

DRIVEWAY, ACCESS RAMPS AND PARKING LOT:

1. SUB-GRADE TO BE COMPACTED TO A MINIMUM DRY DENSITY OF 98% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD) AND A MINIMUM SLOPE OF 1.0%
2. SUB-GRADE PREPARATION TO BE COMPLETED IN ACCORDANCE WITH THE GEOTECHNICAL INVESTIGATIONS RECOMMENDATIONS.
3. GRANULAR 'A' BASE TO BE COMPACTED TO 98% OF MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
4. BOULEVARD COMPACTION TO 95% OF MATERIAL'S SPMDD.
5. ASPHALT DRIVEWAY, ACCESS RAMPS AND PARKING SURFACES TO BE CONSTRUCTED AS SHOWN ON THE PAVEMENT CROSS-SECTIONS DETAIL ON THE SITE SERVICING DRAWING (SS).
6. ENTRANCE CONNECTIONS TO CONSIST OF GRINDING EXISTING ASPHALT AND PROVIDE 0.3m WIDE OVERLAP JOINT AS SHOWN ON THE PAVEMENT LAP JOINT DETAIL ON THIS DRAWING.
7. CONCRETE CURB ON THE PROPERTY TO BE AS PER OPSD-600.110 BARRIER CURB.
8. CONCRETE CURB AT ENTRANCES TO TAPER AS PER OPSD-350.010.
9. ALL CURBS SHALL BE DEPRESSED AT ALL WALKWAY, DRIVEWAY AND SIDEWALK LOCATIONS.
10. CONCRETE STRENGTH FOR CURB AND SIDEWALK LOCATED OUTSIDE OF THE CITY RIGHT-OF-WAY IS TO BE 30MPa AT 28 DAYS.
11. SIDEWALKS TO COMPLY WITH OPSD 310.010 AND ARE TO BE 1.5m WIDE. MINIMUM THICKNESS AS FOLLOWS:
    - –COMMERCIAL DRIVEWAY, 200mm (REINFORCEMENT AS PER OPSS IF REQUIRED)
    - –WHEN NO DRIVEWAY IS PRESENT, 125mm
12. SIDEWALKS TO BE CONSTRUCTED ON 150mm GRANULAR "A" BEDDING UNLESS OTHERWISE SPECIFIED.
13. SIDEWALK RAMPS TO COMPLY WITH OPSD 310.030.

SANITARY SEWER:

1. SANITARY MANHOLES TO BE 1200mmø PRECAST IN CONFORMANCE WITH OPSD-701.010 AND OPSD-701.030 WITH BENCHING ACCORDING TO OPSD-701.021.
2. FRAME AND GRATE TO BE IN CONFORMANCE WITH OPSD-401.010, CLOSED COVER.
3. STEPS TO OPSD-405.01
4. MANHOLE DROP STRUCTURES TO OPSD-1003.010
5. SANITARY MANHOLES TO HAVE 1 TO 3 MULTI-LOK ADJUSTMENT UNITS BELOW THE FRAME AS PER OPSD-704.010.
6. ALL 250mmø SANITARY SEWERS TO BE PVC SDR-35 (OR APPROVED EQUIVALENT).
7. ALL 100mmø AND 150mmø SANITARY SERVICES TO BE PVC SDR-28 (OR APPROVED EQUIVALENT).
8. SERVICE CONNECTIONS TO OPSD-1006.020, GRANULAR 'A' BEDDING.
9. BEDDING TO BE OPSD-802.010 GRANULAR 'A' – TYPE '3 OR 4' FOR FLEXIBLE PIPE (TO BE CONFIRMED BY GEOTECHNICAL ENGINEER).
10. BACKFILL AND BEDDING MATERIAL TO BE COMPACTED TO A DRY DENSITY OF 98% OF THE MATERIAL'S STANDARD PROCTOR MAXIMUM DRY DENSITY (SPMDD).
11. LONG RADIUS BENDS TO BE USED ON SANITARY SEWER CONNECTIONS WHERE THE ANGLE OF CONNECTION BETWEEN THE SERVICE AND SEWER EXCEEDS 90°.
12. SANITARY SEWER COVER LESS THAN 2.0m TO PIPE OBVERT WILL REQUIRE FROST PROTECTION (INSULATION).
13. SANITARY SEWER CLEANOUTS AS REQUIRED BY THE ONTARIO BUILDING CODE TO BE CONSTRUCTED AS PER THE CITY OF OTTAWA STANDARDS.
14. ALL FORCEMAIN AND CURVED SEWER SHALL BE INSTALLED WITH TRACER WIRE.
15. ALL SANITARY MANHOLES SHALL BE COMPLETED WITH FROST STRAPS PER OPSD 701.100.
16. ALL FORCEMAIN TO BE 50mmø (2.0inø) HDPE DR11 PIPING (OR APPROVED EQUIVALENT) C/W CAUTION TAPE PLACED 300mm ABOVE THE PIPE

