CVS/pharmacy # 00329
91 Auburn Street
Portland, ME

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11/10/09

BKA Reference No.209017

August 26, 2009

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SUBSTITUTION REQUEST FORM

Date: _____

To: Architect/Engineer	Project Name:
Attention:	Project No.:
Address:	

We submit for your consideration the following product as a Substitution for the specified product:

Section No. _____ Paragraph _____ Specified Product _____

Proposed Substitution: _____

Reason for Substitution: _____

Cost savings to be realized by Owner, if proposed Substitution is accepted:

☐ No Change ☐ Deduct _____ Days ☐ Other _____

Product Data: Attach complete technical data for the proposed Substitution. Include information on changes to Contract Documents, which proposed Substitution will require for its proper installation.

Samples: ☐ Attached ☐ Will be furnished upon request

Does the Substitution affect dimensions shown on Drawings? ☐ No ☐ Yes (explain)

_____

Affects of proposed Substitution on other Work:

_____

Differences between proposed Substitution and specified Product:

Manufacturers' warranties on the proposed Substitution and specified Products are:

☐ Same ☐ Different (explain)

Maintenance service and spare parts are available for proposed Substitution from:

Submittal constitutes a representation the Contractor has read and agrees to the provisions of Section 01600.

Submittal by Contractor:

Signature

Firm

For Use by Architect/Engineer:

Based on the information supplied by the Contractor, the Architect/Engineer has reviewed the proposed Substitution on the basis of design concept of the Work and conformance with information given in Contract Documents.

☐ Accepted ☐ Accepted as Noted ☐ Rejected

☐ Submit Additional Information:

By: Date:

Comments:

DIVISION 0

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RANSOM
Environmental
Consultants, Inc.

August 4, 2009

Project R091.06039

Mr. Ric Brewster
TRB Development Group, Inc.
36 Londonderry Turnpike
Londonderry, New Hampshire 03106

RE: Geotechnical Investigation
Proposed CVS Pharmacy – Northgate Plaza
91 Auburn Street
Portland, Maine

Dear Mr. Brewster:

Ransom Environmental Consultants, Inc. (Ransom) is pleased to present the results of our geotechnical investigation for the above referenced property (Site). This work was performed in general accordance with our revised proposal entitled "Proposal for Geotechnical Engineering Services," dated July 1, 2009. The purpose of the geotechnical investigation was to obtain information regarding subsurface conditions and soil properties on which to base recommendations for design and construction of foundations and ground floors.

DESCRIPTION OF SITE AND PROPOSED CONSTRUCTION

The Site is located at 91 Auburn Street at the west end of the Northgate Plaza in Portland, Maine. The Site Location Map is provided as Figure 1. Our understanding of the existing conditions and proposed construction is based on conversations with TRB Development Group, Inc. (TRB), and review of the plan set titled "Northgate Plaza, Site Plans," prepared by Appledore Engineering, Inc., revision dated May 19, 2009. Elevations referenced in this report are based on the project datum and above drawings.

The Site is currently developed with strip retail buildings and associated parking and drives. Existing Site grades appear to range from elevation (El.) 91 feet to El. 100 feet at the north and southwest portions of the Site, respectively. It is understood that the three western retail buildings are to be demolished and surrounding pavements are to be reclaimed and reconstructed.

Plans indicate the proposed CVS building is to be rectangular in shape, 12,900 square feet in plan, and have a finished floor at El. 93.85 feet. In addition to the new CVS building, proposed Site improvements include rain gardens 1 and 2 to be located in pavement islands southeast and west of the proposed building, respectively, along with new gravity sewer lines, sewer manhole structures, storm water drains, catch basins, underground electric, and pavements. Fills up to about 2 feet will be required to achieve finished floor level. Proposed grades in other areas of the Site appear to generally match existing grades except in the west rain garden where cuts of about 2 feet are proposed.

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400 Commercial Street, Suite 404, Portland, Maine 04101, Tel (207) 772-2891
Brown's Wharf, Newburyport, Massachusetts 01950, Tel (978) 465-1822
2127 Hamilton Avenue, Hamilton, New Jersey 08619, Tel (609) 584-0090
60 Valley Street, Building F, Suite 106, Providence, Rhode Island 02909, Tel (401) 433-2160

www.ransomenv.com

Our understanding of building foundation loads and settlement criteria are based on Exhibit L, CVS Geotechnical Investigation Requirements, of our CVS Corporate Services Agreement, dated September 1, 2008, and are as follows:

- Interior Columns = 120 kips
- Exterior Columns = 100 kips
- Load Bearing Walls = 3.5 kips per linear foot (klf)
- Floor Slabs = 150 pounds per square foot (psf)
- Maximum total and differential foundation settlements of one inch and one-half inch, respectively.

SCOPE OF SERVICES

This investigation was performed to obtain site-specific subsurface soil information and make geotechnical evaluations and recommendations for the proposed site development. As completed, Ransom's scope of services for this geotechnical investigation included the following items:

1. Prepared a subsurface exploration plan and sampling program.
2. Arranged to have the explorations made by a drilling subcontractor, contacted DigSafe, and arranged to have a private utility locator verify utility clearance at the boring locations.
3. Provided technical monitoring of subsurface explorations and prepared boring logs.
4. Subcontracted laboratory testing on select soil samples to aid in soil description and for determination of engineering properties needed for foundation design and site development analyses.
5. Evaluated acquired field, laboratory, and engineering data with respect to the proposed development, and prepared this geotechnical investigation report presenting our findings, evaluations, and recommendations.

Our scope of work did not include pavement design evaluations or recommendations, or testing and evaluation for the proposed rain gardens.

SUBSURFACE EXPLORATION

The subsurface exploration program was conducted on July 8, 2009 and consisted of six test borings designated B101 through B106. Test borings were not conducted within areas of the proposed footprint

which occur inside the existing building. Exploration locations were determined in the field by a Ransom representative by taping from identifiable site features. Approximate test boring locations are shown on Figure 2, Subsurface Exploration Plan.

Drilling was performed by Northern Test Boring, Inc. of Gorham, Maine using a trailer-mounted rotary drill rig. Explorations were advanced with solid-stem augers. Driven casing with rotary wash techniques were used below a depth of 10 feet in borings B102 and B103. Split-barrel sampling with Standard Penetration Testing (ASTM D 1586) was typically performed continuously to a depth of 10 feet, and at 5-foot depth intervals thereafter. Field vane testing and thin-walled tube sampling (ASTM D1587) were performed in lieu of standard penetration testing in boring B103. Borings were advanced to depths ranging from about 10 to 26.8 feet below local ground surface. Refusal was encountered in borings B102 and B103 at depths of about 13.5 and 26.8 feet below ground surface, respectively.

Drilling activities were monitored by a Ransom field technician who collected soil samples and prepared field boring logs. Soil samples were returned to Ransom's office for review and further analysis. Soil samples were visually classified in general accordance with ASTM D 2488, Standard Practice for the Description and Identification of Soils (Visual-Manual Procedure). Soil samples submitted for laboratory testing were classified in general accordance with ASTM D 2487 Unified Soil Classification System (USCS) where applicable.

Final soil boring logs were prepared on the basis of visual soil classifications and laboratory test results. Soil boring logs and Ransom classification terms and descriptors are included as Attachment A. Stratification lines shown on the boring logs represent approximate boundaries between the soil types encountered; the actual transitions will be more gradual and will vary over short distances.

Laboratory Testing

Laboratory testing was performed on select soil samples recovered from the test borings. The laboratory testing program consisted of grain-size analyses, moisture content, and analytical testing including chloride and sulfate content, and pH. Analytical testing was performed by Analytics Environmental Laboratory, LLC of Portsmouth, New Hampshire. The thin-walled tube sample recovered from boring B103 was opened by R.W. Gillespie & Associates, Inc. (RWG&A) of Saco, Maine for the purpose of conducting a one-dimensional consolidation test. Upon opening, disturbance to the soil sample was evident, and moisture contents were determined in lieu of consolidation testing. The remaining soil tests were performed by John Turner Consulting, Inc. (JTC) of Dover, New Hampshire.

RWG&A and JTC are accredited by the American Association of State Highway and Transportation Officials (AASHTO). The tests performed by RWG&A and JTC were conducted in general accordance with applicable ASTM methods and procedures. Laboratory test results are included in Attachment B and summarized below.

	Boring Designation and Sample Depth (ft)					
	B103 0-2	B105 0-2	B103 8-10	B103 10-12	B103 15-17	B103 22-24
Gravel (%)	21	20	--	--	--	--
Sand (%)	69	66	--	--	--	--
Silt/Clay (%)	10	14	--	--	--	--
Moisture (%)	7	8	32	41	40	44
USCS group symbol	SW-SM	SM	--	--	--	--

Note: -- indicates not determined through laboratory analysis.

Soil Corrosivity Indicator	Corrosive Limits	Boring Designation and Sample Depth (ft)	
		B103, 2-4	B105, 4-6
pH	< 4.5	6.4	7.2
Chloride Content (mg/Kg)	> 500	306	234
Sulfate Content (mg/Kg)	> 2,000	247	241

SUBSURFACE CONDITIONS

Subsurface Soils

Ground surface consists of approximately 2.5 to 5 inches of asphalt pavement, underlain by loose to medium dense fill for pavement base/subbase which extends to depths of about 0.8 to 2.3 feet below ground surface. The fill encountered typically consists of coarse to fine sand, some to little gravel, and little to trace silt. The nature and depth of fills located within the footprint of the existing structure were not determined.

Below the fill, the naturally deposited soils across the Site are glacial marine deposits consisting primarily of silty clay with occasional interbedded layers of silty sand and seams of sand, underlain by relatively thin deposits of dense sand and/or glacial till. The silty clay was encountered to depths ranging from about 12.8 to 25 feet below ground surface.

The silty clay is very stiff to stiff down to depths of about 12 to 15 feet below ground surface, then becomes medium stiff to soft. The undrained shear strength of the silty clay, determined through field

vane shear tests in boring B103, ranged from about 930 to 1,140 pounds per square foot at depths of about 20 to 22 feet below ground surface.

Groundwater

Water levels were measured in all borings during drilling, except in B101. Groundwater was not encountered in boring B105. Where encountered and measured, water levels ranged from about 4.5 to 11.2 feet below ground surface. The relatively shallow water levels encountered in borings B103, B104, and B106 appear to be concentrated in the interbedded sand seams and sand layers within the low permeability silty clay, and likely represent perched water conditions.

Due to the low permeability of the silty clay soils, the water levels observed in the test borings likely do not represent stabilized groundwater levels. It is anticipated that perched water levels might occur near ground surface seasonally. Groundwater levels at the site will fluctuate due to season, temperature, rainfall, snow melt, nearby underground utilities, and construction activity in the area. Therefore, water levels during and after construction will vary from those observed in the explorations.

Bedrock

Refusals were encountered at depths of about 13.5 and 26.8 feet below current grades in borings B102 and B103, respectively. In boring B102, the roller bit was advanced approximately 0.1 feet into the refusal material. Refusals might have occurred on cobbles or boulders, but are considered to generally represent bedrock surfaces.

EVALUATIONS

Geotechnical engineering evaluations for this project are based on the subsurface conditions interpreted from and between widely spaced test borings, the laboratory test results, and the design information currently available. Should differing information become known prior to or during construction, the following evaluations and recommendations should be reviewed by Ransom.

Post Construction Settlement

Post construction settlements were evaluated using the building foundation loads provided in Exhibit L of our CVS Corporate Services Agreement, CVS Geotechnical Investigation Requirements, and a FFE of 93.85 feet. Post construction total and differential settlements are anticipated to be about 1 inch and ½ inch, respectively, if allowable foundation contact pressures are limited to 1,800 pounds per square foot. It is anticipated that the estimated settlements are of a tolerable magnitude. However, the settlement estimates should be reviewed by the structural engineer responsible for design of the proposed building.

Foundations and Ground Floors

With proper site preparation, the proposed building may be supported on continuous and spread footings bearing on undisturbed, naturally deposited, inorganic soils, or compacted structural fill. Foundations should be designed for a maximum allowable contact pressure of 1,800 pounds per square foot.

Slab-on-grade ground floors are considered suitable for the proposed building.

Soils anticipated at foundation subgrade level include existing fills, and naturally deposited very stiff to stiff silty clay and localized areas of silty sand or silt.

Permanent Groundwater Control

Foundations for the proposed building will bear on, or just above, low permeability soils. As a result, water might have a tendency to collect around foundations. Perimeter foundation drains should be provided for the proposed building.

Soil Corrosivity

The test results indicate the soils tested are slightly acidic to neutral and have low chloride and sulfate contents. Based on these results, the soils on Site are not considered corrosive to ductile iron, steel, or reinforced concrete pipes. Standard Type I/II cement is appropriate for foundations.

Construction Considerations

The silty clay soils are sensitive to disturbance when wet, and will lose their load carrying capacity when disturbed. To reduce disturbance of exposed subgrade soils, it will be important to divert runoff, provide positive grading during construction, complete foundation excavations using machines equipped with smooth edged buckets, and limit foot traffic on silty clay foundation subgrades.

The subsurface soils from foundation and site work excavations will likely consist of fill and naturally deposited silty clay, and possibly localized areas of silty sand and silt in the vicinity of boring B103. After demolition of the existing buildings, test pits and evaluation/testing of soils should be conducted to assess the possible reuse of fills which are currently in place below these structures.

Based on visual soil classifications and grain size analyses, the existing fill and naturally deposited soils encountered do not appear suitable for reuse as structural fill due to the relatively high percentage of fines. The existing fill and naturally deposited soils may be used as common fill to raise grades beneath paved surfaces and landscaped areas provided they can be placed and compacted per the recommendations below. Saturated silty clay will likely require off site disposal.

The naturally deposited soils are highly frost susceptible and moisture sensitive and might be difficult to place and compact, especially from fall to spring and during wet periods. Moisture-density relationships should be determined at the start of construction to determine the appropriate range of working moisture

content. Working moisture content for moisture sensitive glacial soils typically ranges from about minus two to plus one percent of the optimum moisture content.

RECOMMENDATIONS

The recommendations provided below are based on interpretations of subsurface conditions at the Site and generally accepted geotechnical engineering principles. The recommendations below are provide for use in design of the foundations and floors for the proposed building. Foundation design and construction will be greatly influenced by subsurface conditions encountered during construction.

It is recommended that foundation design and construction be in accordance with all applicable ordinances, regulations, and rules. It is understood the building code adopted by the State of Maine is the 2003 International Building Code®.

Site Preparation

It is understood that Site preparation will include demolition of three existing retail buildings. Foundations and utilities associated with the existing buildings, and any past uses, should be removed from below the proposed building. Underground structures located beneath the proposed pavements or landscaped areas should be removed to at least 2 feet below proposed finished grade.

Utilities to be relocated should be placed outside of the proposed building. The ends of underground pipes and utility conduits located outside the proposed building which will be abandoned in place should be filled with concrete or grouted.

All topsoil, organic material, pavements, debris, frozen soils, and loose or disturbed soils should be removed from areas receiving new construction. Due to the nature of the Site, earthwork contractors should be diligent to detect any underground structures, and buried debris such as stumps.

Since explorations were not conducted within the existing buildings, the nature and depth of the fill within the existing footprints are unknown at this time. Test pits should be made through the fill in place beneath the existing buildings and within proposed building limits to verify that site stripping for the past site development was thorough and complete, and to evaluate the potential reuse of the existing fill. Test pits will need to be backfilled with compacted structural fill.

Existing pavement base and subbase soils located beneath the proposed building should be removed down to naturally deposited soil subgrades and replaced with compacted structural fill. Naturally deposited soils were encountered at depths of about 1 to 2 feet below current ground surface and are anticipated to be very stiff to stiff, olive-brown silty clay.

Where encountered at subgrade level within the proposed building, the relatively thin layers of silty sand and silt which are saturated, loose, or disturbed should be removed down to very stiff to stiff, olive-brown silty clay. Backfill placed to achieve subgrade levels should be compacted structural fill.

Exposed silty clay and silt subgrades should not be rolled or compacted. Exposed granular subgrades beneath the proposed building and 10 feet outside its perimeter, parking lots, and driveways should be compacted with at least four complete coverages, two each in directions perpendicular to one another, with a 15-ton vibratory drum roller. Compaction should be non-vibratory if pumping or weaving occurs. All soft and unstable subgrades observed during compaction should be undercut a minimum of 12 inches and backfilled as discussed below.

After compaction, exposed granular subgrades should be proof rolled with one pass of a fully-loaded tandem axle dump truck with each successive pass overlapping the previous one. Unstable subgrade areas shall be characterized by weaving or rutting of more than one inch. Any unstable areas encountered should be undercut a minimum of 12 inches and backfilled as discussed below.

Undercut areas should be backfilled with compacted structural fill, common fill, or crushed gravel. The depth of undercutting and type of backfill material should be selected based on the proposed use (i.e. building, pavement, or landscape area), and soil and weather conditions encountered during construction.

Excavations performed for removal of existing structures and existing fills below the proposed building should be backfilled to subgrade elevations with structural fill within the proposed building area, or common fill under pavement and landscaped areas. Recommendations for structural fill and common fill materials and placement are provided in the following section.

Fill and Backfill

The following materials and compaction efforts are recommended for use in areas of fill and backfill:

Type	Screen or Sieve Size	% Passing	Compaction
Structural Fill	6 inches	100	
	3 inches	70-100	95% ASTM D 1557
	No. 4	35-70	Maximum 12-inch lifts
	No. 40	5-35	
	No. 200	0-5	
Common Fill	8 inches	100	92% ASTM D 1557 Maximum 12-inch lifts

Structural fill is recommended for use as fill beneath the proposed building foundations and floor slabs, and backfill against foundations. Structural fill should consist of inorganic sand and gravel free of ice, snow, roots, topsoil, loam, and/or other deleterious materials. Maximum particle size should be limited to 3 inches within 2 feet of foundation walls, footings, and floor slabs.

Compacted structural fill below foundations and ground floor slabs should extend to the limits defined by a 1H:1V line slope down and away from the bottom outside edge of foundations and floor slabs supported by fill. In confined areas and within 4 feet of foundation walls, structural fill should be placed in lifts not

exceeding 6 inches in uncompacted thickness and be compacted with hand-operated compaction equipment.

Common fill may be used to raise grade beneath pavement sections and in landscaped areas. Common fill should consist of inorganic soil free of ice, snow, roots, topsoil, loam, organic, and or other deleterious materials.

The on-site soils encountered are not suitable for use as structural fill, but may be used as common fill. The suitability of fills beneath existing buildings for reuse as structural fill is unknown at this time.

The naturally deposited soils are highly frost susceptible, moisture sensitive, and will be difficult to place and compact. The moisture content will need to be tightly controlled to achieve the specified compaction without pumping and weaving. The naturally deposited soils might require moisture conditioning before placement. Moisture conditioning will not be practical in freezing temperatures. Saturated on-site soils are not considered suitable for use as fill.

On-site soils proposed for reuse should be segregated and stockpiled. Laboratory testing will be needed to verify they meet the specifications for their intended use, and to determine their moisture-density relationship.

Dewatering

Dewatering of foundation excavations might be necessary. It should be practicable to accomplish construction dewatering of shallow excavations by open pumping using sumps and pumps. Excavation side slopes should be monitored for potential seepage and maintained accordingly.

Dewatering requirements will vary across the Site based on soil types and groundwater levels encountered during construction. The silty clay will have relatively low permeability. Higher permeability will occur in the fill and interbedded layers of silty sand.

Surface grading should provide drainage away from constructed facilities during and after construction. Surface runoff should be directed away from excavations.

Groundwater infiltration and surface runoff should be controlled to reduce subgrade disturbance and instability, and allow excavations, filling, foundation and floor slab construction, utility installation and backfilling to be completed in dry conditions. Dewatering should be continuous until excavations are backfilled.

Temporary Excavations

Construction site safety is the responsibility of the Contractor who is also responsible for the means, methods, and sequencing of construction. Ransom is providing the following information for our Client's knowledge. Under no circumstance should the information provided below be interpreted to mean that Ransom is assuming responsibility for construction site safety, excavation and trench safety, or the Contractor's activities. Such responsibility is not being implied and should not be inferred.

The Contractor should be aware that slope height, slope angle, and excavation depths should not exceed those specified in local or state safety regulations, or OSHA Safety and Health Regulations for Construction (29 CFR Part 1926 Subpart P).

Soils within the anticipated excavation depths will likely include loose to medium dense fill and very stiff to stiff silty clay, along with relatively thin layers of silty sand and silt. It is anticipated that foundation and utility excavations can be completed using sloped open-cut techniques. The following slope angles for temporary excavations are presented for planning purposes only.

Soil Type	Excavation Depth (feet)	Slope Angle
Granular Fill	0-4	1.5H:1V
	4-8	2.0H:1V
	Deeper than 8	2.5H:1V
	Below groundwater	Shored and dewatered
Silty Clay	0-4	0.5H:1V
	4-8	1.5H:1V
	Deeper than 8	2H:1V
	Below groundwater	Shored and dewatered

All vehicles and soil stockpiles should be kept a minimum lateral distance from the top of excavations equal to 100 percent of the excavation depth.

Foundations

For the purposes of seismic design, the soil profile is classified as Site Class E according to *Minimum Design Loads for Buildings and Other Structures* (ASCE 7-02) published by the American Society of Civil Engineers (ASCE).

The proposed building may be supported by spread and continuous footings bearing on undisturbed naturally deposited very stiff to stiff, olive-brown silty clay or newly placed compacted structural fill. Footings should be proportioned for a maximum allowable contact pressure of 1,800 pounds per square foot. Minimum footing width should be in accordance with structural design and building code requirements, and not less than 3 feet for spread footings and 2 feet for continuous footings.

Post construction total and differential settlements are anticipated to be about 1 inch and ½ inch, respectively.

Lateral loads may be resisted by friction between the bottoms of the foundations and subgrade, and the passive earth pressure against the sides of foundations. A friction coefficient of 0.35 and an equivalent fluid pressure of 200 pounds per cubic foot should be used for foundation design.

Foundations exposed to exterior or unheated spaces should be placed a minimum of 4 feet below the adjacent finished site grades or floor slabs to provide adequate frost protection. Interior foundations surrounded by heated spaces should be placed a minimum of 2 feet below floor slabs. If exposure to

freezing is anticipated during or after construction, interior foundations should be lowered to the depth recommended for exterior foundations.

It is recommended that foundation excavations be made with excavation equipment fitted with smooth edged buckets. Care should be taken to limit disturbance to foundation subgrades. Foundation subgrades should be free of all loose soil, water, snow, frost, or other deleterious materials. Any loose, soft, or disturbed soils should be removed and replaced prior to concrete placement. Loose, soft, or disturbed granular soils which are removed should be replaced with a minimum of 12 inches of compacted structural fill. Loose, soft, or disturbed silty clay soils which are removed should be replaced with a minimum of 12 inches of crushed stone underlain by filter fabric such as Mirafi 140N.

Freezing of foundation and floor slab subgrades could result in frost heaving and post construction settlement. If freezing occurs, the frozen soils should be removed and replaced with compacted structural fill or crushed stone as discussed above.

Floor Slabs

Ground floor slabs may be designed as slabs-on-grade bearing on a minimum of 12 inches of compacted structural fill. A subgrade modulus of 100 pounds per cubic inch should be used for design of interior slabs-on-grade.

A vapor barrier is recommended to reduce moisture infiltration into the building. It is anticipated that construction details for the floor slabs and specifications for the vapor barrier will be prepared by the project structural engineer.

Exterior slabs at entrances should be underlain by at least 4 feet of structural fill or crushed stone. Surrounding areas should be pitched to drain away to reduce moisture and the potential for frost heave.

Foundation Drainage

Damp-proofing products and materials are typically specified by the project architect or structural engineer responsible for design of the building. The following recommendations are provided as geotechnical aspects of the building design.

Foundation drains should be installed around the exterior walls of the proposed building. The drains should be installed at the bottom of footing level and should consist of 6-inch diameter perforated pipes bedded in at least 2 cubic feet per linear foot of underdrain stone (MDOT 703.22 Underdrain Backfill Material, Type C). The underdrain stone should be completely wrapped in a filter fabric.

Flow from foundation drains should be conveyed by gravity to a surface drainage feature or storm drain that will be free flowing at all times. Multiple outlets should be provided so as not to depend on a single drainage path. Roof drains should not be connected to foundation drains.

Underground Utilities

Utilities may be earth supported. Bedding placed for utilities should be in accordance with utility and manufacturer requirements. Utility trenches should be properly excavated and shored. Utility trenches should be backfilled and compacted according to the recommendations for fill and backfill provided above.

