

OVERTOWN COMMUNITY CENTER BUILDING



BUILDING REHABILITATION FOR:
OVERTOWN COMMUNITY CENTER BUILDING

PHASE III - 100% SUBMITTAL

PROJECT NO. B-40169
300 N.W. 11TH STREET
MIAMI, FLORIDA 33136

SOUTHEAST OVERTOWN / PARK WEST
COMMUNITY REDEVELOPMENT AGENCY

Thomas Regalado

Keon Hardemon
Wilfredo Gort
Francis Suarez
Marc Sarnoff
Frank Carollo

Clarence E. Woods III

Brian Zeltsman, RA

Mayor

SEOPW CRA Chair
SEOPW CRA Vice-Chair
Board Member
Board Member
Board Member

Executive Director
SEOPW CRA

SEOPW CRA
Director of Architecture &
Development

THE U.S. DEPARTMENT OF COMMERCE ECONOMIC
DEVELOPMENT ADMINISTRATION IS PROVIDING PARTIAL
FUNDING FOR THIS PROJECT.

EDA INVESTMENT NO.
04-79-06827



ARCHITEKNICS, INC.
Architects and Planners



capengineering

P 305.661.5392
F 305.661.5832

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F 305.698.3989

P 305.448.1711
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General Decision Number: FL140027 04/04/2014 FL27

Superseded General Decision Number: FL20130027

State: Florida

Construction Type: Building

County: Miami-Dade County in Florida.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/03/2014
1	01/31/2014
2	02/07/2014
3	02/28/2014
4	04/04/2014

CARP0079-001 04/01/2009

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 22.20	6.67

* ELEC0349-001 09/01/2013

	Rates	Fringes
ELECTRICIAN, Includes Installation of HVAC/Temperature Controls Electrical contracts including materials that are over \$2,000,000.....	\$ 30.11	9.56
Electrical contracts including materials that are under \$2,000,000.....	\$ 27.15	9.18

ELEV0071-001 01/01/2014

	Rates	Fringes
ELEVATOR MECHANIC.....	\$ 39.57	26.785+A

FOOTNOTE:

A: Employer contributes 8% basic hourly rate for 5 years or more of service or 6% basic hourly rate for 6 months to 5 years of service as Vacation Pay Credit; Paid Holidays: New Year's Day; Memorial Day; Independence Day; Labor Day; Veteran's Day; Thanksgiving Day; plus the Friday after Thanksgiving; and Christmas Day.

ENGI0487-001 07/01/2013

	Rates	Fringes
OPERATOR: Backhoe/Excavator.....	\$ 22.00	8.80
OPERATOR: Concrete Pump, Truck Mounted		
Trailer Mounted.....	\$ 21.44	8.80
Truck Mounted.....	\$ 27.21	8.80
OPERATOR: Crane		
All Cranes Over 15 Ton Capacity; Boom Truck.....	\$ 29.00	8.80
Yard Crane, Hydraulic Crane, Ccapacity 15 Ton and Under; Boom Truck.....	\$ 22.00	8.80
OPERATOR: Mechanic.....	\$ 22.00	8.80
OPERATOR: Oiler.....	\$ 21.00	8.80

IRON0272-003 04/01/2013

	Rates	Fringes
IRONWORKER, ORNAMENTAL, REINFORCING AND STRUCTURAL.....	\$ 23.59	5.93

PAIN0365-003 08/01/2013

	Rates	Fringes
PAINTER: Roller, Spray, and Steel (Excludes Drywall Finishing/Taping).....	\$ 15.75	7.93

SFFL0821-001 01/01/2014

	Rates	Fringes
SPRINKLER FITTER (Fire Sprinklers).....	\$ 27.53	17.32

SHEE0032-003 08/12/2012

	Rates	Fringes
SHEETMETAL WORKER (HVAC Duct Installation).....	\$ 23.65	12.03

SUFL2009-023 05/22/2009

	Rates	Fringes
BRICKLAYER.....	\$ 18.93	0.00
CARPENTER, Includes Acoustical Ceiling Installation (Excludes Drywall Hanging, and Form Work).....	\$ 15.54	0.00
CEMENT MASON/CONCRETE FINISHER...	\$ 11.13	0.00

DRYWALL HANGER.....	\$ 14.00	0.57
FENCE ERECTOR.....	\$ 10.00	0.00
FLOOR LAYER: Carpet.....	\$ 19.00	2.10
GLAZIER.....	\$ 16.89	2.69
HVAC MECHANIC (HVAC Pipe Installation).....	\$ 16.19	2.48
HVAC MECHANIC (Installation of HVAC Unit Only, Excludes Installation of HVAC Pipe and Duct).....	\$ 17.91	2.64
INSTALLER - OVERHEAD DOOR.....	\$ 14.40	0.00
LABORER: Asphalt Raker.....	\$ 10.40	0.00
LABORER: Asphalt Shoveler.....	\$ 7.88	0.00
LABORER: Common or General.....	\$ 9.85	0.00
LABORER: Concrete Saw (Hand Held/Walk Behind).....	\$ 12.63	0.00
LABORER: Mason Tender - Brick...	\$ 10.75	0.00
LABORER: Mason Tender - Cement/Concrete.....	\$ 12.83	1.90
LABORER: Pipelayer.....	\$ 13.87	1.58
LABORER: Roof Tearoff.....	\$ 8.44	0.00
LABORER: Landscape and Irrigation.....	\$ 10.00	1.60
MECHANICAL INSULATOR, Including Duct and Pipe.....	\$ 13.98	2.07
OPERATOR: Asphalt Spreader.....	\$ 11.41	0.00
OPERATOR: Bulldozer.....	\$ 16.21	0.00
OPERATOR: Distributor.....	\$ 12.37	0.00
OPERATOR: Forklift.....	\$ 14.00	0.00
OPERATOR: Grader/Blade.....	\$ 13.73	0.00
OPERATOR: Loader.....	\$ 16.00	2.82
OPERATOR: Paver (Asphalt, Aggregate, and Concrete).....	\$ 12.75	0.00
OPERATOR: Roller.....	\$ 10.94	0.00

OPERATOR: Screed.....	\$ 13.05	0.00
OPERATOR: Tractor.....	\$ 9.91	0.00
OPERATOR: Trencher.....	\$ 11.75	0.00
PAINTER: Brush, Includes Drywall Finishing/Taping.....	\$ 13.72	2.22
PIPEFITTER, Excludes HVAC Pipe Installation.....	\$ 17.85	2.54
PLASTERER.....	\$ 15.05	0.00
PLUMBER, Excludes HVAC Pipe Installation.....	\$ 20.00	1.37
ROOFER, Includes Built Up, Hot Tar, Modified Bitumen, Shake & Shingle, Single Ply, Slate, & Tile Roofs (Excludes Installation of Metal Roofs).....	\$ 13.59	0.00
ROOFER: Metal Roof.....	\$ 17.10	0.00
SHEET METAL WORKER, Excludes HVAC Duct Installation.....	\$ 15.62	2.03
TILE SETTER.....	\$ 16.50	2.10
TRUCK DRIVER: 3 Axle Truck.....	\$ 10.50	0.80
TRUCK DRIVER: Dump Truck.....	\$ 10.00	0.00
TRUCK DRIVER: Lowboy Truck.....	\$ 13.78	0.00

WELDERS - Receive rate prescribed for craft performing
operation to which welding is incidental.

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Unlisted classifications needed for work not included within
the scope of the classifications listed may be added after
award only as provided in the labor standards contract clauses
(29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification
and wage rates that have been found to be prevailing for the
cited type(s) of construction in the area covered by the wage
determination. The classifications are listed in alphabetical
order of "identifiers" that indicate whether the particular
rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rates.

0000/9999: weighted union wage rates will be published annually each January.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union majority rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

- * an existing published wage determination
- * a survey underlying a wage determination
- * a Wage and Hour Division letter setting forth a position on a wage determination matter
- * a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the

Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

Lobbying Certification and Restriction Forms

CERTIFICATION REGARDING LOBBYING

Applicants should also review the instructions for certification included in the regulations before completing this form. Signature on this form provides for compliance with certification requirements under 15 CFR Part 28, "New Restrictions on Lobbying." The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of Commerce determines to award the covered transaction, grant, or cooperative agreement.

LOBBYING

As required by Section 1352, Title 31 of the U.S. Code, and implemented at 15 CFR Part 28, for persons entering into a grant, cooperative agreement or contract over \$100,000 or a loan or loan guarantee over \$150,000 as defined at 15 CFR Part 28, Sections 28.105 and 28.110, the applicant certifies that to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure occurring on or before October 23, 1996, and of not less than \$11,000 and not more than \$110,000 for each such failure occurring after October 23, 1996.

Statement for Loan Guarantees and Loan Insurance

The undersigned states, to the best of his or her knowledge and belief, that:

In any funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this commitment providing for the United States to insure or guarantee a loan, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

Submission of this statement is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required statement shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure occurring on or before October 23, 1996, and of not less than \$11,000 and not more than \$110,000 for each such failure occurring after October 23, 1996.

As the duly authorized representative of the applicant, I hereby certify that the applicant will comply with the above applicable certification.

NAME OF APPLICANT	AWARD NUMBER AND/OR PROJECT NAME
PRINTED NAME AND TITLE OF AUTHORIZED REPRESENTATIVE	
SIGNATURE	DATE

Requirements for Affirmative Action (EEO)

**NOTICE OF REQUIREMENTS FOR AFFIRMATIVE ACTION
TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY
(EXECUTIVE ORDER 11246 AND 41 CFR PART 60-4)**

The following Notice shall be included in, and shall be a part of all solicitations for offers and bids on all Federal and federally assisted construction contracts or subcontracts in excess of \$10,000.

The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Opportunity Construction Contract Specifications" set forth herein.

The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Timetables	Goals for minority participation for each trade	Goals for female participation for each trade
	39.5 %	6.9%

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non federally involved construction.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order, and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of \$10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor; employer identification number of the subcontractor; estimated dollar amount of the subcontract; estimated starting and completion dates of the subcontract; and the geographical area in which the subcontract is to be performed. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is:

State of	Florida
County of	Miami-Dade
City of	Miami

**U. S. DEPARTMENT OF COMMERCE
ECONOMIC DEVELOPMENT ADMINISTRATION**



**EDA CONTRACTING PROVISIONS
FOR CONSTRUCTION PROJECTS**

These EDA Contracting Provisions for Construction Projects (EDA Contracting Provisions) are intended for use by recipients receiving federal assistance from the U. S. Department of Commerce - Economic Development Administration (EDA). They contain provisions specific to EDA and other federal provisions not normally found in non-federal contract documents. The requirements contained herein must be incorporated into all construction contracts and subcontracts funded wholly or in part with federal assistance from EDA.

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1. **DEFINITIONS**

Agreement – The written instrument that is evidence of the agreement between the Owner and the Contractor overseeing the Work.

Architect/Engineer - The person or other entity engaged by the Recipient to perform architectural, engineering, design, and other services related to the work as provided for in the contract.

Contract – The entire and integrated written agreement between the Owner and the Contractor concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.

Contract Documents – Those items so designated in the Agreement. Only printed or hard copies of the items listed in the Agreement are Contract Documents.

Contractor – The individual or entity with whom the Owner has entered into the Agreement.

Drawings or Plans – That part of the Contract Documents prepared or approved by the Architect/Engineer that graphically shows the scope, extent, and character of the Work to be performed by the Contractor.

EDA - The United States of America acting through the Economic Development Administration of the U.S. Department of Commerce or any other person designated to act on its behalf. EDA has agreed to provide financial assistance to the Owner, which includes assistance in financing the Work to be performed under this Contract. Notwithstanding EDA's role, nothing in this Contract shall be construed to create any contractual relationship between the Contractor and EDA.

Owner – The individual or entity with whom the Contractor has entered into the Agreement and for whom the Work is to be performed.

Project – The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part.

Recipient - An entity receiving Federal financial assistance from EDA, including any EDA-approved successor to the entity.

Specifications – That part of the Contract Documents consisting of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable thereto.

Subcontractor – An individual or entity having direct contract with the Contractor or with any other Subcontractor for the performance of a part of the Work at the Site.

Work – The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.

2. **APPLICABILITY**

The Project to which the construction work covered by this Contract pertains is being assisted by the United States of America through federal assistance provided by the U.S. Department of Commerce - Economic Development Administration (EDA). Neither EDA, nor any of its departments, entities, or employees is a party to this Contract. The following EDA Contracting Provisions are included in this Contract and all subcontracts or related instruments pursuant to the provisions applicable to such federal assistance from EDA.

3. **FEDERALLY REQUIRED CONTRACT PROVISIONS**

- (a) Administrative, contractual, or legal remedies in instances where contractors violate or breach contract terms, and provide for such sanctions and penalties as may be appropriate (Contracts more than the simplified acquisition threshold - currently fixed at \$100,000. *See* 41 U.S.C. 403(11)).
- (b) Termination for cause and for convenience by the Recipient including the manner by which it will be effected and the basis for settlement (all contracts in excess of \$10,000).
- (c) Compliance with Executive Order 11246 of September 24, 1965, *Equal Employment Opportunity*, as amended by Executive Order 11375 of October 13, 1967 and as supplemented by Department of Labor regulations at 41 C.F.R. chapter 60 (applicable to all construction contracts awarded in excess of \$10,000 by recipients of federal assistance and their contractors or subrecipients).
- (d) Compliance with the Copeland "Anti-Kickback" Act (18 U.S.C. § 874) as supplemented by Department of Labor regulations at 29 C.F.R. part 3 (all contracts and subgrants for construction or repair).
- (e) Compliance with the Davis-Bacon Act (40 U.S.C. § 3145) as supplemented by Department of Labor regulations at 29 C.F.R. part 5 (construction contracts in excess of \$2,000 awarded by Recipients and subrecipients).
- (f) Compliance with sections 103 and 107 of the Contract Work Hours and Safety Standards Act (40 U.S.C. §§ 327-330) as supplemented by Department of Labor regulations at 29 C.F.R. part 5. (construction contracts awarded by Recipients and subrecipients in excess of \$2,000, and in excess of \$2,500 for other contracts which involve the employment of mechanics or laborers)
- (g) EDA requirements and regulations pertaining to reporting.

(h) EDA requirements and regulations pertaining to patent rights with respect to any discovery or invention which arises or is developed in the course of or under such contract.

(i) EDA requirements and regulations pertaining to copyrights and rights in data.

(j) Compliance with all applicable standards, orders, or requirements issued under section 306 of the Clear Air Act (42 U.S.C. § 7606), section 508 of the Clean Water Act (33 U.S.C. § 1368), Executive Order 11738, *Providing for Administration of the Clean Air Act and the Federal Water Pollution Control Act With Respect to Federal Contracts, Grants, or Loans*, and Environmental Protection Agency regulations at 48 C.F.R. part 15 (applicable to contracts, subcontracts, and subgrants of amounts in excess of \$ 100,000).

4. **REQUIRED PROVISIONS DEEMED INSERTED**

Each and every provision of law and clause required by law to be inserted in this contract shall be deemed to be inserted herein and the contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the contract shall forthwith be physically amended to make such insertion of correction.

5. **INSPECTION BY EDA REPRESENTATIVES**

The authorized representatives and agents of EDA shall be permitted to inspect all work, materials, payrolls, personnel records, invoices of materials, and other relevant data and records.

6. **EXAMINATION AND RETENTION OF CONTRACTOR'S RECORDS**

(a) The Owner, EDA, or the Comptroller General of the United States, or any of their duly authorized representatives shall, generally until three years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

(b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders that do not exceed \$10,000.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the Owner, EDA, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

7. **CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES**

Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the Owner an estimated construction progress schedule in a form satisfactory to the Owner, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due to the Contractor in accordance with the progress schedule. The Contractor also shall furnish the Owner (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodic itemized estimates of work done for the purpose of making partial payments thereon. The costs employed in making up any of these schedules will be used only to determine the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

8. **CONTRACTOR'S TITLE TO MATERIAL**

No materials, supplies, or equipment for the work shall be purchased by the Contractor or by any subcontractor that is subject to any chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller. The Contractor warrants and guarantees that he/she has good title to all work, materials, and equipment used by him/her in the Work, free and clear of all liens, claims, or encumbrances.

9. **INSPECTION AND TESTING OF MATERIALS**

All materials and equipment used in the completion of the Work shall be subject to adequate inspection and testing in accordance with accepted standards. The laboratory or inspection agency shall be selected by the Owner. Materials of construction, particularly those upon which the strength and durability of any structure may depend, shall be subject to inspection and testing to establish conformance with specifications and suitability for intended uses.

10. **"OR EQUAL" CLAUSE**

Whenever a material, article, or piece of equipment is identified in the Contract Documents by reference to manufacturers' or vendors' names, trade names, catalogue numbers, etc., it is intended merely to establish a standard. Any material, article, or equipment of other manufacturers and vendors that will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed is, in the opinion of the Architect/Engineer, of equal substance and function. However, such substitution material, article, or equipment shall not be purchased or installed by the Contractor without the Architect/Engineer's written approval.

11. **PATENT FEES AND ROYALTIES**

(a) Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device that is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in

the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by the Owner in the Contract Documents.

(b) To the fullest extent permitted by Laws and Regulations, the Contractor shall indemnify and hold harmless the Owner and the Architect/Engineer, and the officers, directors, partners, employees, agents, consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

12. CLAIMS FOR EXTRA COSTS

No claims for extra work or cost shall be allowed unless the same was done in pursuance of a written order from the Architect/Engineer approved by the Owner.

13. CONTRACTORS AND SUBCONTRACTORS INSURANCE

(a) The Contractor shall not commence work under this Contract until the Contractor has obtained all insurance reasonably required by the Owner, nor shall the Contractor allow any subcontractor to commence work on his/her subcontract until the insurance required of the subcontractor has been so obtained and approved.

(b) Types of insurance normally required are:

- (1) Workmen's Compensation
- (2) Contractor's Public Liability and Property Damage
- (3) Contractor's Vehicle Liability
- (4) Subcontractors Public Liability, Property Damage and Vehicle Liability
- (5) Builder's Risk (Fire and Extended Coverage)

(c) **Scope of Insurance and Special Hazards:** The insurance obtained, which is described above, shall provide adequate protection for the Contractor and his/her subcontractors, respectively, against damage claims that may arise from operations under this contract, whether such operations be by the insured or by anyone directly or indirectly employed by him/her and also against any of the special hazards that may be encountered in the performance of this Contract.

(d) **Proof of Carriage of Insurance:** The Contractor shall furnish the Owner with certificates showing the type, amount, class of operations covered, effective dates, and dates of expiration of applicable insurance policies.

14. **CONTRACT SECURITY BONDS**

(a) If the amount of this Contract exceeds \$100,000, the Contractor shall furnish a performance bond in an amount at least equal to one hundred percent (100%) of the Contract price as security for the faithful performance of this Contract and also a payment bond in an amount equal to one hundred percent (100%) of the Contract price or in a penal sum not less than that prescribed by State, Territorial, or local law, as security for the payment of all persons performing labor on the Work under this Contract and furnishing materials in connection with this Contract. The performance bond and the payment bond may be in one or in separate instruments in accordance with local law. Before final acceptance, each bond must be approved by EDA. If the amount of this Contract does not exceed \$100,000, the Owner shall specify the amount of the payment and performance bonds.

(b) All bonds shall be in the form prescribed by the Contract Documents except as otherwise provided in applicable laws or regulations, and shall be executed by such sureties as are named in the current list of *Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies* as published in Treasury Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All bonds signed by an agent must be accompanied by a certified copy of the agent's authority to act. Surety companies executing the bonds must also be authorized to transact business in the state where the Work is located.

15. **LABOR STANDARDS - DAVIS-BACON AND RELATED ACTS**
(as required by section 601 of PWEDA)

(a) **Minimum Wages**

(1) All laborers and mechanics employed or working upon the site of the Work in the construction or development of the Project will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act at 29 C.F.R. part 3, the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at the time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor, which is attached hereto and made a part hereof, regardless of any contractual relationship that may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 C.F.R. § 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 C.F.R. § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the

rate specified for each classification for the time actually worked therein, provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates determined under 29 C.F.R. § 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(2) (i) Any class of laborers or mechanics to be employed under the Contract, but not listed in the wage determination, shall be classified in conformance with the wage determination. EDA shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(A) The work to be performed by the classification requested is not performed by a classification in the wage determination;

(B) The classification is utilized in the area by the construction industry; and

(C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and EDA or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by EDA or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210.

(iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and EDA or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), EDA or its designee shall refer the questions, including the views of all interested parties and the recommendation of EDA or its designee, to the Administrator for determination.

(iv) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(2)(ii) or (iii) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(b) Withholding

EDA or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this Contract or any other federal contract with the same prime Contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the Contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper employed or working on the site of the Work in the construction or development of the Project, all or part of the wages required by the Contract, EDA or its designee may, after written notice to the Contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. EDA or its designee may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

(c) Payrolls and basic records

(1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the Work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the Work in the construction or development of the Project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b) (2) (B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 C.F.R. § 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, the plan or program is financially responsible, and the plan or program has been communicated in writing to the laborers or mechanics affected, and provide records that show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of

apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(2) (i) For each week in which Contract work is performed, the Contractor shall submit a copy of all payrolls to the Owner for transmission to EDA or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 C.F.R. part 5.5(a)(3)(i). This information may be submitted in any form desired. Optional Form WH-347 is available for this purpose. It may be purchased from the Superintendent of Documents (Federal Stock Number 029-005-00014-1), U.S. Government Printing Office, Washington, D.C. 20402; or downloaded from the U.S. Department of Labor's website at www.dol.gov/esa/forms/whd/index.htm. The prime Contractor is responsible for the submission of copies of payrolls by all subcontractors

(ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the Contract and shall certify the following:

(A) That the payroll for the payroll period contains the information required to be maintained under 29 C.F.R. § 5.5(a)(3)(i) and that such information is correct and complete;

(B) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the Contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 C.F.R. part 3;

(C) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the Contract.

(iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph 14(c)(ii) of this section.

(iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under section 1001 of Title 18 and section 231 of Title 31 of the U.S. Code.

(3) The Contractor or subcontractor shall make the records required under paragraph 15(c)(1) of this section available for inspection, copying, or transcription by authorized representatives of EDA or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them

available, EDA or its designee may, after written notice to the Contractor or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 C.F.R. part 5.12.

(d) Apprentices and Trainees.

(1) **Apprentices.** Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Bureau of Apprenticeship and Training, or with a State Apprenticeship Agency recognized by the Bureau, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Bureau of Apprenticeship and Training or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a Contractor is performing construction on a Project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Bureau of Apprenticeship and Training, or a State Apprenticeship Agency recognized by the Bureau, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) **Trainees.** Except as provided in 29 C.F.R. § 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program that has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and

Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman's hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(3) **Equal employment opportunity.** The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, *Equal Employment Opportunity*, as amended, and 29 C.F.R. part 30.

(e) **Compliance with Copeland Anti-Kickback Act Requirements.** The Contractor shall comply with the Copeland Anti-Kickback Act (18 U.S.C. § 874 and 40 U.S.C. § 276(c)) as supplemented by Department of Labor regulations (29 C.F.R. part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that the Contractor and any subcontractors shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled. The Owner shall report all suspected or reported violations to EDA.

(f) **Subcontracts.** The Contractor and any subcontractors will insert in any subcontracts the clauses contained in 29 C.F.R. §§ 5.5(a)(1) through (10) and such other clauses as EDA or its designee may require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 C.F.R. part 5.5.

(g) **Contract termination; debarment.** The breach of the contract clauses in 29 C.F.R. part 5.5 may be grounds for termination of the contract, and for debarment as a Contractor and a subcontractor as provided in 29 C.F.R. § 5.12.

(h) **Compliance with Davis-Bacon and Related Act Requirements.** All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 C.F.R. parts 1, 3, and 5 are herein incorporated by reference in this contract.

(i) **Disputes concerning labor standards.** Disputes arising out of the labor standards provisions of this Contract shall not be subject to the general disputes clause of this Contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 C.F.R. parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and EDA or its designee, the U.S. Department of Labor, or the employees or their representatives.

(j) **Certification of Eligibility.**

(1) By entering into this Contract, the Contractor certifies that neither it nor any person or firm that has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 C.F.R. § 5.12(a)(1).

(2) No part of this Contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 C.F.R. § 5.12(a)(1).

(3) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. § 1001.

16. **LABOR STANDARDS - CONTRACT WORK HOURS AND SAFETY STANDARDS ACT**

As used in this paragraph, the terms “laborers” and “mechanics” include watchmen and guards.

(a) **Overtime requirements.** No Contractor or subcontractor contracting for any part of the Contract work, which may require or involve the employment of laborers or mechanics, shall require or permit any such laborer or mechanic in any workweek in which that person is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(b) **Violation; liability for unpaid wages, liquidated damages.** In the event of any violation of the clause set forth in paragraph (a) of this section, the Contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a) of this section, in the sum of \$10 for each calendar day on which such individual was required or

permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a) of this section.

(c) **Withholding for unpaid wages and liquidated damages.** EDA or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any monies payable on account of work performed by the Contractor or subcontractor under any such Contract or any other federal contract with the same prime Contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b) of this section.

(d) **Subcontracts.** The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (a) through (c) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime Contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a) through (c) of this section.

17. **EQUAL EMPLOYMENT OPPORTUNITY**

(a) The Recipient hereby agrees that it will incorporate or cause to be incorporated into any contract for construction work, or modification thereof, as defined in the regulations of the Secretary of Labor at 41 C.F.R. chapter 60, which is paid for in whole or in part with funds obtained from EDA, the following equal opportunity clause:

During the performance of this contract, the Contractor agrees as follows:

(1) The Contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training including apprenticeship. The Contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided setting forth the provisions of this nondiscrimination clause.

(2) The Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.

(3) The Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding a notice to be provided advising the said labor union or workers representatives of the Contractor's

commitments hereunder, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Contractor will comply with all provisions of Executive Order 11246 of September 24, 1965 and of the rules, regulations, and relevant orders of the Secretary of Labor.

(5) The Contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and pursuant to rules, regulations, and orders of the Secretary of Labor and will permit access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(6) In the event of the Contractor's noncompliance with the nondiscrimination clauses of this Contract or with any of the said rules, regulations, or orders, this Contract may be canceled, terminated, or suspended in whole or in part and the Contractor may be declared ineligible for further Government contracts or federally-assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulations or order of the Secretary of Labor, or as otherwise provided by law.

(7) The Contractor will include the portion of the sentence immediately preceding paragraph 17(a) (1) and the provisions of paragraphs 17(a)(1) through (6) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontract or purchase order as EDA or the Secretary of Labor may direct as a means of enforcing such provisions, including sanctions for noncompliance. Provided, however, that in the event the Contractor becomes involved in or is threatened with litigation with or by a subcontractor or vendor as a result of such direction by EDA or the Secretary of Labor, the Contractor may request the United States to enter into such litigation to protect the interests of the United States.

(8) The Recipient further agrees that it will be bound by the above equal opportunity clause with respect to its own employment practices when it participates in federally-assisted construction work. Provided, however, that if the Recipient so participating is a State or local government, the above equal opportunity clause is not applicable to any agency, instrumentality, or subdivision of such government that does not participate in work on or under the Contract.

(9) The Recipient agrees that it will assist and cooperate actively with EDA and the Secretary of Labor in obtaining the compliance of contractors and subcontractors with the equal opportunity clause and the rules, regulations, and relevant orders of the Secretary of Labor, that it will furnish EDA and the Secretary of Labor such information as they may

require for the supervision of such compliance, and that it will otherwise assist EDA in the discharge of the EDA's primary responsibility for securing compliance.

(10) The Recipient further agrees that it will refrain from entering into any contract or contract modification subject to Executive Order 11246 of September 24, 1965, with a Contractor debarred from, or who has not demonstrated eligibility for, Government contracts and federally assisted construction contracts pursuant to the Executive order and will carry out such sanctions and penalties for violation of the equal opportunity clause as may be imposed upon contractors and subcontractors by EDA or the Secretary of Labor pursuant to Part II, Subpart D of the Executive order. In addition, the Recipient agrees that if it fails or refuses to comply with these undertakings, EDA may take any or all of the following actions: Cancel, terminate, or suspend in whole or in part this EDA financial assistance; refrain from extending any further assistance to the applicant under the program with respect to which the failure or refund occurred until satisfactory assurance of future compliance has been received from such applicant; and refer the case to the Department of Justice for appropriate legal proceedings.

(b) Exemptions to Above Equal Opportunity Clause (41 C.F.R. chapter 60):

(1) Contracts and subcontracts not exceeding \$10,000 (other than Government bills of lading) are exempt. The amount of the Contract, rather than the amount of the federal financial assistance, shall govern in determining the applicability of this exemption.

(2) Except in the case of subcontractors for the performance of construction work at the site of construction, the clause shall not be required to be inserted in subcontracts below the second tier.

(3) Contracts and subcontracts not exceeding \$10,000 for standard commercial supplies or raw materials are exempt.

18. **CONTRACTING WITH SMALL, MINORITY AND WOMEN'S BUSINESSES**

(a) If the Contractor intends to let any subcontracts for a portion of the work, the Contractor shall take affirmative steps to assure that small, minority and women's businesses are used when possible as sources of supplies, equipment, construction, and services.

(b) Affirmative steps shall consist of:

(1) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(2) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;

- (3) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;
- (4) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises;
- (5) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies;
- (6) Requiring each party to a subcontract to take the affirmative steps of this section; and
- (7) The Contractor is encouraged to procure goods and services from labor surplus area firms.

19. **HEALTH, SAFETY, AND ACCIDENT PREVENTION**

(a) In performing this contract, the Contractor shall:

- (1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to their health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;
- (2) Protect the lives, health, and safety of other persons;
- (3) Prevent damage to property, materials, supplies, and equipment; and,
- (4) Avoid work interruptions.

(b) For these purposes, the Contractor shall:

- (1) Comply with regulations and standards issued by the Secretary of Labor at 29 C.F.R. part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (40 U.S.C. § 3701 – 3708); and
- (2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.

(c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this Contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 C.F.R. part 1904.

(d) The Owner shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the Work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Owner may issue an order stopping all or part of the Work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.

(e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as EDA, or the Secretary of Labor shall direct as a means of enforcing such provisions.

20. **CONFLICT OF INTEREST AND OTHER PROHIBITED INTERESTS**

(a) No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept, or approve, or to take part in negotiating, making, accepting, or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the Project, shall become directly or indirectly interested personally in this Contract or in any part hereof.

(b) No officer, employee, architect, attorney, engineer, or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the Project, shall become directly or indirectly interested personally in this Contract or in any part thereof, any material supply contract, subcontract, insurance contract, or any other contract pertaining to the Project.

(c) The Contractor may not knowingly contract with a supplier or manufacturer if the individual or entity who prepared the Contract Documents has a corporate or financial affiliation with the supplier or manufacturer.

(d) The Owner's officers, employees, or agents shall not engage in the award or administration of this Contract if a conflict of interest, real or apparent, may be involved. Such a conflict may arise when: (i) the employee, officer or agent; (ii) any member of their immediate family; (iii) their partner or (iv) an organization that employs, or is about to employ, any of the above, has a financial interest in the Contractor. The Owner's officers, employees, or agents shall neither solicit nor accept gratuities, favors, or anything of monetary value from the Contractor or subcontractors.

(e) If the Owner finds after a notice and hearing that the Contractor, or any of the Contractor's agents or representatives, offered or gave gratuities (in the form of entertainment, gifts, or otherwise) to any official, employee, or agent of the Owner or EDA in an attempt to secure this Contract or favorable treatment in awarding, amending, or making any determinations related to the performance of this Contract, the Owner may, by written notice to the Contractor, terminate this Contract. The Owner may also pursue other rights and remedies that the law or this Contract

provides. However, the existence of the facts on which the Owner bases such findings shall be an issue and may be reviewed in proceedings under the dispute resolution provisions of this Contract.

(f) In the event this Contract is terminated as provided in paragraph (e) of this section, the Owner may pursue the same remedies against the Contractor as it could pursue in the event of a breach of this Contract by the Contractor. As a penalty, in addition to any other damages to which it may be entitled by law, the Owner may pursue exemplary damages in an amount (as determined by the Owner) which shall not be less than three nor more than ten times the costs the Contractor incurs in providing any such gratuities to any such officer or employee.

