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Inspections Division
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Date: 05/16/16

OUTLINE SPECIFICATIONS

WEST PORT LOFTS
22 TATE STREET
PORTLAND, MAINE

ARCHETYPE, P.A.
ARCHITECTS
48 UNION WHARF
PORTLAND, MAINE 04101
(207) 772-6022

April 13, 2016

Reviewed for Code Compliance
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Not Used

End of Section

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SUMMIT
GEOENGINEERING SERVICES

GEOTECHNICAL REPORT

Proposed Apartment Building
22-28 Tate Street
Portland, Maine

Prepared for:

Archetype Architects
48 Union Wharf
Portland, Maine 04101

Prepared by:

Summit Geoengineering Services
145 Lisbon St.
Lewiston, Maine

Project #15139
March 2016

Reviewed for Code Compliance
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SUMMIT
GEOENGINEERING SERVICES

March 2, 2016
SGS #15139

Archetype Architects
Attn: David Lloyd
48 Union Wharf
Portland, Maine 04101

Reference: Geotechnical Report, Proposed Apartment Building
22-28 Tate Street, Portland, Maine

Dear David;

Summit Geoengineering Services, Inc. (SGS) has completed a geotechnical investigation for the proposed apartment building at the site referenced above. Our scope of services included the drilling of 3 borings within the proposed footprint and preparing this geotechnical report summarizing our findings and providing geotechnical recommendations.

Our scope of services for this project did not include an environmental site assessment or further investigation for the presence or absence of hazardous or toxic material on, below, or around the site. Any statements in this report, or on the soil boring logs, regarding odors or unusual and suspicious conditions observed are for informational purposes and are not intended to constitute an environmental assessment.

1.0 Project Description

We understand that the project consists of the construction of a new 3 story apartment building with a footprint of approximately 2,300 square feet at 22-28 Tate Street in Portland, Maine. We further understand that the building will be wood framed and has a proposed finish floor elevation of 97.8 feet. The eastern half of the developed site will include a 10-car parking lot. The upper two floors on the eastern portion of the proposed building will overhang part of the new parking lot.

The existing site includes a gravel parking lot in the location of the proposed building and an existing 2-story building in the location of the proposed parking lot. We understand the existing building and shed will be demolished and removed. Based on conversation with the owner, we understand that previous buildings were present at the site but have since been demolished. Grades at the site slope gently from approximately elevation 100 feet to elevation 92 feet in an easterly direction. Based on these grades and the proposed finish floor and pavement elevations, the new building and parking lot will require up to 3 feet of cut and 3 feet of fill.

We understand that the foundation concept for the new apartment will include three isolated column footings for the support piers for the second and third floor overhang. We further

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erstand that interior load support for the building will be provided by the stair tower.

Anticipated structural loads provided by SDC, Inc. for the newly constructed building are as follows:

Column Loads = Range from 18 kips to 46 kips (DL + LL)
Strip Loads= 2.5 kips per linear foot (DL + LL)

2.0 Exploration

SGS observed the subsurface conditions at the site with the drilling of 3 borings on February 15, 2016. All explorations were performed by SGS using a Power Probe 9500-VTR tracked drill rig. Boring B-3 was drilled to refusal at a depth of 18.1 feet below ground surface. The other two borings, B-1 and B-2, were terminated in the dense glacial till layer at a depths of 17 feet and 22 feet, respectively. All borings were advanced using 2 ¼" inside diameter hollow stem auger. During the borings, split spoon sampling was conducted in general accordance with ASTM D1586 to collect blow counts and soil samples.

Locations of the borings were marked by SGS prior to drilling by measuring from surrounding landmarks. These locations can be seen in the SGS Exploration Plan in Appendix A. The boring logs can be found in Exploration Logs in Appendix B.

3.0 Subsurface Conditions

3.1 Soil

The following subsurface layers and thicknesses were encountered in our geotechnical investigation, starting from the ground surface:

- Fill, 3 feet
- Native Sand, 9.5 feet to 12.3 feet
- Glacial Till, 5.1 feet to greater than 9.5 feet
- Bedrock/Dense Refusal, 18.1 feet (Boring B-3 only)

3.1.1 Fill. The fill was encountered in all of the borings, is approximately 3 feet thick, and is described as light to dark brown sandy gravel with little to some silt and brick pieces. Rubble was encountered at a depth of approximately 2 feet in Borings B-1 and B-2, and is likely part of a previously demolished building/foundation that existed at the site. The fill is humid to frozen (at the time of the explorations, anywhere from 12" to 16" was frozen), compact to dense, and ranges in Standard Penetration Test Blow Count Number (SPT-N) from 15 to 63 with an average of 31 blows per foot. It classifies as GP-GM in accordance with the Unified Soil Classification System.

3.1.2 Native Sand. The native sand was encountered at a depth of 3 feet at all the boring locations and is described as tan-brown to olive-brown fine to medium sand with little to some silt, no to some gravel, and no to little cobbles. It is compact to dense, humid to wet, and ranges

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SPT-N value from 22 to 55 with an average of 31 blows per foot. It classifies as SM or ML in accordance with USCS.

3.1.3 Glacial Till. The glacial till was encountered at a depth of 12.5 feet to 15.3 feet below ground surface and is described as gray silt with little sand and gravel and trace clay. It is compact to dense, humid to wet, and ranges in SPT-N value from 8 to 42 with an average of 27 blows per foot. Higher SPT-N values may indicate the presence of cobbles or boulders. It classifies as ML in accordance with USCS.

3.2 Groundwater

On the day of the explorations, groundwater was observed in Borings B-1 and B-2 at depths of 9.1 feet and 10.3 feet, respectively (elevations 85.4 feet to 85.7 feet). The groundwater surface appeared to be within the middle to lower portion of the native sand layer; however, based on mottling of the upper portion of the layer, we anticipate that groundwater will rise during periods of high rainfall or snow melt.

3.3 Bedrock

Auger refusal, presumed to be bedrock, was encountered at the site at a depth of 18.1 feet below existing ground surface in Boring B-3 (elevation 81.9 feet). Bedrock was not encountered in the other two borings, drilled to a depth of 17 and 22 feet. Mapping by the Maine Geological Survey indicates the bedrock at the site is of the Precambrian Z Spring Point Formation consisting of green schist and amphibolites facies ranging from and mafic to felsic volcanic rock.

4.0 Evaluation

Based on the subsurface conditions encountered in our explorations, and assuming that the recommendations from this report are followed, the foundation for the new apartment building can be constructed as a conventional shallow spread footing and slab-on-grade. Based on proposed site grades from a grading plan prepared by Pinkham & Greer dated 11/19/2015, we anticipate that footings will bear on native sand for exterior footings and a combination of existing fill and native sand for interior footings. The native sand soil is a good load-bearing material for the new footings and slab; however, the existing fill at the site appears to contain some rubble and brick, which is undesirable to have beneath load-bearing elements. With proper subgrade preparations, these materials will be suitable to support the footings and the slab on grade.

Based on the limited sample sizes of the fill obtained in the explorations at the site, it is difficult to properly characterize the composition of the existing fill at the site. We presume that some bricks and concrete pieces (old foundation rubble) are present in the fill, but we are unsure to what extent. If the fill contains large voids, organic materials, or large amount of unsuitable materials, the fill will need to be removed entirely from beneath the footings. However, if the fill contains mostly mineral soil (i.e. sand, silt, and gravel) and is able to be compacted effectively by proofrolling, the existing fill may be able to remain in place and the footings constructed on top of it (with proper subgrade preparation). To properly characterize this fill, we propose to

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erve 1 to 2 test pits within the area of the interior stair tower footing. The test pit(s) can be performed during construction prior to excavation for the footings. Based on the findings in the test pit(s), SGS will recommend appropriate subgrade preparation methods in order to provide a suitable bearing surface to support the footings using the allowable bearing pressure in Section 5.1.

5.0 Foundation Recommendations

5.1 Allowable Bearing Pressure

If the recommendations from this report are followed, the new apartment building can be constructed using conventional shallow footings and slab-on-grade construction. All interior and exterior footings (including the stair tower footing) can be proportioned using a maximum allowable bearing pressure of 2,000 psf. Total settlement is expected to be less than 1.0" and differential settlement is expected to remain within tolerable limits. The allowable bearing pressure above is based on the following conditions:

5.1.1 Exterior Footings

- Exterior footings exposed to freezing temperatures are constructed at a minimum depth of 4 feet below exterior finish grade.
- For exterior footings, we do not anticipate that any existing fill will be present beneath the footings. However, if any existing fill is encountered beneath the footings, it is removed to expose native sand. The existing fill should be removed from beneath the entire footing area and extending laterally beyond all edges equal to the depth of the fill beneath the footing (equal to a 1:1 H:V taper). SGS should be notified if the fill required to be removed is significant.
- Exposed native sand soil at the bottom of footing excavations is proofrolled with a minimum of 4 passes with a 3 ton (minimum operating weight) vibratory plate compactor. Proofrolling should be performed on dry, unfrozen soils. If soft or unsuitable soil is encountered at the bottom of the excavation, it should be removed and replaced with ¾" crushed stone prior to proofrolling.
- Where fill is required to raise the grade beneath footings, all imported fill should consist of Structural Fill (SF, see Section 5.2 for gradation requirements) placed in 12" maximum lifts and compacted to 95% of its optimum dry density in accordance with ASTM D1557 or ¾" crushed stone compacted with 3 passes with a plate compactor.

5.1.2 Interior Footings (Stair Tower Foundation)

We recommend that SGS be retained to monitor 1 to 2 test pits within the proposed area of the interior stair tower foundation to identify the composition of the existing fill. The test pits can occur once the earthwork contractor has mobilized to the site. Based on the findings from the test pit(s), SGS will provide subgrade preparation recommendations for the construction of the stair tower footings. This may include methods such as proofrolling requirements, geotextile fabric and crushed stone improvement, or overexcavation and replacement.

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5.2 Slab-on-Grade

5.2.1 Building Slab

Based on a finish floor elevation of 97.79 feet, we anticipate that a combination of existing fill, native sand, and imported fill will be exposed beneath the slab. We recommend that the slab be constructed on a minimum of 12" of Structural Fill or ¾" crushed stone. The subgrade beneath the 12" of SF or ¾" crushed stone should be compacted with a minimum of 6 passes in each of 2 perpendicular directions with a 10 ton minimum (operating) weight vibratory roller. Any existing rubble or debris exposed in the slab excavation should be removed and replaced with SF or ¾" crushed stone.

The portion of SF passing the 3" sieve shall meet the following gradation requirements:

STRUCTURAL FILL (SF)	
Sieve Size	**Percent finer**
3 inch	100
½ inch	35 to 80
¼ inch	25 to 65
No. 40	0 to 30
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type D

The maximum particle size should be limited to 4 inches. Structural Fill should be placed in 6 to 12 inch lifts and should be compacted to a minimum of 95% of its maximum dry density, determined in accordance with ASTM D1557.

In the northern portion of the building footprint, up to 3 feet of fill may be required to raise the grade to reach the sub-slab elevation. For fill beneath the 12" of SF or ¾" crushed stone, gravel borrow or SF can be used. Prior to placing any fill, the exposed subgrade soil should be proofrolled with a minimum of 6 passes in each of 2 perpendicular directions with a 10 ton minimum (operating) weight vibratory roller. The portion of Gravel Borrow passing the 3" sieve should meet the following gradation requirements:

GRAVEL BORROW	
Sieve Size	**Percent finer**
¼"	0 – 70
No. 200	0 - 10

Maine DOT 703.20, Gravel Borrow

Gravel Borrow should consist of a well graded granular material with a maximum particle size of 6 inches. Gravel Borrow should be placed in 12" maximum lifts and be compacted to a minimum of 95% of its maximum dry density in accordance with ASTM D1557.

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For the conditions described above, the slab can be designed using a subgrade modulus value of 150 pci.

5.2.2 Exterior Slabs

Exterior concrete slabs should be constructed on a minimum of 30" of Structural Fill (SF). Soil exposed in the excavation below the SF for the exterior slabs should be proofrolled with a minimum of 6 passes in each of two perpendicular directions with a 10 ton minimum (operating weight) roller. Any exposed soft or unsuitable soil should be removed and replaced with ¾" crushed stone or compacted SF. Exterior slabs attached to the building should be constructed on frost wall foundations to preclude differential movement between the building threshold and the entry pad, which could block doors.

5.3 Pavement Section Design

The mean annual freezing index for the Portland area is approximately 900 degree F days. The mean annual frost penetration depth for this freezing index and the soil at the site is approximately 30 inches.

Based on the subgrade soil conditions and the anticipated traffic (cars and light trucks traveling at low speeds) we recommend a minimum total pavement section thickness of approximately 60% of the mean annual frost penetration depth, or 18 inches. We further recommend that the pavement section consist of the following materials.

PAVEMENT SECTION MATERIAL THICKNESSES		
Material	**Thickness (in)**	**Specification**
Asphalt Surface Course	3/4	MeDOT 703.09 Type 9.5 mm
Asphalt Binder Course	2-1/4	MeDOT 703.09 Type 19 mm
Base Soil	3	MeDOT 703.06 Type A
Subbase Soil	12	MeDOT 703.06 Type D

The material specifications are referenced to the 2014 Maine Department of Transportation Standard Specifications.

We recommend that the subgrade soil in pavement areas be proofrolled as described in Section 5.2 above. Subbase and Base soil can each be placed in a single lift. These soils should be compacted to a minimum of 95% of their maximum dry density, determined in accordance with ASTM D1557, Modified Proctor Density.

In areas within the building footprint, the asphalt courses can be placed on 3 inches of Type A soil placed and compacted directly on the Structural Fill.

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ɔundwater is not an issue for pavement areas at this site and pavement underdrains are not necessary.

5.4 Frost Protection and Foundation Backfill

The design air freezing index for the Portland area is approximately 1,200 degree F days (10 year, 90% probability). Based on this, a total of 4 feet of frost protection should be provided for the exterior footings. We recommend that the exterior of all foundation elements exposed to freezing temperatures be backfilled with Foundation Backfill (FB). The interior of all foundation elements should be backfilled with SF. The portion of FB passing the 3" sieve size should meet the following gradation requirements:

FOUNDATION BACKFILL (FB)	
Sieve Size	**Percent finer**
3 inch	100
¼ inch	25 to 100
No. 40	0 to 50
No. 200	0 to 7

Reference: MDOT Specification 703.06, Type E

Maximum particle size should be limited to 6 inches. Foundation backfill should be placed in 6 to 12 inch lifts and compacted to 95% of its optimum dry density determined in accordance with ASTM D1557.

5.5 Seismic Site Class and Design Criteria

Based on the blow counts measured during the boring explorations and the depth to bedrock, the site classifies as Site Class C "very dense soil and soft rock" in accordance with the 2012 International Building Code. The following seismic site coefficients should be used:

SEISMIC DESIGN COEFFICIENTS – 2012 IBC	
Seismic Coefficient	**Site Class C**
Short period spectral response (S_S)	0.241
1 second spectral response (S_1)	0.078
Maximum factored spectral response (S_{MS})	0.289
1 second factored spectral response (S_{M1})	0.133
Design short period spectral response (S_{DS})	0.193
Design 1 second spectral response (S_{D1})	0.088

No liquefiable soils were encountered in our subsurface exploration.

