THIS AGREEMENT made in triplicate on the 1st day of October, 2018.

B E T W E E N:

THE CORPORATION OF THE MUNICIPALITY OF SOUTH HURON

(Hereinafter referred to as the “Municipality”)

OF THE FIRST PART

– And –

HAMATHER MOTOR PRODUCTS

(Hereinafter referred to as the “Owner”)

OF THE SECOND PART

WHEREAS the Owner is entering into this agreement with the Municipality dealing with the facilities, works and matters hereinafter mentioned and the provision and maintenance thereof by the Owner and any and all subsequent owners to the satisfaction of and at no expense to the Municipality, as a condition to the approval pursuant to Section 41 of the Planning Act, as amended, of site plans and drawings for a development (hereinafter called the “development”) on the lands and premises of the Owner more particularly described in the Schedule “A” attached hereto in the Municipality of South Huron, in the County of Huron (the “property”).

NOW THEREFORE WITNESSETH THAT in consideration of the covenants and provisions herein and for other good and valuable consideration now paid by the Municipality to the Owner (the receipt and sufficiency of which the Owner hereby acknowledges), the Municipality and the Owner covenant, agree and provide with each other that the Owner shall do and perform, at no expense to the Municipality (unless otherwise expressly provided herein), the following matters and things:

1. DRAWINGS AND CONSTRUCTION OF EXTERNAL WORKS:

The Owner shall submit to and have approved by the Municipality detailed design drawings of external road, sewer and other improvements, together with associated internal works. The Owner shall construct, prior to occupancy of any building (unless otherwise approved by the Municipality), at the Owner’s expense and to the satisfaction of the Municipality, the following works:

(a) water service;
(b) fire protection;
(c) sanitary sewer service;
(d) roadways;
(e) signage;
(f) stormwater management;
(g) lighting

2. STORMWATER MANAGEMENT:

The Owner shall undertake all work required to implement the Drainage Report prepared by AGM on July 31, 2018 and approved by the Municipal Engineer. The approved grading and servicing is incorporated into the attached Schedule “C”.

The Owner agrees to maintain the property in such a manner that ensures compliance with the approved Stormwater Management Plan.

3. PARKING:

(a) Parking Dimensions are sufficient and meet minimum zone provisions for size as proposed on the Site Plan incorporated as Schedule “B”.

(b)

4. LIGHTING FACILITIES:

All lighting of the site shall be oriented and its intensity controlled so as to prevent glare on adjacent roadways and adjacent properties to the satisfaction of the Municipality. Provide confirmation that lighting has been completed in accordance with the approved Site Plan, which forms Schedule “”B” herein.

5. LANDSCAPING

The Owner shall landscape the site and thereafter maintain the same in general conformity with the approved Site Plan attached hereto as Schedule “B”, to the satisfaction of the Municipality of South Huron.

The Owner shall provide a landscape plan to the satisfaction of the Municipality of South Huron prior to implementation.

6. FIRE ROUTE DESIGNATION:

The Owner shall identify the fire route. Such fire route shall be clearly marked showing street allowances and vehicular accesses for the approval of the Fire Chief. Signs specifying that parking is prohibited in the designated fire route shall be displayed.

7. ‘AS CONSTRUCTED’ PREMISES:

The Owner shall provide for the Municipality’s records ‘as constructed’ drawings to the satisfaction of the Municipality for municipal services installed by the Owner which may, in the future, be assumed by the Municipality. These drawings shall be submitted in a satisfactory form prior to the release of any performance bond or security required by this agreement. The development shall be completed in accordance with Schedule “D” herein.

8. INSPECTION AND COMPLETION OF WORKS:

Where the Owner is required to construct certain works to be assumed by the Municipality or carry out work within a public highway, walkway or easement, the Owner shall have his Professional Engineer provide a qualified inspector acceptable to the Municipality to carry out on-site inspection of the works. Upon completion of the work and prior to requesting the Municipality to assume the works, the Owner shall supply to the Municipality, in a form acceptable, a certificate of the Owner’s Professional Engineer substantially in the following form:

CERTIFICATE OF COMPLETION OF WORKS

TO: The Corporation of the Municipality of South Huron

For good and valuable consideration now paid by the Corporation of the Municipality of South Huron (hereinafter called the “MUNICIPALITY”), the receipt and sufficiency of which I/we hereby acknowledge, I/we hereby certify that the municipal services constructed pursuant to the Development Agreement between the Municipality and (Owner’s Name) registered as No. _____ relating to municipal number Lot/Block No._____ Plan No. _____ have been

(a) inspected during construction in accordance with standard engineering practice; and

(b) constructed in accordance with the plans and specifications approved by the Municipality.

Delivered under my/our hand and professional seal at South Huron, Ontario this _____ day of _____, 20_____.

Registered Professional Engineer

The Owner acknowledges and agrees that the form of the Certificate of Completion of Works required under this paragraph may vary depending on the development’s requirements.

9. SUBSURFACE DRAINAGE:

The Owner shall notify the Municipality, in writing, in the event that any existing sewer or drain is encountered during the progress of construction. The Owner shall have its Engineer investigate the matter and shall comply with the recommendations of the Owner's Engineer, as approved by the Municipality, with respect to the sewer or drain encountered. Such recommendations may include connecting the existing sewer to a new sewer being constructed or into another existing sewer, at no expense to the Municipality. The Owner shall also ensure that there is no interruption of any subsurface drainage flow because of construction on the site which would have an adverse effect on neighbouring properties. Should such an interruption occur, the Owner shall carry out any necessary remedial work to correct the problem as requested by the Municipality and to the satisfaction of the Municipality at no expense to the Municipality.

10. ABANDONED PRIVATE DRAIN CONNECTIONS:

The Owner acknowledges that any abandoned existing private drain connections shown on the site plans or encountered during construction are to be excavated at the street line and sealed to the satisfaction of the Municipality.

11. EXISTING PRIVATE DRAIN CONNECTIONS:

The Owner acknowledges that any existing private drain connections which are proposed for re-use are to be excavated at the street line and inspected and approved by the Municipality for such re-use.

12. UNDERTAKING OF CONSTRUCTION:

If no building permit is issued for the development within two (2) years of the date of the approval of the site plans and drawings pursuant to Section 41 of the Planning Act, (Ontario), as amended, or if a building permit is issued but, in the opinion of the Chief Building Official, the Owner does not seriously commence construction of the development within two (2) years from the date of the approval of the site plans and drawings pursuant to Section 41 of the Planning Act (Ontario), as amended, or if any building permit issued for this development is revoked at any time, the Municipality in its sole discretion may revoke its approval of the plans and drawings and may terminate the agreement by giving notice in writing and by registering a notice that the approval is revoked and the agreement is terminated.

13. WORK ACCORDING TO PLANS:

As the Owner has entered into this agreement as a condition precedent to the approval by the Municipality of site plans and drawings dealing with the facilities, works and matters mentioned herein, the Owner shall submit from time to time one or more plans and drawings as may be required pertaining to any of these facilities, works and matters including but not restricted to any plans or drawings specifically mentioned herein. Such plans and drawings as and when approved by the Municipality, whether before or after the date upon which this agreement is entered into, shall be treated as forming part of this agreement in the same manner and to the same extent as if such plans and drawings had been approved and actually attached to this agreement at the time that it is entered into. In all matters not herein provided for, the Owner shall develop his land and shall use the same in accordance with the applicable Zoning By-Law of the Municipality, as amended. The provisions of this agreement and any approved site plan or drawing pertaining to a facility, work or matter shall be construed and applied as complementary to each other but in the event of any conflict, the plan or drawing receiving the last approval shall govern. Without restricting the generality of this clause, the Owner shall develop his lands and shall construct works and maintain them in perpetuity in accordance with the approved Site Servicing Plan which is attached as Schedule "B".

14. WORK AT OWNER'S RISK:

All incidental matters including but not restricted to the removal and planting of trees; cutting, replacing and installing approaches; relocating utilities, pipes, poles, valves and equipment; resetting drains and manholes; and all other things required by this agreement or by the Municipality shall be carried out by the Owner at his own risk and expense. All work must be completed to the satisfaction of the Municipality and to the satisfaction of the owner of such utilities.

15. COMPLETION OF WORK:

All work required under this agreement, including but not restricted to asphalt surfacing, fencing, establishment of landscaping and as constructed drawings, completion of services and any other work set out herein, shall be completed or delivered, as the case may be, within a period of nine (9) months from the date of substantial completion of construction of the development as determined by the Chief Building Official. All such work shall be performed to the satisfaction of the Chief Building Official of the Municipality.

16. SECURITIES:

In order to ensure due performance of all work required under this agreement and to protect the Municipality in respect of its liability for holdback of costs under Section 17 of the Construction Lien Act (Ontario), as amended, for any work on municipal property, the Owner shall deposit with the Municipality prior to the issuance of a building permit, an irrevocable Letter of Credit from a chartered bank, issued in form and content satisfactory to the Municipality's Solicitor, in the amount of One Hundred Percent (100%) of the total securities as set out in Schedule "F".

All Letters of Credit shall be for a minimum guaranteed period of one (1) year or such longer time as the Municipality may decide. All Letters of Credit shall contain the following clause: "It is a condition of the Letter of Credit that it shall be deemed to be automatically extended without amendment from year to year from the present or any future expiration date thereof, unless at least thirty (30) days prior to the present or any future expiration date, we notify you in writing by registered mail that we elect not to consider this Letter of Credit to be renewable for any additional period." Unless each and every Letter of Credit is renewed as noted above, the Municipality shall have the absolute right to refuse to issue building permits and to prohibit occupancy, whether partially or fully completed, from the said date thirty (30) days prior to the expiration of that Letter of Credit.

16.1. SECURITY RELEASE

General securities outlined in Schedule "F" will be released upon the completion of all works, to the satisfaction of the Municipality of South Huron.

17. DEVELOPMENT CHARGES:

The Owner shall pay all development charges applicable to the development in accordance with the By-laws of the Municipality of South Huron.

18. MUNICIPALITY'S RIGHT TO ENTER:

The Municipality or any of its officers, servants or agents may, from time to time, at all reasonable times and upon producing proper identification, enter upon the Owner's lands and premises for the purposes of inspecting the facilities, works and matters to be provided and maintained under this agreement and for the purpose of providing or maintaining at the Owner's expense any facility, work or matter in default of the Owner providing or maintaining the same where such default has continued for fifteen (15) days or more. The Municipality, its officers, servants and agents shall not be liable to the Owner or any occupant of the lands and premises for any losses or damages of any kind whatsoever arising in any way from entry for such purposes. In the event of an emergency, the Municipality's right to enter under this provision shall not be limited to situations in which the default of the Owner has continued for more than fifteen (15) days.

19. ROAD ALLOWANCE INDEMNITY:

Except as otherwise expressly provided in this agreement, the right of the Owner to use and occupy any untravelled portions of road allowances shall, at all times, be at the will of the Municipality and the construction and maintenance of any and all curbs, pavements, plantings and other improvements or works thereon shall at all times be at the risk and expense of the Owner. The Owner shall indemnify and save harmless the Municipality and any of its officers, employees or servants from and against all actions, suits, claims, damages, demands, costs, including reasonable legal fees and disbursements, liabilities and any other claims which may be brought against or made upon the Municipality or any of its officers, employees or servants in consequence of the use and occupation of untraveled portions of road allowances by the Owner or the construction, maintenance or existence of curbs, pavements, plantings or other improvements of the Owner thereon. Any amounts owed by the Owner to the Municipality under this indemnity shall constitute a lien and charge upon the lands of the Owner and shall be collectible in like manner as municipal taxes. Without limiting the foregoing agreement to indemnify, the Municipality may, in case any such action, suit, claim or demand is brought or made against the Municipality or any of its officers, employees or servants, settle any such action, suit, claim or demand on such terms as the Municipality shall see fit, and the Owner shall thereupon forthwith pay to the Municipality the sum or sums so paid, together with such sum as shall represent the reasonable costs of the Municipality and its solicitor in defending or settling any such action, suit, claim or demand.

20. INSURANCE:

Prior to the issuance of any building permit and any commencement of work for the development, the Owner shall supply the Municipality with a certified copy of a comprehensive general liability insurance policy with limits in an amount and in a form acceptable to the Municipality. The minimum limits of such policies shall be $5,000,000 all inclusive, but the Municipality shall have the right to set higher amounts. Such policy or policies shall be issued in the joint names of the Owner and the Municipality. The said insurance policy shall indemnify the Municipality from any loss arising from any claims for damages, injury or otherwise in connection with the work done by or on behalf of the Owner. Such insurance policy shall provide coverage for a period of at least one (1) year and shall continue until all the work required by the Owner under this Agreement is completed and, where applicable, assumed by the Municipality. The said insurance policy must also include a provision confirming that the insurance policy shall not be cancelled or materially amended without providing the Municipality with thirty (30) days' written notice of the insurer's intention to do so. The issuance of such a policy of insurance shall not be construed as relieving the Owner from responsibility for other or larger claims, if any, for which he may be held responsible.

21. GENERAL INDEMNITY:

The Owner shall indemnify and save harmless the Municipality and any of its officers, employees or servants from and against all actions, suits, claims, damages, demands, costs, including reasonable legal fees and disbursements, liabilities and any other claims which may be brought against or made upon the Municipality or any of its officers, employees or servants sustained or incurred by the Municipality or any of its officers, employees or servants as a result of the Municipality entering into this agreement with the Owner. Any amounts owed by the Owner to the Municipality under this indemnity shall constitute a lien and charge upon the lands of the Owner and shall be collectible in like manner as municipal taxes. Without limiting the foregoing agreement to indemnify, the Municipality may, in case any such action, suit, claim or demand is brought or made against the Municipality or any of its officers, employees or servants, settle any such action, suit, claim or demand on such terms as the Municipality shall see fit, and the Owner shall thereupon forthwith pay to the Municipality the sum or sums so paid, together with such sum as shall represent the reasonable costs of the Municipality and its solicitor in defending or settling any such action, suit, claim or demand.

22. BY-LAWS:

Notwithstanding any of the provisions of this agreement, the Owner shall be subject to all By-Laws of the Municipality. In the event of conflict between the provisions of this agreement and the provisions of any By-Law of the Municipality, the provisions of the By-Law prevail.

23. SUBSEQUENT OWNERS BOUND:

Subject to the provisions of the Registry Act and the Land Titles Act, the covenants, agreements, conditions and understandings therein contained on the part of the Owner shall be conditions running with the land described in Schedule "A" hereto and shall be binding upon the Owner and their heirs, estate trustees, administrators, successors and assigns, as the case may be, and subsequent owners and occupiers of the said lands from time to time (and "Owner", wherever used in this agreement, is intended and shall be construed to include such subsequent owners and occupiers).