21. **RESTRICTIONS ON LOBBYING**

(a) This Contract, or subcontract is subject to section 319 of Public Law 101-121, which added section 1352, regarding lobbying restrictions, to chapter 13 of title 31 of the United States Code. The new section is explained in the common rule, 15 C.F.R. part 28 (55 FR 6736-6748, February 26, 1990). Each bidder under this Contract or subcontract is generally prohibited from using federal funds for lobbying the Executive or Legislative Branches of the Federal Government in connection with this EDA Award.

(b) **Contract Clause Threshold:** This Contract Clause regarding lobbying must be included in each bid for a contract or subcontract exceeding \$100,000 of federal funds at any tier under the EDA Award.

(c) **Certification and Disclosure:** Each bidder of a contract or subcontract exceeding \$100,000 of federal funds at any tier under the federal Award must file Form CD-512, *Certification Regarding Lobbying*, and, if applicable, Standard Form-LLL, *Disclosure of Lobbying Activities*, regarding the use of any nonfederal funds for lobbying. Certifications shall be retained by the Contractor or subcontractor at the next higher tier. All disclosure forms, however, shall be forwarded from tier to tier until received by the Recipient of the EDA Award, who shall forward all disclosure forms to EDA.

(d) **Continuing Disclosure Requirement:** Each Contractor or subcontractor that is subject to the Certification and Disclosure provision of this Contract Clause is required to file a disclosure form at the end of each calendar quarter in which there occurs any event that requires disclosure or that materially affects the accuracy of the information contained in any disclosure form previously filed by such person. Disclosure forms shall be forwarded from tier to tier until received by the Recipient of the EDA Award, who shall forward all disclosure forms to EDA.

(e) **Indian Tribes, Tribal Organizations, or Other Indian Organizations:** Indian tribes, tribal organizations, or any other Indian organizations, including Alaskan Native organizations, are excluded from the above lobbying restrictions and reporting requirements, but only with respect to expenditures that are by such tribes or organizations for lobbying activities permitted by other federal law. An Indian tribe or organization that is seeking an exclusion from Certification and Disclosure requirements must provide EDA with the citation of the provision or provisions of federal law upon which it relies to conduct lobbying activities that would otherwise

be subject to the prohibitions in and to the Certification and Disclosure requirements of section 319 of Public Law No. 101-121, preferably through an attorney's opinion. Note, also, that a non-Indian subrecipient, contractor, or subcontractor under an award to an Indian tribe, for example, is subject to the restrictions and reporting requirements.

22. **HISTORICAL AND ARCHAEOLOGICAL DATA PRESERVATION**

The Contractor agrees to facilitate the preservation and enhancement of structures and objects of historical, architectural or archaeological significance and when such items are found and/or unearthed during the course of project construction. Any excavation by the Contractor that uncovers an historical or archaeological artifact shall be immediately reported to the Owner and a representative of EDA. Construction shall be temporarily halted pending the notification process and further directions issued by EDA after consultation with the State Historic Preservation Officer (SHPO) for recovery of the items. *See* the National Historic Preservation Act of 1966 (80 Stat 915, 16 U.S.C. § 470) and Executive Order No. 11593 of May 31, 1971.

23. **CLEAN AIR AND WATER**

Applicable to Contracts in Excess of \$100,000

(a) **Definition.** "Facility" means any building, plant, installation, structure, mine, vessel, or other floating craft, location, or site of operations, owned, leased, or supervised by the Contractor or any subcontractor, used in the performance of the Contract or any subcontract. When a location or site of operations includes more than one building, plant, installation, or structure, the entire location or site shall be deemed a facility except when the Administrator, or a designee, of the United States Environmental Protection Agency (EPA) determines that independent facilities are collocated in one geographical area.

(b) In compliance with regulations issued by the EPA, 2 C.F.R. part 1532, pursuant to the Clean Air Act, as amended (42 U.S.C. § 7401 *et seq.*); the Federal Water Pollution Control Act, as amended (33 U.S.C. § 1251 *et seq.*); and Executive Order 11738, the Contractor agrees to:

(1) Not utilize any facility in the performance of this contract or any subcontract which is listed on the EPA List of Violating Facilities pursuant to 2 C.F.R. part 1532 for the duration of time that the facility remains on the list;

(2) Promptly notify the Owner if a facility the Contractor intends to use in the performance of this contract is on the EPA List of Violating Facilities or the Contractor knows that it has been recommended to be placed on the List;

(3) Comply with all requirements of the Clean Air Act and the Federal Water Pollution Control Act, including the requirements of section 114 of the Clean Air Act and section 308 of the Federal Water Pollution Control Act, and all applicable clean air and clean water standards; and

(4) Include or cause to be included the provisions of this clause in every subcontract and take such action as EDA may direct as a means of enforcing such provisions.

24. **USE OF LEAD-BASED PAINTS ON RESIDENTIAL STRUCTURES**

(a) If the work under this Contract involves construction or rehabilitation of residential structures, the Contractor shall comply with the Lead-based Paint Poisoning Prevention Act (42 U.S.C. § 4831). The Contractor shall assure that paint used on the Project on applicable surfaces does not contain lead in excess of the percentages set forth in Paragraphs (a) and (b) of this section. In determining compliance with these standards, the lead content of the paint shall be measured on the basis of the total nonvolatile content of the paint or on the basis of an equivalent measure of lead in the dried film of paint already applied.

(1) For paint manufactured after June 22, 1977, paint may not contain lead in excess of 6 one-hundredths of 1 percent (.0006) lead by weight.

(2) For paint manufactured on or before June 22, 1977, paint may not contain lead in excess of five-tenths of 1 percent lead by weight.

(b) As a condition to receiving assistance under PWEDA, recipients shall assure that the restriction against the use of lead-based paint is included in all contracts and subcontracts involving the use of federal funds.

(c) **Definitions**

(1) “Applicable surfaces” are those exterior surfaces which are readily accessible to children under seven years of age.

(2) “Residential structures” means houses, apartments, or other structures intended for human habitation, including institutional structures where persons reside, which are accessible to children under seven years of age, such as day care centers, intermediate and extended care facilities, and certain community facilities.

25. **ENERGY EFFICIENCY**

The Contractor shall comply with all standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Public L. No. 94-163) for the State in which the Work under the Contract is performed.

26. **ENVIRONMENTAL REQUIREMENTS**

When constructing a Project involving trenching and/or other related earth excavations, the Contractor shall comply with the following environmental constraints:

(1) **Wetlands.** When disposing of excess, spoil, or other construction materials on public or private property, the Contractor shall not fill in or otherwise convert wetlands.

(2) **Floodplains.** When disposing of excess, spoil, or other construction materials on public or private property, the Contractor shall not fill in or otherwise convert 100 year floodplain areas delineated on the latest Federal Emergency Management Agency (FEMA) Floodplain Maps, or other appropriate maps, i.e., alluvial soils on Natural Resource Conservation Service (NRCS) Soil Survey Maps.

(4) **Endangered Species.** The Contractor shall comply with the Endangered Species Act, which provides for the protection of endangered and/or threatened species and critical habitat. Should any evidence of the presence of endangered and/or threatened species or their critical habitat be brought to the attention of the Contractor, the Contractor will immediately report this evidence to the Owner and a representative of EDA. Construction shall be temporarily halted pending the notification process and further directions issued by EDA after consultation with the U.S. Fish and Wildlife Service.

27. **DEBARMENT, SUSPENSION, INELIGIBILITY, AND VOLUNTARY EXCLUSIONS**

As required by Executive Order 12549, *Debarment and Suspension*, and implemented at 2 C.F.R. part 1326, for prospective participants in lower tier covered transactions (except subcontracts for goods or services under the \$25,000 small purchase threshold unless the subrecipient will have a critical influence on or substantive control over the award), as defined at 2 C.F.R. part 1326.

(1) By entering into this Contract, and by further executing Form CD-512, the Contractor and subcontractors certify, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this Contract by any federal department or agency.

(2) Where the Contractor or subcontractors are unable to certify to any of the statements in this certification, the Contractor or subcontractors shall attach an explanation to this bid.

See also 15 C.F.R. §§ 14.13 or 24.35, as applicable.

28. **EDA PROJECT SIGN**

The Contractor shall supply, erect, and maintain in good condition a Project sign according to the specifications provided by EDA. To the extent practical, the sign should be a free standing sign. Project signs shall not be located on public highway rights-of-way. Location and height of signs will be coordinated with the local agency responsible for highway or street safety in the Project area, if any possibility exists for obstructing vehicular traffic line of sight. Whenever the EDA site sign specifications conflict with State law or local ordinances, the EDA Regional Director will permit such conflicting specifications to be modified so as to comply with State law or local ordinance.

EDA PROJECT SIGN

The Contractor shall supply, erect, and maintain in good condition a project sign according to the specifications set forth below:

EDA SITE SIGN SPECIFICATIONS

Size: 4' x 8' x ¾"

Materials: Exterior grade/MDO plywood (APA rating A-B)

Supports: 4" x 4" x 12' posts with 2" x 4" cross branching

Erection: Posts shall be set a minimum of three feet deep in concrete footings that are at least 12" in diameter.

Paint: Outdoor enamel

Colors: Jet Black, Blue (PMS300), and Gold (PMS7406). Specifically, on white background the following will be placed:

The U. S. Department of Commerce seal in blue, black, and gold;

“EDA” in blue;

“U. S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT
ADMINISTRATION” in black;

“In partnership with” in blue;

(Actual name of the) “Investment Recipient” in black;

“PUTTING AMERICA TO WORK” in blue;

“Barack Obama, President of the United States” in black.

Lettering: Specific fonts are named below; positioning will be as shown on the attached illustration.

“U. S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT
ADMINISTRATION” use Bank Gothic Medium - **BANK GOTHIC MED**

“In partnership with” use Univers™ 55 Oblique - *Univers 55*

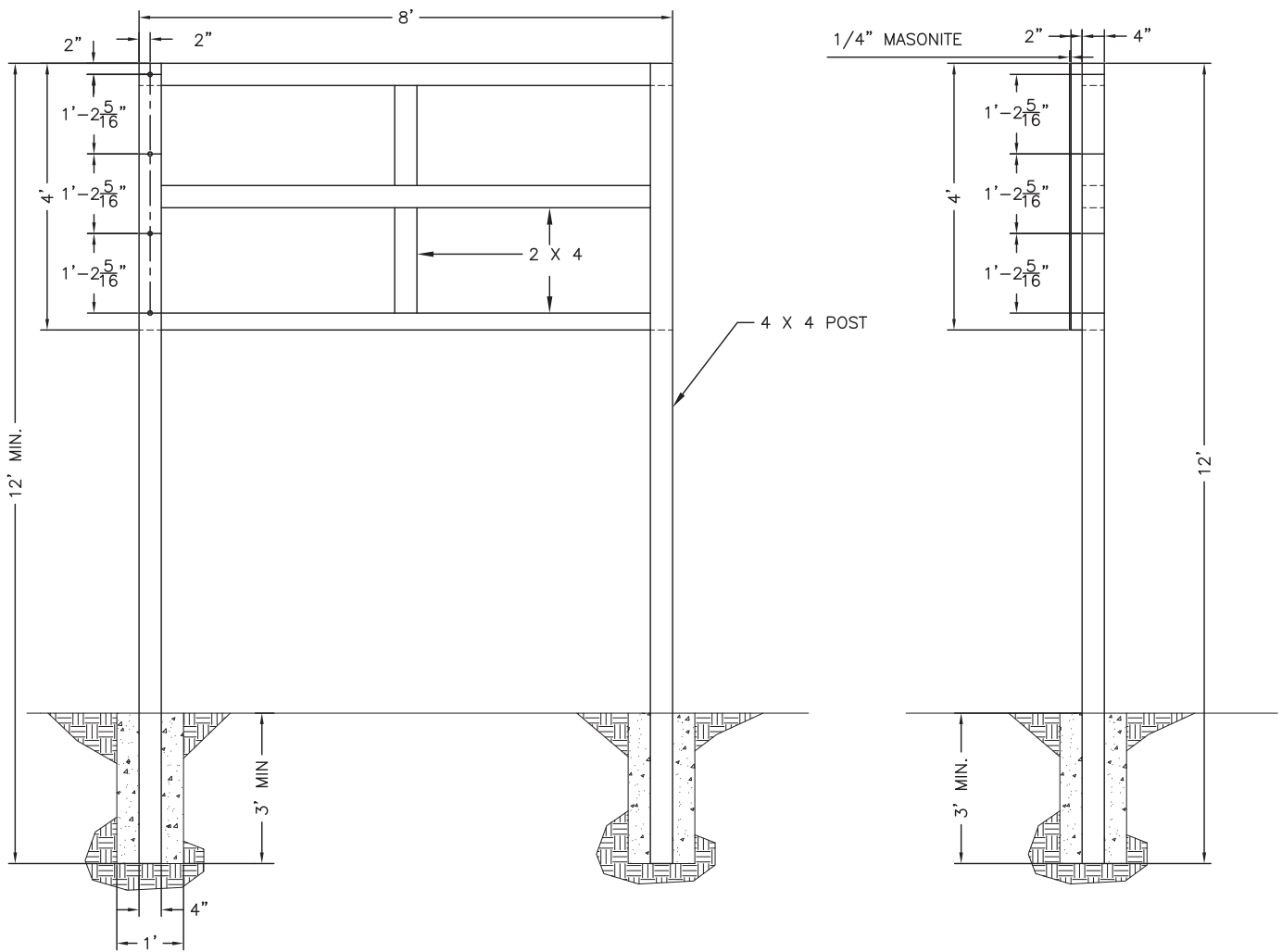
(Name of) “Investment Recipient” use Univers™ Extra Black 85 - **Univers 85**

“PUTTING AMERICA TO WORK” use Walkway Black - **Walkway**

“Barack Obama, President of the United States” use Univers™ 55 Oblique - *Univers 55*

Project signs will not be erected on public highway rights-of-way. If any possibility exists for obstruction to traffic line of sight, the location and height of the sign will be coordinated with the agency responsible for highway or street safety in the area.

The EDA Regional Director may permit modifications to these specifications if they conflict with state law or local ordinances.



SIGN A
 MASONITE SIGN
 SCALE: 3/8" = 1'

PROJECT - SIGN A

ECONOMIC DEVELOPMENT ADMINISTRATION



EDA

U.S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT ADMINISTRATION

In partnership with

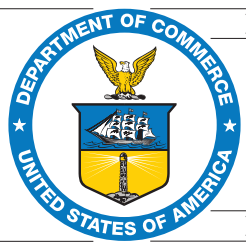
Recipient Name

PUTTING AMERICA TO WORK

Barack Obama, President of the United States

2.25"

13.5"



1.75"

1.75"

EDA

10"

Black
 Blue= PMS300
 Gold= PMS7406

2.0"

1.5"

4.0"

3.0"

3.0"

3.75"

3.0"

4.25"

2.0"

1.75"

4.0"

U.S. DEPARTMENT OF COMMERCE ECONOMIC DEVELOPMENT ADMINISTRATION

In partnership with

Recipient Name

PUTTING AMERICA TO WORK

Barack Obama, President of the United States

96"

48"

**BUY
AMERICAN!!**

Contractors are hereby notified that they are encouraged, to the greatest extent practicable to purchase AMERICAN - MADE equipment and products with funding provided under this award.

SECTION 01011

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. The Work of this Contract comprises the General Construction of:

BASEMENT LEVEL REHABILITATION

1. All existing partition walls and finishes to be removed including existing sanitary pump and room. The space is to be stripped down to its existing primary structure.
2. Provide new commercial kitchen with new mechanical / electrical / plumbing systems.
3. New restroom facilities, office space, and classroom to be provided.
4. New sanitary pump room to be provided for basement level.
5. Existing portion of concrete slab to be removed to provide 4'-0" pit for new elevator.
6. Existing retaining wall on east side of the building (under the main entry) to be removed to allow for the construction of new restroom facilities. New retaining wall to be provided directly under existing steps.

MAIN HALL LEVEL REHABILITATION

7. Portion of existing concrete slab (located by main entrance) is to be sawcut and removed to provide clear space for new elevator.
8. Existing entrance from street level (located on north side of building) is to be blocked up. Existing concrete stair is to be removed. Provide new concrete slab flush with existing main level floor elevation.
9. New structure to be provided for new stage area portions of the concrete slab below the stage may needed to be sawcut and removed to provide clear space for ventikation ducts of commercial kitchen below.
10. New metal frame partition chase wall to be provided with a separation of 4'-0" from West exterior wall for new mechanical systems.
11. New beverage station room to be provided on main hall level.
12. New ADA approved lift to provide for handicap accessibility to stage area.
13. New storage and custodial rooms to be provided on this level. Custodial room will have access hatch to mechanical units above.

MEZZANINE LEVEL REHABILITATION.

1. Provide new wood structure to allow for one continuous finish floor throughout existing mezzanine space to be even with existing stair landing elevations new mezzanine level will house two new offices, an open reception/waiting area, a new ADA accessible restroom, and storage room with area for air handler for mezzanine.
2. Provide new parapet wall with glass curtain wall separation at the edge of the new mezzanine.
3. Portions of the existing concrete mezzanine structure are to be sawcut and removed to provide clear space for new elevator, mezzanine restroom, and storage room. A new concrete slab is to be provided for the restroom and storage room.
4. Existing stairwells are to be renovated and refinished, new railings are to be provided.

EXTERIOR REHABILITATION

1. Pressure clean all exposed exterior building surfaces and prepare for repainting.
2. Remove all existing windows and doors prepare openings for new windows and doors. Windows and doors will be chosen to reflect the building's original historic design.
3. Existing exterior ramp and railings on south side of the building are to be removed. The area is to be prepared for the installation of a new ADA accessible ramp.
4. Provide openings on West exterior wall for new A/C package unit grilles.
5. Existing building entry gates (located at the front entrance) are to be removed.
6. The building façade is to be repainted, color to be selected by the Architect. Color will be chosen to reflect the historic building's original paint scheme.

GENERAL REHABILITATION

1. A new OTIS GEN2 machine-roomless, gearless elevator or approved equal is to be provided to meet all accessible requirements for a project of this type of occupancy.
2. All new mechanical / electrical / plumbing systems to be provided.
3. Natural gas to be provided for new commercial kitchen.
4. New signage is to be provided.

ALL OTHER WORK AS DELINIATED IN THE CONSTRUCTION DOCUMENTS AND AS REQUIRED TO COMPLETE ALL WORK INDICATED HEREWITH.

B. Related Section:

14. Project Coordination - 01040.

1.02 DELIVERY, STORAGE, AND HANDLING

The sequence of delivery and storage of materials shall comply with the Owner's restrictions for use of the site.

1.03 SITE CONDITIONS

Contractor's Use of Premises:

1. The Owner will designate an on-site area for the Contractor's use. Maintain in a clean and organized manner.
2. Remove excess materials from the site after the completion of each sequence or phase of construction.
3. Remove debris and clean areas of the building and project site containing construction materials, debris, and spills on a daily basis.
4. Be responsible for the security of materials and equipment stored on-site. Maintain the safety of persons in and surrounding the project site.
5. Before substantial completion, repair and return the designated on-site area to its original condition, or to its revised use.

1.04 SEQUENCING AND SCHEDULING

Work Restrictions:

1. Demolition:
 - a. Perform demolition in a manner to minimize noise, dust, time of disruption, and safety hazards.
 - b. Perform demolition during hours agreed to by the Owner.
 - c. Drill concrete and masonry to avoid reducing load bearing capacities of structural elements.
2. Safety: Supply and maintain safety signage, barriers, and construction aids. Conduct work to maintain the safety of the building occupants.
3. Ceilings:

- a. Provide new ceiling materials as per drawing. Provide new light fixtures in locations as noted on Drawings.
- b. New work shall match existing texture, color, pattern, construction, type, and quality of finish.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01025

SCHEDULE OF VALUES

PART 1 GENERAL

1.01 SUMMARY

A. Related Section:

1. 01310 - Construction Schedule Critical Path Method (CPM).

1.02 SUBMITTALS

A. Immediately after contract award and before preconstruction meeting, submit a proposed Schedule of Values to the A/E.

1. Schedule of Values shall be compatible with and related to Section 01310 - Construction Schedule Critical Path Method (CPM).
 - a. Tasks shall be cost loaded, organized, and coded to allow schedule to be summarized according to the Construction Specifications Institute (CSI) 16 division format.
 - b. Provide a detailed breakdown of the Contract Amount showing values assigned to each of the various parts of the Work coded and organized by area of work according to Section 01310.
2. Provide separate labor and material values of, but not limited to, the following:
 - a. Each major and minor construction stage and trade operation of work sequence identified by project specification section number, name of operation, and trade.
 - b. Subcontractors and suppliers individually broken down.
 - c. Monthly applications for payments in relation to the CPM.
3. Secure the A/E's approval of the Schedule of Values before submitting first requisition for payment.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01040

COORDINATION

PART 1 GENERAL

1.01 ARCHITECT/ENGINEER (A/E)

- A. References in the General Conditions to A/E refer to the firm of;

Architektnics, Inc., 7450 S.W. 48th Street, Miami, Florida 33155.

1.02 COORDINATION OF DRAWINGS AND SPECIFICATIONS

- A. Where discrepancies occur between the Drawings and specifications, between large scale Drawings and small scale Drawings, or within a document itself, the use of the item or arrangement of better quality, greater quantity, or higher cost shall be decided by the A/E.
- B. If any such discrepancies occur in the Drawings or specifications, notify A/E and the Owner for interpretations or decisions before proceeding with the Work. A/E interpretations or decisions shall be final.
- C. Drawings are diagrammatic and show general arrangement of systems and work included in the Contract.
1. Coordinate Drawings and verify dimensions before laying out work and be responsible for conflicts.
 2. Comply with Drawings in laying out Work and coordinate drawings of various trades involved in the project to verify spaces receiving work.
 3. Notify A/E if space conditions appear inadequate before proceeding.
 - a. If directed by A/E, make reasonable modifications in layout as needed to prevent conflict with work of various trades or for proper execution of Work without extra charge.

1.03 JOB MEASUREMENTS

- A. When measurements are affected by new or existing conditions, verify job measurements and consult A/E for final decision.

PART 2 NOT USED

PART 3 EXECUTION

3.01 CLEANING

- A. In addition to removal of rubbish and leaving buildings "Broom Clean":
1. Replace broken glass.
 2. Remove paint spots and smears, stains, marks, and dirt to provide clean surfaces.
 3. Clean glass, hardware, fixtures, casework, and equipment.
 4. Wash concrete surfaces, tile floors, tile walls and any other impervious floor and wall surfaces.

3.02 CONSTRUCTION DOCUMENTS

- A. The Drawings listed in the following Index of Drawings are a part of the Construction Documents:

TITLE SHEET I-1 INDEX

SURVEY

- S-1 SURVEYOR'S NOTES / VICINITY MAP
S-2 BOUNDARY AND TOPOGRAPHIC SURVEY

LIFE SAFETY

- LS-1 LIFE SAFETY PLAN – BASEMENT LEVEL
LS-2 LIFE SAFETY PLAN – MAIN LEVEL
LS-3 LIFE SAFETY PLAN – MEZZANINE LEVEL

ARCHITECTURAL

- A-1.1 SITE PLAN
A-1.2 SITE PLAN (DEMOLITION)
A-1.3 SITE PLAN (NEW)
- A-2.1 BASEMENT LEVEL FLOOR PLAN - DEMOLITION
A-2.2 BASEMENT LEVEL FLOOR PLAN - NEW
A-2.3 BASEMENT LEVEL FLOOR PLAN – REFLECTED CEILING PLAN - NEW
A-2.4 MAIN LEVEL FLOOR PLAN – DEMOLITION
A-2.5 MAIN LEVEL FLOOR PLAN - NEW
A-2.6 MAIN LEVEL FLOOR PLAN – REFLECTED CEILING PLAN - NEW

- A-2.7 MEZZANINE LEVEL FLOOR PLAN - DEMOLITION
- A-2.8 MEZZANINE LEVEL FLOOR PLAN - NEW
- A-2.9 MEZZANINE LEVEL FLOOR PLAN – REFLECTED CEILING PLAN - NEW
- A-2.10 ROOF PLAN – NEW

- A-3.1 EAST & WEST ELEVATIONS - DEMOLITION
- A-3.2 EAST & WEST ELEVATIONS - NEW
- A-3.3 NORTH ELEVATION - DEMOLITION
- A-3.4 NORTH ELEVATION - NEW
- A-3.5 SOUTH ELEVATION - DEMOLITION
- A-3.6 SOUTH ELEVATION – NEW

- A-4.1 BUILDING SECTIONS - DEMOLITION
- A-4.2 BUILDING SECTIONS - NEW
- A-4.3 BUILDING SECTIONS - NEW
- A-4.4 BUILDING SECTION – DEMOLITION
- A-4.5 BUILDING SECTION – DEMOLITION
- A-4.6 BUILDING SECTION – NEW
- A-4.7 BUILDING SECTION – NEW
- A-4.8 BUILDING SECTION – NEW

- A-5.1 WALL SECTIONS
- A-5.2 WALL SECTIONS

- A-6.1 ELEVATOR – PARTIAL FLOOR PLANS & SECTIONS

- A-7.1 BASEMENT TOILET PLAN
- A-7.2 INTERIOR ELEVATIONS – BASEMENT TOILET ROOM
- A-7.3 MEZZANINE TOILET ROOM – PLAN / INTERIOR ELEVATIONS / DETAILS

- A-8.1 DETAILS
- A-8.2 DETAILS

- A-9.1 WINDOW AND FINISH SCHEDULE
- A-9.2 DOOR SCHEDULE

STRUCTURAL

- S-1.0 FOUNDATION PLAN
- S-2.0 MAIN LEVEL FRAMING PLAN
- S-3.0 MEZZANINE LEVEL FRAMING PLAN
- S-4.1 SECTIONS & DETAILS (1 OF 4)
- S-4.2 SECTIONS & DETAILS (2 OF 4)

- S-4.3 SECTIONS & DETAILS (3 OF 4)
- S-4.4 SECTIONS & DETAILS (4 OF 4)
- S-5.0 MEZZANINE SECTIONS
- S-6.0 WIND PRESSURES FOR EXISTING OPENINGS

MECHANICAL

- M-1.0 NOTES & LEGENDS
- M-2.0 BASEMENT LEVEL – MECHANICAL
- M-3.0 MAIN LEVEL – MECHANICAL
- M-4.0 MEZZANINE LEVEL – MECHANICAL
- M-5.0 MECHANICAL ROOM SECTIONS AND ELEVATIONS
- M-6.0 HVAC SCHEDULES
- M-7.0 HVAC DETAILS #1
- M-8.0 HVAC DETAILS #2

PLUMBING

- P-1.0 NOTES & LEGENDS
- P-2.0 SITE PLAN – PLUMBING
- P-3.0 BASEMENT LEVEL – PLUMBING
- P-4.0 BASEMENT LEVEL – WATER PIPING SYSTEM & NATURAL GAS PIPING
- P-5.0 MEZZANINE LEVEL – PLUMBING
- P-6.0 MAIN LEVEL – PLUMBING
- P-7.0 SANITARY PIPING – ISOMETRIC
- P-8.0 COLD & HOT WATER ISOMETRIC
- P-9.0 DETAILS AND SPECIFICATIONS

ELECTRICAL

- E-1.0 NOTES AND LEGEND
- E-2.0 SITE PLAN – ELECTRICAL
- E-3.0 BASEMENT LEVEL – ELECTRICAL PLAN
- E-4.0 MAIN LEVEL – ELECTRICAL PLAN
- E-5.0 MEZZANINE LEVEL – ELECTRICAL PLAN
- E-6.0 BASEMENT LEVEL – LIGHTING PLAN
- E-7.0 MAIN LEVEL – ELECTRICAL PLAN
- E-8.0 MEZZANINE LEVEL – LIGHTING PLAN
- E-9.0 BASEMENT LEVEL – SYSTEMS PLAN
- E-10.0 MAIN LEVEL – SYSTEMS PLAN
- E-11.0 MEZZANINE LEVEL – SYSTEMS PLAN
- E-12.0 KITCHEN / BEVERAGE SERVICE ROOM – ELECTRICAL PLAN
- E-13.0 ELECTRICAL RISER

- E-14.0 ELECTRICAL PANEL SCHEDULES
- E-15.0 ELECTRICAL PANEL SCHEDULES
- E-16.0 ELECTRICAL PANEL & RISERS

FIRE PROTECTION

- FP-1.0 NOTES & LEGENDS
- FP-2.0 SITE PLAN – FIRE PROTECTION
- FP-3.0 BASEMENT LEVEL – FIRE PROTECTION PLAN
- FP-4.0 MEZZANINE LEVEL – FIRE PROTECTION PLAN
- FP-5.0 MAIN LEVEL – FIRE PROTECTION PLAN
- FP-6.0 DETAILS AND SPECIFICATIONS

KITCHEN

- FS-1.1 MAIN KITCHEN EQUIPMENT PLAN
- FS-1.2 MAIN KITCHEN PLUMBING PLAN
- FS-1.3 MAIN KITCHEN ELECTRICAL PLAN
- FS-1.4 MAIN KITCHEN SPECIAL CONDITIONS PLAN
- FS-1.5 MAIN KITCHEN REFRIGERATION PLAN
- FS-1.6 MAIN KITCHEN EXHAUST VENTILATOR ITEM #36
- FS-1.7 MAIN KITCHEN FIRE SUPPRESSION SYSTEM LINK #37
- FS-1.8 MAIN KITCHEN EXHAUST VENTILATOR ITEM #46
- FS-1.9 MAIN KITCHEN FIRE SUPPRESSION SYSTEM ITEM #47

- FS-2.1 BEVERAGE SERVICE AREA EQUIPMENT PLAN
- FS-2.2 BEVERAGE SERVICE AREA PLUMBING PLAN
- FS-2.3 BEVERAGE SERVICE AREA ELECTRICAL PLAN
- FS-2.4 BEVERAGE SERVICE AREA SPECIAL CONDITIONS PLAN
- FS-2.5 BEVERAGE SERVICE AREA – REFRIGERATION NOTES

END OF SECTION

SECTION 01043

MECHANICAL AND ELECTRICAL COORDINATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: General procedures for mechanical and electrical work and equipment of other divisions. Provide ventilation, mechanical, plumbing, fire protection, and electrical systems to form complete operating systems.

1. Furnish labor, supervision, energy, materials, tools, transportation, equipment, permits, insurance, taxes, temporary protection, and correction necessary to provide the work shown and specified.
2. Provide apparatus, appliances, materials, and work not shown on drawings but mentioned in specifications, or vice versa. Include incidental accessories necessary for proper installation and operation, even if not specified or shown, without additional expense to the Owner.
3. Apparatus referred to in singular numbers, shall include as many such items required to complete the work.
4. Provide piping, wiring, sheet metal connections, and miscellaneous accessories and materials necessary for a complete installation. Complete connections of supplied special traps, control valves, and other equipment furnished by the Owner, if any, and by other trades.

B. Work Not Included: Equipment and wiring provided by local telephone and power utilities.

1.02 DRAWINGS

A. Drawings are diagrammatic and show general arrangement of systems and work.

1. Do not scale drawings.
2. Consult drawings, shop drawings, and details for locations of fixtures, thermostats, and equipment. If not definitely located, obtain locations as required from A/E in writing before rough-in.

B. Comply with drawings in laying out the work.

1. Coordinate with the drawings of other trades to verify installation locations.

2. Maintain maximum headroom clearances and space conditions at all locations as required by codes and regulations.
 3. Where headroom or space conditions appear inadequate, obtain instructions from A/E before proceeding with installation.
- C. Make reasonable modifications in layout to prevent conflict with work of other trades or for proper execution of work, without extra charge to the Owner.
- D. Engineering Drawings are schematic for equipment since exact dimensions and rough-in requirements may vary with different manufacturers.
- 1.03 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLE SUBMITTALS
- A. Submit shop drawings, edited catalog cuts of components, product data, or samples for the following:
1. Names, sizes, and catalog numbers of specialty equipment, fixtures, valves, and other similar items.
 2. Equipment connections.
 3. Details of grills, platforms, pads, hangers, and machine and equipment supports.
 4. Details of typical pipe and duct supports.
 5. Fabrication shop drawings for ductwork, interior air supply, and exhaust systems, including details of louvers and other components.
 6. Shop drawings of switchgear, switchboards, panelboards, transformers, lighting fixtures, wiring and cable raceways and wireways, outlet boxes, pull boxes, junction boxes, wiring devices, disconnect switches, fuses, circuit breakers, and other electrical items as required.
 7. Submit layout drawings for main electrical equipment spaces such as closets. Submit layout drawings for review before installation of the work.
 8. Complete data and details of fans and motors, air handling units, and similar equipment including performance curves.
 9. Locations of sleeves for piping and ductwork passing through concrete slabs and concrete or steel structure. Do not place slabs or concrete fireproofing before submittal has been accepted.
- B. Submit catalog cuts and related shop drawings at the same time. Catalog cuts without shop drawings or vice versa are not acceptable.
- 1.04 COORDINATION WITH OTHER TRADES
- A. To ensure full coordination between trades, furnish information necessary to impacted trades to allow work of all trades to be installed satisfactorily and with

the least possible interference or delay.

