



**PROTOTYPE
SPECIFICATIONS
and Related
CONTRACT DOCUMENTS**

BISMARCK, ND

MICROTEL

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SUPPLEMENTARY CONDITIONS

The following supplements modify, change, delete from or add to the "General Conditions of the Contract for Construction", AIA Document A201, Fourteenth Edition, 2007. Where any Article, Subparagraph or Clause is modified or deleted by these supplements, the unaltered provisions of that Article, Paragraph, Subparagraph or Clause shall remain in effect.

ARTICLE 1; GENERAL PROVISIONS

Par. 1.1 BASIC DEFINITIONS

Add the following Clause 1.1.2.1 to 1.1.2:

- 1.1.2.1 The Agreement for the Contract shall be the "Standard Form of Agreement between Owner and Contractor", AIA Document A101, Latest Edition.

Par. 1.2 EXECUTION, CORRELATION, AND INTENT

Add the following Clause 1.2.1.1 to 1.2.1:

- 1.2.1.1 The Contract Documents shall be signed in not less than triplicate by the Owner and Contractor.

Add the following Clauses 1.2.6, 1.2.7, and 1.2.8 to 1.2:

- 1.2.6 Immediately upon the award of, and prior to signing the Agreement, the successful Bidder shall furnish the Owner the following:

.1 -Workmen's Compensation Certificate - 2 copies

.2 -Certificate(s) of Insurance - 2 copies

.3 -Authority to sign for Corporation

.4 -Performance Bond, Labor and Material Payment Bond, (AIA Standard), Power of Attorney of Surety Agent, and Certificate authorizing Surety to do business in the State of Project Location - 2 copies each (if required).

- 1.2.7 It is understood and agreed by the Contractor, that the work herein described and/or shown on the Drawings shall be complete in every detail even though every item necessarily involved is not particularly mentioned. The Contractor shall be held to provide all labor and materials necessary for the entire completion of the work intended to be so described and/or shown, and shall not avail himself if any manifest unintentional error or omission should occur.
- 1.2.8 Should the Drawings and/or Specifications disagree as to quantity or quality of work required, the greater quantity or better quality shall be provided, unless contrary instructions are issued by the Architect in writing.

ARTICLE 3; CONTRACTOR

Par. 3.3 SUPERVISION AND CONSTRUCTION PROCEDURES

Add the following Clause 3.3.5 to 3.3:

- 3.3.5 The Contractor shall be responsible for the proper laying out of his own work and for any damage to or additional cost for the work of any other contractor by his inaccuracy. All work requiring measuring shall be done according to figures on the Drawings and not scaled from the Drawings. The Architect will furnish additional dimensions upon request by Contractor.

Par. 3.4 LABOR AND MATERIALS

Add the following Clauses 3.4.3 and 3.4.4 to 3.4:

- 3.4.3 "Standards - Substitutions" - the name or make of any article, device, material, form of construction, fixture, etc., named in the Specifications or shown on the Drawings, whether or not the words "or equal" or "approved equal" or "other approved make" are used, shall be known as "Standard" and the bid shall be based on those "Standards". Other articles, devices, materials, form of construction, fixtures, etc., may be considered for approval, if listed on the "Substitution Sheet" attached to the Form of Proposal. No substitutions will be allowed subsequent to the award of Contract.
- 3.4.4 Except as otherwise shown or specified, all manufactured articles, materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned as directed in manufacturer's latest printed instructions. No manufactured articles, materials or equipment shall be used for a purpose not recommended by the manufacturer. Any discrepancies between specified use or procedure and manufacturer's recommendations shall be brought to the Architect's attention prior to installation.

Par. 3.9 SUPERINTENDENT

Add the following Clause 3.9.2 to 3.9:

- 3.9.2 Not later than seven days after the Date of Commencement, the Contractor shall furnish, in writing to the Owner, the name of Job Superintendent.

ARTICLE 4; ADMINISTRATION OF THE CONTRACT

Par 4.1 ARCHITECT

Add the following Clause 4.1.1.1 to 4.1.1:

- 4.1.1.1 The Architect for this project is [add Architect's name here] , who is referred to in all segments of the project manual as the A/E or Architect.

ARTICLE 5; SUBCONTRACTORS

Par. 5.1 DEFINITIONS

Add the following Clauses 5.2.1.1, 5.2.1.2, and 5.2.1.3 to 5.2.1:

- 5.2.1.1 Not later than seven days after the Date of Commencement, the Contractor shall furnish, in writing to the Owner, the names of the persons or entities proposed as manufacturers for all proposed products and the names of all proposed Subcontractors.
- 5.2.1.2 The list of proposed products shall indicate the Contractor's choice in all instances where specific products have been named in the Specifications as "Standards" upon which proposal is based, by listing both the product name and the manufacturer's name. Both products to be purchased directly by the Contractor and those to be furnished by the Subcontractor shall be listed. (Refer to Paragraph 3.4.3 of this Supplementary Conditions for requirements relative to "Standards" named in the Specifications).
- 5.2.1.3 The list of proposed Subcontractors shall be complete for all parts of the work and shall be submitted on AIA Document G-705, List of Subcontractors.

ARTICLE 6; CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

Par 6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

Add the following Clause 6.1.5 to 6.1:

6.1.5 Materials to be purchased by the Owner and installed by the Contractor:

.1 -The Owner reserves the right to purchase certain materials for this project.

.2 - Each Contractor shall examine the Drawings and Specifications for work identified with "F.B.O. - I.B.C." (Furnished by Owner - Installed by Contractor).

.3 - Each Contractor shall assume full responsibility for these items and shall provide and include all labor and materials necessary to fulfill the requirements of the Contract Documents.

.4 - The Owner will be responsible for direct payment to the Material Supplier.

ARTICLE 9; PAYMENTS AND COMPLETION

Par. 9.2 SCHEDULE OF VALUES

Delete Clause 9.2.1 and substitute the following:

9.2.1 Immediately upon award of Contract, the Contractor shall submit to the Owner's representative a schedule of values allocated to various portions of the Work, prepared in such a manner that each major item of Work and each subcontracted item of Work is shown as a single line item in order of Specification Sections, listing separately the Labor and Material and Total Costs for each item, on AIA Document G703, Certificate of Payment, and Continuation Sheet. Information shall be supported by such data to substantiate its accuracy as the Owner's representative may require. This schedule, unless objected to by the Owner's representative, shall be used as a basis for reviewing the Contractor's Applications for Payment.

Par. 9.3 APPLICATIONS FOR PAYMENT

Add the following sentence to subparagraph 9.3.1:

The form of Application for Payment shall be a notarized AIA Document G702, Application and Certification for Payment, supported by AIA Document G703, Continuation Sheet.

Add the following Clauses 9.3.1.3 and 9.3.1.4 to 9.3.1:

9.3.1.3 Until the work is 50 percent complete, the Owner will retain 10 percent of the amount due the Contractor on account of progress payment. At the time the work is 50 percent complete and thereafter, if the manner of completion of the work and its progress are and remain satisfactory to the Owner's representative, and in the absence of other good and sufficient reasons, the Owner's representative will (on presentation by the Contractor of Consent of Surety for each Application) authorize any remaining partial payments to be paid in full.

9.3.1.4 The full Contract retainage may be reinstated if the manner of completion of the work and its progress do not remain satisfactory to the Owner's representative (or if the Surety withholds its consent) or for other good and sufficient reasons.

Par. 9.8 SUBSTANTIAL COMPLETION

Add the following sentence to subparagraph 9.8.3:

The payment shall be sufficient to increase the total payments to 95 percent of the Contract Sum, less such amounts as the Owner's representative shall determine for incomplete work and settled claims.

ARTICLE 11; INSURANCE BONDS

Add the following subparagraph 11.1.1.8 to 11.1.1 (Asbestos Abatement Contract only):

11.1.1.8 Adequate protection against special hazards.

Add the following Clause 11.1.2.1 to 11.1.2:

11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

1. Workers' Compensation:

(a.) State: Statutory

(b.) Applicable Federal Statutory

2. Comprehensive General Liability:

(a.) Bodily Injury:

\$3,000,000	Each Person
\$3,000,000	Each Occurrence

(b.) Property Damage:

\$1,000,000	Each Occurrence
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(c.) Asbestos Liability:

(Asbestos Abatement
Contract Only)

\$3,000,000	Each Occurrence
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3. Comprehensive Automobile Liability:

(a.) Bodily Injury:

\$3,000,000	Each Person
\$3,000,000	Each Occurrence

(b.) Property Damage:

\$1,000,000	Each Occurrence
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Add the following sentence to Subparagraph 11.1.3:

If this insurance is written on a Commercial General Liability policy form, ACORD Form 25S will be acceptable.

Par. 11.3 PROPERTY INSURANCE

Delete Clause 11.3.1.4 and substitute the following:

- 11.3.1.4 The Contractor shall provide insurance coverage for portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.

Par. 11.4 PERFORMANCE BOND AND PAYMENT BOND

Delete Subparagraph 11.4.1 and substitute the following:

- 11.4.1 The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to 100 percent of the Contract Sum.
 - 11.4.1.1 The Contractor shall deliver the required bonds to the Owner not later than three days following the date the Agreement is entered into, or if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of Work, submit evidence satisfactory to the Owner that such bonds will be furnished.
 - 11.4.1.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.
 - 11.4.1.3 Unless otherwise provided, the Bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. The Bonds shall be dated on or after the date of the Contract.

END OF SUPPLEMENTARY CONDITIONS

SECTION 00200

GEOTECHNICAL INVESTIGATION AND SOIL BORING LOGS

PART 1 - GENERAL

Included in this Section of the Specifications is a copy of the Geotechnical Exploration by **Material Testing Services, LLC – Dated 07/30/2012** including data from Test Borings taken at the site and a Test Boring Location Map.

Data indicated on the Test Boring Logs is not intended as representations or warranties of accuracy or continuity between soil borings. Data is made available for the convenience of Contractor only. It is expressly understood that neither Owner nor Architect are responsible for interpretations or conclusions drawn there from by the Contractor.

PART 2 - MATERIALS

Not Used

PART 3 - PRODUCTS

Not Used

REPORT OF
GEOTECHNICAL EXPLORATION

**Proposed Microtel Hotel
Bismarck, North Dakota**

For
Microsleep, LLC
Attn: Mr. Gordon Dihle
Corporate Legal, LLC
6041 South Syracuse Way, Shite 305
Greenwood Village, CO 80111

Laboratory Number 12-112

July 30, 2012

Material Testing Services, LLC

July 30, 2012

Microsleep, LLC
Attn: Mr. Gordon Dihle
Corporate Legal, LLC
6041 South Syracuse Way, Shite 305
Greenwood Village, CO 80111

ref: **Geotechnical Exploration Report**
Proposed Microtel Hotel
Bismarck, North Dakota
Laboratory Number 12-112

Dear Mr. Dihle:

Enclosed is the report of the geotechnical exploration that we recently conducted for the proposed hotel. The work was conducted in general accordance with our proposal.

Information from the above work will be used for design in construction of the foundation system.

The soil samples will be stored at the laboratory for a period of fourteen days from the date of this report. The samples will then be discarded unless we are requested to store them for a longer period of time.

Please call if you have any questions or comments concerning this report.

Sincerely,
MATERIAL TESTING SERVICES, LLC



Rusten R.L. Roteliuk
Geotechnical Engineer

Cc: David Anderson

P.O. Box 634
Minot, North Dakota 58702
701-852-5553

P.O. Box 14516
Grand Forks, North Dakota 58208
701-746-6398

P.O. Box 1093
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Report of Geotechnical Exploration

Proposed Microtel Hotel – Bismarck, North Dakota
Laboratory Number 12-112

1. Introduction

The purpose of this exploration was to give recommendations on the suitability of the existing soils for the proposed construction which included providing information for the building site preparation and allowable bearing capacity for foundation design.

2. Procedures

A total of 12 borings were drilled for the project. Nine were drilled within the proposed building footprint and 3 were drilled in proposed paved areas along the northwest edge of the site. The borings were drilled with standard penetration split-spoon methods, in accordance with ASTM D 1586. Soils were classified in accordance with ASTM Visual-Manual methods (ASTM D 2488). Additional information regarding drilling procedures and soils classification is given on the sheets included in Appendix A. The approximate locations of the borings are shown on the site sketch included in Appendix A.

The locations and ground level elevations at the boring locations were staked by the client.

3. Surface Observations

Based on visual observations of the crew chief, the site was an undeveloped commercial lot with some sparse vegetation. It appeared that some surficial levelling work had been done on the lot. The slopes on the site were fairly gradual with some localized unevenness. The ground elevations at the boring locations ranged from 1776.2 feet at boring 12 to 1783.6 feet at boring 3. Generally, it appeared that the surface drained to the north.

4. Subsurface Observations

Information on the subsurface conditions is given on the attached boring logs. The logs include: descriptions and classifications of soils encountered, the depths to noted soil changes, water level measurements, and soil test results. Standard penetration resistance values are given in the N columns of the logs. A sheet included in Appendix A describes symbols and descriptive terminology used on the boring logs. Also included in Appendix A is a soil classification chart.

4.1. Soils

Fill was encountered at the surface in each of the borings. The fill at the surface in borings 4, 7, 9 and 12 consisted of mostly topsoil, organic lean clay (OL). Fill encountered below the topsoil and at the surface of the remaining 8 borings, consisted of mostly lean clays (CL) and silts (ML) mixed with traces topsoil. The following table represents the amount of fill and topsoil encountered in the borings.

Boring	Ground Elevation	Depth to Bottom of Topsoil (feet)	Depth to Bottom of Fill (feet)	Elevation of Bottom of Fill/Topsoil (feet)
1	1781.2	n/a	3.5	1777.7
2	1781.6	n/a	3.5	1778.1
3	1783.6	n/a	1.0	1782.6
4	1779.1	0.3*	5.5	1773.6
5	1781.9	n/a	3.0	1778.9
6	1782.4	n/a	2.0	1780.4
7	1779.3	0.7*	2.5	1776.8
8	1781.8	n/a	3.0	1778.8
9	1777.2	0.9*	0.9	1776.3
10	1781.7	n/a	3.0	1778.7
11	1781.4	n/a	6.0	1775.4
12	1776.2	0.9*	2.0	1774.2

*Topsoil encountered appeared to be fill.

Below the topsoil and topsoil, the natural soils were alluvial soils consisting of mostly silts (ML), lean clays, sands (SP) and silty sands (SM).

Based on the standard penetration resistance ("N") values, the sands and silty sands ranged from very loose to very dense, but were generally medium dense to dense. The zones of very dense sand appeared to be loosely cemented sandstone. The silts and lean clays were very soft to soft.

4.2. Groundwater

Groundwater measurements were taken at the completion of drilling. Additional measurements were taken after the boreholes were allowed to remain open overnight. After the boreholes were allowed to stand open, groundwater measurements ranged from 12.3 to 18.2 feet below ground level. The measurements translate to an average groundwater level of approximately 1764.0 feet.

Water levels can be expected to fluctuate both yearly and seasonally. The water levels at the time of construction may differ significantly from those encountered during our exploration program. Long term monitoring of the groundwater was not included in the scope of services.

5. Background Information

The following represents our understanding of the project. If there are changes to the project data, or if some of the information is not correct, it is necessary that we be provided with the additional or correct information for further review.

The site is located on the west side of west side of West Turnpike Avenue and east of Interstate Highway 94 in Bismarck, North Dakota. The physical address of the property was indicated to be 1122 Turnpike Avenue.

The building will be generally rectangular in shape and approximately 55' x 180' in plan dimension. A pool area, approximately 50' x 55', is planned to extend out from the northwest side of the main building. The building will be a four story, wood framed structure with a slab on grade. The planned finish floor elevation was indicated to be 1778.5 feet. We presume that the perimeter foundations will be near elevation 1773.5 feet. Interior foundations may be placed at a higher elevation.

No loading information has been provided to us. However, we do not anticipate any unusually heavy loadings for this structure. For the purpose of our analysis, we presume that wall loadings will not exceed 6 kips per lineal foot and that column loads, if any, will not exceed 150 kips per column. We expect that floor loads will not exceed 150 psf (pounds per square foot).

6. Conclusions and Recommendations

The recommendations contained in this report represent our professional opinions. These opinions were arrived at in accordance with currently accepted engineering practices. Other than this, no warranty is intended or implied.

6.1. Discussion

Generally, at the planned elevations, it appears that this site will provide adequate support for the proposed structure. The main concerns for the site are the presence of fill and the soft/loose soils encountered near or below the anticipated foundation elevation in the northeast portion of the building (near borings 11 and 12). However, with proper preparations and precautions during construction, it appears that standard spread footing construction will be feasible.

Because fill was encountered, it is important that excavations be observed by the geotechnical engineer or his representative to verify the soil identifications.

6.2. Excavation and Site Preparation

There will be areas where the soils at the bottoms of the excavations will be sensitive to heavy construction equipment; particularly where the silts and lean clays are encountered. Therefore, we recommend that excavations within the building footprint be performed with a backhoe with a smooth cutting edge to reduce disturbance to the natural soils at the site.

The surface of the site should be stripped of any vegetation and/or topsoil. Any old fill should also be removed from the building footprint prior to placement of any new fill or foundations (See the table in Section 4.1 for fill depths encountered). Disturbed soils should also be removed or re-compacted prior to placing new fill. Excavations that extend below foundations should be oversized one foot horizontally for every foot of vertical fill below foundations.

It appears that the non organic portions of the existing fill and the naturally deposited soils would be suitable for reuse for site fill. However, the fill should be approved by the geotechnical engineer or his representative prior to reuse.

If off site material will be used for structural or controlled, compacted fill, it can consist of non expansive, non organic lean clay, or pit run sand or sand with gravel. Sand fill that contains gravel should have 100 percent passing the 2-inch sieve. If lean clay is used it should have a liquid limit of 40 or less. We would not recommend using fat clay (CH) for fill below the building. All clays, whether on-site or off-site clays, should be placed at a moisture content of minus 2 to plus 3 percent of optimum moisture content.

Loose lift thicknesses should be no more than 8 inches. Vibratory rollers should be used to compact sands and sheepsfoot type compactors should be used on clays. Any fill that is to support footings or floor slabs should be compacted to at least 95 percent of maximum dry density as determined according to ASTM D 698 (standard Proctor).

If earthwork is done during periods of freezing temperatures, we recommend protecting the fill from freezing once it has been placed. No frozen soils should be used as fill and fill should not be placed on frozen ground. Earthwork could be difficult in the spring or late fall when conditions are often cool and wet.

6.3. Foundations

As previously mentioned, foundation excavations should be performed with a backhoe that has a smooth cutting edge to reduce the disturbance of the excavation bottom. Based on measurements taken at the completion of drilling, we do not anticipate that groundwater will enter the excavations. If some groundwater does enter excavations, it should be controlled with surface and/or sump pumps during foundation construction and backfill. Any soils that are disturbed will need to be removed prior to placing new fill or concrete. The bottom of the foundation excavations should be checked by the geotechnical engineer or his representative to determine if additional excavation or subcut is necessary.

In our opinion, the natural, undisturbed soils at or below elevation 1773.5 feet, are capable of supporting a maximum net allowable soil bearing capacity of 2500 psf. Above elevation 1773.5 feet, the undisturbed soils are capable of supporting a maximum net allowable soil bearing capacity of 1500 psf. These loadings should result in a theoretical safety factor of 3 or more with respect to a punching shear failure. Total and differential settlements should not exceed 1 inch and ½ inch, respectively.

We recommend that perimeter footings in heated buildings be provided with at least 4.5 feet of final cover for frost protection. Unheated structures should have 7 feet of final cover for frost protection.

6.4. Floor Slabs

We recommend that the site be prepared as stated in Section 6.2 "*Excavation and Site Preparation*". We recommend that slabs on grade be constructed structurally independent

of foundation walls and columns. We also recommend a 6-inch layer of free draining sand be placed directly below the slabs. The sand should have less than seven percent passing the #200 sieve by weight. If it contains gravel, the gravel should have a maximum size of one inch. The sandy layer will be used to provide a working surface for concrete placement and serve as a capillary break.

If there will be glued surfacing or other surfacing that is moisture sensitive on the floor slabs, we recommend placing a vapor barrier below the slabs. The vapor barrier should consist of suitable polyethylene sheeting to minimize moisture migration to the slab.

With the site prepared as recommended, it is our opinion that the subgrade modulus of 200 pci can be used if a minimum of 18 inches of granular fill is used below the slab. A subgrade modulus of 125 pci can be used if clay fill is used to within 6 inches of the bottom of the slab.

6.5. Foundation Backfill

We recommend that the exterior foundation backfill be compacted in loose lift thicknesses not to exceed 6 inches. Compaction should be to minimum of 92 percent of ASTM D 698 in lawn or landscaped areas. Backfill which will support slabs, sidewalks or driveways should be compacted to at least 95 percent of ASTM D 698.

6.6. Lateral Earth Loads

Walls that must retain earth should be designed for the at-rest lateral earth pressure. For the clays at this site we recommend that the at-rest pressure be considered equivalent to that generated by a fluid with a total unit weight of 65 pcf. Compaction equipment should travel no closer than 12 inches from the wall to prevent building excess lateral pressures on the wall.

To resist lateral loads, we recommend assuming that the natural undisturbed clays have an ultimate passive pressure equivalent to that generated by a fluid having a total unit weight of 375 pcf. If compacted fill is placed on the passive side next to the foundation resisting lateral loads, it should be compacted to at least 95% of maximum density as determined by ASTM D 698. In addition, those portions of the foundations within five feet of final grade in unheated areas should be ignored when calculating passive resistance due to frost softening. An ultimate friction factor of 0.35 can be used between the bottom of the footing and the foundation soils. We wish to point out that these values will give the ultimate resistance to lateral loads. We recommend that a theoretical safety factor of 2.0 be applied for a safe design.

6.7. Uplift Loads

We recommend using the structural dead loads, the weight of the concrete foundation system as well as the weight of the fill placed over the foundation to resist uplift loads. We recommend using a total unit weight of 145 pcf for concrete and 100 pcf for the compacted soil. The fill over the footings should be compacted to at least 95% of maximum density as determined by ASTM D 698 for footings resisting uplift loads.

The above values will give the ultimate resistance to uplift. We recommend using a theoretical safety factor of 2.0 or more.

6.8. Site Drainage

We advise that adequate drainage be maintained during and after construction. We also recommend an appropriate closed conduit system be used to control roof drainage. Downspouts should have extensions and splash pads to carry the water well away from the backfill line.

Exterior grades in lawn areas should slope away from the building at a rate of 1 inch per foot or greater for a distance of at least 10 feet from the building.

6.9. Sensitive Exterior Slabs

Sensitive slabs are slabs that cannot tolerate much movement without causing some difficulties. An example would be the sidewalk or steps in front of a doorway. It is not intended to include all exterior sidewalks and driveways, etc.

Due to the potential for frost movement for exterior slabs, precautions should be taken to minimize future post-construction movement of sensitive slabs due to frost action. Options available include excavating frost susceptible soils to a depth of 5 feet below the slabs and replacing them with non frost susceptible sand containing less than 5 percent passing the #200 sieve by weight. Another option would be to place at least 3 inches of extruded polystyrene foam insulation below the slabs and extend it at least 5 feet laterally past the edge of the slabs. Typically, 6 to 12 inches of sand is placed above the insulation for protection. A third option is to support the slabs or steps on foundations taken to frost depth. At least a 4-inch void should be provided below the slabs if this option is used.

6.10. Site Classification for Seismic Design

The 2009 IBC manual indicates that the Site Class is based on soil parameters of the upper 100 feet of soil. Parameters which can be used include soil shear wave velocity, standard penetration resistance and soil undrained shear strength. Table 1613.5.2 presents the Site Class Definitions. If soil data to a depth of 100 feet is not available in sufficient detail to use Table 1613.5.2, Site Class D shall be used unless the building official or geotechnical data determines that Site Class E or F soil is likely to be present at the site. Based on the available test data, we have no indication that either Site Class E or F soils are present. Therefore, we recommend that Site Class D be assumed. If the Site Class for this project must be determined using subsurface data to 100 feet, it is necessary that you contact us for additional drilling services.

6.11. Excavation Slopes

Safe excavation slopes should be provided in accordance with current OSHA requirements. These regulations are found in the Federal Register, Tuesday, October 31, 1989, Part II, Department of Labor, Occupational Safety and Health Administration (OSHA), 29 CFR Part 1926, Occupational Safety and Health Administration, Standard-Excavation; Final Rule. Based on the boring logs, the existing soils above groundwater levels should be considered Type C. The type of excavation will have to be verified by the contractor at the time of construction.

7. Construction Testing and Observations

We recommend that qualified field personnel be on site at the following times to observe the site soil conditions.

7.1. Site Preparation

We recommend that the site be observed after stripping by the geotechnical engineer or his representative prior to placement of controlled, compacted fill. The proposed fill should also be approved by the geotechnical engineer prior to use.

7.2. Backfilling Operations

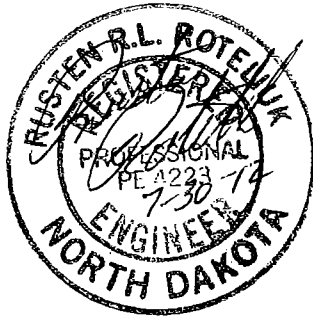
We recommend a representative number of compaction tests be taken during placement of the new fill. Compaction tests should also be performed during construction for foundation backfill, utility lines, etc.. The tests should be performed to determine if the recommended compaction was achieved. As a general guideline, tests should be taken for each 2,000 square feet embankment fill, every 75 to 100 feet in trench fill, and for each 2 feet of fill thickness.

7.3. Foundation Excavations

We also recommend that all footing excavations be observed by the geotechnical engineer or his representative. He would aid in determining if the exposed soils are capable of

supporting the design load bearing pressures.

This report is written by:



Rusten R.L. Roteliuk, P.E.

Geotechnical Engineer

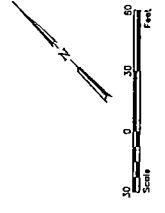
Appendix A

Site Sketch

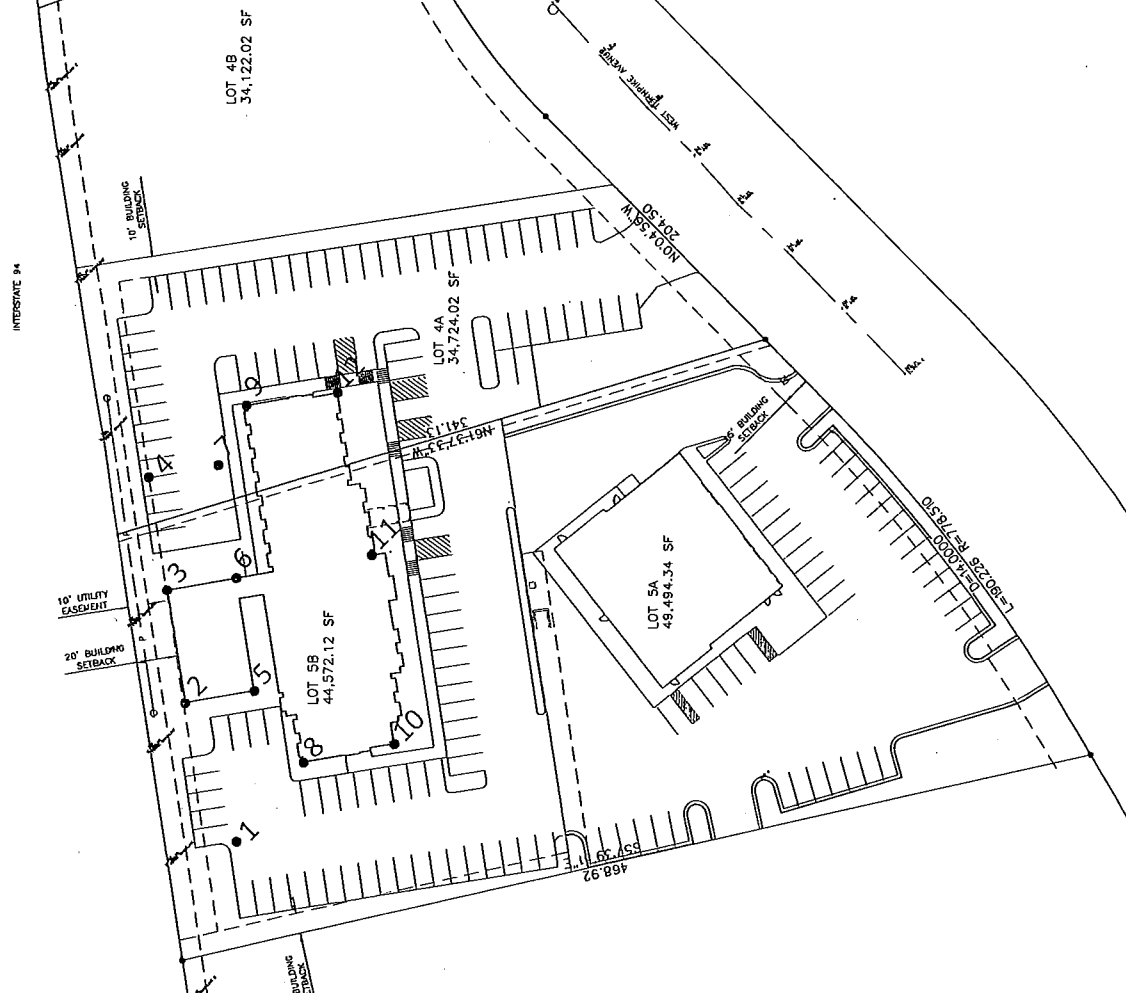
Profile and Boring Logs

Symbols and Descriptive Terminology used on Logs

Soil Classification Chart



18.20'E
18.47'



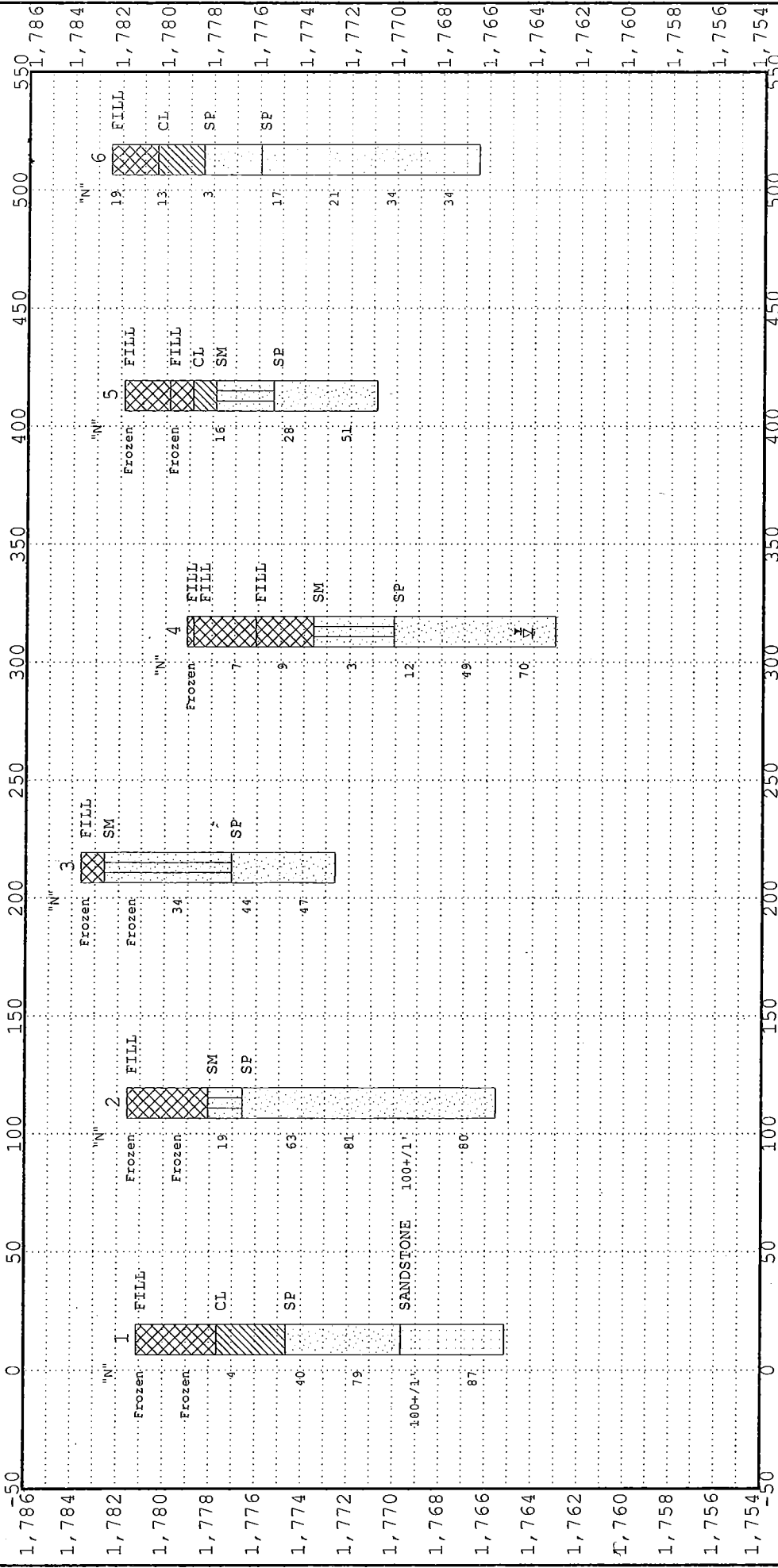
● Soil Boring Locations

Soil Boring Coordinates

Point #	Boring	Coasting
1	423406.79	1890240.82
2	423477.68	1890270.74
3	423554.22	1890303.77
4	423570.75	1890338.80
5	423598.89	1890380.00
6	423603.43	1890353.08
7	423549.88	1890508.08
8	423433.78	1890292.72
9	423501.07	1890387.27
10	423388.10	1890301.41
11	423463.13	1890368.58
12	423533.01	1890434.27

No. _____	Revision _____	Date _____	By _____
 Houston Engineering Inc.			
Bismarck	Date	Drawn by	Date
P: 701.323.0200	1-17-12	NRC	1-17-12
F: 701.323.0300	AS SHOWN	MHG	AS SHOWN
MICROTEL SITE IMPROVEMENTS		PROJECT NO. 7197-001	
BISMARCK, ND		SHEET 1 of 1	

[P:\197-001\Sheet1 - Bismarck.dwg] (DWG) (Project: 7197-001) and rechecked by [M.H.G.] on 1/17/12. 11:30 AM. (Project)



Boring	North	East	Elev.	Depth
1	0	0	1781.2	16.0
2	0	100	1781.6	16.0
3	0	200	1783.6	11.0
4	0	300	1779.1	16.0
5	0	400	1781.9	11.0
6	0	500	1782.4	16.0

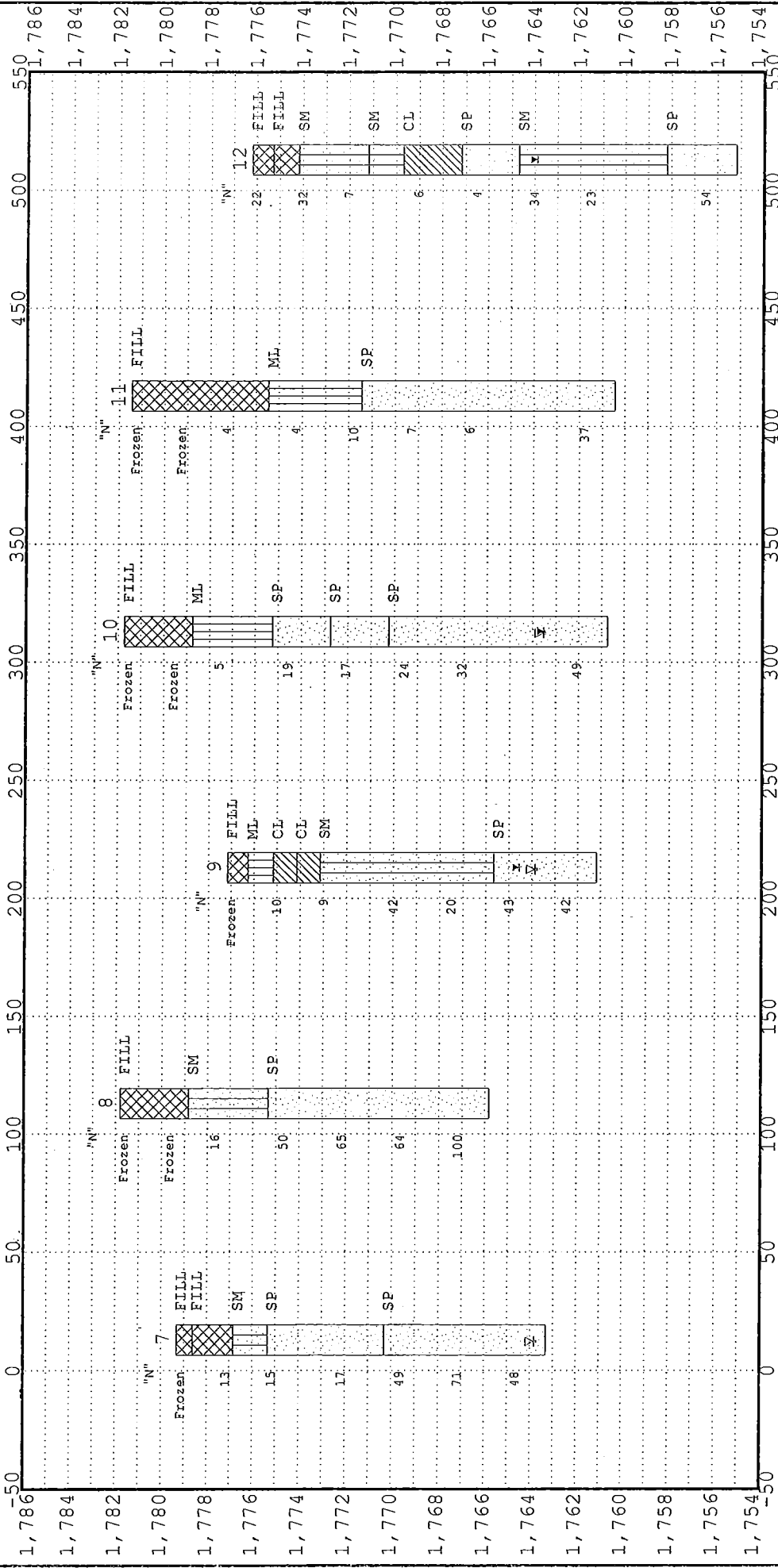
SOIL PROFILE DIAGRAM

Material Testing Services, LLC

Microtel

Bismarck, North Dakota

PROJECT #	DATE
12-112	Jul 12
PLATE	1



Boring	North	East	Elev.	Depth
7	0	600	1779.3	16.0
8	0	700	1781.8	16.0
9	0	800	1777.2	16.0
10	0	900	1781.7	21.0
11	0	1000	1781.4	21.0
12	0	1100	1776.2	21.0

SOIL PROFILE DIAGRAM

Material Testing Services, LLC

Microtel

Bismarck, North Dakota

PROJECT #	DATE	PLATE
12-112	Jul 12	1

MATERIAL TESTING SERVICES, LLC

Box 634
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(701) 852-5553

SOIL BORING RECORD

BORING NUMBER 1 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarck, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
3.5	<u>Fill, mostly Lean Clay</u> , brown, some organics, frozen, (CL)		1781.0	Fill	SB			Frozen						
1777.7	<u>Sandy Lean Clay</u> , brown, dry to moist, very soft, (CL)		1776.2	Fine Alluvium	SB			Frozen						
6.5	<u>Sand</u> , rust brown, fine to grained, dry to moist, dense to very dense, (SP)		1774.7	Coarse Alluvium	SB			4						
11.5	<u>Sandstone</u> , gray, fine grained, dry to moist, very dense		1771.2		SB			40						
1769.7			15		SB			79						
16.0			1766.2		SB			100+/1'						
1765.2	End of Boring													

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	900	16		15.2		NM
LOGGER	BG		2/29/2012	745	-		14.8		NM
REVIEWER	RR								
DRILL RIG	CME 45								

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SOIL BORING RECORD

BORING NUMBER 2 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarck, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12









LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS			
					TYPE	LEGEND	D (pcf)	N VALUES BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)
	<u>Fill, mostly Silt</u> , brown, fine grained, frozen, (ML)	[Cross-hatch pattern]	1781.0	Fill	SB	[Cross-hatch pattern]		Frozen				
3.5					SB	[Cross-hatch pattern]		Frozen				
1778.1	<u>Silty Sand with gravel</u> , brown, fine to coarse grained, dry to moist, medium dense to very dense, (SM)	[Dotted pattern]	5.0	Coarse Alluvium	SB	[Dotted pattern]		19				
1776.6	<u>Sand</u> , gray, fine grained, dry to moist, medium dense to very dense, (SP)	[Dotted pattern]	1776.6		SB	[Dotted pattern]		63				
					SB	[Dotted pattern]		81				
			10		SB	[Dotted pattern]		100+/1'				
			15		SB	[Dotted pattern]		80				
16.0	End of Boring		1765.6									

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1300	16		15.1		NM
LOGGER	BG		2/29/2012	745	-		14.9		NM
REVIEWER	RR								
DRILL RIG	CME 45								

MATERIAL TESTING SERVICES, LLC
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SOIL BORING RECORD

BORING NUMBER **3** SHEET **1** OF **1**
 PROJECT **Microtel**
 PROJECT LOCATION **Bismarck, North Dakota**
 PROJECT NUMBER **12-112**
 START DATE **2/28/12** FINISH DATE **2/28/12**

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS					
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
1.0	<u>Fill, mostly Silt</u> , bn, fine grained, frozen, (ML)		1783.6	Fill	SB			Frozen						
1782.6	<u>Silty Sand with gravel</u> , brown, fine to coarse grained, dry to moist, frozen then dense, (SM)			Coarse Alluvium	SB			Frozen						
6.5			1778.6		SB			34						
1777.1	<u>Sand</u> , rust brown to gray, fine grained, moist, dense, (SP)				SB			44						
11.0			1773.6		SB			47						
1772.6	End of Boring													
NM = None Measurable														

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1350	11		10.0		NM
LOGGER	BG		2/29/2012	745	-		9.8		NM
REVIEWER	RR								
DRILL RIG	CME 45								

MATERIAL TESTING SERVICES, LLC
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SOIL BORING RECORD

BORING NUMBER 4 SHEET 1 OF 1
 PROJECT Microtel
 PROJECT LOCATION Bismarck, North Dakota
 PROJECT NUMBER 12-112
 START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS					
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
1778.8	Fill, mostly Organic Sandy Lean Clay, dark brown, frozen, (OL)	[Cross-hatched pattern]	1779.0	Fill	SB	[X]		Frozen						
3.0	Fill, mostly Sandy Silt, brown, fine grained, dry to moist, frozen, (ML)		SB	[X]		7								
1776.1	Fill, mostly Sandy Lean Clay, brown and dark brown mixed, some organics, dry, (CL)		SB	[X]		9								
1773.6	Silty Sand with gravel, orangish brown, fine to medium grained, moist, very loose, (SM)	[Dotted pattern]	1774.5	Coarse Alluvium	SB	[X]		3						
9.0	Sand, gray, fine grained, moist to waterbearing, medium dense to very dense, (SP)		SB	[X]		12								
1770.1	End of Boring		SB	[X]		49								
16.0			1769.1		SB	[X]		70		▼	▼			
1763.1			1764.1											

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1545	16		15.4		15.0
LOGGER	BG		2/29/2012	745	-		15.1		14.5
REVIEWER	RR								
DRILL RIG	CME 45								

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SOIL BORING RECORD

BORING NUMBER 5 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarck, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
2.0	<u>Fill, mostly Silt</u> , brown and dark brown mixed, fine grained, frozen, (ML)		1781.9	Fill	SB			Frozen					
1779.9	<u>Fill, mostly Sandy Lean Clay</u> , brown and dark brown mixed, some organics, frozen to dry, (CL)				SB			Frozen					
1778.9				Fine Alluvium									
4.0	<u>Sandy Lean Clay</u> , brown, a little gravel, dry, lenses and laminations of silty sand, dry, hard, (CL)				SB			16					
1777.9				Coarse Alluvium									
6.5	<u>Silty Sand with gravel</u> , brown, fine to coarse grained, dry, medium dense, (SM)		1776.9										
1775.4	<u>Sand</u> , gray, fine grained, dry, medium dense to very dense, (SP)				SB			28					
11.0					SB			51					
1770.9	End of Boring		1771.9										

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1210	11		10.3		NM
LOGGER	BG		2/29/2012	745	-		10.1		NM
REVIEWER	RR								
DRILL RIG	CME 45								

MATERIAL TESTING SERVICES, LLC

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SOIL BORING RECORD

BORING NUMBER 6 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarek, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
2.0	<u>Fill, mostly Silt</u> , brown, some organics, moist, (ML)		1782.4	Fill	SB			19						
1780.4	<u>Sandy Lean Clay</u> , brown, a trace of gravel, a few lignite fragments, moist, firm, (CL)			Glacial Till	SB			13						
4.0														
1778.4	<u>Sand with gravel</u> , brown, fine to coarse grained, a few fragments and lenses of lignite, moist, very loose, (SP)		1777.4	Coarse Alluvium	SB			3						
6.5														
1775.9	<u>Sand</u> , gray, fine grained, dry to moist, medium dense to dense, (SP)				SB			17						
					SB			21						
					SB			34						
					SB			34						
16.0														
1766.4	End of Boring													

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1430	16		15.1		NM
LOGGER	BG		2/29/2012	745	-		14.8		NM
REVIEWER	RR								
DRILL RIG	CME 45								

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SOIL BORING RECORD

BORING NUMBER 7 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarck, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
0.7 1778.6	<u>Fill, mostly Organic Sandy Lean Clay</u> , dark brown, frozen, (OL)		1779.30	Fill	SB			Frozen					
2.5 1776.8	<u>Fill, mostly Sandy Lean Clay</u> , brown and dark brown mixed, some organics, frozen to dry, (CL)				Coarse Alluvium			SB		13			
4.0 1775.3	<u>Silty Sand</u> , light brown, a little gravel, dry, medium dense, (SM)		1774.3		SB			15					
9.0 1770.3	<u>Sand with gravel</u> , brown, fine to coarse grained, a few lignite fragments, a few fragments of sandstone, clay lenses, moist, medium dense, (SP)			1774.5		SB			17				
16.0 1763.3	<u>Sand</u> , gray, fine grained, moist to waterbearing, dense to very dense, (SP)		1769.3		SB			49					
						SB			71				
				1764.3		SB			48				
	End of Boring												
NM = None Measurable													

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1630	16		15.9		15.5
LOGGER	BG		2/29/2012	745	-		15.4		NM
REVIEWER	RR								
DRILL RIG	CME 45								

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SOIL BORING RECORD

BORING NUMBER 8 SHEET 1 OF 1
 PROJECT Microtel
 PROJECT LOCATION Bismarck, North Dakota
 PROJECT NUMBER 12-112
 START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
3.0	<u>Fill, mostly Sandy Lean Clay</u> , brown and dark brown mixed, a trace of gravel, some organics, frozen to dry, (CL)		1781.8 ⁰	Fill	SB			Frozen						
1778.8	<u>Silty Sand</u> , brown, fine grained, a little gravel, a few lignite fragments, dry to moist, medium dense, (SM)		1776.8 ⁵	Coarse Alluvium	SB			Frozen						
6.5	<u>Sand</u> , gray, fine grained, moist, dense to very dense, (SP)		1771.8 ¹⁰		SB			16						
1775.3					SB			50						
16.0			1766.8 ¹⁵		SB			65						
1765.8	End of Boring													

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1025	16		14.8		NM
LOGGER	BG		2/29/2012	745	-		14.7		NM
REVIEWER	RR								
DRILL RIG	CME 45								

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SOIL BORING RECORD

BORING NUMBER 9

SHEET 1 OF 1

PROJECT Microtel

PROJECT LOCATION Bismarck, North Dakota

PROJECT NUMBER 12-112

START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS					
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
0.9	Fill, mostly Organic Sandy Lean Clay, dark brown, frozen, (OL)		1777.2	Fill	SB			Frozen						
1776.3	Fill, mostly Silt, brown, moist, frozen, (ML)			Fine Alluvium										
2.0	Sandy Lean Clay, brown, a trace of gravel, moist, firm (CL)				SB			10						
1775.2	Sandy Lean Clay, brown, a trace of gravel, moist, firm (CL)													
1774.2	Sandy Lean Clay, brown, a trace of gravel, a few lignite fragments, dry, firm, (CL)													
4.0	Silty Sand with gravel, brown, fine to coarse grained, a few lignite fragments, a few sandstone fragments, lenses and laminations of silt, moist, loose to dense, (SM)			Coarse Alluvium	SB			9						
1773.2														
			1772.5											
					SB			42						
					SB			20						
11.5			1767.2		SB			43						
1765.7	Sand, gray, fine grained, waterbearing, dense, (SP)				SB			42						
16.0			1762.2											
1761.2	End of Boring													

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1715	16		13.6		13.3
LOGGER	BG		2/29/2012	745	-		13.3		12.6
REVIEWER	RR								
DRILL RIG	CME 45								

MATERIAL TESTING SERVICES, LLC

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SOIL BORING RECORD

BORING NUMBER 10 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarck, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE				TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
3.0	<u>Fill, mostly Sandy Lean Clay</u> , brown and dark brown mixed, some silt mixed in, a trace of gravel, frozen to dry, (CL)		1781.7 ⁰	Fill	SB			Frozen					
1778.7	<u>Silt</u> , dark brown, a few fine roots, weathered, frozen then moist, soft, (ML)		1776.7 ⁵	Fine Alluvium	SB			Frozen					
6.5	<u>Sand</u> , brown, a little gravel, laminate of organics, moist, medium dense, (SP)		1775.2	Coarse Alluvium	SB			5					
9.0	<u>Sand</u> , brown, fine grained, some gravel, moist, medium dense, (SP)		1772.7		SB			19					
11.5	<u>Sand</u> , brown, fine grained, some gravel, moist, medium dense, (SP)		1771.7 ¹⁰		SB			17					
1770.2	<u>Sand</u> , gray, fine grained, moist to waterbearing, medium dense to dense, (SP)		1766.7 ¹⁵		SB			24					
21.0			1761.7 ²⁰		SB			32					
1760.7	End of Boring				SB			49					

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1120	21		18.6		18.2
LOGGER	BG		2/29/2012	745	-		18.6		18.2
REVIEWER	RR								
DRILL RIG	CME 45								

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(701) 852-5553

SOIL BORING RECORD

BORING NUMBER 11 SHEET 1 OF 1
PROJECT Microtel
PROJECT LOCATION Bismarck, North Dakota
PROJECT NUMBER 12-112
START DATE 2/28/12 FINISH DATE 2/28/12

LAYER DEPTH/ ELEVATION (FT)	SOIL DESCRIPTION	SYMBOLIC LOG	ELEVATION/ DEPTH (FT)	GEOLOGY	SAMPLE					TEST RESULTS				
					TYPE	LEGEND	D (pcf)	N VALUES	BLOWS/FT	WATER LEVEL	MOISTURE CONTENT (%)	LIQUID LIMIT (%)	PLASTIC LIMIT (%)	Qu
1781.0	<u>Fill, mostly Silt</u> , brown and dark brown mixed, some organics, frozen to dry to moist, (ML)		1781.0	Fill	SB			Frozen						
			SB											Frozen
6.0			SB											4
1775.4	<u>Sandy Silt</u> , brown, lenses of lean clay, moist, very soft, (ML) 3T sample taken at 7' to 9' from secondary boring.		1776.4	Fine Alluvium	SB		98.2	4		17	35	17		
10.0			3T											
1771.4	<u>Sand</u> , brown, fine grained, moist to waterbearing, loose to dense, (SP)		1771.4	Coarse Alluvium	SB			10						
			SB										7	
15			SB										6	
21.0			1766.4		SB			37						
1760.4	End of Boring		1761.4											

NM = None Measurable

DRILLER	CW	WATER LEVEL MEASUREMENTS	DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING MUD LEVEL	WATER LEVEL
METHOD	4" FA		2/28/2012	1510	21		18.3		NM
LOGGER	BG		2/29/2012	745	-		18.0		NM
REVIEWER	RR								
DRILL RIG	CME 45								

**SYMBOLS AND DESCRIPTIVE TERMINOLOGY
ON TEST BORING LOG**

SYMBOLS FOR DRILLING AND SAMPLING		SYMBOLS FOR LABORATORY TESTS	
<u>Symbol</u>	<u>Description</u>	<u>Symbol</u>	<u>Description</u>
HSA	3 1/4" I.D. hollow stem auger	W	Water content
_FA	4", 6" or 10" diameter flight auger	D	Dry density - pounds per cubic foot
_HA	2", 4" or 6" hand auger	LL	Liquid limit - ASTM** D 4318
_DC	2 1/2", 4", 5" or 6" steel drive casing	PL	Plastic limit - ASTM D 4318
_RC	Size A, B or N rotary casing		--- Inserts in Last Column (Qu or RQD) ---
PD	Pipe drill or cleanout tube	Qu	Unconfined compressive strength, psf - ASTM D 2166
CS	Continuous split barrel sampling	Pq	Penetrometer reading, tsf
DM	Drilling mud	Ts	Torvane reading, tsf
JW	Jetting water	G	Specific gravity
SB	2" O.D. split barrel sampling	SL	Shrinkage limits - ASTM D 427
_L	2 1/2" or 3 1/2" O.D. SB liner sample	OC	Organic content - Combustion method
_T	2" or 3" thin walled tube sample	SP	Swell pressure, tsf
3TP	3" thin walled tube using pitcher sampler	PS	Percent swell under pressure
_TO	2" or 3" thin walled tube using Osterberg sampler	FS	Free swell, percent
W	Wash sample	SS	Shrink swell, percent
B	Bag sample	pH	Hydrogen ion content - Meter Method
P	Test pit sample	SC	Sulfate content, parts/million or mg/l
_Q	BQ, NQ, or PQ wireline system	CC	Chloride content, parts/million or mg/l
_X	AX, BX, or NX double tube barrel	C*	One dimensional consolidation - ASTM D 2435
N	Standard penetration test, blows per foot	Qc*	Triaxial compression
CR	Core recovery, percent	D.S.*	Direct shear - ASTM D 3080
WL	Water level	K*	Coefficient of permeability, cm/sec
••	Water level	DH*	Double hydrometer - ASTM D 4221
NMR	No measurement recorded, primarily due to presence of drilling or coring fluid	MA*	Particle size analysis - ASTM D 422
		R	Laboratory electrical resistivity, ohm-cm - ASTM G 57
		E*	Pressuremeter deformation modulus, tsf
		PM*	Pressuremeter test
		VS*	Field vane shear - ASTM D 2573
		IR*	Infiltrometer test - ASTM D 3385
		RQD	Rock quality designation, percent
		*	Results shown on attached data sheet or graph
		**	ASTM designates American Society for Testing and Materials

DESCRIPTIONS OF N-VALUES VS. SOIL PROPERTIES				DESCRIPTIONS OF SOIL CONDITIONS	
<u>N Value</u>	<u>Density</u>	<u>N Value</u>	<u>Consistency</u>	<u>Condition</u>	<u>Description</u>
0 - 4	Very loose	0 - 4	Very soft	Lamination	Up to 1/2" thick stratum
5 - 10	Loose	5 - 8	Soft	Layer	1/2" to 6" thick stratum
11 - 30	Medium dense	9 - 15	Firm	Dry	Powdery, no noticeable water
31 - 50	Dense	16 - 30	Hard	Moist	Below saturation
Over 50	Very dense	Over 30	Very hard	Wet	Saturated, above liquid limit
				Waterbearing	Pervious soil below water
				Varved	Alternating laminations of any combinations of clay, silt and fine grained sand

DESCRIPTIONS OF GRAVEL PROPORTIONS IN SOILS			DESCRIPTIONS OF PARTICLE SIZES	
<u>Soil Type</u>	<u>Description</u>	<u>Range, %</u>	<u>Material Type</u>	<u>Size</u>
Coarse grained soils	A little gravel	2 - 14	Boulders	Over 12"
Coarse grained soils	With gravel	15 - 49	Cobbles	3" - 12"
Fine grained soils:			Coarse gravel	3/4" - 3"
71-85% passing #200 sieve	A little gravel	2 - 7	Fine gravel	#4 sieve - 3/4"
71-85% passing #200 sieve	With gravel	8 - 29	Coarse sand	#4 - #10 sieve
70% passing #200 sieve	A little gravel	2 - 14	Medium sand	#10 - #40 sieve
70% passing #200 sieve	With gravel	15 - 24	Fine sand	#40 - #200 sieve
70% passing #200 sieve	Gravelly	16 - 49	Silt	100% passing #200 sieve and > 0.002mm
			Clay	100% passing #200 sieve and < 0.002mm

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
			CH	INORGANIC CLAYS OF HIGH PLASTICITY	
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Appendix B

Risks Associated with Excavating and Filling Below Water

RISKS ASSOCIATED WITH EXCAVATING AND FILLING BELOW WATER

For many projects, an excavate-refill program is used to prepare building areas prior to the start of construction. As variations in soil conditions often occur in very short distances, the bottom of any excavations should be observed by an engineer to judge the competency of the natural soils for fill and footing support. In some cases, the required excavation may extend below the ground water level. If the excavation extends below ground water level, a temporary dewatering system is necessary to lower the water level to an elevation below the required excavation bottom. In some situations, the quantity of water is such that a temporary dewatering system cannot economically control the ground water. In these situations, the excavations are sometimes performed below the water level using a dragline or backhoe to remove the inferior soils, and the initial lifts of fill are placed into standing water.

Excavating and refilling below water involves risks of trapping compressible or otherwise unsuitable materials within or below the new fill system. Dislodged excavated materials can be covered by the advancing fill soils, or localized deeper pockets of compressible soils can be missed by the excavating equipment. For this reason, approaching the earthwork without dewatering requires that the owner accept the risk of some future building settlement. This risk results from the engineer's inability to completely observe the excavation bottom during the excavation and initial filling operations. In areas where the excavation terminates below the water table, observations are strictly limited to observing the soils recovered in the bucket of the backhoe or dragline, and possibly probing the excavation bottom if the depth of water is not too great. If the excavation operations are to proceed in this manner, it is necessary that all parties fully understand and accept the risks involved.

While these risks cannot be eliminated, there are a number of procedures which can be used to minimize the risk of future settlement if the excavation proceeds without the aid of dewatering. We strongly recommend the following procedures be employed during the excavation and refilling operations.

1. A preliminary soil boring program should be performed prior to any excavation. This program would establish approximate required bottom of excavation elevations, and provided information regarding the classification of acceptable soils anticipated at the bottom of the excavation.
2. The excavation work should be performed by a backhoe or dragline operator experienced with this type of excavation operation.
3. An experience soils engineer should be retained to provide full-time observations during all excavation and refilling operations below the water level.
4. A suitable amount of lateral excavation oversize should be provided in the excavation bottom. Reference should be made to the preliminary soils report, the job specifications, or the soil engineer's recommendations for information regarding the extent of oversize required for the particular project.
5. Any fill placed below water, and to an elevation of at least 2 feet above the water level, should consist of a clean, free-draining sand containing less than 40 percent passing the #40 sieve and less than 5 percent passing the #200 sieve.
6. The fill should be stockpiled at the water's edge, and should be advanced into the excavation by a bulldozer imparting a strong, downward "Scouring" action to advance the fill along the excavation bottom. This scouring action would tend to force remnant pieces of unstable material ahead of the filling process, where they could be periodically removed by the excavating equipment. Excessive amounts of unsuitable material collecting in front of the fill could impede the ability of the fill mass to scour the excavation bottom.
7. A number of standard penetration borings should be put down through the fill after it has been brought to a level above the ground water table. These borings are instrumental in documenting the effectiveness of the removal of the unsuitable materials as well as judging the density of the newly placed fill at depth.

SECTION 00870

FINISH COLOR SCHEDULE

PART 1 - GENERAL

DESCRIPTION OF WORK: This Section shall be used in conjunction with the Drawings and with related Sections of the Specifications.

Microtel approved FF&E Color Schemes:

1. Breeze
2. Cappuccino
3. Citrus
4. Metro
5. Micro
6. Nature

PART 2 - PRODUCTS

GENERAL

Manufacturers mentioned in this Section are only to establish color or finish. Equivalent products by any of the listed manufacturer's in the corresponding Section will be acceptable.

*** Indicates color shall be in conformance with one of the above listed color schemes approved by Microtel. Color scheme selection shall be made by Owner (from the approved options). Samples shall be submitted to Wyndham Worldwide for approval, where required elsewhere in these specifications.**

All Exterior color schemes must be submitted to Wyndham Worldwide for approval.

FINISH CARPENTRY

Interior Wood Trim *

Shelving *

Column Surrounds - White to match vinyl trim .

Exterior Louver Vents - White to match vinyl trim.

CASEWORK

Plastic Laminate Counter tops, aprons and backsplashes

Offices *

Guest Room *

Granite Counter tops, aprons and backsplashes

Guest Room *

Lobby *

Granite Vanities and Sills

Guest Room Vanity Countertops with undercounter lavatories and backsplashes *

Window Sills *

Custom Cabinet Units *

SHINGLES: Black/Charcoal or approved alternate color

VINYL SIDING

Siding: Oxford Blue #32 or Light Maple #55 by CertainTeed 810 Shale by Wolverine

Trim:

Windows and Doors - #31 Snow by CertainTeed 800 Snow by Wolverine

Corners - Oxford Blue #32 or Light Maple #55 by CertainTeed 810 Shale by Wolverine

Soffits - #31 Snow by CertainTeed 800 Snow by Wolverine

FIBER CEMENT SIDING

Siding: Prefinished CertainTeed ColorMax Pewter or Merino Tan

Trim:

Windows and Doors - Prefinished CertainTeed ColorMax Vanilla White

Corners - Prefinished CertainTeed ColorMax Pewter or Merino Tan

Fascia and Soffits - Prefinished CertainTeed ColorMax Vanilla White

Exposed Trim and Fascia: Prefinished Vanilla White to match trim.

Gutters: Prefinished white to match trim.

Downspouts: Color to match siding, or approved alternate building finish.

Metal Flashing: White to match trim.

FLASHING AND SHEET METAL – Match color of adjacent material

JOINT SEALERS: Match color of adjacent material

STEEL DOORS AND FRAMES: *

WOOD DOORS: *

ALUMINUM ENTRANCES AND STOREFRONT: White Kynar to match vinyl trim.

VINYL (ALUMINUM IN FLORIDA) WINDOWS: White to match aluminum storefront.

FINISH HARDWARE: US26D Satin Chrome, unless specified otherwise.

TILE

Main Entry: *

Lobby: *

Elevator Lobby*

Breakfast Area*

Guest Toilet*

Vending*

Unisex Toilet*

Roll-In Shower*

ACOUSTICAL CEILINGS

Exposed Grid: White

Ceiling Tiles: White

RESILIENT FLOORING

Resilient Base

Guest Room: *
Guest Bath: *
Offices: *
Storage/Laundry/Mechanical/Electrical: *
Stairs: *
Water Heater*
Dryer Enclosure*
Elevator Equipment*
Pantry*
Exercise*
Employee Toilet*
Housekeeping*
Telecom / Electrical*
Maid Break room*
Guest Laundry*
Maintenance*

Composition Sheet Vinyl

Guest Bath: *
Employee Toilet: *
Pantry*
Elevator Cabinet*
Housekeeping*
Telecom / Electric*
Maid Break room*
Guest Laundry*
Maintenance*

Vinyl Composition Tile

Storage/Laundry: *

Rubber Disc Tile

Entries: *

Carpet Edge Guards: *

CARPET: Provide padding as indicated in Section 09680.

Type A

Guest Room: *

Type B

Corridor: *

Lobby: *

Offices: *

Elevator

Exercise Room*

Type C

Office*

Bookkeeping*

Front Desk*

Night Window*

Meeting Room*

PAINT: *

DOOR SIGNAGE: *

Must meet Americans With Disabilities Act & ANSI 117.1 guidelines.

TOILET AND BATH ACCESSORIES: Finishes as specified in Section 10800.

PASSENGER ELEVATORS: *

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01000

SPECIAL CONDITIONS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section

All Subcontractors, as well as the General Contractor, shall be governed by all applicable Sections of these Documents with reference to their respective areas of work. It shall be the responsibility of the General Contractor to apprise their Subcontractors and suppliers of these requirements.

RELATIONS WITH ADJOINING PROPERTY OWNERS

To facilitate his work, the Contractor may choose to make necessary arrangements for use and subsequent rehabilitation of the adjoining Owner's property. Such arrangements are solely the Contractor's responsibility.

GENERAL

The Contractor shall provide sufficient and adequate labor, materials and equipment necessary to properly correlate all phases of the work to the end that the approved Progress Schedule can be adhered to and the Contract completion date met.

SUPERINTENDENT

The General Contractor's Superintendent shall be at the job full-time continuously from the start of the job.

The Contractor's Superintendent shall maintain up-to-date records, including as-built Drawings.

PERMITS, FEES, DEPOSITS, AND NOTICES

The General Contractor shall secure and pay for all permits and certificates of inspection incidental to this work required by City, County, State, or any other governing authority having jurisdiction over premises.

The General Contractor shall ensure that all Subcontractors and Sub-subcontractors have obtained all permits, paid all fees, made any required deposits, and posted all notices required by law before any of their work is started.

Should it be required that any permits or notices be posted at the job site, the General Contractor shall make proper provision for such posting with adequate protection for their preservation throughout the course of the work.

Copies of all permits shall be sent to the Owner's representative and the Architect by the General Contractor.

The General Contractor will coordinate all required inspections by governing authorities.

MEETINGS

Before any work is started, responsible representatives for the Contractor, including his designated job superintendent for the project, shall meet at the site with the Owner's representative to review the requirements and conditions under which the project will be performed.

Progress meetings shall be held at the site under the direction of the Owner's representative. The Contractor shall attend or be represented by someone fully empowered to speak for and commit them to any agreement reached.

EXAMINATION OF THE SITE

All Contractors submitting proposals for this work shall first examine the site and all conditions thereon. All proposals shall take into consideration all such conditions as may affect the work under this Contract.

GRADES, LINES, LEVELS, AND SURVEYS

All grades, lines, levels, and bench marks for the building shall be established and maintained by the General Contractor who shall be responsible for same.

Verify all grades, lines, levels, and dimensions as shown on the Drawings, and report any errors or inconsistencies discovered in the above to the Architect before commencing work. Provide and maintain established bench marks in not less than two widely separated places.

FIELD MEASUREMENTS

The General Contractor shall take measurements in the field to verify or supplement dimensions indicated on Drawings and shall be responsible for accurate fit of specified work. Any discrepancy between the Drawings and the actual conditions shall be reported immediately to the Architect.

Tolerances: The General Contractor shall be responsible to maintain dimensions for spaces requiring close tolerances for such items as equipment or fixtures by "grounding" such locations. Uneven surfaces and joints, which prevent the installation of units whose dimensions are shown in the documents, will not be accepted.

PROTECTION

It shall be the responsibility of each Contractor to see that all personnel comply with Specific Safety Requirements of the agencies of jurisdiction relating to construction and the latest Federal Regulations of the Department of Labor, Bureau of Labor Standards, and the Occupational Safety and Health Act (O.S.H.A.).

Each Contractor shall provide and maintain guard lights for his work at all barricades, railings, obstructions in the streets, roads, or sidewalks, and at all trenches or pits. Remove such work when directed after necessity for same ceases.

Each Contractor will be held responsible for all of his work and materials provided for by the plans and Specifications until the work is completed and accepted.

FIRE PROTECTION

Free access shall be maintained at all times from the street to fire hydrants and to outside connections for standpipes. Fire doors shall be installed and in operation at the earliest possible time.

During the construction period, the General Contractor shall furnish 20 pound ABC all-purpose dry chemical type extinguishers to be located strategically throughout the building. In lieu of the above, the Contractor may substitute 2-1/2 gallon anti-freeze type water extinguishers and 10 pound carbon dioxide extinguishers.

The General Contractor shall appoint one of his personnel who is continually employed on the job site (such as the Superintendent) whose additional duty it will be to act as fire warden for the project. The fire warden shall institute and vigorously enforce a program of fire safety for the project.

The General Contractor shall maintain fire protection equipment, institute fire prevention measures, and direct the prompt removal of all unnecessary combustible material and waste. He shall be responsible for the correct and safe use of soldering coppers, extension lights, flammable liquids, welding and metal cutting apparatus, wax pots, or other open flame tools. This type of work shall be done only when properly supervised and with adequate fire extinguishing equipment available.

Combustible materials shall not be stored in the building.

The use of wood scaffolding shall be kept to a minimum and entirely eliminated when possible, in order to eliminate fire hazards from this source. No part of the building where forms are in place shall be used for the storage of flammable materials of any kind. Temporary structures of combustible material shall be located not less than 30 feet from the building.

No smoking or use of tobacco in any form shall be permitted within the building or on the roof surfaces.

Paints, varnishes, volatile oils, etc., shall be stored in a room having good ventilation and containing no other material, or in metal lockers or metal boxes with self-closing covers.

Gasoline and other volatile and flammable liquids shall be stored in metal barrels well away from other structures or other combustible materials.

Special precautions shall be taken to reduce fire hazards where electric or gas welding or cutting work is done and suitable fire extinguishing equipment shall be maintained near such operations.

The General Contractor shall install and maintain portable fire extinguishers in tool houses and other temporary buildings.

USE OF SITE

The General Contractor shall designate areas for location of parking, storage, and construction trailers.

Material Delivery and Storage

It shall be the responsibility of each Contractor to direct all deliveries to the construction site and not the Owner.

Temporary storage facilities shall be provided to protect equipment and/or materials delivered to the job site which may be damaged by exposure to weather. It shall be the General Contractor's responsibility to provide all labor and materials necessary to provide such protection. The Owner shall be consulted as to the "adequacy" of such temporary protection.

All Contractors shall exercise control over all trucks and equipment using public roads and the Owner's property to preclude spillage, tracking of dirt or debris thereon. Should spillage occur, that Contractor is held to promptly clean and remove same.

Mud from the construction site shall be removed from public and the Owner's roads daily. Failure to remove mud promptly could result in roads being cleaned by the Owner at the responsible Contractor's expense.

WEATHER PROTECTION

All Contractors shall at all times provide protection against weather --- rain, wind, storms, frost, or heat --- so as to maintain his work, materials, apparatus, and fixtures free from injury or damage. At the end of the day's work, all work likely to be damaged shall be covered.

During cold weather, the General Contractor shall protect the work from damage. If low temperatures make it impossible to continue operations safely in spite of cold weather precautions, the Contractor shall cease work.

Any work damaged by failure to provide above protection shall be removed and replaced with new work at the Contractor's expense.

RESTORATION

Where existing properties, streets, paving, curbs, etc., are removed or damaged as a result of work operations, the responsible Contractor shall restore the foregoing items to match the original or as required by local authorities.

PROTECTION OF INSTALLED WORK

All Contractors shall:

Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.

Prohibit traffic and storage on waterproofed and roofed surfaces, and on lawn and landscaped areas.

Provide protective coverings at walls, projections, jambs, sills, and soffits or openings. Protect finished floors and stairs from traffic, movement of heavy objects, and storage.

WATER CONTROL

All Contractors shall provide, operate, and maintain pumps or other equipment necessary to drain his work. Keep excavation pits, trenches, and ditches including the entire subgrade free of any water under any circumstances that may arise.

REMOVAL

Remove temporary materials, equipment, services, and construction prior to Substantial Completion inspection.

Clean and repair damage caused by installation or use of temporary facilities.

SURPLUS FINISH MATERIALS

Unless specified otherwise, a minimum of one percent (1%) of all finish materials shall be turned over to the Owner at the completion of the Project for maintenance and repair work, including, but not limited to touch-up paint, etc.

Refer to respective Specification Sections for further requirements.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

REQUIREMENTS INCLUDED

Description of Work

DESCRIPTION OF WORK

Project Description

The Project Entitled:

Microtel Inn & Suites – Bismarck, ND

Work Included: The work of this project is shown on the Drawings and described in the various Sections of the Specification.

Extent: Contractor shall furnish all labor, tools, equipment and materials to complete all work under this heading as indicated on the Drawings and described in the Specifications.

Items Included: The work to be performed under this Section shall include, but is not limited to, the following:

Items to be furnished by the Owner and installed by the Contractor (F.B.O. - I.B.C.).

Items to be furnished and installed by the Owner (F.B.O. - I.B.O.).

The Drawings and Specifications are complementary and what is required by any one shall be as binding as if required by all.

Drawings and General Provisions of Contract, including General Conditions and Division 1 Specification Sections, apply to work specified in this Section.

QUALITY ASSURANCE

Qualifications of Contractors: In order to assure that Bidders are qualified to perform the work bid upon, the Owner, at his sole discretion, may require bidder to submit an AIA Qualification Statement and a list of three (3) similar projects which have been completed by the Bidder. Such list shall include descriptions of the work performed and a specific person (reference) whom the Owner may contact. If Owner requires such list, submit promptly within five (5) days. Non-compliance may cause rejection of bid.

It is the intent of the Owner and the Project Manual to conform with the AMERICANS WITH DISABILITIES ACT and ANSI 117.1.

CONTRACTOR USE OF PREMISES

General: Contractors shall limit their use of the premises to construction activities in areas indicated.

Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

Keep driveways and entrances serving the premises clear and available to the Owner and the Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

Contractor shall assume full responsibility for protection and safe keeping of products under this Specification.

PROGRESS SCHEDULE

A Progress Schedule listing the major items of work and dates of completion shall be submitted in bar-graph form for the Architect's approval no more than 14 days after the date of the Owner's award of Contract. This Schedule shall be updated before every construction meeting.

BIDDING CLASSIFICATION

This project shall be performed under the following Prime Contracts:

General Contract

HAZARDOUS MATERIALS

In the event the Contractor encounters material reasonably believed to contain asbestos or other hazardous materials which have not been identified or rendered harmless, the Contractor shall immediately stop work in the area affected and report the condition to the Owner in writing. The work in the affected area shall be resumed in the absence of asbestos, as verified by the Owner.

To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Engineer, Architect, Engineer's and Architect's consultants and agents and employees of any of them from and against claims, damages, losses, and expenses, including, but not limited to, attorney's fees arising out of or resulting from performance of the work in the affected area if, in fact, the material is asbestos and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the work itself), including loss of use resulting there from, but only to the extent caused in whole or in part by negligent acts or omissions of the Owner, anyone directly or indirectly employed by the Owner or anyone for whose acts the Owner may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity which would otherwise exist as to a part or person described in this Subparagraph.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

Not Used

END OF SECTION

SECTION 01040

PROJECT COORDINATION

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Construction Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

This Section specifies requirements for project coordination including, but not necessarily limited to:

- Coordination
- Administrative and Supervisory Personnel
- General Installation Provisions
- Cleaning and Protection

Coordination: Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

Where installation of one component depends on installation of other components before or after its own installation, schedule activities in the sequence required to obtain the best results.