STORM SEWER:

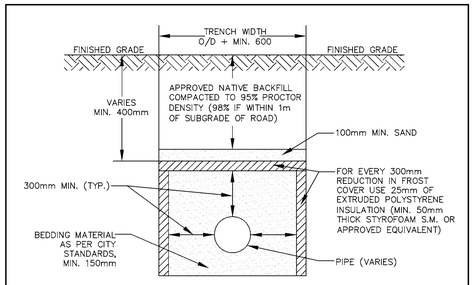
1. ALL SITE DRAINAGE POSSIBLE, INCLUDING ALL ROOF AND ASPHALT DRAINAGE, IS TO BE DIRECTED TO THE STORMWATER MANAGEMENT SYSTEM.
2. STORM SEWER
   - – 450mmø OR LESS: PVC SDR35 (OR APPROVED EQUIVALENT).
   - – GREATER THAN 450mmø: PVC SDR35 OR REINFORCED CONCRETE (OR APPROVED EQUIVALENT).
3. M.H.'S TO OPSD-701.010, 701.011, 701.012, 701.013, 701.014 AND 701.015.
4. C.B.'S TO OPSD-705.010 AND OPSD-705.020.
5. STEPS TO OPSD-405.01.
6. FRAMES AND GRATES TO OPSD-400.010
7. BEDDING TO OPSD-802.030 AND OPSD-802.031 CLASS B, GRANULAR 'A' FOR CIRCULAR RIGID PIPE.
8. BEDDING TO OPSD-802.010 GRANULAR 'A', FOR TYPE 3 OR 4 SOILS AND FLEXIBLE PIPES (TO BE CONFIRMED BY GEOTHECNICAL ENGINEER).
9. CATCHBASIN LEADS – 250mmø UNLESS OTHERWISE NOTED.
10. PIPE SUPPORT AT M.H.'S AND C.B.'S TO OPSD-708.020.
11. BACKFILL AND BEDDING MATERIAL TO BE COMPACTED TO A MINIMUM DRY DENSITY OF 98% OF THE MATERIALS SPMDD.
12. ALL PROPOSED STORM STRUCTURES (MANHOLES, CATCHBASIN MANHOLES & CATCHBASINS) ARE TO CONSIST OF SUMPS.
13. STORM SEWER COVER LESS THAN 1.2m TO PIPE OBVERT WILL REQUIRE FROST PROTECTION (INSULATION).
14. STORM SEWER CLEANOUTS AS REQUIRED BY THE ONTARIO BUILDING CODE TO BE CONSTRUCTED AS PER THE CITY OF OTTAWA STANDARDS
15. CATCHBASINS AND CATCHBASIN MANHOLES LOCATED WITH DEPRESSED ASPHALT AREAS ARE TO INCLUDE A MINIMUM OF THREE (3) SUBDRAIN CONNECTIONS, 10.0m IN LENGTH, PLACED AT SUB-GRADE LEVEL AND EXTENDING RADIALLY AND AT EQUAL DISTANCES FROM EACH OTHER, OUT FROM THE STRUCTURE. WHERE CATCHBASINS OR CATCHBASIN MANHOLES ARE LOCATED WITH A 5.0m DISTANCE TO A CURB, SUBDRAINS EXTENDED TOWARDS THE CURB SHALL TERMINATE AT THE FACE OF THE CURB.
    (REFER TO DETAIL ON THIS DRAWING)
16. ALL STORM MANHOLES SHALL BE COMPLETED WITH FROST STRAPS PER OPSD 701.100.