Construction Quality Control

Ransom should be provided the opportunity to review the final design and specifications to ensure recommendations presented herein have been properly interpreted and applied. It is recommended that all fill, backfill, and compaction be inspected and tested by a qualified firm to verify that material placement and compaction meet the project specifications. Ransom should review all soil inspection and testing reports.

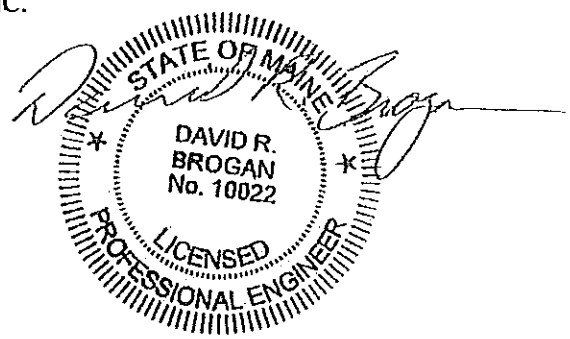
Ransom should be retained to provide geotechnical observation of foundation subgrade preparation during construction.

CLOSURE

This report has been prepared to assist the site and structural engineers in the design and construction of foundations and ground floor slabs related to the proposed CVS Pharmacy at the Northgate Plaza located at 91 Auburn Street in Portland, Maine. This report has been completed based on Ransom's understanding of the project as described herein, and in general accordance with accepted soil and foundation engineering practices. No other warranties, expressed or implied, are made. If changes in the nature, design, or location of the project are made, the evaluations and recommendations presented in this report should be reviewed by Ransom. We have enjoyed working with you on this phase of your project. Should you have any questions regarding this report, please do not hesitate to call.

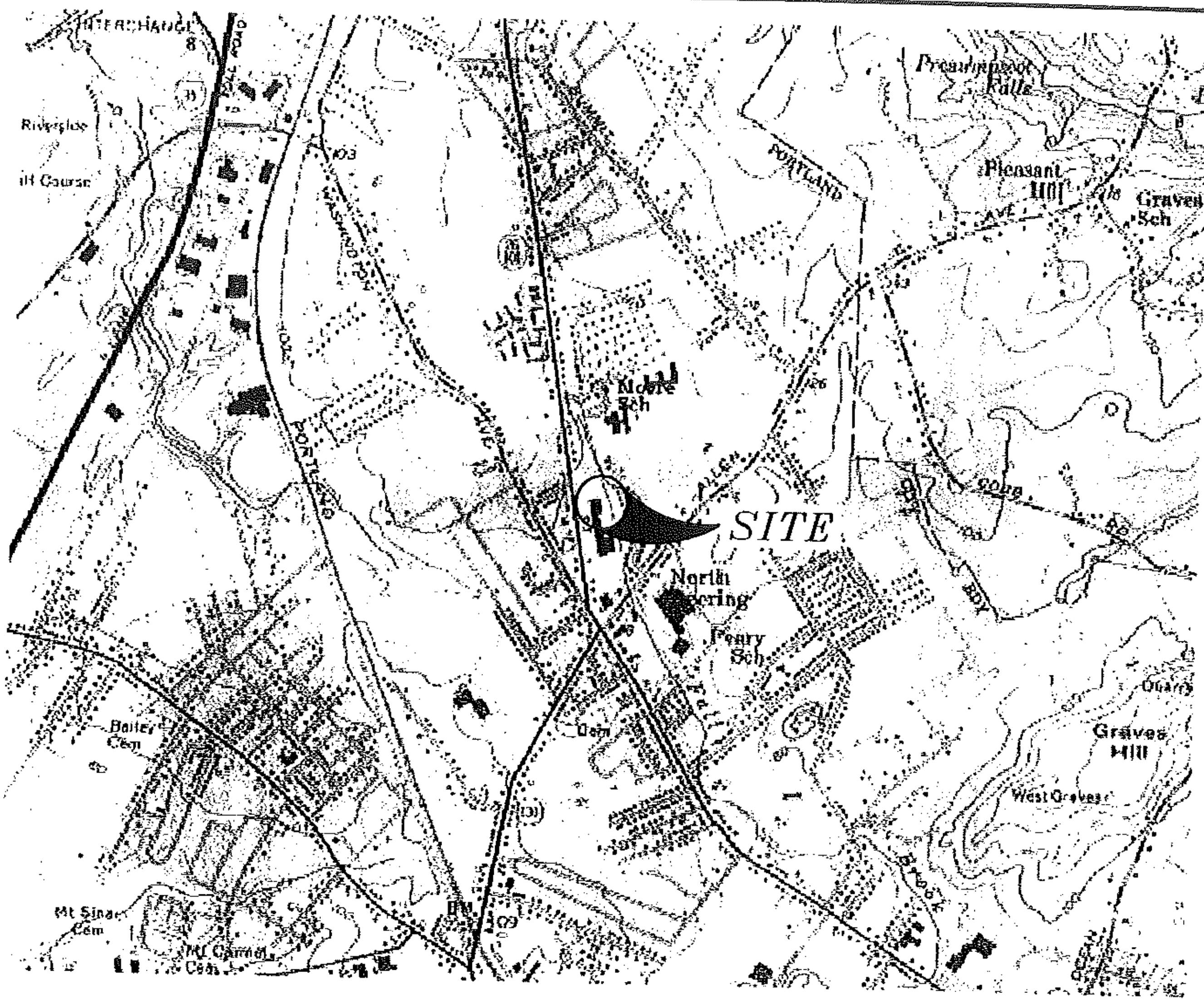
Sincerely,

RANSOM ENVIRONMENTAL CONSULTANTS, INC.



David R. Brogan, P.E.
Senior Geotechnical Engineer/Project Manager

DRB/BRP:jar
Attachments

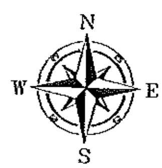


TAKEN FROM U.S.G.S. 7.5x15 MINUTE SERIES TOPOGRAPHIC MAP OF PORTLAND WEST, MAINE–1956, REVISED 1978.

CONTOUR INTERVAL IS 20 FEET.

SITE COORDINATES: LATITUDE 43°42'13"
LONGITUDE 70°17'22"

UTM COORDINATES: 48:39:560mN
3:96:144mE



QUADRANGLE LOCATION

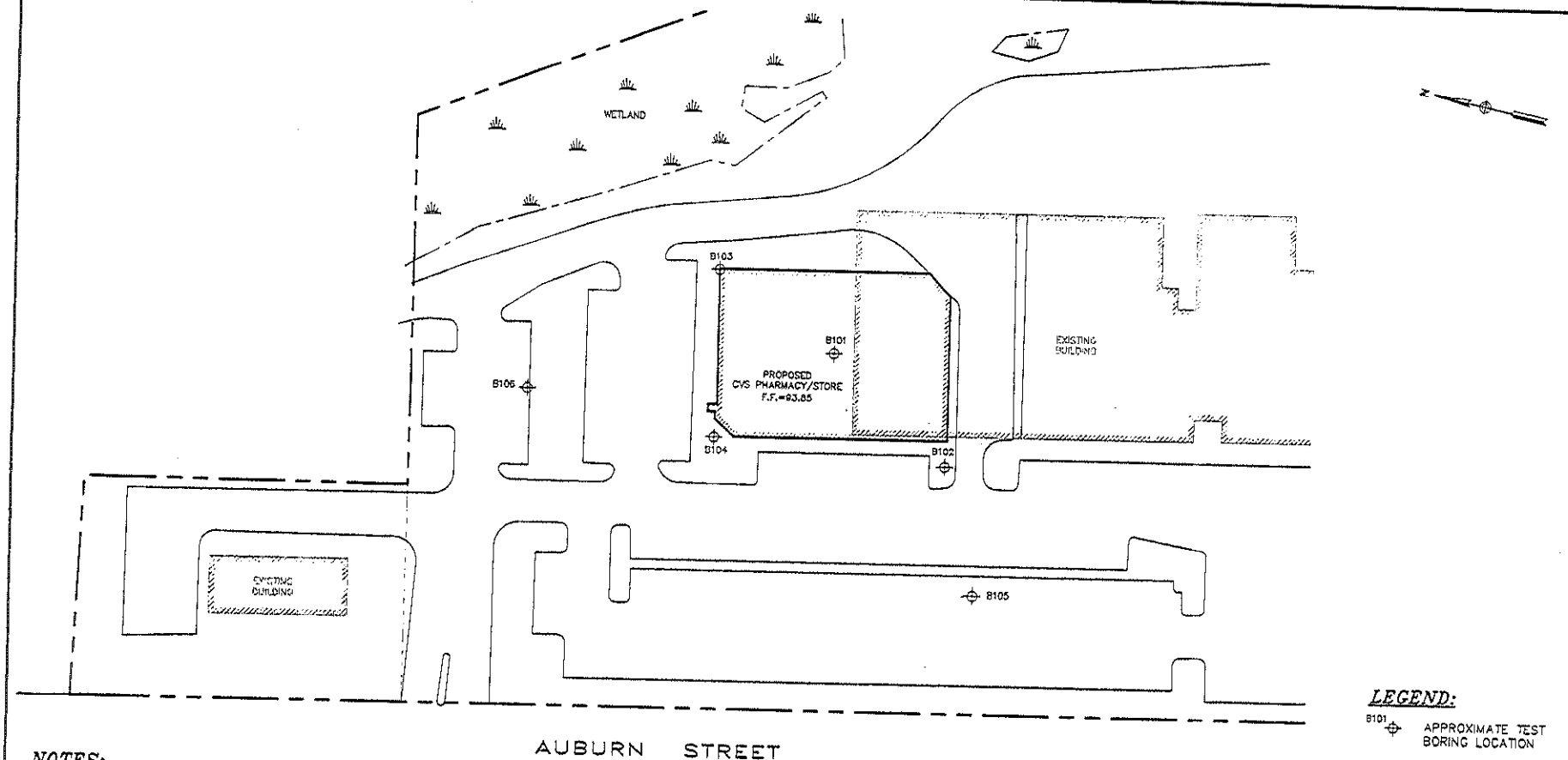
0 1000 2000 3000 4000

SCALE in FEET
1:24,000

RANSOM Environmental Consultants, Inc.

PREPARED FOR:	SITE:	SITE LOCATION MAP
TRB DEVELOPMENT GROUP, INC. 36 LONDONDERRY TURNPIKE LONDONDERRY, NEW HAMPSHIRE	PROPOSED CVS PHARMACY NORTHGATE PLAZA 91 AUBURN STREET PORTLAND, MAINE	DATE: JULY 2009 PROJECT: 091.06039 FIGURE: 1

DWGS\2009\091.06039\091.06039-00.dwg



NOTES:

1. SITE PLAN BASED ON PLAN TITLED "EXISTING CONDITIONS PLAN OF NORTHGATE SHOPPING PLAZA" SHEET 1 OF 3, PREPARED BY DOUCET SURVEY, INC., DATED DECEMBER 29, 2008 AND PLAN TITLED "SITE PLAN", SHEET C2-A, PREPARED BY APPLEDORE ENGINEERING, INC. DATED MAY 19, 2009.
2. SOME FEATURES ARE APPROXIMATE IN LOCATION AND SCALE.
3. THIS PLAN HAS BEEN PREPARED FOR TRB DEVELOPMENT GROUP, INC. ALL OTHER USES ARE NOT AUTHORIZED, UNLESS WRITTEN PERMISSION IS OBTAINED FROM RANSOM ENVIRONMENTAL CONSULTANTS, INC.

LEGEND:

- B101 ⊕ APPROXIMATE TEST BORING LOCATION
- LOT BOUNDARY
- PROPERTY BOUNDARY

0 20 40 80

SCALE in FEET
1"=40'

RANSOM Environmental Consultants, Inc.

PREPARED FOR:
TRB DEVELOPMENT GROUP, INC.
36 LONDONDERRY TURNPIKE
LONDONDERRY, NEW HAMPSHIRE

SITE:
PROPOSED CVS PHARMACY
NORTHGATE PLAZA
91 AUBURN STREET
PORTLAND, MAINE

SUBSURFACE EXPLORATION PLAN

DATE: JULY 2009
PROJECT: 091.06039
FIGURE: 2

ATTACHMENT A

Soil Boring Logs

Geotechnical Investigation
Proposed CVS Pharmacy – Northgate Plaza
91 Auburn Street
Portland, Maine

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B101

Reviewed by: TRB	Total Depth: 22 Feet	Logged By: EPP	
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
				S8	WOH	24/24			
	End of boring at 22'.								
25								25	
30								30	
35								35	

WATER LEVELS:

During Drilling: NM | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced with trailer-mounted Detrich D50 using 4" diameter solid-flight augers.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.

CLIENT:
TRB Development Group, Inc.

SITE:
Proposed CVS Pharmacy
Northgate Plaza, 91 Auburn Street
Portland, ME

Project No.: 091.06039 | Page: 2

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B102

Reviewed by: TRB	Total Depth: 13.5 Feet	Logged By: EPP	
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
	Aspalt pavement (5 inches).								
	(Fill) Medium dense, brown, coarse to fine SAND and coarse to fine GRAVEL, trace silt, moist.	Fill		S1	4-5-7-8	24/17	<1		
	(CL) Stiff, olive-brown CLAY and SILT, moist.	Presumpscot Formation		S2	4-5-5-7	24/24	<1		
	Pocket penetrometer; Su=2 ksf.			S3	4-4-8-10	24/24	<1		
	Becomes very stiff. Pocket penetrometer; Su=3.75 ksf.			S4	6-10-12-13	24/18	<1		
	Becomes stiff.			S5	4-5-5-7	24/24	<1		
	Pocket penetrometer; Su=1.5 ksf. Becomes wet.			S6	4-4-7-6	24/20	<1		
	Glacial till at 12.8' infered from drilling resistance.								
	Top of bedrock at 13.4' infered from drilling resistance. End of boring at 13.5', roller bit refused.								

5 — 10 — 15

WATER LEVELS:

During Drilling	End of Boring	Date:
11.2 Feet		7/8/09

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Boring advanced with trailer-mounted Detrich D50 using 4" diameter solid-flight augers to 10', then 4" casing with rotary wash.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.

CLIENT: TRB Development Group, Inc.

SITE: Proposed CVS Pharmacy, Northgate Plaza, 91 Auburn Street, Portland, ME

Project No.: 091.06039

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B103

Reviewed by: DRB	Total Depth: 26.8 Feet	Logged By: EPP	
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
	Asphalt pavement (3 inches).								
	(Fill) Meldum dense, light brown, coarse to fine SAND, some coarse to fine Gravel, trace silt, moist.	Fill		S1	6-10-8-6	24/13	<1		
	(CL) Stiff, ~~blue-gray~~ brown CLAY and SILT, moist.	Presumpscot Formation		S2	4-4-5-6	24/13	<1		
5	(ML and SM) Interbedded layers of very loose, gray SILT, some Clay, some fine Sand and very loose, gray, fine SAND, little silt, wet.			S3	2-2-1-2	24/24	<1	5	
	(CL) Stiff, olive-brown CLAY and SILT, moist.			S4	1-5-6-7	24/24	<1		
	Pocket penetrometer; Su=2 ksf.			S5	4-4-5-6	24/19	<1		
10	Becomes medium stiff. Clay contains some fine SAND from about 10' to 11.5'.			S6	3-3-3-2	24/24	4	10	
15	Becomes soft and gray.			S7		24/14	4	15	
	Could not push field vane due to sand seam.								

WATER LEVELS:

During Drilling	End of Boring	Date:
4.5 Feet		7/8/09

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced with trailer-mounted Detrich D50 using 4" diameter solid-flight augers to 10', then 4" casing and rotary wash.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.
4. U1 = Shelbey tube sample.
5. FV = Field vane.
6. Sample designated with solid fill submitted for laboratory analysis.

CLIENT:
TRB Development Group, Inc.

SITE:
Proposed CVS Pharmacy
Northgate Plaza, 91 Auburn Street
Portland, ME

Project No.: 091.06039 Page: 1

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B103

Reviewed by: DRB	Total Depth: 26.8 Feet	Logged By: EPP	
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
	Field vane; Su=930 psf.			FV1					
	Field Vane; Su=1,140 psf.			FV2					
				U1	NA	24/21			
25	(SP) Dense, gray, medium to fine SAND, little gravel, trace silt, wet.			S8	25-22-18-50/3"	20/16	<1	25	
	End of boring at 26.8', roller bit refused.								
30								30	
35								35	

WATER LEVELS:

During Drilling	End of Boring	Date:
4.5 Feet		7/8/09

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Boring advanced with trailer-mounted Detrich D50 using 4" diameter solid-flight augers to 10', then 4" casing and rotary wash.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.
4. U1 = Shelbey tube sample.
5. FV = Field vane.
6. Sample designated with solid fill submitted for laboratory analysis.

CLIENT: TRB Development Group, Inc.

SITE: Proposed CVS Pharmacy, Northgate Plaza, 91 Auburn Street, Portland, ME

Project No.: 091.06039

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B104

Reviewed by: TRB	Total Depth: 26.8 Feet	Logged By: EPP	
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
	Asphalt pavement (3 inches).								
	(Fill) Medium dense, brown, coarse to fine SAND and GRAVEL, trace silt, moist.	Fill		S1	12-12-7-5	24/7	<1		
	(CL) Very stiff, olive-brown CLAY and SILT, moist. Pocket penetrometer; Su=2.25 ksf.	Presumpscot Formation		S2	5-5-5-6	24/24	<1		
5	Becomes stiff. Pocket penetrometer; Su=2 ksf.			S3	3-4-4-6	24/22		5	
	Interbedded with seams of brown, fine SAND from about 6.7' to 7.4'.			S4	5-5-5-7	24/16			
	Becomes very stiff. Pocket penetrometer; Su=3.5 ksf.			S5	7-7-12-15	24/20	<1		
10	Pocket penetrometer; Su=2.25 ksf.			S6	6-6-6-7	24/18	<1	10	
15	Becomes soft, gray and wet.			S7	WOH	24/24	<1	15	

WATER LEVELS:

During Drilling: 7.5 Feet | End of Boring | Date: 7/8/09

WELL LEGEND: Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:
1. Boring advanced with trailer-mounted Detrich D50 using 4" diameter solid-flight augers.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.

CLIENT: TRB Development Group, Inc.

SITE: Proposed CVS Pharmacy, Northgate Plaza, 91 Auburn Street, Portland, ME

Project No.: 091.06039 | Page: 1

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B104

Reviewed by: TRB	Total Depth: 26.8 Feet	Logged By: EPP	
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
				S8	WOM	24/20	<1		
	End of boring at 22'.								
25								25	
30								30	
35								35	

WATER LEVELS:

During Drilling	End of Boring	Date:
7.5 Feet		7/8/09

WELL LEGEND: Filter Sand; Native Fill; Bentonite; Bentonite Grout; Concrete; PVC Screen; PVC Riser

NOTES:
1. Boring advanced with trailer-mounted Detrich D50 using 4" diameter solid-flight augers.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.

CLIENT:
TRB Development Group, Inc.

SITE:
Proposed CVS Pharmacy
Northgate Plaza, 91 Auburn Street
Portland, ME

Project No.: 091.06039

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BORING AND MONITORING WELL LOG: B105

Reviewed by: DKB	Total Depth: 10 Feet	Logged By: EPP	
Date Reviewed: 8/4/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09	
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB	

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)	DEPTH	WELL CONSTRUCTION
	Asphalt pavement (3.5 inches).								
	(Fill) Loose, brown, coarse to fine SAND, some Gravel, little silt, moist.	Fill		S1	5-5-3-3	24/8	<1		
	(CL) Very stiff to stiff, olive-brown CLAY and SILT, moist.	Presumpscot Formation		S2	3-4-5-5	24/11	<1		
5	Contains trace fine sand, trace gravel from about 5.8' to 6.3'. Pocket penetrometer; Su=3.5 ksf. Becomes gray.			S3	3-3-3-7	24/24	<1	5	
				S4	8-9-12-14	24/24	<1		
	Contains trace coarse to fine sand from about 8.0' to 8.8'.			S5	8-8-10-12	24/15	<1		
10	End of boring at 10'.							10	
15								15	

WATER LEVELS:

During Drilling: NM | End of Boring: | Date:

WELL LEGEND:

Filter Sand | Native Fill | Bentonite | Bentonite Grout | Concrete | PVC Screen | PVC Riser

NOTES:

1. Boring advanced with trailer-mounted Detrich D50 equipped with 4" diameter solid-flight augers.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.
4. Sample designated with solid fill submitted for laboratory anaysis.

CLIENT:
TRB Development Group, Inc.

SITE:
Proposed CVS Pharmacy
Northgate Plaza, 91 Auburn Street
Portland, ME

Project No.: 091.06039 | Page: 1

RANSOM Environmental Consultants, Inc.

BORING AND MONITORING WELL LOG: B106

Reviewed by: DRB	Total Depth: 10 Feet	Logged By: EPP
Date Reviewed: 8/3/09	Boring Diameter: 4 Inches	Date Drilled: 7/8/09 to 7/8/09
Surface Elevation (ft.): NM	Well Stickup: NA	Driller: NTB

DEPTH	DESCRIPTION (Based on USCS and modified Burmister Soil Classification System)	SOIL PROFILE	SAMPLE	SAMPLE NUMBER	BLOWS (per 6")	PENETRATION/ RECOVERY	OVM (ppmv) / DEXSIL (ppm)
	Asphalt pavement (3 Inches).						
	(Fill) Medium dense, brown, coarse to fine SAND and coarse to fine GRAVEL, moist.	Fill		S1	5-5-6-6	24/12	<1
	(CL) Stiff, brown CLAY and SILT, moist.	Presumpscot Formation		S2	4-5-6-9	24/18	<1
5	Contains little fine sand from about 4.0' to 6.3' becomes wet. Pocket penetrometer; Su=1.75 ksf.			S3	5-5-6-12	24/24	<1
	Becomes gray and very stiff.			S4	9-11-13-13	24/24	<1
10	End of boring at 10'.			S5	8-8-9-14		<1
15							

DEPTH	WELL CONSTRUCTION
5	
10	
15	

WATER LEVELS:

During Drilling	End of Boring	Date:
5 Feet		

WELL LEGEND:

NOTES:

1. Boring advanced with trailer-mounted Detrich D50 equipped with 4" diameter solid-flight augers.
2. Samples collected using standard split-spoon advanced by auto-hammer.
3. NA = Not Applicable; NM = Not Measured.

CLIENT:
TRB Development Group, Inc.

SITE:
Proposed CVS Pharmacy
Northgate Plaza, 91 Auburn Street
Portland, ME

Project No.:	091.06039	Page:	1

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Soil Classification Terms

Grain Size		
Material	*Fraction*	*Sieve Size*
Boulders		12" +
Cobbles		3"–12"
Gravel	coarse	¾"–3"
	fine	No. 4 to ¾"
Sand	coarse	No. 10 to No. 4
	medium	No. 40 to No. 10
	fine	No. 200 to No. 40
Fines (Silt & Clay)		Passing No. 200

Identification of soil type is made on the basis of an estimate of particle sizes, and in the case of fine-grained soils, also on basis of plasticity.

Coarse and Fine Grained Soils	
Descriptive Adjective	**Percentage Requirement*
Trace	1–10%
Little	10–20%
Some	20–35%
And	35–50%

When sampling gravelly soils with a standard split spoon, the true percentage of gravel is often not recovered due to the relatively small sampler diameter.
*Percentage measured by weight.

Standard Penetration Value (N) & Undrained Shear Strength (S_u) v. Relative Density & Consistency

GRANULAR SOILS	
N	*Relative Density (%)*
0–4	Very Loose (0-15)
4–10	Loose (15-35)
10–30	Medium Dense (35-65)
30–50	Dense (65-85)
>50	Very Dense (>85)

COHESIVE SOILS		
S_u (psf)	*N*	*Consistency*
<250	<2	Very Soft
250 to 500	2–4	Soft
500 to 1,000	4–8	Medium
1,000 to 2,000	8–15	Stiff
2,000 to 4,000	15–30	Very Stiff
>4,000	>30	Hard

Consistency of cohesive soils is based upon undrained shear strength determined from field vane shear, pocket penetrometer, torvane, or laboratory tests. Consistency of cohesive soils is based upon the N-value when no other data is available.