24. SEPARATE COVENANTS:

All of the provisions of this agreement are and shall be construed and interpreted as covenants and agreements as though the words importing such covenants and agreements were used in each separate clause hereof. Should any covenant or provision of this agreement be adjudged unlawful or unenforceable, such covenant or provision shall be considered separate, distinct and severable from this agreement and the covenants and provisions of this agreement shall not be affected and shall remain fully enforceable.

25. ENFORCING PERFORMANCE OF REQUIREMENTS:

In addition to any remedy authorized or permitted by this agreement or by law, the Municipality, upon giving fifteen (15) days notice or forthwith in cases of emergency, may, in default of any matter or thing required to be done by the Owner under this agreement, do such matter or thing at the expense of the Owner and if the Municipality has incurred any expense, it may recover the expense by action, by performance bond or other security or by adding the said expenses to the tax roll and recovering same in like manner as municipal taxes. No proceeding by the Municipality under this clause and no waiver under any provision of this agreement shall prejudice the rights of the Municipality in respect of any subsequent default or any matter or thing required to be done by the Owner under this agreement. The rights of the Municipality may be enforced by any remedy authorized or permitted by the Agreement or By-Law and no such remedy shall be exclusive or dependent on any other remedy.

26. NUMBER AND GENDER:

Words importing the singular only shall include the plural; words importing the masculine only shall include the female and words importing a person shall include corporations.

27. NOTICES:

Any notice required or permitted to be given hereunder shall be in writing and shall be effectively given if delivered personally or sent by registered mail in the case of notice to the Municipality as follows:

Municipality of South Huron
P.O. Box 759
322 Main Street South
Exeter ON, N0M 1S6

And in the case of notice to the Owners, as follows:

Mr. Tim Hamather
70704 London Road
Exeter, ON N0M 1S1

Any notice so given shall be deemed conclusively to have been given and received when so personally delivered or on the third (3rd) business day following the sending thereof by registered mail.

28. REGISTRATION:

The Owner agrees that this document shall be registered against the title to the lands affected by it and that such registration shall be done by the Municipality. The cost of such registration and associated legal fees shall be the responsibility of the Owner.

The Owner further agrees that this agreement shall have priority over all mortgages that are registered against the property and the Owner hereby undertakes to deliver an agreement postponing those mortgages to this agreement and to register the same on title.

29. COSTS:

Any costs incurred by the Municipality for the review, implementation and administration of this agreement (including engineering, administrative costs and legal fees) shall be borne by the Owner.

IN WITNESS WHEREOF the Municipality and the Owner hereto have hereunto affixed their Corporate Seals duly attested by the hands of their proper officers in that behalf, the day and year first written above.

THE CORPORATION OF THE MUNICIPALITY OF SOUTH HURON

_____
Per: Maureen Cole, Mayor

_____
Per: Rebekah Msuya-Collison, Clerk

We have authority to bind the Corporation.

SIGNED, SEALED AND DELIVERED
In the presence of

Hamather Motor Products

_____
Per: Tim Hamather, Duly Authorized Officer

I have the authority to bind the Corporation.

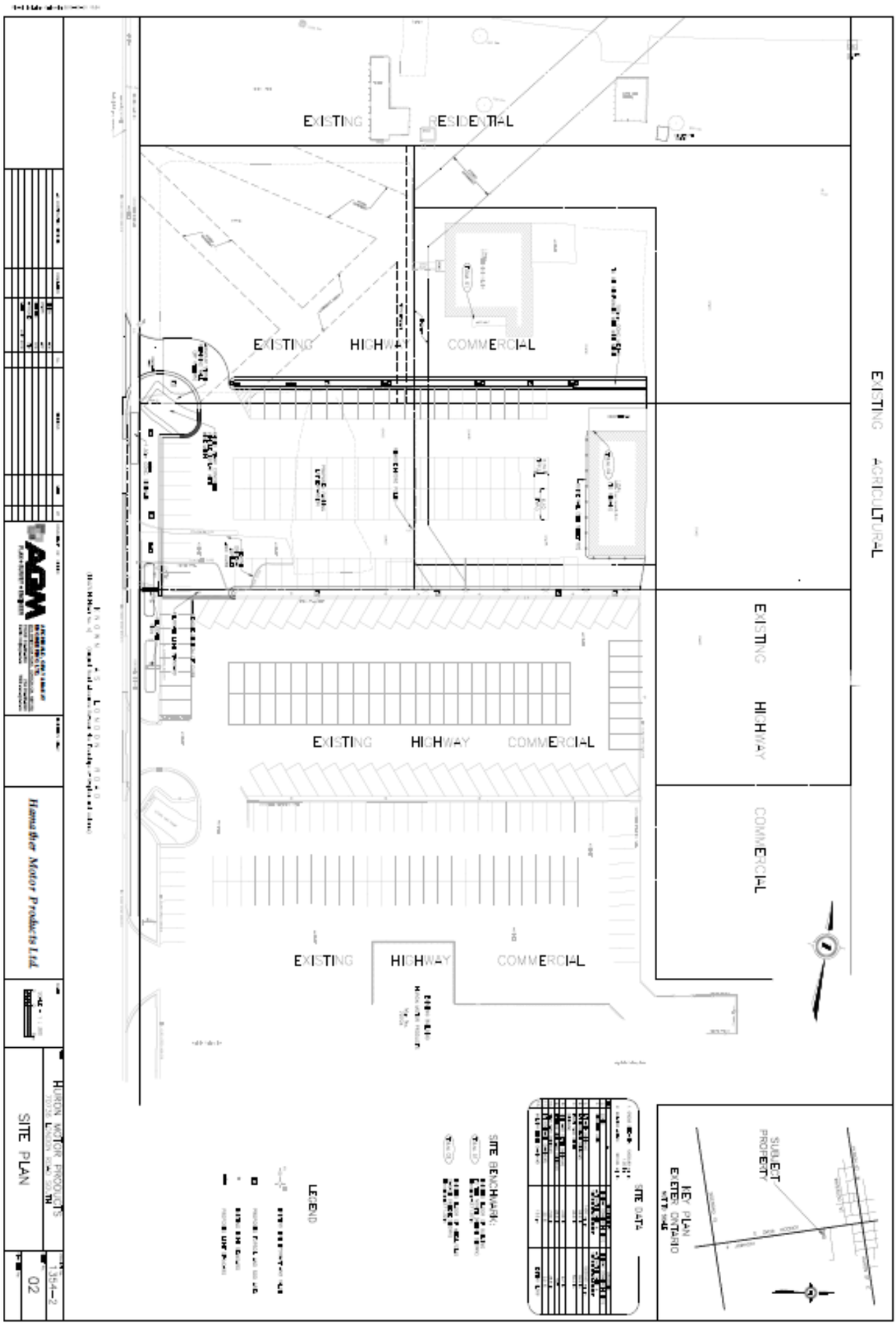
SCHEDULE "A"
LEGAL DESCRIPTION

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.

70736 and 70740 London Road, Exeter, ON
Roll Number 010001038000000 and 010001039000000

SCHEDULE "B"
SITE PLAN

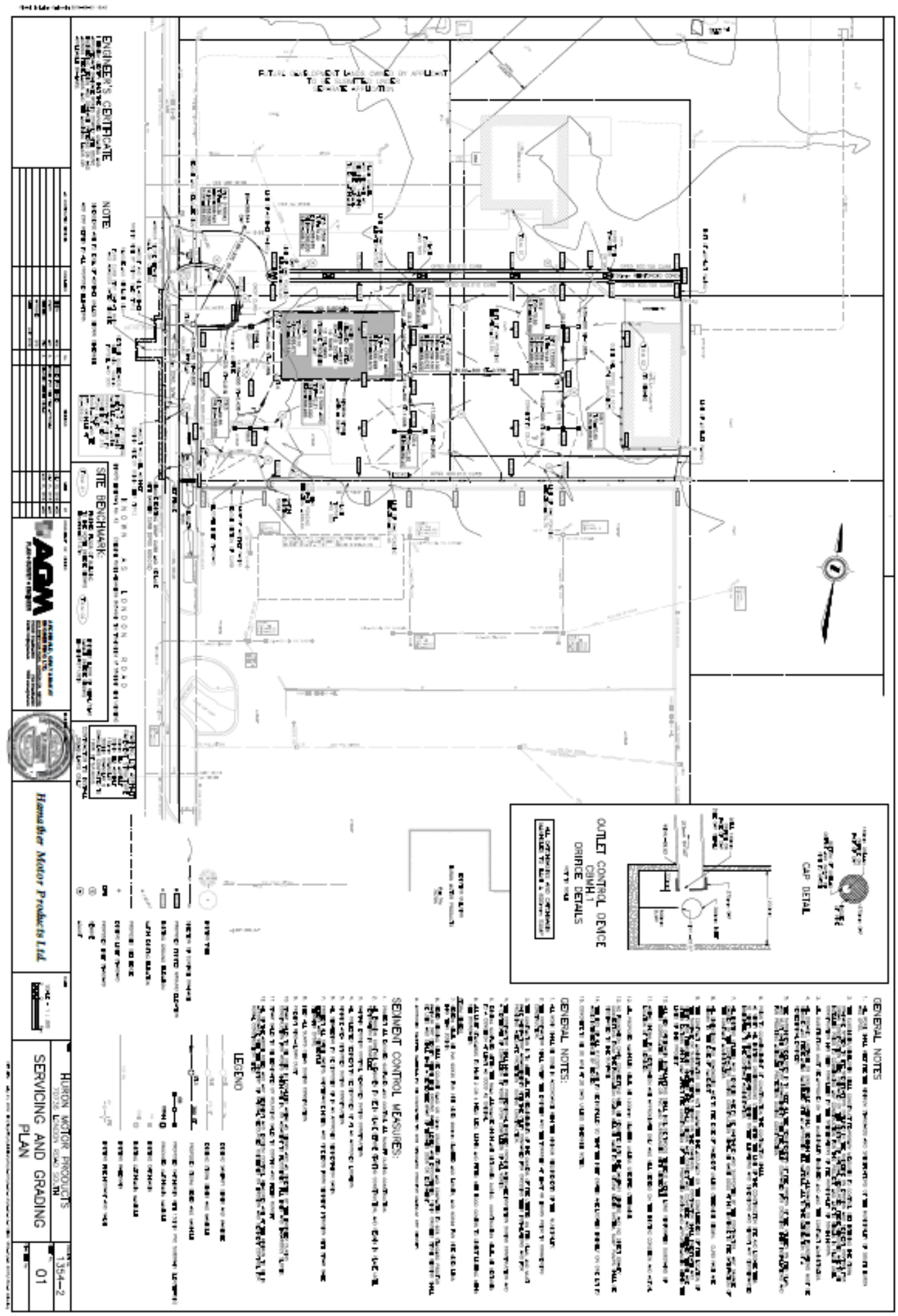
Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.



SCHEDULE "C"

SITE GRADING AND DRAINAGE PLAN

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.



SCHEDULE "D"
SECURITY TO BE PROVIDED

Note: It is understood and agreed that this Schedule forms part of the Municipality's Agreement.

ITEM	COST
Stormwater Management Plan/Storm Sewer Service	$50,000
Sidewalks	$2550
Roadways (Paving, Curbs, Gutter)	$35,380
Lighting	$10,500
Landscaping	$5850
TOTAL	**$104,280**

SCHEDULE “E”

DRAINAGE REPORT

Note: It is understood and agreed that this Schedule forms part of the Municipality’s Agreement.

HAMATHER MOTOR PRODUCTS INC.

70736 LONDON ROAD SOUTH

DRAINAGE REPORT

July 31, 2018

PLAN • SURVEY • ENGINEER

3514 White Oak Road, London, ON N6E 2Z9 t. 519.685.5300 f. 519.685.5303 e. info@agm.on.ca

www.agm.on.ca

1.0 INTRODUCTION

The enclosed report summarizes the proposed stormwater drainage strategy for the proposed development at 70736 London Road South (Hwy.#4), in Exeter. The 1.20 ha site is being partially developed as an expansion to Huron Motor Products. The proposed vehicle storage and display lot will occupy a 0.42 ha area (Figure 1). A reduced copy of the Site Servicing and Grading Plan is attached.

2.0 STORMWATER MANAGEMENT

Stormwater Management will be provided to control post development peak discharge from the site for the 5 year through 100 year storm events.

2.1. Hydrologic Modeling

Stormwater runoff was determined by hydrologic modeling using MIDUSS (Microcomputer Interactive Design of Urban Stormwater Systems). This program allows the user to test the impact on new and existing systems, utilizing accepted rainfall data to represent design storms of various durations and aid in the design of SWM facilities.

The City of Stratford IDF curve parameters were used for the rainfall data. The 3 hour, Chicago Storm Distribution model, with a time to peak ratio of 0.38, was used for determining post development peak flow rates. These flows were used to calculate storage requirements for meeting Stormwater Management targets.

The modeling output can be found in Appendix A.

3.0 EXISTING DRAINAGE

To confirm the existing drainage patterns and outlets for the site, a topographic survey was completed. The total tributary drainage area to the location of the proposed expansion is 0.48 ha. Drainage for the area is in a westerly direction to London Road South with private catch basins draining the minor storm event to the fronting 450mm storm sewer (Figure 2).

Table 1 gives the predevelopment peak flows to London Road South.

