# REPORT OF A SUBSURFACE EXPLORATION AND GEOTECHNICAL ENGINEERING EVALUATION FOR THE PROPOSED

# STUDENT HOUSING
# ONEONTA, NY

FOR

NEWMAN DEVELOPMENT GROUP, LLC
3101 SHIPPERS ROAD
VESTAL, NY 13850

ATTN: Mr. John Nicolich


March 8, 2013

PREPARED BY
JOHN P. STOPEN ENGINEERING PARTNERSHIP
450 SOUTH SALINA STREET
SYRACUSE, NEW YORK 13201-0029

March 5, 2013
#213025.01

# JOHN P. STOPEN ENGINEERING, LLP

PRINCIPALS: JAMES F. KAPLAN, P.E. / JAMES P. STEWART, Ph.D., P.E. / ROBERT J. COSSELMAN, P.E. / KEVIN P. PLACE, P.E.
ASSOCIATE: CHRISTOPHER H. PITULEJ / CONSULTANTS: JOHN P. STOPEN, P.E. / JOHN SODJA, P.E.


March 5, 2013

Newman Development Group, LLC
3101 Shippers Road
Vestal, NY 13850

ATTN: Mr. John Nicolich

RE: Report of a Subsurface Exploration
and Geotechnical Engineering Evaluation
Proposed Student Housing
Oneonta, NY
#213025.01

Dear Mr. Nicolich:

Our report is attached for the subsurface exploration and geotechnical engineering evaluation for the proposed Oneonta Student Housing.

We based our evaluations on:

1. Keystone Associates Grading Plan dated February 20, 2012.

2. Schematic Design Floor Plans and Elevations received on February 25, 2013 by EYP.

3. Subsurface explorations and field observations as described in this report.

We concluded that the proposed structure may be constructed using conventional foundations and slab-on-grade floor. Using the on-site moisture sensitive soils as structural fill will be subject to several limitations that are described in the report.

Sincerely,

JOHN P. STOPEN ENGINEERING, LLP

CHARLES W. DICKHUT, P.E.
Geotechnical Engineer

JAMES P. STEWART, Ph.D., P.E.
Partner, Geotechnical Engineer

CWD/JPS/jlw
Attachment


450 S. SALINA ST. / SUITE 400 / PO BOX 29 / SYRACUSE, NEW YORK 13201 / TEL: 315 - 472 - 5238 / FAX: 315 - 472 - 8430

## Purpose and Scope

This documents and describes our subsurface explorations for the proposed Oneonta Student Housing. It also includes our geotechnical engineering recommendations for design and construction of the facilities.

## Site Description

The site is northeast of the SUNY Campus in Oneonta, NY, as shown on the attached Air Photo. The 9-acre site is north of the Blodgett Road intersection with Ferone Drive.

As shown on the attached Exploration Plan, the site slopes downward to the southwest. The ground level in the vicinity of the proposed work ranges from Elevation 1610 ft in the north and east, to Elevation 1530 ft in the south. The existing ground slopes between 1V:5H and 1V:12H.

An existing ranch-style home with basement is in the west at the end of Blodgett Road. A multi-family home is northeast of the Blodgett Road intersection with Farone Drive. Unpaved roads continue to the north along the east side of the proposed development, and to the east. The remainder of the site is heavily wooded with mature trees. We noted many siltstone cobbles and boulders exposed at the ground surface.

Existing underground utilities include sewer, water and natural gas to the private homes.

## Project Description

As shown on the Exploration Plan, the proposed building will consist of a 4-story structure with a lower lobby entrance level. The proposed lobby floor level will be Elevation 1568.2 ft, and the main building will have floor level at Elevation 1580 ft. There will be an interior courtyard accessible by a breezeway on the north side.

The proposed main parking area is shown as Area A on the Exploration Plan. Proposed grades in Area A range from Elevation 1572 ft in the south to Elevation 1592 ft in the north. The small parking area and road on the west side, Area B, will have grades ranging between Elevation 1562 ft and Elevation 1572 ft. A road with parking will be constructed in Area C around the south and east side of the building with grades ranging from Elevation 1566 ft to 1580 ft. Near the

southwest building corner (Area D), the end of Blodgett Drive will be reconstructed with grades ranging from Elevation 1540 ft to 1566 ft.

A stormwater detention basin will be constructed east of Blodgett Drive, with bottom at Elevation 1530 ft and crest at Elevation 1544 ft.

We understood that the earthwork for the project will take place during summer 2013. An important aspect of the project will be using on-site soil as structural fill. The summer schedule is intended to provide favorable weather for the earthwork.

We understood the building will be a wood-framed structure with interior and exterior bearing walls. Foundation walls and below grade walls will be constructed of reinforced concrete. Estimated maximum wall loads will be 6 kips per foot, and maximum column loads will be 150 kips. The east side and north side of the lobby area will need to retain one-story of earth pressure.

To achieve the proposed main floor level, grades must be raised as much as 12 ft in the west, and lowered as much as 4 ft in the northeast. Achieving the proposed lobby floor level at Elevation 1568.2 ft will require lowering grade as much as 2 ft.

Area A will require lowering grades as much as 10 ft in the north. The southwest portion of Area A and all of Area B will require between 2 and 4 ft of grade-raise fill. Area D will require raising grades as much as 4 ft. The road in Area C will require lowering grades as much as 12 ft. The existing slopes will be steepened to an inclination of 1V:3H in the east to achieve the proposed pavement levels.

The stormwater detention basin will require raising and lowering grades as much as 10 ft. The proposed outlet will connect to the existing stormwater system at Farone Street with invert about Elevation 1516 ft.