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Groundwater Considerations

Groundwater was encountered in Borings B-1 and B-2 at a depth of 9.1 and 10.3 feet, respectively (elevation 85.4 to 85.7 feet). Based on this, we do not anticipate that groundwater will be present in the footing or slab excavations and foundation underdrains are not strictly necessary. However, in order to account for changes in local and regional hydrology, infiltration of stormwater, and potential for groundwater rise during wet periods, it is generally good practice to install perimeter underdrains. We recommend that underdrains consist of 4-inch diameter, perforated PVC pipe surrounded by a minimum of 6 inches of crushed stone wrapped in filter fabric. The underdrains should be placed at the base of the foundation and outlet to a free draining location or pumped if necessary.

6.0 Construction Consideration

Based on the groundwater levels observed from our explorations, we do not anticipate that groundwater will be encountered within the building excavations during construction. Diversion and control of surface water should be performed to prevent water flow from adjacent wet areas or from rain or snowmelt from entering the excavations.

We recommend that SGS be retained to monitor 1 to 2 test pits within the proposed area of the interior stair tower foundation to identify the composition of the existing fill. The test pits can occur once the earthwork contractor has mobilized to the site. Based on the findings from the test pit(s), SGS will provide subgrade preparation recommendations for the construction of the stair tower footings. This may include methods such as proofrolling requirements, geotextile fabric and crushed stone improvement, or overexcavation and replacement.

Footings and slabs should not be constructed on frozen soils. All frozen soil should be removed and replaced with compacted SF, and should not be allowed to re-freeze prior to concrete placement. After concrete has been placed, the subgrade should be protected from freezing using soil cover or insulated blankets.

We recommend that the existing structures and foundations be removed in their entirety from the site prior to construction of the building or paved parking areas.

Excavations deeper than 4 feet should be sloped no greater than 1.5H to 1V for fill or previously disturbed soils. These slopes are based on the current OSHA Excavation Guidelines.

7.0 Closure

Our recommendations are based on professional judgment and generally accepted principles of geotechnical engineering. Some changes in subsurface conditions and the proposed development at the site from those presented in this report may occur. Should these conditions differ materially from those described in this report, or should building loads and configurations change significantly, SGS should be notified so that we can re-evaluate our recommendations. The final foundation plan should be made available to SGS for review to confirm its accordance with the recommendations in this report.

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We recommend that a qualified geotechnical consultant be retained to monitor and test soil materials used during construction and confirm that soil conditions and construction methods are consistent with this report.

We appreciate the opportunity to serve you during this phase of your project. If there are any questions or additional information is required, please do not hesitate to call.

Sincerely,
Summit Geoengineering Services, Inc.

Mathew Hardison, EI
Geotechnical Engineer

STATE OF MAINE
WILLIAM M. PETERLEIN
5787
LICENSED
PROFESSIONAL ENGINEER

William M. Peterlein, PE
Principal Geotechnical Engineer

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APPENDIX A

BORING LOCATION PLAN

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Date: 05/16/16

LEGEND

B-1 SUMMIT TEST BORING (FEBRUARY 15, 2016)

PLAN REFERENCE

"WEST PORT LOFTS CONDOMINIUMS, SUBDIVISION RECORDING PLAT", DATED OCTOBER 9, 2015, PREPARED BY PINKHAM & GREER CIVIL CONSULTANTS.

TEST BORING LOCATION PLAN
PROPOSED BUILDING SITE

22 - 28 TATE STREET - PORTLAND, MAINE

PREPARED FOR

ARCHETYPE

DATE: FEB. 16, 2016	DRAWN BY: KRF	CHECKED BY: WMP
JOB: 15139	SCALE: 1" = 20'	FILE: 15139 BOR

145 LISBON ST. - SUITE 601
LEWISTON, ME 04240
Tel.: (207) 576-3313

173 PLEASANT STREET
ROCKLAND, ME 04841
Tel.: (207) 318-7761

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APPENDIX B

BORING LOGS

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EXPLORATION COVER SHEET

The exploration logs are prepared by the geotechnical engineer from both field and laboratory data. Soil descriptions are based upon the Unified Soil Classification System (USCS) per ASTM D2487 and/or ASTM D2488 as applicable. Supplemental descriptive terms for estimated particle percentage, color, density, moisture condition, and bedrock may also be included to further describe conditions.

Drilling and Sampling Symbols:

SS = Split Spoon Sample
UT = Thin Wall Shelby Tube
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RW = Rotary Wash
SV = Shear Vane
PP = Pocket Penetrometer
RC = Rock Core Sample
Hyd = Hydraulic Advancement of Drilling Rods
Push = Direct Push of Drilling Rods
WOH = Weight of Hammer
WOR = Weight of Rod
PI = Plasticity Index
LL = Liquid Limit
W = Natural Water Content
USCS = Unified Soil Classification System

Water Level Measurements:

Water levels indicated on the boring logs are the levels measured in the boring at the times indicated. In pervious soils, the indicated elevations are considered reliable groundwater levels. In impervious soils, the accurate determination of groundwater elevations may not be possible, even after several days of observations. Groundwater monitoring wells may be required to record accurate depths and fluctuation.

Gradation Description and Terminology:

Boulders:	Over 12 inches
Cobbles:	12 inches to 3 inches
Gravel:	3 inches to No.4 sieve
Sand:	No.4 to No. 200 sieve
Silt:	No. 200 sieve to 0.005 mm
Clay:	less than 0.005 mm

Trace:	Less than 5%
Little:	5% to 15%
Some:	15% to 30%
Silty, Sandy, etc.:	Greater than 30%

Density of Granular Soils and Consistency of Cohesive Soils:

CONSISTENCY OF COHESIVE SOILS		DENSITY OF GRANULAR SOILS	
SPT N-value blows/ft	**Consistency**	**SPT N-value blows/ft**	**Relative Density**
0 to 2	Very Soft	0 to 4	Very Loose
2 to 4	Soft	5 to 10	Loose
5 to 8	Firm	11 to 30	Compact
9 to 15	Stiff	31 to 50	Dense
16 to 30	Very Stiff	>50	Very Dense
>30	Hard		

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SOIL BORING LOG

Project:	New Apartment Building	Boring #:	**B-1**
Location:	22-28 Tate Street	Project #:	15139
City, State:	Portland, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	94.5 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Land Title Survey, 22-28 Tate Street" by Owen Haskell, Inc. dated 6/4/2014
Summit Staff:	M. Hardison, E.I.	Date started: 2/15/2016	Date Completed: 2/15/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	2.25" H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/15/2016	9.1 ft.	85.4 ft. +/-	5' of augers in hole

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/16	0 to 2	10		Light brown Sandy GRAVEL, little to some Silt, trace burnt Wood and Brick pieces, frozen (top 12") to humid, loose, SP-SM		FILL
1				10				
				5				
2				6				
						auger refusal on Rubble encountered at 3' depth, relocated hole 2 times, Brick pieces in auger cuttings		
3					91.5			
4								NATIVE SAND
5								
	S-2	24/22	5 to 7	6		Tan-brown Silty fine to medium SAND, slightly mottled, humid, compact to dense, SM		
6				11				
				15				
7				15				
8								
9								
10							Groundwater	
	S-3	24/24	10 to 12	9		Tan-brown Gravelly SAND, little Silt, wet, dense, SM		
11				14				
				18				
12				23				
13								
14								
15								
	S-4	24/24	15 to 17	4	79.2	Brown Sand and Gravel seam, wet, loose, SP		
16				19		Gray SILT, little Sand and Gravel, trace Clay, dense, wet, ML		GLACIAL TILL
				23				
17				25	77.5			
						End of Boring at 17', no refusal		
18								
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

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Inspections Division
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Date: 05/16/16

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SOIL BORING LOG

Project:	New Apartment Building	Boring #:	**B-2**
Location:	22-28 Tate Street	Project #:	15139
City, State:	Portland, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	96.2 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Land Title Survey, 22-28 Tate Street" by Owen Haskell, Inc. dated 6/4/2014
Summit Staff:	M. Hardison, E.I.	Date started: 2/15/2016	Date Completed: 2/15/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	2.25" H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/15/2016	10.3 ft.	85.7 ft. +/-	10' of augers in hole

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/20	0 to 2	50		Brown Sandy GRAVEL, little to some Silt, frozen (top 16") to humid, dense, SP-SM		FILL
1				41				
				22				
2				33				
						Rubble encountered during drilling at 2.0', broke through at 2.2', potential concrete/brick/granite foundation		
3					93.2			
4								NATIVE SAND
5								
	S-2	24/22	5 to 7	12		Light brown Silty fine to medium SAND, trace Gravel and Cobble fragments, humid, dense, SM		
6				25				
				30				
7				50/4"				
8								
9								
10								
	S-3	24/24	10 to 12	9		Tan-brown Silty fine to medium SAND, slightly mottled, wet, compact, SM	▽ Groundwater	
11				11				
				11				
12				11				
					83.7			
13								GLACIAL TILL
14								
15								
	S-4	24/18	15 to 17	9		Gray SILT, little Sand and Gravel, trace Clay, dense, wet, ML		
16				15				
				19				
17				17				
18								
19								
20								
	S-5	24/20	20 to 22	4		same as above		
21				4	75.2			
				2		Brown Sand and Gravel seam, little Silt, trace Clay, wet, loose, SP		
22				4	74.2			
						End of Boring at 22', no refusal		

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

NOTES: PP = Pocket Penetrometer, MC = Moisture Content
LL = Liquid Limit, PI = Plastic Index, FV = Field Vane Test
Su = Undrained Shear Strength, Su(r) = Remolded Shear Strength

Bedrock Joints
Shallow = 0 to 35 degrees
Dipping = 35 to 55 degrees
Steep = 55 to 90 degrees

Boulders = diameter > 12 inches, Cobbles = diameter < 12 inches and > 3 inches
Gravel = < 3 inch and > No 4, Sand = < No 4 and >No 200, Silt/Clay = < No 200

Soil Moisture Condition
Dry: S = 0%
Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

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SUMMIT
GEOENGINEERING SERVICES

SOIL BORING LOG

Project:	New Apartment Building	Boring #:	**B-3**
Location:	22-28 Tate Street	Project #:	15139
City, State:	Portland, Maine	Sheet:	1 of 1
		Chkd by:	

Drilling Co:	Summit Geoengineering Services	Boring Elevation:	100.0 ft. +/-
Driller:	C. Coolidge, P.E.	Reference:	"Land Title Survey, 22-28 Tate Street" by Owen Haskell, Inc. dated 6/4/2014
Summit Staff:	M. Hardison, E.I.	Date started: 2/15/2016	Date Completed: 2/15/2016

DRILLING METHOD		SAMPLER	
Vehicle:	Tracked	Length:	24" SS
Model:	AMS Power Probe	Diameter:	2"OD/1.5"ID
Method:	2.25" H.S.A.	Hammer:	140 lb
Hammer Style:	Auto	Method:	ASTM D1586

ESTIMATED GROUND WATER DEPTH

Date	Depth	Elevation	Reference
2/15/2016	dry	-	augers pulled

Depth (ft.)	No.	Pen/Rec (in)	Depth (ft)	blows/6"	Elev. (ft.)	SAMPLE DESCRIPTION	Geological/ Test Data	Geological Stratum
	S-1	24/2	0 to 2	8		Dark brown Sandy GRAVEL, little to some Silt, frozen		
1				8		(top 12") to humid, loose, GP		FILL
				8				
2				14				
						Dense drilling (possible Cobble or Rubble) encountered		
3					97.0	at 3' depth		
4								NATIVE SAND
5								
	S-2	24/24	5 to 7	15		Olive-brown SILT, trace to little Sand and Clay, Cobble		
6				20		piece at 6.3', mottled, humid, dense, ML		
				33				
7				25				
8								
9								
10								
	S-3	24/0	10 to 12	7		no recovery (drove cobble piece), likely similar to above		
11				14				
				14				
12				32				
13					87.0			
14								GLACIAL TILL
15								
	S-4	24/24	15 to 17	8		Gray SILT, little Sand and Gravel, trace Clay, dense, wet,		
16				14		ML		
				13				
17				13				
18					81.9			
						End of Boring at 18.1', Refusal on Probable Bedrock		BEDROCK
19								
20								
21								
22								

Granular Soils		Cohesive Soils		% Composition
Blows/ft.	Density	Blows/ft.	Consistency	ASTM D2487
0-4	V. Loose	<2	V. soft	
5-10	Loose	2-4	Soft	< 5% Trace
11-30	Compact	5-8	Firm	5-15% Little
31-50	Dense	9-15	Stiff	15-30% Some
>50	V. Dense	16-30	V. Stiff	> 30% With
		>30	Hard	

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Soil Moisture Condition
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Humid: S = 1 to 25%
Damp: S = 26 to 50%
Moist: S = 51 to 75%
Wet: S = 76 to 99%
Saturated: S = 100%

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DIVISION 1 - GENERAL CONDITIONS

1. All supervision necessary to complete project on agreed upon schedule.
2. Temporary power, heat and toilet facilities during construction.
3. Daily cleanup of construction debris.
4. Certificate of insurance for the General Contractor. Owner to provide Builders Risk Policy for term of construction.
5. Monthly lien waivers for all subcontractors and suppliers.
6. All state and local inspections required by law.
7. Building permit and town fees by General Contractor.
8. All testing by Owner.
9. Special Inspections by Owner.

End of Section

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DIVISION 2 - SITEWORK

02321 - BUILDING EARTHWORK

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes: Excavating, filling and backfilling, trench excavation, and grading indicated or required for building footings, foundation walls, slabs-on-grade, mechanical work, and electrical work within 5'-0" of building line.

1.02 SUBMITTALS

A. Quality control submittals:
   1. Complete shoring and bracing plans, designs, and other means of retaining undisturbed earth for Architect's files.
   2. INTENT IS TO DEMONSTRATE CONTRACTOR'S UNDERSTANDING OF REGULATIONS; NO REVIEW WILL BE MADE OF THIS SUBMITTAL.
   3. Excavating or trenching requiring depths over 3'-0" without this submittal is STRICTLY PROHIBITED.

1.03 PROJECT CONDITIONS

A. Protection:
   1. Protect benchmarks and monuments; if disturbed or destroyed, replace in original position.
   2. Protect existing facilities and adjacent property. Prevent ponding or washing of water on site, on adjacent property, or downstream. Erect straw bale barricades and retention ponds as indicated or required.
   3. Protect areas outside limits of construction from encroachment by construction personnel or equipment, regardless of property ownership. Access by specific written permission or easement only.
   4. Protect active utilities; remove or relocate as indicated. Remove or relocate active utilities encountered but not indicated.
   5. Plug or cap inactive utilities encountered, not less than 5'-0" outside building lines.
   6. Identify and protect utilities for Project duration.