Table 1 - Predevelopment Flows

Storm Event	Peak Flow (m^3/s)
5 Year	0.030
100 Year	0.092

PROPERTY
AREA = 1.20HA

AREA TO BE DEVELOPED
AREA = 0.42HA

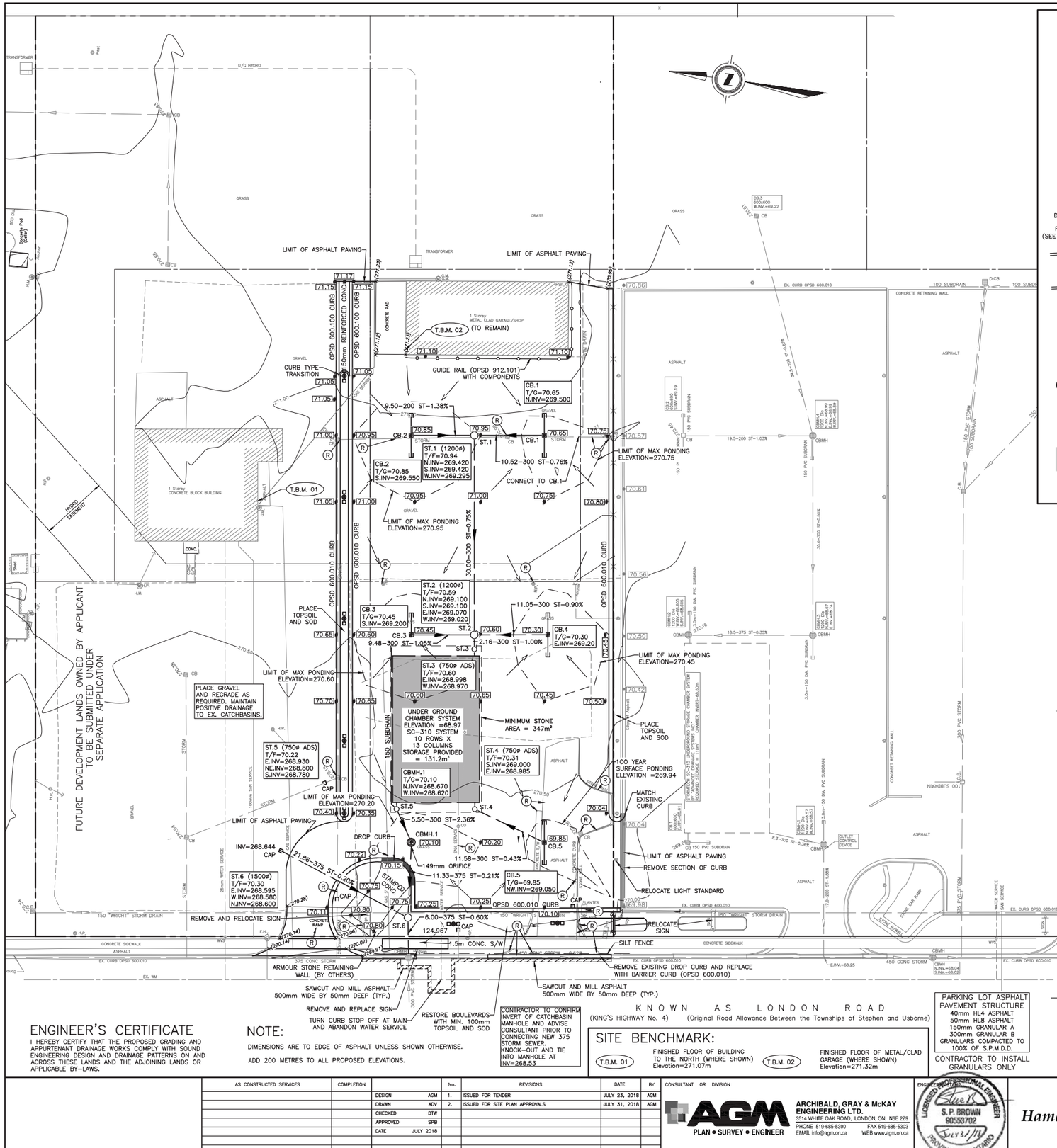
FIGURE 1

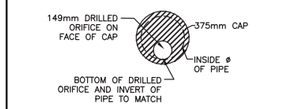
PROPOSED PARKING EXPANSION

SCALE 1:750
DATE: JULY 2018

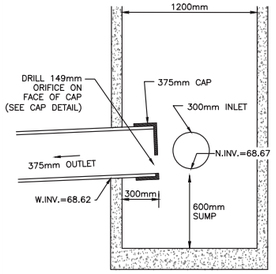
ARCHIBALD, GRAY & McKAY ENGINEERING LTD.
3514 WHITE OAK ROAD, LONDON, ON, N6E 2Z9
PHONE 519-685-5300 FAX 519-685-5303
EMAIL info@agm.on.ca WEB www.agm.on.ca
PLAN • SURVEY • ENGINEER

Plot date: Jul 31, 2018 F:\Projects\U\usborne\US\US-01\US-01-14\US-01-14-11\ENG 1354-2\CAD 2013\1354-2 Base.dwg





CAP DETAIL



OUTLET CONTROL DEVICE CBMH.1 ORIFICE DETAILS

NOT TO SCALE

ALL CATCHBASINS AND CATCHBASIN MANHOLES TO HAVE A 600mm SUMP

GENERAL NOTES

1. ALL WORK SHALL MEET THE THE MINIMUM STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY OF SOUTH HURON AND OPSS.
2. THE SUBDIVIDER/DEVELOPER SHALL CONSTRUCT TEMPORARY MEASURES TO CONTROL SILT ENTERING THE STORM DRAINAGE SYSTEM TO THE SPECIFICATIONS OUTLINED IN THE GUIDELINE ON EROSION AND SEDIMENT CONTROL FOR URBAN CONSTRUCTION SITES PREPARED BY THE MINISTRY OF NATURAL RESOURCES. THESE MEASURES ARE TO BE INSTALLED PRIOR TO COMMENCING ANY CONSTRUCTION FOR THIS PROJECT, AND ARE TO REMAIN IN PLACE UNTIL CONSTRUCTION HAS BEEN COMPLETED TO THE SPECIFICATIONS OF THE MUNICIPALITY OF SOUTH HURON.
3. ALL SUBSTITUTIONS MUST BE APPROVED BY THE MUNICIPALITY ENGINEER AND AND THE CONTRACT ADMINISTRATOR.
4. ALL ORGANIC, UNSTABLE OR UNSUITABLE MATERIALS BENEATH THE ROAD ALLOWANCES OR HOUSE FOUNDATIONS MUST BE REMOVED AND THESE AREAS BACKFILLED WITH AN APPROVED FILL MATERIAL, ALL TO THE SATISFACTION OF A GEOTECHNICAL ENGINEER.
5. THE SUBDIVIDER/DEVELOPER IS TO MEET ALL THE REQUIREMENTS OF THE OWNERS OF THE UTILITIES ON THIS PLAN, AND MUST MAKE SATISFACTORY ARRANGEMENTS WITH THE UTILITY COMPANIES FOR CROSSING THEIR INSTALLATIONS AND FOR PROVIDING ADEQUATE PROTECTION DURING CONSTRUCTION.
6. PRIOR TO COMMENCEMENT OF CONSTRUCTION THE CONTRACTOR SHALL:
   A) VERIFY ALL EXISTING UNDERGROUND UTILITIES WITHIN THE LIMIT OF THE CONSTRUCTION SITE AND LOCATE THEM.
   B) VERIFY ALL BENCHMARK ELEVATIONS, SEWER OUTLET ELEVATIONS AND DIMENSIONS AND REPORT ANY DISCREPANCIES IMMEDIATELY TO THE CONTRACT ADMINISTRATOR.
7. ALL EXISTING UTILITIES AND SERVICES ARE TO BE MAINTAINED AND SUPPORTED BY THE CONTRACTOR. ANY DAMAGE CAUSED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE MADE GOOD AT HIS EXPENSE TO THE SATISFACTION OF THE CONTRACT ADMINISTRATOR.
8. ALL DIMENSIONS FOR ROADWORKS ARE TO THE EDGE OF PAVEMENT UNLESS OTHERWISE SHOWN. CURB RADII ARE SHOWN TO THE EDGE OF PAVEMENT.
9. THE CONTRACT ADMINISTRATOR DOES NOT GUARANTEE THE ACCURACY OR THE COMPLETENESS OF THE LOCATION OF THE SURFACE OR SUBSURFACE DETAILS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL INVESTIGATE AND VERIFY FOR THEMSELVES WHETHER THE DETAILS SHOWN ARE CORRECT AND COMPLETE AND WHETHER THERE ARE OTHER FACTORS WHICH MAY AFFECT THE CONSTRUCTION OF THE PROPOSED WORKS AND APPURTENANCES WITHIN THE LIMITS OF THIS PROJECT.
10. ALL NEW CATCHBASIN INSTALLATIONS SHALL INCLUDE TWO(2) THREE(3) METRE LONG PERFORATED SUBDRAINS OF EITHER CORRUGATED STEEL PIPE OR PVC AND SURROUNDED WITH GEOTEXTILE.
11. AREAS SHOWN FOR RESTORATION ARE APPROXIMATE ONLY AND WILL DEPEND ON THE EXISTING CONDITION AND ACTUAL LOCATION OF THE SERVICES.
12. ALL PROPOSED MANHOLES SHALL BE 1200mm DIAMETER UNLESS SPECIFIED OTHERWISE.
13. NO FOUNDATION DRAIN CONNECTIONS WILL BE PERMITTED INTO THE SANITARY SEWERS AND NO DIRECT GRAVITY CONNECTIONS FROM THE FOUNDATION DRAINS WILL BE MADE TO THE STORM SEWER SYSTEM, SUMP PUMPS SHALL BE DISCHARGED TO THE SURFACE.
14. THE LIDS OF ALL R.Y.CB'S ARE TO BE INSTALLED SO THAT THE INLET GRATES ARE LOCATED ENTIRELY ON ONE LOT TO AVOID INTERFERENCE BY FENCES.
15. CONCRETE TO BE 30 MPa AT 28 DAYS UNLESS OTHERWISE NOTED.

GENERAL NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE MINIMUM REQUIREMENTS OF THE MUNICIPALITY.
2. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE TOWNSHIP AT LEAST 48 HOURS PRIOR TO COMMENCING CONSTRUCTION.
3. THE CONTRACTOR IS TO MEET ALL THE REQUIREMENTS OF THE OWNERS OF THE UTILITIES ON THIS PLAN, AND MUST MAKE SATISFACTORY ARRANGEMENTS WITH THE UTILITY COMPANIES FOR CROSSING THEIR INSTALLATIONS AND FOR PROVIDING ADEQUATE PROTECTION DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL HAVE ITS PROFESSIONAL ENGINEER PROVIDE ADEQUATE INSPECTION DURING CONSTRUCTION AND A CERTIFICATE OF COMPLETION OF WORKS UPON COMPLETION OF ALL WORKS.
5. EXISTING SURFACES WITHIN THE ROAD ALLOWANCE WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED TO A CONDITION AT LEAST AS GOOD AS ORIGINAL.
6. ALL LIGHT STANDARDS TO HAVE 2 OR 4 HEAD L.E.D. LIGHTS AND FITTED WITH HOOD COVERS TO DIRECT LIGHTING WITHIN SITE BOUNDARIES.

STORM SEWERS

7. SEWERS SHALL BE PVC SDR35 FOR PIPE SIZES 200mm DIAMETER AND LARGER, AND SDR28 FOR PIPE SIZES LESS THAN THAN 200mm.
8. SEWER BEDDING SHALL BE COURSE SAND OR 19mm CRUSHED STONE AND COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY. WHERE HIGH GROUND WATER LEVELS ARE ENCOUNTERED, 19mm CRUSHED STONE BEDDING SHALL BE USED AND SHALL HAVE A GEOTEXTILE WRAP OF TERRAFIX 200R OR EQUIVALENT.
9. APPROVED BACKFILL MATERIAL TO BE COMPACTED TO 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.

SEDIMENT CONTROL MEASURES:

1. PROTECT ALL EXPOSED SURFACES AND CONTROL ALL RUNOFF DURING CONSTRUCTION.
2. ALL EROSION CONTROL MEASURES TO BE IN PLACE BEFORE STARTING CONSTRUCTION, AND REMAIN IN PLACE UNTIL RESTORATION IS COMPLETE.
3. MAINTAIN EROSION CONTROL MEASURES DURING CONSTRUCTION.
4. ALL COLLECTED SEDIMENT TO BE DISPOSED OF AT AN APPROVED LOCATION.
5. MINIMIZE AREA DISTURBED DURING CONSTRUCTION.
6. ALL DEWATERING TO BE DISPOSED OF IN AN APPROVED SEDIMENTATION BASIN.
7. PROTECT ALL CATCH BASINS, MAINTENANCE HOLES, AND PIPE ENDS FROM SEDIMENT INTRUSION WITH STRAW BALE FILTERS AND GEOTEXTILE (TERRAFIX 270R).
8. KEEP ALL SUMPS CLEAN DURING CONSTRUCTION.
9. PREVENT WIND-BLOWN DUST.
10. STRAW BALES TO BE USED IN LOCALIZED AREAS AS SHOWN AND AS DIRECTED BY THE ENGINEER DURING CONSTRUCTION FOR WORKS WHICH ARE IN, OR ADJACENT TO FLOODLINES, FILL LINES AND HAZARDOUS SLOPES.
11. STRAW BALES TO BE TERMINATED BY ROUNDING BALES TO CONTAIN AND FILTER RUNOFF.
12. ALL OF THE ABOVE NOTES AND ANY SEDIMENT AND EROSION CONTROL MEASURES ARE AT THE MINIMUM TO BE IN ACCORDANCE WITH THE MINISTRY OF NATURAL RECOURSES GUIDELINES ON EROSION AND SEDIMENT CONTROL FOR RURAL CONSTRUCTION SITES.

LEGEND

- EXISTING SANITARY SEWER AND MANHOLE (SAMH, 200 SA)
- EXISTING STORM SEWER AND MANHOLE (STMH, 375 ST)
- PROPOSED STORM SEWER AND MANHOLE (ST.1, 300 ST)
- PROPOSED CATCHBASIN WITH 150mm PVC SUBDRAIN (LENGTH=3m) (CB)
- PROPOSED CATCHBASIN MANHOLE (CBMH)
- EXISTING CATCHBASIN (CB)
- EXISTING CATCHBASIN MANHOLE (CBMH)
- EXISTING WATERMAIN (150 WM)
- EXISTING FIRE HYDRANT AND VALVE (WV, FH)
- EXISTING TREE
- DIRECTION OF SURFACE DRAINAGE
- PROPOSED FINISHED GROUND ELEVATION (00.00)
- EXISTING GROUND ELEVATION (00.00)
- MATCH EXISTING ELEVATION (x 00.00)
- PROPOSED SILT FENCE
- EXISTING LIGHT STANDARD
- PROPOSED LIGHT STANDARD
- REMOVE (R)
- ADJUST (A)

ENGINEER'S CERTIFICATE

I HEREBY CERTIFY THAT THE PROPOSED GRADING AND APPURTENANT DRAINAGE WORKS COMPLY WITH SOUND ENGINEERING DESIGN AND DRAINAGE PATTERNS ON AND ACROSS THESE LANDS AND THE ADJOINING LANDS OR APPLICABLE BY-LAWS.

NOTE:

DIMENSIONS ARE TO EDGE OF ASPHALT UNLESS SHOWN OTHERWISE.

ADD 200 METRES TO ALL PROPOSED ELEVATIONS.

AS CONSTRUCTED SERVICES	COMPLETION

DESIGN	AGM
DRAWN	ADV
CHECKED	DTW
APPROVED	SPB
DATE	JULY 2018

No.	REVISIONS	DATE	BY
1.	ISSUED FOR TENDER	JULY 23, 2018	AGM
2.	ISSUED FOR SITE PLAN APPROVALS	JULY 31, 2018	AGM

CONSULTANT OR DIVISION

AGM PLAN • SURVEY • ENGINEER

ARCHIBALD, GRAY & McKAY ENGINEERING LTD.
3514 WHITE OAK ROAD, LONDON, ON, N6E 2Z9
PHONE 519-685-5300 FAX 519-685-5303
EMAIL info@agm.on.ca WEB www.agm.on.ca

ENGINEER'S PROFESSIONAL ENGINEER
LICENSED S. P. BROWN 90553702 JULY 31/18 PROVINCE OF ONTARIO

Hamather Motor Products Ltd.

SCALE — SCALE 1 : 300 (3 0 6m)

TITLE
HURON MOTOR PRODUCTS
70736 LONDON ROAD SOUTH
SERVICING AND GRADING PLAN

PROJECT No. 1354-2
SHEET No. 01
PLAN FILE No.

