RIVERHEAD WATER DISTRICT
**** ADDENDUM NO. 1 ****
December 5, 2017

PROJECT NO.: RDWD1702

PROJECT NAME: CONSTRUCTION OF PRE-STRESSED GROUND STORAGE TANK AT PLANT NO. 15

BID DATE: THURSDAY, DECEMBER 7, 2017 AT 10:00 A.M. EST *(NO CHANGE)*

Modifications:

1. *Specification Section 004116 – Proposal – Page 004116-3:* Delete verbiage "Two Hundred and Fifty dollars ($250.00) per day" and replace with "Five Hundred dollars ($500.00) per day".
2. *Specification Section 004116 – Proposal – Page 004116-3:* Delete the 6th paragraph beginning with "Each bidder shall submit…" and ending with "…unopened after contract award."
3. *Specification Section 083100 – Access Doors – Page 083100-1:* Delete verbiage "minimum of 625 psf (live load)" and replace with "minimum of 150 psf (live load)".
4. *Specification Section 312316 – Excavation – Page 312316-1:* Delete Section 3.04, Paragraph A. and replace with "The Engineer shall inspect load-bearing excavated surfaces prior to placement of foundation.
5. *Specification Section 331613 – Prestressed Concrete Aboveground Water Utility Storage Tanks - Page 331613-3:* Delete verbiage "Preload Inc., of Hauppauge, New York" and replace with "Preload LLC of Louisville, KY".
6. *Specification Section 331613 – Prestressed Concrete Aboveground Water Utility Storage Tanks - Page 331613-11:* Delete verbiage "at the expense of the contractor"
7. Please review the attached geotechnical report as prepared by Carlin-Simpson Associates. Please note that the geotechnical report provided is offered solely for the purposes of placing bidders in receipt of information available, and in no event, is to be considered a part of the contract documents. The bidder may interpret such data according to his/her own judgement and acknowledges that he/she is not relying upon the same accurately describing the subsurface conditions which may be found to exist. The bidder further acknowledges that he/she assumes all risk contingent upon the nature of the subsurface conditions to be actually encountered by him/her in performing the work of the contract, even though such actual conditions may result in the bidder performing more or less work than he/she originally anticipated.
8. *Drawing T1.*0: Delete verbiage "Stainless steel vandal guard" and replace with "Aluminum vandal guard".
9. *Drawing T2.0: Detail 3 & 6:* Add the following verbiage: "Note 1: The Contractor may substitute a transition coupling for a flexible connection; flexible connection shall be within one pipe diameter of the edge of foundation. Note 2: The Contractor may substitute C.L.D.I. piping in lieu of welded steel piping as long as continuously welded steel waterstop is provided at the floor penetration."
10. *Drawing T2.0: Detail 2, Tank Elevation:* Delete Note No. 2 and replace with the following verbiage: "The piping bury depth shall be consistent with the tank bury depth. The Contractor shall provide 45° elbow fittings to bring the inlet piping to 4 feet below grade and 20 feet beyond the tank foundation. The contractor shall maintain the outlet piping bury depth to maintain full utilization of the ground storage tank."
11. *Drawing T2.*1: All ladders, guards, and handrails shall be of aluminum construction.

Clarifications/Contractor's Inquiries:

1. *General:* The tank foundation will not require a perimeter drain.
2. *General:* There is no penalty if an alternate bid is not submitted. This was put in place to determine if there was a cost saving in constructing a tank different from that shown in the bid documents.
3. *General:* Owner's Protective Liability Insurance is required for this contract. Bidder's risk insurance is not required.