WATERMAINS:

1. ALL WATER WORKS ARE TO BE COORDINATED WITH THE ENGINEER AND COMPLETED WITH A REPRESENTATIVE FROM THE ENGINEER OFFICE PRESENT.
2. WATERMAIN MATERIAL TO BE POLYVINYL CHLORIDE (PVC) CLASS 150 (DR18). TRACER WIRE (#10 TWU) SHALL BE INSTALLED ALONG THE ENTIRE LENGTH OF PVC WATERMAIN, BROUGHT UP AT EACH VALVE BOX, CHAMBER AND HYDRANT, AND CONNECTED TO A FLANGE. TAPE IS TO BE USED TO AFFIX THE WIRE TO THE PIPE.
3. MECHANICAL JOINT FITTINGS MEETING AWWA SPECIFICATION C-907 AND CSA B137.2 MAY BE USED ON PVC WATERMAIN 150mm TO 200mm IN DIAMETER. MECHANICAL JOINTS SHALL CONFORM TO AWWA C111.
4. DOMESTIC WATER SUPPLY AND SERVICES SHALL BE A MINIMUM OF 50mm IN DIAMETER, IPS SERIES PRESSURE PIPE SDR 41 OR APPROVED EQUIVALENT.
5. NO COUPLINGS WILL BE ALLOWED BETWEEN THE CURB STOP AND MAIN STOP OF THE DOMESTIC WATER SUPPLY SERVICE.
6. ALL MECHANICAL JOINT FITTINGS SHALL HAVE SACRIFICIAL ANODES "PROTECTO CAPS" INSTALLED ON EVERY BOLT.
7. THE MINIMUM HORIZONTAL SEPARATION BETWEEN THE WATERMAIN / WATER SERVICES AND THE SANITARY / STORM SEWER IS TO BE 2.5m.
8. A MINIMUM OF 0.5m VERTICAL CLEARANCE BETWEEN THE WATERMAIN / WATER SERVICES AND ALL UTILITIES MUST BE KEPT WHILE STILL MAINTAINING A MINIMUM DEPTH OF COVER AT ALL TIMES. WATERMAIN & WATER SERVICE TO BE INSULATED WITH HI-40 INSULATION WHERE 0.5m SEPARATION CANNOT BE OBTAINED.
9. WATERMAIN / WATER SERVICE COVER LESS THAN 2.2m TO PIPE OBVERT WILL REQUIRE FROST PROTECTION (INSULATION).
10. THE CONTRACTOR SHALL INFORM THE ENGINEER A MINIMUM OF 48 HOURS IN ADVANCE OF COMMENCING WORK.
11. ALL FILL AREAS SHALL BE FILLED TO SUB-GRADE PRIOR TO INSTALLATION. FILL AREAS SHALL BE COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR DENSITY PRIOR TO THE INSTALLATION OF THE WATERMAIN.
12. WHERE THE WATERMAIN ELEVATION EXCEEDS THE ELEVATION OF ANY OTHER UTILITY/SERVICE AND WHERE THE VERTICAL SEPARATION BETWEEN THE WATERMAIN AND THE OTHER SERVICE EXCEED THE HORIZONTAL SEPARATION, THE WATERMAIN SHALL BE RESTRAINED.
13. PIPE DEFLECTION SHOULD BE USED WHEREVER POSSIBLE TO MINIMIZE THE USE OF BENDS, WHEREVER IT IS NECESSARY TO DEFLECT FROM A STRAIGHT LINE, EITHER IN THE VERTICAL OR HORIZONTAL PLANE, THE AMOUNT OF DEFLECTION SHALL NOT EXCEED THE MANUFACTURER'S SPECIFICATIONS.
14. MECHANICAL RESTRAINTS ARE TO BE UTILIZED FOR THE INSTALLATION OF ALL TEES, BENDS, HYDRANTS, ENDS OF MAINS AND CONNECTIONS 100mm AND LARGER AS OPPOSED TO THRUST BLOCKS AS PER OPSD 1103.010 AND 1103.020.
15. REFER TO WF DRAWING FOR FIRE HYDRANT SPECIFICATIONS AND DETAILS.
16. HYDRANT FLANGE ELEVATIONS SHALL BE SET AT A GRADE THAT WILL GIVE A FLANGE ELEVATION OF 100mm TO 150mm ABOVE THE FINAL GRADE AS PER OPSD 1105.010.
17. HYDRANTS SHALL BE LOCATED A MINIMUM OF 1.5m FROM THE EDGE OF DRIVEWAYS, ROADWAYS, UTILITIES, OR OTHER ABOVE GRADE OBSTACLES.
18. ALL VALVES ARE TO BE RESILIENT SEAT GATE VALVES COMPLETE WITH SLIDER TYPE VALVE BOX.
19. VALVES IN EXCESS OF 1.7m IN DEPTH SHALL REQUIRE A VALVE STEM EXTENSION.
20. CONTRACTOR IS RESPONSIBLE FOR ALL TIE-INS INCLUDING MATERIALS, EXCAVATION AND BACKFILL AS REQUIRED TO FACILITATE THE SWABBING AND TESTING OF THE NEW WATERMAINS UNDER THE SUPERVISION OF THE ENGINEER.
21. THE CONTRACTOR WILL SWAB, PRESSURE TEST, CHLORINATE AND FLUSH THE NEW WATERMAINS, ANY SWABBING, PRESSURE TESTING, CHLORINATING AND FLUSHING BEYOND THE INITIAL PROCEDURE WILL BE THE CONTRACTORS' RESPONSIBILITY. PRESSURE TEST TO 1034kPa (150psi) FOR TWO HOURS, WITHOUT PRESSURE DROP. WATERMAIN TO BE SWABBED AND CHLORINATED BY THE CONTRACTOR UNDER THE SUPERVISION OF THE ENGINEER. UPON SUCCESSFUL TEST RESULTS OF THE CONTRACTORS INSTALLED SYSTEM, CHLORINATE AT 50mg/L CONCENTRATION FOR 24 HOURS. COLLECT SAMPLES FOR BACTERIOLOGICAL TESTING. SAMPLES TO BE COLLECTED BY A 'CERTIFIED OPERATOR'.
22. ALL EXISTING WELLS LOCATED ON THE PROPOSED DEVELOPMENT LANDS ARE TO BE ABANDONED AND DECOMMISSIONED IN ACCORDANCE WITH ONTARIO REGULATION 903 UPON FINAL TESTING AND APPROVAL BY THE HYDROLOGIST (WILSON & ASSOCIATES LTD).