Coordinate installation of different components to assure maximum accessibility for maintenance, service and repair.

Make provisions to accommodate items scheduled for later installation.

Prepare memoranda for distribution to each party involved outlining required coordination procedures. Include required notices, reports, and attendance at meetings.

Prepare similar memoranda for the Owner and separate Contractors where coordination of their Work is required.

Administrative Procedures: Coordinate scheduling and timing of administrative procedures with other activities to avoid conflicts and ensure orderly progress. Such activities include, but are not limited to:

- Preparation of Schedules
- Installation and Removal of Temporary Facilities
- Delivery and Processing of Submittals
- Progress Meetings
- Project Closeout Activities

Coordination Drawings: Prepare Coordination Drawings where close coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space necessitates maximum utilization of space for efficient installation of different components.

Show relationship of components shown on separate Shop Drawings.

Indicate required installation sequences.

Refer to Division 15 Section "Basic Mechanical Requirements", and Division 16 Section "Basic Electrical Requirements", for requirements for mechanical and electrical installations.

Staff Names: Within 15 days of Notice to Proceed, submit a list of Contractor's staff assignments, including Superintendent and personnel at the site; identify individuals, their duties and responsibilities, addresses and telephone numbers.

Post copies in the Project meeting room, the field office, and at each temporary telephone.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

INSPECTION OF CONDITIONS: The installer of each component shall inspect the substrate and conditions under which work is performed. Do not proceed until unsatisfactory conditions have been corrected.

MANUFACTURER'S INSTRUCTIONS: Comply with the manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.

Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.

Provide attachment and connection devices and methods necessary for securing work. Secure work true to line and level. Allow for expansion and building movement.

VISUAL EFFECTS: Provide uniform joint widths in exposed work. Arrange joints in exposed work to obtain the best visual effect. Refer questionable choices to the Architect for final decision.

Recheck measurements and dimensions before starting each installation.

Install each component during weather conditions and project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.

ENCLOSURE OF THE WORK: Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

MOUNTING HEIGHTS: Where mounting heights are not indicated, install individual components at standard mounting heights recognized within the industry for the particular application indicated. Refer questionable mounting height decisions to the Architect for final decision.

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

Clean and maintain completed construction as often as necessary through the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Limiting Exposures: Supervise operations to ensure that no part of construction, completed or in progress, is subject to harmful or deleterious exposure. Such exposures include, but are not necessarily limited to, the following:

- Excessive Weathering
- Excessively High or Low Temperatures or Humidity
- Water or Ice
- Chemicals or Solvents
- Heavy Traffic, Soiling, Staining and Corrosion
- Contact between Incompatible Materials
- Theft or Vandalism
- Excessive Static or Dynamic Loading
- Thermal Shock
- Combustion

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Condition and other Division 1 Specification Sections, apply to this Section.

Refer to other Sections of these Specifications, including Divisions 15 and 16, for specific requirements and limitations applicable to cutting and patching individual parts of the work.

CUTTING AND PATCHING PROPOSAL: Where approval of procedures is required before proceeding, submit a proposal describing procedures in advance of the time cutting and patching will be performed. Include the following information, as applicable:

Describe the extent of cutting and patching required and how it is to be performed. Indicate why it cannot be avoided.

Describe anticipated results, including changes to structural elements and operating components and changes in the building's appearance and other visual elements.

List products to be used and entities that will perform work.

Indicate dates when cutting and patching is to be performed.

List utilities that will be disturbed, including those that will be relocated and those that will be temporarily out-of service. Indicate how long service will be disrupted.

Approval by the Architect and Owner's Representative to proceed does not waive the Architect's right to later require complete removal and replacement of work found to be unsatisfactory.

STRUCTURAL WORK: Do not cut and patch structural elements in a manner that would reduce the load-carrying capacity or load deflection ratio. Obtain approval of the cutting and patching proposal before cutting and patching structural elements.

OPERATIONAL AND SAFETY LIMITATIONS: Do not cut and patch operating elements or safety components in a manner that would reduce their capacity to perform as intended, or would increase maintenance, or decrease operational life or safety. Obtain approval of the cutting and patching proposal before cutting and patching operating elements or safety related systems.

VISUAL REQUIREMENTS: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would reduce the building's aesthetic qualities or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

PART 2 - PRODUCTS

MATERIALS: Use materials identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials that match existing adjacent surfaces to the fullest extent possible. Use materials whose performance will equal or surpass that of existing materials.

PART 3 - EXECUTION

INSPECTION: Before cutting, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding if unsafe or unsatisfactory conditions are encountered.

TEMPORARY SUPPORT: Provide temporary support of work to be cut.

PROTECTION: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions that might be exposed during cutting and patching operations.

Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

Take all precautions to avoid cutting existing pipe, conduit, or ductwork serving the building, but scheduled to be removed, or relocated until provisions have been made to bypass them.

PERFORMANCE: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

Cut existing construction to provide for the installation of other components or the performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

CUTTING: Cut existing construction using methods least likely to damage elements to be retained or adjoining construction. Where possible, review procedures with the original installer. Comply with the original installer's recommendations.

All cutting of areas shall be by Contractor requiring cutting, except where noted otherwise in the Specifications and/or Drawings.

Where cutting is required, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.

Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill. Overcuts are **NOT** allowed

Comply with requirements of applicable sections of Division 2 where cutting and patching requires excavating and backfilling.

PATCHING: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

All patching shall be by Contractor doing cutting work and shall be performed by trade who would customarily be performing that type of work.

Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch, after the patched area has received primer and second coat.

CLEANING: Thoroughly clean areas and spaces where cutting and patching is performed or used as access. Remove paint, mortar, oils, putty and similar items. Thoroughly clean piping, conduit, and similar features before painting or finishing is applied. Restore damaged pipe covering to its original condition.

END OF SECTION

SECTION 01300

SUBMITTALS AND SUBSTITUTIONS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK

Wherever possible throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or reference to recognized industry standards.

To ensure that the specified products are furnished and installed in accordance with the design intent, procedures have been established for advance submittal of design data for its review and approval or rejection by the Architect.

This Section specifies administrative and procedural requirements for submittals required for performance of the work, including:

- Contractor's Construction Schedule
- Shop Drawings
- Product Data
- Samples

RELATED WORK

Contractual Requirements for Submittals: General Conditions

Four (4) copies of all Submittals by Contractors of Documents, plus number of copies to be returned to Contractor, shall be submitted unless otherwise specified.

Individual Submittals Required: Pertinent Sections of these Specifications.

PRODUCT HANDLING: Make all submittals of Shop Drawings, samples, requests for substitutions, and other similar items, in strict accordance with the provisions of this Section of these Specifications.

SUBMITTAL PROCEDURES

Coordination: Coordinate preparation and processing of Submittals with performance of construction activities. Transmit each Submittal sufficiently in advance of performance of related construction activities to avoid delay.

Coordinate each Submittal with fabrication, purchasing, testing, delivery, other Submittals and related activities that require sequential activity.

General Contractor to review all submittals prior to transmittal to Architect. The Architect will only review submittals that have been stamped "Approved" by the General Contractor.

Coordinate transmittal of different types of Submittals for related elements of the work so processing will not be delayed by the need to review Submittals concurrently for coordination.

The Architect reserves the right to withhold action on a Submittal requiring coordination with other Submittals until related Submittals are received.

No extension of Contract Time will be authorized because of failure to transmit Submittals to the Architect sufficiently in advance of the work to permit processing.

Deliver Submittals to the Architect.

Submittal Preparation: Place a permanent label or title block on each Submittal for identification. Indicate the name of the entity that prepared each Submittal on the label or title block.

Provide a space approximately 10" x 10" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

Include the following information on the label for processing and recording action taken:

Project Name

Name of the Owner

Date

Name and Address of Architect

Name and Address of Contractor

Name and Address of Subcontractor or Vendor

Location Where Item is to be used

Name of Manufacturer

Drawing Number and Detail References, as Appropriate

Certification by the Contractor

Submittal Transmittal: Package each Submittal appropriately for transmittal and handling. Transmit each Submittal from General Contractor to Architect using a transmittal form. Submittals received from sources other than the General Contractor will be returned without action.

On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

When Resubmittal is required for any reason, transmit under new letter of transmittal, indicating by reference to a previous Submittal that this is a Resubmittal.

After Architect's review of Submittal, revise and resubmit as required, identifying changes made since previous Submittal.

Distribute copies of reviewed Submittals to concerned persons. Instruct recipients to promptly report any inability to comply with provisions.

All Submittals shall bear the stamp of approval of the General Contractor submitting same as evidence that they have been checked by them, or they will be rejected and not reviewed by the Architect.

SHOP DRAWINGS

Submit newly prepared information drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

Shop Drawings shall be drawn at a scale to clearly indicate all of the above conditions and allow for corrections or modifications which the Architect may wish to make. The Architect shall be the sole judge as to the acceptability of manufacturer's literature and catalog sheets as Shop Drawings.

Shop Drawings shall clearly indicate all dimensional data for all parts of the item; types and materials for all connections; finishes; the exact relation of the item to adjacent materials and equipment in the completed structure including clearance, any necessary isolation, and fastening methods and devices; and mechanical and electrical connections.

Shop Drawings include fabrication and installation Drawings, setting diagrams, schedules, patterns, templates, and similar Drawings. Include the following information:

Dimensions

Identification of Products and Materials Included

Compliance with Specified Standards

Notation of Coordination Requirements

Notation of Dimensions Established by Field Measurement

Sheet Size: Except for templates, patterns, and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11", but no larger than 24" x 36".

Submit in the form of four (4) opaque reproductions plus required amount to be returned to Contractor. After review, reproduce and distribute in accordance with requirements in Article on Procedures, above.

Do not permit Shop Drawing copies, without an appropriate final "Action" marking by the Architect, to be used in connection with the work.

The Contractors shall be responsible for distribution of additional prints to vendors, etc.

Refer to General Conditions for additional requirements.

PRODUCT DATA

Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information, include the following information:

Manufacturer's Printed Recommendations

Compliance with Recognized Trade Association Standards

Compliance with Recognized Testing Agency Standards

Application of Testing Agency Labels and Seals

Notation of Dimensions Verified by Field Measurement

Notation of Coordination Requirements

Type and Model Numbers

Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

Submittals: Submit six (6) copies of each required Submittal. The Architect will retain three (3) and will return the others marked with action taken and corrections or modifications required.

Distribution: Furnish copies of final Submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

Do not proceed with installation until a copy of Product Data applicable is in the installer's possession.

Do not permit use of unmarked copies of Product Data in connection with construction.

SAMPLES

Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, full color-range sets, and swatches showing color, texture, and pattern.

Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Include the following:

- Generic Description of the Sample
- Sample Source
- Product Name or Name of Manufacturer
- Compliance with Recognized Standards
- Availability and Delivery Time

Colors

General: Unless the precise color and pattern is specifically described in the Contract Documents, whenever a choice of color or pattern is available in a specified product, submit accurate color charts and pattern charts to the Architect for his review and selection.

Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between the final Submittal and the actual component as delivered and installed.

Where variation in color, pattern, texture, or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3) that show approximate limits of the variations.

Refer to other Specification Sections for requirements for Samples that illustrate workmanship, fabrication techniques, details of assembly, connections, operation, and similar construction characteristics.

Refer to other Sections for Samples to be returned to the Contractor for incorporation in the work. Such Samples must be undamaged at time of use. On the transmittal, indicate special requests regarding disposition of Sample Submittals.

Preliminary Submittals: Where Samples are for selection of color, pattern, texture, or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

Preliminary Submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

Maintain sets of Samples, as returned, at the Project site for quality comparisons throughout the course of construction.

Unless noncompliance with Contract Document provisions is observed, the Submittal may serve as the final Submittal.

Sample sets may be used to obtain final acceptance of the construction associated with each set.

Distribution of Samples: Prepare and distribute additional sets to Subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the work.

Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the work will be judged.

Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity

ARCHITECT'S ACTION

Except for Submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each Submittal, mark to indicate action taken, and return promptly.

Compliance with specified characteristics is the Contractor's responsibility.

Action Stamp: The Architect will stamp each applicable Submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

Final Unrestricted Release: Where Submittals are marked "CONFORMS AS SUBMITTED", that part of the work covered by the Submittal may proceed, provided it complies with requirements of the Contract Documents. Final payment will depend upon that compliance.

Final-But-Restricted Release: When Submittals are marked "CONFORMS AS NOTED", that part of the work covered by the Submittal may proceed, provided it complies with notations or corrections on the Submittal and requirements of the Contract Documents. Final payment will depend on that compliance.

Returned for Resubmittal: When Submittal is marked "REVISE AND RESUBMIT", do not proceed with that part of the work covered by the Submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new Submittal in accordance with the notations. Resubmit without delay. Repeat, if necessary, to obtain a different action mark.

Do not permit submittals marked "REVISE AND RESUBMIT" to be used at the Project site or elsewhere where work is in progress.

Other Action: Where a Submittal is primarily for information or record purposes, special processing or other activity, the Submittal will be returned marked "ACTION NOT REQUIRED".

PART 2 - PRODUCTS

SUBSTITUTIONS

Source Limitations: To the greatest extent possible for each unit of work, provide products, materials, or equipment of a singular generic kind from a single source.

Compatibility of Options: Where more than one choice is available as options for Contractor's selection of a product or materials, select an option which is compatible with other products and materials already selected (which may have been from among options for those other products and materials). Total compatibility among options, if not assured by limitations within contract documents, must be provided by Contractor. Compatibility is a basic general requirement of product/material selections.

Architect's Approval Required

The Contract is based on the materials, equipment, and methods described in the Contract Documents.

The Contract Drawings and Specifications establish the "minimum standard of quality" each product and/or system must meet to be considered acceptable. Products of other manufacturers will be considered if the product and/or system meets or exceeds the "minimum standard of quality" established by the Contract Documents.

The Architect will consider proposals for substitutions under the "or approved equal" provision of materials, equipment, and methods by Addendum, prior to Bid due date, only when such proposals are accompanied by full and complete technical data and all other information required by the Architect to evaluate the proposed substitutions.

It will be the responsibility of the submitting Contractor to prove equality.

The Submittal shall include a line-by-line, item-by-item description of the specified and proposed product.

Requests for substitutions must be submitted to the Architect NO later than ten (10) days prior to Bid due date.

If the proposed product and/or system is acceptable as an equal, as herein described, an Addendum will be issued noting the specific items accepted.

DO NOT SUBSTITUTE MATERIALS, EQUIPMENT, OR METHODS UNLESS SUCH SUBSTITUTIONS HAVE BEEN SPECIFICALLY APPROVED FOR THIS WORK BY THE ARCHITECT, BY ADDENDUM.

"Or Approved Equal"

Where the phrase "or approved equal" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Architect unless the item has been specifically approved for this work by the Architect.

Color choices will be one of the determining factors for approval.

The decision of the Architect will be final.

Availability of Specified Items

Verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the work.

In the event specified item or items will not be so available, so notify the Architect prior to the receipt of Bids.

Costs of delay caused on non-availability of specified items, when such delays could have been avoided by the Contractor, will be back-charged as necessary and shall not be borne by the Owner.

Whenever the Contractor secures approval for changing any items and such change involves a corresponding change or adjustment in any adjacent or related item, the responsibility for making the required change, or seeing that it is made, rests with the Contractor. The cost of these changes and/or adjustments shall be paid for by the Contractor unless it is otherwise agreed, in writing, at the time the change is approved. The acceptance of any change will not, in any way, relieve the Prime Contractor from full compliance with the Contract Documents.

MANUALS

General: Where Manuals are required to be submitted covering items included in this work, prepare all such Manuals in durable plastic binders approximately 8-1/2 x 11 inches in size with at least the following:

Identification on or readable through the front cover stating the general nature of the Manual.

Neatly typewritten index near the front of the Manual furnishing immediate information as to location of all emergency data regarding the installation.

Complete instructions regarding operating and maintenance of all equipment involved.

Complete nomenclature of all replaceable parts, their part numbers, current cost, and name and address of nearest vendor of parts.

Copy of all guarantees and warranties issued.

Copy of approved Shop Drawing(s) with all data concerning all changes made during construction

MISCELLANEOUS SUBMITTALS

Inspection and Test Reports Not Performed by Owner: Classify each inspection and test report as being either "Shop Drawings" or "product data" depending on whether the report is specially prepared for the project or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.

Warranties (Guarantees)

Categories of Specific Warranties: Warranties on the work are in several categories, including those of General Conditions, and including (but not necessarily limited to) the following specific categories related to individual units of work specified in sections of Divisions 2 through 16 of these Specifications.

Special Project Warranty (Guarantee): A warranty specifically written and signed by Contractor for a defined portion of the work and, where required, countersigned by Subcontractor, installer, manufacturer, or other entity engaged by Contractor.

Specified Product Warranty: A warranty which is required by Contract Documents, to be provided for a manufactured product incorporated into the work, regardless of whether manufacturer has published a similar warranty without regard for specific incorporation of product into the work, or has written and executed a special project warranty as a direct result of Contract Documents requirements.

Coincidental Product Warranty: A warranty which is not specifically required by Contract Documents (other than as specified in this Section), but which is available on a product incorporated into the work by virtue of the fact that manufacturer of product has published warranty in connection with purchases and uses of product without regard for specific applications, except as otherwise limited by terms of warranty.

Refer to individual Sections of Divisions 2 through 16 for the determination of units of work which are required to be specifically or individually warranted, and for the specific requirements and terms of those warranties (or guarantees).

Specific Warranty Forms: Where a special project warranty (guarantee) or specified product warranty is required, prepare a written document to contain terms and appropriate identification, ready for execution by required parties. Submit draft to the Owner (through Architect) for approval prior to final execution.

PART 3 - EXECUTION

COORDINATION OF SUBMITTALS

General: Prior to submittal for Architect's review, use all means necessary to fully coordinate all material, including the following:

Determine and verify all field dimensions and conditions, catalog numbers, and similar data.

Coordinate, as required, with all trades and public agencies involved.

Secure all necessary approvals from public agencies and others. Signify by stamp or other means that all required approvals have been obtained.

Clearly indicate all deviations from the Contract Documents.

The General Contractor shall submit a prioritized tabulation by date of Submittals required during the first 90 days of construction. List those Submittals required to maintain orderly progress of the work, and those required early because of long lead time for manufacture or fabrication.

These dates may be shown on construction schedule at Contractor's option.

TIMING OF SUBMITTALS

General

Make all Submittals enough in advance of scheduled dates for installation to provide all required time for reviews for securing necessary approvals, for possible revision and Resubmittals, and for placing orders and securing delivery.

In scheduling, allow a minimum of **fourteen (14) full working days** for the Architect's initial review following receipt of the Submittals. Allow additional time if the Architect requires coordination with subsequent Submittals.

The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related Submittals are received.

If an Intermediate Submittal is necessary, process the same as the initial Submittal. Allow fourteen (14) working days for reprocessing each Submittal.

No extension of Contract time will be authorized because of failure to transmit Submittals to the Architect sufficiently in advance of the work to permit processing.

END OF SECTION

SECTION 01500

CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

SUMMARY: This Section specifies temporary services and facilities, including utilities, construction and support facilities, security and protection. Provide facilities ready for use. Maintain, expand and modify as needed. Remove when no longer needed, or replaced by permanent facilities.

DESCRIPTION OF WORK: Work of this Section shall include, but not necessarily be limited to, the following:

- Electricity, Lighting
- Heat, Ventilation
- Telephone Service
- Water
- Storm and Sanitary Sewer
- Sanitary Facilities
- Barriers, Barricades, Warning Signs, and Lights
- Enclosures
- Hoisting
- Water Control
- Field Office and Storage Sheds
- Dust Control
- Snow Removal
- Environmental Protection

RELATED SECTIONS

General Conditions

Refer to General Conditions for additional requirements.

Section 01000 - Special Conditions

Section 01010 - Summary of Work

Section 01710 - Cleaning

QUALITY ASSURANCE

Regulations: Each Contractor shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction, including but not limited to:

- Owner's Requirements
- Building Code Requirements
- Health and Safety Regulations
- Utility Company Regulations
- Police, Fire Department, and Rescue Squad Rules
- Environmental Protection Regulations

Standards: Comply with NFPA Code 241, "Standard for Safeguarding Construction, Alterations and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements

for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."

Refer to "Guidelines for Bid Conditions for Temporary Job Utilities and Services", prepared jointly by AGC and ASC for industry recommendations.

Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with the normal application of trade regulations and union jurisdictions.

Electrical Service: Comply with NEMA, NECA, and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

Inspections: Arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

PROJECT CONDITIONS

Temporary Utilities: Prepare a schedule indicating dates of the implementation and termination of each temporary utility. At the earliest feasible time, when acceptable to the Owner, change over from use of the temporary service to use of the permanent service.

Temporary Use of Permanent Facilities: The installer of each permanent service or facility shall assume responsibility for its operation, maintenance and protection during its use as a construction service or facility prior to the Owner's acceptance, regardless of previously assigned responsibilities.

Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities, or permit them to interfere with progress. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on the site.

GENERAL

Any Contractor requiring one of the temporary services before it can be provided as specified, or whose requirements with respect to a particular service differ from the service specified, shall provide such service as suits his needs, at his own expense, and in a manner satisfactory to the Architect and Owner.

USE CHARGES

General: Cost or use charges for temporary facilities are not chargeable to the Owner or the Architect. Contractor's cost or use charges for temporary services or facilities will not be accepted as a basis of claim for an adjustment in the Contract Sum or Contract Time.

Utility Company Charges: Power, sewer and water easements, permanent property assessments, charges required for construction, connection charges, tap fees and the like will be paid for by the Owner.

Water Service: Water is to be extended from the nearest water distribution system to a location to be determined by the General Contractor. The Plumbing Contractor shall provide a water meter to be used during construction and it shall be removed at the completion of the project.

The General Contractor will pay for all metered water used by all Contractors during the entire construction period, in accordance with meter readings.

Sewer Service Use Charges: The General Contractor shall pay sewer service use charges, if required, for sewer usage by all parties engaged in construction at the project site.

Electric Power Service: The General Contractor will pay electric power use charges, whether metered or otherwise, for electricity used by all entities engaged in construction activities at the project site.

Heating Fuel Charges:

Prior to building enclosure: each Contractor shall provide any necessary temporary heating and associated fuel charges.

After building enclosure: HVAC Contractor shall pay for all fuel required for temporary heating and ventilation, other than electric power use.

The term "Enclosure" shall mean when all permanent walls and roofs are in place, insulated and weather tight, windows are covered and all entrances are permanently in place or are provided with suitable temporary enclosure.

Meters required for metering use charges will be furnished and installed by the Contractor responsible for installing distribution equipment.

Other entities using temporary services and facilities include, but are not limited to:

Other Non-prime Contractors

The Owner's Work Forces

Occupants of the Project

The Architect

Testing Agencies

Personnel of Government Agencies.

PART 2 - PRODUCTS

MATERIALS

General: Provide new materials; if acceptable to the Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for the use intended.

Lumber and Plywood: Comply with requirements in Section 06100 -Rough Carpentry.

Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire-retardant tarpaulins.

Water: Provide potable water approved by local health authorities.

EQUIPMENT

Water Hoses: provide 3/4" heavy-duty, abrasion-resistant, flexible rubber hoses 100 ft. long, with pressure rating greater than the maximum pressure of the water distribution system; provide adjustable shut-off nozzles at hose discharge.

Electrical Outlets: Provide properly configured NEMA polarized outlets to prevent insertion of 110-120 volt plugs into higher voltage outlets. Provide receptacle outlets equipped with ground-fault circuit interrupters, reset button and pilot light, for connection of power tools and equipment.

Electrical Power Cords: Provide maximum 100 foot long grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas where construction activities are in progress.

Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. Provide guard cages or tempered glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

Heating Units: Provide temporary heating units that have been tested and labeled by UL, FM, or another recognized trade association related to the type of fuel being consumed.

Sanitary Facilities: Toilet rooms within the new building shall not be used by construction personnel. Provide sanitary facilities that include temporary toilets, wash facilities and drinking water fixtures. Comply with OSHA and other regulations and health codes for the type, number, location, operation, and maintenance of fixtures. Install where facilities will best serve the Project. Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Provide covered waste containers for used materials.

Toilets: The General Contractor shall install self-contained single-occupant toilet units of the chemical, aerated recirculation, or combustion type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. Use of pit-type privies will not be permitted.

Wash Facilities: The Plumbing Contractor shall install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up. Dispose of drainage properly. Supply cleaning compounds.

Drinking Water Facilities: Each Contractor shall provide containerized tap-dispenser bottled-water type drinking water units for their employees and subcontractors.

First Aid Supplies: Comply with governing regulations.

Fire Extinguishers: Provide hand-carried, portable UL-rated, class `A' fire extinguishers for temporary offices and similar spaces. In other locations, provide hand-carried, portable, UL-rated, class `ABC' dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

Comply with NFPA 10 and 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

TEMPORARY FIELD OFFICE

The General Contractor shall provide and maintain clean, temporary weather-tight offices at the site, in location as approved by the Owner, for the use of the General Contractor, his Subcontractors' agents, Owner's Representative, and the Architect, and at which location he or his authorized agent shall be present, or to which either may be readily called at all times. While the work is in progress, copies of permits, approved Shop Drawings, and a complete set of Contract Drawings and Specifications marked up to date with any revisions, shall be kept at said office ready for use at all times.

All expenses in connection with the field office, including the installation cost, and use of heat, light, water, and janitor service shall be borne by the General Contractor.

Field office shall be maintained until Substantial Completion, and then be removed by the respective using contractors no later than 15 days after acceptance of building unless the Architect orders earlier removal by them.

Other Contractors shall provide, maintain, and remove upon completion any necessary temporary field office, shanties, and sheds required to coordinate and control his field operations. Location and construction shall be approved by the General Contractor. If necessary, this location may be off-site. All costs of maintaining, including heat, power, water, telephone/fax, fire protection and clean-up, is the General Contractor's responsibility.

If the job conditions require relocation of any temporary office, shanty or shed, the Contractor shall relocate as directed by the General Contractor or Architect, at no increase in the Contract Amount.

HOISTING

Each Contractor is responsible for hoisting his materials, tools, equipment, etc.

Any temporary openings required by any Contractor for access of material and equipment must be coordinated with the General Contractor. Any costs involved are the Contractor's responsibility.

PART 3 - EXECUTION

INSTALLATION

Use qualified personnel for installation of temporary facilities. Locate facilities where they serve the project adequately and result in minimum interference with performance of the work. Relocate and modify facilities as required.

Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

TEMPORARY UTILITY INSTALLATION

Each Contractor shall provide all temporary and/or permanent requirements necessary to maintain utilities and services for existing facilities and new facilities made necessary by this Construction

Temporary long-term shutdowns required to complete the work require the Contractor to provide temporary requirements necessary to maintain services for new facilities, at no increase in the Contract Amount.

General: Engage the appropriate local utility company to install temporary service or connect to existing service. Where the company provides only part of the service, provide the remainder with matching, compatible materials and equipment; comply with the company's recommendations.

Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services.

Provide adequate capacity at each stage of construction. Prior to temporary utility availability, provide trucked-in services.

Obtain easements to bring temporary utilities to the site, where the Owner's easements cannot be used for that purpose.

Water Service: Install water service connected to nearest system, and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.

Sterilization: Sterilize temporary water piping prior to use.

The Plumbing Contractor shall furnish and install the temporary water service for construction work and be responsible for protecting temporary water lines from freezing and shall remove same upon completion of the project.

The Plumbing Contractor shall remove temporary water service at the completion of the Project.

Temporary Electric Power Service: The Electrical Contractor shall provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload protected disconnects, automatic ground-fault interrupters and main distribution switch gear.

Any Contractor requiring more than included herein above shall provide same including energy consumption cost at no increase in the Contract Amount.

Power Distribution System: Install wiring, overhead, and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 volts, AC 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.

Temporary wiring is to be laid out, balanced, and sized so as to produce a voltage drop of no more than five percent at the extreme end of the line when operating at full load.

Temporary work shall be installed in such a manner as not to interfere with the permanent construction. If such interference does occur, it shall be the responsibility of the Contractor to make such changes as may be required to overcome the interference. The cost of these changes will be included as part of the contract price.

The electrical work for construction purposes shall conform to all Federal and State Specific Safety Requirements, as well as the requirements of the National Electric Code and National Electrical Safety Code. The Electrical Contractor shall obtain and pay for required applications, permits, and inspection pertaining to this work. This cost shall also be included in the Contractor's price.

All temporary facilities are to be maintained and kept in good operating condition. Maintenance personnel necessary to perform this work shall be provided in accordance with the requirements. Maintenance time will include normal working hours for all trades and start up and shut down overtime as required.

Protect installation against weather damage, the normal operations of other trades, Owner's personnel, and visitors to the site.

The Electrical Contractor shall remove temporary power equipment at the completion of the project.

Temporary Lighting: Whenever overhead floor or roof deck has been installed, the Electrical Contractor shall provide temporary lighting including lamps with local switching.

Install and operate temporary lighting that will fulfill security and protection requirements, without operating the entire system, and will provide adequate illumination for construction operations and traffic conditions all as necessary and as required by state and federal safety codes and ordinances.

The Electrical Contractor shall remove temporary lighting equipment at the completion of the Project.

Temporary Telephones: Provide temporary telephone service for all personnel engaged in construction activities, throughout the construction period.

All local calls shall be paid for by the General Contractor.

All long distance and toll calls shall be paid for by the party making the call.

At each telephone, post a list of important telephones numbers.

Sewers and Drainage: If sewers are available, the Plumbing Contractor shall provide temporary connections to remove effluent that can be discharged lawfully. If sewers are not available or cannot be used, provide drainage ditches, dry wells, stabilization ponds and similar facilities. If neither sewers nor drainage facilities can be lawfully used for discharge of effluent, provide containers to remove and dispose of effluent off the site in a lawful manner.

Filter out excessive amounts of soil, construction debris, chemicals, oils and similar contaminants that might clog sewers or pollute waterways before discharge.

Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

Dewatering Facilities and Drains: For temporary drainage and dewatering operations not associated with construction, comply with requirements of applicable Division 2 Sections. Where feasible, utilize the same facilities. Maintain excavations and construction free of water.

The Plumbing Contractor shall remove temporary sewer and drainage work at the completion of the Project.

TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access, in locations approved by General Contractor.

Maintain temporary construction and support facilities until near Substantial Completion. Remove prior to Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

After building enclosure, either permanent or temporary, as approved by the Architect, the Heating Contractor shall provide heat, supplied with air, as follows:

At all times during normal working hours, provide sufficient heat to maintain a temperature of not less than 50 degrees F., and from 40 degrees to 50 degrees F. during periods other than specified herein below.

At all times during the placing, setting, and curing of concrete, provide sufficient heat to ensure heating of the spaces involved to not less than 50 degrees F.

Well before gypsum board work begins and continuous throughout the setting and drying periods, a temperature range between 55 and 70 degrees F. shall be maintained day and night. During this period, no finish woodwork, wood finish flooring, resilient flooring or flexible wall coverings shall be installed or stored in the buildings, and no finish painting or applying of finish wall coatings shall be undertaken.

For a period of ten (10) days previous to the placing of interior wood finish and throughout the placing of this and other interior finishing, varnishing, painting, etc., and until final acceptance of the work or until full occupancy by the Owner, provide sufficient heat to produce a temperature of not less than 70 degrees F.

Heat and air shall be supplied in a manner which shall avoid the rapid drying of material but thoroughly dry to such an extent that no remaining moisture will affect finish material.

Ventilation requirements may be supplemented by the building's permanent heating system if approved, but primary responsibility rests with the Heating Contractor.

The Heating Contractor shall operate the heating and ventilating systems each day, including Saturdays, Sundays, and holidays; operating shall include necessary labor and approved operating personnel in attendance as required by agencies having jurisdiction.

It shall be each Contractor's responsibility to inform the Heating Contractor of the range of temperatures required for temporary heating, during this period, that temperature as recommended by the manufacturer of the materials as mentioned are stored in the building or being installed, and for the length of time recommended, following installation.

The Heating Contractor shall remove all temporary heating, cooling and ventilation equipment at the completion of the Project.

Temporary heating and ventilating equipment, piping, etc., shall be installed in such a manner as not to interfere with work of other trades or the permanent construction. If such interference does occur, it shall be the responsibility of the Heating Contractor to make any changes required to overcome the interference.

Except as hereinafter specified, the permanent heating and ventilating systems may be used for temporary heat. The HVAC Contractor shall provide, operate, and maintain approved adequate heating and ventilating units for the purposes specified before the permanent system is operable and as required to supplement the systems. (The use of salamanders or similar, open-type smoke producing devices, will not be approved.) Only gas (natural or LP) direct-fired forced air heaters or units employing steam-heated coils will be approved for use. (Electrical resistance heaters, electrical boilers, or electric furnaces will not be approved for use.) The units shall be arranged to bring in sufficient outdoor air (min. 1-1/2 air changes per hour) to ventilate the building and to prevent build-up of harmful dusts and fumes and remove excess moisture, especially to prevent damage to built-up roofing. During warm weather, the Heating Contractor shall provide an adequate supply of fresh air (min. 1-1/2 air changes per hour) when necessary to properly ventilate for moisture, dust, and fumes from paints, cements, or adhesives in tightly enclosed areas where natural ventilation will not be sufficient.

All heating and ventilation work for construction purposes shall comply with all local, state and federal requirements and manufacturer's recommendations. Warranties and guarantees for permanent mechanical equipment used for temporary purposes shall not be affected by this use. Maintenance of the equipment shall be the responsibility of the Contractor. Any heating units to be turned over with the building shall be thoroughly checked, cleaned and filters replaced prior to turnover.

When permanent enclosure is achieved and when approved by the Owner, use and maintain the permanent HVAC system for heating and ventilation. Maintenance shall include the following:

- Proper operation and maintenance of the HVAC plant until acceptance of building by Owner.

- Maintenance of temporary filters in all equipment to prevent accumulation of dust and direct coils, housings and ductwork.

- Before Final Inspection: Replacement of all (temporary and existing) filters with new filters, thorough cleaning of coils and other equipment, putting entire system into first class condition, cleaning traps and devices, adjustment and renewal of all materials and equipment not functioning correctly.

Use of permanent heating or cooling equipment for temporary heating or cooling shall not affect guarantee. Guarantee shall take effect at time of building acceptance by Owner.

Provide temporary filters over all return air registers before operating system. These shall remain in place until area is clean and system is ready for final balancing.

Replace filters in all equipment to prevent accumulation of dust and dirt in coils, housings and ductwork.

Should the permanent HVAC system not be operable or capable of furnishing temporary heating and ventilation at the time of permanent enclosure of the building, the HVAC Contractor shall bear the cost of equipment, fuel and power consumed until such time as the permanent HVAC system can furnish the required temporary heating and ventilation.

Before Final Inspection:

- Replace temporary filters with new filters.

- Thoroughly clean coils and other equipment.

- Clean traps and devices, adjust and renew any and all materials and equipment not functioning correctly.

- Vacuum clean the duct system.

- Restore equipment to original condition.

Temporary Paving: The General Contractor shall construct and maintain temporary roads and paving to adequately support the indicated loading and to withstand exposure to traffic during

the construction period. Locate temporary paving for roads, storage areas, and parking, where the same permanent facilities will be located.

Paving: Comply with Division 2 Section "Asphalt Concrete Paving" for construction and maintenance of temporary paving.

Coordinate development of temporary paving with subgrade grading, compaction, installation, and stabilization of sub-base, and installation of base and finish courses of permanent paving.

Install temporary paving to minimize the need to rework the installations and result in permanent roads and paved areas that are without damage or deterioration when occupied by the Owner.

Delay installation of the final course of permanent asphalt concrete paving until immediately before Substantial Completion. Coordinate with weather conditions to avoid unsatisfactory results.

Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.

Temporary Enclosures: Provide temporary enclosure for protection of construction from exposure, foul weather, other construction operations, and similar activities. Where heat is needed and the building enclosure is incomplete, provide enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions.

The General Contractor will provide, maintain and remove upon completion, any required enclosures.

Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.

Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.

Cold Weather Protection:

The General Contractor shall provide any necessary cold weather protection (enclosure, temporary heat, fuel, straw, etc.) to continue with his work so as not to delay the Project. This includes any necessary protection of excavations to prevent freezing.

Cold Weather Protection for Masonry Work: The General Contractor shall provide any necessary cold weather protection (enclosures, temporary heat, fuel, etc.) to continue with his work so as not to delay the Project.

Project Identification and Temporary Signs: The General Contractor shall prepare project identification and other signs of the size indicated; install signs where indicated to inform the public and persons seeking entrance to the project. Support on posts or framing of preservative treated wood or steel. Do not permit installation of unauthorized signs.

Temporary Signs: Prepare signs to provide directional information to construction personnel and visitors.

Temporary Exterior Lighting: The General Contractor shall install exterior yard and sign lights so that signs are visible when work is being performed.

Collection and Disposal of Waste: The General Contractor shall be responsible to collect waste from construction areas and elsewhere daily. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than seven (7) days during normal weather or 3 days when the temperature is expected to rise above 80 degrees F. (27 degrees C.). Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material in a lawful manner.

Stairs: Until permanent stairs are available, the General Contractor shall provide temporary stairs where ladders are not adequate. Cover finished permanent stairs with a protective covering of plywood or similar material so finishes will be undamaged at the time of acceptance.

WATER CONTROL

Each Contractor shall provide, operate, and maintain pumps or other equipment necessary to drain his work and keep excavation pits, trenches, and ditches including the entire sub-grade free of water under any circumstances that may arise.

SNOW REMOVAL

Each Contractor is responsible for snow and ice removal in their own work areas and shall provide same at the direction of the General Contractor as required so as not to delay the Project.

SECURITY AND PROTECTION FACILITIES INSTALLATION: Except for use of permanent fire protection as soon as available, do not change from use of temporary security and protection facilities to permanent facilities until Substantial Completion.

Fire Protection: Until fire protection is supplied by permanent facilities, install and maintain temporary fire protection of types needed to protect against predictable and controllable fire losses.

Refer to Special Conditions for additional requirements.

Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.

Store combustible materials in containers in fire-safe locations.

Provide supervision of welding operations, combustion type temporary heating units, and sources of fire ignition.

Permanent Fire Protection: At the earliest date, complete installation of the permanent fire protection facility, including connected services, and place into operation. Instruct key personnel on use of facilities.

Barricades, Warning Signs, and Lights: Comply with standards and code requirements for erection of barricades. Paint appropriate warning signs to inform personnel and the public of the hazard being protected against. Where needed, provide lighting, including flashing lights.

Refer to Special Conditions for additional requirements.

The General Contractor shall provide barriers around trees and plants designated to remain to protect against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.

Enclosure Fence: When excavation begins, the General Contractor shall install an enclosure fence around the work area.

Covered Walkway: Where required by governing authorities, erect a structurally adequate protection covered walkway for passage of personal along the adjacent public street. Coordinate with entrance gates, other facilities, and obstructions. Comply with regulations of authorities having jurisdiction.

Construct using scaffold or shoring framing, waterproofed wood plank overhead decking, protective plywood enclosure walls, handrails, barricades, warning signs, lights, safe, and well-drained walkways and similar provision for protection and safe passage. Extend the back wall beyond the structure to complete the enclosure fence. Paint and maintain in a manner acceptable to the Architect.

Environmental Protection: Operate temporary facilities and conduct construction by methods that comply with environmental regulations, and minimize the possibility that air, waterways, and subsoil might be contaminated or polluted. Avoid use of tools and equipment which

produce harmful noise. Restrict use of noise making tools and equipment to hours that will minimize complaints.

OPERATION: Enforce strict discipline in use of temporary facilities. Limit availability to intended use to minimize abuse. Maintain facilities in good operating condition until removal.

Protect from damage by freezing temperatures and the elements.

Maintain operation of enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour day basis to achieve indicated results and to avoid damage.

Prevent piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

TERMINATION AND REMOVAL: Remove each facility when the need has ended, or replaced by a permanent facility, or no later than Substantial Completion. Complete or restore construction delayed because of interference with the facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

Temporary facilities are property of the installing Contractor.

Remove paving that is not acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and fill that does not comply with requirements. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials. Repair or replace street paving, curbs, and sidewalks at the temporary entrances.

At Substantial Completion, renovate permanent facilities used during the construction period, including but not limited to:

Replace air filters and clean inside of ductwork and housings.

Replace worn parts and parts subject to unusual operating conditions.

Replace lamps burned out or noticeably dimmed by substantial hours of use.

INSTALLATION

Use qualified personnel for installation of temporary facilities. Locate facilities where they serve the project adequately and result in minimum interference with performance of construction activities. Relocate and modify facilities as required.

Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed, or are replaced by authorized use of completed permanent facilities.

END OF SECTION

SECTION 01580

PROJECT SIGN

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: Work of this Section shall include, but not necessarily be limited to, the following:

The General Contractor shall provide and maintain at the site one 6' x 12' project sign. He shall employ and pay an approved sign painter to letter the sign.

No other signs or advertisements will be allowed to be displayed on the premises.

QUALITY ASSURANCE

Design sign and structure to withstand 50 mph wind velocity.

Sign Painter: Engaged as professional sign painter for not less than three years.

Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

PART 2 - PRODUCTS

SIGN MATERIALS

Structure and Framing: New wood, 4' x 4' treated posts, structurally adequate.

Sign Surfaces: 4' x 8', exterior grade, GPX yellow or green plywood with medium density overlay, minimum 3/4 inch thick.

Rough Hardware: Galvanized, aluminum or brass.

Paint and Primers: Exterior quality, two coats. Colors designated by Architect. Paint to be special mix for sign painting.

Lettering: Exterior quality paint, contrasting colors designated by Architect.

PART 3 - EXECUTION

GENERAL

Design of sign shall be submitted to the General Contractor after award of the Contract.

Install project identification sign within 30 days after date fixed by Owner-Contractor Agreement.

Erect at designated location as directed by Architect.

Erect supports and framing with uprights 36 inches below surface, braced and framed to resist wind loadings.

Install sign surface plumb and level, with butt joints. Anchor securely.

Paint sight-exposed surfaces of sign, supports, and framing.

MAINTENANCE

Maintain signs and supports clean. Repair deterioration and damages.

REMOVAL

Remove signs, framing, supports, and foundations at completion of the Project, when directed by Architect, and restore the area.

END OF SECTION

MICROTEL PROTOTYPE
PROJECT SIGN
01580-1
12/2009

SECTION 01700

PROJECT CLOSEOUT

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK

Definitions: Closeout is hereby defined to include general requirements near end of Contract Time, in preparation for final acceptance, final payment, normal termination of contract, occupancy by Owner, and similar actions evidencing completion of the work. Specific requirements for individual units of work are specified in sections of Divisions 2 through 15. Time of closeout is directly related to "Substantial Completion", and therefore may be either a single time period for entire work or a series of time periods for individual parts of the work which have been certified as substantially complete at different dates. That time variation (if any) shall be applicable to other provisions of this Section.

PREREQUISITES TO SUBSTANTIAL COMPLETION

General: Prior to requesting inspection for certification of substantial completion (for either entire work or portions thereof), complete the following and list known exceptions in request:

Include supporting documentation for completion as indicated in these Contract Documents.

Submit statement showing accounting of changes to Contract Sum.

The General Contractor shall prepare, submit and complete a punch list in accordance with General Conditions.

Submit specific warranties, workmanship/maintenance bonds, maintenance agreements, final certifications, and similar documents.

Obtain and submit releases enabling Owner's full and unrestricted use of the work and access to services and utilities, including (where required) occupancy permits, operating certificates, waivers of lien, and similar releases.

Submit record drawings, maintenance manuals, and similar final record information.

Deliver tools, spare parts, extra stocks of materials, and similar physical items to Owner.

Complete start-up testing of systems, and instructions of Owner's operating/maintenance personnel. Discontinue (or change over) and remove from project site temporary facilities and services, along with construction tools and facilities, mock-ups, and similar elements.

Complete final cleaning up requirements, including touch-up painting of marred surfaces.

Touch-up and otherwise repair and restore marred, exposed finishes.

INSPECTION PROCEDURES: Upon receipt of Contractor's request, the Architect will either proceed with inspection or advise Contractor of prerequisites not fulfilled. Following initial inspection, the Architect will either prepare certificate of substantial completion, or advise Contractor of work which must be performed prior to issuance of certificate; and repeat inspection when requested and assured that work has been substantially completed. Results of completed inspection will form initial "punch-list" for final acceptance.

RECORD DOCUMENT SUBMITTALS

General: Specific requirements for record documents are indicated in individual sections of these Specifications. Other requirements are indicated in General Conditions. General submittal requirements are indicated in "Submittals" sections. Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive

location; provide access to record documents for Architect's reference during normal working hours.

Record Drawings: The General Contractor shall maintain in white-print set (blue-line or black-line) of Contract Drawings and Shop Drawings in clean, undamaged condition, with mark-up of actual installations which vary substantially from the work as originally shown. Mark whichever drawing is most capable of showing "field" condition fully and accurately; however, where Shop Drawings are used for mark-up, record a cross reference at corresponding location on working drawings. Mark with red erasable pencil and, where feasible, use other colors to distinguish between variations in separate categories of work. Mark-up new information which is recognized to be of importance to Owner, but was for some reason not shown on either Contract Drawings or Shop Drawings. Give particular attention to concealed work, which would be difficult to measure and record at a later date. Note related change order numbers where applicable. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates, and other identification on cover of each set.

Record Specifications: The General Contractor shall maintain one copy of specifications, including addenda, change orders, and similar modifications issued in printed form during construction, and mark-up variations (of substance) in actual work in comparison with text of specifications and modifications as issued. Give particular attention to substitutions, selection of option, and similar information on work where it is concealed or cannot otherwise be readily discerned at a later date by direct observation. Note related record drawing information and product data, where applicable. Upon completion of mark-up, submit to Architect for Owner's records.

Maintenance Manuals: Organize maintenance-and-operating manual information into suitable sets of manageable size, and bind into individual binders properly identified and indexed (thumb-tabbed). Include emergency instructions, spare parts listing, copies of warranties, wiring diagrams, recommended "turn-around" cycles, inspection procedures, shop drawings, product data, and similar applicable information. Bind each manual of each set in a heavy-duty two- or three-ring vinyl-covered binder, and include pocket folders for folded sheet information. Mark identification on both front and spine of each binder.

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

FINAL CLEANING

General: Special cleaning for specific units of work is specified in sections of Divisions 2 through 16. General cleaning during progress of work is specified in General Conditions and as temporary services in "Special Conditions" section of this Division. Provide final cleaning of the work, at time indicated, consisting of cleaning each surface or unit of work to normal "clean" condition expected for a first-class building cleaning and maintenance program. Comply with manufacturer's instructions for cleaning operations. Refer to Section 01710 of these Specifications.

Where extra materials of value remain after completion of associated work have become Owner's property, dispose of these to Owner's best advantage as directed.

END OF SECTION

SECTION 01710

CLEANING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: Throughout all phases and items of the construction period, maintain the building and site in a standard of cleanliness as described in this Section.

RELATED WORK

In addition to standards described in this Section, comply with all requirements for cleaning-up as described in various other Sections of these Specifications.

QUALITY ASSURANCE

Inspection: Conduct daily inspection, and more often if necessary, to verify that requirements of cleanliness are being met

Codes and Standards: In addition to the standards described in this Section, comply with all pertinent requirements of Governmental agencies having jurisdiction.

Disposal of volatile fluid wastes (such as mineral spirits, oil, or paint thinner) in storm or sanitary sewer systems or into streams or waterways is not permitted.

PART 2 - PRODUCTS

CLEANING MATERIALS AND EQUIPMENT: Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

COMPATIBILITY: Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material, or as approved by the Architect.

PART 3 - EXECUTION

PROGRESS CLEANING

General

Retain all stored items in an orderly arrangement allowing maximum access, not impeding traffic, and providing the required protection of materials.

Do not allow the accumulation of scrap, debris, waste material, and other items not required for the construction of this work.

Twice weekly, and more often if necessary, the General Contractor shall completely remove all scrap, debris, and waste material from the job site, and shall place into container furnished by the General Contractor.

Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection.

Project Site; The General Contractor shall:

Daily, and more often if necessary, inspect the project site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.

Weekly, and more often if necessary, sweep all interior places clean. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from dust and other material capable of being removed by reasonable diligence using a hand held broom.

As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer

of the succeeding material, using all equipment and materials required to achieve the required cleanliness.

Following the installation of finish floor materials, protect by covering with temporary coverings and/or clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials have been installed. "Clean", for the purpose of this subparagraph, shall be interpreted as meaning free from all foreign material, which in the opinion of the Architect, may be injurious to the finish floor material.

FINAL CLEANING

Definition: Except as otherwise specifically provided, "Clean" (for the purpose of this Article) shall be interpreted as meaning the level of cleanliness generally provided by commercial building maintenance Subcontractors using commercial quality building maintenance equipment and materials.

General: Prior to completion of the work, remove from the job site all tools, temporary structures, surplus materials, equipment, scrap, debris, and waste. Conduct final progress cleaning as described in Article 3.1 above.

Interior: Visually inspect all interior surfaces and remove all traces of soil, waste material, smudges, dust, and other foreign matter. Remove all traces of splashed materials from adjacent surfaces. Remove all paint droppings, spots, stains, and dirt from finished surfaces. Use only the specified cleaning materials and equipment.

Repair, patch, and touch-up marred or damaged surfaces to match adjacent finishes.

Clean the following if located within the project area:

Plumbing Fixtures, Strainers and Floor Drains

Light Fixtures and Lamps

Replace filters of ventilating equipment when units have been operating during construction. In addition, clean grilles and louvers.

Excess lubrication is to be removed from mechanical and electrical equipment.

All Electrical Panels

Clean all transparent materials, including glass and mirrors. Remove glazing compound and other substances that are noticeable from vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

Remove labels that are not permanent labels.

Polished and Resilient Surfaces: To all surfaces requiring the routine application of protective waxes and/or buffed polish, apply the specified coating and/or polish as recommended by the manufacturer of the material being treated, as specified in individual Specification Sections.

Leave concrete floors broom clean. Vacuum carpeted surfaces.

Clean areas traversed by construction personnel.

Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean. Remove stains, spills, and other foreign deposits.

Maintain cleaning until the building, or portion thereof, is accepted by the Owner.

Timing: Schedule final cleaning as approved by the Architect to enable the Owner to accept a completely clean project.

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK

This Section specifies administrative and procedural requirements for Project Record Documents to be prepared and submitted by the General Contractor.

Project Record Documents required include:

- Marked-Up Copies of Contract Drawings
- Marked-Up Copies of Final Conforming Shop Drawings
- Newly Prepared Drawings
- Marked-Up Copies of Specifications, Addenda, and Change Orders
- Marked-Up Final Conforming Product Data Submittals
- Record Samples
- Field Records for Variable and Concealed Conditions
- Record Information on Work that is Recorded only Schematically
- Operating and Maintenance Manuals for Work by General Contractor
- Instruction Manuals Covering the Care, Preservation and Maintenance of Architectural Products and Finishes
- Schedule of Finishes and Colors of Architectural Products
- Warranties and Guarantees for Products Provided by General Contractor

Specific record copy requirements that expand requirements of this Section are included in the individual Sections of Divisions 2 through 16.

General project closeout requirements are included in Section "Project Closeout".

General requirements for submittal of Shop Drawings, Product Data, and Project Record Documents are included in Section "Submittals".

MAJOR SUB-CONTRACTS

The General, Mechanical, Plumbing, Fire Protection, and Electrical Contractors are responsible for obtaining, maintaining, and recording Project Record Document information for its own part of the Work. The Contractor for General Construction is responsible for coordination of Project Record Document information, where information from more than one Contractor is indicated to be integrated to form one combined record of the work.

Where operating and maintenance manuals include information on installations by the Contractor for General Construction and another Contractor, the Contractor for General Construction shall prepare the manuals, including collection, collation and binding of the material and submittal of data as specified.

Where operating and maintenance manuals include information on installations by more than one Contractor, other than the Contractor for General Construction, the Contractor who is the principal source of information, as determined by the Architect, shall receive information furnished by other Contractors, coordinate, collate, and bind the material into unified manuals and submit the manuals, as specified.

Where instruction in operating and maintenance procedures on equipment and systems involves participation of more than one Contractor, the Contractor who is designated by the

Architect as the principal instructor shall coordinate with the other Contractors for a mutually agreeable time to provide instruction to the Owner's operating and maintenance personnel.

SUBMITTALS

Submittal Schedule: Comply with the following schedule for submittal of operating and maintenance manuals:

Before Substantial Completion, when each installation that requires submittal of operating and maintenance manuals is nominally complete, submit two draft copies of each manual to the Owner's representative for review. Include a complete index or table of contents of each manual.

After final inspection, make corrections or modifications to comply with the Architect's comments. Submit the four copies of each approved manual to Owner's representative within fifteen days of receipt of the Architect's comments.

Form of Submittal: Prepare operating and maintenance manuals in the form of an instructional manual for use by the Owner's operating personnel. Organize into suitable sets of manageable size. Where possible, assemble instructions for similar equipment into a single binder.

Drawings: Where Drawings or diagrams are required as part of the manual, provide reinforced punched binder tabs on the Drawings and bind in with the text.

Where oversize Drawings are necessary, fold the Drawings to the same size as the text pages and use as a fold-out.

If Drawings are too large to be used practically as a fold-out, place the Drawing, neatly folded, in the front or rear pocket of the binder. Insert a typewritten page indicating the Drawing title, description of contents and Drawing location at the appropriate location in the manual.

MANUAL CONTENT

In each manual, include information specified in the individual Specification Section and the following information for each major component of building equipment and its controls:

General System or Equipment Description

Copies of Applicable Shop Drawings and Product Data

Operating Instructions

Emergency Instructions

Wiring Diagrams

Inspection and Test Procedures

Maintenance Procedures and Schedules

Precautions Against Improper Use and Maintenance

Copies of Warranties

Repair Instructions Including Spare Parts Listing

Sources of Required Maintenance Materials and Related Services

Manual Index

Warranties, Bonds, and Service Contracts: Provide a copy of each warranty, bond, or service contract in the appropriate manual for the information of the Owner's operating personnel. Provide written data outlining procedures to be followed in the event of product failure. List circumstances and conditions that would affect validity of the warranty or bond.

Architectural Products: Provide manufacturer's data and instructions on care and maintenance of architectural products, including applied materials and finishes.

Manufacturer's Data: Provide complete information on architectural products, including the following, as applicable:

Manufacturer's Catalog Number

Size

Material Composition

Color

Texture

Re-ordering Information for Specially Manufactured Products

Care and Maintenance Instructions: Provide information on care and maintenance, including manufacturer's recommendations for types of cleaning agents to be used and methods of cleaning. Provide information regarding cleaning agents and methods that could prove detrimental to the product. Include manufacturer's recommended schedule for cleaning and maintenance.

Color Schedules: Provide information showing manufacturer's color name and catalog number for all exposed finishes, including paint, carpet, wall coverings, and other finish materials.

MAINTENANCE OF DOCUMENTS AND SAMPLES: Store Record Documents and Samples in the field office apart from Contract Documents used for construction. Do not permit Project Record Documents to be used for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition. Make Documents and Samples available at all times for inspection by the Owner's representative.

RECORD DRAWINGS

General: Refer to Section 01700 for requirements.

Responsibility for Markup: Where feasible, the individual or entity who obtained record data, whether the individual or entity is the installer, Subcontractor, or similar entity, is required to prepare the mark-up on Record Drawings.

At time of Substantial Completion, submit Record Drawings to the Owner's representative for Owner's records. Organize into sets, bind and label sets for Owner's continued use.

RECORD SPECIFICATIONS

General: Refer to Section 01700 for requirements.

Each Contractor is responsible for marking-up Sections that contain its own Work.

The Contractor for General Construction is responsible for collecting marked-up record Sections from each of the other Contractors, and for collating these Sections in proper numeric order with its own Sections to form a complete set of record Specifications.

The Contractor for General Construction is responsible for submitting the complete set of record Specifications as specified.

RECORD PRODUCT DATA

During the construction period, maintain one copy of each Product Data submittal for Project Record Document purposes.

Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submitted. Include significant changes in the product delivered to the site and changes in manufacturer's instructions and recommendations for installation.

Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.

Note related Change Orders and mark-up of Record Drawings, where applicable.

Upon completion of mark-up, submit a complete set of record Product Data to the Owner's representative for the Owner's records.

Where record Product Data is required as part of maintenance manuals, submit marked-up Product Data as an insert in the manual instead of submittal as record Product Data.

Each Contractor is responsible for mark-up and submittal of record Product Data for its own Work.

RECORD SAMPLE SUBMITTAL

Immediately prior to date of Substantial Completion, the Contractor shall meet with the Architect and the Owner's personnel at the site to determine which of the Samples maintained during the construction period shall be transmitted to the Owner for record purposes. Comply with the Owner's representative's instructions for packaging, identification marking, and delivery to Owner's Sample storage space. Dispose of other Samples in manner specified for disposal of surplus and waste materials.

MISCELLANEOUS RECORD SUBMITTALS

Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Immediately prior to Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for use and reference. Submit to the Owner's representative for the Owner's records.

Categories of requirements resulting in miscellaneous records include, but are not limited to, the following:

- Field Records on Excavations and Foundations
- Field Records on Underground Construction and Similar Work
- Survey Showing Locations and Elevations of Underground Lines
- Invert Elevations of Drainage Piping
- Surveys Establishing Building Lines and Levels
- Authorized Measurements Utilizing Unit Prices or Allowances
- Batch Mixing and Bulk Delivery Records
- Load and Performance Testing
- Inspections and Certifications by Governing Authorities
- Leakage and Water-Penetration Tests
- Fire Resistance and Flame Spread Test Results
- Final Inspection and Correction Procedures

PART 2 - PRODUCTS

Not Used

PART 3 - EXECUTION

RECORDING

Post changes and modifications to the Documents as they occur. Do not wait until the end of the Project. The Owner's representative will periodically review record Documents to assure compliance with this requirement.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Extent of cast-in-place concrete is shown on drawings. This Section includes the following miscellaneous materials associated with cast-in-place concrete:

- Water stops
- Pre-molded joint filler
- Under-slab moisture barrier

SUBMITTALS

Shop Drawings:

Shop Drawings/Reinforcement: See ACI 301, Section 5.1 Detailing shall conform to ACI 315-80 "Details of concrete reinforcement".

Shop drawing submittals for reinforcing shall consist of a direct reading transparency plus 3 prints of each drawing.

"Standard Specifications for Structural Concrete for Buildings, ACI-301-Chapter 4, Formwork"

"Recommended Practice for Concrete Formwork, ACI-347 Chapter 1, Design"

Mix Design: See paragraph 2.7 herein for submittal requirements.

Product Data: Submit data for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, water stops, joint systems, curing compounds, dry-shake finish materials, and as requested by Architect.

Laboratory Test Reports: Submit laboratory test reports for concrete materials and mix design.

Materials Certificates: Provide materials certificates in lieu of materials laboratory test reports when permitted by Owner's Representative. Materials certificates shall be signed by manufacturer and Contractor, certifying that each material item complies with, or exceeds, specified requirements. Provide certification that total chloride content of concrete complies with specification requirements. Maximum water-soluble chloride ion in concrete, percent by mass of cement shall be 0.10.

QUALITY ASSURANCE

Codes and Standards: Comply with provisions of following codes, specifications, and standards, except where more stringent requirements are shown or specified:

Reference Specification: To be complete, this Specification Section requires the use of ACI 301 "Specifications for Structural Concrete for Buildings". This specification Section is intended to supplement and modify ACI 301, and will take precedence where conflict exists. Requirements of ACI 301 shall govern the work, except as noted herein.

Field References: Attention is called to requirement (see ACI 301, Section 1.6) for keeping a copy of ACI SP-15 Field Reference manual, in the Concrete Installer's field office at all times. Supervisory personnel shall be familiar with ACI 301 and other standards contained in SP015, as well as with the project specification.

ACI 305 (82) "Hot Weather Concreting"

ACI 306 "Cold Weather Concreting"

All Admixtures shall be produced by a single manufacturer, unless otherwise approved by Architect.

Materials and installed work may require testing and retesting at anytime during progress of work. Tests, including retesting of rejected materials for installed work, shall be done at Contractor's expense.

Source Quality Control: Materials are subject to inspection and tests in field, conducted by a qualified inspection agency. Such inspections and tests will not relieve contractor of responsibility for providing materials in compliance with specification requirements. Promptly remove and replace materials or components which do not comply.

Concrete Testing Service: The Owner shall engage a testing laboratory to perform material evaluation tests and to design concrete mixes.

The reinforcing steel supplier shall certify that all reinforcing steel has been manufacturer in the United States and meets the designated ASTM specifications.

Testing: As per ACI 301, Chapter 16, except as noted.

Required testing services of Sections 16.3 and 16.4 will be performed by an independent testing laboratory employed by the Owner. Testing services required in Section 16.5 shall be performed by same laboratory but at Contractor's expense.

All samples shall be taken after any addition of water at the job site is complete. When pumping or pneumatic equipment is used, samples shall be taken at discharge end. This is for both cylinders and slump tests.

Mold and cure three specimens (cylinders) in accordance with ASTM C31. Three specimens constitute a strength test. Test on cylinder at 7 days and 2 at 28 days. Acceptance of structure will be based on results of 28 day tests.

Air Content:

Determine air content of concrete for each strength test by either the pressure method (ASTM C231) or the volumetric method (ASTM C173). The "chase" air indicator shall not be used.

A minimum of one air content test shall be made in the morning and one in the afternoon. Air content tests shall be made on all concrete whether the concrete is designate as air-entrained or not.

Additional air content tests, for concrete specified as air-entrained, shall be made when any of the following conditions occur:

A change in appearance or consistency of concrete.

Possible reduction of air content due to time delays of truck and/or hot weather.

When air temperature is over 80 degrees F, check each truck load.

Inform Engineer immediately of any slump and/or air content tests that do not meet these specifications. If strength, durability or aesthetics of the structure would be impaired, that concrete shall not be used.

Concrete test reports shall contain the following information: Concrete supplier, quantity of concrete represented, location of samples taken, design strength requirement at 28 days, list of all materials and admixtures used with quantity and brand or source, actual slump, actual air content, air temperature, concrete temperature, weather, cylinder weight as received, date molded, number of days on job site, date tested, test results for 7 and 28 days, and any other information necessary to evaluate test results.

Send one copy of reports on all required laboratory testing directly to the Owner's Representative, one copy to the Contractor and one copy to the concrete supplier. A copy of all test reports shall be in Owner's Representative's office within a minimum of five (5) working days from date of test or inspection.

Verbal information on any concrete not meeting these specifications shall be communicated to the Owner's Representative immediately by phone.

Contractor's responsibility: Provide a box for storing concrete test specimens while on job; maintain temperature in the box between 60 and 80 degrees F; prevent loss of moisture from specimens in accordance with ASTM C31.

Evaluation and acceptance of Concrete: Chapter 17 and as follows: Any test results on in-place concrete conducted without prior knowledge and input of the Owner's Representative, will not be accepted. Owner's Representative reserves the right to reject any nondestructive test results that he considers improperly calibrated or correlated.

Acceptance of Structure: Chapter 18 and as follows: If 28 day test results do not meet requirements of Section 17.2, the Engineer shall have the right to order a change in mix proportions for remaining portions of structure. He may require core test in accordance with Section 17.3.2 to be made at Contractor's expense. Any such testing shall be done by an independent testing agency acceptable to the Owner's Representative.

Testing agencies affidavit that construction is in conformance with the Drawings and specifications.

Contractor shall be responsible for construction loads and necessary supplemental support of members during construction with regard to project safety and construction damage.

Concrete floor sample panel in accordance with item 3.14.3 of ACI-89 shall be placed and maintained as a standard of quality during construction of this project.

PROJECT CONDITIONS

Protection of Footings against Freezing: Cover completed work at footing level with sufficient temporary or permanent cover as required to protect footings and adjacent sub grade against possibility of freezing; maintain cover for time period as necessary.

Protect adjacent finish materials against spatter during concrete placement.

DELIVERY, STORAGE AND HANDLING

See ACI 301, Section 2.5.

Store reinforcement off the ground to avoid soiling by foreign materials.

PART 2 - PRODUCTS

MATERIALS, GENERAL

Where applicable, reference is made herein to material requirements given in ACI 301.

Use manufactured materials in accordance with manufacturer's recommendations. If such recommendations differ from requirements specified herein, call to Engineer's attention before proceeding. Generally, the more stringent requirements will apply.

FORM MATERIALS

General: As per ACI 301, Sections 4.2 and 10.2, except as noted.

Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surfaces with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sized to minimize number of joints and to conform to joint system shown on Drawings. Provide form material with sufficient thickness to withstand pressure of newly placed concrete without bow or deflection.

Plywood shall comply with U.S. Product Standard PS-1 "B-B (Concrete Form) Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

Carton Forms: Waffle configuration, Jefferson-Smurfit Corporation of America or equal, double wall, laminated using water-resistant adhesive and coated with paraffin containing 10% polyethylene, sizes as indicated. Materials in sheets of 2 to 3 feet wide and 8 feet long of thickness shown on Drawings with protection board. Distributor: Redipackaging at (214) 330-9286.

Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection and to prevent spalling concrete upon removal. Provide units which will leave no metal closer than 1-1/2" to surface.

Provide ties which, when removed, will leave holes not larger than 1" diameter in concrete surface.

REINFORCING MATERIALS

Reinforcement: As per ACI 301, Section 5.2, with Selections and Supplements as follows:

Reinforcing Bars: ASTM A 615-87, Grade 60, deformed.

Steel Wire: ASTM A 82-85, plain, cold-drawn steel.

Welded Wire Fabric: ASTM A 185-85, for plain wire, welded steel wire fabric.

Supports for Reinforcement: Provide bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI specifications.

For slabs-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CRSI, Class 2).

Slab Bolsters: For support of all reinforcement over carton forms.

CONCRETE MATERIALS

General:

Cements, admixtures, water and aggregates shall conform to ACI 301, Chapter 2, with selections and supplements as specified herein.

Cements: All cements used shall be Portland Cements conforming to ASTM C150, Type I or III, unless otherwise acceptable to Architect. Types 1A and 1P and fly ash are not acceptable. Use one brand of cement throughout project.

Normal Weight Aggregates: ASTM C 33-86, and as specified. Provide aggregates from a single source for exposed concrete.

For exterior exposed surfaces, do not use fine or coarse aggregates containing spalling-causing deleterious substances.

Local aggregates not complying with ASTM C33 but which have shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.

Water: Drinkable.

Air-Entraining Admixture: ASTM C 260-86, certified by manufacturer to be compatible with other required admixtures. Allowable admixture shall be a Vinsol Resin.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Air-Mix"; Euclid Chemical Co.

"MB-AE 90"; Master Builders.

Approved Equal

Water-Reducing Admixture: ASTM C 494-86, Type A, and containing not more than 0.1 percent chloride ions.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Pozzolith Normal"; Master Builders

"Polyheed"; Master Builders

"Plastocrete 160"; Sika Chemical Corp

"Chemtard"; Chem-Masters Corp

Approved Equal

High-range, water-reducing admixture (super plasticizer) conforming to ASTM C494, Type F or G. Free of chlorides and alkalines, batch plant added, providing a minimum of 20 percent water reduction. Slump shall not exceed 9 inches.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Rheobuild"; Master Builders

"Sikament 300", Sika Corporation

Approved Equal

Freeze Protection Admixture: At the contractor's option, a water-reducing, non-chloride accelerating admixture conforming to ASTM C-494, Type E containing not more than 0.1% chloride ions, specially formulated to provide concrete protection from freezing to as low as 20 degrees F., may be used.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Pozzutec 20"; Master Builders

"Accelguard 80", Euclid Chemicals Company

Approved Equal

Prohibited Admixtures: Calcium chloride thycyanates or admixtures containing more than 0.1 percent chloride ions by weight of cement are not permitted.

RELATED MATERIALS

Granular Base: Evenly graded mixture of fine and coarse aggregates to provide, when compacted, a smooth and even surface below slabs on grade.

Non-Shrink Grout: CRD-C 621, Factory Pre-Mixed Grout

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Set Grout"; Master Builders.

"Euco-NS"; Euclid Chemical Co.

"Sika Grout 212", Sika Corporation

"Sono Grout 14K", Sonneborn

Vapor Retarder: Provide vapor retarder cover over prepared base material where indicated below slabs on grade. Use only materials which are resistant to decay when tested in accordance with ASTM E 154, as follows:

Polyethylene sheet not less than 10 mils thick.

Curing Materials:

General: As per ACI 301, Sections 12.1 and 12.2, with selections and supplements as specified herein.

Moisture Retaining Cover: One of the following, complying with ASTM C-171.

Waterproof Paper

4 mil (.004") Polyethylene Film

White Polyethylene-Coated Burlap

Liquid Membrane-Forming Curing Compound: Liquid type, membrane-forming curing compound complying with ASTM C 309, Type I Class A. Moisture loss not more than 0.055 gr./sq. c.m. when applied at 200 sq. ft./gal.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following.

Exposed Flooring: Two (2) coats of one of the following liquid membrane-forming curing compounds:

"Kure-N-Seal", Sonneborn

"Spray Cure and Seal 15", Spray-Cure.

"Eucocure", Euclid Chemicals.

Concrete to be covered with coating material, such as floor hardener, flooring (carpet, tile), painting, or other finish materials. Contractor to verify compatibility with adhesive manufacturer.

"Kure-N-Seal", Sonneborn-Rexnord.

"Spray Cure and Seal 15", Spray-Cure.

"Eucocure", Euclid Chemicals.

Bonding Compound: Polyvinyl acetate (interior only) or acrylic base.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

Sonocrete; Sonneborn-Contech

"Euco Weld", Euclid Chemicals

"Weld-Crete", Larsen Products Corporation

"Polyweld", Chem-Masters Corporation

"Daraweld"; W.R. Grace

"Everbond"; L & M Construction Chemicals

Epoxy Adhesive: ASTM C 881, two component material suitable for use on dry or damp surfaces. Provide material "Type", "Grade", and "Class" to suit project requirements.

Available Products: Subject to compliance with requirements, products which may be incorporated in the work include, but are not limited to, the following:

"Sikadur 32-Hi-Mod", Sika Chemical Corporation

"Concresive LPL", Master Builders

Euco Epoxy System #452 or #620", Euclid Chemical Company

Water-stops: Provide flat, dumbbell type or center-bulb type water-stops at construction joints and other joints as indicated, sized to suit joints, either rubber, Corps of Engineers (CE) CRD-C 513, or polyvinyl chloride (PVC), CE CDR-C, 572.

Sealing Materials: For laps in sheet covering, provide pressure sensitive tape, nonstaining mastic, or other effective adhesive recommended by covering manufacturer.

Finishing Aid: Sprayable material designed to form a monomolecular film on fresh plastic concrete, and to retard moisture evaporation prior to finishing; such as Confilm of Master Builders Company.

PROPORTIONING AND DESIGN OF MIXES

General: As per ACI 301, Chapter 3, except as noted.

Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. If trial batch method used, use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs. The testing facility shall not be the same as used for field quality control testing.

Submit written reports to Owner's Representative 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 and acceptable to the Owner's Representative. No concrete shall be placed until the mixes have been approved in writing by the Owner's Representative.

All concrete shall be normal weight concrete, 145 pcf, except where otherwise specified and all concrete shall have a minimum slump of 4" plus or minus 1" unless noted otherwise.

Maximum permissible water cement ratio by weight including free surface moisture on aggregate and liquid admixtures shall be as follows:

Non Air-Entrained Concrete

3000 PSI - 0.60

4000 PSI - 0.55

Air-Entrained Concrete

3000 PSI - 0.50

4000 PSI - 0.45

Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

Concrete Quality: Delete Section 3.14 ACI 301 and accompanying tables from this specification. See notes on Structural Drawings for compressive strength, cement content, and other quality requirements for various areas.

Use of Admixtures:

All concrete shall contain the specified water-reducing admixture. Concrete slabs placed at temperatures below 50 degrees F. shall contain an accelerator. When increase workability or pumpability, lower water-cement ratio and higher ultimate and/or initial strength are required, superplasticizer may be used.

When more than one admixture is used in a concrete mix, they shall be of the same manufacturer.

Use air-entraining admixture in all exterior exposed concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having total air content of 6% with a tolerance of plus-or-minus 1 percent.

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

Minimum Cement Factor: Provide concrete for following conditions with minimum cement factor as follows:

Subjected to freezing and thawing; 564 pounds per cubic yard.

Concrete containing superplasticizer shall have a maximum slump of 8" after the addition of superplasticizer at the truck, unless otherwise directed by the Owner's Representative. This concrete shall arrive at the job site having slump between 2" and 3", to be verified, and then the superplasticizer added to reach approved slump level.

Selection of Proportions

Proportions for all classes of concrete shall be selected by one of the methods described in Sections 3.9 and 3.10 of ACI 301. Mixes must be approved by the Owner's Representative before use on the job. No deviations from the approved mixes will be permitted without the Owner's Representative prior approval.

Mix designs proportioned on the basis of previous field experience or trial mixtures (Section 3.9) shall be prepared by an independent testing laboratory within the past 12 months.

For computation of standard deviation referred to in Section 3.9.1.1 of ACI 301, show data in tabular form.

CONCRETE PRODUCTION

General: As per ACI 301, Chapter 7, except as noted.

Ready-Mixed Concrete: Use for all work, except that when small quantities (not over 1/2 cu yd) are needed for isolated or relatively unimportant items, concrete may be batch mixed at site, subject to Owner's Representative prior approval.

Delivery Ticket: In addition to information required on the delivery ticket in ASTM C 94, the following data regarding water, expressed in gal./cu. yd., shall be shown on the delivery ticket or on an attached batch ticket for each truckload of concrete:

Mix design water requirement

Free water in aggregate

Water added at plant

Permissible water to add at job site.

Mixing Time: Concrete which has attained its initial set or as contained water for longer than listed below, shall not be deposited in the work.

<u>Concrete Temperature at Time of Placement, Degrees</u>	<u>Maximum Time Before Placement, Hour</u>
Under 80	1-1/2
80 to 85	1-1/4
86 to 90	1
Over 90	1, with Architect's approval dependent on slump and use

FABRICATING REINFORCEMENT

General: As per ACI 301, Sections 5.3 and 5.4, except as follows:

No welding of reinforcing bars will be permitted without approval of the Architect.

PART 3 - EXECUTION

GENERAL

General: As per ACI 301, Chapter 4, except as noted.

