Water and Sewer Report

for

526 Central Ave

City of Albany
Albany County, New York

February 28, 2018

Prepared by:

MJ Engineering and Land Surveying, P.C.

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Clifton Park, NY 12065
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WATER AND SEWER REPORT
for
526 CENTRAL AVE
CITY OF ALBANY, ALBNAY COUNTY, NY

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L:\PROJECTS\MJ972 LAND DEVELOPMENT\972.21 (526 CENTRAL AVE)\REPORTS\WATER-SEWER\WATER AND SEWER REPORT 2.28.18.DOCX

1.0 INTRODUCTION

1.1 Project Description

This Engineering Report describes the existing and proposed water and sewer systems within the project limits located on 526 Central Ave in the City of Albany. The project involves redeveloping of and existing vacant parcel for retail and apartment use. The buildings are situated on tax parcel 65.37-3-55.1, 53, 47 and 54 which comprise a total of 3.37 acres.

The proposed 5 story building will be comprised of 71 apartment units, +/- 16,193 sf of office space and 4,446 sf of general retail. See enclose architectural layout plan in Exhibit 1.

1.2 Location and Zoning

The property is located on the west side of Central Ave and is approximately 150 south of Manning Blvd. The existing tax parcels that comprise the 3.37 acres are 65.37-3-55.1, 65.37-3-53, 65.37-3-47 and 65.37-3-54 and zoned Mixed Used Form Based Central Ave (MU_FU)

1.3 Existing City Water/Sewer

The City owns and maintains an existing gravity CSO sewer and water distribution main on Central Ave, Central Ave CSO system is part of Beaver Creek Sewer District. The gravity CSO sewer on Central Ave is 15-inch clay pipe per record drawings. The project site is currently serviced with public water via an 20" ductile iron pipe on Central Ave.

1.4 Wetlands

There are no ACOE or NYSDEC jurisdictional wetlands are within the project limits.

1.5 100- Year Flood Plain

Per National Flood Insurance Map (FIRM) panel 36001C0192D dated March 16, 2015 the project site is located outside flood zone AE or with zone X. Therefore, site is outside the 100-year flood plain and is approximately 3/4 mile from zone a flood zone.

2.0 DESIGN STANDARDS

2.1 NYSDEC Water and Sewer Demand and Design Standards

The proposed water laterals for the proposed building will be 6-inch water services to provided domestic and fire suppression within the buildings.

Anticipated water flows are as follows:

Water Usage

	Average Daily Flow (GPD)	Average Flow (GPM)	Peak Flow (GPM)
Apartments- 71 units			
41- 1-Bedroom Units	4,510	3.13	6.26
27- 2 Bedroom Units	5,940	4.13	8.26
3-3 Bedroom Units	990	0.68	1.36
Office Space= 16,200 sf Assumed =30 employees	750	0.53	1.06
Retail Space= 4,500 sf	450	0.31	0.62
Totals=	**12,640**	**8.78**	**17.56**

Table B-3 of NYSDEC Design Standards for Intermediate Sized Water Treatment Systems dated 3/5/2014 was used to determine anticipated flow rate, 110 gal per bedroom, office building 25 gal per employee and 0.1 gallons/sf for retail. Plumbing Fixtures will be specified as low flow type fixtures per NY State requirements for water conservation.

Anticipated sewer flows are as follows:

Sewer Flows

	Average Daily Flow (GPD)	Average Flow (GPM)	Peak Flow (GPM)
Apartments- 71 units			
41- 1-Bedroom Units	4,510	3.13	12.52
27- 2 Bedroom Units	5,940	4.13	16.52
3-3 Bedroom Units	990	0.68	2.72
Office Space= 16,200 sf Assumed =30 employees	750	0.53	2.12
Retail Space= 4,500 sf	450	0.31	1.24
Totals=	**12,640**	**8.78**	**35.12**

2.2 Proposed Water and Sewer

The project will utilize the existing infrastructure on Central Ave for water and sewer needs. Proposed new gravity sewer lateral and water lateral will be installed to service the building. The main water lateral for the buildings will be a 6-inch class 52 ductile iron and connected to the existing 20" waterline on Central Ave. The 6-inch class 52 ductile iron to service the building will be utilized for both domestic and fire protection. The Siamese connection will be provided on the exterior of the building near the southeast corner of the building near the main travel way.

The sewer lateral will be extended from an existing sewer manhole on Central Ave within the sidewalk area. There will be two (2) private sewer manholes and approximately 224 linear feet of 8-inch PVC sewer installed for the connections of the proposed two (2) sewer laterals for the building. There will be two (2) sewer 6-inch PVC laterals and connect to and new private 8-inch sewer line. Due to building confirmation, one sewer lateral will be for the commercial spaces on the 1st and 2nd floors and the second sewer lateral for the apartments on the 1st, 2nd, 3rd, 4Th and 5th floors. The proposed water and sewer facilities have been designed to state and municipal standards, and in accordance with good engineering practice.

2.3 Impacts to City Water and Sewer Systems

The proposed water/sewage usage was determined to be 12,640 gpd. The City of Albany water treatment plant produces on average 19 mgd while the plant has a capacity of 32 mgd. Therefore, there is extra capacity within the existing infrastructure to provide domestic water for the project.

The sewage effluent from the proposed project will connect to an existing 15-inch combined gravity sewer along Central Ave. A new private 8-inch sewer will be connected to the existing sewer manhole. The 15-inch gravity sewer on Central Ave and is part of Beaver Creek CSO Sewer District. Per the City of Albany Division of Engineering letter, development within the sewer district requires additional measures. A stormwater detention system is proposed for the project that store up to the 100-year storm event and will meter the stormwater runoff flows to the existing CSO system. The proposed stormwater detention/infiltration system storage up to the 100-year storm event and exceeds the standards by the City (10-year storage capacity) for project within this sewer district. See stormwater entitled "Stormwater Management Report and Post Construction Maintenance Manual for 526 Central Ave" for additional stormwater related information. The report and design of the stormwater detention and infiltration facility follows the design guidelines of the City of Albany Division of Engineering letter with respect to development within the Beaver Creek Sewer District and also comports To NYSDEC Stormwater Design Manual. The Beaver Creek Sewer District flows to the Albany County South Sewer Treatment Plant. The dry and wet weather condition of the South Waste Water treatment plant is 21 mgd and 45 mgd respectively.

As the site is 50% impervious, 30% gravel, almost all stormwater runoff from the site enters the CSO system on Central Ave unmetered. Based upon average rainfall of 35.7-inches per year for Albany County, the site alone directly discharges at least 1,960,000 gallons of stormwater a year to the CSO system annually. The 1,960,000 gallons (35.7" of rainfall a year x 60% reduction for some absorption of stormwater x 3.37 acres x 43,560 sf/acre x 7.48 gal/cf) is unmetered to the CSO system.

Per the Stormwater Report, 2.36 acres of the site is now allowed to infiltrated stormwater runoff into the ground or about 2,058,879 gallons of stormwater annually (35.7" of rainfall a year x 2.36 acres x 43,560 sf/acre x 7.48 gal/cf x 90% as 90% of all storm are less than 1-year event) and 1,172,902 gallons of stormwater annually (35.7" of rainfall a year x 1.21 acres x 43,560 sf/acre x 7.48 gal/cf) will be metered flow to the existing CSO system by the development of the project. Therefore, on average the CSO system on Central Ave will experience a reduction of about 780,000 gallons of stormwater runoff annually to Albany County South Waste Water treatment plant.

The existing 15-inch CSO system on Central Ave has the capacity during dry weather conditions for additional sewage effluent produced by the proposed project. Also as the site will send less stormwater runoff to the existing CSO system by development of the project, the existing 15-inch CSO system on Central Ave will not be negatively impacted by this development.

2.4 Water Pressures

The building will be serviced by 6-inch class 52 ductile iron water laterals will be used to service as domestic water use and fire flow prevention. The static pressure was determined to be 46 psi and a residual pressure of 45 psi at a flow rate of 980 gpm (see Exhibit 2). M/E Engineering P.C will be designing the sprinkler and domestic services within the building and will be provided to the City in a separate report demonstrating that pressure loss within the system. In addition, M/E Engineering P.C will be providing the City with back flow prevention report in conformance rules and regulations with a completed DOH-347 form.

2.5 District Extensions

The project is located within the city limits, and as such, will not be required to extend the water district or sewer district.

2.6 Financing

Financing the proposed water and sewer improvements to the site shall be born entirely by the developer of the project.