4. *General:* MBE/WBE companies are not required to be used as part of this contract.
5. *General:* There is no buy-American clause in the bid documents. However, pipe fittings must be fabricated in the United States.
6. *General:* This project is tax exempt.
7. *General:* The tank is not required to be designed to resist hydrostatic pressures, the site is located above of the FEMA 500 year flood elevation.
8. *General:* Potable water for construction purposes can be utilized from the hydrant located west of the proposed storage tank.
9. *General:* Regardless of the tank diameter, the Tank Contractor is only responsible for installing 20 feet of yard piping from the edge of the tank foundation.
10. *General:* The Contract T site superintendent is permitted to do the following:
    a. If Contract T is not on site (during sub-contractor work) a site superintendent may be an employee of a sub-contractor on site, subject to approval of the Engineer/Owner.
    b. The site superintendent may change with different constructions phases.
11. *General:* At this time, there are no additional permits that are required for the construction of the tank.
12. *General:* Removal of unsuitable soil material should not be an issue at this site. An additional item is not necessary to be added to the proposal.
13. *General:* The Engineer's estimated cost opinion is $1,785,000.

To verify receipt of this Addendum, the contractor must sign and date this sheet and return immediately via fax or email (preferable). **A copy shall also be included with the bid submission documents.**

To: Jessica Alves, Staff Engineer at H2M
Fax No.: (631) 694-4122
Email: jalves@h2m.com

Name: _____ Signature: _____
(Please Print)

Company: _____ Date: _____

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16 October 2017
REVISED: 2 November 2017

H2M Architects + Engineers
538 Broad Hollow Road
4th Floor East
Melville, New York 11747

Attn: Mr. John R. Collins, P.E. LEED AP
Senior Project Engineer

Re: Report on Subsurface Soil and Foundation Investigation
Proposed Storage Tank
Riverhead Water District
Jamesport, NY (Job # 17-140)

Dear Mr. Collins:

In accordance with our proposal dated 20 June 2017 and your subsequent authorization, we have completed a Subsurface Soil and Foundation Investigation for the referenced sites. The purpose of this study was to determine the nature and engineering properties of the subsurface soil and groundwater conditions for the new construction, to recommend a practical foundation scheme, and to determine the allowable bearing capacity of the site soils.

We understand that the planned construction will consist of a new ground storage tank. We expect that the proposed development will also include new underground utilities. To guide us in our study, you have provided us with a plan that indicates the location of the proposed development.

Our scope of work for this project included the following:

1. Reviewed the proposed construction, the existing site conditions, the expected soil conditions, and planned this study.

2. Retained General Borings Inc. to perform seven (7) test borings at the site.

3. Selected the boring locations in the field, visually identified the soil layers encountered, obtained soil samples, and prepared detailed logs and Boring Location Plans.

4. Performed laboratory soil identification tests on selected representative soil samples.

5. Analyzed the field and laboratory test data and prepared this report containing the results of this study.

SITE DESCRIPTION

The project site is located at Riverhead Water District – Plant No. 15 at 308 Tuthills Lane in Jamesport, New York. The site is currently occupied by a well pump site. The majority of the site is occupied by grass landscape areas. Site grades are relatively flat and elevations vary from approximately elevations +45.0 to +40.0.

SUBSURFACE CONDITIONS

To determine the subsurface soil and groundwater conditions, seven (7) test borings were completed at the site. The borings were performed at the locations shown on the enclosed Boring Location Plan. Detailed logs have been prepared and are included in this report. Our field engineer visually identified all of the soil samples obtained during the boring operations and selected samples were tested in our laboratory.

Soil

The soil descriptions shown on the boring logs are based on the Burmister Classification System. In the Burmister Classification System, the soil is divided into three components: Sand (S), Silt ($) and Gravel (G). The major component is indicated in all capital letters, the lesser in lower case letters. The following modifiers indicate the quantity of each lesser component:

Modifier	Quantity
trace (t)	0 - 10%
little (l)	10% - 20%
some (s)	20% - 35%
and (a)	35% - 50%

The subsurface soil conditions encountered in the borings at may be summarized as follows:

Stratum 1 Topsoil — The surface layer in each of the borings consists of topsoil that ranges from approximately 4 to 6 inches in thickness.

Stratum 2 Sandy Topsoil with organics [OL] — Underlying the surface topsoil in borings SB-1 through SB-6 is a layer of Sandy Topsoil with leaves, roots, and other organics. This layer extends to depths ranging from 2’0” to 4’0” below the existing ground surface.