B. Items of historic or archaeological value discovered during earthwork operations remain Owner's property.

PART 2 - PRODUCTS

2.01 MATERIALS

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A. Compacted structural fill: ASTM D1241-68 (1979), Coarse Aggregate, Type I, Gradation B, gravel, crushed gravel, or crushed stone; compacted to 95% Standard Proctor.

1" Sieve:	75-to-95% retained.
No. 10 Sieve:	20-to-45% retained.
No. 200 Sieve:	5-to-15% retained.

B. Porous fill: ASTM C33-86, size 3; crushed stone or gravel.

PART 3 - EXECUTION

3.01 PREPARATION

A. Excess, unsuitable, and insufficient materials:
   1. Remove excess and unsuitable materials from Project site. Legally dispose of materials off Owner's property.
   2. Provide satisfactory fill material in areas where existing materials are insufficient or unsuitable.
   3. Clear and grub site; stockpile loam if possible.
   4. Protect existing trees and other site work
   5. Remove existing sidewalk.

3.02 APPLICATION

A. Excavation:
   1. Excavate on basis of unclassified excavation. Include excavation under Contract Sum of soil materials required to establish grades indicated and excavation for utilities, structures, and appurtenances.
   2. Assume responsibility for design and construction of excavation shoring and bracing capable of supporting excavations and construction loads. Selected materials and methods are in accord with regulatory requirements and Contractor's option.
   3. Excavation of unsuitable soil material:
      a. If unsuitable soil material, including mass or trench rock or muck is encountered, clear away earth to expose material. Notify Soils Engineer and receive written instructions prior to proceeding.
      b. Remove rock to a depth of 6" below slabs and pavement, 2'-0" outside building walls, 6" below and 8" each side of piping in utility trenches and 1'-0" below finished grade in areas to receive landscaping and grassing.
      c. Perform blasting only after receiving written approval from Architect and notifying Owner's insurance company of intent. Engage experienced mechanics to perform blasting. Provide heavy mats to minimize concussion. Handle, store, and use explosives in accord with "Manual of Accident Prevention in Construction" by Associated General Contractors of America, Inc., 1971 edition.
      d. Remove unsuitable soil materials to extent directed by Testing Agency.

4. Excavate to lines and levels required to obtain finish elevation indicated. Provide space for foundation work and inspection. Cut excavations clean with level bottoms. Where changes in levels occur, provide vertical steps in horizontal footings.
5. Cut footing trenches to exact size of footing; omit forms is soil conditions permit. Notify Soils Engineer, in writing, if earth of doubtful bearing is encountered or if indicated design bearing capacity is not encountered within 8" of indicated depth; await Soils Engineer's written instructions.
6. If excavations are by error carried deeper than indicated, fill additional depth with concrete class specified for foundations at no additional cost.
7. Protect excavations against cave-ins, ponding, and freezing. Provide bracing, shoring, and sheeting to contain excavations. Slope embankments over 5'-0" high at 45□ angle away from excavation, or shore. When freezing can be anticipated prior to concrete placement, protect excavations or delay carrying excavations to full depth until concrete can be placed.
8. Maintain excavations including utility trenches free of surface water. Provide pumps and well points if required to drain excavations. Provide and maintain temporary drainage ditches.
9. Notify Soils Engineer immediately of subsurface water encountered; await written instructions.
10. Notify Testing Agency when footing excavations are complete. Testing Lab shall verify bearing capacity determined by Soils Engineer just prior to footings placement.
11. Trench excavation: Excavate trenches to a maximum width equal to pipe diameter plus 2'-0" for pipe 2'-6" diameter and smaller; 2'-6" for pipe exceeding 2'-6" diameter. Do not over-excavate. If specified trench widths are exceeded, Architect may require installation of stronger pipe or special installation procedures at no additional cost.

B. Fill and backfill:
   1. Provide satisfactory soil material to perform earthwork operations indicated; include filling and backfilling to bring grade to elevations indicated.
   2. Surface preparation to receive fill:
      a. Remove vegetation, unsuitable soil materials, obstructions, and deleterious materials from ground surface prior to fill placement. Break up sloped surfaces steeper than one vertical to four horizontal for fill material to bond with existing surface.
      b. Proofroll areas to receive fill, foundations, pavements, and building slabs with fully loaded 20-ton dump truck or equivalent. Make two complete coverages of areas in each pass of two perpendicular passes. Undercut and replace areas exhibiting "pumping" during proofrolling with selected fill materials compacted in accord with requirements of this section. Perform proofrolling under Testing Agency observation.
   3. Placement and compaction:
      a. Place fill materials in layers not more than 6" in loose depth.

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   b. Placing rocks exceeding 3" diameter in top 1'-0" fill is prohibited. Before compaction, moisten or aerate each layer to provide optimum moisture content. Compact each layer to specified percentage of maximum density for area classification.
   c. Placing backfill or fill material on muddy or frozen surfaces or surfaces containing frost or ice is prohibited.
   d. Perform placement under observation of Testing Agency if required.
4. Bed pipe in trenches on continuous soil foundation shaped to lowest one-fourth of pipe profile. Form depressions for hubs and similar joints only in sizes required for making joints.
5. Backfill against pipe in layers not more than 6" loose depth. Place backfill evenly along both sides of pipe to level of piping top; compact each layer with power tampers. Rock placement exceeding 3" diameter in first 1'-0" of fill directly over piping top is prohibited.
6. Backfill excavations promptly, but not prior to completion of following:
   a. Inspecting, testing, and recording locations of underground utilities.
   b. Shoring and bracing removal, and backfilling voids.
   c. Debris removal from excavations.
   d. Permanent or temporary horizontal bracing for unsupported walls.
7. Place backfill against below grade walls in uniform lifts to prevent wedging action. Placement of backfill until slabs on grade and framed floors lending lateral bracing is in place and until concrete has developed design compressive strength is prohibited.
8. Place porous fill layer in indicated thickness underneath slabs on grade.

C. Compaction:
1. Perform soil materials compaction for fills using mechanical soil compaction equipment for type and size materials to be compacted. Hand compact materials in areas inaccessible to machinery and within 5'-0" of below grade walls.
2. Percentage of maximum density requirements: Provide not less than percentages of maximum density required to obtain design bearing capacity.
3. Moisture control: Where subgrade or soil layer must be moisture conditioned before compaction, apply water to surface of subgrade or soil layer. Scarify and air dry soil material too wet to permit compaction to specified density.
4. Soil material removed because of excess wetness to permit compaction may be stockpiled or spread where directed by Architect and permitted to dry. Assist drying by discing, harrowing, or pulverizing until moisture content is reduced to satisfactory value determined by moisture-density relation tests. When accepted by Soils Engineer, soil material may be used in compacted backfill or fill.

D. Grading:
1. Grade areas to lines and elevations indicated, including adjacent transition areas. Smooth finished surface within specified tolerances, compact and bring to uniform levels of slopes between points where elevations are indicated, or between such points and existing grades.

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2. Provide finish surfaces free from irregular surface changes.
3. After grading, compact subgrade surfaces to depth and percentage of maximum density for each area classification.
4. Where compacted areas are disturbed by construction operations, scarify surface, reshape, and compact to required density.
5. Protection of graded areas: Protect newly graded surfaces from traffic and erosion. Keep free of debris. Where graded or compacted surfaces are damaged by subsequent operations, return to indicated grade and state of compaction.

E. Tolerances:
1. Surfaces under walks and pavements: Shape surface area under walks to line. Grade and cross-section with finish surface not more than 0.10' above or below required subgrade elevation.
2. Surface under building slabs and foundations: Grade level, free of voids, compacted as specified, within 0.05' of required elevation.
3. Grassed areas: Shape areas to receive topsoil within 0.05' above or below required subgrade elevation.
4. Grade areas adjacent to building lines to drain away from building to prevent ponding. Finish grades within 0.05' of indicated elevations.

3.03 FIELD QUALITY CONTROL

A. Testing:
1. Perform the following testing as requested by Owner:
   a. Compaction tests: In accord with ASTM D698-78.
   b. Field density tests for each 2'-0" lift in accord with ASTM D1556-82; one test for each 2000 SF fill.
   c. Inspection and testing subgrades and proposed fill materials.
   d. Examination of foundation excavations to determine if required soil bearing has been achieved.
   e. Inspection of excavation bracing system, including providing and monitoring slope indicator devices and settlement gauges.
2. Contractor's duties relative to testing include:
   a. Provide representative fill soil samples to Testing Agency for test purposes. Provide 50 lb. samples of each fill soil.
   b. Advise Testing Agency sufficiently in advance of operations to allow for quality tests completion and personnel assignment.
3. Contractor shall be responsible for paying costs of additional testing beyond scope required and retesting if initial tests reveal non-conformance with specified requirements.

End of Section

00 - LANDSCAPING

A. General:

SCOPE: The extent of work shall be as shown on Drawings and called for in these specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. Complete grading and spreading topsoil over areas shown on plans.
2. Provide planting of trees and shrubs as shown on plans.
3. Water, cultivate and protect planting until the final acceptance of the project.
4. Site cleanup at project completions.
5. Provide topsoil and seeding in any areas disturbed by grading operations apart from those areas designated for lawn.

DELIVERY, STORAGE AND HANDLING

Plant materials shall be properly labeled and certified free from insect infestation and disease. Plants shall be delivered in first class condition and in time for immediate planting. If this is not possible, plants shall be temporarily heeled in a shady location, and watered daily.

B. Products:

MATERIALS FOR PLANTING:

Plants: Shall conform to standards of the American Association of Nurseryman Inc. Plants shall be of standard quality, true to name and type, and conform to the varieties specified in the plant list.

Mulch: For plant beds shall be a combination of two types: (1) bark mulch which is clean, shredded, free of weeds, seeds, insects and extraneous materials, and (2) bark nuggets, coarse pieces of Douglas Fir bark, or an approved equal.

C. Execution:

PLANTING OF TREES, SHRUBS, AND GROUND COVERS:

Planting Method: All tree pits shall be of size and shape as shown in the Drawings. Shrub beds shall be continuous areas, excavated to the limits shown on the Drawings. Ground cover areas shall be the same as topsoil areas for lawns (six inch depth).

Locations for all plantings shall be pre-approved by the Architect. Stake all individual tree locations and show perimeters for shrub beds and ground cover areas.

Topsoil mix for all planting shall consist of top soil (equal to topsoil in seeded areas), suitable subsoil (B Horizon) of similar soil texture to topsoil, and peat moss.

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psoil mix for mound and backfill, up to within six inches (6") of finish grade of plant pit, shall be a mix of B-Horizon subsoil (70%) and peat moss (30%). Top six inches (6") shall be standard topsoil with 2 inches (2") composted manure well mixed in.

Guarantee Period: All plants shall be guaranteed by the Contractor for a period of not less than one year from time of acceptance. At the end of the guarantee period' any plant that is missing, dead, or not satisfactory in growth or general appearance shall be replaced at no cost to the Owner.

End of Section

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DIVISION 3 - CONCRETE

03300 - CONCRETE & FOUNDATION NOTES: See Structural Drawings

A. GENERAL:

All concrete shall be in compliance with ACI 301 "Specifications for Structural Concrete for Buildings."
Wherever in these Specifications compliance with ASTM standards is stipulated, the Contractor, upon request by the Architect, shall furnish a certificate of compliance from the manufacturer or supplier.

Concrete tests shall comply with ASTM standards.

SCOPE: The extent of work shall be as shown on Drawings. Performance shall meet the requirements of these Specifications or Drawings, whichever requires the higher standards. The work covered by this section of Specifications consists of the following:

1. Complete installation of plain and reinforced concrete work of the entire project shown, called for or otherwise indicated on plans.
2. Furnishing and installing all reinforcing steel, steel mesh, bars and ties.
3. Installing items to be built into concrete.
4. Installing items necessary to fasten and hold reinforcement in place.
5. Furnish and install vapor barrier below slabs
6. Seal exposed garage level concrete floor slab. Floors in units will not be sealed.

For protecting concrete from freezing, the following precautions shall be observed. The Concrete, when placed in the forms, shall have a temperature not less than 70 degrees F. nor more than 140 degrees F. Before placing concrete on any form or on any surface or around reinforcement, heat shall be applied in such a manner that snow and ice will be completely removed. No concrete shall be placed on a subgrade that is frozen or contains frozen materials. After being deposited in the forms, concrete shall be kept at a temperature of 50 degrees F. or more, for at least five (5) days. The use of salts, chemicals, or other materials to lower the freezing point of concrete is prohibited. The use of high early strength cement may reduce the time during which heat is required.

For grout, mortar or patching cement used in freezing weather, the sand, stone and water shall be heated as follows:

All sand shall be heated in such a manner as to remove all frost, ice, and excess moisture. The equipment and method used for heating sand shall be such as will prevent burning or scorching the sand.

B. PRODUCTS:

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Forms for exposed concrete: Shall be of new plyform (or of equivalent quality) or shall be lined, to provide continuous, straight, smooth, exposed surfaces.

Steel reinforcement shall be deformed bars complying with the requirements of ASTM, A-615 grade 60, and of domestic manufacture. Mesh reinforcement shall conform to the requirements of ASTM, A-185. Fiber reinforcing shall conform to ASTM C-1116, Type III virgin polypropylene fibers.

Cement shall be Portland cement of domestic manufacture conforming to the requirements of ASTM, C-150, Type 1 or 11, ASTM C-94 for Ready Mixed concrete. Only one brand of cement shall be used throughout the project.

Coarse aggregate - clean crushed stone or natural gravel, conforming to ASTM specifications C-33, and not larger than three quarter inch (3/4") for slabs or one and one half inches (1-1/2") for walls and footings. Maximum size of course aggregate for reinforced concrete shall be three quarter of minimum spacing between reinforcement or between reinforcement and form.

Fine aggregate - washed natural sand with strong sharp particles, without clay content or foreign matter.

Water - clean, generally suitable for domestic consumption.

Vapor barrier shall be Super Sampson 4SSB by Raven Industries or equal under garage slab.

Metal accessories shall include all spacers, chairs, ties, anchor bolts and other devices for properly spacing, supporting and fastening reinforcement in place.

Perimeter insulation shall be material and size as shown on Drawings. See section 07200 Insulation and Vapor Barriers.

Exposed concrete floor slab sealer to be "Floorcoat" or approved equal, by Euco, in garage.

Use air entraining admixture in exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits:

Concrete structures and slabs exposed to freezing and thawing or subjected to hydraulic pressure require air entraining air content to be within the following limits:

4% for maximum	2" aggregate	See Structural Drawings
6% for maximum	3/4" aggregate	
7% for maximum	1/2" aggregate	
Other concrete:	2% to 4% air	

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Use admixtures for water-reducing and set-control in strict compliance with manufacturer's directions. Comply with ASTMC-260.