## History, Geology, & Seismicity

We understand that the area was considered previously for development as a subdivision. The unpaved roads were conceived

as streets and were rough graded in the 1960's. The north road was benched into the hillside, and the east road was apparently constructed by pushing soil downhill from above. Portions of the area were reportedly cleared of trees. No development occurred except for construction of the ranch style home and access road.

According to geologic literature, the soils at the site consist of dense glacial till. Bedrock consists of the Devonian-aged Unadilla and Oneonta formations. The depth to bedrock was listed as 3 to 10 ft in the vicinity of this project.

The Otsego County soil survey indicated that the soils are expected to contain at least 15 percent of thin flat rock fragments at least 6 inches long.

According to the 2008 USGS Earthquake Hazard Maps, the design earthquake is characterized by mapped spectral response accelerations of $S_s$=0.150g and $S_1$=0.063g. These values must be adjusted by the Site Class described later in this report, as required by Section 1613 of the NYS Building Code.

Subsurface Explorations and Findings

On January 29 and February 4 we performed a subsurface exploration for the project. It consisted of excavating 16 test pit pits at the locations shown on the attached Exploration Plan. Test pits 5A, 6, 106 and 108 were excavated using a CAT 325C track hoe equipped with 3 ft bucket on February 4; other test pits were excavated with a rubber tired back hoe with 2 ft bucket on January 29.

We located the explorations by measuring from existing features. Keystone Associates later surveyed the locations and determined ground levels.

We removed small trees and brush as required for our work, but we did not disturb the larger trees.

We excavated the test pits designated TP-X at locations directed by Keystone Associates for stormwater design. We excavated Test Pits designated as TP-10X at locations we determined appropriate for the other proposed facilities.

Subsurface conditions were as shown on the attached Test Pit Logs and as summarized on the Soil Profiles. Test pits encountered 6 to 18 inches of topsoil, with average thickness of 12 inches. Test pits encountered up to 2 ft of old fill in TP-1, 103, 105, and 110. The old fill consisted of dense silt with sand and gravel. Below the topsoil and old fill, test pits encountered stiff clayey silt with sand, gravel and cobbles. Below depths of 1 to 3 ft, the material became hard, as evidenced by pocket penetrometer readings above 4.5.

We encountered many cobbles and siltstone boulders up to 3 ft in greatest dimension within the soil. The rubber tired back hoe required digging around the boulders to remove them; the track hoe could dislodge the boulders or break them up sufficiently to remove.

Slight seepage was encountered at 8.5 ft in Test Pit 4. Test Pits 5, 5A, and 6 encountered slight seepage at depths of 14 ft. The soils below 14 ft were damp and caved after about an hour.

Keystone Associates evaluated potential stormwater infiltration in Test Pits 1 and 2. The infiltration rate was slow in the dense clayey silt with sand, gravel and cobbles, so we understood significant infiltration will be impractical.

## Geotechnical Engineering Evaluations

The most significant finding of our explorations is that the natural soils are moisture sensitive. Achieving the proposed grades will require earthwork to be performed during dry weather, which is usually considered May to September in this area. Soils must be protected from precipitation before placement as structural fill, and subgrade must be protected from traffic and water infiltration when exposed. Finished grades should be capped with at least a 12-inch-thick layer of granular material to protect subgrades from damage by construction traffic.

The proposed slope inclinations of 1-vertical to 3-horizontal are suitable for long-term stability. The slopes should be re-vegetated without delay after construction since the fine-grained soils are susceptible to erosion.

Raising grades in the building area with on-site soils will require additional measures compared to working with imported granular soil. In addition to protecting the soil and subgrade from precipitation, the building pad should be constructed as a large fill using heavy equipment and then trimmed to final dimensions. Work will need to be suspended during wet weather, and soils may require moisture conditioning to resume work. Boulders and cobbles that are too thick to be incorporated into the lifts of fill should be culled.

Site Class D should be used for seismic design according to Section 1613 of the NYS Building Code. The site is not susceptible to liquefaction or settlement due to the design earthquake. The soils are not susceptible to significant volume change from wetting or drying.

Conventional shallow foundations may be proportioned for maximum net allowable bearing stress of 4 ksf on native soils or new structural fill. We anticipate footings proportioned for this bearing stress will settle less than 3/4 inch, and maximum differential settlements within 40 ft will be 1/2 inch. We believe these values are acceptable for the proposed structure.

During foundation and utility excavations, boulders and cobbles may be removed that require replacement with structural fill or lean concrete.

Site retaining wall and basement walls should be backfilled with imported, free-draining granular material. Drainage should be provided. The on-site soils are not suitable for use as wall backfill. Occupied below grade areas should be water-proofed.

Flexible pavement should be designed using a CBR=5. Since the subgrade is moisture sensitive, attention should be given to providing subbase drainage. Catch basins should be provided with bleeder pipes.

Concrete slab-on-grade floors and rigid pavement should be designed using a subgrade reaction modulus of 150 pci, provided that a 6-inch-thick subbase layer is used.

Subgrades should be proofrolled before placing subbase, and the subbase layer should be proofrolled prior to pavement construction.

Geotechnical Engineering Recommendations

Based on our evaluations, we recommend constructing the proposed building with conventional foundation and slab-on-grade floor as follows:

A. Site Preparation

1. Remove existing structures.

2. Remove topsoil and vegetation from proposed building and pavement areas and to at least 5 ft beyond.

3. Hold a pre-construction meeting with earthwork contractor superintendent, testing agency field representative, the developer and geotechnical engineer.