Stratum 3 Sand or Gravelly Sand [SP]

Below the topsoil layers is medium dense brown, light brown, orange, white coarse to fine SAND, trace Silt, trace (to and) coarse to fine Gravel. Each boring was terminated in this stratum at depths ranging from 32'0" to 62'0" below the existing ground surface.

Additional Subsurface Conditions

Expansive soils were not encountered during this study. In addition, the boring observations as well as the geology of the area do not indicate any potential for sink holes or collapsible soils.

Groundwater

During this investigation, groundwater was not encountered in any of the borings to depths ranging from 32'0" to 62'0" and below the existing ground surface. Based on the boring observations and planned construction, groundwater is not expected to be encountered during construction. Variations in the location of the long-term water table may occur as a result of changes in precipitation, evaporation, surface water runoff, and other factors not immediately apparent at the time of this exploration.

EVALUATION

We understand that the planned construction will consist of a new ground storage tank at the site. The tank will extend approximately 6 feet below the existing ground surface. We expect that site development will also include new underground utilities.

At the time this report was prepared, the site plans had not been finalized. The following evaluation is based on information that has been provided to our office as of the date of this report. Once the planned construction has been further developed, a copy of the site grading plan should be forwarded to our office so that we can review it along with the recommendations in this report. At that time, any changes or additional recommendations can be provided, if required.

The soils encountered at the site generally consist of a layer of Sandy Topsoil with organics (Stratum 2) followed by a medium dense Sand or Gravelly Sand (Stratum 3). Groundwater was not encountered to depths ranging from 32'0" to 62'0" below the existing ground surface. A summary of the boring observations is provided in Table 1, below.

Table 1 - Summary of Boring Observations

Boring No.	Existing Ground Surface Elevation	Observed Depth to Groundwater	Depth to Bottom of Sandy Topsoil with Organics
SB-1	+42.6	NE to 62'0"	3'0" (+39.6)
SB-2	+43.0	NE to 32'0"	2'0" (+41.0)
SB-3	+43.0	NE to 32'0"	3'0" (+40.0)
SB-4	+42.5	NE to 32'0"	4'0" (+38.5)

Boring No.	Existing Ground Surface Elevation	Observed Depth to Groundwater	Depth to Bottom of Sandy Topsoil with Organics
SB-5	+42.6	NE to 32'0"	3'0" (+39.6)
SB-6	+44.4	NE to 32'0"	3'0" (+41.4)
SB-7	+43.1	NE to 32'0"	NE

NE - Not encountered

Implications of Sandy Topsoil and Organics

The boring data indicates that Sandy Topsoil with organics (Stratum 2) is present in portions of the site, extending to depths of approximately 2'0" to 4'0" below the existing ground surface. The depth of the Sandy Topsoil with organics is expected to be variable and may be deeper in unexplored areas of the site. The proposed ground storage tank will extend to approximately 6 feet below the existing ground surface, as a result we expect that the majority of the Sandy Topsoil and Organics will be removed from the tank area during excavation to the planned subgrade elevation.

The Sandy Topsoil and organics is not an acceptable bearing material for the new tank foundations or floor slab. The topsoil creates the possibility of intolerable differential settlements under loading. To eliminate the potential for damaging differential settlements, we recommend that the Sandy Topsoil and organics be completely removed from the new tank and structure areas down to virgin soil and replaced with engineer approved compacted fill.

Provided that the Sandy Topsoil and organics (Stratum 2) and any other unsuitable materials encountered during construction are removed, it is our opinion that the new structural fill and virgin soils can adequately support the new structure foundations and floor slab.

Preparation of New Structure Area and Removal of Existing Fill

All surface materials, such as topsoil, concrete, or asphalt, shall be removed from the planned structure areas. The boring data indicates that Sandy Topsoil with organics (Stratum 2) is present throughout the site. Where encountered in the test borings, the Sandy Topsoil with organics extends to depths ranging from 2'0" to 4'0" below the existing ground surface. However, the Sandy Topsoil with organics is expected to vary in thickness and may extend deeper in the unexplored areas of the site. As discussed above, the Sandy Topsoil with organics is not a suitable bearing material for the new structure foundations or floor slabs. The Sandy Topsoil with organics shall be completely removed from the proposed structure areas and replaced with new compacted fill.