Coordinate the installation of joint materials and vapor barriers with placement of forms and reinforcing steel.

FORMS

Design, erect, support, brace, and maintain formwork to support vertical and lateral, static, and dynamic loads that might be applied until such loads can be supported by concrete structure. Construct formwork so concrete members and structures are of correct size, shape, alignment, elevation, and position. Maintain formwork construction complying with ACI 117.

Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.

Construct forms to sizes, shapes, lines, and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking,

screeds, bulkheads, anchorages and inserts, and other features required in work. Use selected materials to obtain required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

Carton Forms:

Forms to be assembled and placed in accordance with manufacturer's directions.

Sequence of construction over cardboard carton forms is of utmost importance. The carton form base of sand must be level and compacted to provide a stable base for the forms.

Forms must not be placed if rain is expected within the next several days. The reinforcing mat should follow so that a given section of slab can be formed, reinforcing laid and slab poured in the shortest time possible.

It is critical that these forms are protected from moisture. A dewatering under slab trench system should be installed to allow any surface water a route out from under the slab and cardboard forms, in the event the pour/project is subject to a rain storm. If Forms are water soaked after installation, they must be allowed adequate time to dry before concrete is placed over them.

If water has destroyed the structural integrity of the forms and they are unable to withstand the concrete slab load, the forms **must be removed and replaced**.

All forms are to be supported with temporary shoring so as to resist any lateral movement which may result in the forms being crushed when the concrete is placed.

An accurate record of the required concrete quantity must be maintained to assure that no concrete has crushed the forms and has filled the resulting cavity.

The top protective board shall be installed perpendicular to the form sheets and nailed down as per the manufacturer's written instructions.

It will be the concrete subcontractor's responsibility to inspect the forms prior to concrete placement and to assure all voids, cracks, seams, pipe and electrical penetrations have been adequately sealed so that no concrete can flow into the void below.

Reinforcing steel to be supported from forms should be carried on slab bolsters with runners to prevent puncture of forms and consequent displacement of steel.

Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.

Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

Chamfer exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses, and chases from trades providing such items. Accurately place and securely support items built into forms.

Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed. Retightening forms and bracing after concrete placement is required to eliminate mortar leaks and maintain proper alignment.

VAPOR BARRIER INSTALLATION

Following leveling and tamping of granular base for slabs on grade, place vapor barrier sheeting with longest dimension parallel with direction of pour.

Lap joints 6" and seal with appropriate tape.

After placement of moisture barrier, cover with granular material and compact to depth as shown on drawings.

PLACING REINFORCEMENT

General: As per ACI 301, Sections 5.4 and 5.5, except as noted:

Comply with Concrete Reinforcing Steel Institute's recommended practice for "placing reinforcing bars", for details and methods of reinforcement placement and supports, and as herein specified.

Avoiding cutting or puncturing vapor barrier during reinforcement placement and concreting operations.

Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

Place reinforcement to obtain at least minimum coverages for concrete protection. Arrange space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire tie so ends are directed into concrete, not toward exposed concrete surfaces.

Install welded wire fabric in sheets. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either directions.

JOINTS

General: As per ACI 301, Chapter 6, with joint locations as noted:

Construction Joints: Locate and install construction joints as indicated or, if not indicated, locate so as not to impair strength and appearance of the structure, as acceptable to Architect.

Provide keyways at least 1-1/2" deep in construction joints in walls, slabs, and between walls and footings: accepted bulkheads designed for this purpose may be used for slabs.

Place contraction joints perpendicular to main reinforcement. Continue reinforcement across construction joints, except as otherwise indicated.

Construction joints shall be spaced at a maximum of 125 feet at all footings.

Isolation Joints in slabs-on-ground: Construct isolation joints in slabs-on-ground at points of contact between slabs-on-ground and vertical surfaces, such as column pedestals, foundation walls, grade beams, and elsewhere as indicated.

Joint filler and sealant materials are specified in Division 7 Sections of these Specifications.

Contraction (Control) Joints in Slabs-on-Ground: Construct contraction joints in slabs-on-ground to form panels of patterns as shown. Use saw cuts 1/8" x 1/3 slab depth or inserts 1/4" wide x 1/3 of slab depth, unless otherwise indicated.

Form contraction joints by inserting premolded plastic, hardboard or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface of strip is flush with slab surface. Tool slab edges round on each side of insert. After concrete has cured, remove inserts and clean groove of loose debris.

Contraction Joints in unexposed floor slabs may be formed by saw cuts as soon as possible after slab finishing as may be safely done without dislodging aggregate.

If joint pattern is not shown, provide joints not exceeding 15' in either direction and located to conform to bay spacing wherever possible (at column centerlines, half bays, third-bays).

Joint sealant material is specified in Division 7 Sections of these Specifications.

INSTALLATION OF EMBEDDED ITEMS

General: It is this Contractor's responsibility to coordinate with all trades for the setting of the sleeves, anchors, dovetail slots, inserts, frames, flashing reglets, and other embedded items and provide all openings required for the installation of other work in accordance with the Contractor's shop drawings and certified prints.

Structural Integrity: Provide no sleeves or openings in structural concrete unless shown on the structural drawings or approved by the Architect.

Edge Form and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface. Provide and secure units sufficiently strong to support types of screed strips by use of strike-off templates or accepted compacting type screeds.

PREPARATION OF FORM SURFACES

Clean reused forms of concrete matrix residue, repair and patch as required to return forms to acceptable surface condition.

Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

Thin form-coating compounds only with thinning agent of type, amount, and under conditions of form-coating compound manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come into contact with in-place concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

CONCRETE PLACEMENT

General: As per ACI 301, Chapter 8, except as noted.

Preplacement Inspection: Before placing concrete, inspect and complete formwork installation, reinforcing steel, and items to be embedded or cast-in. Notify other crafts to permit installation of their work; cooperate with other trades in setting such work. Moisten wood forms immediately before placing concrete where form coatings are not used.

Apply temporary protective covering to lower two feet of finished walls adjacent to poured floor slabs and similar conditions, and guard against spattering during placement.

Placing: No concrete shall be placed except when Architect or independent testing laboratory representative is present, unless this requirement is specifically waived by the Architect. Give adequate notice to the Architect, the testing laboratory, and all contractors affected before placing concrete. Allow adequate time for installation of all necessary parts.

General: Comply with ACI 304 R-85 "Guide for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.

Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.

Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI 309(R-87).

Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine. Place vibrators to rapidly penetrate placed layer and at least 6" into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix.

Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

Consolidate concrete during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

Bring slab surfaces to correct level with straightedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations.

Maintain reinforcing in proper position during concrete placement operations.

Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 R-88 (new specification) and as specified.

When air temperature has fallen to or is expected to fall below 40 deg F (4 deg. C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg. F (10 deg. C), and not more than 80 deg F (27 deg C) at point of placement.

Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

Do not use calcium chloride, salt, and other materials containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix designs.

Water-reducing, non-chloride accelerator admixture may be allowable only with prior approval by Architect.

Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 R-72 (88) and as herein specified.

Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 degrees Fahrenheit. Mixing water may be chilled, or chopped ice may be used to control temperature provided water.

Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that steel temperature will not exceed the ambient air temperature immediately before embedment in concrete. Fog spray forms, reinforcing steel and subgrade just before concrete is placed.

REPAIR OF SURFACE DEFECTS

General: As per ACI 301, Chapter 9, except that concealed concrete surfaces not exposed to view upon completion, may be patched with nonshrink mortar in lieu of ACI specified mortar.

FINISH OF FORMED SURFACES

General: As per ACI 301, Chapter 10, with sections as follows:

Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4" in height rubbed down or chipped off.

Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, painting, or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces, strike-off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

MONOLITHIC SLAB FINISHES

General: Finish concrete floor surfaces in accordance with ACI 301.

Examination:

Verify that all floor surfaces are ready to receive Work.

Starting Work constitutes acceptance of the existing conditions and this Contractor shall then, at their expense, be responsible for correcting all unsatisfactory and defective Work encountered.

Initial Working:

Remove surface irregularities with bull float before water appears on concrete surface.

Do no further working of the surface until time for floating; do not work surface while water is present.

"Dry Sprinkle" method finishing is not acceptable and will be cause for rejection.

Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds for tile, portland cement terrazzo, and other bonded applied cementitious finish flooring material, and as otherwise indicated.

After placing slabs, plane surface to tolerances for floor flatness (FF) of 15 and floor levelness (FL) of 13. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms, or rakes.

Float Finish: Apply float finish to monolithic slab surface to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, membrane or elastic roofing, or sand-bed terrazzo, and as otherwise indicated.

After screeding, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Walking on surface shall not leave heel prints more than 1/4 inch deep. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to tolerances of FF 18 - FL 15. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture.

Trowel Finish: Apply trowel finish to monolithic slab surfaces to be exposed-to-view, and slab surfaces to be covered with resilient flooring, carpet, ceramic or quarry tile, paint, or other thin film finish coating, system.

After floating, begin first trowel finish operation using a power-driven trowel. Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with surface leveled to tolerances of FF 20 - FL 17. Grind smooth surface defects which would telegraph through applied floor covering system.

Trowel and Fine Broom Finish: Where ceramic or quarry tile is to be installed with thin-set mortar, apply trowel finish as specified, then immediately follow with slightly scarifying surface by fine brooming.

Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.

Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Owner's Representative before application.

CONCRETE CURING AND PROTECTION

General: As per ACI 301, Chapter 12, except as noted. Requirements for curing and protection specified in ACI 301 shall be strictly observed, with particular emphasis on the following:

Initial curing may be accomplished by any of the methods given in ACI 301, Section 12.2, except as noted, using materials specified herein.

Maintain initial curing for approximately 12 hours after finishing. Increase this period to 24 hours when air temperature is 75 degrees F and above.

Total curing period shall consist of 7 cumulative days, (3 days for high-early strength concrete) not necessarily consecutive, during which air in contact with concrete is above 50 degrees F.

For formed surfaces, keep wood forms in contact with concrete wet, as well as steel forms heated by the sun. After form removal, maintain curing for any time remaining of required curing period.

General: Protect freshly place concrete from premature drying and excessive cold or hot temperatures.

Warm, Dry or Windy Weather: Use finishing aid specified herein to reduce moisture evaporation from freshly placed concrete when it is exposed to rapid dry conditions: direct sunlight, low humidity, heated interior, high wind, etc. Prepare dilute solution and spray apply on rate of 10 to 20 gallons solution/5000 sq. ft. if drying conditions are particularly severe, make additional applications as required following various finishing steps.

Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

Curing Methods: Perform curing of concrete by curing and sealing compound, by moist curing, by moisture-retaining cover curing, or by combinations thereof, as specified.

Provide curing and sealing compound to interior slabs and to exterior slabs, walks, and curbs, as follows:

Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

Reflective Materials: During hot sunny weather (generally 75 degrees F. and above) use of white or light colored curing materials is recommended to help keep down concrete surface temperature. White or gray pigmented curing compound shall not be used when determined by the Architect to be objectionable.

Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid chemical floor hardener, waterproofing, dampproofing, membrane roofing, flooring (such as ceramic or quarry tile, glue-down carpet), painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

Membrane curing compounds may be used where flooring (i.e., carpet, tile) is scheduled upon verifying compatibility with adhesive manufacturer.

Where membrane curing and sealing compound is not permitted, Contractor shall provide moisture curing by the following method:

Cover concrete surfaces with moisture-retaining cover for curing concrete placed in widest practicable width with sides and ends lapped at least three inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs, and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

Curing Unformed Surface: Cure unformed surfaces, such as slabs, floor topping, and other flat surfaces by application of appropriate curing method.

Final cure concrete surfaces to receive finish flooring by use of moisture retaining cover, unless specified otherwise.

Sealer and Dustproofer: Apply a second coat of specified curing and sealing compound only to surfaces given a first coat.

REMOVAL OF FORMS

Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

Formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days and until concrete has attained design minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and supports.

RE-USE OF FORMS

Clean and repair surfaces of forms to be reused in work. Split, frayed, delaminated, or otherwise damaged form facing material will not be acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

MISCELLANEOUS CONCRETE ITEMS

Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place, and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

Equipment Bases and Foundations: Provide machine and equipment bases and foundations, as shown on drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with certified diagrams or templates of manufacturer furnishing machines and equipment.

Grout base plates and foundations as indicated, using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.

CONCRETE SURFACE REPAIRS

Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

Cut out honeycomb, rock pockets, voids over 1/4" in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1". Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water, and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.

Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to the satisfaction of Architect. Surface defects, as such, include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets; fins and other projections on surface; and stains and other discolorations that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar, or precast cement cone plugs secured in place with bonding agent.

Correct high areas in uniformed surfaces by grinding, after concrete has cured at least 14 days.

Correct low areas in uniformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when acceptable to Architect.

Repair methods not specified above may be used, subject to acceptance of Architect.

END OF SECTION

SECTION 03350

GYP-CRETE FLOOR UNDERLAYMENT

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to furnishing and installing the following:

The contractor shall furnish all labor, materials, tools, and equipment to install GYP-CRETE Floor Underlayment as shown on the Drawings and/or specified herein.

QUALIFICATIONS

Installations of GYP-CRETE shall be by an approved applicator using approved mixing/pumping equipment.

DELIVERY AND STORAGE OF MATERIALS

All materials shall be delivered in their original unopened packages and protected from exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

ENVIRONMENTAL CONDITIONS

Before, during, and after installation of GYP-CRETE, building interior shall be enclosed and maintained at a temperature above 50 deg. F. until structure and subfloor temperatures are stabilized. Provide continuous heat and adequate ventilation to rapidly remove moisture from the area until underlayment is dry. General Contractor must provide mechanical ventilation if necessary. Under the above conditions, allow 5 to 7 days drying time.

PART 2 - PRODUCTS

MATERIALS

Gypsum Cement - GYP-CRETE 2000 floor underlayment compound as manufactured by the Maxxon GYP-CRETE CORPORATION of Hamel, Minnesota, or approved equal.

Primer - Over new plywood use GYP-CRETE floor primer or approved equal. Sand - washed mason, mortar, or plaster sand complying with ASTM:C 144.

Water - Potable, free from impurities.

MIXING PROPORTIONS

Corridor

1.4 cu. ft. sand per 80 lb. bag of GYP-CRETE to attain compressive strength ranging from 2000 psi to 2500 psi. Do not over water. Water amount will vary with condition of sand.

All Areas Except Corridor

1.8 cu. ft. sand per 80 lb. bag of GYP-CRETE to attain compressive strength ranging from 1600 psi to 2000 psi. Do not over water. Water amount will vary with condition of sand.

PART 3 - EXECUTION

CONDITION OF SURFACE

Minimum construction thickness shall be 3/4" GYP-CRETE.

Subfloor shall be structurally sound, broom clean, and free of mud, oil, grease, or other contaminants.

Prior to installation of GYP-CRETE, General Contractor shall inspect the area to be poured for proper nailing of the plywood and replace any areas of plywood that have weakened or delaminated during construction. All stud wall base plates in doors and other openings shall be removed.

To prevent leakage, fill all cracks and voids with a quick setting drywall patching material such as DURABOND 90 by United States Gypsum.

PRIMING

Plywood: Spray one coat of GYP-CRETE Floor Primer with a concrete or garden sprayer over entire plywood deck using one gallon per 400 square feet. When applying GYP-CRETE over APA span-rated oriented strand or waferboards, a two-part system must be used as a primer; GYP CRETE Floor Primer and GYP-CRETE Surface Conditioner are used. Apply conditioner at 200 S.F. per gallon and primer over conditioner at 400s.f. per gallon.

UNDERLAYMENT APPLICATION

To minimize damage to installed underlayment and to complete fire and sound seals, pouring should be scheduled after the installation of drywall.

Install GYP-CRETE at 3/4" (min.) thickness over wood frame, spreading and screeding to a smooth surface. Place as continuously as possible until installation is complete so that GYP-CRETE slurry is placed against GYP-CRETE that has obtained its initial set, except at authorized joints.

PROTECTION

During construction, contractor shall place temporary wood planking over underlayment wherever it will be subjected to heavy wheeled or concentrated loads.

END OF SECTION

SECTION 04200

UNIT MASONRY

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: The work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Extent of each type of masonry work is indicated on Drawings.

Types of masonry work required include:

Standard Concrete Masonry Units.

Special Masonry Shapes.

Required Masonry Anchors.

QUALITY ASSURANCE

Unit Masonry Standard: Comply with ACI 530.1/ASCE 6, "Specifications for Masonry Structures", except as otherwise indicated.

Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.

Fire Performance Characteristics: Where indicated, provide materials and construction which are identical to those of assemblies whose fire endurance has been determined by testing in compliance with ASTM E 119 by a recognized testing and inspecting organization or by another means, as acceptable to authority having jurisdiction.

Single Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

Single Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

SUBMITTALS

Product Data: Submit manufacturer's product data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

For information only, submit copies of referenced standards utilized for this project unless duplicated in product data.

Samples for Verification Purposes: Submit samples of unit masonry of each type and shape of exposed unit required. Include in each set, the full range of exposed color and texture.

DELIVERY, STORAGE, AND HANDLING

Deliver masonry materials to project in undamaged condition.

Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

Limit moisture absorption of concrete masonry units during delivery and until time of installation to the maximum percentage specified for Type I units for the average annual relative humidity as reported by the U.S. Weather Bureau Station nearest project site.

Store cementitious materials off the ground, under cover and in dry location.

Store aggregates where grading and other required characteristics can be maintained.

Store masonry accessories, including metal items, to prevent deterioration by corrosion and accumulation of dirt.

PROJECT CONDITIONS

Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

Extend cover a minimum of 24 inches down both sides and hold cover securely in place.

Do not apply uniform roof loading for at least 12 hours after building masonry walls or columns.

Do not apply concentrated loads for at least 3 days after building masonry walls or columns.

Staining: Prevent grout or mortar or soil from staining the face of masonry to be left exposed or painted. Remove immediately, grout or mortar in contact with such masonry.

Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.

COLD WEATHER PROTECTION

Do not lay masonry units which are wet or frozen.

Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

Remove masonry damaged by freezing conditions.

Concrete Masonry Units: Heat masonry units so that they are above 20 deg. F. at time of laying.

Provide enclosure and auxiliary heat to maintain an air temperature of at least 40 deg. F. for 24 hours after laying units.

Do not heat water for mortar to above 160 deg. F.

PART 2 - PRODUCTS

CONCRETE MASONRY UNITS

General: Comply with referenced standards and other requirements indicated below applicable to each form of concrete masonry unit required.

Provide special shapes where required for lintels, corners, jambs, sash, control joints, headers, bonding and other special conditions.

Concrete Masonry Units: Provide units complying with characteristics indicated below for grade, type, face size, exposed face and, under each form of block included, for weight classification:

Grade N-1

Size

Manufacturer's standard units with nominal face dimensions of 16" long x 8" high (15-5/8" x 7-5/8" actual) x thickness indicated.

Type I, Moisture-Controlled Units, as Indicated on Drawings

Exposed Faces

Manufacturer's Standard Gray Color and Texture

Hollow Loadbearing Block: ASTM C 90, and as follows:

Weight Classification: Medium weight, minimum compressive strength of 2000 psi (net area).

Solid Loadbearing Block: ASTM C 145, and as follows:

Weight Classification: Medium weight, minimum compressive strength of 2000 psi.

SPECIAL SHAPES: Provide where shown and where required for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

FIRE RATINGS: Where fire ratings on masonry walls are shown on the Drawings, the Contractor shall make certain that the fire-resistant units to be used qualify for the ratings.

MORTAR AND GROUT MATERIALS

Masonry Cement: ASTM C-91

Acceptable Manufacturers

Medusa Cement Co.

Leheigh

Approved Equal

Grout for Unit Masonry: Comply with ASTM C-476 for grout for use in construction of reinforced and nonreinforced unit masonry. Use grout of consistency indicated or, if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout. Minimum compressive strength shall be 2,500 psi in 28 days.

Use fine grout in grout spaces less than 2" in horizontal direction, unless otherwise indicated.

Use coarse grout (maximum 3/8" aggregate) in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.

Mortar color as selected by Architect.

JOINT REINFORCEMENT, TIES AND ANCHORING DEVICES

Materials: Comply with requirements indicated below for basic materials and with requirements indicated under each form of joint reinforcement, tie and anchor for size and other characteristics:

Zinc-Coated (galvanized) Steel Wire: ASTM A 82 for uncoated wire and with ASTM C 641 for zinc coating of class indicated below:

Class 1 (0.40 oz. per sq. ft. of wire surface).

Joint Reinforcement: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10', with prefabricated corner and tee units, and complying with requirements indicated below:

Width: Fabricate joint reinforcement in units with widths of approximately 2" less than nominal width of walls and partitions as required to provide mortar coverage of not less than 5/8" on joint faces exposed to exterior.

Wire Size for Side and Cross Rods: #9 Gauge

Side Rods: 3/16 Inch

Cross Rods: No. 9 Gauge

For single-wythe masonry, provide type as follows with single pair of side rods:

Truss design with continuous diagonal cross rods spaced not more than 16" o.c.

For multi-wythe masonry with cavity filled solid with mortar, provide type as follows:

Truss design with diagonal cross rods spaced not more than 16" o.c. and number of side rods as follows:

Number of Side Rods for Multiple-Wythe Concrete Masonry: One side rod for each face shell of concrete masonry back-up and of concrete masonry facing wythe.

Flexible Anchors: Where flexible anchors are indicated for connecting masonry to structural framework, provide 2-piece anchors, which permit vertical or horizontal differential movement between wall and framework parallel to, but resist tension and compression forces

MICROTEL PROTOTYPE

UNIT MASONRY

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perpendicular to, plane of wall.

Anchors and Ties for Masonry with Wood Frame Backup:

Corrosion-resistant metal meeting or exceeding ASTM A153, corrugated veneer ties, 22 gage, 7/8" minimum width, 6" length minimum. Fasten to wood frame with corrosion-resistant nails of sufficient length to penetrate a minimum of 1-1/2" into studs.

MISCELLANEOUS MASONRY ACCESSORIES

Reinforcing Bars: Deformed Steel, ASTM A 615, Grade 60 for Bars No. 3 to No. 18

Premolded Control Joint Strips: Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall. Size and configuration as indicated.

Polyvinyl Chloride Complying with ASTM D 2287, General Purpose Grade, Designation PVC-63506

Bond Breaker Strips: Asphalt-Saturated Organic Roofing Felt Complying with ASTM D 226, Type I (No. 15 Asphalt Felt)

Weep-holes: Provide the following for weep-holes:

Plastic Tubing: Medium Density Polyethylene with Rope Insert, Outside Diameter and Length as Indicated Below:

3/8" X 4"

Anchor Bolts: Provide steel bolts with hex nuts and flat washers complying with ASTM A-307, Grade A, hot-dip galvanized to comply with ASTM C-153, Class C, in sizes and configuration indicated.

MASONRY CLEANERS

Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2cup dry measure) and laundry detergent (1/2 cup dry measure) dissolved in one gallon of water.

Acidic Cleaner: Manufacturer's standard strength general purpose cleaner designed for new masonry surfaces of type indicated; composed of blended organic and inorganic acids combined with special wetting systems and inhibitors; expressly approved for intended use by manufacturer of masonry units being cleaned.

Available Products: Subject to compliance with requirements, a product which may be used to clean unit masonry surfaces includes, but is not limited to, the following:

"Sure Klean" No. 600 Detergent; ProSoCo, Inc.

MORTAR AND GROUT MIXES

General: Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds or other admixtures, unless otherwise indicated.

Do not use calcium chloride in mortar or grout.

Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless otherwise indicated.

Use Type mortar as shown on Drawings.

Minimum compressive strength as shown on Drawings.

PART 3 - EXECUTION

INSTALLATION, GENERAL

Do not wet concrete masonry units.

Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

Thickness: Build cavity and composite walls, floors and other masonry construction to the full thickness shown. Build single-wythe walls (if any) to the actual thickness of the masonry units, using units of nominal thickness indicated.

Build chases and recesses as shown or required for the work of other trades. Provide not less than 8" of masonry between chase or recess and jamb of openings, and between adjacent chases and recesses.

Leave openings for equipment to be installed before completion of masonry work. After installation of equipment, complete masonry work to match work immediately adjacent to the opening.

Cut masonry units using motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining work. Use full-size units without cutting where possible.

Use dry cutting saws to cut concrete masonry units.

CONSTRUCTION TOLERANCES

Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4" in 10', or 3/8" in a story height not to exceed 20'. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in any story or 20' maximum, nor 1/2" in 40' or more. For vertical alignment of head joints, do not exceed plus or minus 1/4" in 10'.

Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in any bay or 20' maximum, nor 1/2" in 40' or more. For top surface of bearing walls, do not exceed 1/8" between adjacent floor elements in 10' or 1/16" within width of a single unit.

Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

Variation in Mortar Joint Thickness: Do not exceed bed joint thickness indicated by more than plus or minus 1/8", with a maximum thickness limited to 1/2". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

LAYING MASONRY WALLS

Layout walls in advance for accurate spacing of surface bond patterns with uniform joint widths and to accurately locate openings, movement-type joints, returns and offsets. Avoid the use of less-than-half-size units at corners, jambs and wherever possible at other locations.

Lay-up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other work.

Pattern Bond: Lay exposed masonry in the bond pattern shown or, if not shown, lay in running bond with vertical joint in each course centered on units in courses above and below. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2". Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4" horizontal face dimensions at corners or jambs.

Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

Built-in Work: As the work progresses, build-in items specified under this and other Sections of these Specifications. Fill in solidly with masonry around built-in items.

Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.

Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.

Fill cores in hollow concrete masonry units with grout 3 courses (24") under bearing plates, beams, lintels, posts and similar items, unless otherwise indicated.

MORTAR BEDDING AND JOINTING

Lay solid masonry units with completely filled bed and head joint; butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

Lay hollow concrete masonry units with full mortar coverage on horizontal and vertical face shells. Bed webs in mortar in starting course on footings and in all courses of piers, columns and pilasters, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

Maintain joint widths shown, except for minor variations required to maintain bond alignment. If not shown, lay walls with 3/8" joints.

Cut joints flush for masonry walls which are to be concealed or to be covered by other materials, unless otherwise indicated.

All exposed joints shall be well-tooled to a concave or rodded profile, unless otherwise indicated.

Provide raked joints at all vertical scores in scored brick units. Strike to match concave or rodded profile of horizontal joints.

Rake-out expansion joints and joints indicated on Drawings to receive sealant.

Mortar joints shall be struck at a consistent time interval when mortar is at the same medium stiff consistency in order to minimize color variations.

Remove masonry units disturbed after laying; clean and reset in fresh mortar. Do not pound corners or jambs to shift adjacent stretcher units which have been set in position. If adjustments are required, remove units, clean off mortar and reset in fresh mortar.

Collar Joints: After each course is laid, fill the vertical longitudinal joint between wythes solidly and with mortar for the following masonry work:

All exterior walls, except cavity walls, and interior walls and partitions.

Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes. Install at not more than 16" o.c. vertically.

Corners: Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.

Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:

Provide individual metal ties at not more than 24" o.c. vertically.

Provide weep holes in exterior wythe of cavity wall located immediately above ledges and flashing, spaced 2'-0" o.c., unless otherwise indicated.

HORIZONTAL JOINT REINFORCEMENT

General: Provide continuous horizontal joint reinforcement as indicated. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8" on exterior side of walls. Lap reinforcing a minimum of 6".

Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

Reinforce walls with continuous horizontal joint reinforcing, unless specifically noted to be omitted.

Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures and other special conditions.

Space continuous horizontal reinforcement as follows:

For multi-wythe walls (solid or cavity) which are structurally bonded by masonry headers or individual wire ties, space horizontal reinforcement 24" o.c. vertically.

For single-wythe walls, space reinforcement at 16" o.c. vertically, unless otherwise indicated.

For parapets, space reinforcement at 8" o.c. vertically, unless otherwise indicated.

Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2'-0" beyond jambs of the opening, except at control joints.

In addition to wall reinforcement, provide additional reinforcement at openings as required to comply with the above.

ANCHORING MASONRY WORK

General: Provide anchor devices of type indicated.

Anchor single wythe masonry veneer to metal studs with masonry veneer anchors to comply with the following requirements:

Fasten each anchor section through sheathing to metal studs with two metal fasteners of type indicated.

Embed tie section in masonry joints. Provide not less than 1" air space between back of masonry veneer wythe and face of sheathing.

Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.

Space anchors as indicated, but not more than 16" o.c. vertically and 24" o.c. horizontally. Install additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 3'-0".

CONTROL AND EXPANSION JOINTS

General: Provide vertical and horizontal expansion, control and isolation joints in masonry where shown. Build-in related items as the masonry work progresses.

Control Joint Spacing: If location of control joints is not shown, place vertical joints spaced not to exceed 35'-0" o.c. for concrete masonry wythes if reinforced, or 30'-0" o.c. if not reinforced. Locate control joints at points of natural weakness in the masonry work.

Build-in nonmetallic joint fillers where indicated.

LINTELS

Provide masonry lintels where shown and wherever openings of more than 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.

Provide minimum bearing of 8" at each jamb, unless otherwise indicated.

FLASHING OF MASONRY WORK

General: Provide concealed flashing in masonry work at, or above, shelf angles, lintels, ledges and other obstructions to the downward flow of water in the wall so as to divert such water to the exterior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and turn down to form drip.

Refer to Division 7 Specification Sections for flashing materials.

Extend flashing the full length of lintels and shelf angles and minimum of 4" into masonry each end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4", and through the inner wythe to within 1/2" of the interior face of the wall in exposed work. Where interior surface of inner wythe is concealed by furring, carry

flashing completely through the inner wythe and turn up approximately 2". At heads and sills, turn up ends not less than 2" to form a pan.

Install flashing to comply with manufacturer's instructions.

Provide weep holes in the head joints of the first course of masonry immediately above concealed flashings. Space 24" o.c., unless otherwise indicated.

REPAIR, POINTING AND CLEANING

Remove and replace masonry units which are loose, chipped, broken, stained or otherwise damaged, or if units do not match adjoining units as intended. Provide new units to match adjoining units and install in fresh mortar or grout, pointed to eliminate evidence of replacement.

Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings and adjacent work to provide a neat, uniform appearance, prepared for application of sealants.

Final Cleaning: After mortar is thoroughly set and cured, clean masonry as follows:

Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

Test cleaning methods on sample wall panel. Leave 1/2 panel uncleaned for comparison purposes. Obtain Engineer's and Architect's approval of sample cleaning before proceeding with cleaning of masonry.

Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film or waterproof masking tape.

Clean concrete unit masonry to comply with masonry manufacturer's directions and applicable NCMA "Tek" bulletins.

PROTECTION

Provide final protection and maintain conditions in a manner acceptable to Installer, which ensures unit masonry work being without damage and deterioration at time of substantial completion.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Rough Hardware

Loose Bearing and Leveling Plates

Loose Steel Lintels

Ladders

Elevator Pit Ladder

Elevator Sump Pit Cover

Miscellaneous Steel Trim

Steel Columns and Beams

Steel Handrails

RELATED SECTIONS

Section 09900 - Painting Elevators.

Section 14241 - Passenger Elevators.

SUBMITTALS

General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

Product data for products used in miscellaneous metal fabrications, including paint products and grout.

Shop Drawings detailing fabrication and erection of each metal fabrication indicated. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide templates for anchors and bolts specified for installation under other sections.

Samples representative of materials and finished products as may be requested by Architect.

QUALITY ASSURANCE

Quality welding processes and welding operators in accordance with AWS D1.1 "Structural Welding Code - Steel," D1.3 "Structural Welding Code - Sheet Steel", and D1.2 "Structural Welding Code - Aluminum."

Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

PROJECT CONDITIONS

Field Measurements: Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.

PART 2 - PRODUCTS

FERROUS METALS

Metal Surfaces, General: For metal fabrications exposed to view upon completion of the Work, provide materials selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and, for steel sheet, variations in flatness exceeding those permitted by reference standards for stretcher-leveled sheet.

Steel Plates, Shapes, and Bars: ASTM A992

Steel Pipe: ASTM A53

Black finish, unless otherwise indicated.

Galvanized finish for exterior installations.

Type F, standard weight (schedule 40), unless otherwise indicated, or another weight, type, and grade required by structural loads.

Gray Iron Castings: ASTM A48, Class 30

Malleable Iron Castings: ASTM A47, Grade 32510

Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A47, or cast steel, ASTM A 27. Provide bolts, washers, and shims as required, hot-dip galvanized per ASTM A153.

Welding Rods: Select in accordance with AWS Specifications for the metal alloy to be welded.

GROUT AND ANCHORING CEMENT

Nonshrink Nonmetallic Grout: Premixed, factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with CE CRD-C 621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this Section.

Interior Anchoring Cement: Factory-prepackaged, nonshrink, nonstaining, hydraulic controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound. Use for interior applications only.

FASTENERS

General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required for each application and complying with applicable standards.

Bolts and Nuts (anchor bolts): Regular hexagon head type, ASTM A-307, Grade A

Bolts and Nuts (beam connections): Regular hexagon head type, ASTM A-325N,
Grade A

Lag Bolts: Square head type, FS FF-B-561

Machine Screws: Cadmium plated steel FS FF-S-92

Wood Screws: Flat head carbon steel, FS FF-S-111

Plain Washers: Round, carbon steel, FS FF-W-92

Drilled-in Expansion Anchors: Expansion Anchors Complying with FS FF-S-325, Group VIII (anchors, expansion), Type I (internally threaded tubular expansion anchor); and machine bolts complying with FS FF-B-S75, Grade 5.

PAINT

Shop Primer for Ferrous Metal: Manufacturer's or fabricator's standard, fast-curing, lead-free, universal modified alkyd primer selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated, and for capability to provide a sound

foundation for field-applied topcoats despite prolonged exposure complying with performance requirements of FS TT-P-645.

Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035 or SSPC-Paint-20.

Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 except containing no asbestos fibers.

Zinc Chromate Primer: FS TT-P-645.

FABRICATION

Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.

Allow for thermal movement resulting from the following maximum change (range) of exterior metalwork in ambient temperature in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss. Temperature Change (Range): 150 deg. F.

Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flathead (countersunk) screws or bolts. Locate joints where least conspicuous.

Weld corners and seams continuously to comply with AWS recommendations and the following:

- Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

- Obtain fusion without undercut or overlap.

- Remove welding flux immediately.

- At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour

Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.

Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation. Cut, reinforce, drill and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.

Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

ROUGH HARDWARE

Furnish bent or otherwise custom fabricated bolts, plates, anchors, hangers, dowels, and other miscellaneous steel and iron shapes as required for framing and supporting woodwork, and for anchoring or securing woodwork to concrete or other structures. Fabricate items to sizes, shapes, and dimensions required. Furnish malleable-iron washers for heads and nuts which bear on wood structural connections; elsewhere, furnish steel washers.

LOOSE BEARING AND LEVELING PLATES

Provide loose bearing and leveling plates for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill plates to receive anchor bolts and for grouting as required. Galvanize after fabrication.

LOOSE STEEL LINTELS

Fabricate loose structural steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Weld adjoining members together to form a single unit where indicated.

Galvanize loose steel lintels located in exterior walls.

Size loose lintels for equal bearing of one inch per foot of clear span but not less than 8 inches bearing at each side of openings, if not indicated on Drawings.

MISCELLANEOUS FRAMING AND SUPPORTS

General: Provide steel framing and supports for applications indicated or which are not a part of structural steel framework, as required to complete work.

Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, and tap units to receive hardware, hangers, and similar items.

Equip units with integrally welded anchors for casting into concrete or building into masonry. Furnish inserts if units must be installed after concrete is placed. Spacing of anchors shall not be more than 24" o.c.

MISCELLANEOUS STEEL TRIM

Provide shapes and sizes indicated for profiles shown. Unless otherwise indicated, fabricate units from structural steel shapes, plates, and steel bars, with continuously welded joints and smooth exposed edges. Use concealed field splices wherever possible. Provide cutouts, fittings, and anchorages as required for coordination of assembly and installation with other work.

Galvanize miscellaneous framing and supports in exterior locations and where shown to be painted.

STEEL HANDRAILS

Provide steel handrails and brackets as indicated. Return handrails to wall. Extend handrail 12" beyond top riser and continue slope the depth of one tread beyond bottom riser. Handrail assembly to resist 200 pound concentrated load. All welds to be ground smooth. Handrails to be finished as indicated.

CONCRETE FILL AND REINFORCING MATERIALS

Concrete Materials and Properties: Comply with requirements of Concrete Specifications shown on Drawings.

Non-slip Aggregate Finish: Factory-graded, packaged material containing fused aluminum oxide grits or crushed emery as abrasive aggregate; rustproof and non-glazing; unaffected by freezing, moisture, or cleaning materials.

Reinforcing Bars: ASTM A-615, Grade 60, unless noted otherwise.

FINISHES, GENERAL

Comply with NAAMM "Metal Finishes Manual" for recommendations relative to application and designations of finishes. Finish metal fabrications after assembly.

STEEL AND IRON FINISHES

Galvanizing: For those items indicated for galvanizing, apply zinc-coating by the hot-dip process in compliance with the following requirements:

ASTM A-153 for galvanizing iron and steel hardware.

ASTM A-123 for galvanizing both fabricated and unfabricated iron and steel products made of uncoated rolled, pressed, and forged shapes, plates, bars, and strip 0.0299 inch thick and heavier.

Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications: Interiors (SSPC Zone 1A): SSPC0SP3 "Power Tool Cleaning".

Apply shop primer to uncoated surfaces of metal fabrications, except those with galvanized finish or to be embedded in concrete, sprayed-on fireproofing, or masonry, unless otherwise indicated. Comply with requirements of SSPC-PA1 "Paint Application Specification No. 1" for shop painting. Stripe paint all edges, corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

PREPARATION

Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, including concrete inserts, sleeves, anchor bolts, and miscellaneous items having integral anchors that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to project site.

Set sleeves in concrete with tops flush with finish surface elevations; protect sleeves from water and concrete entry.

INSTALLATION, GENERAL

Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installation of miscellaneous metal fabrications. Set metal fabrication accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

Provide temporary bracing or anchors in formwork for items that are to be built into concrete masonry or similar construction.

Field Welding: Comply with AWS Code for procedures of manual shielded metal-arc welding, appearance and quality of welds made, methods used in correctly welding work, and the following:

- Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

- Obtain fusion without undercut or overlap.

- Remove welding flux immediately.

- At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.

SETTING LOOSE PLATES

Clean concrete and masonry bearing surfaces of any bond-reducing materials, and roughen to improve bond to surfaces. Clean bottom surface of bearing plates.

Set loose leveling and bearing plates on wedges, or other adjustable devices. After the bearing members have been positioned and plumbed, tighten the anchor bolts. Do not remove wedges or shims, but if protruding, cut off flush with the edge of the bearing plate before packing with grout.

- Pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

- Use nonmetallic nonshrink grout, unless otherwise indicated.

TOUCH-UP PAINTING: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as used for shop painting to comply with SSPC-PA requirements for touch-up of field painted surfaces.

Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.

For galvanized surfaces clean welds, bolted connections and abraded areas and apply galvanizing repair paint to comply with ASTM A 780.

END OF SECTION

SECTION 06100

ROUGH CARPENTRY

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Wood Grounds, Nailers, and Blocking

Wall, Floor, and Roof Sheathing

Wood Trusses

Engineered Wood Products

All fasteners, adhesives, and other attachment devices shall be furnished by this Contractor.

RELATED WORK

Section 06200 - Finish Carpentry

Section 06400 - Casework

Section 07311 - Asphalt Shingles

Section 07620 - Sheet Metal Flashing and Trim

SUBMITTALS: Submit the following:

Product data, installation instructions and recommendations from manufacturer, including data that materials comply with requirements.

Shop Drawings for wood Floor Joists, Pre-Manufactured Wall Panels and Roof Trusses showing sizes, design values, materials, and dimensional relationships of components, as well as bearing and anchorage details.

Provide Shop Drawings that have been signed and stamped by a professional engineer legally authorized to practice in jurisdiction where project is located, and that have been reviewed and approved by the general contractor.

Wood treatment data, including treatment plant's certification of compliance with indicated requirements.

QUALITY ASSURANCE

Single-Source Responsibility for Trusses and Engineered Wood Products: Obtain each type of engineered wood products from one source from a single manufacturer.

Single-Source Responsibility for Fire Retardant Treated Wood: Obtain each type of fire-retardant-treated wood products from one source for both treatment and fire-retardant formulation.

Standards: Comply with N.F.P.A. "National Design Specification for Wood Construction" and with TPI standards, including "Quality Standard for Metal Plate Connected Wood Trusses", "Commentary and Recommendations for Handling and Erecting Wood Trusses", "Commentary and Recommendations for Bracing Wood Trusses", and "Design Specification for Metal Plate Connected Wood Trusses".

DEFINITIONS

Gypsum Board Construction Terminology Standard: Refer to ASTM C 11 and GA 505 for definitions of terms for gypsum board construction not otherwise defined in this Section or other referenced standards.

PRODUCT HANDLING

Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber as well as plywood and other panels. Provide for air circulation within and around stacks and under temporary coverings, including polyethylene and similar materials.

For lumber and plywood pressure treated with waterborne chemicals, sticker between each course to provide air circulation.

Handle and store trusses with care and comply with TPI recommendations to avoid damage from bending, overturning, or other cause.

COORDINATION

Fit carpentry work to other work. Scribe and cope as required for accurate fit. Correlate location of nailers, blocking, grounds, and similar supports to allow attachment of other work.

PART 2 - PRODUCTS

LUMBER, GENERAL

Lumber Standards: Manufacture lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.

Grade Stamps: Factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.

Nominal sizes are indicated, except as shown by detail dimensions. Provide actual sizes as required by PS 20 for moisture content specified for each use.

Provide dressed lumber, S4S, unless otherwise indicated.

Provide seasoned lumber with 15 percent maximum moisture content at time of dressing and shipment for sizes 2" or less in nominal thickness, unless otherwise indicated.

Framing lumber unless noted otherwise, shall be of a structural grade with minimum allowable working stresses as shown on Drawings.

Studs, furring, plates, and sills shall be standard construction grade lumber unless noted otherwise on Drawings.

Prefabricated Wood I-Joists for Floor Construction: Units manufactured by bonding stress-graded lumber flanges to APA performance-rated panel webs with exterior-type adhesives complying with ASTM D 2559 to produce I-shaped joists complying with the following requirements:

Flange material as standard with joist manufacturer.

Web material as standard with joist manufacturer.

Allowable design stresses as indicated on Drawings.

Sizes: Depth and width as indicated, with flanges not less than 1-1/2" wide.

Acceptable Manufacturer

Wood I-Beam Prefabricated I-Joists and Headers, Georgia Pacific Corporation

TJI Joists, Truss Joist Corporation

Approved Equal

Laminated Veneer Beams

Micro-lam beams as manufactured by Truss Joist Corporation or approved equal. Size as shown on Drawings.

Miscellaneous Lumber: Provide wood for support or attachment of other work including support bases, cant strips, bucks, nailers, blocking, furring, grounds, stripping, and similar members. Provide lumber of sizes indicated, worked into shapes shown.

CONSTRUCTION PANELS, GENERAL

MICROTEL PROTOTYPE

ROUGH CARPENTRY

06100-2

12/2009

Construction Panel Standards: Comply with PS 1 "U.S. Product Standard for Construction and Industrial Plywood" for plywood construction panels and, for products not manufactured under PS 1 provisions, with APA PRP-108.

Trademark: Furnish construction panels that are each factory-marked with APA trademark evidencing compliance with grade requirements.

Concealed Performance-Rated Construction Panels

General: Where construction panels are indicated for the following concealed types of applications, provide APA Performance-Rated Panels complying with requirements designated under each application for grade designation, span rating, exposure durability classification, edge detail (where applicable), and thickness.

Roof Sheathing: APA Rated Sheathing: Exterior, Exposure 1 or OSB Sheathing, as indicated on the drawings

Span Rating: As indicated on Drawings or as required to suit rafter spacing indicated.

Thickness: As shown on Drawings.

Acceptable Manufacturers

Oxboard, by Potlatch

Inner-Seal, by Louisiana Pacific Corporation

Approved Equal

Floor Sheathing: APA Rated Sturd-I-Floor: Exterior, Exposure 1, by Georgia Pacific, or OSB Floor Sheathing

Span-Rating: As indicated on Drawings or as required to suit floor truss spacing indicated.

Thickness: As shown on Drawings.

Edge Detail: Tongue and Groove

Acceptable Manufacturers

Georgia Pacific

Louisiana Pacific

Advantech

Oxboard, by Potlatch

Approved Equal

Where fire-rated retardant roof sheathing is to be provided, product to be "Exterior Fire-X", by Hoover Treated Wood Products. 1-800-531-5558

Wall Sheathing

OSB Sheathing: Square edge OSB Struc-1 sheathing in thicknesses as shown on drawings. Acceptable manufacturer: Louisiana Pacific or approved equal.

Oxboard, by Potlatch Corporation or approved equal; thickness as shown on drawings.

MISCELLANEOUS MATERIALS

Fasteners and Anchorages: Provide size, type, material, and finish as indicated and as recommended by applicable standards, complying with applicable federal Specifications for nails, staples, screws, bolts, nuts, washers, and anchoring devices. Provide metal hangers and framing anchors of the size and type recommended by the manufacturer for each use including recommended nails.

Where rough carpentry work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with a hot-dip zinc coating (ASTM A-153).

MICROTEL PROTOTYPE

ROUGH CARPENTRY

06100-3

12/2009

Foundation Anchors and Wall Bracing: Galvanized steel as manufactured by Teco, Simpson, or Kant Sag.

WOOD TREATMENT MATERIALS

Preservative Treatment: Where lumber or plywood is indicated as "Treated," or is specified herein to be treated, comply with applicable requirements of AWPA Standards C2 (Lumber and C9 Plywood) and of AWPB Standards listed below. Mark each treated item with the AWPB Quality Mark Requirements.

Pressure-treat above-ground items with water-borne preservatives to comply with AWPB LP-2. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 15 percent. Treat indicated items and the following:

Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers and waterproofing.

Wood sills, sleepers, blocking, furring, stripping and similar concealed members in contact with masonry or concrete.

Wood floor plates installed over concrete slabs directly in contact with earth.

Pressure-treat the following with water-borne preservatives for ground contact use complying with AWPB LP-22:

Wood members in contact with ground.

Complete fabrication of treated items prior to treatment, where possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment and to comply with AWPA M-4. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

Fire-Retardant Treatment: Where fire-retardant treated wood is indicated, pressure impregnate lumber and plywood with fire-retardant chemical to comply with AWPA C20 and C27, respectively, for treatment type indicated below. Identify fire-retardant treated wood lumber with appropriate classification marking of Underwriters Laboratories, Inc., U.S. Testing, Timber Products Inspection or other testing and inspecting agency acceptable to authorities having jurisdiction.

Interior Type A: Use where fire-retardant treated wood is indicated for interior applications.

Exterior type: Use where fire-retardant treated wood is indicated for exterior, exposed applications.

Inspect each piece of treated lumber or plywood after drying and discard damaged or defective pieces.

Kiln dry wood after pressure treatment to maximum 19 percent moisture content.

ADHESIVE

Adhesive shall be PL-400, Liquid Nail, or an equal approved by the Architect.

PART 3 - EXECUTION

WOOD TREATMENT

Shop pressure treat and deliver to site ready for installation, wood materials requiring pressure impregnated preservatives.

INSTALLATION, GENERAL

Discard units of material with defects which might impair quality of work, and units which are too small to use in fabricating work with minimum joints or optimum joint arrangement.

Set carpentry work to required levels and lines, with members plumb and true to line and cut and fitted.

Fit rough carpentry to other construction. Scribe and cope as required for accurate fit. Correlate location of nailers, blocking, grounds, and similar supports to allow attachment of other construction.

Securely attach carpentry work to substrate by anchoring and fastening as shown, and to comply with "Recommended Nailing Schedule" of "Manual for Wood Frame Construction" and "National Design Specifications for Wood Construction" published by N.F.P.A.

Countersink nail heads on exposed carpentry work and fill holes.

Use common wire nails, except as otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood. Pre-drill as required.

WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

Provide wherever shown and where required for screeding or attachment of other work. Form to shapes as shown and cut as required for true line and level of work to be attached. Coordinate location with other work involved.

Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.

WOOD FRAMING, GENERAL

Provide framing members of sizes and on spacings shown and frame openings as shown, or if not shown, comply with recommendations of "Manual for Wood Frame Construction" of National Forest Products Association (N.F.P.A.). Do not splice structural members between supports.

Anchor and nail as shown and to comply with "Recommended Nailing Schedule" of "Manual for Wood Frame Construction" and "National Design Specifications for Wood Construction" published by N.F.P.A.

Erect wood framing members true to lines and levels. Do not deviate from true alignment more than 1/4 inch.

INSTALLATION OF CONSTRUCTION PANELS

General: Comply with applicable recommendations contained in Form No. E30, "APA Design/Construction Guide - Residential & Commercial", for types of construction panels and applications indicated.

Fastening Methods: Fasten panels as indicated below:

Floor Sheathing: Screw and glue to framing. No staples will be permitted.

Roof Sheathing: Nail and glue to framing. No staples will be permitted.

OSB Wall Sheathing: Nail to framing as indicated. Provide 1/8" space between panel ends and edges. Install in accordance with manufacturer's recommendations and APA Engineered Wood Construction Guide.

At Roof Sheathing, provide suitable edge support as recommended by APA by use of panel clips, or lumber blocking between Joists. Panel End Joints shall occur over framing. Provide 1/8" spacing at Panel Edges and Ends.

INSTALLATION OF GYPSUM SHEATHING

General: Install gypsum sheathing to comply with manufacturer's instructions, GA-253, and the following:

Cut boards at penetrations, edges, and other obstructions of the work. Fit tightly against abutting construction, except provide a 3/8" setback where non-load-bearing construction abuts structural elements.

Coordinate sheathing installation with flashing and joint sealant installation so that these combined materials are installed in the sequence and manner that prevents exterior moisture from passing through completed exterior wall assembly.

Apply fasteners so that screw heads bear tightly against face of gypsum sheathing boards, but do not cut into face paper.

Do not bridge building expansion joints with gypsum sheathing. Cut and space edges to match spacing of structural support elements.

Vertical Installation: Install four-foot-wide gypsum sheathing boards vertically with vertical edges centered over flanges of studs. Abut ends and edges of each board with those of adjoining boards. Screw-attach boards at perimeter and within field of board to each steel stud as follows:

Fasteners spaced approximately 8" o.c. and set-back 3/8" minimum from edges and ends of boards.

PROTECTION

Protect gypsum sheathing that will be left exposed to weather for more than one month as follows:

Protect cutouts, corners, and joints in the sheathing by filling with a flexible sealant or by applying sheathing tape recommended by sheathing manufacturer at the time sheathing is applied.

END OF SECTION

SECTION 06200

FINISH CARPENTRY

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Wood Millwork

Interior Trim

Shelving

Column Surrounds

Exterior Louver Vents

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 06100 - Rough Carpentry

Section 06410 - Casework

Section 09900 - Painting

REFERENCE STANDARDS

PS 1- Softwood Plywood

PS 58 Basic Hardwood

NFPA National Design Specification for Wood Construction.

AWI Quality Standards

FS TT-W-550 - Wood Preservative, Chromated Copper Arsenate Mixture

FS TT-W-571 - Wood Preservation Treating Practices

QUALITY ASSURANCE

Factory-mark each piece of lumber and plywood with type, grade, mill, and grading agency identification; except omit marking from surfaces to receive transparent finish, and submit mill certificate that material has been inspected and graded in accordance with requirements if it cannot be marked on a concealed surface.

Perform finish carpentry work in accordance with AWI Quality Standards, Custom Grade.

SUBMITTALS

Submit Shop Drawings indicating component profiles and fastening and joining details.

Samples: Submit samples for each species and cut or pattern of finish carpentry.

PRODUCT DELIVERY, STORAGE, AND HANDLING

Protect finish carpentry materials during transit, delivery, storage, and handling to prevent damage, soiling, and deterioration.

Do not deliver finish carpentry materials, until painting, wet work, grinding, and similar operations which could damage, soil, or deteriorate woodwork have been completed in installation areas. If, due to unforeseen circumstances, finish carpentry materials must be stored in other than installation areas, store only in areas meeting requirements specified for installation areas.

JOB CONDITIONS

Conditioning: Installer shall advise Contractor of temperature and humidity requirements for finish carpentry installation areas. Do not install finish carpentry until required temperature and relative humidity conditions have been stabilized and will be maintained in installation areas.

Maintain temperature and humidity in installation area as required to maintain moisture content of installed finish carpentry within a 1.0 percent tolerance of optimum moisture content, from date of installation through remainder of construction period. The fabricator of woodwork shall determine optimum moisture content and required temperature and humidity.

PART 2 - PRODUCTS

LUMBER MATERIALS

Hardwood Lumber: PS 58; Premium Grade in accordance with AWI; maximum moisture content of 15 percent.

Stained Interior Wood Trim and Millwork: Red Oak, Grade 1, sizes and shapes shown on Drawings, of grain type sufficient to receive stained finish.

Painted Wood Trim and Millwork: Popular or Fir, Grade 1 or 2, of grain type sufficient to receive painted finish. Sizes and shapes as show on drawings.

Nominal sizes are indicated, except as shown by detailed dimensions. Provide dressed or worked and dressed lumber, as applicable, manufactured to the actual sizes as required by PS 20 or to actual sizes and patterns as shown, unless otherwise indicated.

SHEET MATERIALS

Shelving: 3/4" X width shown on Drawings, Hardwood Plywood: PS 51; custom grade in accordance with AWI; core material of veneer; type of bond recommended for application; with minimum 3/4" X1-1/4" hardwood nosing.

COLUMN COVERS

Round, smooth aluminum 1/8" thick X 8" diameter, narrow joinery, baked enamel finished aluminum column cover system with standard cap and base, as manufactured by Superior Aluminum Products or approved equal. www.superioraluminum.com Provide all required accessories.

LOUVER VENTS

Vinyl with 1/2" thick slats, beveled and backed with screen wire. Outside casing 1-3/8" X 2". Size and shape as shown on Drawings.

MISCELLANEOUS MATERIALS

Fasteners and Anchorages: Provide nails, screws, and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications.

Where finish carpentry is exposed on exterior or in areas of high relative humidity, provide fasteners and anchorages with a hot-dipped zinc coating (ASTM A-153).

PART 3 EXECUTION

PREPARATION

Condition wood materials to average prevailing humidity conditions in installation areas prior to installing.

INSTALLATION

Discard units of material which are unsound, warped, bowed, twisted improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements, or which are of defective manufacturer with respect to surfaces, sizes, or patterns.

Install the work plumb, level, true, and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 8'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/8" maximum offsets in revealed adjoining surfaces.

Scribe and cut work to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.

Anchor finish carpentry work to anchorage devices or blocking built-in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

Repair damaged and defective finish carpentry work wherever possible to eliminate defects functionally and visually; where not possible to repair properly, replace woodwork. Adjust joinery for uniform appearance.

Clean finish carpentry work on exposed and semi-exposed surfaces.

Preparation for Finishing: Sand work smooth and set all nails and screws. Apply wood filler in exposed nail and screw indentations.

Cleaning: Keep premises in a neat, safe, and orderly condition at all times during execution of this portion of the work, free from the accumulation of sawdust, cut-ends, and debris.

Refer to Division 9 sections for final finishing of installed finish carpentry work.

Protection: Installer of finish carpentry work shall advise Contractor of final protection and maintained conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION

SECTION 06410

CASEWORK

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Plastic Laminate Countertops, Aprons, and Backsplashes

Granite Countertops and Backsplashes

Custom Cabinet Units

Cultured Marble Sills and Countertops with Integral Lavatories and Backsplashes

Note: Casework is part of the FF&E package by Artone Manufacturing. The casework package is based on the Microtel Color Scheme selected by the owner.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 06100 - Rough Carpentry

Section 06200 - Finish Carpentry

REFERENCES

FS MM-L-736 - Lumber, Hardwood

FS MMM-A-130 - Adhesive, Contact

NEMA LD3 - High Pressure Decorative Laminates

PS 1 - Construction and Industrial Plywood

PS 20 - American Softwood Lumber Standard

PS 51 - Hardwood and Decorative Plywood

PS 58 - Basic Hardboard

QUALITY ASSURANCE

Perform work to (custom) quality in accordance with "Quality Standards" of the Architectural Woodwork Institute (AWI).

SUBMITTALS

Submit Shop Drawings and product data. Include materials, component profiles, fastening methods, assembly methods, joint details, accessory listings, and schedule of finishes.

Submit cabinet door sample and sample of all proposed materials.

PART 2 - PRODUCTS

PLASTIC LAMINATE COUNTERTOPS, APRONS, BACKSPLASHES

Plastic Laminate: Shall be standard grade, 1/16" thick, general purpose material complying with current NEMA Standard LP-2. Comply with ANSI A161.2. Acceptable manufacturers shall include:

Formica Corporation
WilsonArt
Laminart

Adhesive: Shall be that which is recommended by the supplier of plastic laminate.

Core: Shall be Particleboard, complying with ANSI A208.1, 45-lb. density, minimum 3/4" thick, or plywood, 5-ply hardwood faced, Type II, Grade BD or better, minimum 3/4" thick, complying with ASTM D 1037.

Where shown, all countertops shall have 3/4" x 4" high separate matching backsplash and matching aprons.

CULTURED MARBLE SILLS AND COUNTERTOPS WITH INTEGRAL LAVATORIES AND SEPARATE MATCHING BACKSPLASHES

Cast filled polyester cultured marble in accordance with ANSI Z-124-3. Size and shape as shown on Drawings, as manufactured by U.S. Marble or approved equal. Refer to Division 15 for lavatory requirements.

LAMINATE CLAD CUSTOM BOX CABINET UNITS

Acceptable Manufacturers:

Artone Manufacturing
or Approved Equal

Modular Box-Type Cabinets: Where shown on Drawings, system shall be modular box-cabinet type construction.

Laminate Clad Cabinets

Quality Standard: Comply with AWI Section 400 and Division 400B, "Laminate Clad Cabinets".

AWI Type of Cabinet Construction: As Indicated

Laminate Cladding

Plastic Laminate: NEMA LD 3 as manufactured by one of the following:

Formica Corporation
Wilson Plastics Company, WilsonArt
Laminart

Particle Board: ANSI A208.1, Mat-Formed Particle Board, Grade 1-M-2, with minimum density of 45 pcf. Internal bond of 60 psi, and minimum screw holding capacity of 225 lb. on faces and 200 lb. on edges.

Concealed Surfaces: Sound and dry solid wood, plywood, or particleboard without defects affecting strength, utility, or stability.

Sides, Dividers, Tops, Bottoms, Shelves, and Stretchers: Plastic laminate GP 50 (0.50 inch nominal thickness) on 3/4 inch thick particleboard. Provide stretchers for top of base cabinet.

Back Panels: 1/8 inch thick hardboard with thermoset decorative panels on interior surfaces fastened to rear edge of end panels and to top and bottom rails.

Exposed Edge Treatment: Edge doors and drawer fronts with PVC Edgebanding: Kwick-Edge PVC, and Accent Edge PVC, as manufactured by Woodtape, or approved equal.

Semi-Exposed Edge Treatment: Edge top of drawer body with PVC Edgebanding: Kwick-Edge PVC and Accent Edge PVC, as manufactured by Woodtape, or approved equal.

Doors, Drawer Fronts, Fixed Panels, Toeboards, and Ends: Plastic laminate GP 50 (0.50 inch nominal thickness) on 5/8 inch thick particleboard.

Drawers: Fabricate with front, bottom, and back rabbeted in sides and secured with glue and mechanical fasteners as follows:

Subfronts, Sides, and Backs: 3/8 inch thick particleboard.

Bottoms: Not less than 1/4 inch thick particleboard.

Joinery: Rabbet backs flush into end panels and secure with concealed mechanical fasteners. Connect tops and bottoms of wall cabinets and bottoms and stretchers of base cabinets to ends and dividers with mechanical fasteners. Rabbet tops, bottoms, and backs into end panels.

Toe Board: 5/8 inch thick particleboard attached to subbase with concealed fasteners.

CABINET HARDWARE

General: Unless scheduled otherwise, manufacturer's standard hardware units of type, size, material and finish indicated, complying with ANSI A-156.9.

Hardware Schedule

Drawer Slides

Guest Rooms: MR 2031, self-closing, 3/4 extension with 75 lb. rating, by Mepla or approved equal.

Front Desk: MR 2080, full extension with 75 lb. rating, by Mepla or approved equal.

Hinges: 1/2 overlay, as manufactured by Grass.

Wall Cabinet Hanging System: Hangstrip System by Grass or approved equal.

Base Cabinet Leg Leveling: Leg leveling system by Grass or approved equal.

Pulls: Recessed pulls, No. SP-036, by Siro Designs, Inc., or approved equal (305-968-0104).

Fasteners: Size and type to suit application.

ACCESSORIES

Valance Moulding: 1/2" x 1/2" L channel, .063 thick, 8700 PVC rigid white. R-1119, by SFR Industries, Inc., or approved equal (715-723-4343).

Fastener Cover Caps: Cover cap (white gloss) and screw base flat, as manufactured by Ark-Plas Products, Inc., or approved equal (501-453-2343).

Gromets: 1" o.d., 3/4" hole, AG series, as manufactured by Doug Mockett & Company, or approved equal (800-523-1269).

PVC Edgebanding: Kwick-Edge PVC and Accent Edge PVC, as manufactured by Woodtape, or approved equal. Sizes and locations as shown on Drawings (800-833-8428).

Drawer Bumpers: Transparent, self-adhesive door bumper by Hafele America Co., or approved equal (800-334-1873).

Door Bumpers: Transparent, self-adhesive door bumper, 12.5mm x 3mm, by Hettich America LP, or approved equal (800-277-2111).

Closet Rod and Flange: OVA wardrobe rail, rolled, with butted seam, steel, nickel plated and wardrobe rail support, 32mm hole distance, with 5mm pegs, zinc alloy nickel plated, as manufactured by Hafele America Co., or approved equal (800-334-1873).

LOCKS

At all locations in drawers and doors shown on Drawings, furnish and install 986 drawer lock by Knappe and Vogt, or approved equal.

FABRICATION

Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.

When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trip for scribing and site cutting.

Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Make corners and joints hairline. Locate counter butt joints minimum 2 feet from sink cut-outs.

Apply laminate backing sheet to reverse side of plastic laminate finished surfaces, where shown on Drawings.

Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures and fittings.

PART 3 - EXECUTION

INSPECTION

Verify adequacy of backing and support framing.

INSTALLATION

All cabinets, countertops, and shelving shall be installed as shown on Drawings and as specified by manufacturer.

Set and secure casework in place rigid, plumb, and level.

Use purpose designed fixture attachments at concealed locations for wall-mounted components.

Use threaded steel concealed joint fasteners to align and secure adjoining cabinet units and counter tops.

Carefully scribe casework which is against other building materials, leaving gaps of 1/32 inch maximum. Do not use additional overly trim for this purpose.

Secure cabinet and counter bases to floor using appropriate angles and anchorages.

Countersink anchorage devices at exposed locations used to wall-mount components, and conceal with solid plugs of species to match surrounding wood. Finish flush with surrounding surfaces.

PLASTIC LAMINATE

INSTALLATION: The plastic laminate shall be bonded to a suitable substrate. Rigid setting type adhesive is recommended. The temperature of the materials, surfacing, substrate, and adhesive, and the area in which the actual fabrication is to be done shall not be less than 65 degrees F. with a relative humidity of not less than 35% and not more than 85%. All inside corners of cutouts in plastic laminate shall be radiused as large as possible with 1/8"R minimum. File edges of the radius smooth and free of cracks and crazes.

METHOD: Assembly of components should be accomplished using approved procedures, materials, and equipment, and the workmanship should conform to established industry practices, conditions, procedures, and recommendations.

ADJUSTING AND CLEANING

Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.

Clean casework, counters, shelves, hardware, fittings and fixtures.

Clean surfaces of plastic laminate with a damp cloth or ordinary bar soap and water. Harsh abrasive cleansers shall not be used. Stubborn dirt may be removed with lacquer thinner, methlethyl Ketone, contact adhesive solvents or cleaner waxes.

END OF SECTION

SECTION 07210

BUILDING INSULATION

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

WORK INCLUDED: Work included under this Section includes, but is not necessarily limited to, furnishing and installing the following:

- Flat and Tapered Rigid Roof Insulation
- Batt Insulation
- Foundation Wall and Under Slab Insulation
- Furred Masonry Walls Insulation
- Insulation Baffles
- Vapor Retarder
- Infiltration Barrier

RELATED SECTIONS

- Section 04200 - Unit Masonry
- Section 06100 - Rough Carpentry
- Section 07530 - Single Ply Membrane Roofing

QUALITY ASSURANCE

Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by r-values, they represent the rate of heat flow through a homogeneous material exactly 1" thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.

Fire Performance Characteristics: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

- Surface Burning Characteristics: ASTM E-84

- Fire Resistance Ratings: ASTM E-119

- Combustion Characteristics: ASTM E-136

Asbestos Content of Inorganic Insulations: provide insulations composed of mineral fibers or mineral ores which contain no asbestos of any type of mixture of types occurring naturally as impurities as determined by polarized light microscopy test per Appendix A of 40 CFR 763.

All insulation in roof and wall assemblies shall be approved for use without an additional thermal barrier in accordance with Local Building Codes.

SUBMITTALS

Product Data: Submit manufacturer's product literature and installation instructions for each type of insulation and vapor retarder material required.

Certified Test Reports: With product data, submit copies of certified test reports showing compliance with specified performance values, including R-values (aged values for plastic insulations), densities, compression strengths, fire performance characteristics, perm ratings, water absorption ratings and similar properties.

DELIVERY, STORAGE, AND HANDLING

Deliver insulation in original labeled bundles.

General Protection: Protect insulations from physical damage and from becoming wet, soiled, or covered with ice or snow. Comply with manufacturer's recommendations for handling, storage, and protection during installation.

Protection for Plastic Insulation

Do not expose to sunlight, except to extent necessary for period of installation and concealment.

Protect against ignition at all times. Do not deliver plastic insulating materials to project site ahead of installation time.

Complete installation and concealment of plastic materials as rapidly as possible in each area of work.

JOB CONDITIONS

The Installer must examine the substrate and the conditions under which insulation work is to be performed and notify the Architect in writing of unsatisfactory conditions. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

Weather Conditions: Proceed with work only when weather conditions are in compliance with manufacturer's recommended limitations, and when conditions will permit the work to proceed in accordance with requirements and the manufacturer's recommendations.

Do not apply insulation to damp, frozen, dirty, dusty, or surfaces unacceptable to manufacturer.

Coordinate this work with all trades and protect it after installation.

PART 2 - PRODUCTS

ACCEPTABLE INSULATION MANUFACTURERS

Flat Rigid Polyisocyanurate Roof Insulation (EPDM Roof Areas)

"Hy-Therm AP", by Celotex

"Pyrox", by Apache

"AC Foam-II" by Atlas

Approved equal by EPDM Manufacturer.

Tapered Rigid Polyisocyanurate Roof Insulation

"Hy-Therm Tapered", by Celotex

"Tapered", by Apache

"Tapered AC Foam", by Atlas

Approved equal by EPDM Manufacturer

Unfaced Glass Fiber Batt Insulation

Owens-Corning Fiberglass Corp.

Schuller International (Manville).

Certainteed Corp.

Approved Equal

Extruded Polystyrene Foam Board Insulation

Foundation Walls and Under Slab.

"Styrofoam Square Edge" by Dow Chemical Company.

"Foamular 150" by UC Industries.

Approved Equal.

Rigid Polyisocyanurate Interior Furred wall.
Tuff-R Insulating Sheathing by Celotex Corporation.
Building Wrap Infiltration Barrier
Building Wrap
DuPont Tyvek Weatherization System
Or Approved Equal.

INSULATING MATERIALS

General: Provide insulating materials which comply with requirements indicated for materials, compliance with referenced standards, and other characteristics.

Flat and Tapered Polyisocyanurate Roof Insulation System: Insulation shall be manufactured for use with Roofing Systems specified and approved for use by roofing manufacturer. Material shall be factory fabricated from Polyisocyanurate Rigid Roof Insulation Board. Factory Mutual Class I approved and Underwriters Laboratories classified Class A. Board shall be cut, cleaned, and vacuumed at the factory to form a rigid installation. "Filler" insulation board shall be provided and applied as per manufacturer's specifications. Thickness as shown on Drawings. Provide all additional boards as required for a smooth uninterrupted surface.

Extruded Polystyrene Board Insulation: Rigid, cellular thermal insulation with closed-cells and integral high density skin, formed by the expansion of polystyrene base resin in an extrusion process to comply with ASTM C-578 for Type indicated; with 5-year aged r-values of 5.4 and 5 at 40 and 75 deg. F. (4.4 and 23.9 deg. C.), respectively; and as follows:

Type IV, 1.6 lb./cu. ft. min. density, unless otherwise indicated.

UnFaced Mineral Fiber Blanket/Batt Insulation: Thermal insulation produced by combining glass mineral fibers with thermosetting resins to comply with ASTM C 665 for Type I.

Rigid-Polyisocyanurate Board Insulation: Rigid, cellular thermal insulation with glass-fiber-reinforced polyisocyanurate closed-cell foam core and aluminum foil facing laminated to both sides; complying with FS HH-1-1972/1, Class 1; aged R-values of 8 and 7.2 per inch at 40 and 75 deg. f., respectively. Surface burning characteristics, maximum flame spread of 25 and smoke developed of 230. 3/4" or thickness as shown on Drawings.

Insulation Baffles: Preformed Rigid fiberboard or Plastic Sheets designed and sized to fit between Roof Framing Members, and to provide Cross Ventilation between insulated Attic Spaces and Vented Eaves..

PART 3 - EXECUTION

INSPECTION AND PREPARATION

Require Installer to examine substrates and conditions under which insulation work is to be performed. A satisfactory substrate is one that complies with requirements of the section in which substrate and related work is specified. Obtain Installer's written report listing conditions detrimental to performance of work in this section. Do not proceed with installation of insulation until unsatisfactory conditions have been corrected.

Verify adjacent materials are dry and ready to receive insulation.

Verify mechanical and electrical services within insulated spaces have been installed and tested.

Verify substrate surface is flat, free of honeycomb, fins, irregularities, and materials that will impede adhesive bond.

Clean substrates of substances harmful to insulations or vapor retarders, including removal of projections which might puncture vapor retarders.

INSTALLATION, GENERAL

Comply with manufacturer's instructions for particular conditions of installation in each case. If printed instructions are not available or do not apply to project conditions, consult manufacturer's technical representative for specified recommendations before proceeding with work.

Verify insulation boards are unbroken and free of damage.

Extend insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.

Apply a single layer of insulation of required thickness, unless otherwise shown or required to make up total thickness.

Trim insulation neatly to fit spaces. Use boards free of damage.

Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.

Install all insulation in accordance with manufacturer's specifications.

INSTALLATION OF ROOF INSULATION

Install insulation systems in accordance with manufacturer's and roofing systems manufacturer's specifications.

System shall fit tight within limitations of roofing manufacturer's specifications and not exceeding 1/4 inch apart. All gaps greater than 1/4 inch must be filled.

INSTALLATION OF PERIMETER AND UNDERSLAB INSULATION

On vertical surfaces, set units in adhesive applied in accordance with manufacturer's instructions. Use type of adhesive recommended by manufacturer of insulation.

Protect top surface of horizontal insulation (from damage during concrete work) by application of protection board.

INSTALLATION OF GENERAL BUILDING INSULATION

Apply insulation units to substrate by method indicated, complying with manufacturer's recommendations. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

Set vapor retarder faced units with vapor retarder to warm side of construction, except as otherwise indicated. Do not obstruct ventilation spaces, except for firestopping.

Tape joints and ruptures in vapor retarder, and seal each continuous area of insulation to surrounding construction to ensure airtight installation.

Pour granular fill insulation into cavities as shown, to completely fill void spaces. Maintain inspection ports to show presence of insulation at extremities of each pour area. Close ports after complete coverage has been confirmed. Limit fall of insulation to one story in height, but not to exceed 10'-0".

INSTALLATION OF VAPOR RETARDERS

General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those which have been stuffed with loose fiber-type insulation.

Seal vertical joints in vapor retarders over framing by lapping not less than 2 wall studs. Fasten vapor retarders to framing at top, end and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners 16" o.c.

Seal overlapping joints in vapor retarders with adhesives per vapor retarder manufacturer's printed directions. Seal butt joints and fastener penetrations with tape of type recommended by vapor retarder manufacturer. Locate all joints over framing members or other solid substrates. Firmly attach vapor retarders to substrates with mechanical fasteners or adhesives as recommended by vapor retarder manufacturer.

Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with cloth or aluminized tape of type recommended by vapor retarder manufacturer to create an airtight seal between penetrating objects and vapor retarder.

Repair any tears or punctures in vapor retarders immediately before concealment by other work. cover with tape or another layer of vapor retarder.

PROTECTION

General: Protect installed insulation and vapor retarders from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

SECTION 07270

FIRE BARRIER SYSTEMS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section shall include, but not necessarily be limited to, furnishing and installing the following:

Penetrations through fire-resistance-rated floor and roof construction, including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.

Penetrations through fire-resistance-rated walls and partitions, including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.

RELATED SECTIONS

Refer to Division 15 and 16 Sections for additional requirements.

SYSTEM PERFORMANCE REQUIREMENTS

General: Provide firestopping systems that are produced and installed to resist the spread of fire, according to requirements indicated, and the passage of smoke and other gases.

F-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with F ratings indicated, as determined per ASTM E 814, but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated.

T-Rated Through-Penetration Firestop Systems: Provide through-penetration firestop systems with T ratings, in addition to F ratings, as determined per ASTM E 814, where indicated and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas. T-rated assemblies are required where the following conditions exist:

Where firestop systems protect penetrations located outside of wall cavities.

Where firestop systems protect penetrations located outside fire-resistive shaft enclosures.

Where firestop systems protect penetrations located in construction containing doors required to have a temperature-rise rating.

Where firestop systems protect penetrating items larger than a 4-inch-diameter nominal pipe or 16 sq. in. in overall cross-sectional area.

For firestopping exposed to view, traffic, moisture, and physical damage, provide products that do not deteriorate when exposed to these conditions.

For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.

For floor penetrations with annular spaces exceeding 4 inches or more in width and exposed to possible loading and traffic, provide firestop systems capable of supporting the floor loads involved either by installing floor plates or by other means.

For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

SUBMITTALS

General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

Product data for each type of product specified.

Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs) and are nontoxic to building occupants.

Product certificates signed by manufacturers of firestopping products certifying that their products comply with specified requirements.