4. Excavate to proposed subgrade.

5. Compact exposed subgrade without delay in cut areas and prior to raising grade using at least 2 passes in each of 2 perpendicular directions using a smooth drum vibratory roller weighing at least 10 tons.

   Proofrolling is to have effect of compacting subgrade and exposing unstable areas requiring repair.

6. Repair unstable or uncompactible areas as disclosed by proofrolling and as directed by Engineer's representative by undercutting and replacing with structural fill. Engineer's representative to report verbally to Engineer each day subgrade is prepared.

7. After subgrade approval by Engineer's representative, raise grade using structural fill. Place working surface on approved subgrade in cut areas.

8. Structural fill to consist of on-site soil free of deleterious material and free of particles that cannot be embedded in the lift of structural fill. During wet

weather, structural fill to have less than 5 percent fines.

9. Compact structural fill to at least 93 percent maximum modified Proctor density (ASTM D1557). Engineer's representative to perform density testing at minimum frequency of 1 test per 2,500 sq ft per lift, with minimum 3 tests per lift. Engineer's representative to report daily to the Engineer when structural fill is placed.

10. Working surface to consist of at least 12 inches of moisture insensitive granular material.

B. Foundation Design and Construction

1. Proportion footings for maximum allowable net bearing stress of 4 ksf.

2. Minimum column footing width to be 36 inches; minimum wall footing width to be 24 inches.

3. Footings requiring protection from frost heave to bear at least 48 inches below exterior grade.

4. Hold a preconstruction meeting with footing contractor, developer, excavator, testing agency and our geotechnical engineer prior to foundation excavation.

5. Footing subgrade to be stable, free of loose or disturbed material, and to be approved by the Engineer's representative before constructing footings.

6. If unstable subgrade is encountered at bearing level, undercut subgrade and replace with structural fill or lean concrete.

7. Engineer's representative to report to the Engineer each day that subgrade is prepared for footing construction.

C. Concrete Slab-on-Grade Floor

1. Construct concrete slab-on-grade floor on a subbase course consisting of at least 6 inches of crushed stone or crushed gravel conforming to NYSDOT Specification 304-2.02

Type 2 or 4. Compact subbase to at least 95 percent of the maximum modified Proctor density (ASTM D1557).

2. For floor subgrade that withstands proofrolling before placing subbase, use subgrade coefficient of 150 pci for slab thickness design.

3. Proofrolling to consist of 2 overlapping passes in each of 2 perpendicular directions using a smooth-drum vibratory roller weighing at least 10 tons. Proofroll subbase before constructing floor.

4. Provide a vapor barrier beneath slabs if impermeable floor finishes are used.

5. Engineer's representative to contact Engineer each day floor subgrade and subbase is prepared.

D. Pavement Design and Construction

1. For subgrade that withstands proofrolling, design flexible pavement based on CBR=5. Use subgrade modulus=150 pci for rigid pavement.

2. Before placing pavement subbase, proofroll subgrade in condition of low soil moisture by making at least 2 overlapping passes in each of 2 perpendicular directions using a smooth drum vibratory roller weighing at least 10 tons.

3. Repair unstable areas by undercutting and replacing with structural fill.

4. Pavement subbase to conform to NYSDOT Specification 304-2.02 Type 2 or 4.

5. Compact subbase to at least 95 percent of the maximum modified Proctor density (ASTM D1557).

6. Proofroll subbase prior to constructing pavement.

7. Engineer's representative to contact Engineer each day that pavement subgrade and subbase is prepared.

E. Basement and Retaining Wall Design

1. Walls backfilled with free-draining granular material may be based on:

Unit Weight = 135 pcf
Internal Friction Angle = 35 degrees
$K_o$ = 0.43 (at rest earth pressure)
$K_a$ = 0.35 (active earth pressure)
Appropriate value of surcharge

F. Special Inspections

These Special Geotechnical Inspections should be provided:

1. Subgrade approval by Engineer's representative for footings, floor, and pavement subgrade.

2. Verification of structural fill and backfill material, and documentation of degree of relative compaction.

G. Design Review

We recommend that you retain us to review Contract Documents to confirm that our geotechnical engineering recommendations have been properly implemented and that the understanding of the project that we had at the time of this report was consistent with the final design. In this review, we may find it necessary to modify or refine our recommendations.

* * * * * * *

These attachments complete our report.

