CORPORATION OF THE TOWN OF AMHERSTBURG
BY-LAW NO. 2016-86

By-law to authorize the execution of a Development Agreement between Pacitti Contracting Company Incorporated and the Council of The Corporation of the Town of Amherstburg 580 Middle Sideroad, Amherstburg

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WHEREAS under Section 8 of the Municipal Act 2001, S.O., 2001, c. 25, as amended, a municipality has the capacity, rights, powers and privileges of a natural person for the purpose of exercising its authority under this or any other Act.

AND WHEREAS under Section 9. (1) (a) and (b) of the Municipal Act 2001, S.O., 2001, c. 25, as amended, Section 8 shall be interpreted broadly so as to confer broad authority on municipalities to enable them to govern their affairs as they consider appropriate and to enhance their ability to respond to municipal issues;

AND WHEREAS the Council of The Corporation of the Town of Amherstburg and owners of said property have agreed to the terms and conditions of a Development Agreement in the form annexed hereto;

NOW THEREFORE the Council of the Corporation of the Town of Amherstburg enacts as follows:

1. THAT By-law 2004-52 is hereby repealed;

2. THAT the Mayor and Clerk be hereby authorized to enter into a Development Agreement between Pacitti Contracting Company Incorporated and the Corporation of the Town of Amherstburg for the development of 580 Middle Sideroad for a commercial development, said agreement affixed hereto;

3. THAT this By-law shall come into force and take effect immediately upon the final passing thereof at which time all by-laws that are inconsistent with the provisions of this by-law and the same are hereby amended insofar as it is necessary to give effect to the provisions of this by-law.

Read a first, second and third time and finally passed this 26th day of September, 2016.

MAYOR – ALDO DICARLO

CLERK – PAULA PARKER

DEVELOPMENT AGREEMENT

THIS AGREEMENT made in quadruplicate this 26th day of September, 2016.

BETWEEN: **PACITTI CONTRACTING COMPANY INC.**
A corporation incorporated pursuant to and subsisting under the laws of the Province of Ontario

(Hereinafter collectively called "**Owner**")

OF THE FIRST PART;

- and -

THE CORPORATION OF THE TOWN OF AMHERSTBURG

(hereinafter called the "**Corporation**")

OF THE SECOND PART;

Hereinafter collectively referred to as the "**Parties**"

WHEREAS the lands affected by this Agreement are described in Schedule "A" attached hereto, and are hereinafter referred to as the "**Development Lands**";

AND WHEREAS the Pacitti Contracting Company Inc. warrants it is the registered owner of the Lands outlined in Schedule "A";

AND WHEREAS, in this Agreement the "**Owner**" includes an individual, an association, a partnership or corporation and, wherever the singular is used therein, it shall be construed as including the plural;

AND WHEREAS the Official Plan in effect in Amherstburg designated parts of the area covered by the Official Plan, including the Lands, as a Site Plan Control area;

AND WHEREAS the Owner intends to develop or redevelop the said lands for neighbourhood commercial use in accordance with the Site Plan attached hereto as Schedule "D", and hereinafter referred to as the "Site Plan";

AND WHEREAS the Corporation as a condition of development or redevelopment of the said lands requires the Owner to enter into a Development Agreement;

NOW THEREFORE THIS AGREEMENT WITNESSETH that in consideration of the premises, along with the sum of FIVE ($5.00) DOLLARS of lawful money of Canada, now paid by each of the Parties hereto to each of the other parties hereto, the receipt and sufficiency of which are hereby acknowledged, the Owner hereby covenants and agrees with the Corporation as follows:

1. The following Schedules attached hereto, are hereby made a part of this Agreement, as fully and to all intents and purposes as though recited in full herein:

   Schedule "A" - Legal description of the Development Lands

   Schedule "B" - Topographic Survey

   Schedule "C"- Phase 2 Build- Out, Existing Development

   Schedule "D"- Phase 2 Build- Out, Phase 2, Site Plan including without the generality thereof:

(a) The location of all buildings and structures to be erected;
(b) The location and provision of parking facilities and access driveways, including driveways for emergency vehicles;
(c) Walkways and all other means of pedestrian access; and
(d) The location and provision for the collection and storage of garbage and other waste materials.
(e) The location of grass and landscaped areas.
(f) The location of the existing stormwater management pond.
(g) The location of the existing and proposed septic tile beds.

Schedule "E"- Landscape Site Plan (LS);

Schedule "F"- Building Elevations (A-1 & A-2);

Schedule "G"- Stormwater Management Plan for Proposed New Development, Dillon Consulting, July 11, 2016

Schedule "H"- Stormwater Management Plan from the first phase of the development, 2004

Schedule "I"- Amending Site Plan drawings 2009, including the Site Grading, Storm Sewer and Watermain Layout, Site Plan and Landscape Design, Sheets 1, 2 and E/M

2. The Owner shall be responsible for consulting with and obtaining any necessary approvals from Hydro One regarding any matters that relate to services for the Development Lands to be provided by Hydro One. In addition, the Owner shall be responsible for any costs associated with the reconstruction, relocation or changes to the hydro system resulting from this development.

3. The Owner shall be responsible for consulting with and obtaining any necessary approvals from Union Gas and Bell Canada regarding any matters that relate to services to be provided by Union Gas and Bell Canada. In addition, the Owner shall be responsible for any costs associated with the reconstruction, relocation or changes to these services resulting from this development.

4. If any proposed upgrades to the existing utilities within the municipal right-of-way are required, the Owner must provide copies of the plans on any utility work to the Corporation.

5. The Owner shall be responsible for consulting with and obtaining any necessary approval or permits from the Ministry of the Environment and Climate Change, the County of Essex and/or the Essex Region Conservation Authority (E.R.C.A.).

6. The Owner shall be responsible for consulting with and obtaining any necessary approvals from the Ministry of Culture, Tourism and Sport.

7. All of the exterior walls of the building shall be as per the elevation drawings as shown on Schedules "F" hereto.

8. All parking or loading areas and lanes and driveways shall be paved with concrete, asphalt or other material capable of permitting accessibility under all climatic conditions, as shown on Schedules "C" and "D" and together with

crushed stone or gravel, having a combined depth of at least 15.2 cm and with provisions for drainage facilities.

9. The Owner shall maintain a minimum of parking spaces, as designated on Schedules "C" and "D".

10. All walkways on the said lands, where so designated on Schedule "C" and "D", shall be constructed of concrete, asphalt or other material capable of permitting accessibility under all climatic conditions by the Owner to the satisfaction of the Corporation. To ensure that this development is accessible to persons with disabilities, the Owner acknowledges that all sidewalks, walkways and islands within this development shall be constructed in such a manner as to safely accommodate persons with special mobility needs.

11. If any curbs, sidewalks, boulevards or highway surfaces of the Corporation are damaged during the development by the Owner, such damage shall be repaired or replaced by the Owner.

12. Snow removal from the parking or loading areas and lanes, driveways and walkways shall be the responsibility of the Owner.

13. The Owner shall install, maintain and direct a system for the disposal of storm and surface water as indicated on the Schedules to the satisfaction of the Corporation, so that no such water will flow along the surface from the said lands onto any adjoining lands. The Owner shall provide a stormwater management plan as necessary to the satisfaction of the criteria of the Corporation and the E.R.C.A.

14. The Owner shall retain the services of a duly qualified engineer to finalize a stormwater quality and quantity management plan to determine the effects of increased surface run-off due to the development of the lands described on Schedule "A" attached hereto. In addition, the said plan, shall ensure that the measures shall control any increases in flows in the downstream watercourses, so as to ensure that the capacity of the watercourses can be maintained up to and including 1:100 year storm event. The stormwater management and floodplain management plans shall be submitted to the E.R.C.A. and the Corporation for approval.

15. The Owner shall, at their own expense, install and implement any and all stormwater quality and quantity management measures and floodplain management measures so identified in the said engineering plans which measures must be implemented or installed to the satisfaction of E.R.C.A. and the Corporation. The Owners shall obtain any and all permits necessary from E.R.C.A. prior to the commencement of any construction or site alteration activities on the subject lands, including placement and the grading of fill material.

16. Site drainage shall be provided for the building in locations and according to the specifications prescribed by the approved Site Services Plan and as approved by the Corporation. Site drainage shall be installed contemporaneously with the construction of the building.

17. The Owners shall, at their own expense, prepare a site grading plan and site drainage plan for this development, which plan shall be filed with the Corporation. The final elevations of all buildings, and the final site grades relating thereto shall conform to the site grading and site drainage plan as filed. A Consulting Engineer, an Ontario Land Surveyor or a Certified Engineering Technologist shall certify or declare, upon completion of the construction of the building that the said site grading and site drainage plan has been complied with, and until such time as the said certification or declaration has been received by the Corporation, occupancy of the building on the subject lands shall not be granted.

18. Any garbage or refuse that is stored outside shall be stored in a non-combustible container and maintained so that the garbage or refuse does not blow or fall out of the container.

19. Any and all lighting shall be installed and maintained in accordance with the standards set out in the Town's Development Manual, and, so as to not, in the opinion of the Corporation, interfere with the use or enjoyment of adjacent properties or with the safe flow of traffic on abutting or adjacent streets.

20. The Owner shall landscape and maintain the ground cover acceptable to the Corporation those lands so indicated on Schedules "E". The Owner agrees that the site will be inspected on an annual basis and any deficiencies will require immediate correction in accordance with the approved site plan.

21. The Owner shall provide a lot grading plan for the development detailing the finished grade elevation of the Lands as well as all drainage services, works and facilities required for the proper development of the Lands.

22. The Owner agrees that any Municipal property, including without limiting the generality of the foregoing, curbs, gutters, pavements, sidewalks, or landscaped areas on the public highway and any property belonging to a third party, which are damaged during construction or otherwise, shall be restored to the satisfaction of the Town. The Owner shall keep the subject lands in a state of good repair (including the cutting of weeds) and upon written notice from the Town shall correct deficiencies in the state of repair within ten (10) days thereof.

23. All driveways for emergency vehicles shall:
    1) Be connected with a public thoroughfare;
    2) Be designed and constructed to support expected loads imposed by firefighting equipment;
    3) Be surfaced with concrete, asphalt or other material capable of permitting accessibility under all climatic conditions;
    4) Have a clear width of 3 metres at all times;
    5) Be located not less than 3 metres and not more than 15.2 metres measured horizontally and at right angles from the face of the building;
    6) Have an overhead clearance not less than 4.5 metres;
    7) Have a change in gradient of not more than 1 in 12.5 over a minimum distance of 15.2 metres; and
    8) Have approved signs displayed to indicate the emergency route.

24. If the Ontario Building Code requires that an architect or professional engineer or both shall be responsible for the field review of any new building or extension provided for in this Agreement, the Owner shall not occupy or use or permit to be occupied or used any said new building or extension until after an architect or professional engineer has given to the Corporation a letter addressed to the Corporation and signed by him certifying that all services on or in the said lands, required for this development or redevelopment, newly installed by the Owner in connection with this development or redevelopment and not contained within a building, have been installed and completed in a manner satisfactory to the architect or professional engineer.

25. The Corporation through its servants, officers and agents including its building inspector, plumbing inspector, fire chief and Director of Engineering and Public Works may from time to time and at any time enter on the Lands to inspect:

    1) The progress of development;
    2) The state of maintenance as provided for in this Agreement.

26. In the event of any servant, officer or agent of the Corporation determining upon inspection that the development is not proceeding in strict accord with the plans and specifications filed with the Corporation, such servant, officer or agent shall forthwith place a notice requiring all work to be stopped upon the Lands, and shall forward a copy by registered mail to the Owner at his last address as shown by the revised assessment rolls, and the Owner shall forthwith correct the deficiency or deviation.

27. In the event of any servant, officer or agent of the Corporation upon inspection being of the opinion that the state of maintenance is not satisfactory, such servant, officer or agent shall forthwith forward notice of such opinion to the Owner by registered mail at his last address as shown from the revised assessment rolls, and the Owner shall forthwith correct the deficiency or appeal to Council of the Corporation as hereinafter provided.

28. In the event that an Owner should disagree with the opinion of the servant, officer or agent of the Corporation as to the progress of the development or as to the state of maintenance, such Owner shall appear before Council of the Corporation, which after hearing the Owner, shall be permitted to express its position as to whether such progress or maintenance is satisfactory, following which Council of the Corporation shall make a decision, by resolution, as to whether to lift or sustain the prior decision of the Corporation's servant, officer or agent, which shall constitute a final determination of the matter.

29. In the event that an Owner should fail to obey a stop work order issued under Section 26. hereof, the Owner recognizes the right of the Corporation to apply to the Courts for a restraining order.

30. In the event that an Owner should fail to correct a deviation or deficiency after notice pursuant to Sections 26 or 27 or after notice of an opinion, which Council of the Corporation determines is correct under Section 28, the Council of the Corporation may by law direct or default of the matter or thing being done by the Owner, after two (2) weeks notice to it by registered mail at the last shown address of the Owner pursuant to the revised assessment rolls of passage of such by-law, that such matter or thing be done by the Corporation at the expense of the Owner, which expense may be recovered by action or like manner as municipal taxes.

31. In the event of an Owner wishing to change at any time any of the buildings, structures or facilities described in the plans annexed or referred to in Section 1 hereof, it shall make application to Council of the Corporation for approval and shall not proceed with such change until approval is given by such Council, or in default by the Ontario Municipal Board, under the procedure set out in Section 41 of the Planning Act, R.S.O. 1990 herebefore referred to.

32. This Agreement and the provisions thereof do not give to the Owner or any person acquiring any interest in the said lands any rights against the Corporation with respect to the failure of the Owner to perform or fully perform any of its obligations under this Agreement or any negligence of the Owner in its performance of the said obligations.

33. In the event that no construction on the Lands has commenced on or before the expiry of one (1) year from the date of registration of this Agreement, the Corporation may subsequently, at its option, on one month's written notice to the Owner, terminate this Agreement, whereupon the Owner acknowledges that agrees that it will not be able to undertake any development construction on the Lands (or any further development or construction) on the Lands.

34. All facilities and matters required by this Agreement shall be provided and maintained by the Owner at its sole risk and expense to the satisfaction of the

Corporation and in accordance with the standards determined by the Corporation and in default thereof and without limiting other remedies available to the Corporation, the provisions of Section 446 of the Municipal Act shall apply.

35. A financial guarantee (certified cheque or irrevocable letter of credit – self renewing without burden of proof) for FIFTY PERCENT (50%) of the value of on-site improvements of this development, exclusive of buildings and structures, is required to be paid and/or posted with the Corporation, in addition to further financial security in the amount of ONE HUNDRED PERCENT (100%) for all off-site works required as part of this development. The Owner's engineer is required to provide a certified estimate of the cost of the on-site and off-site work for consideration by the Town's Director of Engineering and Infrastructure for his/her approval, with any decision by the Town's Director of Engineering and Infrastructure in this regard to be final and binding upon the Owner . Once the Town has inspected and approved the construction of the on-site and off-site works, the Owner will be required to provide security for a ONE (1) year maintenance period in the amount of FIFTEEN PERCENT (15%) of the cost of on-site and off-site improvements.

36. This Agreement shall be registered against the land to which it applies, at the expense of the Owner, and the Corporation shall be entitled, subject to the provisions of the Registry Act and the Land Titles Act, to enforce its provisions against the Owner named herein and any and all subsequent owners of the lands.

37. This Agreement shall ensure to the benefit of and be binding upon the Parties hereto and their respective heirs, executors, administrators, successors and permitted assigns.

38. This Agreement shall be governed by, and interpreted according to, the laws of the Province of Ontario and the laws of Canada applicable therein, and shall be treated in all respects as an Ontario Contract.

39. If any provision or part thereof of this Agreement be illegal or unenforceable, it or they shall be considered separate and severable from the Agreement, and the remaining provisions of the Agreement shall remain in force and effect and shall be binding upon the Parties hereto as though the said provision or part thereof had never been including in this Agreement.

40. The division of this Agreement into Articles, sections and subsections and the insertion of headings are for convenience of reference only and shall not effect the construction or interpretation hereof.

41. This Agreement may be executed in several counterparts, each of which when so executed shall be deemed to be an original, and such counterparts together shall constitute one and the same instrument and shall be effective as of the date set out above.

42. Words importing the singular number include the plural and vice versa; words importing the masculine gender include the feminine and neutral genders.

43. Schedules and other documents attached or referred to in this Agreement are an integral part of this Agreement, and are hereby incorporated into this Agreement by reference.

44. This Agreement constitutes the entire agreement among the Parties and except as herein stated and in the instruments and documents to be executed and delivered pursuant hereto, contains all of the representations and warranties of the respective Parties. There are no oral representations or warranties among the Parties of any kind. This Agreement may not be amended or modified in any respect except by written instrument signed by both Parties.

IN WITNESS WHEREOF the Owner and the Corporation (the latter under the hands and seals of its officers duly authorized in this regard), have executed this Agreement as of the date first above written.

OWNER: **PACITTI CONTRACTING COMPANY INC**

Per Aldo Pacitti

I have authority to bind the Corporation

THE CORPORATION OF THE TOWN OF AMHERSTBURG

Per Aldo DiCarlo, Mayor

Per Paula Parker, Clerk

We have authority to bind the Corporation

Authorized and approved by By-law No. 2016-86 enacted the 26th day of September, 2016.

SCHEDULE "A"

The following is a description of the land to which this instrument applies.

Part of Gore Lot, in the Rear of Lot 19, Concession 1,
Town of Amherstburg, County of Essex, Province of Ontario
P.I.N. 01546-0226 and 01546-0227

SCHEDULE "G" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Pacitti

TOWN OF AMHERSTBURG

Mayor- Aldo DiCarlo

Clerk- Paula Parker

MEMO

TO: John Henderson, P. Eng. - Essex Region Conservation Authority
Todd Hewitt, C.E.T. - Town of Amherstburg

FROM: Ian Wilson, P. Eng. - Dillon Consulting Limited

cc: Rebecca Belanger, Manager of Planning Services – Town of Amherstburg

DATE: July 11, 2016

SUBJECT: 580 Middle Sideroad – Stormwater Management Plan for Proposed New Development

OUR FILE: 15-2001-2000

Dillon Consulting Limited (Dillon) was retained by Pacitti Contracting Company Inc. (Pacitti) to provide professional services for a Site Plan Approval (SPA) application and site servicing for the proposed development at 580 Middle Sideroad (County Road 10), Amherstburg, Ontario (the site). Refer to **Figure 1** for a site location map. This memo summarizes the proposed stormwater management (SWM) design criteria, SWM assessment methodology/tools, and proposed SWM mitigation strategy for the site.

This memo will be submitted to the Essex Region Conservation Authority (ERCA) in support of the site's development permit and to the Town of Amherstburg (Town) in support of the site's SPA application.

1. Site History and Background

The subject property (580 Middle Sideroad) is currently zoned Commercial Neighbourhood type 11 (CN-11) and has a total site area of approximately 1.68 ha, where the western region is currently developed. The existing development on the property includes a single commercial building with parking lot and quantity control SWM pond. The remainder of the site is currently covered with manicured/mowed grass.

The existing quantity control pond was sized for zero release to accommodate runoff from the upstream development. However, the pond is currently pumped under the Essex Terminal Railway to the west of the site at nominal rate of approximately 4 l/s. There are currently no stormwater runoff quality control treatment solutions implemented on-site. The Essex County Soils Survey characterizes the soils on-site as Perth Clay Loam with slow drainage and a Hydrologic Soil Group (HSG) type of C.

On April 11, 2016, the *Ouellette Drain East Town of Amherstburg Drainage Report* by Stantec Consulting Limited dated August 22, 2014 was approved by the Town's Council. This Drainage Report confirmed that the site is within the Ouellette Drain East Watershed and is permitted to discharge to the same.

On May 6th, 2016 a meeting was held with the Town's Planning Services, the Town's Engineering Operations, and ERCA's Watershed Management Services where input was provided on the preliminary site plan. On June 29th, 2016 a meeting was held with the Ouellette Drain East's Drainage Engineer (Don Joudrey) who confirmed the proposed Drain inverts on the site will be lowered 0.35 m to accommodate positive drainage for the site's runoff. Correspondence and minutes are included in **Appendix A**.

2. Stormwater Management Assessment Tools and Methodology

The AutoDesk Storm and Sanitary Analysis 2014 (SSA) software was the hydrologic and hydraulic modelling tool utilized to estimate the site's characteristics under proposed conditions. The Rational Method was utilized to assess the allowable release rate. SSA is a comprehensive modelling package for analyzing and designing urban drainage systems and stormwater sewers which incorporates codes from various sources including USEPA SWM 5. In the SSA assessment, the hydrologic method considered was EPA SWMM SCS CN with hydrodynamic hydraulic link routing.

Data for the return period design storms were obtained from Environment Canada's Short Duration Rainfall Intensity-Duration-Frequency Data (Environment Canada, February 9, 2012) for the Windsor A Station (6139525). The design events were modelled as 24 hour events with a SCS type II distribution.

3. Design Criteria

In discussions with the ERCA and the Town it was confirmed that the allowable release rate for the site should follow the recommendations outlined in the *Ouellette Drain East Town of Amherstburg Drainage Report* (August 22, 2014). The Report's Drainage Engineer confirmed that the allowable release rate for the site shall be per a Rational Method "C" value of 0.60 under a 5 year storm event. **Appendix A** includes correspondence with the Drainage Engineer and meeting minutes with the Town and ERCA.

The total site area is approximately 1.68 ha, however, the existing and proposed development are within a smaller envelope of approximately 0.65 ha. The remainder of the site approximately 1.02 ha will remain as grassed lands and will continue to drain to the existing road side ditch on Middle Sideroad, the road side ditch on 2nd Concession Road, and to the Ouellette Drain East. Refer to **Figure 2** for a catchment map delineating the area of the site to have restricted runoff. The allowable release rate was estimated using the Rational Method and SSA was also used for a check as outlined in **Table 1**.

Table 1: Estimates of Allowable Release Rate

Rational Method		SSA	
Parameter	**Value**	**Parameter**	**Value**
Area	0.65 ha	Area	0.65 ha
Time of Concentration	10 min	Average Slope	0.5%
C Value	0.60	Percent Impervious*	57%
Peak Flow	120 l/s	Peak Flow	110 l/s

*Note: Percent impervious was estimated by converting the C value using the following formula:

$$\%IMP = \frac{C-0.02}{0.7}$$

The peak flow estimates from both methods produced similar results, but **120 l/s shall be utilized as the maximum allowable peak flow**, per the design requirements from the Town and ERCA.

ERCA confirmed that a **normal level of quality protection (70% TSS removal) shall be provided for the entire site** including the lands that have already been developed.

In regards to flood protection, **the lowest openings on all buildings shall be a minimum of 0.30 m above the highest estimated 100 year water level**.

4. Proposed Ultimate Conditions – Summary SWM of Improvements

The proposed SWM improvements for the site include the installation of new catch basins, new storm storms, and a new storm service connection to provide drainage for the proposed new building and parking lot expansion in the eastern region of the site.

A new water quality treatment unit is proposed downstream of the existing v-bottom pond. The pond outlet, currently pumped, shall be replaced with a new gravity outlet to the Ouellette Drain East. The existing pump and forcemain shall be abandoned. Refer to the attached drawings (Sheet 1) to see proposed ultimate conditions improvements.

5. Proposed Temporary Conditions – Summary SWM of Improvements

With the site owner's preferred completion date for construction being September, 2016; it is likely that the proposed drainage improvements to the Ouellette Drain East may not be completed prior to this date. To provide gravity drainage to the site the most significant improvement would be the new open drain to the east of the 2nd Concession Road. If the open drain is not completed by this time temporary SWM measures would be required on-site.

The proposed temporary conditions are recommended **until the Ouellette Drain East improvements east of 2nd Concession Road (i.e. the open drain sections) are completed**. Temporary conditions are presented in the attached drawings, refer to Sheet 2. It is anticipated that temporary conditions will only be required for a period less than one year. ERCA provided comments on the stormwater servicing requirements for the site's temporary conditions, refer to **Appendix A**.

In general, the temporary conditions SWM improvements will be the same as ultimate conditions except that the existing pump station will be utilized as the site's outlet and a temporary second storage pond to the north of the proposed development will be constructed by berming the existing downslope approximately 0.8 m above grade and cutting approximately 0.9m below grade. The temporary berm is proposed with a 3:1 side slope and shall be outside the existing floodplain. The hydraulic connection between the existing pond and proposed temporary pond will be provided by constructing a portion of the ultimate conditions gravity outlet.

6. Proposed Ultimate Conditions – Quantity Control

The proposed conditions model was developed to simulate the hydrologic and hydraulic characteristics of the site, including the potential backwater impact anticipated in the improved Ouellette Drain East.

The hydrologic elements (catchment areas) of the model included the catchments upstream of the site's storm sewer network, the catchment draining to the pond, and upstream areas outletting to the Ouellette Drain East. The catchments parameters are summarized in **Table 2**. The properties for catchment areas external to the site were approximated with aerial images provided by ESRI base mapping and Government of Canada - Canadian Digital Elevation Data (CDED) downloaded from GeoGreatis.

Table 2: Summary of Proposed Conditions Catchments

	Catchment ID	Area (Ha)	Average Slope (%)	Percent Impervious (%)	Equivalent Width (m)
Areas Upstream of SWM Pond	PR_N	0.08	0.5	100	15
	PR_SE	0.12	0.5	100	25
	PR_SW	0.03	0.5	100	15
	EX_N	0.07	0.5	100	20
	EX_C	0.13	0.5	100	20
	EX_S	0.09	0.5	55	30
	EX_P	0.13	0.14	15	30
External Areas	EXT_1	3.02	0.14	35	60
	EXT_2	20.98	0.14	35	115

The hydraulic elements of the model included existing and proposed storm sewers, the existing pond, the proposed new gravity outlet from the pond, and the outlet drain approximately 260 m downstream of the site. The modelled portion of the proposed Ouellette Drain East improvements included the 600 mm diameter sewer drain downstream of the site, the 900 mm diameter culvert proposed to cross under 2nd Concession Road, and 80 m of open ditch downstream of the culvert. **Figure 3** provides a schematic of the proposed conditions model complete with catchments and hydraulic links.