- B. Correct, without extra charge to the Owner, mechanical or electrical work causing interference, unacceptable clearances, or accessibility problems among the work of mechanical, electrical, and other trades caused by lack of coordination.

1.05 SUPERVISION

- A. Make subcontracted trade provide services of an experienced superintendent in charge of installation of the work and skilled workers required to unload, transfer, erect, connect, adjust, start, operate, and test work. Each subcontracted trade superintendent shall be qualified and authorized to make decisions and answer questions directed to the Contractor by A/E regarding progress and details of work.

1.06 INSPECTIONS BEFORE OWNER'S ACCEPTANCE INSPECTION

- A. Arrange and schedule as many inspections of the work as necessary. Notify A/E, in writing, of safety-to-life systems functioning according to specifications.
- B. During the entire period scheduled for these inspections, Contractor and Contractor's superintendent of mechanical and electrical trades shall be present.

1.07 CERTIFICATES

- A. Upon completion of the Work, obtain certification of compliance or approval from authorities having jurisdiction over the Work and deliver certification to the A/E.
- B. See Section 01700 - Contract Closeout for additional certification requirements.

1.08 MANUFACTURERS' NAMEPLATES

- A. Each major component of equipment shall have the manufacturer's name, address, model number, and rating on a metal plate securely affixed in a conspicuous place.
- B. ASME code ratings or other data die-stamped into surface of equipment shall be in a conspicuous place.
- C. Nameplates of distributing agents are not allowed.

1.09 ACCEPTANCE

- A. Operation of mechanical and electrical work by Contractor does not constitute acceptance of work. Acceptance will occur after Contractor has adjusted equipment, demonstrated equipment satisfies requirements of drawings and specifications, has corrected defects, and furnished required certification.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment required for the work shall be new, of good quality, furnished, delivered, erected, connected, finished, and arranged to fit properly into building spaces. Provide accessibility for maintenance and replacement of equipment without need for removing adjacent equipment or piping. If no specific type or quality of material is given, provide materials accepted by A/E.
- B. Equipment shall be of type and capacity shown on drawings, specification equipment schedules, and by manufacturers designated in specifications.
- C. Use the same manufacturer of equipment for parts replacement and maintenance, or approved equal.
- D. Equipment, materials, and components shall be new and current products of manufacturers engaged in production of such equipment and be manufacturer's latest design conforming to Construction Documents. Components by the same manufacturer shall be mechanically and electrically consistent with ratings of installed apparatus. Acceptance or approval is required by authority having jurisdiction. Materials used in fire rated construction and in electrical work shall be UL listed.
- E. Hardware and accessory fittings shall be standard sizes designed, intended, or appropriate for the use. Furnish with corrosion protection suitable for the installed atmosphere.
- F. Equipment of a similar nature shall be by the same manufacturer.
- G. Coordinate space requirements, mounting arrangements, and service connections when substitute equipment is furnished.
 - 1. Before ordering, verify equipment fits assigned spaces and can be

- moved into position without interference from door clearances, ceiling heights, crane access, and other construction.
2. Be responsible for expenses caused by substitution of equipment used as a basis for design.
 3. Maintain clearances for electrical equipment as required by the National Electrical Code (NEC).

PART 3 EXECUTION

3.01 EQUIPMENT INSTALLATION

- A. Where necessary to meet space conditions, bring equipment to its ultimate location disassembled and assemble in place. Provide flanges, studs, and the needed accessories for matching, alignment, and field assembly.
- B. Conduct field tests of equipment during and after assembly under direct supervision of manufacturer's authorized representative. Upon satisfactory conclusion of field tests, manufacturer shall furnish, for each such apparatus or equipment, a written statement certifying there has been no invalidation of any warranties nor impairment of capacity or functioning of equipment. Field tests shall be in addition to factory tests, shop tests, and adjustments.
- C. Avoid field assembly wherever possible by suitable scheduling of the Work.
 1. Field assembly of equipment or apparatuses shall not be grounds for extra compensation.

3.02 FABRICATION AND INSTALLATION

- A. Workers: Use trained and experienced workers, knowledgeable with the items to be installed and manufacturer's current recommended methods of installation for actual fabrication, installation, and testing of work specified.
- B. Welding: Perform welding by certified welders.
 1. Perform electric arc welding conforming with American Welding Society standards.
 2. Clean each weld layer.
 3. Chip out trapped slag and unfused areas before applying next bead.
 4. Visually inspect finished weld for cracks, porosity, or imperfections.
 5. If weld contains any defects, repair to satisfaction of A/E.

- C. Set equipment level, properly aligned, and assembled. Secure equipment and materials firmly in place. Screws, bolts, nuts, clamps, fittings, and other fastening devices shall be tight.
- D. Repair to a new condition or replace materials damaged during delivery, storage, or installation. Touch-up scratched or marred finishes on equipment to match original finish or completely refinish.
- E. Enclosures, panels, cabinets, relays, safety switches, fixtures, and other exposed equipment or accessories shall be factory painted or finished as indicated otherwise. Group mounted items shall be similar in finish and color.
- F. Make connections for air-conditioning and ventilating equipment and controls. Furnish individually mounted starters, thermostats, firestats, and other control devices as specified.
- G. Do not cut, weld, or otherwise weaken building structure to ease installation of mechanical or electrical equipment and materials.
- H. Support electrical raceways, conduits, light fixtures, piping, and HVAC ducts from overhead structure. Support shall not be from ducts, pipes, conduits or other similar non-structural components.
- I. Design and coordinate to safely support suspended electrical and mechanical items on combined support systems.

3.03 SUPPORT ACCESSORIES

- A. Provide inserts, anchors, bolts, boxes, sleeves, and hangers for foundations, supports, pads, bases, and piers required for support of equipment, piping, pumps, tanks, compressors, motors, transformers, panels, racks, and other equipment specified.

3.04 EXCAVATION AND BACKFILLING

- A. Perform excavation, backfilling, and compaction of trenches required for the installation of mechanical and electrical services, and underground piping to points of connection with exterior underground utilities outside the building as specified in Section 02221 - Excavating, Backfilling, and Compaction for Utilities.

3.05 SLEEVE BLOCKOUTS, CUTTING AND PATCHING, AND CORING AND DRILLING

A. Sleeves:

1. Provide pipes passing through concrete slabs with sleeves constructed of galvanized sheet steel with lock seam joints of the following minimum gages.
 - a. 22 gage for pipes 3 inches and smaller.
 - b. 20 gage for pipes larger than 3 inches to 6 inches.
 - c. 18 gage for pipes over 6 inches.
2. Provide pipes passing through interior concrete or masonry walls and partitions with Schedule 40 steel pipe sleeves.
3. At pipes subject to expansion and contraction, provide sleeves of sufficient diameter to allow free movement of pipe. Where pipes are insulated, sleeves shall be of sufficient diameter to pass pipe insulation. Measure floor and wall construction and finishes to determine the proper length of sleeves for various locations. Actual lengths shall comply with the following:
 - a. Terminate sleeves flush with walls and ceilings and 2 inches above the finished floor in areas where the pipes are concealed.
 - b. Extend pipe sleeves 1/4" above finished floor in areas where the pipes are exposed.
 - c. Pipes passing through concrete slabs resting on earth or fill shall be integral with the concrete.
4. The annular space between the pipe or pipe covering in sleeves set in fire walls or floors shall be packed according to the recommendations of NFPA.

B. Provide chases where indicated or needed under work of other Sections.

C. Cutting and Patching:

1. Cut and patch as needed for installation of mechanical and electrical equipment. Perform finish patching according to specifications for each finish, by workers skilled in each type of finish.
2. Install work so no undue cutting and patching will be required in building construction. Do no cutting capable of impairing strength of building construction.
3. Cut and patch as needed for pipes if sleeves and inserts were not

- installed, or where incorrectly located.
4. Provide for access through structural steel webs by noting number, size, and locations on shop drawing submittal and only as accepted by A/E. Reinforce holes as directed by A/E.

D. Coring and Drilling:

1. If a sleeve is omitted, core drill to allow insertion of a pipe sleeve with sufficient clearance to allow grouting in place with specified backer rod and sealant between the hole and sleeve.
2. When core drilling or cutting duct holes in foundations, walls, beams, columns, or structural slabs, determine the location of reinforcement and tendons before coring.
 - a. Core or cut to provide 1-1/2" minimum cover over reinforcing steel or tendons below grade, at exterior or wet locations.
 - b. Leave 3/4" minimum cover in dry or interior locations.
 - c. If cutting tool comes in contact with reinforcement or a tendon, move to a location where steel will not be cut and patch to provide specified concrete coverage over reinforcement.
 - d. Drill overhead concrete slabs from underside.
3. Drill structure as needed to install hangers, anchors, and other supporting devices or fasteners only if inserts have been omitted from the concrete.
4. Holes, except for small screws, shall not be drilled in beams or other structural members, without obtaining prior approval of A/E.

3.06 COVERING OF WORK

- A. Do not cover, or otherwise hide from view, ducts, piping, fittings, or any other work before such work has been examined or approved by A/E or other authority having jurisdiction.
- B. Remove discovered defective work and replace or correct at no additional cost to the Owner.

3.07 SETTING AND ALIGNMENT OF EQUIPMENT

- A. Furnish templates and patterns for installation of equipment. Furnish setting plans and shop details of adjoining work of other trades.

- B. Set unattached electric motors in place under mechanical sections for connection under Division 16.

3.08 NOISE ELIMINATION

- A. Design, select, and install electrical equipment to eliminate noise from electromagnetic fields, radio frequencies, and any other types and levels of noise capable of interfering with other audio, video, or radio frequency equipment in building.

3.09 NOMINAL VOLTAGE

- A. Advise trades and others furnishing equipment of the nominal characteristics, 120/208 volts or 277/480 volts. Equipment furnished shall be suitable for satisfactory operation at such nominal characteristics, either single phase or three phase wye, as shown on Drawings.

3.010 SOUND ISOLATION

- A. Back-to-back boxes, either for power, switches, telephone, or audiovisual are not allowed in walls or partitions.
- B. Stagger boxes to avoid sound transmission.

3.011 PIPING, DUCTWORK, AND RACEWAY INSTALLATION

- A. Provide clearances under beams and over windows for maximum headroom. Verify locations of lines and types of fittings used to obtain these clearances.
- B. Coordinate piping, ductwork, raceway, and lighting trades with each other and with other equipment trades. Where insufficient headroom is provided for work above suspended ceilings or in vertical shafts, obtain clarification and instruction from A/E before installing work.
- C. Lines and Levels: Each trade is responsible for calculating and installing levels and slopes of ductwork and piping based on Contractor's reference lines and bench marks.

3.012 WATERPROOFING AND ROOFING

- A. Where mechanical or electrical work penetrates building envelope or waterproofed construction, the method of installation shall prevent transmission

of water, heat, cold, and drafts.

- B. Follow details, including architectural, establishing types of waterproofing construction for each penetration condition.
- C. Where a detail suitable to an encountered condition is lacking, request written instructions from A/E.
- D. Provide necessary sleeves, sealing, and flashing required to make openings watertight.

3.013 PAINTING AND COATINGS

- A. Except for pipe and pipe fittings, deliver equipment not galvanized, copper, bronze, or with a factory applied final finish, to the job site with a factory applied prime coat of paint per manufacturer's standard specifications.
- B. Apply one coat of asphaltum or other moisture resistant coatings to coil housings and drip pans. Coat insides of drip pans with 2 coats of asphaltum.
- C. Provide buried steel pipes and conduit with 2 coats of asphaltum.

3.014 EXISTING CONDITIONS

- A. Work shall be according to the specifications and Drawings and to the complete satisfaction of the Owner and A/E. Materials and patching required to make project complete shall match existing where applicable. Leave alterations and construction in new condition.
- B. Items to be reused according to Construction Documents, temporarily removed, or de-energized shall be accomplished without damage. Equipment shall be maintained, if required, and returned to its original operating condition.
- C. Perform alterations, demolition, removal, cutting and patching, and other work necessary for construction without additional cost to the Owner. This includes removal, rerouting, etc. of electrical items required to complete installation.
- D. Patch or replace damaged floors, walls, ceilings, and other finished surfaces altered to accommodate the new construction. Patched surfaces shall match existing adjacent surfaces.
- E. Coordinate cutting, patching, demolition, repairing, or replacement of work.

- F. Where alterations take place in occupied areas, clean up daily. Keep noise to a minimum.
- G. Do not disrupt services to existing buildings in any way except with the written permission of the Owner.
- H. Reroute conduits and extend or replace circuits as required.
- I. Be fully responsible for any damage to existing buildings and contents including machinery, furniture, and equipment due to operations. Repair or replace any damages with the direction of A/E at no additional cost to the Owner.

END OF SECTION

SECTION 01045

CUTTING AND PATCHING

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Cutting, fitting, patching, excavation, and backfill as required to complete the Work.
- B. Related Sections:
 - 1. 02072 - Removals.
 - 2. 02200 - Earthwork.
 - 3. 04530 - Masonry Patchwork.
 - 4. 06100 - Carpentry.
 - 5. Mechanical - Division 15.
 - 6. Electrical - Division 16.

1.02 INSPECTION

- A. Inspect existing conditions of the Work, including elements subject to damage or to movement during cutting and patching.
 - 1. After uncovering work, inspect conditions affecting installation of products or performance of work.
 - 2. Report unsatisfactory or questionable conditions to A/E in writing. Do not proceed with the Work until A/E has provided further written instructions.

1.03 PREPARATION

- A. Provide adequate temporary support as necessary to ensure structural integrity of the Work.
- B. Provide devices and methods to protect other portions of the Work from damage.
- C. Provide protection from elements for portions of the Work exposed by cutting and patching work. Maintain excavations free from water.

1.04 PERFORMANCE

- A. Execute cutting and demolition by methods preventing damage to other work and providing proper surfaces to receive installation of new work.
 - 1. Refinish entire surfaces as necessary to provide an even finish to match adjacent finishes:
 - a. For continuous surfaces, refinish to nearest intersecting plane.
 - b. For an assembly, refinish entirely.
- B. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
- C. Restore temporarily cut or removed work.
- D. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations.
- E. Excavate and backfill using methods preventing settlement or damage to other work.
- F. Restore work in a timely manner coordinated with the A/E and the Owner.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01200

PROGRESS MEETINGS

PART 1 GENERAL

1.01 PROGRESS MEETINGS

- A. Attend regularly scheduled progress meetings at a time agreed upon by Contractor, A/E, and the Owner. Determine meeting times at the preconstruction meeting.
- B. Attend meetings scheduled by A/E during the progress of the Work.
- C. The following list of suggested agenda items may be incorporated into progress meetings for review or approval as directed by A/E or the Owner.
 - 1. Minutes of previous meeting.
 - 2. Work progress since last meeting.
 - 3. Field observations, problems, and conflicts.
 - 4. Problems impeding the construction schedule.
 - 5. Corrective measures and procedures to regain projected schedule.
 - 6. Revisions to the construction schedule.
 - 7. Off-site fabrication and delivery schedules.
 - 8. Coordination of work for the following work period.
 - 9. Work quality standards.
 - 10. Proposed changes and impact on construction schedule and completion date.
 - 11. Status of Change Orders, Request for Proposals (FRP), and Request for Information (RFI).
 - 12. Other business.
- D. Attendance:
 - 1. A/E and A/E's consultants as needed.
 - 2. Contractor or authorized representatives.
 - 3. Subcontractors as appropriate to the agenda.
 - 4. Manufacturer's representatives or suppliers as appropriate to the agenda.
 - 5. Others as appropriate to the agenda.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01310

CONSTRUCTION SCHEDULE CRITICAL PATH METHOD (CPM)

PART 1 GENERAL

1.01 CONSTRUCTION SCHEDULE

- A. Within 30 days of contract award, prepare and submit to A/E a proposed construction schedule for review. No payments shall be made to Contractor until said schedule has been submitted.

1.02 DETERMINATION OF FINAL CONSTRUCTION SCHEDULE

- A. Meet with A/E and Project Manager to determine:
 - 1. Construction Staging Area Location: Define construction staging area at time of final construction schedule determination and delineate and resolve specific restrictions, if any.
 - 2. Construction Area Access: Define construction area access at time of final construction schedule.

1.03 INITIAL INPUT DATA AND UPDATE

- A. Provide initial input data and update it monthly to A/E relating to actual work activities accomplished to forecast future work activities and durations.
 - 1. Report problem areas to A/E, including current, unresolved or anticipated delay factors and impact on other activities and control steps are being taken or planned.
 - 2. Review monthly progress and recommend ways to improve schedule and anticipate delays or safety problems.
 - 3. Inform and update participant's revisions to construction schedule.
 - 4. Submit revised schedule each month concerning the next month's construction activities.

1.04 CPM TASKS REQUIRED

- A. CPM schedule shall contain between 50 and 200 detail tasks and in bar chart format showing relationships between tasks.
- B. Schedule long lead time and special fabrication items and provide appropriate

selection codes incorporated into each item to include, as a minimum, the following categories:

1. Submittal.
 2. Approval.
 3. Fabrication/Delivery.
 4. Installation.
- C. Schedule tasks to have a maximum Original Duration of 20 working days except for procurement tasks that may be 30 working days without including a follow up task.
- D. Schedule tasks in working days and in Precedence format.
- E. Include verbs in task descriptions to describe the action taken. For example, "Install lighting fixtures" instead of "Light Fixtures".

1.05 ACTIVITY (TASK) CODES

- A. Code each task to minimally define:
1. Area of Work.
 2. Applicable CSI 5 digit numbering system as used in the project specifications.
 3. Area of work including building and floor where applicable.

1.06 SCHEDULES

- A. Designate the original approved schedule as the baseline schedule. Duplicate to produce a schedule that is updated monthly and to be used as the current schedule.
- B. Each update shall include identification of the Actual Start and Actual Finish dates and remaining duration of all tasks started.
- C. Each approved change order shall be reflected in the current schedule.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01340

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Shop drawings, manufacturer's catalog cuts, product data, samples, and Shop Drawing Transmittal form necessary to satisfy requirements specified.
- B. Related Sections:
 - 1. 01310 - Construction Schedule Critical Path Method (CPM).
 - 2. 01600 - Material and Equipment.
 - 3. 01700 - Contract Closeout.
 - 4. 01740 - Warranties.

1.02 DATES FOR SUBMISSION AND REVIEW

- A. Designate in the CPM the dates for submission to A/E and review completion dates needed for shop drawings, product data, and samples to maintain the project schedule.

1.03 SHOP DRAWINGS/MANUFACTURER'S CATALOG CUTS

- A. Shop Drawings: Submit 6 prints for each required shop drawing.
 - 1. Identify each shop drawing with the following information placed on each drawing:
 - a. Name of the facility.
 - b. Name of project at the facility.
 - c. Owner's project number.
 - d. Name of company submitting the shop drawing.
 - e. Date of drawing.
 - 2. Provide a blank space 6 inches wide by 4 inches high in the lower right corner of each shop drawing page for the A/E's shop drawing stamp.
- B. Manufacturer's Catalog Cuts: Submit 6 copies of each catalog cut or 6 edited catalogs.

- C. Submittal of Samples, Color Charts, Color Chips, or Color Samples for Selection and Coordination:
 - 1. Submit 3 copies of all material color charts, color chips, or color samples within 60 days after start of construction to allow for selection, color coordination, and final acceptance by A/E. Material color charts, color chips, or color samples shall be manufacturer's full color range and of standard sizes unless specified otherwise.
- D. Prints, samples, and color charts shall be at the expense of Contractor.
- E. Submit all color selection materials for complete coordination of color scheme. No individual color selections will be approved before receipt of all the colors.

1.04 SUBMITTAL IDENTIFICATION

- A. Submit only 1 item or system per letter of transmittal properly identified to include the appropriate specification section and section paragraphs.
- B. When shop drawings, edited catalog cuts of components, product data, diagrams, or charts are submitted with more than 1 type of specified product, identify the particular item, including options, intended for use in the Work.
- C. Resubmittals shall be identified with original shop drawing number and followed with a dash (-) and a letter A, B, etc. corresponding to the resubmittal sequence.

1.05 SUBMITTAL COMPLETENESS

- A. Submit catalog sheets, product data, shop drawings, material samples, color chips, color charts, test data, and warranties at the same time for each item.

1. Submit shop drawings with appropriate data and with the Drawing identification mark numbers as shown, specified, or scheduled.
2. Shop drawings without identification mark numbers or with incomplete performance information will not be reviewed until submission is complete.

1.06 PREPARATION

- A. Clearly mark each submittal to identify each appropriate product or model.
- B. Show performance characteristics and capacities.
- C. Show dimensions and clearances required.

1.07 IDENTIFICATION

- A. Identify details by reference to sheets and details, schedules, or room numbers as shown on Drawings.
- B. Manufacturer's standards, schematic drawings, and diagrams:
 1. Modify drawings and diagrams to delete information not applicable to the Work.
 2. Supplement standard information to provide information specifically applicable to the Work.

1.08 SAMPLES

- A. Submit samples of sufficient size and quantity to clearly illustrate:
 1. Functional characteristics of product, integrally related parts, and attachment devices.
 2. Full range of color, texture, and pattern.

1.09 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, catalog cuts, product data, and samples before submission. Determine and verify:
 1. Field measurements.
 2. Field construction criteria.

3. Catalog numbers and similar data.
 4. Conformance with Construction Documents.
- B. Coordinate each submittal with requirements of the Work and of Construction Documents.
 - C. Notify the A/E, in writing at time of submission, of any deviations in submittals from requirements of Construction Documents.
 - D. Shop drawings shall be stamped, approved, and signed by the Contractor before submittal to A/E, otherwise they will be sent back to the Contractor without being processed by the A/E.
 - E. Do not ship apparatus or equipment from stock or fabricate until shop drawings have been reviewed and approved by A/E.
 - F. Always maintain and have available for reference a field copy of accepted shop drawings at the job site.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01410

TESTING LABORATORY SERVICES

PART 1 GENERAL

1.01 TESTING LABORATORY

- A. The Contractor will employ and pay for the services of an independent testing laboratory to perform specified testing as noted in Section 15991 - Testing and Balancing.
 - 1. Contractor shall cooperate with laboratory to perform its required services.
 - 2. Employment of laboratory shall not relieve Contractor's obligations to perform the Work.

1.02 LIMITATIONS OF AUTHORITY OF TESTING LABORATORY

- A. Laboratory is not authorized to:
 - 1. Release, revoke, alter, or expand requirements of Construction Documents.
 - 2. Approve any portion of the Work.
 - 3. Perform any duties of the Contractor.

1.03 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with laboratory personnel and provide access to work or manufacturer's operations.
- B. Secure and deliver to the laboratory adequate quantities of representative samples of materials requiring testing.
- C. Furnish copies of products test reports as required to A/E.
- D. Furnish incidental labor and facilities:
 - 1. To provide access to work to be tested.
 - 2. To obtain and handle samples at project site or at source of product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For storage and curing of test samples.

- E. Notify the Owner before testing operation to allow for laboratory assignment.

1.04 AUTHORIZATION FOR TESTS

- A. A/E will designate tests to be performed and Contractor shall not obligate the Owner for tests without A/E's acceptance.

1.05 TESTING COSTS PAID BY THE OWNER

- A. Tests of various materials, methods, and equipment are required by the Owner and will be performed by the Owner's Testing Laboratory.
- B. The Owner will only pay for initial Owner required tests of materials, methods, and equipment to verify compliance with Construction Documents.

1.06 TESTING COSTS PAID BY CONTRACTOR

- A. Tests:
 - 1. Specified tests of Work with non-compliance results shall be retested at no cost to the Owner until satisfactory compliance is achieved.
 - 2. Not Specified in Construction Documents: Tests determined by Contractor to be of Contractor's benefit and ordered by Contractor, shall be paid by Contractor.
 - 3. Contractor's Option: Contractor may employ the Owner's testing laboratory or may employ a separate, equally qualified independent testing laboratory, acceptable to the Owner and A/E, to perform additional inspections, sampling, and testing the Contractor has determined to be of Contractor's benefit or obligated to perform due to failure of specified initial testing.
- B. Contractor shall furnish gas, water, electricity, and expendable chemicals as necessary for construction and testing purposes.
- C. If substitute materials or equipment are proposed by Contractor, Contractor shall pay testing costs deemed necessary by the A/E to satisfy the A/E and Contract Documents.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01530

BARRIERS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Suitable barriers required to prevent public entry and to protect Work, existing facilities, and landscaping from construction operations, and barrier removals when no longer needed or at completion of Work.

1.02 QUALITY ASSURANCE

- A. Comply with applicable federal, state, and local codes and standards.

PART 2 PRODUCTS

2.01 MATERIALS

- A. New or used, suitable for the intended purpose and complying with requirements of applicable codes and standards.
- B. Fencing: Open-mesh materials per Contractor's option and a minimum height of 6'-0". Construct open-mesh fences according to industry standards.
- C. Other Barriers: Materials per Contractor's option and as appropriate to serve the required purpose.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install barriers in a neat and uniform appearance.
- B. Maintain barriers as needed during construction period.
- C. Relocate barriers as required by progress of construction.
- D. Fences:

1. Before starting work at the site, install enclosure fence with suitable locking entrance gates.
 - a. Locate fences to enclose construction areas and construction staging area.
 - b. Provide vehicular entrance gates in suitable locations to construction and existing facilities. Avoid interference with traffic patterns.
 - c. Locate pedestrian entrance gates as required to provide controlled personnel entry.

3.02 REMOVALS

- A. Remove barriers, including foundations, when construction has progressed to the point when barriers are no longer needed and when approved by A/E.
- B. Clean and repair damage caused by installation or removal of barriers.

END OF SECTION

SECTION 01600

MATERIALS AND EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: General requirements for delivery, storage, handling, and installation of products and Contractor's options in selecting products and requesting substitutions.

1.02 SUBMITTALS

- A. Products Listed: Within 45 days after contract award date, submit to A/E a complete list of specified products to be provided, with names of manufacturers and installing subcontractors.
- B. Manufacturer's Instructions: Comply with manufacturer's printed installation instructions and manufacturer's Materials Safety Data Sheets (MSDS). Obtain and distribute copies of such information to parties involved in installation, including 3 copies to A/E.
 - 1. Maintain 1 set of complete instructions and 1 set of MSDS at the job site during installation and until project completion.

1.03 DELIVERY, STORAGE, AND HANDLING

- A. Arrange deliveries of products according to construction schedules. Avoid conflicts with work, site conditions, and school operations, if applicable.
 - 1. Schedule product delivery for minimum storage time at the site.
- B. Products shall be delivered in undamaged condition, in manufacturer's original containers or packaging, and with identifying labels intact and legible.
- C. Immediately upon delivery, inspect shipments to ensure compliance with Construction Documents and approved submittals. Verify products are undamaged.
- D. Handle products without soiling or damaging.
- E. Storage and Protection:

1. Store products according to manufacturers printed instructions, with seals and labels intact and legible.
 2. Store products prone to damage by elements in weathertight enclosures.
 3. Maintain temperature and humidity within range required by manufacturer's instructions.
 4. Store products aboveground, on blocking, or skids to prevent soiling or staining.
 5. Cover products prone to deterioration with waterproof covers and provide adequate ventilation to avoid condensation.
 6. Store loose granular materials in a well-drained area on solid surfaces to prevent mixing with foreign matter.
 7. Arrange storage to provide easy access for inspection. Inspect stored products periodically to ensure products are maintained under specified conditions and are free from damage or deterioration.
- F. Protection After Installation: Protect installed products from damage. Remove coverings when protection is no longer needed.

1.04 OWNER'S INSTRUCTIONS

A. Contractor's Options:

1. Where products are specified by reference standard only, select any product complying with the requirements of the standard.
2. Where products are specified by naming two or more products or manufacturers, select one of the products or manufacturers named.
 - a. For products specified by naming two or more products or manufacturers without the words "or accepted equivalent" or similar language, a substitution option does not exist.
3. For products specified by naming only one product or one manufacturer, and the words "or accepted equivalent" or similar language, any product submitted as an equivalent shall be treated as a substitution to be submitted for consideration only after award of the contract.
 - a. For products specified by naming only one product and manufacturer without the words "or accepted equivalent" or similar language, a substitution option does not exist.

- B. Product Substitutions: For a period of 45 days after contract award date, A/E will consider written requests from Contractor for substitution of products

according to the General Conditions.

- C. A request for substitution of a product may be submitted to the A/E after the Contractor:
 - 1. Has investigated the proposed product and determined it is equal or superior to the specified product.
 - 2. Agrees to provide same or better warranty for product substitution as for product specified.
 - 3. Agrees to be responsible for coordinating and installing the substitution.
 - 4. Agrees to pay for any necessary changes to other work required by the substitution selected by Contractor.
 - 5. Agrees to pay costs, including A/E's services required to revise the Construction Documents to make the work complete.
 - 6. Waives all claims for additional costs that may subsequently become apparent due to the substitution.
 - 7. Is offering either a substantial credit to the Owner for acceptance of the substitution or a convincing justification that the product to be provided as the substitution is substantially superior in quality, performance, compatibility with adjacent products, durability, vandal-resistance or other important factors.

- D. After the period of 45 days has elapsed, the only substitution requests allowed are for the removal of the specified products from the marketplace or natural catastrophes and other similar acts of God.
 - 1. Scheduling conflicts are not grounds for substitution requests.

PART 2 PRODUCTS

2.01 MANUFACTURED AND FABRICATED UNITS

- A. Fabricate and assemble according to referenced standards and approved shop drawings.
- B. Manufactured related parts of duplicate units to standard sizes and gages shall be interchangeable.
- C. Match similar items by one manufacturer.
- D. Do not use material or equipment for other than designated or specified purpose.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Handle, install, connect, clean, and adjust products according to manufacturers' instructions and specifications.
 - 1. If job conditions or specified requirements conflict with manufacturer's instructions, notify A/E. Do not proceed with the work until A/E issues clarification.

3.02 FIELD QUALITY CONTROL

- A. Upon completion of work and tests, provide necessary skilled labor for operating systems and equipment for 8 continuous hours a day for 3 consecutive days.
- B. Notify major subcontractors to be present at inspections with necessary tools and equipment to facilitate easy and safe access to all parts of the buildings and equipment.

END OF SECTION

SECTION 01700

CONTRACT CLOSEOUT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Fiscal provisions, legal submittals, and administrative requirements.
- B. Closeout Submittals Required of Trades: In respective specification sections and as specified in this section.

1.02 RECORD DOCUMENTS

A. Record Drawings:

- 1. Keep accurate notes on Record Drawings of Work as installed. Include dimensions of underground lines, their offsets, and valve locations.
- 2. Maintain the set of Record Drawings apart from those used for construction.
- 3. Mark each page of the Record Drawings with the words "RECORD DRAWINGS" in neat, large printed letters.
- 4. Record information concurrently as Work progresses.
 - a. Do not conceal any work until the required information is marked on Drawings.
 - b. Show locations of internal utilities and appurtenances concealed in the construction to visible and accessible features.
 - c. Show locations of field changes and details not on original Drawings.

B. Record Specifications and Addenda:

- 1. Mark each section to record manufacturer, trade name, catalog number, supplier of each product, and item of equipment installed.

1.03 CONTRACTOR'S CLOSEOUT SUBMITTALS TO A/E

- A. Evidence of compliance with requirements of governing authorities and construction documents as noted in various sections.
 - 1. Project record documents.