Plotted by Mark Green 2018-07-31 16:11

Plot date: Jul 31, 2018 F:\Projects\U\usborne\US\US-01\US-01-14\US-01-14-11\ENG 1354-2\CAD 2013\1354-2 Base.dwg

FIGURE 2

EXISTING DRAINAGE

SCALE 1:400
DATE: JULY 2018

ARCHIBALD, GRAY & McKAY ENGINEERING LTD.
3514 WHITE OAK ROAD, LONDON, ON, N6E 2Z9
PHONE 519-685-5300 FAX 519-685-5303
EMAIL info@agm.on.ca WEB www.agm.on.ca
PLAN • SURVEY • ENGINEER

Plot date: Jul 31, 2018 F:\Projects\U\usborne\US\US-01\US-01-14\US-01-14-11\ENG 1354-2\CAD 2013\1354-2 Base.dwg

4.0 PROPOSED DRAINAGE

The development of the site will increase the amount of hard surface, resulting in a 67% increase in imperviousness within the development area.

Post development drainage will be directed toward the onsite storm system which will consist of a number of catchbasins discharging through onsite storm sewers to an underground chamber, which will provide storage to limit post development peak discharge. The shop drawings for the chamber are included in Appendix B.

A 149mm diameter orifice located on the 375mm outlet pipe in catchbasin manhole CBMH.1 will control discharge to the existing storm sewer on London Road South. The orifice has been sized to limit the sewer discharge from the site to the predevelopment levels for the 5 to 100 year storm events

Post-Development peak flows and required storage volumes to control to the Pre Development peak flow rates are shown in Table 2.

Table 2 - Post Development Flows

Storm Event	Peak Flow (m^3/s)	Storage (m^3)
5 Year	0.030	57.0
100 Year	0.054	137.5

Site storage is comprised of the underground storage system ($131.2m^3$), upstream pipes and manholes ($6.1m^3$), as well as surface storage ($4.0m^3$). These combined elements will provide the required storage for all storm events up to and including the 100 year storm. Additional storage is available within catchbasins and the respective catchbasin leads on site.

5.0 SUMMARY

Site storage has been provided to control post development peak discharge to pre development levels.

Archibald, Gray & McKay Engineering Ltd.