A summary of the estimated hydrologic and hydraulic ultimate conditions for the proposed improvements are summarized in **Table 3**. The lowest top of bank of the existing pond is approximately 181.15 m.

Table 3: Summary of Estimated Hydraulic Ultimate Conditions

Design Storm	Peak Inflow to Pond (l/s)	Peak WSEL in Existing Pond (m)	Peak Storage in Existing Pond (m^3)	Peak Outflow from Ex. Pond (l/s)	Peak WSEL in Drain D/S of Pond Outlet (m)
2 Year	90	179.63	20	60	179.20
5 Year	110	179.85	40	70	179.39
100 Year	215	180.62	130	85	180.31

Note: WSEL- indicates water surface elevation

From the findings outlined it the above **Table 3** the proposed ultimate conditions SWM solution provides adequate quantity control. The estimated 100 year peak flow from the site is 85 l/s which is less than the allowable release rate of 120 l/s. A freeboard greater 0.30 m is provided from the pond's top of bank to the estimated 100 year high water level.

7. Proposed Temporary Conditions – Quantity Control

The ultimate conditions SSA model was altered to reflect the proposed temporary conditions on-site. The alterations to the model included:

- removing the downstream Ouellette Drain East hydraulic links and associated external drainage areas;
- providing a pump type outflow control from the existing pond (limited to 4 l/s);
- providing a hydraulic connection from the existing pond to the temporary pond via the ultimate conditions 300 mm diameter outlet sewer; and
- providing a catchment to account for the additional upstream drainage area that would outlet to the temporary pond (approximately 0.14 ha).

Table 4: Summary of Estimated Hydraulic Temporary Conditions

Design Storm	Peak Inflow to Ex. Pond (l/s)	Peak WSEL in Existing Pond (m)	Peak WSEL in Temp. Pond (m)	Combined Peak Storage in Ex. & Temp. Pond (m^3)	Peak Outflow from Pump Station (l/s)
2 Year	85	179.89	179.89	145	3.8
5 Year	110	180.12	180.12	210	3.8
100 Year	220	180.69	180.69	420	4.0

Note: WSEL- indicates water surface elevation

From the findings outlined it the above, in **Table 4**, the proposed ultimate conditions SWM solution provides adequate quantity control. The estimated 100 year peak WSEL in the site's ponds are 180.69 m which provides a freeboard greater 0.30 m in both the existing pond and proposed temporary pond.

8. Proposed Conditions – Quality Control

The quality control objective for the proposed development was noted to be a normal level of treatment (70% TSS removal) per the MOECC Stormwater Management Planning and Design Manual (2003). It is recommended that an ADS Water Quality Treatment Unit, 3612WQ, be installed as outlined in the attached Drawings. Supplier information including recommended unit sizing and unit operation is provided in **Appendix D**.

9. Proposed Conditions – Flood Protection and Management

The finished floor elevations of the existing building is approximately **181.74 m** and the finished floor of the proposed new building is **182.10 m**. The lowest openings on these structures will be at or above these respective elevations. The following summarizes the estimated 100 year water surface elevations for the site's ultimate and temporary conditions:

- Ultimate Conditions under the 100 Year Event:
  - Existing Pond – 180.62 m
  - Ouellette Drain East (most upstream end site adjacent) – 180.33 m
  - Maximum Hydraulic Grade Line; site's storm sewer – 180.86 m
- Temporary Conditions under the 100 Year Event:
  - Existing Pond – 180.69 m
  - Temporary Pond – 180.69 m
  - Maximum Hydraulic Grade Line; site's storm sewer – 180.89 m

Under normal operations the existing pond will discharge through the proposed gravity outlet structure. However, under extreme conditions the gravity outlet system may become clogged, restricted, etc.; therefore an overflow spillway is provided to convey flow north of the site to catchbasin directly connected to the Ouellette Drain East.

10. Operational Maintenance of Stormwater Infrastructure

Proper maintenance is fundamental to insuring the proposed stormwater solutions operate as intended. Routine inspections of the condition of the catch basins, manholes, pond, treatment unit, pond outfall, and site grounds should be undertaken. The following summarizes the recommended maintenance procedures for the site.

Storm Sewers, Catch Basins and Manholes

Within the first two years of operation, the system should be inspected after major rainfall events and at a minimum of four times per year. After the first two years, inspections should be completed annually and include a visual check for standing water or build-up of debris in the catch basins /manholes:

- If sediment accumulation is observed in catch basins/manholes then maintenance will include removal of sediment with a vacuum truck.
- If there is an observed blockage in the sewer then a flushing and a video inspection may be required.

Pond

Within the first two years of operation, this system should be inspected after major rainfall events and at a minimum of four times per year. After the first two years, inspections should be completed annually with a visual check. The inspection could consider the following:

- Is the pond level higher than the normal permanent pool more than 24 hours after the storm? This could indicate an issue with the pond outlet.
- Is there an oily sheen on the water near the inlet or outlet; is the water frothy; or is there an unusual colour to the water? This may indicate the occurrence of oil and the need for cleanup.

Overgrown vegetation at the outfall of the pond should be cleared on an as-required basis to facilitate discharge from the site.

ADS Water Quality Treatment Unit

The manufacturer's recommendations for operations, maintenance and cleaning should be followed as outlined **Appendix D**. The maintenance interval will vary depending on the sediment loading to the unit.

11. Erosion and Sediment Control – Construction Period Measures

To minimize the potential for impairment of the quality of receiving waters during construction, an erosion abatement control plan will be implemented prior to and during construction. The plan will consist of the following:

- Silt fencing will be installed at the toe of the proposed stockpiles to intercept suspended solids carried by overland flow and to prevent the runoff from directly entering existing watercourses;
- Straw bale barriers will be installed in existing swales, drains, or at critical downstream flow points to intercept suspended solids carried by overland flow and to prevent the runoff from directly entering existing watercourses;
- Topsoil will be stripped only from areas necessary for new construction; and
- Appropriate grading techniques will be used to prevent increased runoff potential and maintain positive drainage.

A comprehensive erosion and sediment control plan will be developed by the site's contractor, which will be implemented prior to construction.

12. Discussion and Closure

The proposed stormwater solutions for the site considered quantity control requirements, water quality treatment, and flood protection.

The site's land owner intends to have the site's new building completed by September 2016; however it is unlikely the proposed improvements to the Ouellette Drain East will be completed by this time. Therefore a potential temporary condition's stormwater solution was also presented in this memo. Under ultimate conditions a gravity outlet will be provided to relieve the site's stormwater runoff; where runoff from all storms up to and including the 100 year event will be restricted to the allowable release rate or a lesser flow rate.

To provide a normal level of water quality protection it is recommended an ADS Water Quality Treatment Unit be installed.

All finish floor elevations and lowest openings will all be at least 0.30 m above the estimated 100 year WSEL summarized in this memo. An overflow spillway will be provided where under emergency conditions (i.e. clogged outlet pipe, etc.) potential floodwaters from the pond will be conveyed to the Ouellette Drain East.

Ian Wilson, P. Eng., M.A.Sc.

Appendix A

Town of Amherstburg, ERCA
& Drainage Engineer Correspondence

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CONSULTING

MEETING MINUTES

DILLON CONSULTING

Subject:	580 Middle Sideroad – Approval Agencies Site Review Meeting
Date and Time:	May 6, 2016 9:00 a.m.
Location:	Essex Region Conservation Authority, 360 Fairview Avenue West, Essex, Ontario
Our File:	15-2001

Attendees

John Henderson	Essex Region Conservation Authority (ERCA)
Todd Hewitt	Town of Amherstburg (Town)
Rebecca Belanger	Town of Amherstburg (Town)
Aldo Pacitti	Pacitti Contracting Company Inc.
D. Pacitti	Pacitti Contracting Company Inc.
Ian Wilson	Dillon Consulting Limited (Dillon)
Harry White	Dillon Consulting Limited (Dillon)

Notes

Item	Discussion	Action By
1.	**General – Review Draft Site Layout and Servicing**	
1.1.	Reviewed site layout and confirmed the Owner's requirement for site development and building construction to be completed prior to September 1st, 2016.	**Info.**
1.2.	New construction of a 6000 square foot building to the east of the existing building is proposed. The number of uses within the new building has not been confirmed.	**Info.**
2.	**Planning**	
2.1.	It was confirmed that a Zoning By-Law amendment is required for the proposed building use. The amendment public notice process will start immediately once paper work is received by the Town.	**Dillon/Town**
2.2.	It was confirmed that a Site Plan Approval (SPA) for the site is required. The process will be completed concurrently with the Zoning amendment. But the Zoning amendment will be presented to Council first.	**Dillon/Town**
2.3.	For the SPA, it was confirmed the following would be required: landscaping drawing, grading plan, stormwater management plan, building cross-sections, and legal survey.	**Dillon**

3. Ouellette Drainage Act Report

3.1.	It was noted that the proposed improvements in the drain will start after July 1st, 2016; however, the duration of this work may extend past September 1st, 2016.	**Info.**
3.2.	If the site development is completed prior to the drain improvements, it was confirmed that temporary stormwater management measures would be acceptable, but they must provide an adequate solution for up to the 100 year event. Increasing the 100 year flood plain in the Ouellette Drain at this time was noted as acceptable.	**Dillon**
3.3.	The stormwater management allowable release rate shall be confirmed with the Drainage Engineer.	**Dillon**
3.4.	To be conservative, the existing 100 year flood line elevation of 180.31 m shall be utilized for future design unless an updated number is confirmed.	**Info.**

Comment from J. Henderson:
This was acceptable provided that the only impacts were to lands owned by Mr. Pacitti.

4. Stormwater Servicing

4.1.	It was confirmed that a normal level of quality treatment protection shall be provided for the site. Where quality control was previously provided by the limited release rate from the pond.	**Dillon**
4.2.	The lowest opening on all buildings shall be a minimum 0.30 m above the highest 100 year estimated water level.	**Dillon**
4.3.	Appropriate overland flow routes shall be provided to the proposed stormwater management measures and as an emergency flow from the stormwater management measures (i.e. pond).	**Dillon**
4.4.	An ERCA permit shall be required for the site. The estimated permit cost was $1,750. The required supporting documentation shall include a stormwater management plan, a stormwater management report and site grading plan.	**Info./Dillon**

5. Sanitary Servicing

5.1.	A private sewage disposal system shall be provided for the proposed new building; which shall be outside the existing flood line. Septic system to be designed by others.	**Info.**

6. Watermain Servicing

6.1.	The proposed watermain service shall be off of the existing watermain on County Road 10 (Middle Sideroad).	**Info.**
6.2.	A 50 mm service to the new building will be provided. Potential	**Info./Town/Dillon**

install options include (A) a single meter to the building with a single water bill for the site or (B) a service to the new building with a common utility room with separate meters for each unit.

7. Lighting and Hydro

7.1.	For the SPA, it was confirmed that a lighting plan is not required; however, lighting details shall be included on the site plan.	**Info./Dillon**
7.2.	Hydro service will be provided by Hydro One.	**Info.**

Errors and/or Omissions

These minutes were prepared by Ian Wilson, P.Eng., (email: iwilson@dillon.ca), who should be notified of any errors and/or omissions.

Distribution

All Present

Eric Chamberlain	-	Town of Amherstburg
Flavio Forest	-	Dillon Consulting Limited

IDW:d

May 9, 2016

DILLON CONSULTING

Wilson, Ian <iwilson@dillon.ca>

Ouellette Drain East: Potential to lower the top end of the proposed drain

Wilson, Ian <iwilson@dillon.ca> Wed, Jun 29, 2016 at 10:02 AM
To: "donjoudrey@crozierbaird.ca" <donjoudrey@crozierbaird.ca>
Cc: Flavio Forest <fforest@dillon.ca>, Shane McVitty <smcvitty@amherstburg.ca>

Hi All,

The following summarizes the phone meeting (June 29, 9:30 am) with Don Joudrey (Drainage Engineer for the Ouellette Drain East) regarding the lowering of the Ouellette Drain East:

- It was confirmed that the proposed 600 mm pipe on Aldo Pacitti's property could be lowered by 350 mm;
- The lowering may be accomplished by making the slope of the downstream open drain milder (to be confirm by the Drainage Engineer); and
- Dillon will submit documentation supporting Mr. Pacitti's Site Plan Control Application, Rezoning Application, and ERCA permit with the understanding the drain will be lowered 350 mm.

Don, please let me know of any errors or omissions. Thanks and take care,

DILLON CONSULTING
70 years

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F - 519.948.5054
M - 519.791.2169
IWilson@dillon.ca
www.dillon.ca

[Quoted text hidden]

Appendix B

Supporting Figures

DILLON
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STORMWATER MANAGEMENT PLAN
580 MIDDLE SIDEROAD

LOCATION PLAN
FIGURE 1

SUBJECT SITE
EXISTING MUNICIPAL DRAINS
PROPOSED ALIGNMENT OF OUELLETTE DRAIN EAST (BY OTHERS)

DILLON CONSULTING

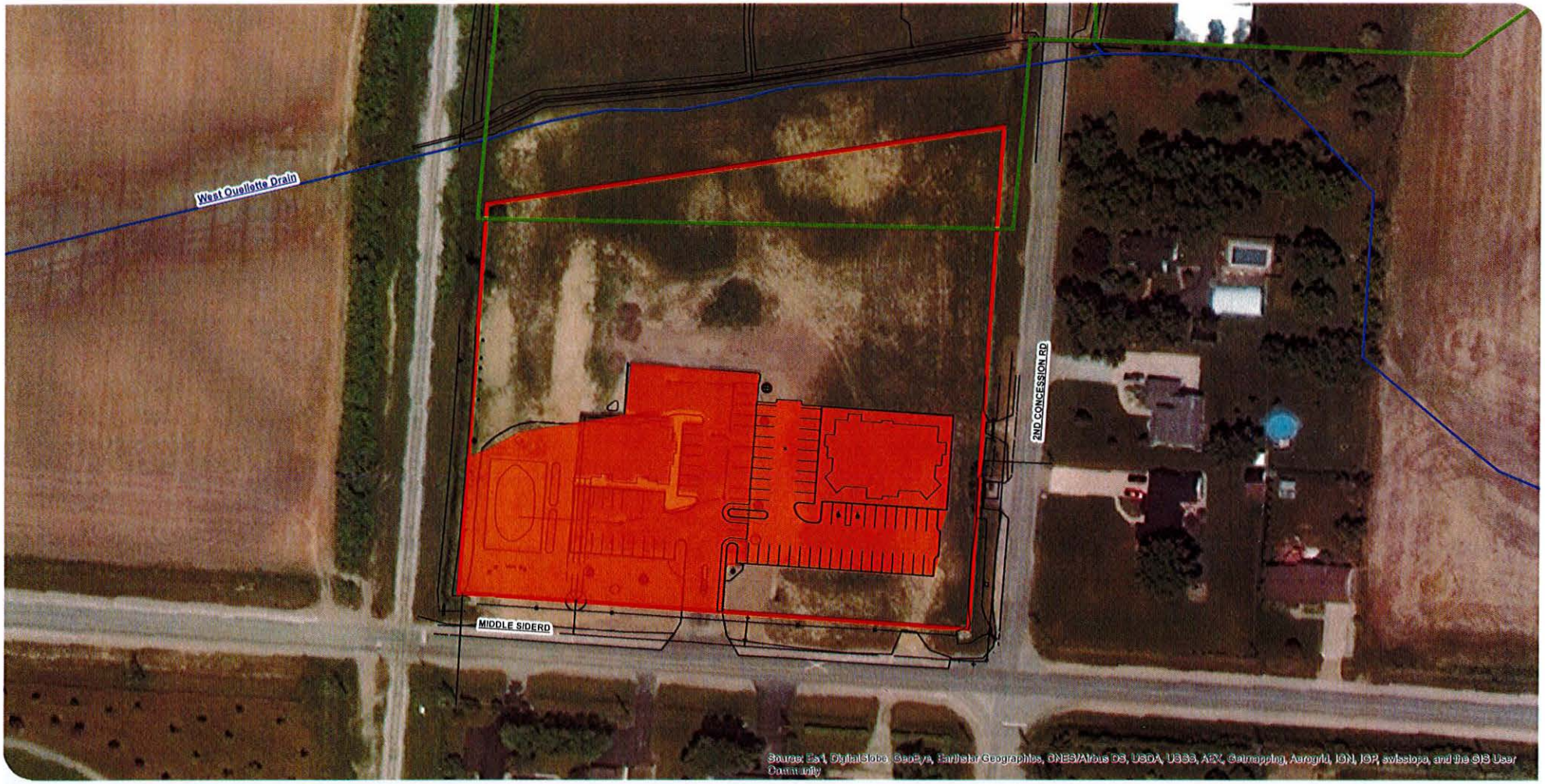
MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF & OMAFRA

MAP CREATED BY: IDW
MAP CHECKED BY: FF
MAP PROJECTION: NAD 1983 UTM Zone 17N

0 125 250 500 Meters
SCALE 1:15,000

THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY.

PROJECT: 15-2001 STATUS: FINAL DATE: 08/06/16



STORMWATER MANAGEMENT PLAN
580 MIDDLE SIDEROAD

CATCHMENT AREA PROPOSED TO DRAIN TO THE EXISTING POND
FIGURE 2

SUBJECT SITE
EXISTING MUNICIPAL DRAINS
PROPOSED CATCHMENT UPSTREAM OF POND
PROPOSED ALIGNMENT OF OUELLETTE DRAIN EAST (BY OTHERS)

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNR
& GOOGLE EARTH

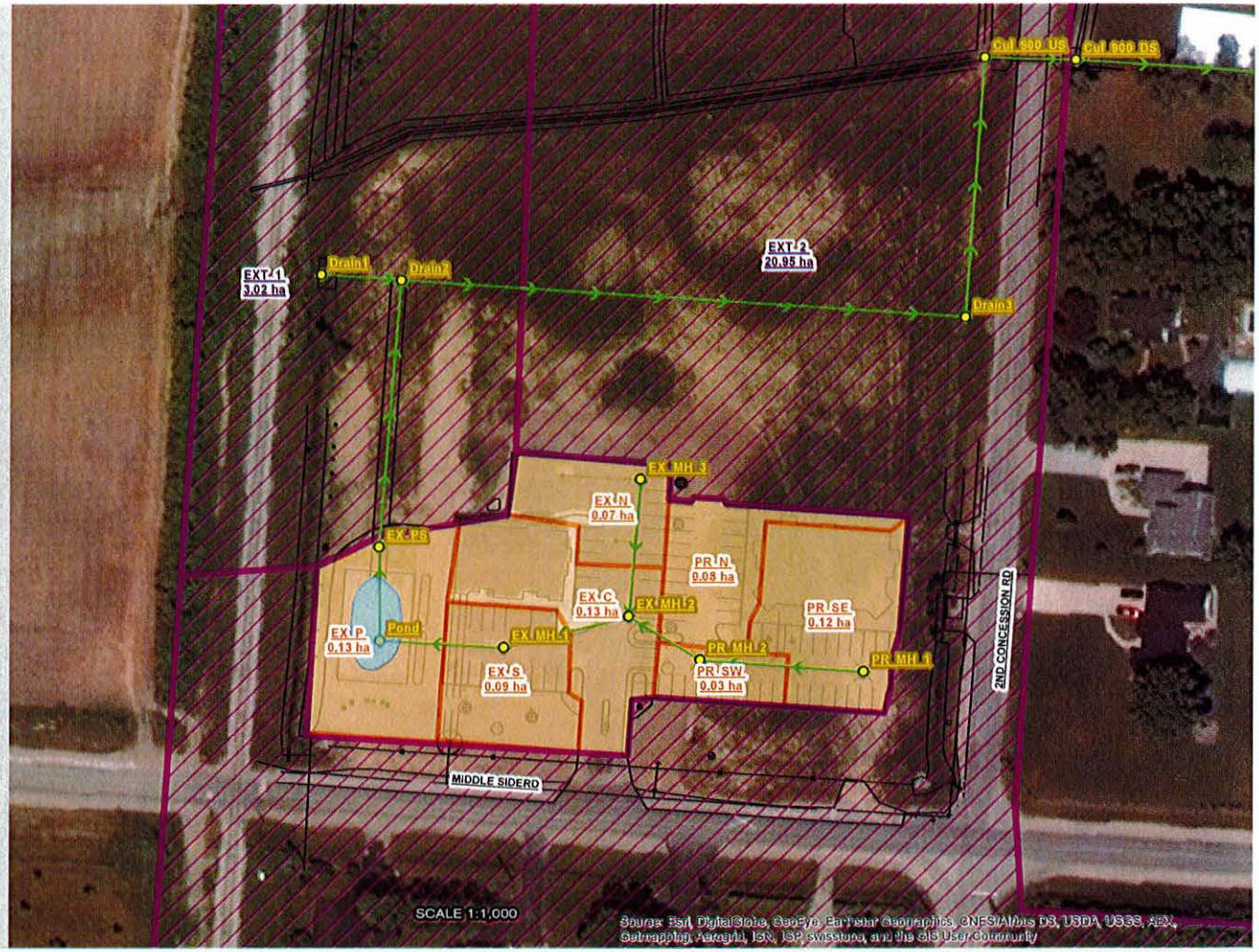
MAP CREATED BY: IDW
MAP CHECKED BY: FF
MAP PROJECTION: NAD 1983 UTM Zone 17N

0 12.5 25 50 Meters

SCALE 1:1,000

THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY.

PROJECT: 15-2001 STATUS: FINAL DATE: 08/06/16



STORMWATER MANAGEMENT PLAN
580 MIDDLE SIDEROAD

PROPOSED UTLIMATE CONDITIONS CATCHMENT MAP & HYDRAULIC LINKS
FIGURE 3

SUBJECT SITE
EXISTING MUNICIPAL DRAINS
INTERNAL CATCHMENTS
PROPOSED ALIGNMENT OF OUELLETTE DRAIN EAST (BY OTHERS)
EXTERNAL CATCHMENTS
HYDRUALIC LINKS
JUNCTION (MH, POND, ETC)

DILLON CONSULTING

MAP DRAWING INFORMATION:
DATA PROVIDED BY MNRF & OMFARA

MAP CREATED BY: IDW
MAP CHECKED BY: FF
MAP PROJECTION: NAD 1983 UTM Zone 17N

THIS DRAWING IS FOR INFORMATIONAL PURPOSES ONLY.