3.0 EXHIBITS

Exhibit 1 – Architectural building layout

Exhibit 2 – Hydrant Flow Data and Hydraulic Model Information

FIRST FLOOR UNITS

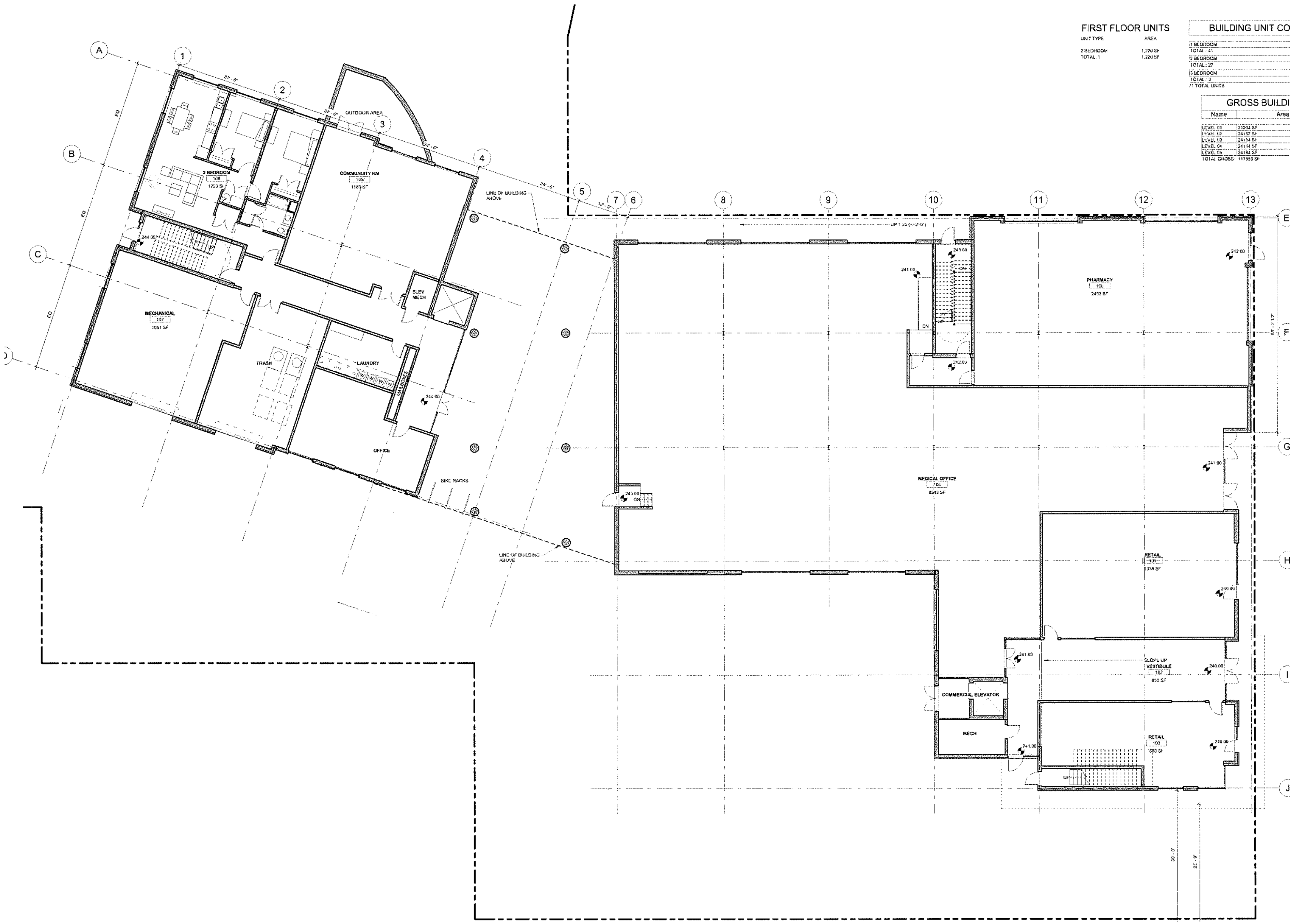
UNIT TYPE	AREA
2 BEDROOM	1,220 SF
TOTAL: 1	1,220 SF

BUILDING UNIT COUNT

1 BEDROOM
TOTAL: 41
2 BEDROOM
TOTAL: 27
3 BEDROOM
TOTAL: 3
71 TOTAL UNITS

GROSS BUILDING

Name	Area
LEVEL 01	21204 SF
LEVEL 02	24157 SF
LEVEL 03	24164 SF
LEVEL 04	24164 SF
LEVEL 05	24164 SF
TOTAL GROSS	117853 SF



1 FIRST FLOOR PLAN
1/8" = 1'-0"

DRAWING SUBMISSION STATUS: [ ] NOT FOR CONSTRUCTION [ ] SCHEMATIC DESIGN [ ] DESIGN DEVELOPMENT [ ] CONSTRUCTION DOCUMENTS [ ] ISSUED FOR CONSTRUCTION

PROJECT NAME/LOCATION
DESCRIPTION [NEW CONSTRUCTION]
THE SWINBURNE BUILDING
526 CENTRAL AVENUE
ALBANY NY 12206

Regan Development

MEP/FP
M/E ENGINEERING
433 STATE STREET, SUITE 410
SCHENECTADY, NY 12305
518.533.2171

STRUCTURAL/ CIVIL
M.J. ENGINEERING & LAND SURVEYING P.C.
21 CORPORATE DRIVE, SUITE 105
CLIFTON PARK, NY 12065

ARCHITECT OF RECORD
HHL Architects

DRAWING TITLE
FIRST FLOOR PLAN

REVISIONS AFTER ISSUANCE

NO.	DATE	DESCRIPTION

SEAL

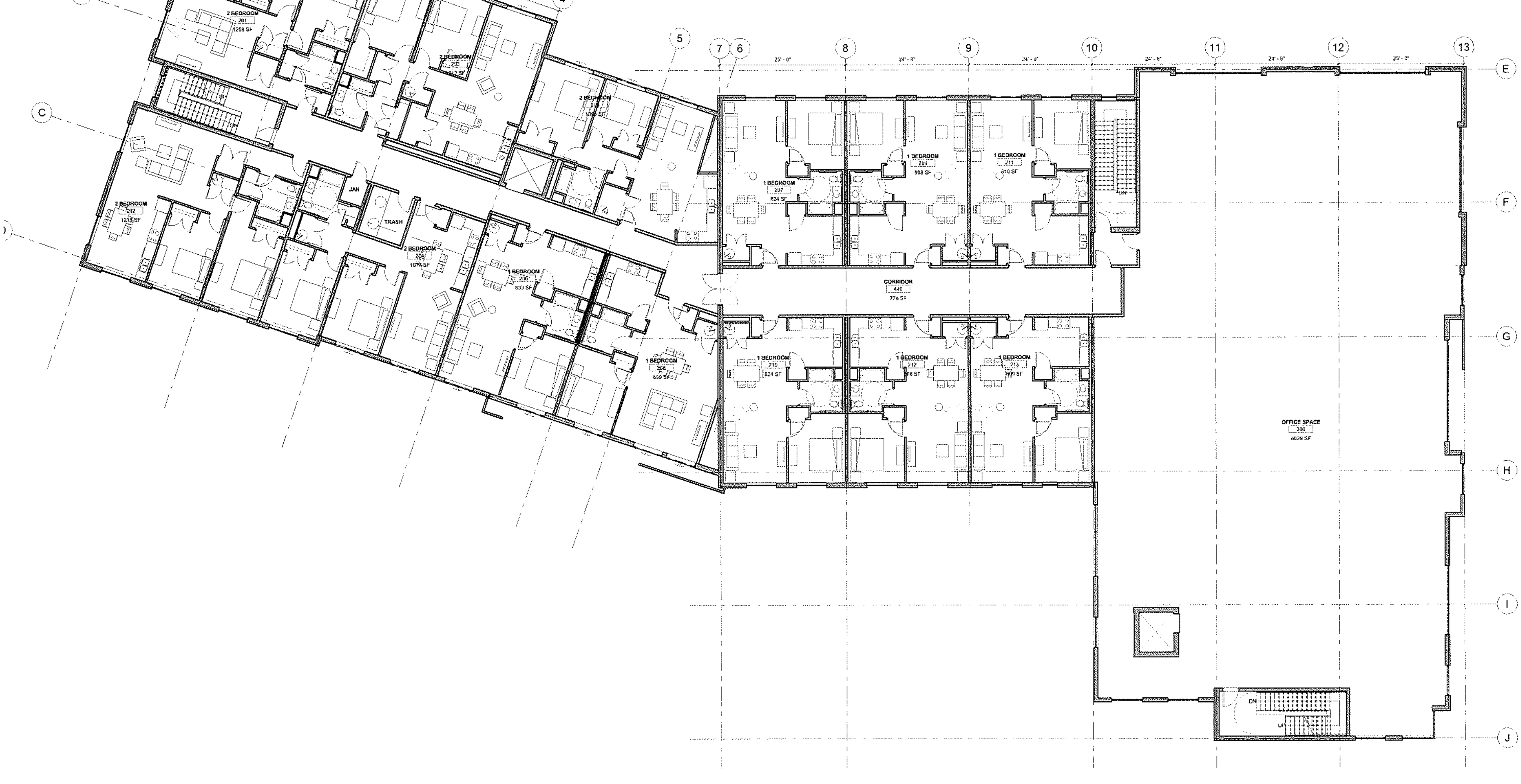
ISSUE DATE 09.07.17
SHEET: XXX / XXX
DRAWING NUMBER
A-101

SECOND FLOOR UNITS

UNIT TYPE	AREA
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	808 SF
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	810 SF
1 BEDROOM	833 SF
1 BEDROOM	893 SF
2 BEDROOM	1,213 SF
2 BEDROOM	1,208 SF
2 BEDROOM	1,077 SF
2 BEDROOM	1,095 SF
2 BEDROOM	1,212 SF
TOTAL: 13	12,329 SF