2. Operating and maintenance data, instructions to Board's personnel.
3. Warranties and bonds.
4. Record list of various building finishes including tile, carpet, acoustical finish, wall covering, paints and coatings, giving manufacturers' brand names or types and colors used in various locations.
5. Keys: According to requirements of Section 08710 - Finish Hardware.
6. Spare parts and maintenance materials.
7. Evidence of payment and release of liens.

1.04 FINAL CHANGE ORDER

- A. Prepare a Final Change Order, reflecting approved adjustments to contract sum not made by previous Change Orders.

1.05 FINAL APPLICATION FOR PAYMENT

- A. Submit final Application.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01730

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 OPERATION MANUALS AND MAINTENANCE INSTRUCTIONS

- A. Submit 1 draft copies of complete operating and maintenance manuals to A/E for review within 60 calendar days after acceptance of mechanical and electrical equipment shop drawings. Submit 2 copies of A/E accepted final operating and maintenance manuals for record documents, bound in durable 3 ring binders, acceptable to A/E, with tabs and index at least 5 days before scheduled acceptance inspection.
 - 1. Properly identify and mark manufacturers' Standard literature to clearly define information applicable to installed equipment.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 01740

WARRANTIES

PART 1 GENERAL

1.01 SUMMARY

- A. Work Includes: General administrative and procedural requirements for manufacturers' standard or special warranties on products as specified.
- B. Related Sections:
 - 1. 01700 - Contract Closeout.
 - 2. 01730 - Operation and Maintenance Data.
- C. Disclaimers and Limitations: Manufacturers' disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work incorporating the products, nor does it relieve suppliers, manufacturers, or subcontractors required to countersign special warranties with the Contractor.

1.02 DEFINITIONS

- A. Standard Product Warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
- B. Special Warranties are written warranties required by or incorporated in the Construction Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.03 WARRANTY REQUIREMENTS

- A. Related Damages and Losses: When correcting warranted Work that has failed, remove and replace other Work damaged because of such failure or that must be removed and replaced to provide access for correction of warranted Work, at no cost to the Owner.
 - 1. Correction of work shall include shipping, labor, supervision, and related work involved in replacing defective parts or materials provided by manufacturers under their warranties.
- B. Replacement Cost: Upon determination that Work covered by a warranty has

failed, replace or rebuild the Work to an acceptable condition complying with requirements of Construction Documents.

- C. The Owner's Recourse: Written warranties made to the Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which the Board can enforce other duties, obligations, rights, or remedies.
 - 1. Rejection of Warranties: The Owner reserves the right to reject warranties and to limit selections to products with warranties not in conflict with requirements of the Construction Documents.
- D. Warranties made by subcontractors to the Contractor are a part of the Contractor's responsibility to the Owner.
- E. The Owner reserves the right to refuse acceptance of Work where a special warranty, certification, or similar commitment is required on such Work or part of the Work, until evidence is presented that entities required to countersign such commitments have done so.

1.04 SUBMITTALS

- A. Submit written warranties to the A/E before the date certified for Substantial Completion. If the A/E's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work or a designated portion of the Work, submit written warranties upon request of the A/E.
- B. Form of Submittal: At Final Completion, compile 2 copies of each required warranty properly executed by the Contractor, subcontractor, supplier, or manufacturer. Organize the warranty documents into an orderly sequence based on the table of contents of the specifications.
- C. Provide warranties in heavy-duty, commercial quality, durable 3-ring vinyl covered loose-leaf binders.

PART 2 NOT USED

PART 3 EXECUTION

3.01 SCHEDULE OF WARRANTIES

- A. Schedule: Provide warranties on products and installations as specified in the following Sections:

THERMAL AND MOISTURE PROTECTION

07525 SBS Modified Bitumen Mineral Surfaced Roofing: 5 years for labor from applicator and 20 years for materials from manufacturer.

07600 Flashing and Sheet Metal: 20 years from manufacturer for repair and replacement and 5 years for labor.

DOORS AND WINDOWS

08520 Aluminum Windows: 3 years for aluminum window.

SPECIALTIES

10625 Operable Partitions: Warranty 3 years for defects in material or installation.

END OF SECTION

02011

SOIL BORING DATA

See Attached Report as prepared by Wingerter Laboratories, Inc.

END OF SECTION

SECTION 02070

SELECTIVE DEMOLITION (REROOFING)

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: The selective removal and subsequent offsite disposal of portions of the existing roofing system indicated on drawings, as specified in this section, and as required to accommodate new construction.
- B. Related Documents:
 - 1. Drawings and general provisions of Contract, including General and Supplementary Conditions, and Division 1 specification sections.
- C. Related Work Specified Elsewhere:
 - 1. Remodeling construction work and patching are included within the respective section of specifications, including removal of materials for reuse and incorporation into remodeling or new construction.
 - 2. Relocation of pipes, conduits, ducts, and other mechanical and electrical work is specified elsewhere.

1.02 SUBMITTALS

- A. Submit the following for review before starting work.
 - 1. A schedule indicating proposed sequence of operations for selective demolition work to A/E for review before starting work.
 - a. Include coordination for shutoff, capping, and continuation of utility services as required, and with details for dust and noise control protection.
 - b. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of the Owner's on-site operations.
 - 2. Photographs of existing interior and exterior conditions of structure surfaces, equipment, and adjacent improvements that might be misconstrued as damage related to removal operations. File with A/E before starting work.

1.03 PROTECTION

- A. Existing sidewalks, curbs, paving, landscaping, or other existing work not specified for removal that is temporarily removed, damaged, exposed, or in any way disturbed or altered by removal work shall be repaired, patched, or replaced at no cost to the Owner.
- B. Do not damage trees within project site unless trimming is indicated on drawings or required because of blocking roof scuppers or damaging roofing.
 - 1. Protect existing trees during reroofing work.
- C. Environmental Protection:
 - 1. Dust Control:
 - a. Control dust resulting from shingles, stucco, and flashing removal to prevent spread of dust to occupied portions of buildings and to avoid creation of a nuisance in surrounding areas.
 - b. Do not use water to control dust when it will result in or create hazardous or objectionable conditions such as roof leaks, flooding, or pollution.
 - 2. Do not dispose of removed roofing materials, wood, or tree trimmings by burning.
 - 3. Explosives are not allowed.

1.04 COORDINATION

- A. Site Inspection: Inspect project area to determine extent of removal, salvage for reinstallation, and patching work.
- B. Scheduling:
 - 1. Areas next to roofing, shingles, stucco and flashing removal work areas may be occupied and if so, their activities cannot be interrupted or disturbed during normal working hours.
 - a. Consult with the Owner and A/E to schedule work accordingly.

PART 2 PRODUCTS

2.01 DISPOSITION OF MATERIALS NOT INDICATED OR SPECIFIED TO BE SALVAGED

A. Title to Materials:

1. Title to materials to be removed, except salvageable equipment to be reinstalled, is vested in the Contractor upon receipt of Notice to Proceed.
 - a. The Owner will not be responsible for condition, loss of, or damage to such materials after receipt by Contractor of Notice to Proceed.
 - b. Remove excess materials such as deteriorated wood, roofing gravel, roofing, and flashings not specified to be salvaged from site and premises upon completion of removal operations. Remove and dispose of debris in a legal manner.

PART 3 EXECUTION

3.01 REMOVAL WORK

A. Perform removal work indicated on drawings and as specified in an orderly manner according to accepted construction schedule.

1. Protect work specified to remain.
2. Repair any damage to existing facilities to remain.
3. Protect adjacent areas from damage or undue dirt and dust.
4. Wet down debris or rubbish, if necessary, to minimize flying dust without causing roof leaks and without damage to new roofing installation.
5. Removals shall be according to federal, state, and local regulations.

3.02 EXISTING WORK

A. Existing work may be cut, altered, removed, or temporarily removed and replaced as necessary for the performance of work required.

1. Exception: Unless otherwise indicated on drawings, do not cut or alter structural members without authorization by A/E.

B. Filling: Holes and other hazardous openings caused by removal work shall be

protected by suitable covers or barriers until mechanical equipment, including fans and vents, are reinstalled.

- C. Restore areas or items remaining in place damaged or defaced by work performed as specified to the comparable existing condition before the start of the work.

3.03 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove from building site debris, rubbish, and other materials resulting from demolition operations, and legally dispose off-site according to federal, state, and local regulations.
- B. Burning of removed materials is not allowed on project site.

END OF SECTION

SECTION 02072

REMOVALS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Removal work as required on drawings and as specified in this section and repair of damage to existing facilities to remain.
- B. Related Sections:
 - 1. 02200 - Earthwork.
 - 2. 02931 – Tree Protection

1.02 SUBMITTALS

- A. Removal Procedure for Site Work: If requested by A/E, submit proposed procedure of removal work.
 - 1. Procedure shall provide:
 - a. Means for safe conduct of work, careful removal, and disposition of materials specified to be salvaged for the Owner.
 - b. Protection of property to remain undisturbed.
 - c. Timely disconnection of utility services.
 - 2. Procedure shall include a detailed description of methods and equipment to be used for each operation, and sequence of each operation.

1.03 PROJECT/SITE CONDITIONS

- A. Existing sidewalks, curbs, paving, landscaping, or other existing work not specified for removal that is temporarily removed, damaged, exposed, or disturbed or altered by removal work shall be repaired, patched, or replaced at no cost to the Owner.
- B. Existing Trees:
 - 1. Do not damage trees within project site specified to be left in place.
 - 2. Protect trees indicated to remain as required with acceptable barricades or temporary fencing during construction.

C. Environmental Protection:

1. Dust Control:

- a. Control dust resulting from demolition to prevent spread of dust to occupied portions of buildings and to avoid creation of a nuisance in surrounding areas.
- b. Do not use water to control dust when it will result in flooding or pollution or other hazardous or objectionable conditions.

- 2. Fire: Do not dispose of demolished materials or trees, etc., by burning.
- 3. Explosives: The use of explosives is not allowed.

D. Site Inspection: Inspect entire project area to determine extent of removal, salvage, and patching work.

1.04 SCHEDULING

A. Activities in areas next to removal areas cannot be interrupted or disturbed during normal facility hours.

- 1. Consult with the Owner and A/E to schedule work. See Section 01310 - Construction Schedule.

B. Utility Companies:

- 1. Coordinate with applicable utility companies and the Owner for utility line removal, if any, and related capping and utility shutdowns required by such removal work.

C. Removals:

- 1. Assign removals to appropriate trades under respective sections, best suited for this type of work to avoid unnecessary damage due to the efforts of unskilled workers.

PART 2 PRODUCTS

2.01 DISPOSITION OF MATERIALS NOT INDICATED OR SPECIFIED TO BE SALVAGED

- A. Title to Materials:
 - 1. Title to materials and equipment to be removed, except salvageable equipment to be retained by the Owner, is vested in the Contractor upon receipt of Notice to Proceed.
 - a. The Owner will not be responsible for condition, loss of, or damage to such materials and equipment after receipt by Contractor of Notice to Proceed.
- B. Remove excess materials and equipment not specified to be salvaged from site and premises upon completion of removal operations.

PART 3 EXECUTION

3.01 REMOVAL WORK

- A. Perform removal work indicated on drawings or as specified in an orderly manner according to accepted construction schedule.
 - 1. Protect work specified to remain.
 - 2. Protect adjacent areas from damage or undue dirt and dust.
 - 3. Wet down debris or rubbish, if necessary, to minimize flying dust.

3.02 EXISTING UTILITIES

- A. Utility work shall be performed according to these specifications for the particular type of utility service involved.

3.03 EXISTING WORK

- A. Existing work may be cut, altered, removed, or temporarily removed and replaced as necessary for the performance of work required.
 - 1. Exception: Unless otherwise indicated on drawings, do not cut or alter structural members without authorization by the A/E.
- B. Filling: Holes and other hazardous openings created by removal work shall be filled following procedures specified in Section 02200 - Earthwork.
- C. Restore damaged or defaced areas or items, remaining in place, of work

performed under this Contract to comparable conditions existing before the work.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Earthwork for buildings, and grassed or landscaped areas as indicated on Drawings and specified in this section.

B. Related Sections:

1. 02221 - Excavating, Backfilling, and Compaction for Utilities.
2. 02280 - Soil Treatment.
3. 02931 – Tree Protection.
4. 02935 - Sodding.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C136-96a Test Method for Sieve Analysis of Fine and Coarse Aggregates.
2. D422-63 Test Method for Particle-Size Analysis of Soils.
3. D698-91 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort.
4. D1556-90 Test Method for Density of Soil in Place by the Sand-Cone Method.
5. D1557-91 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.
6. D2487-93 Classification of Soils for Engineering Purposes (Unified Soil Classification System).
7. D2922-91 Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
8. D2974 Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Materials.
9. D 4972 Test Method for pH of Soils.

B. Miami-Dade County Public Works Manual (M-DCPW).

C. Florida Statute, Chapter 556, Underground Facility Damage Prevention and

Safety.

- D. Consumer Products Safety Commission (CPSC): A Handbook for Public Playground Safety.

1.03 QUALITY ASSURANCE

A. Trench Safety Act:

1. Comply with the Trench Safety Act, sections 553.60 through 553.64 Florida Statutes.
2. Where projects include trenching which exceeds a depth of 5 feet comply with the trench safety standard as required by sections 553.63 and 553.64 Florida Statute.

1.04 DEFINITIONS

- A. "Satisfactory Fill Materials" include materials classified in ASTM D2487 as GW, GP, SW and SP properly worked by Contractor to obtain optimum moisture and compaction.

1. For Grassed or Landscaped Areas:

- a. Within 1.5 feet of the surface of the indicated grade, limit rock size to 3 inches.
- b. Below 1.5 feet of the surface of indicated grade, limit rock size to 12 inches.
- c. Deeper than 6 feet limit rock size to 24 inches.

2. For Buildings:

- a. Within 2 feet of the surface of indicated grade, limit rock size to 2 inches.
- b. Below 2 feet of the surface of indicated grade limit rock size to 6 inches.

- B. "Unsatisfactory Materials" include materials other than "Satisfactory Fill Materials". Materials of any classification determined by testing laboratory as too wet or too soft for providing a stable foundation for structure, paving, and walks will be classified as "unsatisfactory".

- C. Degree of Compaction: Required compaction is expressed as a percentage of maximum density obtained by test procedures of ASTM D1557.

- D. Building Area: The area bounded by lines not less than 4 feet beyond the outside line of the building perimeter footings.
 - 1. Increase the 4 foot dimension by 1 foot for each foot of excavation depth required exceeding 4 feet.

1.05 SUBMITTALS

- A. Submit the following before starting work:
 - 1. Compaction Machinery Specifications.
 - 2. Compaction Tests (by the Owner).
 - 3. Soil Classification Tests using ASTM classification for subgrade materials and USDA classifications for topsoil materials.
 - 4. Stabilized Subgrade Composition and Density.
 - 5. Testing Laboratory (by the Owner).

1.06 SITE CONDITIONS

- A. Determine location and nature of work, character of equipment, and facilities needed for performance of work, general, and local conditions prevailing at site, and other matters affecting work under this contract according to Instructions to Bidders and General Conditions.
- B. Subsurface data, including soil borings, ground water elevations, or conditions, if shown on the drawings or attached to these specifications, are presented only as information available indicating conditions found and limited to exact locations and shall not be interpreted as an indication of conditions that may actually develop during construction.
 - 1. Make deductions of subsurface conditions that may affect methods or cost of construction and agree that no claim for damages or other compensation shall be made, except as are provided for in the agreement, should conditions be found during construction different from those as calculated or anticipated by the Contractor.
 - 2. Neither the Owner nor the A/E will be held responsible for variations found to exist between the subsurface data referred to above and actual field conditions that may develop during construction.
- C. Where existing grades, utility lines, or substructures are shown on drawings, Contractor, the Owner, and A/E assume no responsibility for correctness of existing conditions indicated.

1. Contractor shall locate indicated existing utility lines or substructures that may be affected by this Project, and shall be responsible for any damage or injury they may sustain as a result from working on or near these existing utilities or substructures not specified to be removed or demolished.

D. Bench Marks and Monuments:

1. Maintain existing bench marks, monuments, and other reference points, and if disturbed or destroyed, replace as directed by A/E.

1.07 JOB CONDITIONS

- A. Condition of Premises: Accept site as found and excavate, fill, compact, and backfill site as indicated on drawings and specified in this section.

B. Protection:

1. Adjacent Structures and Property:

- a. Take precautions to guard against movement, settlement, injury, or loss to existing structures or to equipment and furnishings housed therein arising directly or indirectly in connection with this contract according to Instructions to Bidders and General Conditions.
- b. Provide and place bracing or shoring as necessary or proper according to Instructions to Bidders and General Conditions.
- c. Be responsible for the safety and support of such structures and facilities and be liable for any movement or settlement, damage, or injury caused by or resulting therefrom.
 - 1) If, at any time, the safety of any adjacent structures or facilities appears to be in doubt, cease operations and take immediate precautions to support such structures and facilities and notify A/E at once.
 - 2) Resume operations only after permission has been granted by A/E.

2. Adjacent Sidewalks:

- a. Take precautions to guard against movement, settlement, or collapse of any sidewalks and be liable for any such movement,

settlement, or collapse according to Instructions to Bidders and General Conditions.

- 1) Repair such damage promptly when so ordered at no cost to the Owner.
 - 2) Install necessary shoring, including sheet piling as may be required, to protect banks, adjacent paving, structures, and utilities during excavations.
 - 3) Be responsible for any damage to existing structures, equipment, and furnishings due directly or indirectly to construction operations. Except where removal is needed by site grading or location of new buildings, use every possible precaution to prevent injuries to landscaping, drives, curbs, and walks on or next to site of the work and replace, at no expense to the Owner, any of the above destroyed.
3. Existing Landscaping, and Walks: Except where removal is required by site grading or location of new buildings, take every possible precaution to prevent injuries or loss to individual trees, groups of trees, and other existing landscaping, drives, curbs and walks on or next to the site of the work according to Instructions to Bidders and General Conditions, and replace any such damaged or destroyed at no cost to the Owner.

PART 2 PRODUCTS – Not Used.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 GENERAL

- A. Public Safety: Accomplish work in a manner providing for the safety of the public and workers and the protection of property.
- B. Construction: Do not close, obstruct, or store material or equipment in streets, sidewalks, alleys, or passageways without a permit according to local ordinances, regulations, codes, and the Owner's approval.

- C. Interference: Conduct operations with minimum interference with roads and other facilities.
- D. Removal:
 - 1. Unless otherwise noted or specified to be relocated or stored, materials removed become property of Contractor and shall be removed completely away from site.
 - 2. Do not store or allow debris to accumulate on site.
 - 3. If Contractor fails to remove excess debris promptly, the Owner reserves the right to remove the debris at Contractor's expense.
- E. Temporary Structures: Remove temporary structures when no longer required.
- F. Repair:
 - 1. Clean up, repair, or replace, at no cost to the Owner, property damage arising in connection with this Contract.
 - 2. Patch and repair work shall match existing and be performed in a neat and professional manner by workers skilled in the trade involved.
 - 3. This applies to damage to the newly graded areas within the building area limits and damage to adjacent properties by eroded materials.
- G. Erosion Repair:
 - 1. Take every precaution and temporary measure to prevent damage from erosion of freshly graded areas.
 - a. Repair and reestablish grades to required elevations and slopes where settlement or washing occurs before acceptance of work at no cost to the Owner.
 - b. This applies to damage to the newly graded areas within the building area limits and damage to adjacent properties by eroded materials

3.03 LOCATIONS AND ELEVATIONS

- A. Be responsible for surveys, measurements, and layouts required for proper execution of the work.
 - 1. Lay out lines and grades from existing survey control system and as shown on drawings.

B. Locate by stake and mark locations and elevations of following:

1. Elevations of existing earth cut and fill.
2. Final grades for landscape contours.
3. Other items as required to execute work as specified.

3.04 CLEARING AND GRUBBING

- A. Within limits of areas designated for building area, grading and site construction work, remove trees, brush, stumps, wood debris, and other deleterious materials not required to remain as part of finished work.
- B. Remove grass, plants, vegetation, and organic material from same area.
- C. Burning of materials is not allowed on the site.
- D. Remove accumulated material daily or as necessary to prevent fire hazard condition.

3.05 EXCAVATION

- A. Begin excavation after stripping, clearing, and grubbing has been completed.
- B. Excavate to grades required to accommodate the proposed construction.
- C. Excavations for structures shall conform to dimensions and elevations indicated for each building.
 1. Extend excavations a sufficient distance from walls and footings to allow for placing and removal of forms and installation of services, except where the concrete for walls and footing is authorized to be deposited directly against excavation surfaces.
 2. Excavation below general machine excavation for footings and foundations shall be hand worked.
 3. Bottoms of footings shall be on level planes.
- D. Excavate in such a manner that quick and efficient drainage of storm water will occur.
- E. Remove "unsatisfactory materials" encountered from the building areas.
- F. Classify excavated materials and stockpile separately suitable soils for use as backfill materials. If sufficient quantities of excavated materials meeting

requirements for backfill are not available on site, provide materials meeting these requirements.

- G. Stockpile excavated material suitable for use as fill and backfill where directed by A/E.

3.06 FILLING, BACKFILLING, AND COMPACTION

A. Compaction:

- 1. Compact existing earth surfaces (exclude rock) after excavation, backfilling, and compaction of said areas to levels required with "Suitable Backfill Materials".
 - a. Compact with equipment suited for soil compaction.
 - b. Moisten or aerate material, as necessary, to provide moisture content to facilitate obtaining specified compaction with equipment being used.
 - c. Compact each layer to not less than percentage of maximum density specified below, determined according to ASTM D1557, Method D.
 - d. Insure compaction of previously prepared fill areas has been maintained before placing new layers.

	<u>Location</u>	<u>Percent</u>
1)	Under structures and building slabs, except footings, each layer.	95
2)	Under footings, top 1 foot in cut, each layer of fill.	95
3)	Under pavements and sidewalk areas, top 12 inches, each layer.	95
4)	Under pavements and sidewalk areas, below 12 inches, each layer.	90
5)	Under landscaped areas, each Layer.	80-85

B. Filling and Backfilling:

- 1. Materials: "Satisfactory Fill Materials" shall be used in fills and backfills.

2. Place "Satisfactory Fill Material" in horizontal layers not exceeding 12 inches in loose depth.
 - a. Compact as specified in this section.
 - b. Do not place materials on muddy surfaces.

C. Reconditioning of Subgrade:

1. Where approved compacted subgrades are disturbed by the Contractor's subsequent operations or adverse weather, scarify and compact the subgrade as specified to required density before further construction occurs.
2. Use power driven hand tampers for recompaction over underground utilities

D. Backfilling:

1. Do not begin backfilling until:
 - a. Construction below finished grade has been accepted.
 - b. Underground utilities systems have been inspected, tested, and accepted.
 - c. Forms have been removed.
 - d. Excavation cleaned of trash and debris.
2. Bring backfill to indicated finished grades.
3. Backfill materials and compaction shall be as specified.
4. Do not place backfill in wet areas.
5. Do not operate heavy equipment for spreading and compacting backfill closer to foundation or retaining walls than a distance equal to height of backfill above top of footing.
6. Compact the area remaining by power-driven hand tampers suitable for material being compacted.
7. Place backfill carefully around pipes to avoid damage to the pipes.

- E. Protection: Settlement or washing occurring in backfilled areas before acceptance of work shall be repaired and grades reestablished to required elevation and slope.

3.07 DISPOSAL OF EXCESS EXCAVATED MATERIALS

- A. Excess "Satisfactory Fill Materials" and "Unsatisfactory Materials" shall become the property of the Contractor.

1. Remove from site.

3.08 LASER GRADING

- A. Provide gradients and elevations as shown in Construction Documents with current industry standard laser grading procedures using laser automated graders and laser automated dozers to ensure specified tolerances.
- B. Grassed Areas:
 1. Rough grade: At least 4 inches below finish topsoil grade in preparation for topping consisting of at least 4 inches of compacted 80-20 top soil mix as specified in Section 02900.
 2. Grass: As specified in Sections 02900 and 02935.
 3. Gradient: According to grading plan.

3.09 TESTING

- A. The Owner will provide services of a Testing Laboratory to perform specified tests, inspections, instrumentation and inspection of work.
 1. Notify, through A/E, the Owner contracted Testing Laboratory to perform specified tests at the Owner's expense.
- B. Tests of Materials:
 1. Soil Classification:
 - a. One test from each type of material encountered or proposed to be used.
 2. Laboratory Tests for Moisture-Content and Density According to ASTM D1557:
 - a. One test for each material encountered or proposed to be used.
 3. Field Tests for Moisture-Content and Density:
 - a. According to ASTM D1556 or ASTM D2922, one test per layer of fill per 10,000 square feet of area, plus one test per 10,000 square feet of subgrade in cut.

- C. Fill and topsoil mixture may be inspected at any stage of operation to determine compaction characteristics, densities and freedom from organic and plastic materials.
- D. Notification:
 - 1. Give sufficient notification of placing of orders for fill and topsoil with supplier to allow full inspection including testing for compaction characteristics at source of supply.
 - 2. Obtain approval from A/E before placing topsoil mixture at project site, without exception.

END OF SECTION

SECTION 02221

EXCAVATING, BACKFILLING, AND COMPACTION FOR UTILITIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 02200 - Earthwork.
2. 02720 - Storm Drainage System.
3. 15047 - Identification.
4. Division 15 - Mechanical Work.
5. Division 16 - Electrical Work.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D1556-90 Test Method for Density of Soil in Place by the Sand-Cone Method.
2. D1557-91 Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort
3. D2487-93 Classification of Soils for Engineering Purposes (Unified Soil Classification System).

B. Occupational Safety and Health Administration (OSHA): Trench Safety Act.

1.03 DEFINITIONS

- ###### A. "Satisfactory Fill Materials" include materials classified in ASTM D2487 as GW, GP, SW, and SP properly worked by Contractor to obtain optimum moisture and compaction. Maximum size of rock limited to 6 inches. Use 2 inch maximum size for the top 2 feet below the finish indicated grade.

1.04 SUBMITTALS

- ###### A. Submit copies of tests and records performed as specified to A/E for review before starting work.

1.05 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with OSHA, Trench Safety Act, Standard 29 C.F.R.s., Chapter XVII, Subpart P (para. 1926.650 thru 1926.653).

1.06 PROJECT CONDITIONS

- A. Excavation, filling, and backfilling for utilities complete for underground utility lines and structures as specified and as shown on the drawings.
- B. Existing Utilities:
 - 1. Protect existing utilities from movement, settlement, or other damages according to Instructions to Bidders and General Conditions.
- C. Trench Safety Act: Provide trench safety systems at all trench excavations where workers may be exposed to moving ground or cave-ins regardless of depth of trench. All trenches more than 5 feet in depth shall comply with OSHA "Trench Safety Act".

PART 2 PRODUCTS

2.01 MATERIALS

- A. Trench Backfill Materials: Either satisfactory excavated material or fill materials as specified.
- B. Pipe Bedding Material: Bedding material shall be selected or satisfactory backfill material and free of any rocks or stones larger than 2 inches in diameter for cast iron and PVC pipe. Limerock screenings or sand shall be used for copper tubing. (Underground copper lines are 3 inch diameter or less.)

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 EXCAVATION

- A. General:

1. Perform excavating of every description and of whatever substance encountered to depths indicated or specified.
2. Pile materials suitable for backfilling a sufficient distance from banks of trenches to prevent slides or cave-ins.
3. Keep surface drainage of adjoining areas unobstructed.
4. Remove excavated materials not required nor suitable for backfill from site.
5. Remove water by pumping or other acceptable method and discharge at a safe distance from excavation. Continue dewatering until deemed proper or desirable for the installation of utility lines.
6. Comply with the applicable standards and regulations of Miami-Dade County and the city where building is located.
7. Sheet piling and shoring shall be done as is necessary for protection of work and for safety of personnel. Excavating shall be by open cut.

B. Trench Excavations:

1. Make trench of necessary width and depth for proper laying of pipe, with bank as vertical as practical.
2. Coordinate trench excavation to avoid open trenches for prolonged periods.
3. Grade bottom of trenches accurately to provide uniform bearing and support for each section of pipe on undisturbed soil at every point along their entire length, except portions of pipe sections where it is necessary to excavate for couplings and for proper making of pipe joints or where unsatisfactory materials incapable of properly supporting pipe and utility structures are encountered at bottom of trench.
4. Dig holes and depressions for joints after trench bottom has been graded of length, depth, and width required for properly making the particular type of joint.
5. When unsatisfactory soil, incapable of properly supporting pipe, is encountered at the bottom of the trench, remove such soil to a minimum depth of 12 inches, or 1/4 of the pipe diameter, whichever is greater, below the bottom of pipe and backfill material specified.
6. Over-depths in unstable soil excavation and unauthorized over-depths shall be at the expense of Contractor.

C. Special requirements relating to specific utilities are as follows:

1. Storm Drains:
 - a. Where shown on drawings, make width of trench at and below top

- of pipe adequate to allow space for workers to place and properly joint pipe.
- b. Clear space between the barrel of the pipe and trench wall shall not exceed 8 inches on either side of the pipe.
 - c. Width of the trench above the level may be as wide as necessary for sheeting and bracing and proper performance of the work.
 - d. For plastic pipe, where shown on drawings, make depth of trench to allow a minimum of 24 inches of cover over the top of 2-1/2" or less pipe and a minimum of 36 inches of cover over the top of 3 inch or larger pipe from finished grade unless otherwise indicated or required by local utility. Install metallic detection tape 4 inches - 6 inches below finish grade. See Section 15047 - Identification.
 - e. Round the bottom of the trench so at least the bottom quadrant of the pipe shall rest firmly on undisturbed soil or select bedding for as nearly the full length of the barrel as proper joining operations will allow.
 - f. Trenches for plastic pipe shall be cut to an over-depth of not less than 6 inches and a cushion of rock free soil or coarse sand used for not less than 6 inches bedding and 12 inches backfill over the plastic pipe.
 - g. Perform this part of the excavation manually a few feet ahead of the pipe laying operation by workers skilled in this type of work.
2. Electrical Conduit or Cables:
- a. Trenches for plastic conduits shall be a depth providing not less than 24 inches of cover from finished grade or 12 inches or greater of cover from underside of slabs to accommodate bending radii, unless otherwise indicated. Install warning tape 8 inches below finish grade or underside of slab. See Section 15047 - Identification.
 - b. Trenches for plastic conduit and cables shall be cut to an over-depth of not less than 3 inches and a cushion of rock free soil or coarse sand used for not less than 3 inches bedding and 3 inches backfill over the plastic conduit and cable.
3. Excavating for Appurtenances:
- a. Excavations for structures shall be sufficient to leave at least 12 inches in the clear between their outer surfaces and the embankment or shoring used.
 - b. Whenever unstable soil is incapable of properly supporting the structure is encountered in the bottom of the excavation, such soil

shall be removed and excavation backfilled as specified herein in paragraph "Trench Excavation".

- c. Unauthorized over-depths or under-depths in wet or otherwise unstable soil shall be filled with selected backfill material or concrete, as directed, at the expense of the Contractor.

3.03 EXCAVATION OF UNCLASSIFIED MATERIAL

- A. Materials encountered during the excavating to the depth and extent specified and indicated on drawings may include rock, concrete, masonry, or other similar materials.

1. No adjustment will be made in the Contract Price because of the presence (or absence) of rock, concrete, masonry, or other similar materials.

3.04 PROTECTION OR REMOVAL OF UTILITY LINES

- A. Protection:

1. Protect existing utility lines indicated on drawings (or the locations of which are made known to Contractor before excavating and trenching) specified to remain, including utility lines constructed during trenching operations, from damage during trenching, backfilling, and compacting operations.

- a. If such new or existing utility lines are damaged during trenching, backfilling, and compacting operations, repair or replace at no cost to A/E.

2. When utility lines specified to be removed or replaced are encountered within the area of operations, issue notices in ample time for measures to be taken to coordinate necessary interruption of services.

- B. Repair of Damage to Unknown Existing Utility Lines:

1. Existing utility lines not shown on drawings (or the location of which is not known to Contractor in time to avoid damage) damaged during trenching operations shall be repaired by Contractor and an adjustment to the Contract Price will be made according to Instructions to Bidders and General Conditions.