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Rock Classification Terms

Weathering Classification		
Grade	*Symbol*	*Diagnostic Features*
Fresh	F	No visible sign of decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	WS	Slight discoloration inwards from open fracture, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker mineral such as feldspar decomposed. Strength somewhat less than fresh rock but cores can not be broken by hand or scraped by knife.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming distinct but fabric.
Completely Weathered	WC	Minerals decomposed to soil but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advanced state of decomposition resulting in Plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Rock Descriptors			
Term		Meaning	
Hardness	Soft	Scratched by fingernail	
	Medium Hard	Scratched easily by penknife	
	Hard	Scratched with difficulty by penknife	
	Very Hard	Cannot be scratched by penknife	
Jointing/ Fractures	Slight	2 to 6 ft. spacing	
	Moderate	8in. to 2 ft.	
	High	2 in. to 8 in.	
	Intense	< 2in.	
Bedding	Laminated	(< 1")	Natural Break in Rock Layers
	Thin Bedded	(1" - 4")	
	Bedded	(4" - 12")	
	Thick Bedded	(12" - 36")	
	Massive	(> 36")	

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Unified System Classification of Soils (ASTM D 2487)

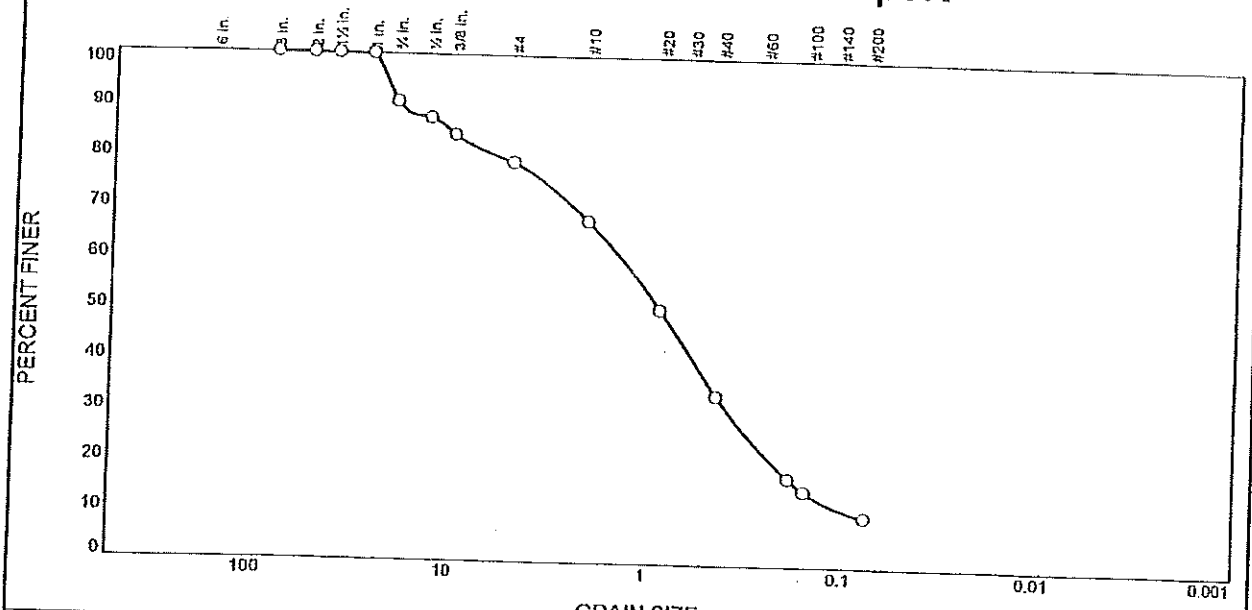
Major Divisions			*Group Symbols*	*Typical Names*
Coarse-Grained Soils More than 50% retained on No. 200 sieve	Gravels 50% or more of coarse fracton retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines.
		Gravels w/ Fines	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	Sands More than 50% coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands little or no fines.
			SP	Poorly graded sands and gravelly sands little or no fines.
		Sands w/ Fines	SM	Silty sands, gravel-sand-silt mixtures.
			SC	Clayey sands, sand-clay mixtures.
Fine-Grained Soils 50% or more passes No. 200 sieve	Silts and Clays Liquid Limit 50% or less		ML	Inorganic silts, very fine sands, rock flour.
			CL	Inorganic clays of low plasticity, gravelly clays, sandy clays, silty clays.
			OL	Organic silts and organic silty clays of low plasticity.
	Silts and Clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity.
Highly Organic Soils			Pt	Peat, mulch and other highly organic soils

ATTACHMENT B

Laboratory Test Results

Geotechnical Investigation
Proposed CVS Pharmacy – Northgate Plaza
91 Auburn Street
Portland, Maine

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.5	11.8	11.3	34.1	23.4	9.9	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	90.5		
1/2	87.4		
3/8	84.0		
#4	78.7		
#10	67.4		
#20	50.2		
#40	33.3		
#80	17.4		
#100	14.9		
#200	9.9		

* (no specification provided)

Material Description

FINE-COARSE SAND, some gravel, trace silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 18.6936 D_{85}= 10.2450 D_{60}= 1.3377
D_{50}= 0.8420 D_{30}= 0.3655 D_{15}= 0.1515
D_{10}= 0.0763 C_u= 17.52 C_c= 1.31

Remarks

Moisture Content 6.8%

Date Received: 7-16-09 Date Tested: 7-20-09

Tested By: Jim Corti

Checked By: John Turner

Title: President

Location: B103 S1

Sample Number: 280A Depth: 0.0 - 2.0 Feet Date Sampled: 7-8-09

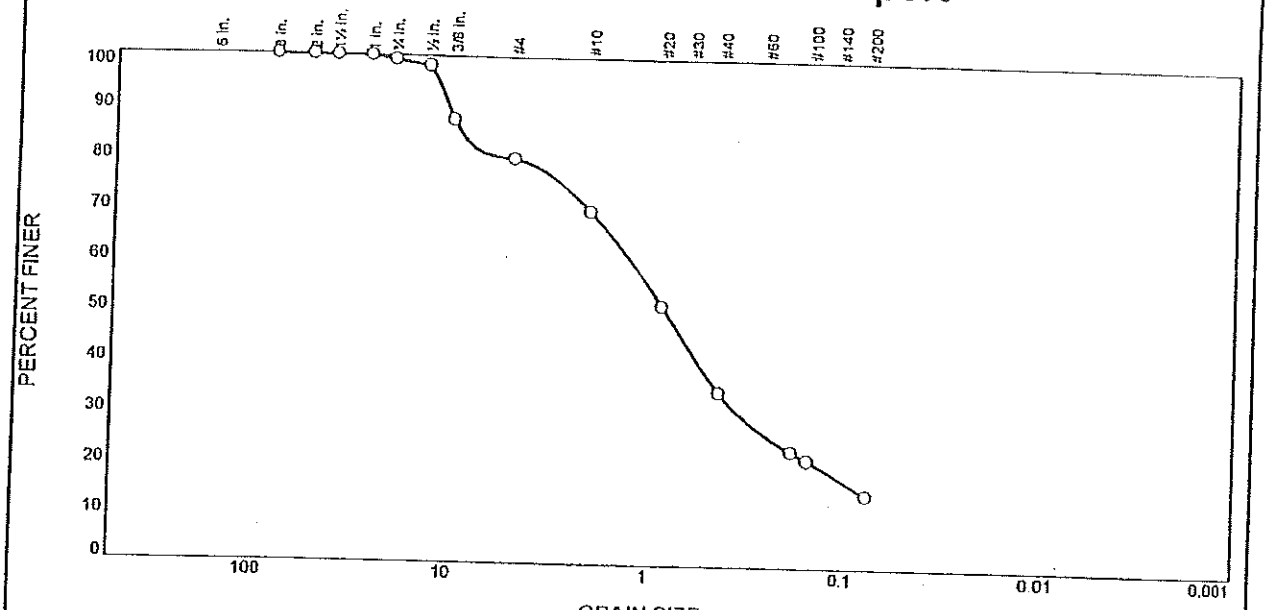
JOHN
TURNER
Dover, NH

Client: Ransom Environmental Consultants, Inc.

Project: Northgate Plaza CVS
Portland, ME

Project No: R091.06039.001 Report #: 001

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.8	19.3	10.2	35.4	19.9	14.4	

Test Results (ASTM C 136 & ASTM C 117)

Opening Size	Percent Finer	Spec.* (Percent)	Pass? (X=Fail)
3	100.0		
2	100.0		
1.5	100.0		
1	100.0		
3/4	99.2		
1/2	98.1		
3/8	87.4		
#4	79.9		
#10	69.7		
#20	51.2		
#40	34.3		
#80	22.9		
#100	21.2		
#200	14.4		

* (no specification provided)

Material Description

FINE-COARSE SAND, some gravel, little silt

Atterberg Limits (ASTM D 4318)

PL= LL= PI=

Classification

USCS (D 2487)= AASHTO (M 145)=

Coefficients

D_{90}= 10.1911 D_{85}= 8.7988 D_{60}= 1.2331
D_{50}= 0.8101 D_{30}= 0.3338 D_{15}= 0.0793
D_{10}= C_u= C_c=

Remarks

Moisture Content = 8.0%

Date Received: 7-16-09 Date Tested: 7-20-09

Tested By: Jim Corti

Checked By: John Turner

Title: President

Location: B105 S1
Sample Number: 280B Depth: 0.0 - 2.0 Feet Date Sampled: 7-8-09

JOHN TURNER
Dover, NH

Client: Ransom Environmental Consultants, Inc.
Project: Northgate Plaza CVS
Portland, ME
Project No: R091.06039.001 Report #: 002

Report of Moisture Content ASTMD2216 Test Results for GEO Evaluation

CLIENT: Ransom Environmental Consultants, Inc.
Attn: Dave Brogan
Brown's Wharf
Newburyport, MA 01950

PROJECT: CVS Store
Northgate Plaza
Portland, ME

PROJECT#: R091.06039.001

DATE: July 21, 2009

REPORT #: 003

ID:	LOCATION:	MOISTURE CONTENT:
280 C	B103 S5 8-10'	32.2%
280 D	B103 S6 10-12'	40.7%
280E	B103 S7 15-17'	40.2%

JOHN TURNER CONSULTING, INC.

19 Dover Street
Dover NH 03820
T 603.749.1841 F 603.516.6851

6 Clinton Avenue
Westfield MA 01085
T 413.485.8407 F 413.642.0164

15 Holly Street, Unit 103
Scarborough ME 04074
T 207.883.7878 F 207.883.3365

MOISTURE DETERMINATIONS

Project Name: Lab Testing-Northgate Plaza CVS
Project No. 400-14 (PN P091.06039.01)
Lab No. 10798
Date: July 17, 2009

BORING NO.	B-103	B-103	B-103	B-103			
SAMPLE NO.	U-1/22.9'	U-1/23.0'	U-1/23.1'	U-1/23.2'			
TARE No.	73	29	26	28			
Wt of Dish + Wet Soil	368.3	363.39	350.78	351.6			
Wt of Dish + Dry Soil	296.11	295.84	283.12	284.3			
Wt. of Tare	131.93	132.74	133.31	133.04			
Wt. of Water	72.19	67.55	67.66	67.3			
Wt. Of Dry Soil	164.18	163.1	149.81	151.26			
Percent Moisture	44.0	41.4	45.2	44.5			

BORING NO.							
SAMPLE NO.							
TARE No.							
Wt of Dish + Wet Soil							
Wt of Dish + Dry Soil							
Wt. of Tare							
Wt. of Water							
Wt. Of Dry Soil							
Percent Moisture							

BORING NO.							
SAMPLE NO.							
TARE No.							
Wt of Dish + Wet Soil							
Wt of Dish + Dry Soil							
Wt. of Tare							
Wt. of Water							
Wt. Of Dry Soil							
Percent Moisture							

Checked by: Matthew J. [signature]

R.W. GILLESPIE & ASSOCIATES, INC.

86 Industrial Park Road, Suite 4
Saco, Maine 04072

200 International Drive, Suite 170
Portsmouth, NH 03801

P.O. Box 289
Augusta, Maine 04332

environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9906
www.analyticslab.com

Mr. Dave Brogan
Ransom Environmental Consultants, Inc.
112 Corporate Drive
Portsmouth NH 03801

Report Number: 64314
Revision: Rev. 0

Re: NORTHGATE PLAZA CVS **R091.06039.001**

Enclosed are the results of the analyses on your sample(s). Samples were received on 16 July 2009 and analyzed for the tests listed below. Samples were received in acceptable condition, with the exceptions noted below or on the chain of custody. These results pertain to samples as received by the laboratory and for the analytical tests requested on the chain of custody. The results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report. Please see individual reports for specific methodologies and references.

Lab Number	Sample Date	Station Location	Analysis	Comments
64314-1	07/08/09	B103, S-2, 2-4'	Chloride	
	07/08/09	B103, S-2, 2-4'	Sulfate	
	07/08/09	B103, S-2, 2-4'	SW-846 9045 pH in Solid	
64314-2	07/08/09	B105, S-3, 4-6'	Chloride	
	07/08/09	B105, S-3, 4-6'	Sulfate	
	07/08/09	B105, S-3, 4-6'	SW-846 9045 pH in Solid	

Sample Receipt Exceptions: None

Analytics Environmental Laboratory is certified by the states of New Hampshire, Maine, Massachusetts, Connecticut, Rhode Island, New York, Virginia, Maryland, and is validated by the U.S. Navy (NFESC). A list of actual certified parameters is available upon request.

If you have any further question on the analytical methods or these results, do not hesitate to call.

Authorized signature _____
Stephen L. Knollmeyer Lab. Director

Date 7/22/2009

Analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5171 Fax 603-430-2151
800-929-9906

Mr. Dave Brogan
Ransom Environmental Consultants, Inc.
112 Corporate Drive
Portsmouth NH 03801

July 22, 2009

CLIENT SAMPLE ID

Project Name: NORTHGATE PLAZA CVS
Project Number: R091.06039.001
Client Sample ID: B103, S-2, 2-4'

SAMPLE DATA

Lab Sample ID: 64314-1
Matrix: Solid
Collection Date: 07/08/09 Time Collected: NA
Lab Receipt Date: 07/16/09
Analysis Date: 07/20/09 Time Analyzed: 11:45

pH ANALYSIS

Sample	Result	Units
64314-1	6.4	pH Units

METHODOLOGY: Sample analyzed according to "EPA SW 846 Method 9045 pH in solid"

COMMENTS:

Authorized signature

Analytics environmental laboratory LLC

195 Commerce Way
Portsmouth, New Hampshire 03801
603-436-5111 Fax 603-430-2151
800-929-9905

Mr. Dave Brogan
Ransom Environmental Consultants, Inc.
112 Corporate Drive
Portsmouth NH 03801

July 22, 2009

CLIENT SAMPLE ID

Project Name: NORTHGATE PLAZA CVS
Project Number: R091.06039.001
Client Sample ID: B105, S-3, 4-6'

SAMPLE DATA

Lab Sample ID: 64314-2
Matrix: Solid
Collection Date: 07/08/09 Time Collected: NA
Lab Receipt Date: 07/16/09
Analysis Date: 07/20/09 Time Analyzed: 11:36

pH ANALYSIS

Sample	Result	Units
64314-2	7.2	pH Units

METHODOLOGY: Sample analyzed according to "EPA SW 846 Method 9045 pH in solid"

COMMENTS:

Authorized signature

Maine Environmental Laboratory

Report of Analyses

One Main Street Yarmouth, Maine 04096-1107 Tel (207) 846-6569 Fax (207) 846-9066 e-mail: melab@maine.rr.com

Melissa Gulli
Analytics Environmental Lab, LLC
195 Commerce Way, Suite E
Portsmouth, NH 03801

July 21, 2009
Page 1 of 3

Report No.: AEL5808-09

Enclosed are the results of the analyses requested on your samples as received by the laboratory. Samples were received in acceptable condition and analyzed within method holding times with all quality control data within laboratory acceptance limits unless noted. Reporting detection limits are the minimum levels for reporting quantitative data. These limits are 3.18 times the method detection limit as defined in CFR 40 Part 136, Appendix B. Data reported between the reporting and method detection limits are J flagged as estimated. Maine Environmental Laboratory is certified by Maine, Massachusetts, New Hampshire and NELAP (cert.#2031). A list of certified parameters is available on request. The results reported herein conform to the most current NELAP standards, where applicable, unless otherwise narrated in the body of the report. This report shall not be reproduced, except in full, without the written consent of the laboratory.

The complete report consists of the following sections: Maine Environmental Laboratory report
Chain of custody form

References

EPA - EPA600/4-79-020, Methods for Chemical Analysis of Water and Wastes, USEPA, Cincinnati, Ohio, March 1983.
SW8 - SW846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, USEPA, third edition, 1986.
STM - Standard Methods for the Examination of Water and Wastewater, 18th edition, APHA,AWWA,WPCF, 1992.
CLP - USEPA CLP Statement of Work for Inorganics, ILMO3.0.
EPA1 - EPA/600/R-93/100 Methods for the Determination of Inorganic Substances in Environmental Samples, Aug. 1993.
EPA2 - EPA/600R-94/111, Methods for the Determination of Metals in Environmental Samples, Supplement I, May, 1994.

Authorized signature David W. Kodis For
Herbert S. Kodis, laboratory director

Maine Environmental Laboratory

Report of Analyses

One Main Street Yarmouth, Maine 04096-1107 Tel (207) 846-6569 Fax (207) 846-9066 e-mail: melab@maine.rr.com

Melissa Gulli
Analytics Environmental Lab, LLC
195 Commerce Way, Suite E
Portsmouth, NH 03801

July 21, 2009

Report No:	AEL5808-09	Sampler:	No Data
Date received:	07/16/09	Sampling date:	07/08/09
Project ID:	Northgate Plaza Cus R091.06039.001	Sample matrix:	Solid
Laboratory ID:	AEL580809-01	Sample ID:	B103,S-2,2-4' (64314-1)

Data reported on a dry weight basis.

Parameter	Results	units	Date Analyzed	Method Detection Limit	Reporting Detection Limit	Method	Reference
Chloride	306	mg/kg	07/16/09	9	29	9056	SW8
Sulfate	247	mg/kg	07/16/09	6	20	9056	SW8

ND = not detected; J = Estimated; B = detected in [illegible]; S = [illegible] due to sample matrix

Maine Environmental Laboratory Report of Analyses

One Main Street Yarmouth, Maine 04096-1107 Tel (207) 846-6569 Fax (207) 846-9066 e-mail: melab@maine.rr.com

Melissa Gulli
Analytics Environmental Lab, LLC
195 Commerce Way, Suite E
Portsmouth, NH 03801

July 21, 2009

Report No:	AEL5808-09	Sampler:	No Data
Date received:	07/16/09	Sampling date:	07/08/09
Project ID:	Northgate Plaza Cus R091.06039.001	Sample matrix:	Solid
Laboratory ID:	AEL580809-02	Sample ID:	B105, S-3, 4-6' (64314-2)

Data reported on a dry weight basis.

Parameter	Results	units	Date Analyzed	Method Detection Limit	Reporting Detection Limit	Method	Reference
Chloride	231	mg/kg	07/16/09	10	31	9056	SW8
Sulfate	241	mg/kg	07/16/09	6	21	9056	SW8

ND = Not Detected J = Estimated Value B = Detected in Blank S = RDL increased due to sample matrix

EL

Chain Of Custody Form

analytics environmental laboratory LLC

195 Commerce Way Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

For Analytics Use Only Rev. 4 03/28/08

Samples were:
1) Shipped or hand-delivered (circled)
2) Temp blank °C 1.8
3) Received in good condition Y (circled) or N
4) pH checked by:
5) Labels checked by: KH

Project#: R091.06039.001 Proj. Name: NORTHGATE PLAZA CUS
Company: ANALYTICS Environmental Laboratory LLC
Contact: Ms. Melissa Gulli
Address: 195 COMMERCE WAY
PORTSMOUTH, NH 03801
Phone: 603-436-5111 PO# 64314 Quote #
Sampler (Signature):

Matrix Key: C = Concrete, WP = Wipe, WW = Wastewater, SW = Surface Water, GW = Groundwater, DW = Drinking Water, S = Soil/Sludge, O = Oil, E = Extract

Container Key: P=plastic G=glass

Station Identification	Sample Date	Sample Time	Analysis	Unpres	4° C	HNO_3	H_2SO_4	HCL	Methanol	Other	Matrix	Container number	Container type	pH	Analytics Sample #
B103, S-2, 2-4'	7-8-09	NA	Chloride, Sulfate	X	X						S	1	G		64314 -1
B105, S-3, 4-6'	↓	NA	Chloride, Sulfate	X	X						S	1	G		-2

Relinquished By Sampler:	Received By:	Time:	Date:
Relinquished By: [signature]	Received By: [signature]	Time: 11 20	Date: 7-16-09
Relinquished By:	Received By:	Time:	Date:

Email Results to:
sknollmeyer@analyticslab.com
mgulli@analyticslab.com

Turnaround Time (TAT)
☐ 24hr* ☐ 48hr* ☐ 72hr* ☒ 48 Days* (7/22/09) ☐ 10 Days
*Fee may apply; lab approval required

Comments / Instructions:
AEL to provide % solids.

Please reference Station ID number and AEL Lab number on report(s).
ok'd by Tammy 7-15-09
Method Type: RCRA (circled) NPDES DW
Metals (Aqueous) Total or Dissolved Field Filtered

Project Requirements:
*Fee may apply

Report Type: ☐ MCP* ☐ Level II* ☐ CTRCP* ☐ Level III* ☐ DOD* ☐ Level IV* ☒ Standard

State: ☐ NH ☐ MA ☐ ME ☐ CT ☐ RI Other:

State Standard:
(eg. S-1 or GW-1)
EDD Required: Y* N (circled)
Type:

Page 1 of 1

Analytics\AEL Documents\AEL COC

Chain Of Custody Form

analytics environmental laboratory LLC
195 Commerce Way Suite E
Portsmouth, NH 03801
Phone (603) 436-5111
Fax (603) 430-2151

Project#: R091.06037.001 Proj. Name: NORTHGATE PLAZA CUS
Company: Ransom Environmental Consultants, Inc.
Contact: DAVE BROOKS
Address: Reuse International Tradeport
112 Corporate Drive, Portsmouth, NH 03801
Phone (603) 436-1490 PO# 331 Quote #
Sampler (Signature):

Matrix Key:
WW=Wastewater
SW=Surfacewater
GW=Groundwater
DW=Drinkingwater
S=Soil/Sludge
O=Oil
E=Extract
X=Other

Preservation: Unpres | 4oC | HNO3 | H2SO4 | HCL | Methanol | Other

Container Key: P=plastic G=glass

Station Identification	Sample Date	Sample Time	Analysis	Matrix	Container number/type		pH	Analytics Sample #
B103, S-2, 2-4'	7/8/09		CHLORIDE	S	1	G		64314-1
B103, S-2, 2-4'	7/8/09		SULFATE	S	1	G		
B103, S-2, 2-4'	7/8/09		pH	S	1	G		
B105, S-3, 4-6'	7/8/09		CHLORIDE	S	1	G		
B105, S-3, 4-6'	7/8/09		SULFATE	S	1	G		-2
B105, S-3, 4-6'	7/8/09		pH	S	1	G		

Email RESULTS? (YES) NO
Email david.bryan@ransomenv.com
Fax RESULTS? YES NO
Fax# _____

Comments / Instructions:

Turnaround Request
Standard ☐ Due Date _____
Priority ☐ Due Date _____

For Analytics Use Only Rev. 2, 10/25/04
Samples were:
1) Shipped or (hand-delivered)
2) Temp blank °C 4°
3) Received in good condition (Y) or N
4) pH checked by: N/A
5) Labels checked by: 7/16/09

Relinquished By Sampler:	Relinquished By:	Relinquished By:
Date: 7/16/09	Date:	Date:
Time: 8:30am	Time:	Time:
Received By:	Received By:	Received By:

Page 1 of 1

Analytics\AEL Documents\AEL COC

DIVISION 1

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SECTION 01010 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK INCLUDES

A. Work of this Project comprises General Construction of a free-standing CVS/Pharmacy as indicated on drawings. All work will be under one contract.

B. Responsibilities: As outlined in responsibility schedule at end of this section.

1.2 QUALITY ASSURANCE

A. All work described in these Specifications or shown on the Drawings and all work necessary to complete finish of the work as described or shown is to be executed in a thoroughly substantial and workmanlike manner. All work shall be done by persons who are thoroughly experienced in their particular trade or crafts.

PART 2 - PRODUCTS

2.1 CLARIFICATION OF INFORMATION

A. Should it appear that the work intended to be described, or any of the matters relative thereto, are not sufficiently detailed or explained on the Drawings, or in the Project Manual, the Contractor shall consult the Architect for such further drawings or explanations as may be necessary, and shall conform to the same as far as they shall be consistent with original Drawings. In the event of any questions arising with respect to the true meaning of the Drawings and Specifications, reference shall be made to the Owner whose decision shall be final and conclusive. In no case shall any work proceed in uncertainty.

