CITY OF WATERTOWN
SITE PLAN APPLICATION
AND
SHORT ENVIRONMENTAL ASSESSMENT FORM, PART 1

** Provide responses for all sections. INCOMPLETE APPLICATIONS WILL NOT BE PROCESSED. Failure to submit required information by the submittal deadline will result in **not** making the agenda for the upcoming Planning Board meeting.

PROPERTY LOCATION

Proposed Project Name: Watertown YMCA Fairgrounds - Parking Lot

Tax Parcel Number: 829105

Property Address: 585 Rand Drive

Existing Zoning Classification: Zoned Neighborhood Business

OWNER OF PROPERTY

Name: Watertown Family YMCA Inc.

Address: 585 Rand Drive
Watertown, NY 13601-1811

Telephone Number: (315)-755-9622

Fax Number: N/A

APPLICANT

Name: Watertown Family YMCA Inc.

Address: 585 Rand Drive
Watertown, NY 13601-1811

Telephone Number: (315)-755-9622

Fax Number: N/A

Email Address: ymca_pschmitt@yahoo.com

ENGINEER/ARCHITECT/SURVEYOR

Name: Matthew J. Cooper, P.E.

Address: 327 Mullin Street
Watertown, NY 13601

Telephone Number: (315)-782-8130

Fax Number: (315)-782-7192

Email Address: MCooper@thebcgroup.com

PROJECT DESCRIPTION

Describe project and proposed use briefly:

The proposed project is construction of a new parking lot to accommodate overflow parking needs of Watertown Family YMCA at the Fairgrounds. Stormwater runoff will be drained to new catch basins included in design and discharged through existing stormwater sewers on Rand Dr.

Is proposed Action:

[X] New [ ] Expansion [ ] Modification/Alteration

Amount of Land Affected:

Initially: 0.319 Acres Ultimately: 0.319 Acres

Will proposed action comply with existing zoning or other existing land use restrictions?

[X] Yes [ ] No If no, describe briefly

What is present land use in vicinity of project?

[ ] Residential [ ] Industrial [ ] Commercial [ ] Agriculture

[X] Park/Forest/Open Space [ ] Other

Describe:

Does project involve a permit approval, or funding, now or ultimately from any other Governmental Agency (Federal, State or Local)?

[ ] Yes [X] No If yes, list agency(s) and permit/approval(s)

Does any aspect of the project have a currently valid permit or approval?

[ ] Yes [X] No If yes, list agency(s) and permit/approval(s)

As a result of proposed project, will existing permit/approval require modification?

☐ Yes ☒ No

Proposed number of housing units (if applicable): N/A

Proposed building area: 1st Floor N/A Sq. Ft.

2nd Floor N/A Sq. Ft.

3rd Floor N/A Sq. Ft.

Total N/A Sq. Ft.

Area of building to be used for the boiler room, heat facilities, utility facilities and storage: N/A Sq. Ft.

Number of parking spaces proposed: 34

Construction Schedule: July-August 2010

Hours of Operation: Normal Business Hours

Volume of traffic to be generated: None, used to manage existing ADT

REQUIRED DRAWINGS:

** The following drawings with the listed information **ARE REQUIRED, NOT OPTIONAL**. If the required information is not included and/or addressed, the Site Plan Application will **not** be processed.

[X] **ELECTRONIC COPY OF ENTIRE SUBMISSION** (PDF preferred)

[X] **BOUNDARY & TOPOGRAPHIC SURVEY**
(Depict existing features as of the date of the Site Plan Application. This Survey and Map must be performed and created by a Professional Land Surveyor licensed and currently registered to practice in the State of New York. This Survey and Map must be stamped and signed with an original seal and signature on at least one copy, the rest may be copies thereof.

- [X] All elevations are National Geodetic Vertical Datum of 1929 (NGVD29).
- [X] 1' contours are shown & labeled with appropriate spot elevations.
- [X] All existing features on and within 50 feet of the subject property are shown and labeled.
- [X] All existing utilities on and within 50 feet of the subject property are shown and labeled.
- [X] All existing easements and/or right-of-ways are shown and labeled.
- [X] Existing property lines (bearings & distances), margins, acreage, zoning, existing land use, reputed owner, adjacent reputed owners & tax parcel numbers are shown and labeled.
- [X] The north arrow & graphic scale are shown.

[X] **DEMOLITION PLAN** (If Applicable)

- [X] All existing features on and within 50 feet of the subject property are shown and labeled.
- [X] All items to be removed are labeled in darker text.

[X] **SITE PLAN**

- [X] All proposed above ground features are depicted and clearly labeled.
- [X] All proposed features are clearly labeled "proposed".
- [X] All proposed easements & right-of-ways are shown and labeled.

[X] Land use, zoning, & tax parcel number are shown.

[X] The Plan is adequately dimensioned including radii.

[X] The line work & text for all proposed features is shown darker than existing features.

[X] All vehicular & pedestrian traffic circulation is shown including a delivery or refuse vehicle entering and exiting the property.

[X] Proposed parking & loading spaces including ADA accessible spaces are shown and labeled.

N/A [ ] Refuse Enclosure Area (Dumpster), if applicable, is shown. Section 161-19.1 of the Zoning Ordinance states, "No refuse vehicle or refuse container shall be parked or placed within 15 feet of a party line without the written consent of the adjoining owner, if the owner occupies any part of the adjoining property".

[X] The north arrow & graphic scale are shown.

[X] **GRADING PLAN**

[X] All proposed below ground features including elevations & inverts are shown and labeled.

[X] All proposed above ground features are shown and labeled.

[X] The line work & text for all proposed features is shown darker than existing features.

[X] All proposed easements & right-of-ways are shown and labeled.

[X] 1' existing contours are shown dashed & labeled with appropriate spot elevations.

[X] 1' proposed contours are shown & labeled with appropriate spot elevations.

[X] All elevations are National Geodetic Vertical Datum of 1929 (NGVD29).

[X] Sediment & Erosion control are shown & labeled on the grading plan unless separate drawings have been provided as part of a Stormwater Pollution Prevention Plan (SWPPP).

☒ **UTILITY PLAN**

☒ All proposed above & below ground features are shown and labeled.

☒ All existing above & below ground utilities including sanitary, storm water, water, electric, gas, telephone, cable, fiber optic, etc. are shown and labeled.

☒ All proposed easements & right-of-ways are shown and labeled.

☒ The Plan is adequately dimensioned including radii.

☒ The line work & text for all proposed features is shown darker than existing features.

☒ The following note has been added to the drawings stating, "All water main and service work must be coordinated with the City of Watertown Water Department. The Water Department requirements supercede all other plans and specifications provided."

☒ **LANDSCAPING PLAN**

☒ All proposed above ground features are shown and labeled.

☒ All proposed trees, shrubs, and other plantings are shown and labeled.

☒ All proposed landscaping & text are shown darker than existing features.

☒ All proposed landscaping is clearly depicted, labeled and keyed to a plant schedule that includes the scientific name, common name, size, quantity, etc.

☒ For additional landscaping requirements where nonresidential districts and land uses abut land in any residential district, please refer to Section 310-59, Landscaping of the City's Zoning Ordinance.