BUILDING UNIT COUNT

1 BEDROOM
TOTAL: 41
2 BEDROOM
TOTAL: 27
3 BEDROOM
TOTAL: 3
71 TOTAL UNITS



1 SECOND FLOOR PLAN
1/8" = 1'-0"

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ARCHITECT OF RECORD
HHL Architects

DRAWING TITLE
SECOND FLOOR PLAN

SEAL

REVISIONS AFTER ISSUANCE
NO | DATE | DESCRIPTION

ISSUE DATE 09.07.17
SHEET: XXX / XXX
DRAWING NUMBER
A-102

THIRD FLOOR UNITS

UNIT TYPE	AREA
1 BEDROOM	833 SF
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	809 SF
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	807 SF
1 BEDROOM	906 SF
1 BEDROOM	942 SF
1 BEDROOM	1,010 SF
1 BEDROOM	899 SF
2 BEDROOM	1,213 SF
2 BEDROOM	1,077 SF
2 BEDROOM	1,208 SF
2 BEDROOM	1,212 SF
2 BEDROOM	1,005 SF
2 BEDROOM	1,347 SF
2 BEDROOM	1,220 SF
3 BEDROOM	1,871 SF
TOTAL 19	19,625 SF

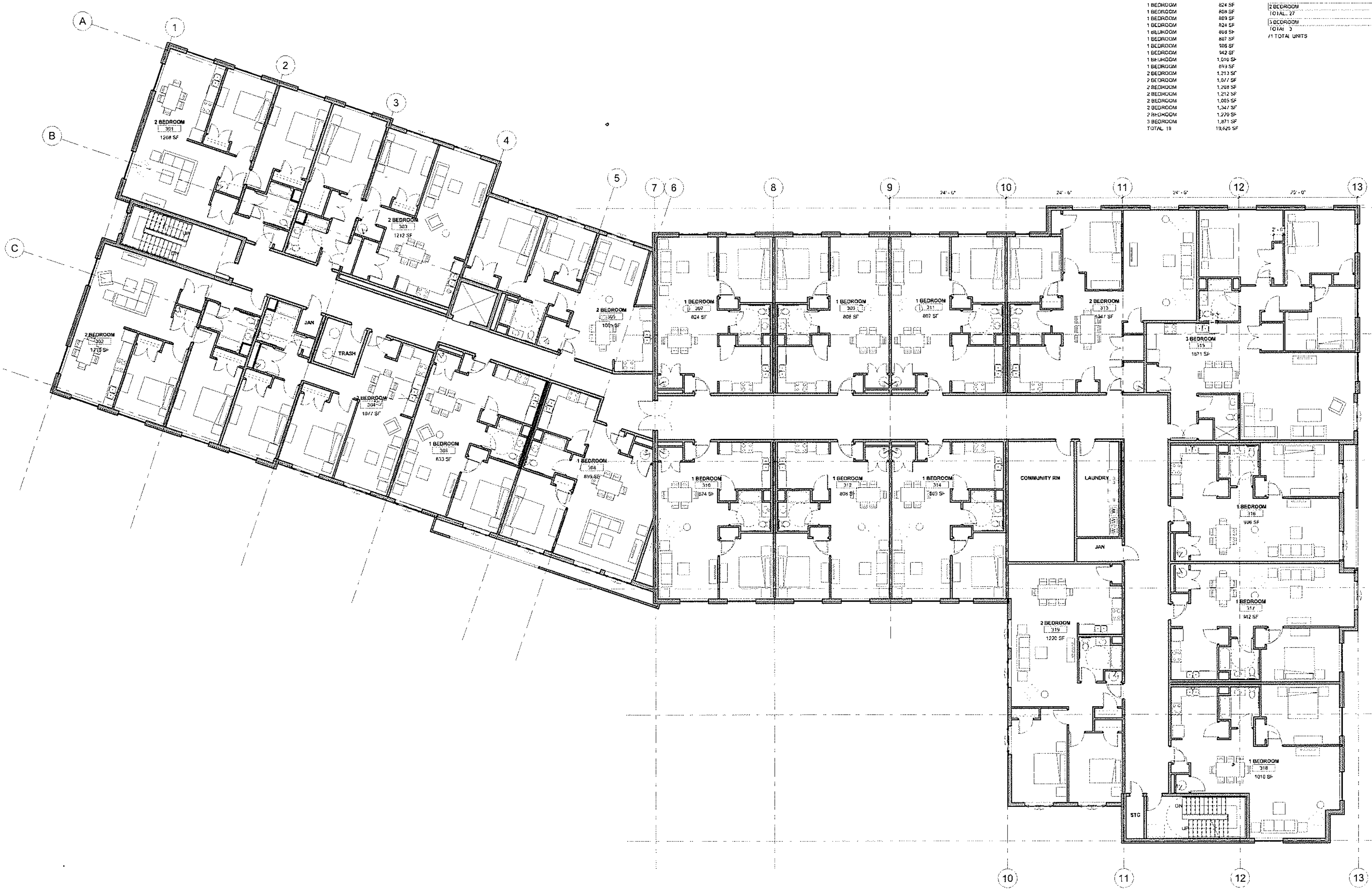
BUILDING UNIT COUNT

1 BEDROOM
TOTAL 41

2 BEDROOM
TOTAL 27

3 BEDROOM
TOTAL 3

71 TOTAL UNITS



1 THIRD FLOOR PLAN
1/8" = 1'-0"

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ARCHITECT OF RECORD
HHL Architects
172 Main Street, Buffalo, New York 14202
716.688.0743 ■ F. 716.847.6414
hhl-architects.com

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THIRD FLOOR PLAN

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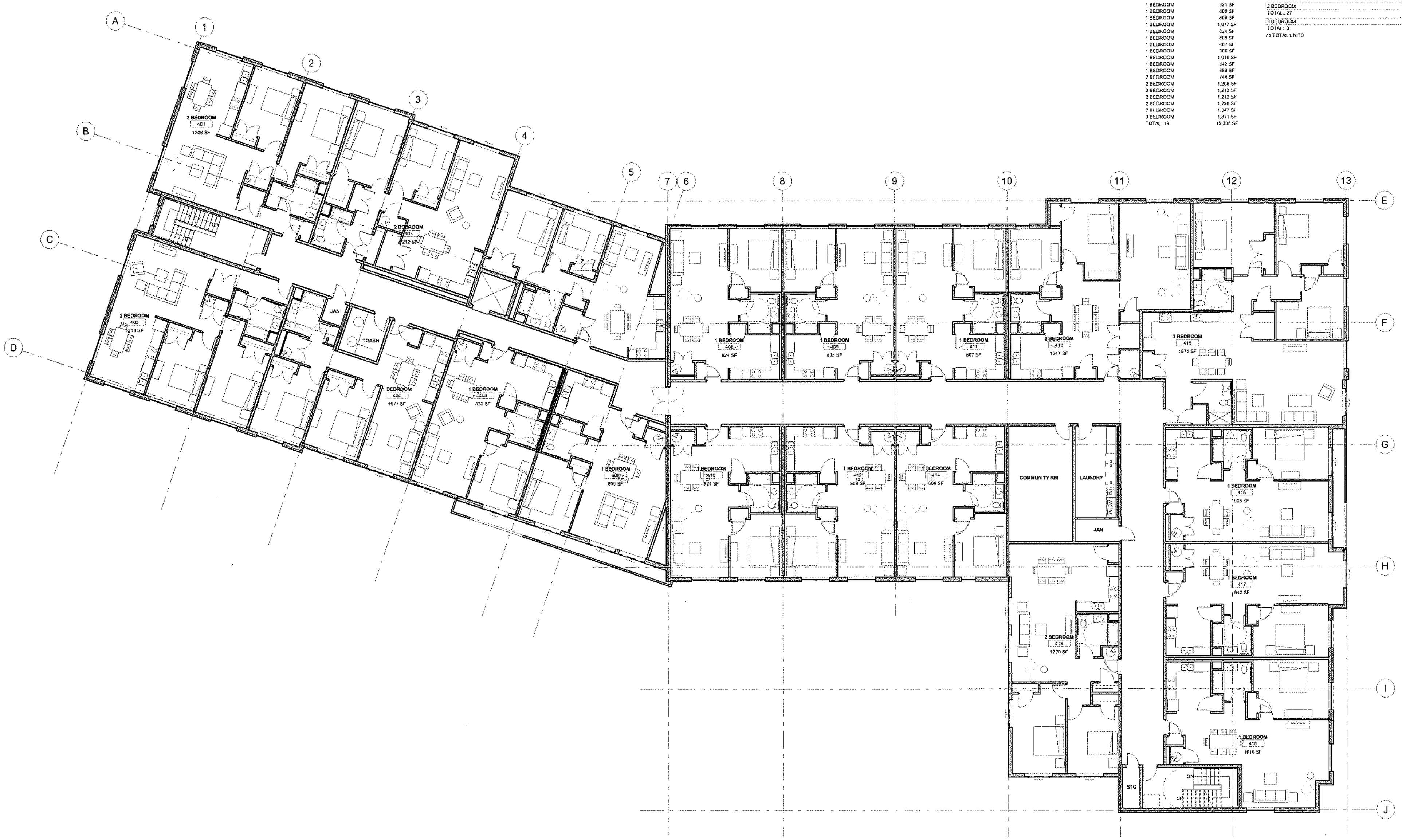