B. It is the intention of the Drawings and the Project Manual to provide a job complete in every respect. Contractor shall be responsible for this result and shall turn over the Project in complete operating condition regardless of whether the Drawings and Project Manual cover every individual item in minute detail.

C. On all Drawings, figures take precedence over measurements by scale. Large scale details take precedence over small scale details. In the event figures are missing, consult the Architect. Do not scale Drawings. In the event of a conflict between wording in the Project Manual and on the Drawings, please notify Architect/Engineer.

D. Certain schedules of materials, may accompany the Drawings in order to accommodate the Contractor and to avoid a confusing amount of lettering on the Drawings. Such diagrams are intended to be used in conjunction with the Drawings and Specifications, but are not to be interpreted as in any manner modifying or restricting such Drawings or the Specifications. Schedules of materials are furnished as a convenience only, and there is no guarantee that any schedule includes all of the work or materials required by the Drawings and the Project Manual.

2.2 NATIONAL ACCOUNTS

A. The following is a summary of the Owner's National Accounts for this Project. Refer to each of the following sections for more information including respective manufacturer's name(s), telephone number(s), and product information.

1. Section 04810 – UNIT MASONRY ASSEMBLIES – Face Brick
2. Section 06402 – INTERIOR ARCHITECTURAL WOODWORK: Cabinets, countertops, Laboratory Tops, and Chair Rail.
3. Section 07240 - EXTERIOR INSULATION AND FINISH SYSTEM - EIFS
4. Section 07530 – FULLY ADHERED EPDM ROOFING SYSTEM – Roofing System.
5. Section 08110 – STEEL DOORS AND FRAMES – Steel Doors and Frames
6. Section 08211 – FLUSH WOOD DOORS – Flush Wood Doors
7. Section 08331 – OVERHEAD COILING DOORS: Rolling Service Door.
8. Section 08334 – OVERHEAD COILING GRILLES: Security Grilles and Pharmacy Grille.
9. Section 08381 – TRAFFIC DOORS: Traffic Doors.
10. Section 08410 – ALUMINUM ENTRANCES AND STOREFRONTS: Storefront Windows.
11. Section 08461 – SLIDING AUTOMATIC ENTRANCE DOORS: Telescoping Door
12. Section 08512 – DRIVE-THRU WINDOW: Drive-Thru Window Package.
13. Section 08711 – DOOR HARDWARE: Door Hardware.
14. Section 09511 – ACOUSTICAL PANEL CEILINGS: Acoustical Ceiling and Ceiling Grid.
15. Section 09540 – DIRECT – APPLIED EXTERIOR FINISH SYSTEM – DEFS
16. Section 09651 – RESILIENT FLOORING: Resilient Flooring
17. Section 09680 – CARPET: Wainscot at Columns.
18. Section 09681 – CARPET TILE: Carpet Tile.
19. Section 09950 – WALL COVERINGS: Wall Coverings.
20. Section 10100 – VISUAL DISPLAY BOARDS: Bulletin Boards.
21. Section 10200 – VISUAL DISPLAY WALLS: Steel Pharmacy Bays.
22. Section 10425 – INTERIOR SIGNAGE: Graphics, Aisle Signs and Toilet Signs.
23. Section 10426 – EXTERIOR SIGNAGE: Pylon, Monument, Drive-Thru, and Building Signs.
24. Section 10450 – CART CORRAL: Cart Storage Enclosure.
25. Section 10801 – Toilet Accessories.
26. Section 11020 – SECURITY SAFES: Free-Standing Front Store and Pharmacy Security Safes.
27. Section 11172 – WASTE COMPACTOR.
28. Section 11200 – WALK IN COOLER: Walk in Beverage Display Cooler.
29. Section 11400 – COOLER AND FREEZERS: Cooling and Refrigeration Units.
30. Section 12300 – STEEL GONDOLA – Store display and storage fixtures.
31. Section 13851 – FIRE ALARM: Fire Alarm System.
32. Section 14566 – VERTICAL LIFT – Vertical Freight Lift.
33. Section 14570 – PNEUMATIC TRANSPORT SYSTEM: Tube Delivery System.
34. Section 15430 – PLUMBING SPECIALTIES: Pharmacy Water Purification System.
35. Section 15782 – ROOFTOP UNITS: HVAC Rooftop Units.
36. Section 16442 – PANELBOARDS: Electrical Switchgear.
37. Section 16511 – INTERIOR LIGHTING: Interior Lighting.
38. Section 16521 – EXTERIOR LIGHTING: Exterior Lighting and Photo metrics.

39. Section 16700 – ELECTRONIC DETECTION SYSTEM: EAS and POS Security System.
40. Section 16710 – BURGLAR ALARM SYSTEM.
41. Section 16729 – PUBLIC ADDRESS AND MUSIC SYSTEM
42. Section 16740 – COMMUNICATIONS EQUIPMENT
43. Section 16750 – ENERGY MANAGEMENT SYSTEM

2.3 YEAR 2000 COMPLIANCE WARRANTY

A. Hardware, software, and firmware products and other products and designs will accurately process date/time data (including calculating, comparing, and sequencing) from, into, and between the twentieth and twenty-first centuries, and the years 1999 and 2000 and leap year calculations to the extent that other information technology, used in combination with the information technology being acquired, properly exchanges date/time data with it.

B. If the Contract requires that specific listed products must perform as a system in accordance with this warranty, then extend that warranty to those listed products as a system.

C. If the Contract requires verification through testing that Products provided are Year 2000 compliant, such testing shall include the following dates and transition to and from each: 31 December 1998, 1 January 1999, 31 December 1999, 1 January 2000, 29 February 2000, 1 March 2000, 31 December 2000, 1 January 2001, 31 December 2004, and 1 January 2005. Contractor will provide, upon request, a copy of testing results which verify that Products are Year 2000 compliant.

D. The duration of this warranty and the remedies available to the Owner for breach of this warranty shall be as defined in and subject to, the terms and limitations of the standard commercial warranty or warranties under this Contract, the remedies available to the Owner under this warranty shall be limited to repair or replacement of any listed product whose noncompliance is discovered and made known in writing within 90 days after acceptance.

E. Do not construe anything in this warranty to limit any rights or remedies the Owner may otherwise have under this Contract with respect to defects other than Year 2000 performance.

PART 3 – EXECUTION

3.1 RESPONSIBILITY SCHEDULE – Refer to the Responsibility Schedule noted on the baseline Prototype Cover Sheet and coordinate with both the CVS Project Manager and CVS Real Estate for approval.

END OF SECTION 01010

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SECTION 01140 - WORK RESTRICTIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 USE OF PREMISES

A. Use of Site: Limit use of premises to work in areas indicated. Do not disturb portions of site beyond areas in which the Work is indicated.

1. Owner Occupancy: Allow for Owner occupancy of site.
2. Driveways and Entrances: Keep driveways and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.

    a. Schedule deliveries to minimize use of driveways and entrances.
    b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01140

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SECTION 01300 - SUBMITTALS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section includes the following administrative requirements to be fulfilled by the Contractor for the performance of the Work.

1. Certificate of Insurance.
2. Schedule of Values.
3. Contractor's Certification.

1.2 QUALITY ASSURANCE

A. Contractor shall complete and submit required documentation and ensure the completeness and accuracy of same.

PART 2 - PRODUCTS

2.1 CERTIFICATE OF INSURANCE

A. Within seven (7) calendar days after notification to the Contractor by the Owner of the acceptance of the Bid **OR** prior to commencement of any Work at the Project site, whichever is earlier, submit to the Owner a Certificate of Insurance meeting all requirements set forth in the Contract Documents.

2.2 SCHEDULE OF VALUES

A. Within fourteen (14) days after notification to the Contractor by the Owner of acceptance of the Bid, submit to the Owner a Schedule of Values depicting a complete and correct breakdown of costs covering the various portions of the Work included in the Contract Sum.

B. The Contractor agrees to revise the submitted breakdown, if necessary, to satisfy the Owner as to the extent and distribution of cost.

C. This breakdown, once accepted, shall become the basis for submitting the Contractor's Applications for Payment.

2.3 CONTRACTOR'S CERTIFICATION

A. Submittals will be submitted only by the Contractor. Indicate by signed stamp that the contract documents have been checked, that the work shown in the submittals is in accordance with the contract requirements and that dimensions and relationship with work of other trades have been checked. If submittals are submitted for review that have not been checked and signed by the Contractor, they will be returned for checking before being considered.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01300

SECTION 01310 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General project coordination procedures.
2. Administrative and supervisory personnel.
3. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to a specific contractor.

1.3 COORDINATION

A. Coordination: Coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. If necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

1.4 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1.5 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing.

d. Designation of responsible personnel.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for processing Applications for Payment.
g. Distribution of the Contract Documents.
h. Submittal procedures.
i. Preparation of Record Documents.
j. Use of the premises.
k. Responsibility for temporary facilities and controls.
l. Parking availability.
m. Office, work, and storage areas.
n. Equipment deliveries and priorities.
o. First aid.
p. Security.
q. Progress cleaning.
r. Working hours.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related Change Orders.
d. Purchases.
e. Deliveries.
f. Submittals.
g. Review of mockups.
h. Possible conflicts.
i. Compatibility problems.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's written recommendations.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.
r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Required performance results.
u. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements.

4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at regular intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Review present and future needs of each entity present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site utilization.
      8) Temporary facilities and controls.
      9) Work hours.
      10) Hazards and risks.
      11) Progress cleaning.
      12) Quality and work standards.
      13) Change Orders.
      14) Documentation of information for payment requests.

3. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

   a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01310

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SECTION 01340 – SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section provides for the preparation and submission of product data and shop drawings.

B. Each Section that has products listed therein incorporates this section by reference and is incomplete without the provisions stated herein.

1.2 FIELD SAMPLES

A. Field samples shall be submitted to the Architect/Engineer.

1.3 MANUFACTURERS

A. The listed manufacturers will be acceptable as long as they comply with the specifications.

B. Manufacturers who are not listed as "acceptable manufacturers" bear the burden of proof to the Architect/Engineer that their products comply with the specifications.

C. Provide all power distribution and similar equipment of the same manufacturer.

1.4 LETTER OF CONFORMANCE

A. Where product data, shop drawings, samples, installation instructions, or certificates are required. General Contractor shall have the option of submitting a Letter of Conformance to the Architect/Engineer for each product submitted, provided the submittal complies with the specifications. Refer to sample "Conformance Letter" at the end of this section.

B. When the conformance letter is submitted for products, no submittal review will be conducted, but General Contractor must maintain product data, shop drawings, samples, installation instructions, certificates, and mock-ups (as applicable) on file at the job site for those products.

1.5 PREPARATION

A. Shop Drawings and Submittal Data:

1. Prior to the start of installation, submit detailed shop drawings, descriptive literature, physical data and performance data for review for the items of equipment and materials listed in this Section. Include identifying symbols and equipment numbers used in plans and specifications, with reference to specification paragraphs, and drawing numbers of all equipment and material submitted. Provide drawings consisting of plans drawn to scale, with elevations and sections, to show clearly the location of major items of equipment, large piping and clearances for maintenance and code requirements. Design consultants' drawings may not be used for shop drawing backgrounds.
2. Submit all data complete by Section. Each Section will be handled separately. Any unacceptable items will be so noted and the entire package returned for correction and resubmittal. Once these items are corrected, the entire Section shall be resubmitted for review of the unacceptable items only. Partial submittals are unacceptable. Intent of this requirement is that all bound sets of data will be identical and will contain only acceptable information.
3. The review of shop drawings does not relieve or modify the responsibility for compliance with the Contract Documents or dimensions or errors contained in the submittal or quantity count. It is clearly understood that in the review process, noting of some discrepancies, but overlooking others, does not grant the Contractor permission to proceed in error. Regardless of any information contained in the shop drawings, layout drawings, catalog data and brochures, the Contract Documents govern the Work, and are neither waived nor suspended in any way by the review of shop drawings, layout drawings, catalog data and brochures.
4. A minimum review period of 7 working days, exclusive of transmittal time, is required in the Architect/Engineer's office each time product data or samples are submitted or resubmitted for review. Take this time period into consideration when scheduling the Work.
5. Include in submittals sufficient drawings, plans, elevations, sections, performance data, dimensions, bolt locations, inserts, sound data, weights and schematics to clearly describe the equipment and to show compliance with these specifications. Provide a cover or title sheet for each submittal containing the following:

    a. Name of Contractor originating the submittal.
    b. Name of project for which the submittal is made.
    c. An index of all items submitted.
    d. Identification of each item of material and equipment.
    e. Date of submittal.
    f. Contractor's certification.

6. Send all submittals as follows:

   a. Send the original submittal, including Fire Protection submittals, by use of an express service overnight to:

      Team CVS / Portland, ME
      BKA Architects, Inc.
      142 Crescent Street
      Brockton, MA 02302
      Telephone: (508) 583-5603
      Fax: (508) 584-2914

   b. Fire Protection submittals shall also be submitted to the applicable local Building Official or Fire Marshal for information only.
   c. Submit to Owner a complete copy of the Contractor's test and material certificate.

7. The original submittal shall consist of one (1) reproducible and five (5) prints of shop drawings and layout drawings as described below. Shop drawings and layout drawings which do not comply with these requirements will be returned for resubmittal.

   a. The Architect/Engineer will retain one (1) copy and Owner will retain one (1) copy of the submittal and the reproducible sepia. Remaining copies will be returned to the Contractor with a "Submittal Review" cover letter marked NOT REVIEWED, FURNISH AS SUBMITTED, FURNISH AS CORRECTED, REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM. If it is marked NOT REVIEWED, FURNISH AS SUBMITTED or FURNISH AS CORRECTED, no additional submittal is required. If it is noted REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM, repeat the submittal in accordance with the Contract Documents. It is intended that the Contractor submit complete and accurate shop drawing data at the first submittal. If the shop drawings or layout drawings are returned to the Contractor noted REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM, only one (1) additional submission is permitted.
   b. If the reproducible sepia marked FURNISH AS SUBMITTED or FURNISH AS CORRECTED is altered for any reason after if has been stamped, the REVIEWED stamp shall automatically be voided.
   c. If the reproducible sepia "Submittal Review" cover letter is altered for any reason after it has been reviewed, the REVIEWED cover letter shall automatically be voided.
   d. Provide all Work in accordance with shop drawings and layout drawings stamped noted NOT REVIEWED, FURNISH AS SUBMITTED or FURNISH AS CORRECTED inasmuch as they are in agreement with the Contract Documents. Where differences occur between the shop drawings and layout drawings and the Contract Documents, the Contract Documents shall govern the Work.

8. Submit one (1) original color brochure (if applicable) as published by the manufacturer along with five (5) copies of catalog data and brochures as described below. Catalog data and brochures which do not comply with these requirements will be returned for resubmittal. Where brochures published by the manufacturer are part of a submittal, include only information relevant to the particular equipment or materials to be furnished. In all cases where compliance with UL, FM, ARI or other similar organization's standards are required, provide proper documentation of this compliance with the manufacturer's published literature or drawings or by a letter signed by an officer of the company.

    a. The Architect/Engineer will retain the original manufacturer's brochure copy and Owner will retain one (1) copy of the submittal. Remaining copies will be returned to the Contractor noted NOT REVIEWED, FURNISH AS SUBMITTED, FURNISH AS CORRECTED, REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM. If it is marked NOT REVIEWED, FURNISH AS SUBMITTED or FURNISH AS CORRECTED, no additional submittal is required. If it is noted REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM, repeat the submittal in accordance with the Contract Documents. It is intended that the Contractor submit complete and accurate catalog data or brochures at the first submittal. If the catalog data or brochures are returned to the Contractor noted REVISE AND RESUBMIT or SUBMIT SPECIFIED ITEM, only one (1) additional submission is permitted. Catalog data and brochures will not be accepted after 45 days from the contract date.
    b. If the catalog data and brochures "Submittal Review" cover letter is altered for any reason after they have been reviewed, the REVIEWED cover letter shall automatically be voided.
    c. Provide all Work in accordance with catalog data and brochures noted NOT REVIEWED, FURNISH AS SUBMITTED or FURNISH AS CORRECTED inasmuch as they are in agreement with the Contract Documents. Where differences occur between the catalog data and brochures and the Contract Documents, the Contract Documents shall govern the Work.

9. NOTE: Submission of the five (1) copies of the catalog data and brochures is not required when the Contractor provides items consisting of the exact manufacturer, model and type specified. Only a submittal cover and the original color brochure (if applicable) as published by the manufacturer is required describing the item, the manufacturer and model number, along with certifying that it is "furnished as specified," will be sufficient. No review will be conducted.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION

3.1 REQUIRED SUBMITTALS BY SECTION

A. Product Data:

1. The term "product data" shall consist of, but not be limited to, the following items as applicable:

a. Manufacturer's Product Specifications.
b. Standard Details and Construction.
c. Finishes and Colors.
d. Certified Product Test Results.
e. Rough-In and Installation Instructions.
f. General Recommendations.
g. Maintenance Recommendations.
h. Accessories.
i. Required Supports.
j. Capacities.
k. Dimensions.
l. Type/Arrangement.
m. Performance/Operation.
n. Controls.
o. Size Capacities.
p. Piping Requirements.
q. Written Sequence of Controls.
r. Wiring Diagrams.
s. Pipe, Fittings and Valves.
t. Special Fabrications.
u. Drains.
v. Pressure Regulators.

B. Shop Drawings:

1. The term "shop drawings" shall consist of, but not be limited to, the following items as applicable:

a. Drawings, Plan Layout, Elevations, Grid and Spacing of Components.

1) Accessories, Fittings, Anchorages and Schedule of Components.
2) Material Certification.
3) Installation Drawings.
4) Schedules.
5) Piping Diagrams.
6) Wiring Diagrams.

3.2 FINAL SUBMITTAL

A. In addition to the number of copies of shop drawings and product data required to review submittals, maintain a separate file of final reviewed copies of such material. Deliver approved submittals in a hard-back binder for the Owner's use. Incorporate changes and revisions made throughout the construction period. Delivery of reviewed copies is a condition of final acceptance for the project.

END OF SECTION 01340

LETTER OF CONFORMANCE

Date: _____

Project Name: _____ Project Number _____

Project Location: City/ State: _____

Specification Section Number: _____ Specified Product: _____

This letter of Conformance is offered in lieu of Shop Drawings, Product Data, cut Sheets or Samples in accordance with Section 01300 – Submittals. The undersigned hereby declares that the Product identified above by manufacturer's name and model number is an acceptable product, suitable for the intended use as defined within the Contractor Documents and will be provided, installed and placed in operational condition in accordance with the manufacturer's printed instruction and Contract Documents.

General Contractor understands that he/she is not relieved of responsibility of acquiring and maintaining manufacturer's information necessary to coordinate installations.

(Contact name of Subcontractor offering above product)

_____ Phone: _____

(Signature)

(Contact name of General Contractor)

_____ Phone: _____

(Signature)

1.4 SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

1. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

1.6 QUALITY CONTROL

A. Contractor Responsibilities: Unless otherwise indicated, provide quality-control services specified and required by authorities having jurisdiction.

1. Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality-control services.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

C. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.

3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
5. Do not perform any duties of Contractor.

D. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field-curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

E. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

F. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Submit schedule within 30 days of date established for the Notice to Proceed.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary facilities and utilities required for the execution of the Work.

B. Temporary facilities shall be provided, maintained and paid for by the responsible Contractor or Subcontractor as specified herein and on completion of the Project the responsible Contractor or Subcontractor shall remove these temporary facilities from the premises.

1.2 QUALITY ASSURANCE

A. Comply with requirements of local laws and regulations governing construction and local industry standards in the installation and maintenance of temporary services and facilities.

1. Building Codes, including local requirements for permits, testing and inspection.
2. Health and safety regulations as governed by OSHA.
3. Utility company regulations and recommendations governing temporary utility services.
4. Police and Fire Department rules and recommendations.
5. Environmental protection regulations governing use of water and energy, and the control of dust, noise and other nuisances.

B. Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities, and obtain required certifications.

C. During progress of the Work, submit copies of reports and permits required by governing authorities, or necessary for installation and efficient operation of temporary services and facilities.

1. Submit copies of reports of tests, inspections, meter readings and similar procedures performed on temporary utilities before, during and after performance of the Work. Submit copies of permits, easements and similar documentation necessary for the installation, use and operation of temporary utility service.

D. Provide each temporary service and facility ready for use at each location when the service of facilities is first needed to avoid delay in performance of the Work. Maintain, expand as required, and modify temporary services and facilities as needed throughout the progress of the Work. Do not remove until services or facilities are no longer needed, or are replaced by the authorized use of completed permanent facilities.

E. Operate temporary services and facilities in a safe and efficient manner. Do not overload temporary services or facilities, and do not permit them to interfere with the progress of the Work. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.

PART 2 - PRODUCTS

2.1 TEMPORARY ACCESS

A. Locate, provide, and maintain temporary access to the construction site where such access will not interfere with the progress of the Work. The temporary access shall be for the free use of Subcontractors, vendors, the Owner and the Architect. The temporary access shall be adequate to sustain the loads to be carried and shall be maintained in a useable condition at all times. Such access shall be coordinated with the work being performed by other forces elsewhere on the site or adjacent property.

1. Provide snow removal where required to maintain temporary access to the Project.

B. Contractor and Subcontractors shall confine their construction activities to occur within the construction limits and staging area.

C. Maintain a temporary construction opening at the main entrance to the building for the use of Subcontractors.

2.2 TEMPORARY UTILITIES

A. Utility Permits:

1. Pay for, and make all necessary arrangements for, the securing of any temporary permits for the installation of electric light, power, and water during the term of building operation under the Contract.

B. Electric Service:

1. Provide, maintain, pay for, and arrange with the local utility company for electrical service of adequate capacity for the needs of all Contractors on the site during the construction period.
2. Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.

a. Use only grounded extension cords. Use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths.
b. Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets.

c. Provide ground-fault protection for plug-in connection of power tools and equipment.

d. Protect lamps where fixtures are exposed to breakage by construction operations. Provide exterior fixtures where fixtures are exposed to the weather or moisture.

3. The Electrical Subcontractor shall maintain light bulbs and extension cords sufficient to light the building for safety purposes and to carry on the Work properly.

4. Any Contractor who requires temporary electrical service for tools and equipment, other than lighting and fractional horse power motors, shall make installation arrangements with an electrical contractor. Contractors with equipment which utilizes 3/4 HP or larger motors and/or 3 phase power shall make similar arrangements. Any Contractor who requires these special power connections shall arrange and pay for the cost of installation and removal such services upon completion of the Work.

5. Owner will pay costs of energy used.

C. Heating and Ventilating:

1. During the construction of the building and until Substantial Completion of the Work, provide, pay for, and maintain all heat, fuel, and services necessary to protect work and material against injury from dampness and cold. Temporary heating units shall be approved types that will not stain or damage building materials.

D. Sanitary Facilitates:

1. Provide and maintain adequate chemical toilet facilities in a clean and sanitary condition for the use of Subcontractors. Comply with governing regulations including safety and health codes for the type, number, location, operation, and maintenance of toilets.

2. The Contractor and each Subcontractor shall provide their own drinking water from a proved safe source, so piped or transported as to be kept clean and fresh and service from single service containers or satisfactory types of sanitary drinking stands or fountains.

2.3 TEMPORARY CONSTRUCTION

A. Maintain equipment such as temporary stairs, barricades, ladders, ramps, scaffolds, runways, derrick, chutes, and the like, as required for proper execution of Work by trades. Such apparatus, equipment and constructions shall be as required by all State and local laws applicable thereto.

2.4 TEMPORARY STORAGE

A. Each Subcontractor shall provide storage sheds as their needs may require and shall coordinate the location with the Contractor. All temporary structures shall be removed before final acceptance of the Work.

B. Contractors are advised that there is limited storage at the project site. Contractors shall bring only the amount of product necessary for the completion of the immediate work.

2.5 SIGNS

A. No signs, billboards, or other advertisements shall be erected on the premise by the Contractor.

B. Furnish and maintain all necessary signs required for the performance of the Work such as "Office", "Men", "Danger", "High Voltage", etc.

2.6 WATER

A. Provide water to the site.

B. Subcontractors shall furnish their own hoses.

C. Site water will be available for general use upon completion of utilities.

D. The Contractor shall pay for temporary meter and/or water consumption.

2.7 FIRST AID FACILITIES

A. Provide and maintain adequate first aid facilities and clearly visible signage identifying location of first aid facilities.