Product test reports from, and based on tests performed by, a qualified testing and inspecting agency evidencing compliance of firestopping with requirements based on comprehensive testing of current products.

QUALITY ASSURANCE

Fire-Test-Response Characteristics: Provide firestopping that complies with the following requirements and those specified under the "System Performance Requirements" article:

Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL, Warnock Hersey, or another agency performing testing and follow-up inspection services for firestop systems that is acceptable to authorities having jurisdiction.

Through-penetration firestop systems are identical to those tested per ASTM E 814 under conditions where positive furnace pressure differential of at least 0.01 inch of water is maintained at a distance of 0.78 inch below the fill materials surrounding the penetrating items in the test assembly. Provide rated systems complying with the following requirements:

Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.

Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by UL in their "Fire Resistance Directory", by Warnock Hersey or by another qualified testing and inspecting agency.

Information within construction documents referring to specific design designations of through-penetration firestop systems is intended to establish requirements for performance based on conditions that are expected to exist during installation. Any changes in conditions and designated systems require the Architect's prior approval. Submit documentation showing that the performance of proposed substitutions equals or exceeds that of the systems they would replace and are acceptable to authorities having jurisdiction.

Single-Source Responsibility: Obtain through-penetration firestop systems for each kind of penetration and construction condition indicated from a single manufacturer.

Provide firestopping products containing no detectable asbestos as determined by the method specified in 40 CFR Part 763, Subpart F, Appendix A, Section 1, "Polarized Light Microscopy".

Coordinate Work: Coordinate construction of openings and penetrating items to ensure that designated through-penetration firestop systems are installed per specified requirements.

DELIVERY, STORAGE, AND HANDLING

Deliver firestopping products to project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life, if applicable, qualified testing and inspecting agency's classification marking applicable to project, curing time, and mixing instructions for multicomponent materials.

Store and handle firestopping materials to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

PROJECT CONDITIONS

Environmental Conditions: Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

Ventilation: Ventilate firestopping per firestopping manufacturers' instructions by natural means or, where this is inadequate, forced air circulation.

PART 2 - PRODUCTS

FIRESTOPPING, GENERAL

Compatibility: 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 firestopping manufacturer based on testing and field experience.

Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire-resistance-rated systems. Accessories include, but are not limited to, the following items:

Permanent Forming/Damming/Backing Materials, Including the Following:

Semirefractory Fiber (mineral wool) Insulation

Ceramic Fiber

Sealants Used in Combination with Other Forming/Damming Materials to Prevent Leakage of Fill Materials in Liquid State

Fire-rated Formboard

Temporary Forming materials

Substrate Primers

Collars

Steel Sleeves

Fire barrier penetration sealing systems shall be as manufactured by one of the following:

3M Brand Fire Protection Products

"Firemaster", by Thermal Ceramics

Tremco

United States Gypsum Company

Hilti

INSTALLATION DETAILS: Refer to details at the end of this Section.

Systems shall include all necessary items for use in areas as shown on the Drawings.

3M fire protection product details are included in these Specifications only to establish the level of quality, except where specific manufacturer products not listed above is specified. Equivalent products by any of the listed manufacturers will be acceptable, as approved by the Architect.

Under normal environmental conditions, all material used shall be non-corrosive to metal and compatible with synthetic cable jackets. When exposed to flame or heat, it should be capable of expanding up to ten times.

Provide all miscellaneous items required to attach materials as specified and shown on Drawings.

PART 3 - EXECUTION

EXAMINATION

Examine substrates and conditions, with installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

PREPARATION

Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:

Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.

Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.

Remove laitance and form release agents from concrete.

Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond. Do not allow spillage and migration onto exposed surfaces.

Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

INSTALLING THROUGH-PENETRATION FIRESTOPS

General: Comply with the "System Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.

Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.

Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

For fill materials that will remain exposed after completing work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

CLEANING

Clean-off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

Promptly remove any excess materials from any exposed finish surfaces. Repair floors, walls, or other surfaces which have been stained, marred, or otherwise damaged during installation of fire barrier materials.

END OFSECTION

SECTION 07311

ASPHALT SHINGLES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Extent of shingles is indicated on Drawings and is hereby defined to include moisture shedding underlayment, eave, valley and ridge protection, and associated protective flashing.

Ridge Vent

RELATED WORK

Section 00870 - Finish Color Schedule

Section 06100 - Rough Carpentry

Section 07600 - Flashing and Sheet Metal

SUBMITTALS

Product Data: Submit technical product data, installation instructions and recommendations from shingle manufacturer, including data that materials comply with requirements.

For information only, submit copies of all reference standards utilized for this project, unless duplicated in product data.

Samples: Submit full range of samples for color and texture selection. After selection, submit two full-size shingles for verification of each color/style/texture selected.

QUALITY ASSURANCE

Fire-Test-Response Classification: Where products with a fire-test-response classification are specified, provide asphalt shingles identical to those tested according to ASTM E 108 or UL 790 and listed by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify each bundle of asphalt shingles with appropriate markings indicating fire-test-response classification of applicable testing and inspecting agency. Shingles comply with UL997 for wind-resistance.

DELIVERY, STORAGE AND HANDLING

Deliver materials to avoid water damage, and store rolled goods on end. Comply with manufacturer's recommendations for job site storage and protection.

JOB CONDITIONS

Substrate: Proceed with shingle work only after substrate construction and penetrating work have been completed.

Weather Conditions: Proceed with shingle work only when weather conditions are in compliance with manufacturer's recommendations and when substrate is completely dry.

Application of perimeter underlayment permitted only when air temperature is 40 degrees F. and above.

EXTRA STOCK

Provide minimum of 2% of installed quantity of each type/color/texture shingle used in the work. Provide in unopened, clearly labeled bundles or containers.

PART 2 - PRODUCTS

ASPHALT SHINGLE MATERIALS

Fiberglass Shingles: Mineral-Granule surfaced, self-sealing, minimum 215 lb/sq fiberglass-based, strip asphalt shingles, complying with both ASTM D 3018, Type I, and ASTM D 3462, square type tab. Provide shingles with a Class A fire-test-response classification that pass the wind-resistance-test requirements of ASTM D 3161.

Acceptable Manufacturer:

Certainteed Corporation

GAF Corporation

Owens-Corning Fiberglass

Hip and Ridge Shingles: Manufacturer's standard factory precut units to match shingles.

ACCESSORIES

Asphalt-saturated Roofing Felt: No. 15 Unperforated organic felt, complying with ASTM D 226 or ASTM D 4869, 36" wide

Or approved Alternate material.

Asphalt Plastic Cement: Fibrated asphalt cement complying with ASTM D 4586, designed for trowel application.

Nails: Aluminum or hot-dip galvanized 11 or 12-gauge, sharp-pointed, conventional roofing nails with barbed shanks, minimum 3/8" diameter head, and of sufficient length to penetrate 3/4" into solid decking or to penetrate through plywood sheathing. Material of nails in contact with flashing shall match materials selected for flashing to prevent galvanic action. Staples are not permitted.

Metal Drip Edge: Minimum .024" aluminum sheet, brake-formed to provide 3" roof deck flange, and 1-1/2" fascia flange with 3/8" drip at lower edge. Furnish in 8' or 10' lengths. Color as selected by Owner's representative.

Ridge Vent

"Shingle Vent II", by Air Vent, Inc.

"Ridge Master Plus", by Mid-America Building Products Corporation

Perimeter Underlayment: Polyethylene-sheet-backed rubberized asphalt membrane, 40 mils thick. Provide primer when recommended by underlayment manufacturer.

Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to, the following:

"Bituthene Ice and Water Shield", W. R. Grace & Company (provided only in the Northern United States).

"Polyken 640 Underlayment Membrane", Polyken Technologies.

"Polyguard Deck Guard", Polyguard Products, Inc.

"Winterguard Waterproofing Shingle Underlayment", by Certainteed.

FLASHING

Sheet Metal Materials: Furnish the sheet metal materials as specified in section 07600.

Vent Pipe Flashing: Lead conforming to ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick, unless otherwise indicated. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof extending at least 4 inches (100 mm) from pipe onto roof.

Provide "Capmaster", by Mid-America Building Products, Inc. at all vent pipes.

Furnish and install additional flashing materials as specified in Section 07600.

PART 3 - EXECUTION

GENERAL

Comply with manufacturer's instructions and recommendations, but not less than those recommended by ARMS's Residential Asphalt Roofing Manual" or "The NRCA Steep Roofing Manual".

INSPECTION

Examine substrate and conditions under which shingling work is to be performed and must notify Contractor in writing of unsatisfactory conditions. Do not proceed with shingling work until unsatisfactory conditions have been corrected.

PREPARATION OF SUBSTRATE

Clean substrate of any projections and substances detrimental to shingling work. Cover knotholes or other minor voids in substrate with sheet metal flashing secured with roofing nails.

Coordinate installation of shingles with flashing and other adjoining work to insure proper sequencing. Do not install shingle roofing until all vent stacks and other penetrations through roofing have been installed and are securely fastened against movement.

INSTALLATION

General: Comply with instructions and recommendations of shingle manufacturer, except to extent more stringent requirements are indicated, but in no case less than recommended by the NRCA Steep Roofing Manual.

Do not install underlayment or shingles on wet surfaces.

Felt Underlayment: Apply one layer felt horizontally over entire surface, lapping succeeding courses a minimum of 2 inches, end laps a minimum of 4 inches, and hips and valleys a minimum of 6 inches. Fasten with sufficient number of nails to hold in place until shingle application.

Omit felt underlayment at areas of perimeter underlayment. Lap felt underlayment over perimeter underlayment as recommended by manufacturer, but not less than 2 inches.

Perimeter Underlayment: Apply minimum 36" wide layer of perimeter underlayment at eaves, under valley flashing and other locations shown on Drawings. Extend perimeter underlayment at eaves a minimum of 12" inside exterior wall line.

Apply perimeter underlayment materials promptly at air temperatures of 40 degrees Fahrenheit and above.

Metal Open Valleys: Comply with ARMA and NRCA recommendations. Install a second felt underlayment shingle lapped at least 12 inches (300 mm) and sealed with plastic asphalt cement. Install a metal valley shingle lapped at least 9 inches (225 mm) and sealed with plastic asphalt cement.

Install asphalt shingles beginning at lower end with a starter strip of roll roofing or inverted shingles with tabs removed. Fasten shingles in pattern, with weather exposure, and using a minimum of five, or number of fasteners per shingle as recommended by manufacturer. Use vertical and horizontal chalk lines or premarked underlayment to insure straight coursing.

Cut and fit asphalt shingles at ridges and edges to provide maximum weather protection. Provide same weather exposure at ridges as specified for roof. Lap shingles at ridges to shed water away from direction of prevailing wind. Fasteners at ridges shall be of sufficient length to penetrate sheathing as specified.

Flashing: Install metal flashing as indicated and in accordance with details and recommendations of the "Asphalt Roofing" Section of "The NRCA Steep Roofing Manual".

Ridge Vents: Install ridge vents according to manufacturer's instructions.

ADJUSTING

Replace any damaged materials installed under this Section with new materials meeting specified requirements.

END OF SECTION

SECTION 07464

FIBER CEMENT SIDING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Fiber Cement Exterior Siding

Related Trim, Soffits, Flashings, Accessories, and Fastenings

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 06100 – Rough Carpentry

Section 07210 – Building Insulation

Section 09900 - Painting

REFERENCES

ASTM C-1186

DELIVERY, STORAGE AND HANDLING

Protect fiber cement products during transit, delivery, storage and handling to prevent damage, soiling and deterioration. Store fiber cement materials in accordance with manufacturer's recommendations.

SUBMITTALS

Submit siding and trim material and color samples to Owner and Wyndham Worldwide for approval.

PART 2 - PRODUCTS

MATERIALS

Fiber Cement Siding, Soffits and Trim: Non-combustible fiber cement, exterior grade siding, soffit and trim board complying with ASTM C1186, Grade II, Type A. No asbestos fibers shall be contained in products. Vented soffits to be perforated per manufacturer. All materials shall come pre-finished from the factory.

Acceptable Manufacturers:

CertainTeed or approved equal

ACCESSORIES

Accessory Components: Starter strips, trim, inside and outside corners, window trim and flashing, and all other required components of same material and finish as siding as required to complete installation per manufacturer's recommendations.

Nails and Staples: Corrosion resistant type; of size, strength and type as recommended by siding manufacturer to withstand local conditions, including but not limited to wind loads, temperature, etc. All exposed nails to be prefinished to match siding and trim colors.

Sealants or Caulking: Refer to Section 07900. Use only products as approved by siding manufacturer. All caulking or sealants to be precolored to match prefinished siding and trim colors.

COLORS

Per section 00870 for prefinished siding and trim colors.

FABRICATION

Components:

Siding – CertainTeed prefinished Textured Dutch Lap fiber cement siding.

8 1/4" (7" exposure) x 12'. Siding to be sealed/primed by manufacturer with FiberTect sealant/primer prior to prefinishing.

Soffit – CertainTeed prefinished Weatherboards fiber cement vented soffit to match siding. Soffit to be sealed/primed by manufacturer with FiberTect sealant/primer prior to prefinishing.

Fascia – CertainTeed prefinished Weatherboard Smooth fiber cement fascia to match siding. 7/16"x12'. Fascia to be sealed/primed by manufacturer with FiberTect sealant/primer prior to prefinishing.

Trim - CertainTeed fiber cement trim to match siding. Trim shall be 4/4" or 5/4" by applicable width as required. All trim boards to be sealed/primed by manufacturer with FiberTect sealant/primer prior to prefinishing.

All siding and trim to be prefinished by manufacturer.

PART 3 - EXECUTION

INSPECTION

Prior to installation of siding, with siding installer present inspect substrate and adjoining work on which this work is dependent for its proper installation. All substrates shall comply with manufacturer's recommendations and tolerances. Work shall not proceed until unsatisfactory conditions are corrected.

INSTALLATION

Clean substrates of projections and substances that may be detrimental to installation.

Install flashings at sills and head of wall openings.

Fiber Cement Siding shall be installed over an approved air infiltration barrier specifically designed for use under fiber cement siding.

Install fiber cement siding, soffit and trim in accordance with manufacturer's instructions. Arrange components to encourage natural watershed. Securely fasten in place, aligned, level, and plumb.

Position cut ends over bearing surfaces. All butt joints or laps shall be installed in accordance with manufacturer's instructions. Seal all cuts and back-flash all joints. Locate splices a minimum of one stud cavity away from door and/or windows.

Install corner strips, closures, and trim.

All inside and outside corners to receive trim.

Exercise care when site cutting. Ensure cuttings or burred edges do not remain on finish surfaces.

Use concealed fasteners where possible, per manufacturer's recommendations. Maintain neat appearance.

Caulk around doors, windows, soffits and louver frames per manufacturer's recommendations. Only use caulking or sealants approved by manufacture.

Retouch paint on prefinished siding, trim and nails where required using manufacturer approved color matched paint.

Maintain minimum clearances between siding and finished grade and sidewalks, as recommended by manufacturer.

END OF SECTION

SECTION 07467

VINYL SIDING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Solid Vinyl Exterior Siding

Related Trim, Soffits, Flashings, Accessories, and Fastenings

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 07200 - Insulation: Rigid Insulation Sheathing

REFERENCES

ASTM D-3679 - Standard Specification for PVC Siding

STORAGE

Store siding flat, off the ground, away from dirt, moisture, and direct heat, and under a waterproof cover draped to permit air circulation.

SUBMITTALS

Submit siding and trim material and color samples to Owner and Microtel Corp. for approval.

PART 2 - PRODUCTS

MATERIALS

Siding: Extruded polyvinyl chloride type with integral color; minimum .044 inches thick.

Acceptable Manufacturers:

Monogram by CertainTeed

Wolverine Technologies, Inc.

ACCESSORIES

Accessory Components: Starter strips, trim, inside and outside corners, window trim and flashing, and all other required components of same material and finish as siding.

Nails and Staples: Corrosion resistant type; of size and strength to securely and rigidly retain the work.

COLORS

Per section 00870

FABRICATION

The acceptable material for exterior walls finish is vinyl siding as per ASTM-D-3679, standard specification for PVC siding with Dutch lap double 5" exposure, Wood grain texture, Butt height =.55. Exterior trim shall be White in color per color code Snow 800.

PART 3 - EXECUTION

INSPECTION

Prior to installation of siding, inspect substrate and adjoining work on which this work is dependent for its proper installation. Work shall not proceed until unsatisfactory conditions are corrected.

INSTALLATION

Install in accordance with the "Rigid Vinyl Siding Application Manual" by the Society of Plastics Industry.

Install flashings at sills and head of wall openings.

Install siding in accordance with manufacturer's instructions. Arrange components to encourage watershed. Securely fasten in place, aligned, level, and plumb. Cut board ends over bearing surfaces.

Install corner strips, closures, and trim.

All corners shall be mitered.

Exercise care when site cutting. Ensure cuttings or burred edges do not remain on finish surfaces.

Use concealed fasteners except where approved by Architect. Place sealant or gaskets to arrest weather penetration. Maintain neat appearance.

END OF SECTION

SECTION 07530

SINGLE PLY MEMBRANE ROOFING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Extent of flexible sheet roofing (FSR) is indicated on Drawings and is hereby defined to include non-traffic-bearing sheet membrane system intended for weather exposure as primary roofing.

Types of roofing systems specified in this Section utilizing flexible sheet roofing membranes include the following:

Fully Adhered System

Flexible sheet roofing membranes include the following:

Ethylene Propylene Diene Monomer (EPDM)

Installation of roof insulation and all counterflashing and accessory items are included under this Section.

RELATED SECTIONS

Section 06100 - Rough Carpentry

Section 07210 - Building Insulation

Section 07600 - Flashing and Sheet Metal

Section 07900 - Joint Sealers

QUALITY ASSURANCE

Manufacturer: Obtain primary flexible sheet roofing from a single manufacturer. Provide secondary materials as recommended by manufacturer of primary materials.

Installer: A firm with not less than five years of successful experience in installation of roofing systems similar to those required for this project and which is licensed by manufacturer of primary roofing materials.

Work associated with flexible sheet roofing, including (but not limited to) vapor retarders, insulation, flashing and counterflashing, expansion joints, and flexible sheet joint sealers, is to be performed by installer of flexible sheet roofing.

PROJECT CONDITIONS

Weather: Proceed with roofing work when existing and forecasted weather conditions permit work to be performed in accordance with manufacturers' recommendations and warranty requirements.

STORAGE OF MATERIALS

Storage of all insulation and roofing materials at site shall be in a dry place properly protected from the elements, as approved by manufacturer.

WET MATERIALS

Insulation that has become wet before or after installation shall be removed and replaced. Drying out of wet insulation will not be permitted or acceptable for installation.

SPECIAL PROJECT WARRANTY

Warranty shall cover, at no cost to the Owner, all labor and materials required to repair or replace roofing, flashing, sheet metal, copings, and metal work against leaks or faulty

workmanship. All costs for any of the above shall be absorbed by the General Contractor primarily, and his Roofing Contractor and materials manufacturer secondarily.

Warranty period is 15 years after date of Substantial Completion for labor and material with an additional five-year warranty (total of 20 years) on membrane material.

SUBMITTALS

Manufacturer's Data, Roofing

For information only, submit two copies of specifications and installation instructions from the manufacturer for each major roofing product or system required. Include certification or other data substantiating compliance with the requirements. Indicate by transmittal form that the installer has received a copy of manufacturer's installation instructions and recommendations.

Furnish from the manufacturer of product to be used above the insulation, a written statement that their material is compatible with the insulation.

Warranty

Warranty shall be submitted in triplicate by the General Contractor to the Owner for review and file.

Shop Drawings: Submit Shop Drawings showing roof configuration, sheet layout, seam locations, colors (as applicable), details perimeter and special conditions.

REGULATORY REQUIREMENTS

Factory Mutual Engineering Corporation (FM): Roof Assembly Classification, **[revise to suit location.]**

PART 2 - PRODUCTS

GENERAL

Compatibility: Provide products which are recommended by manufacturers to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

FULLY ADHERED SYSTEM, EPDM MEMBRANE

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work shall be one of the following:

Roofing Products International, Inc. (216/662-7555)

"Royal Edge Fully Adhered System"

Carlisle Syntec Systems (800/345-EPDM)

"Sure-Seal Adhered Roofing System"

Versico Incorporated (800/992-7663)

"Versigard Adhered System"

PHYSICAL PROPERTY	SPECIFICATION VALUE	TEST METHOD
Color	Black	-----
Tensile Strength	1305 psi min.	ASTM D412
Elongation	300% min.	ASTM D412
PHYSICAL PROPERTY	SPECIFICATION VALUE	TEST METHOD
Tear Resistance	180 lb/in min.	ASTM D624(DieC)
Brittleness		
Temperature	Pass @ -40 deg. F.	ASTM D746
Shore A Hardness (3 second reading)	65 +/- 10	ASTM D2240

Ozone Resistance	No cracks, 7x	ASTM D1149 110mPa/166h 40 deg. C/50% extension
Heat Aging		ASTM D573 166h @125deg. C
Tensile Strength	1710 psi min.	
Elongation	225% min.	
Water Absorption	+2% max.	ASTM D471 7 days @70deg. C

Membrane: EPDM Membrane shall be supplied in .060 mil, black, of standard sizes up to 40 feet in width and 125 feet in length, or the longest sheet possible, as required by each installation.

Flashing: Shall be minimum .060" thickness, EPDM elastomer with factory applied adhesive backing, or field applied adhesive applied, as recommended by the manufacturer.

Joint Tape: Same material as membrane with adhesive or clean surface for solvent joint adhesion, as recommended by the membrane manufacturer.

Sealant: As recommended by the membrane manufacturer.

Bonding Adhesive: Shall be compatible with substrate materials to which the membrane is to be adhered, as recommended by manufacturer.

Lap and Water Stop Sealant: Shall be gun or trowel consistency for use in sealing flashing edges, as recommended by manufacturer.

Pourable Sealer: Compatible with materials with which it is used, as recommended by manufacturer.

Night Seal: Compatible with materials with which it is used, as recommended by manufacturer, to seal work in progress when inclement weather occurs or is expected.

Splice Wash: Material recommended by manufacturer.

Other Materials: Furnish other materials not shown or specified required for complete and proper installation of roof system, as recommended by the roofing manufacturer.

INSULATION: As specified in Section 07200 of the Specification, compatible with and approved by the Roofing System Manufacturer.

AUXILIARY MATERIALS FOR ROOFING SYSTEM

Sheet Seaming System: Manufacturer's standard materials for sealing lapped joints, including edge sealer to cover exposed spliced edges as recommended by manufacturer of FSR system.

Tapered Edge Strips and Flashing Accessories: Types recommended by manufacturer of FSR material, provided at locations indicated and at locations recommended by manufacturer., including adhesive tapes, flashing cements, and sealants.

Flashing Material: Manufacturer's standard system compatible with flexible sheet membrane shall be minimum .06" thickness.

Membrane Adhesive: As recommended by FSR membrane manufacturer for particular substrate and project conditions, formulated to withstand min. 60 psf uplift force.

Molded Pipe Seals: Factory molded pipe seals with stainless steel clamps. Site as required for all roof pipe penetrations. Color shall be black.

FASTENERS (RIGID INSULATION)

Fastener Plate: Shall be Factory Mutual approved, minimum 3" square galvalume plate and shall be used as part of the plate/fastener assembly with the fastener plate to mechanically attach the insulation and membrane to the roof deck.

PART 3 - EXECUTION

PREPARATION OF SUBSTRATE

General: Comply with manufacturers' instructions for preparation of substrate to receive FSR system.

Clean substrate of dust, debris, and other substances detrimental to FSR system work. Remove sharp projections. Do not apply sheet roofing to damp, frozen, dirty, dusty, or deck surfaces unacceptable to manufacturer. Roof surface shall be free of ponded water, ice, or snow.

Install flashings, and accessory items as shown, and as recommended by manufacturer even though not shown.

Prime substrate where recommended by manufacturer of materials being installed.

Prevent compounds from entering and clogging drains and conductors, and from spilling or migrating onto surfaces of other work.

INSPECTION

The Contractor shall be responsible for providing a proper substrate to receive the roofing system. Installation shall not proceed until substrate is inspected and approved by the Owner's representative .

Substrate shall have positive drainage and shall be verified by Contractor prior to installation of new materials.

Surface joints shall be less than 1/4" wide. All joints wider than 1/4" must be repaired with proper materials.

Verify that drains, sleeves, and curbs which pass through surfaces to receive roofing are rigidly installed.

Surfaces to receive new materials shall be as required by manufacturer to ensure a proper bond.

Verify that surfaces are free of cracks, depressions, waves, or projections which may be detrimental to successful installation. Remove foreign materials.

Starting work of this Section means acceptance of substrate and site conditions.

INSTALLATION - GENERAL

Comply with the instructions and recommendations of the roofing materials manufacturer, except to the extent more stringent requirements are indicated.

Confinement of Materials: Do not allow fluid and plastic materials to spill or migrate beyond surfaces of intended application, or to flow into drains, conductors, or ceilings below.

Performance: It is required that roofing work be watertight for normal weather exposures, and not deteriorate in excess of manufacturer's published limitations.

INSTALLATION OF ROOF DECK INSULATION

The insulation shall be installed mechanically-fastened to deck according to the roofing manufacturer's recommendations. Mechanical fasteners shall penetrate into the decking as required by Factory Mutual and manufacturer of roofing materials.

Stagger joints in boards, forming a complete thermal envelope.

Fasteners shall be spaced a maximum of 2'-0" o.c. and there shall be one fastener installed at each and every corner of each board, and in addition, the pattern of fasteners shall conform to specified Requirements for wind uplift.

Exposure: Do not install more insulation each day than will be covered by waterproofing by end of same day.

MEMBRANE INSTALLATION

Edges of roofing shall be sealed at the end of each day's work and if inclement weather is expected during the work period.

PROTECTING ROOFING

After completing roofing (including associated work), institute appropriate procedures for surveillance and protection of roofing during remainder of construction period. At the end of the construction period, or at a time when remaining construction will in no way affect or endanger roofing, make a final inspection of roofing and prepare a written report to Owner, describing nature and extent of deterioration or damage found.

Repair or replace (as required) deteriorated or defective work found at the time of final inspection to a condition free of damage and deterioration at the time of substantial completion and according to requirements of the specified warranty.

DEFECTIVE WORK

Refinish or remove and replace insulation surfaces not acceptable to receive roofing or where physical properties do not meet specified requirements.

END OF SECTION

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Exposed Trim and Fascia

Roof Drainage Systems

Metal Flashing

Flashing at Windows, Doors and other locations as shown on Drawings.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 06100 - Rough Carpentry: Installation of Wood Blocking, Nailers, and Grounds.

Section 07311 - Asphalt Shingles

Section 07900 - Joint Sealers

QUALITY ASSURANCE

Installer Qualifications: Engage an experienced installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

SUBMITTALS

Submit Shop Drawings, color samples, product information, and samples clearly detailing shaping, jointing, length of sections, fastening, and installation details.

For information only, submit two copies of Specifications, installation instructions, and general recommendations by the manufacturer of flashing and sheet metal materials. Include published data or certified test data for each material showing compliance with the requirements. Indicate by transmittal form that one copy of each installation instruction has been distributed to the installer.

EXISTING CONDITIONS

Exercise care when working on or about roof surfaces to avoid damaging or puncturing membrane or flexible flashings.

Place plywood panels on roof surfaces adjacent to work of this Section and on access routes. Keep in place until completion of work.

Roofing and flashing shall not be applied during precipitation and shall not be started in the event there is a probability of precipitation during application. Metal faced flashing shall not be applied when ambient temperature is below 35 degrees F.

WARRANTY

Provide Owner with warranty stating that flashing material and metal wall fascia will properly shed water and protect roof and wall from physical damage for a minimum period of five years from date of Substantial Completion and the damage resulting from failure to provide above stated performances will be repaired to satisfaction of Owner at no additional cost.

PART 2 - PRODUCTS

ALUMINUM FLASHING

Materials

Aluminum Sheet: ASTM B209, Alloy 3003, Temper H14, AA-C22A41, minimum .027 inch thick (24 gauge) sheet of smooth finish with factory applied anodized finish.

Fasteners: Concealed type; of same material as flashings; sized to suit application.

Size and shape as shown on Drawings.

GUTTERS AND DOWNSPOUTS

Materials

Minimum .027 inch thick sheet aluminum conforming to requirements of ASTM B209, with factory applied anodized finish.

Anchorage Devices: Type recommended by manufacturer and acceptable to the Architect.

Size and shape as shown on Drawings.

WALL FLASHING: Perm-A-Barrier wall flashing and Perm-A-Barrier primer as manufactured by W.R. Grace & Company.

MISCELLANEOUS MATERIALS AND ACCESSORIES

Bituminous Paint: Acid and alkali-resistant type; black color; FS TT-C-494 or SSPC-Paint 12 solvent type, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants".

Epoxy Seam Sealer: Two-part, noncorrosive, aluminum seam-cementing compound, recommended by aluminum manufacturer for exterior and interior nonmoving joints, including riveted joints.

Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

FABRICATION, GENERAL

Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

Form gutters and downspouts of profiles and sizes indicated and as required to properly collect and remove water. Fabricate complete with required connection pieces.

Form sections square, true, and accurate in size, in maximum possible lengths and free of distortions and defects detrimental to appearance or performance. Hem exposed edges. Allow for expansion at joints.

Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

Form exposed sheet metal work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

Seams: Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Expansion Provisions: Comply with SMACNA standards. Space movement joints at maximum of 10 feet (3 m) with no joints allowed within 24 inches (610 mm) of corner or intersection. Where lapped or bayonet-type expansion provisions in work cannot be used or would not be sufficiently weatherproof and waterproof, form expansion joints of intermeshing hooked flanges, not less than 1 inch (25 mm) deep, filled with mastic sealant (concealed within joints).

Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

Size: As recommended by SMACNA manual or sheet metal manufacturer for application, but never less than thickness of metal being secured.

PART 3 - EXECUTION

GENERAL INSTALLATION REQUIREMENTS

Comply with manufacturer's instructions and recommendations for handling and installation of flashing and sheet metal work.

Performance: Coordinate the work with other work for the correct sequencing of items which make up the entire membrane or system of weatherproofing or waterproofing and rain drainage. It is required that the flashing and sheet metal work be permanently watertight, and not deteriorate in excess of manufacturer's published limitations.

Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

INSTALLATION

GENERAL: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual". Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install work with laps, joints, and seams that will be permanently watertight and weatherproof.

Install exposed sheet metal work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.

Sealed Joints: Form nonexpansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards. Fill joint with sealant and form metal to completely conceal sealant.

Use joint adhesive for nonmoving joints specified not to be soldered.

Seams: Fabricate nonmoving seams in sheet metal with flat-lock seams. Tin edges to be seamed, form seams, and solder. Fabricate nonmoving seams in aluminum with flat-lock seams. Form seams and seal with epoxy seam sealer. Rivet joints for additional strength.

Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

Roof-Penetration Flashing: Coordinate roof-penetration flashing installation with roofing and installation of items penetrating roof. Install flashing as follows:

- Turn lead flashing down inside vent piping, being careful not to block vent piping with flashing

- Seal and clamp flashing to pipes penetrating roof, other than lead flashing on vent piping.

Cleaning and Protection

- Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

- Provide final protection and maintain conditions that ensure sheet metal flashing and trim work during construction is without damage or deterioration other than natural weathering at the time of Substantial Completion.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Clean and Prepare Joint Surfaces

Sealant and Backing Materials

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 07620 - Sheet Metal Flashing and Trim

SUBMITTALS

Submit product data, samples and manufacturer's surface preparation and installation instructions.

For information only, submit copies of all referenced standards utilized for this project, unless duplicated in product data.

Submit samples of each color required for each type of joint sealer exposed to view.

WARRANTY

Submit two copies of a written guarantee agreeing to repair or replace joint sealers which fail to perform as air tight and watertight joints; or fail in joint adhesion, cohesion, abrasion resistance weather resistance, or general durability; or appear to deteriorate in any other manner not clearly specified by submitted manufacturer's data as an inherent quality of the material for the exposure indicated. Provide two-year warranty.

Replace sealants which fail because of loss of cohesion or adhesion or do not cure.

PART 2 - PRODUCTS

SEALANT MATERIALS - GENERAL CAULKING: Masonry walls, window perimeters, Ceramic Tile and other exterior joints as shown on Drawings.

Sealant composition shall be an epoxidized polyurethane terpolymer in a multicomponent form.

Specified products are "Dymeric 511", as manufactured by Tremco or "Sonolastic NP11" as manufactured by Sonneborn Building Products. Color to be selected from Tremco "Fastpack" color system or approved equal.

Performance Characteristics: Hardness, Average 35 (Shore A) after 5 years, Sagging - none up to 122 degrees F, low temperature flexibility -64 degrees F, meets U.S. Spec. TT-S-00227E, Class A.

SEALANT MATERIALS - GLAZING

Sealant composition shall be a silicone base, single component, solvent curing, capable of withstanding movement of up to 50 percent of joint width and shore a hardness of 26. Sealant shall conform to ASTM C920, TTS-S-001543A and TT-S-00230C (COM-NBS).

Specified product is "SILGLAZE N" as manufactured by General Electric Company, "SPECTREM 2" by Tremco, or approved equal.

SEALANT MATERIALS - HOLLOW METAL FRAMES

Sealant composition shall be an epoxidized polyurethane terpolymer in a single component form.

Specified products are "Dymonic" as manufactured by Tremco, "Sonolastic NPI" as manufactured by Sonneborn Building Products, or approved equal.

Sealant shall be used continuously between the intersection of the frame and adjacent wall material.

ACCESSORIES

Primer: Non-staining type, recommended by sealant manufacturer to suit application.

Joint Cleaner: Non-corrosive and nonstaining type, recommended by sealant manufacturer; compatible with joint forming materials.

Joint Filler: ASTM D1056; D1565; round, closed cell polyethylene, non-gassing rod oversized 30 percent.

"Sonofoam Soft Backer-Rod", by Sonneborn

Approved Equal

Bond Breaker: Pressure sensitive polyethylene tape recommended by sealant manufacturer to suit application.

Cleaners for Nonporous Surfaces: Provide nonstaining, chemical cleaners of type which are acceptable to manufacturers of sealants and sealant backing materials, which are not harmful to substrates and adjacent non-porous materials, and which do not leave oily residues or otherwise have a detrimental effect on sealant adhesion or in-service performance.

Masking Tape: Provide nonstaining, nonabsorbent type compatible with joint sealants and to surfaces adjacent to joints.

PART 3 - EXECUTION

EXAMINATION

Examine joints indicated to receive joint sealers, with Installer present, for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealer performance. Do not proceed with installation of joint sealers until unsatisfactory conditions have been corrected.

PREPARATION

Surface Cleaning of Joints: Clean out joints immediately before installing joint sealers to comply with recommendations of joint sealer manufacturers and the following requirements:

Remove all foreign material from joint substrates which could interfere with adhesion of joint sealer, including dust; paints, except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer; old joint sealers; oil; grease; waterproofing; water repellents; water; surface dirt; and frost.

Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous joint substrate surfaces, by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealers. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Remove laitance and form release agents from concrete.

Joint Priming: Prime joint substrates where indicated or where recommended by joint sealer manufacturer based on pre-construction joint sealer-substrate tests or prior experience. Apply primer to comply with joint sealer manufacturer's recommendations. Confine primers to areas of joint sealer bond, do not allow spillage or migration onto adjoining surfaces.

Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces which otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears such as masonry or EIFS materials. Remove tape immediately after tooling without disturbing joint seal.

INSTALLATION OF JOINT SEALERS

General: Comply with joint sealer manufacturers' printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

Installation of Sealant Backings: Install sealant backings to comply with the following requirements:

Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths which allow optimum sealant movement capability. Do not leave gaps between ends of joint fillers. Do not stretch, twist, puncture, or tear joint fillers. Remove absorbent joint fillers which have become wet prior to sealant application and replace with dry material.

Install bond breaker tape between sealants and joint fillers, compression seals, or back of joints where adhesion of sealant to surfaces at back of joints would result in sealant failure. Bond breaker must be used in all conditions where three-sided adhesion may be possible.

Install compressible seals serving as sealant backings to comply with requirements indicated above for joint fillers.

Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths which allow optimum sealant movement capability.

Tooling of Nonsag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents which discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

Provide concave joint configuration per Figure 6A in ASTM C 962, unless otherwise indicated.

Use masking tape to protect adjacent surfaces of recessed tooled joints.

All joints shall be free of air pockets, foreign embedded matter, ridges, and sags.

CURE: Cure sealant in compliance with manufacturer's instructions and recommendations to obtain high, early bond strength, internal cohesion strength and surface durability.

CLEANING: Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealers and of products in which joints occur.

PROTECTION: Protect joint sealers during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage and deterioration occurs, cut out and remove damaged or deteriorated joint sealers immediately and reseal joints with new materials to produce joint sealer installations with repaired areas indistinguishable from original work.

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: The work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Interior Hollow Metal Doors and Frames

Exterior Hollow Metal Doors and Frames

Interior Hollow Metal Lites

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 04200 - Unit Masonry

Section 07900 - Joint Sealers

Section 08210 - Wood Doors & Knock-Down Steel Frames

Section 08710 - Finish Hardware

Section 08800 - Glazing

Section 09260 - Gypsum Wallboard Systems

Section 09900 - Painting

PRODUCT HANDLING

Deliver hollow metal work cartoned or crated to provide protection during transit and job storage.

Label each item, before shipping, with metal or plastic tags to show their location, size, door swing, and other pertinent information.

QUALITY ASSURANCE

Hollow metal doors and frames shall be fabricated in accordance with standards and specifications established by Steel Door Institute.

Opening Assemblies shall meet the requirements of NFPA 105 Hot Smoke Test.

All stairwell doors and other doors as may be shown on the Drawings shall comply with the temperature-rise rating of 450 degrees F maximum in 30 minutes of fire exposure.

Inspection: General Contractor shall provide, in writing to Owner, an inspection of all Steel Doors and Frames for conformance to specifications. Inspection shall include checking for fit tolerance plumb and level, as well as proper hardware and operation.

REFERENCES

SDI - Steel Door Institute Publications SDI 100, 105 through 122

ANSI /A123.1 "Standard Nomenclature for Steel Doors and Steel Frames"

ANSI/A224.1 "Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

SUBMITTALS: Submit Shop Drawings and product data indicating pertinent dimensioning, construction, component connections and locations, anchorage methods and locations, hardware locations and installation details.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS: Except as otherwise specified herein or specifically approved by the Architect, all hollow metal doors and frames shall be products of any of the following manufacturers subject, however, to compliance with Specification requirements:

The Steelcraft Manufacturing Company

The Ceco Corporation

Republic Steel Corporation

SHOP PAINTING: Apply a primed finish to all ferrous metal surfaces furnished under this Section. Clean and chemically treat metal surfaces to assure maximum paint adherence. Follow with a dip or spray coat of rust-inhibitive metallic oxide, zinc chromate, or synthetic resin primer on all exposed surfaces. Finished surfaces shall be smooth and free from irregularities and rough spots.

HOLLOW METAL FRAMES

LOCATION AND TYPE: All metal frames for doors shall be formed of steel to sizes and shapes indicated. Frames shall be fabricated with full welded unit type construction at joints. Frames shall be furnished with Underwriter's Laboratories label, as required, at the place of manufacturer. Knock-down type frames will not be permitted.

TYPE AND GAUGES OF METAL: Metal for frames shall be cold-rolled or hot-rolled, pickled and oiled, steel sheets with clean, smooth surfaces. Except where other gauges are indicated or specified, frames shall be fabricated from steel, not lighter than the following U.S. Standard gauges: Interior frames shall be 16-gauge, unless designated otherwise. Exterior frames shall be 14 gauge sheets, 0.30 per square foot per side, hot-dipped galvanized or electrolytic zinc-coated steel with a stretcher level degree of flatness.

Cold-rolled steel shall conform to ASTM A336; hot-rolled steel to ASTM A569; hot-dipped galvanized with ASTM A526 with ASTM A525; or electrolytic zinc-coated steel to ASTM A591 Class "A".

WORKMANSHIP AND DESIGN: The finished work shall be strong and rigid, neat in appearance, and free from defects. Fabricate members straight and true with corner joints well-formed, in true alignment and fastenings concealed where practicable.

FORMING CORNER JOINTS: Joints for welded-type frames shall be mitered and continuously arc-welded for full depth and width of frame and trim. All contact edges shall be closed tight and all welds on exposed surfaces dressed smooth and flush.

PROVISION FOR HARDWARE: Frames shall be prepared at the factory for the installation of hardware. Welding of hinges to frames will not be permitted. Frames shall be mortised, reinforced, drilled, and tapped to templates to receive all mortised hardware. Provide cover boxes in back of all hardware cutouts. Lock strikes shall be set out and adjusted to provide clearance for silencers.

Provide concealed metal reinforcements for hardware as required. The gauges of metal for reinforcement shall be in accordance with the manufacturer's recommendations for the type of hardware and the thickness and width of doors to be hung in the frame, provided that the gauges used are not lighter than those required by Commercial Standard CS-242-62, and of the following: a minimum thickness of steel reinforcing plates for the following hardware.

Hinges and Pivots: 0.1793 inch (4.6 mm) thick by 1-1/2 inches (38 mm) wide by 6 inches (150 mm) longer than hinge, secured by not less than 6 spot welds.

Strikes Flush Bolts, and Closers: 0.1046 inch (2.7 mm).

Surface-Mounted Hold-Open Arms and Panic Devices: 0.1046 (2.7 mm).

Galvanize all reinforcement for exterior doors.

JAMB ANCHORS: Furnish jamb anchors as required to secure frames to adjacent construction, formed of not less than 0.0516 inch (1.3 mm) thick galvanized steel.

Masonry Construction: Adjustable, flat, corrugated, or perforated, T-shaped to suit frame size, with leg not less than 2 inches (50 mm) wide by 10 inches (250 mm) long. Furnish at least 3 anchors per jamb up to 90 inches (2250 mm) in height, 4 anchors up to 96 inches (2400 mm) in jamb height, and 1 additional anchor for each 24 inches (600 mm) or fraction thereof over 96 inches (2400 mm) in height.

FLOOR ANCHORS: Provide floor anchors for each jamb and mullion that extends to floor, formed of not less than 0.0747 inch (1.9 mm) thick galvanized steel sheet, as follows:

Monolithic Concrete Slabs: Clip-type anchors, with 2 holes to receive fasteners, welded to bottom of jambs and mullions.

Separate Topping Concrete Slabs: Adjustable type with extension clips, allowing not less than 2 inch (50 mm) height adjustment. Terminate bottom of frames at finish floor surface.

HEAD ANCHORS: For frames more than 42 inches (1066 mm) wide mounted in stud walls, provide 2 head anchors.

HEAD REINFORCING: For frames over 48 inches (1200 mm) wide in masonry wall openings, provide continuous steel channel or angle stiffener, not less than 0.1046 inch (2.7 mm) thick for full width of opening, welded to back of frame at head. Where installed in masonry, leave vertical mullions in frames open at top for grouting.

SPREADER BARS: Provide removable spreader bar across bottom of frames, tack welded to jambs and mullions.

PLASTER GUARDS: Provide 0.0179 inch (0.45 mm) thick steel plaster guards or dust cover boxes, welded to frame, at back of hardware cutouts where mortar or other materials might obstruct hardware operation and to close off interior of openings.

SHIPMENT: For welded type frames, provide temporary steel spreaders fastened across bottom of frames. Where construction will permit concealment, leave spreaders in place after installation. Otherwise, remove spreaders after frames are set and anchored. In place of spreaders, frames may be strapped together in pairs with heads inverted for bracing during shipment. Before shipping, label each frame with metal or plastic tapes to show their location, size, door swing, and other pertinent information.

HOLLOW METAL DOORS

TYPE AND GAUGES OF METAL: Metal for doors shall be cold-rolled, pickled and oiled, stretcher leveled steel sheets with clean, smooth surfaces. The gauges of metal shall be as follows:

Interior Doors: 16 gauge for face sheets, stiles and rails; 20 gauge louvers; 18 gauge moldings and trims; anchors not less than 15 gauge.

Metal shall be phosphate treated prior to painting.

Exterior doors shall be fabricated as thermal insulating door and frame assemblies and tested in accordance with ASTM C-236. Provide thermal-rated assemblies with U-factor of 0.24 or better. 16-gauge face sheets, 0.30 per square foot per side, hot-dipped galvanized or electrolytic zinc-coated steel with a stretcher level degree of flatness.

Cold-rolled steel shall conform to ASTM A336; hot-rolled steel to ASTM A569; hot-dipped galvanized to ASTM A525; or electrolytic zinc-coated steel to ASTM A591 Class "A".

REINFORCE INSIDE OF DOORS with vertical steel sheet sections not less than 0.0299 inch (0.75 mm) thick. Space vertical reinforcing 6 inches (150 mm) o.c. and extend full door height. Spot weld to both face sheets at not more than 6 inches (150 mm) o.c.

REINFORCE TOPS AND BOTTOMS with 0.0598 inch (1.5 mm) thick horizontal steel channels spot welded maximum 6 inches (150 mm) o.c. to outer sheets. Close top and bottom edges to provide flush, waterproof weather seal, as integral part of

door construction or by adding inverted steel channels at least 0.0598 inch (1.5 mm) thick.

WORKMANSHIP: The finished work shall be rigid, neat in appearance, and free from defects; form molding members straight and true with joints coped or mitered, well formed and in true alignment. All welded joints on exposed surfaces shall be dressed smooth so they are invisible after finishing.

DOOR SIZES AND CLEARANCES: Doors shall be of type, sizes, and design indicated. The clearances for doors shall be 1/8" at jambs and heads and 3/4" at bottom, unless indicated or specified otherwise. Clearances at meeting edges of pairs of doors shall be 1/4" (1/8" on fire doors).

PROVISIONS FOR HARDWARE: Mortise, reinforce, drill, and tap doors at factory to receive all mortise-type hardware. Provide reinforcing only for doors to receive surface-applied hardware, except push plates and kick plates; drilling and tapping for surface-applied hardware will be done in the field. Provide metal reinforcing plates for surface-applied hardware as required. The gauges of metal for reinforcing plates shall comply with manufacturer's recommendation for the type of hardware used and the size and thickness of doors, provided that the minimum requirements are as follows:

Hinge Reinforcement - 3/16 Inch

Strike Reinforcement - 11 Gauge

Closers and Bracket Reinforcement - 12 Gauge

Mortise Covers - 26 Gauge

The gauges used shall not be lighter than those required by Commercial Standard CS 242-62.

Doors with labels shall carry Underwriters label on the door and on the frame. They shall be constructed to meet Procedure No. R-3791 and R-3821, as listed by Underwriters Laboratories.

All building exterior doors must have threshold and interlocking weather stripping and shall have DSH I #105 "Cush-N-Seal" per Door and Hardware Systems, Inc., 13 Silver Street, Rochester, NY 14611: Phone (716)235-8543; Fax: (716)2350431. Installed per manufacturer recommendations.

Furnish and install vision lites and louvers of sizes and locations as shown on the Drawings. Provide fusible link louvers at fire-rated doors.

PART 3 - EXECUTION

GENERAL

Fabricate and install hollow metal units and their accessories in strict accordance with these Specifications and manufacturer's data.

Installation shall be with fasteners supplied by the manufacturer. Self-drilling/tapping screws are not acceptable and will be rejected.

PLACING FRAMES

Comply with the provisions of the "Steel Door Institute" 105, unless otherwise indicated.

Set frames accurately in position, plumbed, aligned, and braced until permanent anchors are set.

Anchor bottom of frames to floors with expansion bolts, or with power fasteners. Build wall anchors into walls or secure to adjoining construction as indicated or specified. Where frames require ceiling struts or other structural overhead bracing, they shall be anchored securely to ceiling or structural framing above as indicated and specified.

Install fire-rated frames in accordance with NFPA Standard No. 80.

DOOR INSTALLATION

Fit hollow metal doors accurately in their respective frames within clearances specified in SDI 100.

Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

ADJUSTMENT

Check and readjust operating finish hardware items in hollow metal work just prior to final inspection.

Remove and replace defective work including doors or frames which are warped, bowed, or otherwise damaged.

TOUCH-UP

Immediately after erection of hollow metal work, sand smooth any rusted or damaged areas of prime coat and touch-up of compatible air drying primer.

PROTECTION: Protect doors and frames from damage during transportation and at the job site; store at the site under cover on wood blocking or on suitable floors. After installation, protect doors and frames from damage during subsequent construction activities. Damaged work will be rejected and shall be replaced with new work. Factory enameled finished work shall be shipped in cartons or other suitable containers.

CLEANING: Upon completion, metal surfaces of doors and frames that are completely factory finished shall be thoroughly cleaned and touched-up as recommended by the door manufacturer.

In accordance to Microtel Inn Design and Construction Standards manual, these doors shall be installed at all exterior door openings in the mechanical room, laundry room, and at all stairwell exterior doors.

END OF SECTION

SECTION 08210

INTERIOR WOOD DOORS AND METAL FRAMES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK

Extent and location of each type of flush wood door is indicated on Drawings and in schedules – color per Microtel color scheme.

Types of doors required include the following:

Pre-finished Solid Core Flush Wood Doors with Wood Veneer Faces

Pre-finished Hollow Core Flush Wood Doors with Wood Veneer Faces

RELATED WORK

Section 00870 - Finish Color Schedule

Division 6 - Rough and Finish Carpentry

Section 08110 - Steel Doors and Frames

SUBMITTALS

Product Data: Door manufacturer's technical data for each type of door, including details of core and edge construction, trim for openings and louvers, and factory-finishing specifications.

Shop Drawings: Submit Shop Drawings indicating location and size of each door, elevation of each kind of door, details of construction, location and extent of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.

Submittals shall use the same designations for door and hardware numbers as shown on the Drawings.

QUALITY ASSURANCE

Quality Standards: Comply with the following standards:

NWWDA Quality Standard: I.S.1-A "Architectural Wood Flush Doors", of National Wood Window and Door Association (NWWDA).

AWI Quality Standard: "Architectural Woodwork Quality Standards", including Section 1300 "Architectural Flush Doors", of Architectural Woodwork Institute (AWI) for grade of door, core construction, finish and other requirements exceeding those of NWWDA quality standard.

Fire-Rated Wood Doors: Provide wood doors that comply with NFPA 80, are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152, and which are labeled and listed for ratings indicated by UL, Warnock Hersey or other testing and inspection agency acceptable to authorities having jurisdiction.

Manufacturer: Obtain doors from one source and by a single manufacturer.

Inspection: General Contractor shall provide, in writing to Owner, an inspection of all doors and frames for conformance to specifications. Inspection shall include checking for fit tolerance, plumb and level, as well as proper hardware and operation.

PRODUCT DELIVERY, STORAGE, AND HANDLING

Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of

NWWDA pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as with manufacturer's instructions.

Identify each door with individual opening numbers which correlate with designation system used on Shop Drawings for door, frames, and hardware, using temporary, removable or concealed markings.

PROJECT CONDITIONS

Conditioning: Do not deliver or install doors until building is enclosed, wet work is complete, and conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to Project's geographical location:

Referenced AWI quality standard including Section 100-S-11, "Relative Humidity and Moisture Content".

WARRANTY

General: Warranties shall be in addition to and run concurrent with, and not be a limitation of, other rights the Owner may have under the Contract Documents.

Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form signed by manufacturer, Installer and General Contractor, agreeing to repair or replace defective doors that have warped (bow, cup or twist) more than 1/4 inch in a 42" x 84" section, or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3 inch span, or do not conform to tolerance limitations of referenced quality standards.

Warranty shall also include reinstallation and finishing that may be required due to repair or replacement of defective doors where defect was not apparent prior to hanging.

Warranty shall be in effect during the following period after date of Substantial Completion:

Solid Core Interior Doors: Limited Lifetime

Hollow Core Interior Doors: One Year

Contractor's Responsibilities: Replace or refinish doors where Contractor's work contributed to rejection or to voiding of manufacturer's warranty.

PART 2 - PRODUCTS

DOORS

INTERIOR FLUSH WOOD DOORS

Available Manufacturers: Subject to compliance with requirements, provide doors by one of the following:

Mohawk Corporation

Graham Manufacturing Corporation

Chapell Door Company

Solid Core Doors for Transparent Finish: Comply with the following requirements:

Faces: Rotary Sliced Red Oak, ANSI/HPVA A Grade, Pair and Book-Matched, veneer thickness to be manufacturer's standard, but not less than 1/50 inch before field sanding. Wood species, color and finish per Microtel color scheme.

AWI Grade: "A" Grade

Construction: 5-ply

Core: Particleboard, ANSI/A208.1, 1-LD-2

Thickness: 1-3/4"

Fire-Rated Solid Core Doors: Comply with the following requirements.

Faces and AWI Grade: Provide faces and grade to match non-rated doors in same area of building, unless otherwise indicated.

Construction: Manufacturer's standard core construction as required to provide fire-resistance rating indicated.

Hollow Core Doors for Transparent Finish: Comply with the following requirements:

Faces: Rotary sliced Red Oak, pair and book matched

AWI Grade: "A" Grade

Core: Standard Hollow Core

Blocking: Provide Wood Blocking of same thickness as core.

Thickness: 1 3/8"

FABRICATION

Fabricate flush wood doors to produce doors complying with following requirements:

Vertical edge bands shall be 3/4" outer strip to match face veneer. Top and bottom edges shall be 1-1/4" minimum thickness of hardwood. Veneer tape edges are not acceptable and will be rejected.

Factory-prefit and premachine doors to fit frame opening sizes indicated with the following uniform clearances and bevels:

Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.

Openings: Cut and trim openings through doors to comply with applicable requirements of referenced standards for kind(s) of doors required.

Light Openings: Trim openings with moldings of material and profile indicated.

Finish Wood Doors at factory with AWI Premium Grade with performance requirements comparable to either AWI System TR-2 Catalyzed Lacquer or AWI System TR-4 Conversion Varnish.

Effect: Semi-filled

Sheen: Satin

PART 3 - EXECUTION

EXAMINATION

Examine installed door frames prior to hanging door.

Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.

Reject doors with defects.

Do not proceed with installation until unsatisfactory conditions have been corrected.

INSTALLATION

Hardware: For installation see Division 8, "Finish Hardware" Section of these Specifications.

Provide reinforcement for all hardware as required.

Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.

Install fire-rated doors in corresponding fire-rated frames in accordance with requirements of NFPA No. 80.

Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.

Fitting Clearances for Non-Rated Doors: Provide 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4" clearance from bottom of door to top of threshold.

Fitting Clearances for Fire-Rated Doors: Complying with NFPA 80.

Bevel non-rated doors 1/8" in 2" at lock and hinge edges.

Bevel fire-rated doors 1/8" in 2" at lock edge; trim stiles and rails only to extent permitted by labeling agency.

Field-Finished Doors: Refer to the following for finishing requirements:

Division 9 Section, "Painting"

ADJUSTING AND PROTECTION

Operation: Rehang or replace doors which do not swing or operate freely.

Finished Doors: Refinish or replace doors damaged during installation.

Protect doors as recommended by door manufacturer to ensure that wood doors will be without damage or deterioration at time of Substantial Completion.

In accordance to Microtel Inn Design and Construction Standards manual, the following shall apply:

DOORS AND FRAMES

Hollow metal Steel frames must be used at all interior openings, 18 gauge, constructed with standard jamb anchors, per S.D.I.-100 and be factory finished.

GENERAL

- Furnish and deliver prefinished or primed steel door frames for interior doors.
- Door frames shall be fixed throat type.
- Refer to drawings, door schedule and details for required types and sizes of frames.

REGULATORY REQUIREMENTS

Fire rated steel frames shall be of the types tested and approved by Inchcape Testing Services, Warnock Hersey and shall bear the labels of the same. Rated frames shall receive a permanent embossed fire rating label.

QUALIFICATIONS

Assembly and installations, including field modifications, shall be performed by qualified personnel which have been approved by the architect or owner's representative.

All product modifications shall be performed by the manufacturer or a modification distributor approved by the manufacturer.

SHOP DRAWINGS AND PRODUCT DATA

All frames shall be fabricated as shown in the shop drawings. Indicate installation requirements of finished hardware and reinforcements. Shop drawings to be submitted to and approved by architect prior to fabrication. Submit manufacturer's product data showing details of design and construction, and printed instructions covering installation.

SAMPLES

Submit sample of door frame corner construction, complete with snap-on casings.

Submit color samples of prefinished components for selection and approval.

DELIVERY, STORAGE, AND HANDLING

Factory package all components in protective cartons to prevent damage during shipping. Store material in a protective area under cover on wooded skids and keep material vented to avoid condensation until ready for installation.

PRODUCTS

MANUFACTURER

Prefinished or primed steel door frames shall be manufactured by: Rediframe Products Division, Dunbarton Corporation of Dothan, Alabama (800) 633-7553. Timely Industries, Div. of SDS Industries (800) 247-6242. Approved equal complying with products standards, features, and construction specifications herein.

GENERAL

Frames shall be prefinished or primed knock-down type designed for installation at rough wall openings including over prefinished walls.

- Provide steel frames with prefinished or primed steel, aluminum, or decorative vinyl casings to conceal fasteners. Prepare steel frames to receive decorative mouldings to conceal fasteners.
- Provide all accessories and fasteners necessary for field assembly and installation per the frame manufacturer's standard.

Prepare for and provide reinforcements per manufacturer's standards as required to receive finished hardware.

Construct steel door frames for 1-3/4" or 1-3/8" thick doors as scheduled.

Construct frames to fit the finished wall thickness shown. Frame manufacturer shall have standard frames for the following finished wall thicknesses:

- For 1-3/4" doors: 2-7/8", 3-1/2", 3-5/8", 3-3/4", 4-1/2", 4-5/8", 4-3/4", 4-7/8", 5-1/4", 5-3/8", 6-3/4", 6-7/8" and 7-3/8".
- For 1-3/8" doors: 2-5/8", 2-7/8", 3-1/2", 3-5/8", 3-3/4", 4-1/2", 4-5/8", 4-3/4", 4-7/8", 5-1/4", 5-3/4", 6-3/4", 6-7/8", and 7-3/8".

Hardware preparations:

- * For 1-3/4" doors: Hinges - frames to be mortised for 4" x 4" x 1/4" radius standard weight template hinges, 4-1/2" x 4-1/2" square standard weight template hinges, or 4" x 4" x 5/8" radius residential weight template or non-template hinges.
Strikes - frames to be mortised for a 2-3/4" (ANSI 115.3) strike or a 4-7/8" (ANSI 115.1) strike.

- For 1-3/8" doors:
Hinges - frames to be mortised for a 3-1/2' x 3-1/2" x 1/4' radius standard weight template hinges.
Strikes - frames to be mortised for a 2-3/4' (ANSI 115.3) strike.

MATERIALS

Header and jamb members: Form interior door frames of ASTM A366 commercial quality cold rolled steel. Form exterior door frames of galvanized steel having an A40 coating per ASTM A525. Provide frames in the following gages:

- Fire rated standard frames for 1-3/4" doors: 18 gauge
- 1-3/8" or 1-3/4" door frames: 18 gauge

Casings:

- Steel- Form interior members from 22 gauge ASTM A366 commercial quality cold rolled steel. Form exterior members from 22 gauge galvanized steel having an A40 coating per ASTM A653.

Hinge Reinforcements

- 3-1/2" x 3-1/2" x 1/4" radius template - Factory installed 14 gauge HRPO with zinc dichromate finish (10 gauge equivalent number of threads / SDI-107)
- 4" x 4" 1/4" radius template - Factory installed 14 gauge HRPO with zinc dichromate finish (10 gauge equivalent number of threads / SDI-107)
- 4-1/2" x 4-1/2" square template - Factory installed 14 gauge HRPO with zinc dichromate finish (10 gauge equivalent number of threads /SDI-107)
- 4"x 4" x 5/8" radius template or non-template - Factory installed 14 gauge hot dipped galvanized steel having G60 zinc coating per ASTM A525 (10 gauge equivalent number of threads / SDI-107)
- Strikes and deadbolts covers and dust box 18 gauge ASTM A366 commercial quality cold rolled steel in the following finishes : 2D Brasstone Zinc Dichromate, US10 Bronze, US26D Dull Chrome, and US10B Oil-Rubbed Bronze.
- Door closer reinforcement: Steel or Aluminum per manufacturer's standard.
Standard arm mounting - aluminum extrusion 6063-T5 alloy per manufacturer's standard
Parallel arm mounting - 16 gauge galvanized steel having an A40 coating per ASTM A525

Casing corner alignment clips:

Prepainted 22 gauge ASTM A366 commercial quality cold rolled steel in the following colors: Black, White

- Fasteners: Per manufacturer's standards and / or per labeling agency for fire rated frames.
Fasteners to be a minimum of 1/2" (13mm) longer than the combined thickness of the drywall.
#6 self tapping bugle head drywall screws
#8D Common or Coated nail
- Paint: Per manufacturer's standard baked on synthetic enamel, applied over a cleaned and phosphate coated surface. Paint dry film thickness shall be approximately 1.0 mil for finished paint. Paint dry film thickness shall be approximately .5 mil for prime painted frames.
Prime painted frames should be field painted within (30) days with a good quality oil-based enamel. Factory finish paint shall pass 100-hour salt spray test per ASTM B117 and 200-hour humidity test per ASTM D1735 (with no blistering).

DOOR FRAMES

Frame members shall be of a double rabbet profile with integral stops. Construct jamb member to interlock and align with header members to form a strong joint. Frames shall receive die cut mitered steel or aluminum casing held tight together and in alignment with concealed corner backing pieces. Casing shall conceal all frame fasteners. Provide concealed clips to receive snap-on casings.

FINISHES

Door frames

- All building exterior doors must have threshold and interlocking weather stripping and shall have DSH I #105 "Cush-N-Seal" per Door and Hardware Systems, Inc., 13 Silver Street, Rochester, NY 14611: Phone (716)235-8543; Fax: (716)2350431. Installed per manufacturer recommendations.
- Prefinished with factory applied baked enamel to match the interior of the Microtel.
- Wood hollow-core doors are permitted only in the guest room bathroom.
- Guest room and inside corridor wood doors shall be 3'0" X 6'8" X 1 3/4" or local code whichever is greater solid core bonded hardwood veneer - fully sound stripped minimum 20 minute fire rating or local code whichever is greater, and shall have DSHI #105 "Cush-N-Seal" per Door and Hardware Systems, Inc., 13 Silver Street, Rochester, NY 14611: Phone (716)235-8543; Fax: (716)2350431. Installed per manufacturer recommendations.
- Microtel suggest the Decorative Laminate Doors as an alternate. Guestroom and inside wood doors shall be 3'-0 X 6'-8 X 1 3/4" or local code, which ever is greater. All doors shall be 3 ply construction consisting of a solid particle board door with bonded stiles and rails and Wilsonard brand decorative laminate solid or wood grain veneer faces of .050 thickness, edges to be stained or painted to match the face as manufactured by Buell Door Company of Dallas, Texas, fully sound stripped minimum 20 minute rating or local code, which ever is greater, and shall have DSHI#105 "Cush-N-Seal" per Door and Hardware Systems, Inc. 13 Silver Street, Rochester, NY 14611, phone: (716)235-8543, fax: (716)235-0431. Installed per manufacturers recommendations
- Guest room entrance doors must be self-closing with spring hinges per ANSI K8107F with the same finish as the door lock and self-locking. Guest room door lock must have a 1 " mortise deadbolt and a 3/4" dead locking latch with E key access, hotel function electronic lock as manufactured by Vingcard model - 2100 or Onity-HT 24 antique brass series, and safety chain/bar. It is required the lock set be full function (i.e., turning handle release deadbolt). A "one-way" tamper proof 180 degree glass viewer must be installed in the center of the door at 5' above floor level. A threshold must be provided at each exterior entrance door. On handicapped access door, two "One-Way" tamper-proof 180 degree glass viewers must be installed in the center of the door at 5'0" above floor level and 48" above floor level for handicapped viewing. A threshold must be provided at each exterior door.
- Interconnecting guest room openings must have two doors, 3'0" X 6'8" by 1-3/4" thick and solid core with one hour fire rating each leaf or as required by code. The doors must be self-locking with one-way locking devices, as well as deadbolt locks that can only be operated from the originating guest room. Connecting doors must have one of the following: automatic drop bottoms or the carpet pad must be double thickness and door must be sound seal by door and hardware systems on head and jamb. The lockset on the communication door shall be as per ANSI 4000, Grade 2, Schlage Type A25D **or equal** with 2 3/4" backset with UL latch bolt lever type on room side only with blank lock trim cover plate on inside with 1/2" minimum latch protection. Dead bolt locking device shall be as Schlage B-180 ANSIE 2191 with finish same as guestrooms. Sound seal by door and hardware systems shall have installed on them DSHI #105 Cush-N-Seal provided by Door & Hardware Systems, Inc., 13 Silver Street, Rochester, New York 14611: Phone (716)235-8543; Fax (716)235-0431.

- Labeled openings required by code must comply with NFPA No. 80 and bear the Underwriter's Laboratories label with FM approval.
- Emergency exit signs, devices with alarms, must be provided at all unattended emergency exists, as required by local code.
- Labeled doors at stairwell enclosures must have "B labeled" doors, "30-minute temperature rise, 450 degree Fahrenheit maximum or better" rating. They must be self-closing, non-locking with "panic" hardware.
- Highest quality finish hardware must be utilized in the public areas. Grand Master Keying must be in accordance with the National Hardware Council recommendations for hotel facilities. Panic exit devices and fire-rated openings must be Underwriter's Laboratories tested and bear Underwriter's Laboratories label (NFPA Std. 80). An electronic door locking system is required on all doors. **Per the Americans with Disabilities Act, all doorways shall have a minimum of 32" opening, from inside surface of door stop to edge of door, when door has been open 90 degrees from door jamb.**

END OF SECTION

SECTION 08410

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Interior and Exterior Aluminum Storefront Framing, Doors, Door Frames and Lights
Anchors, Brackets, and Attachments
Door Hardware
Perimeter Sealant

WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

Section 08700 - Hardware: Additional Door hardware items other than specified in this Section, and keying requirements.

RELATED WORK

Section 00870 - Finish Color Schedule
Section 07900 - Joint Sealers: Perimeter Sealant and Back-Up Materials
Section 08461 - Automatic Sliding Doors
Section 08700 - Finish Hardware
Section 08800 - Glass and Glazing

REFERENCES

ANSI/ASTM A36 - Structural Steel
ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products
ANSI/ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
ANSI/ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube
ANSI/ASTM E283 - Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors

PERFORMANCE

System to provide for expansion and contraction within system components caused by a cycling temperature range of 170 degrees F. without causing detrimental effects to system or components.

Design for windload of 30 PSF with maximum deflection in both vertical and horizontal mullions not to exceed 1/175 of span.

Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior.

Limit air infiltration through assembly to 0.6 CFM/SF of assembly surface area, measured at a reference differential pressure across assembly of 0.3 inches water gage as measured in accordance with ANSI/ASTM E283.

System to accommodate, without damage to system or components, or deterioration of perimeter seal: Movement within system; movement between system and perimeter framing components; dynamic loading and release of loads; and deflection of structural support framing.

QUALITY ASSURANCE

Inspection: General Contractor shall provide, in writing to Owner, an inspection of all aluminum entrances and storefronts for conformance to specifications. Inspection shall include checking for fit tolerance plumb and level, as well as proper hardware and operation.

SUBMITTALS: Submit Shop Drawings and product data and manufacturer's installation instructions. Include system and component dimensions; components within assembly; framed opening requirements and tolerances; anchorage and fasteners; glass and infills; door hardware requirements; and affected related work.

DELIVERY, STORAGE, AND HANDLING

TRANSPORTATION AND HANDLING: Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

STORAGE AND PROTECTION: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.

SPECIAL WARRANTY

The work of this Section shall be jointly guaranteed by the manufacturer and installer for a period of five (5) years after final payment.

All materials shall be free from manufacturing defects and defects in installation workmanship. Any material or workmanship judged defective during this period shall be removed and replaced at no cost to the Owner.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

For purpose of designating design and quality of aluminum storefront system, fixed window system, Drawings and Specifications are based on the following:

Entry Framing System:

"500 Tuffline Entrance Framing" by Kawneer company

Approved equal, by Tubelite Architectural products

For purpose of designating design and quality of entrance doors, Drawings and Specifications are based on Tuffline Series, Continuous Hinge-Hung Doors with 1/4" clear tempered glazing as manufactured by Kawneer Company with 5" Stiles, 5" Top and 10" Bottom Rails and 5/16" vertical and horizontal muntins, as shown on Drawings. Door frames to be heavy wall frames. Standard wall thickness for door frames is not acceptable.

Other manufacturer's aluminum doors, as manufactured by Tubelite are acceptable upon approval when design fabrication and installation meet or exceed requirements specified and detailed on Drawings.

MATERIALS

All framing members shall be extruded aluminum of 6063T-5 alloy and shall be of the size, shape, and intended function as shown on the Drawings. Performance requirements shall conform to standards established by local jurisdiction in relation to wind load and deflection limits.

FASTENERS: Stainless Steel

FINISH: All exposed aluminum surfaces shall have a manufactured-applied, 20-year warrantied, Kynar 500 fluorocarbon finish, free from blemishes and surface defects. Color as scheduled in Section 00870.

FABRICATION

Aluminum door shall have tight hairline joints where rails are fitted against stiles and shall be fastened by means of tensioned steel tie rods in top and bottom rails. Doors shall have an adjusting mechanism in the top rail to provide for minor clearance adjustments. Glass stops shall be snap-in type with bulb type glazing strips. Weather stripping shall be pile.

Store front sections shall be square cut and assembled with the proper clips and screws as provided by the manufacturer to form neat hairline joints. All fastenings shall be concealed except those specifically detailed otherwise at certain transition areas. All glazing gaskets shall be cut over length and installed in slight linear compression to prevent shrinkage from the corners. All framing shall be erected square and true into correct size rough openings prepared by others and in strict accord with the Drawings.

HARDWARE

Standard Kawneer entrance door hardware shall be supplied with doors as follows, unless indicated otherwise:

Interior Main Entry Doors, 10'-0" wide X 7'-0" high, bi-parting doors.

Stanley Dura-Glide 2000 series, or approved equal.

Manufacturer's

Stanley

Dorma

Horton

Note: Door to have access control feature. Card reader by Section 08700

Exterior Main Entry Doors, 10'-0" wide X 7'-0" high, bi-parting doors.

Stanley Dura-Glide 2000 series, or approved equal.

Manufacturer's

Stanley

Dorma

Horton

Single Exterior Insulated Steel Entry Doors at stairwells, 3'-0" x 7'-0"

Note: Door by Section 08110. Hardware as indicated on door schedule.

Single Exterior Entry Doors at Corridors, 3'-0" x 7'-0", ALD X ALF

1 each - Continuous Hinges, SL-11HD, Select Products Unlimited, White.

1 each - Exit Device, 8804-16-ET-LNL X less Pull X US26D by card activated lock manufacturer.

1 each - Closer, surface mounted type, 4020-18 by LCN

1 each - Weather Stripping (3 sides), white

2 each - Bottom Sweep, white

Note: Cylinder, electric strike and card reader by Section 08700. and as indicated on door schedule.

SEALANTS

For metal to metal joints use Standard Products Company Stan Pro Urethane Epoxy Sealant No. 103, Dow Corning Silicone Rubber Sealant, or approved equal, color to match finish of aluminum to which applied.

For perimeter of framing members, refer to Section 07900 - Joint Sealers.

PART 3 EXECUTION

INSPECTION

Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

Beginning of installation means acceptance of existing conditions.

INSTALLATION

Install doors, frames, glazing and hardware in accordance with manufacturer's instructions.

Use anchorage devices to securely attach frame assembly to structure.

Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

Coordinate attachment and seal of air and vapor barrier materials. Install sill flashings where required.

Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious, stone or other dissimilar materials.

Install glass and infill panels in accordance with Section 08800, using exterior wet method of glazing.

Install perimeter non-hardening, non-skinning type sealant, and installation requirements in accordance with Section 07900.

Adjust operating hardware.

TOLERANCES

Variation from Plane: 0.03 inches per foot maximum or 0.25 inches per 30 feet, whichever is less.

Misalignment of Two Adjoining Members Abutting in Plane: 0.015 inches.

CLEANING

Remove protective material from prefinished aluminum surfaces.

Wash-down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08461

AUTOMATIC SLIDING DOORS

PART 1 - GENERAL

SECTION INCLUDES

Automatic Sliding Doors and Sidelights
Operators and Control Devices for Automatic Sliding Doors

RELATED SECTIONS

Section 07900 - Caulking
Section 08410 – Entrances and Storefronts: Aluminum Doors and Frames
Section 08700 – Door Hardware: Cylinder locks.
Section 08800 – Glass and Glazing: General glazing requirements.
Division 16 Electrical - Applicable sections.

REFERENCES

ANSI A117.1 American National Standard for Accessible and Useable Buildings and Facilities.
ANSI A156.10 Power Operated Pedestrian Doors.
ANSI-Z297.1.2 Safety Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings..
ASTM B 209 Standard Specifications for Aluminum and Aluminum–Alloy Sheet and Plate.
ASTM B 221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
American Association of Automatic Door Manufacturer's (AAADM)
Aluminum Associations Standard AA DAF-45 – Designation System for Aluminum Finishes.
NFPA 70 National Electric Code
NFPA Life Safety Code
UL 325 Door, Drapery, Gate, Louver and Window Operators and Systems – (UL) listed.

PERFORMANCE REQUIREMENTS

Provide automatic entrance door assemblies capable of withstanding structural loads and thermal movements based on testing manufacturer's standard units in assemblies similar to those indicated for this Project.

Thermal Movements: Provide automatic entrance doors that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change (Range): 120 deg F (61 deg C) to 130 deg F (54 deg C), material surfaces.

Operating Range: Minus 30 deg F (Minus 34 deg C) to 130 deg F (54 deg C)

Opening-Force Requirements for Egress Doors: Not more than 50 lbf (222 N) required to manually set door in motion if power fails, and not more than 15 lbf (67N) required to open door to minimum required width.

Closing-Force Requirements: Not more than 30 lbf (133N) required to prevent door from closing.

Operators: Fully adjustable for opening and closing speeds, checking speeds and hold open time.

Electrical: 120 VAC, 60 Hz, 5 Amp service provided to the header.

SUBMITTALS

Submit under provisions of Section 01300.

Product Data: Manufacturer's product and installation data.

1. Operation and maintenance data.

Shop Drawings: Indicate layout and dimensions head, jamb, and sill conditions; elevations; components, anchorage, adjacent construction interface, recesses, materials, and finishes, electrical characteristics and connection requirements.

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

Contract Closeout: Submit.

1. Manufacturer's Warranty.
2. Owners Manual.
3. AAADM inspection compliance form completed and signed by certified AAADM inspector prior to doors being placed in operation as proof of compliance with ANSI A156.10.