FOURTH FLOOR UNITS

UNIT TYPE	AREA
1 BEDROOM	833 SF
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	808 SF
1 BEDROOM	1,077 SF
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	807 SF
1 BEDROOM	906 SF
1 BEDROOM	1,010 SF
1 BEDROOM	942 SF
1 BEDROOM	899 SF
2 BEDROOM	748 SF
2 BEDROOM	1,208 SF
2 BEDROOM	1,213 SF
2 BEDROOM	1,212 SF
2 BEDROOM	1,220 SF
2 BEDROOM	1,347 SF
3 BEDROOM	1,871 SF
TOTAL: 19	19,388 SF

BUILDING UNIT COUNT

1 BEDROOM
TOTAL: 41

2 BEDROOM
TOTAL: 27

3 BEDROOM
TOTAL: 3

71 TOTAL UNITS

1 FOURTH FLOOR PLAN
1/8" = 1'-0"

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hhlarchitects.com

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FOURTH FLOOR PLAN

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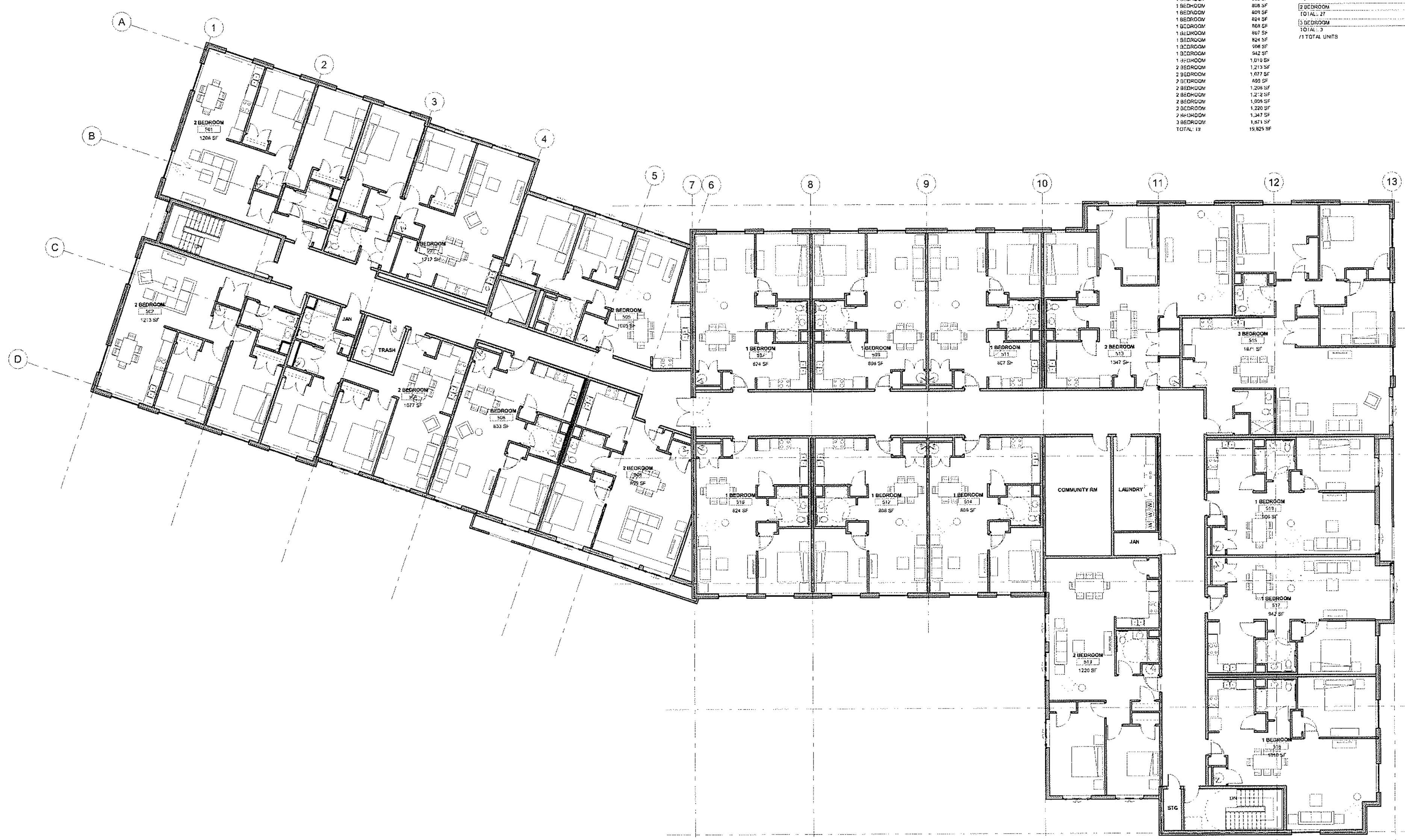

1 FIFTH FLOOR PLAN
1/8" = 1'-0"

FIFTH FLOOR UNITS

UNIT TYPE	AREA
1 BEDROOM	833 SF
1 BEDROOM	808 SF
1 BEDROOM	809 SF
1 BEDROOM	824 SF
1 BEDROOM	808 SF
1 BEDROOM	807 SF
1 BEDROOM	824 SF
1 BEDROOM	906 SF
1 BEDROOM	942 SF
1 BEDROOM	1,010 SF
2 BEDROOM	1,213 SF
2 BEDROOM	1,077 SF
2 BEDROOM	899 SF
2 BEDROOM	1,208 SF
2 BEDROOM	1,212 SF
2 BEDROOM	1,005 SF
2 BEDROOM	1,220 SF
2 BEDROOM	1,347 SF
3 BEDROOM	1,871 SF
TOTAL: 19	19,825 SF