C. EXECUTION:

MIXING:

Proportion design mixes to provide concrete with the following properties:

1. Interior Slab on Grade:
   a. Strength: 3500 psi @28 days, 3/4" aggr.
   b. W/C Ratio: 0.50
   c. Entrained Air: 3% ± 1%
   d. Slump: 3" ±

2. Footings:
   a. Strength: 3000 psi @28 days, 3/4" aggr.
   b. W/C Ratio: 0.60
   c. Entrained Air:3% ± 1%
   d. Slump: 4" ±

3. Exterior Slabs, and all other exposed Site Concrete:
   a. Strength: 4000 psi @28 days, 3/4" aggr.
   b. W/C Ratio: 0.45
   c. Entrained Air: 6% ± 1%
   d. Slump: 4" ±
   e. DCI Corrosion Inhibitor by Grace: 3 1/2 gal/cy.
      Add @ Batch Plant

4. Walls & Piers
   a. 4,000 ¾ Aggregate
   b. .50 W/C
   c. 5% Air
   d. Slump 4

Do not increase the water ratio in concrete for easier movement of concrete in the formwork. Use admixtures for cold weather pouring in compliance with Portland Cement Association standards.

Proportions of cement, fine and coarse aggregate, other permitted additives and mixing water shall be selected to produce concrete of the required placeability, durability, workability and strength, and other required properties. ACI 301, Specifications for Structural Concrete or ACI 318, Building Code Requirements for Reinforced Concrete, shall be utilized to proportion ingredients for concrete.

Submit written reports to Architect/Engineer of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect/Engineer.

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Materials for concrete shall be thoroughly mixed in accordance with ACI 301 to assure that a uniform distribution of all materials has been achieved.

Any concrete which has developed initial set or which is not poured within 1-1/2 hours after water has been added shall not be used. If air temperature is above 90 degrees F., reduce mixing and delivery time to 60 minutes.

D. TESTING:

Owner will employ a testing lab to inspect, sample and test the materials, the production of concrete, and to submit test reports.

Contractor shall give Architect and testing agency 48 hours notification prior to each placement.

Sampling and testing for quality control during placement of concrete includes the following:

Sampling Fresh Concrete: ASTM C 172

Slump: ASTM C 143; one test for each concrete load at point of discharge.

Compression Test Specimen: ASTM C 31; one set of 3 standard cylinders for each compressive strength test.

Compressive Strength Tests: ASTM C 39; one set for each 100 cu. yds. or fraction thereof, of each concrete class placed in any one day or for each 5,000 sq. ft. of surface area placed; one specimen tested at 7 days, one specimen tested at 28 days, and one specimen retained in reserve for later testing if required.

Strength level will be considered satisfactory if averages of sets of three consecutive test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

Test results will be reported on same day that tests are made, in writing, to Architect, Owner, and Contractor. Reports shall contain project name, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions, and break strength and type of break for both 7 and 28 day tests.

E. FORMWORK, REINFORCING STEEL AND INSERTS:

Formwork shall be in accordance with ACI 347 - Recommended Practice for Concrete Formwork. Forms shall be oiled with non-staining oil and shall be erected to achieve finished concrete built true to elevations, lines and dimensions shown on

Drawings. Walls shall be straight and plumb and corners shall be 90 degrees square.

Reinforcement shall comply exactly with the design. Remove scale, rust and other materials which reduce bonding with concrete before placing reinforcing steel. Place and secure accurately. Use metal spacers to hold steel in place. Wire stirrups to the bars at top and bottom. Tie crossing bars together. Lap steel 30 diameters at splices. Stagger splices.

Placement of sleeves, collars, knockouts, conduit, nailers, blocks, anchor bolts and other inserts shall be done according to Drawings and as necessary for electrical, plumbing and mechanical requirements.

Contractor is responsible for coordinating locations of such elements with appropriate trades and other subcontractors.

Notify Architect for inspection purposes of time of proposed completion of Formwork, Reinforcing and Inserts 24 hours before pouring concrete.

F. PLACING CONCRETE:

In Walls:
Upon undisturbed or compacted (95%) base, place concrete continuously in layers not over 12 inches (12") deep, and thoroughly compact by means of vibrators, hand tamping and spading during the operation of placing, thoroughly work the concrete around reinforcement, embedded fixtures, pipes, conduits and into the corners of the forms so as to prevent interior voids, honeycomb, and the patching of concrete surfaces after forms are removed. Internal vibrators should be used to aid in the compaction of the concrete. Extreme care shall be used on thin sections and exposed concrete.

When pouring is once started, it shall be carried on as a continuous operation until the placing of the panel, section or individual foundation is completed. The top surface shall be level.

No concrete shall be placed at freezing temperatures except in compliance with procedures outlined in "Cold Weather Concrete Placement", ACI 306-78.

G. FLOOR SLABS:

Floor Slabs on Fill: Slabs shall be of thickness indicated, poured on moisture barrier and gravel fill specified. Reinforce the slab with wire reinforcing mesh. Concrete shall be full thickness of slab and troweled out as specified below. Slabs in the area where floor drains occur shall be pitched to drains with a uniform gradual pitch in all directions. Lap reinforcing mesh a minimum of one section of the mesh.

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Generally slab thickness shall be four inches (4"). Greater thickness according to Drawings shall be provided to depths shown. Slabs shall be thickened under all bearing partitions and under non-bearing masonry walls.

Slabs shall be constructed in accordance with ACI-302, "Recommended Practice for Concrete Floor and Slab Construction."

Before Pouring Floor Slab: Install perimeter insulation as shown on Drawings. Wall insulation shall be held in place to concrete with cold setting cement and all insulation joints shall be tight.

Super Sampson 4SSB by Raven Industries or equal vapor barrier shall be laid over two inches (2") maximum layer of leveling sand in ten foot (10'-0") wide strips. Lap one foot (1'-0") minimum where lapping is necessary. Care shall be taken not to puncture vapor barrier; also tape vapor barriers to collars and other slab penetrations to insure complete seal. Allow adequate extension of vapor barrier at perimeter walls to overlap sill plate as shown on Drawings.

Install control joints as shown on Drawings according to manufacturer's recommendations.

FINISHING FLOOR SLAB:

Accurately screed slab, to a uniform level surface; thoroughly compact with a mechanical or wood float and then steel trowel to a true, hard, dense, smooth surface. Steel troweling should not be started until the pressure of a finger ceases to make an indentation. Finish concrete floor surfaces shall be true within a tolerance of one quarter (1/4") in ten feet (10'-0"); cut down high spots and fill low spots. Slab finishing shall be in accordance with ACI-301.

Apply Euco floor coat slab sealer to garage slab and all exterior concrete slabs or pads as soon as possible after concrete finishing - immediately after the disappearance of "Sheen" of surface moisture. Apply with roller, low pressure sprayer of lambs wool applicator according to manufacturer's recommendations. Do not apply sealer to interior unit slabs. Finish of upper level slabs to be coordinated with individual Owners.

H. FORM REMOVAL:

Forms shall not be removed until sufficient strength has been obtained to support the member's weight and any superimposed loads, and minimum of twenty four hours (24) after pouring, longer if colder than 50 degrees F. Removal of forms and shores shall be in strict accordance with the specified provisions of ACI 318 covering this subject.

Upon form removal, concrete shall be cleaned of any oil residue and all tie holes, honeycomb and other voids shall be patched with 1:2 mortar and damp cured. Concrete shall be clean in preparation for dampproofing application.

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"Fins" and other protrusions shall be cleaned and finished on all areas of exposed concrete.

Concrete surfaces to be exposed shall be smooth and free of voids or other defects and protrusions. Architect shall approve all concrete which will remain exposed.

I. CURING:

Keep exposed surfaces of concrete moist for a period of at least five (5) days after forms are removed. In hot weather, thoroughly wet exposed concrete at least twice daily during the first week. All concrete shall be cured in accordance with ACI 301.

Related Work: 07200 Insulation

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DIVISION 4 - MASONRY

04200 - UNIT MASONRY

1. GENERAL

1.1 DESCRIPTION OF WORK

A. Extent of Unit Masonry is shown on the drawings.

1.2 SUBMITTALS

A. Submit samples of exposed masonry units and mortar, illustrating full range of colors and textures.

2. PRODUCTS

2.1 MASONRY BLOCK

A. Masonry shall be ground face block.

2.2 METAL REINFORCING, TIES, ANCHORS

A. Acceptable manufacturers: Heckmann Building Products, or approved equal.

B . Brick ties at masonry veneer construction:

1. 14 Ga # 315-D anchor with 3/16 x 4" #316 triangle ties. Min. 2" into bed joints. Ties to be stainless steel.

2. At sheathing secure anchors through sheathing directly to wood studs with s/s wood screws as recommended by anchorage manufacturer.

3. Maximum spacing: 24 in. o.c. vertically, 16 in. o.c. horizontally or closer spacing as required at expansion joints, corners, floors, etc., or to secure directly to studs.

4. Material: stainless steel.

2.3 THROUGHWALL FLASHING

A. Through-wall flashing: Shall be 7 oz. Asphalt & Copper-Coated Thru-Wall Flashing as manufactured by Sandell Manufacturing Co., Inc., Cambridge, Massachusetts, telephone (617) 491-0540, or approved equal.

B. Through-wall flashing sealant: Shall be Sandell Trowel Mastic, as manufactured by Sandell Manufacturing Co., Inc.

ROOFING FELT

A. No. 30, asphalt-saturated, unperforated organic roofing felt, complying with ASTM D 226, Type I, 36 inches wide.

2.5 MASONRY ACCESSORIES

A. Weepholes: medium-density polyethylene, 3/8 in. diameter, full depth of outer wythe.

B. Chemical cleaning agents for newly-installed masonry: ProSoco Sure-Klean liquid masonry cleaners or equal by Diedrich, as recommended by manufacturer for particular condition. Recommended cleaners include Sure-Klean No. 600 Detergent, No. 101 Lime Solvent, and Vana Trol.

3. EXECUTION

3.1 MASONRY WORK IN GENERAL

A. Erect all masonry work in compliance with the line and level tolerances. Correct, or replace, as directed by the Architect, non-conforming masonry work at no additional cost to the Contract.

B. Lay no face brick or concrete masonry unit having chipped edges or face defects where such unit or piece would be exposed to view. Remove any such unit or piece, if installed, replace with new matching material, and bear all costs therefore.

C. Examine all Drawings as to requirements for the accommodation of work of other trades. Provide all required recesses, chases, slots, cutouts, and set loose lintels. Place anchors, bolts, sleeves and other items occurring in the masonry work. Take every precaution to minimize future cutting and patching. Closely coordinate the location and placement of such items.

D. Protect all masonry from rain prior to, and during the installation thereof. If the temperature is in excess of 80 degrees F. at time of installation, lightly moisten contact surfaces or masonry units by brushing with water.

E. Lay all masonry in full mortar beds, and completely butter all concealed from view vertical edges with mortar. Completely fill cells of masonry units with mortar where vertical reinforcement is to be installed therein and in other locations specified or indicated on the Drawings.

F. Provide complete protection against breakage and weather damage to all masonry work, including substantial wood boxing around door jambs, over the tops of walls and wherever necessary to protect work at all stages of completion. Protect masonry when not roofed over, at all times when masons are not working on the walls. Apply non-staining tarpaulins or waterproof

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paper, properly weighted, or nailed, to assure their remaining in place to protect masonry from all possible hazards.

G. Fit masonry into bucks and frames so as not to distort alignment of such items, and fill backs of such items with mortar, except where joints are indicated to receive caulking and sealant and have no compressible filler therein, in which case rake joints to a uniform depth of ¾ inch for proper installation of caulking and sealant material.

H. Use only power saw, equipped with carborundum blade, for cutting exposed masonry, as needed to assure straight, evenly-cut edges.

I. Lay out coursing before setting to minimize cutting closures or jumping bond. Do not spread any more mortar than can be covered before surface of mortar has begun to dry. Do not endanger bond or mortar by moving masonry when once laid. If necessary to re-adjust any items, remove entirely, clean-off mortar, and reset with fresh mortar.

J. Except for cleaning down and pointing, finish all new masonry as the walls and partitions are carried up.

K. Point and fill all holes and cracks in mortar joints with additional fresh mortar; do not merely spread adjacent mortar over defect or use dead mortar droppings. Do all pointing while mortar is still soft and plastic. If hardened, chisel defect out and refill solidly with fresh additional mortar, and tool as specified.

3.3 INSTALLATION

G. Through-wall flashing:

1. Install flashing.

2. Masonry and concrete surfaces receiving through wall flashings shall be thoroughly dry, free from loose material, and reasonably smooth. There shall be no slopes that will form pockets or prevent free drainage of water to exterior surfaces of wall.

3. Set flashing in sealant. Hold sealant back 1/4 inch from face of lintel. Hold flashing 1/2 inch back from face of lintel.

4. At wall openings, extend flashing 6 in. beyond each side of opening and turn up to form pan. Fold all corners, do not cut.

5. Lap joints between lengths of flashing 6 in. minimum and seal with mastic. Seal penetrations through flashing with mastic or overlapping piece of flashing.

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H. Provide weepholes at 24 inches on center maximum spacing through outer face of masonry at all through-wall flashing.

I. At masonry veneer construction over gypsum sheathing, provide rubber washers or bituminous dampproofing compound at all penetrations made in sheathing board or paper as part of work under this Section, including screw heads and veneer-tie anchorage.

J. Provide openings and chases as required for structural members, ductwork, large pipes, etc. Cut exposed masonry with carborundum saw to ensure straight even edges. Neatly block around and patch penetrations. Provide compressible filler around edges of openings to accommodate vibration and structural deflection. Ensure that joint reinforcement remains uncut or is well-lapped.

K. Provide control and expansion joints at locations shown, and keep clean of mortar droppings. Install Joint Sealers in accordance with Section 07900.

L. Build other work into the masonry work as shown, fitting masonry units around other work, and grouting to secure anchorage.

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DIVISION 5 - STRUCTURAL STEEL

05120 – Structural Steel

PART 1 GENERAL

1.01 DESCRIPTION OF WORK:

A. Structural steel work includes, but is not limited to new steel columns, cap plates, base plates, beams, bearing plates anchor rods and leveling plates. It includes schedules, notes and details to show size and location of members, typical connections, and type of steel required. It is that work defined in AISC "Code of Standard Practice".

1.02 REFERENCE SPECIFICATIONS:

A. AISC "Code of Standard Practice for Steel Buildings and Bridges.

B. AISC "Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design", including "Commentary" and Supplements thereto as issued.

C. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts".

D. AWS D1.1 "Structural Welding Code" - Steel.

1.03 SUBMITTALS

A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for structural steel including mill reports and high-strength bolts.

B. Shop Drawings: Submit shop drawings, including complete details and schedules for fabrication and assembly of structural steel members, procedures and diagrams.

C. Connection Design: Submit design calculations prepared and stamped by a Professional Engineer registered in the State of Maine for all connections not shown on the drawings and/or tabulated in the AISC "Manual of Steel Construction" (ASD or LRFD).