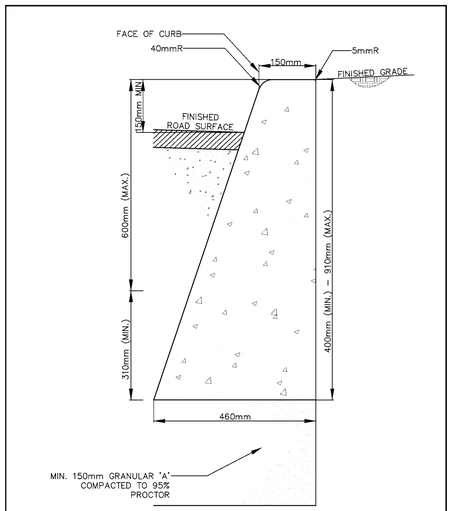
EROSION / SILT CONTROLS:

1. ALL SILT CONTROL AND EROSION PROTECTION DEVICES ARE TO BE IN PLACE PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND SHALL REMAIN IN PLACE AND BE MAINTAINED BY THE CONTRACTOR UNTIL CONSTRUCTION IS COMPLETE, THE GRASS HAS ESTABLISHED GROWTH AND FINAL APPROVAL IS PROVIDED BY THE ENGINEER.
2. EROSION CONTROL WORKS SHALL BE INSPECTED AFTER EVERY RAINFALL AND REPAIRED/REPLACED (AS REQUIRED BY THE ENGINEER).
3. ALL DISTURBED AREAS TO BE RESTORED USING TOPSOIL AND SEED IMMEDIATELY AFTER ESTABLISHING FINAL GRADES.
4. FILTER FABRIC IS TO BE INSTALLED UNDER THE LIDS/GRADTES OF ALL ON SITE STRUCTURES UNTIL FINAL SITE GRADING AND STABILIZATION IS COMPLETE.
5. TOPSOIL TO BE STOCKPILED IN EXISTING CLEARINGS OR IN APPROVED PROPOSED CLEARINGS ONLY.
6. SILT FENCE TO BE MAINTAINED ON THE IMMEDIATE DOWNSTREAM SIDE OF ALL STOCKPILED MATERIAL AND ALONG THE PROPERTY LINE WHERE THE TOPOGRAPHY DRAINS AWAY FROM THE SITE TO ADJACENT LANDS.