BUILDING UNIT COUNT

1 BEDROOM
TOTAL: 41

2 BEDROOM
TOTAL: 27

3 BEDROOM
TOTAL: 3

71 TOTAL UNITS

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ALBANY NY 12206

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FIFTH FLOOR PLAN

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1 NORTH - WEST ELEVATION

2 NORTH - EAST ELEVATION

THE SWINBURNE BUILDING

HHL Architects

EXTERIOR ELEVATIONS

A-300

1 SOUTH - EAST ELEVATION

2 SOUTH - WEST ELEVATION

THE SWINBURNE BUILDING

HHL Architects

EXTERIOR ELEVATIONS

A-301

Albany Water Department
Fire Hydrant Flow Test

ID

293

Location

526 Central Avenue

Date	By	Representing	Witnessed By
11/15/2017	Peter Siciliano	AWD	Gerard Jones

Purpose of Test	System Demand MGD
Requested by MJ Engineering	18 Million

Pumps In Operation

N/A

Pressure Regulated Zone

Flow Hydrant Location

526 Central Avenue, South side of Central Avenue

Nozzle Size	Number of Nozzles	Pitot Pressure	Pitot Flow GPM
2.5"	1	36	980

Total Flow GPM

980

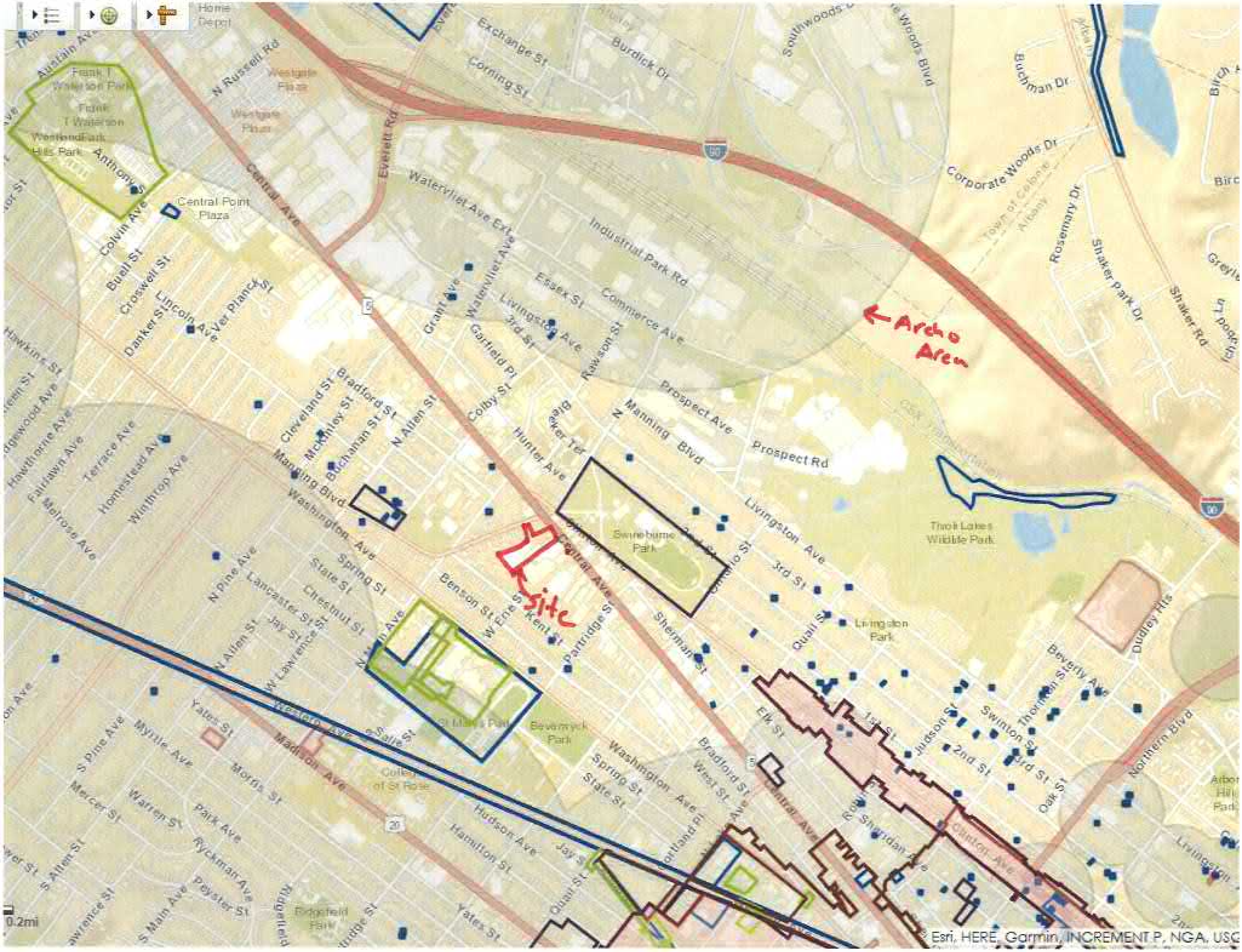
Residual Hydrant Location

526 Central Avenue

Static Pressure PSI	Residual Pressure PSI	Fire Flow at 20 psi
46	45	5693

Remarks

The two hydrants 100 feet apart are fed off of the same 20" water main on Central Avenue



← Archo Area
Site
Central Ave
Swinburne Park
Livingston Park
Tivoli Lakes Wildlife Park
Beverwyck Park
St Mary's Park
College of St Rose
Central Point Plaza
Westgate Plaza
Home Depot
Manning Blvd
Washington Ave
Livingston Ave
Clinton Ave
Madison Ave
Northern Blvd
Everett Rd
Industrial Park Rd
Commerce Ave
Prospect Ave
Prospect Rd
Corporate Woods Dr
Shaker Rd
Shaker Park Dr
Rosemary Dr
Buchman Dr
Town of Colonie
Albany
Esri, HERE, Garmin, INCREMENT P, NGA, USGS
0.2mi

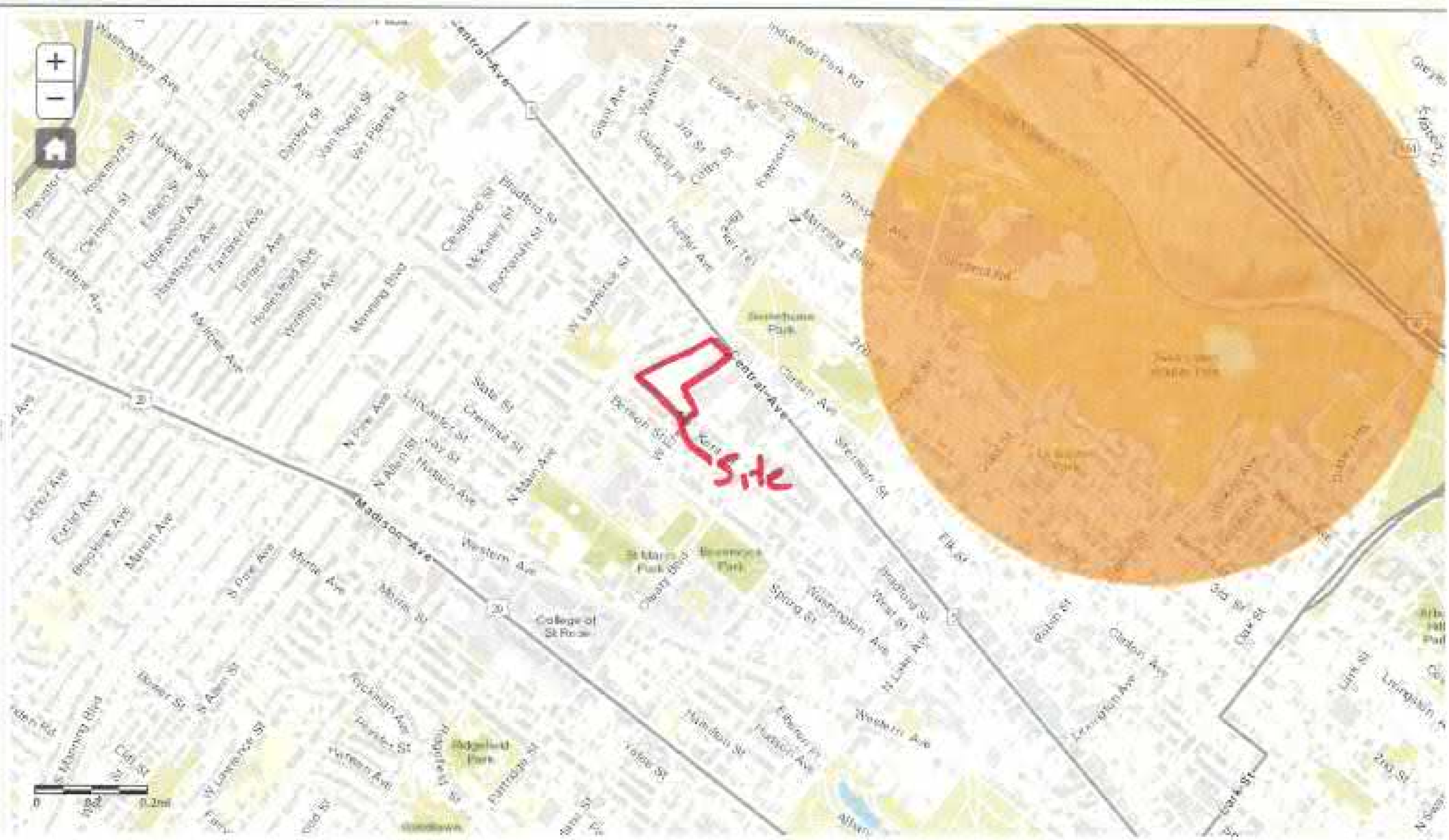
Environmental Resource Mapper

Search
Tools
Layers and Legend

☐ All Layers

☐ ★ Unique Geological Features
☐ Waterbody Classifications for Rivers/Streams
☐ Waterbody Classifications for Lakes
☐ State Regulated Freshwater Wetlands
State Regulated Wetland Checkzone
☐ Significant Natural Communities
Natural Communities Near This Location
☑ Rare Plants or Animals

Other Wetland Layers
Reference Layers
Tell Me More...
Need A Permit?
Contacts



Post Construction Maintenance Manual
for

526 Central Ave

City of Albany
Albany County, New York

February 28, 2018

Prepared by:

MJ Engineering and Land Surveying, P.C.

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POST CONSTRUCTION STORMWATER MAINTENANCE PLAN
for
526 CENTRAL AVE

CITY OF ALBANY, ALBANY COUNTY, NEW YORK

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1.0 OPERATION AND MAINTENANCE INFORMATION

Site Address	526 Central Ave
Descriptive Site Location	Property is located approximately 400 feet southwest of Central Ave and Manning's Blvd intersection.
Property Owner	Regan Development Corpooration 1055 Saw Mill Road Ardsley NY 10502
Property Management (if different than Owner)	SAME AS OWNER

2.0 DESIGN AND CONSTRUCTION INFORMATION

Maintenance Mechanism	☒ Maintenance Agreement ☒ Commercial Property ☐ Homeowners Association ☐ Maintenance Assumed by Government Entity List:
Required Inspections	• Inspection by a licensed professional engineer is required in accordance with Inspection forms in Exhibit G. • Local municipality has authority to enter the site to inspect the stormwater management practices. The frequency of municipal inspection has not been determined.
Providers of Maintenance Services	Coordinator of maintenance activities and inspections: ***Regan Development Corporation*** Landscaping and snow removal activities: ***TO BE DETERMINED***____________________________***(List Company)*** Stormwater Management Practice (SMP) Maintenance: ***TO BE DETERMINED***____________________________***(List Company)*** SMP inspections and party required to submit required reports to the local municipality: ***TO BE DETERMINED***____________________________***(List Company)***
Emergency Contact **(Local government authority to contact in case of failure of the stormwater treatment practice that threatens public safety)**	Neil O'Connor, P.E. Stormwater Program Coordinator 10 North Enterprise Drive Albany, NY 12204 Phone: (518) 434-5300 If calling off-hours for an emergency, please call the Police Department at (518) 438-4000