PART 2 PRODUCTS

2.01 MATERIALS:

A. Structural Steel Wide Flange Shapes: ASTM A992, Grade 50

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B. Other Structural Steel Shapes, Plates and Bars: ASTM A36

C. HSS shapes (square, rectangular and round): ASTM A500, Grade B, Fy = 46 ksi

D. Steel Pipe: ASTM A53, Grade B

E. Anchor Rods: ASTM F1554, Grade 36 headed unless otherwise indicated.

F. Unfinished Threaded Fasteners: ASTM A 307, Grade A

G. Structural Steel Primer Paint: Fabricator's standard zinc rich, rust inhibitive primer. Coat all exposed exterior steel with 2 part epoxy primer and paint system. Prep steel surfaces as needed.

H. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325

2. Direct-tension-indicator bolts conforming to ASTM F1852 or direct-tension-indicating washers conforming to ASTM F959 may be used at Contractor's option.

I. Electrodes for Welding: E70XX and comply with AWS Codes.

PART 3 EXECUTION

3.01 ERECTION:

A. General: Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

B. Surveys: Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds.

C. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads.

E. Setting Plates and Base Plates: Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.

H. Gas Cutting: Do not use gas cutting torches in field for correcting fabrication errors in primary structural framing. Cutting will be permitted only on secondary members which are not under stress.

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I. Paint Damage: Touch up shop applied paint whenever damaged or bare.

3.02 QUALITY CONTROL:

A. Testing: Owner shall engage an independent testing agency to inspect all high-strength bolted and welded connections, to perform tests and prepare reports of their findings.

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DIVISION 6 - WOOD AND PLASTICS

06100 - ROUGH CARPENTRY

A. GENERAL

SCOPE: The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. All rough carpentry work as required by Drawings and as specified under this section to include: framing, sheathing, siding and exterior trim, vents, access panels, meter enclosures, certain site improvements and temporary structures, caulking framing for air sealing and other misc. items specified elsewhere and shown on Drawings. Install safety rails to meet OSHA and contractors standards.

2. Installation of metal and other items furnished by other trades, if specifically noted in these specifications and cutting/patching for other trades as necessary for proper execution of their work. Provide blocking for all kitchens and bathrooms.

3. A representative with authority, chosen by the Contractor and approved by the Architect and Owner, shall give general supervision and superintendence.

B. PRODUCTS:

All lumber shall be as shown on Drawings or called for in this section. Lumber shall be live stock, thoroughly seasoned, and well manufactured. Materials shall be free from warp that cannot be corrected by bridging or nailing.

Framing Lumber: SPF, NELMA #2 grade or better. Lumber shall be stamped SPF dry with moisture content not to exceed 19%, dressed four sides sound and free from significant warps, checks, splits, and knots. Dressed sizes shall comply with American Lumber Standards and sizes shown on Drawings are nominal unless shown as actual by inch (") notations.

Pressure Treated Lumber used for sills, all deck framing, and in other contact with concrete, water, or earth shall meet AWPA C-2 for acceptable water-borne preservative process (no creosote or Pentachlorophenol).

Sheathing: All sheathing shall bear A.P.A. stamp. See drawings for specifications.

Wall Sheathing: APA Rated plywood sheathing 24/0, span rating of 24 o.c. 19/32" minimum thickness installed according to manufacturer's recommendations and in accordance with ANSI A 208.1 (U.B.C. Standard #25-25. See drawings for sizes.

Floor Sheathing: See Drawings.

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Roof Sheathing: See Drawings.

Exterior Trim: See Drawings.

Trim Flashing: Copper "Z" flashing 24 gauge with 1/4" lower lip.

Nails: As noted in these Specifications and on Drawings.

Screws, Bolts and Other Fasteners: as shown on Drawings and of length adequate to support loads where shown; where not shown, consult Architect.

Decks: Deck to be composite bd. Equal to "Cross Timbers" Professional Grade by GAF.

Sill Sealer: All sills set in Latex Caulk.

C. EXECUTION:

General: The Contractor shall carefully lay out and erect all structural members of rough carpentry, framing, sheathing, blocking, bridging and other items of work as necessary to install the finished work as shown on Drawings and as noted in Specifications. All members shall be properly braced, plumbed and leveled. A sufficient number of nails, as shown on Drawings and nailing schedule, screws and bolts shall be used to insure the rigidity of the construction.

Framing: All framing shall be installed closely fitted, accurately set in place to the required lines and levels, and shall be of the dimensions shown on Drawings. Do not impair structural members by improper cutting or drilling, that is, no more than 25% of center cross section removed from any framing member. Columns shall be continuous without splices from base to girder and shall be joined by nailing alternate sides with 2-16d nails 12" o.c.

All top plates shall have stud supports at butt joints (bottom plate if double top). Double top plate joints staggered with minimum 4'-0" between.

Framing Over Girders and Bearing Partitions: Joists may be butted together over the center bearing, only with prior approval of Architect and provided joists are tied together. Normally joists shall be lapped and nailed together. Minimum lap, 5 inches; maximum overhang, 12 inches. Joists shall be doubled under all parallel bath partitions. Install sill sealer below pressure treated sill plate. Exterior studding to be 24" o.c. with double 2x6's. Interior walls to be 16" o.c. for 2x4's.

Blocking: (2x6, 2x8 or wider) shall be provided as necessary for the application of subflooring, plumbing and fixtures, toilet accessories, shelving & millwork and kitchen cabinets located on Drawings, drapery track and other wall mounted accessories, electrical and communications equipment: and to provide firestopping. Provide either blocking for or center stud in closet backwalls for closet

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rod/shelf bracket. Provide blocking at interior base of exterior walls to receive wood baseboard.

Wall Sheathing: May be applied horizontally. Blocking required at horizontal joint leave 1/8" - 1/4" space at panel side joints and end joints, unless otherwise recommended by manufacturer. Nail 5/8" sheathing with 8d common nails at 4" o.c. at edges, 12" o.c. at intermediate supports.

Installation of oriented strand board must meet manufacturer's recommendations for cut edge treatment, protection and all other aspects of this product.

Roof Sheathing: Shall be installed continuous over two or more spans with long dimension across supports. End joints shall be over supports and staggered in adjacent courses. Leave 1/4" space at panel edge joints and 1/8" space at panel end joints; unless otherwise recommended by manufacturer. Nail: 6d common at 6" o.c. at panel edges, 12" o.c. at intermediate supports or staple: 1-1/2" 16 GA galvanized wire staples with 3/8" min. crown at 4" o.c. at panel edges and 8" o.c. at intermediate supports. H" clips required at joints perpendicular to framing midway between every support.

Floor Sheathing: Shall be installed continuous over two or more spans with long dimension across support. Sheathing to be glue-nailed using only adhesives conforming to APA specification AFG-01 applied in accordance with manufacturers recommendations.

If OSB Panels with sealed surfaces and edges are used, use only solvent-based glues; check with panel manufacturer. Apply continuous glue bead to joists and to groove of T&G panel. Avoid squeeze out. Fully nail plywood subfloor at time of gluing and nail with 8d at 12" o.c. at intermediate supports and 6" o.c. at edges. Stagger end joints in adjacent courses and leave 1/8" space at side and end joints. Joints are to be flush, nail heads shall not protrude, floors shall not squeak, and surface shall be acceptable for gypsum flooring.

Wood Shingles Siding: Shall be clear eastern white cedar by Maibec, 5" exposure. See attached installation guide.

Door Frames: Shall be securely anchored to the supporting construction. Install solid wood blocking at all hinges and door latch locations. Framing shall be so door can be hung true and plumb (See Section 08200 Doors). Window framing shall be as shown on Drawings, true and plumb.

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200 - FINISH CARPENTRY

1. GENERAL

1.1 DESCRIPTION OF WORK:

A. The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. All finished carpentry work and millwork as required by Drawings and as specified under this section.
2. Installation of metal and other items furnished by other trades, if specifically noted in these Specifications.

2. PRODUCTS:

2.1 BOARD LUMBER shall comply with the American Lumber Standards Simplified Practice Recommendation No. 16. Grade of board lumber shall be suitable for its intended use. Finish lumber is to be painted and shall be dressed free of tool marks and other objectionable defects. All exposed lumber to be architectural quality grade: Custom.

2.2 INTERIOR TRIM: 1x4 painted wood base, 1x3 door trim, window sill and apron painted wood.

2.3 STAIR RISERS AND TREADS: 3/4" APA plywood in common area or hard pine board in townhouses.

2.4 STAIR RAILINGS: Brosco, #75 Fir (1-1/2" x 1-3/4" round).

2.5 WALL BASE AND STAIR SKIRTBOARDS: 6" Birch.

2.6 STAIR HANDRAIL BRACKETS: Stanley SP7081, Brush Chrome finish. Secure with #8 or #10 Brass screws of adequate length for wall condition, minimum 1-1/4" into blocking.

2.7 NAILS: 6d for 1/2" finish stock and 4d finish for thinner wood. Use 8d generally for nailing 3/4" wood trim to framing.

2.8 SCREWS, BOLTS & OTHER FASTENERS: With penetration into framing or blocking adequate to support loads shown.

3. EXECUTION:

3.1 ALL ITEMS OF MILLWORK shall be carefully erected, leveled and plumbed with tight-fitting joints and square corners, carefully cut and secured. Exposed nails shall be

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set adequately for putty. Moulds and faces shall be free from hammer or other tool marks, clean-cut and true pattern. All work shall be thoroughly cleaned and sanded to receive the finish. Sharp corners of small members of finished woodwork shall be slightly rounded. All trim baseboards, etc. fastened to walls shall be secured to wall framing members and nails set. Care shall be taken to avoid splitting ends of trim boards.

3.2 INTERIOR TRIM: Install trim with finishing nails and glue where required to assure permanent, tight joints, according to Drawing details.

3.3 STAIRS: Handrails supported every 4'-0" o.c. minimum secured into solid blocking (1-1/4" minimum screw depth for handrails). Risers and treads to be glued and screwed together.

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DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07100 - VAPOR BARRIERS

1. See Drawings.

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00 - INSULATION

1. Exterior Walls: R-22 closed cell foam in exterior walls, see drawings for details.

2. Roof: Minimum R-30, see drawings and specifications.

3 Under Concrete floor slab 2" extruded polystyrene board, high density.

4. Buried insulation as shown on foundation drawings to be expanded polystyrene high density, 2" thick.

5. Sill Sealer: Latex caulk all sills. Windows and doors frames provide expanding foam insulation at all voids. Allow min. 1/2" at jambs and head to ensure continuous.

6. The wall types call for the following:
   a. Double stud wall between units: Spray applied cellulose.
   b. Wall between stair and units: 5½" high density fiberglass bats.
   c. Partition walls within apartment: 3½ high density fiberglass batts.

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:10 – CELLULOSE INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cellulose Insulation:
   1. Pneumatically blown dry into floor assemblies.
   2. Pneumatically sprayed damp into open wall cavities.

1.2 REFERENCE STANDARDS

A. ASTM C 739 – Standard Specification for Cellulosic Fiber Loose-Fill Thermal Insulation.

B. ASTM E 84 – Standard Test Method for Surface Burning Characteristics of Building Materials.

C. ASTM E 119 – Standard Test Methods for Fire Tests of Building Construction and Materials.

D. CPSC Standard 16 CFR Parts 1209 and 1404.

E. UL 723 – Standard for Test for Surface Burning Characteristics of Building Materials.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data, including installation instructions.

B. Manufacturer's Certification: Submit manufacturer's certification that materials comply with specified requirements and are suitable for intended application and can provide field quality control.

C. Warranty Documentation: Submit manufacturer's standard warranty.

1.4 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer regularly engaged, for past 10 years, in manufacture of cellulose insulation of similar type to that specified.

B. Installer's Qualifications:
   1. Installer regularly engaged, for past 3 years, in installation of cellulose insulation of similar type to that specified.
   2. Employ persons trained for installation of cellulose insulation.

1.5 DELIVERY, STORAGE, AND HANDLING

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.. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer's instructions.
   2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
   3. Store materials in clean, dry area indoors.
   4. Protect materials during storage, handling, and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. GreenFiber, 2500 Distribution St, Charlotte, North Carolina 28203, Toll Free 800-228-0024
www.greenfiber.com

B. Nu-Wool Company, Inc., 2472 Port Sheldon Street, Jenison, Michigan 49428. Toll Free (800) 748-0128. Phone (616) 669-0100. Fax (616) 669-2370. Website www.nuwool.com. E-mail info@nuwool.com.

2.2 THERMAL INSULATION

A. Cellulose Insulation:
   1. Pneumatically Blown Dry into Attics Assemblies: GreenFiber INS765/Cel-Pak, Nu-Wool Premium Cellulose Insulation.
   2. Pneumatically Blown dense-pack into Wall/Floor Cavities: Damp applied or Dry applied
      Dry:GreenFiber INS765 or Cel-Pak, Nu-Wool Premium Cellulose Insulation.
      Damp: GreenFiber INS735, Nu-Wool Premium Cellulose Insulation.

B. Material Description:
   1. Manufactured from recycled newspapers.
   2. Post-Consumer Recycled Content: 85 percent.
   3. Fibers: Treated with boric acid or a combination of Boric acid and sodium polyborate additives to create permanent flame resistance.
   4. Fungicide Additive: The boric acid is:
      a. EPA registered.
      b. Makes insulation resistant to mold growth.
   5. Additives:
      a. Non-toxic.
      b. Non-corrosive.
      c. Does not irritate normal skin.

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d. Does not give off odor during or after installation.
e. Does not attract vermin or insects.
f. Does not adversely affect other building materials.

C. Compliance:
1. UL classified R-8078 or R-15890
2. CPSC Standard 16 CFR Parts 1209 and 1404.
3. ASTM C 739.
4. ASTM E 119: Firewalls U382, U369a, U369b, U360, U370, U377 (GF FRM Firewall Assemblies)
5. ES Report ESR-2217 or R-15890

D. Test Results:
1. Settled Density:
   a. Maximum density after long-term settling of dry installation: 1.4 to 1.6 lbs per cu ft.
2. Thermal Resistance:
   a. Average thermal resistance (R-value) per inch: 3.65 to 3.8.
3. Flammability Characteristics:
   a. Critical Radiant Flux: 0.12 W/cm^2 minimum.
   b. Smoldering Combustion: No evidence of flaming and weight loss of 15.0 percent maximum.
4. Moisture Vapor Sorption:
   a. Moisture Gain in Insulation: 15 percent maximum by weight.
5. Environmental Characteristics:
   a. When in contact with steel, copper, aluminum, or galvanized materials: Non-corrosive.
   b. Does not support fungal growth.
6. Surface Burning Characteristics, ASTM E 84 and UL 723: Nu-Wool Premium Cellulose Insulation.
   a. Flame Spread Index: 10 to 15.
   b. Smoke Developed Index: 5 to 20.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive cellulose insulation.

B. Notify Architect of conditions that would adversely affect installation or subsequent use.

C. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Protection of In-Place Conditions:

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1. Protect adjacent surfaces, electrical boxes, open pipes, and register openings in accordance with manufacturer's instructions.
2. Protect adjacent surfaces from contact with pneumatically blown dry or pneumatically sprayed damp cellulose insulation.

B. Preparation: Ensure mechanical, plumbing, electrical, and other utility installations have been completed before installation of cellulose insulation.