We recommend that a series of supplemental test pits be performed at the time of construction to further evaluate the Sandy Topsoil with organics conditions in and around the planned structure areas. The test pits should be conducted under the full time observation of a Carlin-Simpson & Associates representative. These test pits will allow us to determine the horizontal and vertical limits of the unsuitable material within the proposed structure areas.

After the surface materials are removed, the Sandy Topsoil with organics shall be excavated from the limits of the new structure areas. The removal of the Sandy Topsoil from the proposed structure areas shall extend through the existing fill, down to the virgin soil. At the bottom of the excavation, the removal of the unsuitable material shall extend horizontally beyond the structure limits a minimum distance of five (5) feet.

The removal of the Sandy Topsoil with organics from the proposed structure areas shall be performed under the full time inspection of Carlin-Simpson & Associates or a qualified geotechnical engineer. The on-site representative from Carlin-Simpson & Associates or a qualified geotechnical engineer shall direct the Contractor during this operation to ensure that all of the unsuitable material has been removed from the proposed structure areas.

During the removal of the unsuitable material from the structure areas, the Contractor should segregate the potentially re-usable material from the non-reusable fill (i.e. debris and topsoil). The on-site representative from Carlin-Simpson & Associates or a qualified geotechnical engineer shall evaluate the suitability of the excavated materials for use as compacted fill during the excavation and prior to its re-use. Potentially usable fill should be stockpiled and covered with tarps or plastic sheeting for protection from excess moisture. Any fill material that is or becomes wet must be dried prior to its re-use.

After the surface materials and Sandy Topsoil have been removed and prior to the placement of new structural fill, the exposed subgrade must be graded level and proofrolled by several passes of a vibratory drum roller. The proofrolling operation is necessary to densify the underlying soils. Carlin-Simpson & Associates shall be retained to observe the proofrolling of the subgrade. If any soft or otherwise unsuitable soils are noted, the unsuitable material shall be removed and replaced with new structural fill. Carlin-Simpson & Associates shall be responsible for determining what material, if any, is to be removed and will direct the Contractor during this operation.

New structural fill required to achieve final grades shall consist of either suitable on-site soil or imported sand and gravel. Imported fill shall contain less than 20% by weight passing a No. 200 sieve. The structural fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 95% of its Maximum Modified Dry Density (ASTM D1557). Each layer must be compacted, tested, and approved prior to placing subsequent layers. The suitability of the excavated soil for reuse as structural fill is discussed in a following section of this report. Imported structural fill shall meet the following specified gradation:

US Standard Sieve Size	Percent Finer By Weight
3 inch	100
No. 4	30-80
No. 40	10-50
No. 200	0-20

After the installation of compacted fill has been completed to the required subgrade elevation, the virgin soil and new compacted fill may be used to support the proposed structure foundations and floor slab.

New Structure Foundations

Provided that the structure subgrade has been prepared as outlined above, the new tamk foundations may be designed as shallow spread footings utilizing a net design bearing pressure of 4,000 psf (2.0 TSF). All foundations shall bear directly on the virgin soil or engineer approved new compacted fill. The excavations for the new foundations shall be performed under the full time inspection of Carlin-Simpson & Associates or a qualified geotechnical engineering firm. The on-site representative shall confirm that the foundation bearing material is capable of supporting the design bearing pressure.

Prior to the placement of formwork, reinforcement steel, and concrete, the bearing subgrade shall be cleaned of all loose soil and compacted with several passes of a small vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or "jumping jack" style tamper (i.e. Wacker Model BS 600). This must be performed under the observation of Carlin-Simpson & Associates or a qualified geotechnical engineer. If instability is observed during the compaction of the bearing subgrade, the soft soil shall be removed and replaced with new compacted fill.