Air Photo
Exploration Plan
Soil Profiles
Test Pit Logs

JOHN P. STOPEN
ENGINEERING, LLP

Respectfully submitted,

JOHN P. STOPEN ENGINEERING, LLP

CHARLES W. DICKHUT, P.E.
Geotechnical Engineer

JAMES P. STEWART, Ph.D., P.E.
Partner, Geotechnical Engineer

CWD/JPS/jlw


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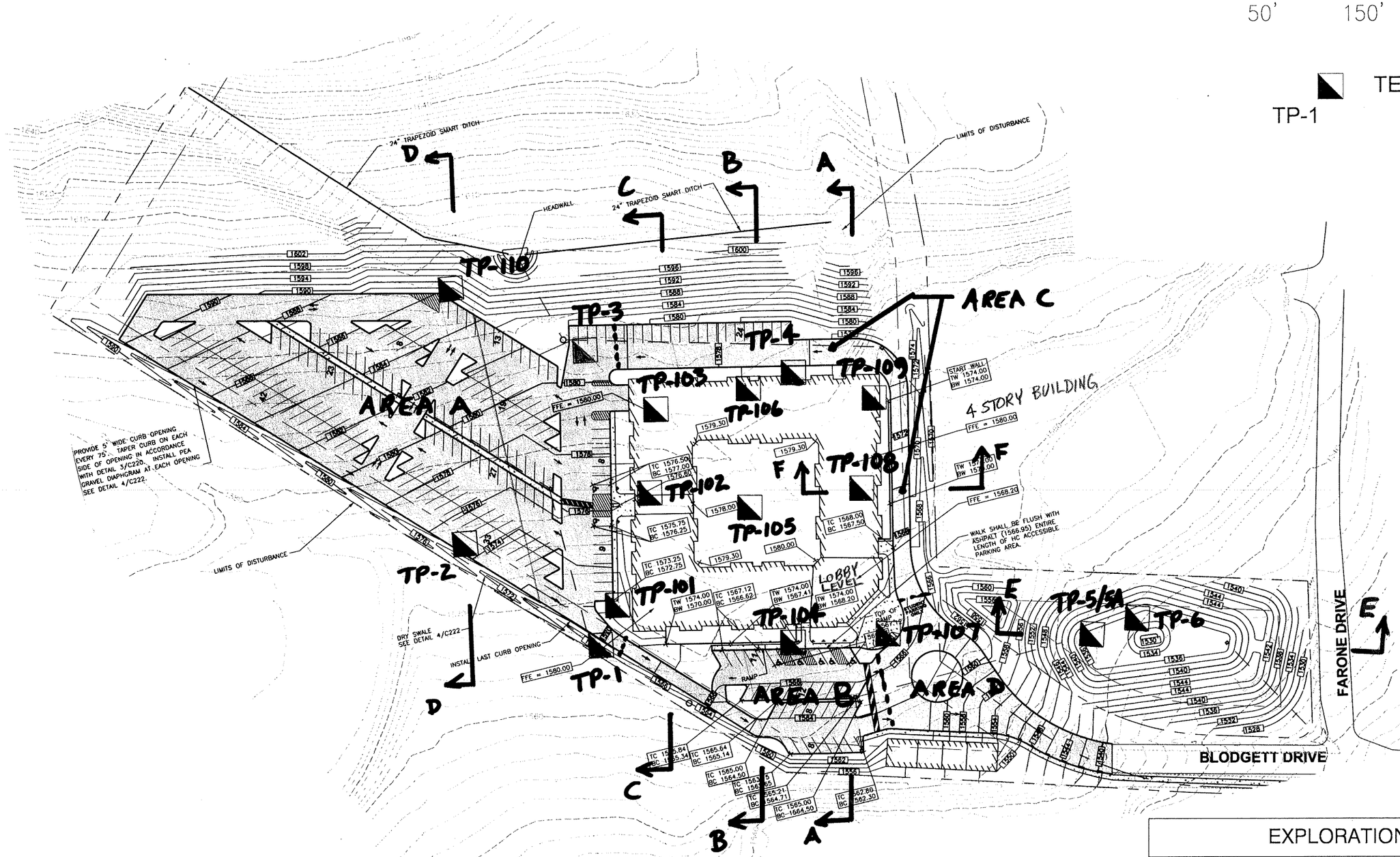
# AIR PHOTO

STUDENT HOUSING
ONEONTA, NY
#213025.01
CWD 3/5/13



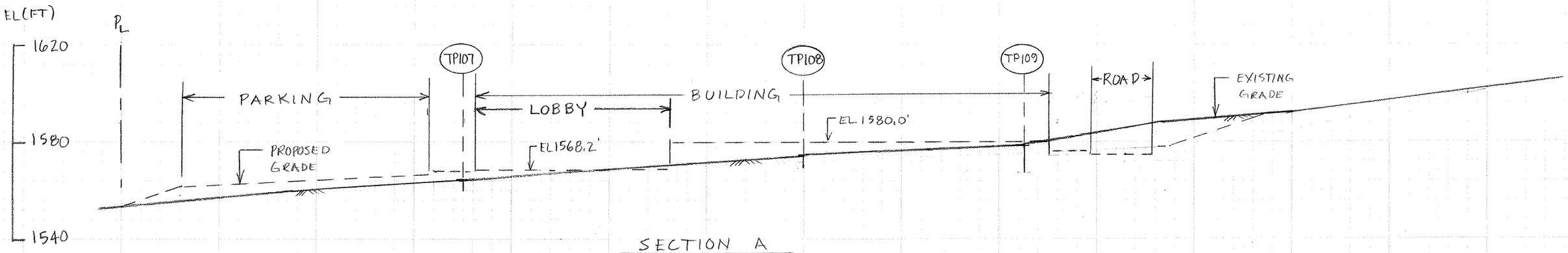

# EXPLORATION PLAN

PROPOSED STUDENT HOUSING
ONEONTA, NY

JOHN P. STOPEN
ENGINEERING PARTNERSHIP
450 SOUTH SALINA ST. P.O. BOX 29
SUITE 400 SYRACUSE, NEW YORK 13201
(315) 472-5238 Fax. (315) 472-8430

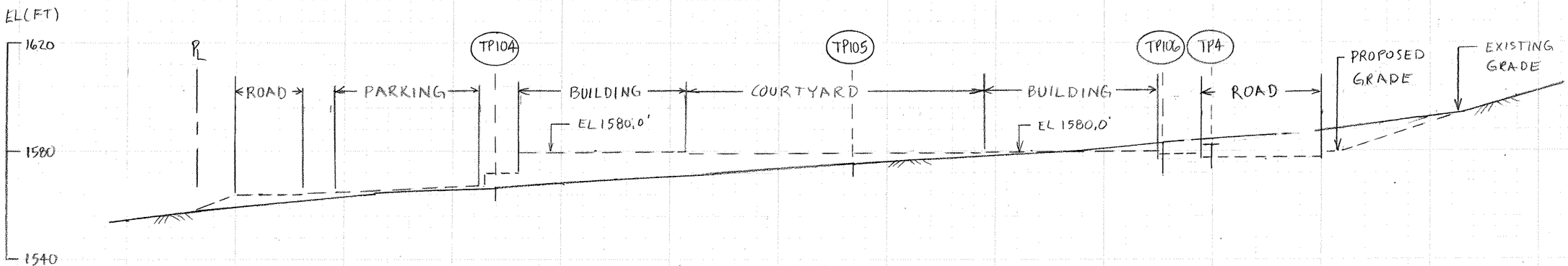
DATE: 2/25/2013
JOB NO.: 213025.01
CHECKED: Wes Dickhut
DRAWN: Wes Dickhut