3.3 INSTALLATION

A. Install cellulose insulation in accordance with manufacturer's instructions at locations indicated on the Drawings.

B. Install cellulose insulation to uniform density without voids, gaps, or air pockets.

C. Install cellulose insulation to density and depth to achieve required R-values, see drawings.

D. Pneumatically Blown Dry Cellulose Insulation:
1. Pneumatically blow cellulose insulation dry into roof and floor assemblies after mechanical, plumbing, electrical, and other utility installations have been completed.
2. Ensure heat-producing devices have barriers constructed around them to prevent contact with cellulose insulation.
3. Install cellulose insulation to a density of 1.6 lbs. per cu. ft.

E. Pneumatically Sprayed Damp Cellulose Insulation:
1. Pneumatically spray cellulose insulation with controlled water fog for adhesion into open wall cavities after mechanical, plumbing, electrical, and other utility installations have been completed.
2. Install cellulose insulation to a density of 3.0 to 3.5 lbs. per cu. ft to prevent settling in wall cavities.
3. Use quantity of water in installation to ensure proper adhesion into wall cavities and proper density.
4. Install gypsum board a minimum of 24 hours after installation of pneumatically sprayed damp cellulose insulation.

3.4 PROTECTION

A. Protect installed cellulose insulation from damage during construction.

End of Section

160 – SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fiber cement siding panels, fascia, moulding and accessories.

1.2 RELATED SECTIONS

A. Section 05400 – Light Gage Metal Framing: Wall framing and bracing.

B. Section 06100 – Rough Carpentry: Wood framing and bracing.

C. Section 06100 – Rough Carpentry: Sheathing.

D. Section 06455 – Simulated Wood Trim.

E. Section 07210 – Insulation: Exterior wall insulation.

1.3 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.

C. Shop Drawings: Provide detailed drawings of atypical non-standard applications of cementitious siding materials which are outside the scope of the standard details and specifications provided by the manufacturer.

D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

E. Verification Samples: For each finish product specified, two samples, minimum size 4 by 6 inches (100 by 150 mm), representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years experience with installation of similar products.

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B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store siding on edge or lay flat on a smooth level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

C. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.6 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.7 WARRANTY

A. Product Warranty: Limited product warranty against manufacturing defects.
   1. Hardieplank lap and Hardipanel vertical siding for 50 years.
   2. HardieTrim for 10 years.

B. Finish Warranty: Limited product warranty against manufacturing finish defects.
   1. When used for its intended purpose, properly installed and maintained according to Hardie's published installation instructions, James Hardie's ColorPlus finish with ColorPlus Technology, for a period of 15 years from the date of purchase: will not peel; will not crack; and will not chip.

C. Workmanship Warranty: Application limited warranty for 2 years.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: James Hardie Building Products, Inc; 26300 La Alameda, Suite 250, Mission Viejo, CA 92691. ASD. Toll Free Residential: (888)

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J-HARDIE. Toll Free Commercial: (866) 274-3464. Tel: (949) 348-1800. Fax: (949) 367-0185. Email: info@JamesHardie.com. Web - Residential: http://www.jameshardie.com. Web - Commercial: http://www.jameshardiecommercial.com.

B. Substitutions: Not permitted.

C. Requests for approval of equal substitutions will be considered in accordance with provisions of Section 01600.

2.2 SIDING

A. Code Compliance Requirement for Materials:
1. National Evaluation Report No. NER 405 (BOCA, ICBO, SBCCI)
2. City of Los Angeles, Research Report No. 24862
3. Metro Dade County, Florida Acceptance No. 07-0148, 04
4. US Department of Housing and Urban Development Materials Release 1263d
5. California DSA PA-019.
6. City of New York M EA 223-93-M.
7. Non-asbestos fiber-cement siding where required to be non-combustible shall be tested in accordance with ASTM E136.

B. Lap Siding: Hardieplank as manufactured by James Hardie Building Products, Inc.
1. Type: Smooth 7 ¼ "with 6" exposure.

2.3 FASTENERS

A. Wood Framing Fasteners:
1. Wood framing: 6d common corrosion resistant nails.

B. Metal Framing:
1. Metal framing: 1-5/8 inches (41 mm) No. 8-18 by 0.323 inch (8.2 mm) head self-drilling, corrosion resistant S-12 ribbed buglehead screws.

2.4 FINISHES

A. Factory Primer: Provide factory applied universal primer.
1. Primer: PrimePlus by James Hardie.
2. Topcoat: Field finish two (2) coats.

B. Factory Finish: Refer to Exterior Finish Schedule.
1. Product: ColorPlus by James Hardie.

C. Factory Finish Color for Trim, Soffit and Siding Colors: - By Architect

PART 3 EXECUTION

3.1 EXAMINATION

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A. Do not begin installation until substrates have been properly prepared.

B. If framing preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Nominal 2 inch by 6 inch (51 m by 102 mm) wood framing selected for minimal shrinkage and complying with local building codes, including the use of water-resistive barriers or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

D. Minimum 20 gauge 6 inch (92 mm) C-Stud 16 inches maximum on center metal framing complying with local building codes, including the use of water-resistive barriers and/or vapor barriers where required. Minimum 1-1/2 inches (38 mm) face and straight, true, of uniform dimensions and properly aligned.
   1. Install water-resistive barriers and claddings to dry surfaces.
   2. Repair any punctures or tears in the water-resistive barrier prior to the installation of the siding.
   3. Protect siding from other trades.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Following manufacturer's instructions, all cut ends of siding must be sealed and primed prior to installation.

3.3 INSTALLATION - HARDIEPLANK SIDING

A. Install materials in strict accordance with manufacturer's installation instructions.

B. Starting: Install a minimum 1/4 inch (6 mm) thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1-1/4 inches (32 mm) wide laps at the top. The bottom edge of the first plank overlaps the starter strip.

C. Allow minimum vertical clearance between the edge of siding and any other material in strict accordance with the manufacturer's installation instructions.

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D. Align vertical joints of the planks over framing members.

E. Maintain clearance between siding and adjacent finished grade.

F. Locate splices at least one stud cavity away from window and door openings.

G. Use off-stud metal joiner in strict accordance with manufacturer's installation instructions.

H. Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

C. Blind nail to sheathing following all manufacturers' instructions.

D. Locate splices at least 12 inches (305 mm) away from window and door openings.

E. Wind Resistance: Where a specified level of wind resistance is required Hardieplank lap siding is installed to framing members and secured with fasteners described in Table No. 2 in National Evaluation Service Report No. NER-405.

F. Allow 1/8-inch gap between trim and siding.

G. Seal gap with paintable, high-quality sealant.

3.4 FINISHING

A. Finish unprimed siding with a minimum one coat high quality, alkali resistant primer and one coat of either, 100 percent acrylic or latex or oil based, exterior grade topcoats or two coats high quality alkali resistant 100 percent acrylic or latex, exterior grade topcoat within 90 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

B. Finish factory primed siding with a minimum of one coat of high quality 100 percent acrylic or latex or oil based exterior grade paint within 180 days of installation. Follow paint manufacturer's written product recommendation and written application instructions.

3.5 PROTECTION

A. Protect installed products until completion of project.

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B. Touch-up, repair or replace damaged products before Substantial Completion.

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165 – SIDEWALL SIDING VENTILATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Siding Ventilation System for Use in Sidewall Construction.

B. Related Sections
   1. Division 6 Section: Rough Carpentry (06 10 00), Finish Carpentry (06200).
   2. Division 7 Section: Roofing and Siding Panels (07400), Exterior Insulation and Finish Systems (72460), Siding

1.02 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.
B. Product Data: Submit manufacturer's product data and installation instructions.
C. Samples: Submit selection and verification samples.
D. Closeout Submittals: Submit the following:
   1. Warranty documents specified herein.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Utilize an installer having demonstrated experience on projects of similar size and complexity.

1.04 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirement Section.
B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.

1.05 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

   1. Warranty Period: 50 years, beginning with date of substantial completion.

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RT 2 PRODUCTS

2.01 SIDING VENTILATION SYSTEM

A. Manufacturer: Cor-A-Vent, Inc., PO Box 428, Mishawaka, IN 45646-0428
B. Proprietary Products/Systems: Siding Ventilation System, including the following:
    1. Cora-Vent SV3:
        a. Cor-A-Vent SV3 Strips with insect screens.
        b. Cor-A-Vent sturdy-strips

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions: No substitutions permitted.

2.03 ACCESSORIES

A. Provide the following accessories:
    1. See Section 07250
        a. Material:

    2. Fasteners: As recommended by Manufacturer

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Comply with the instructions and recommendations of the siding ventilation manufacturer.

3.02 EXAMINATION

A. Site Verification of Conditions:
    1. Verify that site conditions are acceptable for installation of siding ventilation.
    2. Do not proceed with installation of siding ventilation until unacceptable conditions are corrected.

3.03 PROTECTION

A. Protect installed work from damage due to subsequent construction activity on the site.

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RAINSCREEN SIDING VENTILATIC
W/ COR-A-VENT SV-3™

eCRUSH RESISTANT EXTRUDED POLYPROPYLENE CORE
•FLUTED AIRWAYS PROVIDE MAXIMUM AIRFLOW
e ENHANCED INSECT SCREEN

|..:[7/16"

SIDING MUST BE NAILED THROUGH
SV-3 AND THROUGH STURDI STRIPS
INTO STRUCTURE BEHIND

eOPTIONAL STARTER STRIP ACCESSORY
eSTURDI STARTER IS NON-VENTING

COR-A-VENT, INC. P.O. BOX 428, MISHAWAKA, IN 46546-0428 800-837-8368	
SCALE, N.T.S.	APPROVED BY: G. SELLS
DATE: 3/6/15	DRAWN BY: BM
SIDING VENTILATION DETAIL W/ COR-A-VENT SV-3™	
ARCHITECT REFERENCE DRAWING	DRAWING NUMBER COR-SV-3

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500 – ROOFING & FLASHING

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. Fully adhered EPDM sheet roofing, tapered and flat roof insulation, elastomeric flashing edge strips and roof drains.

1.02 CODES, REGULATIONS AND STANDARDS

A. Contractor Responsibility: The Contractor shall assume full responsibility and liability for compliance with all applicable Federal, State and local codes, regulations and standards pertaining to work practices, hauling, disposal, protection of workers and visitors to the site, and persons occupying areas adjacent to the site. This includes modification of procedures to comply with changes to codes, regulations and standards which occur during the work of this contract. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State and local regulations. The Contractor shall hold the Owner and Owner's Representatives harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulations on the part of himself, his employees or his subcontractors.

1.03 QUALITY ASSURANCE

A. Roofing contractor to be approved in writing by the membrane manufacturer. Contractor shall be able to substantiate that he has been trained by the membrane manufacturer.
B. Roofing and flashing workmanship to comply with industry standards. The National Roofing Contractors Association's (NRCA) ***ROOFING AND WATERPROOFING MANUAL*** along with ***ARCHITECTURAL SHEET METAL MANUAL*** as published by Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) will be used to establish industry standards.

1.04 SUBMITTALS

A. Sample fifteen (15) year watertight warranty for the EPDM membrane.
B. Sample twenty (20) year material warranty for the EPDM membrane.
C. Current EPDM membrane manufacturer's application specifications.
D. Shop drawings of each flashing condition, such as eave, curb, vent, wall termination, fascia and siding. Show securement of panels and clips, spacing, type and number of fasteners.

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5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in their original, unopened containers, clearly labeled with manufacturer's name. All material to be stored in waterproof trailers or sheds, up on raised platforms and under lock and key until use. Do not use materials damaged in handling or storage. Replace damaged material with new material. Store adhesives between 60 and 80 degrees F. Should they be exposed to lower temperatures, restore to room temperature for three to five days prior to use.

1.06 WARRANTY

A. A ten (10) year watertight warranty and twenty (20) year material warranty shall be issued by the EPDM membrane manufacturer.
B. The roofing contractor shall furnish the Owner with his personal two (2) year watertight warranty.

PART 2 PRODUCTS

2.01 ROOF INSULATION

A. Flat roof insulation to be polyisocyanurate R factor R60 minimum, closed-cell foam core with manufacturer's standard facing laminated to both sides, complying with FS HH-I-1972/2, Class 1. Roof insulation to be ISO 95+ by Firestone, H-Shield by Hunter Panels or approved equal.
B. Over all foam insulation, install one layer of 1/2" high density fiberboard roof insulation. The high density fiberboard roof insulation to be Structodek by Wood Fiber Industries, High Density Fiberboard by the Celotex Corp. or approved equal. **EPDM to be "Low Slope Fire Resistant" LSFR meeting U.L. - B. - FA.- 38.**

2.02 MEMBRANE ROOF SYSTEM

A. Membrane roofing to be fully adhered .060" EPDM sheet roofing furnished in twenty five foot (25') wide (or wider) rolls by Firestone, Carlisle or Versico. Roof membrane to be fully adhered to the 1/2" high density fiberboard roof insulation.
B. Use the roof membrane for flashing of curbs and walls per the manufacturer's standard details. Use reinforced EPDM anchor strips to avoid splice joints at walls and edges.
C. Adhesives, sealants, thinner, cleaner and accessories to be furnished by the membrane manufacturer.
D. **Six inch (6") wide seam tape will be required for all field seams**.

2.03 METAL FLASHING

A. Edge strip to be formed using 16 ounce copper. Concealed clips to be formed using 20 ounce plain copper.

B. Cap flashing to be formed using 16 ounce plain copper.

2.04 FASTENERS

A. Use fasteners recommended by the membrane manufacturer to secure anchor bars and termination bars.
B. Fasteners used to secure roof insulation to the wood deck to be #14-10 Heavy Duty Roofing Fasteners with CR-10 coating, a minimum shank diameter of 0.170" and a thread diameter of 0.125". Pressure plates to be 3" diameter Galvalume plates. Screws and plates to be manufactured by Olympic Fasteners or approved equal. Length, size and accessories to be as required by the EPDM membrane manufacturer selected.
C. Copper flashing to be secured with annular-ring copper nails as shown on attached drawings.

PART 3 EXECUTION

3.01 PREPARATION OF SURFACES

A. Surfaces on which the roofing system is to be applied shall be clean, smooth, dry, free of fins, rot, sharp edges, loose and foreign materials, oil and grease.

3.02 ROOF MEMBRANE

A. Adhere the .060" EPDM membrane to the 1/2" high density fiberboard in strict accordance with the manufacturer's specifications.
B. **Six inch (6") wide seam tape will be required for all field seams**.
C. Install an additional layer of roof membrane material, loosely applied, for additional protection at locations shown to receive concrete paver system.

3.03 FLASHING - - WALLS, PARAPETS, CURBS AND VENTS

A. Use the longest pieces of material which are practical. All flashing and terminations shall be done in accordance with the applicable manufacturer's details.
B. Care must be taken to set the elastomeric flashing so it does not bridge where there is a change of direction (i.e. where a parapet meets the roof deck). This can be accomplished by creasing the membrane into the angle change prior to adhering up the wall. Excess bridging will be cause for rejection and will be re-done at the contractor's expense.
C. Install termination bars at the top of all base flashing, fastening a minimum of 6" on center.