All exterior footings shall bear at least 36 inches below the finished outside grade for protection from frost. Interior column footings may bear on the virgin soil or new structural fill just below the floor slabs provided the structure is heated during winter. The wall footings shall have a minimum width of 18 inches and column footings, if required, shall have a minimum dimension of 30 inches.

Ground Storage Tank Walls

Where tank walls extend below the ground surface, the soil adjacent to the walls will exert a horizontal pressure against the wall. A summary of the soil parameters for horizontal pressures can be found below.

Table 2 – Soil Parameters for Wall Design

Soil Type	Unit Weight (pcf)	Internal Angle of Friction (phi)	Coefficient of Active Earth Pressure (K_a)	Active Equivalent Fluid Pressure (psf/ft)	Coefficient of Earth Pressure at Rest (K_o)	At Rest Equivalent Fluid Pressure (psf/ft)
Sandy Topsoil (OL)	To be removed from tank area.					
Sand or Gravelly Sand (SP)	135	30	0.33	45	0.50	65
Compacted Backfill	135	30	0.33	45	0.50	65

For sliding, the coefficient of friction between concrete and the virgin site soils or new structural fill is 0.45. The vertical shear coefficient (K_v, downdrag coefficient) for the new backfill is 0.10.

Where tank walls are buried, we recommend that a footing drain be placed around the exterior of the new structure to prevent water from accumulating against the foundation wall. This drain may consist of a minimum four (4) inch diameter, rigid wall perforated PVC pipe surrounded by at least 12 inches of 3/4-inch clean crushed stone. The stone shall be wrapped in a geotextile fabric, such as Mirafi 140N or equivalent. The foundation drainpipe should be extended to daylight or to the stormwater collection system. The outside face of the foundation wall, where it extends below grade, must be damp proofed or waterproofed.

Outside the structure, the backfill placed adjacent to the foundation walls and above the footing drain shall consist of either clean crushed stone or an imported sand and gravel mixture containing less than 20% by weight passing a No. 200 sieve and placed in layers not exceeding one (1) foot in thickness. This clean sand and gravel or crushed stone backfill shall extend a minimum of one (1) foot horizontally from the back face of the foundation walls, and shall extend vertically up the wall face to two (2) feet below the finished ground surface elevation. Where retained soils are not covered by concrete or pavement and are exposed to weather, the top two (2) feet of backfill should consist of low permeable soil. This will help to minimize water infiltration behind the wall. Surface grades should be sloped away from the tank to prevent water from accumulating adjacent to the wall.

Beyond this point, the walls should be backfilled with suitable soil placed in layers up to one (1) foot in thickness. The suitability of the on-site soil for reuse as compacted fill is discussed in a separate section below. The new fill should be compacted with a vibratory drum trench compactor (i.e. Wacker Model RT560), a heavy vibratory plate tamper (i.e. Wacker BPU 3545A or equivalent), or “jumping jack” style tamper (i.e. Wacker Model BS 600) to at least 92% of its Maximum Modified Dry Density (ASTM D-1557). Heavy equipment should not be operated near the tank walls as damage to the walls could occur.

New Slabs

After the footings and foundation walls are installed, fill will be required to backfill the excavations and to raise grades in the tank area to the slab subgrade elevations. New fill for the floor slabs shall consist of either suitable on-site soil or imported sand and gravel. Imported sand and gravel shall contain less than 20% by weight passing a No. 200 sieve. The fill shall be placed in layers not exceeding one (1) foot in loose thickness and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D-1557). Fill layers shall be compacted, tested, and approved before placing subsequent layers.

The structure slabs may be designed as a slab on grade bearing on densified virgin soil or new engineer approved compacted fill. We recommend a Modulus of Subgrade Reaction (k) of 200 pounds per cubic inch (pci) be used for design. We recommend a minimum of six (6) inch layer of 3/4-inch crushed stone beneath the floor slab for

additional support and drainage. Floor slabs should be designed with reinforcement steel as required for the anticipated loading.