PROJECT: 18-2001 STATUS: FINAL DATE: 07/06/18

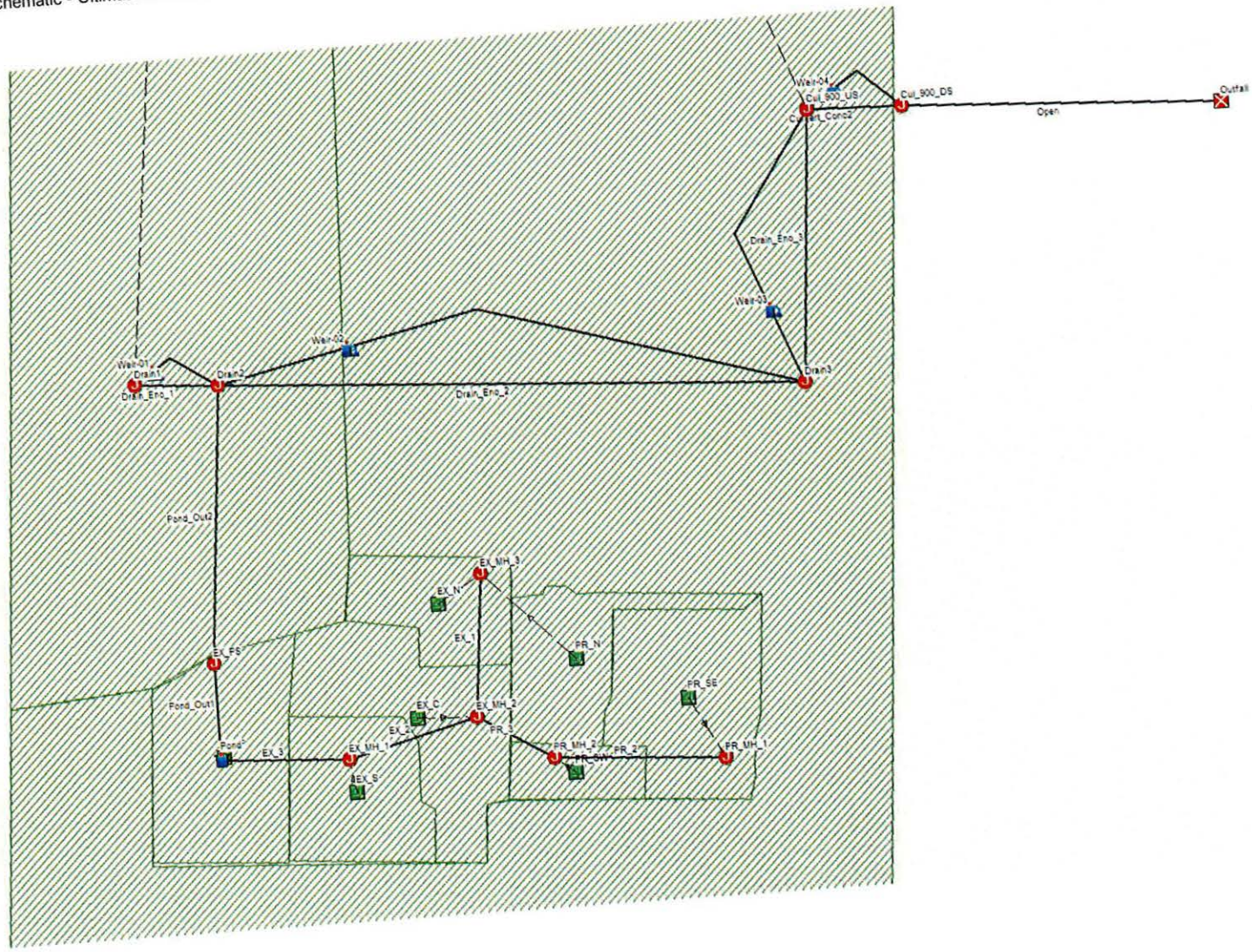
Appendix C

Quantity Control Calculations

DILLON
CONSULTING

Allowable Release Rate Assessment - Rational Method						
Rainfall Intensity (I = A(T)^B)						
	2 yr	**5 yr**	**10 yr**	**25 yr**	**50 yr**	**100 yr**
A	24	31	35.7	41.7	46	50.4
B	-0.71	-0.709	-0.708	-0.707	-0.707	-0.706
Time of Concentration = T (min)	10.0	10.0	10.0	10.0	10.0	10.0
Intensity = I (mm/hr)	85.6	110.4	126.9	148.0	163.3	178.6
Peak Flow using Rational Method (Q = 0.00278*C*I*A)						
Area = A (ha)	0.65					
Runoff Coefficient = C	0.60	0.60	0.60	0.66	0.720	0.750
Peak Flow = Q (m³/s)	**0.093**	**0.120**	**0.138**	**0.177**	**0.212**	**0.242**

SSA Model Schematic - Ultimate Conditions



Autodesk© Storm and Sanitary Analysis 2014 - Version 8.1.48 (Build 1)

****
Project Description
****
File Name ..... Pacitti-Updated.SPF

****
Analysis Options
****
Flow Units ..... LPS
Subbasin Hydrograph Method. EPA SWMM
Infiltration Method ..... SCS Curve Number
Link Routing Method ..... Hydrodynamic
Storage Node Exfiltration.. Constant rate, wetted area
Starting Date JUN-06-2016 00:00:00
Ending Date JUN-07-2016 06:00:00
Antecedent Dry Days 0.0
Report Time Step 00:02:00
Wet Time Step 00:05:00
Dry Time Step 01:00:00
Routing Time Step ..... 2.00 sec

****
Element Count
****
Number of rain gages 1
Number of subbasins 10
Number of nodes 14
Number of links 16
Number of pollutants 0
Number of land uses 0

****
Subbasin Summary
****

Subbasin ID	Total Area hectares	Equiv. Width m	Imperv. Area %	Average Slope %	Raingage
Allow	0.65	150.00	57.00	0.5000	-
EX_C	0.13	20.00	100.00	0.5000	-
EX_N	0.07	20.00	100.00	0.5000	-
EX_P	0.13	30.00	15.00	0.1400	-
EX_S	0.09	30.00	55.00	0.5000	-
EXT_1	3.02	60.00	35.00	0.1400	-
EXT_2	20.99	115.00	35.00	0.1400	-
PR_N	0.08	15.00	100.00	0.5000	-
PR_SE	0.12	25.00	100.00	0.5000	-
PR_SW	0.03	15.00	100.00	0.5000	-

****
Node Summary
****

Node ID	Element Type	Invert Elevation m	Maximum Elev. m	Ponded Area m²	External Inflow
Cul_900_DS	JUNCTION	178.02	181.43	0.00	
Cul_900_US	JUNCTION	178.05	181.43	0.00	

Drain1	JUNCTION	178.80	180.40	0.00
Drain2	JUNCTION	178.76	180.40	0.00
Drain3	JUNCTION	178.41	180.35	0.00
EX_MH_1	JUNCTION	178.99	181.22	0.00
EX_MH_2	JUNCTION	179.11	181.38	0.00
EX_MH_3	JUNCTION	179.68	181.47	0.00
EX_PS	JUNCTION	178.33	181.29	0.00
PR_MH_2	JUNCTION	179.50	181.75	0.00
PR_MH_3	JUNCTION	179.33	181.63	0.00
Allowable	OUTFALL	0.00	0.00	0.00
Outfall	OUTFALL	177.87	179.38	0.00
Pond	STORAGE	179.00	181.20	0.00

****
Link Summary
****

Link ID	From Node	To Node	Element Type	Length m	Slope %	Manning's Roughness
Culvert_Conc2	Cul_900_US	Cul_900_DS	CONDUIT	20.3	0.1478	0.0150
Drain_Enc_1	Drain1	Drain2	CONDUIT	17.9	0.2235	0.0150
Drain_Enc_2	Drain2	Drain3	CONDUIT	125.8	0.1828	0.0150
Drain_Enc_3	Drain3	Cul_900_US	CONDUIT	58.2	0.1890	0.0150
EX_1	EX_MH_3	EX_MH_2	CONDUIT	30.7	0.7818	0.0150
EX_2	EX_MH_2	EX_MH_1	CONDUIT	28.6	0.4196	0.0150
EX_3	EX_MH_1	Pond	CONDUIT	27.7	0.4332	0.0150
Open	Cul_900_DS	Outfall	CHANNEL	81.9	0.1099	0.0320
Pond_Out1	Pond	EX_PS	CONDUIT	10.7	0.2804	0.0150
Pond_Out2	EX_PS	Drain2	CONDUIT	58.5	0.2735	0.0150
PR_2	PR_MH_2	PR_MH_3	CONDUIT	36.6	0.3825	0.0150
PR_3	PR_MH_3	EX_MH_2	CONDUIT	18.6	0.3763	0.0150
Weir-01	Drain1	Drain2	WEIR			
Weir-02	Drain2	Drain3	WEIR			
Weir-03	Drain3	Cul_900_US	WEIR			
Weir-04	Cul_900_US	Cul_900_DS	WEIR			

****
Cross Section Summary
****

Link ID	Shape	Depth/ Diameter m	Width m	No. of Barrels	Cross Sectional Area m²	Full Flow Hydraulic Radius m	Design Flow Capacity LPS
Culvert_Conc2	CIRCULAR	0.90	0.90	1	0.64	0.23	603.18
Drain_Enc_1	CIRCULAR	0.60	0.60	1	0.28	0.15	251.57
Drain_Enc_2	CIRCULAR	0.60	0.60	1	0.28	0.15	227.55
Drain_Enc_3	CIRCULAR	0.60	0.60	1	0.28	0.15	231.36
EX_1	CIRCULAR	0.30	0.30	1	0.07	0.07	74.10
EX_2	CIRCULAR	0.45	0.45	1	0.16	0.11	160.06
EX_3	CIRCULAR	0.45	0.45	1	0.16	0.11	162.64

Open	TRAPEZOIDAL	1.45	5.35	1	4.60	0.74
3899.18						
Pond_Out1	CIRCULAR	0.30	0.30	1	0.07	0.07
44.38						
Pond_Out2	CIRCULAR	0.30	0.30	1	0.07	0.07
43.83						
PR_2	CIRCULAR	0.30	0.30	1	0.07	0.07
51.84						
PR_3	CIRCULAR	0.30	0.30	1	0.07	0.07
51.42						

********** Runoff Quantity Continuity **********	Volume hectare-m	Depth mm
Total Precipitation	2.731	107.900
Evaporation Loss	0.000	0.000
Infiltration Loss	0.806	31.865
Surface Runoff	1.651	65.231
Final Surface Storage	0.275	10.846
Continuity Error (%)	-0.039	

********** Flow Routing Continuity **********	Volume hectare-m	Volume Mliters
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	1.651	16.509
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	1.657	16.569
Surface Flooding	0.000	0.000
Evaporation Loss	0.000	0.000
Initial Stored Volume	0.005	0.051
Final Stored Volume	0.001	0.013
Continuity Error (%)	-0.134	

****
Composite Curve Number Computations Report
****

Subbasin Allow

Soil/Surface Description	Area (ha)	Soil Group	CN
> 75% grass cover, Good	0.69	C	74.00
Composite Area & Weighted CN	0.69		74.00

Subbasin EX_C

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.13	-	74.00
Composite Area & Weighted CN	0.13		74.00

Subbasin EX_N

Soil/Surface Description	Area (ha)	Soil Group	CN

-	0.07	-	74.00
Composite Area & Weighted CN	0.07		74.00

Subbasin EX_P

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.13	-	74.00
Composite Area & Weighted CN	0.13		74.00

Subbasin EX_S

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.09	-	74.00
Composite Area & Weighted CN	0.09		74.00

Subbasin EXT_1

Soil/Surface Description	Area (ha)	Soil Group	CN
-	3.02	-	74.00
Composite Area & Weighted CN	3.02		74.00

Subbasin EXT_2

Soil/Surface Description	Area (ha)	Soil Group	CN
-	20.95	-	74.00
Composite Area & Weighted CN	20.95		74.00

Subbasin PR_N

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.12	-	74.00
Composite Area & Weighted CN	0.12		74.00

Subbasin PR_SE

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.12	-	74.00
Composite Area & Weighted CN	0.12		74.00

Subbasin PR_SW

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.03	-	74.00
Composite Area & Weighted CN	0.03		74.00

```
************************************************
EPA SWMM Time of Concentration Computations Report
************************************************

        Tc = (0.94 * (L^0.6) * (n^0.6)) / ((i^0.4) * (S^0.3))

        Where:

        Tc = Time of Concentration (min)
        L  = Flow Length (ft)
        n  = Manning's Roughness
        i  = Rainfall Intensity (in/hr)
        S  = Slope (ft/ft)

-----------------
Subbasin Allow
-----------------

        Flow length (m):                          43.33
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   27.30

----------------
Subbasin EX_C
----------------

        Flow length (m):                          65.00
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   18.51

----------------
Subbasin EX_N
----------------

        Flow length (m):                          35.00
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   12.77

----------------
Subbasin EX_P
----------------

        Flow length (m):                          43.33
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.14000
        Computed TOC (minutes):                   60.20

----------------
Subbasin EX_S
```

Flow length (m):	30.00
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583
Impervious Rainfall Intensity (mm/hr):	4.49583
Slope (%):	0.50000
Computed TOC (minutes):	22.50

Subbasin EXT_1

Flow length (m):	503.33
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583
Impervious Rainfall Intensity (mm/hr):	4.49583
Slope (%):	0.14000
Computed TOC (minutes):	223.21

Subbasin EXT_2

Flow length (m):	1825.22
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583
Impervious Rainfall Intensity (mm/hr):	4.49583
Slope (%):	0.14000
Computed TOC (minutes):	483.48

Subbasin PR_N

Flow length (m):	52.67
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583
Impervious Rainfall Intensity (mm/hr):	4.49583
Slope (%):	0.50000
Computed TOC (minutes):	16.31

Subbasin PR_SE

Flow length (m):	48.00
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583
Impervious Rainfall Intensity (mm/hr):	4.49583
Slope (%):	0.50000
Computed TOC (minutes):	15.43

Subbasin PR_SW

Flow length (m):	20.00
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583

Impervious Rainfall Intensity (mm/hr): 4.49583
Slope (%): 0.50000
Computed TOC (minutes): 9.13

****
Subbasin Runoff Summary
****

Subbasin ID	Total Rainfall mm	Total Runon mm	Total Evap. mm	Total Infil. mm	Total Runoff mm	Peak Runoff LPS	Runoff Coefficient	Time of Concentration days hh:mm:ss
Allow	107.90	0.00	0.00	21.62	83.63	202.51	0.775	0 00:27:18
EX_C	107.90	0.00	0.00	0.00	106.67	49.67	0.989	0 00:18:30
EX_N	107.90	0.00	0.00	0.00	106.71	28.06	0.989	0 00:12:46
EX_P	107.90	0.00	0.00	42.74	61.18	19.82	0.567	0 01:00:11
EX_S	107.90	0.00	0.00	22.63	82.88	28.53	0.768	0 00:22:30
EXT_1	107.90	0.00	0.00	32.69	69.54	336.47	0.644	0 03:43:12
EXT_2	107.90	0.00	0.00	32.69	63.14	1353.91	0.585	0 08:03:28
PR_N	107.90	0.00	0.00	0.00	106.69	30.81	0.989	0 00:16:18
PR_SE	107.90	0.00	0.00	0.00	106.70	47.16	0.989	0 00:15:25
PR_SW	107.90	0.00	0.00	0.00	106.68	12.24	0.989	0 00:09:07

****
Node Depth Summary
****

Node ID	Average Depth Attained m	Maximum Depth Attained m	Maximum HGL Attained m	Time of Max Occurrence days	Time of Max Occurrence hh:mm	Total Flooded Volume ha-mm	Total Time Flooded minutes	Retention Time hh:mm:ss
Cul_900_DS	0.27	0.93	178.95	0	12:07	0	0	0:00:00
Cul_900_US	0.30	1.62	179.67	0	12:06	0	0	0:00:00
Drain1	0.13	1.53	180.33	0	12:06	0	0	0:00:00
Drain2	0.15	1.55	180.31	0	12:07	0	0	0:00:00
Drain3	0.14	1.63	180.04	0	12:07	0	0	0:00:00
EX_MH_1	0.36	1.64	180.63	0	12:09	0	0	0:00:00
EX_MH_2	0.35	1.61	180.72	0	12:06	0	0	0:00:00
EX_MH_3	0.32	1.14	180.82	0	12:06	0	0	0:00:00
EX_PS	0.69	2.21	180.54	0	12:11	0	0	0:00:00
PR_MH_2	0.33	1.36	180.86	0	12:06	0	0	0:00:00

PR_MH_3	0.33	1.46	180.79	0	12:06	0	0	0:00:00
Allowable	0.00	0.00	0.00	0	00:00	0	0	0:00:00
Outfall	0.00	0.00	177.87	0	00:00	0	0	0:00:00
Pond	0.09	1.62	180.62	0	12:13	0	0	0:00:00

****
Node Flow Summary
****

Node ID	Element Type	Maximum Lateral Inflow LPS	Peak Inflow LPS	Time of Peak Inflow Occurrence days	hh:mm	Maximum Flooding Overflow LPS	Time of Peak Flooding Occurrence days	hh:mm
Cul_900_DS	JUNCTION	0.00	1681.08	0	12:06	0.00		
Cul_900_US	JUNCTION	1353.59	1685.00	0	12:06	0.00		
Drain1	JUNCTION	336.44	336.44	0	12:06	0.00		
Drain2	JUNCTION	0.00	371.72	0	12:06	0.00		
Drain3	JUNCTION	0.00	367.32	0	12:06	0.00		
EX_MH_1	JUNCTION	28.53	196.27	0	12:00	0.00		
EX_MH_2	JUNCTION	49.66	167.81	0	12:00	0.00		
EX_MH_3	JUNCTION	58.87	58.87	0	12:00	0.00		
EX_PS	JUNCTION	0.00	83.15	0	12:30	0.00		
PR_MH_2	JUNCTION	47.15	47.15	0	12:00	0.00		
PR_MH_3	JUNCTION	12.24	59.37	0	12:00	0.00		
Allowable	OUTFALL	202.47	202.47	0	12:00	0.00		
Outfall	OUTFALL	0.00	1662.36	0	12:07	0.00		
Pond	STORAGE	19.81	214.90	0	12:00	0.00		

****
Storage Node Summary
****

Storage Node ID	Maximum Ponded Volume 1000 m³	Maximum Ponded (%)	Time of Max Ponded days	hh:mm	Average Ponded Volume 1000 m³	Average Ponded (%)	Maximum Storage Node Outflow LPS	Maximum Exfiltration Rate cmm	Time of Max. Exfiltration Rate hh:mm:ss	Total Exfiltrated Volume 1000 m³
Pond	0.129	55	0	12:13	0.003	1	83.15	0.00	0:00:00	0.000

****
Outfall Loading Summary
****

Outfall Node ID	Flow Frequency (%)	Average Flow LPS	Peak Inflow LPS
Allowable	79.69	6.54	202.47
Outfall	100.00	151.02	1662.36

System 89.84 157.56 1792.58

****
Link Flow Summary
****

Link ID	Element Type	Time of Peak Flow Occurrence		Maximum Velocity Attained	Length Factor	Peak Flow during Analysis	Design Flow Capacity	Ratio of Maximum /Design Flow	Total Reported Time	Maximum Flow Depth	Surcharged minutes
		days	hh:mm	m/sec		LPS	LPS				
Culvert_Conc2	CONDUIT	0	12:06	2.64	1.00	1681.08	603.18	2.79	7	1.00	SURCHARGED
Drain_Enc_1	CONDUIT	0	12:02	1.09	1.00	309.31	251.57	1.23	38	1.00	SURCHARGED
Drain_Enc_2	CONDUIT	0	12:03	1.11	1.00	313.79	227.55	1.38	40	1.00	SURCHARGED
Drain_Enc_3	CONDUIT	0	12:07	1.27	1.00	359.11	231.36	1.55	52	1.00	SURCHARGED
EX_1	CONDUIT	0	12:00	1.04	1.00	58.84	74.10	0.79	35	1.00	SURCHARGED
EX_2	CONDUIT	0	12:00	1.05	1.00	167.74	160.06	1.05	51	1.00	SURCHARGED
EX_3	CONDUIT	0	12:00	1.23	1.00	196.09	162.64	1.21	55	1.00	SURCHARGED
Open	CHANNEL	0	12:07	1.12	1.00	1662.36	3899.18	0.43	0	0.49	Calculated
Pond_Out1	CONDUIT	0	12:30	1.18	1.00	83.15	44.38	1.87	75	1.00	SURCHARGED
Pond_Out2	CONDUIT	0	12:30	1.18	1.00	83.23	43.83	1.90	72	1.00	SURCHARGED
PR_2	CONDUIT	0	12:00	0.71	1.00	47.15	51.84	0.91	42	1.00	SURCHARGED
PR_3	CONDUIT	0	12:00	0.84	1.00	59.35	51.42	1.15	48	1.00	SURCHARGED
Weir-01	WEIR	0	12:06			183.32				0.62	
Weir-02	WEIR	0	12:07			127.78				0.42	
Weir-03	WEIR	0	00:00			0.00				0.00	
Weir-04	WEIR	0	00:00			0.00				0.00	

****
Flow Classification Summary
****

Link	--- Fraction of Time in Flow Class ---- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
Culvert_Conc2	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.43	0.0001
Drain_Enc_1	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.34	0.0001

Drain_Enc_2	0.00	0.00	0.00	0.07	0.00	0.00	0.93	0.55	0.0001
Drain_Enc_3	0.00	0.00	0.00	0.32	0.00	0.00	0.68	0.53	0.0001
EX_1	0.04	0.00	0.00	0.03	0.00	0.00	0.92	0.85	0.0000
EX_2	0.05	0.00	0.00	0.94	0.00	0.00	0.01	0.52	0.0000
EX_3	0.06	0.00	0.00	0.04	0.00	0.00	0.90	0.70	0.0000
Open	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.35	0.0000
Pond_Out1	0.01	0.00	0.00	0.92	0.00	0.00	0.07	0.48	0.0001
Pond_Out2	0.06	0.01	0.00	0.81	0.00	0.00	0.11	0.35	0.0001
PR_2	0.05	0.00	0.00	0.04	0.00	0.00	0.91	0.61	0.0000
PR_3	0.07	0.00	0.00	0.04	0.00	0.00	0.89	0.60	0.0001

****
Time-Step Critical Elements
****
None

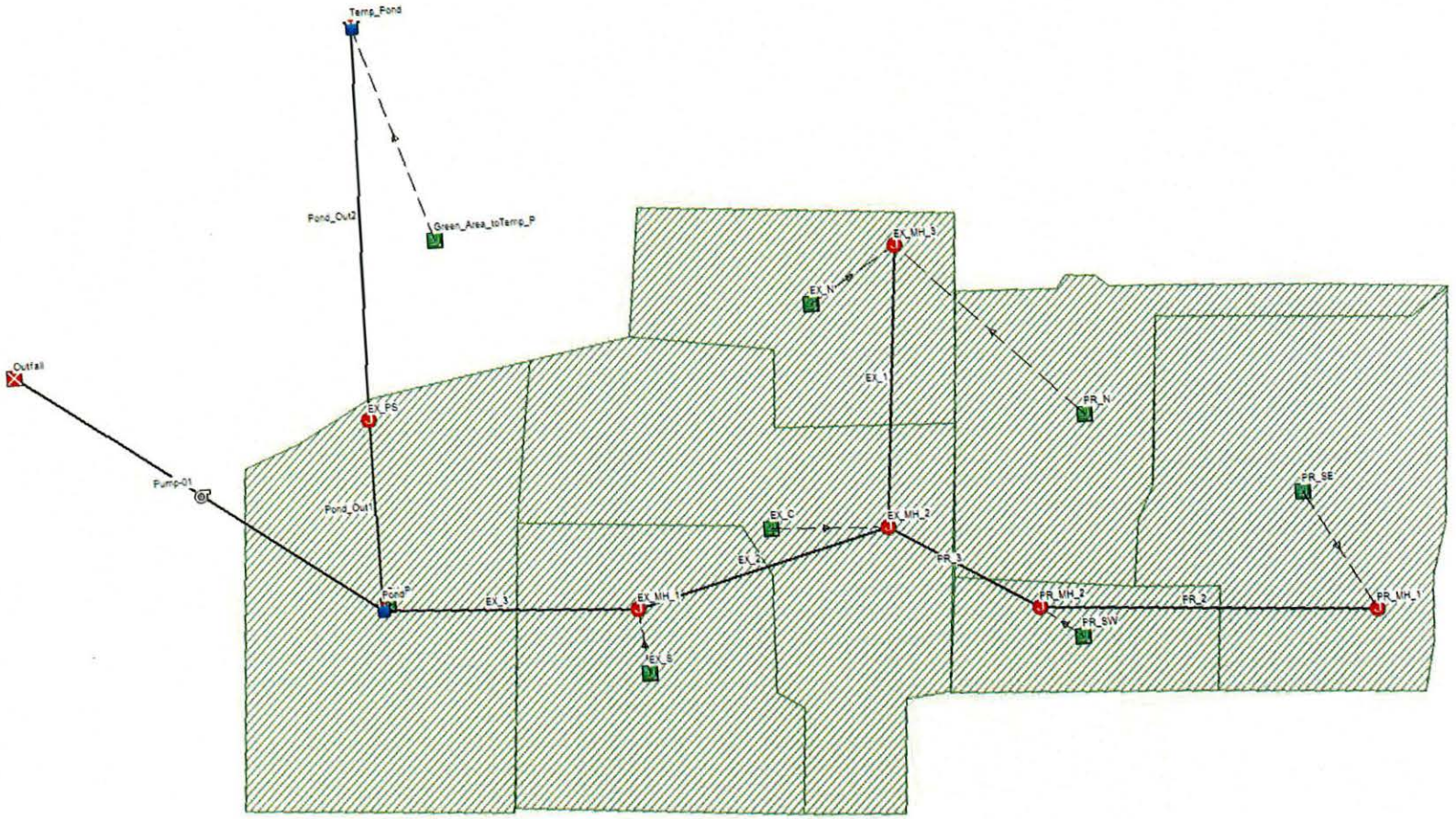
****
Highest Flow Instability Indexes
****
All links are stable.