☒ **Site Plan complies with and meets acceptable guidelines set forth in Appendix A - Landscaping and Buffer Zone Guidelines (August 7, 2007).**

☒ **PHOTOMETRIC PLAN** (If Applicable)

☒ All proposed above ground features are shown.

☒ Photometric spot elevations or labeled photometric contours of the property are clearly depicted. Light spillage across all property lines shall not exceed 0.5 foot-candles.

☒ **CONSTRUCTION DETAILS & NOTES**

☒ All details and notes necessary to adequately complete the project including, but not limited to, landscaping, curbing, catch basins, manholes, water line, pavement, sidewalks, trench, lighting, trash enclosure, etc. are provided.

☒ Maintenance & protection and traffic plans & notes for all required work within City streets including driveways, water laterals, sanitary laterals, storm connections, etc. are provided.

☒ The following note must be added to the drawings stating:
"All work to be performed within the City of Watertown margin will require sign-off from a Professional Engineer, licensed and currently registered to practice in the State of New York, that the work was built according to the approved site plan and applicable City of Watertown standards. Compaction testing will be required for all work to be performed within the City of Watertown margin and must be submitted to the City of Watertown Codes Department."

N/A ☐ **PRELIMINARY ARCHITECTUAL PLANS** (If Applicable)

☐ Floor plan drawings, including finished floor elevations, for all buildings to be constructed are provided.

☐ Exterior elevations including exterior materials and colors for all buildings to be constructed are provided.

☐ Roof outline depicting shape, slope and direction is provided.

☒ **ENGINEERING REPORT**

**** The engineering report at a minimum includes the following:**

☒ Project location

☒ Project description

☒ Existing & proposed sanitary sewer flows & summary

☒ Water flows & pressure

☒ Storm Water Pre & Post Construction calculations & summary

☒ Traffic impacts

☒ Lighting summary

☒ Landscaping summary

[X] **GENERAL INFORMATION**

[X] ALL ITEMS ARE STAMPED & SIGNED WITH AN ORIGINAL SIGNATURE BY A PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT, OR SURVEYOR LICENSED AND CURRENTLY REGISTERED TO PRACTICE IN THE STATE OF NEW YORK.

N/A [ ] If required, a copy of the Stormwater Pollution Prevention Plan (SWPPP) submitted to the NYSDEC will also be sent to the City of Watertown Engineering Department.

N/A [ ] If required, a copy of all submittals sent to the New York State Department of Environmental Conservation (NYSDEC) for the sanitary sewer extension permit will also be sent to the City of Watertown Engineering Department

N/A [ ] If required, a copy of all submittals sent to the New York State Department of Health (NYSDOH) will also be sent to the City of Watertown Engineering Department.

[X] Signage will not be approved as part of this submission. It requires a sign permit from the Codes Department. See Section 310-52.2 of the Zoning Ordinance.

[X] Plans have been collated and properly folded.

N/A [ ] Explanation for any item not checked in the Site Plan Checklist.

_____

_____

_____

_____

_____

[X] Completed SEQR – Short Environmental Assessment Form – Part I.
*A copy of the SEQR Form can be obtained from the City of Watertown website.

SIGNATURE

I certify that the information provided above is true to the best of my knowledge.

Applicant (please print) Peter Schmitt

Applicant Signature Peter Schmitt Date: 6/18/10

PROJECT I.D. Number 2010-061

Appendix C

State Environmental Quality Review

SEQR

SHORT ENVIRONMENTAL ASSESSMENT FORM

For UNLISTED ACTIONS Only

PART 1 – PROJECT INFORMATION (To be completed by Applicant or Project Sponsor)

1. APPLICANT/SPONSOR
Watertown Family YMCA Inc.

2. PROJECT NAME
Watertown YMCA Fairgrounds - Parking Lot

3. PROJECT LOCATION:
Municipality City of Watertown County Jefferson County

4. PRECISE LOCATION (Street address and road intersections, prominent landmarks, etc., or provide map)
585 Rand Drive
Watertown, NY 13601-1811

5. IS PROPOSED ACTION:
☑ New ☐ Expansion ☐ Modification/alteration

6. DESCRIBE PROJECT BRIEFLY:
Proposed is construction of a new parking lot to accommodate overflow parking needs of Watertown Family YMCA at the Fairgrounds. Stormwater runoff will be drained to new catch basins included in design and discharged through existing stormwater sewers on Rand Dr.

7. AMOUNT OF LAND AFFECTED:
Initially 0.319 acres Ultimately 0.319 acres

8. WILL PROPOSED ACTION COMPLY WITH EXISTING ZONING OR OTHER EXISTING LAND USE RESTRICTIONS?
☑ Yes ☐ No If no, describe briefly

9. WHAT IS PRESENT LAND USE IN VICINITY OF PROJECT?
☐ Residential ☐ Industrial ☐ Commercial ☐ Agriculture ☑ Park/Forest/Open Space ☐ Other
Describe:

10. DOES ACTION INVOLVE A PERMIT APPROVAL, OR FUNDING, NOW OR ULTIMATELY FROM ANY OTHER GOVERNMENTAL AGENCY (FEDERAL, STATE OR LOCAL)?
☐ Yes ☑ No If yes, list agency(s) and permit/approvals

11. DOES ANY ASPECT OF THE ACTION HAVE A CURRENTLY VALID PERMIT OR APPROVAL?
☐ Yes ☑ No If yes, list agency(s) and permit/approvals

12. AS A RESULT OF PROPOSED ACTION, WILL EXISTING PERMIT/APPROVAL REQUIRE MODIFICATION?
☐ Yes ☑ No

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Peter Schmitt Date: 6/21/10

Signature: Peter Schmitt

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment

OVER

A. DOES ACTION EXCEED ANY TYPE I THRESHOLD IN 6 NYCRR, PART 617.12? If yes, coordinate the review process and use the FULL EAF.

☐ Yes ☐ No

B. WILL ACTION RECEIVE COORDINATED REVIEW AS PROVIDED FOR UNLISTED ACTIONS IN 6 NYCRR, PART 617.6? If NO, a negative declaration may be superseded by another involved agency.

☐ Yes ☐ No

C. COULD ACTION RESULT IN **ANY** ADVERSE EFFECTS ASSOCIATED WITH THE FOLLOWING: (Answers may be handwritten, if legible)

C1. Existing air quality, surface or groundwater quality or quantity, noise levels, existing traffic patterns, solid waste production or disposal, potential for erosion, drainage or flooding problems? Explain briefly:

C2. Aesthetic agricultural, archaelogical, historic, or other natural or cultural resources; or community or neighborhood character? Explain briefly:

C3. Vegetation or fauna, fish shellfish or wildlife species, significant habitats, or threatened or endangered species? Explain briefly:

C4. A community's existing plans or goals as officially adopted, or a change in use or intensity of use of land or other natural resources? Explain briefly:

C5. Growth, subsequent development, or related activities likely to be induced by the proposed action? Explain briefly.

C6. Long term, short term, cumulative, or other effects not identified in C1-C5? Explain briefly.

C7. Other impacts (including changes in use of either quantity or type of energy)? Explain briefly.