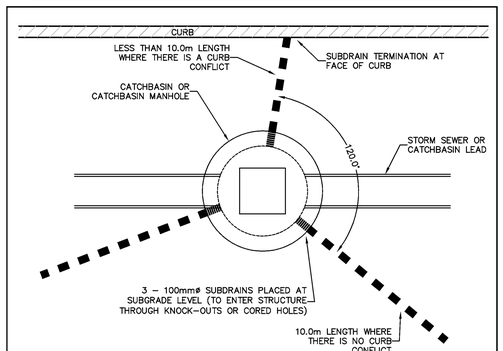
NOTE: INSULATION SHALL BE PLACED WITH ENDS CLOSELY BUTTED TOGETHER. ALL JOINT ENDS SHALL BE STAGGERED WHEN MORE THAN ONE LAYER OF INSULATION IS BEING INSTALLED.

INSULATION FOR SHALLOW PIPES
N.T.S.

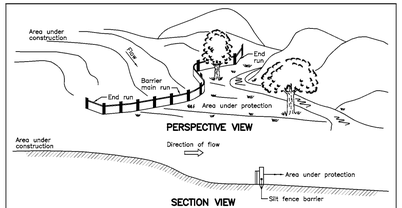


NOTE: CONCRETE STRENGTH TO BE 30 MPa COMPRESSIVE AT 28 DAYS WITH 5% TO 7% AIR ENTRAINMENT.

EXTENDED CONCRETE CRUB DETAIL
N.T.S.

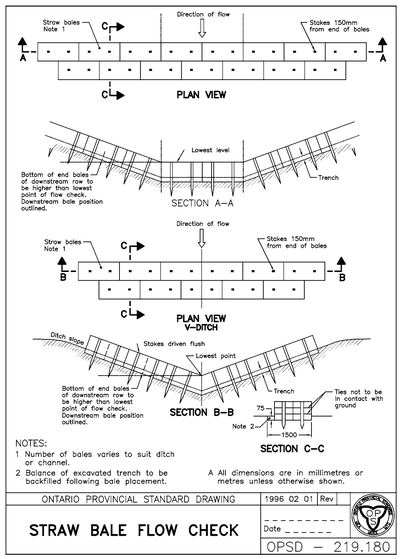


SUBDRAIN CONNECTION DETAIL
N.T.S.



NOTE:
A All dimensions are in millimetres or metres unless otherwise shown.

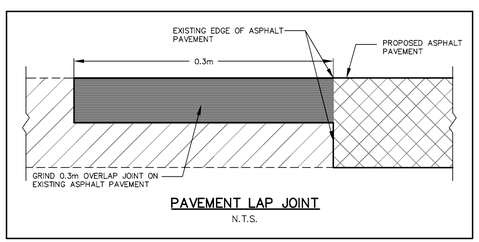
ONTARIO PROVINCIAL STANDARD DRAWING	1996 02 01	Rev
HEAVY DUTY SILT FENCE BARRIER	Date	
	OPSD – 219.130	



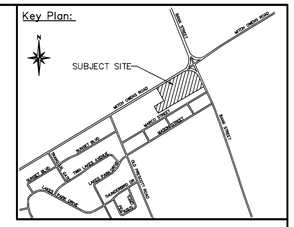
NOTES:
1 Number of bales varies to suit ditch or channel.
2 Balance of excavated trench to be backfilled following bale placement.

A All dimensions are in millimetres or metres unless otherwise shown.

ONTARIO PROVINCIAL STANDARD DRAWING	1996 02 01	Rev
STRAW BALE FLOW CHECK	Date	
	OPSD – 219.180	



PAVEMENT LAP JOINT
N.T.S.