WARRANTY

Automatic Entrance Doors shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.

During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.

During warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.

QUALITY ASSURANCE

Manufacturer Qualifications: Manufacturer to have minimum five years documented experience in the fabrication of automatic doors of the type required for this project and be capable of providing field service representation during installation.

Installer Qualifications: Installer to be experienced in the work of this section who has specialized in the installation of work similar to that required for this project.

Emergency-Exit Door Requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

Automatic sliding door system shall be certified by the manufacturer to meet performance design criteria according to the following test standards:

1. ANSI A156.10.
2. NFPA 101.
3. Underwriter's Laboratories 325 (UL) listed.

DELIVERY, STORAGE, AND HANDLING

Package hardware items individually with necessary fasteners and installation templates when necessary; label and identify each package with door opening code to match door schedule.

Delivery in factory original unopened, undamaged containers.

Store materials in a dry, warm, ventilated weather tight location.

PROJECT CONDITIONS

Field Measurements: General Contractor shall verify openings to receive automatic entrance door assemblies by field measurements before fabrication and indicate measurements on Shop Drawings.

Mounting Surfaces: General Contractor shall verify all surfaces to be plumb, straight and secure; substrates to be of proper dimension and material.

Other trades: General Contractor shall advise of any inadequate conditions or equipment.

COORDINATION

Coordinate work with other directly affected components involving manufacture or fabrication of reinforcement door hardware and recessed items.

Coordinate work with other directly affected components involving electrical wiring.

PART 2 PRODUCTS

MANUFACTURERS

Acceptable Manufacturer: Dorma Automatics, Inc., Model ESA-300 or approved equals by Horton Automatics, division of Overhead Door Corp, Model US-23-3000.04 by Besam, Inc. and Stanley Access Technologies.

MATERIALS

Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Headers, stiles, rails, and frames: 6063-T6
2. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.
3. Sheet and Plate: ASTM B209.

Sealants and Joint Fillers: Performed under Division 7 Section "Joint Sealants".

FINISH

All exposed aluminum surfaces shall have a manufactured-applied, 20-year warrantied, KYNAR 500 fluorocarbon finish, free from blemishes and surface defects. Color as scheduled in Section 00870.

Comply with NAAMM Metal Finishes Manual for Architectural and Metal Products for recommendations for applying and designing finishes. Finish designations prefixed by AA comply with system established by Aluminum Association for designing finishes.

AUTOMATIC ENTRANCE DOOR ASSEMBLIES

Provide manufacturer's standard automatic entrance door assemblies including doors, sidelites, framing, headers, carrier assemblies, roller tracks, door operators, activation two (2) BEA wizard activate and threshold protection safety system per each sliding leaf, and accessories required for a complete installation

Sliding Automatic Entrance Doors:

Bi-Parting sliding doors:

1. Configuration: Two sliding leaves and two fixed sidelites.
2. Traffic Pattern: Two-way
3. Emergency Breakaway Capability: Sliding leaves only.
4. Mounting: Between jambs.

COMPONENTS

Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.

Framing Members: Manufacturer's standard extruded aluminum reinforced as required to support imposed loads.

1. Nominal Size: 1 ¾ inch by 4 ½ inch (45 by 115 mm).

Stile and Rail Doors and Sidelites: Manufacturer's standard 1 ¾ inch (45mm) thick glazed doors with extruded-aluminum tubular stile and rail members. Incorporate concealed tie-rods that span full length of top and bottom rails or mechanically fasten corners with reinforcing brackets that are welded.

1. Glazing Stops and Gaskets: Snap-on, extruded –security aluminum stops and preformed gaskets.
2. Site Design: Narrow stile; 2inch (51 mm) nominal width.
3. Bottom Rail Design: Minimum 4 inch (102mm) nominal height.
4. Muntin Bars: Horizontal tubular rail member for each door; 2 inch (51 mm) nominal width.

Glazing: Performed under Division 8 Section Glazing. All Glazing furnished by "by others: shall be ¼ inch (6mm) tempered, unless otherwise specified.

Headers: Fabricated from extruded aluminum and extending full width of automatic entrance door units to conceal door operators, carrier assemblies, and roller tracks. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.

1. Mounting: Concealed, with one side of header flush with framing.
2. Capacity: Capable of supporting doors-up to 220 lb (100kg) per leaf over spans up to 14 feet (4.3m) without intermediate supports.

Carrier Assemblies and Overhead Roller Tracks: Manufacturer's standard carrier assembly that allows vertical adjustment of at least 1/8 inch; consisting of urethane with precision steel lubricated ball-bearing wheels, operating on a continuous roller track. Support doors from carrier assembly by 2 inch diameter anti-riser wheels and two anti-rise rollers for each active leaf.

1. Minimum Load Wheel Diameter: 2 ½ inch (64mm).

Thresholds: Manufacturer's standard thresholds as indicated below:

1. Continuous standard tapered extrusion double bevel.
2. All thresholds to conform to details and requirements for code compliance.
3. Thresholds to accommodate finish floor conditions and heights both sides of openings.

Fasteners and Accessories: Stainless steel.

Signage: Provide signage in accordance with ANSI/BHMA A156.10.

DOOR OPERATORS

Provide door operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, operation under normal traffic load for type of occupancy indicated.

Electromechanical Operators: Self-contained overhead unit powered by a minimum of ¼ horsepower, permanent-magnet DC motor with gear reduction drive, microprocessor controller; and encoder.

1. Operation: Power opening and power closing.
2. Features
 - a. Adjustable opening and closing speeds.
 - b. Adjustable back-check and latching.
 - c. Adjustable braking.
 - d. Adjustable hold-open time between 0 and 30 seconds.
 - e. Obstruction recycle.
 - f. On/Off switch to control electric power to operator.
 - g. Energy conservation switch that reduces door-opening width.
 - h. Variable rate open/closed speed control.
 - i. Closed loop speed control with active braking and acceleration.
 - j. Variable obstruction recycle time delay.
 - k. Self adjusting stop position.
 - l. Self adjusting closing compression force.
 - m. Optional Switch to open/Switch to close operation.
3. Mounting: Concealed
4. Drive System: Synchronous belt type.
5. Equipment adjustments shall not require special testers or monitors.

Electrical service to door operators shall be provided under Division 16 Electrical. Minimum service to be 120 VAC, 5 amps.

ELECTRICAL CONTROLS

Electrical Control System: Electrical control system shall include a microprocessor controller and position encoder. The encoder shall monitor revolutions of the operator shaft and send signals to microprocessor controller to define door position and speed. Systems utilizing external magnets and magnetic switches are not acceptable. A single controller shall be capable of controlling up to 2 operators per entrance system.

Life Cycle Data Counter: The microprocessor control shall incorporate the following features to ensure trouble free operation:

1. Automatic Reset Upon Power Up
2. Fuse Protection
3. Electronic Surge Protection
4. Internal Power Supply Protection
5. Software protection in the case of software malfunction.

Soft Start/Stop: A "soft-start" "soft-stop" motor driving circuit shall be provided for smooth normal opening and recycling.

Safety Search Circuitry: Provide system to recycle the sliding panels when an obstruction is encountered during the closing cycle. If an obstruction is detected, the system shall search for that object on the next closing cycle by reducing door closing speed prior to the previously encountered obstruction location, and will continue to close in check speed until doors are fully closed, at which time the doors will reset to normal speed. If obstruction is encountered again, the door will come to a full stop. The doors shall remain stopped until obstruction is removed and operate signal is given, resetting door to normal operation.

Emergency Breakaway Feature: Provide release hardware that allows panel(s) to swing out in direction of egress to full 90 degrees from any position in sliding mode. Maximum force to open panel shall be 50 lbf (222N) according to ANSI/BHMA A156.10. Interrupt powered operation of panel operator while in breakaway mode.

1. Emergency breakaway feature shall include at least one adjustable detent device mounted in the top of each breakaway panel to control panel breakaway force.

Cylinder and card reader at interior main entrance doors, by Section 08700.

Cylinder at exterior main entrance doors by Section 08700. Cylinders to be key operated on exterior, thumb turn on interior in accordance with NFPA 101.

Thresholds: Provide handicap compliant thresholds.

Carriage lock: Provide carriage locks at interior sliding doors.

Control Switch: Provide manufacturer's standard header mounted rocker switches to allow for full control of the interior automatic entrance door. Controls to include, but are not limited to:

1. Power On/Off
2. Reduced Opening
3. Open/Closed/Automatic
4. One Way Traffic

Sliding Weather Stripping: Manufacturer's standard replaceable components complying with AAMA 701; made of nylon woven pile with nylon-fabric or aluminum-strip backing.

Weather Sweeps: Manufacturer's standard adjustable nylon brush sweep mounted to underside of door bottom.

FABRICATION

Factory fabricates automatic entrance door assembly components to designs, sizes, and thickness indicated and to comply with indicated standards.

1. Form aluminum shapes before finishing.
2. Use concealed fasteners to greatest extent possible.
 - a. Where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration, use self-locking devices.
 - b. Reinforce members as required to receive fastener threads.

Framing: Provide automatic entrance doors as prefabricated assemblies.

1. Fabricate tubular and channel frame assemblies with manufacturer's standard mechanical or welded joints. Provide sub-frames and reinforcement as required for a complete system to support required loads.
2. Perform fabrication operations in manner that prevents damage to exposed finish surfaces.
3. Form profiles that are sharp, straight, and free of defects or deformations.
4. Prepare components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
5. Fabricate components with accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.

Doors: Factory fabricated and assembled in profiles indicated. Reinforce as required to support imposed loads and for installing hardware.

Door Operators: Factory fabricated and installed in headers, including adjusting and testing.

Glazing: Fabricate framing with minimum glazing edge clearances for thickness and type of glazing indicated.

Hardware: Factory install hardware to the greatest extent possible; remove only as required for final finishing operation and for delivery to and installation at Project site.

Aluminum door shall have tight hairline joints where rails are fitted against stiles and shall be fastened by means of tensioned steel tie rods in top and bottom rails. Doors shall have an adjusting mechanism in the top rail to provide for minor clearance adjustments. Glass stops shall be snap-in type with bulb type glazing strips.

Store front sections shall be square cut and assembled with the proper clips and screws as provided by the manufacturer to form neat hairline joints. All fastenings shall be concealed except those specifically detailed otherwise at certain transition areas. All glazing gaskets shall be cut over length and installed in slight linear compression to prevent shrinkage from the corners. All framing shall be erected and true into correct size rough openings prepared by others and in strict accord with the Drawings.

PART 3 - EXECUTION

INSPECTION

Examine conditions for compliance with requirements for installation tolerances, header support, and other conditions affecting performance of automatic entrance doors. Proceed with installation only after unsatisfactory conditions have been corrected.

INSTALLATION

Do not install damaged components. Fit frame joints to produce joints free of burrs and distortion. Rigidly secure non-movement joints.

Entrances: Install automatic entrance doors with plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
2. Set headers, carrier assemblies, tracks, operating brackets, and guides level and true to location with anchorage for permanent support.

Door Operators: Connect door operators to electrical power distribution system as specified in Division 16 Sections.

Glazing: Install glazing as specified in Division 8 section "Glazing"

Sealants: Comply with requirements specified in Division 7 Section "Joint Sealants" to provide weather tight installations.

FIELD QUALITY CONTROL

Testing Services: Factory Trained Installer shall test and inspect each automatic entrance door to determine compliance of installed systems with applicable ANSI standards.

ADJUSTING

Adjust door operators, controls, and hardware for smooth and safe operation, for weather-tight closure, and complying with requirements in ANSI/BHMA A156.10.

CLEANING AND PROTECTION

Clean glass and aluminum surfaces promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Repair damaged finish to match original finish. Comply with requirements in Division 8 Section "Glazing", for cleaning and maintaining glass.

END OF SECTION

SECTION 08520

ALUMINUM WINDOWS (where required for impact resistance only)

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Horizontal Sliding, Single Hung Aluminum Window Units

Fixed Aluminum Half-Round

Perimeter Sealant

Wood Blocking, Shims, Anchors, Clips, and all accessories necessary for a complete installation.

All Aluminum Trim and Closure Pieces

All Operable Window Hardware

Note: Aluminum windows only required in high wind/impact areas.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 07900 - Joint Sealers: Perimeter sealant and backup materials.

Section 08410 - Aluminum Entrances and Storefront

Section 08800 - Glass & Glazing

QUALITY ASSURANCE

All window units shall be manufactured by a single source.

Standards: Requirements for aluminum windows, terminology and standard of performance, and fabrication workmanship are those specified and recommended in 101.93 and applicable General Recommendations published by AAMA and AA. All testing shall be conducted using AAMA specified test sizes.

Sections 08520 and 08800 to be furnished by single source insuring product compatibility and coordination.

DELIVERY, STORAGE, AND HANDLING

Transportation and Handling: Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

Storage and Protection: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain with temperature and humidity ranges required by manufacturer's instruction.

SUBMITTALS

Submit Shop Drawings and product data that include wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related work; and installation requirements and instructions.

Provide samples of materials as may be requested without cost to Owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, etc.

Provide test reports certifying conformance with Performance Specifications, including required sound transmittance rating.

Manufacturer shall approve Shop Drawings in writing to insure proper product application.

PART 2 - PRODUCTS

MATERIALS

Provide the following types of thermally broken, aluminum windows, in sizes and shapes as shown Drawings.

Horizontal Slider Units: Series 2880 as manufactured by General Aluminum Corporation, or approved equal.

Fixed Half-Round Units: Series 2800 as manufactured by General Aluminum Corporation, or approved equal.

Single-Hung Units: Series 2700 as manufactured by General Aluminum Corporation, or approved equal.

Window units shall be supplied by the General Contractor and installed by this Contractor. All fasteners, tools, equipment, and other materials necessary for a complete installation shall be furnished by this Contractor.

Insect Screens: Provide removable insect screen panel for each moveable glazed sash.

Screen Fabric: 18 by 16 mesh fiberglass screen cloth.

Screen Frame: Provide formed or extruded aluminum frames and removable vinyl fabric-retainer spline.

Finish shall match window.

Muntins: Aluminum grid between lites of insulated glass. Finish to match windows.

Approved alternate windows - Winguard Windows by PGT Industries – 1-877-550-6006.

PERFORMANCE

Structural Performance, AAMA Ratings:

Horizontal Slider Units: HS-R25

Fixed Half-Round Units: DH-R25

Single-Hung Units: DH-R25

Thermal Transmittance (with 15 mph exterior wind) (BTU/HR/FT²/DEG. F)

Horizontal Slider Units: U_c = 0.50

Fixed Half-Round Units: U_c = 0.48

Single-Hung Units: U_c = 0.48

GLASS MATERIALS

Windows shall be glazed as follows:

Insulating Glass: Manufacturer's standard low "E" units consisting of overall 1/2" (nominal) thick; two sheets of clear glass, permanently and hermetically sealed together at edges with spacers with -60 degree F dewpoint; fabricated to the sizes and shapes indicated. Ten year warranty.

FINISHES

The exposed surfaces of all aluminum shall be cleaned of all fabricating oils and debris, and given an electrostatically applied acrylic enamel coating of 1.0 +/- 2 mils dry film thickness (minimum).

Color: Refer to Section 00870 - Finish Color Schedule.

FABRICATION

Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.

Rigidly fit and weld joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant.

Develop drainage holes with moisture pattern to exterior.

Prepare components to receive anchor devices. Fabricate anchorage items.

PART 3 - EXECUTION

INSTALLATION - GENERAL

Installation Details: Before proceeding with the manufacturing of the windows, the Window Contractor shall submit complete installation details for the Architect's approval. These Drawings shall show elevations of windows, full-sized details of all sections of windows, collateral materials and details of anchorage. Supplemental data shall contain calculations of moments of inertia on frames and mullion connections plus instructions for storage, handling, and erection of windows and sliding doors.

Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

Beginning of installation means acceptance of existing conditions.

Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

Coordinate attachment and seal of air and vapor barrier materials. Install under sill flashings, if required.

Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.

Install perimeter sealant, backing materials, and installation requirements in accordance with Section 07900. Apply sealant to ends of sill for watertight seal.

Windows shall be installed by experienced workmen in exact accordance with the manufacturer's instructions and approved Shop Drawings.

ADJUSTING AND CLEANING

After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be responsibility of General Contractor.

Remove protective material from prefinished aluminum surfaces.

Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08560

VINYL WINDOWS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Horizontal Sliding, Single Hung Vinyl Window Units

Fixed Vinyl Half-Round

Perimeter Sealant

Wood Blocking, Shims, Anchors, Clips, and all accessories necessary for a complete installation.

All Vinyl Trim and Closure Pieces

All Operable Window Hardware

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 07900 - Joint Sealers: Perimeter sealant and backup materials.

Section 08410 - Aluminum Entrances and Storefront

Section 08800 - Glass & Glazing

QUALITY ASSURANCE

All window units shall be manufactured by a single source.

Standards: Requirements for aluminum windows, terminology and standard of performance, and fabrication workmanship are those specified and recommended in 101.93 and applicable General Recommendations published by AAMA. All testing shall be conducted using AAMA specified test sizes.

Windows shall be capable of withstanding appropriate wind loads, design pressures, wind-borne debris and seismic requirements.

Sections 08560 and 08800 to be furnished by single source insuring product compatibility and coordination.

DELIVERY, STORAGE, AND HANDLING

Transportation and Handling: Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

Storage and Protection: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain with temperature and humidity ranges required by manufacturer's instruction.

SUBMITTALS

Submit Shop Drawings and product data that include wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related work; and installation requirements and instructions.

Provide samples of materials as may be requested without cost to Owner, i.e., vinyl, glass, fasteners, anchors, frame sections, mullion section, etc.

Provide test reports certifying conformance with Performance Specifications, including required sound transmittance rating.

Manufacturer shall approve Shop Drawings in writing to insure proper product application.

PART 2 - PRODUCTS

MATERIALS

Provide the following types of thermally broken, Vinyl windows, in sizes and shapes as shown Drawings.

Horizontal Slider Units: Series 2180 as manufactured by PennCo, Inc. 606-928-6476.

Fixed Half-Round Units: as manufactured by PennCo, Inc. 606-928-6476.

Single-Hung Units: as manufactured by PennCo, Inc. 606-928-6476.

Window units shall be supplied by the General Contractor and installed by this Contractor. All fasteners, tools, equipment, and other materials necessary for a complete installation shall be furnished by this Contractor.

Windows at projects with vinyl siding to be furnished with integral J-Mold frame. Sliding windows to have metallic cam locks.

Insect Screens: Provide removable insect screen panel for each moveable glazed sash.

Screen Fabric: 18 by 16 mesh fiberglass screen cloth on operable portion of window.

Screen Frame: Provide formed frames and removable vinyl fabric-retainer spline.

Finish shall match window.

Muntins: Vinyl grid between lites of insulated glass at all windows.. Finish to match windows.

Impact Resistant Windows – where required by code, to be Aluminum per Section 08520.

PERFORMANCE

Structural Performance, AAMA Ratings:

Horizontal Slider Units: HS-R25

Fixed Half-Round Units: DH-R25

Single-Hung Units: DH-R25

Thermal Transmittance (with 15 mph exterior wind) (BTU/HR/FT²/DEG. F)

Horizontal Slider Units: $U_c = 0.50$

Fixed Half-Round Units: $U_c = 0.48$

Single-Hung Units: $U_c = 0.48$

GLASS MATERIALS

Windows shall be glazed as follows:

Insulating Glass: Manufacturer's standard low "E" units consisting of overall 1/2" (nominal) thick; two sheets of clear glass, permanently and hermetically sealed together at edges with spacers with -60 degree F dewpoint; fabricated to the sizes and shapes indicated. Ten year warranty.

FINISHES

The exposed surfaces of all vinyl shall be cleaned of all debris.

Color: Refer to Section 00870 - Finish Color Schedule.

FABRICATION

Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.

Rigidly fit and weld joints and corners. Accurately fit and secure corners tight. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant.

Develop drainage holes with moisture pattern to exterior.

Prepare components to receive anchor devices. Fabricate anchorage items.

PART 3 - EXECUTION

INSTALLATION - GENERAL

Installation Details: Before proceeding with the manufacturing of the windows, the Window Contractor shall submit complete installation details for the Owner's approval. These Drawings shall show elevations of windows, full-sized details of all sections of windows, collateral materials and details of anchorage. Supplemental data shall contain calculations of moments of inertia on frames and mullion connections plus instructions for storage, handling, and erection of windows and sliding doors.

Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

Beginning of installation means acceptance of existing conditions.

Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

Coordinate attachment and seal of air and vapor barrier materials. Install under sill flashings, if required.

Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.

Install perimeter sealant, backing materials, and installation requirements in accordance with Section 07900. Apply sealant to ends of sill for watertight seal.

Sliding windows to have securely installed stops that prevent window opening greater than 6".

Windows shall be installed by experienced workmen in exact accordance with the manufacturer's instructions and approved Shop Drawings.

ADJUSTING AND CLEANING

After completion of window installation, windows shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be responsibility of General Contractor.

Remove protective material from prefinished surfaces.

Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

Upon completion of construction, clean all window track, so windows slide smoothly.

END OF SECTION

SECTION 08660

SECURITY WINDOWS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Exchange Window

All as shown on Drawings and specified herein.

RELATED WORK

Section 07900 - Joint Sealers

REFERENCES

ANSI/ASTM A36 - Structural Steel

ANSI/ASTM A167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

ANSI/ASTM A386 - Zinc-Coating (Hot-dip) on Assembled Steel Products

ANSI/ASTM B221 - Aluminum-Alloy Extruded Bar, Rod, Wire, Shape, and Tube

ASTM B209 - Aluminum and Aluminum-Alloy Sheet and Plate

FS TT-P-645 - Primer, Paint, Zinc Chromate, Alkyd Type

SUBMITTALS

Submit Shop Drawings and product data that include wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related work; and installation requirements and instructions.

Provide samples of materials as may be requested without cost to Owner, i.e., metal, glass, fasteners, anchors, frame sections, mullion section, etc.

DELIVERY, STORAGE, AND HANDLING

Transportation and Handling: Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry. Provide equipment and personnel to handle products by method to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

Storage and Protection: Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather-tight enclosures; maintain with temperature and humidity ranges required by manufacturer's instruction.

Provide strippable coating to protect prefinished aluminum surfaces.

WARRANTY

The manufacturer shall guarantee his work against material defects in manufacture for a period of ten (10) years.

PART 2 - PRODUCTS

EXCHANGE WINDOW

Model XW2436 as manufactured by Creative Industries, Inc., 1024 Western Dr., Indianapolis, IN 46241, (800) 776-2068, or approved equal. Clear anodized aluminum frame. Provide stainless steel shelf with built-in deal tray.

Clear Bullet Resistant Glass 1 1/2" thick shall be multi-layered clear float glass laminate with polyvinyl butyral interlayer. Glass shall be in conformance with Federal Specification 16 CFR 1201 and Underwriter's Laboratories Standard 752 Report for Ballistic Level Rating of Class II HPSA.

Acceptable Manufacturer
Globe Amerada Glass Co.
Approved Equal

FABRICATION

Fabricate items allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling installation.

Rigidly fit and weld joints and corners. Accurately fit and secure corners tight. Make corner joints flush and hairline.

Prepare components to receive anchor devices. Fabricate anchorage items.

Concealed Steel Items: Galvanized in accordance with ANSI/ASTM A386 to 2.0 oz./sq. ft.

Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

PART 3 - EXECUTION

INSTALLATION - GENERAL

Installation Details: Before proceeding with the manufacturing of the windows, the Contractor shall submit complete installation details for the Architect's approval. These Drawings shall show elevations of windows, full-sized details of all sections of windows, tray, collateral materials and details of anchorage.

Verify wall openings are ready to receive work of this Section.

Beginning of installation means acceptance of existing conditions.

Align window frame and tray plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent work.

Windows shall be installed by experienced workmen in exact accordance with the manufacturer's instructions and approved Shop Drawings.

ADJUSTING AND CLEANING

After completion of window and tray installation, units shall be inspected, adjusted, put into working order and left clean, free of labels, dirt, etc. Protection from this point shall be responsibility of General Contractor.

Remove protective material from prefinished aluminum surfaces.

Wash down exposed surfaces using a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

SECTION 08700

FINISH HARDWARE

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: The work of this Section shall include, but is not necessarily limited to, furnishing and installing the following:

All the finish hardware including all screws, bolts, and other devices required to complete the work.

Templates of all hardware shall be promptly furnished to the hollow metal door manufacturer.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 08100 - Steel Doors and Frames

Section 08210 - Wood Doors

Section 08410 - Aluminum Entrances and Storefronts

Section 08461 - Automatic Sliding Door

REFERENCES

ANSI A115.1 AND A115.2

ANSI A117.1

Americans with Disabilities Act Architectural Guidelines (ADAAG)

NFPA 101, Life Safety Code

NFPA 80, Standard for Fire Doors and Windows

DELIVERY OF HARDWARE

Reinforcement for all hardware for metal doors and frames shall be installed at the factory and be made to template and furnished with machine screws. The face of locks shall be beveled to match the bevel edge of metal doors. All hardware for the metal doors shall be ordered as soon as possible after the Contract is awarded.

GUARANTEE: Furnish a written guarantee which shall cover a period of two (2) years from and after the completion of the building and its acceptance by the Owner.

CERTIFICATIONS

Conform to governing Building Codes for requirements applicable to the work specified herein.

Conform to ANSI/NFPA 101 with regard to requirements for fire-rated doors and frames.

SUBMITTALS

Submit hardware schedule, product data, Shop Drawings and keying schedule. Include product data on each type of hardware listed in hardware schedule.

QUALITY ASSURANCE

Inspection: General Contractor shall provide, in writing to Owner, an inspection of all finish hardware for conformance to specifications. Inspection shall include checking for fit tolerance plumb and level, as well as proper items, fasteners and operation.

PART 2 - PRODUCTS

MATERIALS AND FABRICATION

Base Metals: Produce hardware units of basic metal and forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness, but in no case of lesser (commercially recognized) quality than specified for applicable hardware units by applicable ANSI/BHMA A156 series standards for each type of hardware item and with ANSI/BHMA A156.18 for finish designations indicated. Do not furnish "optional" materials or forming methods for those indicated, except as otherwise specified.

Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware that has been prepared for self-tapping sheet metal screws, except as specifically indicated.

Furnish screws for installation with each hardware item. Provide Phillips flathead screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.

Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their is the only means of reinforcing the work adequately to fasten the hardware securely. Where thru-bolts are used as a means of reinforcing the work, provide sleeves for each thru-bolt or use sex screw fasteners.

GENERAL REQUIREMENTS

Butt Hinges: Unless otherwise scheduled, shall be five-knuckle, full mortise template, ball bearing type with non-rising loose pin, flat button tip. Exterior hinges, and certain others as scheduled, shall have non-removable pins by use of set screw in the barrel. These are identified in the schedule as "NRP".

Screws: Provide Phillips flathead screws complying with the following requirements:

For metal doors and frames install machine screws into drilled and tapped holes.

For wood doors and frames install wood screws.

For fire-rated wood doors install No. 12 x1-1/4 inch, threaded-to-the-head steel wood screws.

Finish screw heads to match surface of hinges or pivots.

Locks and Latches: Locks shall utilize standard cutouts to facilitate interchange without further mortising.

All guest room entry and exterior doors shall be mortise type lock sets.

All other interior doors, unless otherwise scheduled, shall be commercial, cylindrical lock sets, ANSI A156.2, series 4000, Grade 1, U.L. listed for all functions up to 3-hour doors.

Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame, finished to match hardware set, unless otherwise indicated.

Provide flat lip strikes for locks with 3-piece, antifriction latchbolts as recommended by manufacturer.

Provide extra long strike lips for locks used on frames with applied wood casing trim.

Provide recess type top strikes for bolts locking into head frames, unless otherwise indicated.

Provide dust-proof strikes for foot bolts, except where special threshold construction provides nonrecessed strike for bolt.

Exit Devices: Shall be listed under "Panic Hardware" in accident equipment lists of Underwriters Laboratories. Where labeled fire doors are used as exits, they shall be equipped with labeled "Fire Exit Hardware".

Door Closers: Except where other device for automatically closing and controlling the action of swing doors is noted, shall be liquid type of rack and pinion design with working parts enclosed in a cast iron case. For doors subject to positive or negative HVAC pressures, closer size shall be adjusted accordingly. All Closures on Wood Doors shall be fastened with Through Bolts.

Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit depending on size of door, exposure to weather, and anticipated frequency of use.

Where parallel arms are required for closers, provide closer unit one size larger than recommended for use with standard arms.

Access-Free Manual Closers: Where manual closers are indicated for doors required to be accessible to the physically handicapped, provide adjustable units complying with ANSI A117.1 provision for door opening force and delayed action closing.

Combination Door Closers and Holders: Provide units designed to hold door in open position under normal usage and to release and close door automatically under fire conditions. Incorporate an integral electromagnetic hold mechanism designed for use with UL listed fire detectors, provided with normally closed switching contacts.

Weatherstripping and Seals:

General: Provide continuous weatherstripping on exterior doors and smoke, light, or sound seals on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

Replaceable Seal Strips: Provide only those units where resilient or flexible seal strip is easily replaceable and readily from stocks maintained by manufacturer.

Weatherstripping at Jambs and Heads: Provide bumper-type resilient insert and metal retainer strips, surface applied unless shown as mortised or semi-mortised.

Weatherstripping at Door Bottoms: Provide threshold consisting of contact-type resilient insert and metal housing of design and size shown.

Thresholds:

General: Except as otherwise indicated, provide metal threshold unit of type, size, and profile as shown or scheduled.

Exterior thresholds shall have a maximum 1/4" rise.

Door Stops: Wall type door bumpers shall be provided for all openings where conditions permit. In the event a wall type bumper cannot be used, a floor stop shall be provided.

Door Guards: Polished cast brass or bronze. Edge guards to be installed with adhesive full width of backing of 2 edges. Foam tape will not be accepted. Edge guards secured by screws or nails will not be accepted.

Card Activated Locks

Provide System 760 as manufactured by KABA / ILCO, Inc., 215-453-2100, or by Onity.

Exterior entries to have battery-operated compatible surface mounted remote card reader to operate electric strike, model 730.

Provide Registration Desk Key Card System with Storage Rack sized for number of guest rooms.

MISCELLANEOUS REQUIREMENTS

The hardware shall be the proper kind for its required use and shall fit its intended location. Should any hardware, as specified, fail to meet the intended requirements or require

modification to suit the intended location, this matter, or any other necessary advance information, shall be brought to the attention of the Architect for correction or decision in ample time to avoid delay in the manufacture and delivery of hardware.

The finish hardware listed herein shall not be construed as necessarily being a complete hardware schedule, but shall be considered as an indication of the hardware requirements desired by the Architect. It shall be the Contractor's responsibility to examine the Drawings and door schedules and provide all necessary or additional hardware as required but not scheduled herein. Such items of hardware shall be of the same type, quality, and quantity as that scheduled for similar doors or similar purposes.

In the accompanying hardware list, catalog numbers used are those of specific manufacturers, used to establish a minimum standard of quality and requirements as to type, weight, mechanical construction and operation to which hardware shall conform. That list indicates manufacturers on which catalog numbers are based, as well as acceptable equivalent manufacturers.

Proposals shall be based on specified (base or acceptable equivalent) brands. If the Contractor wishes to submit other brands as equivalent to those specified, he shall enter such proposed substitutions separately from his basic proposal. For each item proposed, he shall enter the amount to be added to or deducted from his base bid in the event the proposed substitution is accepted by the Owner and Architect. Substitute items shall not be used without the approval of the Architect.

HARDWARE MANUFACTURERS

<u>Hardware Item</u>	<u>Base Manufacturer</u>	<u>Acceptable Equivalents</u>
Spring Hinges	Hager	Stanley
Hinges	Hager	Stanley, McKinney
Lockset (Standard Type)	Schlage	Sargent, Yale
Lockset (Electronic System)	KABA/ILCO System E-760	Onity, Vingcard
Closer	LCN	Sargent, Dorma
Stops, Flush Bolts	Ives	Rockwood, Quality, Taymor
Weatherstrip, Door Sweeps, Thresholds	NGP, Stanley	Pemko, Zero, Door and Hardware Systems
Exit Devices	Sargent	Adams-Rite, Von Duprin
Peep Sight	Ives	Quality
Door Guard	Ives	Quality, Door & Hardware Systems, Inc.
Surface Bolts	Ives	Quality
Frame Smoke Seals	DSHI #105 "Cush N Seal" by: Door & Hardware System (716) 235-8543	None
Door Silencers	Glynn-Johnson	Door & Hardware Systems, Inc.
Electric Strike	Folger Adams	None

CYLINDERS AND KEYING

Keying System: Master keying must be in accordance with the National Hardware Council's recommendations for hotels.

For Manual Locks:

Equip locks with manufacturer's standard 6-pin tumbler cylinders.

Equip locks with manufacturer's interchangeable core cylinders operable by a control key.

Comply with Owner's instructions for master keying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group.

Permanently inscribe each key with number or lock that identifies cylinder manufacturer key symbol, and notation "DO NOT DUPLICATE".

Key Material: Provide keys of nickel silver only.

Key Quantity: Furnish three change keys for each lock; five master keys for each master system; and five grandmaster keys for each grandmaster system.

Deliver keys to Owner's representative.

For Electronic Locks:

Provide card keys as required to comply with master keying.

Provide one system controller.

Provide one spare lock with keys.

Keying

General: Supplier will supply three reusable card keys per lock (or three keys for standard locks) and three sets of master keys.

Keying shall be as follows:

Each room shall be keyed separately.

A master key for all guest rooms.

A master key for all rooms.

A master key to open guest room deadbolts.

Room keys shall open exterior doors.

Keying Schedule – Submit keying schedule to Owner for approval prior to fabrication.

Keying to have 3 levels of security.

PART 3 - EXECUTION

INSPECTION

Verify that doors and frames are ready to receive work and dimensions, are as indicated on Shop Drawings, and as instructed by the manufacturer.

Beginning of installation means acceptance of existing conditions.

INSTALLATION

Install each hardware item in compliance with manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, install each item completely and then remove and store in a secure place during the finish application. After completion of the finished, reinstall each item. Do not install surface-mounted items until finishes have been completed on the substrate.

Conform to ANSI A117.1 and ADAAG for positioning requirements for the Disabled.

All door closers shall be installed out of public sight wherever possible.

All doors off corridors and all communicating doors to have frame-mounted smoke seals.

FASTENINGS

Furnish proper screws, hex bolts, through bolts, etc., as required to make secure attachment of each item to the material it is installed on.

PROTECTION AND CLEANING

After installation, clean metal surfaces on both interior and exterior of all mortar, plaster, paint and other contaminants. After cleaning, protect work against damage.

FINAL ADJUSTMENT

Whenever hardware is installed more than one month prior to acceptance or occupancy of a space or area, return during the week prior to acceptance or occupancy and make a final check and adjustment of all hardware items in such space or area.

At the completion of the project, manufacturers' suppliers or representatives shall inspect their hardware and make any corrections required due to errors or improper installation.

PART 4 - HARDWARE SCHEDULE

See door and hardware schedule on drawings.

END OF SECTION

SECTION 08800

GLASS AND GLAZING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Types of work in this Section include glass and glazing for:

- Tempered Glass
- Polished Wire Glass
- Insulated Units
- Mirror Glass

RELATED SECTIONS

- Section 07900 - Sealants
- Section 08110 - Steel Doors and Frames
- Section 08410 - Aluminum Entrances and Storefronts
- Section 08460 - Automatic Sliding Doors

SUBMITTALS

Product Data: Submit manufacturer's technical data for each glazing material and fabricated glass product required, including installation and maintenance instructions.

Samples: Submit, for verification purposes, 12" square samples of each type of glass indicated except for clear single pane units, and 12" long samples of each color required (except black) for each type of sealant or gasket exposed to view. Install sealant or gasket sample between two strips of material representative of adjoining framing system in color. Sample requirement may be waived by Architect at his discretion.

Compatibility and Adhesion Test Report: Submit statement from sealant manufacturer indicating that glass and glazing materials have been tested for compatibility and adhesion with glazing sealants and interpreting test results relative to material performance, including recommendations for primers and substrate preparation needed to obtain adhesion.

QUALITY ASSURANCE

Glazing Standards: Comply with recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual" and "Sealant Manual" except where more stringent requirements are indicated. Refer to those publications for definitions of glass and glazing terms not otherwise defined in this section or other referenced standards.

Single Source Responsibility for Glass: To ensure consistent quality of appearance and performance, provide materials produced by a single manufacturer or fabricator for each kind and condition of glass indicated and composed of primary glass obtained from a single source for each type and class required.

DELIVERY, STORAGE, AND HANDLING

Protect glass and glazing materials during delivery, storage and handling to comply with manufacturer's directions and as required to prevent edge damage to glass, and damage to glass and glazing materials from effects of moisture including condensation, of temperature changes, of direct exposure to sun, and from other causes.

PROJECT CONDITIONS

Environmental Conditions: Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

WARRANTY

General: Warranties shall be in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

All material shall be free from manufacturer defects and installation workmanship. Any material or workmanship judged to be defective shall be replaced at no cost to the Owner.

Insulating glass units shall be jointly guaranteed for a period of five (5) years by the manufacturer and installer against obstruction of vision between interior glass surfaces caused by failure of the hermetic seal. Units damaged during guarantee period shall be replaced at no cost to the Owner.

PART 2 - PRODUCTS

ACCEPTABLE GLASS MANUFACTURERS

All glass shall be new material, graded under Federal Specifications DD-G-451-D-451D

All glass in related area shall be from one manufacturer.

GLASS MATERIALS

Refer to Drawings for location of glass.

Glass I: Clear Float Glass: Type 1 (transparent glass, flat), Class 1 (clear), Quality q3 (glazing select), as manufactured by one of the following;

PPG Industries, Inc.

LOF, Libbey-Owens-Ford Company

AFG, American Float Glass

Glass II: Tempered Glass: 1/4", Condition A (uncoated surfaces), Type 1 (transparent glass, flat), Class 1 (clear), Quality q3, clear, fully tempered safety glass (meet requirements of ANSI Z97.1).

All tempered glass shall conform to ANSI Z97.1, ASTM C1048, and Federal Standard CPSC 16 SFR 1201. Tempered glass shall bear permanent monogram indicating tempered quality. Fabrication marks on tempered glass shall be located to be concealed in completed installation.

Glass III: Wire Glass: Type II, class I (translucent), Quality q9 (glazing), comply with ANSI Z91.1, 1/4" thick; Form I (wired, polished both sides), mesh M2 (square).

Sealed Insulating Glass Units

Provide preassembled units consisting of organically sealed panes of glass enclosing a hermetically sealed dehydrated air space and complying with ASTM E 774 for performance classification indicated as well as with other requirements specified for glass characteristics, air, space, sealing system, sealant, space material, and dessicant.

Thickness of Each Pane: 1/4"

Air Space Thickness: 1/2"

Sealing System: Manufacturer's Standard Dual Seal

Dessicant: Manufacturer's Standard - Either Molecular Sieve or Silica Gel or Blend of Both

Spacer Material: Manufacturer's Standard Metal, with Bronze Anodized Finish

Exterior Pane of Glass: Glass Type III

Interior Pane of Glass

Glass I or II

Mirror Glass: 3/16" clear plate glass conforming to FS DD-M-00411B with 15 year guarantee against silver spoilage. Polish all edges.

Mirror Mounting: Mirror Mastic: An adhesive setting compound, produced specifically for setting mirrors by spot application, certified as compatible with glass coating by organic protective coating manufacturer and approved by mirror manufacturer for use in high humidity conditions. Provide and install stainless steel J-channels where indicated. Acceptable manufacturers:

"Pazwall Multi-Purpose Adhesive" by Paz Systems, Inc.

Approved equal.

ELASTOMERIC GLAZING SEALANTS AND PRE-FORMED GLAZING TAPES

General: Provide products of type indicated and complying with the following requirements:

Compatibility: Select glazing sealants and tapes of proven compatibility with other materials with which they will come into contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.

Suitability: Comply with recommendations of sealant and glass manufacturers for selection of glazing sealants and tapes which have performance characteristics suitable for applications indicated and conditions at time of installation.

Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated which complies with ASTM C 920 requirements, including those for Type, Grade, Class and Uses.

Colors: Provide color of exposed sealants indicated or, if not otherwise indicated, as selected by Architect from manufacturer's standard colors.

Preformed Butyl-Polyisobutylene Glazing Tape: Provide manufacturer's standard solvent-free butyl-polyisobutylene formulation with a solids content of 100 percent; complying with AAMA A 804.1; in extruded tape form; nonstaining and non-migrating in contact with non-porous surfaces; packaged on rolls with a release paper on one side; with or without continuous spacer rod as recommended by manufacturers of tape and glass for application indicated.

Sealants: Provide structural and weatherseal sealants recommended by the manufacturer of the structural sealant glazed curtain wall system.

As manufactured by the following:

General Electric

Tremco

Approved Equal

Refer to Section 07900 for requirements.

Structural silicone sealant shall be specifically designed and tested for use as structural sealant.

Spacers, Setting Blocks, Gaskets, and Bond Breakers: Provide the curtain wall manufacturer's permanent nonmigrating types compatible with sealants and suitable for joint movement and sealing requirements.

MISCELLANEOUS GLAZING MATERIALS

Compatibility: Provide materials with proven record of compatibility with surfaces contacted in installation.

Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

Setting Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealants, 80 to 90 Shore A durometer hardness.

Spacers: Neoprene, EPDM or silicone blocks, or continuous extrusions, as required for compatibility with glazing sealant, of size, shape and hardness recommended by glass and sealant manufacturers for application indicated.

Edge Blocks: Neoprene, EPDM or silicone blocks as required for compatibility with glazing sealant, of size and hardness required to limit lateral movement (side-walking) of glass.

Compressible Filler Rods: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

Muntins – White interior plastic muntins on all windows and glass in doors.

PART 3 - EXECUTION

EXAMINATION: Require Glazier to inspect work of glass framing erector for compliance with manufacturing and installation tolerances, including those for size, squareness, offsets at corners; for presence and functioning of weep system; for existence of minimum required face or edge clearances; and for effective sealing of joinery. Obtain Glazier's written report listing conditions detrimental to performance of glazing work. Do not allow glazing work to proceed until unsatisfactory conditions have been corrected.

PREPARATION: Clean glazing channels and other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to substrates. Remove lacquer from metal surfaces where elastomeric sealants are indicated for use.

GLAZING, GENERAL

Comply with combined printed recommendations of glass manufacturers, of manufacturers of sealants, gaskets and other glazing materials, except where more stringent requirements are indicated, including those of referenced glazing standards.

Protect glass from edge damage during handling and installation; use a rolling block in rotating glass units to prevent damage to glass corners. Do not impact glass with metal framing. Use suction cups to shift glass units within openings; do not raise or drift glass with a pry bar. Rotate glass with flares or bevels along one horizontal edge which would occur in vicinity of setting blocks so that these are located at top of opening. Remove from project and dispose of glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance and appearance.

Apply primers to joint surfaces where required for adhesion of sealants, as determined by pre-construction sealant-substrate testing.

Anchor components securely in place in the manner indicated. Shim and allow for movement resulting from changes in thermal conditions. Provide separators and isolators to prevent corrosion, electrolytic deterioration, and "freeze-up" of moving joints.

Glazing: Inspect glass and framing for compliance with manufacturing and installation tolerances, including size, squareness, and offsets at corners; for existence of minimum face or edge clearances; and for effective sealing of joinery.

Avoid point loading of glass. Do not proceed with glazing work until unsatisfactory conditions have been corrected. Do not field-cut glass.

Field-Glazed Structural Silicone Glazing Work: Clean frames and glass surfaces with an approved solvent. Prime surfaces and apply structural sealant in accordance with manufacturer's recommendations. Clean excess structural sealant before curing. Mechanically hold glass firmly in place until sealant is sufficiently cured. Install compressible backer rods in joint before applying weatherseal sealant.

Erection Tolerances: Install curtain wall components plumb, level, accurately aligned, and located in reference to column lines and floor levels. Erection tolerances indicated below are the maximum allowable for both no-load and full-load conditions and are not cumulative.

Adjust work to conform to the following tolerances:

Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.

Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.

Alignment: Limit offset of member alignment to 1/16 inch where surfaces are flush or less than 1/2 inch out of flush and separated by less than 3 inches by protruding work; otherwise limit offsets to 1/8 inch.

Location: 3/8 inch maximum deviation from the measured theoretical location of any member at any location.

GLAZING

Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner, but with edge nearest corner not closer than 6" from corner, unless otherwise required. Set blocks in thin course of sealant which is acceptable for heel bead use.

Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (length plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8" minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

Provide edge blocking to comply with requirements of referenced glazing standard, except where otherwise required by glass unit manufacturer. Set units of glass in each series with uniformity of pattern, draw, bow and similar characteristics.

Provide compressible filler rods or equivalent back-up material, as recommended by sealant and glass manufacturers, to prevent sealant from extruding into glass channel weep systems and from adhering to joints back surface as well as to control depth of sealant for optimum performance, unless otherwise indicated. Force sealants into glazing channels to eliminate voids and to ensure complete "wetting" or bond of sealant to glass and channel surfaces.

MIRROR INSTALLATION

General: Install mirrors to comply with printed directions of mirror manufacturer, and with referenced FGMA standard and NAMM document. Mount mirrors in place to avoid distorting reflected images and provide space for air circulation between back of mirror and face of mounting surface.

Mastic Spot Installation System: Install mirrors with mastic as follows:

Identify and examine surfaces over which mirror is to be mounted. Comply with manufacturer's printed installation directions for preparation of mounting surfaces including coating surfaces with mastic manufacturer's special bond coating where applicable.

Apply barrier coat to mirror backing where approved by manufacturers of mirror and backing material. Apply mastic in spots to comply with mastic manufacturer's printed directions for coverage and to allow air circulation between back of mirror and face of mounting surface. After mastic is applied, align mirror and press into place while maintaining a minimum air space of 3/16 inch between back of mirror and mounting surface.

PROTECTION AND CLEANING

Protect exterior glass from breakage immediately upon installation by use of crossed streamers attached to framing and held away from glass. Do not apply markers to surfaces of glass. Remove nonpermanent labels and clean surfaces.

Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove immediately by method recommended by glass manufacturer.

Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less often than once a month, for buildup of dirt, scum, alkali deposits or staining. When examination reveals presence of these forms of residue, remove by method recommended by glass manufacturer.

Remove and replace glass which is broken, chipped, cracked, abraded or damaged in other ways during construction period, including natural causes, accidents and vandalism.

Wash glass on both faces not more than 4 days prior to date scheduled for inspections intended to establish date of substantial completion.

END OF SECTION

SECTION 09260

GYPSUM WALLBOARD SYSTEMS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section shall include, but not necessarily be limited to, furnishing and installing the following:

- Gypsum Board and Required Accessories
- Spray-Applied Acoustical Plaster Finish
- Sound Deadening Board

RELATED SECTIONS

- Section 06100 - Rough Carpentry
- Section 07200 - Insulation
- Section 07270 - Fire Barrier Systems
- Section 09900 - Painting

DEFINITIONS

Gypsum Board Construction Terminology: Refer to ASTM C-11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this section or in other referenced standards.

QUALITY ASSURANCE

Fire-Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire-resistance rating has been determined per ASTM E-119 by a testing and inspecting organization acceptable to authorities having jurisdiction.

Provide fire-resistance-rated assemblies identical to those indicated by reference to GA File Nos. in GA-600 "Fire Resistance Design Manual" or to design designations in U.L. "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.

Single Source Responsibility for Panel Products: Obtain each type of gypsum board, other panel products, and related joint treatment materials from a single manufacturer.

Sound Transmission Characteristics: For gypsum board assemblies indicated to have STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

DELIVERY, STORAGE, AND HANDLING

Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

PROJECT CONDITIONS

Environmental Conditions, General: Establish and maintain environmental conditions for application and finishing gypsum board to comply with ASTM C-840 and with gypsum board manufacturer's recommendations, whichever are more stringent.

Minimum Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg. F. (4 deg. C.). For adhesive attachment and finishing of gypsum board maintain not less than 50 deg. F. (10 deg. C.) for 48 hours prior to application and continuously thereafter until drying is complete. Do not exceed 95 deg. F (35 deg. C) when using temporary heat sources.

Ventilation: Ventilate building spaces as required for drying joint treatment materials. Avoid drafts during dry, hot weather to prevent materials from drying too rapidly.

Samples – Furnish (4) 6"X6" samples of knock down wall texture to owner for approval by owner and Microtel Corporate.

REFERENCES

Gypsum Association, GA-216 Recommended Specifications for the application and finishing of gypsum board.

PART 2 - PRODUCTS

GYPSUM BOARD PRODUCTS

Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include the following:

Domtar Gypsum Company

Georgia-Pacific Company

Gold Bond Building Products Div., National Gypsum Company

United States Gypsum Company

General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.

Thickness: Provide gypsum board in thicknesses indicated or, if not otherwise indicated, in 1/2 and 5/8 inch thicknesses to comply with ASTM C 840 for application system and support spacing indicated.

Gypsum Wallboard: ASTM C 36 and as follows:

Type: Type X

Type: Sag-resistant type for ceiling surfaces.

Type: Moisture-resistant type for all toilet rooms.

Edges: Tapered and featured (rounded or beveled) for prefilling.

Sound Deadening Board: Provide 1/2" thick "G-P Hushboard" wood fiber sound deadening board by Georgia-Pacific.

TRIM ACCESSORIES

Accessories for Interior Installation: Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

Material: Formed metal or metal combined with paper, unless otherwise indicated, complying with the following requirement:

Metal shall be sheet steel zinc-coated by hot-dip process.

All metal trims to be mud-set type

Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:

Cornerbead on outside corners, unless otherwise indicated.

LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim, unless otherwise indicated.

L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.

At Joints between Gypsum Board and exterior door and window frames, trim shall be USG RP Series, rigid vinyl, or approved equal.

JOINT TREATMENT MATERIALS

General: Provide materials complying with ASTM C-475, ASTM C-840, and recommendations of manufacturer of both gypsum board and joint treatment materials for the application indicated.

Joint Tape: Paper reinforcing tape, unless otherwise indicated.

Use pressure sensitive or staple-attached open-weave glass fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.

For filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by the gypsum board manufacturer for this purpose.

For topping compound, use sandable formulation.

Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

Ready-Mixed Formulation: Factory-Mixed Product

Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.

Topping compound formulated for fill (second) and finish (third) coats.

All-purpose compound formulated for both taping and topping compounds.

SPRAY-APPLIED TEXTURED FINISH: Asbestos-free spray finish applied at a rate of 8 sq. ft. per pound minimum. Acceptable products for wall and ceiling spray texture shall include:

Gold Bond Building Products (Medium Finish).

United States Gypsum Company (Medium Finish).

Approved equal by Ruco, Design Texture, Beadex and Quick Spray.

ACOUSTICAL SEALANT

Latex Acoustical Sealant: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:

Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90.

Product has flame-spread and smoke-developed ratings of less than 25 per ASTM E 84.

Acoustical Sealant for Concealed Joints: Manufacturer's standard nondrying, non-hardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

MISCELLANEOUS MATERIALS

General: Provide auxiliary materials for gypsum drywall construction which comply with referenced standards and the recommendations of the manufacturer of the gypsum board.

Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum boards.

Spot Grout: ASTM C-475, setting-type joint compound of type recommended for spot grouting hollow metal door frames.

Gypsum Board Screws: ASTM C-1002

Gypsum Board Nails: ASTM C-514

Water: All water used in joint system shall be clean and free from deleterious amounts of foreign material.

Other Materials: All other materials not specifically described but required for a complete and proper installation of gypsum drywall shall be as selected by the Contractor, subject to approval by the Architect.

PART 3 - EXECUTION

EXAMINATION

Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

APPLICATION AND FINISHING OF GYPSUM BOARD, GENERAL

Gypsum Board Application and Finishing Standards: Install and finish gypsum board to comply with ASTM C-840 and GA-216.

Install Batt insulation where indicated, prior to gypsum board unless readily installed after board has been installed on one side.

Locate exposed end-butt joints as far from center of walls and ceilings as possible and stagger not less than 24 inches in alternate courses of board.

Install ceiling boards across framing in the manner which minimizes the number of end-butt joints and which avoids end joints in the central area of each ceiling. Stagger end joints at least 24 inches.

Install wall/partition boards in manner which minimizes the number of end-butt joints or avoids them entirely where possible. At stairwells and similar high walls, install boards horizontally with end joints staggered over studs.

Install exposed gypsum board with face side out. Do not install imperfect, damaged, or damp boards. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.

Locate both edge or end joints of sound board & gypsum board over supports, except in horizontal applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position boards so that like edges abut, tapered edges against tapered edges and mill-cut or field-cut ends against mill-cut or field-cut ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

Attach gypsum board to studs so that leading edge or end of each board is attached to open (unsupported) edge of stud flanged first.

Attach gypsum board to supplementary framing and blocking provided for additional support at openings and cutouts.

Form control joints and expansion joints at locations indicated, with space between edges of boards, prepared to receive trim accessories.

Isolate perimeter of non-load-bearing drywall partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and trim edge with "U" bead edge trim. Seal joints with acoustical sealant.

Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, control and expansion joints, openings and penetrations with a continuous bead of acoustical sealant including a bead at both faces of partitions. Comply with ASTM C-919 and manufacturer's recommendations for location of edge trim and close off sound-flanking paths around or through construction, including sealing of partitions above acoustical ceilings.

Space fasteners in gypsum boards in accordance with referenced gypsum board application and finishing standard and manufacturer's recommendations.

GYPSUM BOARD APPLICATION METHODS

Single-Layer Application: Install gypsum wallboard as follows:

On ceilings, apply gypsum board prior to wall/partition board application to the greatest extent possible, at right angles to framing, unless otherwise indicated.

On partitions/walls, apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.

On Z-furring members, apply gypsum board vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

Multiple-Layer Application: Install gypsum backing board for base layer and gypsum wallboard for face layer.

On ceilings, apply base layer prior to applying base layer on walls/partitions; apply face layers in same sequence. Offset face-layer joints at least 16 inches from parallel base-layer joints. Apply base layers at right angles to framing members unless otherwise indicated.

On partitions/wall, apply base layer and face layers vertically (parallel to framing) with joints of base layer over supports and face layer joints offset at least 10 inches with base layer joints.

On furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

Single-Layer Fastening Methods: Apply gypsum boards to supports as follows:

Fasten with screws.

Multiple-Layer Fastening Methods: Apply base layer of gypsum board and face layer to base layer as follows:

Fasten both base layers and face layers separately to supports with screws.

Direct-Bonding to Substrate: Where gypsum panels are indicated as directly adhered to a substrate (other than studs, joists, furring members or base layer of gypsum board), comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum panels until fastening adhesive has set.

INSTALLING TRIM ACCESSORIES

General: Where feasible, use the same fasteners to anchor trim accessory flanges as required to fasten gypsum board to the supports. Otherwise, fasten flanges to comply with manufacturer's recommendations.

Install corner beads at external corners.

Install edge trim where edge of gypsum panels would otherwise be exposed or semi-exposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.

Install edge trim where edge of gypsum board would otherwise be exposed or semi-exposed. Provide edge trim-type with face flange to receive joint compound except where other types are indicated.

Install "LC" bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.

Install "L" bead where edge trim can only be installed after gypsum board is installed.

Install U-type trim where edge is exposed, revealed, gasketed, or sealant-filled (including expansion joints).

FINISHING OF GYPSUM BOARD ASSEMBLIES

General: Apply joint treatment at gypsum board joints (both directions), flanges of corner bead, edge trim, and control joints, penetrations, fastener heads, surface defects and elsewhere as required to prepare work for decoration and level of gypsum board finish indicated.

Prefill open joints, rounded or beveled edges, and damaged areas, using setting-type joint compound.

Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.

Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.

Level 1 for ceiling plenum areas, concealed areas, and where indicated, unless a higher level of finish is required for fire-resistive-rated assemblies and sound-rated assemblies.

Level 2 where water-resistant gypsum backing board panels form substrates for tile, and where indicated.

Level 4 for gypsum board surfaces indicated to receive light-textured finishes, wallcoverings, and flat paints over light textures.

Level 4 for gypsum board surfaces indicated to receive gloss and semi-gloss enamels, nontextured flat paints, and where indicated.

Level 5 for gypsum board exposed ceilings to receive paint.

For Level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using one of the following combinations of joint compounds (not including prefill), and sand between coats and after last coat.

Where Level 5 gypsum board finish is indicated, apply joint compound combination specified for Level 4 plus a thin, uniform skim coat of joint compound over entire surface. Use joint compound specified for the finish (third coat) or a product specially formulated for this purpose and acceptable to gypsum board manufacturer. Produce surfaces free of tool marks and ridges ready for decoration of type indicated.

Where Level 2 gypsum board finish is indicated, apply joint specified for first coat in addition to embedding coat.

Where Level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.

Allow not less than 24 hours drying time between coats.

SPRAY-APPLIED ACOUSTICAL PLASTER: Apply in strict accordance with manufacturer's specifications. Prepare surface as directed. Apply a full coat of good quality flat white primer, as recommended and approved by manufacturer, over entire surface prior to applying textured finish.

ADJUST AND CLEAN

Cut, patch, repair, and point-up gypsum board as required. Repair cracks and indented surfaces.

Promptly remove compound from door frames, windows, and other surfaces. Repair floors, walls, and other surfaces which have been stained, marred, or otherwise damaged during the framing and gypsum board work. Daily remove unused materials, containers, and equipment. Clean floors of all gypsum board and wood debris and leave broom clean.

PROTECTION

Provide final protection and maintain conditions, in a manner suitable to installer, which ensures gypsum drywall construction being without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09300

TILE

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Porcelain Floor Tile and Accessories

Ceramic Floor Tile, Wall Tile and Accessories

Crack Bridging Membrane

All in locations as shown on the Drawings. All finish colors to be confirmed per the approved

Microtel Color Scheme.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 07900 - Joint Sealers

REFERENCES

Tile Council of America, Inc. - "Hand Book for Ceramic Tile Installation".

ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar.

ANSI A118.1 - Dry-Set Portland Cement Mortar

ANSI A137.1 - Recommended Standard Specifications for Ceramic Tile

Note: All tile shall meet recommended slip coefficient for each given use area.

QUALITY ASSURANCE

In addition to complying with all pertinent codes and regulations, conform to ANSI - American Standard Specification for the Installation of Ceramic Tile.

All tiles and accessories shall be produced by a single manufacturer.

SUBMITTALS: Submit manufacturer's product data along with installation and maintenance instructions.

Submit three samples of each type and color of tile required, not less than 12 inch square on plywood or hardwood backing, and grouted. Also, submit one full size sample of each tile accessory. Review by owner and Microtel Corporate will be for color, pattern, and texture only. Compliance with all other requirements is the exclusive responsibility of the Contractor.

PRODUCT DELIVERY, STORAGE, AND HANDLING: Deliver packaged materials and store in original containers with seals unbroken and labels intact until time of use in accordance with manufacturer's directions. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

JOB CONDITIONS: Substrate shall be prepared to receive new tile in a manner acceptable to the tile manufacturer. Existing flooring and other materials shall be removed and surface prepared to accept new tile.

PART 2 - PRODUCTS

PORCELAIN FLOOR TILE

ANSI A137.1, 12" X 12" tile. Color and finish by Section 00870.

Provide matching accessories and special shapes as required.

Acceptable Products

Daltile: Stone Peak 931-210-7093

CERAMIC FLOOR TILE

ANSI A137.1, 8" X 8" tile. Color and finish by Section 00870.

Provide matching accessories and special shapes as required.

Acceptable Products

Daltile or equal with non-slip texture.

CERAMIC WALL TILE

ANSI A137.1, 6" X 6" tile. Color and finish by Section 00870.

Provide matching accessories and special shapes as required.

Acceptable Products

Daltile or equal.

CRACK BRIDGING MEMBRANE

Provide anti-fracture membrane with fiberglass mesh tape in locations as recommended by the manufacturer.

Manufacturers: Acceptable manufacturers for membrane shall include:

SEMCO Anti-Fracture Membrane as manufactured by Custom Building Products 800-272-8786

MORTAR MATERIALS - FLOOR TILE

Bond Coat: Thin Set Mortar with acrylic admix used in conformance with ANSI A108.5. Materials shall conform with ANSI A118.4.

Acceptable Manufacturers include:

Master-Blend Thin-Set with acrylic mortar admix or custom-flex as manufactured by Custom Building Products.

Ceramic Tile: Base – Coved sanitary base.

GROUT MATERIALS: FLOOR TILE

Polymer-Modified "DRY" Grout used in conformance with ANSI A108.10. Materials shall conform to ANSI A118.6.

Acceptable Manufacturers:

PolyBlend Tile Grout as manufactured by Custom Building Products.

LEVELING COAT

Leveling coat shall be 1/4" thick or less and shall consist of dry set mortar to which an equal volume of a mixture of one part Portland Cement and 1-1/2 parts sand has been added or as recommended by the manufacturer. Leveling coat must be compatible with other related materials.

Maximum variation in surface of leveling coat shall not exceed 1/8" in 8'-0" from required plane.

Leveling coat shall be cured at least 24 hours before tile is applied.

Surface to which leveling coat is to be applied shall be free of any coatings, oil, and wax.

OTHER MATERIALS: Other materials, including adhesives not specifically described but required for a complete and proper installation of tiles, shall be only as recommended by the manufacturer of material to which it is applied.

EXTRA STOCK: Furnish additional tile to the Owner, for replacement stock, amounting to 3 percent of each finish, color, and size of each type of tile.

PART 3 - EXECUTION

INSPECTION: Installer must examine the areas and conditions under which flooring and accessories are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

PREPARATION: Prior to laying flooring, vacuum surfaces to be covered and inspect subfloor. Start of flooring installation indicates acceptance of subfloor conditions and full responsibility for completed work. Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions in subfloors.

Apply concrete slab primer for ceramic tile, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

CRACK BRIDGING MEMBRANE

Install membrane in strict accordance with manufacturer's specifications.

Provide 12 inch wide mesh tape at all control joints and existing cracks in concrete floor.

PRE-MOLDED CONTROL JOINTS

Install pre-molded control joints at all control joint locations in area of tile floor and other locations as shown on Drawings. Install over crack bridging.

TILE INSTALLATION

Comply with the ANSI Standard Installation Specifications, as previously indicated.

Handle, store, mix, and apply mortar and grout in compliance with manufacturer's instructions.

Extend tile work into recesses and under equipment and fixtures to form a complete covering without interruptions. Terminate work neatly at obstructions, edges, and corners without disruption of pattern or joint alignment.

Sound tile after setting and replace hollow sounding units.

General: Install tile after finishing operations, including painting, have been completed. Moisture content of concrete slabs, building air temperature, and relative humidity must be within limits recommended by the flooring manufacturer.

Lay tile from center marks established from center of area so that tile at opposing edges of the area are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at edge perimeters. Lay tile square to room axis unless otherwise shown.

Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged. Cut tile neatly in and around all fixtures. Broken, cracked, chipped, or deformed tile are not acceptable.

Lay tile with grain in tile running in same direction. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Grind cut edges of tile abutting trim, finish, or built-in items.

ADJUST AND CLEAN

Clean grout and setting material from face of tile while materials are workable. Leave tile face clean and free of all foreign matter.

Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective work.

Protection: When recommended by tile manufacturer, apply a protective coat of neutral protective cleaner to completed surface. Protect installed tile work with Kraft paper or other heavy covering during the construction period to prevent damage. Prohibit all foot and wheel traffic from using tiled floors for at least 3 days, preferably 7 days.

Before final inspection, remove protective coverings and rinse neutral cleaner from all tile surfaces.

END OF SECTION

SECTION 09380

STONE COUNTERTOPS, VANITY TOPS AND SILLS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

Section 00870 "Finish Color Schedule"

Microtel approved FF&E Interior Color Schemes and corresponding approved granite colors.

- Crystal Gold (Breeze Scheme)
- Santa Cecelia gold (Cappuccino Scheme)
- Giallo Fiorito (Citrus Scheme)
- Leopard Pearl (Metro Scheme)
- Marigold Colored (Micro Scheme)
- New Tunis Green (Nature Scheme)

DESCRIPTION OF WORK: The work of this Section includes, but is not necessarily limited to, furnishing and installing of Granite Counter Tops, Vanity tops, Window Sills, Backsplashes and Aprons for the following locations:

- Front Desk Counter
- Breakfast and Beverage Counters with Backsplash
- Guest Bathroom Vanity Tops with Backsplash and Apron
- Guest room Wet Bar Tops with Backsplash and Sidesplash
- Window Sills

QUALITY ASSURANCE

Fabricator Qualifications: Only shops that employ skilled workers experienced in custom fabrication of stone countertops similar to those specified in this project.

Installer Qualifications: Fabricator shall install products.

Single Source Responsibility for Stone: Obtain all stone material for the project, of each variety, from a single quarry.

Single Source Responsibility for Grout Materials: Obtain grout ingredients of uniform quality, including color, from one manufacturer for each component.

SUBMITTALS

Product Data: Submit manufacturer's product data for each type of stone, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

For information only, submit copies of referenced standards utilized for this project unless duplicated in product data.

Samples for Verification Purposes: Once Owner has selected approved FF&E Color Scheme and corresponding approved granite color, submit samples of stone of each type and/or color required, and corresponding grout color, to Owner and Wyndham Worldwide for approval. Include in each set, the full range of exposed color and texture.

DELIVERY, STORAGE, AND HANDLING

Deliver stone materials to project in undamaged condition. Lift stone with wide-belt slings. Do not use wire rope or ropes that may cause staining. Do not use pinch or wrecking bars. If required, move stone with dollies with cushioned wood supports.

Store stone to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, staining, breaking, chipping or other causes.

Stone to be stored on a-frames or pallets with nonstaining separators and nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Place and stack skids and stones to distribute weight evenly and to prevent breakage or cracking of stones.

Store grout materials off the ground, under cover and in dry location.

Store stone accessories, including metal items, to prevent deterioration by corrosion and accumulation of dirt.

PROJECT CONDITIONS

Field Measurements: Verify dimensions of construction and/or casework to receive stone countertops and vanities by field measurement prior to fabrication.

Coordinate fabrication schedule with construction progress to avoid delays in the work.

After installation, do not permit any materials to be stored on tops. All tops to be protected for damage and/or staining.

COLD WEATHER PROTECTION

Remove any ice or snow from stone materials prior to delivery inside the building.

Do not install stone tops until the building is fully conditioned. Do not set stone when the air temperature or material temperature is below 50 degrees F (10 degrees C).

Maintain minimum ambient temperatures of 50 degrees F (10 degrees C) during installation and for seven days after completion unless higher temperatures are required by fabricator's or suppliers instructions.

PART 2 - PRODUCTS

MATERIALS, GENERAL

Comply with referenced standards and other requirements indicated below. Provide all tops as required for counters, vanities, front desk and window sills.

Stone to be cut from contiguous, matching slabs in which natural marking occur, unless stones from randomly selected blocs are acceptable to Owner for aesthetic effect.

Stone Color to match approved Microtel FF&E Color Scheme and corresponding approved Granite Color, for finish and other aesthetic characteristics. Granite and Grout samples to be approved by owner and Wyndham Worldwide prior to ordering.

GRANITE

Granite Building Stone Standard: ASTM C568.

Materials, Finish and Color per the Microtel Approved Color Schemes.

MANUFACTURER'S

Global Stone Enterprises – (727) 209-1135

Rennolds & Associates – (847) 530-8569

MORTAR MATERIALS

Portland Cement: ASTM C150, Type I or II, natural color, white or blend to produce mortar color to match material.

Low-Alkali Cement: Not more than 0.60 percent total alkaline when tested according to ASTM C114.

Aggregate: ASTM C144

ADHESIVES SEALERS AND SEALANTS

General: Use only adhesives and grout specifically formulated for stone and recommended by their manufacturer for the application specified.

Water Cleanable Epoxy Grout: ANSI A118.3, chemical resistant, water cleanable, tile setting and grouting epoxy.

Subject to compliance with requirements, provide products by one of the following manufacturer's, or an approved equal:

Bonsal, W.R. Company

Bonstone Materials Corp.

Custom Building Products

Stone Adhesive: Two part epoxy or polyester adhesive, formulated specifically for bonding stone with stone, with an initial maximum set time of 2 hours at 70 deg. F.

Color: Clear or Colored to match stone

Subject to compliance with requirements, provide products by one of the following manufacturer's, or an approved equal:

Epoxy Adhesive - Akemi North America; Akepox

Epoxy Adhesive - Axson North America, Inc.; Wood & Stone Company; Akabond

Polyester Adhesive - Akemi North America; Platinum Clear

Polyester Adhesive - Akson North America, Inc.; Wood & Stone Company; Wood & Stone Polyester

Sealant for Countertops: Clear silicone sealant complying with the requirements of Division 07 Section "Joint Sealants", and that will not stain the stone as it is applied.

Penetrating Sealer: Penetrating sealer that protects the exposed faces of stone and grout from staining. Sealer shall be UV transparent, non-yellowing, VOC Compliant, mold and mildew resistant, and USDA approved as safe on food handling surfaces.

Grout: Grout colors to match granite coloring, and be approved by the owner and Wyndham Design and Construction prior to ordering.

DIMENSION STONE ACCESSORIES

Setting Buttons: Lead or resilient plastic buttons, nonstaining to the stone, sized to suite joint thickness and bed depths of dimensioned stonework involved without intruding into required depths of joint sealants or causing third-side adhesion between sealant and setting button.

STONE COUNTERTOP, VANITY AND WINDOW SILL FABRICATION

General: Select stone for intended use to prevent fabricated units from containing cracks, seams and starts that could impair structural integrity or function.

Grade and mark stone for final locations to produce countertops and vanities with an overall uniform appearance.

Granite to comply with recommendations of National Building Granite Quarries Association (NBGQA) "Specifications for Architectural Granite.

Fabricate stone countertops and vanities in sizes and shapes required to comply with requirements indicated, including details on Drawings and final Shop Drawings.

Cut and Drill sinkages and holes in stones for anchors, fasteners, supports and lifting devices as indicated or needed to set dimensioned stonework securely in place. Set beds to fit supports.

Cut stones to produce pieces of thickness, size and shape indicated to comply with fabrication and construction tolerances recommended by applicable stone association and/or by stone source, for faces, edges, beds and backs.

Clean sawed backs of stones to remove rust stains and free iron particles.

Provide openings, reveals, and similar features as needed to accommodate adjacent work.

Fabricate molded edges to produce stone shapes having a uniform profile throughout their entire length, and with precisely formed arises slightly eased to prevent snipping, and matched at joints between units. Form corners of molded edges as indicated with outside corners slightly eased, unless noted otherwise.

Finish exposed faces and edges of stones to comply with requirements indicated for finish under each type and application of stone required to and to match approved samples. Provide matching finish on exposed edges of countertops, splashes and cutouts.

Thickness: Provide thickness as indicated, but not less than the following:

Tops and Sills nominal Thickness: Provide $\frac{3}{4}$ " thick countertops, vanities and window sills with Polished finish.

Edge Detail: All countertops, vanities and window sills to have an "Eased" and Polished edge.

Backsplashes and Sidesplashes: Provide 2 CM thick x 4" high backsplashes and sidesplashes with Polished finish.

Joints: Fabricate countertops in sections for joining in field, with joints located as indicated and as follows:

Bonded Joints: 1/32" or less in width.

Grouted Joints: 1/16" in width.

Sealant-filled: 1/16" in width

Splined Joints: Accurately cut kerfs in edges at joints for insertion of metal splines to maintain alignment of surfaces at joints. Make width of cuts slightly more than thickness of splines to provide snug fit. Provide at least three splines in each joint.

Cutouts and Holes:

Under counter Fixtures – Make cutouts for undercounted fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves with edges at right angles to top. Attach under counter fixtures in field.

Counter-Mounted Sinks: Prepare countertops in shop for field cutting openings for counter-mounted sinks. Park tops for cutouts and drill holes at corners of cutout locations. Make corner holes of largest radius practical.

Fittings: Drill countertops in shop for plumbing fittings, undercounted soap dispensers and similar items.

PART 3 - EXECUTION

EXAMINATION

Examine substrates indicated to receive stone countertops and conditions under which stone countertops will be installed, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance. Confirm all substrates are installed flush with top of cabinets.

For the record, prepare written report, endorsed by installer, listing conditions detrimental to performance of stone countertops and vanities.

Proceed with installation only after any/all unsatisfactory conditions have been corrected.

PREPARATION

Advise installers of other work about specific requirements for placement of inserts and similar items to be used by stone countertop and vanity installer for anchoring stone countertops and vanities. Furnish installers of other work with Drawings or Templates showing locations of these items.

Clean dirty or stained stone surfaces by removing soil, stains and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives. Allow stone to dry before installing.

CONSTRUCTION TOLERANCES

Variation from Plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches.

Variation from Level: Do not exceed 1/8 inch in 96 inches, 1/4 inch maximum.

Variation in Plane at Joints (Lipping): Do not exceed 1/64 inch difference between planes of adjacent units.

Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64 inch difference between edges of adjacent units, where edge line continues across joint.

INSTALLATION OF COUNTERTOPS

General: Install countertops over plywood subtops and/or wood frames, with a full spread of water-cleanable epoxy adhesive.

Bond seams with stone seam adhesive and draw tight as countertops are set. Mask areas of countertops adjacent to seams to prevent adhesive smears. Use clamps to ensure countertop units are properly aligned and seams are minimum width.

Complete cutouts not finished in shop. Mask areas of countertops adjacent to cutouts while cutting to prevent damage.

Install backsplash and end splashes by adhering to wall with water-cleanable epoxy adhesive. Leave 1/16 inch gap between countertop and splash for filling with sealant. Use temporary shims to ensure uniform spacing.

Apply sealant to seams and to gap between countertops and splashes, and comply with Joint Sealants section.

Attach under counter fixtures.

ADJUSTING AND CLEANING

Remove and replace or repair stonework of the following description:

Broken, chipped, stained or otherwise damaged stones. Broken, chipped, stained or otherwise damaged stone may be repaired, provided the methods and results are acceptable to Owner.

Stones and joints not matching approved samples.

Stonework not complying with other requirements indicated.

Replace in manner that results in stonework matching approved samples, complying with other requirements and showing no evidence of replacement.

Clean stonework not less than six days after completion of work, using clean water and stiff bristle fiber brushes. Do not use wire brushes, acid-type cleaning agents, cleaning compounds

with caustic or harsh fillers, or other materials or methods that could damage stone.

SEALER APPLICATION

All surfaces must be clean and free from all loose grit and debris, satins, dirt and wax coatings. Surfaces shall remain dry for a minimum of 24 hours before and 24 hours after the application of sealer.