3.05 BACKFILLING

A. General:

1. Coordinate backfilling with testing of utilities. Leave sheeting in place where damage is likely to result from withdrawal.
2. Carefully backfill trenches with satisfactory specified materials.
3. Bring backfill up evenly in 9 inch maximum layers, loose depth, and thoroughly and carefully compact with mechanical or hand tampers until pipe has a minimum cover of one foot. Take care not to damage the pipe.
4. Deposit remainder on the satisfactory backfill material in the trench in one foot layers and compact by mechanical means to percentages as specified.
 - a. Trenches and excavation pits improperly backfilled or where settlement occurs shall be reopened to the depth required for proper compaction, refilled and compacted, with the surface restored to the specified grade and compaction.
5. Keep excavations free of ground and surface water until backfilling operation is complete.

B. Appurtenances:

1. At structures, remove forms and trash before backfilling.
 - a. Place satisfactory backfill materials symmetrically on all sides in 9 inch maximum loose depth layers.
 - b. Moisten each layer, if necessary, and compact with mechanical or hand tamper, taking care not to injure the structure by excessive tamping.
2. Materials and density shall be as previously specified for trenches depending upon location of the structure.

C. Compaction:

1. Material may be compacted by a hand tamper, a powered hand tamper, a vibrating tamper, or mechanized power tamper provided such compaction percentages meet the required density as specified below.
2. Backfilling and compacting by means of hydraulic methods will not be allowed except as may be approved by A/E.

- a. Compact each layer to not less than the percentage of maximum density specified below, determined according to ASTM D1557, Method D:

<u>FILLS AND BACKFILL</u>	<u>COHESIONLESS SOIL</u>
Under slabs and pavement	95%
Under walk areas, top 12 inches	95%
Under walk areas, below top 12 inches	90%
Under landscape areas	85%
Under other areas noted on Site Plan	85%

3.06 TESTING

- A. Notify, through A/E, the Owner contracted Testing Laboratory to perform specified tests at the Owner's expense.
- B. Tests of Materials shall be as follows:
 - 1. Laboratory Tests for Moisture Content and Density:
 - a. According to ASTM D1557, one test for each material encountered or proposed to be used.
 - 2. Field Tests for Moisture Content and density:
 - a. According to ASTM D1556, one test per layer per 100 linear feet of ditch.

END OF SECTION

SECTION 02280

SOIL TREATMENT

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Termiticide application to soil under new buildings as indicated on drawings and specified in this section.
- B. Use of chlordane, heptachlor, aldrin, dieldrin and chlorpyrifos class of chemicals are not allowed.
- C. Related Sections:
 - 1. 02200 - Earthwork.
 - 2. 03300 - Cast-In-Place Concrete.
 - 3. 07190 - Vapor/Radon Barrier.

1.02 SUBMITTALS

- A. Submit the following for review before starting work:
 - 1. Product data, including manufacturers specifications, chemical analysis, with recommended dilution, application directions, and safety precautions.
 - 2. Sample copy of applicator's warranty for review.
 - 3. Applicator's experience evidence with copies of current local and state licenses and current Certified Operator-in-Charge certificate.

1.03 QUALITY ASSURANCE

- A. Work shall be done by a bonded Contractor whose principal business is pest control and termite treatment and can show evidence of at least 5 years of successful operation in this field.
- B. Field Samples:
 - 1. Test samples of the mixture of the concentrate and water will be taken by the Owner contracted Testing Laboratory.

2. If sample solution indicates noncompliance with the manufacturer's application requirements, the Contractor shall pay for the initial test performed by the Owner, any subsequent retesting required by the Owner, and reapplication of soil treatment solution.

1.04 PROTECTION

- A. To avoid surface flow or overspray of toxicant from application site, do not apply soil poisons when soil or fill is excessively wet or after heavy rains.
- B. Unless treated areas are to be immediately covered, take precautions to prevent disturbance of treatment by human or animal contact.
- C. Comply with applicable laws, codes, ordinances of Federal, State, and local regulatory agencies having jurisdiction over use of soil poisons.
- D. Provide warning signs and instruct workers to use protective measures for their safety.

1.05 WARRANTY

- A. Upon completion of soil treatment and as a condition of substantial completion, furnish the Owner with a written warranty, from the applicator, which shall provide that:
 1. Application was made at concentration, rates, and methods complying with these specifications.
 2. Effectiveness of treatment is warranted for not less than 5 years without additional cost to the Owner, by means of a 5-year repair and replacement bond.
 3. Upon evidence of subterranean termite activity, retreat area at no additional charge to the Owner. Additional treatment shall be sufficient to prevent termites from attacking building or its contents.
 4. Upon occurrence of damage to building or to its contents within warranty period, retreat soil and replace damage at no cost to the Owner.
 5. Warranty bond shall be drawn in favor of the Owner, successor, or assigns and shall be non-cancelable by all parties to the contract except the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Florida Registered Soil Termiticides:
 - 1. Biflex, bifenthrin, FMC Corporation.
 - 2. Talstar, bifenthrin, FMC Corporation.
 - 3. Demon TC, cypermethrin, Zeneca.
 - 4. Prevail, cypermethrin, FMC Corporation.
 - 5. Tribute, fenvalcrate, Aventis Environmental Science.
 - 6. Termidor, fipronil, Aventis Environmental Science.
 - 7. Premise, imidicloprid, Bayer Corporation.
 - 8. Dragnet SFR, permethrin, FMC Corporation.
 - 9. Prelude, permethrin, Zeneca.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 APPLICATION

- A. Before mixing concentrate and water as recommended by the manufacturer for specific application and conditions, contact the Owner 48 hours in advance.
- B. Apply termiticide mixture to the following:
 - 1. Soil and earth that will be covered by or lie next to buildings.
 - 2. Masonry foundations.
 - 3. Areas around pipes and conduits penetrating slabs on fill to provide a lethal barrier to subterranean termites.
- C. Apply termiticide mixture after subgrade has been made ready for placement of any floor slab vapor barrier, and as soon as practical before placement of concrete slabs and caps on masonry piers. Piling, pile caps, grade beams, foundation walls, and below grade waterproofing shall have been completed.
- D. Apply at least 12 hours before placement of concrete slabs and during normal working hours to be subject to inspection. Notify applicator at least 24 hours before application of termiticide mixtures will be completed.
- E. Soil Conditions: Apply termiticide mixtures when moisture content soil is sufficiently low to allow uniform distribution of chemical throughout specified areas.

F. Application Under Slabs on Fill:

1. Apply termiticide mixtures uniformly to all areas beneath concrete slabs-on-grade, including beneath walkways and entrance platforms and beneath sidewalks within 5 feet of buildings.
2. A minimum of 1 gallon of termiticide mixtures shall be uniformly applied to each 10 square feet of area to be treated.
3. Ground areas beneath concrete slabs-on-grade and paving abutting building slabs shall be similarly treated for a distance not less than 3 feet from building.

G. Application Along Foundation Walls, Pipes, and Conduits:

1. Treat critical areas along both sides of exterior and interior foundation walls, columns, and around utility pipes, conduits, ducts, and other similar items extending through soil beneath, and next to new construction, to a depth of 1 foot in a strip 6 inches wide, at a rate of 4 gallons of termiticide mixture to each 10 linear feet.
2. Mix chemical with soil as it is placed against walls and utility lines.
3. Apply at least 1 gallon of termiticide mixture around each pipe.

H. Retreatment of Disturbed Soil: Retreat soil surfaces disturbed after treatment and before placement of slabs and covering structures.

3.03 CLEAN UP

- A. Improper disposal of pesticide, spray mixture, or rinsate is a violation of federal law. Comply with manufacturer's instructions for disposal of these materials and empty containers. Do not allow supplies of chemicals to remain on site unattended.

END OF SECTION

SECTION 02529
CONCRETE SIDEWALKS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 02200 - Earthwork.
2. 03300 - Cast-In-Place Concrete.

1.02 REFERENCE STANDARDS

- A. Miami-Dade County Public Works Manual (M-DCPW), latest edition.

1.03 SUBMITTALS

- A. Submit properly identified manufacturer's literature and installation instructions before starting work.
- B. Concrete Tests: Submit for review.

1.04 QUALITY ASSURANCE

- A. Perform tests according to the specified standards.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete:

1. Provide concrete for sidewalks as specified in Section 03300.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Concrete Sidewalks: Provide as indicated on drawings and specified in Section 145 of M-DCPW.

3.03 TESTING

- A. Provide tests as specified in Section 03300, Sections 145 of M-DCPW and Section 520 of FDOT.

END OF SECTION

SECTION 02720

STORM DRAINAGE SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 02221 - Excavating, Backfilling, and Compaction for Utilities.
2. 03300 - Cast-in-place Concrete.

1.02 REFERENCES

A. The American Society for testing and Materials (ASTM):

1. A53-96 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. A74-96 Specification for Cast Iron Soil Pipe and Fittings.
3. C131-96 Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
4. C443-94 Specification for Joints for Circular Concrete Sewer and Culvert Pipe, Using Rubber Gaskets (Metric).
5. C564-95a Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
6. D3034-96 Specification for Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.

B. The American Association of the State Highway Transportation Officials (AASHTO).

C. Florida Department of Transportation (FDOT), latest edition, Standard Specifications for Road and Bridge Construction.

1. Delete the basis of payment and other pay measurement requirements from FDOT specifications.
2. Payment for work specified in this section will be included as part of lump sum bid for entire project according to Construction Documents.

D. Miami-Dade County Public Works Manual - Standard Specifications (DCPW).

E. Cast Iron Soil Pipe Institute.

1.03 SUBMITTALS

A. Submit properly identified shop drawings and manufacturer's catalog cuts, technical data, and certificates on the following for review before starting work.

1. Precast concrete structures.
2. Frames and grates.
3. Pipe.
4. Test reports.
5. Plastic filter fabric.

B. Include manufacturer's certificates of compliance or certified analysis according to applicable standards with each shipment of material.

1.04 QUALITY ASSURANCE

A. Work shall be performed according to plans and specifications in a neat and accurate manner.

1.05 STORAGE

A. Keep materials, structures, equipment, and appurtenances stored on the site clean and free of foreign materials.

B. Replace damaged items at no cost to the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

A. High Density Polyethylene Storm Drainage Pipe:

1. Advance Drainage Systems, Inc., or approved equal.
2. Hancor, Inc., or approved equal.

B. Corrugated Metal Pipes:

1. Helically corrugated aluminum alloy round pipe shall comply with AASHTO M196. 16 gage thickness unless otherwise indicated on the drawings.

2. Helical corrugated aluminum-alloy pipe perforated shall comply with AASHTO M196. 16 gage thickness unless otherwise indicated on the drawings.
 - a. Perforated pipe shall have perforations of 1/4" to 3/8" diameter holes at $\pm 2\text{-}3/4$ " o.c., with a minimum of 114 holes per linear foot.
 3. Helically corrugated steel pipe shall comply with AASHTO M36. Pipe shall be fully bituminous coated according to the requirements of AASHTO M190, for Type A. Thickness: 16 gage unless otherwise indicated on the drawings.
 4. Joint: Locking bands with a rubber or neoprene gasket for a flexible watertight joint. Locking band shall comply with AASHTO M36 and gasket shall comply with ASTM C443.
- C. PVC Sewer Pipe and Fittings: ASTM D3034 for SDR 35.
1. Joints: Bell spigot type, elastomeric gasket joints.
- D. Cast Iron Soil Pipe: Comply with ASTM A74 for Cast Iron Soil Pipe and Fittings.
1. Joints: Provide with roll-on joints complying with ASTM C564 and Cast Iron Soil Pipe Institute recommendations for compression joints.
- E. Black Steel Pipe: Comply with ASTM A53 for schedule 40 Pipe and Fittings.
- F. Catch Basins and Storm Manholes: Cast-in-place concrete or precast concrete, with cast iron frames and hinged grates as indicated on drawings and specified in Section 425 of FDOT Specification.
- G. Ballast Rock: Ballast rock shall be obtained from fresh water local sources. When subjected to ASTM C131 tests, the loss shall not exceed 40 percent. Ballast rock designated as 2 inches shall fall within the 3/4" to 2-1/2" range.
- H. Plastic Filter Fabric: Plastic filter fabric shall comply with Section 985 of the FDOT "Plastic Filter Fabric" for the piping trench.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Excavation and Backfilling for Trenches and Manholes: As specified in Section 02221-Excavating, Backfilling, and Compaction for Utilities.

- B. Placing Pipe:

1. Carefully examine each pipe before laying. Do not use defective or damaged pipe.
2. Lay pipelines to grades and alignment indicated.
3. Provide proper facilities for lowering sections of pipe into trenches.
4. Inspect pipe in place before backfilling and remove and replace those damaged during placement at no cost to the Owner.
5. Storm Sewer Pipe:
 - a. Shape bottom of trench by hand to give uniform circumferential support to lower one fourth of each pipe.
 - b. Where applicable, lay pipe upgrade with tongue or spigot ends pointing in direction of flow.
 - c. Lay each pipe true to line and grade indicated on drawings and in such a manner to form a close concentric joint with adjoining pipe and to prevent sudden offsets of flow line.
 - d. Keep interior of storm sewer free of dirt and superfluous materials as work progresses.
 - e. Keep a suitable swab or drag in pipe where cleaning after laying is difficult due to small pipe size and pull forward past each joint immediately after each jointing has been completed.
 - f. If maximum width of trench at top of pipe as specified is exceeded, install either concrete cradling, pipe encasement or other bedding as may be required to support added load of backfill.
 - g. Keep trenches for sections of sewer free from water until pipe-jointing material has set and trench backfilled.
 - h. Do not lay pipe when condition of trench or weather is unsuitable for such work.
 - i. Keep open ends of pipes and fittings securely closed at times when work is not in progress.
 - j. If pipe cannot be adequately supported on undisturbed earth or tamped backfill, encase pipe in concrete or support it on a concrete cradle.

C. Concrete Structure:

1. Concrete structures shall be constructed according to plans and as specified on Concrete Work - Division 03300, excavation and backfill as specified in Section 02221 - Excavating, Backfilling, and Compaction for Utilities, DCPW, and as indicated on the drawings.
2. Leveling courses at structures for manholes and catch basins shall be 3 to 12 inches and according to DCPW SD4.5.

D. Catch Basins and Manholes: Frames and Inlet Grates or Solid Covers: Set the cast iron frames and grates in a bed or mortar and carefully adjust to elevations shown on the drawings.

3.03 CLEAN UP

- A. If drainage well has been used for disposal of water from dewatering operation, upon completion of dewatering clean out the detention tank and perform capacity tests as specified to insure that the disposal well is capable of disposing of storm water as indicated on drawings and specified in this Section.

END OF SECTION

SECTION 02931

TREE PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Protection of existing trees from damage because of Contractor's operations including, but not limited to:

1. Vegetation protective signage.
2. Tree protection fencing.
3. Boxing of tree trunks.
4. Root pruning, construction pruning, and root protection.

B. Related Sections:

1. 02200 - Earthwork

1.02 SUBMITTALS

A. Proposed methods and schedule for tree and plant protection.

B. Proposed methods, materials, and schedule for root pruning, construction pruning, and tree fertilization.

1.03 QUALITY ASSURANCE

A. Comply with the most stringent applicable requirements of the following standards.

1. American National Standards Institute (ANSI) Z133.1 - Safety Requirements for Pruning, Trimming, Repairing, Maintaining and Removing Trees, and for Cutting Brush.
2. International Society of Arboriculture (ISA) - Guide for Establishing Values of Trees and Other Plants.
3. National Arborist Association (NAA) - Ref.1, Pruning Standards for Shade Trees.
4. International Society of Arboriculture (ISA) - Construction Management Guidelines.

B. Damaged Trees/palms:

1. Trees scheduled to remain and are damaged during construction shall be replaced per canopy equivalency at no expense to the Owner.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Tree Protection Fencing:

1. Tree protection fencing shall be 4 feet high galvanized chain link fencing.
2. Stakes for fencing shall be 8 feet galvanized steel posts, driven a minimum of 3 feet into the ground. Posts shall be spaced 10 feet o.c. maximum.

B. Boxing (Fencing):

1. Boxing shall be 4 inch x 4 inch posts spaced 8 feet o.c., with 2 inch x 4 inch rails between bays approximately 24 feet x 24 feet centered on the tree trunk, to a height of approximately 5 feet.

C. Root Pruning:

1. Liquid fertilizer applied to root pruned and construction pruned trees shall be Peters M77 Sequestered-Cleated Soluble Fertilizer by W.R. Grace and Co., Cambridge, MA, or accepted equivalent.
2. Dormant oil spray shall be a dormant miscible spray, Volck Oil, by Ortho or accepted equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

A. Fencing:

1. Before start of demolition work and clearing and grubbing operations, tree protection fencing shall be installed at all trees designated to be protected. Fencing shall be installed a minimum of 15 feet beyond the drip line of trees to be protected, unless otherwise accepted by the A/E.

B. Boxing:

1. Box trees to remain and not within designated tree protection areas.

C. Root Pruning:

1. Where construction will occur close to existing trees designated to remain, roots shall be pruned. Proximity shall be as determined in the field by the A/E.
2. Root pruning is the physical cutting of tree roots to minimize root damage and promote healing. Suitable means for root pruning include trenching, vibrating plow, or stump grinder. Any method capable of tearing roots or disturbing the soil beyond the grading limit is not allowed.
3. Root prune trees as noted to a depth of 24 inches by trencher, backhoe, or other approved means.
4. Backfill root pruning trench with existing soil mixed with peat moss or well-rotted sawdust to a mixture of approximately 75 percent soil and 25 percent humus. Tamp lightly to set soil.
5. Apply mulch to a depth of 4 to 6 inches at minimum dripline radius around tree to reduce compaction and increase moisture retention. Mulch depth shall be feathered to grade at base of trunk.

D. Construction Pruning and Root Protection:

1. To compensate for root zone damage by cut or fill work, prune top of tree to approximate percent of damaged root zone area.
2. Construction pruning shall consist of pruning the tree crown to compensate for root zone damage due to construction operations. Construction pruning shall include a fertilization/insecticide program.
3. Construction pruning shall comply with NAA Ref.1 for Class IV - Crown Reduction Pruning and ANSI Z133.1.
4. For those trees remaining within construction zone to be protected, apply mulch to a depth of 6 inches within dripline radius around tree to reduce compaction and increase moisture retention. Mulch depth shall be feathered to grade at base of trunk. Remove protection mulch after completion of work as specified.

E. Fertilization and Insect Spraying:

1. Treat root pruned and construction pruned trees with liquid fertilizer, dormant oil spray, and insecticide.
 - a. Liquid fertilizer shall be applied at a rate recommended by the

manufacturer and as required by NAA Ref.2.

- b. Apply dormant oil spray, at a rate recommended by the manufacturer, in early spring before buds begin to swell.
- c. Apply insecticide spray twice to root pruned trees following application of dormant oil spray. Spray insecticide at rates recommended by spray manufacturer at intervals appropriate for effective insect control.

F. Removal of Protection:

- 1. Except as otherwise indicated or requested by A/E, temporary protection devices and facilities installed during course of the work shall be removed only after all work that may injure or damage trees and plants is completed.

END OF SECTION

SECTION 02935

SODDING

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 02200 - Earthwork.
2. 02221 - Excavating, Backfilling, and Compaction for Utilities.

1.02 SUBMITTALS

A. Soil Testing and Amendment:

1. Obtain and test, one representative mixed sample, each, of planting soil and top soil materials intended for use on this project. These samples shall be blended mixes composed uniformly of materials taken from the stockpile of the two respective soil types.
2. Test soils for horticultural purposes and submit the test results to the A/E accompanied by a recommendation from the testing agency regarding the suitability of the samples and appropriate soil amendments required to correct any detrimental or deficient soil conditions.
3. Testing shall include, but not be limited to:
 - a. Tests required to determine soil pH and the identification and quantity of soluble salts or other common pollutants that may be in the samples. Soil pH range for sodded areas shall be 6.0-6.5.
 - b. After application of topsoil and amendments, a representative soil sample shall be obtained by collecting 15 to 20 samples from the top 4 inches of soil from various areas.
 - c. Samples shall be combined and mixed thoroughly.
 - d. Submit samples to an independent testing firm for analysis.
 - e. Analysis shall provide pH and fertility levels of soil along with recommended actions for appropriate soil amendments to adjust pH levels and fertility levels.
 - f. Contractor shall amend soil according to analysis recommendations by roto-tilling the amendments thoroughly into the top 4 inches of soil.
 - g. A second soil sample shall be submitted for analysis after soil amendments have been incorporated into the soil.

- h. Final soil testing analysis results shall be submitted to the Owner before any planting of sod.

B. Certificates:

- 1. Submit certificates from supplier stating the delivered topsoil mix, sod, and other landscaping materials comply with requirements specified.
- 2. Deliver certificates upon final completion of the installation.

1.03 QUALITY ASSURANCE

- A. Sod shall comply with Florida Department of Agriculture quarantine requirements.
- B. The sod supplier shall certify on the invoice that the sod product is Floratam St. Augustine grass.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Protect solid sod before, during, and after installation from over-heating, drying out, and physical damage.
- B. Replace damaged or rejected solid sod at no cost to the Owner.

1.05 WARRANTY

- A. Contractor is to replace, at no additional cost to the Owner, grass areas in unsightly or damaged condition, for 90 days after final completion. Replace dead grass at no additional cost to the Owner for one year.
 - 1. Irrigate the newly planted grass until final completion. Irrigation shall occur in sufficient quantity to insure the orderly establishment of the grass.
 - 2. Contractor shall not be responsible for the replacement of lost materials due to "Acts of Providence", theft, vandalism, or for reasons out of the control of the Contractor.
- B. Warrant sod for 90 days after final completion and the satisfactory conclusion of the maintenance period. Any grass that fails or dies within that period shall be replaced and replanted immediately without expense to the Owner, The Contractor shall not be held responsible for losses beyond his control arising from "Acts of Providence", acts of vandalism, or loss arising from documented neglect by the Owner to properly care for planting after final completion.

1.06 MAINTENANCE

- A. Maintain sod, starting at the time of planting and continuing for 90 calendar days after final completion.
- B. Maintain and protect sodding until end of maintenance period.
- C. Sodding Maintenance:
 - 1. Provide a complete maintenance cultural program until final completion.
 - 2. Cultural program shall consist of watering, fertilizing, mowing, insect and disease control, and weed control.
 - a. Begin mowing program as soon as sod is firmly rooted.
 - 1) Mow Floratam St. Augustine sod with a rotary type mower at least three times per month at a 3 inch mowing height.
 - 2) Mowing program shall include weed-eating and edging of beds, and along walks, curbs, and buildings.
 - 3. Final completion is contingent upon full coverage of the sodded area resulting in healthy, vigorous turf, free of insects, disease, and weeds.
- D. General Maintenance:
 - 1. Maintenance shall include watering, weeding, fertilizing, cultivating, spraying, adjustment of guying, staking, and pruning necessary to keep plant materials in a healthy vigorous growing condition and to keep planted areas neat and attractive.
 - 2. Provide equipment and means for proper application of water to those planted areas not provided with an irrigation system.
- E. Replacements:
 - 1. At the end of maintenance period, plant material shall be in a healthy growing condition.
 - 2. During maintenance period immediately replace any plants showing weakness and probability of failure with a new healthy plant of the same type and size, without additional cost to the Owner.
- F. Extension of Maintenance Period: Continue maintenance period, at no additional cost to the Owner, for additional 30 days after previously noted

deficiencies have been corrected. Warranty extension period shall start upon acceptance of planting and at the end of the maintenance period.

- G. The Contractor shall conclude maintenance (exclusive of replacement within warranty period) upon written acceptance of the A/E at the end of the maintenance period or, as provided for above, at the end of the extended maintenance period.
- H. Protection:
 - 1. Irrigate the newly planted grass until final completion.
 - 2. Planting area shall be kept weed free with a herbicide program until final completion.

PART 2 PRODUCTS

2.01 MATERIALS

A. Solid Sod:

- 1. St. Augustine Floratam: At all areas in "Construction Staging Area" and any other sod damaged by Contractor during construction.
- 2. Mow sod to a height not to exceed 1-1/2" before lifting.
- 3. Sod shall be strongly rooted and free of pernicious weeds, 1-1/2" minimum root structure, freshly dug, brought to the site and placed immediately.
- 4. Sod showing discoloration or wilting will be rejected.
- 5. Sod containing nutgrass, lippia, water sedge, and dollar weed is not acceptable.

B. Commercial Fertilizers:

- 1. Commercial grade fertilizer, uniform in composition, dry, free flowing, and delivered to site in fully labeled, unopened containers, bearing name, trade name or trademark and warranty of producer.
- 2. Fertilizers shall comply with applicable State and Federal law.
- 3. At least 50 percent of the nitrogen content shall be derived from natural organic sources and potash derived from sulphate of potash.
- 4. Each container of fertilizer shall bear manufacturer's statement of analysis or a manufacturer's certificate of compliance shall be submitted to the A/E upon delivery to the site.

5. The following minimum percentages of available plant food by weight are required.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Inspect work of other trades and verify work is complete to the point landscape work may start. Verify planting may be completed according to Construction Documents.
- C. Discrepancies:
 1. In event of discrepancy, immediately notify A/E.
 2. Do not proceed with installation of materials or plants in areas of discrepancy until such discrepancies have been fully resolved to the satisfaction of the A/E.
- D. It shall be the Contractor's responsibility to thoroughly test the irrigation system before planting and report any malfunctions to the Owner. No planting shall be done until the irrigation system is operating properly.

3.02 PREPARATION OF ROUGH GRADING AND SUBGRADE

- A. Rough grading and subgrade shall be correct and suitable materials and proper drainage shall exist before placing sod. Soil or drainage conditions detrimental to growth of plant material shall be corrected.
- B. Existing subgrade shall be scarified to a minimum depth of 3 inches before spreading of topsoil. Subgrade shall be brought to true and uniform grade, and shall be cleared of stones greater than 2 inches, sticks, and other extraneous materials.
- C. Soil in compacted areas shall be tilled to a depth of 12 inches to produce a loose friable soil.
- D. Sodding shall not begin if any areas exhibit ponded conditions.

3.03 SPREADING OF TOPSOIL

- A. Subgrade shall be damp when topsoil is spread.
- B. Areas where sod is to be planted shall have a subgrade 6 inches lower than the finish grade. A 4 inch layer of topsoil shall be added before the placing of sod.
- C. Topsoil in areas to receive sod shall be fine graded with drag or rake. Remove sticks, stones, and extraneous matter. Grading shall round out breaks in grade, smooth down lumps and ridges, and fill in holes and crevices. Grade shall be maintained until placement of sod.
- D. Topsoil shall be partially incorporated into the subsoil to avoid potential layering effect of different soil layers. Apply 1/3 topsoil depth. Roto-till, plow, or disk into subsoil, then apply remainder.

3.04 INSTALLATION OF SODDING

- A. Install sod as soon as practical following placement and grading of topsoil mixture.
- B. Sod shall be free of mesh before installation.
- C. Fertilizer: Spread 30 pounds of commercial fertilizer per 1,000 square feet of finished topsoil, lightly rake in and level.
- D. Sod Placement:
 - 1. Lift sod from trucks or storage piles and place by hand with closed joints and no overlapping.
 - 2. Ground shall be leveled with the back of a rake and sod laid with joints closely butted so no voids are visible, keeping surface of sod flush with the adjoining pavements.
 - 3. All sprinkler heads shall be flagged by the playing field contractor before laying of the sod. The sod supplier/installer shall cut sod away from all sprinkler heads.
 - 4. After laying, sprinkle sod thoroughly, and tamp sufficiently to incorporate sod with topsoil blanket and to insure tight joints between sections or strips.
 - 5. After laying, cover sod with sufficient sand top dressing to fill voids remaining and then thoroughly water to wash top dressing into sodded surface.

6. Completed sod surface shall be true to finish grade indicated on plans, even and firm at all points and shall, after settlement, be flush with top of abutting walks, paving, concrete borders, catch basins and the like.
7. Keep new sod properly watered until final completion.
8. Protect sodded areas against trespassing and damage of any kind for the duration of maintenance period.

3.05 ADJUSTMENT AND CLEANING

A. Site Clean-Up:

1. Upon completion of any landscape project, thoroughly clean up the project site.
2. Remove equipment, unused materials, deleterious material, and surplus excavated material.
3. Fine grade disturbed areas and the areas adjacent to the new plantings to provide a neat and uniform site.
4. Damaged or altered existing structures, because of the landscape work, shall be corrected.

END OF SECTION

SECTION 03100

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03200 - Concrete Reinforcement
2. 03300 - Cast-in-Place Concrete
3. 04220 - Concrete Unit Masonry

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D994-94 Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
2. E154-88 Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls or as Ground Cover.

1.03 QUALITY ASSURANCE

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

1. ACI 117/117R-90 Tolerances for Concrete Construction and Materials.
2. ACI 301-89 Specifications for Structural Concrete for Buildings.
3. ACI 318-95 Building Code Requirements for Reinforced Concrete.
4. ACI 347R-88 Recommended Practice for Concrete Formwork.

B. Qualifications:

1. Formwork Engineer: Professional engineer, with Florida registration and experience in design of formwork and related items.
2. Formwork Contractor: Florida licensed contracting firm having 5 years successful experience in fabrication and erection of formwork systems of similar scope and complexity as required for this project. Contractor shall have sufficient capacity to produce formwork without causing delay in work.

1.04 FORMWORK AND RESHORING DESIGN

A. Formwork:

1. Comply with Chapter 4 of ACI 301
2. Formwork engineer shall perform or oversee design, drawings, erection, and removal.
3. Design according to ACI 117 and ACI 347, including provisions for construction loads and placing equipment to be used on project.
4. Verify strength and stiffness of in-place building elements to resist required loads and restrict deformations to specified tolerances.
5. Earth cuts shall not be used as forms for vertical surfaces. Natural rock formations maintaining a stable vertical cut may be used as side forms. Comply with OSHA's "Trench Safety Act".
6. Design and Installation of Formwork: Form ties that leave through holes in the concrete are not allowed.
7. Removal Strength:
 - a. Wall forms and column forms may be removed 12 hours after pouring.
 - b. Beams and other slabs shall not have forms removed until the concrete has achieved 75 percent of its design strength. Beams shall be reshored immediately upon removal of forms.
 - c. In addition to the above, flat slab forms and stair slab forms shall not be removed for 5 days. Upon removal of forms, reshores shall be placed and remain in place until concrete is 14 days old.

B. Reshoring:

1. Design reshoring to resist active loads.
2. Space shoring so no lower floor or member will be excessively loaded from design live loads or will induce tensile stress in concrete members where no reinforcing steel is provided.
3. Extend shores beyond minimums to ensure proper distribution of loads throughout structure.
4. Consider special loading requirements to support load of special elements where elements of similar size and capacity do not exist in supporting structure below.

1.05 FORMWORK SUBMITTALS

- ### A. Product Data: Submit manufacturer's product data with application and

installation instructions for proprietary materials and items.

B. Formwork:

1. Submit shop drawings, signed and sealed by formwork engineer, for fabrication and erection of specific finished concrete surfaces as indicated. Show construction of forms as required.
2. A/E'S review is for general applications and features only. Design of formwork for structural stability and efficiency is Contractor's responsibility, and will not be reviewed.

C. Reshoring:

1. Submit shop drawings, signed and sealed by formwork engineer, for reshoring system showing:
 - a. Arrangement and sequencing of reshores required.
 - b. Specific areas where reshores do not align vertically.
 - c. Required installation procedures.
 - d. Removal criteria.
2. Submit calculations showing:
 - a. Loading diagrams for each floor or differently loaded area showing maximum imposed loads at each critical sequence.
 - b. Ratio of total load to strength at actual age.
 - c. Verification of member strength where shores do not align vertically.
 - d. Verification of structure to resist required lateral loads.

D. Foundations for Formwork and Reshoring:

1. Submit shop drawings, signed and sealed by formwork engineer, or include with formwork and reshoring shop drawings, showing:
 - a. Subgrade preparation required including compaction and moisture control.
 - b. Size and description of sill assemblies.

E. Formwork Removal:

1. Authorization for Removal: Formwork engineer shall furnish a signed and sealed report establishing the criteria for removal of formwork, shoring,

and reshoring. Deviation from established criteria is not allowed.