3.0 MAINTENANCE AND INSPECTION RESPONSIBILITIES

Permitting Authority	City Of Albany City Hall 24 Eagle Street Albany NY 12207
Design Engineer	James Easton PE M.J. Engineering and Land Surveying, P.C. 21 Corporate Drive, Suite 105 Clifton Park, NY 12065 Phone: (518) 371-0799 Fax: (518) 371-0822
Contractor	***TO BE DETERMINED*** ______________________________ ***(List Company)***
Emergency Contact (Local government authority to contact in case of failure of the stormwater treatment practice that threatens public safety)	Neil O'Connor. P.E. Stormwater Program Coordinator 10 North Enterprise Drive Albany, NY 12204 Phone: (518) 434-5300 If calling off-hours for an emergency, please call the Police Department at (518) 438-4000

4.0 FUNDING MECHANISM

	☐ Maintenance performed by Municipality and Funded through: ☐ General Revenues ☐ Stormwater Utility of other fee assessment --- OR --- ☒ Maintenance performed by Owner and Funded or guaranteed through: ☐ Performance Bond ☐ Letter of Credit ☐ Escrow Account ☒ Private Funds ☒ Maintenance Agreement, See Attached
Estimated Annual O & M Costs	The estimated cost of maintenance of the stormwater management practice (SMP) excluding landscaping costs are: **$ 5,500** per year The estimated annual cost is in terms of year 2018 dollars. The anticipated annual cost for subsequent years may be estimated from the attached inflation worksheet. An inflation rate of 3.0% per year has been used. A cost projection is attached that includes a detailed estimate of the annual routine maintenance cost and the cost of infrequent maintenance items.

Practice A: Private Closed Drainage System, Infiltration Array and Hydrodynamic Unit	
Site Map identifying location of practice	Refer to Construction Plans
Practice Type	Infiltration (I-4 NYSDEC)
Contributing Drainage Area	Post Area #1A (2.36 ac)
Private Drainage System Location	Throughout project site – see construction drawings
Attachments	• See Exhibit E.1 for location of Practice A. • See Exhibit E.2 for Operation and Maintenance for required inspections of Infiltration area. All or any item(s) indicated on inspection report shall be rectified within one (1) month of report submission. • See Exhibit E.2 for Operation and Maintenance for Hydrodynamic unit.
Frequency	• Private Closed drainage system and catch basins shall be cleaned when maximum 6" sediment occurs within the closed drainage system. Estimated at every 10-years. • Private Catch basin, manholes, outlet structure, flared end sections and piping shall be repaired, replaced or fixed. • Private Closed drainage system and catch basins shall be cleaned when a maximum 6" sediment occurs within the closed drainage system. Estimated at every 10-years. • See Exhibit E.3 for Contech® Operation and Maintenance Literature for required activities, timing, methods and inspection. • Sediment removal shall be performed per the Contech Operation and Maintenance manual dictates.
Special Needs or Requirements	• High Pressure Water to clean underground closed drainage system. • A vacuum truck may be needed for removal of sediment to wash out location. • Catch basins/ manhole frame and grates, mortar or pipe.

Practice B: Private Closed Drainage System, Detention Array and Hydrodynamic Unit	
Site Map identifying location of practice	Refer to Construction Plans
Practice Type	N/A
Contributing Drainage Area	Post Area #1B (1.12 ac)
Private Drainage System Location	Throughout project site – see construction drawings
Attachments	• See Exhibit E.1 for location of Practice A. • See Exhibit E.2 for Operation and Maintenance for Hydrodynamic unit.
Frequency	• Private Closed drainage system and catch basins shall be cleaned when maximum 6" sediment occurs within the closed drainage system. Estimated at every 10-years. • Private Catch basin, manholes, outlet structure, flared end sections and piping shall be repaired, replaced or fixed. • Private Closed drainage system and catch basins shall be cleaned when a maximum 6" sediment occurs within the closed drainage system. Estimated at every 10-years. • See Exhibit E.3 for Contech® Operation and Maintenance Literature for required activities, timing, methods and inspection. • Sediment removal shall be performed per the Contech Operation and Maintenance manual dictates.
Special Needs or Requirements	• High Pressure Water to clean underground closed drainage system. • A vacuum truck may be needed for removal of sediment to wash out location. • Catch basins/ manhole frame and grates, mortar or pipe.

5.0 ATTACHMENTS TO MAINTENANCE PLAN

The following items shall be kept with the Post-Construction Maintenance Plan:

Present	*Item*	Description
☒	***As-Built Plans***	
☐	***Final Landscaping Plans***	Refer to Construction Drawings
☒	***Design Calculations Report***	Owner shall keep a copy of the Stormwater Management Report, including design calculations, with the Maintenance Plan.
☐	***Specifications for Potential Repair Items***	No detailed specifications have been developed for this project. Owner is referred to construction drawing set.
☒	***Operation, Maintenance and Inspection Checklist***	Attached document(s) list the estimated frequencies for maintenance and inspection items anticipated with this development project. The checklist is presented as an estimated frequency for activities. Actual site conditions may require more (or less) frequent assessment and maintenance.
☐	***Manuals and Warranties***	Any documentation or instructions for proprietary products and mechanical components, such as valves, pumps, aerators, etc.
☐	***Bid Specifications***	Detailed bid specifications have not been developed for this project. Owner is referred to construction drawing set.
☐	***Easements***	Owner shall keep a copy of all recorded stormwater related easements with the Maintenance Plan.
☐	***Covenants***	Not Applicable. Owner shall keep a copy of all stormwater related covenants with the Maintenance Plan. Typically developed for projects with Homeowners Associations.
☒	***Maintenance Agreement***	Owner shall keep a copy of the stormwater related Maintenance Agreement with the Maintenance Plan. See attached Agreement between Municipality and Owner regarding upkeep of Stormwater Management Practice.
☒	***Detailed Cost Estimate***	Detailed cost estimates are provided, showing anticipated costs for routine and infrequent maintenance aspects related to the Stormwater management practice.
☒	***Maintenance and Tracking Log***	Owner shall keep copies of all maintenance, inspection and regulatory correspondence related to the stormwater practice. Correspondence and records shall be made available to regulatory agencies upon request.

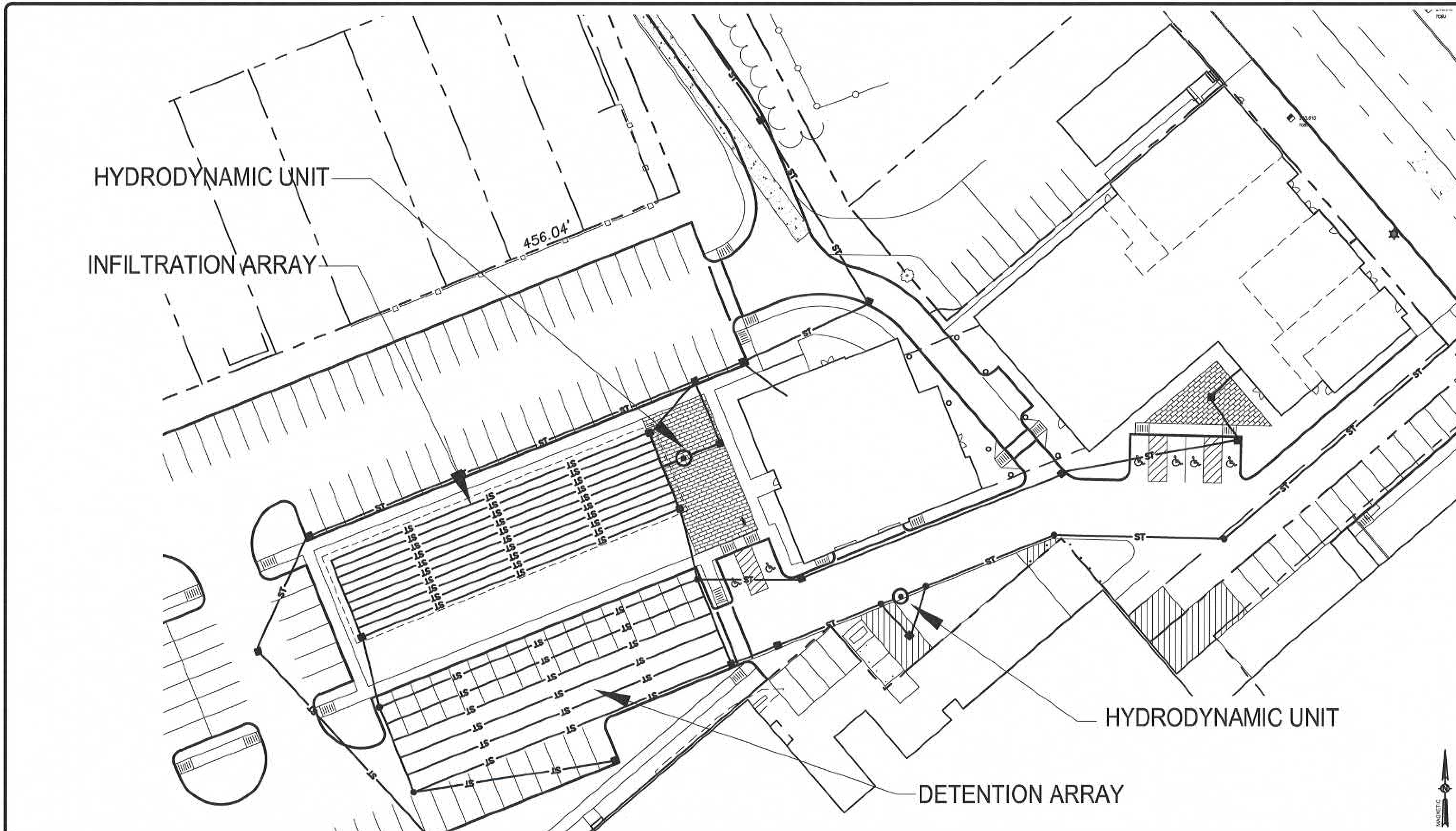
Exhibits

Exhibit E – Post Construction Maintenance Information

.1 Location Map

.2 Maintenance Checklist

.3 Estimated O & M Costs



THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, (I.E.) ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS "A" MISDEMEANOR.