D. WILL THE PROJECT HAVE AN IMPACT ON THE ENVIRONMENTAL CHARACTERISTICS THAT CAUSED THE ESTABLISHMENT OF A CEA?

☐ Yes ☐ No

E. IS THERE, OR IS THERE LIKELY TO BE, CONTROVERSY RELATED TO POTENTIAL ADVERSE ENVIRONMENTAL IMPACTS?

☐ Yes ☐ No If yes, explain briefly

PART III – DETERMINATION OF SIGNIFICANCE (To be completed by Agency)

INSTRUCTIONS: For each adverse effect identified above, determine whether it is substantial, large, important or otherwise significant. Each effect should be assessed in connection with its (a) setting (i.e. urban or rural); (b) probability of occurring; (c) duration; (d) irreversibility; (e) geographic scope; and (f) magnitude. If necessary, add attachments or reference supporting materials. Ensure that explanations contain sufficient detail to show that all relevant adverse impacts have been identified and adequately addressed.

☐ Check this box if you have identified one or more potentially large or significant adverse impacts which **MAY** occur. Then proceed directly to the FULL EAF and/or prepare a positive declaration.

☐ Check this box if you have determined, based on the information and analysis above and any supporting documentation, that the proposed action **WILL NOT** result in any significant adverse environmental impacts AND provide on attachments as necessary, the reasons supporting this determination:

Name of Lead Agency

Print or Type Name of Responsible Officer in Lead Agency

Title of Responsible Officer

Signature of Responsible Officer in Lead Agency

Signature of Preparer (If different from responsible officer)

Date

Preliminary Engineering Report

WATERTOWN FAMILY YMCA INC.

Fairgrounds YMCA Parking Lot Design

Project No. 2010-061

Prepared for:
Watertown Family YMCA Inc.
585 Rand Drive
Watertown, New York 13601

Phone No. (315) 755-9622

June 2010

Preliminary Engineering Report

WATERTOWN FAMILY YMCA INC.

Fairgrounds YMCA – Parking Lot Design
BC&A Project No. 2010-061

June 2010

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SECTION 1.0
EXECUTIVE SUMMARY

1.1 Purpose of Report

Watertown Family YMCA Inc. retained the firm Bernier, Carr & Associates, P.C. to provide site design for a new parking lot addition. Fundamentally, this report provides an explanation of existing site conditions in addition to proposed site development.

1.2 Project Location

Located in Jefferson County, New York, the Watertown Family YMCA is one of many buildings on the City of Watertown's Fairgrounds. This location is presently zoned as a neighborhood business region, and the tax parcel number where construction activities will proceed is 829105.000. See Appendix A for a USGS Topographic Map.

Figure 1 Project Location 585 Rand Drive

1.3 Project Description

The Watertown Family YMCA currently owns and operates a facility located on the City of Watertown's Fairgrounds. An existing parking lot (Figure 1) has insufficient parking for the increased amount of visitors during special fairground and YMCA activities. To accommodate for additional parking access, a new asphalt parking lot is proposed for construction adjacent to Rand Drive and the Fairground YMCA.

Proposed for construction is a new parking lot to accommodate overflow parking needs of the Watertown Family YMCA located at the City of Watertown's Fairgrounds. The new parking lot will be installed between the existing YMCA building and Rand Drive. Total disturbed project area is 0.319 acres. Two catch basins will be installed to properly manage stormwater runoff from the impervious asphalt surface.

SECTION 2.0
EXISTING CONDITIONS

2.1 Environmental Resources

2.1.1 Soils

The project area consists of well drained, fine sandy loams. More specifically, 80 percent of the project area is composed of Agawam and other similar soils. Depth to the water table is more than 80 inches on average. Existing terrain is generally flat with only two feet of maximum elevation change (Appendix B).

2.1.2 Surface Water Resources

The project area is south of Black River. Stormwater runoff collected by the newly installed catch basins will be directed by twelve (12) inch PVC pipe to an existing catch basin located on Rand Drive. Water from this catch basin currently flows indirectly through a series of stormwater pipes and eventually into an outlet at Black River.

Since the total disturbed area is less than one acre, a Stormwater Pollution Prevention Plan (SWPPP) is not required. However, new catch basins are designed to include sumps that will collect lawn litter, sediment and other runoff contaminants.

2.2 Existing & Proposed Sanitary Sewer Flows & Summary

An existing eight (8) inch PVC sanitary sewer line runs parallel to the front entrance of the YMCA between the building and the existing parking lot. This project will not interfere with existing sanitary sewer lines, and no modifications will be made during construction. Construction activities will be performed in such a way to have as minimal disturbance as possible on this and other site utilities.

2.3 Water Flows & Pressure

An existing four (4) inch diameter water line provides water to the YMCA. No modifications will be made to this or any other water source on site. Development will not interfere with the water requirements of the YMCA.

SECTION 3.0
DEVELOPED CONDITIONS

3.1 Stormwater Pre & Post Construction Summary

Total disturbed area is less than one (1) acre (i.e. 0.319 acres), so a Stormwater Pollution Prevention Plan (SWPPP) is not required to proceed with construction. To accommodate for increased runoff from the new impervious asphalt surface, grading is performed to drain stormwater runoff to two catch basins along the centerline of the parking lot. Calculations were performed to verify that all additional flows would not impair the function of existing stormwater sewer pipelines (Appendix C). The catch basins included in design will prevent sediment, trash, and other solids from entering the stormwater sewer system. It is recommended that all catch basins be inspected and cleaned at least annually.

3.2 Traffic Impacts

The primary purpose of the new parking lot addition is to facilitate easier access to the YMCA by providing overflow parking to existing parking. Once installed, the new parking lot will decrease congestion of cars in the existing parking lot during times of heavy use. During construction there will be little to no interference with traffic. The existing parking lot has two entrances with one entrance at sufficient distance from the location of demolition. Traffic will not increase as a result of the new parking lot both during construction and after project completion. It is further expected that the new parking lot will enable easier accessibility to fairground events.

3.3 Lighting Summary

A photometric plan was developed to calculate illuminance in order to provide adequate parking lot lighting. Three total light fixtures will be installed between the location of the new parking lot and Rand Drive. A minimum of 0.2 foot-candles is the required illuminance for a parking lot of this type. The minimum illuminance value as indicated in the photometric plan component of the contract drawings is 0.5 foot-candles. Thus, minimum requirements were exceeded by design, but not unreasonably large.

Light will not spill into Rand Drive. Nighttime driving conditions will not be impaired by the contract specified lighting fixtures. Total power consumption will not exceed 0.5 amperes at 120 volts. The site will be further investigated to identify existing panels with spare junctions to connect the new metal halide type fixtures (Appendix C, Section C.3).

3.4 Landscaping Summary

As stated by the City of Watertown Planning Board, "landscaping is required to minimize negative impacts from development by creating visual and noise buffers between adjoining property uses and promoting harmonious streetscapes."

Landscaping specifications were followed in accordance with guidelines set forth in "Appendix A – Landscaping and Buffer Zone Guidelines (August 7, 2007)." A new medium deciduous tree (e.g. *Syringa reticulate,* common name Japanese Tree Lilac) will be planted in the specified location in the contract drawings to meet design guidelines. All existing on-site trees will be maintained and protected during construction activities.