Settlement

Settlement of individual footings, designed in accordance with recommendations presented in this report, is expected to be within tolerable limits for the proposed structures. For footings placed on the virgin soils or new structural fill approved by a qualified geotechnical engineering firm and constructed in accordance with the requirements outlined in this report, the maximum total settlement is expected to be on the order of one (1) inch or less. Maximum differential settlement between adjacent columns or load bearing walls is expected to be half the total settlement.

The above settlement values are based on our engineering experience with similar soil conditions and the anticipated structural loading, and are to guide the Structural Engineer with his design. To minimize difficulties during the foundation installation phase, it is critical that the services of a qualified geotechnical engineering firm be retained to observe the foundation bearing surfaces and to confirm the recommended bearing pressures and that unsuitable material, if encountered during construction, has been removed from the proposed addition areas.

Seismic Design Considerations

From the site-specific test boring data, the Seismic Site Class was determined using the International Building Code – New York State Edition and Table 20.3-1 of ASCE 7-10. The site-specific data used to determine the Site Class typically includes soil test borings to determine Standard Penetration resistances (N-values) in the upper 100 feet of soil profile. Based on estimated average N-values in the upper 100 feet of soil profile, the site can be classified as Site Class D – Stiff Soil Profile.

New structures should be designed to resist stress produced by lateral forces computed in accordance with Section 1613 of the International Building Code – New York State Edition. The values in Table 3 shall be used for this project.

Table 3 – Seismic Design Values

Mapped Spectral Response Acceleration for Short Periods, [Fig 22-1]	S_S=0.0154g
Mapped Spectral Response Acceleration at 1-Second Period, [Fig 22-2]	S_1=0.056g
Site Coefficient [Table 11.4-1]	F_a=1.6
Site Coefficient [Table 11.4-2]	F_v=2.4
Max Considered Earthquake Spectral Response for Short Periods [Eq 11.4-1]	S_{MS}=0.246g
Max Considered Earthquake Spectral Response at 1-Second Period [Eq 11.4-2]	S_{M1}=0.134g
Design Spectral Response Acceleration for Short Periods [Eq 11.4-3]	S_{DS}=0.164g
Design Spectral Response Acceleration for 1-Second Period [Eq 11.4-4]	S_{D1}=0.090g

Utilities

New utilities shall not bear in the Sandy Topsoil with organics (Stratum 2). The new utilities shall bear in the densified Sand or Gravelly Sand (Stratum 3) or new compacted fill. The bottom of all trenches should be excavated clean and shaped so a hard bottom is provided for the pipe support. If any soft or unsuitable soil conditions are encountered during construction, the unsuitable materials must be removed and replaced with new compacted fill.

After the utility is installed, the trench must be backfilled with compacted fill. The fill shall consist of suitable on-site soil or imported sand and gravel. Imported sand and gravel shall contain less than 20% by weight passing a No. 200 sieve. Controlled compacted fill shall be placed in six (6) inch layers and each layer shall be compacted to at least 92% of its Maximum Modified Dry Density (ASTM D-1557). The backfill must be free of topsoil and debris.

Temporary Construction Excavations

Temporary construction excavations shall be conducted in accordance with the most recent OSHA guidelines or applicable federal, state, or local codes. In our opinion, the on-site soils would be considered either a Type "B" or Type "C" soil as defined by OSHA regulations. A qualified person should evaluate the excavations at the time of construction to determine the appropriate soil type and allowable slope configuration.

Temporary support (i.e. trench boxes, sheeting and shoring, etc.) should be used for any excavation that cannot be benched or sloped in accordance with the applicable regulations, where necessary to protect adjacent utilities and structures, and where water seepage or saturated soils are encountered within the excavation. In the event that water is encountered within the excavation, an evaluation of the excavation's stability must be performed. Perched water or groundwater encountered within the excavation will destabilize the sides of the excavation. Temporary support will be required to stabilize the excavation. Dewatering of the excavation will also be required.

Suitability of the On-Site Soils for Use as Compacted Fill

Topsoil (Strata 1 and 2) is not suitable for use as structural compacted fill.

The virgin soils (Stratum 3) that will be excavated during construction generally consist of Sand or Gravelly Sand. The virgin soils that may be excavated during construction are generally suitable for use as new compacted fill throughout the site or as structural fill in the structure areas provided that they remain relatively dry enough to be properly compacted.