DRAWING No.
GT-2



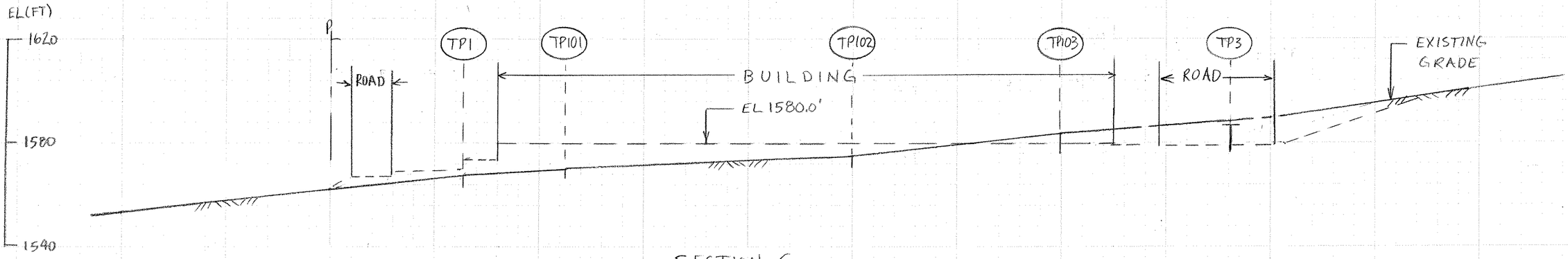

SECTION A

SCALE 1"= 40'




SECTION B

SCALE 1"= 40'

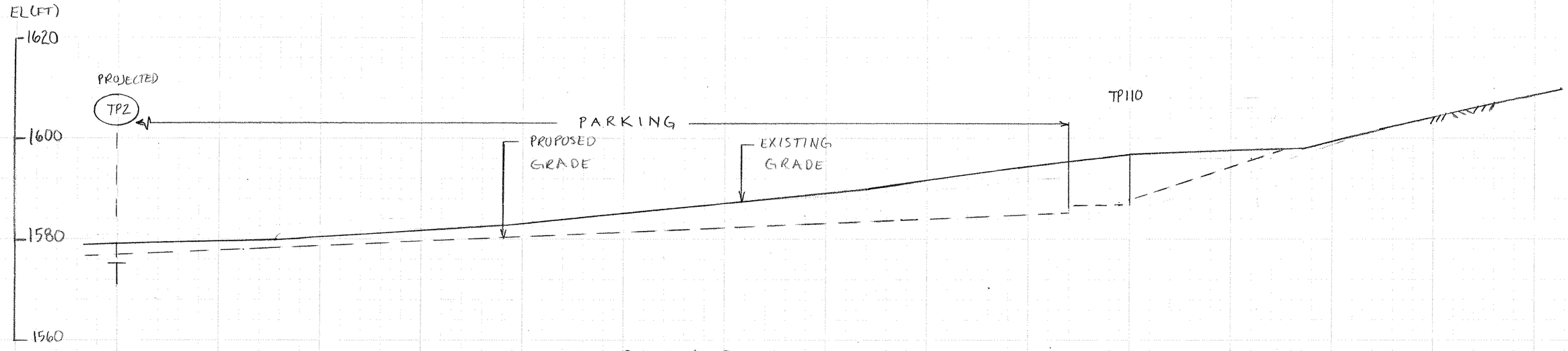



SECTION C

SCALE 1"=40'

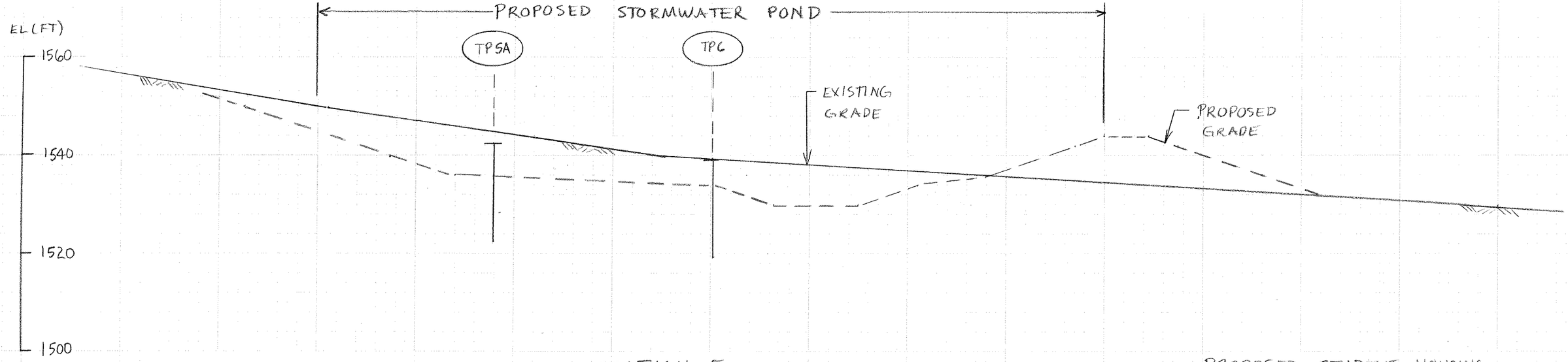
NOTE: SUBSURFACE CONDITIONS HAVE BEEN DETERMINED AT EXPLORATION LOCATIONS ONLY. CONDITIONS BETWEEN THESE LOCATIONS REPRESENT THE ENGINEER'S INTERPRETATION.