2.8 PROTECTION OF WORK AND PROPERTY

A. Contractor shall be responsible for care and protection of the Work, equipment, and adjacent property until installation is complete and accepted by Owner.

B. Contractor shall not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio. Damage to the structural members of the building by any Contractor shall be made good at that Contractor's expense. Contractors shall obtain written approval from the Owner before cutting, drilling, or driving anchors into columns and before penetrating any beams.

1. Where damage occurs and responsibility for damage can be determined, the cost shall be charged to the party responsible. If responsibility cannot be determined, the cost shall be prorated among all contractors in proportion to their activities at the building at the time the damage was done, as determined by the Owner.

SECTION 01500 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Temporary facilities and utilities required for the execution of the Work.

B. Temporary facilities shall be provided, maintained and paid for by the responsible Contractor or Subcontractor as specified herein and on completion of the Project the responsible Contractor or Subcontractor shall remove these temporary facilities from the premises.

1.2 QUALITY ASSURANCE

A. Comply with requirements of local laws and regulations governing construction and local industry standards in the installation and maintenance of temporary services and facilities.

1. Building Codes, including local requirements for permits, testing and inspection.
2. Health and safety regulations as governed by OSHA.
3. Utility company regulations and recommendations governing temporary utility services.
4. Police and Fire Department rules and recommendations.
5. Environmental protection regulations governing use of water and energy, and the control of dust, noise and other nuisances.

B. Inspect and test each service before placing temporary utilities in use. Arrange for required inspections and tests by governing authorities, and obtain required certifications.

C. During progress of the Work, submit copies of reports and permits required by governing authorities, or necessary for installation and efficient operation of temporary services and facilities.

1. Submit copies of reports of tests, inspections, meter readings and similar procedures performed on temporary utilities before, during and after performance of the Work. Submit copies of permits, easements and similar documentation necessary for the installation, use and operation of temporary utility service.

D. Provide each temporary service and facility ready for use at each location when the service of facilities is first needed to avoid delay in performance of the Work. Maintain, expand as required, and modify temporary services and facilities as needed throughout the progress of the Work. Do not remove until services or facilities are no longer needed, or are replaced by the authorized use of completed permanent facilities.

E. Operate temporary services and facilities in a safe and efficient manner. Do not overload temporary services or facilities, and do not permit them to interfere with the progress of the Work. Do not allow unsanitary conditions, public nuisances or hazardous conditions to develop or persist on the site.

PART 2 - PRODUCTS

2.1 TEMPORARY ACCESS

A. Locate, provide, and maintain temporary access to the construction site where such access will not interfere with the progress of the Work. The temporary access shall be for the free use of Subcontractors, vendors, the Owner and the Architect. The temporary access shall be adequate to sustain the loads to be carried and shall be maintained in a useable condition at all times. Such access shall be coordinated with the work being performed by other forces elsewhere on the site or adjacent property.

1. Provide snow removal where required to maintain temporary access to the Project.

B. Contractor and Subcontractors shall confine their construction activities to occur within the construction limits and staging area.

C. Maintain a temporary construction opening at the main entrance to the building for the use of Subcontractors.

2.2 TEMPORARY UTILITIES

A. Utility Permits:

1. Pay for, and make all necessary arrangements for, the securing of any temporary permits for the installation of electric light, power, and water during the term of building operation under the Contract.

B. Electric Service:

1. Provide, maintain, pay for, and arrange with the local utility company for electrical service of adequate capacity for the needs of all Contractors on the site during the construction period.
2. Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service.

a. Use only grounded extension cords. Use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths.
b. Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets.

2.9 SAFETY

A. Contractor agrees to conduct work in a safe manner at all times, taking the precautions necessary to prevent injury and loss to employees at the project site, the Owner's employees, as well as to members of the public who may be near the project site.

B. Contractor will comply with regulations and standards, laws, ordinances, codes and rules with reference to safety and accident prevention.

C. Contractor accepts responsibility for enforcing the standards and regulations of the Occupational Safety and Health Act or other Acts pertaining to safety.

2.10 FIRE PROTECTION

A. Contractor shall be responsible for the maintenance of the following fire prevention steps.

1. SMOKING is not allowed in the building.

B. Each Contractor shall recognize the utmost importance of extraordinary precautions necessary to prevent a fire in, or adjacent to, the Project. Each Contractor, Subcontractors and workmen shall provide sufficient fire fighting devices, watchman, standby helpers, or other precautions while temporary heating devices are being used during operations such as welding, brazing, testing, or other phases of Work which present a fire hazard or potential fire hazard.

2.11 TEMPORARY CONTROLS

A. Maintain the following protection/controls:

1. Dust and noise control
2. Protection of adjacent property.
3. Traffic and Parking control.
4. Rodent and pest control.
5. Waste disposal services.

B. Consumption of food and beverage within the building after enclosure shall be limited to an isolated area determined by the Contractor and approved by the Owner. This area shall be left broom clean at the end of each day and all refuse removed daily.

PART 3 - PRODUCTS – Not Used

END OF SECTION 01500

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SECTION 01600 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following administrative and procedural requirements: Selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products.

1.3 DEFINITIONS

A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation, shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.

D. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner.

1.4 SUBMITTALS

A. Product List: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

a. Specification Section number and title.
b. Generic name used in the Contract Documents.
c. Proprietary name, model number, and similar designations.
d. Manufacturer's name and address.
e. Supplier's name and address.
f. Installer's name and address.
g. Projected delivery date or time span of delivery period.
h. Identification of items that require early submittal approval for scheduled delivery date.

3. Initial Submittal: Within 15 days after date of commencement of the Work, submit 4 copies of initial product list. Include a written explanation for omissions of data and for variations from Contract requirements.

a. At Contractor's option, initial submittal may be limited to product selections and designations that must be established early in Contract period.

4. Completed List: Within 30 days after date of commencement of the Work, submit 4 copies of completed product list. Include a written explanation for omissions of data and for variations from Contract requirements.
5. Architect's Action: Architect will respond in writing to Contractor within 15 days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement that products comply with the Contract Documents.

B. Substitution Requests: Submit four copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form provided at end of Section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified material or product cannot be provided.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
g. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
h. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
i. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
j. Cost information, including a proposal of change, if any, in the Contract Sum.
k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

   a. Form of Acceptance: Change Order.
   b. Use product specified if Architect cannot make a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturer's written instructions.

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected.
5. Store products to allow for inspection and measurement of quantity or counting of units.
6. Store materials in a manner that will not endanger Project structure.
7. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
8. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
9. Protect stored products from damage.

B. Storage: Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution. Submit a draft for approval before final execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Refer to Divisions 2 through 16 Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 1 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT OPTIONS

A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged, and unless otherwise indicated, that are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish "salient characteristics" of products.

B. Product Selection Procedures: Procedures for product selection include the following:

1. Product: Where Specification paragraphs or subparagraphs titled "Product" name a single product and manufacturer, provide the product named.

   a. Substitutions may be considered, unless otherwise indicated.

2. Manufacturer/Source: Where Specification paragraphs or subparagraphs titled "Manufacturer" or "Source" name single manufacturers or sources, provide a product by the manufacturer or from the source named that complies with requirements.

3. Products: Where Specification paragraphs or subparagraphs titled "Products" introduce a list of names of both products and manufacturers, provide one of the products listed that complies with requirements.

   a. Substitutions may be considered, unless otherwise indicated.

4. Manufacturers: Where Specification paragraphs or subparagraphs titled "Manufacturers" introduce a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

   a. Substitutions may be considered, unless otherwise indicated.

5. Available Products: Where Specification paragraphs or subparagraphs titled "Available Products" introduce a list of names of both products and manufacturers, provide one of the products listed or another product that complies with requirements. Comply with provisions in "Comparable Products" Article to obtain approval for use of an unnamed product.
6. Product Options: Where Specification paragraphs titled "Product Options" indicate that size, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide either the specific product or system indicated or a comparable product or system by another manufacturer. Comply with provisions in "Product Substitutions" Article.

7. Visual Matching Specification: Where Specifications require matching an established Sample, select a product (and manufacturer) that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches satisfactorily.

    a. If no product available within specified category matches satisfactorily and complies with other specified requirements, comply with provisions of the Contract Documents on "substitutions" for selection of a matching product.

8. Visual Selection Specification: Where Specifications include the phrase "as selected from manufacturer's colors, patterns, textures" or a similar phrase, select a product (and manufacturer) that complies with other specified requirements.

    a. Standard Range: Where Specifications include the phrase "standard range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
    b. Full Range: Where Specifications include the phrase "full range of colors, patterns, textures" or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 PRODUCT SUBSTITUTIONS

A. Timing: Architect will consider requests for substitution if received within 60 days after the Notice to Proceed. Requests received after that time may be considered or rejected at discretion of Architect.

B. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

    1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

2. Requested substitution does not require extensive revisions to the Contract Documents.
3. Requested substitution is consistent with the Contract Documents and will produce indicated results.
4. Substitution request is fully documented and properly submitted.
5. Requested substitution will not adversely affect Contractor's Construction Schedule.
6. Requested substitution has received necessary approvals of authorities having jurisdiction.
7. Requested substitution is compatible with other portions of the Work.
8. Requested substitution has been coordinated with other portions of the Work.
9. Requested substitution provides specified warranty.
10. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

2.3 COMPARABLE PRODUCTS

A. Where products or manufacturers are specified by name, submit the following, in addition to other required submittals, to obtain approval of an unnamed product:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01600

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SECTION 01700 - EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
   1. Construction layout.
   2. General installation of products.
   3. Coordination of Owner-installed products.
   4. Progress cleaning.
   5. Starting and adjusting.
   6. Protection of installed construction.
   7. Correction of the Work.

1.3 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Acceptance of Conditions: Examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
   1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
      a. Description of the Work.
      b. List of detrimental conditions, including substrates.
      c. List of unacceptable installation tolerances.
      d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

3.3 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 8 feet in spaces without a suspended ceiling.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.

G. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

H. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.4 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction forces.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction forces.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction forces at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction forces if portions of the Work depend on Owner's construction.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

B. Site: Maintain Project site free of waste materials and debris.

C.

D. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

E. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

F. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

G. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

H. Cutting and Patching: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.
   1. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

I. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.

J. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

K. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

L. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.8 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

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SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITION

A. The Developer is the person or entity identified as such in the agreement and is referred to throughout the contract documents as if singular in number. The term "Developer" means the developer or the developer's authorized representative.

B. The CVS Representative is the person or entity identified as such in the agreement and is referred to throughout the contract documents as if singular in number. The term "CVS Representative" means the CVS Representative or the CVS authorized representative.

C. Contract conditions from project to project may allow that the two above definitions be interchangeable. The "Developer" shall complete actions listed in this section for Fee-for-Service program contracts. The "CVS Representative" shall complete actions listed in this section for other contract types.

1.3 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. List of Required Documents
6. Final Documentation on CD-Rom.
7. Instruction of Owner's personnel.
8. Final cleaning.

1.4 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
3. Obtain and submit assignments and permits allowing Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar permits and assignments.
4. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, and similar final record information.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
6. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions and provide manuals, security codes and keys.
7. Complete startup testing of systems.
8. Submit test/adjust/balance records.
9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, construction signs, and similar elements.
10. Advise Owner of changeover in electric, gas, water, sewer, and other utilities.
11. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
12. Complete final cleaning requirements, including touchup painting.
13. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Developer will either proceed with inspection or notify Contractor of unfulfilled requirements. Developer will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Developer, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.5 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit an Application for Final Payment. (See subsection 1.9).
2. Submit certified copy of Developer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Developer. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Developer will either proceed with inspection or notify Contractor of unfulfilled requirements. Developer will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.6 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit three (3) copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

a. Project name.
b. Date.
c. Name of Developer.
d. Name of Contractor.
e. Page number.

1.7 PROJECT RECORD DOCUMENTS (AS-Built Drawings)

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Developer's reference during normal working hours.

B. Record Drawings: Maintain and submit one set of blue- or black-line white prints of Contract Drawings and Shop Drawings to Developer.

1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity that obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
b. Accurately record information in an understandable drawing technique.
c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
d. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

2. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at the same location.
3. Mark important additional information that was either shown schematically or omitted from original Drawings.
4. Note Construction Change Directive numbers, Change Order numbers, alternate numbers, and similar identification where applicable.
5. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location. Organize into manageable sets; bind each set with durable paper cover sheets. Include identification on cover sheets.

C. Record Specifications: Submit one copy of Project's Specifications, including addenda and contract modifications. Mark copy to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
3. Note related Change Orders, Record Drawings, and Product Data, where applicable.

1.8 OPERATION AND MAINTENANCE MANUALS

A. Assemble a complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system to Developer. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data:

a. Emergency instructions and procedures.
b. System, subsystem, and equipment descriptions, including operating standards.
c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
d. Description of controls and sequence of operations.
e. Piping diagrams.

2. Maintenance Data:

a. Manufacturer's information, including list of spare parts.
b. Name, address, and telephone number of Installer or supplier.
c. Maintenance procedures.
d. Maintenance and service schedules for preventive and routine maintenance.
e. Maintenance record forms.
f. Sources of spare parts and maintenance materials.
g. Copies of maintenance service agreements.
h. Copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.9 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated. All warranties from manufactures, suppliers, contractors, and others to be assigned and delivered to owner.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.

2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

1.10 LIST OF REQUIRED DOCUMENTS FOR FINAL PAYMENT

A. The following list of documents shall be submitted by the General Contractor to the Developer before CVS will release final payment:

1. Permanent Certificate of Occupancy
2. Execute and deliver certificate from the developer and the general contractor confirming completion (form COMP)
3. As Built Survey (ALTA, CVS Standards)
4. Waiver of Liens from Developer, General Contractor, and for all Sub Contractor & material suppliers, (Attached is a list of sub contractors with their Names, Addresses, and Phone Numbers)
5. Affidavit of release of liens (6706A G.C.)
6. Final Draw request and CVS approval (including and remaining Soft Costs)
7. Sign off from CVS Construction Project Manager
8. Execution and deliver Site Engineer Certification (form ENG)
9. Title date down to be obtained by CVS (not earlier than 5 business days prior to date of payment)

B. A copy of the above list is attached to the end of this section.

1.11 FINAL DOCUMENTATION

A. Final Documentation: The developer shall provide final documentation in the form of a CD-Rom to CVS upon the completion of the project. The information shall be included in the following format and submitted to the payment group within CVS/pharmacy. CVS will distribute this information to each applicable store location.

1. Cover Page
2. Index
3. Section A

    a. Permanent Certificate of Occupancy
    b. Building Permit

4. Section B

   a. Certificate of Completion (form COMP)
   b. Contractors Affidavit
   c. Site Engineers Certification (form ENG)

5. Section C-Waiver of Liens

   a. Final Waiver of Liens
   b. List sub-contractors with Names, Addresses and Phone Numbers

6. Section D-Warranties

   a. List sub-contractors with Names, Addresses and Phone Numbers

7. Equipment Vendors

   a. List vendors with Names, Addresses and Phone Numbers

8. AS-Built Drawings

   a. List as-built drawings

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

   1. Schedule training with Owner, through Architect, with at least seven days' advance notice.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to unusual operating conditions.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.

q. Clean ducts, blowers, and coils if units were operated without filters during construction.

r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01770

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CVS/pharmacy # 00329 Portland, ME

08/26/09

Store #:

Developer:

Location:

Attn:

The Following is a list of required documents for CVS to release final payment:

We have checked off what we have received:

Please furnish the remainder of the documents. Final payment **will not be executed** until this has been received.

- ☐ Permanent Certificate of Occupancy
- ☐ Certificate from the Developer and the General Contractor confirming completion form (COPM)
- ☐ As Built Survey (ALTA, CVS Standards)
- ☐ Waiver of Liens from Developer, General Contractor, all Sub Contractors & material suppliers (Attach a list of sub contractors with their Names, Addresses, and Phone Numbers)
- ☐ Affidavit of release of liens (6706A G.C.)
- ☐ Final Draw request and CVS approval (including any remaining Soft Costs)
- ☐ Sign off from CVS Construction Project Manager
- ☐ Site Engineer Certification (form ENG)
- ☐ Title update by CVS

COMMENTS:

_____

_____

_____

By: _____ Date:

Send to: Payment Group Manager

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SECTION 01800 – REQUEST FOR INFORMATION

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section provides for the preparation and submission of a Request For Information (RFI).

B. Each Section incorporates this Section by reference and is incomplete without the provisions stated herein.

1.2 ORIGINATION

A. Requests for Information (RFIs) are generated by General Contractor for a project and are numbered accordingly. Questions from subcontractors shall be directed to the General Contractor, rather than directly to architect.

1. All contractual relationships shall be clarified by the Owner.
2. RFIs shall be generated using the established attached form describing pertinent project data and contractor information, concerns, and proposed solutions.
3. The General Contractor shall fax clarifications, or correspond directly with the architect.

1.3 SUBMISSION

A. General Contractor shall fax the RFI to the architect. The fax to the architect shall be addressed to the Construction Coordinator. The standard Request for Information form shall be utilized.

1. Owner shall introduce this process to the General Contractor for the project.
2. For a phoned-in RFI, the standard RFI form shall be completed by the recipient of the call and processed through normal channels. Phoned-in RFIs are discouraged to minimize errors in interpretation of the question.

B. The Construction Coordinator shall promptly deliver the RFI to the appropriate Design Team member who will then review and initiate the research process. Additionally, the Construction Coordinator and Project Manager shall monitor the status of the RFI throughout the day to ensure that the appropriate action is underway.

C. A reply or status report shall be provided to the General Contractor and Owner within 24 hours.

D. The Design Team member shall study the RFI and formulate a cursory reply. Once the Team member reaches a conclusion or questions arise, the Team member shall consult with the appropriate Project Manager for confirmation of the desired solution or to obtain the most appropriate solution. Any Discipline Leader, Project Manager and/or Program Manager will be utilized for instructions, opinion, and guidance.

E. The subject matter contained in an RFI may require additional data from other sources.

1. The subject matter contained in an RFI may be unclear and require additional data from the General Contractor.

    a. In this case, the appropriate Project Manager and/or Program Manager shall accompany the Team member in contacting the General Contractor and/or the Owner.
    b. A telephone conversation record of all calls shall be recorded and copied to the General Contractor and the Owner and always be attached to the RFI response.

2. Should the subject matter contained in an RFI require input from the Owner, the Project Manager will fax the RFI form to the Owner along with the original RFI and all supportive documentation.

    a. The information requested as needed from the Owner should be so noted under the category heading "ADDITIONAL INFORMATION REQUIRED".
    b. Any RFI containing a major product substitution must be discussed with the Owner prior to resolution. In any event, the Owner shall be notified of the RFI status within 24 hours of receipt at architects office.

F. Once the Design Team member has concluded research into the RFI and formulated a final response in adequate detail (referencing drawing plans, sections, and details as well as specification paragraphs), the reply shall be prepared using the Master RFI Reply Form. RFI responses should contain clear and concise written replies with details, specifications, sketches, etc., if appropriate. All categories of the RFI shall be addressed. The intent of the RFI response is to completely resolve the issue and eliminate the need for further discussions.

G. The RFI shall then be delivered to the Project Manager for approval and signature prior to returning it to the General Contractor. The complete RFI package will include a Fax Transmittal Form appropriately filled out. In the event that the Project Manager is not immediately available, the RFI shall be submitted directly to the Program Manager.

H. Under no circumstances shall the Team member allow the absence of the Discipline Leader, Project Manager, or Program Manager to hold up release of the RFI. If no one is available, the next appropriate party in the chain of command outside the immediate design team and/or discipline shall be pursued.

1.4 RESPONSE

A. The response or acknowledgment of the RFI must be faxed by the Construction Coordinator to the General Contractor and the Owner within 24 hours of receipt. The RFI response is immediately logged out by the project manager.

1. The fax coversheet must contain a notice of each affected project, the master specifications, and/or each prototype.
2. If the RFI cannot be addressed and responded to within the 24 hour mandated time frame, an acknowledgment of receipt along with a status describing the anticipated completion time shall be faxed to the General Contractor and the Owner.
3. Under no circumstances shall an RFI be forwarded to the General Contractor and the Owner with pending questions or need for clarification. General Contractor and Owner shall be immediately contacted for consultation in this instance.

B. The project manager shall serve as the individual who is responsible for recognizing any RFI not logged out within the required 24 hour period. In the event an RFI is not logged out within 24 hours, the project manager shall consult with the appropriate Design Team member as to the status. The Project Manager and the Program Manager will be notified via a status log of all outstanding RFIs. This outstanding RFI log will be created at 4:00 p.m. each day and delivered to the appropriate Team Member, Project Manager, and Program Manager, and may be faxed directly to the General Contractor and Owner as appropriate.

1.5 FEEDBACK

A. Where responses to RFIs consist of options or directions given to the field which require feedback, an explanation of the action taken in the field shall be sent back to the architect in order that an up-to-date set of documents can be maintained.

1.6 RFI LOG

A. An updated RFI log in complete format, along with hard copies of the week's RFIs, will be provided to the General Contractor and Owner weekly. This is the responsibility of the architect.

PART 2 - PRODUCTS (Not used)

PART 3 - EXECUTION (Not used)

END OF SECTION 01800

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REQUEST FOR INFORMATION

RFI Date:		**Project Name:** CVS / Portland, ME	
RFI No.:		**Project No.:** 209017	
To:	BKA Architects, Inc. – Team CVS	508-584-2914	FAX
From:	General Contractor		FAX

Information Requested (Summary)

Topic:

The A/E will review formal requests from the General Contractor for information regarding the Work. Each Request for Information will be reviewed according to the contract requirements and a notification in writing will be made or progress underway will be reported.

Information Requested

Drawing/Specification:

Existing Condition/Statement of Concern:

Proposed Solution:

By:	*Signature:*	*Title:*

cc:

Request for Information Response

A/E RFI # _____

Contractor RFI# _____

PROJECT: CVS Portland, ME PROJECT NO.: 209017

RFI DATE: _____ RFI REPLY DATE: _____

TO: Team CVS – Portland, ME FAX NO.: 508-584-2914

_____ FAX NO.: _____

FROM: _____

Telephone Number: ( ) - FAX Number: ( ) -

TOPIC:

DRAWING/SPECIFICATION REFERENCE:

EVALUATION OF CONDITIONS:

DISCUSSION OF ALTERNATIVES:

ADDITIONAL INFORMATION REQUIRED:

RECOMMENDATIONS:

ATTACHMENTS:

Response By: _____ Action Item Number: _____

cc: No. of Pages Transmitted: _____

JOB #	CVS/Pharmacy Store # 00329		Portland, ME			
209017	[DISCIPLINE] REQUEST FOR INFORMATION					
RFI NO.	DESCRIPTION	DATE IN	DATE OUT	ACTION BY	TRANSMITTAL METHOD AND REMARKS	ACTION ITEM #

DIVISION 2

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SECTION 02230 - SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Protecting existing trees and vegetation to remain.
2. Removing trees and other vegetation.
3. Clearing and grubbing.
4. Topsoil stripping.
5. Removing above-grade site improvements.
6. Disconnecting, capping or sealing, and abandoning site utilities in place.
7. Disconnecting, capping or sealing, and removing site utilities.

1.2 MATERIALS OWNERSHIP

A. Except for materials indicated to be stockpiled or to remain Owner's property, cleared materials shall become Contractor's property and shall be removed from the site.

1.3 PROJECT CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

B. Notify utility locator service for area where Project is located before site clearing.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Satisfactory Soil Materials: As specified in Division 2 Section "Earthwork."

1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

B. Locate and clearly flag trees and vegetation to remain or to be relocated.

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to Owner.

3.2 TREE PROTECTION

A. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Remove fence when construction is complete.

B. Do not excavate within drip line of trees, unless otherwise indicated.

C. Where excavation for new construction is required within drip line of trees, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Architect.

3.3 UTILITIES

A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.

B. Do not interrupt utilities serving facilities occupied by Owner or others unless permitted. Arrange to provide temporary utility services.

C. Excavate for and remove underground utilities indicated to be removed.

3.4 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding 8-inch (200-mm) loose depth, and compact each layer to a density equal to adjacent original ground.

3.5 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials.

C. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3.6 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

3.7 DISPOSAL

A. Disposal: Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 02230

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SECTION 02300 - EARTHWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Preparing subgrades.
2. Excavating and backfilling.
3. Drainage course for slabs-on-grade.
4. Subbase course for concrete walks and pavements.
5. Base course for asphalt paving.