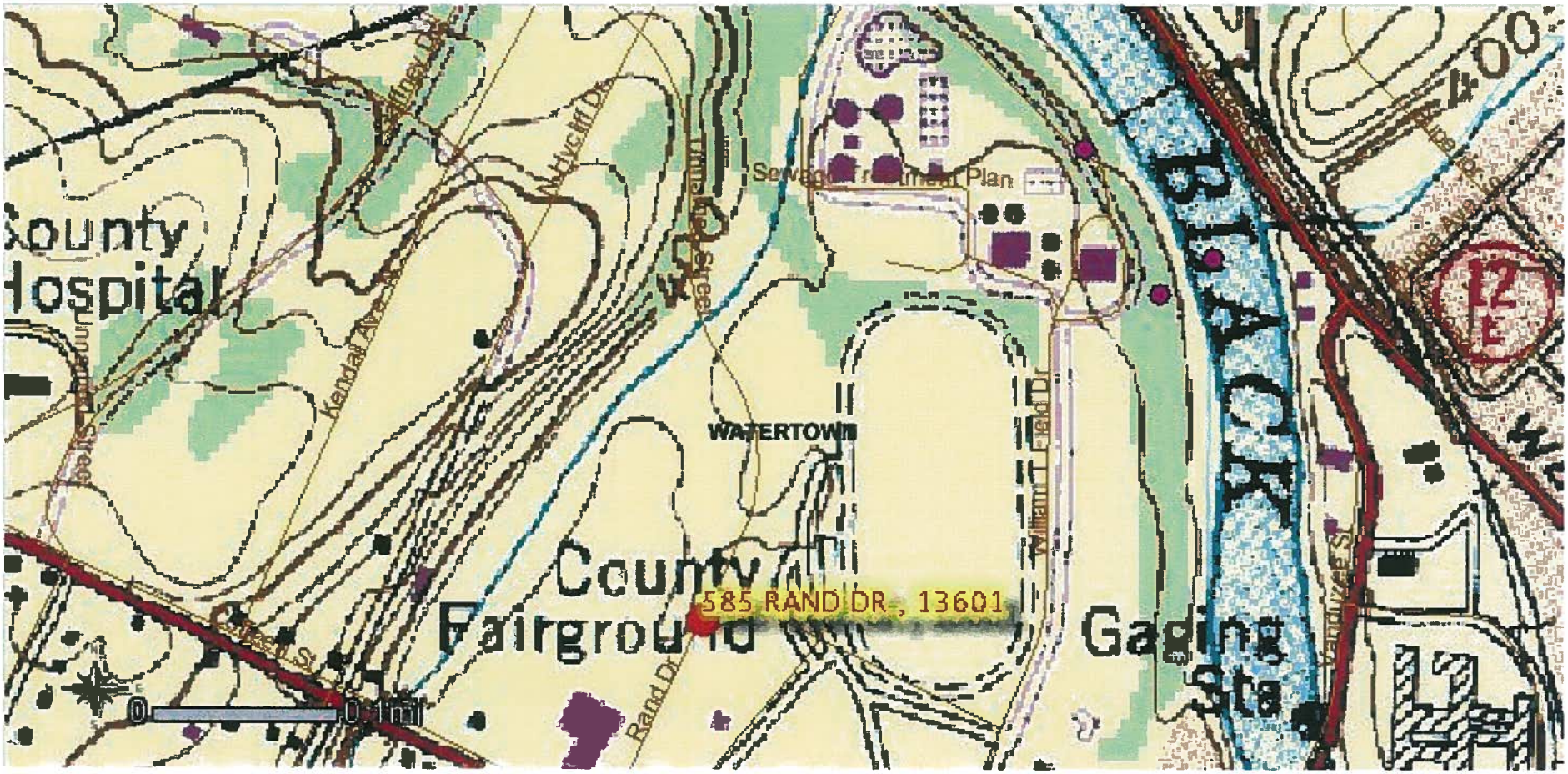
SECTION 4.0
CONCLUSION

4.1 Conclusion

It is the final conclusive recommendation of this Preliminary Engineering Report that the City of Watertown accepts this report and allows construction activities to proceed.

If accepted, the new parking lot will deter limited parking access to the YMCA and other fairground facilities during times of heavy use.

APPENDIX A
USGS TOPOGRAPHIC MAP



USGS Topographic Map

Fairground YMCA, 585 Rand Drive

APPENDIX B
WEB SOIL SURVEY DATA & MAP

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

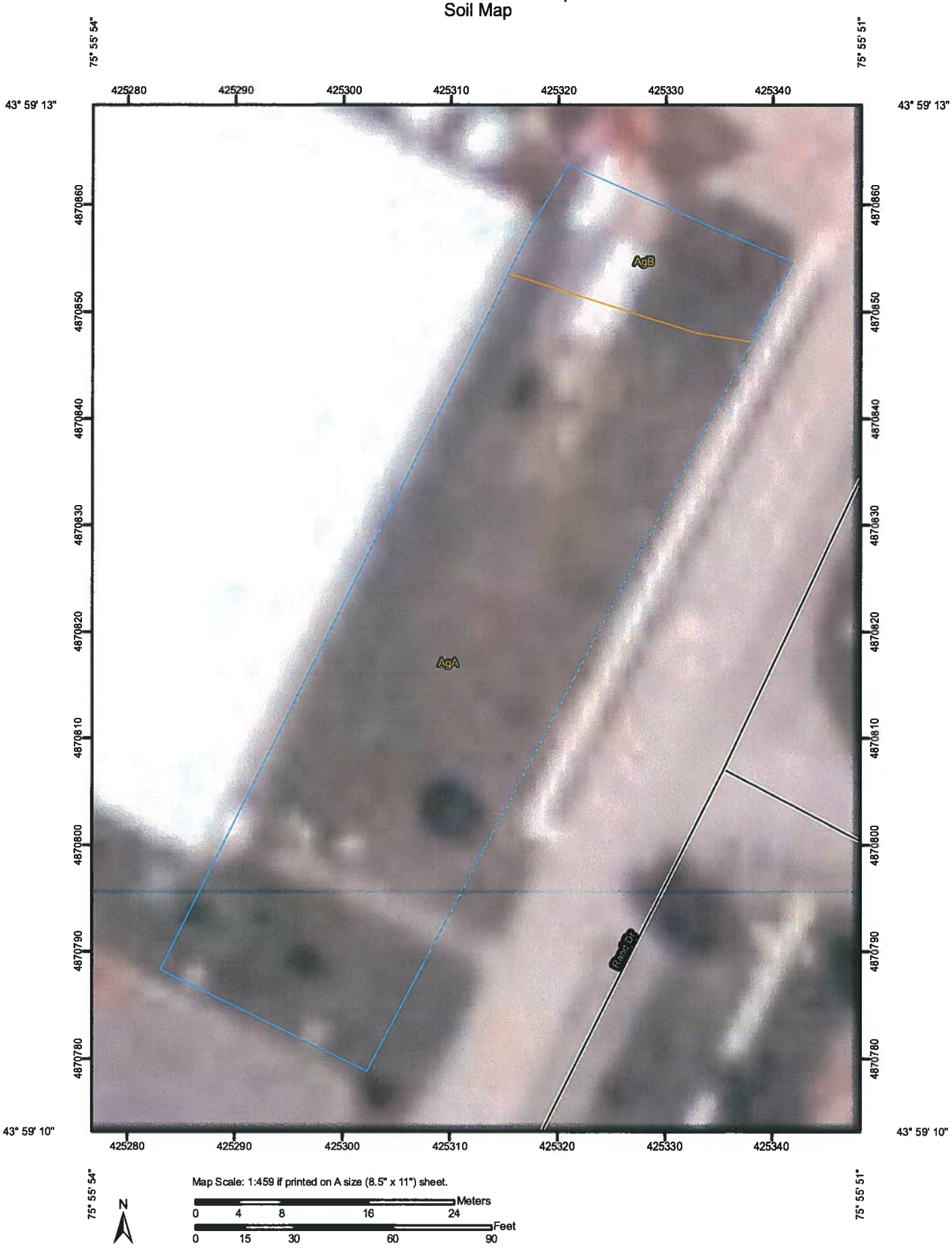
A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Jefferson County, New York