PROPOSED STUDENT HOUSING
ONEONTA, NY
#213025.01
CWD 2/25/2013




SECTION D

SCALE 1"=20'

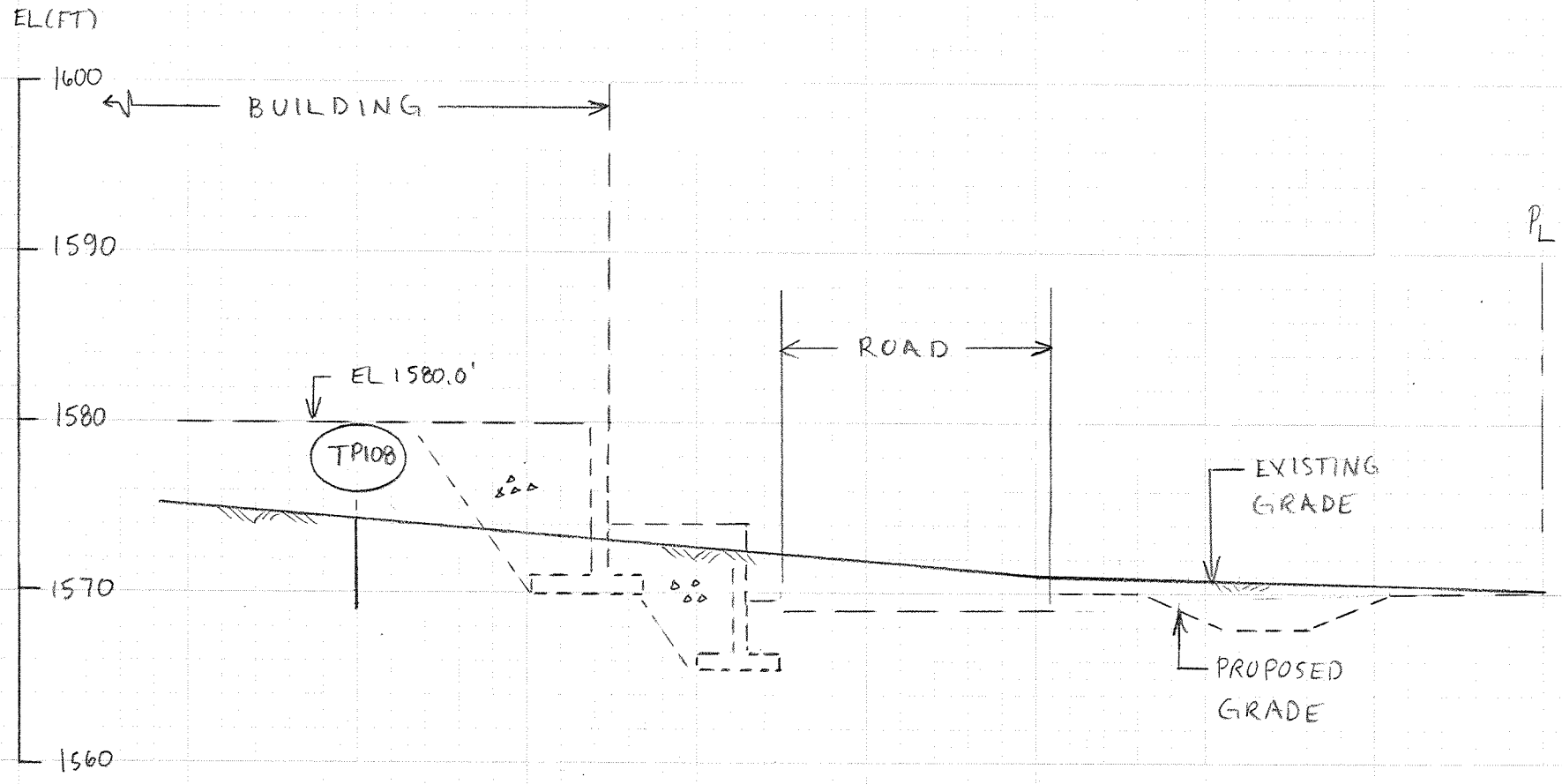



SECTION E

SCALE 1"=20'

NOTE: SUBSURFACE CONDITIONS HAVE BEEN DETERMINED AT EXPLORATION LOCATIONS ONLY. CONDITIONS BETWEEN THESE LOCATIONS REPRESENT THE ENGINEER'S INTERPRETATION.

PROPOSED STUDENT HOUSING
ONEONTA, NY
# 213025.01
CWD 2/21/13




SECTION F

SCALE 1"=10'

NOTE: SUBSURFACE CONDITIONS HAVE BEEN DETERMINED AT EXPLORATION LOCATIONS ONLY. CONDITIONS BETWEEN THESE LOCATIONS REPRESENT THE ENGINEER'S INTERPRETATION.