SUBMITTAL / REVISIONS

No.	DATE	DESCRIPTION	BY	REVIEWED BY:	DATE

PROJ. MANAGER:	JWE
CHIEF DESIGNER:	JWE
DESIGNED BY:	JWE
DRAWN BY:	AML
CHECKED BY:	JWE

SEAL

DRAFT

MJ Engineering and Land Surveying, P.C.
1533 Crescent Road - Clifton Park, NY 12065

REGAN DEVELOPMENT

MAINTENANCE MAP

526 CENTRAL AVE
CITY OF ALBANY NY

SCALE: 1"=80'
CONTRACT No.: 972.21
MJ PROJ. No.: 972.21
DATE: 3/3/2018

FIG 1

Infiltration Trench Operation, Maintenance, and Management Inspection Checklist

Project:
Location:
Site Status:

Date:

Time:

Inspector:

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
1. Debris Cleanout (Monthly)		
Trench surface clear of debris		
Inflow pipes clear of debris		
Overflow spillway clear of debris		
Inlet area clear of debris		
2. Sediment Traps or Forebays (Annual)		
Obviously trapping sediment		
Greater than 50% of storage volume remaining		
3. Dewatering (Monthly)		
Trench dewaters between storms		
4. Sediment Cleanout of Trench (Annual)		
No evidence of sedimentation in trench		
Sediment accumulation doesn't yet require cleanout		
5. Inlets (Annual)		

MAINTENANCE ITEM	SATISFACTORY / UNSATISFACTORY	COMMENTS
Good condition		
No evidence of erosion		
6. Outlet/Overflow Spillway (Annual)		
Good condition, no need for repair		
No evidence of erosion		
7. Aggregate Repairs (Annual)		
Surface of aggregate clean		
Top layer of stone does not need replacement		
Trench does not need rehabilitation		

Comments:

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Actions to be Taken:

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CONTECH®
CONSTRUCTION PRODUCTS INC.

CDS® Inspection and Maintenance Guide

CDS TECHNOLOGIES

Maintenance

The CDS system should be inspected at regular intervals and maintained when necessary to ensure optimum performance. The rate at which the system collects pollutants will depend more heavily on site activities than the size of the unit. For example, unstable soils or heavy winter sanding will cause the grit chamber to fill more quickly but regular sweeping of paved surfaces will slow accumulation.

Inspection

Inspection is the key to effective maintenance and is easily performed. Pollutant transport and deposition may vary from year to year and regular inspections will help ensure that the system is cleaned out at the appropriate time. At a minimum, inspections should be performed twice per year (e.g. spring and fall) however more frequent inspections may be necessary in climates where winter sanding operations may lead to rapid accumulations, or in equipment washdown areas. Installations should also be inspected more frequently where excessive amounts of trash are expected.

The visual inspection should ascertain that the system components are in working order and that there are no blockages or obstructions in the inlet and separation screen. The inspection should also quantify the accumulation of hydrocarbons, trash, and sediment in the system. Measuring pollutant accumulation can be done with a calibrated dipstick, tape measure or other measuring instrument. If absorbent material is used for enhanced removal of hydrocarbons, the level of discoloration of the sorbent material should also be identified during inspection. It is useful and often required as part of an operating permit to keep a record of each inspection. A simple form for doing so is provided.

Access to the CDS unit is typically achieved through two manhole access covers. One opening allows for inspection and cleanout of the separation chamber (cylinder and screen) and isolated sump. The other allows for inspection and cleanout of sediment captured and retained outside the screen. For deep units, a single manhole access point would allows both sump cleanout and access outside the screen.

The CDS system should be cleaned when the level of sediment has reached 75% of capacity in the isolated sump or when an appreciable level of hydrocarbons and trash has accumulated. If absorbent material is used, it should be replaced when significant discoloration has occurred. Performance will not be impacted until 100% of the sump capacity is exceeded however it is recommended that the system be cleaned prior to that for easier removal of sediment. The level of sediment is easily determined by measuring from finished grade down to the top of the sediment pile. To avoid underestimating the level of sediment in the chamber, the measuring device must be lowered to the top of the sediment pile carefully. Particles at the top of the pile typically offer less resistance to the end of the rod than consolidated particles toward the bottom of the pile. Once this measurement is recorded, it should be compared to the as-built drawing for the unit to determine weather the height of the sediment pile off the bottom of the sump floor exceeds 75% of the total height of isolated sump.

Cleaning

Cleaning of a CDS systems should be done during dry weather conditions when no flow is entering the system. The use of a vacuum truck is generally the most effective and convenient method of removing pollutants from the system. Simply remove the manhole covers and insert the vacuum hose into the sump. The system should be completely drained down and the sump fully evacuated of sediment. The area outside the screen should also be cleaned out if pollutant build-up exists in this area.

In installations where the risk of petroleum spills is small, liquid contaminants may not accumulate as quickly as sediment. However, the system should be cleaned out immediately in the event of an oil or gasoline spill should be cleaned out immediately. Motor oil and other hydrocarbons that accumulate on a more routine basis should be removed when an appreciable layer has been captured. To remove these pollutants, it may be preferable to use absorbent pads since they are usually less expensive to dispose than the oil/water emulsion that may be created by vacuuming the oily layer. Trash and debris can be netted out to separate it from the other pollutants. The screen should be power washed to ensure it is free of trash and debris.

Manhole covers should be securely seated following cleaning activities to prevent leakage of runoff into the system from above and also to ensure that proper safety precautions have been followed. Confined space entry procedures need to be followed if physical access is required. Disposal of all material removed from the CDS system should be done in accordance with local regulations. In many jurisdictions, disposal of the sediments may be handled in the same manner as the disposal of sediments removed from catch basins or deep sump manholes.

CDS Model	Diameter		Distance from Water Surface to Top of Sediment Pile		Sediment Storage Capacity	
	ft	m	ft	m	yd3	m3
CDS2015-4	4	1.2	3.0	0.9	0.5	0.4
CDS2015	5	1.5	3.0	0.9	1.3	1.0
CDS2020	5	1.5	3.5	1.1	1.3	1.0
CDS2025	5	1.5	4.0	1.2	1.3	1.0
CDS3020	6	1.8	4.0	1.2	2.1	1.6
CDS3030	6	1.8	4.6	1.4	2.1	1.6
CDS3035	6	1.8	5.0	1.5	2.1	1.6
CDS4030	8	2.4	4.6	1.4	5.6	4.3
CDS4040	8	2.4	5.7	1.7	5.6	4.3
CDS4045	8	2.4	6.2	1.9	5.6	4.3

Table 1: CDS Maintenance Indicators and Sediment Storage Capacities

Support

- Drawings and specifications are available at www.contechstormwater.com.
- Site-specific design support is available from our engineers.

CONTECH Construction Products Inc. provides site solutions for the civil engineering industry. CONTECH's portfolio includes bridges, drainage, sanitary sewer, stormwater and earth stabilization products. For information on other CONTECH division offerings, visit contech-cpi.com or call 800.338.1122

The product(s) described may be protected by one or more of the following US patents: 5,322,629; 5,624,576; 5,707,527; 5,759,415; 5,788,848; 5,985,157; 6,027,639; 6,350,374; 6,406,218; 6,641,720; 6,511,595; 6,649,048; 6,991,114; 6,998,038; 7,186,058; 7,296,692; 7,297,266; 7,517,450 related foreign patents or other patents pending.

CONTECH CONSTRUCTION PRODUCTS INC.
800.925.5240
contechstormwater.com

CDS Inspection & Maintenance Log

CDS Model: ______________________ Location: ______________________

Date	Water depth to sediment[1]	Floatable Layer Thickness[2]	Describe Maintenance Performed	Maintenance Personnel	Comments

1. The water depth to sediment is determined by taking two measurements with a stadia rod: one measurement from the manhole opening to the top of the sediment pile and the other from the manhole opening to the water surface. If the difference between these measurements is less than eighteen inches the system should be cleaned out. **Note: To avoid underestimating the volume of sediment in the chamber, the measuring device must be carefully lowered to the top of the sediment pile.**

2. For optimum performance, the system should be cleaned out when the floating hydrocarbon layer accumulates to an appreciable thickness. In the event of an oil spill, the system should be cleaned immediately.