****
Routing Time Step Summary
****

Minimum Time Step	:	0.50 sec
Average Time Step	:	2.00 sec
Maximum Time Step	:	2.00 sec
Percent in Steady State	:	0.00
Average Iterations per Step	:	2.01

Analysis began on: Mon Jul 11 14:26:53 2016
Analysis ended on: Mon Jul 11 14:26:57 2016
Total elapsed time: 00:00:04

SSA Model Schematic - Temporary Conditions



SSA Model Outputs 100 Year Event - Temporary Conditions

Autodesk© Storm and Sanitary Analysis 2014 - Version 8.1.48 (Build 1)

****
Project Description
****
File Name ..... Pacitti-Updated - Temp Conditions.SPF

****
Analysis Options
****
Flow Units ..... LPS
Subbasin Hydrograph Method. EPA SWMM
Infiltration Method ..... SCS Curve Number
Link Routing Method ..... Hydrodynamic
Storage Node Exfiltration.. Constant rate, wetted area
Starting Date JUN-06-2016 00:00:00
Ending Date JUN-07-2016 06:00:00
Antecedent Dry Days 0.0
Report Time Step 00:02:00
Wet Time Step 00:05:00
Dry Time Step 01:00:00
Routing Time Step ..... 1.00 sec

****
Element Count
****
Number of rain gages 1
Number of subbasins 9
Number of nodes 10
Number of links 8
Number of pollutants 0
Number of land uses 0

****
Subbasin Summary
****

Subbasin ID	Total Area hectares	Equiv. Width m	Imperv. Area %	Average Slope %	Raingage
Allow	0.69	150.00	57.00	0.5000	-
EX_C	0.13	20.00	100.00	0.5000	-
EX_N	0.07	20.00	100.00	0.5000	-
EX_P	0.13	30.00	15.00	0.1400	-
EX_S	0.09	30.00	55.00	0.5000	-
Green_Area_toTemp_P	0.14	30.00	28.00	0.5000	-
PR_N	0.08	15.00	100.00	0.5000	-
PR_SE	0.12	25.00	100.00	0.5000	-
PR_SW	0.03	15.00	100.00	0.5000	-

****
Node Summary
****

Node ID	Element Type	Invert Elevation m	Maximum Elev. m	Ponded Area m²	External Inflow
EX_MH_1	JUNCTION	178.99	181.22	0.00	
EX_MH_2	JUNCTION	179.11	181.38	0.00	
EX_MH_3	JUNCTION	179.68	181.47	0.00	

EX_PS	JUNCTION	178.33	181.29	0.00
PR_MH_1	JUNCTION	179.50	181.75	0.00
PR_MH_2	JUNCTION	179.33	181.63	0.00
Allowable	OUTFALL	0.00	0.00	0.00
Outfall	OUTFALL	0.00	0.00	0.00
Pond	STORAGE	179.00	181.20	0.00
Temp_Pond	STORAGE	178.86	181.10	0.00

****
Link Summary
****

Link ID	From Node	To Node	Element Type	Length m	Slope %	Manning's Roughness
EX_1	EX_MH_3	EX_MH_2	CONDUIT	30.7	0.7818	0.0150
EX_2	EX_MH_2	EX_MH_1	CONDUIT	28.6	0.4196	0.0150
EX_3	EX_MH_1	Pond	CONDUIT	27.7	0.4332	0.0150
Pond_Out1	Pond	EX_PS	CONDUIT	10.7	0.2804	0.0150
Pond_Out2	EX_PS	Temp_Pond	CONDUIT	38.6	0.2850	0.0150
PR_2	PR_MH_1	PR_MH_2	CONDUIT	36.6	0.3825	0.0150
PR_3	PR_MH_2	EX_MH_2	CONDUIT	18.6	0.3763	0.0150
Pump-01	Pond	Outfall	TYPE2 PUMP			

****
Cross Section Summary
****

Link ID	Shape	Depth/ Diameter m	Width m	No. of Barrels	Cross Sectional Area m²	Full Flow Hydraulic Radius m	Design Flow Capacity LPS
EX_1	CIRCULAR	0.30	0.30	1	0.07	0.07	74.10
EX_2	CIRCULAR	0.45	0.45	1	0.16	0.11	160.06
EX_3	CIRCULAR	0.45	0.45	1	0.16	0.11	162.64
Pond_Out1	CIRCULAR	0.30	0.30	1	0.07	0.07	44.38
Pond_Out2	CIRCULAR	0.30	0.30	1	0.07	0.07	44.74
PR_2	CIRCULAR	0.30	0.30	1	0.07	0.07	51.84
PR_3	CIRCULAR	0.30	0.30	1	0.07	0.07	51.42

********** Runoff Quantity Continuity **********	Volume hectare-m	Depth mm
Total Precipitation	0.160	107.900
Evaporation Loss	0.000	0.000
Infiltration Loss	0.028	18.650
Surface Runoff	0.128	86.858
Final Surface Storage	0.004	2.607
Continuity Error (%)	-0.199	

Flow Routing Continuity	Volume hectare-m	Volume Mliters
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	0.129	1.285
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	0.094	0.936
Surface Flooding	0.000	0.000
Evaporation Loss	0.000	0.000
Initial Stored Volume	0.001	0.006
Final Stored Volume	0.034	0.343
Continuity Error (%)	0.948	

****
Composite Curve Number Computations Report
****

Subbasin Allow

Soil/Surface Description	Area (ha)	Soil Group	CN
> 75% grass cover, Good	0.69	C	74.00
Composite Area & Weighted CN	0.69		74.00

Subbasin EX_C

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.13	-	74.00
Composite Area & Weighted CN	0.13		74.00

Subbasin EX_N

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.07	-	74.00
Composite Area & Weighted CN	0.07		74.00

Subbasin EX_P

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.13	-	74.00
Composite Area & Weighted CN	0.13		74.00

Subbasin EX_S

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.09	-	74.00
Composite Area & Weighted CN	0.09		74.00

Subbasin Green_Area_toTemp_P

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.14	-	74.00
Composite Area & Weighted CN	0.14		74.00

Subbasin PR_N

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.12	-	74.00
Composite Area & Weighted CN	0.12		74.00

Subbasin PR_SE

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.12	-	74.00
Composite Area & Weighted CN	0.12		74.00

Subbasin PR_SW

Soil/Surface Description	Area (ha)	Soil Group	CN
-	0.03	-	74.00
Composite Area & Weighted CN	0.03		74.00

****
EPA SWMM Time of Concentration Computations Report
****

Tc = (0.94 * (L^0.6) * (n^0.6)) / ((i^0.4) * (S^0.3))

Where:

Tc = Time of Concentration (min)
L = Flow Length (ft)
n = Manning's Roughness
i = Rainfall Intensity (in/hr)
S = Slope (ft/ft)

Subbasin Allow

Flow length (m):	46.00
Pervious Manning's Roughness:	0.10000
Impervious Manning's Roughness:	0.01500
Pervious Rainfall Intensity (mm/hr):	4.49583
Impervious Rainfall Intensity (mm/hr):	4.49583
Slope (%):	0.50000
Computed TOC (minutes):	28.30

Subbasin EX_C

```
        Flow length (m):                          65.00
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   18.51

----------------
Subbasin EX_N
----------------

        Flow length (m):                          35.00
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   12.77

----------------
Subbasin EX_P
----------------

        Flow length (m):                          43.33
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.14000
        Computed TOC (minutes):                   60.20

----------------
Subbasin EX_S
----------------

        Flow length (m):                          30.00
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   22.50

------------------------------
Subbasin Green_Area_toTemp_P
------------------------------

        Flow length (m):                          46.67
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
        Computed TOC (minutes):                   38.89

----------------
Subbasin PR_N
----------------

        Flow length (m):                          52.67
        Pervious Manning's Roughness:           0.10000
        Impervious Manning's Roughness:         0.01500
        Pervious Rainfall Intensity (mm/hr):    4.49583
        Impervious Rainfall Intensity (mm/hr):  4.49583
        Slope (%):                              0.50000
```

```
        Computed TOC (minutes):                    16.31

  -----------------
  Subbasin PR_SE
  -----------------

        Flow length (m):                           48.00
        Pervious Manning's Roughness:            0.10000
        Impervious Manning's Roughness:          0.01500
        Pervious Rainfall Intensity (mm/hr):     4.49583
        Impervious Rainfall Intensity (mm/hr):   4.49583
        Slope (%):                               0.50000
        Computed TOC (minutes):                    15.43

  -----------------
  Subbasin PR_SW
  -----------------

        Flow length (m):                           20.00
        Pervious Manning's Roughness:            0.10000
        Impervious Manning's Roughness:          0.01500
        Pervious Rainfall Intensity (mm/hr):     4.49583
        Impervious Rainfall Intensity (mm/hr):   4.49583
        Slope (%):                               0.50000
        Computed TOC (minutes):                     9.13


  ***********************
  Subbasin Runoff Summary
  ***********************
```

Subbasin ID	Total Rainfall mm	Total Runon mm	Total Evap. mm	Total Infil. mm	Total Runoff mm	Peak Runoff LPS	Runoff Coefficient	Time of Concentration days hh:mm:ss
Allow	107.90	0.00	0.00	21.62	83.63	213.61	0.775	0 00:28:17
EX_C	107.90	0.00	0.00	0.00	106.67	49.67	0.989	0 00:18:30
EX_N	107.90	0.00	0.00	0.00	106.71	28.06	0.989	0 00:12:46
EX_P	107.90	0.00	0.00	42.74	61.18	19.82	0.567	0 01:00:11
EX_S	107.90	0.00	0.00	22.63	82.88	28.53	0.768	0 00:22:30
Green_Area_toTemp_P	107.90	0.00	0.00	36.21	68.40	30.93	0.634	0 00:38:53
PR_N	107.90	0.00	0.00	0.00	106.69	30.81	0.989	0 00:16:18
PR_SE	107.90	0.00	0.00	0.00	106.70	47.16	0.989	0 00:15:25
PR_SW	107.90	0.00	0.00	0.00	106.68	12.24	0.989	0 00:09:07

****
Node Depth Summary
****

Node ID	Average Depth Attained m	Maximum Depth Attained m	Maximum HGL Attained m	Time of Max Occurrence days	Time of Max Occurrence hh:mm	Total Flooded Volume ha-mm	Total Time Flooded minutes	Retention Time hh:mm:ss
EX_MH_1	1.11	1.70	180.69	0	18:19	0	0	0:00:00
EX_MH_2	1.04	1.63	180.74	0	12:06	0	0	0:00:00
EX_MH_3	0.69	1.17	180.85	0	12:06	0	0	0:00:00
EX_PS	1.68	2.36	180.69	0	18:20	0	0	0:00:00
PR_MH_1	0.80	1.39	180.89	0	12:06	0	0	0:00:00
PR_MH_2	0.90	1.48	180.81	0	12:06	0	0	0:00:00
Allowable	0.00	0.00	0.00	0	00:00	0	0	0:00:00
Outfall	0.00	0.00	0.00	0	00:00	0	0	0:00:00
Pond	1.01	1.69	180.69	0	18:20	0	0	0:00:00
Temp_Pond	1.15	1.83	180.69	0	18:20	0	0	0:00:00

****
Node Flow Summary
****

Node ID	Element Type	Maximum Lateral Inflow LPS	Peak Inflow LPS	Time of Peak Inflow Occurrence days	Time of Peak Inflow Occurrence hh:mm	Maximum Flooding Overflow LPS	Time of Peak Flooding Occurrence days	Time of Peak Flooding Occurrence hh:mm
EX_MH_1	JUNCTION	28.53	196.33	0	12:00	0.00		
EX_MH_2	JUNCTION	49.67	167.84	0	12:00	0.00		
EX_MH_3	JUNCTION	58.87	58.87	0	12:00	0.00		
EX_PS	JUNCTION	0.00	71.67	0	12:06	0.00		
PR_MH_1	JUNCTION	47.16	47.16	0	12:00	0.00		
PR_MH_2	JUNCTION	12.24	59.38	0	12:00	0.00		
Allowable	OUTFALL	213.61	213.61	0	12:00	0.00		
Outfall	OUTFALL	0.00	4.00	0	13:31	0.00		
Pond	STORAGE	19.82	215.12	0	12:00	0.00		
Temp_Pond	STORAGE	30.93	99.76	0	12:06	0.00		

****
Storage Node Summary
****

Storage Node ID	Maximum Ponded Volume 1000 m³	Maximum Ponded (%)	Time of Max Ponded days	Time of Max Ponded hh:mm	Average Ponded Volume 1000 m³	Average Ponded (%)	Maximum Storage Node Outflow LPS	Maximum Exfiltration Rate cmm	Total Exfiltration Volume hh:mm:ss	Maximum Exfiltrated Volume 1000 m³
Pond	0.142	60	0	18:20	0.079	34	75.47	0.00	0:00:00	0.000
Temp_Pond	0.280	70	0	18:20	0.160	40	3.18	0.00	0:00:00	0.000

****
Outfall Loading Summary
****

Outfall Node ID	Flow Frequency (%)	Average Flow LPS	Peak Inflow LPS
Allowable	79.93	6.69	213.61
Outfall	85.33	3.89	4.00
System	82.63	10.58	217.41

****
Link Flow Summary
****

Link ID	Element Type	Time of Peak Flow Occurrence days hh:mm	Maximum Velocity Attained m/sec	Length Factor	Peak Flow during Analysis LPS	Design Flow Capacity LPS	Ratio of Maximum /Design Flow	Ratio of Maximum Flow	Total Reported Condition	Time Surcharged minutes	Maximum Depth
EX_1	CONDUIT	0 12:00	0.96	1.00	58.85	74.10	0.79	1.00	1083	SURCHARGED	
EX_2	CONDUIT	0 12:00	1.06	1.00	167.84	160.06	1.05	1.00	1086	SURCHARGED	
EX_3	CONDUIT	0 12:00	1.23	1.00	196.31	162.64	1.21	1.00	1088	SURCHARGED	
Pond_Out1	CONDUIT	0 12:06	1.01	1.00	71.67	44.38	1.62	1.00	1123	SURCHARGED	
Pond_Out2	CONDUIT	0 12:06	1.01	1.00	71.65	44.74	1.60	1.00	1130	SURCHARGED	
PR_2	CONDUIT	0 12:00	0.67	1.00	47.14	51.84	0.91	1.00	1084	SURCHARGED	
PR_3	CONDUIT	0 12:00	0.84	1.00	59.38	51.42	1.15	1.00	1085	SURCHARGED	
Pump-01	PUMP	0 13:31			4.00		1.00	1536			

****
Flow Classification Summary
****

Link	--- Fraction of Time in Flow Class ---- Dry	Up Dry	Down Dry	Sub Crit	Sup Crit	Up Crit	Down Crit	Avg. Froude Number	Avg. Flow Change
EX_1	0.04	0.00	0.00	0.60	0.00	0.00	0.35	0.34	0.0000
EX_2	0.05	0.00	0.00	0.94	0.00	0.00	0.01	0.22	0.0000
EX_3	0.06	0.00	0.00	0.63	0.00	0.00	0.31	0.26	0.0000
Pond_Out1	0.01	0.00	0.00	0.99	0.00	0.00	0.00	0.03	0.0000

Pond_Out2	0.00	0.00	0.00	0.99	0.00	0.01	0.00	0.01	0.0000
PR_2	0.05	0.00	0.00	0.61	0.00	0.00	0.34	0.25	0.0000
PR_3	0.07	0.00	0.00	0.61	0.00	0.00	0.33	0.24	0.0000

```
**************************
Highest Continuity Errors
**************************
Node PR_MH_2 (1.78%)
Node EX_MH_2 (1.14%)
Node EX_MH_1 (1.12%)


***************************
Time-Step Critical Elements
***************************
None


*******************************
Highest Flow Instability Indexes
*******************************
All links are stable.


************************
Routing Time Step Summary
************************
Minimum Time Step           :     0.78 sec
Average Time Step           :     1.00 sec
Maximum Time Step           :     1.00 sec
Percent in Steady State     :     0.00
Average Iterations per Step :     2.00


Analysis began on:  Mon Jul 11 16:50:07 2016
Analysis ended on:  Mon Jul 11 16:50:11 2016
Total elapsed time: 00:00:04
```

Appendix D

ADS Quality Treatment Unit

DILLON
CONSULTING

ADVANCED DRAINAGE SYSTEMS NET ANNUAL TSS REMOVAL EFFICIENCY

Units:	Metric	
Project Name:	580 Middle Sideroad	
Project Location:	Windsor	
Mean Annual Rainfall:	805.20	mm
Site Drainage Area:	0.66	ha
Runoff Coefficient, C:	0.74	
Length, L:	0.21	km
Slope, S:	0.5	%
Assumed Sediment:	F-95	
Proposed Unit:	3612WQA	
Number of Units:	1	
Time of Concentration:	0.24	hrs
Intensity Scaling Factor:	25.69	
Restricted Flow per Unit:	na	m3/s

	Rainfall Intensities for Standard Return Periods (mm/hr)					
Duration (h)	2 year	5 year	10 year	25 year	50 year	100 year
0.083	138.2	178.6	206.3	240.4	266.4	291.7
0.167	84.6	109.5	126.5	147.5	163.4	179.0
0.25	63.5	82.2	95.0	110.8	122.8	134.5
0.50	38.9	50.4	58.2	68.0	75.3	82.5
1	23.8	30.9	35.7	41.7	46.2	50.6
2	14.6	18.9	21.9	25.6	28.3	31.0
6	6.7	8.7	10.1	11.8	13.1	14.3
12	4.1	5.3	6.2	7.2	8.0	8.8
24	2.5	3.3	3.8	4.4	4.9	5.4

	Runoff (Rational Method) for Standard Return Periods (m3/s)					
Duration (h)	2 year	5 year	10 year	25 year	50 year	100 year
0.083	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
0.167	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
0.25	0.086	0.112	0.129	0.150	0.167	0.182
0.5	0.053	0.068	0.079	0.092	0.102	0.112
1	0.032	0.042	0.048	0.057	0.063	0.069
2	0.020	0.026	0.030	0.035	0.038	0.042
6	0.009	0.012	0.014	0.016	0.018	0.019
12	0.006	0.007	0.008	0.010	0.011	0.012
24	0.003	0.004	0.005	0.006	0.007	0.007

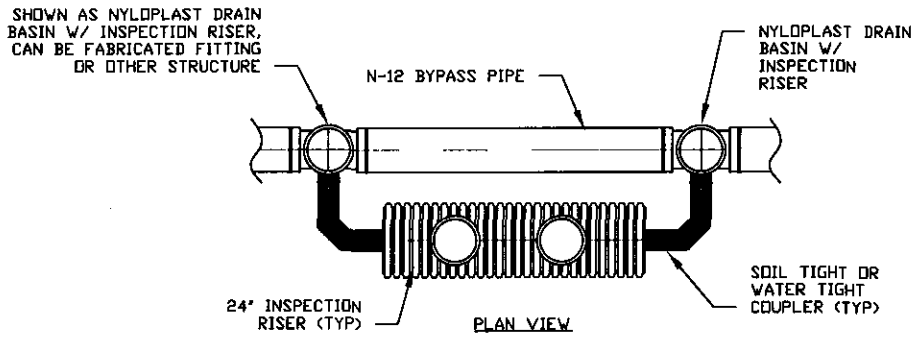
Removal Efficiency-Treated Flow:	90.46%
Net Removal Efficiency:	88.51%
Portion of Total Runoff Treated:	96.62%
(Restricted) Removal Efficiency-Treated Flow:	#VALUE!
(Restricted) Net Removal Efficiency:	#VALUE!
(Restricted) Portion of Total Runoff Treated:	#VALUE!

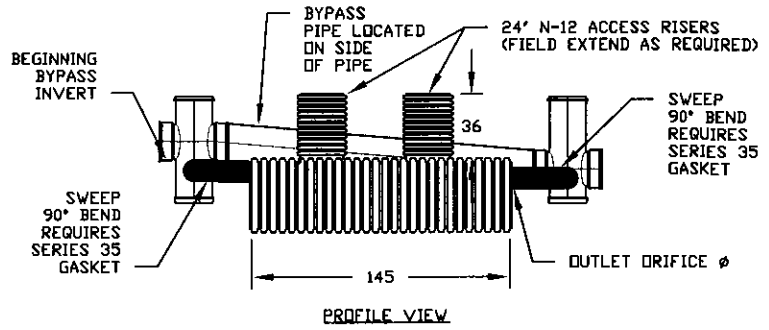
For more information about this Efficiency Calculation Spreadsheet please contact:

Alex Navarro - Advanced Drainage Systems Inc.
alex.navarro@ads-pipe.com
905.826.1835

Hans Arisz - R.V. Anderson Associates Limited
harisz@rvanderson.com
506.455.2888

ADS HDPE WATER QUALITY UNIT
3612WQ(A/B)XX





ADS MODEL #	MAIN PIPE DIA.	SIEVE SIZE	PARTICLE SIZE (CM)	TREATED FLOW RATE (CFS)	INLET ø	OUTLET ø	OUTLET ORIFICE ø	ELEVATION CHANGE*
3612WQAXX	36"	140	0.0106	0.86	10"	10"	5.94"	11.9"
3612WQBXX	36"	200	0.0075	0.43	10"	10"	4.20"	11.9"

XX DENOTES A BY-PASS SIZE OF 12", 15", 18", 24", 30", 36", 42", 48", OR 60"
XX=00 DENOTES UNITS W/OUT A BY-PASS. THE OUTLET PIPE ø WILL MATCH THE INLET PIPE ø.
* ELEVATION CHANGE FOR UNITS WITHOUT A BY-PASS IS 2"

NOTES:

1. REFERENCE TECHNICAL NOTE 1.03 FOR ADDITIONAL INFORMATION.
2. ELEVATION CHANGE DENOTES THE ELEVATION DROP FROM INVERT OF BY-PASS AT INLET TO INVERT OF BY-PASS AT OUTLET.

ADS

3612WQ(A/B)XX

DRAWN BY	APPROVED BY	DRAWING #
CRM 8-23-10		

REVISIONS	
BY	DATE

DWG. SCALE: 1:100

INSTALLATION GUIDE

Storm Water Quality Units

IG 2.01
October 2008

ADS polyethylene products and a well-constructed backfill envelope work together to support soil and live loads. Although backfill has special significance in applications involving high loads, it is important to take reasonable precautions during any pipe installation. Correct installation will ensure long-term trouble-free service for all types of pipe systems.

The recommendations presented here detail how to correctly install Water Quality Units. Installation with proper backfill materials, compaction levels, and placement procedures are essential to achieve long term system performance. These recommendations assume the drainage designer used design criteria available from ASTM D2321 and ADS. The designer should discuss installations involving conditions not covered by that document (poor soils, high loads, or other factors that may affect the performance of the system) with ADS Regional Engineers or Application Engineering through the nearest manufacturing location. All installations must comply with local, state, and federal regulations.

Backfill Material Selection

- Structural backfill material must be a Class I material described in Table 1.
- Native soil meeting class II, III, or IVA, as described in Table 1, are NOT acceptable initial backfill materials. However, they may be used as final backfill once the initial backfill is placed and compacted.
- Class I materials shall be compacted to a minimum Standard Proctor Density of 95%.
- In regions where Class I backfill material may not be readily obtainable, flowable fill may be a suitable alternative. Where flowable fill is used, precaution must be taken to prevent flotation during installation.

Table 1
Acceptable Backfill Material and Compaction Requirements

	Soil Classification		Minimum	Maximum* Compaction
Description	ASTM D2321	ASTM D2487	Standard Density (%)	Layer Height (in.)
Flowable Fill	n/a	n/a	Dumped	**
Graded or crushed stone Crushed gravel	Class I	-	Compacted	12 (0.3m)
Well-graded sand, gravels, and gravel/sand mixtures; Poorly graded sand,gravels and gravel/sand mixtures; little or no fines	Class II	GW GP SW SP	**Material Not Recommended**	
Silty or clayey gravels, Gravels/sand/silt or gravels and/clay mixtures, silty or clayey sands, sand/clay or sand/silt mixtures	Class III	GM GC SM SC	**Material Not Recommended**	
Inorganic silts and low to medium plasticity clays; gravelly, sandy, or silty clays; some fine sands	Class IVA	ML CL	**Material Not Recommended**	
*Layer Heights should not exceed one-half the pipe diameter. Layer heights may also need to be reduced to accommodate compaction method. **Where flowable fill is used, precaution must be taken to prevent flotation.				

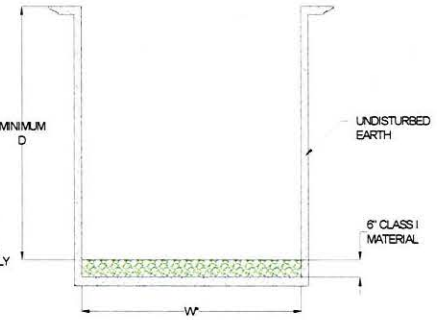
NOTE: These recommendations are general in nature and are not meant to be specific. Consult a geotechnical engineer for project specific design and installation recommendations.

Trench Construction

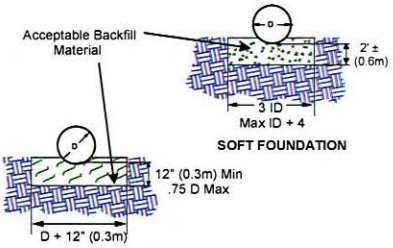
- Trench or ditch should be just wide enough to place and compact backfill around the entire pipe. A minimum width of OD + 36" but no greater than OD + 72" is recommended. *Trench width does not account for the bypass pipe, this estimate is for the main unit only.*
- As with any pipe, groundwater or seasonal high water tables may impede installation. De-watering is necessary for safe, efficient installation.

ADS UNIT SIZE	MINIMUM D	MINIMUM W*
36" (900 mm)	4.5' (1.37 M)	6.5' (1.98 M)
42" (1050 mm)	5.0' (1.52 M)	7.0' (2.13 M)
48" (1200 mm)	5.5' (1.68 M)	7.5' (2.29 M)
60" (1500 mm)	7.5' (2.29 M)	8.5' (2.59 M)

* DOES NOT ACCOUNT FOR BYPASS PIPE, THIS ESTIMATE IS FOR THE MAIN UNIT ONLY



- Trench or ditch bottoms containing bedrock, soft muck or refuse, or other material unable to provide long-term pipe support are unacceptable.
- If a firm foundation is exposed, replace excavated material with acceptable backfill and compact as shown.



- Remove rock or unyielding material 1-foot (0.3m) below grade and 6" (0.15m) on either side of pipe.*
- Excavate soft areas approximately 2 feet (0.6m) below grade and three times pipe width.*
- If soft area remains after excavation or if native soil can migrate into backfill, use synthetic fabric (geotextile) to separate native soil from backfill.*

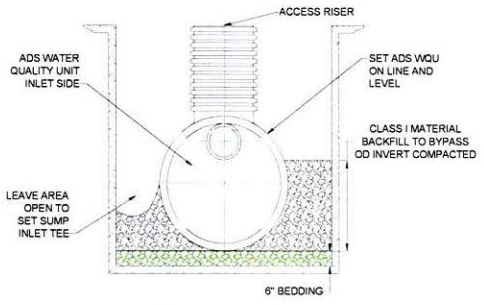
- For a flat bottom trench, the middle of bedding equal to 1/3 the pipe OD shall be loosely placed while the remainder shall be compacted in accordance with Table 1.

*These recommendations are general in nature and are not meant to be specific. Consult a geotechnical engineer for project specific design and installation recommendations

Backfill Envelope Construction

Placing Unit and Initial Backfill

- Utilize care when lowering unit into the trench. Handle using nylon slings and two pick points. Do not use slings around risers.
- Place and compact Class I backfill in layers to meet requirements of Table 1.
- When the unit consists of two sections, place the downstream section first. Properly lube the bell and spigot to connect and home the remaining section.