1.3 DEFINITIONS

A. Backfill: Soil materials used to fill an excavation.

B. Base Course: Layer placed between the subbase course and asphalt paving.

C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

E. Excavation: Removal of material encountered above subgrade elevations.

1. Additional Excavation: Excavation below subgrade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

F. Fill: Soil materials used to raise existing grades.

G. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

H. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.

I. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.

J. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.4 PROJECT CONDITIONS

A. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Owner's representative and then only after arranging to provide temporary utility services according to requirements indicated.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: ASTM D 2487 Soil Classification Groups **[GW, GP, GM, SW, SP, and SM]** <**Insert satisfactory soil groups**>, or a combination of these group symbols; free of rock or gravel larger than **[3 inches]** <**Insert size**> in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Backfill and Fill: Satisfactory soil materials.

D. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

G. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch sieve and 0 to 5 percent passing a No. 8 sieve.

H. Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.

D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.

3.2 EXCAVATION

A. Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Excavate for structures, pavements, and walks to indicated elevations and dimensions. Extend excavations for placing and removing concrete formwork, for installing services and other construction, and for inspections. Trim bottoms to required lines and grades to leave solid base to receive other work.

C. Excavate utility trenches to indicated gradients, lines, depths, and invert elevations of uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit.

1. Excavate trenches deeper than bottom of pipe elevation, 6 inches deeper in rock, 4 inches deeper elsewhere, to allow for bedding course. Hand excavate for bell of pipe.

D. Proof roll subgrades, before filling or placing aggregate courses, with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.

E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.

F. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.

1. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

G. Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.

3.3 BACKFILLS AND FILLS

A. Utility Trench Backfill: Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations.

1. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit. Place and compact final backfill of satisfactory soil material to final subgrade.
2. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

B. Fill: Place and compact fill material in layers to required elevations.

C. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.

1. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

D. Compaction: Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

E. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 92 percent.
3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent.

F. Grading: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved subgrades to tolerances of plus or minus 1 inch and pavements and areas within building lines to plus or minus 1/2 inch.

G. Subbase and Base Courses: Under pavements and walks, place subbase course on prepared subgrade. Place base course material over subbase. Compact to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

H. Under slabs-on-grade, place drainage course on prepared subgrade. Compact to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

B. Allow testing agency to test and inspect subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

C. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.

3.5 PROTECTION AND DISPOSAL

A. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

D. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION 02300
CVS 11/99

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SECTION 02361 - TERMITE CONTROL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following for termite control:

1. Soil treatment.
2. Bait station system. (If required by the CVS Project Manager)

1.3 DEFINITIONS

A. EPA: Environmental Protection Agency.

B. PCO: Pest control operator.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.

B. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

1.5 PROJECT CONDITIONS

A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

1.6 COORDINATION

A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

B. Install bait station system after construction and landscaping is completed. (If required by the CVS Project Manager)

1.7 WARRANTY

A. General Warranty: Special warranty specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Five years from date of Substantial Completion.

1.8 MAINTENANCE SERVICE

A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 SOIL TREATMENT

A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AgrEvo Environmental Health, Inc.; a Company of Hoechst and Schering, Berlin.
2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
3. Bayer Corp.; Garden & Professional Care.
4. DowElanco.
5. FMC Corp.; Pest Control Specialties.
6. Zeneca Professional Products.

2.2 BAIT STATION SYSTEM (If required by the CVS Project Manager)

A. General: Provide bait stations and, if applicable, monitoring stations, according to manufacturer's EPA-Registered Label for product, manufacturer's written instructions, and the following:

1. Provide number of stations, based on the dimensions of building perimeter indicated on Drawings, according to manufacturer's written instructions.
2. Comply with manufacturer's written instructions for termite management system. Provide not less than one cluster of stations per 20 linear feet (6 linear meters), based on the linear dimensions of building perimeter indicated on Drawings, consisting of not less than three stations per cluster.

B. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, the following:

1. Hexaflumuron: Sentricon System, Recruit II; DowElanco.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil and around foundations.

B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated, except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended by termiticide manufacturer.

C. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

3.3 APPLICATION, GENERAL

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

3.4 APPLYING SOIL TREATMENT

A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.

1. Slabs-on-Grade: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, and piers; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
3. Masonry: Treat voids.
4. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.

B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.

C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.

D. Post warning signs in areas of application.

E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

3.5 INSTALLING BAIT STATION SYSTEMS (If required by the CVS Project Manager)

A. Place bait stations and, if applicable, monitoring stations, according to the EPA-Registered Label for the product and manufacturer's written instructions, in areas that are conducive to termite feeding and activity, as follows:

1. Areas of high soil moisture.
2. Each area where roof drainage system, including downspouts and scuppers, drains to soil.
3. Along driplines of roof overhangs without gutters.
4. Where condensate lines from mechanical equipment drip or drain to soil.
5. At plumbing penetrations through ground-supported slabs.

6. Other sites and locations as determined by the PCO.
7. Reference site plan of other locations.

B. Inspect and service stations from time of their application until completion of the time period established by continuing service agreement, according to the EPA-Registered Label for the product and manufacturer's written instructions for termite management system and bait products.

1. Service Frequency: Inspect monitoring stations not less than once every three months.

C. Inspect and service stations from time of their application until completion of the time period established by continuing service agreement, according to the EPA-Registered Label for the product and manufacturer's written instructions for termite bait products.

1. Service Frequency: For supplementary and preventive treatment, inspect not less than once every three months.

END OF SECTION 02361

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SECTION 02810 - IRRIGATION SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes piping, valves, sprinklers, specialties, controls, and wiring for automatic-control irrigation system.

1.3 DEFINITIONS

A. Circuit Piping: Downstream from control valves to sprinklers, specialties, and drain valves. Piping is under pressure during flow.

B. Drain Piping: Downstream from circuit-piping drain valves. Piping is not under pressure.

C. Irrigation Main Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.

1.4 SUBMITTALS

A. Product Data: Include pressure ratings, rated capacities, and settings of selected models for the following:

1. General-duty valves.
2. Specialty valves.
3. Control-valve boxes.
4. Sprinklers.
5. Irrigation specialties.
6. Controllers.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 PIPES, TUBES, AND FITTINGS

A. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedule 40.

1. PVC Socket Fittings, Schedule 40: ASTM D 2466.

B. PE, Controlled OD Pipe: ASTM F 771 and ASTM D 3035, PE 3408 compound, **[DR 9] [DR 9 and DR 11] [DR 11]**.

1. PE Socket Fittings: ASTM D 2683.
2. PE Butt-Fusion Fittings: ASTM D 3261.

C. PE, Controlled ID Pipe: ASTM F 771 and ASTM D 2239; PE 3408 compound; **[SIDR 7] [SIDR 9] [SIDRs 9, 11.5, and 15]**.

1. Insert Fittings for PE Pipe: ASTM D 2609, PA or PP. Include bands or other fasteners.

2.3 GENERAL-DUTY VALVES

A. PVC Ball Valves: MSS SP-122, **[union] [nonunion]** type, with full-port ball, **[socket] [threaded] [socket or threaded]** detachable end connectors, and pressure rating not less than **[125 psig] [150 psig] <Insert other>**.

1. Material Option: MSS SP-122, of plastic other than PVC and suitable for potable water. Include threaded ends and pressure rating not less than 150 psig, unless otherwise indicated.
2. Manufacturers:

a. American Valve, Inc.
b. Sloane, George Fischer.

2.4 SPECIALTY VALVES

A. Plastic Automatic Control Valves: Molded-plastic body, normally closed, diaphragm type with manual flow adjustment, and operated by 24-V ac solenoid.

1. Manufacturers:

a. Nelson, L. R. Corporation.
b. Rain Bird Sprinkler Mfg. Corp.
c. Toro Company (The); Irrigation Div.

B. Automatic Drain Valves: Spring-loaded-ball type of corrosion-resistant construction and designed to open for drainage if line pressure drops below 2-1/2 to 3 psig.

C. Quick-Couplers: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

D. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4 inch minimum to 3 inches maximum.

2.5 SPRINKLERS

A. Description: Brass or plastic housing and corrosion-resistant interior parts designed for uniform coverage over entire spray area indicated, at available water pressure.

1. Manufacturers:

a. Hunter Industries Incorporated.
b. Nelson, L. R. Corporation.
c. Rain Bird Sprinkler Mfg. Corp.
d. Toro Company (The); Irrigation Div.

2. Flush, Surface Sprinklers: Fixed pattern, with screw-type flow adjustment.
3. Bubblers: Fixed pattern, with screw-type flow adjustment.
4. Shrubbery Sprinklers: Fixed pattern, with screw-type flow adjustment.
5. Pop-up, Spray Sprinklers: Fixed pattern, with screw-type flow adjustment and stainless-steel retraction spring.
6. Pop-up, Rotary, Spray Sprinklers: Gear drive, full-circle and adjustable part-circle types.
7. Pop-up, Rotary, Impact Sprinklers: Impact drive, full-circle and part-circle types.
8. Aboveground, Rotary, Impact Sprinklers: Impact drive, full-circle and part-circle types.

2.6 SPRINKLER SPECIALTIES

A. Strainer/Filter Units: Brass or plastic housing, with corrosion-resistant internal parts; of size and capacity required for devices downstream from unit.

B. Emitters: PE or vinyl body.

1. Manufacturers:

a. Agrifim.
b. Amiad Filtration Systems.
c. Netafim USA.
d. NIBCO INC.
e. Rain Bird Sprinkler Mfg. Corp.
f. Toro Company (The); Irrigation Div.

2. Single-Outlet Emitters: To deliver the following flow at approximately 20 psig:

a. Flow: 1/2 gph.
b. Tubing Size: 1/8-inch minimum ID and 10 feet long.

3. Outlet Caps: Plastic, for outlets without tubing.

C. Drip Tubes: NPS 1/2, flexible PE or PVC tubing for emitters and other devices, of length indicated and with plugged end.

1. Manufacturers:

a. Netafim USA.
b. NIBCO INC.
c. Rain Bird Sprinkler Mfg. Corp.

2.7 AUTOMATIC-CONTROL SYSTEM

A. Manufacturers:

1. Nelson, L. R. Corporation.
2. Rain Bird Sprinkler Mfg. Corp.
3. Toro Company (The); Irrigation Div.

B. Exterior Control Enclosures: NEMA 250, Type 4, weatherproof, with locking cover and two matching keys; include provision for grounding.

1. Material: Enameled-steel, sheet metal.
2. Mounting: As indicated..

C. Interior Control Enclosures: NEMA 250, Type 12, dripproof, with locking cover and two matching keys.

1. Material: Enameled-steel, sheet metal.
2. Mounting: As indicated.

D. Control Transformer: 24-V secondary, with primary fuse.

E. Controller Stations for Automatic Control Valves: Each station is variable from approximately 5 to 120 minutes. Include switch for manual or automatic operation of each station.

F. Timing Device: Adjustable, 24-hour, 14-day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate 2 or more times daily.

1. Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.
2. Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.

G. Wiring: UL 493, Type UF-B multiconductor, with solid-copper conductors and insulated cable; suitable for direct burial.

1. Feeder-Circuit Cables: No. 12 AWG minimum, between building and controllers.
2. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves; color-coded different from feeder-circuit-cable jacket color; with jackets of different colors for multiple-cable installation in same trench.
3. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.

PART 3 - EXECUTION

3.1 EARTHWORK

A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

B. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

C. Install piping and wiring in sleeves under sidewalks, roadways, parking lots, and railroads.

D. Drain Pockets: Excavate to sizes indicated. Backfill with cleaned gravel or crushed stone, graded from 3/4 to 3 inches, to 12 inches below grade. Cover gravel or crushed stone with sheet of asphalt-saturated felt and backfill remainder with excavated material.

E. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of **[36 inches]** **<Insert other>** below finished grade, or not less than **[18 inches]** **<Insert other>** below average local frost depth, whichever is deeper.
2. Circuit Piping: **[12 inches]** **<Insert other>**.
3. Drain Piping: **[12 inches]** **<Insert other>**.

4. Sleeves: **[24 inches] <Insert other>**.

3.2 PIPING APPLICATIONS

A. Piping in control-valve boxes and aboveground may be joined with flanges instead of joints indicated.

B. Underground Irrigation Main Piping: Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

C. Circuit Piping: Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

D. Drain Piping: Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

E. Sleeves: Schedule 40, PVC pipe and socket fittings; and solvent-cemented joints.

F. Transition Fittings: Use transition fittings for plastic-to-metal pipe connections according to the following:

1. Couplings:

a. Underground Piping NPS 1-1/2 and Smaller: Manufactured fitting or coupling.
b. Underground Piping NPS 2 and Larger: AWWA transition coupling.

2. Fittings:

a. Underground Piping: Union with plastic end of same material as plastic piping.

3. Transition fittings are specified in Division 2 Section "Piped Utilities -- Basic Materials and Methods".

3.3 VALVE APPLICATIONS

A. Underground, Shutoff-Duty Valves: Use the following:

1. NPS 2 and Smaller: Curb stop with tee head, curb-stop service box, and shutoff rod.
2. NPS 3 and Larger: Gate valve with elastomeric gaskets and stem nut, valve box, and shutoff rod.

B. Underground, Manual Control Valves: Bronze globe valve with control-valve box and valve key.

C. Control Valves: Plastic ball valve.

D. Drain Valves: Plastic ball valve.

3.4 INSTALLATION

A. Install piping at minimum uniform slope of 0.5 percent down toward drain valves.

B. Install piping free of sags and bends.

C. Install groups of pipes parallel to each other, spaced to permit valve servicing.

D. Install fittings for changes in direction and branch connections.

E. Install unions adjacent to valves and to final connections to other components.

F. Lay piping on solid subbase, uniformly sloped without humps or depressions.

G. Underground Gate Valves: Install in valve box with top flush with grade.

1. Install valves and PVC pipe with restrained, gasketed joints.

H. Underground Curb Stops: Install in service box with top flush with grade.

I. Underground, Manual Control Valves: Install in manual control-valve box.

J. Control Valves: Install in control-valve box.

K. Drain Valves: Install in control-valve box.

L. Flush circuit piping with full head of water and install sprinklers after hydrostatic test is completed.

M. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries, unless otherwise indicated.

N. Install freestanding controllers on precast concrete bases not less than 36 by 24 by 4 inches thick, and not less than 6 inches greater in each direction than overall dimensions of controller.

O. Install control cable in same trench as irrigation piping and at least 2 inches below[**or beside**] piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas if irrigation piping is installed in sleeve.

3.5 CONNECTIONS

A. Ground equipment according to Division 16 Section "Grounding and Bonding".

B. Connect wiring according to Division 16 Section "Conductors and Cables".

3.6 LABELING AND IDENTIFYING

A. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tape over underground piping, during backfilling of trenches.

B. Refer to Division 2 Section "Earthwork" for warning tapes.

3.7 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace units and retest as specified above.

3.8 ADJUSTING

A. Adjust settings of controllers.

B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.

C. Adjust sprinklers so they will be flush with, or not more than 1/2 inch above, finish grade.

END OF SECTION 02810
CVS 9/00

SECTION 02821 - CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Galvanized steel chain-link fabric.
2. Galvanized steel framework.
3. Privacy slats.
4. Gate operator.

1.3 DEFINITIONS

A. CLFMI: Chain Link Fence Manufacturers Institute.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An experienced installer who has completed chain-link fences and gates similar in material, design, and extent to those indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Source Limitations for Chain-Link Fences and Gates: Obtain each grade, finish, type, and variety of component for chain-link fences and gates from one source with resources to provide chain-link fences and gates of consistent quality in appearance and physical properties.

1.5 PROJECT CONDITIONS

A. Field Measurements: Verify layout information for chain-link fences and gates shown on Drawings in relation to property survey and existing structures. Verify dimensions by field measurements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Privacy decorative slatting chain link fence.

a. PDS Fence Products.

2.2 CHAIN-LINK FENCE FABRIC

A. Steel Chain-Link Fence Fabric: Height indicated on Drawings. Provide fabric fabricated in one-piece widths for fencing in height of 8 feet and less. Comply with CLFMI's "Product Manual" and with requirements indicated below:

1. Mesh and Wire Size: 2-inch mesh, 9 ga. diameter.
2. Zinc-Coated Fabric: ASTM A 392, with zinc coating applied to steel wire before weaving according to ASTM A 817, Type II, zinc coated (galvanized) with the following minimum coating weight:

a. Class 1: Not less than 1.2 oz./sq. ft. of uncoated wire surface.

2.3 INDUSTRIAL FENCE FRAMING

A. Round Steel Pipe: Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F 1083. Comply with ASTM F 1043, Material Design Group IA, external and internal coating Type A, consisting of not less than 1.8-oz./sq. ft. zinc; and the following strength and stiffness requirements:

1. Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Light Industrial Fence.

B. Post Brace Rails: Match top rail for coating and strength and stiffness requirements. Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.

C. Top Rails: Fabricate top rail from lengths 21 feet or longer, with swedged-end or fabricated for expansion-type coupling, forming a continuous rail along top of chain-link fabric.

D. Intermediate Rails: Match top rail for coating and strength and stiffness requirements.

2.4 TENSION WIRE

A. General: Provide horizontal tension wire at the following locations:

1. Location: Extended along bottom of fence fabric.

B. Metallic-Coated Steel Wire: 0.177-inch- diameter, marcelled tension wire complying with ASTM A 824 and the following:

1. Coating: Type II, zinc coated (galvanized) by the hot-dip process, with the following minimum coating weight:

a. Class 1: Not less than 0.8 oz./sq. ft. of uncoated wire surface.

2.5 INDUSTRIAL SWING GATES

A. General: Comply with ASTM F 900 for the following swing-gate types:

1. Single gate.
2. Double gate.

B. Metal Pipe and Tubing: Galvanized steel. Comply with ASTM F 1083 and ASTM F 1043 for materials and protective coatings.

C. Frames and Bracing: Fabricate members from round galvanized steel tubing with outside dimension and weight according to ASTM F 900 for the following gate fabric height:

1. Gate Fabric Height: More than 6 feet.

D. Frame Corner Construction: As follows:

1. Welded.

E. Gate Posts: Fabricate members from round galvanized steel pipe with outside dimension and weight according to ASTM F 900 for the following gate fabric heights and leaf widths:

F. Hardware: Latches permitting operation from both sides of gate, hinges, center gate stops and, for each gate leaf more than 5 feet wide, keepers. Fabricate latches with integral eye openings for padlocking; padlock accessible from both sides of gate.

2.6 FITTINGS

A. General: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

B. Post and Line Caps: Hot-dip galvanized pressed steel or hot-dip galvanized cast iron. Provide weathertight closure cap for each post.

C. Rail and Brace Ends: Hot-dip galvanized pressed steel or hot-dip galvanized cast iron. Provide rail ends or other means for attaching rails securely to each gate, corner, pull, and end post.

D. Rail Fittings: Provide the following:

1. Top Rail Sleeves: Hot-dip galvanized pressed steel or round steel tubing. Not less than 6 inches long.
2. Rail Clamps: Hot-dip galvanized pressed steel. Provide line and corner boulevard clamps for connecting intermediate rails in the fence line to line posts.

E. Tension and Brace Bands: Hot-dip galvanized pressed steel.

F. Tension Bars: Hot-dip galvanized steel, length not less than 2 inches shorter than full height of chain-link fabric. Provide one bar for each gate and end post, and two for each corner and pull post, unless fabric is integrally woven into post.

G. Truss Rod Assemblies: Hot-dip galvanized steel rod and turnbuckle or other means of adjustment.

H. Tie Wires, Clips, and Fasteners: Provide the following types according to ASTM F 626:

1. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:

a. Hot-Dip Galvanized Steel: 0.106-inch- diameter wire; galvanized coating thickness matching coating thickness of chain-link fence fabric.

2. Round Wire Clips: Hot-dip galvanized steel for attaching chain-link fabric to H-beam posts.
3. Round Wire Hog Rings: Hot-dip galvanized steel or aluminum for attaching chain-link fabric to horizontal tension wires.

2.7 PRIVACY SLATS

A. Material: PVC, UV-light stabilized, not less than 0.023 inch thick, sized to fit mesh specified for direction indicated.

B. Color: To match building brick.

2.8 GROUT AND ANCHORING CEMENT

A. Nonshrink, Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

B. Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer for exterior applications.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for a verified survey of property lines and legal boundaries, site clearing, earthwork, pavement work, and other conditions affecting performance.

1. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

3.3 INSTALLATION, GENERAL

A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified.

1. Install fencing on established boundary lines inside property line.

B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.

C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil. Set posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Using mechanical devices to set line posts per ASTM F 567 is permitted. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

1. Dimensions and Profile: As indicated on Drawings.
2. Exposed Concrete Footings: Extend concrete 2 inches above grade, smooth, and shape to shed water.

3.4 CHAIN-LINK FENCE INSTALLATION

A. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of as indicated on Drawings.

B. Line Posts: Space line posts uniformly at 8 feet o.c.

C. Post Bracing Assemblies: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts. Locate horizontal braces at midheight of fabric on fences with top rail. Install so posts are plumb when diagonal rod is under proper tension.

D. Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches o.c. Install tension wire in locations indicated before stretching fabric.

1. Bottom Tension Wire: Install tension wire within 6 inches of bottom of fabric and tie to each post with not less than same gage and type of wire.

E. Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended by fencing manufacturer.

F. Intermediate Rails: Install in one piece at post-height center span, spanning between posts, using fittings, special offset fittings, and accessories.

G. Chain-Link Fabric: Apply fabric to outside of enclosing framework. Leave 2 inches between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

H. Tension or Stretcher Bars: Thread through fabric and secure to end, corner, pull, and gate posts with tension bands spaced not more than 15 inches o.c.

I. Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

1. Maximum Spacing: Tie fabric to line posts 12 inches o.c. and to braces 24 inches o.c.

J. Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side.

K. Privacy Slats: Install slats in direction indicated, securely locked in place.

1. Diagonally, for privacy factor of 80 to 85 .

3.5 GATE INSTALLATION

A. General: Install gates according to manufacturer's written instructions, level, plumb, and secure for full opening without interference. Attach fabric as for fencing. Attach hardware using tamper-resistant or concealed means. Install ground-set items in concrete for anchorage. Adjust hardware for smooth operation and lubricate where necessary.

3.6 ADJUSTING

A. Gate: Adjust gate to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

END OF SECTION 02821

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SECTION 02870 – SITE AND STREET FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes outdoor trash receptacle and recycle container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide outdoor trash receptacle and recycle container as manufactured by Allied Fiberglass at (800) 226-3072 or approved equal.

2.2 COMPONENTS

A. Outdoor Trash/Ash Hide-A-Butt Receptacle shall have the following features:

1. Model No.: SLC-2648 STD HAB
2. Size: 26"x26"x48"
3. Trash capacity: 45 gallons
4. Material: Aggregate fiberglass composite.
5. Weight: 150 lbs.
6. All hardware: to be stainless steel.
7. Trash Liner: Poly rigid liner with UL94HB rating.
8. Side door access for trash liner with positive lock system.
9. 4 side entry trash openings that are 6.25"x.17"
10. Hide a butt ash urn with flip top that keeps rain out and butts hidden.
11. Color: Greystone

B. Recycle Container (Only in Rhode Island) shall have the following features:

1. Model No.: 11R-361832
2. Size: 36"x18"x32"
3. Material: ABS plastic.
4. Weight: 75 lbs.
5. Color: PD-8 Dove Gray

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install outdoor trash receptacle and recycle container at building entrance in location selected by CVS project manager.

3.2 CLEANING

A. Clean all surfaces of the outdoor trash receptacle and recycle container. Exercise care to avoid damage to the finish.

3.3 PROTECTION

A. Initiate and maintain protection and other precautions required through the remainder of the construction period to ensure that, except for normal weathering, outdoor trash receptacle and recycle container will be free of damage or deterioration at the time of Substantial Completion.

END OF SECTION 02870

SECTION 02930 - EXTERIOR PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Trees.
2. Shrubs.
3. Ground cover.
4. Plants.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape installer who maintains an experienced full-time supervisor on Project site when exterior planting is in progress.

B. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery.

B. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.

1.6 WARRANTY

A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner, or incidents that are beyond Contractor's control.

1. Warranty Period for Trees and Shrubs: One year from date of Substantial Completion.
2. Warranty Period for Ground Cover and Plants: Six months from date of Substantial Completion.

1.7 MAINTENANCE

A. Trees and Shrubs: Maintain during warranty period by pruning, cultivating, watering, weeding, fertilizing, restoring planting saucers, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease.

B. Ground Cover and Plants: Maintain during warranty period by watering, weeding, fertilizing, and other operations as required to establish healthy, viable plantings.