PART 2 PRODUCTS

2.01 FORM MATERIALS

- A. Forms for Unexposed Finish Concrete: Form concrete surfaces to be concealed in finished structure with plywood, lumber, metal, or other material.
- B. Form Ties: Ties that leave plastic tube lined holes through members are not allowed.
- C. 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.
- D. Forming Accessories: CRD-C572-74 polyvinyl chloride (PVC).
 - 1. Waterstops: Flat dumbbell type at construction joints and center bulb type at building expansion joints.
 - 2. Drips: 3/8" wide x 1/2" high drip groove placed 3/4" back from edge in cast-in-place exterior soffits.
- E. Premolded Expansion Joint: ASTM D994, 1/2" thick.
- F. Vapor Retarder:
 - 1. Provide moisture retarder cover over prepared base material where indicated.
 - 2. Use polyethylene sheet not less than 6 mils thick or other materials resistant to decay when tested according to ASTM E154.

PART 3 EXECUTION

3.01 FORMS

- A. Erect, support, brace, and maintain formwork to support applied vertical and lateral loads 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.

- B. Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent materials.
- C. Construct forms to sizes, shapes, lines, and dimensions shown to obtain accurate alignment, location, grades, and level and plumb work in finished structures.
 - 1. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required in work.
 - 2. Use selected materials to obtain required finishes.
 - 3. Solidly butt joints and provide backup at joints to prevent leakage of cement paste.
- D. 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.
 - 1. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only.
 - 2. Kerf wood inserts for forming keyways, reglets, recesses, and the like, to prevent swelling and for easy removal.
- E. Provide temporary opening where interior area of formwork is inaccessible for clean out, for inspection before concrete placement, and for placement of concrete.
 - 1. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar.
 - 2. Locate temporary openings on forms at inconspicuous locations.
- F. Form Ties:
 - 1. Factory-fabricated, adjustable-length, removable or snapoff metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.
 - 2. Unless otherwise indicated, provide ties so portion remaining within concrete after removal is at least 1- 1/2" inside concrete.
 - 3. Unless otherwise shown, provide form ties that will not leave holes larger than 1 inch diameter in concrete surface.
- G. Provisions for Other Trades:

1. Provide openings in concrete formwork to accommodate work of other trades.
2. Determine size and location of opening, recesses, and chases from trades providing such items.
3. Accurately place and securely support items built into forms.

H. Cleaning and Tightening:

1. Thoroughly clean forms and adjacent surfaces to receive concrete.
2. Remove chips, wood, sawdust, dirt, or other debris just before concrete is placed.

3.02 JOINTS

- A. Construction Joints: Locate and install construction joints not shown on drawings to not impair strength and appearance of the structure, as acceptable to A/E.
- B. 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.
- C. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.
- D. Isolation Joints in Slabs-on-Ground:
1. 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.
 2. Joint filler and sealant materials are specified in Division 7 sections of these specifications.
- E. Contraction (Control) Joints in Slabs-on-Ground:
1. Construct contraction joints in slabs-on-ground to form panels of patterns as shown.
 2. Use inserts 1/4" wide x 1/4 of slab depth, unless otherwise indicated.
- F. Form contraction joints by inserting premolded hardboard or fiberboard strip into fresh concrete until top surface of strip is flush with slab surface. After concrete has cured, remove inserts and clean groove of loose debris.

1. Contraction joints may be formed by saw cuts as soon after slab finishing as possible without dislodging aggregate.

3.03 RE-USE OF FORMS

- A. Clean and repair surfaces of forms to be re-used in work. Split, frayed, delaminated, or otherwise damaged form facing materials are not acceptable for exposed surfaces. Apply new form coating compound as specified for new formwork.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 QUALITY ASSURANCE

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

1. ACI 117/117R-90 Tolerances for Concrete Construction and Materials.
2. ACI 301 Specifications for Structural Concrete for Buildings.
3. ACI 315 Details and Detailing of Concrete Reinforcement.
4. ACI 318-05 Building Code requirements for Reinforced Concrete.
5. ACI 439.3R-91 Mechanical Connection of Reinforcing Bars.
6. AWS DI.4-79 Structural Welding Code Reinforcing Steel.
7. CRSI, Manual of Standard Practice, 2002.
8. CRSI, Placing Reinforcing Bars, 2002.
9. Wire Reinforcement Institute, Manual Standard Practice, 2008.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A82-02 Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. A184/A-96 Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
3. A185-02 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
4. A496-02 Specification for Steel Wire, Deformed, for Concrete Reinforcement.
5. A497-01 Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
6. A615/04a Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
7. A775/A-96 Specification for Epoxy-Coated Reinforcing Steel Bars.
8. C1116-95 Specification for Fiber-reinforced Concrete and Shotcrete.

1.03 SUBMITTALS

A. General:

1. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement.
 - a. Comply with ACI 315 showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement and accessories.
 - b. Include special reinforcement required at openings through concrete structures.

B. Selection of splices: Splices shall be full tension, unless noted otherwise.

1. Splices noted on the drawings to be compression splices shall be furnished by one of the following:
 - a. Compression lap splices according to ACI 315.
 - b. Mechanical compression only connectors according to ACI 439-3R, staggered 1/2 Class "C" lap length and maintaining not less than 1/4 the total tensile capacity of any column face.
 - c. Full penetration welds staggered not less than 18 diameters.
2. Splices shown on the drawings as either Class "A" or Class "B" may be one of the following:
 - a. Class "B" lap splices.
 - b. Class "A" (but not less than compression lap) lap splices staggered not less than one Class "B" lap length.
 - 1) Exception: This shall not be allowed when shown as class "B" in a location, which by design, has already accounted for other continuing bars or staggered splices.
 - c. Appropriate mechanical connectors according to ACI 439-3R staggered not less than 24 diameters.
 - d. Full penetration welds staggered not less than 24 diameters.
3. Unless otherwise noted in the drawings, reinforcing shall be spliced to develop the full strength of the bar in either tension or compression. Those splices shall be furnished by one of the following:

- a. Class "B" lap splices where only 1/2 of the total rebars are spliced at any one floor.
 - b. Full penetration welds staggered not less than 36 diameters.
 - c. Appropriate mechanical connectors according to ACI 439-3R staggered not less than 36 diameters.
4. Total steel at lap splices shall not exceed 8 percent for columns or shear wall cores containing the spliced bars.
 - a. All bars may be lapped at one section for up to 4 percent steel.
 - b. 1/2 of the bars may be lapped for up to 5.3 percent steel.
 - c. 1/3 of the bars may be lapped for up to 6 percent steel.
 - d. Above 6 percent steel, other splice choices shall be used.
 5. Where staggered lap splices are used, provide a mixture of bar sizes as appropriate where vertical bar size changes on the drawings.
 6. Where different size bars are lap spliced, the length of splice may be based on the smaller bar size. If there is a larger quantity of the smaller bar size, the splice length shall be based on the larger bar.
 7. It shall be the responsibility of the reinforcing detailer to determine the concrete strength at the point of a lap splice, the bar position (top or other), bar spacing, confinement condition based on ties or stirrups or edge condition to select the proper lap length.
 8. Increase laps for bundled bars according to ACI 318, with number based on total bars in group including lapped bars.
- C. Detailing of Splices: Placing shop drawings shall specifically show splice lap lengths where they occur. Bar diameter lap tables and references to other charts are not acceptable.
 - D. Staggered Laps Required: Provide staggered laps in any member as necessary to keep space between bars within splice zone at least 1 inch or 1 bar diameter clear.
 - E. Detailing of Bar Placement: For any bar other than those placed at an edge condition, between edge condition or openings, or any other location where the bar cannot be shifted longitudinally, a dimension shall be shown from an identifiable building grid, wall, or edge to at least one end of the bar.
 - F. Congested Areas of Placement: For any conditions resulting in bar spacing less than 2 diameters clear or where the placement of bars in one member requires critical templating to allow bar placement in an intersecting member,

furnish details of sufficient scale to show clearances, spacing, and arrangements for properly placing those bars.

- G. Accessories: Show accessories, supports, chairs, bolsters, and spacers necessary to complete the installation. Where supports are beyond the scope of CRSI detailing standards and custom designed supports are required, provide engineering calculations demonstrating the capacity of the system.
- H. Flat Plates: Provide not less than 3 separate drawings of each plate separately showing bottom bars, top bars, and accessories.
- I. Welding Submittals:
 - 1. If welding of reinforcing bars is to be included as part of the work, submit the following:
 - a. A complete welding procedure specification according to AWS DI.4.
 - b. A certified chemical analysis of the steel to be welded.
 - c. Carbon equivalence calculations according to AWS DI.4.
 - d. Qualification papers for welders who will be employed on the project. Welders shall have passed a qualification test within a 12 month period before the work or furnish a statement from a testing agency acceptable to A/E that they have observed or tested that welder's work under similar requirements within the past 6 months.

1.04 SUBSTITUTIONS

- A. Reinforcing Splicing:
 - 1. Splices shown in the drawings shall be considered mandatory for base bid purposes.
 - 2. Alternative methods of providing for splices are available within the constraints of this specification and ACI 318.
 - 3. If alternative splices are desired, the shop drawing submitted shall clearly indicate the change and include authorization by any other subcontractors involved in the change.

PART 2 PRODUCTS

2.01 REINFORCING MATERIALS

- A. Comply with Chapter 5 of ACI 301.
- B. Reinforcing Steel:
 - 1. Bars #3 through #11 shall be deformed bars according to ASTM A615 Grade 60 and according to the additional requirements of Paragraph 5.2.2.1 of ACI 301.
 - 2. Bars #2 in size shall be plain round meeting A615/A-96a Grade 40.
 - 3. Welded wire fabric shall be of plain wire. Welded wire fabric shall be galvanized at exterior exposed concrete.
 - 4. Unless indicated otherwise the minimum concrete protective cover specified in Paragraph 5.7.1 of ACI 301 is the specified cover for this project unless indicated otherwise.
- C. Epoxy-Coated Reinforcing Bars: ASTM A775.
- D. Form-Saving Splice Connectors: Flanged devices to allow insertion of threaded reinforcing bars into a previously formed face. Available products include, but are not limited to:
 - 1. Form Saver by Lenton, or approved equal.
 - 2. DB-SAE Splices System by Richmond, or approved equal.
 - 3. Rebar Flange Coupler by Williams, or approved equal.
- E. Mechanical Connectors and Splice Devices: Proprietary products suitable for the use intended and listed in ACI 439-3R-83.
- F. Steel Wire: ASTM A82, plain, cold-drawn, steel.
- G. Fabricated Deformed Steel Bar Mats: ASTM A184.
- H. Welded Steel Wire Fabric: ASTM A185.
- I. Deformed Steel Wire: ASTM A496.
- J. Welded Deformed Steel Wire Fabric: ASTM A497.
- K. Supports for Reinforcement: Provide supports for reinforcement including 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 Class C or Class A as required acceptable.
 - 1. For slabs-on-grade, use supports with sand plates or horizontal runners

- where base material will not support chair legs.
2. Provide custom supports as required to support top layer of mats and other special conditions not provided for within CRSI standards.

L. Fiber Reinforcement:

1. Manufacturers:
 - a. Fibermesh by Synthetic Industries, Chattanooga, TN, or approved equal.
 - b. Ferro by Forta Corporation, Grove City, PA., or approved equal.
2. Comply for use in plain concrete as defined in ACI 318.1. and the following:
 - a. Fibers shall not be used as a replacement for any reinforcement required for structural purposes.
 - b. Blend fibers into the concrete mix according to manufacturers written instructions.
 - c. Provide control joints according to Section 5.2 of ACI 318.1.
 - d. Fibers shall comply with ASTM C1116-95.

PART 3 EXECUTION

3.01 PLACING REINFORCEMENT

- A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as specified.
- B. Clean reinforcement of loose rust and mill scale, dirt, and other materials that reduce or destroy bond with concrete.
- C. 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.
- D. When any reinforcing bar is placed projecting either horizontally or vertically from a given element to subsequently lap with other reinforcing bar, verify the detailed lap length will be achieved.

1. Report any deviation to the A/E for correction before placing concrete in the first element.
 2. Bar projections resulting in laps shorter than the detailed laps shall be considered rejected, and corrective measures shall be taken at the direction of the A/E with no additional cost to the Owner.
- E. Place reinforcement to obtain at least minimum coverages for concrete protection.
1. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations.
 2. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces.
- F. Install welded wire fabric in as long lengths as practicable.
1. Lap adjoining pieces at least one full mesh plus 2 inches and wire splices.
 2. Offset end laps in adjacent widths to prevent continuous laps in either direction.
- G. Provide the A/E with not less than 48 hours notice before starting any welding of reinforcing bars.
1. Welding of reinforcing bars shall only be allowed under the direct supervision of the A/E.
 2. Welding of crossing reinforcing bars is not allowed.
 3. Any bars with unauthorized or unacceptable welds shall be replaced at no additional cost to the Owner.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03100 - Concrete Formwork.
2. 03200 - Concrete Reinforcement
3. 03312 - Concrete Testing.
4. 07270 - Firestopping and Fire and Smoke Barrier Caulking.
5. 07190 - Vapor/Radon Barrier.
6. 07900 - Joint Sealers.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A615/A-04 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
2. C78-94 Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading).
3. C150-04 Specification for Portland Cement.
4. C260-95 Specification for Air-Entraining Admixtures for Concrete.
5. C309-97 Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
6. C494-92 Specification for Chemical Admixtures for Concrete.
7. D1751-83 Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
8. D1752-84 Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.03 SUBMITTALS

A. Submit shop drawings for reinforcement and accessories:

1. Detail beams and reinforcing in elevation and not in schedules.
2. Show slab reinforcing in plan view, similar to the structural drawings, not scheduled, and drawn to a minimum scale of 1/8" = 1'-0". Show reinforcing on the plan view along with size, quantity, marks, and spacing.
3. Detail walls and reinforcing in elevation and not in schedules.
4. Other items may be detailed as needed.
5. A/E will not review drawing submitted not complying with these requirements. Contractor shall verify detailing proceeds as specified to avoid untimely reinforcing arrival.

B. Materials and methods of curing.

C. Concrete materials and mix designs.

D. Certifications required for admixtures (chloride and solids).

E. Chlorides in concrete.

F. Test reports.

G. Waterstops and premolded joint fillers.

H. Curing compounds.

1.04 STANDARDS

A. Concrete work shall comply with requirements of ACI 301- Specifications for Structural Concrete for Buildings, except as specified.

B. The Contractor shall familiarize himself with the requirements of ACI 301 and this specification.

C. The requirements that follow are listed in the sequence of chapter numbers of ACI 301 for ready reference purposes.

D. Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 MATERIALS

A. Comply with Chapter 1 of ACI 301.

2.02 MATERIALS FOR CONCRETE

A. Comply with Chapter 2 of ACI 301 and the following:

1. Cement: Type I or III complying with ASTM C150.
2. Admixtures:
 - a. Water Reducing Admixture: The admixture shall comply with ASTM C494, Type A, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon WR-75 by Euclid Chemical Co., or approved equal.
 - 2) Pozzolith 200N by Master Builders, or approved equal.
 - 3) Plastocrete 160 by Sika Chemical Corp., or approved equal.
 - b. Water Reducing, Retarding Admixture: The admixture shall comply with ASTM C494, Type D, and not contain more chloride ions that are present in municipal drinking water.
 - 1) Eucon Retarder-75 by Euclid Chemical Co., or approved equal.
 - 2) Pozzolith 100XR by Master Builders or approved equal.
 - 3) Plastiment by Sika Chemical Corp., or approved equal.
 - c. High Range Reducing Admixture (Superplasticizer): The admixture shall comply with ASTM C494, Type F or G, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Eucon 37 by Euclid Chemical Co., or approved equal.
 - 2) Sikament by Sika Chemical Corp., or approved equal.
 - d. Non-Chloride Accelerator: The admixture shall comply with ASTM C494, Type C or E, and not contain more chloride ions than are present in municipal drinking water.
 - 1) Accelguard 80 by Euclid Chemical Co., or approved equal.
 - 2) Darex Set Accelerator by W.R. Grace, or approved equal.
3. Air Entraining Admixture: Complying with ASTM C260.
4. Calcium Chloride: Calcium chloride or admixture containing more than 0.1 percent chloride ions are not allowed.

- B. Certification: Written compliance to above-mentioned requirements and the chloride ion content will be required from the admixture manufacturer (include admixtures) before mix design review by the A/E.

2.03 PROPORTIONING

- A. Comply with Chapter 3 of ACI 301 and the following:

- 1. Strength: Normal weight concrete - see drawings.

- a. Concrete slabs, designated as "Concrete Pavement": 28-day compressive strength not less than 4,000 psi and a flexural strength (modulus of rupture) of not less than 650 psi when tested according to "Method of Test for Flexural Strength of concrete (using simple beam with third point loading)", ASTM C78. Include curb or curb and gutters.

- 2. Durability:

- a. Pumped Concrete:

- 1) Testing shall be completed at the final discharge location after pumping.
- 2) Testing shall be completed at the truck before pumping.
- 3) Samples shall include samples for both slump and strength tests.
- 4) Adding of water to transit mixers/agitators.
 - a) Contractor shall maintain a maximum time limit of 90 minutes on the introduction of water into the cement.
 - b) Only 1 addition of water on the site to bring the mix to the producer's mix slump criteria is allowed.

- b. Design Mixes:

- 1) Design mixes for concrete intended to be placed as-is from the truck shall be designed as such.
- 2) Design mixes for concrete intended to be pumped shall be made on one of the following bases:
 - a) The mix shall be designed as a truly plastic mix by proper proportioning. See ACI 304.2R - Placing

Concrete By Pumping Methods for guidelines for a pumpable plastic workable mix. Trial batches shall be made, and without a device to test pumping ability, results of field trials shall be used.

- b) Water shall not be added at the pump. One addition of water at the truck to meet the design slump (at the truck) is allowed.
 - c) A super plasticizer may be used.
- c. Concrete slabs placed at temperatures below 40 degrees F. shall contain the "Non-Chloride Accelerator".
 - d. Concrete required to be air entraining shall contain the "Air Entraining Admixture", and air content shall comply with table 3.4.1 of ACI 301.
 - e. Pumped concrete and concrete with a water/cement ratio less than 0.50 shall contain the "High Range Water Reducing Admixture".
 - f. The "Water Reducing", Type A, or "Water Reducing and Retarding", Type D admixtures complying with ASTM C494 may be used at the option of the Contractor.
 - g. Concrete containing the "High Range Water Reducing Admixture" (superplasticizer) shall have a maximum slump of 8 inches unless otherwise directed by the A/E. The concrete shall be proportioned for a slump of 2 to 3 inches, be verified, then the high range water reducing admixture added to increase the slump to the approved level.
 - h. All other concrete shall be proportioned to have a maximum slump of 4 inches.
- 3. Normal weight concrete shall be air-entrained. Amount of air-entraining shall be according to Table 3.4.1.
 - 4. Requirements for Other Concrete: The requirements of Paragraph 2.03 D(1).

2.04 FORM WORK

A. Comply with Chapter 4 of ACI 301 and the following:

- 1. Earth cuts shall not be used as forms for vertical surfaces. Natural rock formations maintaining a stable vertical cut may be used as side forms. Comply with OSHA's "Trench Safety Act".
- 2. Design and Installation of Formwork: Form ties that leave through holes in the concrete are not allowed.
- 3. Removal Strength:

- a. Wall forms and column forms may be removed 12 hours after pouring.
- b. Slabs supported by precast joists may have forms removed as follows:
 - 1) Joist spacing 4'-6" or less, 24 hrs.
 - 2) Joist spacing between 4'-6" and 6'-8", 48 hrs.
 - 3) Joist spacing between 6'-8" and 8'-8", 72 hrs.
- c. Beams and other slabs shall not have forms removed until the concrete has achieved 75 percent of its design strength. Beams shall be reshored immediately upon removal of forms.
- d. In addition to the above, flat slab forms and stair slab forms shall not be removed for 5 days. Upon removal of forms, reshores shall be placed and remain in place until concrete is 14 days old.

2.05 REINFORCEMENT

- A. Comply with Chapter 5 of ACI 301 and Section 03200 - Concrete Reinforcement.

2.06 FIBER REINFORCEMENT

- A. Comply for use in plain concrete as defined in ACI 318.1. and Section 03200 - Concrete Reinforcement.

2.07 JOINTS AND EMBEDDED ITEMS

- A. Comply with Chapter 6 of ACI 301 and the following:
 - 1. Expansion Joints:
 - a. Premolded joint fillers shall be preformed bituminous type, ASTM D1751 for joints without sealant.
 - b. Premolded expansion joint fillers for pavements, for joints with sealant and where indicated shall be non-extruding and resilient type of ASTM D1752, compatible with urethane joint sealant compounds.
 - 2. Waterstops:
 - a. Waterstops and fittings shall be manufactured from PVC. The

waterstops shall be as manufactured by Greenstreak or accepted equivalent.

- b. For construction joints, 4 inch serrated typed with Centerbulb, RS 316-4 or RB316-4 shall be used.
- c. For expansion joints, 6 inch serrated type with Centerbulb, RB38T6 or RSB386 shall be used.
- d. Make splices using splicing unions according to manufacturer's instructions. Make waterstop intersections using factory molded fittings.
- e. Provide #14 tie wire at 2'-0" center to center embedded in base pour for waterstop support.

3. Safety Nosings For Exterior Concrete Stairs:

- a. Cast abrasive aluminum 3 inches wide, equipped with manufacturer's standard continuous anchors.
- b. Length shall be 6 inches less than the full width of stairs.
- c. Provide factory-applied reinforced protective tape on exposed surfaces of nosings.
- d. Manufacturers:
 - 1) Model No.101 by Wooster Products Inc., or approved equal.
 - 2) Model "A" by American Abrasive Metals, or approved equal.
 - 3) Model "AX" by Safety-T-Metal Co., Inc., or approved equal.

2.08 PRODUCTION OF CONCRETE

A. Comply with Chapter 7 of ACI 301 and following:

1. Ready-Mixed Concrete:

- a. Provide copies of each delivery ticket to the A/E. Include mix designation on delivery ticket.
- b. Do not place concrete over 90 minutes old from the time it was batched.

2. Weather Conditions:

- a. Where the relative humidity is less than the corresponding concrete temperature as placed, or intended to be placed, as indicated in the following Table, the Contractor shall follow the recommendations of ACI 305R, "Hot Weather Concreting".

<u>Concrete Temperature (F)</u>	<u>Minimum Relative</u>	<u>Humidity</u>
100°	80	
95°	70	
90°	60	
85°	50	
80°	40	
75°	30	

- b. The above Table is based upon a wind speed of 10 mph. For ambient wind speeds more than 10 mph, the Contractor shall follow the recommendations of Fig.2.1.5 of ACI 305R if the relationships of air temperature, wind velocity, relative humidity, and concrete temperature indicate a rate of evaporation more than 0.2 pounds per sq.ft. per hour.
- c. Concrete having a temperature more than 100 degrees F. shall not be placed.
- d. The requirements of Paragraph 7.6.1.2 of ACI 301 (cooling of concrete ingredients are not waived).

2.09 PLACING

A. Comply with Chapter 8 of ACI 301 and the following:

- 1. Protection: When the temperature of the concrete exceeds the minimum relative humidity relationship specified in Paragraph "Production of Concrete", the requirements of Paragraph "Production of Concrete" shall control.

2.010 REPAIR OF SURFACE DEFECTS

A. Comply with Chapter 9 of ACI 301 and the following:

- 1. With prior approval of the A/E, as to method and procedure, repair defective areas according to ACI 301, Chapter 9, except that the bonding compound Euco Weld by the Euclid Chemical Company or Weldcrete by the Larsen Company must be used.
- 2. Defects designated as "structural" by the A/E shall be repaired with prior approval of the A/E, as to method and procedure, using the epoxy adhesive epoxy mortar as furnished by the Euclid Chemical Company or Sika Chemical Corp.

2.011 FINISHING OF FORMED SURFACES

A. Comply with Chapter 10 of ACI 301 and the following:

1. Finishes:

- a. All concrete shall be "rough form finish" according to Paragraph 10.2 of ACI 301, except concrete that will be exposed to view shall be "smooth form finish".

2.012 SLABS

A. Comply with Chapter 11 of ACI 301 and the following:

1. Finishes: Finishes shall be according to Paragraph 11.8 of ACI 301 except as specified.
2. Maximum allowable tolerances for floor slabs not receiving ceramic or quarry tile shall be 1/8" in a 10 foot radius.
3. Exterior slabs receiving tile, pavers, or similar covering shall be troweled finish.

2.013 CURING AND PROTECTION

A. Comply with Chapter 12 of ACI 301 and the following:

1. Preservation of moisture according to Paragraph 12.2 of ACI 301.
2. Curing and Sealing Compound: Super Floor Coat or Super Pliocure by the Euclid Chemical Company or Masterseal 66 by Master Builders. The compound shall comply with ASTM C309, Type 1 or Type 1D, 30 percent solids content minimum, and have test data from an independent laboratory indicating a maximum moisture loss of 0.030 grams per sq.cm. when applied at a coverage rate of 300 sq.ft. per gallon. Manufacturers certification required.
3. Curing and Hardening Compound: "Eucosil" by the Euclid Chemical Company or "Curetox" by Toch Brothers. The compound shall be sodium silicate type.
4. Apply compounds according to manufacturer's directions.
5. Slabs receiving carpet or are of exposed concrete in the finished structure shall receive the "Curing and Sealing Compound". Exclude exterior walks and pavements.
6. Slabs receiving resilient tile or cementitious or other toppings are to receive the "Curing and Hardening Compound".
7. Verify the compatibility of the compound with the applied coverings or toppings.
8. Submit manufacturer's data.

9. Application of Curing and Sealing and Curing and Hardening Compound: Apply compound to concrete floors and slabs according to manufacturer's directions and as follows:
- a. After fresh placed concrete surface has been finished and will not be marred by application, uniformly apply undiluted compound by spray, brush or squeegee without allowing compound to collect in low spots.
 - b. Keep traffic off surface for 24 hours or until surface is completely dry.
 - c. Within 1 week of a date set by the A/E, thoroughly clean and wash exposed concrete interior floors, then apply a second uniformly applied coat of the specified Curing and Sealing Compound without allowing compound to collect in low spots. Keep traffic off surface for 24-hours following the second coat, or until surface is completely dry. Exclude walks, pavements, and exterior slabs.
- B. Temperature, Wind, and Humidity: The requirements of "Production of Concrete" shall decide the conditions and precautions for hot weather concreting.

2.014 TESTING

- A. Comply with Chapter 16 of ACI 301, Section 03312 - Concrete Testing, and the following:
1. Testing Agencies: The cost of testing services unless specified otherwise, will be as follows:
 2. Services described in Paragraphs 16.3.1, 16.3.2, and 16.3.3 of ACI 301 (review or check test Contractor's materials and mix design, secure and test production samples at plants or stock piles) will be paid by the Board, as required by the A/E.
 3. Services described in Paragraphs 16.3.4, 16.3.5, and 16.3.6 of ACI 301 (strength, slump, and temperature tests of concrete) will be paid by the Board.
 4. If air entrained concrete is specified, tests according to Paragraphs 16.3.5 and 16.3.6 of ACI 301 (air content) will be paid by Contractor.
 5. Services described in Paragraph 16.5 of ACI 301, additional testing and inspection because of changes proposed by Contractor, additional testing because of failure to meet specifications shall be paid by Contractor.
- B. Testing Services:

1. For strength test of concrete, mold, cure, and test 5 specimens. Test 1 at 3 days, 1 at 7 days, and 3 at 28 days.
2. Make 1 strength test for each 50 cubic yards or fraction thereof placed in any 1 day.

2.015 EVALUATION AND ACCEPTANCE OF CONCRETE

- A. Comply with Chapter 17 of ACI 301.

2.016 ACCEPTANCE OF STRUCTURE

- A. Comply with Chapter 18 of ACI 301.

PART 3 - NOT USED.

END OF SECTION

SECTION 03312

CONCRETE TESTING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Provide labor, materials, necessary equipment, services, and related work to complete the concrete testing work including, but not necessarily limited to, the following:

1. Testing and evaluation of concrete ingredients.
2. Sampling and testing of concrete.
3. Testing of grout.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C31/C-98 Practice for Making and Curing Concrete Test Specimens in the Field.
2. C39-99 Test Method for Compressive Strength of Cylindrical Concrete Specimens.
3. C42-99 Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
4. C94-04 Specification for Ready-Mixed Concrete.
5. C143-90a Test Method for Slump of Hydraulic Cement Concrete.
6. C173-94a Test Method for Air Content of freshly Mixed Concrete by the Volumetric Method.
7. C231-97 Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
8. C494-99 Specification for Chemical Admixtures for Concrete.

1.03 QUALITY ASSURANCE

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

1. ACI 301 Specifications for Structural Concrete for Buildings.
2. ACI 318 Building Code Requirements for Reinforced Concrete.
3. ACI 347 Recommended Practice for Concrete Formwork.

B. Testing Laboratory Qualifications:

1. Testing laboratory shall comply with state and local requirements.
2. Compression testing machines shall comply with ASTM C39.

PART 2 PRODUCTS NOT USED

PART 3 EXECUTION

3.01 SAMPLING FRESH CONCRETE

- A. Comply with ASTM C172, except for slump to comply with ASTM C94.
- B. Slump: ASTM C143, at each sample for strength tests, at each load for concrete of specified strength of 6,000 psi and greater, and at intervals not exceeding 10 minutes for concrete containing ASTM C494, Type F admixture. Perform visual slump evaluation of each load and perform test when questionable.
- C. Air Content: One for each set of compressive strength test specimens and at every load where concrete is subject to hydrostatic pressure, according to the following.
 1. ASTM C173 Volumetric method for lightweight or normal weight concrete
 2. ASTM C231 Pressure for normal weight concrete.
- D. Concrete Temperature:
 1. Test hourly when air temperature is 40 degrees F. and below.
 2. Test hourly when air temperature is 80 degrees F. and above.
 3. Each time a set of compression test specimens is made.
- E. Compression Test Specimens: ASTM C31;
 1. Number of Cylinders per Set:
 - a. One set of 3 standard cylinders for each compressive strength test.
 2. Frequency of Sampling:
 - a. One set for each 50 cubic yards or fraction thereof of each concrete class placed in any one day or for each 5,000 square feet of slab

- surface area placed.
 - b. When frequency of testing will provide less than 5 strength tests for a given class of concrete, take samples from at least 5 randomly selected batches or from each batch if fewer than 5 are used.
3. Point of Sampling:
- a. Samples may be taken at the discharge of the truck except when concrete is placed by conveyor or pumping, take samples at point of final placement of concrete within the structure at intervals not exceeding every 150 cubic yards placed.
 - b. Samples taken at point of final placement may be in place of samples at intervals required above, or samples may be taken at point of final placement, at option of testing agency.
4. Handling:
- a. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.

3.02 COMPRESSIVE STRENGTH TESTS

- A. Comply with ASTM C39.
- B. Time of tests:
 - 1. 1 specimen at 7 days.
 - 2. 1 specimens tested at specified age and 1 reserve.

3.03 REPORTS

- A. A. Reports of compressive strength test shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for tests.

3.04 ACCEPTANCE

- A. When strength of field-cured cylinders is less than 85 percent of companion laboratory cylinders, evaluate current operations and provide corrective procedures for protecting and curing the in-place concrete.

- B. Strength level of concrete will be considered satisfactory if averages of sets of 3 consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.

3.05 ADDITIONAL TESTS

- A. The testing service will make additional test of in-place concrete when test results indicate specified concrete strengths and other characteristics have not been attained in the structure, as directed by A/E.
 - 1. Testing service may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed.
 - 2. Contractor shall pay for such tests conducted and any other additional testing as may be required, when unacceptable concrete is verified.

END OF SECTION

SECTION 03320
CONCRETE TOPPING

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 02072 - Removals.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A185-02 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Concrete Strength: Normal weight concrete - 3,000 psi at 28 days.
- B. Welded Wire Mesh: According to ASTM A185, galvanized smooth wire 6 x 6 1.4/1.4.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Roughen substrate to insure bonding of topping.
- B. Place concrete topping with wire mesh reinforcing and allow a minimum of 28 days curing time before proceeding with finished flooring materials.
- C. Finish concrete surface with steel trowel, allowing not more than 1/8" variation in a 10'-0" radius.
 1. Bring finished surface to a minimum 1/4" below level of existing flooring at door openings and other passageways.