Proper moisture conditioning of the soil will be required. In the event that the on-site material is too wet at the time of placement and cannot be adequately compacted, the soil should be aerated and allowed to dry or the material removed and a drier suitable fill material used. In the event that the on-site material is too dry at the time of placement and

cannot be adequately compacted, water may be needed to increase the soil moisture content for proper compaction.

The in-situ soils that exist throughout the site will become soft and unstable if exposed to excessive construction traffic and moisture. The instability will occur quickly when exposed to these elements and it will be difficult to stabilize the subgrade. We recommend that adequate site drainage be implemented early in the construction schedule and if the subgrade becomes wet, the contractor should limit construction activity until the soil has dried.

GENERAL

The findings, conclusions and recommendations presented in this report represent our professional opinions concerning subsurface conditions at the site. The opinions presented are relative to the dates of our site work and should not be relied on to represent conditions at later dates or at locations not explored. The opinions included herein are based on information provided to us, the data obtained at specific locations during the study and our past experience. If additional information becomes available that might impact our geotechnical opinions, it will be necessary for Carlin-Simpson & Associates to review the information, reassess the potential concerns, and re-evaluate our conclusions and recommendations.

Regardless of the thoroughness of a geotechnical exploration, there is the possibility that conditions between borings will differ from those encountered at specific boring locations, that conditions are not as anticipated by the designers and/or the contractors, or that either natural events or the construction process have altered the subsurface conditions. These variations are an inherent risk associated with subsurface conditions in this region and the approximate methods used to obtain the data. These variations may not be apparent until construction.

The professional opinions presented in this geotechnical report are not final. Field observations and foundation installation monitoring by a qualified geotechnical engineer, as well as soil density testing and other quality assurance functions associated with site earthwork and foundation construction, are an extension of this report. Therefore, either Carlin-Simpson & Associates or a qualified geotechnical engineering firm should be retained by the owner to observe all earthwork and foundation construction, to document that the conditions anticipated in this study actually exist, and to finalize or amend our conclusions and recommendations. Carlin-Simpson & Associates is not responsible or liable for the conclusions and recommendations presented in this report if Carlin-Simpson & Associates does not perform these observation and testing services.

In order to preserve continuity in this project, the owner shall retain the services of Carlin-Simpson & Associates to provide full time geotechnical related monitoring and testing during construction. This shall include, but not be limited to, the observation and testing of the following: 1) the excavation and removal of unsuitable soil from the new structure areas, where required; 2) the proofrolling of the subgrade soil prior to placement of new structural fill; 3) the placement and compaction of new structural fill; 4) the

excavations for the new structure foundations; and 5) the preparation of the subgrade for the floor slabs.

This report has been prepared in accordance with generally accepted geotechnical engineering practice. No other warranty is expressed or implied. The evaluations and recommendations presented in this report are based on the available project information, as well as on the results of the exploration. Carlin-Simpson & Associates should be given the opportunity to review the final drawings and site plans for this project to determine if changes to the recommendations outlined in this report are needed. Should the nature of the project change, these recommendations should be re-evaluated.

This report is provided for the exclusive use of H2M Architects + Engineers and the project specific design team and may not be used or relied upon in connection with other projects or by other third parties. Carlin-Simpson & Associates disclaims liability for any such third party use or reliance without express written permission. Use of this report or the findings, conclusions or recommendations by others will be at the sole risk of the user. Carlin-Simpson & Associates is not responsible or liable for the interpretation by others of the data in this report, nor their conclusions, recommendations or opinions.

If the conditions encountered during construction vary significantly from those stated in this report, this office should be notified immediately so that additional recommendations can be made.

Thank you for allowing us to assist you with this project. Should you have any questions or comments, please contact this office.

Very truly yours,

CARLIN-SIMPSON & ASSOCIATES

Stephen Rossi

STEPHEN ROSSI, E.I.T.
Project Manager

Robert Simpson

ROBERT B. SIMPSON, P.E.

File: 17-140