PART 2 - PRODUCTS

2.1 EXTERIOR PLANTS

A. Tree and Shrub Material: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Provide balled and burlapped trees and shrubs.

B. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

C. Annuals: Provide healthy, disease-free plants of species and variety shown or listed. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

D. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed.

2.2 PLANTING MATERIALS

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 5 percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Import topsoil from either of the following sources:

1. Topsoil Source: Reuse surface soil stockpiled on-site and supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Verify suitability of stockpiled surface soil to produce topsoil.
2. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

B. Inorganic Soil Amendments:

1. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.
2. Sulfur: Granular, biodeg radable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 sieve and a maximum 10 percent passing through No. 40 sieve.

C. Organic Soil Amendments:

1. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve.
2. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.
3. Peat: Finely divided or granular texture, with a pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having a water-absorbing capacity of 1100 to 2000 percent.
4. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

D. Fertilizer:

1. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

2. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
3. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

    a. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soils reports from qualified testing agency.

4. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

    a. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soils reports from qualified testing agency.

E. Mulches:

1. Organic Mulch: Shredded hardwood, ground or shredded bark, wood and bark chips or pine needles.
2. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1-inch sieve.

F. Weed-Control Barriers:

1. Nonwoven Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum.

PART 3 - EXECUTION

3.1 EXTERIOR PLANTING

A. Bed Establishment:

1. Loosen subgrade of planting beds to a minimum depth of 8 inches.
2. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
3. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
4. Spread planting soil mix to a depth of 8 inches but not less than required to meet finish grades after natural settlement, unless otherwise indicated. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
5. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

B. Trees and Shrubs:

1. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation. Excavate approximately three times as wide as ball diameter.
2. Set trees and shrubs plumb and in center of pit or trench with top of root ball 1 inch above adjacent finish grades.

    a. Balled and Burlapped: Remove burlap and wire baskets from tops of root balls and partially from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
    b. Place planting soil mix around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil mix.

3. Organic Mulching: Apply 4-inch average thickness of organic mulch extending 12 inches beyond edge of planting pit or trench. Do not place mulch within 3 inches of trunks or stems.

C. Tree and Shrub Pruning: Prune, thin, and shape trees and shrubs according to standard horticultural practice. Prune trees to retain required height and spread. Do not cut tree leaders; remove only injured or dead branches from flowering trees. Prune shrubs to retain natural character. Shrub sizes indicated are sizes after pruning.

D. Ground Cover and Plant Planting:

1. Set out and space ground cover and plants as indicated.
2. Dig holes large enough to allow spreading of roots, and backfill with planting soil.
3. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
4. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
5. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

E. Planting Bed Mulching:

1. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches.
2. Mulch backfilled surfaces of planting beds and other areas indicated. Apply 3-inch average thickness of mulch, and finish level with adjacent finish grades. Do not place mulch against plant stems.

F. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged exterior planting.

G. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 02930
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DIVISION 3

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SECTION 03300 - CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the various classes of concrete.

B. Class Application $f'c$ Exposure

1. Footings and Foundation walls; exposed to moderate sulfate, no exposure.
2. Interior slabs on grade, no exposure.
3. Exterior walks and slabs; exposed to freeze-thaw, deicing chemicals, and moderate sulfate, no exposure.

1.3 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix, include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Concrete Mix Data:

1. Submit field or laboratory test records used to document that proposed mixture will achieve the required average compressive strength for each class of concrete.
2. Specified compressive strength, $f'c$
3. Average compressive strength of proposed mixture(s), $f'cr$
4. Documentation of strength test results of similar concrete mixtures indicating the standard deviation in accordance with ACI 318
5. Slump
6. Air content
7. Density
8. w/cm ratio
9. Maximum aggregate size
10. Sources and designations of ingredient materials proposed for use.

11. Submit delivery ticket for each batch of concrete delivered to the jobsite in accordance with ASTM C 94 and indicate:

    a. The maximum quantity of jobsite water addition permitted.

    b. Document the actual amount water added at the jobsite with initials of the person requesting the addition.

12. Indicate amounts of mix water to be withheld for later addition at Project site.

D. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

E. Welding Certificates: Copies of certificates for welding procedures and personnel.

F. Material Test Reports:

1. Cementitious materials and aggregates.
2. Admixtures.
3. Curing materials.
4. Floor and slab treatments.
5. Vapor retarders.

1.4 QUALITY ASSURANCE

A. Installer shall employ an on-site supervisor of the finishing crew who is qualified as ACI Certified Concrete Flatwork Technician or equivalent. Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.

C. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

1. Personnel conducting field tests shall be certified as ACI Concrete Field Testing Technician Grade I or equivalent.

2. Personnel conducting laboratory tests shall be certified as ACI Concrete Strength Testing Technician or ACI Concrete Laboratory Testing Technician – Grade I or equivalent.
3. Test results for the purpose of acceptance shall be certified by a Registered Professional Engineer employed with the Testing Agency.

D. Source Limitations: Obtain each type or class of cementitious material of the dame brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.

E. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."

F. Tolerances: Comply with the following, unless more stringent provisions are indicated:

1. ACI 301, "Specifications for Structural Concrete."
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Coordinate all foundation penetrations with Architect, plumbing, mechanical, electrical contractors and local agencies.

H. Pre Installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."

1. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including:

a. Architect
b. Structural Engineer
c. Contractor
d. Concrete Contractor
e. Pumping Contractor
f. Ready-mix concrete producer
g. Independent testing agency

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Prefabricated Forms (Void Forms):

1. Wall/Grade Beam and Structural Slab Void Forms: (for structurally suspended slabs only)

a. Function: Create void space directly under grade beams, structural slabs or walls.
b. Composition: Corrugated paper material with a moisture resistant exterior and having an interior fabrication of a uniform, cellular configuration composed of non-wax impregnated components.
c. Depth: As indicated on the drawings.
d. Profile: Provide trapezoidal, Trapvoid form.
e. Strength: Forms must be capable of sustaining a working load of 1,600 psf.
f. Accessories: Seam pads to eliminate concrete flow in void forms and end caps to seal off void form end.
g. Acceptable Manufacturer: Trapvoid, seam pads and end caps as manufactured by Sure Void Products, Inc., Englewood, Co., phone (800) 458-5444.

2. Void Forms at Entry Paving: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

B. Steel Bar Mats: ASTM A 184/A 184M, assembled with clips.

C. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete.

B. Joint Dowel Bars: Plain-steel bars, ASTM A 615/A 615M, Grade 60. Cut bars true to length with ends square and free of burrs.

2.4 CONCRETE MATERIALS

A. Cementitious Materials: use materials meeting the following requirements with limitations specified in Section 2 "Concrete Mixtures."

1. Cement: ASTM C 150 or ASTM C 1157 or ASTM C 595
2. Fly Ash: ASTM C 618, Type C.
3. Ground Granulated Blast-Furnace Slag: ASTM C 989
4. Silica Fume: ASTM C 1240

B. Normal weight Aggregate: ASTM C 33

C. Water: ASTM C 1602

D. Admixtures:

1. Air-Entraining Admixtures: ASTM C 260.
2. Water-Reducing Admixture: ASTM C 494, Type A.
3. Retarding Admixture: ASTM C 494, Type B.
4. Accelerating Admixtures: ASTM C 494, Type C (non chloride).
5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
6. Water-Reducing and Accelerating Admixtures: ASTM C 494, Type E.
7. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
8. Plasticizing Admixture: ASTM C 1017, Type I
9. Plasticizing and Retarding Admixture: ASTM C 1017, Type II
10. Other admixtures for specific use with the permission of the design professional

2.5 FIBER REINFORCEMENT

A. Synthetic Fiber: Fibrillated polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Fibrillated Fibers:

a. Fibrasol F; Axim Concrete Technologies.
b. Fibermesh; Fibermesh, Div. of Synthetic Industries.
c. Forta; Forta Corporation.
d. Grace Fibers; W. R. Grace & Co., Construction Products Div.

2.6 WATERSTOPS

A. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophylic material for adhesive bonding to concrete.

1. Products: Subject to compliance with requirements, provide one of the following:

a. Volclay Waterstop-RX; Colloid Environmental Technologies Co.
b. Conseal CS-231; Concrete Sealants Inc.
c. Swellseal Joint; De Neef Construction Chemicals (U.S.) Inc.
d. Hydrotite; Greenstreak.
e. Mirastop; Mirafi Moisture Protection, Div. of Royal Ten Cate (USA), Inc.
f. Adeka Ultra Seal; Mitsubishi International Corporation.
g. Superstop; Progress Unlimited Inc.

2.7 VAPOR RETARDERS

A. Vapor Retarder: ASTM E 1745, Class A with a water vapor transmission rate of 0.012 perms or less as tested by ASTM E 96, not less than 10 mils thick.

2.8 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A; 25 percent solids minimum.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 22 percent solids.

F. Products: Subject to compliance with requirements, provide one of the following:

1. Evaporation Retarder:

a. Cimfilm; Axim Concrete Technologies.
b. Finishing Aid Concentrate; Burke Group, LLC (The).
c. Spray-Film; ChemMasters.
d. Aquafilm; Conspec Marketing & Manufacturing Co., Inc.
e. Sure Film; Dayton Superior Corporation.
f. Eucobar; Euclid Chemical Co.
g. Vapor Aid; Kaufman Products, Inc.
h. Lambco Skin; Lambert Corporation.
i. E-Con; L&M Construction Chemicals, Inc.
j. Confilm; Master Builders, Inc.
k. Waterhold; Metalcrete Industries.
l. Rich Film; Richmond Screw Anchor Co.
m. SikaFilm; Sika Corporation.
n. Finishing Aid; Symons Corporation.
o. Certi-Vex EnvioAssist; Vexcon Chemicals, Inc.

2. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound:

a. Cureseal 1315 WB; Burke by Edoco,
b. Sealcure 1315 WB; Conspec Marketing & Manufacturing Co., Inc., a Dayton Superior Company
c. Super Diamond Clear VOX; Euclid Chemical Company
d. Lumiseal WB Plus; L&M Construction Chemicals
e. Vexcon Starseal 1315; Vexcon Chemicals, Inc."

2.9 RELATED MATERIALS

A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

2.10 CONCRETE MIXES

A. Prepare design mixtures for each class of concrete on the basis of laboratory trial mixtures or field test data, or both according to ACI 318, Chapter 5. Design mixtures shall meet the following requirements.

1. Class 1 (Footings and foundation walls, exposed to moderate sulfate):

   a. Specified Compressive Strength: As noted on structural drawing.
   b. Nominal maximum aggregate size: 1-1/2 in. Smaller size maximum aggregate may be used.
   c. Cement: ASTM C 150 Type II or ASTM C 595 (MS designation).
   d. Maximum w/cm: 0.50
   e. Admixtures: no calcium chloride containing admixtures

2. Class 1 (Footings and foundations walls, no exposure):

   a. Specified Compressive Strength: As noted on structural drawing.
   b. Nominal maximum aggregate size: 1-1/2 in. Smaller size maximum aggregate may be used.

3. Class 2 (Interior Slabs on Grade, no exposure):

   a. Specified compressive strength: As noted on structural drawing.
   b. Nominal maximum aggregate size: 1-1/2 in. Smaller size maximum aggregate may be used.
   c. Non air entrained. Air content shall not exceed 3%.

4. Class 3 (Exterior walks and slabs, exposed to freeze-thaw, deicing chemicals, and moderate sulfate):

   a. Specified Compressive Strength: As noted on structural drawing.
   b. Nominal maximum aggregate size: 1-1/2 in. Smaller size maximum aggregate may be used.
   c. Air content: 5.5% +/- 1.5% or adjusted for max aggregate size from ACI 211.1
   d. Cement: ASTM C 150, Type II, ASTM C 1157 Type MS, or ASTM C 595 (MS designation)
   e. As appropriate, the following limits shall be complied with:

      1) Fly Ash: Maximum 25% by weight
      2) Slag: Maximum 50% by weight

3) Silica Fume: Maximum 10% by weight
4) Total of fly ash, slag, and silica fume: Maximum 50% by weight
5) Total of fly ash and silica fume: Maximum 35% by weight

6) Maximum w/cm: 0.45
7) Admixtures: no calcium chloride containing admixtures

5. Class 3 (Exterior walks and slabs, no exposure):

a. Specified Compressive Strength: As noted on structural drawing.
b. Nominal maximum aggregate size: 1-1/2 in. Smaller size maximum aggregate may be used.

2.11 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94 and ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor bolts, accurately located, to elevations required.
2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
3. Install dovetail anchor slots in concrete structures as indicated.

3.3 VAPOR RETARDERS

A. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions.

3.4 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.5 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated.
2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.

1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.6 WATERSTOPS

A. Flexible Waterstops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's written instructions.

B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, bonding or mechanically fastening and firmly pressing into place. Install in longest lengths practicable.

3.7 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless:

1. Batch ticket indicates an amount of mixing water that was withheld for later addition at Project site.
2. Addition of water at Project site must be certified by the Testing Agency that the maximum water/cement ratio per the approved mix design is not exceeded.

C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.

F. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:

1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.8 FINISHING FLOORS AND SLABS

A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.

C. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, or another thin film-finish coating system
2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:

    a. Specified overall values of flatness, F(F) 25; and levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and levelness, F(L) 15.

3. Finish and measure surface so gap at any point between concrete surface and an unleveled freestanding 10-foot- long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed the following:

    a. 1/4 inch.
    b. 3/16 inch.
    c. 1/8 inch.

3.9 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.

D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.10 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.
    b. Continuous water-fog spray.
    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

    a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in this Article.

B. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

C. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 Cu. Yd. or fraction thereof of each concrete mix placed each day.

    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
4. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.

    a. Cast and field cure one set of four standard cylinder specimens for each composite sample.

5. Compressive-Strength Tests: ASTM C 39; test two laboratory-cured specimens at 7 days and two at 28 days.

    a. Test two field-cured specimens at 7 days and two at 28 days.
    b. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.

D. When the average strength of two cylinders tested at 7 days is less than 70 percent of the specified compressive strength the contractor shall evaluate mix designs and construction procedures an make appropriate adjustments to assure strength requirements are met at 28 days for subsequent concrete work.

E. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests conducted at 28 days equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

F. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.

G. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.

H. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect.

END OF SECTION 03300

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DIVISION 4

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NATIONAL ACCOUNTS

The following is a list of specification sections within this Division stipulating National Accounts the Owner has entered into with the specified manufacturer(s).

1. Section 04810 – UNIT MASONRY ASSEMBLIES – Face Brick.

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SECTION 04200
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete masonry units for single wythe and cavity wall construction.

B. Face brick units for cavity wall construction.

C. Mortar for masonry units.

D. Reinforcement, anchorage and accessories.

E. Masonry flashings.

F. Masonry sealer coating.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

A. Section 05500 - Metal Fabrications: Placement of loose steel lintels.

1.03 RELATED SECTIONS

A. Section 01020 - Allowances: Cash Allowances.

B. Section 07100 – Waterproofing and Dampproofing: Application of dampproofing at cavity wall construction.

C. Section 07900 - Joint Sealers: Rod and sealant at control joints.

1.04 REFERENCES

A. ANSI/ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.

B. ANSI/ASTM C652 - Hollow Brick (Hollow Masonry Units Made From Clay or Shale).

C. ASTM A123 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

D. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

E. ASTM B370 - Copper Sheet and Strip for Building Construction.

F. ASTM C90 - Hollow Load Bearing Concrete Masonry Units.

G. ASTM C145 - Solid Load Bearing Concrete Masonry Units.

H. ASTM C144 - Aggregate for Masonry Mortar.

I. ASTM C150 - Portland Cement.

J. ASTM C207 - Hydrated Lime for Masonry Purposes.

K. ASTM C270 - Mortar for Unit Masonry.

L. ASTM C387 - Packaged, Dry, Combined Materials, for Mortar and Concrete.

M. ASTM C404 - Aggregates for Masonry Grout.

N. ASTM C476 - Grout for Masonry.

O. ASTM C780 – Pre-construction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

P. ASTM C1019 - Method of Sampling and Testing Grout.

Q. ANSI/ASTM C73 - Calcium Silicate Face Brick (Sand-Lime Brick).

R. ANSI/ASTM C126 - Ceramic Glazed Structural Clay Facing Tile, Facing Brick, and Solid Masonry Units.

S. ANSI/ASTM C216 - Facing Brick (Solid Masonry Units Made From Clay or Shale).

T. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

U. UL - Underwriters' Laboratories.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 01340.

B. Submit samples under provisions of Section 01340.

C. Submit four samples of face brick units to illustrate color, texture and extremes of color range.

D. Include mortar design mix; indicate Proportion or Property method used, required environmental conditions and admixture limitations.

E. Samples: Submit two ribbons of mortar color, illustrating color and color range.

F. Submit manufacturer's certificate under provisions of Section 01340 that products meet or exceed specified requirements.

1.06 QUALIFICATIONS

A. Installer: Company specializing in performing the work of this Section with minimum five years documented experience.

1.07 REGULATORY REQUIREMENTS

A. Conform to requirements for masonry construction.

1.08 MOCK-UP

A. Provide mock-up of face brick masonry under provisions of Section 01400.

B. Erect face brick to 4 x 4 feet panel size, include specified mortar and accessories.

C. When accepted, mock-up will demonstrate minimum standard for the Work. Mock-up may not remain as

part of the Work.

1.09 PRE-INSTALLATION CONFERENCE

A. Convene one week prior to commencing work of this Section.

1.10 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site under provisions of Section 01600.

B. Store and protect products under provisions of Section 01600.

C. Accept face brick units on site. Inspect for damage.

1.11 ENVIRONMENTAL REQUIREMENTS

A. Strictly comply with recommendations of the International Masonry Industry All-Weather Council – Recommended Practices and Guide Specifications for Cold (Hot) Weather Masonry Construction; the Brick Institute of America –Technical Notes on Brick Construction, Parts 1, 2 and 3; The Portland Cement Assoc.

1.12 SEQUENCE AND SCHEDULING

A. Coordinate work under provisions of Section 01040.

B. Coordinate the masonry work with brick veneer and installation of window anchors.

PART 2 PRODUCTS

2.01 MANUFACTURERS – CONCRETE MASONRY UNITS

A. Park Avenue Cement Block Company.

B. Substitutions: Under provisions of Section 01600.

2.02 CONCRETE MASONRY UNITS

A. Hollow Load Bearing Block Units: ASTM C90, Grade N, Type I - Moisture Controlled; normal weight.

B. Veneer Block Units: ASTM C145, Grade N-1; Architectural split face, natural color.

C. Masonry Units: Nominal modular sizes of 4 x 16 x 8 inches, 6 x 16 x 8 inches, and 8 x 16 x 8 inches. Provide special units for
90 degree corners, bond beams, lintels and control joints.

2.03 MANUFACTURERS – FACE BRICK UNITS

A. Glen-Gery Brick.

B. Spaulding Brick Company of Rhode Island.

C. Belden Brick Company.

D. Substitutions: Under provisions of Section 01600.

2.04 FACE BRICK UNITS

A. See Section 04233 – Calcium Silicate Building Stone.

2.05 MORTAR MATERIALS – CONCRETE MASONRY UNITS

A. Portland Cement: ASTM C150, Type I.

B. Aggregates: ASTM C144, standard masonry type; clean, dry, protected against dampness, freezing and foreign matter.

C. Hydrated Lime: ASTM C207, Type S.

D. Water: Clean and free from injurious amounts of oil, alkali, organic matter or other deleterious material.

E. Use no admixtures unless written approval is obtained from Architect.

F. Color: As selected by Architect.

2.06 MORTAR MIXES – CONCRETE MASONRY UNITS

A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S, using the Property Method, 1800 psi compressive strength.

B. Mortar for Reinforced Masonry; ASTM C270, Type S using the Property Method, 1800 psi compressive strength.

2.07 GROUT MIXES

A. Grout: ASTM C476; consistency which will completely fill all spaces intended to receive grout.

B. Bond Beams and Lintels: 3,000 psi strength at 28 days; 7-8 inches slump; premixed type in accordance with ASTM C94 or mixed in accordance with ASTM C476, fine and course grout.

C. Engineered Masonry: 3,000 psi strength at 28 days; 7- 8 inches slump; premixed type in accordance with ASTM C94 or mixed in accordance with ASTM C476, fine and course grout.

2.08 MORTAR MATERIALS – FACE BRICK UNITS

A. Portland Cement: ASTM C150, Type I, white color.

B. Mortar Aggregate: ASTM C144, Standard Masonry Type.

C. Hydrated Lime: ASTM C207, Type N.

D. Water: Clean and potable.

2.09 MORTAR MIXES – FACE BRICK UNITS

A. Mortar for Reinforced Masonry: ASTM C270, Type N, using the Property Method to achieve 750 psi strength.

2.10 MORTAR MIXING – FACE BRICK UNITS

A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.

B. Add mortar color, if required, in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

D. If water is lost by evaporation, retemper only within two hours of mixing.

E. Use mortar within two hours after mixing at temperatures of 80 degrees F, or two-and-one-half hours at temperatures under 50 degrees F.

2.11 MORTAR COLOR – FACE BRICK UNITS

A. Mortar Color: Mineral oxide pigment; color as selected by Architect.

2.12 ADMIXTURES

A. The use of air entraining, antifreeze compounds or calcium chloride admixtures or other substances is not allowed.

2.13 REINFORCEMENT AND ANCHORAGE

A. CMU: Truss type, welded wire units fabricated from 9 gage ASTM A82 cold-drawn galvanized steel wire with deformed side wire and smooth cross wire; Space reinforcing at 16" on center vertically maximum. Provide one side rod for each concrete masonry shell face.

B. CMU AND BRICK VENEER: Composite wall ties with two legged, galvanized steel adjustable eye and pintle type units with minimum 3/16" wire diameter; Spaced anchors at 16" on center horizontally and at 16"on center vertically.

C. Joint Stabilizing Anchors: To connect new masonry walls to existing masonry walls at vertical control joints; Cold-drawn steel; hot dip galvanized; spaced at 16" on center vertically; "D/A 2200," manufactured by Dur-O-Wall, Inc."

D. Reinforcing Steel: ASTM A615, 60 ksi 276, 414, 517 MpA yield grade, deformed billet bars, unprotected finish..

E. Substitutions: Under provisions of Section 01600.

2.14 MASONRY FLASHINGS

A. Membrane Flashings: Grace Construction Products, Inc. –"Perm-A-Barrier" self-sealing, self-healing, fully adhered wall flashing; 32 Mil thick, pliable and highly adhesive rubberized asphalt compound bonded completely and integrally to 8 mil thick, high density 4 ply cross laminated fill; 40 mil overall thickness.

B. Substitutions: Under provisions of Section 01600.

2.15 ACCESSORIES

A. Preformed Control Joints: Neoprene material conforming to ASTM D1056, Class RE41; provide with heat fused joints; thickness as required to suit masonry condition; manufactured by "AA Wire Products Company".

B. Weep Holes: Preformed plastic tubes.

C. CLEANING SOLUTIONS: ProSoCo, Inc. "SureKlean 600" detergent masonry cleaner; Non-acidic, not harmful to masonry work or adjacent materials.

D. Substitutions: Under provisions of Section 01600.

2.16 MASONRY SEALER COATING

A. Sealer Coating: ProSoCo, Inc. "Sure Klean" products.

1. "Sure Klean Weather Seal": For use on brick veneer surfaces.

2. "Sure Klean Blok-Guard"; For use on CMU veneer surfaces.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Verify items provided by other Sections of work are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied to other Sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COURSING

A. Establish lines, levels and coursing indicated; protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Lay concrete masonry units in running bond. Course one unit and one mortar joint to equal 8 inches. Form concave mortar joints.

D. Lay brick units in running bond. Course three brick units and three mortar joints equal to 8 inches. Form concave mortar joints.

3.04 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head, bed and collar joints, uniformly jointed with other work.

B. Lay hollow masonry units with face shell bedding on head and bed joints.

C. Buttering courses of joints or excessive furrowing of mortar joints are not permitted.

D. Remove excess mortar as Work progresses.

E. Interlock intersections and external corners.

F. Prior to laying, wet brick having an I.R.A. greater than 25 GR/Min/30In.

G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.

H. Perform jobsite cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

I. Cut mortar joints flush where insulation bitumen dampproofing is applied.

3.05 WEEPS

A. Install weep holes in brick veneer at 32 inches on center horizontally above through-wall flashing, above shelf angles and at bottom of walls.