Fairground YMCA

June 18, 2010

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features

- Gully
- Short Steep Slope
- Other

Political Features

- Cities

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:459 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:15,840.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 18N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jefferson County, New York
Survey Area Data: Version 7, Feb 5, 2010

Date(s) aerial images were photographed: 7/30/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Jefferson County, New York (NY045)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
AgA	Agawam fine sandy loam, 0 to 3 percent slopes	0.4	87.5%
AgB	Agawam fine sandy loam, 3 to 8 percent slopes	0.1	12.5%
Totals for Area of Interest		**0.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If

intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Jefferson County, New York

AgA—Agawam fine sandy loam, 0 to 3 percent slopes

Map Unit Setting

Elevation: 0 to 1,000 feet
Mean annual precipitation: 33 to 50 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 110 to 170 days

Map Unit Composition

Agawam and similar soils: 80 percent

Description of Agawam

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits derived mainly from crystalline rock

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.1 inches)

Interpretive groups

Land capability (nonirrigated): 1

Typical profile

0 to 10 inches: Fine sandy loam
10 to 30 inches: Fine sandy loam
30 to 60 inches: Loamy fine sand

AgB—Agawam fine sandy loam, 3 to 8 percent slopes

Map Unit Setting

Elevation: 0 to 1,000 feet
Mean annual precipitation: 33 to 50 inches
Mean annual air temperature: 45 to 46 degrees F
Frost-free period: 110 to 170 days

Map Unit Composition

Agawam and similar soils: 80 percent

Description of Agawam

Setting

Landform: Deltas, outwash plains, terraces
Landform position (two-dimensional): Summit
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Sandy glaciofluvial deposits derived mainly from crystalline rock

Properties and qualities

Slope: 3 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Moderate (about 7.1 inches)

Interpretive groups

Land capability (nonirrigated): 2e

Typical profile

0 to 10 inches: Fine sandy loam
10 to 30 inches: Fine sandy loam
30 to 60 inches: Loamy fine sand

APPENDIX C
CALCULATIONS

Section C.1
Pre Construction

Calculations Performed By: DBW
Calculations Checked By: MJC

Section C.1 — Pre-Construction

1. Determine Time of Concentration

t_c = Time of concentration

$$t_c = \frac{L}{k(S^{0.5})} * \left(\frac{1hr}{3600s}\right)$$

$$t_c = \frac{235ft}{2.1(3^{0.5})} * \left(\frac{1hr}{3600s}\right) = 0.018hr$$

2. Calculation Summary (Performed in Excel)

Graphical Peak Discharge Method - NRCS Dimensionless Unit Hydrograph

Pre-Construction — **Tax Parcel No.** 829105

1. Data

Composite Curve Number Calculations

Area Type	Approximate Area (sq ft)	Fractional Area	CN
Grass	0.319	1	61
Total	0.319		

Drainage Area (acres)	0.319
Runoff Curve Number	61
Time of Concentration (hr)	0.72
Rainfall Distribution	II

Time of Concentration
tc 0.018 hr

Storage
S 6.4

Initial Abstraction
Ia = 0.2S

Time to Peak
(D/2) + tl

		Storm 1	Storm 2	Storm 3
2. Frequency		1-yr	10-yr	100-yr
3. Rainfall (P),	in	2.4	3.8	5.2
4. Initial Abstraction (Ia)	in	1.28	1.28	1.28
5. Compute Ia/P		0.53	0.34	0.25
6. Runoff Volume (VR)	in	0.17	0.71	1.49
7. Peak Runoff, Qp	cfs	0.10	0.41	0.86

For a 100-year rainfall intensity the peak flow for the existing grass surface is 0.86 cfs. As calculated below, peak flow for the impervious surface is 1.36 cfs using the same graphical peak discharge method. The flow increases as expected, but is properly managed with the newly installed catch basins.

Section C.2
Catch Basin Design

Section C.2 Catch Basin Design

1. Determine Existing ST Pipeline Maximum Flow Rate (12" Diameter Pipe)

Use Manning's Equation for Pipe Flowing Full

$$Q = \frac{(Cm)(A)(R^{2/3})(S^{1/2})}{n}$$

$$Q = \frac{(1.49)\left(\frac{\pi * (1ft)^2}{4}\right)((0.25 * 1ft)^{2/3})(0.02^{1/2})}{0.009}$$

$$Q = 7.30cfs$$

Where

Cm = Constant (1.49 for BG Units)
A = Pipe cross-sectional area
R = Hydraulic radius
S = Slope of pipeline (Assumed)
n = Manning's roughness coefficient (=0.009 for PVC)

D = Pipe diameter (12 in)

1A. Determine Velocity of Stormwater from Maximum Flow Rate (12" Diameter)

Use Conservation of Mass Equation (For Pipe Flowing Full):

$$V = \frac{Q}{A} = \frac{7.30cfs}{\left(\frac{\pi * (1ft)^2}{4}\right)}$$

$$V = 9.3fps$$

According to the 2004 Edition of *Recommended Standards for Wastewater Facilities: Chapter 30 Design of Sewers*, "all sewers shall be designed and constructed to give mean velocities when flowing full, of not less than 2.0 feet per second." This design meets this criterion for the 12 and 10 inch diameter pipes.