Floor surface temperature must be above 50 degrees F and below 90 degrees F.

Test on a small area before using to determine if the product is acceptable with the type of stone.

A uniform coating of sealer shall be applied AFTER installation of stone materials. Apply sealer to comply with Sealer manufacturer's written instructions.

PROTECTION

Provide final protection of all stone countertops and vanities and maintain conditions in a manner acceptable to fabricator and installer ensuring no damage or deterioration at time of substantial completion.

END OF SECTION

SECTION 09510

SUSPENDED ACOUSTICAL CEILING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Suspended Metal Grid Systems Complete With Wall Trim

Ceiling Tiles

Plastic Eggcrate at Valances

All in locations as shown on Drawings. Where required by code, alternate vinyl coated tiles to be installed in food prep areas.

QUALITY ASSURANCE

Qualifications of Installers

The suspended ceiling Subcontractor shall have a record of successful installations of similar ceilings acceptable to the Architect.

For the actual fabrication and installation of all components of the system, use only personnel who are thoroughly trained and experienced in the skills required and completely familiar with the requirements established for this work.

CODES AND STANDARDS: In addition to complying with all pertinent codes and regulations, suspension system shall be installed according to ASTM C636, Installation of Metal Ceiling Suspension System for Acoustical Tile and Lay-in Panels.

PRODUCT HANDLING: Use all means necessary to protect the materials of this Section before, during, and after installation and to protect work and materials of all other trades.

ENVIRONMENTAL REQUIREMENTS

Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

SUBMITTALS

Submit samples of all ceiling tile materials for approval.

PART 2 - PRODUCTS

STRUCTURAL EXPOSED SUSPENSION SYSTEM

Manufacturer: Design for this system is based on use of USG Interiors (Donn Products). System used shall be that upon which design was based, by Armstrong, Chicago Metallic, or an equal approved in advance by Microtel.

Type I Grid: DX-24 System

System used shall be double-web, direct hung, exposed system.

Main Runners

Number DX-24 with 1-1/2" ht., 15/16" face, steel.

The main runner shall have a non-directional bayonet coupling.

Cross Runners: Number DX-216 or DX-424 designed to support lay-in lighting fixtures and to receive acoustical tile at sides of fixture opening.

Perimeter Wall Angles: Hemmed Edge, 7/8" x 7/8".

Accessories: Provide all accessories needed for proper installation of system.

Finish: All exposed surfaces shall be finished to match color of ceiling tile.

General: The systems shall be such that the ceiling panels may be removed without damage; that the main runner and cross runners may be removed and replaced without deforming the runners or disturbing the balance of the grid system.

Type I: 24" x 24" x 3/4" ceiling panels with square-cut shadowline edge for use with Type I Grid System. Color to be white.

"Sandrift No. 808", by U.S.G. Interiors, Inc.

Approved Equal by Armstrong

Approved Equal by Celotex Corporation

LIGHTING: Contractor shall be responsible for providing sufficient support on grid systems to support light fixtures. All fixtures shall be supported at each and every corner.

REPLACEMENT STOCK: This Contractor shall supply Owner with replacement stock amounting to 2% of each type of tile and suspension system specified.

PART 3 - EXECUTION

SURFACE CONDITIONS

Inspection: Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence. Verify that suspended ceiling systems may be installed in strict accordance with all pertinent codes and regulations, and the manufacturer's recommendations.

Discrepancies: In the event of discrepancy, immediately notify the Architect. Do not proceed in areas of discrepancy until all such discrepancies have been fully resolved.

INSTALLATION: Fabricate and install all components of the suspended ceiling systems in strict accordance with all pertinent codes and regulations, and the manufacturer's recommendations, firmly anchoring all items in place for long life under hard use.

Suspension from electrical or mechanical equipment will not be allowed.

CLEANING UP: Completely remove all finger prints and traces of soil and damage from the surfaces of grid and acoustical materials, using only those cleaning materials recommended for that purpose by the manufacturer of the material being cleaned. Replace units which are damaged or improperly installed.

END OF SECTION

SECTION 09650

RESILIENT FLOORING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Vinyl Composition Tile

Resilient Base

Carpet Edge Guards

RELATED SECTIONS

Section 00870 - Finish Color Schedule

QUALITY ASSURANCE

Single-Source Responsibility for Floor Tile: Obtain each type, color and pattern of flooring from a single source with resources to provide products of consistent quality in appearance and physical properties without delaying progress of the work.

DELIVERY, STORAGE, AND HANDLING

Deliver tiles and installation accessories to Project site in original manufacturer's unopened cartons and containers each bearing names of product and manufacturer, Project identification, and shipping and handling instructions.

Store flooring materials in dry spaces protected from the weather with ambient temperatures maintained between 50 degrees F. (10 degrees C.) and 90 degrees F. (32 degrees C.). Store tiles on flat surfaces. Move tiles and installation accessories into spaces where they will be installed at least 48 hours in advance of installation.

PROJECT CONDITIONS

Maintain a minimum temperature of 70 degrees F. (21 degrees C.) in spaces to receive tiles for at least 48 hours prior to installation, during installation, and for not less than 48 hours after installation. After this period, maintain a temperature of not less than 55 degrees F. (13 degrees C.).

Do not install tiles until they are at the same temperature as the space where they are to be installed. Close spaces to traffic during tile installation.

SEQUENCING AND SCHEDULING

Do not install resilient flooring materials over concrete slabs until the slabs have cured and are sufficiently dry to bond with adhesive as determined by tile manufacturer's recommended bond and moisture test.

TEST MATERIALS

Deliver extra materials to Owner. Furnish extra materials matching products installed as described below, packaged with protective covering for storage and identified with labels clearly describing contents. Furnish not less than one box for each 50 boxes or fraction thereof, of each class, wearing surface, color, pattern, and size of resilient floor tile installed.

SUBMITTALS

Submit manufacturer's product and maintenance data for each type of resilient flooring and accessory.

Asbestos Content: Provide written certification that tile and adhesive materials containing no asbestos of any type or mixture of types occurring naturally as impurities as

determined by polarized light microscopy test per Appendix A of 40 CFR 763 will be utilized on this Project.

Certification by resilient flooring manufacturer that products supplied for flooring installation comply with local regulations controlling use of volatile organic compounds (VOCS).

Submit color selection in the form of actual sections of resilient flooring, including accessories, for each type of resilient flooring required showing full range of colors and patterns available.

PART 2 - PRODUCTS

VINYL COMPOSITION TILES: All vinyl tile shall be the maximum extent possible of a single batch number. Tile shall be 12" x 12" x 1/8" thick, with uniform disbursement of color and texture throughout the thickness of the tile. Comply with ASTM F 1066, Composition 1 (nonasbestos formulated).

Acceptable Manufacturers

Armstrong: "Imperial Excelon"

Approved Equal

BASE: Where called for in finish schedule, resilient bases shall be extruded rubber, cove type, 1/8" thick, 4" high with premolded inside and outside corners. Job mitering of corners will not be permitted. Colors shall be per Section 00870 from standard and designer colors. Acceptable manufacturers include:

Armstrong

Approved Equal

VINYL CARPET EDGE GUARDS

Between carpet and resilient floor tile, system shall be CE-XX-B with CBD-00-A track base, as manufactured by Johnsonite or approved equal. Color per Section 00870.

INSTALLATION ACCESSORIES

Concrete Slab Primer: Nonstaining type as recommended by flooring manufacturer.

Trowelable Underlayments and Patching Compounds: Latex-modified, portland-cement-based formulation provided or approved by tile manufacturer for applications indicated.

Adhesives to be **Non-Toxic, Low Odor, and Solvent Free** with no alcohol, glycol, or ammonia. Adhesive shall be antimicrobial with no hazardous vapors and contain no carcinogenic materials, per OSHA Regulation 29 CFR 1910-1200. All containers shall contain material safety data sheets (MSDS) and be available at job site for inspection. Provide product as manufactured by W.F. Taylor Co., Inc. (800-397-4583) recommended for intended installation, as approved by base manufacturer, or approved equal.

Stair Tread Nose Filler: Two-part epoxy compound recommended by resilient tread manufacturer to fill nosing substrates not conforming to tread contours.

Other materials, including edge strips not specifically described, but required for a complete and proper installation of resilient flooring, shall be only as recommended by the manufacturer of material to which it is applied.

PART 3 - EXECUTION

INSPECTION: Installer must examine the areas and conditions under which resilient flooring and accessories are to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

CONCRETE SUBFLOORS: Verify that concrete slabs comply with ASTM F 710 and the following:

Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials whose presence would interfere with bonding of adhesive. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by tile manufacturer.

Finishes of subfloors comply with tolerances and other requirements specified in Division 3 Section, "Cast-In-Place Concrete" for slabs receiving resilient flooring.

PREPARATION

General: Comply with manufacturer's installation specifications for preparing substrates to receive products indicated.

Prior to laying flooring, vacuum surfaces to be covered and inspect subfloor. Start of flooring installation indicates acceptance of subfloor and full responsibility for completed work.

This Contractor to remove coatings, including curing compounds, adhesives, plastics, and other substances that are incompatible with flooring adhesives and that contain soap, wax, oil, or silicone, by using a terrazzo or concrete grinder, a drum sander, or a polishing machine equipped with a heavy-duty wire brush. Surface to receive new flooring shall be prepared, including removal of existing materials not acceptable for proper installation of new materials, as required by manufacturer.

Use leveling compound as recommended by flooring manufacturer for filling small cracks and depressions in subfloors.

Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

INSTALLATION - GENERAL: Install flooring after finishing operations, including painting, have been completed. Moisture content of concrete slabs, building air temperature, and relative humidity must be within limits recommended by flooring manufacturer's directions.

Patch and repair floors and walls to receive flooring for proper installation of flooring, stair accessories, and base.

Place flooring with adhesive cement in strict compliance with manufacturer's recommendations. Butt tightly to vertical surfaces and edgings. Scribe around obstructions and to produce neat joints, laid tight, even, and straight. Extend flooring into toe spaces.

Maintain reference markers, holes, or openings that are in place or plainly marked for future cutting by repeating on finish flooring as marked on subfloor. Use chalk or other non-permanent marking device.

Install flooring on covers for telephone and electrical ducts and other such items as occur within finished floor areas.

Maintain overall continuity of color and pattern with pieces of flooring installed in these covers. Tightly cement edges to perimeter of floor around covers and to covers.

Tightly cement flooring to subbase without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.

INSTALLATION - VINYL COMPOSITION TILE FLOORS: Lay tile from center marks established from center of area so that tile at opposite edges of the area are of equal width. Adjust as necessary to avoid use of cut widths less than 1/2 tile at edge perimeters. Lay tile square to room axis unless otherwise indicated.

Match tiles for color and pattern by using tile from cartons in same sequence as manufactured and packaged. Cut tile neatly in and around all fixtures. Broken, cracked, chipped, or deformed tiles are not acceptable. Lay tile with grain in tile running in same direction.

ACCESSORIES: Apply resilient base to walls, columns, pilasters, casework, and other permanent fixtures in rooms or areas where base is required. Install base in as long lengths as practicable. Tightly bond base to backing throughout the length of each piece with continuous contact at horizontal and vertical surfaces. On irregular surfaces, fill voids along top edge of resilient wall base with manufacturer's recommended adhesive filler material.

Place resilient edge strips tightly butted to adjacent materials of type indicated and bond to substrates with adhesive. Install edging strips at all unprotected edges of flooring unless otherwise shown. Apply resilient accessories to stairs and risers as indicated and according to manufacturer's installation instructions.

CLEANING AND PROTECTION: Remove any excess adhesive or other surface blemishes using neutral type cleaners as recommended by floor manufacturer.

Protect flooring against mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods indicated or recommended by manufacturer of resilient product involved.

Clean products specified in this Section not more than four days prior to dates scheduled for inspections intended to establish date of Substantial Completion in each area of Project. Clean products using method recommended by manufacturer. Strip protective floor polish that was applied after completing installation, prior to cleaning.

FINISHING: After completion of project and just prior to final inspection of work, thoroughly clean floors and accessories. Apply wax and buff with type of wax, number of coats, and buffing procedures in compliance with flooring manufacturer's instructions.

END OF SECTION

SECTION 09680

CARPETING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: Work in this Section includes the furnishing of all labor, material, equipment, appliances, and tools to perform the work indicated on the Drawings or specified herein. The work shall include, but not be limited to the following:

Prepare surfaces to receive carpeting.

Install carpeting on floor surfaces where indicated, complete with required accessories.

Install resilient edge strips where carpeting terminates at other floor finishes.

Carpet and pad (where required) will be purchased and furnished by owners, installation by contractor.

Note: All carpet colors to be chosen from the approved Microtel Color Scheme.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 09650 - Resilient Base Flooring

REFERENCE STANDARDS

FS DDD-C-0095 Carpet and rugs, wool, nylon, acrylic, modacrylic, polyester, polypropylene.

QUALITY ASSURANCE

Installer Qualifications: Firm with not less than 5 years of experience in installation of commercial carpeting of type, quantity, and installation methods similar to work of this Section.

Successful vendor shall be responsible for field measurements to determine carpet layout.

All products shall comply with the Carpet and Rug Institute Indoor Air Quality Testing Program (Green Label).

Carpet Surface Burning Characteristics: Provide carpet identical to that tested for the following fire performance characteristics, per test method indicated below, by UL or other testing and inspecting organizations acceptable to authorities having jurisdiction. Identify carpet with appropriate markings of applicable testing and inspecting organization.

Test Method: DOC FF 1-70

Rating: Pass

SUBMITTALS

Product data for each type of carpet material and installation accessory required. Submit written data on physical characteristics, durability, resistance to fading, and flame resistance characteristics. A copy of the manufacturer's printed installation manual shall accompany Bid for review and approval by the Owner.

Shop Drawings showing layout and seaming diagrams. Indicate pile or pattern direction and locations and types of edge strips. Indicate columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet. Show installation details at special conditions.

Samples for verification purposes in manufacturer's standard size, showing full range of color, texture, and pattern variations expected. Prepare samples from same material to be used for the work. Submit the following:

12" x 12" sample of each type of carpet chosen to be used.

One 6" long sample of each type of edge stripping to be used.

Carpet manufacturer shall furnish a certified statement that the carpet bid meets the requirements of the Specifications.

PRODUCT HANDLING

Do not deliver carpet until areas of building are ready for carpet installation. Provide protection from loss or damage.

All carpet, when delivered to the job site, shall have manufacturer's sealed registered number tags attached and intact. The registered tags are to be applied at the carpet mill and should bear complete information and specifications of the carpet. Manufacturer shall send at time of shipment a letter containing registration number and complete carpet specification.

Store materials in original undamaged packages and containers, inside well-ventilated, dry area protected from weather, moisture, soilage, extreme temperatures and humidity. Lay flat, blocked off ground. Maintain minimum temperature of 68 degrees F. (20 degrees C.) at least three days prior to and during installation in area where materials are stored. Never stack carpet more than two rolls high or stand up on roll ends on job site. Do not bend or fold carpet in storing.

JOB ENVIRONMENT

Do not commence with carpet installation until painting and finishing work is complete and ceilings and overhead work has been tested, approved, and completed.

In areas to receive carpet, room temperatures shall be maintained at 65-90 degrees F and with relative humidity ranging between 20 and 65 percent minimum for 72 hours prior to, during, and 72 hours following application. Materials shall be conditioned at application temperature and humidity at least 24 hours prior to application. Provide sufficient lighting for carpet installation.

Contractor shall provide method approved by the Owner's representative to mechanically exhaust all spaces to receive carpet to the exterior during installation and a minimum of 72 continuous hours, or length of time required by the manufacturer or Owner after installation.

Subfloor Moisture Conditions: Before installing carpet Contractor shall verify that Moisture emission rate of not more than 3 lb/1000 sq. ft./24 hours (14.6 kg/1000 sq. m./24 hours) when tested by calcium chloride moisture test in compliance with CRI 104, 6.2.1, with subfloor temperatures not less than 55 deg F (12.7 deg C), or as recommended by manufacturer.

Subfloor Alkalinity Conditions: Before installing carpet Contractor shall verify that a pH range of 5 to 9 when subfloor is wetted with potable water and pHDrion paper is applied.

EXTRA STOCK

The Owner shall be permitted to view all carpet scraps and retain any he chooses for future repairs before they are removed from the job site.

This Contractor shall furnish to the Owner, additional carpet to be used for future repairs, in the amount of 5% of the total yardage installed of each type and color selected:

WARRANTY

Project shall be guaranteed for a period of seven (7) years from date of installation against dimensional instability, shrinkage, doming, loss of Resiliency, and delamination of face or back.

Wear: Manufacturer shall guarantee that no part of carpet wearing surface shall wear more than 10% by weight in 10 years.

Static: Manufacturer shall guarantee that the carpet will maintain static generation at less than 3.0 KV at 70 degrees F. and 20% R.H. throughout the life of the product, as tested under AATCC-134.

Protective Treatment: Manufacturer shall guarantee that the carpet includes a carpet protector providing improved resistance to soiling applied at the factory.

Guarantee against defective workmanship for a period of one (1) year.

Each carpet type specified shall be the maximum extent possible of a single batch number.

PART 2 - PRODUCTS

MATERIALS

Carpet "A" - Guest Rooms: Carpet used in all Guest Rooms shall minimally meet the following criteria; see Section 00870 for color and pattern:

Style		Custom 28
Yarn System		100% Solution Dyed Nylon
Yarn Size		1245/2 Ply
Stitch Gauge		1/10
Density	4032	
Yarn Weight		28 Oz.
Pile Height		(.250)
Stitches Per Inch		26.5 Per 3
Stitches Per Square Inch	88.33	
Primary Back		Woven Polypropylene
Total Weight/Sq. Yard		66Oz.
Width		12 to 15 Ft.
Flammability		Passes
Pile Test (CPSC FF1-70; ASTM D- 2859)		

Acceptable Manufacturers:

Easton Carpet

Global Tex

Regency House Carpets

Underlay shall be 40 ounce Hartex Super Carpet Cushion as manufactured by Leggett Platt, Inc. or 50 ounce Badger Rubber Cushion, as manufactured by Sponge Cushion, Inc. (SCI).

Carpet "B" - Corridors, Lobby, Elevator and Offices: Carpet used in these areas shall minimally meet the following criteria; see Section 00870 for color and pattern:

Style		Custom 36
Yarn System		100% Solution Dyed Nylon
Yarn Size		1245/2 Ply
Stitch Gauge		1/10
Density	5184	
Yarn Weight		36 Oz.
Pile Height		(.250)
Stitches Per Inch		34.5 Per 3
Stitches Per Square Inch	115	
Primary Back		Woven Polypropylene
Total Weight/Sq. Yard		74Oz.
Width		12 to 15 Ft.
Flammability		Passes

Pile Test (CPSC FF1-70; ASTM D- 2859)

Acceptable Manufacturers:

Easton Carpet

Global Tex

Regency House Carpets

Underlay shall be Hatex Super Carpet Cushion; 40 oz./sy as manufactured by Leggett Platt, Inc., or approved equal.

36 oz. Carpet baseboard shall be used in locations shown on drawings.

ACCESSORIES

Seaming: Hot-melt seaming adhesive or similar product recommended by carpet manufacturer for taping seams and buttering cut edges at backing to form secure seams and prevent pile loss at seams.

Adhesive: As recommended by carpet manufacturer for use intended, complying with the following:

Carpet adhesive to be non-toxic, low odor, and solvent free, with no alcohol, glycol, or ammonia. Adhesive shall be antimicrobial with no hazardous vapors and contain no carcinogenic materials, per OSHA Regulation 29 CFR 1910-1200. All containers shall contain material safety data sheets (MSDS) and be available at job site for inspection.

Miscellaneous Materials: Including edge strips not specifically described, as recommended by manufacturers of carpet, and other carpeting products; and selected by Installer to meet project circumstance and requirements.

CARPET PROTECTION

Cover all carpet as required to protect carpet and other adjacent materials during installation.

PART 3 - EXECUTION

PREPARATION

Inspection: Surfaces to be covered with carpet shall be prepared to meet all recommendations of manufacturer. Surface shall meet criteria for dryness, alkalinity, and porosity.

Clear floor surface of debris, oil, grease, chemicals, detergents or solvents, and other substances which would be detrimental to the proper performance of carpet. Allow floors to thoroughly dry.

Ensure floors are level with maximum surface variation of 1/4 inch in 10 feet.

Ensure concrete floors are free from scaling and irregularities and exhibit neutrality relative to acidity and alkalinity.

Use an approved cementitious filler to patch cracks, small holes, and for leveling.

GENERAL INSTALLATION

Carpet shall extend to the back of all toe spaces, under all millwork, cabinetwork, convectors, bookshelving, and similar items to the limiting planes of the floor surface. Where carpet terminates at a doorway, termination of carpet shall occur under the edge of the closed door, or at the side of the threshold where this is required. Cut and fit carpeting to all obstructions protruding from the floor surface, such as columns, pipes, thresholds, electrical, and telephone outlets, etc. All raw edges shall be latexed and securely and neatly tucked into place.

Carpet shall be installed by experienced carpet layers in an approved manner, using the carpet manufacturer's recommended adhesive and procedures. Install carpet with pile running in the same direction, unless specifically directed to do otherwise.

INSTALLATION - BROADWIDTH CARPET

Check matching of carpet before cutting and ensure there is no visible variation between cut pieces.

Cut carpet, where required, in a manner to allow proper seam and pattern match. Ensure cuts are straight and true and unfrayed.

Where possible and practical, locate seams in areas of least amount of traffic. Cross seams required due to length of rolls received shall be placed to avoid occurrence at conspicuous locations, near doors or at pivot points. No seams shall occur at doorways and entries perpendicular to the doors or entries. Seams occurring at doors parallel to doors shall be centered directly under the door. Seams occurring at corridor change of direction shall follow the wall line parallel to the carpet direction.

Join seams in recommended manner and so as not to detract from the appearance of the carpet installation and decrease its life expectancy. Ensure seams are straight, not overlapped or peaked, and free of gaps.

Lay carpet on floors with run of the pile in same direction of anticipated traffic.

Do not change run of pile or grain in any one room or from one room to next.

Cut and fit carpet neatly around projections though floor and to walls and other vertical surfaces. Fit carpet snugly to walls or other vertical surface where no base is scheduled, leaving no gaps.

Do not place heavy objects, such as furniture, on carpeted surfaces for minimum of 24 hours.

Entire carpet installation is to be laid tight and flat to subfloor, well-fastened at edges, and present a uniform, pleasing appearance. Ensure monolithic color, pattern, and texture match within any one area.

Install edging strips where carpet terminated at other floor coverings. Use full-length pieces only. Butt tight to vertical surfaces. Where splicing cannot be avoided, butt ends tight and flush.

Where carpet is glued down, vacuum clean substrate. Spread adhesive in quantity recommended by manufacture to ensure proper adhesion over full area of installation. Apply only enough adhesive to permit proper adhesion of carpet before initial set.

COMPLETION

After installation is completed, remove any spots with suitable spot remover, remove all cuttings, vacuum carpet thoroughly and leave in a clean and perfect condition.

The installation contractor shall be responsible for the installation and condition of all carpet until a final inspection is made and installation has been accepted.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

DESCRIPTION OF WORK: The work under this Section includes the furnishing of all labor, material, equipment, appliances, and tools to perform the work indicated on the Drawings or specified herein. The work shall include, but not be limited to, the following:

This Section includes surface preparation and the application of paint materials to exposed interior and exterior items and surfaces scheduled. Surface preparation, prime and finish coats specified are in addition to shop-priming and surface treatments.

Paint all exposed surfaces, whether or not colors are designated, except where a surface or material is indicated not to be painted or is to remain natural. Where an item or surface is not mentioned, paint the same color as similar adjacent materials or surfaces. If color or finish is not designated, the Owner will select from standard colors or finishes available.

Paint all exposed plumbing, heating, and electrical material to match the walls and ceilings of that area unless noted otherwise. This shall include, but not be limited to, pipes, insulation, conduit ducts, access panels, grilles, diffusers, whether the adjacent surfaces receive paint or not, and the like. Include dampers or baffles behind grilles.

Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, or labels.

Labels: Do not paint over Underwriter's Laboratories, Factory Mutual or other code-required labels, or equipment name, identification, performance rating, or nomenclature plates.

DEFINITIONS: "Paint" includes coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

RELATED SECTIONS: The following listed work is included under other Sections:

Section 00870 - Finish Color Schedule

Prime coat on new hollow metal work shall be furnished under the "Steel Doors and Frames" Section 08110.

Prime coat on lintels shall be furnished under the Division 5 Sections.

SUBMITTALS

Product Data: Submit manufacturer's technical information, label analysis, and application instructions for each paint material proposed for use.

QUALITY ASSURANCE

SINGLE SOURCE RESPONSIBILITY: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

COORDINATION OF WORK: Review Sections in which primers are provided to ensure compatibility of the total systems for various substrates.

MATERIAL QUALITY: Provide the manufacturer's best quality trade sale type paint material of the various types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude of equal products of other manufacturers.

DELIVERY AND STORAGE

Deliver materials to the job site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label with trade name and manufacturer's instructions.

Store materials not in use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45 deg. F. (7 deg. C.). Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

PROJECT CONDITIONS: Do not apply paint in snow, rain, fog, or mist, or when the relative humidity exceeds 85 percent, or at temperatures less than 5 degrees F. (3 degrees C.) above the dew point, or to damp or wet surfaces.

MATERIALS: All finishing materials, thinners, etc., shall be the best quality, first line materials as manufactured by:

Pratt and Lambert, Inc.

Martin-Senour

Benjamin Moore

Pratt and Lambert materials are mentioned in these Specifications only to establish the level of quality, except where specific manufacturer product not listed above is specified. Equivalent products by any of the listed manufacturers will be acceptable, as approved by the Architect.

Raw linseed oil, turpentine, benzine, gloss oil, or coal oil shall not be used in any of the materials for painting work.

PART 2 - PRODUCTS

Detailed specifications for the various surfaces follow. If these specifications conflict with the recommendations of the manufacturer, this discrepancy shall be brought to the attention of the Architect, and the Architect shall decide which method shall be followed. All colors to be per the approved Microtel Color Scheme:

<u>Surface</u>	<u>Dry Mill Type & Luster</u>	<u>No of Coats</u>	<u>Product</u>	<u>Thicknesses (Per Coat)</u>
A. Interior Ferrous Metal Shop Primed or Previously Painted	Acrylic Latex Semi-Gloss	1	Benjamin Moore "1" 100% Acrylic Multi-Purpose Primer	1.25
		2	Benjamin Moore Interior Semi-Gloss	1.50
B. Interior Gypsum Board	Acrylic Latex Satin	1	Benjamin Moore "4" Interior Latex Wall Primer	1.50
		2	Benjamin Moore Interior Velvet	1.50
C. Interior Gypsum Board	Acrylic Latex Satin Enamel	1	Benjamin Moore Primer	1.00
		2	Benjamin Moore	1.20

<u>Surface</u>	<u>Dry Mill Type & Luster</u>	<u>No of Coats</u>	<u>Product</u>	<u>Thicknesses (Per Coat)</u>
D. Interior Concrete Masonry Units or Concrete	Acrylic Latex Semi-Gloss	2	Benjamin Moore (50 sf/gal)	12.00
		1	Benjamin Moore Interior Semi-Gloss	1.50
E. Interior Concrete Floor	Alkyd	2	Benjamin Moore Alkyd Floor Paint	1.25
F. Interior Wood	Acrylic Latex Semi-Gloss	1	Benjamin Moore "1" 100% Acrylic Multi-Purpose Primer	1.25
		2	Benjamin Moore Interior Semi-Gloss	1.50
G. Interior Wood	Natural Finish	1	Benjamin Moore Stain	Nominal
	Stain Satin	1	Benjamin Moore Filler Sealer	1.00
	Clear Finish	2	Benjamin Moore Finish	1.00
H. Exterior Wood	Acrylic Latex	1	Benjamin Moore EggShell Primer	2.3
		2	Benjamin Moore Exterior Eggshell	1.25
I. Exterior Wood	Natural Finish (wet-on-wet coats)	2	Benjamin Moore Penetrating oil Rustic Stain	Nominal
J. Exterior Aluminum	Acrylic Latex	1	Benjamin Moore Primer	1.25
	EggShell	2	Benjamin Moore Exterior EggShell	1.25
K. Exterior Ferrous Metal	Alkyd Satin	1	Benjamin Moore "9" Int/Ext Alkyd Metal Primer (Z1009)	1.25
		2	Benjamin Moore Enamel	1.25

<u>Surface</u>	<u>Dry Mill Type & Luster</u>	<u>No of Coats</u>	<u>Product</u>	<u>Thicknesses (Per Coat)</u>
L. Pipes, Mechanical Equipment	Latex Acrylic Eggshell	1	Benjamin Moore Acrylic Metal Primer	1.25
		1	Benjamin Moore Interior Velvet	1.50
M. Galvanized Ductwork	Latex Acrylic Eggshell	1	Benjamin Moore "3" Int/Ext Latex Metal Primer	1.25
		1	Benjamin Moore Interior Velvet	1.50

COLOR SAMPLES: The Contractor shall furnish samples of all finishes in triplicate and obtain the approval of color match before starting work. Final colors must match exactly with the approved sample. Refer to Section 00870, Finish Color Schedule, for colors required.

PART 3 - EXECUTION

Examine substrates and conditions under which painting will be performed for compliance with requirements. Do not begin application until unsatisfactory conditions have been corrected.

PREPARATION: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and items in place that are not to be painted, or provide protection prior to surface preparation and painting. Remove items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting, reinstall items removed using workmen skilled in the trades involved.

Clean surfaces before applying paint or surface treatments. Schedule cleaning and painting so dust and other contaminants will not fall on wet, newly painted surfaces.

Provide protection for adjacent surfaces as necessary to prevent paint from coming into contact with adjacent materials not scheduled for painting.

SURFACE PREPARATION: Clean and prepare surfaces to be painted in accordance with manufacturer's instructions for each particular substrate condition. Notify Architect in writing of problems anticipated using specified finish coat material with substrates primed by others.

Cementitious Surfaces: Prepare concrete, concrete masonry, cement plaster and similar surfaces to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze.

Determine alkalinity and moisture content of surfaces to be painted. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

Ferrous Metals: Clean non-galvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council.

Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush, clean with solvents, and touch-up with the same primer as the shop coat.

Galvanized Surfaces: Utilize SSPC-SP1 solvent cleaning and chemical wash (tri-sodium phosphate). Power wash with tri-sodium phosphate type cleaner (5% solution at 140 degrees F.) and solvent clean after rinsing and drying with a non-petroleum based solvent cleaner so that surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock, by mechanical methods.

Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush clean with solvents, and touch-up with the same primer as the shop coat.

MATERIALS PREPARATION: Mix and prepare paint in accordance with manufacturer's directions.

Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain before using.

Use only thinners approved by manufacturer, and only within recommended limits.

APPLICATION: Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

Paint colors, surface treatments, and finishes are indicated in "schedules."

The number of coats and film thickness required is the same regardless of application method. Do not apply succeeding coats until previous coat has cured. Sand between applications where required to produce a smooth, even surface. Apply additional coats when undercoats or other conditions show through final coat, until paint film is of uniform finish, color, and appearance.

The term "exposed surfaces" includes areas visible when permanent or built-in items are in place. Extend coatings in these areas to maintain system integrity and provide desired protection.

Paint back sides of access panels and removable or hinged covers to match exposed surfaces.

Omit primer on metal surfaces that have been shop-primed, unless primer becomes worn, damaged, or more than six months old from date of delivery to job site.

MINIMUM COATING THICKNESS: Apply materials at the manufacturer's recommended spreading rate. Provide total dry film thickness of the system as recommended by the manufacturer.

BLOCK FILLERS: Apply block fillers at a rate to ensure complete coverage with pores filled.

PRIME COATS: Before application of finish coats, apply a prime coat as recommended by the manufacturer to material required to be painted or finished, and has not been prime coated by others.

Recoat primed and sealed substrates where there is evidence of suction spots or unsealed areas in the first coat to assure a finish coat with no burn-through or other defects due to insufficient sealing.

Back Priming

All wood trim shall be back primed before installation. Spot prime all ends of trim.

BRUSH APPLICATION: Brush-out and work brush coats into surfaces in an even film. Eliminate cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Draw neat glass lines and color breaks. Apply primers and first coats by brush unless manufacturer's instructions permit use of mechanical applicators.

MECHANICAL APPLICATIONS: Mechanical methods for paint application will ONLY be permitted by written permission of the Architect.

COMPLETED WORK: Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

CLEANING

At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing, scraping, or other proper methods, using care not to scratch or damage adjacent finished surfaces.

Protect work of other trades, whether to be painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.

Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations. At completion of construction activities of other trades, touch-up and restore damaged or defaced painted surfaces.

END OF SECTION

SECTION 10522

FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work under this Section includes, but is not necessarily limited to, furnishing and installing the following:

Fire Extinguishers and Brackets

Fire Extinguisher Cabinets

Accessories

REFERENCES

NFPA 10 - Portable Fire Extinguishers

QUALITY ASSURANCE

Conform to NFPA 10 requirements for extinguishers.

SUBMITTALS

Submit product data which shall include physical dimensions, operational features, color and finish, anchorage details, rough-in measurements, location, and details.

Submit manufacturer's installation instructions.

OPERATION AND MAINTENANCE DATA

Do not install extinguishers when ambient temperatures may cause freezing.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

J. L. Industries, Inc.

Larsen's

Watrous

EXTINGUISHERS: Multi-Purpose, Dry-Chemical Type: Steel Tank, pressurized, including hose and nozzle; 10-pound, ABC classification, UL 4A/60BC.

BRACKET: Furnish wall mount bracket where shown on Drawings complete with mounting hardware.

CABINETS

Semi-Recessed Panorama, Fire Rated Cabinet Model 2017 P43-Fire-FX with Steel Frame and with clear glass door, as manufactured by J. L. Industries, Inc. 800-554-6077, or approved equal.

Mounting Hardware: Appropriate to Cabinet

Fabrication

Form body of cabinet with tight inside corners and seams.

Pre-drill holes for anchorage.

Form perimeter trim and door stiles by welding, filling, and grinding smooth.

Hinge doors for 180 degree opening with continuous piano hinge. Provide pull handle and roller type catch.

FINISHES

Extinguishers: Red Enamel.

Cabinet: White painted powder coat finish

PART 3 - EXECUTION

INSPECTION

Verify rough openings for cabinet are correctly sized and located.

Beginning of installation means acceptance of existing conditions.

INSTALLATION

Install cabinets plumb and level in wall openings. Secure rigidly in place in accordance with manufacturer's instructions.

END OF SECTION

SECTION 10800

TOILET AND BATH ACCESSORIES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work in this Section includes, but is not necessarily limited to, furnishing and installing the following:

Toilet Room Accessories and Attachment Hardware

REFERENCE STANDARDS

ASTM A167 - Stainless and Heat Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

ASTM A366 - Cold Rolled Carbon Steel Sheets, Commercial Quality.

SUBMITTALS: Provide manufacturer's technical data and installation instructions for each toilet accessory. Provide setting drawings, templates, instructions, and directions for installation of anchorage devices in other work.

QUALITY ASSURANCE: Provide products of the same manufacturer for each type of accessory unit and for units exposed in the same area.

DELIVERY, STORAGE, AND HANDLING

Do not deliver accessories to site until rooms in which they are to be installed are ready to receive them.

Store packages to prevent physical damage or wetting.

Pack accessories individually in a manner to protect accessory and its finish.

Maintain protective covers on all units until final clean-up.

PROTECTION: Protect adjacent or adjoining finished surfaces and work from damage during installation of work of this Section.

GUARANTEE

Work of this Section shall be jointly guaranteed by the manufacturer and the installer for a period of one year after final payment. Any material or workmanship that is judged defective during this period shall be replaced at no cost to the Owner.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS - TOILET ACCESSORIES

Franklin Brass

Bobrick Washroom Equipment, Inc.

Accessory Specialties, Inc.

Glaro

Scott

Perma-Built

Kohler

Parker-Scovill

Bradley

Taymor

MATERIALS - TOILET ACCESSORIES

18-8 (Type 302) stainless steel alloy of at least 22 gauge in all elements of cabinet work. All exposed stainless steel to have a #4Satin finish with all elements of a unit to have brushing in one direction.

Exposed surfaces to be protected with a factory applied PVC film to be left in place until final clean-up.

Mirrors to be 1/4" polished plate glass with 15-year guarantee against silver spoilage.

Stainless steel tubing: 18 gal., Type 304, seamless welded.

Fasteners, screws, and bolts: Hot dip galvanized. Expansion shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component substrate.

Adhesive: Epoxy type contact cement.

TOILET AND BATH ACCESSORIES: Products mentioned in these specifications are to establish the level of quality. Equivalent products by any of the listed manufacturers will be acceptable, upon approval by the Architect.

Guest Rooms:

Waste Receptacle: By others

Mirrors:

Flush mirror, non-banded, mounted with plastic clips screw anchored to wall. Size and locations as shown on Drawings

Mirrors to be either ADA sloped mirror or flush mirror mounted at ADA height.

Accessible Units: Bobrick Model B-165, size as shown on Drawings.

Grab Bars: (Accessible Units) Franklin Brass 5700 Series, size and location as shown on Drawings, with slip resistant surface at bath tubs only.

Toilet Tissue Holder: Franklin Brass, Model 970, recessed extra roll paper holder.

Shower Curtain Rod: Franklin Brass, Model 161 CS, 20 gal. seamless type. 304 Polished Stainless Steel.

Double Robe Hook: Double prong hook, 1-5/8" projections, Franklin Brass, Model 1302.

Towel Holder: Franklin Brass, Model 2780 PC.

Towel Bar: Franklin Brass, Model 2770 PC-24" length..

Facial Tissue Dispenser: Franklin Brass, Model 935 cover with 919 recess box.

Stainless Steel Shelf: 5" wide Model 1475, 24" long (Accessible Units), by Franklin Brass or approved equal.

Garment Bag Hook: Model 25-6999 CH chrome plated finish by Taymor.

Employee Toilets

Waste Receptacle: By others.

Mirror: Bobrick Model B-165, size as shown on Drawings.

Grab Bars: Franklin 5700 Series, size and locations as shown on Drawings.

Toilet Tissue Holder: Franklin Brass Model 970 recessed extra roll paper holder..

Facial Tissue Dispenser: Franklin Brass, Model 926 chrome plated steel snap-on cover.

Towel Dispenser: Franklin Brass, Model 1955, C-Fold Towel Dispenser.

Sanitary Napkin Receptacle: Franklin Brass, Model 1985.

Liquid Soap Dispenser: Franklin Brass, Model 1920 Satin Stainless Steel, Vertical.

Toilet Seat Cover Cabinet: Franklin Brass Model 1987 Satin Stainless Steel. Locate cabinet as directed by Owner's Representative in field.

FABRICATION - TOILET ACCESSORIES

Provide steel anchor plates and anchor components for installation on building finishes.
Form surfaces flat without distortion. Maintain flat surface without scratches or dents.
Back paint components where contact is made with building finishes to prevent electrolysis.
Hot dip galvanize ferrous metal anchors and fastening devices.
Shop assemble components and package complete with anchors and fittings.

PART 3 - EXECUTION

PREPARATION

Deliver inserts and rough-in frames to job site and in appropriate time for building-in. Provide templates and rough-in measurements as required.
Before starting work, notify Architect in writing of any conflicts detrimental to installation or operation of units.
Verify with Architect exact location of accessories.

INSTALLATION

Install fixtures, accessories, and items in accordance with manufacturer's printed instructions.
Use concealed fastenings wherever possible.
Install true, plumb, and level, securely and rigidly anchored to substrate in accordance with manufacturer's instructions for each item and each type of substrate construction.
Fasteners for all accessory mounting to be theft-resistant.

END OF SECTION

SECTION 14241

PASSENGER ELEVATORS

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provision of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: Work of this Section includes, but is not necessarily limited to, furnishing and installing the following:

Furnish and install a complete new telescopic hydraulic passenger elevator system including, but not limited to, the elevator cab, elevator entrances, hydraulic cylinder assembly, motor, pump, and controls. The new elevator system shall be furnished and installed in complete accordance with the Specifications and Drawings.

WORK INCLUDED IN OTHER SECTIONS

General Contractor to provide the following:

Confirm length, width, and clear overhead dimensions for hoistway, and provide size as required, as approved by Architect and elevator manufacturer.

Provide all structural supports for guide rails and other mechanisms, as located by elevator manufacturer.

Sill supports and grouting inside of hoistway for doors.

Telephone Cable by Division 16.

RELATED SECTIONS

Section 00870 - Finish Color Schedule

Section 05500 - Metal Fabrications: Pit Ladders, Sump Pit Cover

Section 09680 - Carpeting

Division 16 - Electrical

REFERENCES

ASTM B-221 - Aluminum-Alloy Extruded Bars, Rods, Shapes, Tubes

ASTM B-209 - Aluminum-Alloy Sheet and Plate

ASTM A-167 - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip

PS-1 - Construction and Industrial Plywood

FS L-P-508 - Plastic Sheet, Laminated, Decorative, and Nondecorative

ASTM A-526 - Steel Sheet, Zinc-Coated, (Galvanized) by the Hot Dip Process, Commercial Quality.

MIL-L-1914 - Lumber and Plywood, Fire-Retardant Treated

AWS D1.1 - Structural Welding Code

SYSTEM DESCRIPTION

The work of this Section includes furnishing and installing a passenger elevator which consists of the following characteristics:

Quantity and Type	-	One (1) Single-Stage Telescoping Holeless Hydraulic Passenger Elevator
Capacity		3500 Pounds
Speed		125 Feet per Minute
Travel		Verify Drawings
Landings		Verify Drawings
Openings		Verify Drawings
Operation		Selective Collective
Clear Car Inside Size		Nominal, Minimum 6'-8" Wide x 5'-5" Deep, or as required by local and/or state code, and Approved by Architect.
Hoistway Entrances (Size) (Type)		3'-6" Wide x 7'-0" High Right Hand Single Horizontal Sliding as viewed from corridor.
Power Supply		[Modify per location]
Signals		Illuminated car and hall buttons, car position indicator with audible signal, car direction sign with dual stroke gong and as specified herein.
Additional Features		Complete provisions for the handicapped, dual ray photo cell with disconnect switch, emergency light, telephone cabinet, and as specified herein. Elevator to be capable of accommodating and 24" X84" stretcher.

REGULATORY REQUIREMENTS

Conform to:

ANSI A-17.1 - American Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks

ANSI C-1 - National Electric Code

ANSI A-17.2 - American Standard Practice for the Inspection of Elevators, Escalators, and Moving Walks

Local and State Codes

Americans With Disabilities Act (ADA)

The Elevator Contractor shall obtain and pay for all required inspections and permits and perform tests as called for by regulations of governing authorities.

SUBMITTALS

Submit Shop Drawings and product data that clearly indicate space requirements, general arrangement of elevator equipment, and material being supplied. Show connections, attachments, reinforcing, anchorage and location of exposed fastenings, and location and amount of loads and reactions to be carried on the building structure..

Submit descriptive brochures or detail Drawings of landing buttons, hall fixtures, car position indicators, and car operating panels, car interior, and hoistway doors and frames for review.

Submit samples of finishes, car flooring, and materials required for cars, operating and signal system fixtures, and finish of hoistway entrances and doors.

Certification that a service office of the manufacturer is located within 100 miles of the Project and that a parts warehouse is located within 100 miles of the Project.

Submit repair parts catalogs, instruction manuals, and wiring diagrams specific to this project.

Note: Submittals to be reviewed and approved prior to pouring elevator pit, and purchasing elevator.

MAINTENANCE SERVICE

Maintain entire elevator installation for 12 months after date of Substantial Completion of Work only by competent and trained employees of the manufacturer. Provide 24-hour Emergency Call-Back Service during maintenance period for normal working hours.

Include systematic examination, adjustment, and lubrication of elevator equipment, repair, or replace worn electrical and mechanical parts of the elevator equipment using only genuine standard parts produced by manufacturer of equipment concerned.

Replace seals, packing, and valves to maintain required factor of safety.

Perform work without removing cars during peak traffic periods.

Ensure that competent personnel handle maintenance service. Maintain locally an adequate stock of parts for replacement or emergency purposes and have qualified personnel available at such places to ensure the fulfillment of this service without unreasonable loss of time.

MAINTENANCE PROPOSAL

Proposal for maintenance of installed elevator work for a period of three years after termination of regular maintenance as required in the preceding Article.

Proposal shall include stipulated sum for above stated time period with premiums due annually.

DELIVERY, STORAGE, AND HANDLING

Deliver items or materials to site after area in which they are to be installed is ready to receive them in their place of final installation.

Store materials in allotted storage area, and in such a manner as to prevent deterioration, damage, or loss of their essential properties.

Fully protect movable and operating equipment from weather.

Wrap and create factory finished materials in manner to protect their finishes.

QUALITY ASSURANCE

Processors or other equipment which can only be serviced by the manufacturer are prohibited.

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

The following manufacturers who will manufacturer and install the elevator equipment will be acceptable upon approval of the Architect:

Otis Elevators

Schindler Elevator Co.

Thyssen Krup

CAR ENCLOSURE

The car shall be similar to Montgomery Elevator Company Design, including the following:

Ceiling

Ceiling panel material – plastic laminate, color per Section 00870 from Manufacturer's standards.

Lighting – 20W Halogen, trim color per Section 00870.

Front Return Walls - stainless steel #4 finish.

Side Walls - plastic laminate, color per Section 00870 from Manufacturer's standards.

Base - stainless steel #4 finish.

Entrance Columns - stainless steel #4 finish.

Transom - stainless steel #4 finish.

Car Doors - stainless steel #4 finish.

Car Sills - extruded aluminum natural finish.

Handrails - on rear wall, Stainless Steel No. 4 Finish, ADA acceptable profile and color per Section 00870, spaced 1-1/2" from the car wall at 32" above car floor.

Protective pads and hooks - for side and rear walls.

Lighting - The minimum illumination in the car shall be in accordance with the latest edition of ANSI/ASME A-17.1 1984 Elevator Code.

CAR FRAME AND PLATFORM

The car frame which supports the elevator platform and enclosure shall be made of structural steel members. Platform shall be manufacturer's standard with a suitable sub-floor and a finished floor of carpet by others. Underside of platform shall be properly fireproofed.

HOISTWAY ENTRANCES AND DOORS

Hoistway entrances of the hollow metal, horizontal sliding, one speed side opening type shall be provided at each of the hoistway openings. Size shall be as indicated in Specification and drawings.

Profile: Square jamb.

Fire Rating: Underwriter's Laboratories label or other as accepted by governing authorities, for rating as indicated on Drawings.

Finish will be as follows:

Entrance Frames: Stainless Steel, No. 4 Finish.

Door Panels and Sight Guards: Stainless Steel, No. 4 Finish.

Entrance Sills: Extruded Aluminum

Master Door Operator

A Master Gearless Door Operator with direct current motor shall be provided to open and close the car and hoistway doors simultaneously. Opening speed shall not be less than 2-1/2 feet per second. Closing speed shall not exceed the limitations set by the American National Standard Safety Code. Door movement shall be cushioned or checked at both limits of travel. An electro-mechanical interlock shall be provided on each hoistway door to prevent the operation of the elevator unless all doors are closed and locked. An electric contact shall be provided on the car door to prevent the operation of the elevator unless the car door is closed.

The door operator shall be arranged so that, in case of interruption or failure of electric power from any cause, the doors can be readily operated by hand from within the car. Emergency devices and keys for opening the doors from the landing shall be provided as required by the local codes.

The doors shall open automatically when the car is leveling at the respective landings, and shall close after a predetermined time interval or immediately on pressing a car button. A "Door Open" button shall be provided in the car, the momentary pressing of which shall reopen the doors and reset the time interval.

Electronic Door Safety Device

Similar to Montgomery Elevator "The Edge".

Door Hangers and Tracks

Hangers and tracks shall be provided at each car and hoistway entrance. Tracks shall be of bar steel with the working surface contoured to match the sheaves. The hangers shall be designed for power operation and have provisions for vertical and lateral adjustment. Hangers shall be designed for two point suspension of the door panel.

Hanger sheaves shall be polyurethane with pre-lubricated and sealed for life bearings. Car door hangers shall have 3-1/4" diameter sheaves. Hoistway door hangers shall be 2-1/2" diameter sheaves.

A cable drive shall be used to transmit motion from one door panel to the other.

Hoistway Door Jamb Markings

Floor designation shall be provided on both sides of each hoistway entrance door jamb, visible from within the car and the elevator lobby. Designations shall be 2" high, raised .030" and located 60" above the floor.

OPERATING EQUIPMENT

Power Unit: A power unit especially designed and manufactured for this service shall be furnished. It shall include a constant displacement rotary screw type pump, motor, V belt drive assembly, oil reservoir, hydraulic control unit, fill strainer, tank strainer in the suction line, oil level gauge and drip pan. The power unit shall be located near the hoistway at the lowest landing.

Valves: Control valve including safety check valve, up direction valve with high pressure relief including up leveling and soft stop features, lowering valve including down leveling and manual leveling feature shall be mounted in a compact unit assembly. Control valves shall be solenoid operated and designed to open and close gradually to give smooth control. All valves shall be readily accessible for adjustment.

Automatic Two-Way Leveling: An automatic two-way leveling device shall be provided so that the car will approach landing stops at reduced speed from either direction of travel. The leveling device shall, within its zone, be entirely independent of the operating device and shall automatically stop and maintain the car approximately level with the landing, regardless of change in load.

Plunger: The plunger shall be accurately ground and polished seamless steel. The bottom of the plunger shall be fitted with a heavy steel disc welded in place and provided with a suitable extended edge to provide a positive stop designed to prevent the plunger from leaving the cylinder.

Cylinder: The cylinder shall be machined from steel pipe with a machined flange at the upper end and a heavy steel bulkhead welded in the lower end. The cylinder shall be provided with a suitable steel fitting for connecting to oil line and with an air bleeder.

Cylinder Casings: Protective casings 2 inches (50 mm) larger than cylinders, fabricated from schedule 40 or 80 PVC pipe complying with ASTM D1785, with bottoms of casings sealed with end caps complying with ASTM D2467 and attached with solvent cement complying with ASTM D2564.

Packing Gland: A steel packing gland with bronze guide bearing, wiper ring and packing especially designed for hydraulic elevator service shall be provided. An oil collector ring and drain hole shall be furnished.

Piping and Oil: Piping shall be provided from power unit to cylinder complete with necessary fittings. Oil of proper grade for this service shall be provided.

A shut off valve (stop cock) shall be provided in the oil line designed to shut off the flow of oil between the cylinder and the power unit. Provide one stop cock in the elevator machine room.

Hydraulic Muffler: A muffler shall be provided in the oil line near the power unit. The muffler shall be designed to reduce pulsation and noise which may be present in the flow of the hydraulic fluid.

Platen Plate Isolation: The platen plate shall be mounted on suitable sound dampeners designed to isolate the platen plate from the car frame.

Power Unit Isolation: The power unit shall be mounted on vibration sound dampeners designed to isolate the unit from the building structure.

Low Oil Control

A low oil control feature shall be provided designed to automatically cause an up traveling car to descend to the lowest terminal landing if the system does not have a sufficient reservoir of oil.

If power operated doors are used, the car and hoistway doors shall automatically open at the lowest terminal landing to permit passengers to egress. The doors shall then automatically close and all control buttons, except the Door Open button in the car operating panel, shall be made ineffective.

The oil reservoir should be refilled before the elevator is returned to service.

Guide Rails: Elevator guide rails shall be provided and erected plumb and securely fastened to the hoistway framing.

Car Guide Shoes: The top and bottom of the car frame shall be provided with suitable roller guide shoes.

Buffers: Spring buffers shall be provided in the elevator pit.

CONTROLS AND INDICATORS

Microprocessor Elevator Logic Control: The operation shall be accomplished utilizing microprocessor computer logic control. The elevator control program shall be contained in nonvolatile, programmable, read only memory. Control shall be constructed such that future alterations in elevator operation may readily be made by altering the read only memory. Safety circuits shall be monitored and controlled by the programmable logic control with redundant protection. The microprocessor elevator logic control shall be contained in a Cabinet.

Controller

The controller shall control starting, stopping, and prevent damage to the motor from overload or from excess current. It shall automatically cut off the power supply and bring car to rest in the event of operation of any of the safety devices. The controller shall be enclosed in a cabinet within the Machine Room.

Selective Collective Operation

Pressure upon one or more Car Buttons shall send the car to the designated landings in the order in which the landings are reached by the car, irrespective of the sequence in which the buttons are pressed, provided the hoistway door interlock and car door switch circuits are completed. During this operation, the car shall also answer calls from the landings which are in the prevailing direction of travel. Each landing call shall be canceled when answered.

Pressure upon a Hall Button at a floor above the car location shall cause the car to start Up and answer any Up calls as they are reached by the car irrespective of the sequence in which the buttons had been pressed. The car shall not stop at floors where Down

buttons only had been pressed. If no further Car or Up Hall calls are registered, the car shall reverse its direction preference for response to Car Calls or Down Hall calls.

The car shall start Down to answer calls below the car and shall not stop where Up calls only are registered. When traveling Up, the car shall reverse at the highest call and proceed to answer calls below it. When traveling Down, the car shall reverse at the lowest call and answer calls above it.

Should both an Up and a Down call be registered at an intermediate landing, only the call corresponding to the direction in which the car is traveling shall be canceled upon the stopping of the car at the landing. Terminal limit switches shall be provided in the hoistway designed to automatically stop the car at or near the closest terminal landing.

Emergency Stop Switch: An emergency stop switch shall be provided in the car, designed to cut off current supply to motor and down direction valves and bring the car to rest independent of the regular operating devices.

Car Operating Panel: A flush-mounted operating panel shall be furnished in the car containing car registration push buttons for each floor, emergency stop switch, alarm button, door open and close push buttons, light switch, emergency personnel operation key switch to accommodate the interior core keying system, and photo cell disconnect key switch.

Each car registration button shall illuminate when pressed, signaling that the car has been registered. Each button will remain illuminated until the call has been answered.

Tactile car control symbols shall be placed adjacent to the emergency stop switch, door open, door close, alarm bell, and all call registration buttons.

The new car operating panel shall be mounted at Code required handicap levels.

Emergency Communication System: Provide hands-free audio Telephone. System shall automatically dial preprogrammed number of front desk. System shall be contained in flush-mounted cabinet with identification, instructions for use, and battery back-up power supply, and shall comply with ADA regulations.

Emergency Light: A battery powered emergency light shall be provided in the elevator car.

Car Position Indicator: A digital electric position indicator shall be provided in the elevator car. The position of the car and the hoistway shall be indicated by the illumination of the numeral corresponding to the floor at which the elevator is stopped or passing. An audible signal shall sound to indicate the car is stopping at or passing a floor.

Car Direction Signs: A car direction sign with visual and audible signal shall be provided in the car jamb, located 6'-0" above the car floor. The car direction sign shall be visible from the proximity of the hall push button fixture to indicate to the waiting passenger the direction the car will travel. One car direction sign shall be provided for each elevator car entrance.

The visual signal lens size shall be at least 2-1/2" in the smallest dimension. The audible signal shall sound once for the up direction and twice for the down direction.

Hall Call Buttons: A hall call button station shall be provided for each elevator landing, containing a single call button at the terminal landings and two call buttons at the intermediate landings. Each call button shall be heat/touch sensitive, shall illuminate when a call is registered, and shall extinguish when the call is answered. The hall call button fixture shall be mounted at the required height for accessibility per ADAAG.

Fire Emergency Service

Provide Phase I fire emergency service in accordance with the latest ANSI/ASME A17.1, with key switch marked "BYPASS", "OFF" and "ON" at a designated level of the elevator. The key shall be removable only in the "ON" or "OFF" positions.

OFF Position: Normal elevator service with smoke detectors functional.

ON Position: Elevator returned nonstop to designated level and door shall open and remain open. Emergency stop switch in cab shall be rendered inoperative. All

elevator hall call buttons, call register lights, and directional lanterns shall be rendered inoperative. A visual and audible signal shall be provided.

Door reopening devices for power-operated doors which are sensitive to smoke or flame shall be rendered inoperative.

A car stopped at a floor shall have its in-car "emergency stop switch" rendered inoperative from the time the doors are fully closed and the car starts to move until the car is removed from Phase I operation.

Provide a car operation switch for operation by emergency personnel.

Provide Phase II (in car operation by emergency personnel) fire emergency service with key switch marked "OFF", "HOLD", and "ON" in operating panel in car. Switch shall be made operational only when main floor hall key operated switch is in the "ON" position or a sensor has been activated and the car is at the main floor or other approved floor.

"ON" Position

The elevator shall be operable only by a person in the car.

Elevators shall not respond to elevator corridor calls.

Operation shall be initiated by registering one or more car calls in the car. The doors are closed by the constant pressure of the "DOOR CLOSE" button. Release of the DOOR CLOSE button before doors are completely closed shall allow the doors to immediately reopen. Once the doors are closed and a car call is registered, the car will travel to the call registered floor. When shutdown is initiated, all car calls shall be reset.

Once the car has gone into motion, the car shall travel to the car call floor and stop with doors closed. Door open shall be by constant pressure of the "DOOR OPEN" button, the doors to immediately re-close if pressure is released. Once fully opened, doors shall remain open until closing is initiated per (3) above.

HOLD Position: The car shall remain at the floor with its doors open and the door close buttons are inoperative.

Car calls operated in error shall be reset by momentary pressure on the "CALL CANCEL" button.

OFF Position: Provided the elevator is not at the designated or alternate floor, and Phase I operation activated (Fireman's Service), the doors will close and the car shall return nonstop to the designated or alternate floor and the doors shall open and remain open. The car will be placed on Phase I mode after the doors are completely open, and the in-car Phase II key switch remains in the "OFF" position.

During automatic return to designated floor, the following applies:

Door reopening devices for power operated doors which are sensitive to smoke or flame shall be rendered inoperative. Mechanically actuated door reopening devices not sensitive to smoke or flame shall remain operative.

Door closing shall be normal, except doors whose only reopening protective device has been rendered inoperative will close with reduced speed.

Door open button shall remain operative.

In-car EMERGENCY STOP button shall remain operative. (If equipped with the "In-Car Key Operated Stop Switch", it will remain operative.)

PART 3 - EXECUTION

INSPECTION

Examine work of other Sections on which the work of this Section depends. Report defects to Owner's representative in writing which may affect work of this Section or equipment operation.

Ensure that shafts and openings for moving equipment are plumb, level, and in-line and that pit is to proper depth with ladder.

Ensure that Machine Room is properly illuminated, heated, and ventilated and equipment foundations correctly located, complete with floor and access door.

PREPARATION

Before fabrication of controls, take necessary job site measurements and verify where work is governed by other Sections. Check measurement of space for equipment and means of access for installation and operation. Obtain dimensions from site for preparation of Shop Drawings.

Ensure the following preparatory work, provided under other Sections has been properly completed to receive the elevator work:

Supply of electric feeder wires to the terminals of the elevator control panel, including fused main line switch or circuit breaker. Provision of hoistway outlets for car light, and for light in pit and outlets in machine room for light. Furnishing of electric power for testing and adjusting elevator equipment.

Provision of hoistway outlet for telephone.

Supply of power for emergency cab lighting and ventilation from power panel specified in Division 16 and fed by the building emergency circuits.

Machine room enclosed and protected from moisture, with lockable door.

Supply in ample time for installation, inserts, anchors, pipe sleeves, bearing plates, brackets, supports and bracing including setting templates and diagrams for placement.

INSTALLATION:

Perform work with competent mechanics skilled in this work and under the direct control and supervision of the elevator manufacturer's experienced foreman.

Set hoistway entrances in alignment with car openings and true with plumb sill lines.

Install machinery, guides, controls, car, and equipment and accessories in accordance with manufacturer's instructions, applicable codes, and standards to provide a quiet, smoothly operating installation, free from sidesway, oscillation, or vibration.

Mount machine immediately adjacent to hoistway on concrete foundation. Isolate and dampen machine vibration with properly sized sound-reducing anti-vibration pads.

Install and hook-up piping between machine and cylinder.

Furnish stainless steel license holders in each elevator car to suite certificate issued. Design holder with nonvisible tamperproof fastenings.

FIELD QUALITY CONTROL

Obtain and pay for inspections and permits and make such tests as are required by regulations of authorities. Make tests in presence of Architect.

Final inspection shall be after elevator installation, hoisting enclosure, and machine room are complete.

Inspect installation in accordance with ANSI A-17.2.

Deliver test certificates and permits to Owner.

ADJUSTING AND CLEANING

Make necessary adjustments of equipment to ensure elevator operates smoothly and accurately.

Prior to final acceptance, remove protection from headrails and control surfaces and clean and polish surfaces with due regard to type of material.

At completion of work of this Section, remove tools, equipment and surplus materials from site.

END OF SECTION

SECTION 14560

LINEN CHUTES

PART 1 - GENERAL

RELATED DOCUMENTS

Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to work of this Section.

DESCRIPTION OF WORK: The work of this Section shall include, but not necessarily be limited to, furnishing and installing the following:

Linen (laundry) Chutes

RELATED SECTIONS

Hook-ups for water and electrical services are included in Divisions 15 and 16 respectively.

REFERENCE STANDARDS

NFPA Code: Comply with applicable portions of National Fire Protection Association (NFPA) No. 82.SUBMITTALS

Product Data: Submit manufacturer's product specifications, standard details, installation instructions and general recommendations for total pre-engineered chute system. Mark-up data sheets to indicate actual selections for sizes and other details of installation.

Shop Drawings: Submit 1/4" scale section/elevation drawing, 1/2" scale typical landing plans, and 1-1/2" scale details of chute fabrication. Distinguish between factory fabrication and field assembly work. Show required piping, and wiring connections and conduit runs for wiring.

PART 2 - PRODUCTS

MANUFACTURERS

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

Cutler-Federal, Inc., Eaton Park, FL

Midland Metalcraft Corp., Joliet, IL

Wilkinson Chutes, Inc., Stow, OH

MATERIALS AND FABRICATION

General: Provide manufacturer's standard chute system of type, service, sizes and shapes indicated. Fabricate of metals and finishes as indicated; include support units, expansion joint materials; roof counterflashing and retainer band, roof-termination vent unit; intake chute throat sections located where indicated to accommodate door units as specified, discharge door units of type indicated; sprinkler heads where indicated, and manufacturer's standard accessories, fasteners and installation materials.

Chute Metal: 24 inch diameter, aluminum-coated, cold-rolled, commercial quality, steel sheet ASTM A 463, Type 1 with T1-40 coating, gauge shall be U.S. No. 16 (0.062" thick).

Chute Intake Door/Frame Units: Provide self-closing units at each landing and at heights above floor as indicated. Use manufacturer's recommended heights if not otherwise shown. Provide 21 inch x 18 inch door size. Equip doors with positive latch and latch handle. Provide manufacturer's standard stainless steel door units, AISI Type 302/304 with standard satin finish or No. 3 directional polish.

UL Labeled Door Units: Provide UL "B" labeled door units (1.0 hour with 30-minute temperature rise of 250 deg. F., (139 deg. C.), complete with closers.

Foot Operators: Equip each hopper-type door unit with manufacturer's standard foot operator, which unlatches and opens hopper door when foot pedal is depressed.

Chute Discharge Door Units: Provide manufacturer's standard fusible-link, fire-protection, self-closing steel door unit of the type label construction even though UL label may not be required.

Fire Sprinklers: Equip chute with sprinkler heads in accordance with NFPA Standard No. 13, ready for piping connections (as work of another Specification Section). Provide access for maintenance of heads. Except as otherwise indicated or required by governing regulations, provide 1/2" I.P.S. heads, one located in chute above highest intake door, and one located at intake door on alternate floors. Provide sheet metal deflectors to sidewall sprinklers to repel laundry.

Horizontal Discharge: Provide 24 inch x 30 inch, top-hinged, self-closing hopper door with self-latching hardware, bearing UL "B" label. Provide floor leg-brace, designed to absorb impact of material dropping against chute turn unit. Provide drain pipe connection, minimum 2" I.P.S.

PART 3 - EXECUTION

INSTALLATION

General: Comply with chute manufacturer's instructions and recommendations. Assemble components with tight, non-leaking joints; and anchor securely to supporting structure with sufficient anchorages to withstand impact and wind loading stresses on vent units. Provide for thermal expansion movement of chute sections. Except as otherwise indicated, install chutes plumb, without offsets or obstructions, for free fall of materials within chutes. Install chute systems complete with doors, and with safety and fire-resistive components and accessories.

Intake and Discharge Doors: Install doors at heights and locations indicated. Provide anchorages, wall/chute interfaces, self-closing operation, self-latching and similar features of installation to comply with labeling and fire-resistive requirements for fire-resistive door construction. Interface door units with throat sections of chutes in a manner which will ensure safe, snag-proof, sanitary depositing of materials in chutes by users.

Coordinate foot-pedal door operator installation with door and enclosure wall installation.

TESTING, ADJUSTING, CLEANING

Test operate components of chute system upon completion of installation; demonstrate use and safety features to Owner's personnel. Operate doors, locks and interlock system to demonstrate that hardware is adjusted and electrical wiring is connected correctly. Where possible, complete test operations prior to installation of shaft enclosures.

Cleaning: Following completion of enclosure walls and ceilings, clean exposed surfaces of finished metal components of chute system. Remove foreign substances and repair imperfections in finishes, but do not remove UL labels.

END OF SECTION

SECTION 15010

MECHANICAL GENERAL PROVISIONS

PART 1 - GENERAL

1.01 REFERENCE

- A. The provisions of the Instructions to Bidders, General Conditions, Supplementary Conditions, Alternates, Addenda and Division 1 are a part of this specification. Contractors and Subcontractors shall examine same as well as other Divisions of the specifications which affect work under this Division.
- B. The requirements of this Section shall govern all Division 15 work for this project. Bidders are referred to in this section as "Mechanical Contractors" and all provisions apply to each contractor and their subcontractors.

1.02 DESCRIPTION OF WORK

- A. Mechanical, Architectural, Structural, Electrical and all other project drawings, as well as the Specifications for all the Divisions, are a part of the Contract Documents. Work of this section is shown on the mechanical drawings.
- B. Drawings and Specifications are to be considered as supplementing each other. Work specified but not shown, or shown but not specified, shall be performed or furnished as though mentioned in both Specifications and Drawings. All systems shall be complete and fully operational upon completion of the project.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 1: Temporary Water Service, Sanitary Facilities, Fire Protection and Heating Construction.
- B. Divisions 2: Site Drainage and Utilities.
- C. Division 3: Poured-In-Place Concrete.
- D. Division 7: Flashing of Curbed Roof Mounted Items.
- E. Division 9: Finish Painting
- F. Division 16: Electric Power Wiring

1.04 QUALITY ASSURANCE

- A. Codes and Permits:
 - 1. Work shall be installed in full accordance with all applicable codes, rules and regulations of public authorities and/or utilities. Included shall be N.F.P.A., Factory Mutual Engineering, OSHA, State and local Building Codes. Additionally, plumbing work shall conform to Health Department Rules and Regulations. All

these Codes, Rules and Regulations are hereby incorporated into this specification;

2. Comply with specification requirements in excess of Code requirements where no conflicts exist;
 3. Prior to starting any work, mechanical contractors shall secure all necessary permits and inspection certificates required. All fees for permits, utility connection charges, inspections and certificates shall be paid for by mechanical contractor;
4. Deliver official record of approval, by governing agencies, to architect for transmittal to owner.

B. Standards:

1. Comply with applicable provisions of code approved editions of following National Standards:

National Plumbing and Sanitary Code
NFPA

Pressure Piping and Mechanical Refrigeration Systems and Equipment

ASHRAE Recommended Construction for Ductwork

SMACNA Duct Construction Standards

ASTM Standards

American Welding Society Code

National Pressure Vessel Code

National Electric Code

NFPA Life Safety Code and Standards under Appendix B of Life Safety Code

Underwriters Laboratory

Factory Mutual Engineering

American Society of Sanitary Engineers

1.05 SUBMITTALS

A. Shop Drawings:

1. Submit shop drawings for mechanical equipment, ductwork and fixtures with adequate details and scales as necessary to clearly show construction. Indicate the operating characteristics for each required item. Clearly identify each item on the submittal as to mark, location and use, using same identification as provided on design drawings;
2. Ductwork drawings shall be fully dimensioned based on field verified building clearances and indicate structural, lighting and other piping at critical locations;
3. Contractor shall review and indicate his approval of each shop drawing prior to submittal for review. Do not start work or fabrication until shop drawings have been reviewed by the Engineer and returned to the Contractor;
4. Submittals will be reviewed only for general compliance with the contract documents and not for dimensions, quantities, etc. The submittal review shall not relieve the contractor of responsibility for purchase of the item in full compliance with the contract documents and its complete and proper installation;

5. Where submittals vary from the contract requirements, the contractor shall clearly indicate on submittal or accompanying documents the nature and reason for variations;
 6. Refer to various sections for listing of shop drawings required on this project.
- B. Record Drawings (Also see Division I - General Requirements).
1. Each Contractor or Subcontractor for Mechanical work shall keep one complete set of the contract working drawings on the job site on which he shall record any deviations or changes from such contract drawings made during construction.
 2. These drawings shall also record the location of all concealed water and electric service, water piping, sewers, wastes, vents, ducts, conduit and other piping, by indication of measured dimensions to each such line from readily identifiable and accessible walls or corners of the building. Plans also shall show invert elevation of sewers and top of water lines.
 3. Record drawings shall be kept clean and undamaged and shall not be used for any purpose other than recording deviations from working drawings and exact locations of concealed work.
 4. After the project is completed these sets of Drawings shall be delivered to the Architect in good condition, as a permanent record of the installation as actually constructed.

1.06 COORDINATION AND SUPERVISION

- A. Examine work of other trades which comes in contact with or is covered by the work. Do not attach to, cover, or finish against any defective work, or install work of this Division in a manner which will prevent other trades from properly installing their work. Consult all drawings, specifications and details of other Divisions of the work.
- B. Proper clearances for architectural design and equipment access and service shall be maintained for all items and components.
- C. Contractors shall report any interferences between their and other work or construction as soon as discovered. If contractor proceeds without coordination, correction shall be the responsibility of the installing contractor without cost to the owner.
- D. Drawings are diagrammatic and show approximate location of ducts, piping, etc. Take all measurements and establish exact locations in the field. Adapt to construction and work of other trades as required for coordination of the work.
- E. Each contractor shall be responsible for layout and coordination of openings and chases required for these installations, which are provided by other trades. Provide dimensioned drawing and fully coordinate this work.
- F. Each contractor shall provide adequate competent supervision on job during all working hours with authority and instructions to answer questions and carry out instructions of Architect or his representative.

1.07 DRAWINGS AND SPECIFICATIONS

- A. Drawings and specifications are supplemental to each other. It is intended that work covered by these specifications and drawings include everything requisite and necessary to make the various systems complete and operative, irrespective of whether or not every item is specifically provided for. Any omission of direct reference herein to any essential item shall not excuse contractor from complying with the above intent.
- B. In case of error or inconsistency, specifications shall take precedence over drawings. Figured dimensions supersede scaled ones. Contractor shall take no advantage of, and shall promptly call Architect's attention to any error, omission or inconsistency in specifications and drawings.
- C. Special attention is directed to requirements that equipment and materials stated in specifications and/or indicated on drawings shall be furnished, completely installed, adjusted and left in safe and satisfactory operating condition. Accessories, appliances and connections necessary for proper operation of equipment shall be provided.
- D. Materials, apparatus or equipment specified or otherwise provided for on drawings, addenda, or change orders issued subsequent to award of contract, shall be same brand, type, quality and character originally specified, unless otherwise provided.
- E. Layout of equipment, accessories, specialties and suspended, concealed or exposed piping systems are diagrammatic, unless dimensioned. In preparing shop drawings, contractor shall check project conditions before installing work. If there are any interferences or conflicts, they shall be called to the attention of Architect immediately for clarifications.
- F. The drawings indicate required size and points of termination of pipes and ducts and suggest proper routes to conform to structure, avoid obstructions and preserve clearances. However, it is not intended that drawings indicate all necessary offsets and it shall be the work of the installing contractor to make the installation in such a manner as to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear, without further instruction or cost to the owner.
- G. It is intended that the mechanical items be located symmetrical with architectural elements and shall be installed at exact height and locations as shown on the architectural drawings. Refer to architectural details in completing and correlating work. Confirm all locations with Architect prior to rough-in.

1.08 PROVISIONS FOR LATER INSTALLATION

- A. Become acquainted with nature and progress of construction against which this work attaches. Review structural drawings for coordination of openings. Cut no structural members or slabs without Architect's written instructions.
- B. When this work cannot be installed concurrently with the building construction, arrange for inserts, sleeves, access panels, etc., as necessary for installation at a later date.

1.09 LOCAL CONDITIONS

- A. Visit site and become familiar with facilities and conditions affecting work. No additional payment will be made on claims that arise from lack of knowledge of existing condition.

- B. Exercise extra care when working in areas where underground services may exist. Any costs for repair of damage to such services become responsibility of Contractor causing damage.

1.10 PROTECTION

- A. When setting up pipe shop, cutting, threading machines, protect area against staining, abrasion. Cost of correcting any such condition will be charged against the respective Contractor.
- B. Protect finish floors from chips and cutting oil by use of chip receiving pan and oil proof cover.
- C. Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.
- D. Protect from paint droppings, insulation adhesive, by use of drop cloths.
- E. Contractors shall be responsible for including and maintaining adequate precautions and safeguards related to their work during all phases of construction. Include protection, warnings and safety devices and equipment for protection of personnel, equipment and materials. Comply with all requirements of governing authorities, including OSHA.
- F. Provide adequate supervision and standby fire protection means during the construction period and particularly while soldering or welding within the building. Comply fully with the fire marshal requirement.

1.09 PRODUCT HANDLING

- A. Pay all costs for transportation of materials, equipment to job site.
- B. Provide all scaffolding, tackle, hoists, rigging necessary for placing mechanical materials and equipment in their proper place. Remove temporary work when no longer required. Comply with applicable State, Federal and local regulations.
- C. Contractor shall keep materials clean and protected from weather and/or damage before and after installation until final acceptance by the owner. Protect all openings, bearings, controls, motors, etc., from dirt and moisture.

1.12 OPERATING INSTRUCTIONS: Provide to Owner after all equipment is in operation and at an agreeable time, competent instructors for the purpose of training Owner's personnel in all phases of operation and maintenance of equipment and systems. There shall be two training sessions; one for the heating season and one for the cooling season.

1.13 DAMAGE AND EMERGENCY REPAIRS

- A. Contractor shall be held responsible for damage to work caused by his work or through the negligence of his workmen. All patching and repairing of damaged work and the cost of same shall be paid by the contractor causing the damage. All existing facilities and installations shall be restored to their original condition when damaged by the work of this Division.