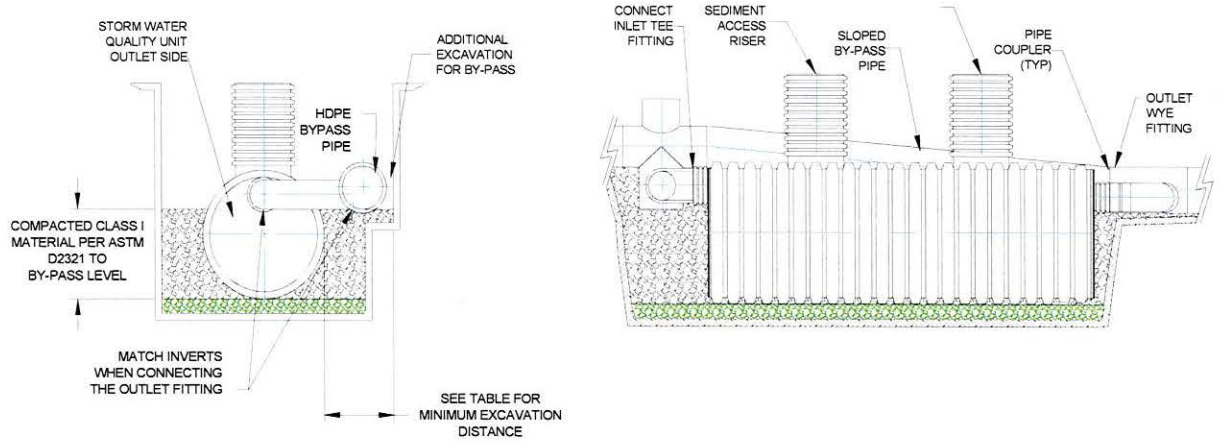


Connecting the Bypass

- Start on the downstream end by connecting the outlet fitting – be sure to match the inverts of the unit outlet and bypass pipe.
- The bypass pipe of the ADS WQU is designed to convey the peak storm water flow of the storm line. For example, at a 1% slope, peak flow rates for the bypass are as follows:

Diam. (in)	CFS	L/S	Diam. (in)	CFS	L/S
12	4	100	36	72	1900
15	7	190	42	110	2900
18	11	300	48	160	4200
24	24	660	60	280	7600
30	44	1200			

- Bypass fittings can be connected using the same couplers as the main storm sewer pipe. Couplers may be split couplers, gasketed split couplers, bell-bell couplers or welded couplers.



- Place and compact initial backfill in layers around pipe to at least 12" (0.3m) above the crown as shown.
- Avoid impacting pipe or separator unit with compaction equipment.

Backfill Around the Unit and Bypass

- Distance from outside diameter of SWQU (trench side) to bypass outer trench wall are provided in the following table (see detail above for distance reference):

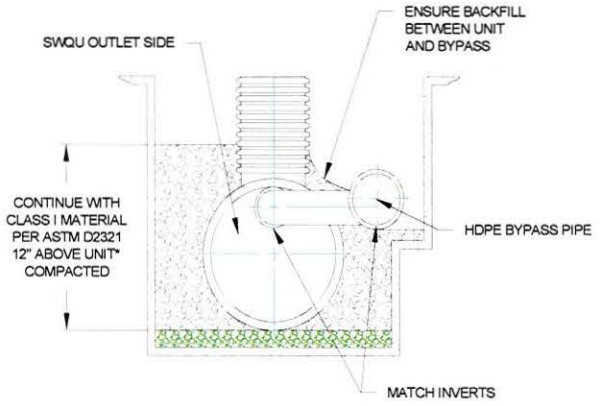
Bypass Pipe Diameter, in (mm)								
12 (300)	15 (375)	18 (450)	24 (600)	30 (750)	36 (900)	42 (1050)	48 (1200)	60 (1500)
41 (1041)	44 (1118)	49 (1245)	56 (1422)	64 (1626)	71 (1803)	78 (1981)	85 (2159)	100 (2540)

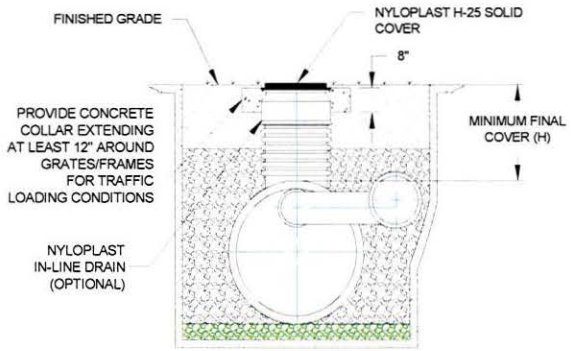
- Continue backfill with Class I material to 12" above the Water Quality Unit (24" for 60" units).
- Place and compact initial backfill in layers around pipe to at least 12" (0.3m) above the crown.

- Avoid impacting pipe or separator unit with compaction equipment.
- Final backfill and compaction should be appropriate for anticipated loading.
- Fill unit with water to the top of the sediment weir plate once backfill is placed and compacted 12" above the unit.

Final Cover and Riser Extensions

- For non-traffic loading, H=12" for 36", 42", and 48" units measured from the top of the unit to the bottom of bituminous pavement or top of rigid pavement. H=24" for 60" units.
- For traffic loading, H=24" for 36", 42", and 48" units measured from the top of the unit to the bottom of bituminous pavement or top of rigid pavement.
- If sufficient cover is provided, no further precautions are required.
- If sufficient cover is not provided, mound and compact material over pipe to provide minimum cover needed for load during construction. Final backfill and compaction should be appropriate for anticipated loading.





INSTALLATION GUIDE

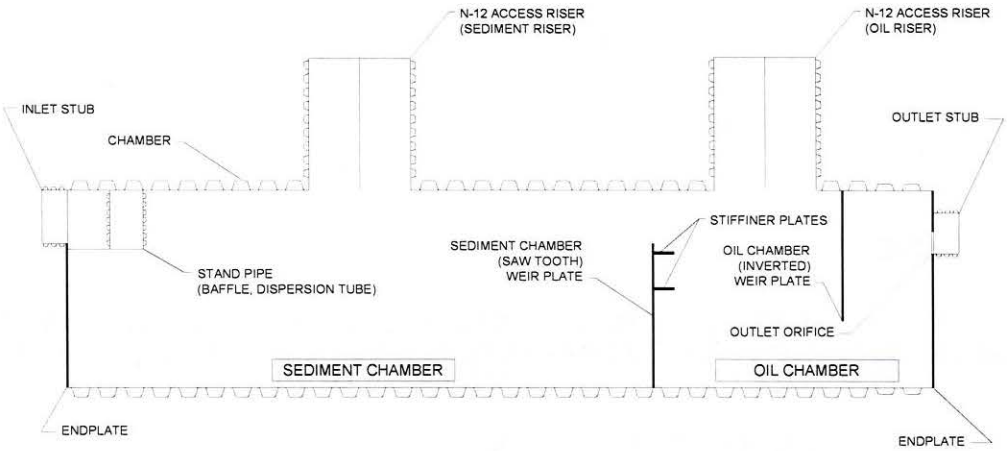
Storm Water Quality Units – Inspection & Maintenance

IG 2.02
October 2008

Description / Basic Function

The ADS Water Quality Unit harnesses the proven concepts utilized in municipal sewage treatment systems and transforms it into a compact Water Quality Unit.

The unit is ideal for storm water applications including gas stations and fast food restaurants; this system gives you a highly effective BMP solution to meet EPA requirements.



Risers

The ADS Water Quality Unit consists of two risers. A 24" riser is centered over Sediment and Oil Chambers. These two risers provide access to the individual chambers of the Storm Water Quality Unit for maintenance and inspection. Entry into the WQU should be considered an OSHA confined space and appropriate guidelines should be followed.

Maintenance Overview

The purpose of maintaining a clean and obstruction free Water Quality Unit is to ensure the system performs its intended function. A build up of debris in excess of the design storage volume could reduce the efficiency of the system.

A company specializing in such activities should perform inspection and maintenance of the Water Quality Unit.

Inspection / Maintenance Frequency for the ADS Water Quality Unit

- Inspected quarterly (4 times a year) and after major storm events.
- Cleaned (pumped and pressure washed) a minimum of once a calendar year
- Site or surrounding site conditions may require more inspections and maintenance

Inspection

An inspection should be performed when the system is installed. This allows the owner to measure the invert prior to accumulation of sediment. This survey will allow the monitoring of sediment build-up without entering the system, thereby eliminating the need for confined space entry. Documentation of pre-inspection data should be captured.

Procedures

1. In the By-Pass Structure inspect for blockage. Inspect the diversion structure and weir for damage and sediment buildup. Any damage should be repaired and sediment should be removed as required.
2. On the Water Quality Unit, locate the risers. The risers will be 24" in diameter.
3. Remove the lid of each riser. It is recommend that this be done one at a time so an open riser is not left exposed during inspection or maintenance of the other risers.
4. In the 24" riser over the Sediment Chamber, inspect the amount of floatable debris. Then measure the sediment buildup with a measuring device such as a Sludge Judge® Also inspect that the inlet pipe does not have any blockage. Blockage inspection is better suited after unit is vacuumed. Any confined space entry would be done through this riser and OSHA requirements must be followed.
5. In the 24" riser over the Oil Chamber, measure / inspect the oil depth.
6. Inspect structure and components for any damage.
7. Replace all riser lids.

Maintenance

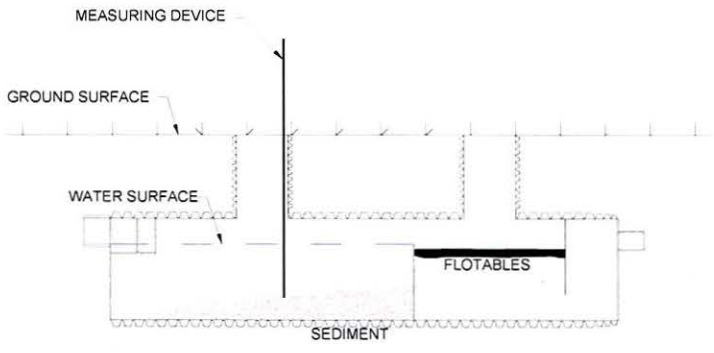
Cleaning should be performed if ***sediment volume has reduced the storage area by 20% or if the depth of sediment has reached approximately 25% of the diameter of the structure (See Table 1 for cleanout depth information).*** Furthermore, the system may need cleaning in the event a spill of a foreign substance enters the unit.

Inspection Procedures (Measuring Sediment Depth)

1. Lower measuring device into sediment riser of unit.
2. Read measurement at ground surface.
3. Subtract the current measurement reading from the distance between the ground surface to the invert of the SWQU (obtained when unit was first installed or is clean).
4. Compare calculated difference to the respective value in Table 1. If resulting value is equal to or greater than the respective value on the Table 1, maintenance shall be performed. The figure below illustrates the inspection procedure.

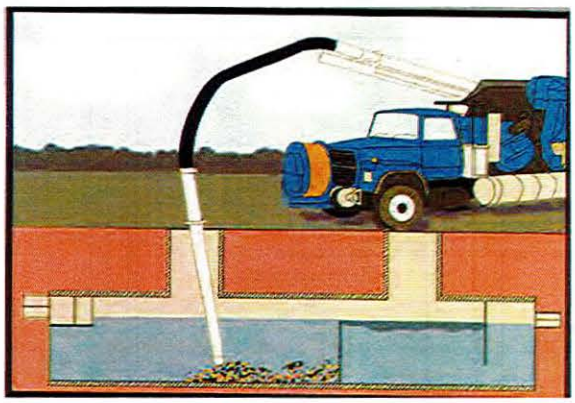
Table 1
Sediment Depth at Cleanout

Model Number	Diameter (in)	Sediment Depth (in)
3620WQ	36	9
3640WQ	36	9
4220WQ	42	10
4240WQ	42	10
4820WQ	48	12
4840WQ	48	12
6020WQ	60	15
6040WQ	60	15



Cleaning Procedures

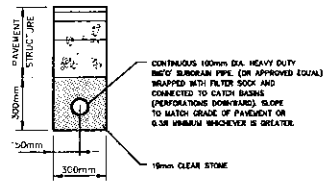
1. Insert vacuum hose into By-Pass Structure and pump out. Inspect By-Pass Structure for any damage.
2. Insert vacuum hose into 24" riser and pump out the Sediment Chamber. Pressure wash this Chamber if needed. Inspect for any damage. Inspect the inlet pipe for any blockage. Also inspect weir plate for damage.
3. Insert vacuum hose into other 24" riser. This will pump out the Oil Chamber. Inspect for any structural damage. Pressure wash this Chamber if needed.
4. Refill water quality unit with water.
5. Replace all riser lids.



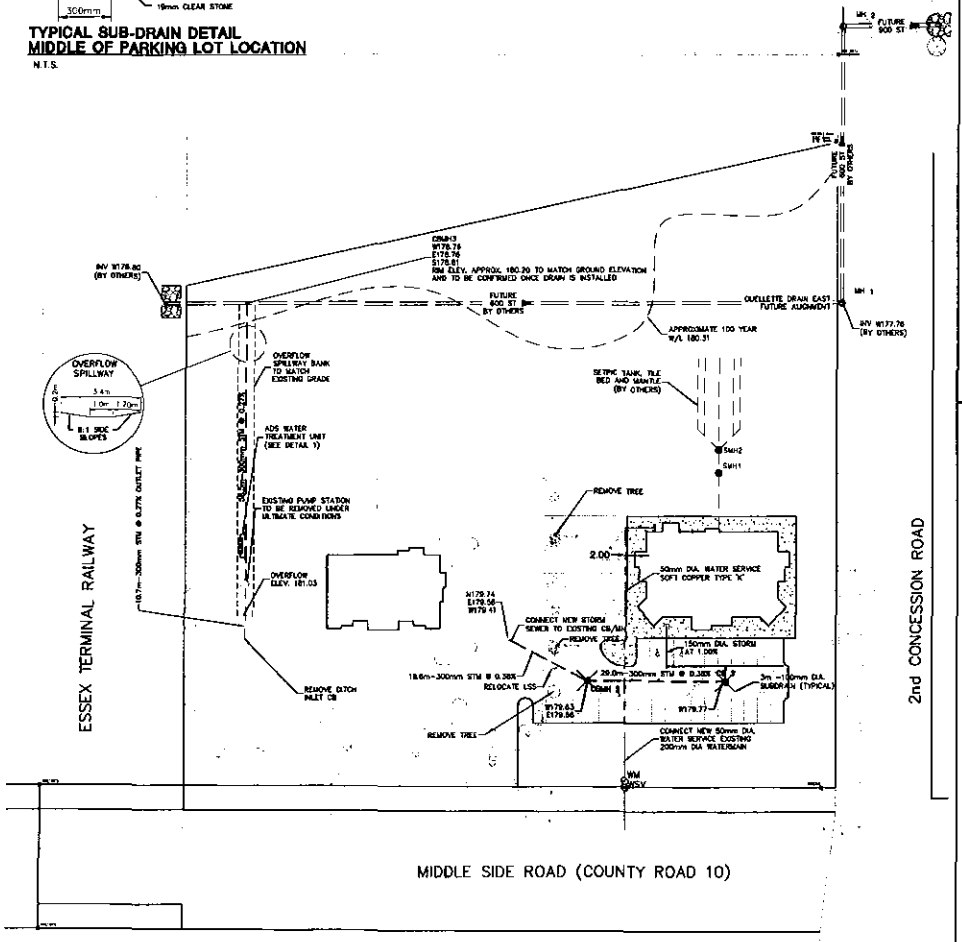
The owner or operator is responsible for meeting all federal, state, and local laws and regulations during the maintenance and cleanout operations.

Material Disposal

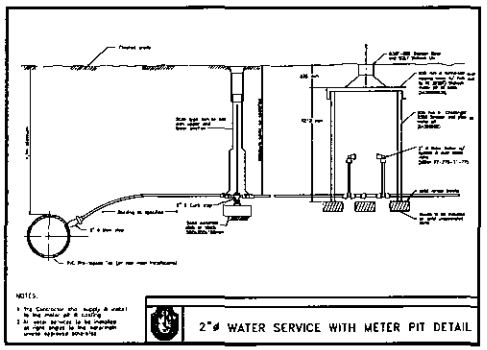
Owners are responsible for complying with all federal, state, and local regulations when disposing of material collected from the storm water quality unit. Water and sediment from cleanout procedures should not be dumped into sanitary sewer.

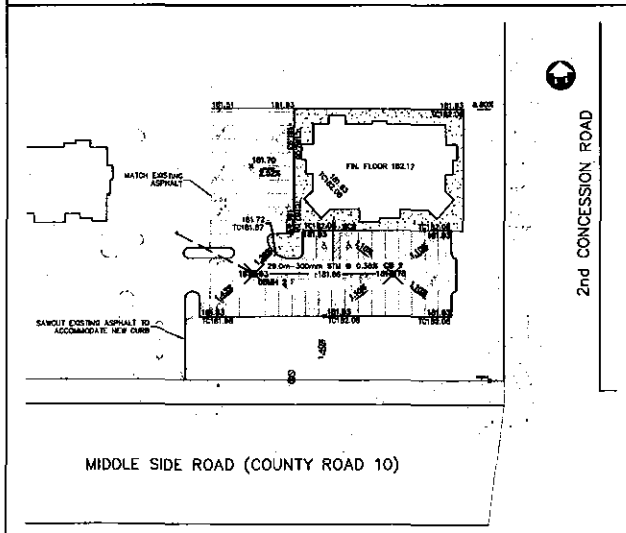


TYPICAL SUB-DRAIN DETAIL
MIDDLE OF PARKING LOT LOCATION
N.T.S.



ULTIMATE CONDITIONS - STORMWATER MANAGEMENT & WATER SERVICING





NEW CONSTRUCTION

GENERAL NOTES:

1. THE OWNER AND DILLON CONSULTING LIMITED DO NOT GUARANTEE THE ACCURACY OF THE UTILITIES SHOWN ON THE DRAWINGS. OTHER UTILITIES MAY BE PRESENT OR THE UTILITIES SHOWN MAY DIFFER IN SIZE OR LOCATION FROM THOSE SHOWN. THE CONTRACTOR SHALL NOTE THAT SERVICES FROM THE MAIN LINES ARE NOT SHOWN. THE CONTRACTOR ASSUMES FULL RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES AND TO REPAIR ANY DAMAGE IT MAY CAUSE TO THESE UTILITIES OR TO OTHER THIRD PARTIES. THE CONTRACTOR AGREES TO INDEMNIFY THE OWNER AND DILLON CONSULTING LIMITED AGAINST ANY CLAIMS WHICH MAY ARISE FROM THE CONTRACTOR'S ACTIONS.
2. ALL DIMENSIONS AND RADII ARE TO CONSTRUCTION BASELINE OR EDGE OF PAVEMENT.
3. THE CONTRACTOR SHALL CONSTRUCT ALL TO WITHIN 5mm OF DIMENSIONS SPECIFIED, UNLESS NOTED OTHERWISE.
4. LIMITS OF PARKING LOT CONSTRUCTION AROUND THE PERIMETER OF PROPOSED BUILDING SITES SHALL BE UP TO AND INCLUDING THE CONCRETE CURB. ALL WORK TO BE COORDINATED WITH THE SCHEDULE OF THE BUILDING GENERAL CONTRACTOR.
5. RESTORATION OF ALL BOULEVARD AREAS ABUTTING THE SITE PERIMETER AND WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE PART OF THIS CONTRACT AND SHALL INCLUDE GRADING, 100mm TOPSOIL AND NURSERY SOD, FROM PROPERTY LINE TO ROADWAY.
6. ALL CATCH BASINS SHALL BE 600mmx600mm OPSD 705.010. (UNLESS NOTED OTHERWISE) INSTALL DEBRIS TRAP.
7. ALL SUBDRAIN PIPE TO CB's SHALL BE 100mm DIA. HEAVY DUTY SIG 'O'. (UNLESS NOTED OTHERWISE) CONNECT TO CB's WHERE POSSIBLE.
8. ALL STORM SEWER SERVICES TO BE INSTALLED TO 1.5m FROM THE BUILDING FACE, CAPPED AND SHALL BE 150mm DIA. PVC DR 28 PIPE.
9. NEW WATER SERVICES TO BE TERMINATED 1.5m FROM BUILDING FACE.
10. HYDRO, BELL, CODECO AND GAS SERVICES TO THE SITE SHALL BE COORDINATED BY THE OWNER.

NEW CONSTRUCTION LEGEND

- NEW CONCRETE BARRIER CURB
- PROPOSED STORM SEWER
- PROPOSED WATERMAIN
- 100 YEAR HIGH WATER LINE
- EG EXISTING GROUND
- TOB TOP OF BANK
- BB BOTTOM OF BANK
- 150mm ASPH. 300mm GRANULAR 'A' / 300mm COMPACTED GRANULAR 'A'
- CONCRETE SIDEWALK
- 2004 SURVEY OF EXISTING SITE
- 2018 SURVEY OF EXISTING SITE
- 185.00 PROPOSED GRADE

FOR SITE PLAN APPLICATION
NOT FOR CONSTRUCTION

WINDSOR, ONTARIO

PLOTTED BY: OUELLETTE, BEN

Pacitti Contracting Company Inc

DILLON CONSULTING

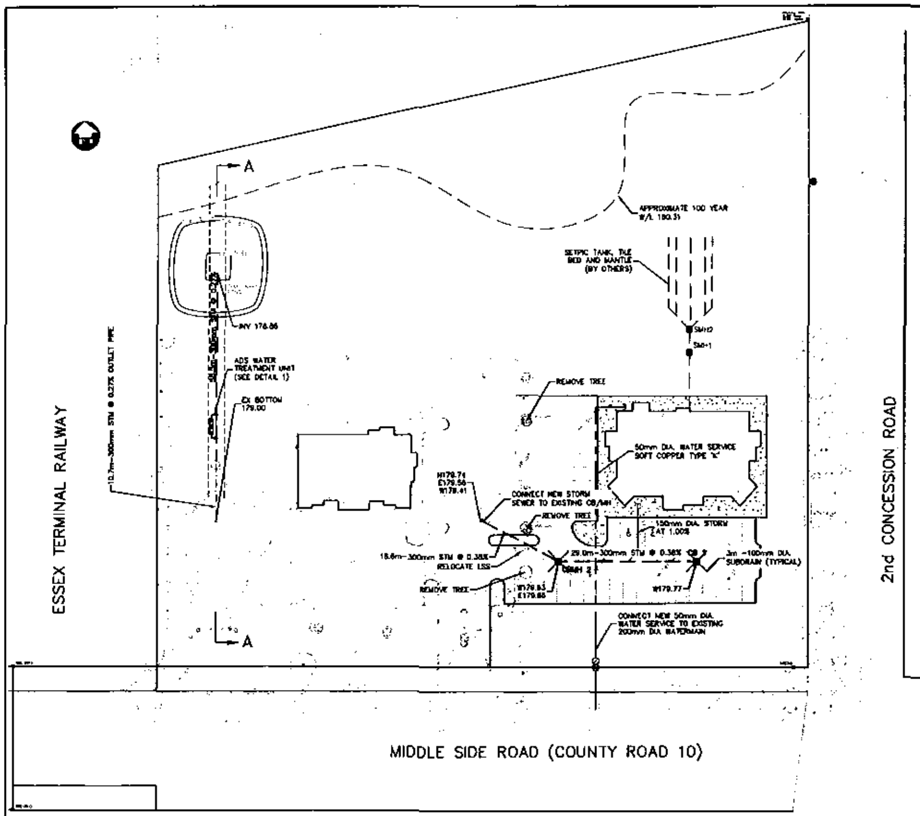
DESIGN	IDW
DRAWN	MJC
CHECKED	RJZ
APPROVED	RBH
DATE	JULY 2018
SCALE	1:500

Pacitti Commercial Site Development
Phase 2

REMOVALS, SITE GRADING STORMWATER MANAGEMENT AND WATER SERVICE LAYOUT

15-2001-2000

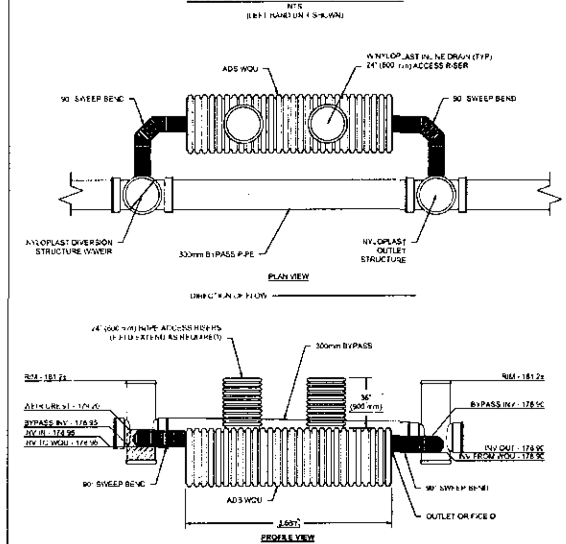
1



TEMPORARY CONDITIONS - STORMWATER MANAGEMENT & WATER SERVICING

SCALE 1:500

3612WQA12 ADS WATER QUALITY UNIT



ADS MODEL #	MAIN PIPE Ø	SIEVE SIZE	PARTICLE SIZE (CM)	TREATED FLOW RATE (CFS)	INLET Ø	OUTLET Ø	OUTLET ORIFICE Ø	ELEVATION CHANGE¹
3612WQA12	36" (900 mm)	140	0.0106	0.86	10" (250 mm)	10" (250 mm)	5.94" (150 mm)	2" (50 mm)

1/ DENOTES A BY-PASS SIZE OF 12" (300mm)

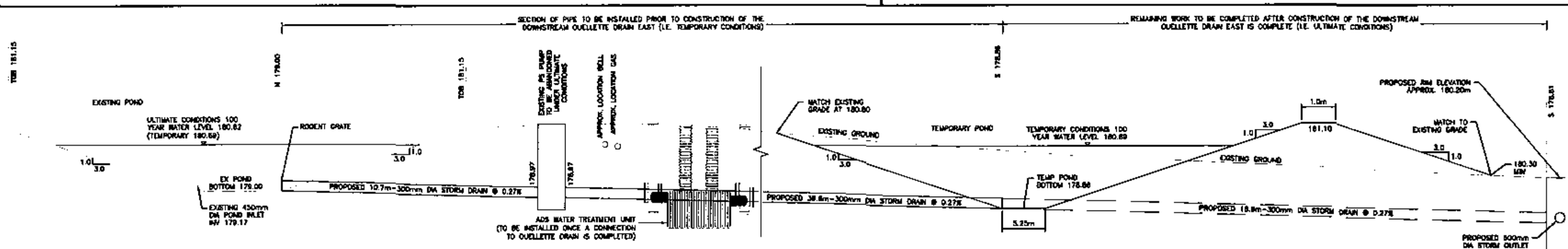
DETAIL 1 - ADS WATER QUALITY TREATMENT UNIT

SCALE N.T.S.