3.04 METAL FLASHING

A. Bottom edge of copper edge strips to be secured with continuous

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cleats. Nail top flange with annular-ring nails, three inches (3") on center. Strip top flange with 6" pressure sensitive flashing.
B. Submit details of all proposed flashing conditions.

3.05 TEMPORARY WATER CUT-OFF

A. Temporary water cut-offs are to be constructed at the end of each working day to protect the insulation, roofing, building and building interior from damage due to wind, snow and rain.
B. Temporary water cut-offs are to be detailed by the contractor and approved by the manufacturer and Owner.

3.06 CLEAN UP

A. Site clean-up shall be complete and to the satisfaction of the Owner.
B. All roofs, building, landscape and parking areas shall be cleaned of all trash, debris and dirt caused by or associated with this work.
C. Any areas stained, dirtied, discolored or otherwise damaged due to this work shall be cleaned, restored and replaced as required.
D. All debris shall be removed from the premises promptly and the construction area left clean daily.

3.07 INSPECTION AND TESTING

THE OWNER RESERVES THE RIGHT TO INSPECT AND TEST ALL CONSTRUCTION OPERATIONS AND MATERIALS.

A. Any defect or noncompliance discovered by inspection shall be reported to the contractor who shall promptly remove any defective material from the site.
B. The Owner reserves the right to inspect the work or parts of it as he chooses. His failure to inspect the work in progress shall not relieve the contractor of the responsibility for properly executing the contracted work, nor shall it impair the Owner's right to reject deficiencies he may subsequently discover.

PART 4 JOB CONDITIONS

A. Roofing to be applied in dry weather.
B. Completed roof areas shall not be trafficked. The work shall be coordinated to prevent this situation by working toward the roof edges.
C. This project is subject to compliance with all requirements of the Occupational Safety and Health Administration (OSHA). All work on this project must meet the requirements of all applicable state and local codes, laws and ordinances.

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340 – FIRESTOPPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification Section, apply to work specified in this section.

1.02 DEFINITIONS

A. Firestopping: Material or combination of materials used to retain integrity of fire-rated construction by maintaining an effective barrier against the spread of flame, smoke, and hot gases through penetrations in, or construction joints between, fire rated wall and floor assemblies.

1.03 GENERAL DESCRIPTION OF THE WORK OF THIS SECTION

Only tested firestop systems shall be used in specific locations as follows:

A. Penetrations for the passage of duct, cable, cable tray, conduit, piping, electrical busways and raceways through fire-rated vertical barriers (walls and partitions), horizontal barriers (floor/ceiling assemblies), and vertical service shaft walls and partitions.

B. Safing slot gaps between edge of floor slabs and curtain walls.

C. Openings between structurally separate sections of wall or floors.

D. Gaps between the top of walls and ceilings or roof assemblies.

E. Expansion joints in walls and floors.

F. Openings and penetrations in fire-rated partitions or walls containing fire doors.

G. Openings around structural members which penetrate floors or walls.

1.04 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections.

1.05 REFERENCES

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A. Test Requirements: ASTM E 814, "Standard Method of Fire Tests of Through Penetration Fire Stops"

B. Test Requirements: UL 1479, "Fire Tests of Through-Penetration Firestops"

C. Test Requirements: UL 2079, "Tests for Fire Resistance of Building Joint Systems"

D. Underwriters Laboratories (UL) of Northbrook, IL publishes tested systems in their "FIRE RESISTANCE DIRECTORY" that is updated annually.

1. UL Fire Resistance Directory:
   a. Firestop Devices (XHJI)
   b. Fire Resistance Ratings (BXRH)
   c. Through-Penetration Firestop Systems (XHEZ)
   d. Fill, Voids, or Cavity Material (XHHW)
   e. Forming Materials (XHKU)
   f. Joint Systems (XHBN)
   g. Perimeter Fire Containment Systems (XHDG)

2. Alternate Systems: "Omega Point Laboratories Directory" (updated annually).

E. Test Requirements: ASTM E 1966, "Standard Test Method for Fire Resistive Joint Systems"

F. Test Requirements: ASTM E 2307, "Standard Test Method for Determining Fire Resistance of Perimeter Fire Barrier Systems Using Intermediate-Scale, Multi-story Test Apparatus"

G. Inspection Requirements: ASTM E 2174, "Standard Practice for On-site Inspection of Installed Fire Stops"

H. ASTM E 84, "Standard Test Method for Surface Burning Characteristics of Building Materials"

I. International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgments

J. International Building Code (IBC 2009)

K. NFPA 101 - Life Safety Code

L. NFPA 70 - National Electric Code

1.06 QUALITY ASSURANCE

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A. Fire-Test-Response Characteristics: Provide through-penetration fire stop systems and fire-resistive joint systems that comply with specified requirements of tested systems.

B. Fire stop System installation must meet requirements of ASTM E 814, UL 1479 or UL 2079 tested assemblies that provide a fire rating equal to that of construction being penetrated.

C. Proposed fire stop materials and methods shall conform to applicable governing codes having local jurisdiction.

D. Fire stop Systems do not reestablish the structural integrity of load bearing partitions/assemblies, or support live loads and traffic. Installer shall consult the structural engineer prior to penetrating any load bearing assembly.

E. For those firestop applications that exist for which no qualified tested system is available through a manufacturer, an engineering judgment derived from similar qualified tested system designs or other tests will be submitted to local authorities having jurisdiction for their review and approval prior to installation. Engineering judgment documents must follow requirements set forth by the International Firestop Council.

1.07 SUBMITTALS

A. Submit Product Data: Manufacturer's specifications and technical data for each material including the composition and limitations, documentation of qualified tested firestop systems to be used and manufacturer's installation instructions to comply with Section 01 30 00.

B. Manufacturer's engineering judgment identification number and document details when no qualified tested system is available for an application. Engineering judgment must include both project name and contractor's name who will install firestop system as described in document.

C. Submit material safety data sheets provided with product delivered to job-site.

1.08 INSTALLER QUALIFICATIONS

A. Engage an experienced Installer who is certified, licensed, or otherwise qualified by the firestopping manufacturer as having been provided the necessary training to install manufacturer's products per specified requirements. A supplier's willingness to sell its firestopping products to the Contractor or to an Installer engaged by the Contractor does not in itself confer qualification on the buyer.

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B. Installation Responsibility: assign installation of through-penetration firestop systems and fire-resistive joint systems in Project to a single sole source firestop specialty contractor.
   - NOTE: THE REQUIREMENT FOR A SINGLE SOLE SOURCE FIRESTOP SPECIALTY CONTRACTOR IS A CONDITION OF THE BUILDING PERMIT AND IS NOT NEGOTIABLE. FIRESTOPPING CANNOT BE INSTALLED ON A TRADE-BY-TRADE BASIS.

C. The work is to be installed by a contractor with at least one of the following qualifications:

FM 4991 Approved Contractor
UL Approved Contractor
Hilti Accredited Fire Stop Specialty Contractor

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and UL label where applicable.

B. Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

C. Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements, including temperature restrictions.

D. Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

E. Do not use damaged or expired materials.

1.10 PROJECT CONDITIONS

A. Do not use materials that contain flammable solvents.

B. Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

C. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

D. Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

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E. During installation, provide masking and drop cloths to prevent firestopping materials from contaminating any adjacent surfaces.

PART 2 - PRODUCTS

2.01 FIRESTOPPING - GENERAL

A. Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

B. Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

C. Penetrations in Fire Resistance Rated Walls: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Not less than the fire-resistance rating of the wall construction being penetrated.

D. Penetrations in Horizontal Assemblies: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. F-Rating: Minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
2. T-Rating: when penetrant is located outside of a wall cavity, minimum of 1-hour rating, but not less than the fire-resistance rating of the floor construction being penetrated.
3. W-Rating: Class 1 rating in accordance with water leakage test per UL 1479.

E. Penetrations in Smoke Barriers: Provide firestopping with ratings determined in accordance with UL 1479 or ASTM E 814.

1. L-Rating: Not exceeding 5.0 cfm/sq. ft. of penetration opening at both ambient and elevated temperatures.

F. Mold Resistance: Provide penetration firestoppping with mold and mildew resistance rating of 0 as determined by ASTM G21.

G. Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.

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2 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with through penetration firestop systems (XHEZ), joint systems (XHBN), and perimeter firestop systems (XHDG) listed in Volume 2 of the UL Fire Resistance Directory; provide products of the following manufacturers as identified below:

1. Hilti, Inc., Tulsa, Oklahoma
   800-879-8000
   www.us.hilti.com
   Chris Allington 508-509-8316
   Chris.allington@hilti.com

2. Substitution requests shall be considered in accordance with contract provisions.

2.03 MATERIALS

A. Use only firestop products that have been UL 1479, ASTM E 814 or UL 2079 tested for specific fire-rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.

B. Pre-installed firestop devices for use with noncombustible and combustible pipes (closed and open systems), conduit, and/or cable bundles penetrating concrete floors and/or gypsum walls, the following products are acceptable:

1. Hilti Cast-In Place Firestop Device (CP 680-P)
   a. Add Aerator Adaptor when used in conjunction with aerator system.
2. Hilti Tub Box Kit (CP 681) for use with tub installations.
3. Hilti Cast-In Place Firestop Device (CP 680-M) for use with noncombustible penetrants.
4. Hilti Speed Sleeve (CP 653) for use with cable penetrations.
5. Hilti Firestop Drop-In Device (CFS-DID) for use with noncombustible and combustible penetrants.
6. Hilti Firestop Block (CFS-BL)

C. Sealants, caulking materials, or foams for use with non-combustible items including steel pipe, copper pipe, rigid steel conduit and electrical metallic tubing (EMT), the following products are acceptable:

1. Hilti Intumescent Firestop Sealant (FS-ONE)
2. Hilti Self-leveling Firestop Sealant (CP 604)
3. Hilti Fire Foam (CP 620)
4. Hilti Flexible Firestop Sealant (CP 606)
5. Hilti Elastomeric Firestop Sealant (CP 601S)

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D. Sealants or caulking materials for use with sheet metal ducts, the following products are acceptable:

1. Hilti Elastomeric Firestop Sealant (CP 601S)
2. Hilti Flexible Firestop Sealant (CP 606)
3. Hilti Intumescent Firestop Sealant (FS-ONE)

E. Sealants, caulking or spray materials for use with fire-rated construction joints and other gaps, the following products are acceptable:

1. Hilti Firestop Joint Spray (CFS-SP WB)
2. Hilti Elastomeric Firestop Sealant (CP 601S)
3. Hilti Flexible Firestop Sealant (CP 606)
4. Hilti Self-leveling Firestop Sealant (CP 604)

F. Pre-formed mineral wool designed to fit flutes of metal profile deck and gap between top of wall and metal profile deck; as a backer for spray material.

1. Hilti Speed Plugs (CP 777)
2. Hilti Speed Strips (CP 767)

G. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including insulated metal pipe, PVC jacketed, flexible cable or cable bundles and plastic pipe, the following products are acceptable:

1. Hilti Intumescent Firestop Sealant (FS-ONE)

H. Foams, intumescent sealants, or caulking materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti Intumescent Firestop Sealant (FS-ONE)
2. Hilti Fire Foam (CP 620)
3. Hilti Elastomeric Firestop Sealant (CP 601S)
4. Hilti Flexible Firestop Sealant (CP 606)

I. Non-curing, re-penetrable intumescent putty or foam materials for use with flexible cable or cable bundles, the following products are acceptable:

1. Hilti Firestop Putty Stick (CP 618)
2. Hilti Firestop Plug (CFS-PL)

J. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes, the following products are acceptable:

1. Hilti Firestop Putty Pad (CP 617)

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2. Hilti Firestop Box Insert

K. Firestop collar or wrap devices attached to assembly around combustible plastic pipe (closed and open piping systems), the following products are acceptable:

1. Hilti Firestop Collar (CP 643N)
2. Hilti Firestop Collar (CP 644)
3. Hilti Wrap Strips (CP 648E/648S)

L. Materials used for large openings and complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti Firestop Mortar (CP 637)
2. Hilti Firestop Block (CFS-BL)
3. Hilti Fire Foam (CP 620)
4. Hilti Firestop Board (CP 675T)

M. Non curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays and bundles, multiple steel and copper pipes, electrical busways in raceways, the following products are acceptable:

1. Hilti Firestop Block (CFS-BL)
2. Hilti Firestop Board (CP 675T)

N. Sealants or caulking materials used for openings between structurally separate sections of wall and floors, the following products are acceptable:

1. Hilti Firestop Joint Spray (CFS-SP WB)
2. Hilti Elastomeric Firestop Sealant (CP 601S)
3. Hilti Flexible Firestop Sealant (CP 606)
4. Hilti Self-leveling Firestop Sealant (CP 604)

O. For blank openings made in fire-rated wall or floor assemblies, where future penetration of pipes, conduits, or cables is expected, the following products are acceptable:

1. Hilti CFS-BL Firestop Block
2. Hilti CFS-PL Firestop Plug

P. Provide a firestop system with a "F" Rating as determined by UL 1479 or ASTM E814 which is equal to the time rating of construction being penetrated.

Q. Provide a firestop system with an Assembly Rating as determined by UL 2079 which is equal to the time rating of construction joint assembly.

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RT 3 - EXECUTION

3.01 PREPARATION

A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

1. Verify penetrations are properly sized and in suitable condition for application of materials.
2. Surfaces to which firestop materials will be applied shall be free of dirt, grease, oil, rust, laitance, release agents, water repellents, and any other substances that may affect proper adhesion.
3. Provide masking and temporary covering to prevent soiling of adjacent surfaces by firestopping materials.
4. Comply with manufacturer's recommendations for temperature and humidity conditions before, during and after installation of firestopping.
5. Do not proceed until unsatisfactory conditions have been corrected.

3.02 COORDINATION

A. Coordinate construction of openings, penetrations and construction joints to ensure that the fire stop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration fire stop systems. Coordinate construction and sizing of joints to ensure that fire-resistive joint systems are installed according to specified requirements.

C. Coordinate fire stopping with other trades so that obstructions are not placed in the way prior to the installation of the fire stop systems.
Do not cover up through-penetration fire stop and joint system installations that will become Concealed behind other construction until each installation has been examined by the building inspector.

3.03 INSTALLATION

A. Regulatory Requirements: Install firestop materials in accordance with UL Fire Resistance Directory or Omega Point Laboratories Directory.

B. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of through-penetration and construction joint materials.

1. Seal all holes or voids made by penetrations to ensure an air and water resistant seal.
2. Consult with mechanical engineer, project manager, and damper manufacturer prior to installation of UL firestop systems that might hamper the performance of fire dampers as it pertains to duct work.
3. Protect materials from damage on surfaces subjected to traffic.