LICENSED PROFESSIONAL ENGINEER
S. P. BROWN
90553702
JULY 31/18
PROVINCE OF ONTARIO

Lukas Grabowski
Engineer-in-Training

Steve Brown, P.Eng.
Engineering Design Manager

Appendix A
Hydrologic Modeling

Pre Development

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.07  rev. 387"
"                MIDUSS created                     Friday, September 23, 2005"
"           10   Units used:                                          ie METRIC"
"                Job folder:          F:\Projects\U\usborne\US\US-01\US-01-14\"
"                     US-01-14-11\ENG 1354-2\ENG\SWM\MIDUSS\Stormtech Model"
"                Output filename:                                 5yearPre-2.out"
"                Licensee name:                                       lgrabowski"
"                Company                                                        "
"                Date & Time last used:               6/25/2018 at 2:08:09 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"      860.460   Coefficient A"
"        7.382   Constant B"
"        0.759   Exponent C"
"        0.380   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          118.338    mm/hr"
"             Total depth                 48.624    mm"
"            6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"            1   Triangular SCS"
"            3   Specify values"
"            1   SCS method"
"          101   No description"
"       16.000   % Impervious"
"        0.484   Total Area"
"       77.000   Flow length"
"        1.300   Overland Slope"
"        0.407   Pervious Area"
"       77.000   Pervious length"
"        1.300   Pervious slope"
"        0.077   Impervious Area"
"       77.000   Impervious length"
"        1.300   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.526   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.893   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.030     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           0.407      0.077      0.484      hectare"
"             Time of concentration  29.905     4.254      23.681     minutes"
"             Time to Centroid       132.907    92.343     123.065    minutes"
"             Rainfall depth         48.624     48.624     48.624     mm"
"             Rainfall volume        197.69     37.65      235.34     c.m"
"             Rainfall losses        23.080     5.661      20.293     mm"
"             Runoff depth           25.544     42.963     28.331     mm"
"             Runoff volume          103.85     33.27      137.12     c.m"
"             Runoff coefficient     0.526      0.893      0.585      "
"             Maximum flow           0.026      0.020      0.030      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.030     0.030     0.000     0.000"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.07  rev. 387"
"                MIDUSS created                     Friday, September 23, 2005"
"           10   Units used:                                          ie METRIC"
"                Job folder:          F:\Projects\U\usborne\US\US-01\US-01-14\"
"                        US-01-14-11\ENG 1354-2\ENG\SWM\MIDUSS\Stormtech Model"
"                Output filename:                                100yearPre-2.out"
"                Licensee name:                                        lgrabowski"
"                Company                                                        "
"                Date & Time last used:                6/27/2018 at 2:29:49 PM"
" 31          TIME PARAMETERS"
"        5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"            1   Chicago storm"
"     1717.700   Coefficient A"
"       12.472   Constant B"
"        0.764   Exponent C"
"        0.380   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          181.635    mm/hr"
"             Total depth                 92.643    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 101"
"            1   Triangular SCS"
"            3   Specify values"
"            1   SCS method"
"          101   No description"
"       16.000   % Impervious"
"        0.484   Total Area"
"       77.000   Flow length"
"        1.300   Overland Slope"
"        0.407   Pervious Area"
"       77.000   Pervious length"
"        1.300   Pervious slope"
"        0.077   Impervious Area"
"       77.000   Impervious length"
"        1.300   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       88.000   Pervious SCS Curve No."
"        0.693   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        3.464   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.941   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.092     0.000     0.000     0.000 c.m/sec"
"             Catchment 101          Pervious   Impervious Total Area "
"             Surface Area           0.407      0.077      0.484      hectare"
"             Time of concentration  21.733     3.528      18.048     minutes"
"             Time to Centroid       119.962    90.300     113.959    minutes"
"             Rainfall depth         92.643     92.643     92.643     mm"
"             Rainfall volume        376.65     71.74      448.39     c.m"
"             Rainfall losses        28.484     7.165      25.073     mm"
"             Runoff depth           64.159     85.478     67.570     mm"
"             Runoff volume          260.84     66.19      327.04     c.m"
"             Runoff coefficient     0.693      0.941      0.733      "
"             Maximum flow           0.081      0.034      0.092      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.092     0.092     0.000     0.000"
```

Post Development

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.07  rev. 387"
"                MIDUSS created                      Friday, September 23, 2005"
"           10   Units used:                                          ie METRIC"
"                Job folder:          F:\Projects\U\usborne\US\US-01\US-01-14\"
"                     US-01-14-11\ENG 1354-2\ENG\SWM\MIDUSS\Stormtech Model"
"                Output filename:              5 year post-final-revised-3.out"
"                Licensee name:                                       lgrabowski"
"                Company                                                      "
"                Date & Time last used:                6/27/2018 at 2:10:05 PM"
" 31          TIME PARAMETERS"
"       5.000   Time Step"
"     180.000   Max. Storm length"
"    1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     860.460   Coefficient A"
"       7.382   Constant B"
"       0.759   Exponent C"
"       0.380   Fraction R"
"     180.000   Duration"
"       1.000   Time step multiplier"
"            Maximum intensity          118.338    mm/hr"
"            Total depth                 48.624    mm"
"           6   005hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 1"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"           1   Sump #1"
"     100.000   % Impervious"
"       0.056   Total Area"
"      14.000   Flow length"
"       2.000   Overland Slope"
"       0.000   Pervious Area"
"      14.000   Pervious length"
"       2.000   Pervious slope"
"       0.056   Impervious Area"
"      14.000   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      83.000   Pervious SCS Curve No."
"       0.406   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       5.202   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.893   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.014     0.000     0.000     0.000 c.m/sec"
"            Catchment 1            Pervious   Impervious Total Area "
"            Surface Area           0.000      0.056      0.056      hectare"
"            Time of concentration  10.893     1.344      1.344      minutes"
"            Time to Centroid       110.712    87.966     87.966     minutes"
"            Rainfall depth         48.624     48.624     48.624     mm"
"            Rainfall volume        0.00       27.23      27.23      c.m"
"            Rainfall losses        28.907     6.069      6.069      mm"
"            Runoff depth           19.717     42.555     42.555     mm"
"            Runoff volume          0.00       23.83      23.83      c.m"
"            Runoff coefficient     0.406      0.893      0.893      "
"            Maximum flow           0.000      0.014      0.014      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.014     0.014     0.000     0.000"
" 52          CHANNEL DESIGN"
"       0.014   Current peak flow    c.m/sec"
"       0.015   Manning 'n'"
"          0.   Cross-section type: 0=trapezoidal; 1=general"
"       0.000   Basewidth    metre"
"      50.000   Left bank slope"
"      50.000   Right bank slope"
"       1.000   Channel depth    metre"
"       0.500   Gradient   %"
"            Depth of flow                0.031    metre"
"            Velocity                     0.293    m/sec"
"            Channel capacity           148.463    c.m/sec"
"            Critical depth               0.028    metre"
" 53          ROUTE Zero Route"
"        0.00   Zero Route Reach length   ( metre)"
"                    0.014     0.014     0.014     0.000 c.m/sec"
```

```
" 40          HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                 0.014    c.m/sec"
"             Hydrograph volume           23.831    c.m"
"                     0.014     0.014     0.014     0.014"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.014     0.000     0.014     0.014"
" 33          CATCHMENT 2"
"           1   Triangular SCS"
"           3   Specify values"
"           1   SCS method"
"           2   sump #2"
"      54.500   % Impervious"
"       0.129   Total Area"
"      28.000   Flow length"
"       2.000   Overland Slope"
"       0.059   Pervious Area"
"      28.000   Pervious length"
"       2.000   Pervious slope"
"       0.070   Impervious Area"
"      15.500   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      83.000   Pervious SCS Curve No."
"       0.406   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       5.202   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.893   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                     0.018     0.000     0.014     0.014 c.m/sec"
"             Catchment 2            Pervious   Impervious Total Area "
"             Surface Area           0.059      0.070      0.129      hectare"
"             Time of concentration  16.510     1.429      5.629      minutes"
"             Time to Centroid       117.564    88.132     96.328     minutes"
"             Rainfall depth         48.624     48.624     48.624     mm"
"             Rainfall volume        28.54      34.19      62.73      c.m"
"             Rainfall losses        28.905     5.970      16.405     mm"
"             Runoff depth           19.719     42.655     32.219     mm"
"             Runoff volume          11.57      29.99      41.56      c.m"
"             Runoff coefficient     0.406      0.893      0.672      "
"             Maximum flow           0.004      0.018      0.018      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                     0.018     0.018     0.014     0.014"
" 52          CHANNEL DESIGN"
"       0.018   Current peak flow    c.m/sec"
"       0.015   Manning 'n'"
"          0.   Cross-section type: 0=trapezoidal; 1=general"
"       0.000   Basewidth    metre"
"      50.000   Left bank slope"
"      50.000   Right bank slope"
"       1.000   Channel depth    metre"
"       0.500   Gradient   %"
"             Depth of flow                0.034    metre"
"             Velocity                     0.312    m/sec"
"             Channel capacity           148.463    c.m/sec"
"             Critical depth               0.031    metre"
" 53          ROUTE Zero Route"
"        0.00   Zero Route Reach length   ( metre)"
"                     0.018     0.018     0.018     0.014 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                 0.033    c.m/sec"
"             Hydrograph volume           65.393    c.m"
"                     0.018     0.018     0.018     0.033"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.018     0.000     0.018     0.033"
" 33          CATCHMENT 3"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"           3   sump #3"
```

```
"      100.000   % Impervious"
"        0.062   Total Area"
"       22.360   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       22.360   Pervious length"
"        2.000   Pervious slope"
"        0.062   Impervious Area"
"       22.360   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.406   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.893   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.015     0.000     0.018     0.033 c.m/sec"
"             Catchment 3            Pervious   Impervious Total Area "
"             Surface Area           0.000      0.062      0.062      hectare"
"             Time of concentration  14.426     1.780      1.780      minutes"
"             Time to Centroid       115.010    88.668     88.668     minutes"
"             Rainfall depth         48.624     48.624     48.624     mm"
"             Rainfall volume        0.00       30.15      30.15      c.m"
"             Rainfall losses        28.884     5.815      5.815      mm"
"             Runoff depth           19.741     42.809     42.809     mm"
"             Runoff volume          0.00       26.54      26.54      c.m"
"             Runoff coefficient     0.406      0.893      0.893      "
"             Maximum flow           0.000      0.015      0.015      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.015     0.015     0.018     0.033"
" 52          CHANNEL DESIGN"
"        0.015   Current peak flow    c.m/sec"
"        0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"        0.000   Basewidth    metre"
"       50.000   Left bank slope"
"       50.000   Right bank slope"
"        1.000   Channel depth    metre"
"        0.500   Gradient   %"
"             Depth of flow                 0.032    metre"
"             Velocity                      0.298    m/sec"
"             Channel capacity            148.463    c.m/sec"
"             Critical depth                0.028    metre"
" 53          ROUTE Zero Route"
"          0.00   Zero Route Reach length   ( metre)"
"                     0.015     0.015     0.015     0.033 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"            6   Combine "
"          113   Node #"
"                TO ADS UNIT"
"             Maximum flow                  0.048    c.m/sec"
"             Hydrograph volume            91.935    c.m"
"                     0.015     0.015     0.015     0.048"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.015     0.000     0.015     0.048"
" 33          CATCHMENT 4"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            4   sump #4"
"      100.000   % Impervious"
"        0.060   Total Area"
"       22.130   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       22.130   Pervious length"
"        2.000   Pervious slope"
"        0.060   Impervious Area"
"       22.130   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.406   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
```

```
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.893   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.015     0.000     0.015     0.048 c.m/sec"
"            Catchment 4            Pervious   Impervious Total Area "
"            Surface Area           0.000      0.060      0.060      hectare"
"            Time of concentration  14.337     1.769      1.769      minutes"
"            Time to Centroid       114.900    88.655     88.655     minutes"
"            Rainfall depth         48.624     48.624     48.624     mm"
"            Rainfall volume        0.00       29.17      29.17      c.m"
"            Rainfall losses        28.884     5.812      5.812      mm"
"            Runoff depth           19.740     42.812     42.812     mm"
"            Runoff volume          0.00       25.69      25.69      c.m"
"            Runoff coefficient     0.406      0.893      0.893      "
"            Maximum flow           0.000      0.015      0.015      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.015     0.015     0.015     0.048"
" 52         CHANNEL DESIGN"
"       0.015   Current peak flow    c.m/sec"
"       0.015   Manning 'n'"
"          0.   Cross-section type: 0=trapezoidal; 1=general"
"       0.000   Basewidth    metre"
"      50.000   Left bank slope"
"      50.000   Right bank slope"
"       1.000   Channel depth    metre"
"       0.500   Gradient   %"
"            Depth of flow                0.032    metre"
"            Velocity                     0.298    m/sec"
"            Channel capacity           148.463    c.m/sec"
"            Critical depth               0.028    metre"
" 53         ROUTE Zero Route"
"        0.00   Zero Route Reach length   ( metre)"
"                    0.015     0.015     0.015     0.048 c.m/sec"
" 40         HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"            Maximum flow                 0.063    c.m/sec"
"            Hydrograph volume          117.622    c.m"
"                    0.015     0.015     0.015     0.063"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.015     0.000     0.015     0.063"
" 33         CATCHMENT 5"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"           5   Sump #5"
"     100.000   % Impervious"
"       0.064   Total Area"
"      23.400   Flow length"
"       2.000   Overland Slope"
"       0.000   Pervious Area"
"      23.400   Pervious length"
"       2.000   Pervious slope"
"       0.064   Impervious Area"
"      23.400   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      83.000   Pervious SCS Curve No."
"       0.406   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       5.202   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.893   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.016     0.000     0.015     0.063 c.m/sec"
"            Catchment 5            Pervious   Impervious Total Area "
"            Surface Area           0.000      0.064      0.064      hectare"
"            Time of concentration  14.825     1.829      1.829      minutes"
"            Time to Centroid       115.494    88.713     88.713     minutes"
"            Rainfall depth         48.624     48.624     48.624     mm"
"            Rainfall volume        0.00       31.12      31.12      c.m"
"            Rainfall losses        28.895     5.824      5.824      mm"
"            Runoff depth           19.729     42.800     42.800     mm"
"            Runoff volume          0.00       27.39      27.39      c.m"
```

```
"             Runoff coefficient     0.406      0.893      0.893      "
"             Maximum flow           0.000      0.016      0.016      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.016     0.016     0.015     0.063"
" 52          CHANNEL DESIGN"
"        0.016   Current peak flow    c.m/sec"
"        0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"        0.600   Basewidth    metre"
"       50.000   Left bank slope"
"       50.000   Right bank slope"
"        1.000   Channel depth    metre"
"        0.500   Gradient   %"
"             Depth of flow                0.027    metre"
"             Velocity                     0.300    m/sec"
"             Channel capacity           150.842    c.m/sec"
"             Critical depth               0.024    metre"
" 53          ROUTE Zero Route"
"         0.00   Zero Route Reach length   ( metre)"
"                    0.016     0.016     0.016     0.063 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"            6   Combine "
"          113   Node #"
"                TO ADS UNIT"
"             Maximum flow                 0.078    c.m/sec"
"             Hydrograph volume          145.014    c.m"
"                    0.016     0.016     0.016     0.078"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.016     0.000     0.016     0.078"
" 33          CATCHMENT 6"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            6   sump #6"
"      100.000   % Impervious"
"        0.065   Total Area"
"       23.300   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       23.300   Pervious length"
"        2.000   Pervious slope"
"        0.065   Impervious Area"
"       23.300   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.406   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.893   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.016     0.000     0.016     0.078 c.m/sec"
"             Catchment 6            Pervious   Impervious Total Area "
"             Surface Area           0.000      0.065      0.065      hectare"
"             Time of concentration  14.787     1.825      1.825      minutes"
"             Time to Centroid       115.447    88.710     88.710     minutes"
"             Rainfall depth         48.624     48.624     48.624     mm"
"             Rainfall volume        0.00       31.61      31.61      c.m"
"             Rainfall losses        28.893     5.824      5.824      mm"
"             Runoff depth           19.731     42.800     42.800     mm"
"             Runoff volume          0.00       27.82      27.82      c.m"
"             Runoff coefficient     0.406      0.893      0.893      "
"             Maximum flow           0.000      0.016      0.016      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.016     0.016     0.016     0.078"
" 52          CHANNEL DESIGN"
"        0.016   Current peak flow    c.m/sec"
"        0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"        0.600   Basewidth    metre"
"       50.000   Left bank slope"
"       50.000   Right bank slope"
"        1.000   Channel depth    metre"
"        0.500   Gradient   %"
"             Depth of flow                0.027    metre"
```

```
"             Velocity                       0.300    m/sec"
"             Channel capacity             150.842    c.m/sec"
"             Critical depth                 0.024    metre"
" 53          ROUTE Zero Route"
"         0.00   Zero Route Reach length   ( metre)"
"                  0.016     0.016     0.016     0.078 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                   0.094    c.m/sec"
"             Hydrograph volume            172.835    c.m"
"                  0.016     0.016     0.016     0.094"
" 40          HYDROGRAPH   Confluence    113"
"           7   Confluence "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                   0.094    c.m/sec"
"             Hydrograph volume            172.835    c.m"
"                  0.016     0.094     0.016     0.000"
" 54          POND DESIGN"
"       0.094   Current peak flow    c.m/sec"
"       0.012   Target outflow    c.m/sec"
"       180.0   Hydrograph volume    c.m"
"         46.   Number of stages"
"     268.818   Minimum water level    metre"
"     269.961   Maximum water level    metre"
"     268.818   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               268.818     0.000       0.0"
"               268.843     0.017       3.6"
"               268.869     0.019       7.1"
"               268.894     0.020      10.6"
"               268.920     0.022      14.1"
"               268.945     0.023      17.6"
"               268.970     0.024      21.0"
"               268.996     0.026      27.7"
"               269.021     0.027      34.3"
"               269.047     0.028      40.9"
"               269.072     0.029      47.4"
"               269.097     0.030      53.8"
"               269.123     0.031      60.1"
"               269.148     0.032      66.2"
"               269.174     0.033      72.3"
"               269.199     0.034      78.2"
"               269.224     0.035      84.0"
"               269.250     0.035      89.5"
"               269.275     0.036      94.8"
"               269.301     0.037      99.7"
"               269.326     0.038     104.1"
"               269.351     0.039     108.2"
"               269.377     0.039     112.0"
"               269.402     0.040     115.7"
"               269.428     0.041     119.4"
"               269.453     0.042     123.1"
"               269.478     0.042     126.7"
"               269.504     0.043     130.3"
"               269.529     0.044     133.9"
"               269.555     0.044     134.1"
"               269.580     0.045     134.1"
"               269.605     0.046     134.2"
"               269.631     0.046     134.3"
"               269.656     0.047     134.4"
"               269.682     0.048     134.5"
"               269.707     0.048     134.6"
"               269.732     0.049     134.7"
"               269.758     0.050     134.8"
"               269.783     0.050     134.9"
"               269.809     0.051     135.0"
"               269.834     0.051     135.1"
"               269.859     0.052     135.2"
"               269.885     0.053     135.4"
"               269.910     0.053     136.1"
"               269.936     0.054     137.3"
"               269.961     0.054     139.5"
"           1.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"               268.620     0.630    0.1490     1.000"
"             Peak outflow                   0.030    c.m/sec"
```

```
"             Maximum level              269.110    metre"
"             Maximum storage             57.031    c.m"
"             Centroidal lag               1.812   hours"
"                  0.016     0.094     0.030     0.000 c.m/sec"
```

```
"                MIDUSS Output ----------------------------------------------->"
"                MIDUSS version                          Version 2.07  rev. 387"
"                MIDUSS created                     Friday, September 23, 2005"
"           10   Units used:                                          ie METRIC"
"                Job folder:          F:\Projects\U\usborne\US\US-01\US-01-14\"
"                     US-01-14-11\ENG 1354-2\ENG\SWM\MIDUSS\Stormtech Model"
"                Output filename:            100 year post-final-revised-6.out"
"                Licensee name:                                       lgrabowski"
"                Company                                                       "
"                Date & Time last used:               6/27/2018 at 2:12:13 PM"
" 31          TIME PARAMETERS"
"       5.000   Time Step"
"      180.000   Max. Storm length"
"     1500.000   Max. Hydrograph"
" 32          STORM Chicago storm"
"           1   Chicago storm"
"     1717.700   Coefficient A"
"       12.472   Constant B"
"        0.764   Exponent C"
"        0.380   Fraction R"
"      180.000   Duration"
"        1.000   Time step multiplier"
"             Maximum intensity          181.635    mm/hr"
"             Total depth                 92.643    mm"
"            6   100hyd   Hydrograph extension used in this file"
" 33          CATCHMENT 1"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            1   Sump #1"
"      100.000   % Impervious"
"        0.056   Total Area"
"       14.000   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       14.000   Pervious length"
"        2.000   Pervious slope"
"        0.056   Impervious Area"
"       14.000   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.592   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.941   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.024     0.000     0.000     0.000 c.m/sec"
"             Catchment 1            Pervious   Impervious Total Area "
"             Surface Area           0.000      0.056      0.056      hectare"
"             Time of concentration  7.461      1.115      1.115      minutes"
"             Time to Centroid       104.064    86.722     86.722     minutes"
"             Rainfall depth         92.643     92.643     92.643     mm"
"             Rainfall volume        0.00       51.88      51.88      c.m"
"             Rainfall losses        38.070     7.639      7.639      mm"
"             Runoff depth           54.573     85.003     85.003     mm"
"             Runoff volume          0.00       47.60      47.60      c.m"
"             Runoff coefficient     0.592      0.941      0.941      "
"             Maximum flow           0.000      0.024      0.024      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.024     0.024     0.000     0.000"
" 52          CHANNEL DESIGN"
"        0.024   Current peak flow    c.m/sec"
"        0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"        0.000   Basewidth    metre"
"       50.000   Left bank slope"
"       50.000   Right bank slope"
"        1.000   Channel depth    metre"
"        0.500   Gradient   %"
"             Depth of flow                0.038    metre"
"             Velocity                     0.335    m/sec"
"             Channel capacity           148.463    c.m/sec"
"             Critical depth               0.034    metre"
" 53          ROUTE Zero Route"
"         0.00   Zero Route Reach length   ( metre)"
"                     0.024     0.024     0.024     0.000 c.m/sec"
```

```
" 40          HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                 0.024    c.m/sec"
"             Hydrograph volume           47.602    c.m"
"                     0.024     0.024     0.024     0.024"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.024     0.000     0.024     0.024"
" 33          CATCHMENT 2"
"           1   Triangular SCS"
"           3   Specify values"
"           1   SCS method"
"           2   sump #2"
"      54.500   % Impervious"
"       0.129   Total Area"
"      28.000   Flow length"
"       2.000   Overland Slope"
"       0.059   Pervious Area"
"      28.000   Pervious length"
"       2.000   Pervious slope"
"       0.070   Impervious Area"
"      15.500   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      83.000   Pervious SCS Curve No."
"       0.592   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       5.202   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.941   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                     0.036     0.000     0.024     0.024 c.m/sec"
"            Catchment 2            Pervious   Impervious Total Area "
"            Surface Area           0.059      0.070      0.129      hectare"
"            Time of concentration  11.308     1.185      4.721      minutes"
"            Time to Centroid       108.672    86.734     94.396     minutes"
"            Rainfall depth         92.643     92.643     92.643     mm"
"            Rainfall volume        54.38      65.13      119.51     c.m"
"            Rainfall losses        37.901     7.490      21.327     mm"
"            Runoff depth           54.742     85.153     71.316     mm"
"            Runoff volume          32.13      59.87      92.00      c.m"
"            Runoff coefficient     0.592      0.941      0.782      "
"            Maximum flow           0.013      0.030      0.036      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                     0.036     0.036     0.024     0.024"
" 52          CHANNEL DESIGN"
"       0.036   Current peak flow    c.m/sec"
"       0.015   Manning 'n'"
"          0.   Cross-section type: 0=trapezoidal; 1=general"
"       0.000   Basewidth    metre"
"      50.000   Left bank slope"
"      50.000   Right bank slope"
"       1.000   Channel depth    metre"
"       0.500   Gradient   %"
"            Depth of flow                0.044    metre"
"            Velocity                     0.371    m/sec"
"            Channel capacity           148.463    c.m/sec"
"            Critical depth               0.040    metre"
" 53          ROUTE Zero Route"
"        0.00   Zero Route Reach length   ( metre)"
"                     0.036     0.036     0.036     0.024 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                 0.058    c.m/sec"
"             Hydrograph volume          139.600    c.m"
"                     0.036     0.036     0.036     0.058"
" 40          HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                     0.036     0.000     0.036     0.058"
" 33          CATCHMENT 3"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"           3   sump #3"
```

```
"      100.000   % Impervious"
"        0.062   Total Area"
"       22.360   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       22.360   Pervious length"
"        2.000   Pervious slope"
"        0.062   Impervious Area"
"       22.360   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.592   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.941   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                     0.026     0.000     0.036     0.058 c.m/sec"
"             Catchment 3            Pervious   Impervious Total Area "
"             Surface Area           0.000      0.062      0.062      hectare"
"             Time of concentration  9.881      1.476      1.476      minutes"
"             Time to Centroid       106.998    87.229     87.229     minutes"
"             Rainfall depth         92.643     92.643     92.643     mm"
"             Rainfall volume        0.00       57.44      57.44      c.m"
"             Rainfall losses        38.152     6.942      6.942      mm"
"             Runoff depth           54.491     85.700     85.700     mm"
"             Runoff volume          0.00       53.13      53.13      c.m"
"             Runoff coefficient     0.592      0.941      0.941      "
"             Maximum flow           0.000      0.026      0.026      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                     0.026     0.026     0.036     0.058"
" 52          CHANNEL DESIGN"
"         0.026   Current peak flow    c.m/sec"
"         0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"         0.000   Basewidth    metre"
"        50.000   Left bank slope"
"        50.000   Right bank slope"
"         1.000   Channel depth    metre"
"         0.500   Gradient   %"
"              Depth of flow                 0.039    metre"
"              Velocity                      0.342    m/sec"
"              Channel capacity            148.463    c.m/sec"
"              Critical depth                0.035    metre"
" 53          ROUTE Zero Route"
"          0.00   Zero Route Reach length   ( metre)"
"                     0.026     0.026     0.026     0.058 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"            6   Combine "
"          113   Node #"
"                TO ADS UNIT"
"              Maximum flow                  0.084    c.m/sec"
"              Hydrograph volume           192.734    c.m"
"                     0.026     0.026     0.026     0.084"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                     0.026     0.000     0.026     0.084"
" 33          CATCHMENT 4"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            4   sump #4"
"      100.000   % Impervious"
"        0.060   Total Area"
"       22.130   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       22.130   Pervious length"
"        2.000   Pervious slope"
"        0.060   Impervious Area"
"       22.130   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.592   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
```

```
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.941   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.025     0.000     0.026     0.084 c.m/sec"
"            Catchment 4            Pervious   Impervious Total Area "
"            Surface Area           0.000      0.060      0.060      hectare"
"            Time of concentration  9.819      1.467      1.467      minutes"
"            Time to Centroid       106.919    87.211     87.211     minutes"
"            Rainfall depth         92.643     92.643     92.643     mm"
"            Rainfall volume        0.00       55.59      55.59      c.m"
"            Rainfall losses        38.149     6.956      6.956      mm"
"            Runoff depth           54.494     85.686     85.686     mm"
"            Runoff volume          0.00       51.41      51.41      c.m"
"            Runoff coefficient     0.592      0.941      0.941      "
"            Maximum flow           0.000      0.025      0.025      c.m/sec"
" 40         HYDROGRAPH Add Runoff "
"           4   Add Runoff "
"                    0.025     0.025     0.026     0.084"
" 52         CHANNEL DESIGN"
"       0.025   Current peak flow    c.m/sec"
"       0.015   Manning 'n'"
"          0.   Cross-section type: 0=trapezoidal; 1=general"
"       0.000   Basewidth    metre"
"      50.000   Left bank slope"
"      50.000   Right bank slope"
"       1.000   Channel depth    metre"
"       0.500   Gradient   %"
"            Depth of flow                0.038    metre"
"            Velocity                     0.338    m/sec"
"            Channel capacity           148.463    c.m/sec"
"            Critical depth               0.035    metre"
" 53         ROUTE Zero Route"
"        0.00   Zero Route Reach length   ( metre)"
"                    0.025     0.025     0.025     0.084 c.m/sec"
" 40         HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"            Maximum flow                 0.109    c.m/sec"
"            Hydrograph volume          244.146    c.m"
"                    0.025     0.025     0.025     0.109"
" 40         HYDROGRAPH Start - New Tributary"
"           2   Start - New Tributary"
"                    0.025     0.000     0.025     0.109"
" 33         CATCHMENT 5"
"           1   Triangular SCS"
"           1   Equal length"
"           1   SCS method"
"           5   Sump #5"
"     100.000   % Impervious"
"       0.064   Total Area"
"      23.400   Flow length"
"       2.000   Overland Slope"
"       0.000   Pervious Area"
"      23.400   Pervious length"
"       2.000   Pervious slope"
"       0.064   Impervious Area"
"      23.400   Impervious length"
"       2.000   Impervious slope"
"       0.250   Pervious Manning 'n'"
"      83.000   Pervious SCS Curve No."
"       0.592   Pervious Runoff coefficient"
"       0.100   Pervious Ia/S coefficient"
"       5.202   Pervious Initial abstraction"
"       0.015   Impervious Manning 'n'"
"      98.000   Impervious SCS Curve No."
"       0.941   Impervious Runoff coefficient"
"       0.100   Impervious Ia/S coefficient"
"       0.518   Impervious Initial abstraction"
"                    0.027     0.000     0.025     0.109 c.m/sec"
"            Catchment 5            Pervious   Impervious Total Area "
"            Surface Area           0.000      0.064      0.064      hectare"
"            Time of concentration  10.154     1.517      1.517      minutes"
"            Time to Centroid       107.305    87.308     87.308     minutes"
"            Rainfall depth         92.643     92.643     92.643     mm"
"            Rainfall volume        0.00       59.29      59.29      c.m"
"            Rainfall losses        38.091     6.878      6.878      mm"
"            Runoff depth           54.551     85.765     85.765     mm"
"            Runoff volume          0.00       54.89      54.89      c.m"
```

```
"             Runoff coefficient     0.592      0.941      0.941      "
"             Maximum flow           0.000      0.027      0.027      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.027     0.027     0.025     0.109"
" 52          CHANNEL DESIGN"
"        0.027   Current peak flow    c.m/sec"
"        0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"        0.600   Basewidth    metre"
"       50.000   Left bank slope"
"       50.000   Right bank slope"
"        1.000   Channel depth    metre"
"        0.500   Gradient   %"
"             Depth of flow                0.034    metre"
"             Velocity                     0.343    m/sec"
"             Channel capacity           150.842    c.m/sec"
"             Critical depth               0.030    metre"
" 53          ROUTE Zero Route"
"         0.00   Zero Route Reach length   ( metre)"
"                    0.027     0.027     0.027     0.109 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"            6   Combine "
"          113   Node #"
"                TO ADS UNIT"
"             Maximum flow                 0.136    c.m/sec"
"             Hydrograph volume          299.035    c.m"
"                    0.027     0.027     0.027     0.136"
" 40          HYDROGRAPH Start - New Tributary"
"            2   Start - New Tributary"
"                    0.027     0.000     0.027     0.136"
" 33          CATCHMENT 6"
"            1   Triangular SCS"
"            1   Equal length"
"            1   SCS method"
"            6   sump #6"
"      100.000   % Impervious"
"        0.065   Total Area"
"       23.300   Flow length"
"        2.000   Overland Slope"
"        0.000   Pervious Area"
"       23.300   Pervious length"
"        2.000   Pervious slope"
"        0.065   Impervious Area"
"       23.300   Impervious length"
"        2.000   Impervious slope"
"        0.250   Pervious Manning 'n'"
"       83.000   Pervious SCS Curve No."
"        0.592   Pervious Runoff coefficient"
"        0.100   Pervious Ia/S coefficient"
"        5.202   Pervious Initial abstraction"
"        0.015   Impervious Manning 'n'"
"       98.000   Impervious SCS Curve No."
"        0.941   Impervious Runoff coefficient"
"        0.100   Impervious Ia/S coefficient"
"        0.518   Impervious Initial abstraction"
"                    0.027     0.000     0.027     0.136 c.m/sec"
"             Catchment 6            Pervious   Impervious Total Area "
"             Surface Area           0.000      0.065      0.065      hectare"
"             Time of concentration  10.128     1.513      1.513      minutes"
"             Time to Centroid       107.275    87.301     87.301     minutes"
"             Rainfall depth         92.643     92.643     92.643     mm"
"             Rainfall volume        0.00       60.22      60.22      c.m"
"             Rainfall losses        38.096     6.883      6.883      mm"
"             Runoff depth           54.547     85.760     85.760     mm"
"             Runoff volume          0.00       55.74      55.74      c.m"
"             Runoff coefficient     0.592      0.941      0.941      "
"             Maximum flow           0.000      0.027      0.027      c.m/sec"
" 40          HYDROGRAPH Add Runoff "
"            4   Add Runoff "
"                    0.027     0.027     0.027     0.136"
" 52          CHANNEL DESIGN"
"        0.027   Current peak flow    c.m/sec"
"        0.015   Manning 'n'"
"           0.   Cross-section type: 0=trapezoidal; 1=general"
"        0.600   Basewidth    metre"
"       50.000   Left bank slope"
"       50.000   Right bank slope"
"        1.000   Channel depth    metre"
"        0.500   Gradient   %"
"             Depth of flow                0.034    metre"
```

```
"             Velocity                       0.343    m/sec"
"             Channel capacity             150.842    c.m/sec"
"             Critical depth                 0.030    metre"
" 53          ROUTE Zero Route"
"         0.00   Zero Route Reach length   ( metre)"
"                  0.027     0.027     0.027     0.136 c.m/sec"
" 40          HYDROGRAPH   Combine    113"
"           6   Combine "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                   0.164    c.m/sec"
"             Hydrograph volume            354.779    c.m"
"                  0.027     0.027     0.027     0.164"
" 40          HYDROGRAPH   Confluence    113"
"           7   Confluence "
"         113   Node #"
"               TO ADS UNIT"
"             Maximum flow                   0.164    c.m/sec"
"             Hydrograph volume            354.779    c.m"
"                  0.027     0.164     0.027     0.000"
" 54          POND DESIGN"
"       0.164   Current peak flow    c.m/sec"
"       0.012   Target outflow    c.m/sec"
"       355.0   Hydrograph volume    c.m"
"         46.   Number of stages"
"     268.818   Minimum water level    metre"
"     269.961   Maximum water level    metre"
"     268.818   Starting water level    metre"
"           0   Keep Design Data: 1 = True; 0 = False"
"                 Level Discharge    Volume"
"               268.818     0.000       0.0"
"               268.843     0.017       3.6"
"               268.869     0.019       7.1"
"               268.894     0.020      10.6"
"               268.920     0.022      14.1"
"               268.945     0.023      17.6"
"               268.970     0.024      21.0"
"               268.996     0.026      27.7"
"               269.021     0.027      34.3"
"               269.047     0.028      40.9"
"               269.072     0.029      47.4"
"               269.097     0.030      53.8"
"               269.123     0.031      60.1"
"               269.148     0.032      66.2"
"               269.174     0.033      72.3"
"               269.199     0.034      78.2"
"               269.224     0.035      84.0"
"               269.250     0.035      89.5"
"               269.275     0.036      94.8"
"               269.301     0.037      99.7"
"               269.326     0.038     104.1"
"               269.351     0.039     108.2"
"               269.377     0.039     112.0"
"               269.402     0.040     115.7"
"               269.428     0.041     119.4"
"               269.453     0.042     123.1"
"               269.478     0.042     126.7"
"               269.504     0.043     130.3"
"               269.529     0.044     133.9"
"               269.555     0.044     134.1"
"               269.580     0.045     134.1"
"               269.605     0.046     134.2"
"               269.631     0.046     134.3"
"               269.656     0.047     134.4"
"               269.682     0.048     134.5"
"               269.707     0.048     134.6"
"               269.732     0.049     134.7"
"               269.758     0.050     134.8"
"               269.783     0.050     134.9"
"               269.809     0.051     135.0"
"               269.834     0.051     135.1"
"               269.859     0.052     135.2"
"               269.885     0.053     135.4"
"               269.910     0.053     136.1"
"               269.936     0.054     137.3"
"               269.961     0.054     139.5"
"           1.   ORIFICES"
"                Orifice   Orifice   Orifice Number of"
"                 invert coefficie  diameter  orifices"
"               268.620     0.630    0.1490     1.000"
"             Peak outflow                   0.054    c.m/sec"
```

```
"             Maximum level              269.939    metre"
"             Maximum storage            137.530    c.m"
"             Centroidal lag               2.063   hours"
"                  0.027     0.164     0.054     0.000 c.m/sec"
```