NEW CONSTRUCTION LEGEND

———	NEW CONCRETE BARRIER CURB
— —	PROPOSED STORM SEWER
— - - —	PROPOSED WATERMAIN
— — —	100 YEAR HIGH WATER LINE
EG	EXISTING GROUND
TOB	TOP OF BANK
BB	BOTTOM OF BANK
LSS	LIGHT STANDARD
	35mm HL3 / 40mm HL4 / 300mm COMPACTED GRANULAR 'A'
	CONCRETE SIDEWALK
	2004 SURVEY OF EXISTING SITE
	2015 SURVEY OF EXISTING SITE
185.00	PROPOSED GRADE

FOR SITE PLAN APPLICATION NOT FOR CONSTRUCTION



SECTION A-A - TEMPORARY AND PERMANENT POND OUTLET PROFILE

SCALE N.T.S.

Conditions of Use

Verify elevations and/or dimensions on drawing prior to use. Report any discrepancies to Dillon Consulting Limited.

Do not scale dimensions from drawing.

Do not modify drawing, re-use it or use it for purposes other than those intended at the time of its preparation without prior written permission from Dillon Consulting Limited.

Pacitti Contracting Company Inc

DILLON CONSULTING

IDW	NMC	RJZ	RBH
JULY 2015	AS SHOWN		

Pacitti Commercial Site Development
Phase 2

TEMPORARY STORM SEWER LAYOUT AND DETAILS

15-2001-2000

2

PROJECT NO.: 04-3072-1000
DESIGN BY: SES
DATE: April 19, 2004

PACITTI DEVELOPMENT
ON-SITE STORM WATER DETENTION CALCULATIONS

A. PRE-DEVELOPED SITE CONDITIONS:

Ex. Site Area = 3304 sq.m = 0.33 Ha

B. PROPOSED SITE CONDITIONS:

Commercial (C=0.62)= 3304 sq.m = 0.33 Ha

C. RUNOFF COEFFICIENTS:

EXISTING: Cund= 0.20 (1:5 yr freq)

FUTURE: Cdev= 0.63 (1:5 yr freq)

D. PRE-DEVELOPED (ALLOWABLE) DISCHARGE FOR 1:5 YEAR FREQUENCY STORM:

Average Runoff Coefficient, Cund = 0.20
Time of Concentration = 16.6 min. (for 1:5 year)
Intensity, i = 86.75 mm/hr Where Intensity, i = 125 * 25.4 / (T+20),
for CITY OF WINDSOR 1:5 year frequency stor

Qund = 2.78 C i A
= 15.94 L/s

E. POST-DEVELOPMENT DISCHARGE FOR 1:5 YEAR FREQUENCY STORM:

Average Runoff Coefficient, Cdev = 0.63

Qdev = 2.78 C i A
= 0.58 * i L/s

SCHEDULE "H" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Pacitti

TOWN OF AMHERSTBURG

Mayor- Aldo DiCarlo

Clerk- Paula Parker

F. STORM VOLUME CALCULATIONS FOR 1:5 YEAR FREQUENCY STORM:

Duration (min.) t	Intensity* (mm/hr) I	Qd=2.78CIA (L/s)	Storm Volume (cu.m.)** V1=Qd t 60	Relief Volume*** (cu.m.)** V2=Qu t 60	Storage (cu.m.) V1 - V2
0	158.75	0.00	0.00	0.00	0.00
5	127.00	22.24	6.67	4.78	1.89
10	105.83	37.07	22.24	9.56	12.68
15	90.71	47.66	42.89	14.34	28.55
20	79.38	46.15	55.38	19.12	36.26
25	70.56	41.02	61.53	23.90	37.63
30	63.50	36.92	66.46	28.68	37.77 ****
35	57.73	33.56	70.48	33.47	37.02
40	52.92	30.77	73.84	38.25	35.59
45	48.85	28.40	76.68	43.03	33.65
50	45.36	26.37	79.11	47.81	31.31
55	42.33	24.61	81.22	52.59	28.64
60	39.69	23.08	83.07	57.37	25.70

* Where Intensity, i = 125 * 25.4 / (T+20), for CITY OF WINDSOR 1:5 year frequency Storm

** Where Qd or Qu is entered in cms

*** Qund = 15.94 L/s for 1:5 year storm

****** Max. volume to be stored = 37.77 cu.m. for 1:5 year storm**

Storage will be provided in the proposed temporary swale proposed with the smaller culvert to restrict flows to the municipal drain to predeveloped flows.

Dillon Consulting Limited

STORM SEWER DESIGN SHEET

Town of Amherstburg
County of Essex

Project Name: Pacitti Development
Project Number: 04-3104-1000

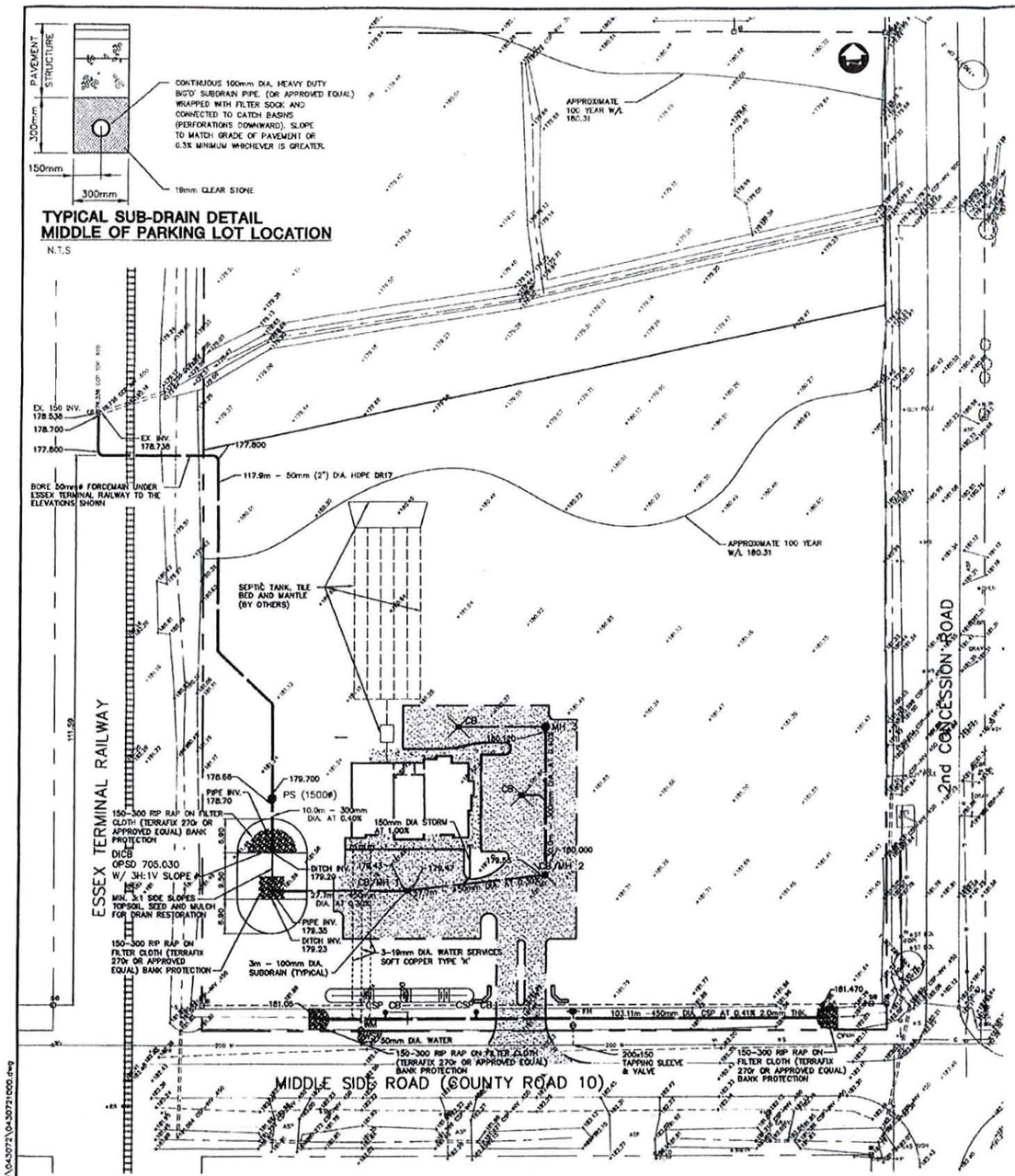
Location	From M.H.	To M.H.	Len. (m)	Area (ha)	Run. Coef.	2.78AC	Accum. 2.78AC	T of In (min)	T of F (min)	T of C (min)	Intens. (mm/Hr)	Exp.fl. (L/s)	Invert Up M.H.	Elev. Low M.H.	Fall (m)	Slope (%)	Pipe D(mm)	Capac. (L/s)	Vel. (m/s)	Act.T of Fl(min)	Drop in Low M.H	Ground Elevation Up M.H.	Pipe Diameter D(mm)	Pipe Wall Thickness t(mm)	Depth of Cover (m)
A1	CB/MH 1	CB/MH 2	27.70	0.14	0.645	0.24	0.24	15.00	0.61323	15.61	89.15	21.61	180.197	180.053	0.144	0.520	200	23.68	0.75	0.61	0.025	181.330	200	7	0.9
A2 A3 A4	CB/MH 2	outlet	42.70	0.20	0.625	0.34	0.58		0.94977	16.56	86.64	50.50	180.028	179.900	0.128	0.300	300	52.97	0.75	0.95	0.000	181.500	300	7	1.2
Orifice Pipe																0.070	250	15.73							

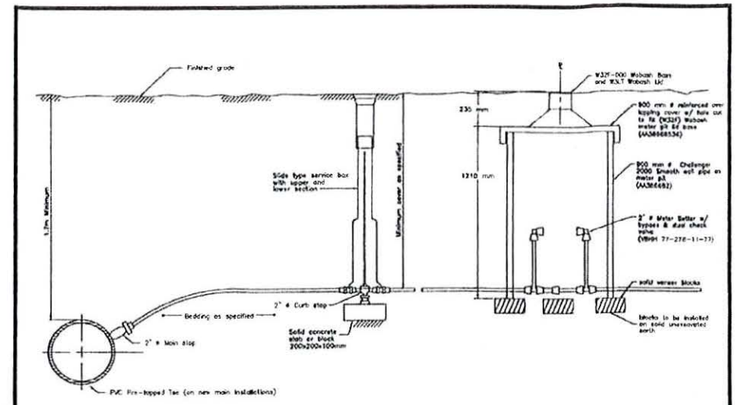
Total Area 0.33 ha.

NOTES :

1) Design Storm = 1:5 Year C.O.W. (125*25.4/(Tc+20)) mm/hr
2) Manning's Coefficient = 0.013
3) Minimum Velocity = 0.60 m/s 2.0 fps)
   Maximum Velocity = 3.00 m/s 9.8 fps)

Susan E. St.Louis 4/18/2004

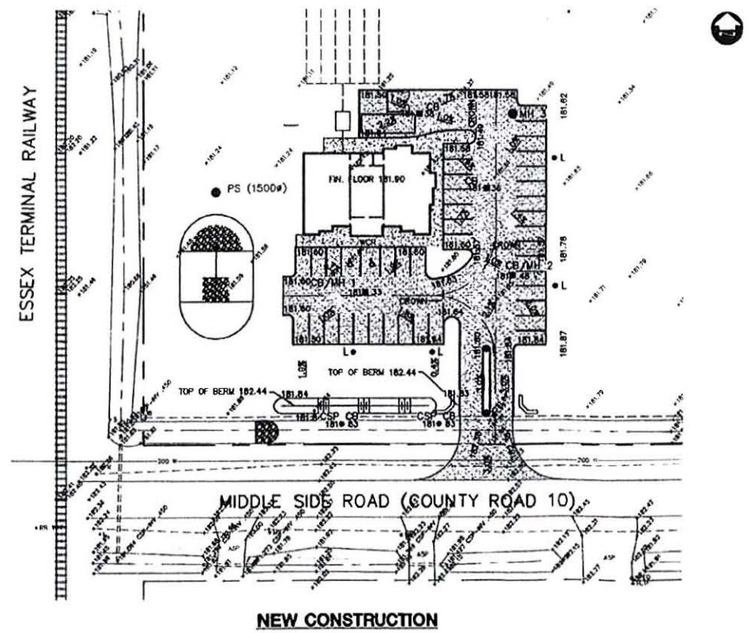




NOTES:

1. The Contractor shall supply & install to the meter pit & casting.
2. All water services to be installed at right angles to the watermain unless approved otherwise.

2"ø WATER SERVICE WITH METER PIT DETAIL



SCHEDULE "I" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

1 Aldo Pacitti

TOWN OF AMHERSTBURG

2 Mayor- Aldo DiCarlo

3 Clerk- Paula Parker

4 LIMITS OF PARKING LOT CONSTRUCTION AROUND THE PERIMETER OF PROPOSED BUILDING SITES SHALL BE UP TO AND INCLUDING THE CONCRETE CURB. ALL WORK TO BE COORDINATED WITH THE SCHEDULE OF THE BUILDING GENERAL CONTRACTOR.

5 RESTORATION OF ALL BOULEVARD AREAS ABUTTING THE SITE PERIMETER AND WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE PART OF THIS CONTRACT AND SHALL INCLUDE GRADING, 100mm TOPSOIL AND NURSERY SOD, FROM PROPERTY LINE TO ROADWAY.

6 ALL CATCH BASINS SHALL BE 600mmx600mm OPSD 705.010. (UNLESS NOTED OTHERWISE) INSTALL DEBRIS TRAP.

7 ALL CATCH BASINS LEADS TO BE 200mm DIA. AT 1.00% (UNLESS NOTED OTHERWISE)

8 ALL SUBDRAIN PIPE TO CB's SHALL BE 100mm DIA. HEAVY DUTY BIG "O". (UNLESS NOTED OTHERWISE) CONNECT TO CB's WHERE POSSIBLE.

9 ALL STORM SEWER SERVICES TO BE INSTALLED TO 1.5m FROM THE BUILDING FACE, CAPPED AND SHALL BE 150mm DIA. PVC DR 28 PIPE.

10 NEW WATER SERVICES TO BE TERMINATED 1.5m FROM BUILDING FACE.

11 LAYOUT DIMENSIONS FOR SERVICES ARE SHOWN ON THE SITE PLAN.

12 ALL STORM AND CB LEAD CONNECTIONS TO PVC AND CONC MAINLINE SEWERS SHALL BE MADE USING A PREFABRICATED "WYE" CONNECTION.

13 CSP CB TO BE 300mm DIA. CSP WITH CAST IRON GRATE.

14 THE LIGHTING LAYOUT IS BASED ON 8.1m MOUNTING HEIGHT AND 250 WATT METAL HALIDE, HOLOPHANE SOMERSET OUTDOOR FIXTURE SMST250MH.

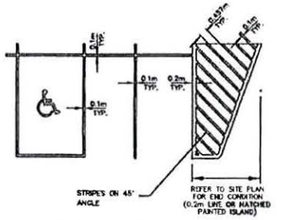
15 HYDRO, BELL, COGECO AND GAS SERVICES TO THE SITE SHALL BE COORDINATED BY THE OWNER.

STATISTICS

Parcel Area = 0.35ha (0.9 acres)
Building Size: 383 sq.m (3907 sq.ft.)
Parking Spaces Required: 13
Parking Spaces Provided: 41 (Including Handicap Spaces)
Handicapped Spaces Required: 2
Handicapped Spaces Provided: 2
Loading Spaces Required: 1
Loading Spaces Provided: 1

Landscaped Area: 1350.1sq.m (14532.4 sq.ft)
Curb Length: 289.9m (951.1 ft)

Typical Parking Space = 2.8m x 5.5m (9'x18')
Typical Handicapped Space = 3.7m x 5.5m (12.1'x18')
Typical Loading Space = 3.5m x 10m (11.5'x32.8')



TYPICAL PARKING LINE PAINTING
N.T.S.

NOTES: 1. ALL PARKING LOT LINE STRIPPING TO BE PAINTED WITH PARA PAINT 'S' NPI - YELLOW OR EQUAL. COLOUR SAMPLE TO BE APPROVED.

NEW CONSTRUCTION LEGEND

	NEW CONCRETE BARRIER CURB
WCR	WHEEL CHAIR RAMP (OPSD-303.04)
185.00	FINISHED GRADE AT EDGE OF PAVEMENT,
	35mm HL3 40mm HL4 300mm COMPACTED GRANULAR 'A'
	CONCRETE SIDEWALK

DILLON CONSULTING LIMITED
November 26, 2008
DATE

Pacitti Contracting Company Inc

DILLON CONSULTING
3200 Deziel Drive, Suite 608, Windsor, ON N8W 5K8
Phone: (519) 948-5000 Fax (519) 948-5054

No.	ISSUED FOR	DATE	BY
7	ENTRANCE REVISED	NOV 14/08	MDH,RJZ
6	REVISED PER ERCA COMMENTS	OCT 02/08	MDH,TAM
5	REVISED STORM DESIGN	JUL 28/08	MDH,TAM
4	REVISED STORM DRAINAGE	JUN 07/08	MDH,RJZ
3	REVISED BUILDING AREAS AND LANDSCAPING	MAY 06/08	KD,RJZ
2	TOWN REVIEW	APR 22/08	SES,RJZ
1	CLIENT REVIEW	APR 14/08	SES,RJZ

SURVEY	GBW
DESIGN	SES/MDH
DRAWING	RJZ
PRE-TICKER	DD

HORIZONTAL 1:500

Pacitti Commercial Site Development

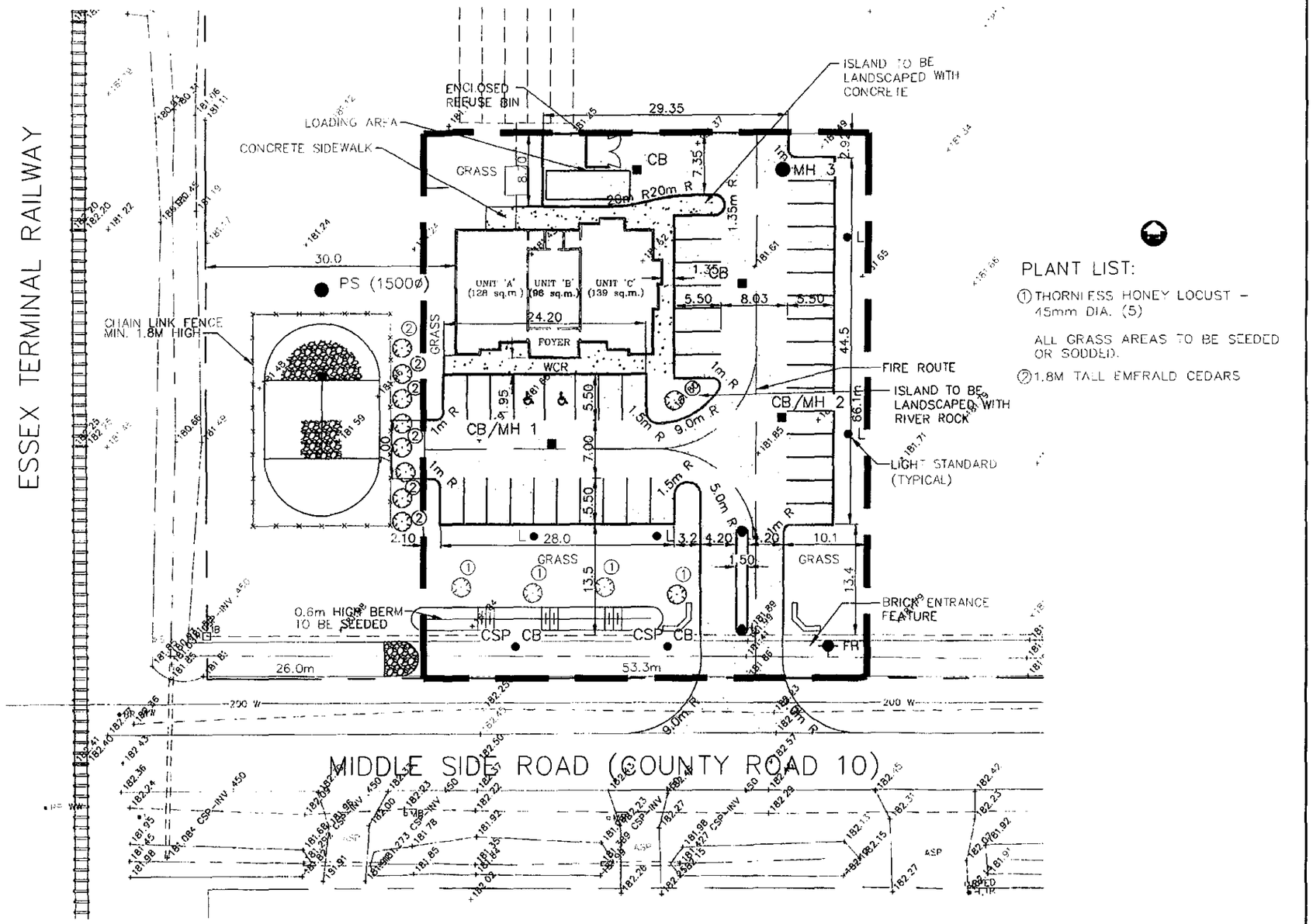
REMOVALS, SITE GRADING, STORM SEWER AND WATER MAIN LAYOUT

PROJECT NO. 04-3072-1000

SHEET NO. 1

28 Nov 2008

AMENDED SCHEDULE "D" TO BYLAW 2004-52
COUNCIL RESOLUTION JUNE 15, 2009



SITE PLAN

DILLON CONSULTING LIMITED
November 28, 2008
DATE

Pacitti Contracting Company Inc

DILLON CONSULTING
3200 Deziel Drive, Suite 608, Windsor, ON N8W 5K8
Phone: (519) 948-5000 Fax (519) 948-5054

No.	Issued For	Date	By
6	DRAINAGE REVISED	NOV 14/08	MDH,RJZ
5	REVISED PER CRCA COMMENTS	OCT 02/08	MDH,TAM
4	REVISED STORM DESIGN	JUL 28/08	MDH,TAM
3	REVISED STORM DRAINAGE	JUN 07/06	MDH,RJZ
2	TOWN REVIEW	APR 22/04	SES,RJZ
1	CLIENT REVIEW	APR 14/04	SES,RJZ