CONTECH®
CONSTRUCTION PRODUCTS INC.

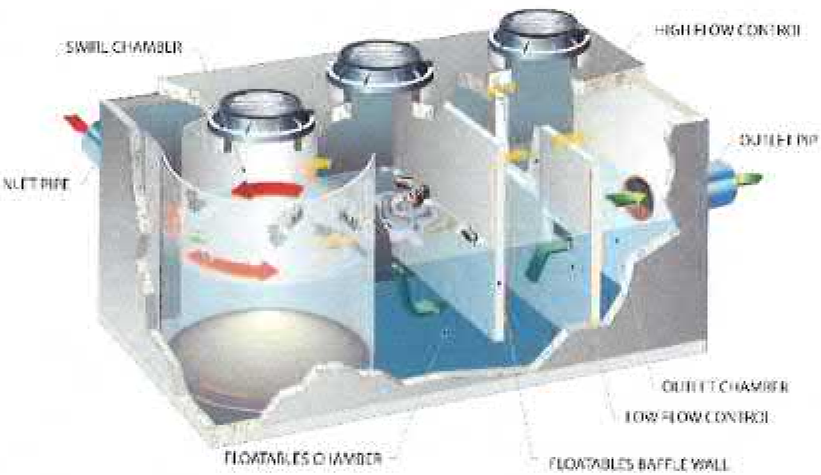
Hydrodynamic Separation Products Overview

CDS Vortechs® VortSentry® VortSentry® HS

Vortechs®

High performance hydrodynamic separation

The Vortechs system is a high-performance hydrodynamic separator that effectively removes finer sediment, oil and grease, and floating and sinking debris. Its swirl concentrator and flow controls work together to minimize turbulence and provide stable storage of captured pollutants. The design also allows for easy inspection and unobstructed maintenance access. With comprehensive lab and field testing, the system delivers proven results and site-specific solutions.



Precast models can treat peak design flows up to 25 cfs; cast-in-place models handle even greater flows. A typical system is sized to provide an 80% load reduction based on laboratory-verified removal efficiencies for varying particle size distributions such as 50-micron sediment particles.

How does it work?

Water enters the swirl chamber at a tangent, inducing a gentle swirling flow pattern and enhancing gravitational separation. Sinking pollutants stay in the swirl chamber while floating pollutants are stopped at the baffle wall. Typically Vortechs systems are sized such that 80% or more of runoff through the system will be controlled exclusively by the low flow control. This orifice effectively reduces inflow velocity and turbulence by inducing a slight backwater appropriate to the site.

During larger storms, the water level rises above the low flow control and begins to flow through the high flow control. The layer of floating pollutants is elevated above the influent pipe, preventing re-entrainment. Swirling action increases in relation to the storm intensity, which helps prevent re-suspension. When the storm drain is flowing at peak capacity, the water surface in the system approaches the top of the high flow control. The Vortechs system will be sized large enough so that previously captured pollutants are retained in the system even during these infrequent events.

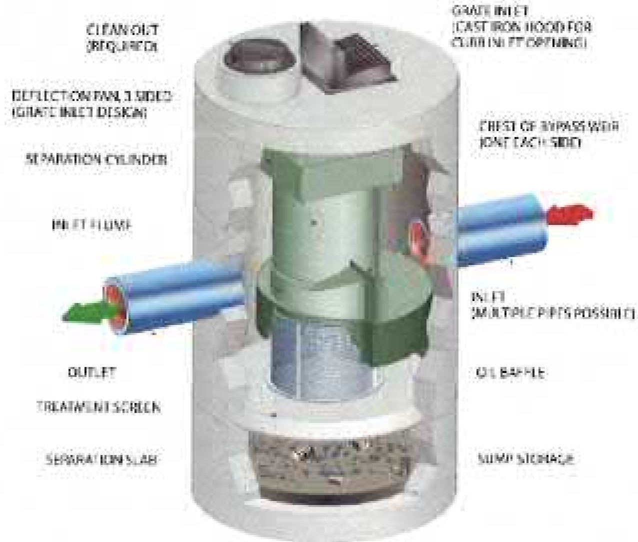
As a storm subsides, treated runoff decants out of the Vortechs system at a controlled rate, restoring the water level to a dry-weather level equal to the invert of the inlet and outlet pipes. The low water level facilitates easier inspection and cleaning, and significantly reduces maintenance costs by reducing pump-out volume.

Vortechs

- Proven performance speeds approval process
- Treats peak flows without bypassing
- Flow controls reduce inflow velocity and increase residence time
- Unobstructed access simplifies maintenance
- Shallow system profile makes installation easier and less expensive
- Very low headloss
- Flexible design fits multiple site constraints

Vortechs®

Patented continuous deflection separation (CDS) technology



Using patented continuous deflective separation technology, the CDS system screens, separates and traps sediment, debris, and oil and grease from stormwater runoff. The indirect screening capability of the system allows for 100% removal of floatables and neutrally buoyant material without blinding. Flow and screening controls physically separate captured solids, and minimize the re-suspension and release of previously trapped pollutants. Available in precast or cast-in-place. Offline units can treat flows from 30 to 8500 L/s (1 to 300 cfs). Inline units can treat up to 170 L/s (7.5 cfs), and internally bypass larger flows in excess of 1420 L/s (50 cfs). The pollutant removal capability of the CDS system has been proven in the lab and field.

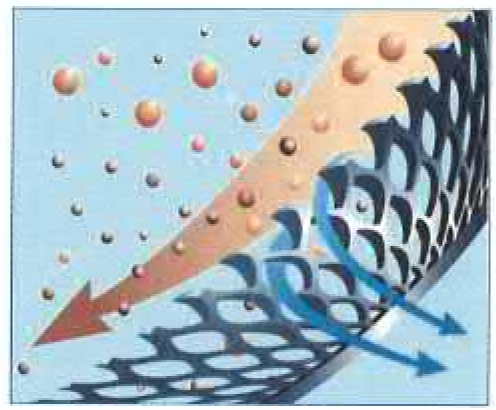
How does it work?

Stormwater enters the CDS unit's diversion chamber where the diversion weir guides the flow into the unit's separation chamber and pollutants are removed. All flows up to the system's treatment design capacity enter the separation chamber.

Swirl concentration and screen deflection forces floatables and solids to the center of the separation chamber where 100% of floatables and neutrally buoyant debris larger than the screen apertures are trapped.

Stormwater then moves through the separation screen, under the oil baffle and exits the system. The separation screen remains clog free due to continuous deflection.

During flow events exceeding the design capacity, the diversion weir bypasses excessive flows around the separation chamber, so captured pollutants will not wash out.



CDS

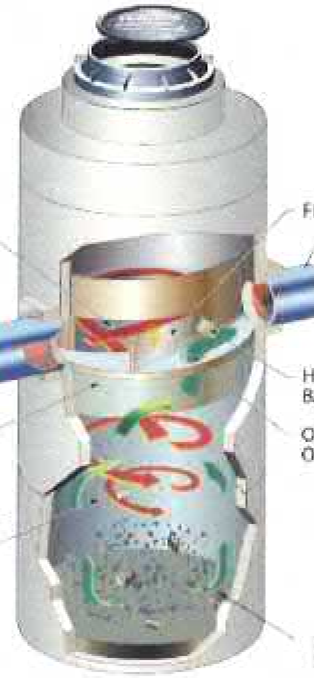
- Removes sediment, trash, and free oil and grease
- Patented screening technology captures and retains 100% of floatables, including neutrally buoyant and all other material larger than the screen aperture
- Operation independent of flow
- Performance verified through lab and field testing
- Unobstructed maintenance access
- Customizable/flexible design and multiple configurations available
- Separates and confines pollutants from outlet flow
- Inline, offline, grate inlet and drop inlet configurations available
- Multiple screen aperture sizes available

VortSentry®

Hydrodynamic separation with internal bypass

The VortSentry is a hydrodynamic separator with a small footprint that makes it an effective treatment option for projects where space is at a premium and effective removal of floating and sinking pollutants is critical. The internal bypass ensures treatment chamber velocities remain low, which improves performance and eliminates the risk of resuspension.

In addition to standalone applications, the VortSentry is an ideal pretreatment device. The system is housed inside a concrete manhole structure for easy installation (often without the use of a crane) and unobstructed maintenance access.



How does it work?

Stormwater runoff enters the unit tangentially to promote a gentle swirling motion in the treatment chamber. As stormwater circles within the chamber, settleable solids fall into the sump and are retained. Buoyant debris and oil and grease rise to the surface and are separated from the water as it flows under the baffle wall. Treated water exits the treatment chamber through a flow control orifice located behind the baffle wall.

During low-flow conditions all runoff is diverted into the treatment chamber by the flow partition. At higher flow rates, a portion of the runoff spills over the flow partition and is diverted around the treatment chamber, filling the head equalization chamber. This collapses the head differential between the treatment chamber and the outlet, resulting in a relatively constant flow rate in the treatment chamber even with a substantial increase in total flow through the system. This further reduces the potential for resuspension or washout of captured pollutants.

VortSentry

- Treatment and internal bypass in one structure
- Compact design ideal for congested sites
- Unobstructed maintenance access
- Round, lightweight construction for easy installation