Appendix B
Stormwater Chamber

SWM STORAGE - UNDERGROUND CHAMBER UNIT AND UPSTREAM PIPES

Elevation (m)	CBMH.1 (m^3)	300 dia. Pipe (m^3)	ST.5 (m^3)	ADS UNIT (m^3)	ST.4 (m^3)	300 dia. Pipe (m^3)	ST.3 (m^3)	300 dia. Pipe (m^3)	ST.2 (m^3)	300 dia. Pipe (m^3)	Surface (m^3)	Total (m^3)	Description
268.818	0.00	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**BOTTOM OF STONE**
268.843	0.00	0.130	0.00	3.455	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.59	
268.868	0.00	0.170	0.00	6.911	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.08	
268.894	0.00	0.210	0.00	10.366	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.58	
268.919	0.00	0.250	0.00	13.821	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.07	
268.945	0.00	0.290	0.00	17.276	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.57	
268.970	0.00	0.320	0.00	20.732	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.05	**BOTTOM OF CHAMBER**
268.995	0.029	0.350	0.00	27.358	0.00	0.00	0.00	0.00	0.00	0.00	0.00	27.74	
269.021	0.057	0.370	0.00	33.919	0.00	0.004	0.00	0.00	0.00	0.00	0.00	34.35	
269.046	0.086	0.390	0.00	40.391	0.00	0.030	0.00	0.011	0.00	0.00	0.00	40.91	
269.072	0.115	0.390	0.00	46.775	0.00	0.085	0.00	0.024	0.00	0.00	0.00	47.39	
269.097	0.144	0.390	0.00	53.048	0.00	0.150	0.00	0.038	0.00	0.005	0.00	53.77	
269.122	0.172	0.390	0.00	59.189	0.00	0.230	0.00	0.053	0.00	0.023	0.00	60.06	5 YR. STORM ELEV = 269.110
269.148	0.201	0.390	0.00	65.195	0.00	0.320	0.00	0.069	0.00	0.063	0.00	66.24	
269.173	0.230	0.390	0.00	71.070	0.00	0.400	0.00	0.086	0.00	0.120	0.00	72.30	
269.199	0.259	0.390	0.000	76.769	0.00	0.490	0.00	0.100	0.00	0.210	0.00	78.22	
269.224	0.287	0.390	0.000	82.268	0.00	0.580	0.00	0.120	0.00	0.320	0.00	83.97	
269.249	0.316	0.390	0.009	87.546	0.00	0.650	0.00	0.130	0.00	0.450	0.00	89.49	
269.275	0.345	0.390	0.020	92.557	0.00	0.730	0.00	0.140	0.00	0.620	0.00	94.80	
269.300	0.373	0.390	0.031	97.217	0.00	0.780	0.00	0.150	0.00	0.800	0.00	99.74	
269.326	0.402	0.390	0.042	101.260	0.011	0.810	0.011	0.150	0.00	1.010	0.00	104.09	
269.351	0.431	0.390	0.053	105.057	0.023	0.820	0.023	0.150	0.00	1.210	0.00	108.16	
269.376	0.460	0.390	0.065	108.642	0.034	0.820	0.034	0.150	0.000	1.400	0.00	111.99	**TOP OF CHAMBER**
269.402	0.488	0.390	0.076	112.097	0.045	0.820	0.045	0.150	0.002	1.580	0.00	115.69	
269.427	0.517	0.390	0.087	115.553	0.056	0.820	0.056	0.150	0.031	1.730	0.00	119.39	
269.453	0.546	0.390	0.098	119.008	0.067	0.820	0.067	0.150	0.059	1.860	0.00	123.07	
269.478	0.575	0.390	0.110	122.463	0.079	0.820	0.079	0.150	0.088	1.950	0.00	126.70	
269.503	0.603	0.390	0.121	125.919	0.090	0.820	0.090	0.150	0.117	2.030	0.00	130.33	
269.529	0.632	0.390	0.132	129.374	0.101	0.820	0.101	0.150	0.146	2.080	0.00	133.93	**TOP OF STONE**
269.554	0.661	0.390	0.143	129.374	0.112	0.820	0.112	0.150	0.174	2.110	0.00	134.05	
269.580	0.689	0.390	0.154	129.374	0.124	0.820	0.124	0.150	0.203	2.120	0.00	134.15	
269.605	0.718	0.390	0.166	129.374	0.135	0.820	0.135	0.150	0.232	2.120	0.00	134.24	
269.630	0.747	0.390	0.177	129.374	0.146	0.820	0.146	0.150	0.261	2.120	0.00	134.33	
269.656	0.776	0.390	0.188	129.374	0.157	0.820	0.157	0.150	0.289	2.120	0.00	134.42	
269.681	0.804	0.390	0.199	129.374	0.168	0.820	0.168	0.150	0.318	2.120	0.00	134.51	
269.707	0.833	0.390	0.211	129.374	0.180	0.820	0.180	0.150	0.347	2.120	0.00	134.60	
269.732	0.862	0.390	0.222	129.374	0.191	0.820	0.191	0.150	0.375	2.120	0.00	134.69	
269.757	0.891	0.390	0.233	129.374	0.202	0.820	0.202	0.150	0.404	2.120	0.00	134.79	
269.783	0.919	0.390	0.244	129.374	0.213	0.820	0.213	0.150	0.433	2.120	0.00	134.88	
269.808	0.948	0.390	0.255	129.374	0.225	0.820	0.225	0.150	0.462	2.120	0.00	134.97	
269.834	0.977	0.390	0.267	129.374	0.236	0.820	0.236	0.150	0.490	2.120	0.00	135.06	
269.859	1.005	0.390	0.278	129.374	0.247	0.820	0.247	0.150	0.519	2.120	0.010	135.16	
269.884	1.034	0.390	0.289	129.374	0.258	0.820	0.258	0.150	0.548	2.120	0.160	135.40	
269.910	1.063	0.390	0.300	129.374	0.269	0.820	0.269	0.150	0.577	2.120	0.720	136.05	
269.935	1.092	0.390	0.312	129.374	0.281	0.820	0.281	0.150	0.605	2.120	1.870	137.29	100 YR. STORM ELEV = 269.939
269.961	1.120	0.390	0.323	129.374	0.292	0.820	0.292	0.150	0.634	2.120	3.960	139.47	

VOLUME CALCULATION DOES NOT INCLUDE CATCHBASIN LEEDS AND CATCHBASIN STORAGE

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	VIVEK SHARMA 647-463-9803 VIVEK.SHARMA@ADS-PIPE.COM
ADS SALES REP:	ANDREW OKOLISAN 519-670-0564 ANDREW OKOLISAN@ADS-PIPE.COM
PROJECT NO:	S080669

ADVANCED DRAINAGE SYSTEMS, INC.