- D. Do not use sealing or curing agents of any kind.
- E. Leave new concrete surface clean and free of dirt and other foreign matter ready to receive application of new troweled flooring materials.
- F. Maintain substrate damp for the 24-hour period immediately preceding placement of topping.
- G. Wet cure topping for 7 days with continuous spray/mist, burlap, or other accepted means.

END OF SECTION

SECTION 03600

GROUT

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 - Cast-In-Place Concrete.
2. 03600 - Grout.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C109-02 Test Method for Compressive Strength of Hydraulic Cement Mortars.
2. C191-92 Test Method for Time of Setting Hydraulic Cement by Vicat Needle.
3. C531-95 Test Methods for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Coatings.
4. C579-96 Test Method for Compressive Strength of Chemical Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Coatings.
5. C827-87 Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.

1.03 SUBMITTALS

- ###### A. Manufacturer's literature including specifications and printed installation instructions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Grouting Mortar:

1. Bonsal.

2. Burke.
3. Five-Star Products.
4. Master Builder.
5. Mobil.
6. Thoro.

2.02 NONSHRINK CEMENTITIOUS GROUT

- A. Exhibit no visible bleeding 2 hours after placement in a fluid consistency of 20 to 30 second flow through CRD C79 Flow Cone.
- B. Grout shall show no shrinkage and a maximum of 4.0 percent expansion at any time before initial set and tested according to ASTM C827.
- C. Grout shall show no shrinkage and a maximum of 0.2 percent expansion in the hardened state when tested according to CRD C588.
- D. Compressive Strength: Minimum of 5,000 psi at 7 days and minimum strengths as listed below according to ASTM C109 modified.
 1. 24 Hours: 2,000 psi.
 2. 7 Days: 5,000 psi.
- E. Grout shall show initial set time of not less than 60 minutes when tested according to ASTM C191.
- F. Grout shall contain no metallic substances, water reducing agents, accelerators super plasticizers, or other materials.
- G. Technical service shall be provided by the manufacturer of grout upon request of contractor.
- H. Water shall be clean and free from injurious amounts of oil, alkalies, and other deleterious materials according to AASHTO T26.

2.03 EPOXY GROUT

- A. Grout shall be flowable and a 100 percent solids system.
- B. Grout shall show no shrinkage and a maximum of 4 percent expansion when tested according to ASTM C531 (Modified).
- C. Compressive strength shall be determined by ASTM C579 attaining the

minimum strengths listed below:

1. 24 hours: 5,000 psi.
2. 2 days: 8,000 psi.
3. 7 days: 11,000 psi.

D. Peak exotherm temperature of a 2 inch diameter by 4 inch high cylinder of grout shall not exceed 95 degrees F. when tested at 75 degrees F. material and air temperatures.

E. Grout shall not exceed a coefficient of thermal expansion of 30×10^{-6} in/in/degrees F. when tested according to ASTM C531.

2.04 GROUT STORAGE

A. Grout components shall be delivered to the construction site in moisture proof bags. Bags shall be stored in a dry weatherproof area within a temperature range of 40 to 90 degrees F.

B. Remove damp or defective material from the site at expense to the Owner.

C. Storage time of nonshrink cement grout mix shall be limited to 10 months.

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. Concrete surfaces shall be prepared for grouting by removing all oil, grease, laitance, and other foreign substances.

B. Roughen surfaces to receive grout by chipping or nail raking of plastic concrete to assure a good bond of grout to existing concrete. Clean thoroughly with water and soak surface for 24 hours before placing cement grout. Surfaces shall be kept completely dry for epoxy grout.

C. Metal surfaces of equipment bases to be epoxy grout shall be thoroughly cleaned to bright metal.

3.02 FORMS

A. Forms for fluid grout shall be built of materials with adequate strength to withstand the placement of grout.

- B. Forms for nonshrink cement grout shall be tight against all surfaces and joints shall be sealed with tape. Form oil shall be used for easy form release.
- C. Forms for grout shall be watertight with chamfer strips in place. Caulking shall be used on all joints. Forms for epoxy grout shall be lined with polyethylene or waxed for easy form release.
- D. Forms shall be 4 to 6 inches higher than the base plate on one side of forms when using hydraulic head pressure for placing.
- E. Provide air relief holes at least 1/4" in diameter at every recessed base plate corner.

3.03 MIXING

- A. Grout shall be mixed according to manufacturer's recommendations.
- B. Nonshrink cement grout shall be added to water to obtain the desired consistency.
- C. Epoxy Grout:
 1. Components shall be conditioned to a temperature of between 70 and 85 degrees F. before use.
 2. Epoxy hardener shall first be added to resin and thoroughly mixed for 2 to 3 minutes without whipping air into the mix.
 3. Low speed mixer or hand stirring shall be used.
 4. Mixed resin and hardener shall then be put into clean mortar mixer and the entire bag of aggregate added.
 5. Epoxy grout component ratios shall not be altered and no solvents or thinners added to the mix.
- D. Mix nonshrink cement grout between 3 and 5 minutes for uniform consistency.
- E. Epoxy grout shall be mixed until aggregate is uniformly wetted.
- F. Mortar mixer shall be used instead of a concrete mixer for mechanical mixing of grout.
- G. Remixing of grout by adding more water or remixing of stiffening grout is not allowed.

3.04 REINFORCEMENT

- A. Reinforcement and joints for epoxy grout shall be provided when and by methods recommended by the manufacturer of the grout.

3.05 PLACEMENT

- A. Grout shall be rapidly placed continuously from one side of baseplate only in one direction.
- B. Grout under base plates to fill all spaces and completely fill anchor bolt sleeves.
- C. Hydraulic head grouting pressure shall be maintained by keeping the level of grout in the head box above the bottom of the base plate. Head box shall be filled to the maximum level and grout worked down to top of base plate.
- D. Shims used for temporary leveling of equipment and base plates shall be removed after the grout has obtained sufficient strength to carry the baseplate loading. Voids left by the removal of shims shall be filled with a second placement of grout.

3.06 FINISHING

- A. After cement grout has reached final set, it shall be trimmed back to the level as shown on drawings.
- B. Top surfaces of epoxy grout may be finished by troweling with a steel trowel moistened with oil before set.

3.07 CURING

- A. Nonshrink Cementitious Grout:
 - 1. Grout shall be cured according to manufacturer's specifications and recommendations.
 - 2. Forms shall remain in place for 24 hours.
 - 3. Temperature of base plates and supporting concrete shall be maintained between 40 and 90 degrees F. during grouting and for a minimum of 12 hours after placing.
- B. Epoxy Grout:
 - 1. Grout shall be cured according to manufacturer's specifications and

- recommendations.
2. Forms shall remain in place for a minimum of 24 hours after placing grout.
 3. Temperature of base plate and supporting concrete shall be maintained between 40 and 80 degrees F. during grouting and for a minimum of 24 hours after placing.

3.08 TESTING

- A. Contractor shall be responsible for preparing, storing, curing, and transporting the test samples to the laboratory for testing.
- B. Grout shall develop required compressive strength according to ASTM C109 (modified) for packaged grouts and ASTM C579 for epoxy grout.
- C. Three test cubes shall be made for each day of grouting. Tests shall be made of one cube at the following intervals:
 1. Cement Grout: 24 hours, 7 days, and 28 days.
 2. Epoxy Grout: 24 hours, 2 days, and 7 days.
- D. Test reports shall be submitted to the A/E immediately after the result of each age test is available.

END OF SECTION

SECTION 04220

CONCRETE UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 - Cast-In-Place Concrete.
2. 08100 - Steel Doors and Frames.
3. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A82-02 Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. C55-03 Specification for Concrete Brick.
3. C90-03 Specification for Loadbearing Concrete Masonry Units.
4. C91-03a Specification for Masonry Cement.
5. C129-96a Specification for Non-Loadbearing Concrete Masonry Units.
6. C144-03 Specification for Aggregate for Masonry Mortar.
7. C150-04 Specification for Portland Cement.
8. C270-04 Specification for Mortar for Unit Masonry.
9. C331-04 Specification for Lightweight Aggregates for Concrete Masonry Units.

1.03 SUBMITTALS

- ###### A. Submit properly identified product data on masonry units and each type of metal anchor and accessory, before starting work.

1.04 QUALITY ASSURANCE

- ###### A. Certifications: Provide certification from concrete unit masonry manufacturer stating the materials supplied meet specifications.
- ###### B. U-block is not allowed.

1.05 PROJECT CONDITIONS

A. Environmental Conditions

1. Temperature: 40 degrees F. minimum and rising.
2. Weather: No application during precipitation.

PART 2 PRODUCTS

2.01 LOAD BEARING CONCRETE UNIT MASONRY

- A. Weight: Normal.
- B. Size: 8 inches x 16 inches x thickness indicated, 2 cell stretcher type with vertical mortar keys at each end.
- C. Texture: Medium.
- D. Grade: ASTM C90, Type I or II.
- E. Unit Linear Shrinkage: Type I, 0.03 percent, ASTM C90.
- F. Shapes: Appropriate to suit conditions.

2.02 NON-LOAD BEARING CONCRETE UNIT MASONRY

- A. Weight: Normal.
- B. Size: 8 inches x 16 inches x thickness indicated, 2 cell flush end type.
- C. Texture: Medium.
- D. Grade: ASTM C129, Type I or Type II.
- E. Unit Linear Shrinkage: Type I, 0.03 percent, ASTM C90.
- F. Shapes: Appropriate to suit conditions including partition top closures.

2.03 CONCRETE BRICK

- A. Grade: ASTM C55, Grade N-I or N-II.

- B. Size: Appropriate to suit conditions.

2.04 MORTAR

- A. Portland Cement: ASTM C150, Type I, domestic.
- B. Masonry Cement: ASTM C91, domestic.
- C. Sand: ASTM C144.
- D. Water: Potable.
- E. Mortar Mix: ASTM C270, Type S, 1800 psi for above grade use, and Type M-2500 psi for below grade use. Mix accurately in following proportions by volume:

Type S

1 part masonry cement
1/2 part Portland cement
4 parts sand

Type M

1 part masonry cement
1 part Portland cement
4-1/2 parts sand

2.05 REINFORCEMENT, ANCHORS, TIES, AND ACCESSORIES

- A. Horizontal Joint Reinforcement: Continuous 9 gage truss design, deformed, galvanized steel, including preformed welded corners according to ASTM A82. Widths to suit thickness of block to within 1 inch of each face.
 - 1. Acceptable manufacturers:
 - a. Blok-Trus by A.A. Wire Products, or approved equal.
 - b. Standard Truss by Dur-O-Wal, or approved equal.
 - c. Trus-Mesh by Hohmann and Barnard, Inc., or approved equal.
- B. Buck Anchors: 16 gage corrugated galvanized steel, 1-1/4" wide, 8 inch long leg, with 2 inch upturned end, punched for fastenings, complete with No.10 galvanized machine screws and metal expansion anchors for securement to concrete.
- C. Dovetail Slots: 22 gage galvanized with filler, 1 inch wide x 1 inch deep.
- D. Dovetail Anchors: 16 gage corrugated galvanized steel, 1 inch wide x 5-1/2" long, sized to fit dovetail slots.

PART 3 EXECUTION

3.01 LOCATION OF MASONRY SYSTEMS

- A. Load Bearing Units: For partitions and walls 8 inches or greater.
- B. Load Bearing Lightweight Units: For partitions and walls as indicated.
- C. Non-Load Bearing Units: For partitions 4 or 6 inches.
- D. Concrete Brick: Filling-in to suit conditions.
- E. Corners and Special Shapes: As required to suit conditions, including corners, returns, offsets, and to maintain bond.

3.02 LOCATION OF REINFORCEMENT, ANCHORS, TIES, AND ACCESSORIES

- A. Horizontal Joint Reinforcement:
 - 1. Provide at every second course and at first joint above and below openings, for all masonry, interior or exterior.
 - 2. Use Standard No.8 ladder type and truss type for all other masonry construction.
- B. Buck Anchors: Every second block course for masonry walls and partitions abutting precast concrete and wherever dovetail anchors cannot be incorporated. Secure upturned ends to concrete with specified screws and anchors.
- C. Dovetail Anchors: Every second block course for masonry walls and partitions abutting cast-in-place concrete with continuous dovetail anchor slots.

3.03 ERECTION

- A. Laying Units:
 - 1. Lay masonry plumb, true to line, with level and accurately spaced courses.
 - 2. Keep bond plumb throughout.
 - 3. Lay corners and reveals plumb and true.
 - 4. Avoid overplumbing of corners and jambs to fit stretcher units after they are set in position.

5. Where adjustment must be made after mortar has started to harden, remove mortar and replace with fresh mortar.
6. Use concrete brick to course out walls concealed in the finished work.
7. Cut masonry units dry.
8. Use masonry saws for cuts exposed in the finished work.

B. Tolerances:

1. Plumb masonry work within tolerance of $\pm 1/8$ " in 5 feet.
2. Level courses within tolerance of $1/4$ " in length of any run.

C. Bond:

1. Provide common bond, with vertical joints centered over masonry unit below, except where other bonds are indicated. (Provide stack bond with vertical joints centered over joints below).
2. Bond masonry at corners and intersections.

D. Joint Treatment:

1. Block Exposed to View: Tooled concave joints mortar thoroughly compacted and pressed against edges of units and float finish joints.
2. Concealed Block: Joints struck flush.
3. Joint Thickness: $3/8$ ".

E. Jointing Methods:

1. Where concrete block cores are indicated to be filled with concrete, lay in full mortar beds and full mortar end joints.
2. Lay all other concrete block with full beds of mortar on vertical and horizontal face shells.
3. Furrowing of mortar not allowed.
4. Shove vertical joints tight.
5. Finish tooled joints to uniformly straight and true lines and surfaces, smooth and free of tool marks.
6. Uniformly rake joints between masonry and door frames to $3/8$ " depth to receive caulking or sealant.
7. Rake joints around flush electrical outlets in wet locations to receive caulking or sealant.

F. Mortar Filled Units:

1. First cell of blocks abutting door jambs and window frames.

2. Cells of blocks at free ends of partitions and walls.
3. Where necessary for embedment of anchors, and where otherwise shown.
4. Voids around ducts, pipes, and other items passing through masonry work.
5. Hollow metal door frames and elevator hoistway door frames in masonry walls and partitions: Grout solid with mortar as masonry is laid. Include tops of door frames.

G. Load Bearing Masonry Walls:

1. Erect masonry before reinforced concrete building frame.
2. Close masonry top course cores under poured concrete beams with paper stuffing or metal caps.
3. Do not use flush end type units against columns or poured concrete walls.

H. Non-Load Bearing Masonry Wall and Partition Anchorage:

1. Erect masonry after steel and concrete frames are in place, and after concrete floors and roof decks are in place.
2. After forms are stripped, remove slot fillers.
3. At edges of non-bearing interior masonry walls and partitions abutting concrete columns and poured concrete walls, provide corrugated dovetail type anchors.
4. Grout dovetail slots and space between end of masonry units and concrete solid.
5. Point up all joints solid and flush on both sides of partitions.

I. Partition Heights:

1. Partitions to be continuous from floor to underside of floor or roof construction above where so indicated.
2. Full height partitions and walls to be wedged tight with tile or brick set in mortar.
3. Use brick or solid units for top masonry course.
4. Point up all joints solid and flush on both sides of walls and partitions.
5. Where suspended ceilings on both sides of partitions are indicated, the partitions other than those shown to be continuous may be terminated approximately four inches above the ceiling level.

J. Concrete Fill for Masonry Cores:

1. Coordinate masonry work to allow placing of pea rock concrete as indicated and as specified in Concrete section.
 2. Fill top courses of concrete masonry walls with concrete before placing or use concrete brick for top courses to assure solid masonry.
- K. Pipe Chase Walls and Partitions: Erect after pipes are in place, tested, and accepted.
- L. Slots, Chases, Recesses and Openings: Provide as required for work of other trades.
- M. Setting of Items Furnished Under Other Sections: Set anchors, bolts, sleeves, access panels, door frames, and other items occurring in masonry as the work proceeds.
- N. Securing Hollow Metal Door Frames: Set in hollow metal frames on floor, floor clips secured and frames braced in proper position. Grout anchors into masonry joints as walls are erected.
- O. Lintels: Set reinforced precast concrete or coordinate installation of cast-in-place concrete lintels as indicated. Precast concrete lintels to be set in full mortar beds with 8 inches minimum bearing each end.
- P. Installation of Horizontal Wall Reinforcement:
1. In masonry areas indicated to have concrete filled cores, provide reinforcement in every horizontal joint.
 2. At other areas, provide reinforcing in every second block course joint and at first joint above and below openings for exterior and interior masonry.
 3. Cut corners and intersections as recommended by manufacturer.
 4. Extend reinforcement 6 inches into concrete tie columns and concrete encasement of steel columns poured after block is in place.
 5. Unless walls have cast-in-place concrete corner tie columns, make wall and partition joint reinforcing continuous around corners and at intersections according to manufacturer's published directions.
 6. Lap splices in joint reinforcement no less than 6 inches. Reinforcement shall not be continuous through expansion joints.
- Q. Covers: At work stoppage, provide waterproof covers secured over exposed wall tops for weather protection.
- R. Pointing: Point holes in masonry. Cut out and point up defective joints.

END OF SECTION

SECTION 04530

MASONRY PATCHWORK

PART 1 GENERAL

1.01 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C55-96a Specification for Concrete Brick.
2. C90-96a Specification for Loadbearing Concrete Masonry Units.
3. C91-95c Specification for Masonry Cement.
4. C144-93 Specification for Aggregate for Masonry Mortar.
5. C150-96 Specification for Portland Cement.
6. C270-96a Specification for Mortar for Unit Masonry.

1.02 SUBMITTALS

- A. Properly identified manufacturer's literature before starting work.
- B. Samples: Properly identified samples of masonry units and each type of metal anchor and accessory.

1.03 QUALITY ASSURANCE

- A. Submit unit masonry manufacturer's "CM-2" Certificate of Compliance issued by the Florida Concrete and Products Association for each type of unit masonry specified.
- B. U-block is not allowed.

1.04 PROJECT CONDITIONS

- A. Environmental Conditions:
 1. Temperature: 40 degrees F. minimum and rising.
 2. Weather: No application during precipitation.

PART 2 PRODUCTS

2.01 LOAD BEARING AND NON BEARING CONCRETE UNIT MASONRY

- A. Weight: Normal.
- B. Size: 8 inches x 16 inches x 8 inches thick or as indicated on drawings, 2 cell stretcher type.
- C. Texture: Medium.
- D. Grade: ASTM C90; Grade N-1, amended to allow a maximum moisture content of 50 percent total absorption.

2.02 CONCRETE BRICK

- A. Grade: ASTM C55, Grade N-1, amended to allow a maximum moisture content of 50 percent total absorption.
- B. Size: Appropriate to suit conditions.

2.03 MORTAR

- A. Portland Cement: ASTM C150, Type I, domestic.
- B. Masonry Cement: ASTM C91, domestic.
- C. Sand: ASTM C144.
- D. Water: Potable.
- E. Mortar Mix: ASTM C270, Type S, 1800 psi. Mix accurately in following proportions by volume:
 - 1. Type S:
 - a. 1 part masonry cement.
 - b. 1/2 part Portland cement.
 - c. 4 parts sand.

PART 3 INSTALLATION

3.01 PATCHING

- A. Remove existing mortar from new opening.

1. Fill in as required with new concrete masonry units and fresh mortar.

B. Laying Units:

1. Lay masonry plumb, true to line, with level and accurately spaced courses.
2. Keep bond plumb throughout.
 - a. Where adjustment must be made after mortar has started to harden, remove mortar and replace with fresh mortar.
3. Cut masonry units dry.
4. Joints: 3/8" thick thickness, strike flush.

C. Jointing Methods:

1. Lay concrete block with full beds of mortar on vertical and horizontal face shells.
 - a. Furrowing of mortar is not allowed.

D. Pointing: Point holes in masonry. Cut out and point up defective joints.

3.02 MORTAR FILLED ITEMS

- A. Where necessary and where indicated on drawings.
- B. Voids around penetrations through block work.

END OF SECTION

SECTION 05120
STRUCTURAL STEEL

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09901 - Painting.

1.02 REFERENCES

A. America Society for Testing and Materials (ASTM):

1. A36/A-96 Specification for Carbon Structural Steel.
2. A53-96 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. A123-89a Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. A307-94 Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
5. A325-96 Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
6. A385-80 Practice for Providing High Quality Zinc Coatings (Hot Dip).
7. A490-93 Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
8. A500-93 Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
9. A501-93 Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

1.03 QUALITY ASSURANCE

A. Florida Building Code (FBC).

B. American Institute of Steel Construction, Inc., (AISC): Manual of Steel Construction, Eighth Edition.

1. Specification for Design, Fabrication and Erection of Buildings.
2. Code of Standard Practice for Steel Buildings and Bridges.

- 3. Structural Joints Using ASTM A325 or ASTM A490.
- C. American Welding Society (AWS); Structural Welding Code, AWS D1.1.
- D. Steel Structures Painting Council (SSPC).
- E. Where requirements of AWS are in conflict with requirements of AISC, requirements of AISC shall take precedence.

1.04 SUBMITTALS

- A. Submit both shop and erection drawings with indexes for structural steel for review before starting work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Rolled Shapes and Plates: ASTM A36.
- B. Anchor Bolts: ASTM A307, with regular series hexagonal head nuts, unless otherwise specified, hot dipped galvanized where noted.
- C. Nuts and Bolts Except Anchor Bolts: ASTM A325, washers as required. Bolts connecting galvanized members shall also be galvanized.
- D. Electrodes: E70 or F7 Series, as appropriate.
- E. Shop Paint: Manufacturer's standard, compatible with finish coats. Refer to Section 09900.
- F. Structural Tubing: ASTM A500, Grade B, $F_y=46\text{KSI}$.
- G. Pipe: ASTM A501, $F_y=36\text{ ksi}$ or ASTM A53, type E or S, Grade B, $F_y=35\text{ ksi}$.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Unless otherwise specified, comply with AISC specifications and "Standards" for fabrication and erection.
- B. Connections:
 - 1. Shop connections shall be welded or bolted at the option of the Contractor, unless otherwise indicated.
 - 2. Field connections shall be bolted except where specifically indicated to be welded. Field moment connections may be welded.
 - 3. Bolts shall be ASTM A325, friction type, unless otherwise indicated.
 - 4. Connections shall be as generally indicated where the complete connection is shown.
 - 5. Connections not detailed will be designed by the Contractor for the controlling stresses indicated using AISC requirements.
 - 6. Minimum connection is two 3/4" diameter ASTM A325, bolts or equivalent in weld, (15.5K).
 - 7. For framed connections in non-composite construction and for beams without concentrated loads, where reactions are not indicated, design the connection for one-half of the total uniform load capacity of the beam shown in "Tables for Allowable Loads on Beams", AISC.
 - 8. Where moment connection or continuous framing is indicated, design connections for the moment indicated, but not less than 50 percent of the moment capacity, however, where the design moment is not given, design the connection for 100 percent of the moment capacity. Moment connections shall be Type 1, rigid frame.
 - 9. Columns shall be detailed as indicated, bearing surfaces shall be finished (planed).
 - 10. Moment connections, shop or field, shall not have bolts through the top flange plates to avoid interference with the metal decking.
 - 11. Stiffened seats, unless indicated, are not allowed unless the Contractor verifies architectural clearances are maintained and interferences with any elements of the building will not occur.
- C. Shop Cleaning: Clean steel to the requirements of SSPC-SP2.
- D. Shop Painting: Shop paint steel except steel intended to be encased in concrete and steel to be hot dipped galvanized.
- E. Erection Marks:

1. Column marks shall be the column number assigned on the structural drawings supplemented by tier or level number.
 2. Beam marks shall be prefixed by floor or level number.
- F. Hot Dip Galvanize After Fabrication: According to ASTM A123, ASTM A385, and ASTM A123, all steel exposed to the weather. Erect those members with galvanized ASTM A325 bolts. Seal weld all members to be hot dipped galvanized.

3.03 TESTING

- A. The Owner may elect to inspect work in shop or field or both by nondestructive means as specified.
1. Contractor shall make no claim for extra work or delay using as a basis the inspection of work by the Owner.
- B. Welding Inspection:
1. Inspector designated by the Owner will assume the duties and responsibilities of "Inspector" specified in Chapter Six of AWS D1.1-79.
 2. Acceptance Criteria:
 - a. Visual: AWS D1/1, Para.3.7 and 8.15.
 - b. Radiographic, Ultrasonic, Magnetic Particle, and Dye Penetrant: AWS D1.1, Para.8.15.
 - c. Where more than one type of testing is used, acceptance criteria is "passing" all testing procedures used.
 3. Inspector will spot inspect by ultrasonic means, 100 percent (one spot per weld) of all tension groove welds and 50 percent of all compression groove welds shop and field.
 - a. Where metal thickness is less than 5/16", radiographic spot testing will be used.
 4. Inspector will inspect welds by visual rules.
 5. Inspector may use radiographic means where ultrasonic testing is not feasible.
 6. Inspector may supplement any testing with dye penetrate, magnetic, radiographic, or ultrasonic plans.
 7. Contractor shall be responsible for associated costs of inspections including handling, surface preparation and repair of discontinuities.

- C. Provide ladders or other appropriate means for inspecting personnel to properly gain access to field joints.
- D. Bolting Inspection: Inspector will test bolts both in the shop and in the field by methods specified in "Structural Joints Using ASTM A325 or ASTM A490 Bolts".

END OF SECTION

SECTION 05520

METAL HANDRAILS AND RAILINGS

PART 1 GENERAL

1.01 SUBMITTALS

- A. Properly identified manufacturer's literature, including shop and erection drawings before starting work.
- B. Railing Assemblies or Railing Components: Submit shop drawings prepared under direction of an engineer licensed in the State of Florida showing compliance to the Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 HANDRAIL AND RAILING COMPONENTS

- A. Wall Brackets: Malleable iron or aluminum as manufactured by Julius Blum & Company, Inc., Carlstadt, NJ, or accepted equivalent.
 - 1. Material:
 - a. Type A: Aluminum, Model #384 for use with aluminum pipe handrail section.
 - b. Type B: Malleable iron, Model #382 for use with steel pipe handrail section.
- B. Pipe Handrail Sections:
 - 1. Stair Handrails:
 - a. Size:
 - 1) Handrail (Typical handrail at 34 to 38 inches): 1-1/4" to 1-1/2" outside diameter.
 - b. Steel: Schedule 80, of design and dimensions indicated with smooth bends and welded joints ground smooth and flush.
 - c. Aluminum:

- 1) Schedule 80, Alloy 6061-T6 of design and dimensions indicated with smooth bends and welded joints ground smooth and flush.
 - 2) Schedule 40, Alloy 6061-T6 of design and dimensions indicated with smooth bends and joints using bolted or fastener connections of tamper-resistant fasteners.
2. Vertical Members (Posts):
- a. Steel: 1-1/4" dia. nominal pipe size, Schedule 40, of design and dimensions indicated with welded joints ground smooth and flush.
 - b. Aluminum:
 - 1) 1-1/4" dia. nominal pipe size, Schedule 80, Alloy 6061-T6 of design and dimensions indicated with welded joints ground smooth and flush.
 - 2) Alternate 1-1/4" dia. nominal pipe size, Schedule 40 alloy 6061-T6 of design and dimensions indicated with smooth bends and joints using bolted or fastener connections of tamper-resistant fasteners.
3. Design and construct to withstand 200-pound concentrated load applied at any point, from any direction.
- a. Wall brackets and other points of support are shown to indicate general appearance. Submit shop drawings to indicate accurate location of necessary brackets and other points of support to show compliance with load requirements.
4. Provide complete with necessary sleeves, brackets, tamper-resistant bolts, and tamper-resistant fastening devices as required for a complete installation.

2.02 HANDRAIL AND RAILING ASSEMBLIES

A. Manufacturers:

1. Aluminum Manufacturing Industries, Inc., Miami, FL., or approved equal.
2. Dixie Metal Products, Inc., Ft. Lauderdale, FL., or approved equal.
3. Largo Aluminum, Key Largo, FL., or approved equal.

B. Fabrication:

1. Intermediate Posts:
 - a. Size: Round shaped, composed of two extrusions joined to form a square shape of not less than 2" dia., designed to be mechanically fastened to the top rail channel with approved fasteners using not less than 2 extruded fastener seams.
 - b. Material: Alloy 6061-T6.
 - c. Minimum Wall Thickness: 0.062".
 - d. Maximum Spacing: 48 inches on center.
2. Corner Posts: Same as intermediate posts except mechanically attached to top rail using a specially designed aluminum casting.
3. Pickets:
 - a. Size: Square shaped, 3/4" x 3/4" mechanically fastened to the top rail channel with approved tamper-resistant fasteners using 2 extruded fastener seams to prevent picket rotation within the top and bottom extrusions.
 - b. Material: Alloy 6061-T5.
 - c. Minimum Wall Thickness: 0.062".
 - d. Spacing: Equal spacing placed to reject a 4-inch diameter ball.
4. Guardrails:
 - a. Size: Round shaped, 2" dia. x 1" mechanically fastened to top rail channel with approved tamper-resistant fasteners at maximum 24 inches on center.
 - b. Material: Alloy 6063-T6.
 - c. Minimum Wall Thickness: 0.062".
5. Top Rail Channel:
 - a. Size: Rectangular shaped, 2" x 0.438".
 - b. Material: Alloy 6063-T6.
 - c. Minimum Wall Thickness: 0.062".
6. Bottom Rail:
 - a. Size: Rectangular shaped, 1.625" x 1" mechanically fastened to the post with approved fasteners using 2 extruded fastener seams.
 - b. Material: Alloy 6063-T6.
 - c. Minimum Wall Thickness: 0.062".

7. Approved Tamper-Resistant Fasteners: 18-8 stainless steel screws with the head to be tamper-resistant, sized as recommended by the aluminum railing assembly manufacturer.

2.03 FINISHING

A. Aluminum Handrail and Railing Components and Assemblies:

1. Finish with clear anodizing according to Aluminum Association Standard AA-C22-A21.
 - a. Anodizing: 200R1 clear with a typical coating of 0.15 mil thickness produced in a 15 percent solution of H₂SO₄ at approximately 70 degrees F at 12 amps per sq.ft.

2.04 MISCELLANEOUS

- A. Hot Dip Galvanizing: Hot dip galvanize ferrous items according to ASTM A385 and ASTM A123, minimum 2.0 ounces per square foot.
- B. Galvanized Metal Repair Compound:
 1. Hot Applied: Federal Specifications O-G-93.
 2. Cold Applied: Galvaneal, Galvicon, or Z.R.C.
- C. Isolation Coating: Zinc chromate paint, heavy-bodied bituminous paint, water-white methacrylate lacquer, or acceptable non-conductive tape.
- D. Expanding Grout: Premix Anchoring Cement by Premix-Marbletite, Miami, FL, or accepted equivalent.

2.05 FASTENINGS, ANCHORS, AND BOLTS

- A. Provide required cast-in-place or self-drilling anchor bolts as indicated or as recommended by the handrail and railing assembly manufacturer, complete with matching washers and nuts.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Erection:
 - 1. Erect metal handrail and railing components and metal handrail and railing assemblies at proper locations and elevations as indicated, plumb, level, in alignment, and not distorted by fastenings.
 - 2. Erect according to accepted shop drawings and manufacturer's directions or as specified in this section.
- B. Supplementary Parts: Provide as necessary to complete each item.
- C. Contact With Dissimilar Materials:
 - 1. Apply isolation coatings where dissimilar metals are in contact or aluminum components contact dissimilar metals or concrete or lime mortar surfaces.
 - 2. Select coatings appropriate to the condition from materials specified in this section.
- D. Expanding Grout: Apply according to manufacturer's printed instructions to clean and dust free surfaces to ensure proper mechanical bond.
- E. Malleable Iron Handrail and Railing Components: Paint to match adjacent surfaces.

END OF SECTION

SECTION 06100

CARPENTRY

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Carpentry work including grounds, nailers, blocking, miscellaneous framing, plywood backing panels, plywood sheathing, preservative treatment, and necessary accessories indicated or specified in this section.
- B. Related Sections:
 - 1. 06300 - Wood Treatment.
 - 2. 07210 - Building Insulation.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A153-95 Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. D226-95 Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

1.03 QUALITY ASSURANCE

- A. Factory mark each piece of lumber and plywood to identify type, grade, agency providing inspection service, producing mill, and other qualities as specified.