Legend:

EXISTING FEATURES (EX)

- EX SIB / EX IB – EX STD IRON BAR / EX IRON BAR
- EX UP – EX UTILITY POLE
- EX BELL PED
- EX WS – EX WATER SERVICE
- EX HYD – EX FIRE HYD.
- NS – EX ST NAME SIGN
- SS – EX STOP SIGN
- 123.45 – EX ELEVATION
- EX FENCE
- EX U/G GASMAIN
- EX U/G BELL
- EX WV – EX WATERMAIN & VALVE
- EX SAN @ 0.0% – EX SAN SEWER & MH
- EX STM @ 0.0% – EX STM SEWER & MH

PROPOSED FEATURES (PR)

- NS – PR STREET NAME SIGN
- SS – PR STOP SIGN
- PR FENCE
- PR STREET LIGHT
- PR WATER SERVICE
- PR SAN SERVICE
- PR HYDRO TRANSFORMER
- 150 – 00mmø W/M – PR WATERMAIN & VALVE
- PR FIRE HYDRANT
- PR WATER VALVE
- 0m–00mmø SAN @ 0.0% – PR SAN SEWER
- MH K – PR SANITARY MANHOLE
- 0m–00mmø STM @ 0.0% – PR STM SEWER
- MH 4 – PR CATCHBASIN MANHOLE
- MH 4 – PR MANHOLE
- PR CATCHBASIN
- 000.00 – PROPOSED ELEVATION
- PR SWALE
- (104.90) – MATCH EXISTING ELEVATIONS
- (104.50)s – PR. ELEVATION OF NATIVE SOILS BELOW AREA BED

BOREHOLE INFORMATION CHART

BOREHOLE	CLAY DEPTH	WATER TABLE (ESTIMATE)
1	NO CLAY	6.7m
2	NO CLAY	N/A
3	3.7m	2.4m
4	NO CLAY	N/A
5	NO CLAY	2.7m
6	5.5m	3.7m
7	8.2m	1.8m – 2.4m
8	8.8m	1.8m – 2.4m
9	4.9m	2.4m
10	NO COMPLETE	2.4m
11	2.1m	2.4m
12	4.9m	2.4m
13	4.6m	2.4m
14	2.1m	N/A
15	NO CLAY	N/A
16	NO CLAY	1.5m – 1.8m
17	4.6m	3.4m
18	4.6m	3.4m
19	5.5m	2.4m
20	NO CLAY	N/A
21	5.2m	3.7m
22	NO CLAY	N/A
23	5.2m	5.2m
24	NO CLAY	N/A
25	NO CLAY	N/A
26	NO CLAY	N/A
27	NO CLAY	N/A
28	NO CLAY	N/A
29	NO CLAY	N/A
30	NO CLAY	N/A
31	NO CLAY	N/A

NOTE:
ALL BOREHOLE INFORMATION WAS TAKEN FROM THE GEOTECHNICAL REPORT FROM BAE & ASSOCIATES ENVIRONMENTAL INC. DATED AUGUST 9, 2013

Notes:

1. Unless noted otherwise, the measurements and distances shown on this drawing are shown in meters.
2. Do not scale drawings.
3. It is the contractor's responsibility to verify all dimensions, levels and datums on site and report any discrepancies or omissions to WMI & Associates Ltd. prior to construction.
4. This drawing is to be read and understood in conjunction with all other relevant documents applicable to this project.
5. This drawing is the exclusive property of WMI & Associates Ltd. and the reproduction of any part of this document without prior written consent is strictly prohibited.

Benchmark: 113.99

#3 CONCRETE MONUMENT (001196530377). NORTH SIDE OF MITCH OWENS ROAD APPROXIMATELY 250m WEST OF THE INTERSECTION OF MITCH OWENS ROAD AND BANK STREET.

REGISTERED PROFESSIONAL ENGINEER – J.W. LIGHTHEART – 100140403 – Feb. 4, 2014 – PROVINCE OF ONTARIO

No.	Issue / Revision	Date
1	1st Submisson	Feb. 4, 2014

Greely Commercial Center

DETAIL SHEET 1

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Drawn By	TG	Checked By	JWL	Drawing No.
Scale	N.T.S.	Project No.	11-183	DS1