- B. The owner reserves the right to make emergency repairs as required to keep equipment in operation, without voiding Contractor's warranty or relieving him of responsibility during warranty period.

1.14 WARRANTY

- A. Mechanical contractors shall warrant all material, equipment, fixtures and workmanship for a period of one year from date of final acceptance.
- B. Any equipment, piping, fixture or other component part of system which fails during warranty period and all resulting damage shall be replaced or repaired by contractor without cost to owner.
- C. Warranty on any repairs or replacements shall be extended from date of replacement or repair of that item for one year.
- D. Any additional manufacturer's warranties on equipment shall be extended to owner.
- E. Refrigeration compressors and heat exchangers in air conditioning and/or heating systems shall be warranted for a total of five years on compressors and ten years on heat exchangers by the manufacturer. If failure occurs during warranty period, manufacturer shall replace compressor without charge to owner. Replacement labor after the one year project warranty period shall be the owner's responsibility.

1.15 REQUIREMENTS FOR FINAL INSPECTION

- A. All of the following items must be completed prior to final inspections. No exceptions will be made and no final payment will be made until all items are completed.
 - 1. Thoroughly clean all parts of the apparatus and equipment. Exposed parts which are to be painted shall be thoroughly cleaned of cement, plaster and other materials and all oil and grease spots shall be removed. Such surfaces shall be carefully wiped and all cracks and corners scraped out..
 - 2. Exposed metal work shall be carefully brushed down with steel brushes to remove rust and other spots and left smooth and clean.
 - 3. Strainer elements shall be removed during cleaning and flushing period, after which they shall be replaced and adjusted.
 - 4. Clean systems internally before placing in operation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Provide material and labor which is neither drawn nor specified but which is obviously a component part of and necessary to complete work and which is customarily a part of work of similar character.

- B. Provide incidental concrete, reinforcing steel, masonry, mortar, miscellaneous steel, painting and the like required to complete mechanical installations; perform in manner specified in applicable Division of General Trades Specification.
- C. All equipment and material shall be new, free from defects, U.L. listed where applicable and warranted by the manufacturer.

2.02 MATERIAL SUBSTITUTIONS

- A. Systems have been laid out around particular fixtures and equipment considered base items. Manufacturer first listed is base item, other makes when named in these specifications or on the drawings are acceptable and may be bid, provided performance, construction, components and quality are equivalent to base item and can be properly installed. All manufacturers other than base item manufacturer are considered substitutions.
- B. Substitutions are subject to approval of Architect and his decision shall be final. In submitting substitutions, include make and model number and complete literature and performance data for evaluation.
- C. Contractor making a substitution shall be responsible for adaption to space, clearances and performance of substituted item and all costs incurred in his own, other Contractor's work, or changes in mechanical or building drawings that result from the substitution. Notify all other contractors and suppliers affected by substitution.

PART 3 - EXECUTION

3.01 INSTALLATION REQUIREMENTS

- A. Location of piping, equipment, ducts, etc., on the drawings are diagrammatic; indicated positions shall be followed as closely as possible, exact locations shall be subject to building construction and interferences with other work. In general, conceal piping, ductwork located outside of Equipment Rooms. Difficulties preventing the installation of any part of work as indicated, shall be called to the attention of the Architect. Architect will determine locations and changes, Contractor shall install the work accordingly. Architect reserves right to make minor changes in location of any part of the work up to the time of roughing-in without additional cost.
- B. All materials and equipment shall be installed in a neat and workmanlike manner by competent specialists for each subtrade. The installation of any materials and equipment not meeting these standards may require removal and reinstallation at no additional cost to the Owner.
- C. Install, connect equipment, services, materials in accordance with best engineering practice and in conformity with manufacturer's printed instructions.
- D. Take all measurements and determine all elevations at the building.
- E. Do all cutting and patching in existing construction as necessary for installation of this work. Do not cut any structural member without specific permission from the Architect. Have cutting done by skilled mechanics as carefully as possible, and with as little

damage as possible. Have patching done by first-class mechanics, skilled in the several trades.

3.02 CUTTING AND PATCHING

- A. Perform all cutting, framing and patching in completed construction as necessary for installation of this work. Do not cut any structural member without written permission from the architect. Have cutting done by skilled mechanics as carefully as possible, and with as little damage as possible. Have patching done by first-class mechanics, skilled in the several trades.
- B. In new construction, lay out location and size of all openings to be provided by other trades in advance of their work. Set sleeves, lintels, etc., for openings and provide layout dimensioned drawings as required for coordination with other contractors. If openings information and sleeves are not provided to other trades in advance of their work, this contractor shall provide all required openings as required for existing construction.
- C. In existing construction, contractor shall perform all cutting, patching and framing of chases and openings required by this work. Properly sized structural lintels shall be provided above masonry wall openings and steel angle frames around panel walls, floor or roof openings.
- D. Core drill round openings and neatly saw cut rectangular openings in floors or walls. Sleeves shall be grouted or patched to match existing wall or floor construction. Install 1" minimum width trim flange around rectangular exposed penetrations and escutcheon plate around round exposed penetrations.

3.03 FIRE STOPPING

- A. Where pipes pass through floor construction, core drill opening, set steel pipe sleeve and fill voids between sleeve and floor construction with nonshrinking grout. Pack opening between pipe and sleeve with fire stopping ceramic fiber insulation and grout. Sleeves shall be set two inches minimum above finished floor.
- B. Where ducts pass through fire rated construction, provide U.L. listed fire damper with steel frame at penetration and 10 gauge H.R. steel retaining angles on all four sides on both sides of wall or as follows: All fire dampers shall be installed per SMACNA "Fire Damper and Heat Stop Guide for Air Handling Systems" as applicable for the type wall, floor or ceiling penetration.

3.04 ACCESS DOORS

- A. Proper access for service and maintenance shall be ascertained before installation of any item. The mechanical contractor shall furnish access doors adequately sized for servicing concealed items furnished under this contract. Doors shall be fire rated where installed in rated construction and shall have concealed hinge door, screw drive latch and primed painted finish. Frames shall match the construction of adjoining surfaces.
- B. Doors in new construction shall be furnished to general trades contractor for installation. In existing construction, doors shall be installed by the mechanical contractor with surrounding surfaces patched and painted to match existing.
- C. Access doors shall be as manufactured by Milcor or approved equivalent.

3.05 PAINTING

- A. Finish painting is included under Division 9 - Finishes, except where specifically called for under this Division.
- B. Certain painting specified as part of the Mechanical Trades Work is included herein and shall comply with Division 9.
- C. Materials and equipment installed under this Division shall be left free from dirt, grease and foreign matter, ready for painting.
- D. No equipment or piping shall be painted before being tested.
- E. Damaged surfaces of prefinished materials and equipment shall be touch-up painted to match existing finish by the contractor.

3.06 PIPE IDENTIFICATION

- A. Identify each pipe, in Equipment Rooms, above accessible ceilings and in accessible shafts as follows:
 - 1. Color code ID bands or marker backgrounds to identify contents of pipe in conformance with Scheme for Identification of Piping Systems, ANSI A13.1-1956.
 - 2. Provide identifying band of color at least six inches wide near each valve and fitting, on both sides of pipes passing through walls and on long runs at not over 20 foot intervals.
 - 3. Indicate on pipe, by stenciling with 1" high letters, direction of flow and contents. Place in location so as to be easily read from floor. Lacquer or varnish over stencils.
 - 4. Manufactured labels and color bands are acceptable, provided they are applied to clean, dust free surfaces so as not to loosen.

3.07 EQUIPMENT IDENTIFICATION

- A. Identify each piece of equipment and ducts as to nature of service and system number corresponding to designation on design drawings, by stenciling with 1" high letters or attaching two-color engraved plastic nameplates. Apply one coat lacquer or varnish over the stencils.

Item Type Identification

Pumps	Stencil
Motor Starters	Nameplate
Air Handling Units	Stencil
Switches, Pilot Lights (Remote)	Nameplate
Air Ducts	Stencil
Condensing Units	Stencil

- B. Name plates shall be laminated phenolic with a black surface and white core and shall be mechanically fastened with screws to each item. Use 1/16" thick material for plates up to 2" by 4". For larger sizes use 1/8" thick material. Lettering shall be minimum 1/4" height, spaced at four per inch.

3.08 VALVE TAGS

- A. Provide a numbered two-color engraved plastic tag or stamped brass tag approximately one (1) inch in diameter, attached to handwheel of each valve with non-rusting "S" hook of adequate size. Local stop and shut-off valve to an equipment item need not be tagged.
 - 1. Engrave each tag with number and service designation of valve. Prefix numbers with "P" for Plumbing and "H" for Heating. In color coded lines, background plastic color shall correspond to service identification color.
 - 2. Accurately record numbers and locations on the "Record" drawings.
 - 3. Provide typed valve directories in framed, Plexiglas covered enclosure, identifying each valve as to size, type, service and location. Mount where directed by Owner.
 - 4. Where valves occur above lay-in ceilings fasten 3/4" square plastic marker to panel below valve. Marker shall have white background with black engraved letters and numbers identifying valve concealed above.

3.09 OPERATING AND MAINTENANCE MANUAL

- A. Prepare three (3) complete operating and maintenance manuals in hardback binders describing operation of the systems and a recommended maintenance schedule. Turn all equipment warranties over to Owner.
- B. Manuals shall include:
 - 1. Job name and names of contractor with address and telephone number for service.
 - 2. Manual index.
 - 3. Identification, name, mark, number as indicated on drawings.
 - 4. Step-by-step procedures for start-up and shut-down on each system and piece of equipment.
 - 5. Normal equipment operating characteristics.
 - 6. Performance data, curves, ratings.
 - 7. Wiring diagrams.
 - 8. Manufacturer's descriptive literature.
 - 9. Automatic controls with diagrams and written description of operation.

10. Manufacturer's maintenance and service manuals.
11. Spare parts and replacement parts list for each piece of equipment.
12. Name of service agency and installer.
13. Final accepted shop drawings.
14. Maintenance and lubrication instructions.
15. Belt sizes, types and lengths.
16. Plumbing fixtures, valves parts list.

3.10 CLEANING UP

- A. At all times keep premises and building in neat and orderly condition, follow explicitly any instructions of Architect in regard to storing of materials, protective measures and disposing of debris. All rubbish resulting from the work herein specified shall be removed from the premises, as fast as it accumulates.
- B. Upon completion of his work, each contractor shall remove and see that each of his subcontractors removes from the site all tools, equipment, surplus materials and rubbish pertaining to his operations. Each contractor shall pay all costs for such removal and disposition and shall cooperate with General Contractor in final cleaning. Refer to the General Conditions for details.
- C. Replace all filters used during construction with proper system filters at completion of work.
- D. Flush and clean domestic water piping systems with approved detergent to remove excess flux, oils, loose mill scale and other extraneous materials. Flush, sanitize and fill domestic water system, in accordance with requirements of AWWA or authorities having jurisdiction.
- E. After flushing systems, clean filters, strainers, traps and dirt leg.

3.11 LUBRICATION, PACKING AND SUPPLIES

- A. Properly lubricate all rotating, reciprocating equipment before it is started with correct grade, type and quantity of lubricant.
- B. Maintain all lubrication gaskets and packing during construction; assure that at the time of acceptance all are in first class condition.
- C. Install initial charge of refrigerant and any other supplies required to place equipment in operation.

3.12 TESTS AND ADJUSTMENTS

- A. Obtain all inspections required by law, ordinances, rules, regulations of authorities having jurisdiction, furnish certificates of such inspections. Pay all fees and provide all equipment, power and labor necessary for inspections and tests.

- B. During testing period maintain on job a competent engineer thoroughly familiar with all phases for as long a period as required to thoroughly adjust all systems and demonstrate that they are functioning properly.
- C. Perform all tests, including but not limited to those hereinafter specified, make necessary adjustments to obtain specified equipment and system characteristics.
- D. Do not consider work under this Specification complete until Contractor has obtained required inspections, performed tests, made necessary adjustments and has submitted satisfactory evidence of completion.
- E. Pressure Tests:
 - 1. All piping shall be given the following pressure test without appreciable pressure drop. Equipment which would be damaged by the required test pressure shall be isolated from the system during test.

<u>Service</u>	<u>Medium</u>	<u>(PSI)</u>	<u>Hrs</u>	
Heating hot water	Water	125	6	
Underground water	Water	125	*	
Domestic water	Water	125	6	
Gas	Air	50	24	

* AWWA Procedures

- 2. Test medium for refrigerant piping shall be oil pumped dry nitrogen. Twenty-four hour standing time minimum. Test the low side of the system to 150 psi and the high side to 300 psi. Tests shall conform to "Pressure Piping Systems Code" 4101:8-3 and ANSI Standard B31.5 "Refrigeration Piping".
- 3. Correct leaks in screwed joints by replacing thread or fitting or both. Caulking of threaded joints is not permitted. Repair leaks in copper tubing by sweating out joints, thoroughly cleaning both tube and fitting, and resoldering.
- 4. Hydrostatic and/or air tests shall be made before piping is concealed or covered. Contractor shall be responsible for completely draining the systems after hydrostatic tests are performed. Any damage from freezing prior to acceptance of the completed installation shall be repaired at the sole expense of this contractor.

END OF SECTION 15010

SECTION 15050

BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 REFERENCE: Requirements of Division 1 of these specifications shall apply to all work under this section.

1.02 WORK INCLUDES

Pipe Valves, Fittings and Accessories
Thermometers and Pressure Gauges
Pressure Gauges
Floor, Ceiling and Wall Plates
Foundations
Sleeves
Roof Flashings
Access Doors
Electrical Diagrams
Motors, Drives and Guards
Vibration Control
Excavation and Backfill

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 2: Earthwork
- B. Division 2: Site Drainage and Utilities
- C. Division 15: Mechanical General Provisions
- D. Division 15: Insulation
- E. Division 15: Plumbing
- F. Division 15: Heat Transfer
- G. Division 15: Air Distribution

1.04 SUBMITTALS

- A. Submittals are required for the following:
 - 1. Pipe materials, joints and hangers;
 - 2. Valves, cleanouts and drains;
 - 3. Thermometers and pressure gauges;
 - 4. Roof curbs;
 - 5. Vibration control.
- B. Refer to Section 15010.

- 1.05 MATERIALS: All piping, valves and appurtenances shall be continuously rated by the manufacturer for the intended service conditions.

PART 2 - PRODUCTS

2.01 PIPE AND FITTINGS

- A. All materials utilized on this project shall meet or exceed applicable code requirements. If the following materials do not comply with the applicable codes, notify the developer by written Qualification of Bid and bid project utilizing code approved materials.
- B. Plumbing Systems Building Interior - Materials for above and below grade plumbing systems inside the building to 5'0" outside building wall shall be as follows:
1. Gas Above Grade ½" to 2": Schedule 40 black steel, screwed, ASTM A-120. Malleable iron screwed fittings, ASTM A-47 - A-338.
 2. Gas Above Grade 2½" and over: Schedule 40 black steel, welded, ASTM A-120. Schedule 40 black steel plain end fittings, ASTM A-120, solvent weld joints.
 3. Sanitary and Storm Drains Above Grade: All shall be Schedule 40 PVC ASTM D-1785 with solvent weld joints, with PVC-DWV ASTM D-2665 fittings.
 4. Sanitary and Storm Drains Below Grade: All shall be Schedule 40 PVC ASTM D-1785 with solvent weld joints, with PVC-DWV ASTM D-2665 fittings when approved by local code.

NOTE: NO PVC PIPING TO PENETRATE FIRE WALLS.

5. Vent Piping: All shall be Schedule 40 PVC ASTM D-1785, solvent weld joints. Fittings shall be PVC-DWV ASTM D-2665.
6. Fire Protection: All shall be Type "L" hard drawn copper, ASTM B-88. Fitting shall be wrought copper with solder joints, ASTM B16.22, or PVC when approved by local and/or state code.
7. Indirect Drain Below Grade 1½" and Above: PVC, SDR-35, ASTM D-3033, solvent weld joints. Fittings shall be PVC to match.
8. Indirect Drain Above Grade ½" up to 1¼": Schedule 40 PVC ASTM D-1785 with solvent weld joints, with PVC-DWV ASTM D-2665 fittings, when approved by local code.
9. Domestic Water Above Grade ½" up to 3": Schedule 40 CPVC pipe (Flowguard Gold): ASTM D1784, ASTM D2846, ASTM F441, ASTM F442, CSA B137.6. Fittings shall be ASTM F437, ASTM F438, ASTM F439, when approved by local code.

10. Domestic Water Above Grade 4" and Over: Schedule 40 galvanized steel, ASTM A-120. Fittings shall be galvanized wrought iron, screwed joints, ASTM A-74 and A-338.
11. Domestic Water Below Grade ½" up to 2": Schedule 40 CPVC pipe (Flowguard Gold): ASTM D1784, ASTM D2846, ASTM F441, ASTM F442, CSA B137.6. Fittings shall be ASTM F437, ASTM F438, ASTM F439, when approved by local code.
12. Domestic Water Below Grade 3" and Above: Ductile iron, cement lined, Class 52 ANSI A21.51 with ANSI A21.11 joints. Fittings shall be ductile iron, cement lined Class 52 ANSI A21.11 with compression or mechanical joints, or Schedule 40 CPVC pipe (Flowguard Gold): ASTM D1784, ASTM D2846, ASTM F441, ASTM F442, CSA B137.6. Fittings shall be ASTM F437, ASTM F438, ASTM F439, when approved by local code.

NOTE: NO CPVC PIPING WITHIN 10 FEET OF WATER HEATERS.

- C. Mechanical Systems Piping and Fittings shall be as follows.
1. Condensate Drains: All shall be Schedule 40 PVC plastic. Fittings shall be PVC plastic.
 2. Refrigerant Piping: All shall be type "ACR" hard copper. Fittings shall be long radius wrought copper.

2.02 PIPE JOINTS

- A. Cast iron sewer pipe connections shall be as listed below. The type of pipe used must conform to the fitting requirements for a proper, leak-tight connection. Joints must be Code approved.
1. Lead joints - Pipe in hub shall be caulked with picked oakum and then filled in one (1) pour with pure molten pig lead. Lead shall be not less than 1½";
 2. Neoprene seal gaskets - A positive seal elastomeric compression type neoprene gasket to be inserted in hub, inside gasket uniformly coated with seal lubricant and pipe inserted into gasket;
 3. No-hub - A no-hub coupling CISPI-310 with neoprene gasket which is placed over spigots and both spigots firmly seated to separator rings. The stainless steel shield shall be placed over gasket and tightened with adjustment screws. No-hub is permitted below grade only with heavy duty clamps. Couplings shall be as manufactured by UPC Clamp-All Series.
- B. Verified tile sewer pipe to be assembled with premium rubber compression type joints.
- C. Screwed pipe and fittings shall be assembled with sharp, clean, tapered threads using Teflon tape on the male thread only. All cut pipe shall be reamed to the full inside diameter.

- D. Solder joints in copper tubing (except refrigerant piping) shall be made with flux and non-lead, non-toxic antimony alloy solder, except underground lines below floors where all joints shall be brazed. The ends of tubing shall be cut square and the tube ends at inside of fittings burnished with emery cloth before assembly joints shall be wiped clean of excess flux and solder after completion.
- E. Silver Solder: Refrigerant piping and below-grade brazed joints. Joints shall be prepared the same as solder joints and made with silver brazing alloy have a melting point above 1,000°F. Purge piping with inert gas during soldering operations.
- F. Flange joints shall be made with matching ground surface flanges and composition gaskets made tight with bolts and nuts.
- G. Weld joints shall be made with gas or electric welding with minimum of two passes done by code certified welder.
- H. Solvent weld joints shall be made with a solvent cement suitable for the type of plastic specified. The ends of the pipe shall be cut square and all burrs removed. Clean pipe end and fitting jacket with pipe cleaner and apply solvent cement. Insert pipe end such that pipe bottoms against fitting pipe stop.

2.03 VALVES

- A. Valves shall be of the same manufacturer where possible and equal to those manufactured by Lunkenheimer, Nibco, Jenkins, Powell, Milwaukee, Keystone, DeZurik or Hammond and withstand minimum 125 pounds steam working pressure.
- B. Valves for mechanical systems shall be as follows. Other valve requirements shall be as specified in the valve section of other sections of this specification.
- C. Shut-Off Valves:
 - 1. Ball Valves 2" and Smaller: Two piece construction, chrome ball, reinforced TFE seats, 150 psi swp, 600 psi wog. Screwed Nibco #T-585-70, soldered Nibco #S-585-70;
 - 2. Gate Valves 2½" and larger: C.I. gate valves - bolted bonnet, O.S.&Y, solid wedge, bronze mounted, 125 psi swp, 200 psi wog, flanged, Nibco #F-617-0;
 - 3. Butterfly valves 2½" and larger: Water service only, wafer type, 150 psi rated with EPDM liner, stainless stem, aluminum-bronze disc, handle operator with lock, 2½" through 6", type 5, flanged, Nibco #World-2000;
 - 4. Globe valves 2½" and smaller, Union bonnet, renewable disc, bronze globe, 150 psi swp, 300 psi wog. Screwed Nibco #T-235, solder Nibco #S-235.
- D. Check Valves:

1. Vertical 2" and smaller: Bronze spring guided check valve 125 psi swp, 250 psi wog, TFE seat. Screwed Nibco #T-480, solder Nibco #S-480;
 2. Vertical 2½" and larger: Iron body spring guided renewable seat and disc, 125 psi wog, flanged Nibco F-910;
 3. Horizontal 2" and smaller: Bronze Y-pattern, renewable discs, 125 psi swp, 200 psi wog. Screwed Nibco #T-413, solder Nibco #S-413;
 4. Horizontal 2½" and larger: Iron body spring guided, renewable seat and disc, 125 psi wog, flanged, Nibco #F-918.
- E. Drain Valves: ½" and ¾" shall be brass boiler drain with hose thread and cap, 125 psi wog. Screwed Nibco #74, solder Nibco #74-2.
- F. Gas Valves:
1. ½" to 3": Screwed or flanged ends, resilient seal, eccentric valve with lever handle, DeZurik Figure 125-1-RS24;
 2. 4" and over: flanged end, resilient, seal, eccentric valve with lever handle, DeZurik Figure 125F-6-RS25.
 3. Equivalent valves as manufactured by Nibco or Crane.

2.04 STRAINERS

- A. In general, install strainers ahead of all automatic water valves, pump suction lines and elsewhere as indicated on plans.
- B. Strainers 2" and smaller shall be 250#, cast semi-steel body, screwed pattern with 20 mesh stainless steel or Monel screens.
- C. Strainers in copper piping to have bronze bodies.
- D. Strainers to be Sarco, Crane or Mueller.

2.05 UNIONS

- A. Unions in steel piping 2" and smaller, malleable iron, ground joint brass to iron seat suitable for 150 psi SWP. Galvanized or black as required.
- B. Unions in copper piping 2" and smaller, cast brass solder fittings with machined and lapped seats suitable for 125 psi working pressures.
- C. Connections between screwed piping and tubing in hot water systems shall be made with wrought copper adapters.
- D. Connections between ferrous and non-ferrous piping in domestic water systems shall be made with dielectric unions.
- E. Connections in piping 2½" and larger shall be flanged with matching gaskets for the service intended.

2.06 THERMOMETERS

- A. Thermometers: Mercury in glass type with 9" Fahrenheit scale of proper range for service indicated, glass covered case with magnified mercury column, separable well, straight or angle mounted as required.
1. Bi-metal dial type thermometers may be supplied in lieu of mercury type.
 2. Thermometers located below 6'0" level: mercury type with 9" scale, forward or straight type as required by job conditions. Thermometers serving locations above 6'0" level, to be dial type with remote bulb. Mount 4" diameter dials 5'6" above floor on bracket at appropriate location.
- C. Acceptable manufacturers: Trerice, Taylor, American or Palmer.

2.07 PRESSURE GAUGES: Install gauges in the suction and discharge of the heating pumps. Provide gauges having proper ranges as required by conditions. Gauges to have 6" diameter dials, cocks, snubbers, and siphons, as manufactured by Trerice, American Consolidated, Marsh or Ashcroft.

2.08 FLOOR, CEILING AND WALL PLATES: Fit all pipe passing through walls, floors or ceilings in finished rooms with steel or brass escutcheons. Where surface is to receive a paint finish make escutcheons prime painted; otherwise make escutcheons nickel or chrome plated. Where piping is insulated, fit escutcheons outside insulation.

2.09 FOUNDATIONS

- A. Except where otherwise noted, provide all foundations for equipment furnished under this Division.
- B. Construct foundations of 3000 pound concrete complete with all necessary foundation bolts, sleeves anchor plates, washers and nuts. Smooth all exposed portions of foundations and bevel corners.
- C. Unless otherwise noted on Drawings, make all foundations a minimum of 4 inches thick.

2.10 SLEEVES

- A. Where pipes pass through masonry or concrete partitions, or rated fire partitions other than masonry, set machine cut steel pipe sleeves 1" larger than outside diameter of pipe, with ends of sleeves flush with partition faces.
- B. Where pipes pass through floors, set Schedule 40 galvanized steel pipe sleeves 1" larger than outside diameter of pipe. Top of sleeve to be 4" above finished floor in machine rooms and wet floor locations.
- C. Where pipes are insulated, provide sleeves large enough to allow insulation to pass through sleeve. Center pipes in sleeves.
- D. Set sleeves true to line, grade; position and plumb or level and so maintain throughout construction period.

- E. Where concrete or masonry floors and walls are core drilled for pipe passage steel sleeves are not required.
- F. Seal opening between pipe and sleeve or opening as required to maintain the integrity of the fire rating of all walls and floors.

2.11 INSERTS, HANGERS AND SUPPORTS

- A. Provide all inserts, hangers, anchors, guides and supports to properly support and retain piping, ductwork and conduits; to control expansion, contraction, anchorage, drainage and prevent sway and vibration. Piping shall be so supported as not to place a strain on valves or equipment.
- B. Support individual piping from hangers as manufactured by Ellen, Grinnell, Michigan Hanger Company, Modern or Fee and Mason.
 - 1. Uninsulated piping 2" and smaller - Grinnell Figure 97 malleable iron adjustable nut and wrot ring.
 - 2. Uninsulated piping 2 1/2" and larger - Grinnell Figure 260, carbon steel adjustable wrought clevis type.
 - 3. Copper tubing (uninsulated) - Grinnell Figure CT-97 carbon steel ring and malleable iron adjusting nut completely copper plated.
 - 4. Insulated piping 2" and smaller - 18 gauge galvanized steel shield over insulation in 180 degree segments, minimum 12 inches long with Grinnell Figure 260 clevis type pipe attachment.
- C. Hanger Spacing:

PIPE SIZE	ROD	STEEL	COPPER
Through 3/4"3/8"	8'	6'	
1"	3/8"	8'	8'
1 1/4" & 1 1/2"	3/8"	10'	
2"	3/8"	12'	10'
2 1/2" & 3"	1/2"	12'	12'
4"	5/8"	16'	12'
6"	3/4"	16'	--
8"	7/8"	20'	--
10"	1"	20'	--

Provide additional hanger support within two feet of each elbow and at valves, strainers and other equipment in pipe lines.

- D. Cast iron soil pipe hung from building construction shall be supported at intervals of not over five feet next to hub. Additional supports shall be provided where necessary to maintain proper alignment and grade.

- E. Plastic soil pipe hung from building construction shall be supported at intervals of not over five feet and next to each hub. Additional supports shall be provided where necessary to maintain proper alignment and grade.
- F. Trapeze hangers may be used for multiple runs of piping and shall consist of a channel with adjustable hanger rods. Hanger spacing shall be determined by the smallest pipe supported. All piping shall be free for independent movement on the trapeze hanger. Insulation protection saddles shall be as specified for individual pipe support. Hanger system shall be as manufactured by Unistrut or equivalent.
- G. Do not suspend a pipe from another pipe or ductwork. Do not support ceiling framing or lighting from piping or ductwork.
- H. Support ductwork with 16 gauge galvanized steel strap hangers, steel rods or steel angle trapeze hangers per SMACNA Standards. Maximum spacing 8'0".

2.12 ROOF FLASHINGS

- A. Flat roofs:
 - 1. Flashing material shall be four pound lead with minimum thickness of 1/16" or material as specified for flashing through EPDM membrane;
 - 2. Provide flashing around each pipe extending through the roof. Flashing shall extend a minimum of 12" in all directions from the pipe. Solder sleeves on vent extensions, extend to top of vent and turn down 2" inside;
 - 3. All surfaces of the lead flashing including the edges shall be coated with the same material as used by the roofing Contractor.
- B. Pitched Roofs: One piece neoprene sealed flashing shall be provided on all pipes passing through shingled roofs with a slope greater than 2" in 12". The flashing shall be a weatherproof joint constructed of a neoprene collar with a self-adjusting pipe opening from 1½" through 4". The collar shall be dieformed to a one piece aluminum base with no seams or joints. Roof curbs matching roof slope shall be provided for all ducts and exhaust fan penetrations.

2.13 ACCESS DOORS

- A. Provide access doors with frames in all locations where necessary for access to concealed valves, dampers, other equipment requiring service or inspection. Where practical group valves, dampers, etc., so as to be accessible from a single door.
- B. Doors: flush type, 14 gauge steel; frames: 16 gauge steel. Supply with factory prime coat finish. Equip doors with invisible hinges and catches. Units shall be Milcor, Newman Brothers or equal. Supply style which is compatible with the specific wall or ceiling construction. Supply in factory prime coat finish. Doors shall be sufficiently large for access to equipment, but not less than 16" x 12".
- C. Access doors installed in fire rated construction shall be U.L. classified fire rated access doors, rating one and one-half hour "B" label.

2.14 ELECTRICAL CONNECTIONS (Starters by Electrical Contractor)

- A. Refer to those portions of the Electrical Drawings and Specifications which establish characteristics of electrical service and furnish equipment to operate on that service. Verify all electrical service sizes, voltages and phase with electrical contractor, prior to ordering equipment.
- B. Refer to electric section of specifications for starters and disconnect switches. Starters to be provided by Division 16000 contractor. Where equipment has magnetic starters, field supplied disconnect switches or disconnect switches specified as an integral part of the equipment, this Contractor shall furnish them.
- C. Provide coordinated wiring diagrams for all equipment of heating, ventilating and temperature control system conforming to system operation specified. Provide line diagrams, power diagrams, terminal connections. Submit all such drawings as shop drawings.

2.15 MOTORS

- A. For each item of equipment requiring electric drive provide a motor having starting and running characteristics consistent with the torque and speed requirements of the driven machine. Design, construction, performance characteristics to conform to applicable provisions of latest NEMA, ASA, IEEE standards for rotating electrical equipment. Unless otherwise specified, motors are to be general purpose with open type enclosures, rated for a temperature rise of 40 degrees C. Motor horsepower specified in connection with equipment drive minimum. Supply motor manufacturer's verification of motor horsepower characteristic power curves of the driven equipment. In no case shall power requirements of driven equipment exceed nominal nameplate rating of motor furnished. Do not take advantage of service factors in selecting motors.
 - 1. Install, align all motors required.
 - 2. Recheck alignment of motors factory coupled to equipment.

2.16 DRIVES AND GUARDS

- A. For each item of belt driven equipment, provide an adjustable drive sheave with adjustable limits plus or minus 12½%, based on a service factor of 1.5 as applied to motor nameplate rating. Drives of one horsepower and over shall have at least two belts, with all multiple belt sets matched.
- B. Provide substantial drive guard for each belt drive secured to the equipment. Provide openings in skirt guards for insertion of revolution counter at drive sheave and driven sheave centers. Provide conveniently removable coupling guard for direct driven equipment.
- C. Provide a typed list of belt drives, listing each item with pitch diameter, bore size and keyway dimensions of each sheave and manufacturer's replacement belt numbers. Bind lists in Operating and Maintenance Manuals.

- D. Provide all necessary changes in drive sheaves and/or belts as required to obtain specified air deliveries.
- E. Provide substantial guard screen for all rotating equipment, i.e. exhaust fans, condenser fans, etc., where exposed on project. Guards shall be removable for equipment service.

2.17 VIBRATION CONTROL

- A. Vibration or noise created in any part of the building by the operation of any equipment furnished and/or installed under this contract will be prohibited and this Contractor shall take all precautions by isolating the various items of equipment from the building structure.
- B. Flexible connections shall be used between ductwork and air handling equipment and the ductwork attached rigidly to the structure.
- C. Fans shall be supported from spring isolation hangers or bases.
- D. Isolators shall be manufactured by Mason Industries, Consolidated Kinetics or Amber Booth.

PART 3 - EXECUTION

3.01 GENERAL PIPING

- A. Provide shut-off valves at all branch connections to main, at all fixture groupings, each piece of apparatus and in mains to sectionalize the systems and elsewhere as indicated on plans.
- B. Install valves with stems at or above horizontal position.
- C. Install all valves and equipment with unions or flanges to facilitate removal.
- D. Provide hose end drain valves at all low points, trapped sections and on equipment side of all branch valves to permit draining of all parts of liquid piping systems. Install valves at high points of equipment and piping to allow venting.
- E. Pipe equipment drip bases to nearest drain.
- F. Locate covered piping a sufficient distance from walls, other pipe, ductwork or other obstacles, to permit application of the full thickness of insulation specified; if necessary use extra fittings and pipe.
- G. Use dielectric unions where dissimilar pipe materials are joined.
- H. Make piping connections to equipment indicated.
- I. Plug open ends of pipe, ductwork or equipment at all times during installation to keep dirt and foreign material out of system.

- J. Arrange and install all pipes, valves, cleanouts, access openings and equipment so as to be accessible for service. Locate equipment to maintain clearances for tube, coil pulling, periodic servicing.
- K. Make reductions in piping lines with reducing coupling.
- L. No piping shall be installed at locations subject to freezing

3.02 WELDING

- A. Install all pressure piping systems to conform to requirements of State Piping and Welding Codes where applicable.
 - 1. Welding of gas piping shall conform to Section IX of the ASME Boiler and Pressure Vessel Code for welds and piping systems intended to operate at less than 20% of the specified minimum yield strength.
 - 2. Any pipe welding not covered by code shall also be performed by certified welders according to code procedures.

3.03 EXPANSION

- A. Install all piping throughout the project with adequate allowance for expansion to prevent damage to the building, equipment and piping. Provide anchors, loops or approved type expansion joints as required for complete control of movement. Make changes in directions with fittings.
 - 1. Make branch connections to mains for heating risers, radiators and domestic hot water risers with at least two 90 degree elbows.
 - 2. Bullhead connections in any piping service are prohibited.
 - 3. Supplement all loops, joints, compensators, etc., with adequate guides located as close to loops and joints as possible to preserve alignment and pitch.
 - 4. Provide securely supported pipe anchors as required to control expansion, contraction in piping.

3.04 EXCAVATION AND BACKFILL

- A. Provide all excavation and backfilling necessary for installation of work.
- B. Trenches are to be dug to grade and depths required for proper installation of pipe. Provide bedding and lay pipe as indicated on drawing.
- C. Shore or sheet pile trenches if necessary to prevent caving. Do not endanger work of others or existing structures. Contractor will be held solely responsible for damage.
- D. In the event that rock or shale is encountered or any condition such that it is not possible to provide a flat, even grade in bottom of trench, notify A/E at once.

- E. Prior to commencing work, contractor shall notify Utility Protection Service and underground utility companies and ascertain locations of all existing utilities. Verify all sewer depths, sizes and locations prior to starting work.
- F. Hand dig in location of other piping, utilities or sewers so as not to damage existing below-grade installations.
- G. After piping has been installed, tested and approved by Inspector, backfill as called for in detail on drawings. Compact to 95% Proctor density in layers not to exceed twelve inches.
- H. Provide and operate pumping equipment as necessary to keep trenches, other excavations, free of water. No piping shall be installed in trenches until trenches have been pumped and bottom dried-out sufficiently to receive piping.
- I. Backfill below floors with sand, paved areas or sidewalk with AASHTO No. 68 crushed stone to level to receive concrete or paving work. In other areas, backfill after initial twelve inch sand cover over top of pipe to be with clean earth, compacted as described above and to six inches above adjoining grade to allow for settling.
- J. Provide protection for open trenches with suitable barricades, bridges and night lighting in accordance with safety regulations of governing authorities and lights at night.
- K. Set sleeves in foundation walls and floor for pipe and waterproof and seal around sleeve after pipe installations. Provide concrete thrust blocks and restraints at all changes in direction of below grade water piping.
- L. Remove from site and properly dispose of all excess excavation materials.

END OF SECTION 15050

SECTION 15250

INSULATION

PART 1 - GENERAL

REFERENCE: Requirements of Division 1 of these specifications shall apply to all work under this section.

WORK INCLUDES: All labor, equipment, accessories, materials, and services required to furnish and install all insulation, fittings, and finishes for piping, ducts and related mechanical equipment in the plumbing, heating, ventilating, and air conditioning systems.

RELATED WORK SPECIFIED ELSEWHERE:

Division 15: Mechanical General Provisions

Division 15: Basic Materials and Methods

Division 15: Plumbing

Division 15: Heat Transfer

Division 15: Air Distribution

SUBMITTALS

Submit shop drawings or descriptive literature for all insulation products to be used.

Refer to Section 15010.

PART 2 - PRODUCTS

MATERIAL

All insulation material (insulation, jackets, adhesives, cements, mastics, sealers, coatings and finishes) shall have composite Fire and Smoke Hazard ratings as tested under procedure ASTM E-84, NFPA 255 and UL 723, not exceeding, as follows:

Flame Spread 25

Smoke Developed 50.

Provide the following insulation products as manufactured by Owens-Corning. Insulation products as manufactured by Armstrong, CertainTeed or Knauf are acceptable. Adhesives shall be Benjamin Foster or equal.

OWENS-CORNING FIBERGLASS 25: ASJ/SSL HEAVY DENSITY PIPE INSULATION (see insulation thickness schedule).

<u>Service</u>	<u>Thickness</u>	<u>Type</u>
Domestic cold water	B	
Domestic hot water	A	
Recirculating hot water	B	
Horizontal Rainwater Leaders	B	

Pipes Must Be Insulated

Service

Supplies, drain and trap beneath lavs for use by the handicapped (L-2)

OWENS-CORNING ED-150 FRK 25: 2" THICK FACED DUCTWRAP

Service

Supply air ductwork located in the attic.

OWENS-CORNING TYPE 703 Fiberglass Equipment insulation with ASJ, all service jacket, 1-1/2" thick.

Service

Hot Water Storage Tank.

Schedule of "Fiberglass 25" pipe insulation thickness.

MINIMUM PIPE INSULATION THICKNESS

PIPE SIZE	TO 1"	1-1/4-2"	2-1/2-4"	5"-6"	ABOVE 6"
TYPE					
A.....	1".....	1-1/2".....	1-1/2".....	2".....	2"
B.....	1/2".....	1/2".....	1/2".....	1/2".....	1/2"

Pipe insulation thicknesses specified in the above schedule are based on products having a maximum "k" factor of 0.26 at a mean temperature of 75 F. These thicknesses can be reduced for products having significantly lower "k" values and shall be increased for products having higher "k" values in order to produce equivalent or greater thermal resistance.

PART 3 - EXECUTION

INSTALLATION

All insulation shall be installed over clean dry surfaces. Insulation must be dry and in good condition. Wet or damaged insulation will not be acceptable. No insulation shall be applied prior to pressure test completion of the respective piping systems.

All insulation shall be continuous through wall and ceiling openings, sleeves and pipe hanger locations.

Fiberglass pipe insulation shall be installed with joints butted firmly together. Jacket laps to be sealed with factory applied adhesive, butt joints to be sealed with butt strips, having factory applied adhesive. Valves and fittings shall be insulated using mitered sections of insulation, insulation cement, or premolded fitting insulation. The insulation applied to the valves and fittings shall be covered with the same type of covering as used on the pipe insulation.

Valve bonnets, unions, strainers will be left free of insulation except for cold piping subject to condensation (refrigerant, suction, chilled water and domestic water piping systems) where they shall be covered. All insulation ends shall be tapered and sealed regardless of service. Where vapor barrier jackets are used on cold surfaces, insulation must be applied with vapor seal integrity maintained throughout the entire system.

Armaflex II pipe insulation shall be applied with proper adhesive for working temperature of service, insulate all valves and fittings to match adjacent piping. All Armaflex insulation installed outside shall be protected with two coats of protective paint.

All insulation products shall be applied in accordance with manufacturer's written recommendations and this specification. The workmanship shall be first class and all joints shall be made tight.

END OF SECTION

SECTION 15400

PLUMBING

PART 1 - GENERAL

1.01 REFERENCE: Requirements of Division 1 of these specifications shall apply to all work under this section.

1.02 WORK INCLUDES

- All required utility connections.
- Cold water system.
- Hot water system.
- Natural gas piping.
- Sanitary drainage and vent systems.
- Rainwater leaders.
- Thermostatic mixing valves.
- Fixtures.
- Drains and cleanouts.
- Water hammer arresters.
- Hot water heaters.
- Hot water storage tank.
- Pumps.
- Connections to equipment furnished by others.
- Backflow preventer.
- Plumbing valves.
- Miscellaneous plumbing products.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 15 - Mechanical General Provisions.
- B. Division 15 - Basic Materials and Methods.
- C. Division 15 - Insulation.

1.04 SUBMITTALS

- A. The following submittals are required:
 - 1. Fixtures;
 - 2. Water heaters;
 - 3. Hot water storage tank;
 - 4. Drains, cleanouts and carriers;

5. Thermostatic mixing valves;
 6. Circulating pumps;
 7. Miscellaneous plumbing items;
 8. Valves;
 9. Backflow preventer.
- B. Refer to Section 15010.

PART 2 - PRODUCTS

2.01 GAS FIRED DOMESTIC HOT WATER HEATER

- A. Water heaters shall be a sealed combustion system utilizing PVC piping for intake and exhaust, 316L stainless steel tank, electronic control, of glass-lined design and include a powered gas burner with electronic flame safeguard, intermittent ignition, main and pilot automatic gas valves , redundant solenoid gas valve, gas pressure regulator, diaphragm air switch for proof of blower operation and flame inspection port. Maximum supply gas pressure to heater 13” WIC Heaters shall be equipped with two 4” handhole cleanouts, shall have an ASME working pressure of 160 psi, and stamped National Board, and listed by Underwriters Laboratories.
- B. Controls shall include:
1. High temperature limit control (manual reset);
 2. Upper and lower thermostats;
 3. Combination temperature and pressure gauge;
 4. Low water cutoff;
 5. ASME rated temperature relief valve;
 6. Draft regulator.
- C. Control compartment door shall be hinged for easy access. The heaters shall be equipped with multiple anodes for cathodic protection. The heaters shall be insulated with a vermin proof 2” foam insulation or equal. glass fiber insulation or equal.
- D. Heaters must meet or exceed current ASHRAE 90 for recovery efficiency and standby loss. The outer jacket shall be high impact plastic or metal with a baked enamel finish over a bonderized undercoating. All internal surfaces of the heaters exposed to water shall be glass-lined with an alkaline borosilicate, nickelous oxide composition that has been fused to steel by firing at a temperature range of 1400 F to 1600 F. Heat exchanger shall be constructed out of 90/10 cupronickel.

- E. Heater tanks shall have a five year limited warranty against corrosion as outlined in the written warranty.
- F. Professional start-up service to be included.
- G. Water heaters by shall be Rheem Advantage Plus 98% efficient or A.O. Smith Corporation Cyclone.

2.02 CLEANOUTS

- A. Install cleanouts where required by code, at maximum of 50' intervals for 4" and smaller sewers and 100' intervals for 5" and larger sewers and where shown on the drawings.
- B. Provide flush cover plates for access in finished areas.
- C. Outside cleanouts occurring in paved, slag or cinder areas shall be Josam Series No. 58860 or equal by Smith, Wade or Zurn and set in a 16"x16"x10" deep concrete collar flush with grade. Outside cleanouts occurring in other areas shall be installed with a vitreous riser and vitreous stopper flush with finished grade.
- D. Cleanouts shall be as scheduled on the drawings, as manufactured by J.R. Smith or approved equivalent by Josam, Wade or Zurn.

2.03 DRAINS

- A. Drains in floors having membrane waterproofing shall be complete with a flashing clamp device to firmly secure membrane to drain body.
- B. Drains shall be as scheduled on the drawings as manufactured by J.R. Smith or approved equal by Josam, Wade or Zurn.

2.04 MISCELLANEOUS PLUMBING PRODUCTS

- A. Hose bibs:
 - 1. Polished chrome plated with hose thread end, integral vacuum breaker and loose "T" handle key;
 - 2. Unit shall be as scheduled on the drawings or approved equivalent by T & S Brass or Royal Brass.

- B. Water hammer arresters:
 - 1. Permanently air charged and maintenance free unit conforming to P.D.I. Standard WH 201;
 - 2. Unit shall be as noted on the drawings or approved equivalent by Sioux Chief, Watts or Amtrol.
- C. Trap primer valve: Corrosion resistant brass unit with adjustable flow rate to operate on pressure drop within system and with integral vacuum breaker. Unit to be capable of multiple discharges of up to eight drain lines. Unit shall be Precision Plumbing Products Model Oregon #1 or equal.

2.06 CIRCULATING PUMP

- A. Unit shall be an in-line, horizontal, all bronze and oil lubricated circulating pump suitable for 125 psi working pressure. The pump shall have a steel shaft with integral thrust collar, two horizontal sleeve bearings and mechanical ceramic water seal. The motor shall be non-overloading, open drip-proof design with built-in thermal overload.
- B. Unit shall be as manufactured by Bell & Hossett or equivalent by Armstrong or Taco.

2.07 PLUMBING FIXTURES AND TRIM

- A. Furnish and install all plumbing fixtures and equipment in accordance with the provisions on these specifications. Fixtures shall be non-absorbent vitreous china, cast iron or steel coated with acid-resistant enamel or stainless steel as indicated.
- B. All wall fixtures to be mounted on chair type carriers with the weight carried on the structural floor independent of the wall construction.
- C. Counter tops shall be supplied by General Contractor with the hole for sink already cut. This contractor shall set sink and connect same.
- D. All fixtures shall be furnished with water flow restrictors as required by State and local codes.

- E. Fixtures and equipment and accessories shall be as listed on the drawings.

2.08 BACKFLOW PREVENTER OR DOUBLE CHECK VALVE

- A. The reduced pressure backflow preventer shall consist of two separate spring loaded check valves and a differential relief valve. These devices shall automatically reduce the pressure in the "Zone" between the check valves. Should the differential pressure between the upstream and the downstream of the unit drop to 2 psi, the differential relief valve shall open and maintain the proper differential.
- B. Both check valves and the differential relief valve shall be so constructed that they may be serviced without removing the device from the line. These devices shall be rated to 150 psi working pressure and water temperatures of 32 °F to 140 °F.
- C. Backflow preventers shall comply with ASSE #1013.

PART 3 - EXECUTION

3.01 SANITARY DRAINAGE AND VENT SYSTEMS

- A. Horizontal waste and vents shall be installed to grades specified, unless indicated otherwise on drawings. Waste piping 2" and smaller, pitch at 1/4" per foot, 3" and larger piping, at 1/4" per foot, vent piping, all sizes at 1/8" per foot. Make changes in direction with "Y" branches and 1/4, 1/8 or 1/16 bends.
- B. Connections to vertical wastes and vents shall be made with a sanitary "T" or "TY" fittings, and at base of vertical stacks change to horizontal with long turn fittings.
- C. All drainage fittings 2" or smaller shall be long turn pattern. Increase or reduction in size shall be with concentric fittings.
- D. Install cleanouts at base of all stacks, at maximum 50' intervals for 4" and smaller drains and at 100' intervals for 5" and larger sewers. Cleanouts shall be the size of pipe to which it is installed up to 4" in diameter. Pipe over 4" in diameter shall have a 4" cleanout.

- E. Terminate vent pipes at least 12" above roof. Make each vent terminal watertight with the roof by using sheet lead (4 psf) with base not less than 12" in all directions from center of pipe and collar full height of pipe and turned down 2" inside of pipe.
- F. Lay all sanitary and drains with full length of each section resting on a solid bed. Lay pipe starting at upgrade with spigot end of pipe pointing in direction of flow.
- G. Connect to site sanitary sewer at 5'0" outside building and extend into building.
- H. Extend sanitary sewer to street sewer and make connection per authority having jurisdiction.

3.02 DOMESTIC WATER SUPPLY SYSTEMS

- A. Install new water service from 5'0" outside building into building.
- B. Piping to be size and routed as generally indicated on drawings. Install hot and cold water distribution piping to all fixtures, equipment, hose bibs, etc., requiring same. Connections for all fixtures and equipment in accordance with schedule on drawing or code.
- C. Pitch all piping for positive drainage, either to fixtures, fixture supply stop or low points in system. Provide drain valves at low points.
- D. Install in manner to allow for expansion and contraction in piping and not to interfere with the work of other trades. No piping shall be installed at locations subject to freezing.
- E. Provide valves at branches, connections to equipment and other places that may be indicated. All equipment and fixtures must be capable of being isolated for service and/or replacement. Include shut-off valves, check valves, unions and other accessories.
- F. Install hose bibs and wall hydrants with code approved vacuum breakers. Extend make-up water to other water systems with approved backflow prevention devices.
- G. Nipples between copper pipe and fixture supply fittings shall be red brass pipe not galvanized steel pipe.

- H. Thoroughly flush entire system, submit one representative sample of water taken from a remote location from the incoming service line to a recognized testing laboratory and submit results to the owner. Water quality shall meet EPA requirements.
- I. Underground water service shall be buried with a minimum of 5' of cover and installed per utility company's requirements.

3.03 GAS PIPING SYSTEM

- A. Install new gas service 5'-0" outside building into building. Underground gas service shall be buried with a minimum of 2' cover.
- B. Piping to be size and routed as generally indicated on drawings. Install gas distribution piping to all gas using equipment and appliances.
- C. Connections shall include gas cock, dirt leg and union.
- D. All gas piping 2½" and over shall be welded.
- E. Underground gas service shall be buried with a minimum of 24" cover and installed per utility requirements. Metallic piping systems shall have cathodic protection.

3.04 PLUMBING FIXTURES

- A. All fixture supports to be of type permitting adjustment to fit variations in construction. All grounds or special supports necessary for setting fixtures shall be provided before plastering or other finished construction work is begun. All fixtures shall be hung at height as indicated on architectural plans.
- B. Accessories, in general, are listed for each fixture. The contractor shall, however, supply all stops, traps, escutcheons and connections as necessary to complete installation of each fixture, whether such items are listed or not.
- C. After all fixtures have been set and are ready for use, thoroughly clean all fixtures furnished, removing all stickers, rust stains and any other matter or discoloration leaving every part in good condition. Adjust all flush valves and other fixture water supplies to give proper water flow.

- D. Assemble lavatory and sink wastes and traps with slip joints and compression fittings on fixture side of trap. Sewer side connections shall be made with screwed joints. Slip joints on sewer side of traps are not acceptable.
 - E. Vacuum breakers shall be furnished and installed as a part of the fixture trim wherever there is a possibility of back siphoning.
- 3.05 RECIRCULATING HOT WATER SYSTEM: The terminal point of the hot water mains shall be connected as directed on the plans to recirculating hot water mains. The recirculating mains shall be vented through fixtures and installed so that no air binding will occur in them. Each branch return is to be valved to permit balancing of the system.
- 3.06 STERILIZATION
- A. After the domestic water lines have been tested and approved, the piping shall be sterilized.
 - B. Prior to chlorination, all water mains shall be thoroughly flushed out.
 - C. Lines shall be in contact with sterilizing solution for a minimum of three hours during which time no valves shall be operated.
 - D. Each section of line shall be treated with a solution containing a minimum of 50 ppm, chlorine.
 - E. If the bacteriological examination is satisfactory, the line shall be certified for use.

END OF SECTION 15400

SECTION 15500

FIRE PROTECTION

PART 1 - GENERAL

1.01 WORK INCLUDES

- Hydraulic calculations and submittals.
- Pipe and fittings.
- Sprinklers.
- Accessories.
- Alarm check valve and trim.
- Fire Department siamese connection.

1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 15 - Mechanical General Provisions.
- B. Division 15 - Basic Materials and Methods.
- C. Division 15 - Plumbing.
- D. Division 15 - Electrical.

1.03 PERMITS: Permits required for fire protection installation shall be obtained and paid for by a State licensed fire protection contractor.

1.04 CODES AND STANDARDS

- A. Conform to all applicable fire and building code regulations, including State Building Code, Local Building Code and Fire Marshall requirements.
- B. Conform to NFPA standards, including Bulletin 13.

1.05 DRAWING COORDINATION

- A. The drawings are essentially diagrammatic to the extent that offsets, bends, special fittings and exact locations are not indicated.
- B. Attention is called to the limited space available for the installation of mechanical services. It is essential for the coordination of all trades that this contractor be responsible for confirming the location and elevations of his piping and equipment at the job site to avoid

encroaching upon the space needed and allocated for another trade.

- C. Drawings are not intended to be scaled for rough-in measurement or to serve as shop drawings, installation drawings or sleeve drawings. "Working Plans" for these purposes shall be prepared by the contractor.

1.06 SUBMITTALS

- A. Submittals are required as follows:

1. Sprinkler heads;
2. Alarm check valves;
3. Dry system check valve;
4. Dry system air compressor;
5. Siamese connection;
6. Hydraulic calculations and shop drawings;
7. Backflow preventer.

- B. Submit shop drawings for all required materials and equipment. Furnish 1/8" = 1'0" scale drawings for sprinkler system. Submit shop drawings to and obtain approval from authorities having jurisdiction and owner's insurance company.

1.07 TESTS

- A. The appropriate tests and flushing procedures shall be conducted as the installation progresses, as stipulated by the applicable regulations. Contractor shall provide all necessary labor and equipment for such tests.
- B. All tests shall be witnessed by all interested agencies unless specifically waived by the agency in writing. A minimum of advance notification shall be given in writing to all such parties.
- C. All pressure testing and flushing shall be in accordance with NFPA-13.
- D. Perform flow test on city main at nearest fire hydrant to project to determine basis of available water supply for hydraulic calculations.
- E. Make hydrostatic test on sprinkler system, 200 psi for two (2) hours.

- F. All defects made evident by the tests shall be properly repaired by the contractor. Leaks shall be repaired only by means of tightening or replacing the fitting and not resorting to any caulking method.
- G. After the completion of testing and adjustments, contractor shall furnish three (3) copies each of signed certificates of approval and acceptance of all parts of the systems, from all authorities having jurisdiction.
- H. Upon completion of the entire fire protection system installation, an operating test shall be made in the presence of the purchaser, local fire officials and representative of the authority having jurisdiction.

1.08 APPROVALS

- A. Submit shop drawings and hydraulic calculations to and obtain approval from State and local government agencies and the owner's insurance underwriter. After the above and prior to construction, the documents shall be submitted to the Architect for review.
- B. All devices and materials pertaining to all fire protection work shall bear the U.L. stamp of approval

1.09 CERTIFICATION

- A. Contractor shall provide owner with three (3) copies each of the following:
 - 1. Flushing certificate;
 - 2. Water main flow test;
 - 3. Hydrostatic pressure test certificate;
 - 4. Record Drawings.

1.10 TEMPORARY FIRE PROTECTION AND PRECAUTION: During the construction period, provide temporary fire extinguisher facilities as required by the local fire marshall including portable extinguishers and small hose streams.

1.11 DESIGN CRITERIA

- A. The system shall be hydraulically designed to provide the minimum density as specified below:

1. Attic space, rental units and public space - Light Hazard Design; 0.10 GPM/sq. ft. over the most remote 1500 square foot;
 2. Storage areas, linen rooms, exercise rooms, warming and serving areas, mechanical rooms and similar occupancies - Ordinary Hazard Design; 0.20 GPM/sq.ft. over the most remote 1500 square foot.
- B. This contractor shall perform a flow test of the site water supply and submit test report with hydraulic design calculations.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Pipe and Fittings:
1. Pipe and tube shall be welded or seamless steel or copper as scheduled in Table 3-1.1.1 and in accordance with paragraph 3.1 of NFPA-13, 1989 edition;
 2. Piping joined with threaded fittings or by couplings with pipe having cut grooves shall have a minimum of Schedule 40 wall thickness;
 3. Groove joining shall be done by an approved combination of couplings, gaskets and grooves. Grooves on pipe shall be dimensionally compatible with fittings;
 4. Pipe and tube used in sprinkler system shall be designed to withstand a working pressure of not less than 175 psi.
- B. Valves:
1. Shut-off valves in the fire and standpipe system shall be U.L. approved OS&Y gate valves or butterfly valves, 175 lbs. WWP;
 2. Check valves in fire lines and sprinkler lines shall be U.L. iron body bronze mounted checks, flanged ends, 175 lbs. WWP;
 3. All system shut-off valves shall be in the open position;

4. Alarm check valves shall be U.L. listed with pressure gages, test valves, drains and trim. Include water motor gong with wall mounted alarm gong;
5. Dry pipe valve UL listed with latching clapper, air plate assembly, accelerator and required UL trim.

C. Sprinkler Systems:

1. Install U.L. or F.M. approved sprinklers as indicated on drawings. Sprinkler heads shall be as manufactured by Gem, Central Sprinkler Corporation, Star or Viking;

2. Provide upright spray type, pendent type, or sidewall type, as indicated on plans;

Pendent Polished chrome with matching escutcheon, Gem
Aquarius

Upright Rough bronze

Sidewall Polished chrome with matching escutcheon, Gem
Aquarius

3. The temperature rating of the heads shall be selected to compensate for the maximum ambient temperature of space protected;
4. Provide a stock of spare heads of each type and rating of not less than the quantities required by NFPA-13. Provide a metal cabinet appropriately labeled for head storage;
5. Automatic sprinkler piping systems shall be hydraulically designed by the contractor;
6. The sprinkler system shall be hydraulically balanced to provide the required minimum density over any area, including the most hydraulically remote area;
7. Calculations shall include the sprinkler system demand and hose stream requirements;
8. The hydraulic calculations shall be based on the Hazen-Williams Formula with a "C" factor of 140 for underground piping and 120 for overhead piping;

9. A riser name plate shall be permanently affixed to each calculated system riser, providing hydraulic data in accordance with N.F.P.A. requirements.

2.02 BACKFLOW PREVENTER

- A. Double detector check backflow preventer:
 1. Two (2) independent iron body check valves with bronze seats and shut-off valves, ball type test cocks and conforming to ASSE Standard No. 1015;
 2. Unit shall be code approved and as manufactured by Watts, Model No. 709 series with strainer and OS & Y gate valves or equivalent by Hersey, Febco or Lawler.

2.03 FIRE DEPARTMENT SIAMESE CONNECTIONS: Provide 2½"x2½"x4" cast brass with double clapper checks and 2½" inlet shall be equipped with cast brass lugged plugs and chains. Escutcheon plate shall be provided, integral with assembly or as a separate component, with raised letters to read "Auto Spkr" or "Standpipe". Croker Standard No. 207, Elkart or Standard polished brass.

2.04 TAMPER SWITCHES

- A. Provide Potter Electric Signal Company, Notifier or equal I155 V gate valve switch. Provide N.O. and N.C. contacts.
- B. Tamper switches shall be installed as per manufactures recommendations.
- C. Electrical contractor to wire.

2.05 FLOW SWITCHES

- A. Provide Autocall waterflow indicators, Viking or Notifier where shown on Drawings. Size as required for piping served. Provide N.O. and N.C. contacts and incorporate a pneumatic adjustable retard.
- B. Flow switches shall be installed as per manufacturers recommendations.

C. Electrical Contractor to wire.

2.06 AIR COMPRESSOR

A. Provide and install a maintenance air compressor, electric motor driven, air cooled, single stage, oil-less compressor. Permanently lubricated ¼ HP, 115 volt AC 60 cycle, 2.0 SCFM at 50 psi.

B. FF approved unit with all required trim and controls.

C. Unit shall be as manufactured by Viking Mode D-1 or equivalent.

PART 3 - EXECUTION

3.01 INSTALLATION

A. The contractor shall furnish all labor, necessary construction equipment, materials necessary for the complete installation of the fire protection system as shown on the drawings. All work shall be in strict compliance with all governing State and local code requirements, in full conformity with the best current trade practices and subject to approval of the Architect or his representative.

B. All work details not covered by these specifications shall be governed by the requirements of the latest edition of NFPA No. 13.

C. Piping shall be screwed, welded, flanged or joined with mechanical fittings. Acceptable mechanical fittings include Aeroquip or Victaulic as listed by Factory Mutual. All welding shall be performed in conformance with NFPA No. 13.

D. Insulate connections between pipe fittings, hangers of dissimilar metal against direct contact. Use dielectric insulating flanges and unions.

E. Support all sprinkler piping, standpipe risers, etc., as specified in NFPA No. 13.

F. Flushing Connections: 4" long nipple and cap shall be provided at ends of all cross mains.

G. Reducers shall be eccentric and installed in piping so that piping can be drained.

- H. All drain lines including riser drain, alarm drain, inspector's test drain, low points, etc., shall terminate with turned down ells and shall be so located that discharged water will not interfere with normal conduct of business in building. Concrete splash guards shall be provided at grade level beneath all outside drains to minimize soil erosion.
- I. Provide inspector's test nozzle at furthest point of each riser system and pipe to safe discharge point. Provide sleeves for all pipes passing through fire walls and partitions. Set sleeves before floors and walls are poured. Pack sleeves with fireproofing materials.
- J. Copper solder joints shall have pipe or tubing ends reamed to full inside diameter after cutting. Exterior of joint must be smooth. Clean with steel wool. All joints shall be made with non-toxic high melting point solder.
- K. Make screwed joints with pipe compound applied to male threads only. All cut ends of the pipe shall be carefully reamed to full size. U.L. approved flexible couplings are permitted on all feed mains and standpipe risers.
- L. Valves shall not be installed with stems in less than a horizontal position. All fire valves shall be chained and locked in the open position.
- M. Locations of all sprinkler heads and piping shall be coordinated and centered with the ceiling grid pattern, lighting fixtures, columns, HVAC diffusers, all mechanical equipment and other possible obstructions.
- N. No "wet" piping shall be installed in unheated spaces or exterior walls.
- O. Contractor shall extend system from flanged connection provided by Section 15400 contractor.

END OF SECTION 15500

SECTION 15700

HEAT TRANSFER

PART 1 - GENERAL

1.01 REFERENCE: Requirements of Division 1 of these specifications shall apply to all work under this section.

1.02 WORK INCLUDES

Through-the-wall heating and air conditioning units.
Refrigeration accessories.
Temperature controls and wiring.
Filters.
Combination heater/fans.
Ductless split system air conditioner.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 15 - Mechanical General Provisions.
- B. Division 15 - Basic Materials and Methods.
- C. Division 15 - Insulation.
- D. Division 15 - Air Distribution.

1.04 SUBMITTALS: Refer to Section 15010.

PART 2 - PRODUCTS

2.01 THROUGH-THE-WALL PACKAGED TERMINAL AIR CONDITIONING UNITS

- A. Supply and install air-cooled through-the-wall packaged terminal air conditioners.
- B. Performance shall be as scheduled on the drawings.
- C. Wired controls shall be Remote Smart Stat; Inncom e528 w/ door switch & PIR.
- D. Compressor shall be hermetically sealed, internally isolated and mounted on combination rubber and spring isolators.

- E. Evaporator and condenser coils shall be all copper tubing with rippled aluminum sheet fins. Refrigerant control shall be by expansion valve.
- F. Evaporator and condenser fans shall be direct drive with permanent split capacitor motors. Evaporator fan shall be centrifugal type and condenser fan shall be propeller type with slinger ring for condensate removal.
- G. Wall sleeve shall be a special fabrication for mounting inside suite window seat. It shall be one piece galvanized steel with electrodeposition paint finish and high solids polyester overspray. Sleeve shall be shipped with rear closure panel. Wall thickness, and sleeve length, to be confirmed prior to ordering.
- H. Unit chassis shall be slide-out design, shipped with front. Unit shall feature welded, insulated bulkhead.
- I. Units shall be ARI rated and U.L. listed as manufactured by Amana, AAF, Zone Aire, Climate Control, Carrier or General Electric.

2.02 DUCTLESS SPLIT SYSTEM AIR CONDITIONERS

- A. Ductless fan-coil units shall be ceiling suspended or high wall mounting type as indicated on the drawings. Units shall be by Carrier, Sanyo Friedrich or Mitsubishi.
- B. All units shall be furnished with micro-processor controls, diagnostics to check compressor drive and indoor fan malfunction; restart function for automatic start after a power failure; mounting bracket and template; cleanable filters; wired controls shall be Remote Smart Stat; Inncom e528 w/ door switch & PIR.
- C. Ceiling suspended units shall include a built-in condensate pump.
- D. Units shall be listed by U.L. or ETL.
- E. Condensing units shall include hermetic compressor, condenser coil and fan arranged for horizontal air flow, high and low pressure switches and crankcase heater.

PART 3 - EXECUTION

3.01 REFRIGERANT PIPING SYSTEMS

- A. Refrigerant piping and equipment installation shall conform to the applicable requirement of the Safety Code for Mechanical Refrigeration (ANSI B9.1) and the Ohio Basic Building Code Article 4101:2-29.
- B. Piping and specialties shall be sized to prevent excessive pressure drop and allow compressors and evaporators to operate together with balance points at or above the specified capacities.
- . Piping and specialties shall be arranged to return oil at all loads and prevent liquid from "slugging" the compressor or siphoning to the evaporator. Provide double suction risers and traps as required.
- D. Pitch horizontal refrigerant piping 1/2" per 10 feet in direction of flow.
- E. Provide separate refrigerant circuits for multiple compressor applications.

3.02 CONTROL SYSTEMS AND WIRING

- A. This contractor shall furnish all control wiring for control of mechanical equipment.
- B. Line voltage wiring shall be in conduit and 24 volt wiring may be open if code allowed, where it is concealed above ceilings or in equipment rooms.
- C. Provide all relays, switches and auxiliary devices required to accomplish control of the mechanical systems.
- D. Control sequences shall be as follows:
 - 1. Through-Wall Air Conditioning Units - Controlled from wall mounted thermostat.
 - 2. Split System Room Air Conditioning Units - Controlled from wall mounted thermostat. Provide wiring for defrost thermostat;

3. Room Ventilation and Combustion Air - Motorized damper on combustion air louver shall be interlocked to open on operation of hot water heaters and clothes driers.

END OF SECTION 15700

SECTION 15800
AIR DISTRIBUTION

PART 1 - GENERAL

1.01 REFERENCE: Requirements of Division 1 of these specifications shall apply to all work under this section.

1.02 WORK INCLUDES

- Exterior louvers.
- Access door (ductwork and plenum casing).
- Ductwork.
- Flues.
- Exhaust fans.
- Dryer vents.
- Filters.
- Motor operated dampers.
- Fire dampers.
- Grilles and diffusers.
- Exterior louvers.

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Division 15 - Mechanical General Provisions.
- B. Division 15 - Basic Materials and Methods.
- C. Division 15 - Insulation.
- D. Division 15 - Heat Transfer.

1.04 SUBMITTALS

- A. The following submittals are required:
 - 1. Grilles, louvers and accessories;
 - 2. All HVAC equipment and controls;
 - 3. Flues.
 - 4. Fire dampers.
- B. Refer to Section 15010.

PART 2 - PRODUCTS

2.01 EXHAUST FANS

- A. In general, Greenheck fans are specified, equals as manufactured by Jenn-Air, Acme or Loren-Cook are acceptable.
- B. Size, capacity and arrangement shall be as indicated on the drawings.

2.02 LOW PRESSURE RECTANGULAR DUCTWORK

- A. Rectangular ductwork and plenum chambers shall be constructed of the following gauges:

<u>U.S. GAUGE</u> <u>LARGEST DIMENSION</u>	<u>GALVANIZED STEEL</u>
To 12"	26
13" to 30"	24
31" to 54"	22
55" to 84"	20
over 84"	18
Plenums	18

- B. All ductwork shall be constructed of galvanized steel.
- C. Exposed ductwork shall be fabricated from "Paint Grip" galvanized steel or similar mill surface etch treatment.

2.03 ALUMINUM DRYER VENTS

- A. Dryer vents shall be aluminum complying with ASTM B 209, Alloy 3003, Temper H14.
- B. Thickness, Round Ductwork: Fabricate aluminum ductwork from the following minimum thicknesses of sheet for diameters up to the corresponding maximum dimensions indicated:

- 0.020" up to 13" diameter.
- 0.025" up to 22" diameter.
- 0.032" up to 36" diameter.
- 0.040" up to 50" diameter.
- 0.051" up to 60" diameter.

2.04 MOTOR OPERATED DAMPERS

- A. Dampers shall be equivalent to Ruskin CD50/OB low leakage control damper, opposed blade.
 - B. Operator shall be factory installed two position electric motor, 120 volt.
- 2.05 METALBESTOS FLUES: Provide "Metalbestos" type "QC" and "RV", air insulated double wall construction flues of size as indicated on plans. Equivalent flues by Mastervent or Metal-Fab.

2.06 GRILLES AND DIFFUSERS

- A. See drawings for all grille, diffuser and accessory locations and CFM.
- B. In general, Titus grilles and diffusers are specified, equals as manufactured by Krueger, Tuttle and Bailey or Anemostat-Waterloo are acceptable.
- C. All grilles, registers and diffusers to have a factory applied off-white finish unless otherwise noted on plans.
- D. Refer to architectural reflected ceiling plan for exact location of ceiling diffusers.

2.07 GALVANIZED STEEL FLUE CONNECTORS

- A. Galvanized steel flues shall be constructed of the following gauges

<u>DIAMETER OF FLUE (IN)</u>	<u>U.S. GAUGE GALVANIZED STEEL</u>
0 - 5	24 Gauge
6 - 9	22 Gauge
10 - 16	20 Gauge
Greater than 16	14 Gauge

2.08 FLEXIBLE DUCTWORK

- A. Flexible ducts shall be Owens-Corning INL-25 or Valuflex or approved equal as manufactured by Certain Teed, Flexaust or Wiremold.

- B. Ducts shall bear U.L. Class 1 Air Duct label as tested under U.L. 181 and required by NFPA 90A as an air duct.

2.09 EXTERIOR LOUVERS

- A. Provide extruded aluminum stationary exterior wall louvers, size as indicated on plans.
- B. Louvers shall be Ruskin ELF-375, 4" deep, with 1/2" square mesh aluminum screen on interior face. Provide acrylic enamel finish. Submit color samples for approval.
- C. Published louver performance data bearing the AMCA Certified Ratings Seal for Air Performance and Water Penetration must be submitted for approval prior to fabrication and must demonstrate pressure drop and later penetration equal to or less than the Ruskin model specified.
- D. Equivalent louvers by Airo-lite, American Warming and Construction Specialties are acceptable.
- E. Through-wall unit grills to be Architectural grade, factory finished to match the building. Grills to be Reliable or approved equal.

2.10 FIRE DAMPERS: Install fire dampers where indicated on drawings. Fire dampers shall be Safe-Air Inc. horizontal and vertical Model 150, type "XM" in low pressure ductwork, type "C" in high pressure ductwork. Dampers shall be UL classified for use in two hour fire partitions. Equivalent by Air Balance Inc. or Ruskin may be substituted.

2.11 FLEXIBLE DUCT CONNECTIONS: Provide flexible connections with 1" slack between ducts and fans where shown on drawings. Flexible material shall be "Vent-glas" as manufactured by Iden Associates.

2.12 ACCESS DOORS AND HARDWARE

- A. Furnish access doors for each automatic damper, fire damper, coil, fan, filter bank and where indicated.
- B. Provide access doors with latches, hinges and felt gaskets as manufactured by Young Regulator Company, Ventlock or Dura-Dyne.

2.13 DAMPERS AND DEFLECTORS

- A. Provide all manual dampers with Young Regulator Company, Ventlock or Dura-Dyne operators. Use Young Regulator No. 443-B operators for balancing dampers.
- B. Combustion air intakes shall be equipped with 24 volt electric motor operated dampers, Ruskin CD36 or approved equal with end switch to close when blade is in the fully open position.

2.14 CEILING TYPE FIRE DAMPERS

- A. All ceiling register and grille openings in fire rated ceilings shall be protected by appropriately UL Fire Resistance Classified ceiling fire dampers. Fire dampers with 1-1/2 or 3 hour ratings for walls or floors are not to be utilized in fire rated ceiling openings. Each ceiling diffuser opening shall be protected with appropriately UL Fire Resistance Classified Ceiling Classification(s) and shall apply to the specific ceiling system design and diffusers, grille or register construction being installed. All installations shall be in accordance with manufacturer's published installation instructions.
- B. Lay in ceiling diffusers shall be a minimum of 24 gauge steel construction. Ceiling diffuser radiation shield shall consist of an appropriate ceiling fire damper protecting the diffuser neck and a thermal insulating blanket protecting the diffuser pan. The entire system shall be UL classified for use in all UL fire rated floor/ceiling and roof/ceiling systems with fire resistance ratings of three hours or less. System proposed for installation must be equivalent in all respects to Ruskin Model CFD5 ceiling diffuser radiation shield.

PART 3 - EXECUTION

3.01 DUCTWORK AND ACCESSORIES

- A. Provide all sheet metal work as shown on the drawings in accordance with the latest edition of the ASHRAE guide and data book, SMACNA Standards and this Specification, the most demanding of which shall be the minimum standard.
- B. Install ductwork and flues indicated on drawings making all necessary changes in cross sections and offsets, whether or not specifically indicated.

- C. All changes in cross section shall be made without reducing the design area of the duct.
- D. Cap all open ends of ductwork until connected to grilles, diffusers, equipment to prevent entrance of debris, dust, etc.
- E. Make changes in direction of ductwork, unless otherwise specified with square elbows and double thickness turning vanes; full radius elbows having inside radius equal to width of duct measured in plane of turn; or one-third radius elbows with inside radius equal to one-third duct width and a single vane radius of two-thirds duct width.
- F. No pipe or other obstructions shall pass through air ducts.
- G. Install all ducts run below ceilings so as to maintain maximum headroom in all rooms and corridors.
- H. Ducts passing through exterior walls shall be provided with weatherproof flashings, ducts passing through roof shall be provided with roof curb and counter flashing. Where ducts pass exposed through interior building walls provide a sheet metal collar to conceal the gap between the wall opening and the duct.
- I. Ducts shall not be hung from other ducts, pipe or conduit.
- J. Fire dampers shall be installed in accordance with conditions of their approval, manufacturers instructions, requirements of NFPA 90A and UL fire resistance directory.
- K. Duct dimensions are gross except for lined ducts where dimensions are for net free area.
- L. All joints and seams in ducts shall be reasonably air-tight; poorly made joints, splits, visible holes at corners, etc., shall be reworked or new pieces of ductwork installed. Where excessive pulsating of ductwork or plenum housing is found, additional stiffeners shall be added.
- M. Furnish and install all manual dampers and deflectors indicated on the drawings or where necessary to properly distribute and balance air. Provide damper in each supply duct leaving duct main and in each branch serving individual supply, return and exhaust outlets and where otherwise indicated.