2. Determine Existing ST Pipeline Maximum Flow Rate (10" Diameter Pipe)

Use Manning's Equation for Pipe Flowing Full

$$Q = \frac{(Cm)(A)(R^{2/3})(S^{1/2})}{n}$$

$$Q = \frac{(1.49)\left(\frac{\pi * (0.83ft)^2}{4}\right)((0.25 * 0.83ft)^{2/3})(0.02^{1/2})}{0.009}$$

$$Q = 4.44cfs$$

Where

Cm = Constant (1.49 for BG Units)
A = Pipe cross-sectional area
R = Hydraulic radius
S = Slope of pipeline (Assumed 2%)
n = Manning's roughness coefficient (=0.009 for PVC)

D = Pipe diameter (10 in)

2A. Determine Velocity of Stormwater from Maximum Flow Rate (10" Diameter)

Use Conservation of Mass Equation (For Pipe Flowing Full):

$$V = \frac{Q}{A} = \frac{4.44cfs}{\left(\frac{\pi * (0.83ft)^2}{4}\right)}$$

$$V = 8.21fps$$

According to the 2004 Edition of *Recommended Standards for Wastewater Facilities: Chapter 30 Design of Sewers*, "all sewers shall be designed and constructed to give mean velocities when flowing full, of not less than 2.0 feet per second." This design meets this criterion for the 12 and 10 inch diameter pipes.

3. Determine if Site Area is Greater than One Acre

Total Site Area = 0.319 acres

The parking lot will not require a Stormwater Management Practice or SWPPP.

4. Determine Maximum Flow with Proposed Catch Basins (Rational Method)

The parking lot is segmented into two subcatchment drainage areas. Two newly installed catch basins will be used to drain stormwater runoff from the center of the parking lot. These calculations are used to verify that the existing stormwater sewer will be able to manage runoff from a 100-year flood event. If Q_{peak} is less than the Q calculated in Sections 1 and 2 for 12 and 10 inch diameter pipes, then the existing system can manage the stormwater runoff from the new parking lot.

$$Q_{peak} = CiA\left(\frac{1.0083cfs}{acre-in./hr}\right)$$

Where

Q_{peak} = 100-yr rainfall peak flow rate
C = Rational method coefficient
(Is a ratio of the peak runoff rate to the rainfall rate and has an upper limit of 1.0)
i = Rainfall intensity (in./hr)
A = Area of subcatchment (acres)

4A. Calculate the rainfall intensity using an IDF curve.

The IDF coefficients (a, b, and c) used were derived for New York, New York, and are a reasonable estimate of coefficients that can be used across New York State. These values are taken from Wurbs and James *Water Resources Engineering* Table 7.7: "Coefficients for a Recurrence Interval of 10-Years" (p 475). The coefficients are adjusted by the coefficient C to be used for a 100-year flood event. C is set to a maximum coefficient value of 1.0 to avoid any fractional minimizing errors.

For the Left Catch Basin:

$$i = \frac{a}{(t_{c,left}+b)^c} = \frac{51.4}{(4.24E-4hr+7.85)^{0.75}} = 11.0in/hr$$

For the Right Catch Basin:

$$i = \frac{a}{(t_{c,right}+b)^c} = \frac{51.4}{(5.40E-4hr+7.85)^{0.75}} = 11.0in/hr$$

Where

t_c = Time of concentration

$$t_c = \frac{L}{k(S^{0.5})} * \left(\frac{1hr}{3600s}\right)$$

$$t_{c,left} = \frac{L}{k(S^{0.5})} * \left(\frac{1hr}{3600s}\right) = \frac{55ft}{20.8(3^{0.5})} * \left(\frac{1hr}{3600s}\right) = 4.24E-4hr$$

$$t_{c,right} = \frac{L}{k(S^{0.5})} * \left(\frac{1hr}{3600s}\right) = \frac{70ft}{20.8(3^{0.5})} * \left(\frac{1hr}{3600s}\right) = 5.40E-4hr$$

4B. Calculate Q_{peak} for a 100-year flood for each catch basin.

Even though rainfall intensities are the same, the area of each subcatchment is different depending on grade design, so two calculations are performed below.

Left Catch Basin:

$$Q_{peak} = CiA\left(\frac{1.0083cfs}{acre-in./hr}\right)$$

$$Q_{peak,left} = (1.0)(11.0in/hr)(0.117acres)\left(\frac{1.0083cfs}{acre-in./hr}\right) = 1.30cfs$$

Right Catch Basin:

$$Q_{peak} = CiA\left(\frac{1.0083cfs}{acre-in./hr}\right)$$

$$Q_{peak,right} = (1.0)(11.0in/hr)(0.122acres)\left(\frac{1.0083cfs}{acre-in./hr}\right) = 1.35cfs$$

Both peak flow rates are less than values calculated for the maximum flow of the existing stormwater sewer pipelines as calculated in Sections 1 and 2.

5. Determine Maximum Flow with Proposed Catch Basins (NRCS CN Method)

5A. Time of Concentration

Same values used as calculated in Section 4B.

5B. General Data Summary

-Curve Number (CN) is 98 for Asphalt Parking Lot

-Rainfall Type II

Table 1 Rainfall Intensity of Design Storms

Recurrence Interval	1-yr	2-yr	10-yr	50-yr	**100-yr**
Rainfall Amount (in)	2.3	2.6	3.8	4.8	5.2
*Values interpolated from maps in the Rainfall Atlas, TR-40 (National Weather Service, 1964).					

5C. Calculate Time to Peak for 24 Hour Duration

These calculations are performed for a 24 hour duration storm event; the time to peak is maximum at 24 hours making peak flow minimum.

$$T_P = \left(\frac{24hr}{2}\right) + t_l$$

$$t_l = 0.6 * t_c$$
$$t_{l,left} = 2.54E-4hr$$
$$T_{P,left} = 12.0003hr$$

$$t_{l,right} = 3.24E-4hr$$
$$T_{P,right} = 12.0003hr$$

Where

T_P = Time to peak
t_l = Time lag

5D. Calculate Storage

$$S = \frac{1000}{CN} - 10$$

$$When_CN = 98$$
$$S = 0.204$$

5E. Calculate Runoff Volume for 100-yr Flood Event

$$VR_{100} = \left[\frac{(P_{100} - 0.2S)^2}{P_{100} + 0.8S} \right] = 4.96in$$

Where

P_{100} = Precipitation from 100-yr rainfall intensity (Section 5B: Table 1)

5F. Use NRCS Graphical Method Equation to Find Q_{peak}.

$$Q_{peak} = \frac{0.75(VR_{100}_in)(A_acres)}{T_P} * \frac{2.54cm}{1in} * \frac{1m}{100cm} * \frac{4046.86m^2}{1acre} * \frac{1hr}{3600s} * \frac{35.14ft^3}{1m^3}$$

$$Q_{peak,left} = \frac{0.75(4.96in)(0.117acre)}{12.0003hr} * (conversion_factors) = 0.036cfs$$

$$Q_{peak,right} = \frac{0.75(4.96in)(0.122acre)}{12.0003hr} * (conversion_factors) = 0.038cfs$$

If the Time to Peak is a minimum then the flow rate becomes a maximum. The calculations are repeated for a shorter Time to Peak of 20 minutes:

$$T_P = (20\min) * \frac{1hr}{60\min} + t_{l(left_or_right)}$$

$$Q_{peak,left} = \frac{0.75(4.96in)(0.117acre)}{0.3336hr} * (conversion_factors) = 1.31cfs$$

$$Q_{peak,right} = \frac{0.75(4.96in)(0.122acre)}{0.3336hr} * (conversion_factors) = 1.36cfs$$

Both peak flow rates are less than values calculated for the maximum flow of the existing stormwater sewer pipelines as calculated in Sections 1 and 2.