PROPOSED STUDENT HOUSING
ONEONTA, NY
#213025.01
CWD 2/21/13

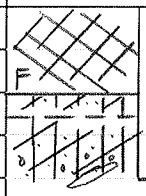
# JOHN P. STOPEN ENGINEERING LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 1 Elevation 1567.3' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | |  FILL: Topsoil – 24" |
| | | | | Brown stiff CLAYEY SILT, little f-c Sand |
| | | | | Brown hard CLAYEY SILT, little f-c Sand, |
| 5' | | | | little f-c Gravel, many siltstone flagstones |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | Test pits excavated with CAT 442 Rubber tired backhoe with |
| | | | | 2' wide bucket |

Test Pit No. 2 Elevation 1574.9' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | |  Topsoil – 3", with roots to 12" |
| | | | | Brown hard CLAYEY SILT, little f-c Sand, |
| | | | | little f-c Gravel, few Cobbles |
| 5' | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |

# JOHN P. STOPEN ENGINEERING LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 3 Elevation 1586.7' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 13" |
| | | 2.5 | | Brown very stiff CLAYEY SILT, little f-c Sand, |
| | | 4.5+ | | little f-c Gravel |
| | | | | Brown hard CLAYEY SILT, little f-c Sand, |
| 5' | | | | little f-c Gravel, few Cobbles |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
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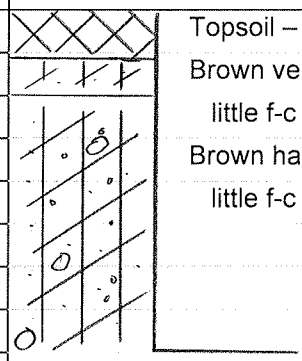
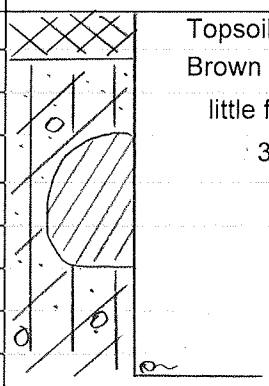


Test Pit No. 4 Elevation 1582.5' Water Slight Seep 8.5'

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 14" |
| | | | | Brown hard CLAYEY SILT, little f-c Sand, |
| | | | | little f-c Gravel, few Cobbles, |
| | | | | 3' dia. Boulder |
| 5' | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |



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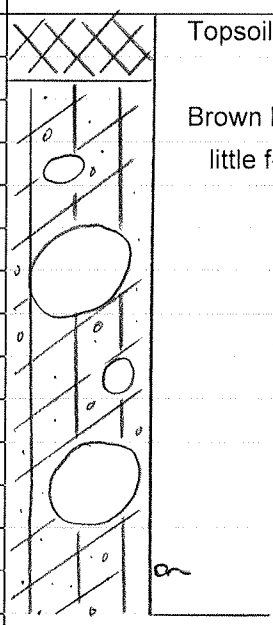
## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 5 Elevation 1542.6' Water Slight Seep 13'

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | Damp | | | Topsoil and Roots – 18" |
| | Moist | | | |
| | Moist | | | Brown hard CLAYEY SILT, little f-c Sand, |
| | Moist | | | little f-c Gravel, few Cobbles and Boulders |
| 5' | Moist | | | |
| | Moist | | | |
| | Moist | | | |
| | Moist | | | |
| | Moist | | | |
| | Moist | | | |
| 10' | Moist | | | |
| | Moist | | | |
| | Damp | | | |
| | Wet | | | |
| | | | | |
| 15' | | | | |
| | | | | |



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## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 101 Elevation 1570.0' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | Damp | | | Topsoil – 18" |
| | Damp | 1.5 | | Stiff brown CLAYEY SILT, little f-c Sand |
| | Moist | 4.5+ | | Hard brown CLAYEY SILT, little f-c Sand, |
| | | | | little f-c Gravel, few Cobbles |
| 5' | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |

Test Pit No. 102 Elevation 1574.8' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | Damp | | | Topsoil – 14" |
| | Damp | 1.75 | | Stiff brown CLAYEY SILT, little f-c Sand, |
| | Moist | 4.5+ | | little f-c Gravel |
| | | | | becomes hard, with Cobbles and 3' dia. |
| 5' | | | | siltstone Boulders |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |

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## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 103 Elevation 1583.0' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Fill: Cobbles, and f-c Sand, little f-c Gravel |
| | | | | Topsoil – 12" |
| | | | | Very stiff to hard brown CLAYEY SILT, |
| 5' | | | | little f-c Sand, little f-c Gravel, |
| | | | | few Cobbles and Boulders |
| 10' | | | | |

Test Pit No. 104 Elevation 1566.9' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 12" |
| | Damp | 1.5 | | Stiff brown CLAYEY SILT, little f-c Sand, |
| | Moist | | | trace f Gravel |
| | Moist | 4.5+ | | Hard brown CLAYEY SILT, little f-c Sand, |
| 5' | | | | little f-c Gravel, few Cobbles |
| 10' | | | | |

# JOHN P. STOPEN ENGINEERING LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 105 Elevation 1575.8' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | Moist | 4.5+ | | Fill: Hard gray CLAYEY SILT, some f-c Sand, |
| | Moist | 4.5+ | | little f-c Gravel |
| | Moist | 4.5+ | | Hard brown CLAYEY SILT, little f-c Sand, |
| | Moist | 4.5+ | | little f-c Gravel, few Cobbles and Boulders |
| 5' | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |

Test Pit No. 107 Elevation 1565.2' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 7" |
| | damp | 1.0 | | Stiff brown CLAYEY SILT, little f-c SAND, |
| | | 4.5+ | | little f Gravel |
| | | | | Hard brown CLAYEY SILT, little f-c SAND, |
| 5' | | | | little f-c Gravel |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |

# JOHN P. STOPEN ENGINEERING LLP

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## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | January 29, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 40° Rain |
| Job No. | 213025.01 | Observer | Wes Dickhut |

Test Pit No. 108 Elevation 1574.3' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 9" |
| | Damp | 1.5 | | Stiff brown CLAYEY SILT, little f-c Sand, little f-c Gravel |
| | Moist | 4.5+ | | Hard brown CLAYEY SILT, little f-c Sand, little f-c Gravel, few Cobbles |
| 5' | | | | |
| 10' | | | | |

Test Pit No. 110 Elevation 1596.7' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | Moist | 4.5+ | | Fill: Hard brown CLAYEY SILT, little f-c Sand, little f-c Gravel |
| | Moist | 4.5+ | | |
| | Moist | 4.5+ | | Hard brown CLAYEY SILT, little f-c Gravel, little f-c Sand, few Cobbles and Boulders |
| | Moist | 4.5+ | | |
| 5' | Moist | 4.5+ | | |
| | Moist | 4.5+ | | |
| | Moist | 4.5+ | | |
| | Moist | 4.5+ | | |
| | Moist | 4.5+ | | |
| 10' | Moist | 4.5+ | | |

# JOHN P. STOPEN ENGINEERING LLP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | February 4, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 20° Sunny |
| Job No. | 213025.01 | Observer | N. McLean |

Test Pit No. 5A Elevation 1542.6' Water *13'-9"

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 12" |
| | damp | | | Stiff brown CLAYEY SILT, trace f Sand, few Boulders |
| 5' | moist | | | |
| 10' | moist | | | Stiff brown CLAYEY SILT, little f Gravel, trace f-c Sand, few Cobble-sized siltstone fragments, few Boulders |
| | moist | | | |
| 15' | | | | Medium-dense gray f GRAVEL, some Clayey Silt, little f-c Sand |
| | moist | | | Medium-dense brown mottled gray f GRAVEL, some Clayey Silt, little f-c Sand |
| 20' | moist | | | |
| | | | | Slight seepage observed at 2 ft and 14 ft |
| | | | | Test pit completed at 12:30 P.M., |
| | | | | Hole caved to 14 ft by 2:10 P.M. |
| 25' | | | | *About 3" of water accumulated on top of collapsed soil at 14' after 1.5 hours |

# JOHN P. STOPEN ENGINEERING PARTNERSHIP

450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | February 4, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 20° Sunny |
| Job No. | 213025.01 | Observer | N. McLean |

Test Pit No. 6 Elevation 1539.4' Water *14'-9"

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 12" |
| | | | | Stiff brown CLAYEY SILT, trace f Sand, few Cobbles and Boulders |
| | damp | | | |
| | | | | |
| 5' | | | | |
| | damp | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | moist | | | Light brown stiff CLAYEY SILT, trace f Sand |
| | | | | |
| | | | | |
| | | | | |
| 15' | moist | | | ▽ Stiff brown mottled gray CLAYEY SILT, some f Gravel, trace f-c Sand, many Cobble-sized siltstone fragments |
| | | | | |
| | | | | |
| | | | | |
| | moist | | | |
| 20' | | | | |
| | | | | |
| | | | | Slight seepage observed at 4 ft, 11 ft, and 13 ft |
| | | | | Test pit completed at 1:18 P.M. |
| | | | | Hole caved to 15 ft by 2:30 P.M. |
| 25' | | | | *About 3" of water accumulated on top of collapsed soil at 15' after 1.25 hours |
| | | | | |

# JOHN P. STOPEN ENGINEERING LLP

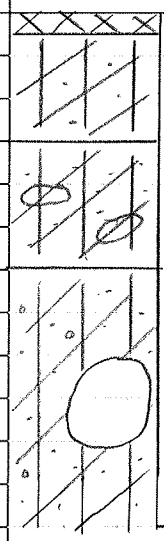
450 South Salina Street P.O. Box 29 Syracuse, NY 13201 (315)472-5238

## TEST PIT LOGS

| | | | |
|---|---|---|---|
| Client | Newman Development | Date | February 4, 2013 |
| Project | Student Housing | Datum | Site |
| Location | Oneonta, NY | Weather | 20° Sunny |
| Job No. | 213025.01 | Observer | Nathan McLean |

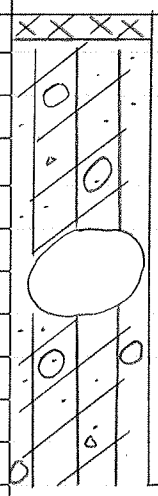
Test Pit No. 106 Elevation 1583.2' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 6" |
| | Damp | 2.5 | | Stiff brown CLAYEY SILT, trace f-c Sand |
| | | | | |
| | Damp | 2.5 | | Very-stiff light brown CLAYEY SILT, little f-c Sand, |
| 5' | | | | frequent Cobble-sized siltstone fragments |
| | | | | |
| | Damp | | | Hard brown CLAYEY SILT, little f-c Gravel, |
| | | | | trace f-c Sand |
| | | | | Boulder at 9' |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |



Test Pit No. 109 Elevation 1578.5' Water None

| depth | moisture | pocket pen | w | Description |
|---|---|---|---|---|
| | | | | Topsoil – 8" |
| | | 2.5 | | Hard brown CLAYEY SILT, little f-c Gravel, |
| | | | | trace f Sand, frequent Cobbles |
| | | | | |
| 5' | | 2.5 | | Boulder at 5' |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| 10' | | | | |
| | | | | |
| | | | | |
| | | | | |



Test pits excavated with CAT 325C excavator with 3' wide bucket