HURON MOTOR PRODUCTS

EXTER, ONTARIO -CANADA

STORMTECH CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740 OR SC-310.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE CSA S6 CL-625 TRUCK AND THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL BE CERTIFIED TO CSA B184, "POLYMERIC SUB-SURFACE STORMWATER MANAGEMENT STRUTURES", AND MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418-16 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS. STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 150 mm (6") SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 20-50 mm (3/4-2").
8. THE CONTRACTOR MUST REPORT ANY KNOWN DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 900 mm (36") OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT

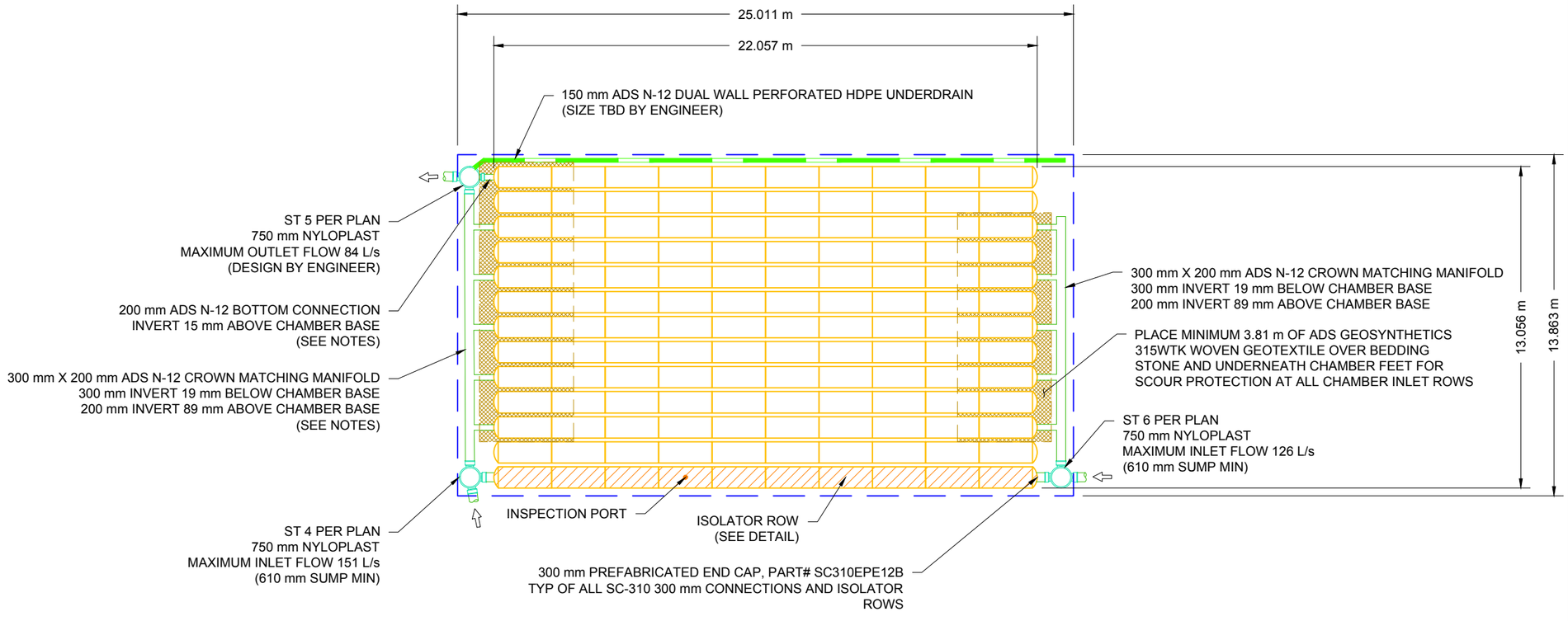
130	STORMTECH SC-310 CHAMBERS
26	STORMTECH SC-310 END CAPS
152	STONE ABOVE (mm)
152	STONE BELOW (mm)
40	% STONE VOID
131.2	**INSTALLED SYSTEM VOLUME (m^3) (PERIMETER STONE INCLUDED)**
347	SYSTEM AREA (m^2)
78	SYSTEM PERIMETER (m)

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	271.814
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	269.986
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	269.833
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	269.833
MINIMUM ALLOWABLE GRADE (TOP OF RIGID PAVEMENT):	269.833
TOP OF STONE:	269.528
TOP OF SC-310 CHAMBER:	269.376
300 mm X 200 mm MANIFOLD INVERT (200 mm PIPE):	269.059
300 mm ISOLATOR ROW INVERT:	268.994
200 mm BOTTOM CONNECTION INVERT :	268.985
BOTTOM OF SC-310 CHAMBER:	268.970
300 mm X 200 mm MANIFOLD INVERT (300 mm PIPE):	268.951
UNDERDRAIN INVERT:	268.818
BOTTOM OF STONE:	268.818

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.
- THIS CHAMBER SYSTEM WAS DESIGNED WITHOUT SITE-SPECIFIC INFORMATION ON SOIL CONDITIONS OR BEARING CAPACITY. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR DETERMINING THE SUITABILITY OF THE SOIL AND PROVIDING THE BEARING CAPACITY OF THE INSITU SOILS. THE BASE STONE DEPTH MAY BE INCREASED OR DECREASED ONCE THIS INFORMATION IS PROVIDED.



HURON MOTOR PRODUCTS
EXTER, ONTARIO -CANADA

DATE: 4/24/2018 | DRAWN: PM | CHECKED: CJD

PROJECT #: S080669

REV	DWN	CKD	DESCRIPTION
4/25/2018	PM	RWD	UPDATE PER ENG
07-13-18	JKL	GFI	UPDATED PER ENG. REQUEST

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

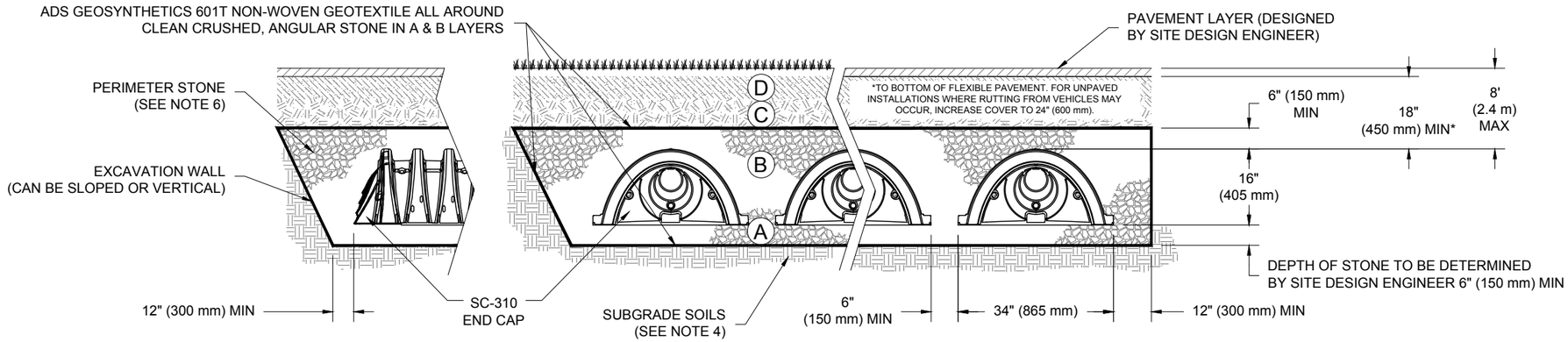
ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

SCALE = 1 : 200

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [2] [3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

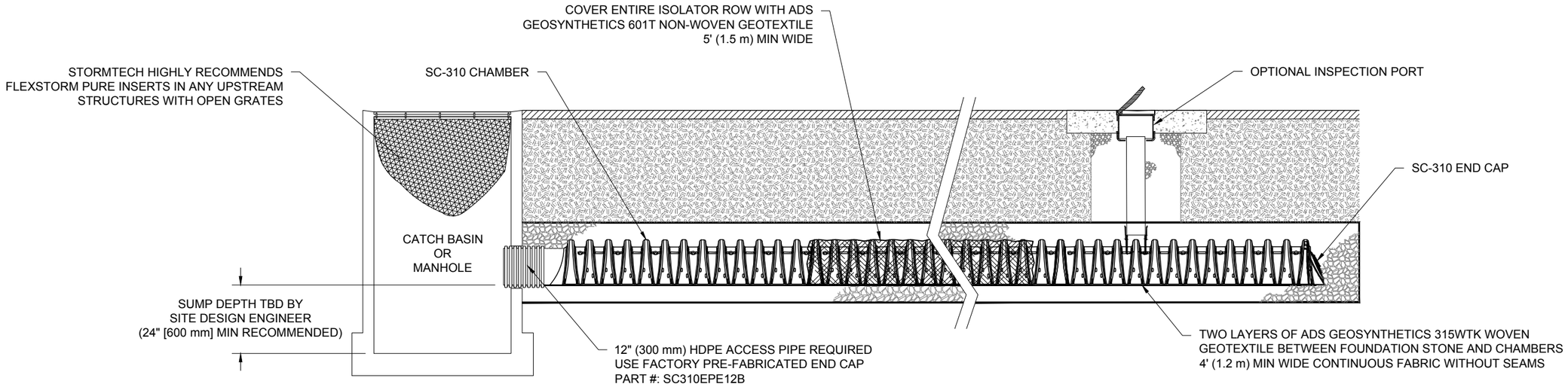
1. SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922
"STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

HURON MOTOR PRODUCTS
EXTER, ONTARIO -CANADA
DATE: 4/24/2018 | DRAWN: PM | PROJECT #: S080669 | CHECKED: CJD

REV	DWN	CKD	DESCRIPTION
4/25/2018	PM	RWD	UPDATE PER ENG
07-13-18	JKL	GFI	UPDATED PER ENG. REQUEST

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

4640 TRUEMAN BLVD
HILLIARD, OH 43026
ADS
ADVANCED DRAINAGE SYSTEMS, INC.



SC-310 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

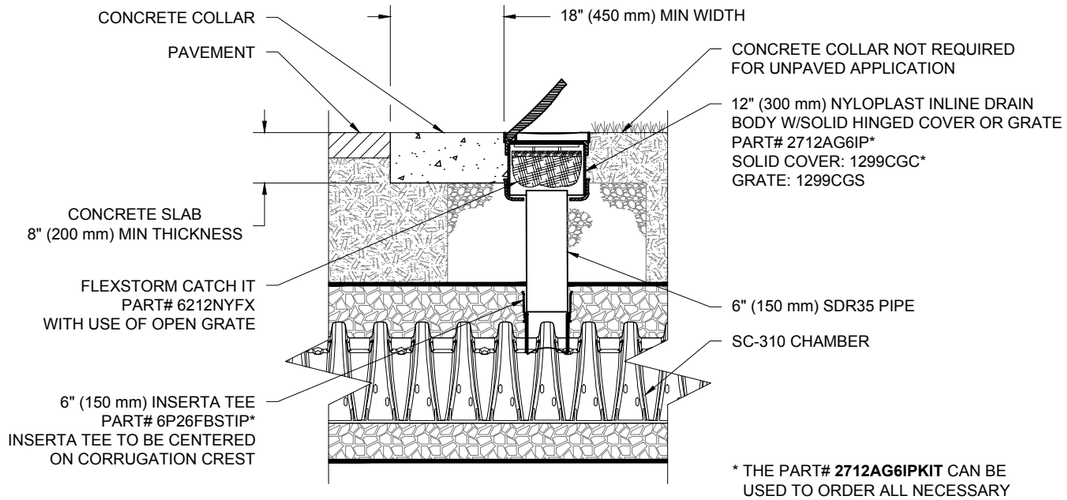
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



* THE PART# **2712AG6IPKIT** CAN BE USED TO ORDER ALL NECESSARY COMPONENTS FOR A SOLID LID INSPECTION PORT INSTALLATION

SC-310 6" INSPECTION PORT DETAIL
NTS

HURON MOTOR PRODUCTS
EXTER, ONTARIO -CANADA

DATE: 4/24/2018 | DRAWN: PM | PROJECT #: S080669 | CHECKED: CJD

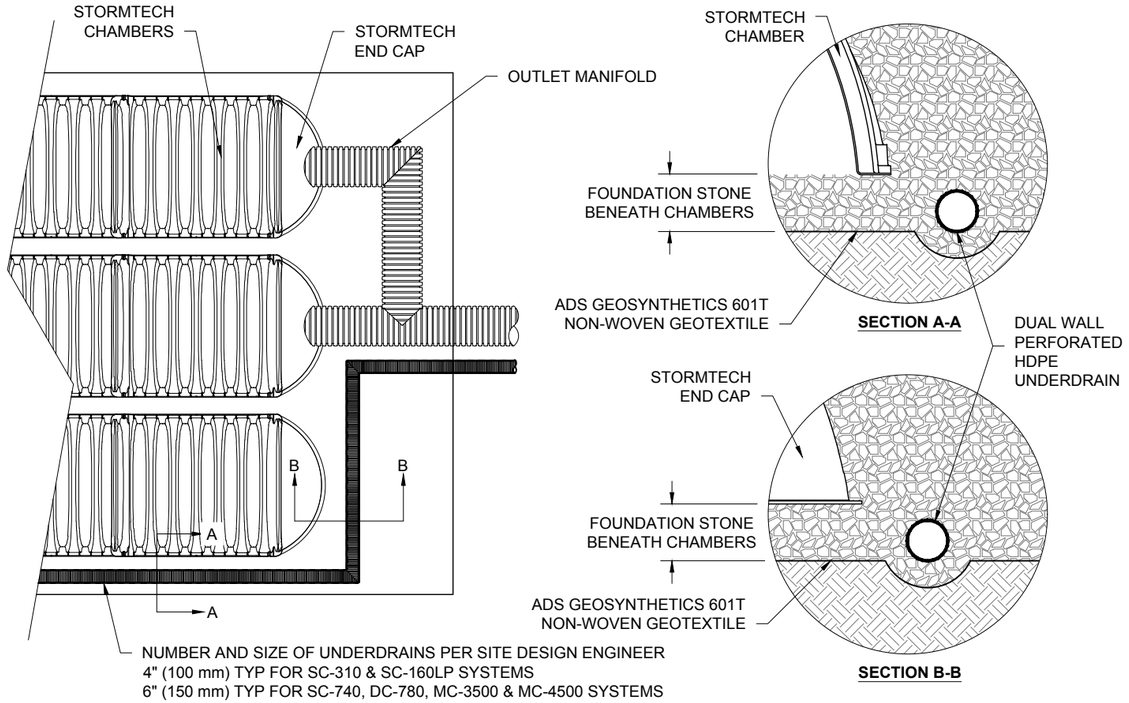
REV	DWN	CKD	DESCRIPTION
4/25/2018	PM	RWD	UPDATE PER ENG
07-13-18	JKL	GFI	UPDATED PER ENG. REQUEST