6. Flow Rate Summary of Rational Method and NRCS Curve Number Method

Table 2 Summary of Calculated Flow Rates

Method	Left Catch Basin Flow Rate (Q_{peak}, 100-yr)	Right Catch Basin Flow Rate (Q_{peak}, 100-yr)
Rational	1.30cfs	1.35cfs
NRCS Curve Number (CN)	1.31cfs	1.36cfs

7. Verify the New Catch Basin Dimensions and Number

7A. Determine the normal depth of sheet slow from Q_{peak} for each parking lot subcatchment.

The highest Q_{peak} (i.e. values calculated for the NRCS Curve Number Method are used, see Section 6: Table 2).

$$Q_{peak,100-yr} = \frac{(Cm)(T)(y_n^{5/3})(S^{1/2})}{n}$$

Where

Cm = Constant (1.49 for BG Units)
T = Top width of flow (Assumed to be 100 ft for each catch basin)
S = Slope of grade (Assumed 3% average)
n = Manning's roughness coefficient (=0.011 for paved area, sheet flow)
y_n = Normal depth

$$1.36cfs = \frac{(1.49)(100ft)(y_n^{5/3})(3\%^{1/2})}{0.011}$$

$$Solve_for_y_n$$

$$y_n = 0.003ft$$

7B. Determine the minimum size of the grate inlet for each catch basin.

For weir flow, the capacity of a slotted drain inlet with a width greater than 0.15 ft is as follows:

$$Q_I = (Cw)(L)(y_n^{3/2})$$

Where

Cw = Weir equation coefficient (2.3 for BG units)
L = Width of catch basin (Assumed 2 ft to match existing)
y_n = Normal depth (Calculated as 0.003 ft)

$$Q_I = (2.3)(2ft)(0.003ft^{3/2})$$

$$Q_I = 7.56E-4cfs$$

If the catch basin is completely submerged it acts as an orifice:

$$Q_o = 0.6(A)(\sqrt{2(g)(d)})$$

Where

A = Cross-sectional area of catch basin
g = Acceleration due to gravity (32.2 ft-s^{-2})
d = Depth of flow (Assumed to be a minimum of 0.4 ft)

$$Q_o = 0.6(\pi * (1ft)^2)(\sqrt{2\left(32.2\frac{ft}{s^2}\right)(0.4ft)}) = 9.6cfs$$

The orifice flow rate is much greater than peak runoff from a 100-year storm event (i.e. 9.6 cfs >> 1.36 cfs). The grate inlet will never be fully submerged because water will adequately drain through the grate inlet and the existing stormwater pipeline before it acts as an orifice. Thus, the grate inlet of each new catch basin is sized appropriately to drain water at a rate greater than the design storm maximum 100-year flood event rainfall intensity. New catch basins will be sized circular to drain water flowing orthogonally to the new grade.

8. Determine Total Water Quality Volume of Stormwater Runoff

Use New York State Stormwater Management Design Manual Equation

$$WQv = \frac{(P)(Rv)(A)}{12}$$

$$WQv = \frac{(0.9)(0.95)(0.319ac)}{12}$$

$$WQv = 990.06ft^3$$

$$Rv = 0.05 + 0.009(I)$$

$$I = 100$$

Where

WQv = Water quality volume
P = 90% rainfall event number
Rv = Adjustment factor
A = Area in acres
I = Impervious cover percentage

Since the parking lot is less than one-acre in area (i.e. the total disturbed area is only 0.319 acre) it is not necessary to include a Stormwater Management Practice in final design.

9. Calculate New Catch Basin Rim / Invert Elevations

9A. Leftmost Catch Basin on Parking Lot Centerline

Rim Elev. 393'

Inv out = 391.10' = [390.68' + (0.0022*)(85') = 390.87' (Min)]

9B. Rightmost Catch Basin on Parking Lot Centerline

Rim Elev. 393.31'

Inv in = 390.90'
Inv out = 390.80' [390.57' (Existing CB Inv. in) + (0.0022*)(52') = 390.68' (Min)]

*Ten State Standards Recommended Slope per Foot for 12" Diameter Pipe

9C. ALTERNATE: Parking Lot Access Catch Basin (Not Used)

Rim Elev. 393.89'

Inv in = 389.24' (Existing CB Inv. out) – (0.0028**)(67') = 389.05'
Inv out = 389.05'

**Ten State Standards Recommended Slope per Foot for 10" Diameter Pipe

10. Determine Maximum Flow into Existing Catch Basin (Rational Method)

The rational method is used to determine contributing flow from a 100-year rainfall event to an existing catch basin on Rand Drive. The new parking lot catch basins will be connected to this existing catch basin. The rim and invert elevations of this catch basin are recorded below. Refer to the site plan in the contract drawings to locate the referenced catch basin based on elevation data.

Rim 393.62'
12" Inv. In 390.57'
12" Inv. Out 390.57'

$$Q_{peak} = CiA\left(\frac{1.0083cfs}{acre - in./hr}\right)$$ Where

Q_{peak} = 100-yr rainfall peak flow rate
C = Rational method coefficient
(Is a ratio of the peak runoff rate to the rainfall rate and has an upper limit of 1.0)
i = Rainfall intensity (in./hr)
A = Area of subcatchment (acres)

10A. Calculate the rainfall intensity using an IDF curve.

The IDF coefficients (a, b, and c) used were derived for New York, New York, and are a reasonable estimate of coefficients that can be used across New York State. These values are taken from Wurbs and James *Water Resources Engineering*, Table 7.7: "Coefficients for a Recurrence Interval of 10-Years" (p 475). The coefficients are adjusted by the coefficient C to be used for a 100-year flood event.

Rainfall Intensity for the Existing Catch Basin:

$$i = \frac{a}{(t_c + b)^c} = \frac{51.4}{(0.002hr + 7.85)^{0.75}} = 11.0in/hr$$

Where

t_c = Time of concentration

$$t_c = \frac{L}{k(S^{0.5})} * \left(\frac{1hr}{3600s}\right) = \frac{210ft}{20.8(2^{0.5})} * \left(\frac{1hr}{3600s}\right) = 0.002hr$$

10B. Calculate Q_{peak} for a 100-year flood for the existing catch basin.

$$Q_{peak} = CiA\left(\frac{1.0083cfs}{acre-in./hr}\right)$$

$$Q_{peak} = (1.0)(11.0in/hr)(0.406acres)\left(\frac{1.0083cfs}{acre-in./hr}\right) = 4.51cfs$$

The sum of this peak flow and peak flow from the new parking lot catch basins must be less than the total manageable flow for an existing 12 inch diameter pipe that is the outlet for the existing catch basin (i.e. Q = 7.30 cfs).

10C. Calculate the total contributing flow to the existing catch basin if the new catch basins are connected, in series.

$$Q_{Total} = Q_{peak_existing} + Q_{peak,left} + Q_{peak,right}$$

$$Q_{Total} = 4.51cfs + 1.31cfs + 1.36cfs$$

$$Q_{Total} = 7.18cfs < 7.30cfs$$

7.30 cfs is the maximum flow rate for the existing 12" diameter pipe

Since the total combined sum of all contributing flow--from the new parking lot stormwater runoff and stormwater runoff from Rand Drive--is less than the maximum allowable flow, the new parking lot catch basins are tied into this catch basin. These calculations provide sufficient water management for 100-year rainfall intensity.