3.04 FIELD QUALITY CONTROL

A. Examine sealed penetration areas to ensure proper installation before concealing or enclosing areas.
B. Keep areas of work accessible until inspection by applicable code authorities.
C. Inspection of through-penetration firestopping shall be performed in accordance with ASTM E 2174, "Standard Practice for On-Site Inspection of Installed Fire Stops" or other recognized standard.
D. Perform under this section patching and repairing of firestopping caused by cutting or penetrating of existing firestop systems already installed by other trades.
E. Manufacturer's Field Services: During Installation, provide periodic destructive testing inspections to assure proper installation/application. After installation is complete, submit findings in writing indicating whether or not the installation of the tested system identified was installed correctly.

3.05 IDENTIFICATION & DOCUMENTATION

A. The firestop contractor is to supply documentation for each single application addressed. This documentation is to identify each penetration and joint location on the entire project.

A.1 The Documentation Form for through penetrations is to include:

1. A Sequential Location Number
2. The Project Name
3. Date of Installation
4. Detailed description of the penetrations location
5. Tested System or Engineered Judgment Number
6. Type of assembly penetrated
7. A detailed description of the size and type of penetrating item
8. Size of opening
9. Number of sides of assemblies addressed
10. Hourly rating to be achieved
11. Installers Name

A.2 The Documentation Form for Construction Joints is to include:

1. A Sequential Location Number
2. The Project Name

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3. Date of Installation
4. Detailed description of the Construction Joints location
5. Tested System or Engineered Judgment Number
6. Type of Construction Joint
7. The Width of the Joint
8. The Lineal Footage of the Joint
9. Number of sides addressed
10. Hourly rating to be achieved
11. Installers Name

B. Copies of these documents are to be provided to the general contractor at the completion of the project.

C. Identify through-penetration firestop systems with pressure-sensitive, self-adhesive, preprinted vinyl labels. Attach labels permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems. Include the following information on labels:

1. The words: "Warning -Through Penetration Firestop System-Do Not Disturb. Notify Building Management of Any Damage."
2. Contractor's Name, address, and phone number.
3. Through-Penetration firestop system designation of applicable testing and inspecting agency.
4. Date of Installation.
5. Through-Penetration firestop system manufacturer's name.
6. Installer's Name.

3.06 ADJUSTING AND CLEANING

A. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

B. Clean all surfaces adjacent to sealed holes and joints to be free of excess firestop materials and soiling as work progresses.

3.07 LABOR USE TO INSTALL FIRESTOP SYSTEMS

A. To ensure complete harmony on the project site, the installation of each scope of work is to be performed jurisdictionally correct per existing trade agreements.

End of Section

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'00 - JOINT SEALERS AND AIR SEALING

1. GENERAL:

1.1 DESCRIPTION OF WORK: The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet requirements of these Specifications.

2. PRODUCTS:

2.1 CAULKING MATERIAL

A. One part polyurethane on exterior walls for caulking joints at all junctions as necessary to obtain complete watertight construction.

3. EXECUTION:

3.1 ALL POTENTIAL INFILTRATION cracks & joints to be caulked. Caulking shall be done only by workmen who are thoroughly experienced in this work. Exterior caulking shall be applied around windows, doors, vents, utilities, and any other infiltration "crack".

3.2 INTERIOR CAULKING shall be applied to seal all penetrations through top plates of interior walls, (due to electrical or plumbing), and at tubs, showers, counter tops, bottom of party walls GWB, and other as shown on Drawings.

3.3 IN GENERAL see Drawings for any additional applications. Joints and spaces to be caulked shall be dry and free from dust. Finished caulking "bead" shall be neat and smooth, free of gaps and sags and run continuously. Complete all caulking work and allow to stand for the manufacturer's recommended time period before painting. Prime if required before finish coat of paint is applied.

End of Section

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DIVISION 8 - DOORS AND WINDOWS

08100 – STEEL DOORS AND FRAMES

PART 1 – GENERAL

1.01 GENERAL PROVISIONS:

A. The CONDITIONS OF THE CONTRACT and all Sections of Division 1 are hereby made a part of this section.

1.02 DESCRIPTION OF WORK:

A. Work Included: Provide labor, materials, and equipment necessary to complete the work of this section. Extent of steel doors and frames required is indicated on drawings and in schedules.

1. Furnish and Install:
   a. Steel frames for hollow metal doors
   b. Steel frames for wood doors
   c. Steel sidelite, borrowed lite, and transom frames
   d. Hollow metal doors
2. Install Only: Finish hardware for hollow metal doors as specified in Section 08710 Finish Hardware.

B. Related work specified elsewhere:

1. SECTION 09900: PAINTING

1.03 QUALITY ASSURANCE; SUBMITTALS:

A. Manufacturer: Provide steel doors and frames complying with these specifications from one of the following:

1. CECO
2. Curries
3. Steelcraft

C. Supplier: A recognized hollow metal supplier, with in-house fabrication facilities, who has been furnishing doors and frames in the project's vicinity for a period of not less than five years.

D. Product Data: Submit four copies of manufacturers technical product data for each item. Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and maintenance.

Door Schedule: Submit final door schedule in manufacturer's standard format and as outlined below. Coordinate doors, frames and related work to ensure proper size, thickness, hand, function, and fasteners.

1. **NOTE: Contractor shall make all submittals for finish hardware, doors, frames and related items simultaneously, only after proper review and coordination by own staff beforehand.**

2. Final Door Schedule Content: Based on doors and frames in drawings, organize door schedule to indicate complete designations of every item required for each door or opening. Include the following information:

   a. Type, style, hand, size and construction of each item.

   b. Anchors and fastenings to related work.

   c. Corner construction of welded and/or knocked down frames.

   d. Location of door and frame cross-referenced to indications on drawings both on floor plans and in hardware schedule.

   e. Explanation of all abbreviations, symbols, codes, etc. contained in schedule.

   f. Mounting locations for hardware.

   g. Door construction and materials.

   h. Gage and finish of all materials.

3. Shop Drawings: Submit separate detail drawings, referenced to door schedule, showing size, hand, construction, fasteners, anchors and all other details pertinent to the fabrication of doors and frames for this project.

1.04 APPROVAL OF SUBSTITUTIONS:

A. Manufacturers and model numbers specified herein are to establish a standard of quality. If products other than those specifically identified herein are to be considered for this Project, they must be submitted for approval of the Architect not less than ten (10) calendar days prior to receipt of General Bids.

B. Requests for approval of substitutions shall be in writing, accompanied by catalog cuts, technical information and physical samples.

C. Approval of substitutions shall only be valid when issued by Architect to all bidders in the form of Addendum.

1.05 REFERENCES:

A. ANSI A115 Series: Standards for Steel Doors And Frames.

B. NFPA 80, NFPA 101.

C. Other applicable building and life safety codes.

Door and Hardware Institute: "Recommended Locations for Builder's Hardware.

E. ANSI A117.1: American National Standard Providing Accessibility and Usability for Physically Handicapped People.

F. Other applicable industry standards.

1.06 PRODUCT PACKAGING AND HANDLING:

A. Tag each item or package separately, with identification related to final door schedule.

B. All doors shall be packaged in full cartons and securely banded.

C. Doors and frames shall be received by the contractor at the jobsite and handled in a manner so as not to be damaged. They shall be stored upright in a protected area on wood runners or skids and shall be covered with vented tarpaulins or plastic.

1.07 WARRANTY: Doors and frames specified for this Project shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of Substantial Completion of Project.

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Doors shall be manufactured from commercial quality cold-rolled steel sheets. Exterior doors shall be A60 hot-dipped galvanized.

B. Frames shall be manufactured from commercial quality cold-rolled steel sheets. Exterior frames shall be A60 hot-dipped galvanized.

C. Steel shall conform to ASTM standards A366 or A620 and A568 (uncoated), ASTM A526 or A642 and A525 (galvanized).

D. All doors and frames shall be chemically treated for paint adhesion and prime painted to meet performance requirements of ANSI A224.1.

E. U Factor of 1.5 or less.

2.02 DOOR FABRICATION:

A. Interior doors shall be 1-3/4" thick, manufactured from two 18 gage steel sheets. A one piece resin-impregnated honeycomb core with sanded edges shall be securely bonded to both face sheets. Doors shall have mechanically interlocked vertical edges, flush face sheets, and hairline seam edges. The top and bottom of the door shall be closed flush by 16 gage steel channels (where concealed door bottoms are specified, bottom channel shall be reversed to allow insertion of door bottom into door web). At contractor option, in lieu of honeycomb cores, doors may be provided with a rigid

polystyrene foam core, continuously bonded to the face sheets, and completely filling the door.

B. Exterior doors shall be 1-3/4" thick, manufactured from two 16 gage galvanized steel sheets. The interior of the doors shall be completely filled with a foamed-in place polyurethane core, chemically bonded to all interior surfaces. Doors shall have mechanically interlocked vertical edges, flush face sheets, and hairline seam edges. The top and bottom of the door shall be closed flush by 16 gage steel channels (where concealed door bottoms are specified, bottom channel shall be reversed to allow insertion of door bottom into door web).

C. All doors shall be handed type with factory preparation for all concealed or mortised Finish Hardware scheduled. Door closer reinforcements shall be provided for all doors whether scheduled to received closer or not. Reinforce doors for all surface applied hardware.

D. Non-handed doors, and/or filler plates for cutouts not required for scheduled hardware preparation shall NOT be acceptable.

2.03 FRAME FABRICATION:

A. General: Frames shall be knocked down and field assembled or welded type at contractor option.

B. Standard knockdown or welded frames shall be manufactured form 16 gage steel sheets with 2" face and 5/8" integral stop. Jamb depth to be determined by wall thickness in accordance with the drawings. Supply appropriate anchors for wall construction.

C. Drywall frames shall be manufactured form 16 gage steel sheets with 2" face and 5/8" integral stop and double back bend to grip the partition firmly without marring the wall surface. Jamb depth to be determined by wall thickness in accordance with the drawings. Provide adjustable plumb anchors to insure square and plumb installation. Supply standard floor anchors for bottom of each jamb.

D. Prepare frames for all concealed or mortised hardware and reinforce for all surface applied hardware.

E. Provide plaster guards for all hardware cutouts.

F. Prepare frames to receive pneumatic type silencers: two for each pair frame, three for each single frame.

G. Exterior frames shall be 16 ga welded, galvanized with thermally broken jambs.

2.04 FIRE RATED ASSEMBLIES

A. All labeled fire doors and frames shall be of a type tested in accordance with ANSI/UL-10b, ASTM E-152, NFPA-252, or UL-305, and shall provide the degree

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of fire protection, heat transmission, panic-loading capabilities, and/or smoke control as indicated on the label and required by the drawings.

B. Labeled doors and frames shall bear the label of Underwriters Laboratories, Warnock Hersey, or Factory Mutual and shall meet all requirements of the labeling agencies current procedures and policies.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Doors and frames shall be assembled, installed, and erected plumb and in true alignment and in conformance with manufacturer's recommendations and final approved shop drawings. Preparation for surface applied hardware shall be performed on the jobsite. Frames shall be rigid and securely anchored in place. Doors shall be installed in a manner to achieve functional operation and appearance.

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200 – INTERIOR APARTMENT DOORS

A. GENERAL:

SCOPE: The extent of work shall be as shown on Drawings and called for in these Specifications. Performance shall meet the requirements of these Specifications. The work covered by this section of Specifications consists of the following:

1. Furnishing and installing all door frames as called for on drawings or noted in Specifications.
2. Furnishing and installing all interior wood and exterior metal doors as specified.
3. Furnishing and installing hardware in accordance with Door Schedule, including locksets, closers, holders, knockers etc.

NOTE: The Contractor shall submit drawings on every item specified in this section. There shall be no substitutions without a specific written explanation from the subcontractor that the specific item is equal with the item specified by the Architect. All substitutions shall be approved by the Architect and the Owner.

B. PRODUCTS:

All doors and frames shall be of the material, type and finish as called for on Drawings or in these Specifications. All dimensions shall be as shown by Door Schedule on Drawings. Door identified by manufacturer's name and type of brand name may be substituted for others of equal quality only with the approval of the Architect. Doors delivered for installation shall be carefully stored to prevent damage or warping.

All Interior unit swing doors and sliding shall be 1-3/8" Atherton #550 moulded, solid core, smooth panel doors by Door Craft Inc. and distributed by Brosco or equal. Units shall be prehung and primed. Verify finish and coordinate with painting specification. Note: All pass thru doors to be solid core.

Apartment Entry Door: To be 1 ¾ solid core Birch face with metal frame, 1 hr. rated with spring loaded hindges.

C. EXECUTION:

Install doors after completion of all other work which would raise the moisture content of wood doors or damage door surfaces. Fit, hang and trim as required by the opening so the doors will close and not bind. Solid blocking at hinges and latch required. Provide even clearance of 1/8" at sides and top, 1/4" over thresholds, and 3/4" over floors. See also Section 06100 & 06200 Rough and Finish Carpentry.
Install doorstops for all swing doors.

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At completion of work, door glass shall be cleaned, leaving no masking tape or any other visible marks on the surface; doors shall be free of any nicks, scratches or marks; all doors shall open and close freely; and all locksets shall operate with key, (if required) and hardware function properly.

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10 - WINDOWS

1. Install windows as shown on Drawings.
2. Equal to Eagle aluminum clad with fir interior.

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DIVISION 9 - FINISHES

09250 - GYPSUM DRYWALL

1. 5/8" thick gypsum board installed per U.S.G. Handbook, taped and finished.
2. Cement backer board at all shower units in apartments.

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00 - FLOOR COVERINGS

See Drawings

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00 - PAINTING

Exterior:

1. Exterior entry door and frame – storage room door and frame: one coat primer; two coats finish, Medium Gloss finish.

2. Fiber cement panels and lap siding: Two (2) coats at exposed surfaces after installation on all trim and cornice. Seal all ends. Paint to be Sherwin Williams Duration Paint, acrylic latex.

3. PVC Trim Boards. Provide 2 coats of paint designed specifically for vinyl products such as Sherwin Williams VinylSafe™ or Benjamin Moore Vinyl Select.
   1st Coat: Sherwin Williams SuperPaint® VinylSafe™ Exterior Latex Acrylic Satin, A89 Series. 2nd Coat: Sherwin Williams SuperPaint® VinylSafe™ Exterior Latex Acrylic Satin, A89 Series (4 mils wet, 1.44 mils dry per coat)

Interior:

1. Wood Trim and Doors: Bin all knots. One coat primer; two coats finish - Semi Gloss Finish.

2. Apartment entry doors o receive three (3) coats polyurethane.

3. Gypsum Board: One coat primer; two coats finish - Eggshell Finish.

4. Ceilings: One coat primer; one coat finish - Flat Finish Ceiling White.

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DIVISION 10 - SPECIALITIES

10550 - POSTAL SPECIALITIES - MAILBOXES

As manufactured by Auth-Florence 1400 Series provide for 8 boxes.

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DIVISION 14 – CONVEYING SYSTEMS

Provide lift, see drawings for manufacture requirements.

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DIVISION 15 – MECHANICAL

15710 – SPRINKLER

Design and install complete sprinkler system to meet NFPA 13R with dry system in exterior overhang areas. Provide testing, Fire Marshal approval.

End of Section