SURVEY	GBW
DESIGN	SES/MDH
DRAFTING	RJZ
PRE-TENDER	DB

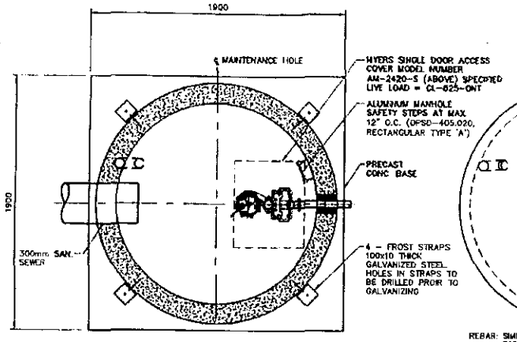
HORIZONTAL 1:250

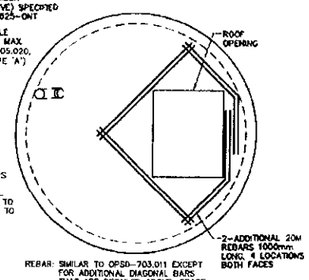
Pacitti Commercial Site Development

SITE PLAN AND LANDSCAPE PLAN

PROJECT NO 04-3072-1000
SHEET NO. 2
28 Nov 2008

AMENDED SCHEDULE "F" TO BYLAW 2004-52
COUNCIL RESOLUTION JUNE 15, 2009



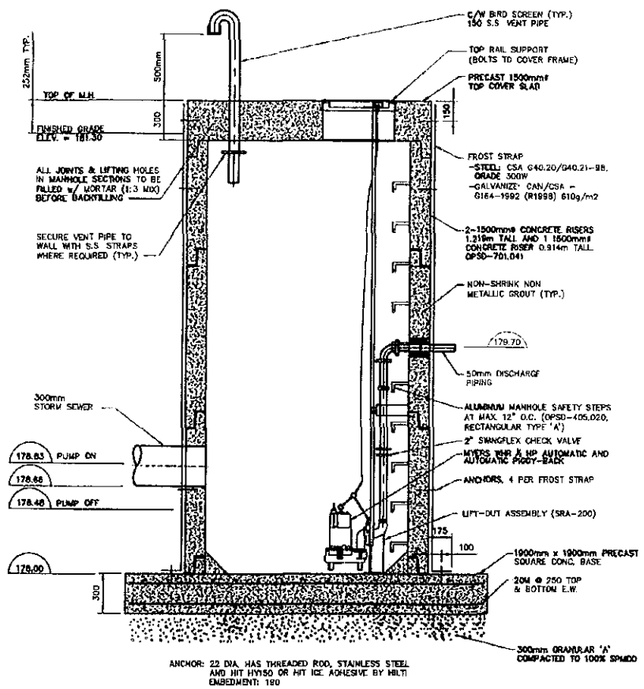


SUBMERSIBLE PUMPING STATION PLAN

SCALE: 1:20

ROOF PLAN

SCALE: 1:20



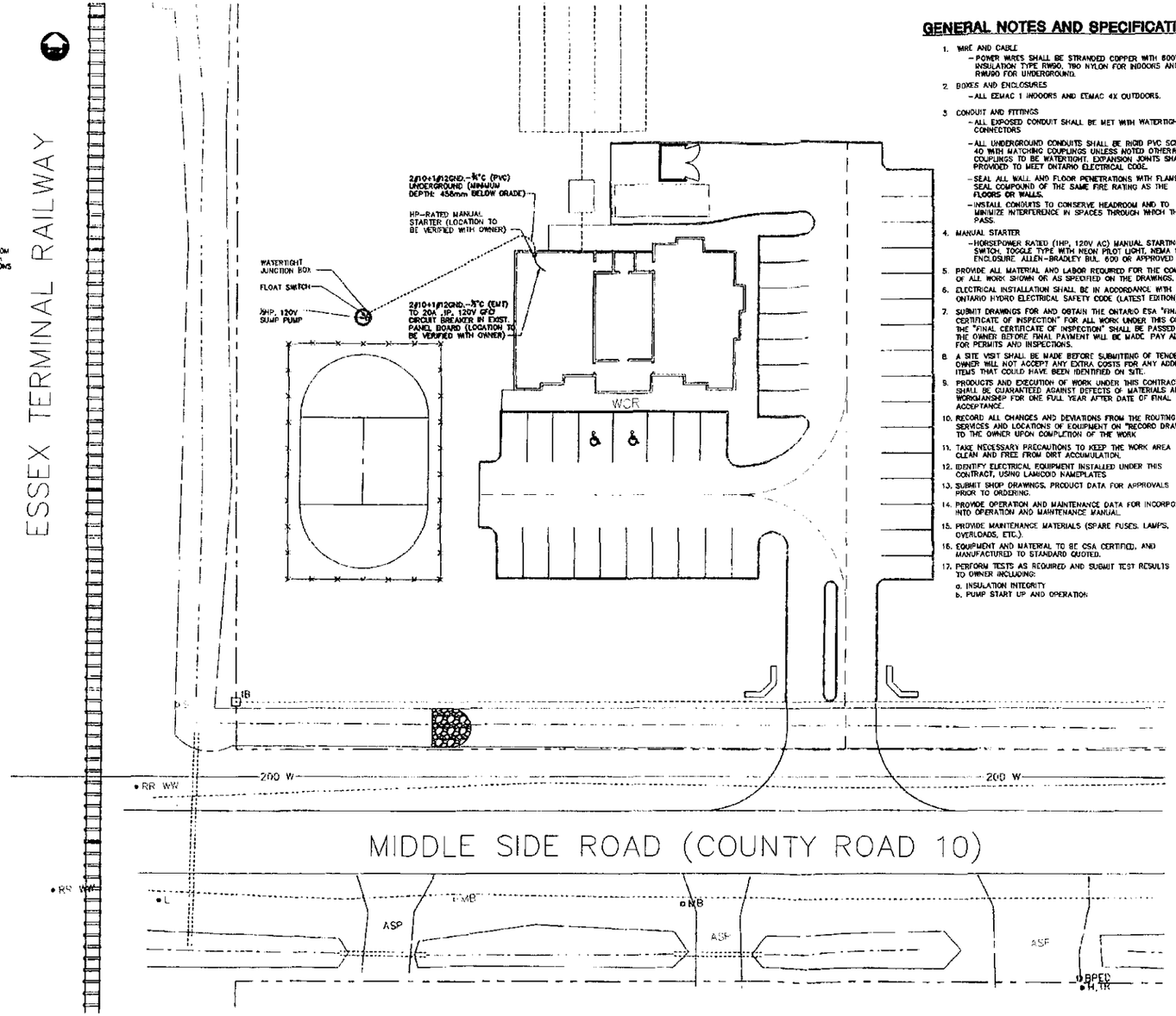
SUBMERSIBLE PUMPING STATION SECTION

SCALE: 1:20

NOTES:

1. CHAMBER BASE TO BE FOUNDED ON NATURAL UNDISTURBED SOIL WITH AN ALLOWABLE BEARING CAPACITY OF 200 kPa.
2. SUBMIT SHOP DRAWINGS FOR ALL COMPONENTS TO ENGINEER FOR APPROVAL.

ESSEX TERMINAL RAILWAY



POWER PLAN

GENERAL NOTES AND SPECIFICATIONS

1. WIRE AND CABLE
   - POWER WIRES SHALL BE STRANDED COPPER WITH 600V INSULATION TYPE RW90, TWO NYLON FOR INDOORS AND RWU90 FOR UNDERGROUND.
2. BOXES AND ENCLOSURES
   - ALL EEMAC 1 INDOORS AND EEMAC 4X OUTDOORS.
3. CONDUIT AND FITTINGS
   - ALL EXPOSED CONDUIT SHALL BE MET WITH WATERTIGHT CONNECTORS
   - ALL UNDERGROUND CONDUITS SHALL BE RIGID PVC SCHEDULE 40 WITH MATCHING COUPLINGS UNLESS NOTED OTHERWISE. COUPLINGS TO BE WATERTIGHT. EXPANSION JOINTS SHALL BE PROVIDED TO MEET ONTARIO ELECTRICAL CODE.
   - SEAL ALL WALL AND FLOOR PENETRATIONS WITH FLAME SEAL COMPOUND OF THE SAME FIRE RATING AS THE FLOORS OR WALLS.
   - INSTALL CONDUITS TO CONSERVE HEADROOM AND TO MINIMIZE INTERFERENCE IN SPACES THROUGH WHICH THEY PASS.
4. MANUAL STARTER
   - HORSEPOWER RATED (1HP, 120V AC) MANUAL STARTING SWITCH, TOGGLE TYPE WITH NEON PILOT LIGHT, NEMA 1 ENCLOSURE ALLEN-BRADLEY BUL. 600 OR APPROVED EQUAL.
5. PROVIDE ALL MATERIAL AND LABOR REQUIRED FOR THE COMPLETION OF ALL WORK SHOWN OR AS SPECIFIED ON THE DRAWINGS.
6. ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE ONTARIO HYDRO ELECTRICAL SAFETY CODE (LATEST EDITION).
7. SUBMIT DRAWINGS FOR AND OBTAIN THE ONTARIO ESA "FINAL CERTIFICATE OF INSPECTION" FOR ALL WORK UNDER THIS CONTRACT. THE "FINAL CERTIFICATE OF INSPECTION" SHALL BE PASSED ON TO THE OWNER BEFORE FINAL PAYMENT WILL BE MADE. PAY ALL FEES FOR PERMITS AND INSPECTIONS.
8. A SITE VISIT SHALL BE MADE BEFORE SUBMITTING OF TENDER. THE OWNER WILL NOT ACCEPT ANY EXTRA COSTS FOR ANY ADDITIONAL ITEMS THAT COULD HAVE BEEN IDENTIFIED ON SITE.
9. PRODUCTS AND EXECUTION OF WORK UNDER THIS CONTRACT SHALL BE GUARANTEED AGAINST DEFECTS OF MATERIALS AND WORKMANSHIP FOR ONE FULL YEAR AFTER DATE OF FINAL ACCEPTANCE.
10. RECORD ALL CHANGES AND DEVIATIONS FROM THE ROUTING OF SERVICES AND LOCATIONS OF EQUIPMENT ON "RECORD DRAWINGS" TO THE OWNER UPON COMPLETION OF THE WORK
11. TAKE NECESSARY PRECAUTIONS TO KEEP THE WORK AREA CLEAN AND FREE FROM DIRT ACCUMULATION.
12. IDENTIFY ELECTRICAL EQUIPMENT INSTALLED UNDER THIS CONTRACT, USING LAMICOID NAMEPLATES.
13. SUBMIT SHOP DRAWINGS, PRODUCT DATA FOR APPROVALS PRIOR TO ORDERING.
14. PROVIDE OPERATION AND MAINTENANCE DATA FOR INCORPORATION INTO OPERATION AND MAINTENANCE MANUAL.
15. PROVIDE MAINTENANCE MATERIALS (SPARE FUSES, LAMPS, OVERLOADS, ETC.).
16. EQUIPMENT AND MATERIAL TO BE CSA CERTIFIED, AND MANUFACTURED TO STANDARD QUOTED.
17. PERFORM TESTS AS REQUIRED AND SUBMIT TEST RESULTS TO OWNER INCLUDING:
    a. INSULATION INTEGRITY
    b. PUMP START UP AND OPERATION

V. I. HURST — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — STRUCTURAL only

BRUNO DILORETO — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO

DILLON CONSULTING LIMITED

December 17, 2008
DATE

S. L. KUPISZ — REGISTERED PROFESSIONAL ENGINEER — PROVINCE OF ONTARIO — Mechanical only

Pacitti Contracting Company Inc

DILLON CONSULTING
3200 Deziel Drive, Suite 608, Windsor, ON N8W 5K8
Phone: (519) 948-5000 Fax (519) 948-5054

No.	ISSUED FOR	DATE	BY
3	ENTRANCE REVISED	NOV 14/08	MDH,RJ/
2	REVISED AS PER ERCA COMMENTS	OCT 02/08	MDH,TAM
1	REVISED STORM DESIGN	JUL. 28/08	MDH,TAM

SURVEY	GBW
DESIGN	CWW/VC
DRAFTING	TAM
PRE-TENDER	DD

0 5m
HORIZONTAL 1:250

Pacitti Commercial Site Development

SITE PLAN, LANDSCAPE PLAN, AND PUMPING STATION DETAIL

PROJECT NO. 04-3072-1000
SHEET NO. **E/M**
17 Dec 2008

AMENDED SCHEDULE "F" CONTINUED
TO BYLAW 2004-52
COUNCIL RESOLUTION JUNE 15, 2009

ELEVATIONS

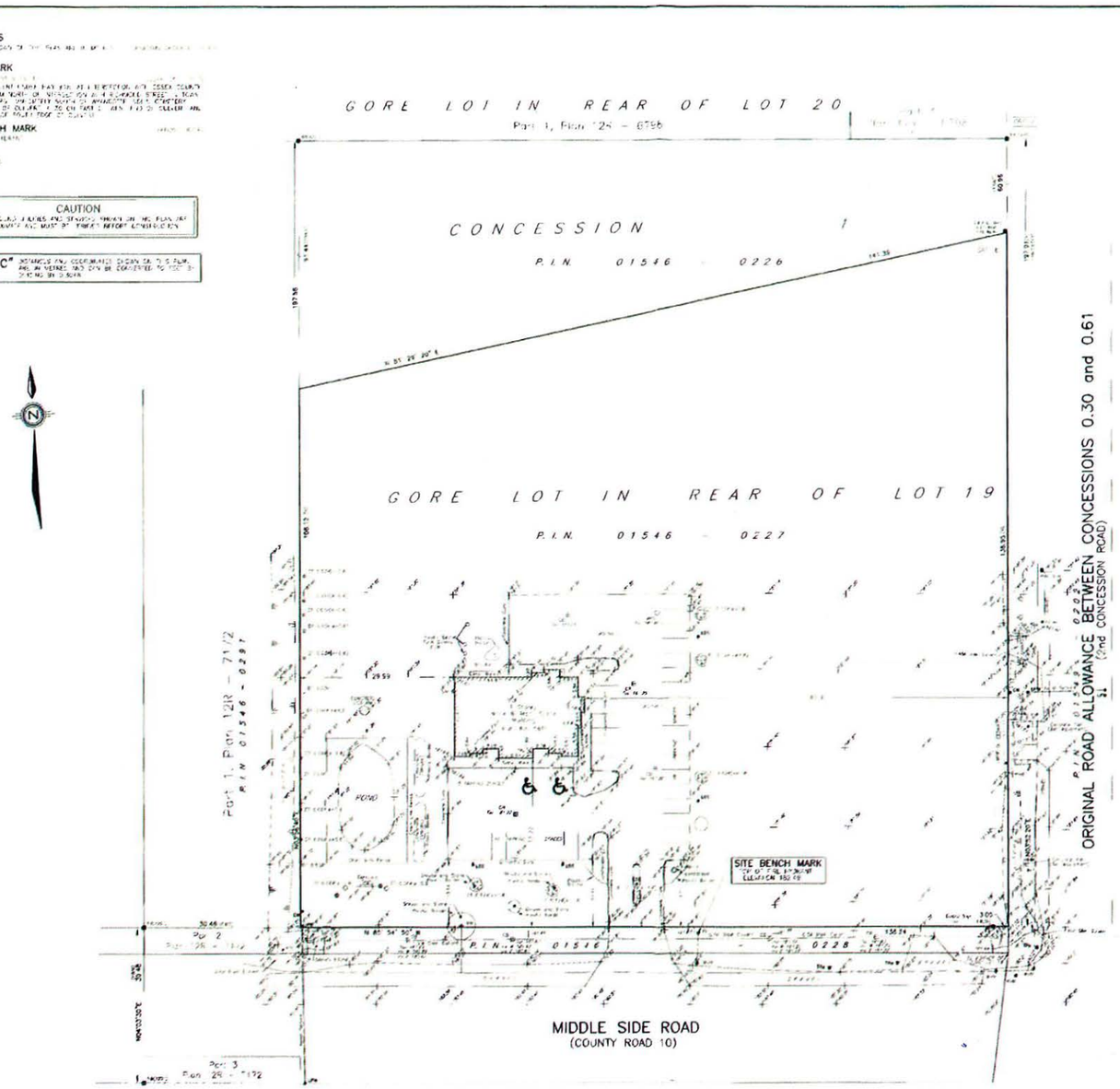
BENCH MARK

SITE BENCH MARK

AREA

CAUTION

"METRIC"



TOPOGRAPHIC SURVEY
OF
PART OF GORE LOT
IN REAR OF LOT 19,
CONCESSION 1
GEOGRAPHIC TOWNSHIP OF ANDERDON
NOW IN THE
TOWN OF AMHERSTBURG
COUNTY OF ESSEX, ONTARIO

SCALE = 1:400

METRES

LEGEND AND NOTES

LEGEND

INTEGRATION DATA

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

MARCH 25, 2016

ANDREW S. MARTIN
ONTARIO LAND SURVEYOR
for VERMAEGEN STUBBERFIELD HARTLEY BREWER BEZAIRE INC.

WINDSOR — LEAMINGTON

VERMAEGEN STUBBERFIELD HARTLEY BREWER BEZAIRE INC.

ONTARIO LAND SURVEYORS

4-27705 — C-4196'A'

SCHEDULE "B" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Pacitti

TOWN OF AMHERSTBURG

Mayor: Aldo DiCarlo

Clerk: Paula Parker

Jul 12, 2016 - 11:54am C:\projects\all\working directory\sheets\

DILLON CONSULTING
3200 Deziel Drive, Suite 608, Windsor, ON N8W 5K8
Phone (519) 948-5000 Fax (519) 948-5054

No	ISSUED FOR	DATE	BY
1	MUNICIPAL REVIEW	JUL 12/16	HW/KDW

SURVEY	MAY 11/16	VSH/BB
DESIGN	JUL 07/16	HW/KDT
DRAFTING	JUL 07/16	HW
PRE-TENDER		

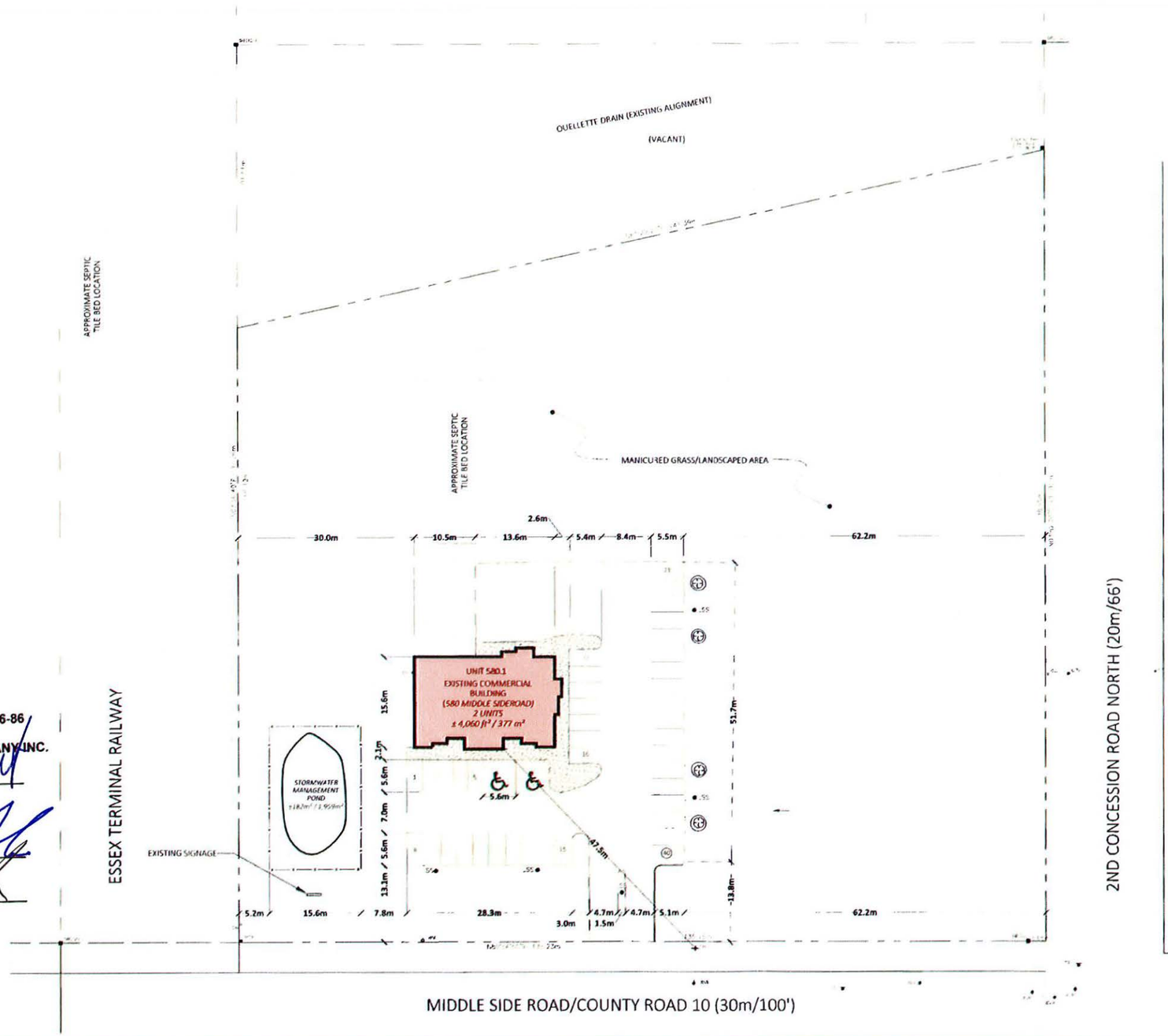
SCALE 1:1000 (ORIG.) SCALE 1:500 (PRINT)

PACITTI CONTRACTING COMPANY INC.
580 MIDDLE SIDEROAD DEVELOPMENT
SITE PLAN CONTROL APPROVAL
PHASE 2 BUILD-OUT
TOPOGRAPHIC SURVEY

PROJECT NO 15-2001: 2000

SHEET NO 1

SPC-6-16



SCHEDULE "C" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Pacitti

TOWN OF AMHERSTBURG

Mayor- Aldo DiCarlo

Clerk- Paula Parker

SITE STATISTICS:

TOTAL SITE AREA	= 16,789 m² (180,719 ft²)

BUILDING SPECIFICATIONS:

BUILDING FOOTPRINT	= 377 m² (4,060 ft²)
LOT COVERAGE (%)	= 2.25%
PARKING REQUIREMENTS	
PARKING REQUIREMENTS FOR PHASE 1 ARE CALCULATED BASED UPON THE MOST INTENSE USE OF THE DEVELOPMENT IN THIS CASE WE CONSIDER PLACE OF WORSHIP AS THE USE WHICH REQUIRES 1 PER 5 PERSON CAPACITY AND NOT AN EXACT PER m² RATIO. THE DEVELOPMENT DEMONSTRATES 2 USES IN 1 BUILDING. PARKING REQUIREMENTS ARE CONSIDERED TO BE THE PARKING PROVIDED DIVIDED BY THE BUILDING FOOTPRINT	
SPACES REQUIRED	= 40
377m² DIVIDED BY 40 SPACES = 9 SPACES PER m² (PHASE 1) 20 SPACES PER m² (PHASE 2	
SPACES PROVIDED	= 40
ACCESSIBLE SPACES REQUIRED	= 1
1 PER FIRST 25 SPACES 1 PER EACH 100 SPACES THEREAFTER	
ACCESSIBLE SPACES PROVIDED	= 2
ASPHALT PARKING AREA	= 1,835 m² (19,757 ft²)
CONCRETE SIDEWALK AREA	= 186m² (2,002 ft²)
LANDSCAPING AREA	= 13,994m² (150,630ft²)
CURBING LENGTH	= 180 m (591 ft)

NOTES:
EXISTING PARKING SPACE MINIMUM SIZE:
PHASE 1: 2.6 m X 5.5 m
EXISTING ACCESSIBLE SPACE SIZE:
PHASE 1: 5.5 m X 5.8 m
EXISTING COLLECTOR AISLE MINIMUM WIDTH:
PHASE 1: 7.0 m
ALL MUNICIPAL RIGHT OF WAYS SHOWN ARE 20m WIDE (66ft)

LEGEND

- EXISTING PHASE 1 BUILDING
- ACCESSIBLE PARKING SPACE
- ASPHALT PAVEMENT
- CONCRETE SIDEWALK
- EXISTING PLANTING
- EXISTING FENCE
- EXISTING LIGHT STANDARD

SOURCE: PLAN OF SURVEY C-4198'A' - VSHBB (2016)

DILLON CONSULTING
3200 Deziel Drive, Suite 608 Windsor ON N8W 5K8
Phone (519) 948-5000 Fax (519) 948-5054

No		DATE	BY
2	MUNICIPAL REVISIONS	AUG 10/16	HW/DW
1	MUNICIPAL REVIEW	JUL 12/16	HW/DW

SURVEY	MAY 11/16	VSHBB
DESIGN	JUL 07/16	HW/KDT
DRAFTING	JUL 07/16	HW
PRE-TENDER		

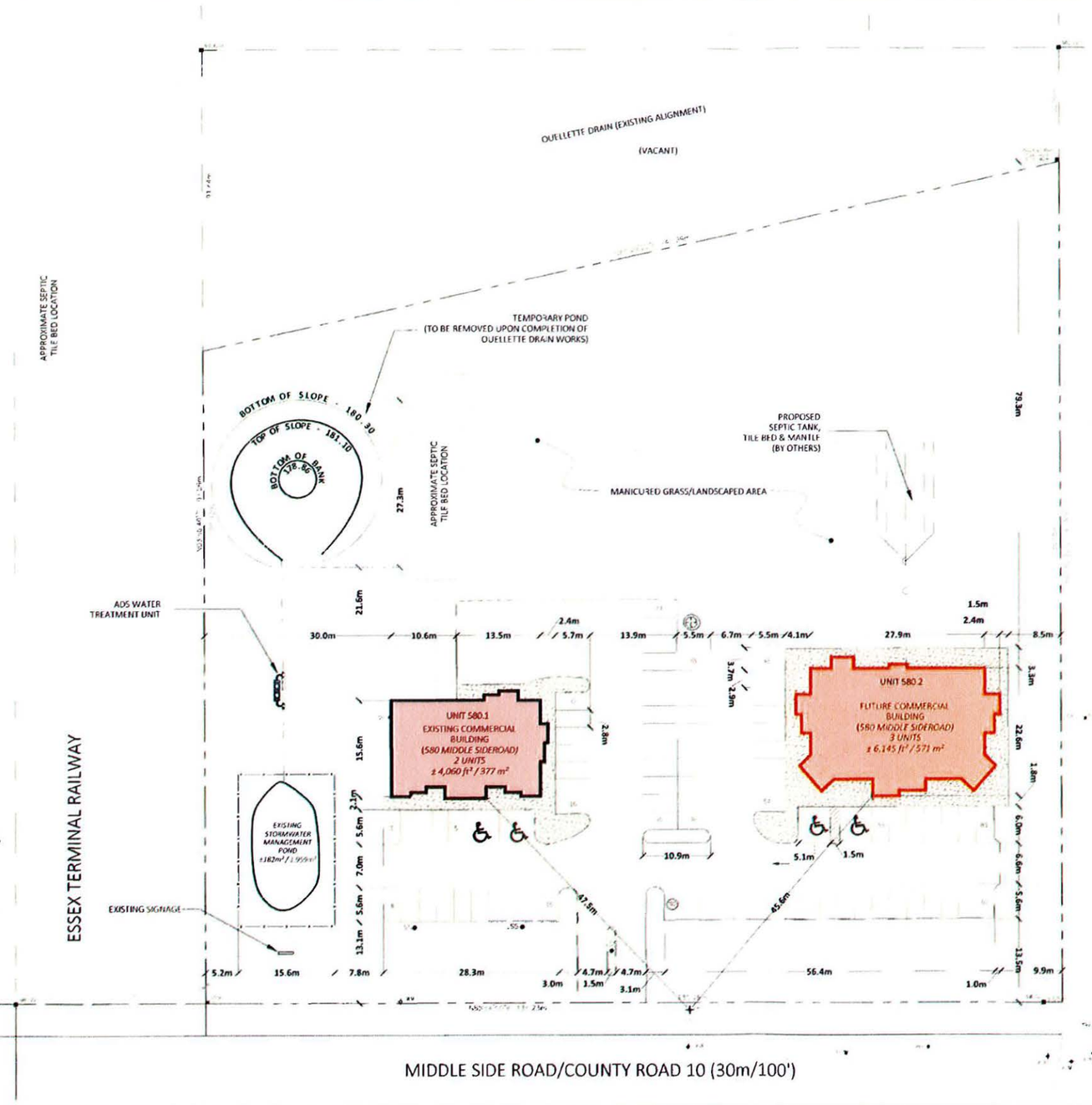
SCALE 1:750 (11"x17")
SCALE 1:375 (22"x34")