3.06 CAVITY WALL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep holes.

3.07 REINFORCEMENT AND ANCHORAGES – SINGLE WYTHE MASONRY

A. Install horizontal joint reinforcement 16 inches oc.

B. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening.

C. Place joint reinforcement continuous in first joint below top of walls.

D. Lap joint reinforcement ends minimum 6 inches. Extend minimum 16 inches each side of openings.

E. Reinforce joint corners and intersections with prefabricated corner pieces 16 inches oc.

3.08 REINFORCEMENT AND ANCHORAGES – CAVITY WALL VENEER MASONRY

A. Install veneer anchors at 16" on center horizontally and 16" on center vertically; at one course above all openings, extending three feet beyond each side of opening; and within 8 inches of corners and abutting masonry veneer.

3.09 MASONRY THROUGH-WALL FLASHINGS

A. Install through wall flashing on top of masonry base course or at locations shown on the Drawings. Terminate flashing at top by extending up and behind sheathing as shown on the Drawings. Overlap adjacent pieces by 2" and roll all overlaps with a steel hand roller or blunt object..

B. Trim bottom edge ½" back from exposed face of building. Apply a bead or trowel coat of bituthene mastic along termination's seams, cuts, penetrations and punctures.

C. Fill cavity to depth of 8" with 3/8" pea stone.

3.10 LINTELS

A. Install loose steel lintels over window openings and door openings as specified on the drawings.

B. Install reinforced unit masonry lintels over openings as specified on the drawings.

C. Openings up to 48 Inches Wide: Place two, No. 5 reinforcing bars 1 inch from bottom web, unless noted otherwise.

D. Openings Over 48 Inches. Reinforce openings as detailed.

F. Use single piece reinforcing bars only.

G. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

H. Place and consolidate grout fill without displacing reinforcing.

I. Allow masonry lintels to attain specified strength before removing temporary supports.

J. Maintain minimum 8 inch bearing on each side of opening.

3.11 BITUMINOUS DAMPPROOFING

A. Apply Bituminous dampproofing to face of concrete masonry backer units at cavity wall construction.

3.12 GROUTED COMPONENTS

A. Reinforce bond beams as shown on drawings, placed 1 inch from bottom of web.

B. Lap splices minimum 24 bar diameters.

C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.

D. Place and consolidate grout fill without displacing reinforcing.

E. At bearing locations, fill masonry cores with grout for a minimum 12 inches either side of opening.

3.13 ENGINEERED MASONRY

A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed.

B. Place mortar in masonry unit bed joints back 1/4 inch from edge of unit grout spaces, bevel back and upward. Permit mortar to cure 7 days before placing grout.

C. Reinforce masonry unit cores with reinforcement bars and grout as indicated.

D. Retain vertical reinforcement in position at top and bottom of cells and at intervals not exceeding 192 bar diameters. Splice reinforcement in accordance with Section 03300.

E. Wet masonry unit surfaces in contact with grout just prior to grout placement.

F. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout spaces 2 inches or greater in width with course grout using low lift grouting techniques.

G. When grouting is stopped for more than one hour, terminate grout 1 1/2 inch below top of upper masonry unit to form a positive key for subsequent grout placement.

H. Low Lift Grouting: Place first lift of grout to a height of 16 inches and rod for grout consolidation. Place subsequent lifts in 8 inch increments and rod for grout consolidation.

3.14 CONTROL JOINTS

A. Do not continue horizontal joint reinforcement through control joints.

B. Install preformed control joint device in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.

C. Size control joint in accordance with Section 07900 for sealant performance.

D. Provide control joints at 20 feet on center, maximum, unless noted otherwise.

3.15 BUILT-IN WORK

A. As work progresses, build in metal door frames, window frames, wood nailing strips, anchor bolts, plates, lintels and other items furnished by other Sections.

B. Build in items plumb and level.

C. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.

D. Do not build in organic materials subject to deterioration.

3.16 TOLERANCES

A. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.

B. Maximum Variation From Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.

C. Maximum Variation From Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.

D. Maximum Variation From Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.

E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.

F. Maximum Variation From Cross Sectional Thickness of Walls: 1/4 inch.

3.17 CUTTING AND FITTING

A. Cut and fit for concealed items as required. Coordinate with other Sections of Work to provide correct size, shape and location.

B. Obtain Architect approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.18 CLEANING

A. Clean work under provisions of Section 01700.

B. Remove excess mortar and mortar smears.

C. Replace defective mortar. Match adjacent work.

D. Clean soiled surfaces with cleaning solution.

E. Use non-metallic tools in cleaning operations.
F. Do not use strong acids for cleaning.

3.19 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 01500.

B. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

3.20 SCHEDULES

A. Exterior wall systems; Locations of wall types shown on drawings.

END OF SECTION 04200

SECTION 04800 - MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Provide unit masonry construction:
   1. Concrete masonry non-bearing partitions.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
   1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.

C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

A. Fire Performance for Fire-Rated Brick and Concrete Block Assemblies: ASTM E 119.

B. Testing: Independent Testing Laboratory.

C. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

D. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Concrete Masonry Units: C-3 (3 hour rated CMU)
   1. Concrete Masonry Units: ASTM C 90, 1500 f'm compressive strength:
      a. Normal weight.
   2. Size: Face dimension of 11-5/8 inches high by 15-5/8 inches long by width required for application.
   3. Special Shapes: As required by building configuration.
   4. Bond Pattern: Running Bond.

B. Mortar and Grout for Brick and Concrete Masonry Unit Assemblies:
   1. Mortar Mix: ASTM C 270, Type S, for reinforced masonry, masonry below grade and masonry in contact with earth and ASTM C 270, Type N, for above-grade loadbearing and nonloadbearing walls and parapet walls and for interior loadbearing and nonloadbearing partitions.
   2. Mortar Materials: Portland cement, ASTM C 150, Type I or II.
   3. Mortar Materials: Masonry cement, ASTM C 91.
   4. Mortar Materials: Ready mixed, ASTM C 207, Type S.
   5. Mortar Aggregate: Natural color, ASTM C 144.
   6. Grout Aggregate: ASTM C 404.
   7. Hydrated Lime: ASTM C 207, Type S.
   8. Color: Natural color.

C. Reinforcing Steel:
   1. Reinforcing Bars: ASTM A 615, Grade 60.
   2. Deformed Reinforcing Wire: ASTM A 496.
   3. Welded Wire Fabric: ASTM A 185, plain.
   4. Welded Wire Fabric: ASTM A 497, deformed.

D. Reinforcing: Welded wire with deformed side rods.
   1. Steel Wire: 9 gauge (.1875 inch) galvanized steel.
   2. Type: Ladder type.

E. Ties and Anchors:
   1. Masonry to Steel Frame: Anchor with crimped wire anchor section for welding to steel.
   2. Anchor Bolts: ASTM A 307, Grade A, galvanized.

F. Masonry Accessories:
   1. Nonmetallic expansion joint strips.
   2. Preformed control joint gaskets.
   3. Bond breaker strips.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Installation of Masonry Assemblies:
   1. Comply with PCA Recommended Practices for Laying Concrete Block, Brick Institute of America BIA Tech Notes, and NCMA TEK Bulletins.
   2. Comply with cold weather and warm weather protection procedures as recommended in BIA Tech Notes.
   3. Provide fire-rated assemblies complying with ASTM E 119.
   4. Sawcut units when required. Maintain uniform joint width. Provide full bed, head and collar joints except at weepholes.
   5. Install lintels and accessories in masonry construction.
   6. Coordinate installation of flashings.
   7. Comply with applicable codes and regulations for spacing of ties and horizontal reinforcing.
   8. Provide expansion and control joints in accordance with BIA and NCMA recommendations.

9. Remove and replace damaged units.
10. Clean brick using bucket and brush method, BIA Tech Note 20.
11. Clean concrete masonry by dry brushing, NCMA TEK No. 28.

END OF SECTION 04800

DIVISION 5

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DIVISION 5

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B. Apply 1 shop coat of primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil thick.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Do not install joists until supporting construction is in place and secured.

B. Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

C. Field weld joists to supporting steel bearing plates. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

D. Bolt joists to supporting steel framework using carbon-steel bolts, unless otherwise indicated.

E. Bolt joists to supporting steel framework using high-strength structural bolts, unless otherwise indicated. Comply with RCSC's "[**Allowable Stress Design Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts**] [**Load and Resistance Factor Design Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts**]" for high-strength structural bolt installation and tightening requirements.

F. Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.2 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.

B. Field welds will be visually inspected according to AWS D1.1

C. Correct deficiencies in Work that inspections and test reports have indicated are not in compliance with specified requirements.

D. Additional testing will be performed to determine compliance of corrected Work with specified requirements.

3.3 REPAIRS AND PROTECTION

A. Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists, accessories, and abutting structural steel.

1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
2. Apply a compatible primer of the same type as the shop primer used on adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensures joist and accessories are without damage or deterioration at time of Substantial Completion.

END OF SECTION 05210

SECTION 05310 - STEEL DECK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Non-composite form deck.

1.2 SUBMITTALS

A. Product Data: For each type of deck, accessory, and product indicated.

B. Shop Drawings: Include layout and types of deck panels, anchorage details, reinforcing channels, pans, deck openings, special jointing, accessories, and attachments to other construction.

C. Product certificates.

D. Welding certificates.

E. Research/Evaluation Reports: Evidence of steel deck's compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.

1.3 QUALITY ASSURANCE

A. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.

C. Fire-Test-Response Characteristics: Where indicated, provide steel deck units identical to those steel deck units tested for fire resistance per ASTM E 119 by a testing and inspection agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
2. Steel deck units shall be identified with appropriate markings of applicable testing and inspecting agency.

D. AISI Specifications: Calculate structural characteristics of steel deck according to AISI's "Specification for the Design of Cold-Formed Steel Structural Members."

PART 2 - PRODUCTS

2.1 NONCOMPOSITE FORM DECK

A. Noncomposite Steel Form Deck: Fabricate ribbed-steel sheet noncomposite form deck panels to comply with "SDI Specifications and Commentary for Noncomposite Steel Form Deck," in SDI Publication No. 29, the minimum section properties indicated, and the following:

1. Galvanizing: ASTM A 525; G60, 0.60 oz./sq. ft.
2. Profile Depth: 9/16 inch.
3. Design Uncoated-Steel Thickness: 0.0179 inch.

2.2 ACCESSORIES

A. Accessories: Steel deck manufacturer's standard accessory materials, including mechanical fasteners, closure strips, pour stops, and closures for deck.

B. Shear Connectors: ASTM A 108, Grades 1010 through 1020 headed stud type, cold-finished carbon steel, AWS D1.1, Type B, with arc shields.

C. Galvanizing Repair Paint: High zinc-dust content paint for repair of damaged galvanized surfaces complying with Military Specifications MIL-P-21035 (Ships).

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install deck panels and accessories according to applicable specifications and commentary in SDI Publication No. 29, manufacturer's written instructions, requirements in this Section and on Contract drawings.

B. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

C. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

D. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to decking.

E. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of decking, and support of other work per deck manufacturers specifications.

F. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

1. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install according to deck manufacturer's written instructions.

G. Pour Stops and Girder Fillers: Weld steel sheet pour stops and girder fillers to supporting structure according to SDI recommendations, unless otherwise indicated.

H. Floor Deck Closures: Weld steel sheet column closures, cell closures, and Z-closures to deck, according to SDI recommendations, to provide tight-fitting closures at open ends of ribs and sides of decking. Weld cover plates at changes in direction of floor deck panels, unless otherwise indicated.

I. Repairs and Protection:

1. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on both surfaces of prime-painted deck immediately after installation, and apply repair paint.

3.2 FIELD QUALITY CONTROL

A. Testing: Owner will engage a qualified independent testing agency to perform field quality-control testing.

B. Field welds will be subject to inspection.

C. Remove and replace work that does not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of corrected work with specified requirements.

3.3 REPAIRS AND PROTECTION

A. Repair Painting: Wire brush and clean rust spots, welds, and abraded areas on surfaces of prime-painted deck immediately after installation, and apply repair paint.

B. Provide final protection and maintain conditions to ensure that steel deck is without damage or deterioration at time of Substantial Completion.

END OF SECTION 05310

SECTION 05400 - COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Exterior non-load-bearing, curtain-wall framing.

2. All other light gage framing sizes and gages are as noted on construction documents and are to be installed per the manufacturer's requirements.

1.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Provide cold-formed metal framing capable of withstanding design loads without deflections greater than the following:

1. Exterior Non-Load-Bearing, Curtain-Wall Framing:

Horizontal deflection of **1/600** of the wall height where wall studs back up masonry veneers.

Horizontal deflection of **1/360** of the wall height where studs back up EIFS or wood siding veneers.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include layout, spacings, sizes, thicknesses, and types of cold-formed metal framing; fabrication; and fastening and anchorage details, including mechanical fasteners.

C. Mill certificates or test reports.

D. Welder certificates.

E. Research/evaluation reports.

1.4 QUALITY ASSURANCE

A. Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold-formed metal framing.

B. Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency.

C. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."

D. Fire-Test-Response Characteristics: Where metal framing is part of a fire-resistance-rated assembly, provide framing identical to that of assemblies tested for fire resistance per ASTM E 119 by a testing agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by GA File Numbers in GA-600, "Fire Resistance Design Manual," or by design designations from UL's "Fire Resistance Directory" or from the listings of another testing agency.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Allied American Studco, Inc.
2. Angeles Metal Systems.
3. Clark Steel Framing Industries.
4. Consolidated Fabricators Corp.
5. Consolidated Systems, Inc.
6. Dale Industries, Inc.
7. Design Shapes in Steel.
8. Dietrich Industries, Inc.
9. Knorr Steel Framing Systems.
10. MarinoWare; Div. of Ware Industries, Inc.
11. Scafco Corp.
12. Steel Construction Systems.
13. Steel Developers, LLC.
14. Steeler, Inc.
15. Super Stud Building Products, Inc.
16. Unimast, Inc.
17. United Metal Products, Inc.

2.2 MATERIALS

A. Steel Sheet: ASTM A 653/A 653M, structural steel, G60 zinc coating, Grade 33 for minimum uncoated steel thickness of 0.0428 inch and less; Grade 50 for minimum uncoated steel thickness of 0.0538 inch and greater.

B. Wall Framing: Manufacturer's standard steel studs, of web depths indicated, with stiffened flanges, complying with ASTM C 955, and as follows:

1. Depth: 6-inches

2. Minimum Uncoated-Steel Thickness: **0.0428 inch.** (18 gage)
3. Flange Width: **1-5/8 inches.**
4. Section Properties: Sx = 0.772 in^3 Ix = **2.316 in^4** Mx = 16,764 in-lb.

5. Track: Manufacturer's standard U-shaped steel track, unpunched, with straight flanges, complying with ASTM C 955, manufacturer's standard flange width except where noted as deflection track on the contract drawings. Minimum uncoated-steel thickness to match steel studs

2.3 ACCESSORIES AND MISCELLANEOUS MATERIALS

A. Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi, of manufacturer's standard thickness and configuration, unless otherwise indicated.

B. Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.

C. Anchor Bolts: ASTM F 1554, Grade 36, threaded carbon-steel headless, hooked, bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

D. Expansion Anchors: Fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 5 times design load, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

E. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 conducted by a qualified independent testing agency.

F. Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.

G. Galvanizing Repair Paint: SSPC-Paint 20 or DOD-P-21035.

H. Cement Grout: Portland cement, ASTM C 150, Type I; and clean, natural sand, ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

I. Thermal Insulation: ASTM C 665, Type I, unfaced mineral-fiber blankets produced by combining glass or slag fibers with thermosetting resins.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to ASTM C 1007, manufacturer's written recommendations, and requirements in this Section.

1. Cut framing members by sawing or shearing; do not torch cut.
2. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.

3. Install framing members in one-piece lengths.
4. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed.
5. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
6. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.

B. Erection Tolerances: Install cold-formed metal framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:

1. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

C. Non-Load-Bearing, Curtain-Wall Installation: Install continuous tracks sized to match studs. Align tracks accurately and securely anchor to supporting structure. Space studs as indicated; set plumb, align, and fasten both flanges of studs to track, unless otherwise indicated.

1. Isolate non-load-bearing steel framing from building structure with deflection track to prevent transfer of vertical loads while providing lateral support.
2. Install horizontal bridging in curtain-wall studs, spaced in rows indicated on Shop Drawings but not more than 54 inches apart. Fasten at each stud intersection.
3. Install miscellaneous framing and connections, including stud kickers, web stiffeners, clip angles, continuous angles, anchors, fasteners, and stud girts, to provide a complete and stable curtain-wall-framing system.

D. Joist Installation: Install, align, and securely anchor perimeter joist track sized to match joists as indicated on Shop Drawings. Install joists bearing on supporting frame, level, straight, and plumb; adjust to final position, brace, and reinforce. Fasten to both flanges of joist track.

1. Install joists over supporting frame with a minimum end bearing of 1-1/2 inches. Reinforce ends and bearing points of joists as indicated on Shop Drawings.
2. Space joists not more than 2 inches from abutting walls and at spacings indicated.
3. Frame openings with built-up joist headers consisting of joist and joist track, nesting joists, or another combination of connected joists if indicated.
4. Install joist reinforcement at interior supports with single, short length of joist section located directly over interior support, with lapped joists of equal length to joist reinforcement, or as indicated. Install web stiffeners to transfer axial loads of walls above.
5. Install bridging at each end of joists and at intervals indicated. Fasten bridging at each joist intersection as indicated.
6. Secure joists to load-bearing interior walls to prevent lateral movement of bottom flange.
7. Install miscellaneous joist framing and connections, including web stiffeners, closure pieces, clip angles, continuous angles, hold-down angles, anchors, and fasteners, to provide a complete and stable joist-framing assembly.

SECTION 02920 - LAWNS AND GRASSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes **seeding and sodding**.

B. Verify with CVS Project Manager on which method to be used.

1.3 DEFINITIONS

A. Finish Grade: Elevation of finished surface of planting soil.

B. Manufactured Soil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

C. Planting Soil: Native or imported topsoil, manufactured topsoil, or surface soil modified to become topsoil; mixed with soil amendments.

D. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

1.4 QUALITY ASSURANCE

A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when planting is in progress.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Sod: Harvest, deliver, store, and handle sod according to requirements in TPI's "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in its "Guideline Specifications to Turfgrass Sodding."

PART 2 - PRODUCTS

2.1 SEED

A. Seed Species: State-certified seed of grass species, as follows:

1. Full Sun: <**Insert species.**>
2. Sun and Partial Shade: Proportioned by weight as follows:

a. <**Insert percentage**> percent <**Insert species**>.
b. <**Insert percentage**> percent <**Insert species**>.
c. <**Insert percentage**> percent <**Insert species**>.

3. Shade: Proportioned by weight as follows:

a. <**Insert percentage**> percent <**Insert species**>.
b. <**Insert percentage**> percent <**Insert species**>.
c. <**Insert percentage**> percent <**Insert species**>.

2.2 TURFGRASS SOD

A. Turfgrass Sod: Number 1 Quality/Premium, including limitations on thatch, weeds, diseases, nematodes, and insects, complying with TPI's "Specifications for Turfgrass Sod Materials" in its "Guideline Specifications to Turfgrass Sodding." Furnish viable sod of uniform density, color, and texture, strongly rooted, and capable of vigorous growth and development when planted.

B. Turfgrass Species: <**Insert species.**>

C. Turfgrass Species: Sod of grass species as follows:

1. Full Sun: <**Insert species.**>
2. Sun and Partial Shade: Proportioned by weight as follows:

a. <**Insert percentage**> percent <**Insert species**>.
b. <**Insert percentage**> percent <**Insert species**>.
c. <**Insert percentage**> percent <**Insert species**>.

3. Shade: Proportioned by weight as follows:

a. <**Insert percentage**> percent <**Insert species**>.
b. <**Insert percentage**> percent <**Insert species**>.
c. <**Insert percentage**> percent <**Insert species**>.

SECTION 02870 – SITE AND STREET FURNISHINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes outdoor trash receptacle and recycle container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide outdoor trash receptacle and recycle container as manufactured by Allied Fiberglass at (800) 226-3072 or approved equal.

2.2 COMPONENTS

A. Outdoor Trash/Ash Hide-A-Butt Receptacle shall have the following features:

1. Model No.: SLC-2648 STD HAB
2. Size: 26"x26"x48"
3. Trash capacity: 45 gallons
4. Material: Aggregate fiberglass composite.
5. Weight: 150 lbs.
6. All hardware: to be stainless steel.
7. Trash Liner: Poly rigid liner with UL94HB rating.
8. Side door access for trash liner with positive lock system.
9. 4 side entry trash openings that are 6.25"x.17"
10. Hide a butt ash urn with flip top that keeps rain out and butts hidden.
11. Color: Greystone

B. Recycle Container (Only in Rhode Island) shall have the following features:

1. Model No.: 11R-361832
2. Size: 36"x18"x32"
3. Material: ABS plastic.
4. Weight: 75 lbs.
5. Color: PD-8 Dove Gray

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install outdoor trash receptacle and recycle container at building entrance in location selected by CVS project manager.

3.2 CLEANING

A. Clean all surfaces of the outdoor trash receptacle and recycle container. Exercise care to avoid damage to the finish.

3.3 PROTECTION

A. Initiate and maintain protection and other precautions required through the remainder of the construction period to ensure that, except for normal weathering, outdoor trash receptacle and recycle container will be free of damage or deterioration at the time of Substantial Completion.

END OF SECTION 02870

2.3 PLANTING MATERIALS

A. Topsoil: ASTM D 5268, pH range of 5.5 to 7, a minimum of 4 percent organic material content; free of stones 1 inch (25 mm) or larger in any dimension and other extraneous materials harmful to plant growth. Import topsoil from either of the following sources:

1. Topsoil Source: Reuse surface soil stockpiled on-site and supplement with imported or manufactured topsoil from off-site sources when quantities are insufficient. Verify suitability of stockpiled surface soil to produce topsoil.
2. Topsoil Source: Amend existing in-place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

B. Inorganic Soil Amendments:

1. Lime: ASTM C 602, Class T, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.
2. Sulfur: Granular, biodeg radable, containing a minimum of 90 percent sulfur, with a minimum 99 percent passing through No. 6 (3.35-mm) sieve and a maximum 10 percent passing through No. 40 (0.425-mm) sieve.

C. Organic Soil Amendments

1. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8.
2. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with pH range of 3.4 to 4.8.
3. Peat: Finely divided or granular texture, with pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having water-absorbing capacity of 1100 to 2000 percent.
4. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture, free of chips, stones, sticks, soil, or toxic materials.

D. Fertilizer:

1. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.
2. Superphosphate: Commercial, phosphate mixture, soluble; a minimum of 20 percent available phosphoric acid.
3. Commercial Fertilizer: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

   a. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soils reports form qualified testing agency.

4. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:

   a. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soils reports form qualified testing agency.

E. Mulches:

1. Straw Mulch: Provide air-dry, clean, mildew- and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.
2. Peat Mulch: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with pH range of 3.4 to 4.8.
3. Peat Mulch: Finely divided or granular texture, with pH range of 6 to 7.5, containing partially decomposed moss peat, native peat, or reed-sedge peat and having water-absorbing capacity of 1100 to 2000 percent.
4. Compost Mulch: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8.

2.4 PLANTING SOIL MIX

A. Planting Soil Mix: Mix topsoil with the following soil amendments **[and fertilizers]** in the following quantities:

1. Ratio of Loose Compost to Topsoil by Volume: **[1:4] [1:3] [1:2] <Insert ratio>**.
2. Ratio of Loose Peat to Topsoil by Volume: **<Insert ratio.>**
3. Ratio of Loose Wood Derivatives to Topsoil by Volume: **<Insert ratio.>**
4. Weight of Lime per 1000 Sq. Ft. (92.9 Sq. m): **<Insert weight.>**
5. Weight of Sulfur per 1000 Sq. Ft. (92.9 Sq. m): **<Insert weight.>**
6. Weight of Bonemeal per 1000 Sq. Ft. (92.9 Sq. m): **<Insert weight.>**
7. Weight of Superphosphate per 1000 Sq. Ft. (92.9 Sq. m): **<Insert weight.>**
8. Weight of Commercial Fertilizer per 1000 Sq. Ft. (92.9 Sq. m): **<Insert weight.>**
9. Weight of Slow-Release Fertilizer per 1000 Sq. Ft. (92.9 Sq. m): **<Insert weight.>**

PART 3 - EXECUTION

3.1 LAWN PREPARATION

A. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches (150 mm). Remove stones larger than 1-1/2 inches (38 mm) in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Apply superphosphate fertilizer directly to subgrade before loosening.
2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.