- N. Where dampers are concealed above suspended ceilings, other than removable ceilings or behind walls provide access doors or provide Young Regulator Company adjustable recessed damper operators with flush prime coated covers and extended regulator number 896, 912, 914 or 927 as applicable.
- O. Install additional dampers where required by the Air Balance Contractor to properly adjust the system air volumes.
- P. Dampers shall be fabricated with blades no larger than 8" wide X 48" long. Dampers over 48" in length shall have intermediate support and bearings.

3.02 FLUE

- A. Provide all pipe, fittings, stack cap, ventilated roof thimble, drain section, flashing collars and stack supports required for a complete installation. Install per manufacturer's recommendations.
- B. Horizontal and vertical piping shall be securely supported from building construction by galvanized strap iron.

END OF SECTION 15800

**SECTION 16010
ELECTRICAL GENERAL PROVISIONS**

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

- A. The Instructions to Bidders, General Conditions, Special Conditions, Addendas, Alternates; these technical specifications and all drawings, together with the Form of Proposal and Agreement, comprise the Contract Documents for the Electrical Contract.
- B. The Contractor is required to read carefully the specifications for all parts of the work so as to become familiar not only with the work covered by this Section, but also that of other Divisions and Sections, including all drawings.
- C. Refer to the General Requirements, Division 15 - Mechanical, as many of the general requirements stated therein are applicable to the electrical work and coordination of the two trades is covered.
- D. The Contractor shall watch the progress of the work and report to the Architect immediately any cases where ample space has not been provided to accommodate his work. He must not cut through any finished work until he has received permission from the Architect. No claims for extra work will be allowed because of misinterpretation of Plans and Specifications or due to conflict between trades for useable space.
- E. The Contractor is invited to submit alternative methods or materials as a cost reduction factor, however safety and integrity of the systems, must be maintained.

1.02 CONTENTS

- A. Specified Herein: General requirements for electrical work.
- B. Described herein are the following:

Scope
Work not Included
Quality Assurance, Standards and Symbols
Fees and Inspection Certificates

Materials
Submittals
Substitutions
Temporary Power and Light
Electrical Drawings
Coordination
Equipment Identification and Marking
Sleeves, Inserts, Fastenings, Supports, Cutting
and Patching
Scaffolding
Trenching and Backfilling
Testing, Adjusting, Cleaning
As-Built Drawings

1.03 SCOPE

- A. Any devices or materials obviously a part of the equipment and/or necessary to its satisfactory performance and/or labor necessary to accomplish the intent of the construction although not specifically mentioned herein nor shown on the drawings, shall be furnished without extra cost to the Owner.
- B. The work consists of the following:
1. [Insert size and type of service here], underground electric service from a new pad mounted transformer, including spare 4" PVC conduits. Also 1-1/2" metering conduit from switchgear to wall mounted meter socket. Electrical Contractor is to verify all requirements and connection points with the serving utility.
 2. Primary service cable, conduit, transformer, metering transformers, meter socket and meter will be provided by the local electric company. All connections at the transformer will be made by them.
 3. Contractor will provide trench, backfill, and concrete pad, per the electrical company specifications.
 4. Branch feeders, branch wiring, receptacles, special outlets, switches, light fixtures, dimmers, contactors, starters, timers, etc., as shown on the plans or required for operation of the electrical system.

5. A complete conduit and raceway system, including rigid, thin-wall, flexible, sealtite and plastic conduits properly grounded to the building grounding system and/or water service piping.
6. Battery operated emergency and exit light fixtures.
7. All power and control wiring including starters, switches, contactors, relays, fuses, etc., as shown on the plans or specified herein.
8. A telephone service conduit, where shown on the plans, a plywood mounting board in the equipment room, and installation of Owner furnished cables from outlets to service backboard.
9. A television service conduit, conduit from corridor to room outlet box, and a plywood mounting board in the equipment room.
10. A fire alarm system, including all conduit and wiring, manual pull stations, audio/visual warning alarms, smoke detectors, and fire alarm panel with annunciator.
11. Smoke detectors with integral alarms and auxiliary contact in each of the rooms as shown on the plans, with additional devices in handicap and hearing impaired rooms.
12. Cutting and patching of holes required for the installation in concrete, wood, steel or masonry.
13. Repair of all damage done to the premises as a result of the installation and removal of all debris or surplus material left by those engaged in the work.
14. Complete and thorough cleaning of all equipment furnished and installed, both inside and outside, and made ready for painting by others.
15. Testing and adjusting of all equipment.
16. Provisions and installation of all bases, supports, hangers and vibration isolators for the work outlined herein.

17. Cooperation with other crafts in putting the installation in place at any time when space required is ready and the progress of the work so dictates.
 18. All new outside building lighting and sign lighting, including wiring, timers, photocells, switches and circuit breakers.
 19. Electric infrared heat lamps and wall heating units.
- C. Utility service requirements outlined above are general in nature. Consult with local utilities for exact requirements.

1.04 WORK NOT INCLUDED

- A. The following work is not included in this Division unless specifically called for in individual Sections:

Painting;
Temperature control wiring;
Telephone equipment;
TV equipment.

1.05 QUALITY ASSURANCE, STANDARDS AND SYMBOLS

- A. For the electrical work (in addition to standards specified in individual work sections), the following standards are imposed, as applicable to the work in each instance:

AWS Standards for Welding
NFPA 70 National Electrical Code
ANSI C2, National Electrical Safety Code
Standards of National Bureau of Fire Underwriters
State Building Code
NECS Standards for Installation
Local Codes and/or Ordinances
NEMA Standards for Materials and Products
NFPA 72A, B, C, D, E Standards for Fire Alarm System Installation

- B. All wiring shall be done in accordance with the standards and requirements of the latest edition of the National Electrical Code, as issued by the National Fire Protection Association International, the National Electrical Safety Code and the Standards of the National Bureau of Fire Underwriters.

- C. Symbols: Except as otherwise indicated, refer to ANSI Y32.9 "Graphic Symbols for Electrical and Layout Diagrams Used in Architecture and Building Construction", for definitions of symbols used on the drawings to show electrical work.
- D. All materials and equipment for which label service is available shall bear the label of the Underwriters' Laboratories Inc.
- E. Rules and regulations of the local Utility Companies, and the Local Fire Department, wherein they apply, shall form a part of this Specification.
- F. In addition, the entire installation shall meet all the requirements of the State Building Code, as well as the Law, Rules and Regulations of the Local Building Department and all authorities having jurisdiction.
- G. Guarantee: This Contractor shall guarantee his workmanship and material (lamps excepted) for a period of one year from the date of final acceptance and leave his work in perfect order at completion. Should defects develop within the guarantee period, this Contractor shall, upon notice of same, remedy the defects and have all damages to other work or furnishings caused by the defects or the work of correcting same repaired and/or replaced at his expense, to the condition before such damage.

1.06 FEES AND INSPECTION CERTIFICATES

- A. The Contractor shall obtain and pay for all permits and inspection services and certificates in conjunction with this work.
- B. Upon completion of the work, Contractor shall obtain the approval of all recognized agencies concerned with the work, along with the approval of the National Board of Fire Underwriters, such certificates of inspection and approval from said bureau and/or agencies must be submitted to the Architect.

1.07 MATERIALS

- A. General: Refer to Division 1 sections for general requirements on products, materials and equipment.

- B. All materials shall be new, the best of their respective kinds, unless otherwise specified, and shall be installed by labor thoroughly skilled in the class of work anticipated by this Contract.
- C. Trade names mentioned in the Specifications shall be understood as indicative of the grade and quality of materials required in fulfillment of the Contract. This contractor may submit equal materials by other manufacturers to the Owner's Agent for approval.
- D. Compatibility: Provide products which are compatible with other products of the electrical work and with other work requiring interface with the electrical work, including electrical connections and control devices. For exposed electrical work, coordinate colors and finishes with other work.
- E. All materials installed prior to approval will be at the Contractor's risk and materials not acceptable must be removed from the work.

1.08 SUBMITTALS

- A. Furnish the Owner's Agent with complete shop drawings and associated data in accordance with General Conditions, for all major elements of the Electrical work for review, checking and approval. None of the following equipment shall be fabricated, delivered, erected or connected other than from drawings officially approved by the Architect. Coordinate with subcontractors for HVAC and Plumbing work.

Lighting and power panels;
Lighting fixtures with photometric and thermal test data;
Fire alarm system and smoke detectors;
Electric baseboards and wall heaters;
Time clocks, contactors, safety switches, motor starters.

1.09 SUBSTITUTION OF MATERIALS

- A. The selection of materials indicated in these specifications shall be strictly adhered to and no substitutions will be permitted except by written authorization by the Architect.
- B. In general, the contract drawings and specifications show and describe arrangements suitable for the specific items of equipment either named or described. In the event that Contractor submits for

approval, and receives such approval, for a device or piece of equipment which requires connections or arrangements of these services differing from those indicated or described in the contract documents, Contractor shall give timely notice and shall make suitable alterations in the work to accommodate the substitute equipment, and he shall be responsible for any and all additional costs incurred by virtue of the substitution of such equipment for the equipment named or described in the contract documents.

1.10 TEMPORARY POWER AND LIGHTING

A. Description of System: Furnish and install temporary electrical power service for construction needs throughout construction period in accordance with the special conditions as follows:

1. Provide power for miscellaneous tools and equipment, for pumping, for temporary heating and ventilating and for temporary storage and construction buildings.
2. Provide temporary lighting of minimum 5 foot candles for safe and adequate working conditions throughout the project, for security and for temporary office and construction buildings.

B. Materials (General)

1. Comply with Electrical - Basic Materials and Methods.
2. Materials may be new or used, but must be adequate in capacity for required purposes, and must not create unsafe conditions or violate requirements of applicable codes.
3. At Contractor's option, patented specialty products may be used, if UL approved.
4. Provide required facilities, including transformers, conductors, poles, conduits, raceways, breakers, fuses, switches and lighting fixtures with lamps.
5. Provide appropriate enclosures for environment in which used, in compliance with NEMA standards.

C. Installation

1. Install work in neat and orderly manner.

2. Make structurally and electrically sound throughout.
3. Maintain to give continuous service and to provide safe working conditions.
4. Modify and extend service as work progress requires.
5. Locate so that power is available at any desired point with no more than 100' (30.00 m) extension, and with no more than 5% voltage drop at full load.
6. Provide circuit breaker protection for each outlet with ground fault interrupting capacity.
7. Provide equipment grounding continuity for entire system.
8. Removal: Completely remove temporary materials and equipment upon completion of construction. Repair damage caused by installation, and restore to specified or original condition.

1.11 ELECTRICAL DRAWINGS

- A. The drawings accompanying the specifications have been made to scale with the best knowledge of conditions, dimensions and space requirements available at the time of design. Any errors or discrepancies detected in the drawings shall be reported to the Architect immediately upon discovery and shall be corrected by the Contractor for this Section to the satisfaction of the Architect and without additional expense to the Owner. The drawings shall be carefully checked to insure that the equipment, as shown, will operate satisfactorily in the space allotted to it.
- B. Conductor and conduit sizes are shown on the drawings for power and lighting systems. In any case, minimum sizes for wire and conduit shall comply with all applicable codes. In addition, the minimum conduit size in any floor slab shall be 3/4".
- C. Major equipment of the system is located on the floor plans and the interconnection conduit and wiring is included in the riser diagrams.

- D. The drawings are indicative of the work to be installed, but do not show all bends, fittings, boxes and specialties required to complete the installation.
- E. All conduits, wires, outlet boxes, switches, receptacles, devices and fixtures shall be included in the work.
- F. In all instances where a device, or part of the equipment herein referred to in the singular number (as the lighting panel), it shall be understood that such reference shall apply to as many such devices as are necessary to complete the work.
- G. Where it is stated that the contractor shall "provide" a device or piece of equipment, it shall mean that such devices or equipments are furnished and installed.

1.12 CO-ORDINATION

- A. General: Refer to the Division 1 sections for general coordination requirements applicable to the entire work. It is recognized that the contract documents are diagrammatic in showing certain physical relationships which must be established within the electrical work, and in its interface with other work including utilities and mechanical work, and that such establishment is the exclusive responsibility of the Contractor. Install the wiring and equipment at such times and in such manner as will in no way retard progress or completion of the project. Arrange electrical work in a neat, well organized manner with conduit and similar services running parallel with primary lines of the building construction, and with a minimum of 7'0" overhead clearance where possible. Locate operating and control equipment properly to provide easy access and arrange entire electrical work with adequate access for operation and maintenance. Advise other trades of openings required in their work for the subsequent move-in of large units of electrical work (equipment).
- B. Confer with the Heating and Plumbing Contractors where there is a likelihood of interference due to locations, etc., of the various systems. If any interference occurs due to failure to cooperate with other Contractors, he will be required to rearrange his work at his own expense.
- C. The layout of wiring on the small scale drawings shall not be considered absolute. The design shall be subject to such revisions

as may be necessary to overcome building obstructions. No changes shall be made in outlet locations without the written consent of the Architect.

- D. Examine the Architectural Drawings and details for the placement of all outlets to properly coordinate them with relation to cabinets, tables, benches, structural panels, trims, moldings, etc. Examine all other shop drawings, catalog cuts, etc., for special apparatus which may be roughed in and to which connections must be made. Outlets, apparatus and connections thereto which are improperly located through failure to follow the above instructions, shall be subject to correction and/or relocation without extra charge to the Owner.
- E. Coordination Drawings: For locations where several elements of electrical (or combined mechanical and electrical) work must be sequenced and positioned with precision in order to fit into the available space, prepare coordination drawings (shop drawings) showing the actual physical dimensions (at accurate scale) required for the installation. Prepare and submit coordination drawings prior to purchase-fabrication-coordination.

1.13 EQUIPMENT IDENTIFICATION AND MARKING

- A. Provide nameplates on all equipment of the type listed in the following schedule:
 - Main Switchboard
 - Sub Main Distribution Panel
 - Panelboards
 - Safety Switches
 - Fire Alarm Panel
 - Stairway Rescue Intercom
- B. Lettering shall include name of equipment, the specific unit number and any reference to "On-Off", or other instructions that are applicable.
- C. Nameplates shall be laminated phenolic with a black surface and white core. Use 1/16" thick material for plates up to 2"x4". For larger sizes use 1/8" thick material.
- D. Lettering shall be condensed Gothic. The space between lines shall be equal to the width of the letters. Use 1/4" minimum height

letters which occupy four to the inch. Increase letter size to 3/4" on larger plates.

- E. Provide warning signs where there is hazardous exposure or danger associated with access to or operation of electrical facilities. Provide text of sufficient clarity and lettering of sufficient size to convey adequate information at each location; mount permanently in an appropriate and effective location. Comply with recognized industry standards for color and design.
- F. Operational Tags: Where needed for proper and adequate information on operation and maintenance of electrical systems, provide tags of plasticized card stock, either pre-printed or hand printed to convey the message; example: "DO NOT OPEN THIS SWITCH WHEN BURNER IS OPERATING".
- G. Feeders, mains, branches for power and light, common and section wires for any special signal or control systems, etc., shall be tagged and identified with standard wire markers in all panels and pull boxes in accordance with symbols and designation shown on the drawings, schedules and with the manufacturer's wiring diagram symbols for the special systems.
- H. All exterior underground conduits shall be identified with a 4" plastic ribbon tape for the full length of the underground conduit, installed 18" above the conduit. Tape shall be printed to identify electrical conduit.

1.14 SLEEVES, INSERTS, FASTENINGS, SUPPORTS, CUTTING AND PATCHING

- A. Furnish and install all sleeves which are required to protect equipment or which may be necessary to facilitate its installation. Sleeves used in conjunction with formed concrete shall be located where required and approved by the Architect.
- B. Provide and install all inserts required for equipment. Inserts shall be cast iron or cast steel of slotted type to receive a machine bolt head or nut, after installation. Be responsible for the proper spacing of inserts and their alignment and preservation before and during construction.
- C. All fastenings, supports, clamps and anchors, etc., shall be of type made for the purpose. For hollow tile, or lath construction, toggle or

machine bolt fastenings shall be used. For structural iron, use machine screws and for solid masonry, use metallic expansion shields and machine screws. For wood or materials of similar fibrous nature lag screws or bolts shall be employed. Screws with wooden plugs or anchors will not be accepted on any of the work. Studs and fasteners implanted in solid masonry by power actuated devices will be acceptable if precautions are taken to prevent spawling.

- D. The subcontractor for this Section shall give the General Contractor complete information as to the size, position and arrangement of conduits, cabinets, boxes, etc., requiring openings in floors, walls, etc., so openings may be provided as construction progresses. Refer to General Conditions, Article "Openings, Channels, Cutting, Etc.". Cutting and channeling shall be by Electrical Contractor; patching will be done by General Contractor.
- E. All conduit and outlet installations and cutting of any kind must be done with great care so as not to leave unsightly surfaces which may not be entirely concealed by plates, escutcheons or other normal concealing construction. If such unsightly conditions occur, Contractor will be required, at his own expense, to replace the damaged construction.
- F. Provide nail guards on both sides of studs to protect conduit and Type NM cable runs.

1.15 SCAFFOLDING: Furnish and erect all scaffolding, ladders, etc., required in the installation of wiring, equipment and fixtures.

1.16 TRENCHING AND BACKFILLING

- A. Do all trenching and backfilling as required for underground electrical work.
- B. Refer to Section 2 - Sitework, and perform backfill and compaction accordingly.

1.17 TESTING, ADJUSTING AND CLEANING

- A. All electrical conductors after the installation of the apparatus and wiring has been completed, shall be tested to insure continuity, proper splicing, freedom from unwanted grounds and insulation

values in accordance with National Electrical Code requirements. Furnish and use suitable instruments in making all tests.

- B. Electrical Contractor shall provide necessary electrical personnel and testing instruments as required to assist the Architect in testing of installation, and he shall pay all professional engineering fees required in such testing. Data on all tests shall be submitted to the Architect.
- C. Upon completion of the work, all component parts, both singularly and as a whole, shall be adjusted and left in satisfactory condition. All parts of the wiring system, including switches and other auxiliaries shall be tested and proved free from unwanted grounds or other defects. All overload devices including equipment furnished under other contracts, shall be set and adjusted to suit the load conditions, which load conditions shall be determined with suitable instruments by the Contractor. All parts of the installation, including lighting fixtures, panelboards, etc., shall be cleaned, dusted or washed and adjusted to the satisfaction of the Architect.

1.18 AS-BUILT DRAWINGS

- A. Contractor shall keep an accurate record of all deviations from contract drawings and specifications. He shall neatly and correctly enter in colored crayon any deviations on drawings affected, and shall keep drawings available for inspection. Extra set of drawings will be furnished for this purpose.
- B. At the completion of the job, and before final acceptance, the Contractor shall provide a complete set of as-built drawings. The Contractor shall show locations for all major electrical devices, including panelboards and all major runs of conduit, the circuiting of each fixture, outlet, etc., shall be shown. Certify to the accuracy of each print, by signature thereon, and deliver same to Architect. Drawings shall be reproducibles.

1.19 OPERATION AND MAINTENANCE MANUALS

- A. Contractor shall prepare, assemble and submit five (5) copies of an Operation and Maintenance Manual for the electrical system as installed.

- B. Operation and Maintenance manuals shall be bound in a hard cover, three ring binder or equivalent protection, and shall contain as a minimum the following:
1. Shop drawings or catalog product literature of all material listed in paragraph 1.08 Submittals;
 2. Wiring diagrams and instructions for fire alarm system, contactors, motor starters and time clocks;
 3. Control drawings for any systems not furnished under other contracts;
 4. Maintenance instructions for all equipment furnished under this contract.

END OF SECTION 16010

SECTION 16100
BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All work performed under the requirements of this Section shall be subject to the conditions set forth under "General Conditions" and shall comply with all requirements contained under Division 1, "General Requirements" as far as applicable to this portion of the work.
- B. All work under this Section shall conform to the requirements set forth in Section 16010 "Electrical General Provisions".

1.02 CONTENTS

- A. Specified Herein: Requirements for basic electrical materials, equipment and wiring methods.
- B. Described herein are the following:
 - Scope
 - Safety Switches
 - Fuses
 - Wiring Devices
 - Wall Plates
 - Connectors, Lugs, Taps and Splices
 - Junction and Pull Boxes
 - Outlet and Switch Boxes
 - Conductors
 - Conduit

1.03 SCOPE

- A. The work under this Section shall comprise, but is not necessarily limited to the following:
 - 1. Provide all labor and material required to install a 120/208 volt interior wiring system, utilization outlets, disconnect switches and fuses.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Storage Conditions: It is recognized that space at the project for storage of materials and products may be limited. Coordinate the deliveries of electrical materials and products with the scheduling and sequencing of the work so that storage requirements at the project are minimized. In general, do not deliver individual items of electrical equipment to the project substantially ahead of the time of installation. Limit each shipment of bulk and multiple-use materials to the quantities needed for installations within three weeks of receipt.
- B. Handle all electrical material carefully to prevent damage, dents or marring of the finish.
- C. Protection and Identification: Deliver products to project properly identified with names, model numbers, types, grades, compliance labels and similar information needed for distinct identification; adequately packaged or protected to prevent deterioration during shipment, storage and handling. Store in a dry, well ventilated, indoor space, except where prepared and protected by the manufacturer specifically for exterior storage.
- D. Do not install damaged material. Remove from the project site.

PART 2 - PRODUCTS

2.01 SWITCHES, SAFETY

- A. Safety switches shall be general duty, sheet steel enclosed, of the type, size and electrical characteristics indicated, surface mounted, fusible rated at 240 volts, ampere ratings as required for the application or as noted on the drawings, 60 Hertz, 3 blades, incorporating quick-make, quick-break type switches, constructed so switch blades are visible in "OFF" position with door open; equipped with operating handle which is easily recognizable, and is padlockable in the "OFF" position; with current carrying parts constructed of high-conductivity copper and silver-tungsten type switch contact; with positive pressure type reinforced fuse clips.
- B. Fuses: Unless indicated on the drawings as non-fused type, provide fuses for safety switches, as recommended by the switch

manufacturer of class, type and rating needed to meet electrical requirements.

C. Switches installed in outdoor locations shall be weatherproof NEMA 3R.

D. Switches manufactured by the following will be acceptable:

Westinghouse - Type G300
Square "D" - Type D General Duty
ITE - Type J General Duty
Cutler Hammer - Series CH General Duty
General Electric - Type TG General Duty

2.02 FUSES - 250 VOLTS AND LESS

A. Fuses shall not be shipped in the switches in electrical equipment nor shall they be shipped to the job until the equipment is ready to be energized. All fuses shall be of the same manufacture to retain selectivity as designed (Bussman - No substitution). All fuses shall be installed by an electrical contractor.

1. All fuses shall be current limiting with 200,000 amperes interrupting capacity.
2. U.L., Inc., Class L fuses (bolt-type dimensions 601 to 6000 amps) shall open within .015 seconds at current of 15 times rating, shall have O-ring gas seals at the end bells, and have silver short circuit links. Bussman KRP-C HI-CAP.
3. U.L., Inc., Class RK1 fuses (standard dimensions 600 amperes or less) shall be installed in all switches. Fuses 70 amp through 600 amp shall have silver short circuit strips. Bussman LPN-RK or LPS-RK LOW-PEAK Dual-Element Fuses.
4. For motor protection Dual-Element fuses shall be installed in individual circuits and be sized at 125% of motor nameplate current rating or the next higher standard fuse size. Where excessive ambient temperature, high inertia motor loads or frequent "on-off" cycling requiring larger fuses, consult the electrical engineer. Use fuse reducers where fuse gaps are larger than fuse dimensions. Bussman LPK-RK or LPS-RK LOW-PEAK Dual-Element Fuses.

2.03 WIRING DEVICES

- A. General: Provide factory-fabricated wiring devices, in type, color and electrical rating for the service indicated. Type and grade shall be as described in the following paragraphs.
- B. Receptacles: Comply with NEMA Standards Publication No. WD1 and as follows:
 - 1. Duplex: Provide duplex standard specification grade receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke, 15-ampere, 125 volts, with metal plaster ears, back and side wired, NEMA configuration 5-15R, unless otherwise indicated;
 - 2. GFCI: Provide standard specification grade, duplex, ground fault circuit interrupter receptacles, feed-through type, capable of protecting connected downstream receptacles on single circuit, grounding type, UL rated Class A, Group 1, 15 ampere rating, 125 volts, 60 hertz; with solid state ground fault sensing and signaling; with five milliampere ground fault trip level; equipped with 15-ampere plug configuration, NEMA 5-15R.
- C. Switches: Comply with NEMA Standards Publication No. WD1 and as follows:
 - 1. Snap: Provide standard specification grade flush single-pole toggle switches, 15 ampere, 120/277 volts AC, with mounting yoke insulated from mechanism, equipped with plaster ears and side-wired screw terminals;
 - 2. Lighted Snap: Same as above, except with lighted handle wired to light when switch is "on";
 - 3. 3-Way Snap: Provide standard specification grade flush 3-way toggle switches, 15 ampere, 120/277 volts, with mounting yoke insulated from mechanism, equipped with plaster ears and side-wired screw terminals;
- D. In general, wiring devices shall be furnished in ivory color with ivory smooth finish plastic plates with openings to match devices.

- E. Wiring devices and plates shall be as manufactured by Harvey Hubbell, Leviton, General Electric or Bryant.

2.04 CONNECTORS, LUGS, TAPS AND SPLICES

- A. All splicing shall be done in outlet boxes, junction boxes, etc. All connections between conductors sizes No. 6 AWG and larger and devices or apparatus rated over 30 amperes shall be made with solderless mechanical connectors of appropriate type and current carrying capacity. Connectors and lugs shall be of the Allen set screw type and shall be Burndy or approved equal.
- B. In all other instances, including lighting fixtures, splices shall be made with solderless connectors similar to "Scotchlocks" by 3M Company, "Wing Nuts" by Ideal Company, or "Piggy" connectors by T & B Company. Splices may also be made by soldering and taping.
- C. Splices occurring in conductors No. 6 and larger, and in soldered connections of smaller conductors shall be covered with rubber insulating tape and friction tape and air drying insulation varnish applied. No splices will be permitted in mains or feeders and taps from feeders to panelboards shall be made with solderless connectors. Insulating splicing units, as manufactured by Burndy will be accepted in lieu of splicing insulating called for above. "Scotchfill" electrical insulating putty covered with "Scotch" brand No. 33 or No. 88 plastic tapes will also be acceptable. In all cases of taping, the insulating of the splice must be equivalent to 150% of the conductor insulation value.

2.05 JUNCTION AND PULL BOXES: Furnish and install junction and pull boxes, wherever required, or otherwise necessary to facilitate installation of the equipment. Junction boxes shall be galvanized finished sheet steel of code thickness, or ample size to properly enclose the conductors terminating in, or passing through them. Junction boxes shall not be placed in locations made inaccessible by piping, ducts or other equipment, and locations shall be as approved by the Architect.

2.06 OUTLET AND SWITCH BOXES

- A. Furnish and install outlet boxes of proper type and size as required at all outlets where shown, secured firmly in place and set true and square and flush with the finished surfaces. Boxes shall be rigidly

supported from the building structure independent of the conduit system. Boxes cast into masonry or concrete are considered to be rigidly supported.

- B. All boxes for lighting outlets shall be provided with fixture studs of a size suitable for the weight of the fixture to be supported, but in no case less than 3/8". The stud shall be of integral construction with the box, or of the type which is inserted from the back of the box. In no case shall the weight of the fixture be dependent upon bolts holding the stud to the box.
- C. Outlet boxes for exterior lights for exposed conduit runs shall be of the cast, rust resistant metal. Gasketed covers shall be provided where outlet is exposed to weather or moisture. Wiring device boxes for surface conduit work shall be FS Series cast type.

2.07 CONDUCTORS

- A. All wire shall be in strict accordance with the applicable standards and shall be delivered on site with original factory tags attached and shall be less than one (1) year old when installed.
- B. Except as specifically designated otherwise, no wire smaller than No. 12 AWG copper shall be used. Generally, all wire and cable sizes are shown, either directly or by implication that no marking designates No. 12 size. In the event that size is not indicated for a feeder or motor run which, obviously could not be interpreted as No. 12, the wire size shall conform to the National Electrical Code sizing for the type or service indicated.
- C. Single conductor 600 volt wire shall be copper and be equal to, or better than, THHN or XHHW Specifications. Wire shall be rated for 75°C. maximum temperature in dry locations and 90°C. in wet locations. Wire shall be listed by UL, and conductor identification shall include size, voltage manufacturer's name and number, UL listing and wire type. Aluminum or copper clad aluminum smaller than #12 AWG shall not be used.
- D. Wire sizes up to No. 10 AWG inclusive may be solid or stranded No. 8 AWG and larger, stranded.

E. Wires shall be color coded as follows:

Phase A - Red
Phase B - Blue
Phase C - Black
Neutral - White
Ground - Green

F. Wire installed in areas and locations subject to temperatures unsafe for plastic insulation (167 degrees F), shall have heat resistant insulation and shall be Type FEP or FEBP, depending upon the situation encountered.

G. Wire shall be as manufactured by Anaconda Wire and Cable Company, Carol Wire or General Cable Corporation.

2.08 CONDUIT

A. General: Provide metal conduit, tubing and fittings of type, grade, size and weight (wall thickness) indicated for each service. Where type and grade are not indicated, provide proper selection determined by Installer to fulfill wiring requirements and comply with National Electrical Code for electrical raceways.

B. Rigid Steel Conduit: Conduit shall be hot dipped galvanized or sherardized heavywall rigid steel conduit conforming to Federal Specification WW-C-581 and ANSI C80.1.

C. Non-Metallic Conduit: Conduit shall be plastic polyvinyl chloride schedule 40 conforming to Federal Specification WC-1094A, NEMA TC-2-1978 and UL Standard 651.

D. Electrical Metallic Tubing (EMT): Conduit shall be zinc coated steel electrical metallic tubing conforming to Federal Specification WW-C-563 and ANSI C80.3.

E. Flexible Metal Conduit: Conduit shall be manufactured of heavily zinc coated sheet metal strips interlocked to form a flexible, smooth wiring channel.

- F. Liquid-tight Flexible Metal Conduit: Provide liquid-tight flexible metal conduit comprised of single strip, continuous, flexible, interlocked, double-wrapped steel, galvanized inside and outside; forming smooth internal wiring channel; with liquid-tight jacket of flexible polyvinyl chloride (PVC). Conduit shall be Anaconda "Sealtite" or "Electri-Flex".

2.09 CONDUIT FITTINGS

- A. Conduit fittings for exposed work shall be rust-resistant. Castings shall provide ample wiring space, shall have smooth round edges and full-threaded hubs.
- B. Fittings shall be as manufactured by Crouse Hinds, Appleton or Killark.
- C. EMT fitting, connectors and couplings shall be steel set screw type as manufactured by OZ/GEDNEY, T & B or EFCOR.

PART 3 - EXECUTION

- 3.01 INSPECTION: Installer must examine the areas and conditions under which electrical work is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.
- 3.02 ELECTRICAL INSTALLATIONS: General - Install electrical equipment for this project as indicated, in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve the intended functions.
- 3.03 SAFETY SWITCHES: Install disconnect switches used with motor-driven appliances and motors and controllers within sight of the controller position unless otherwise indicated.
- 3.04 PULL, JUNCTION, OUTLET AND SWITCH BOXES
 - A. Install electrical boxes as indicated, or in compliance with NEC requirements, in accordance with the manufacturer's written

instructions and with recognized industry practices to ensure that the boxes and fittings serve the intended purposes.

- B. Provide weatherproof outlets for interior and exterior locations exposed to weather or moisture exposure.
- C. Provide knockout closures to cap unused knockout holes where blanks have been removed.
- D. Locate boxes and conduit bodies so as to ensure accessibility of electrical wiring.
- E. Avoid using round boxes where conduit must enter box through side of box, which would result in a difficult and insecure connection with a locknut or bushing on the rounded surfaces.
- F. Secure boxes rigidly to the substrate upon which they are being mounted, or solidly embed boxes in concrete or masonry.

3.05 WIRING DEVICES AND PLATES

- A. Unless otherwise indicated, detailed or directed, the mounting heights of outlets shall be as indicated below. Dimensions given are from center of outlet to top of finished floor unless otherwise noted:

Duplex receptacle	- 18"
Groundfault Interrupting (GFI) Duplex Receptacles	- 48" (coordinate with counters)
Switches	- 48"
Fire Alarm Pull Station	- 48" to handle
Telephone Outlets	- 18" or as indicated
Panelboards	- 72" to top of panel box
Fire Alarm Audio Visual	- 96" or 8" below ceiling

All mounting heights shall be subject to checking with the details shown on the architectural drawings and with the Architect, and locations shall be verified through the Architect before installing wiring, apparatus, etc. The Architect reserves the right to change the exact location of any outlet before same is fully installed without additional expense to the Owner.

- B. Delay installation of devices until wiring is completed.

- C. Install receptacles and switches only in electrical boxes which are clean; free from excess building materials, debris, etc.
- D. Install plates after wall finish work is complete.
- E. Upon installation of wall plates and receptacles, advise Contractor regarding proper and cautious use of convenience outlets. At time of Substantial Completion, replace those items which have been damaged, including those burned and scored by faulty plugs, during construction.
- F. Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements.

3.06 CONDUCTORS AND CONDUIT

- A. General: Except as indicated herein after or on the drawings, all wiring above accessible ceilings, exposed over 8'0" above floor, and in stud walls shall be done with insulated conductors in electrical metallic tubing (EMT), wiring exposed on walls and in areas subject to damage shall be insulated conductors in rigid metal conduit and wiring where buried in slabs or earth shall be insulated conductors in rigid PVC Schedule 40 conduit.
- B. Conduit Installation: Conduit sizes, type and length shall be furnished and installed as required by the drawings and as specified in these Specifications. The drawings indicate generally the size and location of the conduits. Conduits not shown but obviously required shall be run where directed, of sizes as approved by the Architect. The conduit system shall connect all outlet boxes, junction boxes, panelboards, cabinets, push-button stations, motors, etc.
 - 1. Field bends and offsets shall be uniform and symmetrical, without conduit flattening or finish scarring. Minimum bend radii shall be as required by the NEC, but in no case less than six (6) times conduit diameter.
 - 2. Conduit found unacceptable while on the job before installation shall be removed from the premises upon notice.

3. Approved pipe plugs or caps shall be installed in conduit before pouring of concrete. Conduit shall also be kept dry and free of water and debris by means of plugs or caps.
4. Where conduit enters through exterior concrete walls or below grade footings, the entrance shall be made watertight. Pipe sleeves shall be provided in the concrete with 1/2" minimum clearance around the conduit for an entrance seal similar to O.Z. Type FSK.
5. At all entrances to panelboards, pull boxes, or outlet boxes, conduit runs shall be secured in place with galvanized locknuts and bushings; one locknut inside and one locknut outside the box with the bushing on the inside. Bushings shall be of the insulating type.
6. Field bends shall be made with standard tools and equipment manufactured specifically for conduit bending.
7. Complete the installation of electrical raceways before starting installation of cables within raceways.
8. Provide flexible conduit for motor connections and for other electrical equipment connections where subjected to movement and vibration.
9. Provide liquid-tight flexible conduit for connection of motors and for other electrical equipment where subject to movement and vibration, and also were subjected to one or more of the following conditions:

Exterior location.
Moist or humid atmosphere where condensate can be expected to accumulate.
10. Where possible, install horizontal raceway runs above water and steam piping.
11. Exposed conduit shall run parallel or perpendicular to members of the building structure, rigidly maintained and clamped with one-hole malleable iron conduit clamps, or conduit supports similar to those of Steel City Electric Company or Unistrut Corporation.

12. Transition from underground PVC conduit through floor slab shall be made with rigid steel conduit elbows and rigid steel conduit up through floor.
 13. Where conduit enters or leaves finish grade, apply two (2) layers of 3M #33 or equal at a distance of 12" above grade to 12" below grade or to 3" beyond PVC whichever is farther. Minimum of 24". Conduits passing through concrete floors or walls and not sleeved shall have two layers 3M #33, a minimum of 12" either side of penetration.
- C. Conductor Installation: Conductor sizes, type and quantity shall be furnished and installed as required by the drawings and as specified in these specifications.
1. All wiring shall be installed in accordance with the applicable provision of the National Electrical Code and as specified herein and shown on the drawings.
 2. All branch circuit wiring involving a total length over 75' shall use the next largest wire size for the home run and/or the portion exceeding 75'.
 3. Pull conductors together where more than one is being installed in a raceway.
 4. Use pulling compound or lubricant, when necessary; compound must not deteriorate conductor and insulation.
 5. Do not use a pulling means, including fish tape, cable or rope which can damage the raceway.
 6. Keep conductor splices to a minimum.
 7. Wire shall be installed only after all work that may cause injury is completed, such as the pouring of concrete.
 8. Install splices and taps which have equivalent or better mechanical strength and insulation as the conductor.
 9. Use splice and tap connectors which are compatible with the conductor material.

10. Wire Marking: Wires shall be identified at the following locations:

Power and lighting branch circuits and feeders at fixtures, outlets, motors, etc. Identify to indicate originating panel and circuit number.

3.07 ELECTRIC HEATING EQUIPMENT

- A. Furnish and install wall heaters and infrared heaters as specified on the drawings and in accordance with manufacturer's directions.
 - 1. Infrared heaters shall be wired to operate from a room thermostat furnished by the mechanical contractor.

END OF SECTION 16100

SECTION 16200

SERVICE AND DISTRIBUTION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All work performed under the requirements of this Section shall be subject to the conditions set forth under "General Conditions" and shall comply with all requirements contained under Division 1, "General Requirements" as far as applicable to this portion of the work.
- B. All work under this Section shall conform to the requirements set forth in Section 16010 "Electrical General Provisions" and 16100 "Basic Materials and Methods".

1.02 CONTENTS

- A. Specified herein: Requirements for electrical service and distribution.
- B. Described herein are the following:

- Scope
- Utility Service Work and Coordination
- Main Service Switchboard
- Circuit Breaker Distribution Panelboard
- Circuit Breaker Lighting & Appliance Panelboards
- Grounding

1.03 SCOPE

- A. The extent of electrical service and distribution work is indicated by drawings and in schedules, in other Division 15 and 16 requirements of this Section, and is hereby defined to include, but not necessarily limited to:
 - 1. Trenching and backfilling for primary conduits;
 - 2. Providing transformer pad.
 - 3. Service conduit and wire from transformer to service entrance equipment;
 - 4. Panelboards;
 - 5. Grounding;

6. Metering equipment installation, including conduit from meter socket to pad mounted transformer.

PART 2 - PRODUCTS

2.01 MAIN DISTRIBUTION SWITCHBOARD

- A. Furnish and install the service entrance switchboard as herein specified and shown on the associated electrical drawings. The switchboard shall meet the latest requirements of Underwriters Laboratories Standard #891, NEMA PB2, and the National Electrical Code. The switchboard shall be furnished with an Underwriters Laboratories label.
- B. The switchboard shall be deadfront with front accessibility required. The switchboard frame shall be of formed code gauge steel rigidly welded and bolted together to support all cover plates, bussing and component devices during shipment and installation. Steel base channels shall be bolted to the frame to rigidly support the entire shipping section for moving on rollers and floor mounting. Each switchboard section shall have an open bottom and an individually removable top plate for installation and termination of conduit. The switchboard enclosure shall be painted on all exterior and interior surfaces. The paint finish shall be a medium light gray, ANSI #49, applied by electro-deposition process over an iron phosphate pre-treatment. All front covers shall be screw-on and removable and all doors shall be hinged with removable hinge pins. Top and bottom conduit areas shall be clearly indicated on shop drawings.
- C. The switchboard bussing shall be of sufficient cross-sectional area to meet UL Standard 891 temperature rise. Through bus shall be extruded aluminum plated by the ALSTAN 70 or 80 process. The through bus shall have an ampacity of 1200 amperes and shall be rated to withstand a short circuit current rating of equal or greater than the available fault current. The through bus supports, connections and joints are to be bolted with hex-head bolts and Belleville washers to minimize maintenance requirements. This contractor shall verify with the serving utility the available short circuit current and provide equipment which exceeds this value, but not less than 100 KAIC.
- D. The switchboard, as a complete unit, shall be given a single short circuit current rating by the manufacturer. Such ratings shall be

established by the actual tests by the manufacturer, in accordance with UL specifications, on equipment constructed similarly to the subject switchboard.

- E. The main switch shall be of the fusible bolted pressure contact type with ratings as shown on the associated drawings. Pressure contacts are to be made by firmly bolting blades to both top and bottom stationary contacts. The switch shall have quick-break Kineamatic-Action mechanisms, inter-phase barriers and arcing equipment. Switch shall be manually operated. In accordance with UL Standard 977, switch shall have an interrupting rating of twelve times the continuous rating. The operating mechanism shall immediately be in a condition to open the switch. The distribution section shall be as described in Paragraph 2.02.

2.02 PANELBOARDS

- A. General: Except as otherwise indicated, provide panelboards, enclosures and ancillary components of types, sizes and ratings indicated, which comply with manufacturer's standard materials, design and construction, in accordance with published product information; equip with number of unit panelboard devices as required for a complete installation. Where more than one type of component meets indicated requirements, selection is Installer's option. Where types, sizes or ratings are not otherwise indicated, comply with NEC, UL and established industry standards for applications indicated. Panelboard ratings, current and voltage, fused switch or circuit breaker complement, and mounting are indicated on the drawings. Interrupting ratings shall be determined for the system by the manufacturer of the equipment supplier.
- B. Circuit Breaker Distribution Panelboards: Provide dead-front safety type circuit breaker distribution panelboards as indicated, with panelboard switching and protective devices in quantities, ratings, types and with arrangement shown; with anti-turn solderless pressure type main lug connectors approved for bottom of panel. Equip with copper bus bars and ground bus; provide suitable lugs on ground bus for outgoing feeders requiring ground connections. Provide main and branch circuit breakers for each circuit. Circuit breakers shall be of the quick-make quick-break type with external operating handle suitable for padlocking in the "OFF" position. An interlock shall prevent the opening of the cover when the breaker is "ON" unless the interlock release is operated.

1. Integrated equipment short circuit rating: Panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the integrated equipment short circuit rating shown on the panelboard schedule or on the plans. This rating shall be established by testing with the circuit breakers mounted in the panelboard. Short circuit tests on the overcurrent devices and on the panelboard structure shall be made simultaneously by connecting the fault to each overcurrent device with the panelboard connected to its rated voltage source. Method of short circuit testing shall be per Underwriters Laboratories Standard UL 67. The source shall be capable of supplying the specified panelboard short circuit current or greater. Testing of panelboard overcurrent devices for short circuit rating only while individually mounted is not acceptable. Also, testing of the bus structure by applying a fixed fault to the bus structure alone is not acceptable. Panelboards shall be marked with their maximum short circuit rating at the supply voltage and shall be UL listed.
 2. Cabinet: Panelboard assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be as specified in UL Standard 50 for cabinets. Wiring gutters shall be sized in accordance with UL Standard 67. Cabinets shall be equipped with a four piece front without door and have concealed, self-adjusting trim clamps. Fronts shall be of full finished steel with rust inhibiting primer and baked enamel finish.
 3. UL Listing: Circuit breaker distribution and power panelboards shall be listed by Underwriters Laboratories and shall bear the UL label. Panelboards shall be Square D "I Line" panelboards.
- C. Lighting and Appliance Panelboards: Provide dead-front safety type lighting and appliance panelboards as indicated, with switching and protective devices in quantities, ratings, types and arrangement shown; with anti-turn solderless pressure type lug connectors approved for copper conductors; construct unit for connecting feeders at top or bottom of panel, as required; equipped with aluminum bus bars, full-sized neutral bar, with plug-in type molded case branch circuit breakers for each circuit, with toggle handles that indicate when tripped. Where multiple-pole breakers are indicated, provide with common trip so overload on one pole will trip all poles simultaneously. Provide a bare uninsulated grounding bar suitable for bolting to enclosure. Provide panelboards fabricated by

same manufacturer as enclosures and which fit properly with enclosures.

- D. Panelboard Enclosures: Provide galvanized sheet steel cabinet type enclosures, in sizes and NEMA types as indicated, code-gage, minimum 16-gage thickness. Construct with multiple knockouts and wiring gutters.
- E. All panelboard fronts shall be equipped with interior circuit-directory frame and card with clear plastic covering. Provide baked gray enamel finish over a rust inhibitor. Design enclosure for surface or flush mounting, as indicated on the drawings. Provide enclosures fabricated by same manufacturer as panelboards and which fit properly with panelboards to be enclosed. Panelboard Accessories: Provide panelboard accessories and devices, including but not necessarily limited to, circuit breakers, ground-fault protection units, etc., as recommended by panelboard manufacturer for ratings and applications indicated.
- F. Panelboards manufactured by the following shall be acceptable:

Circuit Breaker Lighting & Appliance

Square D "NQO" with QO-VH breakers 22,000 A/C

ITE "NPA" with QHP breakers 22,000 A/C

Cutler Hammer Type "PB" with "CHB" breakers 22,000 A/C

Westinghouse "QIOP" with PHW breakers 22,000 A/C

General Electric Type AL with THHQL breakers 22,000 A/C

2.03 FUSES

- A. Provide a complete set of fuses for all fusible devices on the project.
- B. Fuses shall be as specified in Section 16100 2.03.

2.04 MATERIALS AND COMPONENTS, GROUNDING

- A. General: Except as otherwise indicated, provide for each electrical grounding indicated, a complete assembly of materials, including but not necessarily limited to cable, wire, connectors, terminals (solderless lugs), grounding rods/electrodes and plate electrodes, bonding jumper braid, and other items and accessories needed for a complete installation. Where more than one type meets indicated requirements, selection is Installer's option. Where material or

component is not otherwise indicated, provide products complying with NEC and established industry standards.

- B. Electrical Grounding Conductors: Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to NEC. Conductors shall be stranded bare copper, except where run with circuit conductors ground wire shall have green insulation or green identification at terminations.
- C. Connectors, Terminals and Clamps: Provide electrical connectors, terminals and clamps as recommended by the connector, terminal and clamp manufacturer for intended applications.
- D. Ground Rods: Steel with copper welded exterior, 3/4" diameter by 8'.

PART 3 - EXECUTION

3.01 INSPECTION: Installer must examine areas and conditions under which electrical work is to be installed and notify Contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 ELECTRICAL INSTALLATIONS: General- Install electrical equipment for this project as indicated, in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation" and in accordance with recognized industry functions.

3.03 ELECTRICAL SERVICE

- A. Provide a new [INSERT SERVICE SIZE HERE] electric service into the building, including trench and backfill for primary service, concrete transformer pad and secondary service conduit and feeder cable.
- B. Provide trench, backfill and concrete pad. Primary service feeders, transformer and all transformer hook up shall be by Utility Company. Install 4" PVC conduits from the transformer to the new main switchboard in Electrical Room. Pull conductors and make termination.

- C. Install conduit and provide space in switchgear for utility and current transformers where required by the serving utility. Provide interconnecting conduit between meter socket location and metering transformers in the switchgear.
- D. Provide all termination's for 120/208 Volt service conductors.
- E. Ground service.

3.04 PANELBOARDS

- A. Coordinate installation of panelboards and enclosures with cable and raceway installation work.
- B. Anchor enclosures firmly to walls and structural surfaces, ensuring that they are permanently and mechanically secure.
- C. Provide electrical connections within enclosures.
- D. Fill out panelboard's circuit directory card upon completion of the work.
- E. The system of branch circuits for power and lighting shall be connected to panel busses in such a manner as to electrically balance the connected loads as close as is practicable.
- F. Touch up marred or scratched surfaces to match original finish.

3.05 DISTRIBUTION

- A. Provide feeder conduits and wire from main power panel to branch panels and major mechanical equipment.
- B. Conduit and wire shall be as specified in Section 16100.
- C. Provide green insulated ground wire sized per Table 250-95 N.E.C. in all feeder conduits, power conduits, PVC conduits, flex conduits and exterior circuits.

3.06 INSTALLATION OF ELECTRICAL GROUNDING

- A. General: Install electrical grounding systems where shown, in accordance with applicable portions of National Electrical Code, with National Electrical Contractors Association's "Standard of Installation" and in accordance with recognized industry practices to ensure that electrical grounding complies with requirements and serves intended purposes.
- B. Coordinate with other electrical work, as necessary to interface installation of electrical grounding system with other work.
- C. Install braided type bonding jumpers with ground clamps on water meter piping to electrically bypass water meter.
- D. Install clamp-on connectors only on thoroughly cleaned metal contact surfaces, to ensure electrical conductivity and circuit integrity.
- E. Unless specifically noted otherwise on the drawings, grounding of the electrical system shall be by means of the metallic raceway or an insulated grounding conductor installed with circuit conductors in all non-metallic conduits. Grounding conductors in non-metallic shall be sized in accordance with NEC 250-95 and shall run from grounding bus of serving panel to ground bus of served panel, grounding screw of receptacles, lighting fixture housings, light switch outlet or metal enclosures of served equipment.
- F. Green bonding jumper shall be installed in all flexible metallic conduit.

3.07 INSTALLATION OF FUSES

- A. Fuses shall not be installed until equipment is ready to be energized.
- B. Supply spare fuses in accordance with Section 16100 - 2.03.

END OF SECTION 16200

SECTION 16300

LIGHTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All work performed under the requirements of this Section shall be subject to the conditions set forth under "General Conditions" and shall comply with all requirements contained under Division 1, "General Requirements" as far as applicable to this portion of the work.
- B. All work under this Section shall conform to the requirements set forth in Section 16010 "Electrical General Provisions" and 16100 "Basic Materials and Methods".

1.02 CONTENTS

- A. Specified herein: Requirements for installation of interior and exterior equipment.
- B. Described herein are the following:
 - 1. Lighting Fixtures
 - 2. Ballasts
 - 3. Lamps

1.03 SCOPE

- A. The work shall comprise, but is not necessarily limited to the following:
 - 1. Interior fluorescent and high intensity discharge lighting fixtures;
 - 2. Exterior pole and wall mounted high intensity discharge lighting fixtures;
 - 3. Battery operated emergency lighting and exit lights with battery backup.

PART 2 - PRODUCTS

2.01 LIGHTING FIXTURES, BALLASTS AND LAMPS

- A. Provide lighting fixtures as indicated on drawings, completely installed, wired and connected in place, tested and left in satisfactory operating condition.

Contact Commercial Lighting at 800-755-0155 for National Account pricing.

- B. Fixtures shall be complete with all necessary appurtenances, wiring, lamp holders, lamps, reflectors, glassware, canopies, wall bases, pendants, etc., and shall be wired with Type A.F. fixture wire not less than No. 14 AWG. All pendants and canopies shall be of the type required for the specific lighting fixtures and shall be of the same manufacturer as the lighting fixture. Fixtures shall carry U.L. labels.

- C. Fluorescent fixture finish shall be applied after fabrication and shall consist of a five stage phosphate treatment followed by an application of white baked enamel or polyester finish with a reflection of 85% or better. Use of pre-painted stock will not be acceptable. Lenses shall be clear virgin acrylic prismatic type, 0.125" thick.
- D. Fluorescent fixture ballasts shall be rated for 120 volt operation, sound rated "A", rapid start, high power factor "P" type and shall be of the latest energy saving magnetic, G.E. Maxi-Miser I, Advance Mark 3 or equal. Ballasts shall be CBM/ETL tested and U.L. listed.
- E. High intensity discharge ballasts shall be of the rating, type and make as recommended by the lamp manufacturer, which properly matches the lamps to the power line by providing the appropriate voltages and impedances for which the lamps are designed. All H.I.D. ballasts shall be U.L. labeled.
- F. Self-contained emergency lighting unit shall be constructed to conform to Underwriters Laboratories, Inc. Standard No. 924 and installed to conform to Article 700 of the National Electrical Code. It shall be designed to provide automatic emergency lighting for a minimum of 90 minutes upon failure of normal electric power. Emergency power source shall be a 6 volt rechargeable maintenance free (gel type) battery. Electronics shall be of solid state design. Unit shall be rated for 120/277 volts, 60 Hertz. Controls shall include a "test" switch and a pilot light assembly indicating charge rate. Lamps shall be two sealed beam type glare-free lamp housing constructed of injection molded thermoplastic.
- G. Exit sign housing shall be constructed of white injection molded thermoplastic housing with radius stresses stencils, capable of eliminating light leaks Normal illumination with no hot spots provided by two 15T6-145V extended life energy conserving AC lamps, derated to 12 watts for 120 volt operation. Snap out arrows and downlight to comply with plans. Full field flexibility shall be capable through the use of individual conversion kits.
- H. Provide all lamps types, plus five percent spares for each type required, as noted on the drawings. All fluorescent lamps shall be energy saving "Lite White", "GE Wattmaster II" or equal, with lamp color as specified on the Drawings. Only the number of lamps required to provide adequate lighting for work yet to be done, in each area, and acceptable temporary lighting elsewhere (both as determined by the Architect) shall be installed by this Contractor at the time lighting fixtures are installed and tested. Remaining lamps are to be installed not more than ten (10) days prior to acceptance of the project by the Owner. All lamps shall be in working order at the time of final acceptance of the work by the Owner and the Architect. This contractor shall replace all defective lamps with new lamps until the work is finally accepted.
- I. Lighting fixtures shall be as cataloged on the fixture schedule.

PART 3 - EXECUTION

1.01 LIGHTING FIXTURES AND WIRING

- A. Install lighting fixtures to types indicated, where shown and at indicated heights, in accordance with lighting fixture manufacturer's written instructions and with recognized industry practices, to ensure that fixtures comply with requirements and serve intended purposes. Comply with NEMA standards and requirements of National Electrical Code pertaining to installation of interior lighting fixtures and with applicable portions of NECA's Standard of Installation".

- B. Fasten fixtures securely to structural support member of building and check to ensure that solid pendent fixtures are plumb.
- C. Ensure that support system for lay-in type ceilings is adequate to support the lighting fixtures specified.
- D. Wiring to lay-in type fixtures shall be arranged to facilitate relocation of the fixture to the adjacent ceiling tile in any direction.
- E. Clean interior lighting fixtures of dirt and debris upon completion of installation.
- F. Protect installed fixtures from damage during remainder of construction period.
- G. Upon completion of installation of interior lighting fixtures, and after building circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units and proceed with retesting.
- H. At date of substantial completion, replace lamps in interior lighting fixtures which are observed to be noticeably dimmed after Contractor's use and testing, as judged by the Architect/Engineer. Furnish stock or replacement lamps amounting to 5% (but not less than one lamp in each case) of each type and size lamp used in each type fixture. Deliver replacement stock as directed to Owner's storage space.

In accordance to the Microtel Inn Design and Construction Standards manual, the following section on lighting shall apply:

LIGHTING

- A. The architectural theme and design of the Microtel building is such that its image and identity is and shall remain our billboard. Therefore, adequate exterior lighting for safety, security, guest convenience and aesthetics purposes must be provided in addition to general parking area lighting, and must provide a minimum of 2 foot candles of light maintained at the surface per square foot or as required by local codes; whichever is greater.
- B. Exterior light posts in parking areas or roadways must be installed on concrete bases 30" high.
- C. Exterior lighting should be controlled by adjustable photo-electric devices sensitive to available natural illumination. The following systems should be centrally controlled and wired as one total system rather than a collection of independent systems.
 - 1. Parking lot lighting
 - 2. Walkway lighting
 - 3. Building illumination flood lighting - must be installed at ground level in landscape beds on proper bases.
 - 4. Ground mounted signage
 - 5. High rise signs
 - 6. Building mounted signs
 - 7. Landscape lighting
- D. All parking lot lighting shall be architectural area lighting by Lithonia Lighting and shall include or provide the following:
 - 1. Clear mogul base lamp
 - 2. Porcelain enclosed 4KV rated screw shell type lamp holder with spring loaded center contact

3. Multi tap ballast assembly
 4. Constant wattage auto transformer ballast
 5. Epoxy undercoat and acrylic thermoset powder finish with UV inhibitor to prevent ultraviolet degradation and fading
 6. Housing to be seamless die cast aluminum with an adjustable fitting to permit directional aiming
 7. Warranty for fixture and pole to be 5 years
 8. Warranty on the paint finish shall be 7 years
- E. Interior & Exterior lighting
1. Refer to schedule in drawings.

END OF SECTION 16300

SECTION 16400

COMMUNICATION SYSTEM

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All work performed under the requirements of this Section shall be subject to the conditions set forth under "General Conditions" and shall comply with all requirements contained under Division 1, "General Requirements" as far as applicable to this portion of the work.
- B. All work under this Section shall conform to the requirements set forth in Section 16010 "Electrical General Provisions" and 16100 "Basic Materials and Methods".

1.02 CONTENTS

- A. Specified herein: Requirements for telephone system installation.
- B. Described herein are the following:
 - Scope
 - Raceways, Pull Boxes, Outlet Boxes
 - Telephone and TV Service Conduits
 - Fire Alarm System

1.03 SCOPE

The extent of communication system work is indicated on the drawings and by requirements of this Section. Telephone system work consists of a system of outlets and conduit with pull wire from all outlets to above first floor ceiling, plywood backboards and service entrance conduit with pull wire. Television system work consists of plywood backboard, conduit from each room to above first floor ceiling space and service entrance conduit with pull wire. Fire Alarm System work includes a system of raceways, outlets, sending and sounding devices as required.

PART 2 - PRODUCTS

2.01 RACEWAYS, PULL BOXES, OUTLET BOXES:

Shall be as specified in Section 16100 Electrical Basic Materials and Methods.

2.02 TELEPHONE AND TELEVISION BACKBOARDS:

Telephone and television backboards shall be 3/4" fire rated plywood painted gray, sized as indicated on the drawings or required by installing utility.

2.03 COMMUNICATION SERVICE CONDUITS

- A. Service conduits shall be rigid polyvinyl chloride (PVC) suitable for underground burial. Size of conduits shown shall be verified with serving utilities.
- B. Conduits shall be UL listed, manufactured to NEMA TC-2 and WC 1094 specifications.
- C. Provide all necessary couplings, spacers, fittings and adapters required for a complete installation.

- D. Conduit shall be supplied on television, and telephone runs to corridor for maintenance purpose.

2.04 FIRE ALARM SYSTEM

- A. Furnish and install a complete fire alarm system as described herein and shown on the drawings.
- B. All equipment, devices, etc., shall be listed by Underwriter's Laboratories and shall meet all local and state requirements.
- C. Operation: The operation of any manual or automatic alarm initiating device shall activate all alarm indicating appliances until the alarm initiating device has been restored to normal and a reset switch manually actuated at the control panel. Operation of any alarm indicating device shall light it's associated red alarm light emitting diode (LED). Fire alarm system supplier shall provide an approved alarm verification system without using two cross-zoned detectors.
- D. Control Unit: The control unit shall be modular and use solid state components. Alarm initiating circuits shall meet the requirements of National Electrical Code 760 for power limited applications and shall function with up to 100 ohms resistance through alarm initiating device contacts and associated wiring. The control unit shall contain an internal audible trouble signal with silencing switch, system reset switch and lamp test switch along with individual system LED's for trouble, remote annunciator trouble and ground faults. A trouble signal silencing switch shall be furnished, so that faults on the alarm initiating circuits and the alarm indicating circuits can initiate trouble signals and be silenced independently of each other. When trouble signals are silenced after being sounded by faults, whether the alarm initiating circuits or the alarm indicating circuits, the trouble signal shall restore to normal automatically without manual restoration of the associated trouble signal silence switch. A common alarm and a common trouble relay shall be furnished. Each relay shall provide a dry form "C" contact wired to terminals. A trouble signal shall sound and a separately identified LED light upon ground fault between any supervised circuit and ground whether or not the ground fault causes the system to be inoperative. All field wiring connections shall be made to terminals. Each initiating circuit shall be able to be individually tested for alarm or trouble or be disabled at the control panel so protection from other circuits is not affected during maintenance or test periods. Each circuit shall be supervised for opens and shorts. A trouble LED shall be provided on each alarm indicating board. The alarm indicating circuits shall operate 24v DC polarized alarm indicating appliances. (Both audible and visual units on same circuit.) Each alarm initiating zone shall be provided with dry Form "C" contacts to provide for zone annunciation and shutting down air circulating fans and release doors within the alarm zone as indicated on drawings. The control panel shall provide for 20 zones, including spare zones as shown on the Drawings. Additional batteries shall be provided to provide if necessary for 24 hours of operation and five minutes of alarm in case of power failure. Control panel shall be flush mounted. Control unit shall be Auto Call Model MDK. Units manufactured by Simplex, Pyrotronics, Gamewell, ECI, and Notifier will be considered equal.
- E. Manual Fire Boxes: Manual fire boxes shall be non-coded and shall be semi flush mounted in finished areas and surface mounted in unfinished areas. Stations shall be double action with "LIFT TO BREAK" plastic shield. When operated, fire boxes shall remain mechanically locked until manually reset. Construction shall be of rigid metal with raised lettering and clear plastic shield with lettering "LIFT TO BREAK - PULL LEVER DOWN". Manual fire boxes shall be Auto Call double action Type 4050. Double action

stations requiring external hammer to break glass to gain access to actuating lever shall not be acceptable.

- F. Automatic Detectors: The smoke detectors shall be photoelectric type interchangeable and compatible with ionization type. The light source shall be pulsed infrared LED for low power consumption under standby conditions. Internal detector circuits shall be shielded against electrical interference. It shall be resistant to transients, "noise" and RF interference. The detectors shall be furnished with a round base to enable the detector to operate on a 2 wire loop with end-of-line resistors. It shall have a built-in LED output for alarm indication. Detector shall be equal to Auto Call B401B/2451.
- G. Audio/Visual Warning Alarms Standard Rooms and Corridors: The audio/visual alarms shall provide 95 dB minimum sound at a distance of 10'. The visual signal shall be xenon flasher with 8000 candlepower and a flash rate of 3 per second. Components shall be mounted in a back box. For flush mount installations, a trim ring shall be provided. Alarm shall be Auto Call #V45084R.
- H. Audio/Visual Warning Alarms, Hearing Impaired Rooms: The audio/visual shall provide 85 dB minimum sound at 10', and a visual strobe rated at 100 candela. Alarm shall be Gentex #GX-90-S.
- I. Stand Alone System Detection Smoke Alarms: Furnish and install smoke alarms in each of the guest rooms, connected to an unswitched source of 120 volt power. Detector shall be photoelectric type, direct wired, 120 volts, with power-on indicator light, test-normal switch, alarm horn 85 decibels or greater with alarm activated dry contacts for remote annunciation. Unit shall be UL approved and meet all national codes and shall be equal to ESL #320CC.
- J. Stand-Alone System Detection for Handicapped Units: Furnish and install smoke alarms in each guest room connected to an unswitched source of power-on indicator light, test normal switch, alarm horn 85 dB or greater 120 volt power. Detector shall be photoelectric type, direct wired, with and Xenon flasher rated 100 candela WMH battery backup Gentex #7910CS.
- K. Door hold and release devices shall be semi-flush mounted electromagnetic holders to match system used. When energized they shall hold the door with approximately 25 pounds of force. The doors shall be released on activation any fire alarm system initiating device. Devices shall be U.L. approved and meet all national codes and shall be equal to Auto Call Model #FM998.
- L. Connect to and wire completely to flow and tamper switches furnished and installed by others, flow and tamper to be zoned separately and wired per manufacturer's wiring diagrams.
- M. Heat detectors shall be combination fixed temperature 200 F, and rate of rise. Unit shall be Auto Call #602.

2.05 STAIRWAY AUDIO VISUAL RESCUE INTERCOM

- A. General: The contractor shall supply and install an audio/visual rescue intercom system, to meet ADA requirements, as manufactured by Tektone Sound & Signal, Inc., Lake Park, Florida. One distributor must supply entire system and be with a reasonable area of the installation site. Supplier must be properly staffed to provide service on the equipment on a continuing basis.

- B. System Operation: When a call is placed at a remote rescue location by pressing the momentary button on the station, the following must occur:
1. The call placed light on remote station will illuminate;
 2. The light on the master station annunciator will illuminate, designating the rescue area originating the call;
 3. The associated station button can be pressed at the master panel and the call can be answered by speaking into the speaker/microphone;
 4. Answering the call at the master will light a lamp on the remote station signifying that the call has been answered;
 5. The remote master station may be used by fire department or rescue squad for communication with desk or remote stations or by late night customers to communicate with desk;

The call can be silenced at the master; however, it must be canceled at the station placing the call.

- C. Equipment:
1. Remote Station: Tektone SIR-150N, dual gang, stainless steel plate, with call button, call placed light, call answered light and cancel switch. Call placed SCR control added to maintain call answered light;
 2. Master Station: Tektone NC-150 Series. Extruded aluminum frame and panels for strength and durability. (No plastic panels permitted). Modular in design makes them easier to install and service. lamps will be rectangular with room numbers hot stamped in the lens. (Transfer lettering not accepted.) Must have call tone silence switch and silence mode indicator. Unit shall be complete with desk mounting cabinet;
 3. Annunciator Control: Tektone PK-151, rugged aluminum case housing all control and circuitry, with screw terminal connection, solid state, 16 volt, AC or 24 volt DC;
 4. Power Supply: Tektone SS-106, 30 volt AC, U.L. approved transformer;
 5. Back Box: Tektone OF-202 sized as necessary with OH-202N frame;
 6. Remote Master Station: Tektone NC150N, four zone with properly sized OH203N back box and OF203 frame.

PART 3 - EXECUTION

3.01 TELEPHONE SYSTEM

- A. Furnish and install plywood panel in electrical room and 4" PVC conduit to utility pole.
- B. Furnish and install conduit system with pullwires to outlets in Lobby-Office area.
- C. Prewire guest rooms by providing conduit from each room outlet to above the accessible first floor ceiling space and install cables from each room to the service backboard. Cables will be furnished by the Owner.

- D. Telephones, telephone equipment, telephone jacks, and final connections will be provided by the Owner's telephone contractor.

3.02 TELEVISION SYSTEM

- A. Furnish and install plywood panel in electrical room and 3" PVC conduit to utility pole.
- B. Provide conduit to above first floor ceiling space from Guest Room outlet in each room and Lounge outlet to plywood panel.
- C. TV jacks, cable and other material and connections will be provided by the Owner's TV contractor.

3.03 INSTALLATION OF FIRE ALARM SYSTEM

- A. Provide in accordance with manufacturers instructions all wiring conduit and outlet boxes required for the installation of a complete system. A representative of the manufacturer shall supervise all final connections and completely test and adjust the system.
- B. All wiring is to be installed in accordance with NFPA 72A and continuously color coded.
- C. Fire alarm system shall be tested in the presence of the local Fire Marshall and all authorities having jurisdiction and all required certification obtained.
- D. System installer shall submit complete wiring diagrams for approval. Wiring shall be Class B supervised with minimum #18 AWG for initiating circuits #14 AWG for signaling circuit. Type FPL cable may be used where approved by local codes.
- E. System shall be zoned for one zone for each building section divided by fire walls. Zoning shall be in compliance with local code officials.
- F. Alarm circuit shall be for general alarm.
- G. Provide tie to city where required.

3.04 STAIRWAY AUDIO VISUAL RESCUE INTERCOM

- A. Installation: All wiring and installation must be completed according to manufacturers' specifications. Final inspection must be made by a factory trained and authorized technician. A complete manual, (operating-installation-service) must be left at installation site along with point drawing showing specific system installed with color code legend of wiring.
- B. Warranty: All components carry a one-year warranty against workmanship. Repair or replacement will be made at the discretion of the manufacturer.

3.05 TEST, GUARANTEE AND DRAWINGS:

The contractor shall conduct tests of the system in the presence of the owner or his agent. All materials and installation shall be guaranteed to be free of defects in material and workmanship for one (1) year. The contractor shall turn over to the owner system wiring diagrams and maintenance data.

In accordance to the Microtel Inn Design and Construction Standards manual, the following section shall apply:

GENERAL TELEPHONE SYSTEM REQUIREMENTS

The following are minimum standards and requirements for telephone systems to be installed in Microtel Inns. Prior to the installation of any telephone systems, it is required that a survey be conducted to determine the actual demand. All systems should be designed using these standards as a guideline only. Microtel must approve all telephone systems

MICROTEL INNS TELEPHONE SCOPE REQUIREMENTS

1. Main phone number for the property going into a switchboard.
2. A local phone line and number dedicated solely for 800# reservations service.
3. A phone line dedicated solely for the "MICROPHONE" direct access to Microtel Inns reservations. This can be either a separate line with it's own local number or can utilize one of the trunks in the PBX system. This second option should only be employed if the remaining trunks are sufficient to handle the hotel traffic.
4. A local phone number for hotel fax service.

NOTE: A minimum of three (3) separate local phone numbers will be required. (Four {4} if separate line is order for the "MICROPHONE").

1. MAIN PHONE SERVICE

Call the local phone company at the start of construction to find out from them how soon before opening you can get the phone numbers assigned.

Make a note to get the phone numbers as soon as the phone company allows.

Order your PBX and switchboard equipment. A **minimum** of 12 trunks will be required for a 60 room property and 16 to 18 trunks for any property larger than 60 rooms.

2. RESERVATIONS LINE

Order a separate line from the local phone company to be dedicated for **reservations only**. As soon as you know this local phone number, call Sharon "Sam" Wilkinson with MCI at 1-678-256-7332 to have an 800 number assigned for your property. This 800 number will be set to ring through the dedicated local phone number.

Sam will need the following information:

- The local phone dedicated for the reservations 800#
- The physical address of the hotel
- The contact at the property
- The main phone number for the property
- The hotels projected opening date

Sam MUST have this information no later than 4 weeks prior to opening to ensure the property is on the reservations system.

Your PBX technician can set this line up to ring as either a separate button on your switchboard or to a separate phone kept at the front desk.

3. "MICROPHONE"

Order a dedicated line from the local phone company to be run to the PBX equipment.

Purchase a black trimline wall hanging telephone.

Ask the PBX technician to install this phone to the equipment and to preprogram the phone to dial 1-888-771-7171 as soon as the phone is taken off the hook.

4. FAX LINE

The fax line should be placed directly onto a wall jack and bypass the PBX equipment.

NOTE: To take advantage of the US Franchise Systems negotiated discount rates for 1+ and 0+ service, Sharon "Sam" Wilkinson at MCI needs to set the service up. This way she can ensure that you are participating in the discount plan. She can also assist you in answering your phone service and commission related questions. Sam can be reached at 1-678-256-7332 or pager: 1-800-356-3630 or e-mail: sharon.wilkinson@wcom.com.

END OF SECTION 16400

SECTION 16500

WIRING MECHANICAL EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All work performed under the requirements of this Section shall be subject to the conditions set forth under "General Conditions" and shall comply with all requirements contained under Division 1, "General Requirements" as far as applicable to this portion of the work.
- B. All work under this Section shall conform to the requirements set forth in Section 16010 "Electrical General Provisions".

1.02 CONTENTS

- A. Specified Herein: Requirements for wiring mechanical equipment.
- B. Described herein are the following:
 - Scope
 - Equipment, motors and appliances.

1.03 SCOPE

- A. The work under this Section shall comprise, but is not necessarily limited to the following:
 - 1. Furnish and install all power, control and interlock wiring as indicated on the plans and herein described, including all disconnect switches, starters, controls and accessory equipment not supplied as part of the equipment furnished by others or as may be required to properly power and control the equipment.

PART 2 - PRODUCTS

2.01 MATERIALS: Refer to Section 16100.

PART 3 - EXECUTION

3.01 FURNISH AND INSTALL WIRING TO EQUIPMENT, MOTORS AND APPLIANCES AS FOLLOWS

- A. Bathroom Exhaust Fans: Wire fan to operate with light on a common switch.
- B. Through-the-Wall Air Conditioning Units: Furnish and install wire from the unit terminal box back to the 120/208 volt power panel indicated.
- C. Hot Water Recirculator: Furnish and install a motor starting switch with thermal overload protection and pilot light and wire complete to the 120 volt pump motor through an aquastat attached to the hot water recirculating line to operate the pump as required.
- D. Telephone Equipment Panel: Furnish and install duplex receptacles at the plywood panel for the use of the telephone company.
- E. Television Equipment: Furnish and install a duplex receptacle at the plywood panel for the use of the television equipment installer. Furnish and install conduit with pull string to desk for pay cable computer interconnection.
- F. Attic Roof Vent Fans: Wire fans to operate from a humidistat located in the attic, furnished by the mechanical contractor.
- G. Exhaust Fans: Where shown, wire fan to operate on a thermostat furnished by the mechanical contractor.

END OF SECTION

SECTION 16600

ELECTRIC COMFORT HEATERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: All work performed under the requirements of this Section shall be subject to the conditions set forth under "General Conditions" and shall comply with all requirements contained under Division 1, "General Requirements" as far as applicable to this portion of the work.

1.02 CONTENTS

- A. Specified Herein: Requirements for electric comfort heating materials, equipment and wiring methods.
- B. Described herein are the following:
 - Scope
 - Cabinet Unit Heaters

1.03 SCOPE

- A. The work under this Section shall comprise, but is not necessarily limited to the following:
 - 1. Provide all labor and material required to install electric comfort heating equipment.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Storage Conditions: It is recognized that space at the project for storage of materials and products may be limited. Coordinate the deliveries of electrical materials and products with the scheduling and sequencing of the work so that storage requirements at the project are minimized. In general, do not deliver individual items of heating equipment to the project substantially ahead of the time of the installation.
- B. Shop drawing approval is required for all electric comfort heating.

PART 2 - PRODUCTS

2.01 ELECTRIC WALL HEATERS

- A. Furnish electric wall heaters as shown and scheduled on the plans. Heaters shall have wall recessed box and be U.L. listed with built-in thermostats having an "off" position.
- B. Furnish with baked enamel cabinets, permanently lubricated fan motor and wall trim flanges.
- C. Architectural style heaters shall have 16 gauge front cover with concealed thermostat adjustment.
- D. Heater shall be protected with automatic reset thermal cutout switch and be factory prewired.
- E. Electric wall heaters shall be as manufactured by Markel or equivalent.

PART 3 - EXECUTION

3.01 ELECTRIC HEATERS

- A. This contractor shall furnish and install all electric heaters and controls.
- B. Maintain clearances around heaters in full accordance with the manufacturer's installation instructions and U.L. requirements.
- C. Wire heat lamp in bathrooms with exterior walls through a wall mounted thermostat.