PACITTI CONTRACTING COMPANY INC.
580 MIDDLE SIDEROAD DEVELOPMENT
SITE PLAN CONTROL APPROVAL
PHASE 2 BUILD-OUT
EXISTING DEVELOPMENT

PROJECT NO 15-2001: 2000
SHEET NO 2

Sep 10, 2016 - 10:31am C:\projects\working directory\active\20

SPC-6-16



SITE STATISTICS:

TOTAL SITE AREA = 16,789 m² (180,719 ft²)

BUILDING SPECIFICATIONS:	PHASE 1	PHASE 2
BUILDING FOOTPRINT	= 377 m² (4,060 ft²)	= 571 m² (6,145 ft²)
DEVELOPMENT TOTAL	***= N/A***	***= 948m² (10,205ft²)***
LOT COVERAGE (%)	= 2.25%	= 3.40%
DEVELOPMENT TOTAL	***= N/A***	***= 5.65%***
PARKING REQUIREMENTS		
PARKING REQUIREMENTS FOR PHASE 1 ARE CALCULATED BASED UPON THE MOST INTENSE USE OF THE DEVELOPMENT. IN THIS CASE WE CONSIDER PLACE OF WORSHIP AS THE USE WHICH REQUIRES 1 PER 5 PERSON CAPACITY AND NOT AN EXACT PER m² RATIO. THE DEVELOPMENT DEMONSTRATES 2 USES IN 1 BUILDING. PARKING REQUIREMENTS ARE CONSIDERED TO BE THE PARKING PROVIDED DIVIDED BY THE BUILDING FOOTPRINT		
SPACES REQUIRED	= 41	= 29
637m² DIVIDED BY 41 SPACES = 9 SPACES PER m² (PHASE 1: 20 SPACES PER m² (PHASE 2)		
DEVELOPMENT TOTAL	***= N/A***	***= 70***
SPACES PROVIDED	= 41	= 44
DEVELOPMENT TOTAL	***= N/A***	***= 80 (5 REMOVED)***
ACCESSIBLE SPACES REQUIRED	= 1	= 2
1 PER FIRST 20 SPACES. 1 PER EACH 100 SPACES THEREAFTER		
ACCESSIBLE SPACES PROVIDED	= 2	= 2
DEVELOPMENT TOTAL	***= N/A***	***= 4***
ASPHALT PARKING AREA	= 1,835 m² (19,757 ft²)	= 1,318 m² (14,186 ft²)
DEVELOPMENT TOTAL	***= N/A***	***= 3,153m² (33,943ft²)***
CONCRETE SIDEWALK AREA	= 186m² (2,002 ft²)	= 374m² (4,026 ft²)
DEVELOPMENT TOTAL	***= N/A***	***= 560m² (6,028ft²)***
LANDSCAPING AREA	= 13,994m² (150,630ft²)	= -2,452m² (26,393ft²)
DEVELOPMENT TOTAL	***= N/A***	***= 11,542m² (124,237ft²)***
CURBING LENGTH	= 180 m (591 ft)	= 256 m (839 ft)
DEVELOPMENT TOTAL	***= N/A***	***= 436m (1,430ft)***

NOTES:
PARKING SPACE MINIMUM SIZES:
PHASE 1: 2.6 m X 5.5 m, PHASE 2: 2.87m X 5.5m
ACCESSIBLE SPACE SIZES:
PHASE 1: 5.5 m X 5.8 m, PHASE 2: 5.1m X 6.0m (+1.5m ACCESS AISLE)
COLLECTOR AISLE MINIMUM WIDTHS:
PHASE 1: 7.0 m, PHASE 2: 6.6m
ALL MUNICIPAL RIGHT OF WAYS SHOWN ARE 20m WIDE (66ft)

LEGEND

- EXISTING PHASE 1 BUILDING
- PROPOSED PHASE 2 BUILDING
- ACCESSIBLE PARKING SPACE
- ASPHALT PAVEMENT
- CONCRETE SIDEWALK
- EXISTING FENCE
- EXISTING LIGHT STANDARDS TO REMAIN
- EXISTING PLANTING TO REMAIN

SOURCE: PLAN OF SURVEY C-4198'A' - VSHBB (2016)

SCHEDULE "D" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Pacitti

TOWN OF AMHERSTBURG

Mayor- Aldo DiCarlo

Clerk- Paula Parker

Sep 16, 2016 - 10:32am C:\projects\working directory\

DILLON CONSULTING
3200 Dougall Drive, Suite 808 Windsor ON N8W 5K8
Phone: (519) 948-5000 Fax: (519) 948-5054

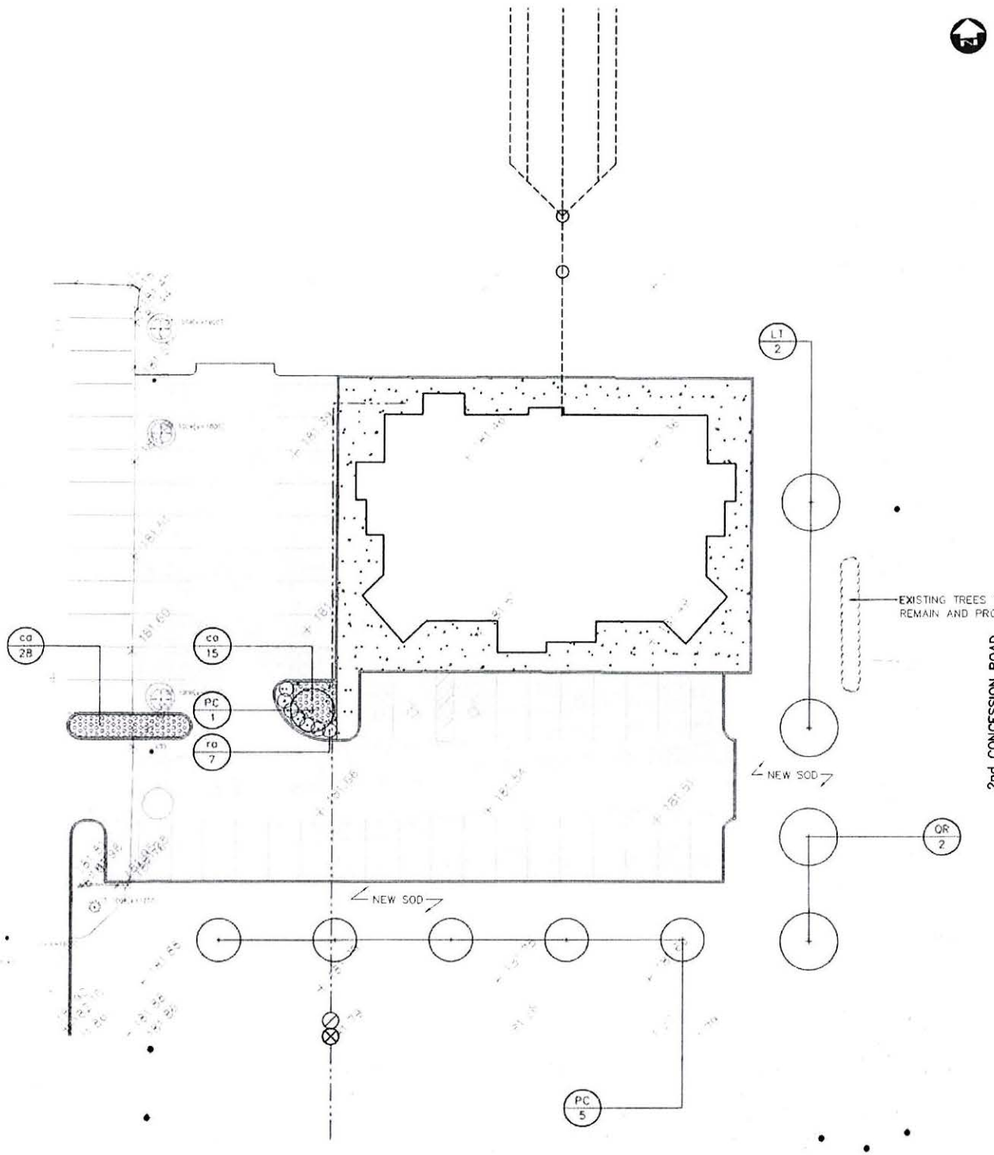
NO	REVISIONS	DATE	BY
2	MUNICIPAL REVISIONS	AUG 19/16	HW/DW
1	MUNICIPAL REVIEW	JUL 12/16	HW/DW
	ISSUED FOR	DATE	BY

SURVEY	MAY 11/16	VSHBB
DESIGN	JUL 07/16	HW/KDT
DRAFTING	JUL 07/16	HW
PRE-TENDER		

SCALE: 1:750 (ARCH 1) SCALE: 1:375 (ARCH 2)

PACITTI CONTRACTING COMPANY INC.
580 MIDDLE SIDEROAD DEVELOPMENT
SITE PLAN CONTROL APPROVAL
PHASE 2 BUILD-OUT
PHASE 2 SITE PLAN

PROJECT NO: 15-2001: 2000
SHEET NO: 3

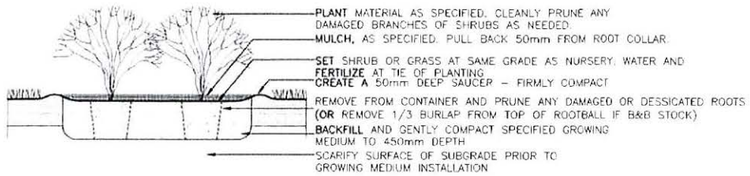


MIDDLE SIDE ROAD (COUNTY ROAD 10)

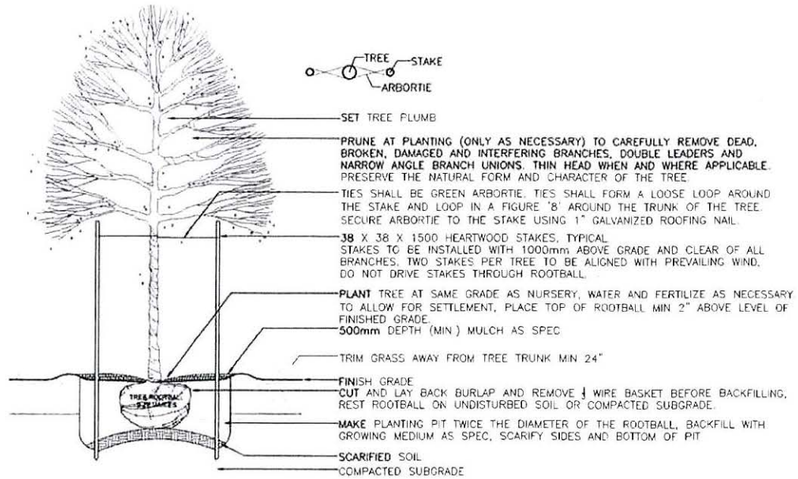
PLAN
1:250

PLANT LIST

CODE	BOTANICAL NAME	COMMON NAME	QTY	SIZE	COND.	SPACING
DECIDUOUS TREES						
LT	Liriodendron tulipifera	Tulip Tree	2	50mm cal.	WB	AS SHOWN (APPROX. 10-11m)
QR	Quercus rubra	Red Oak	2	50mm cal.	WB	AS SHOWN (APPROX. 10-11m)
PC	Pyrus calleryana	Callery Pear	6	50mm cal.	WB	AS SHOWN (APPROX. 10-11m)
SHRUBS AND DECORATIVE GRASSES						
ro	rhus aromatica 'Gro-Low'	Rhus aromatica 'Gro-Low'	7	60cm ht.	3 gal.	1.0m o/c
co	Calamagrostis acutiflora	Karl Foerster Grass	43	pot	2 gal.	0.6m o/c



SHRUB AND DECORATIVE GRASS PLANTING DETAIL
NTS



DECIDUOUS TREE PLANTING DETAIL
NTS

PLANTING NOTES:

1. THE CONTRACTOR SHALL SUPPLY ALL MATERIALS IN QUANTITIES SUFFICIENT TO COMPLETE THE WORK SHOWN ON THESE DRAWINGS. ANY DISCREPANCIES SHOWN IN THE PLANT LISTS, AND THOSE REQUIRED BY THE DRAWINGS, SHALL BE REPORTED TO THE CONTRACT ADMINISTRATOR FOR DIRECTION. **NO PLANT OR MATERIAL SUBSTITUTION SHALL BE PERMITTED UNLESS AUTHORIZED BY THE LANDSCAPE ARCHITECT OR CONTRACT ADMINISTRATOR IN WRITING.**
2. ALL WORK AND PLANT MATERIALS ARE TO BE GUARANTEED BY THE CONTRACTOR FOR A MINIMUM OF TWO (2) FULL GROWING SEASON AT WHICH TIME THE CONTRACTOR SHALL REMOVE THE SILT FENCE AND MAKE GOOD ANY REPAIRS OR REQUIRED PLANT REPLACEMENTS.
3. ALL PLANT INSTALLATION MATERIALS SUCH AS STAKES AND TIE-UPS MUST BE BIODEGRADABLE. THEY SHOULD BE SUFFICIENTLY STRONG ENOUGH TO PROVIDE SUPPORT AGAINST SNOW/WIND IN EXPOSED AREAS AND EROSION FOR TWO (2) FULL GROWING SEASONS.
4. CALIPER TREE TO BE SPACED APPROXIMATELY 8M O/C.
5. SHRUBS TO BE SPACED 1M O/C UNLESS OTHERWISE NOTED ON THE PLANTING LIST. SHRUBS OF THE SAME SPECIES SHOULD BE PLANTED IN CLUSTERS USING PRESCRIBED SPACING.
6. PROVIDE A MYCORRHIZAE (FUNGUS-BASED INOCULANTS) TREATMENT FOR EACH TREE/SHRUB PLANT PIT AT THE TIME OF INSTALLATION. MYKE PRO IS AVAILABLE FROM:

   Premier Tech
   1 Premier Avenue
   Riviere-du-loup, Quebec G5R 6C1
   (800) 606-6926 www.usemyke.com

LEGEND

- PROPOSED DECORATIVE GRASSES
- PROPOSED DECIDUOUS CALIPER TREES
- PROPOSED CONIFEROUS TREES
- PROPOSED SHRUBS

SCHEDULE "E" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Paciti

TOWN OF AMHERSTBURG

Mayor- Aldo DiCarlo

Clerk- Paula Parker

PACITTI CONTRACTING COMPANY INC

DILLON CONSULTING

DESIGN	REVIEWED BY
KP	DW
DRAWN	CHECKED BY
KP	DW
DATE	
JULY 2016	
SCALE	
AS SHOWN	

Pacitti Commercial Site Development
Phase 2

LANDSCAPE SITE PLAN

PROJECT NO. 15-3001-2000

SHEET NO. LS

FILENAME: C:\PROJECTWISE WORKING DIRECTORY\ACTIVE\JHOP\JHOP127\15-3001-06-LMD-SCS.DWG
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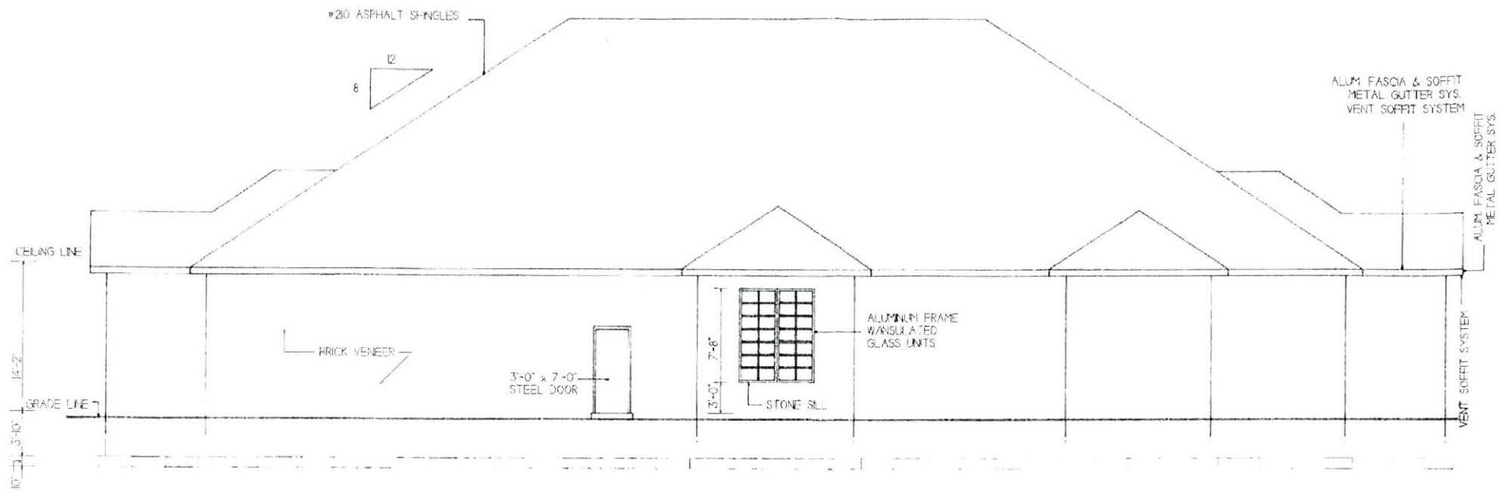
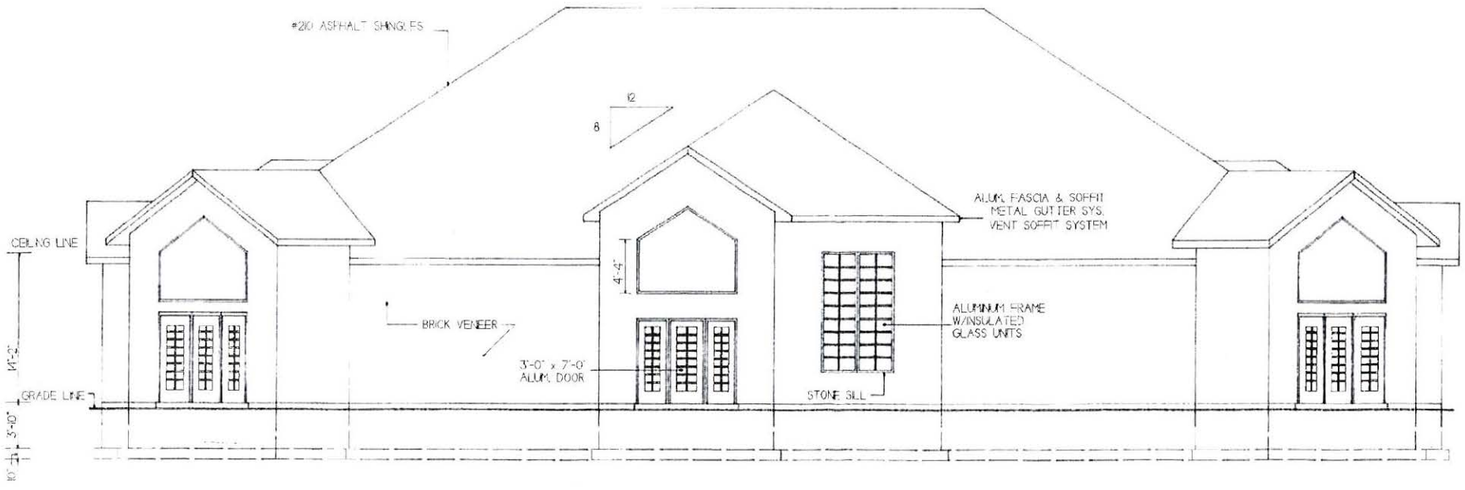
PLOTTED BY: PRESTON, KATHRYN
WINDSOR, ONTARIO



NORTH ELEVATION

SCALE: 3/16" = 1'-0"



SOUTH ELEVATION

SCHEDULE "F" TO BY-LAW 2016-86

PACITTI CONTRACTING COMPANY INC.

Aldo Pacitti

TOWN OF AMHERSTBURG

Mayor- Aldo DiCarlo

Clerk- Paula Parker

PACITTI
CONTRACTING COMPANY INC.

DETAIL LEGEND

Detail number
Location sheet | Detail sheet

REVISIONS - DRAWING ISSUE

DATE	ISSUED FOR

DRAWN BY: A.P.

CHECKED BY:

PREP. BY: A. P.

PROJECT NUMBER: PAC16-001

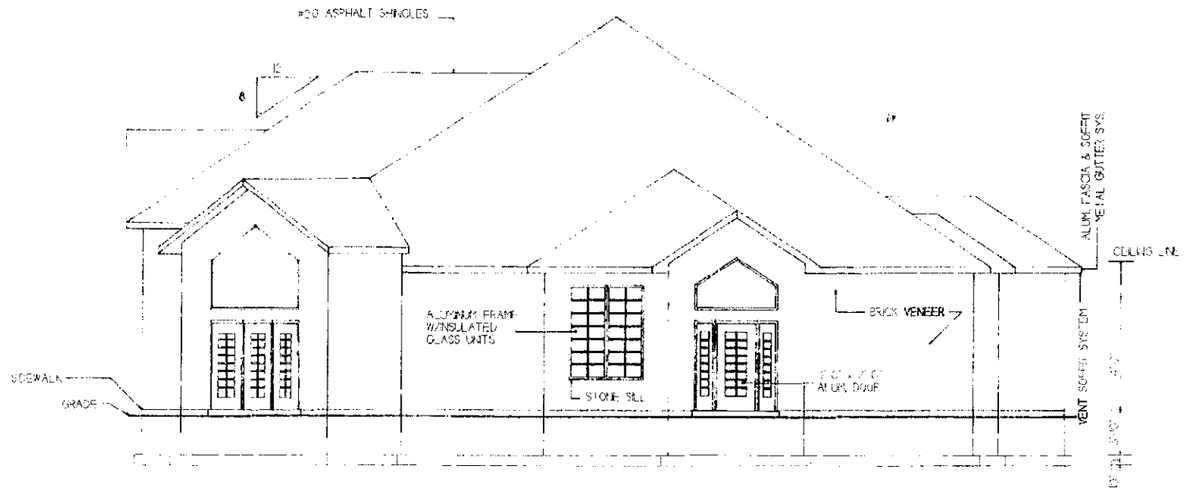
DATE: MARCH 1, 2016

PROJECT TITLE: COMMERCIAL 6000 SQ. FT.

SCALE: AS NOTED

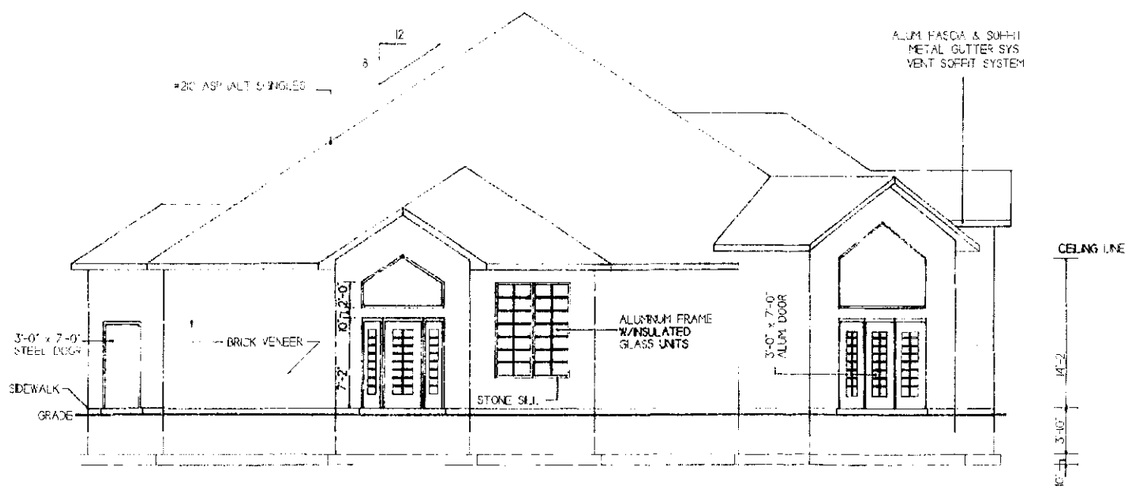
DRAWING TITLE: ELEVATIONS

DRAWING NUMBER: A-1



EAST ELEVATION

SCALE: 3/16" = 1'-0"



WEST ELEVATION

PACITTI
CONTRACTING COMPANY INC.

DETAIL LEGEND

Detail number / Location sheet / Detail sheet

REVISIONS - DRAWING ISSUE

DATE	ISSUED FOR

DRAWN BY: A.P.

CHECKED BY:

PREP. BY: A. P.

PROJECT NUMBER: PAC16-001

DATE: MARCH 1, 2016

PROJECT TITLE: COMMERCIAL 6000 SQ. FT.

SCALE: AS NOTED

DRAWING TITLE: ELEVATIONS

DRAWING NUMBER: A-2