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

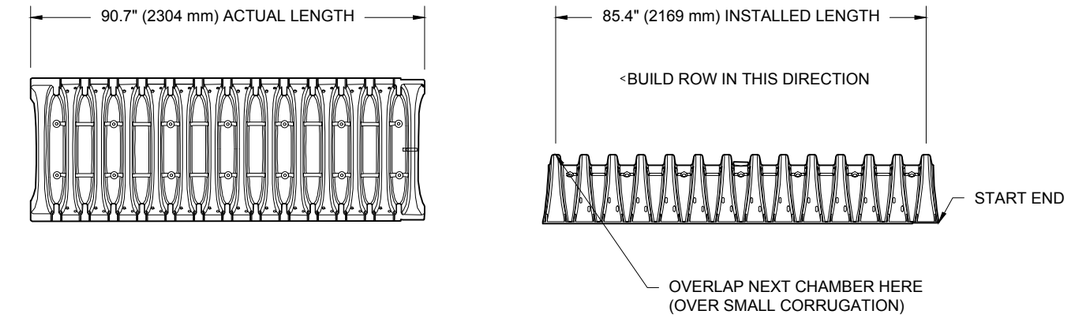
UNDERDRAIN DETAIL

NTS



SC-310 TECHNICAL SPECIFICATION

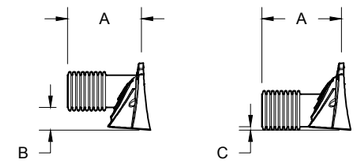
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

HURON MOTOR PRODUCTS
EXTER, ONTARIO -CANADA

DATE: 4/24/2018 DRAWN: PM
PROJECT #: S080669 CHECKED: CJD

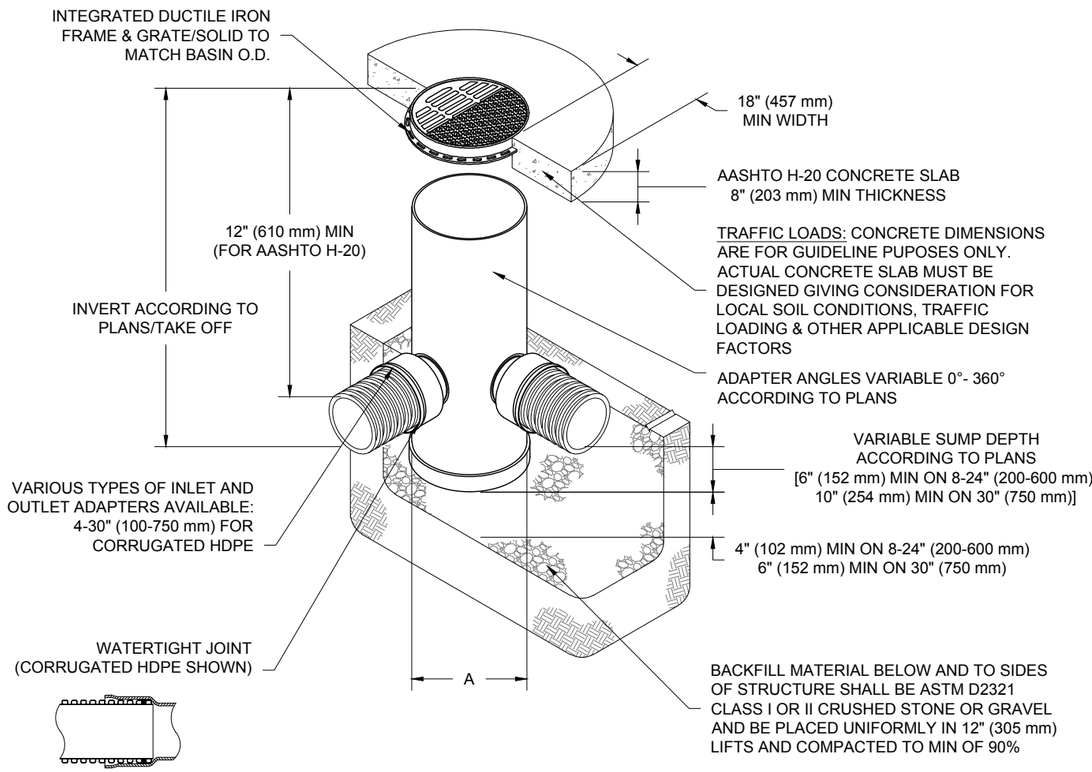
REV	DWN	CKD	DESCRIPTION
4/25/2018	PM	RWD	UPDATE PER ENG
07-13-18	JKL	GFI	UPDATED PER ENG. REQUEST

StormTech
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026

NYLOPLAST DRAIN BASIN

NTS



NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

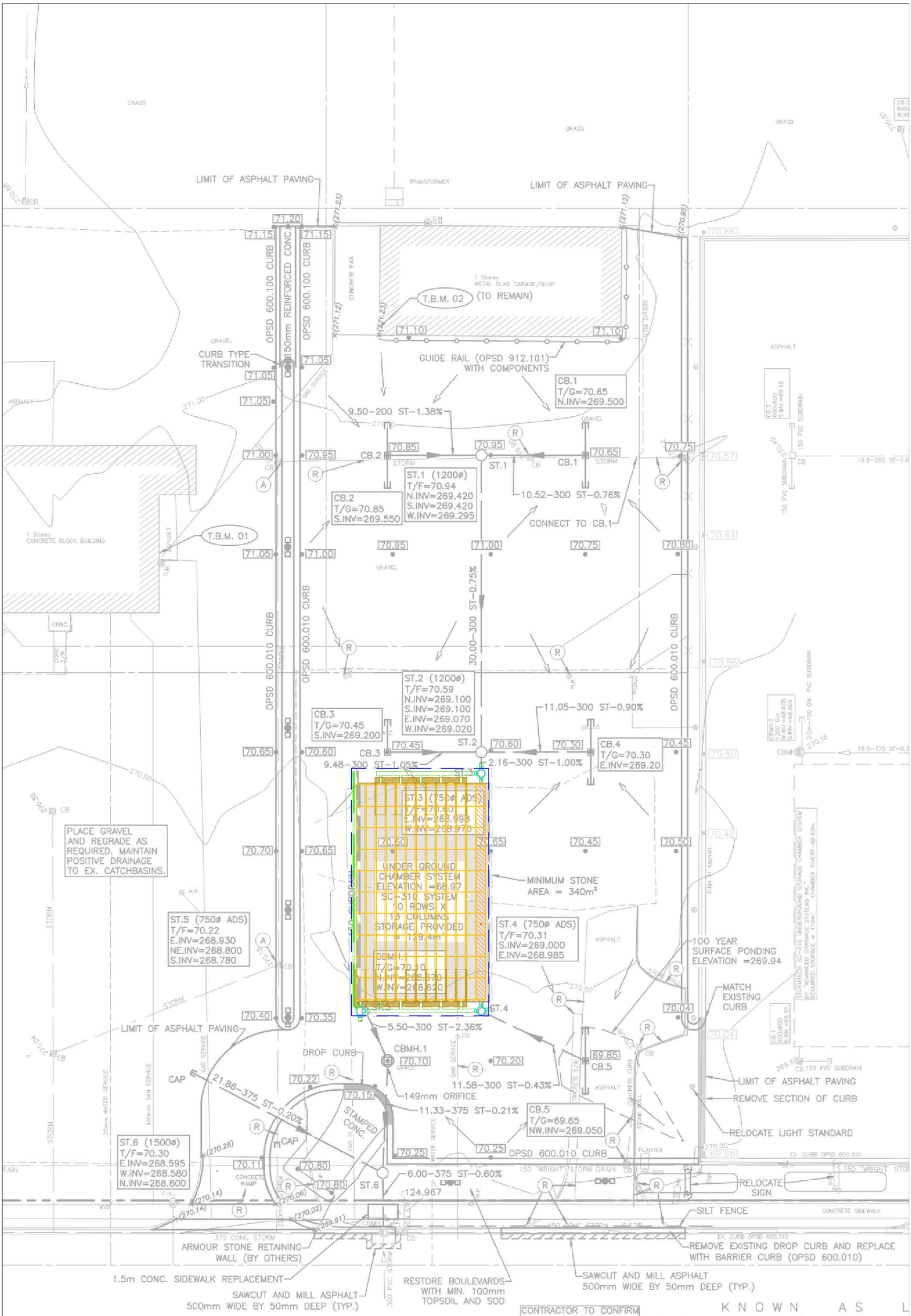
HURON MOTOR PRODUCTS
EXTER, ONTARIO -CANADA

DATE: 4/24/2018 DRAWN: PM
PROJECT #: S080669 CHECKED: CJD

REV	DWN	CKD	DESCRIPTION
4/25/2018	PM	RWD	UPDATE PER ENG
07-13-18	JKL	GFI	UPDATED PER ENG. REQUEST

3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

4640 TRUEMAN BLVD
HILLIARD, OH 43026


LIMIT OF ASPHALT PAVING
LIMIT OF ASPHALT PAVING
TRANSFORMER
GRASS
GRASS
GRASS
OPSD 600.100 CURB
150mm REINFORCED CONC.
OPSD 600.100 CURB
CONCRETE PAD
1 Storey METAL CLAD GARAGE/SHOP
T.B.M. 02
(TO REMAIN)
GRAVEL
CURB TYPE TRANSITION
GUIDE RAIL (OPSD 912.101) WITH COMPONENTS
CB.1
T/G=70.65
N.INV=269.500
9.50-200 ST-1.38%
CB.2
T/G=70.85
S.INV=269.550
ST.1 (1200ø)
T/F=70.94
N.INV=269.420
S.INV=269.420
W.INV=269.295
10.52-300 ST-0.76%
CONNECT TO CB.1
1 Storey CONCRETE BLOCK BUILDING
T.B.M. 01
OPSD 600.010 CURB
30.00-300 ST-0.75%
OPSD 600.010 CURB
ST.2 (1200ø)
T/F=70.59
N.INV=269.100
S.INV=269.100
E.INV=269.070
W.INV=269.020
11.05-300 ST-0.90%
CB.3
T/G=70.45
S.INV=269.200
9.48-300 ST-1.05%
2.16-300 ST-1.00%
CB.4
T/G=70.30
E.INV=269.20
ST.3 (750ø ADS)
T/F=70.60
E.INV=268.998
W.INV=268.970
UNDER GROUND CHAMBER SYSTEM ELEVATION =68.97
SC-310 SYSTEM
10 ROWS X 15 COLUMNS
STORAGE PROVIDED = 129.4m³
MINIMUM STONE AREA = 340m²
PLACE GRAVEL AND REGRADE AS REQUIRED. MAINTAIN POSITIVE DRAINAGE TO EX. CATCHBASINS.
ST.5 (750ø ADS)
T/F=70.22
E.INV=268.930
NE.INV=268.800
S.INV=268.780
ST.4 (750ø ADS)
T/F=70.31
S.INV=269.000
E.INV=268.985
100 YEAR SURFACE PONDING ELEVATION =269.94
MATCH EXISTING CURB
CBMH.1
T/G=70.10
S.INV=268.530
W.INV=268.500
ST.4
5.50-300 ST-2.36%
LIMIT OF ASPHALT PAVING
DROP CURB
CAP
21.86-375 ST-0.20%
149mm ORIFICE
11.33-375 ST-0.21%
CB.5
T/G=69.85
NW.INV=269.050
11.58-300 ST-0.43%
CB.5
LIMIT OF ASPHALT PAVING
REMOVE SECTION OF CURB
RELOCATE LIGHT STANDARD
RELOCATE SIGN
ST.6 (1500ø)
T/F=70.30
E.INV=268.595
W.INV=268.580
N.INV=268.600
STAMPED CONC.
CAP
OPSD 600.010 CURB
6.00-375 ST-0.60%
ST.6
124.967
150 "WRIGHT" STORM DRAIN
SILT FENCE
ARMOUR STONE RETAINING WALL (BY OTHERS)
375 CONC STORM
REMOVE EXISTING DROP CURB AND REPLACE WITH BARRIER CURB (OPSD 600.010)
1.5m CONC. SIDEWALK REPLACEMENT
SAWCUT AND MILL ASPHALT 500mm WIDE BY 50mm DEEP (TYP.)
RESTORE BOULEVARDS WITH MIN. 100mm TOPSOIL AND SOD
SAWCUT AND MILL ASPHALT 500mm WIDE BY 50mm DEEP (TYP.)
CONTRACTOR TO CONFIRM INVERT OF CATCHBASIN MANHOLE AND ADVISE CONSULTANT PRIOR TO CONNECTING NEW 375 STORM SEWER. KNOCK-OUT AND TIE INTO MANHOLE AT INV=268.53
KNOWN AS
(KING'S HIGHWAY No. 4)
(Original Road Allowanc
SITE BENCHMARK:
T.B.M. 01
FINISHED FLOOR OF BUILDING TO THE NORTH (WHERE SHOWN)
Elevation=271.07m
FICATE
D GRADING AND
LY WITH SOUND
ATTERNS ON AND
NING LANDS OR
NOTE:
DIMENSIONS ARE TO EDGE OF ASPHALT UNLESS SHOWN OTHERWISE.
ADD 200 METRES TO ALL PROPOSED ELEVATIONS.
AS CONSTRUCTED SERVICES
COMPLETION
No.
REVISIONS
DATE
BY
CONSULTANT OR DIVISION