11. ALTERNATE Determine Maximum Flow into CB for Lot Access (Not Used)

A third catch basin will be installed between two existing catch basins connected by an existing 10" diameter PVC pipe on the Southwest curb of the access drive for the new parking lot. It is necessary to verify that additional parking lot runoff will not overwhelm the existing stormwater sewer system that the catch basin will be tied in with.

As before, the Rational Method is used to calculate flow for a 100-year rainfall intensity, but calculations are less explicit to avoid redundancy. Please refer to previous calculations for a more detailed explanation.

$$Q_{peak} = CiA\left(\frac{1.0083cfs}{acre-in./hr}\right)$$

$$i = \frac{a}{(t_c+b)^c} = \frac{51.4}{(7.08E-4hr+7.85)^{0.75}} = 11.0in/hr$$

$$t_c = \frac{L}{k(S^{0.5})} * \left(\frac{1hr}{3600s}\right) = \frac{75ft}{20.8(2^{0.5})} * \left(\frac{1hr}{3600s}\right) = 7.08E-4hr$$

$$Q_{peak,new} = (1.0)(11.0in/hr)(0.036acres)\left(\frac{1.0083cfs}{acre-in./hr}\right) = 0.396cfs = 0.40cfs$$

The catch basin "upstream" from the new catch basin contributes the following calculated flow:

$$Q_{peak_existing} = (1.0)(11.0in/hr)(0.169acres)\left(\frac{1.0083cfs}{acre-in./hr}\right) = 1.88cfs$$

$$Q_{Total} = Q_{peak_existing} + Q_{peak,new}$$
$$Q_{Total} = 1.88cfs + 0.40cfs$$
$$Q_{Total} = 2.28cfs < 4.44cfs$$

4.44 cfs is the maximum flow rate for the existing 10" diameter pipe

Section C.3
Lighting

Section C.3 Lighting

1. Parking Lot Lighting Specifications

TYPE	METAL HALIDE (MH1)	METAL HALIDE (MH2)
MANUFACTURER	Cooper Lighting - Lumark	Cooper Lighting – Lumark
MODEL NUMBER	MPTR-SL-250	MPTR-2F-150
HEIGHT	30 ft	30 ft
LUMINAIRE	MEDIUM ARCHITECTURAL AREA LUMINAIRE – Spill Light Eliminator	ARCHITECTURAL AREA LUMINAIRE – Type II
LAMP	250 WATT PULSE-START CLEAR ED-28 HORIZONTAL BURN	150 WATT PULSE-START CLEAR ED-28 HORIZONTAL BURN
REFLECTOR	PREMIUM SEGMENTED REFLECTOR	FORMED SPECULAR ALUMINUM
REFRACTOR	CLEAR FLAT GLASS	FLAT GLASS
SOCKET POSITION	HORIZONTAL	HORIZONTAL
LAMP LUMENS	22000	14000

Calculations Performed By: DBW
Calculations Checked By: MJC

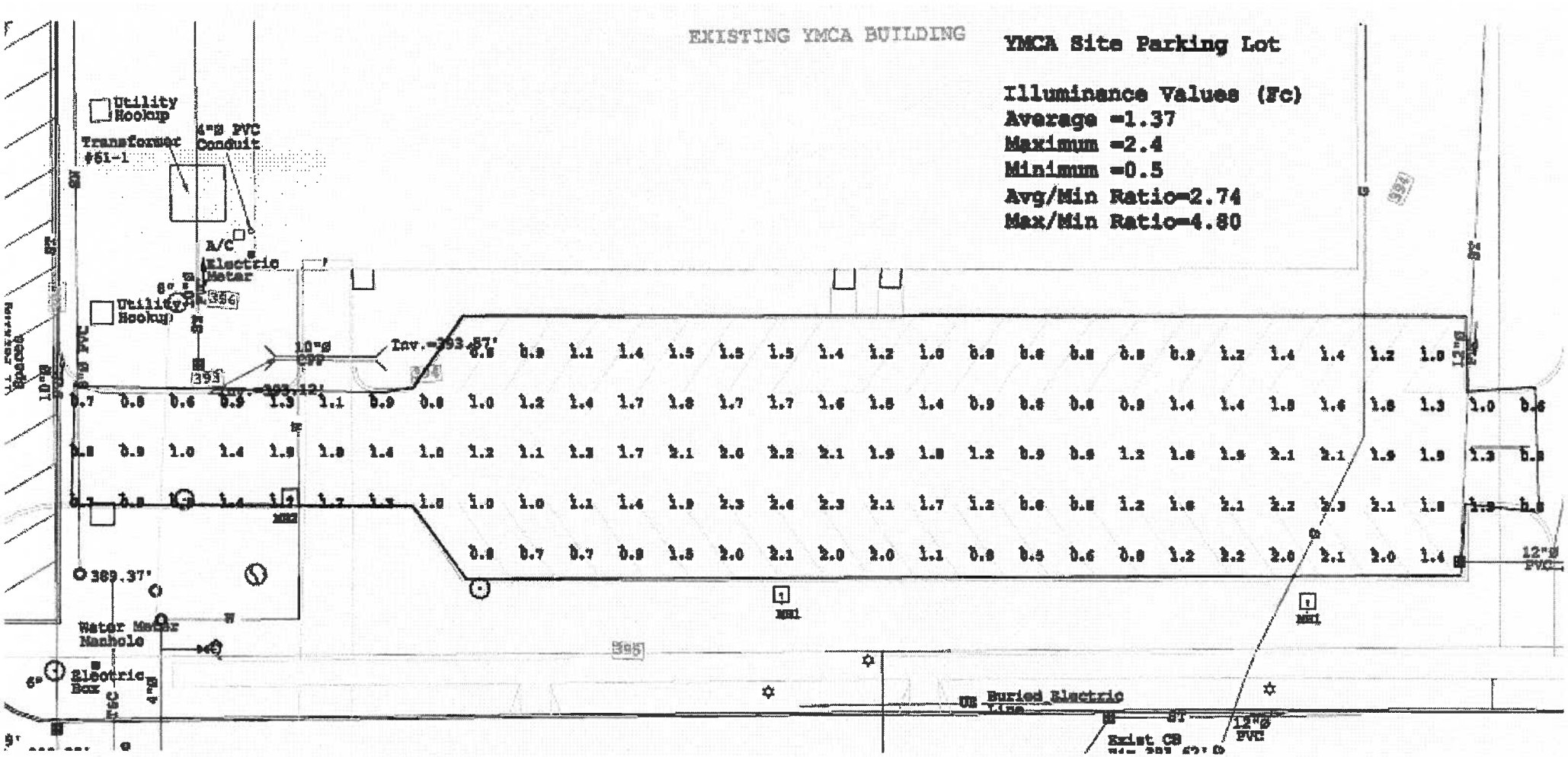


Figure 1 Parking Lot Lighting Illuminance Values