1.04 DELIVERY AND STORAGE

- A. Keep materials dry during delivery and storage.
 - 1. Protect against weather and contact with damp or wet surfaces.
 - 2. Stack lumber and plywood and provide air circulation within stacks.

PART 2 PRODUCTS

2.01 MATERIALS

A. Exterior Plywood:

1. Conform with US Department of Commerce PS 1-66, bearing APA grade mark.
2. Grade: APA rated sheathing, EXT, span rating to suit rafter spacing.
3. Thickness: Indicated on drawings.

B. Interior Plywood (Concealed): Where plywood will be concealed by other work, provide exterior type plywood C-D plugged grade, unless otherwise specified.

C. Interior Plywood (Painted Finish): Same as concealed, except with hardwood plywood or medium density overlay, Grade MDO EXT-101; smooth surface with no grooves.

D. Interior Plywood (Transparent Finish):

1. Exterior type plywood, Grade A veneers on exposed surfaces, Grade B veneers on semi-exposed surfaces, and Grade D or better veneers on concealed surfaces.
 - a. Birch - (Natural) (Select) (Rotary Cut) (Red) (White).
 - b. Oak - (Rotary Cut) (Plain Sliced) (Red) (White).

E. Lumber:

1. Standard:

- a. Comply with American Softwood Lumber Standards PS-20 by U.S. Department of Commerce.
- b. Nominal sizes are shown or specified, except as shown by actual dimensions.
- c. Provide actual sizes complying with minimum size requirements for PS-20 for moisture content specified for each use.

2. Moisture Content: Seasoned lumber with 19 percent maximum moisture content at time of dressing and complying with dry size requirements of PS-20, unless otherwise specified.

F. Framing Lumber:

1. Lumber complying with grading rules according to requirements of National Grading Rule for Dimension Lumber of American Lumber Standards Committee established under PS-20.
2. Light Framing (2 inches to 2 inches thick and 2 inches to 4 inches wide): "Stud" grade lumber for stud framing and "standard" grade for other light framing.

G. Boards:

1. Boards complying with dry size requirements of PS-20 where lumber less than 2 inches in nominal thickness and 2 inches or more in nominal width is shown or specified.
2. Moisture Content - Exposed Work: Moisture content of 19 percent maximum, SDRY Southern Pine No.2 per SPIB for paint finish.
3. Moisture Content - Concealed Work: Moisture content of 19 percent maximum, Southern Pine (SPIB) No.2 boards.

H. Miscellaneous Materials:

1. Fasteners and Anchorages:
 - a. Provide size, type, material, and finish and as recommended by applicable standards, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers, and anchoring devices.
 - b. Provide metal hangers and framing anchors of size and type recommended by the manufacturer for each use including recommended nails.
 - c. Where rough carpentry Work is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners and anchorages with hot-dip zinc, ASTM A153.
2. Building Paper: ASTM D226, Type I, asphalt saturated felt, non-perforated, 15 lb. type.

I. Treated Wood: Refer to Section 06300, "Wood Treatment".
PART 3 EXECUTION

3.01 PREPARATION

- A. Protect installed carpentry work from damage by work of other trades until accepted by the Owner.

1. Review proposed protection methods with A/E for acceptance.
- B. Examine substrates, adjoining construction, and conditions where work is to be installed.
- C. Do not proceed with work where unsatisfactory conditions exist.
- D. Where rough carpentry is fitted to other work, obtain measurements of other work and verify dimensions shown on shop drawing details.
- E. Apply heavy brush coat of same chemical treatment material to surfaces exposed by sawing, cutting, or drilling.

3.02 INSTALLATION

- A. Materials: Use only sound, thoroughly seasoned materials of longest practical lengths and sizes to minimize jointing, free from warp that cannot be easily corrected by anchoring and attachment.
- B. Installation:
 1. Closely fit and accurately set members to required lines and levels, and rigidly secure in place.
 2. Attachment and Anchorage:
 - a. Nail size and nail spacing shall be sufficient to develop adequate strength for connection without splitting the member.
 - b. Countersink nailheads on exposed carpentry work and fill holes.
 - c. Anchors and Attachments: Hot dip galvanized finish, except where otherwise shown.
 - d. Use common wire nails, except as otherwise shown or specified.
 - e. Use finishing nails for finish work.
 - f. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish material(s).
 - g. Make tight connections between members.
 - h. Install fasteners without splitting wood, pre-drill as necessary.
 3. Wood Grounds, Nailers, Blocking, and Sleepers:
 - a. Provide as shown and as required for screeding or attachment of other work.
 - b. Form to shapes as shown and cut as required for true line and

- level of work to be attached.
 - c. Set true to line and level, plumb, with intersections true to required angle.
 - d. Coordinate location with other work involved.
 - e. Provide wood blocking to strengthen and supplement horizontal metal stud framing members between studs required for recessed or surface mounted items including, but not limited to, cabinets, finish hardware, magnetic door holding devices.
 - f. Cut blocking to fit between framing members and rigidly attach thereto.
 - g. Secure blocking and nailers to building structure as indicated and as specified.
 - h. Provide wood grounds for attachment of finish trim and other work to plaster.
 - i. Grounds shall be dressed, preservative treated. Use key-beveled lumber not less than 2 inch nominal width and of thickness required to bring face of ground to exact thickness of finish material involved.
 - j. Remove temporary grounds when not longer required.
4. Roof Sheathing: Nail to framing and use spacer clips at edges for expansion/contraction control.

END OF SECTION

SECTION 06300

WOOD TREATMENT

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 06100 - Carpentry.
2. 06400 - Architectural Woodwork.

1.02 SUBMITTALS

A. Wood Treatment Data:

1. Submit chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated material.
2. Preservative Treatment: For each type specified, including certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained and conformance with applicable standards.
3. Water-Borne Treatment: Include statement that moisture content of treated materials was reduced to levels indicated before shipment to project site.
4. Fire-Retardant Treatment: Include certification by treating plant that treatment material complies with specified standard and other requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Preservative Treatment:

1. Where lumber or plywood is specified to be treated, comply with applicable requirements of AWPA Standards C2, Lumber, and C9, Plywood and of AWPB standards listed.
2. Mark each treated item with AWPB Quality Mark Requirements.
3. Pressure treat aboveground items with water-borne preservatives to comply with AWPB LP2.

4. After treatment, kiln-dry lumber and plywood to a maximum moisture content, respectively, of 19 percent and 15 percent.
5. Treat indicated items and the following:
 - a. Wood nailers, curbs, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - b. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 - c. Wood Framing Members: Maximum 18 inches above grade.
6. Pressure treat the following with water-borne preservatives for ground contact use complying with AWPB LP22:
 - a. Wood members in contact with ground.
 - b. Wood members in contact with fresh water.
7. Pressure treat softwood lumber, timber, and plywood for wood foundation systems with water-borne preservatives for ground contact to comply with AWPB FDN.
8. Complete fabrication of treated items before treatment, where possible.
9. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

PART 3 EXECUTION

3.01 APPLICATION

- A. Place treated lumber and plywood as detailed.

END OF SECTION

SECTION 06400

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.01 SUMMARY

- A. Provide necessary services, tools, equipment, material, and labor required to furnish and install millwork and cabinet work. Install cabinet hardware specified. Do all finishing work in the shop.
- B. Related Sections:
 - 1. 08711 - Finish Hardware.

1.02 REFERENCES

- A. ANSI/AHA A135.4 - Basic Hardwood.
- B. American Society for Testing and Materials (ASTM):
 - 1. D1037-96a Test Methods for Evaluating the Properties of Wood-Base Fiber and Particle Panel Materials.

1.03 SUBMITTALS

- A. Manufacturer's Data: Submit 8 copies of manufacturer's data for each item furnished under this Section.
- B. Shop Drawings:
 - 1. Submit 8 copies of shop drawings showing plans, elevations, and large scale details for each fabricated item. Identify locations of each item. Show plastic laminate colors, patterns, and inserts.
- C. Samples:
 - 1. Submit samples of each wood species to receive transparent finishes.
 - 2. Submit a finished sample of each finish.
 - 3. Submit samples of milled paneling and trim items.

1.04 QUALITY ASSURANCE

- A. Built-ins and casework shall be constructed and installed to carry intended loads, not have sharp corners, splinters, or any construction features or projections that would be hazardous to occupants and users. Casework and cabinets shall be constructed in conformance with applicable state and federal accessibility requirements.
- B. Cabinet work shall follow minimum requirements described in the latest edition of the Architectural Woodwork Institute (AWI) following "Custom Grade" standards.
- C. Particle board is not allowed.
- D. Casework shall be "Custom Grade" overlay design with plastic laminate finish.
- E. Only manufacturers with financial stability and 5 years experience in casework manufacture and installations of similar scope will be considered.
 - 1. The installer must be a company whose primary business is the manufacturing of plastic laminate casework.
 - 2. The installer shall have adequate physical facilities and personnel for this size project with a qualified engineering department to provide layout and shop drawings for review before fabrication.
- F. Evidence of qualifications shall include product catalog, descriptive literature, and specifications for the proposed product. Submit a sample cabinet, complete with drawer, door hardware, and corner sample of counter top with the product literature.

1.05 PRODUCT DELIVERY AND STORAGE

- A. Deliver casework when the building is secure and weather tight.
- B. The air circulation control system shall be operating and maintaining humidity and temperature conditions similar to the conditions to be maintained by the Owner.
- C. Painting and other finish work shall be complete in immediate and adjacent areas within the building where millwork/cabinet work/casework is stored.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Plastic Laminate by companies listed below or approved equal:

1. Nevamar.
2. Formica.
3. Micarta.
4. Pionite.
5. Wilson Art.

2.02 MATERIALS

A. Case members, tops, bottoms, sides, dividers, shelves, door fronts, and drawer fronts shall be 3/4" thick 7 ply closed grain hardwood plywood.

B. Case backs shall be 1/4" thick closed grain hardwood plywood.

C. Plywood shall have type II water-resistant glue.

D. Plywood: Provide manufacturer's association stamp except where exposed to view.

E. Plywood exposed to view unless otherwise specified shall be hardwood plywood with exterior glue.

F. Plastic Laminate: High pressure laminate conforming to NEMA specification LD3 latest edition. Laminate the plastic laminate sheets to the core stock under pressure with water resistant adhesive to achieve a Type II bond.

1. Material Thickness:

- a. 0.050" - Exposed surfaces and edges of drawer fronts, door fronts, counter tops, backsplash, and all other remaining exposed exterior horizontal and vertical surfaces.
- b. 0.027" - Exposed interior surfaces of door backs, cabinet sides, backs, and shelving and all other remaining exposed interior horizontal and vertical surfaces.
- c. Concealed Surfaces: Not applicable.

2. Colors and Patterns:

- a. Colors and patterns shall be judged equivalent, as determined by

- the A/E, to those selected by the Owner.
- b. Any preselected colors and patterns shown on the drawings or in the specifications shall govern.
 - c. Where colors or patterns are not shown, plastic laminate equivalent in cost to standard solid colors shall be bid upon, assuming not more than 10 colors.
 - d. A/E's range of color selection shall not be limited to colors stocked locally, but by entire color line of specific manufacturer as determined by samples in A/E's office.
3. Where hinges or other attachment requiring screws for holding power in concealed wood are required, lumber shall be one of the following:
- a. Southern Yellow Pine.
 - b. Gum.
 - c. Birch.
 - d. Beech.
4. Where screw holding power is not required, concealed lumber shall be:
- a. Southern Yellow Pine.
 - b. Gum.
 - c. Birch.
 - d. Beech.
 - e. Ponderosa.
 - f. Pine.
 - g. Poplar.
5. Lumber scheduled or detailed to be covered with plastic laminate shall be one of the following:
- a. Southern Yellow Pine.
 - b. Gum.
 - c. Poplar.
 - d. Birch.
 - e. Beech.
 - f. Fir.
 - g. Virola/Tek Ply.
6. Lumber used for construction of bins or shelving supports located in storage rooms, unless otherwise shown on the drawings, finished under Painting Section with "natural finish" and shall be of one of the following:

- a. Southern Yellow Pine.
 - b. Gum.
 - c. Poplar.
 - d. Birch.
 - e. Beech.
7. Lumber scheduled or detailed to be transparent finished (varnished, stained, oil-rubbed, gloss, or satin polyurethane finish) shall be the following:
- a. Birch.
 - b. White Oak.
 - c. Red Oak.
8. Lumber scheduled to be painted or enameled shall be one of the following. Do not use fir plywood in this application:
- a. Southern Yellow Pine.
 - b. Gum.
 - c. Poplar.
 - d. Birch.
 - e. Beech.
- G. Fiberboard: Class 1 Tempered, smooth face hardboard, with 6,000 psi average modulus of rupture. Comply with ANSI/AHA 135.4 and ASTM D1037.
- 1. Use fiberboard only where specifically scheduled or called for on drawings or in specifications.
 - 2. Fiberboard as backs for wall supported cabinets is not allowed.
- H. Adhesives: Use adhesives meeting Strength and Rate of Loading, Moisture Resistance, and Heat Resistance requirements set forth in AWI 100-G-11. Do not use glues containing formaldehyde.
- 1. For interior work:
 - a. Modified Polyvinyl Acetate: For normal use except items requiring high moisture resistance.
 - b. Casein Glue: For normal use except waterproofed items.
 - c. Contact Cements (not the solvent type): For bonding high water pressure laminates only.
- I. Finish Hardware:

1. Hinges for 3/4" Thick Doors:
 - a. US26D satin chrome plated steel, 5 knuckle, wrap around type allowing 270 degree swing at end of cabinet work unit, mounted with minimum 4 plated No.8 self-tapping screws per hinge leaf. Concealed European type hinges are not allowed.
 - b. For doors up to and including 48 inches high: Provide 2 hinges.
 - c. For doors over 48 inches high: Provide 3 hinges.
 - d. Manufacturers:
 - 1) RPC 376-26D.
 - 2) Accepted equivalent.
2. Pulls: 5/16" wire pull, 4" long, solid brass, US26D satin chrome plated.
 - a. Stanley 4484.
 - b. Epcoc MC.
 - c. Colonial 753
 - d. Accepted equivalent.
3. Door Catches: Stanley SP45.
 - a. For doors up to and including 38 inches high: Provide 1 heavy duty magnetic type catch, slotted for adjustment. Attach with screws.
 - b. For door 38 inches high and over: Provide 2 heavy duty magnetic type catches, slotted for adjustment. Attach with screws.
4. Surface bolts for inactive doors in cabinet door pairs with locks indicated:
 - a. Ives 40 x US26D x 6 inches.
 - b. Quality B-6 x US26D x 6 inches.
 - c. Baldwin 0324 x US26D x 6 inches.
 - d. Accepted equivalent.
5. Locks for 3/4" doors with plastic laminate finish: (all doors to be lockable). Satin chrome or nickel plated steel 6 tumbler lock with grooved key.
 - a. KV 987, with strike.
 - b. Yale 9660, with strike.
 - c. Corbin 0764L, with strike.
 - d. Accepted equivalent.

6. Drawer Slides: Zinc plated cold rolled steel. Grant or KV 1300 rated for 75 pound capacity.
7. Steel Standards: KV 233ZC with zinc plated finish, 5/8" screw nails, and KV 237ZC shelf clips. Surface mount.

2.03 FABRICATION

- A. Construct cabinet work as shown on the drawings and meeting the following requirements:
 1. Face frames, mortise and tenon, screw, glue, and make all such joints concealed.
 2. Cabinet members, bottoms, sub-top, sides, and back shall be joined by dado and rabbeted joints secured with glue and concealed mechanical fasteners. Case backs shall have a 3-inch anchor cleat the full width of the unit at the top.
 3. Case construction of butt joints with dowel pins is not allowed.
 4. Construct the toe space base from solid lumber and separately framed.
 5. Drawers: Lock shouldered.
 6. Drawer Sides and Backs:
 - a. Well sanded Southern Yellow Pine, Poplar, Gum, or Birch, with corners rounded and natural finish.
 - b. Plastic laminate on 1/2" plywood with plastic laminate interior and exterior.
 7. Drawer Bottoms: 1/4" tempered fiberboard with factory applied gloss surface of color approved by A/E.
 8. Cabinet interior sides drilled to receive shelf pins leaving exposed core are not acceptable.
 9. Shelving:
 - a. 3/4" plywood for lengths less than 36 inches.
 - b. 1 inch plywood or 3/4" plywood with 3/4" x 1-1/2" hardwood edges at front and rear of shelf for lengths 36 inches or greater.
 10. Adjustable Shelving: Use surface mounted standards and notched shelving ends.
 11. Exposed Shelving: In storage rooms, utility rooms, kitchen pantries, shops, mechanical or electrical rooms, or in janitor closets, shall be "natural finish" constructed of plywood with edges banded of similar material and have outside face veneers of similar material of either:

- a. Gum.
 - b. Poplar.
 - c. Beech.
 - d. Birch.
- B. All other Shelving: Hardwood plywood with bonded edges, finished "transparent" and of plywood with veneers meeting the following criteria:
- 1. Cabinet and casework hardware will be supplied under the finish Hardware Section and shall be installed by the cabinet and casework fabricator. Locate hardware accurately on shop drawings.
 - 2. Species: Birch, APA grade marked MDO 1 face/2 face, interior grade.
 - 3. Where normally exposed to view (behind cabinet doors): Birch, AWI Custom Quality.
 - 4. Where normally concealed from view (behind cabinet doors): Birch, AWI Economy Quality.
- C. When specifically called for on the drawings as laminated plastic faced cabinets doors, ends, drawer fronts, dividers, and backs (except against walls):
- 1. Provide plywood with laminated plastic on all surfaces not occurring against building walls or fixed partitions.
 - 2. Provide stiles and rails of laminated plastic covered lumber.
- D. All other cabinets not specifically called for on the drawings as laminated plastic faced shall be constructed of "transparently finished" hardwood plywood doors, ends, drawer fronts, dividers, and backs (except against walls) with lumber stiles and rails of same species, as follows:
- 1. Species: Birch or White Oak APA grade marked MDO 1 face/2 faced, interior grade.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which the millwork/ cabinetwork is to be installed, and notify the Contractor in writing of conditions detrimental to the proper and timely completion of this phase of the Work. Do not proceed with this phase until the unsatisfactory conditions have been corrected. Commencement of work shall be construed as acceptance of the conditions.

- B. Contractor shall take accurate field measurements and adjust the shop drawings accordingly before fabrication. The A/E shall be informed in writing of any dimension changes resulting from such field measurement before fabrication.
- C. The casework shall be set in place, leveled, and secured to walls and floors as normal and standard to the trade. Fillers shall be used between casework and walls and shall be accurately scribed to walls for a neat installation. Casework shall be caulked where meeting walls, floors and soffits. Seal all counter joints and where backsplash meets counter top.
- D. The casework installer shall accurately cut openings required for sinks or other equipment as indicated on plans.

3.02 INSTALLATION

- A. Provide first quality construction following best trade practices.
- B. Cuts, miters, joints, etc. shall be well sawn and joined. Nail heads or holes shall not be exposed in finish work. Drive nails and screws true and straight. Glue joints securely together. Sand all surfaces thoroughly, leaving clean and ready for finishing.
- C. Bond plastic laminate to surfaces with technique and contact cement approved by laminated plastic manufacturer.
- D. Install cabinet hardware according to requirements of the finish hardware as specified and in accurate positions as indicated on the drawings.

END OF SECTION

SECTION 07190

VAPOR/RADON BARRIER

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 02200 - Earthwork.
2. 03300 - Cast-In-Place Concrete.

1.02 SUBMITTALS

- ###### A. Submit properly identified manufacturer's literature before starting work.

1.03 QUALITY ASSURANCE

- ###### A. Comply with the following regulatory requirements issued by the Florida Department of Health - Bureau of Environmental Toxicology Radon and Indoor Air:

1. Florida Standard for Radon-Resistant New Commercial Building Construction.
2. EPA Handbook for Design and Installation of a Home Radon Reduction System - Sub-Slab Depressurization for Low Permeability Fill Material.

PART 2 PRODUCTS

2.01 MATERIALS

A. Vapor/Radon Barrier:

1. Interior Slabs: 10 mil minimum polyethylene film.
2. Exterior Slabs: 6 mil polyethylene film.

- ###### B. Tape: As recommended by vapor/radon barrier manufacturer, except at vertical penetrations, use reinforced duct tape.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Lay vapor/radon barrier over entire area to receive interior slab work, lap edges at least 12 inches and seal with tape.
 - 1. Lay vapor/barrier with seams perpendicular to and lapped in direction of concrete pour.
 - 2. Turn edges up to top of slab.
 - 3. Where expansion joints are indicated at adjacent vertical surfaces, extend vapor/radon barrier beyond expansion joint filler and turn up to top of slab.
 - 4. Do not allow screed supports or other items to penetrate vapor/radon barrier.

- B. Extend vapor/radon barrier over surfaces of areas to be protected from vapor or transmission from conditioned space to unconditioned space after placement of insulation.
 - 1. Seal all joints by lapping 2 inches minimum and tape all joints.
 - 2. Repair any punctures or tears before placement of finished surface material.

- C. Seal perimeters, penetrations, and joints and tape to prevent vapor moisture and radon gas penetration.

3.02 PROTECTION

- A. Protect vapor/radon barrier from damage until permanent covering is in place.
 - 1. Repair punctures and tears in vapor and radon barrier using patches of the material overlapping the puncture or tear a minimum of 12 inches. Seal with tape.

END OF SECTION

SECTION 07210
BUILDING INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 06100 - Carpentry.
2. 09200 - Metal Studs, Lath, Suspension Ceilings, Plaster, and Stucco.
3. 09250 - Gypsum Wallboard.
4. Division 7 - Thermal and Moisture Protection.

1.02 REFERENCES AND CODES

A. Florida Building Code (FBC).

B. American Society for Testing and Materials (ASTM):

1. C272-91 Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
2. C739-91 Specification for Cellulose Fiber (Wood Base) Loose Fill Thermal Insulation.
3. C1149-90 Specification for Self-Supported Spray Applied Cellulosic Thermal/Acoustical Insulation.
4. D1622-93 Test Method for Apparent Density of Rigid Cellular Plastics.
5. E84-96a Test Method for Surface Burning Characteristics of Building Materials.
6. E96-95 Test Methods for Water Vapor Transmission of Materials.
7. E662-95 Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
8. E736-92 Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
9. E759-92 Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members.
10. E859-93 Test Method for Air Erosion of Sprayed Fire Resistive Materials (SFRMs) Applied to Structural Members.

1.03 SUBMITTALS

- A. Submit properly identified manufacturer's product data including installation instructions before starting work.
- B. Submit Southern Building Code Congress International (SBCCI) Public Safety Testing and Evaluation Services reports including trade name, application, and thermal protection requirements of insulation used.

1.04 QUALITY ASSURANCE

- A. ASTM E84 Flame Spread: 25 or less.
- B. ASTM E662 Smoke Development: 450 or less.
- C. Materials used shall contain no formaldehyde.

PART 2 PRODUCTS

A. Plastic Foam Board Wall Insulation:

1. Manufacturers:

- a. Styrofoam SE by Dow Chemical Co.
- b. Formula R by U.C. Industries.
- c. Foamular 150 by Owens Corning.
- d. Approved equal.

2. Physical Data:

- a. "R" Value: 5 per inch minimum at 75 degrees Fahrenheit mean.
- b. Size: 1 inches thick x 16 inches wide x 8 feet long.
- c. Material: Extruded polystyrene foam board. Beadboard is not acceptable.
- d. ASTM C272 Water Absorption: 0.7 percent by volume, maximum.
- e. ASTM E96 Moisture Vapor Transmission: 1.1 perm, maximum.
- f. Adhesive for Wall Insulation: "Styrofoam No.11 Brand Mastic" or as recommended by insulation manufacturer.

B. Polyisocyanurate Roof Insulation.

1. Manufacturers:

- a. Energy 2 by NRG Barriers.

- b. Accepted equivalent.
2. Physical Data:
- a. "R" Value: 5.6 per inch minimum at 75 degrees Fahrenheit mean.
 - b. Board Thickness: 1/2 inch minimum (12.7mm), 2 inches (51mm) maximum.
 - c. Board Size: 4'-0" x 4'-0" maximum.
 - d. ASTM D1622 Board Density: 2.0 pcf.
 - e. ASTM D1621 Compressive Strength: 23 psi minimum.
 - f. ASTM C209 Water Absorption: 1 percent by volume, maximum.
 - g. ASTM E-96 Moisture Vapor Transmission: 1 perm, maximum.
 - h. Dimensional Stability: 2 percent maximum linear change when conditioned at 158 degrees F. And 97 percent relative humidity for 7 days.
 - i. Curing Time: 24 hours minimum, plus an additional 24 hours minimum per inch (25mm) of thickness at a minimum of 60 degrees F. before shipment from manufacturer.
3. Protection: Provide 1/2" minimum Dens Deck Type X or accepted equivalent.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install the accepted insulation according to the manufacturer's printed instructions for the specific product.

END OF SECTION

SECTION 07270

FIRESTOPPING AND SMOKE BARRIER CAULKING

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 - Cast-In-Place Concrete.
2. 04220 - Concrete Unit Masonry.
3. 09250 - Gypsum Wallboard.
4. 15410 - Piping (Plumbing).
5. 15510 - Piping (HVAC).
6. 15515 - Valves, Hangers, and Specialties.
7. 16112 - Raceways and Conduits.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. E84-96a Test Method for Surface Burning Characteristics of Building Materials.
2. E119-95a Test Methods for Fire Tests of Building Construction and Materials.
3. E814-94b Test Method for Fire Tests of Through-penetration Fire Stops.

B. Underwriters Laboratories, Inc. (UL) 1479 and 2079.

1.03 SUBMITTALS

- A. Submit properly identified product data including material specifications, published installation details, material safety data sheets (MSDS), and directions. Provide UL classified fire test data for each slab edge, floor penetration, and fire wall penetration condition.
- B. Shop drawings shall show typical installation details for methods of installation and type of firestop materials used.

1.04 QUALITY ASSURANCE

- A. Applicator: Acceptable to firestopping and smoke barrier caulking manufacturer.
- B. Fire safing insulation, fire and smoke barrier caulk, putty, fire barrier wrap/strips, fire prevention pillows, fire barrier partitions, fire barrier covers complete with necessary metal clips, supports, fastenings, and covers shall meet ASTM E814 for 2 hour fire rating for fire walls as indicated.
- C. Materials shall be listed in UL Building Materials Directory - Through Penetration Fire Stops Systems and Fill Void or Cavity Materials.
- D. Firestopping materials shall not contain lead, PCBs, ethylene glycol, or lead.
- E. Products containing solvents or requiring hazardous waste disposal are not allowed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping and Smoke Barrier Caulking:

1. AD Firebarrier.
2. Bio Fireshield.
3. Enerstop.
4. Hilti.
5. U.S. Gypsum Company (USG).
6. Specified Technologies Inc (STI).
7. 3M.
8. Tremco.
9. Approved equal.

2.02 MATERIALS

A. Fire Safing Insulation:

1. USG Thermafiber safing insulation complete with impaling clips for slab edges and firestop sealant.
2. Accepted equivalent.

B. Fire and Smoke Barrier Caulk:

1. AD Firebarrier Silicone.
2. Bio Fireshield: Biostop 500+ Sealant, Biotherm 100/200 Sealant:
3. Enerstop: 100 SL Sealant, 200 G Sealant, 300 C Compound.
4. Hilti: FS 601 Sealant, FS 604 Sealant, FS-ONE.
5. STI: Spec Seal Series 100, Pensil 300, Firedam 150+.
6. 3M: CP 25 Fire Barrier Caulk, 303 Fire Barrier Putty, Flame Stop V, Flame Stop VI.
7. Tremco: Fyre Shield, Fyre Sil, WBM, or acrylic.
8. Approved equal.

C. Fire Barrier Wrap/Strip:

1. Bio Fireshield: Biostop Wrap Strip.
2. Enerstop: 400 MW Mineral Wool, 600 P.I. Pipe Insulation.
3. STI: Spec Seal Wrap/Strip.
4. 3M FS-195 Wrap/Strip.
5. Tremco: Intumescent Wrap Strip.
6. Approved equal.

D. Trowelable Fire Barrier Compound:

1. AD Firebarrier Silicone.
2. Bio Fireshield: Bio K-10, Biostop Fire Rated Putty and Putty Pads.
3. Hilti FS 635.
4. STI: Spec Seal mortar, putty, and putty pads.
5. Approved equal.

E. Sheet Metal Fire Barrier Restricting Collars: Provide suitable galvanized bolts and expansion anchors.

1. STI: Spec Seal metal restraining collars.
2. 3M: Restricting Collar RC-1.
3. Tremco: MCR.
4. Approved equal.

F. Prefabricated Firestop Collar:

1. AD Firebarrier Collars.
2. Bio Fireshield: Biostop Pipe Collar.
3. Hilti: CP 642.
4. STI: Spec Seal plastic pipe collars.
5. 3M: PPD.
6. Tremco: Tremstop D Firestop Collars.

7. Approved equal.
- G. Fire Prevention Pillows: Meeting ASTM E814 requirements and classified by UL.
1. Bio Fireshield: Bio Firestop Pillows.
 2. Hilti: FS 657 Fire Block.
 3. STI: Spec Seal.
 4. Tremco: Tremstop.
 5. Approved equal.
- H. Fire and Smoke Barrier Spray.
1. Bio Fireshield: Biostop 700, Biostop 750.
 2. 3M: Fire Dam Spray.
 3. Approved equal.
- I. Firestopping Sleeve.
1. STI: EZ-Path.
 2. Accepted Equivalent.
- J. Hose Clamps for Restricting Collars: Standard galvanized steel or stainless steel hose clamps.
- K. Metal Supports for Firesafing "Packing Material":
1. 30 gage by 1 inch wide galvanized sheet steel "Z" shaped clips to support "packing material" around floor penetrations.
 2. 10 gage galvanized steel wire hat shaped support hangers to support "damming material" or "packing material" at floor penetrations.
 3. Hardware cloth of 19 gage galvanized " " mesh wire.

PART 3 EXECUTION

3.01 PREPARATION

- A. Masonry, concrete, and gypsum board surfaces shall be smooth, clean, and free of loose debris, holes, and projections.

3.02 APPLICATION

- A. Apply fire safing insulation, fire and smoke barrier caulk, and fire barrier wrap/strips according to manufacturer's published installation details, directions, UL classified fire test data, and as specified.

- B. Floor and Fire Wall Penetrations - Metal Pipes and Conduits:
 - 1. Where gaps between metal pipes and conduits openings are 1/4" or less, seal gaps with specified fire and smoke barrier caulk.
 - 2. Where gaps between metal pipes and conduits are more than 1/4":
 - a. Pack space between opening and pipe, conduit and duct with specified fire safing insulation and of depth of insulation to provide a 2 hour minimum fire resistance as indicated according to fire safing manufacturer's directions.
 - b. Apply specified fire and smoke barrier caulk of required 1 inch uniform depth over fire safing insulation support. Smooth surface of caulk at exposed areas.
 - c. In place of specified fire and smoke barrier caulk, provide fire and smoke barrier wrap/strips, wire tied in place and covered with of specified fire and smoke barrier caulk according to manufacturer's directions.

- C. Fire Wall Penetrations - Plastic Pipe and Conduit Perimeters and Insulated Metal Pipe Perimeters:
 - 1. Where gaps between plastic pipes and plastic conduits and wall openings are 1/4" or less and where insulated metal pipes occur, provide sheet metal fire barrier restricting collar wrap/strip with fire and smoke barrier caulk on both sides of wall and at bottom of floor only to provide 2 hour fire resistance as indicated according to manufacturer's directions.
 - a. Provide number of wrap/strips around pipes and conduits according to wrap/strip manufacturer's tables.
 - b. Enclose wrap/strips with sheet metal restricting collars bolted to each side of wall for fire wall penetrations and to underside of floor for floor penetrations. Bend support tabs back to pipe or insulation and secure collar with metal hose clamp.
 - c. Seal all seams and edges at wall and floor with 1/4" bead of specified fire and smoke barrier caulk.

 - 2. Plastic pipe and insulated cable penetrations to fire walls:
 - a. Provide galvanized steel pipe sleeves equivalent to EMT, sized to

allow annular space of not less than 3/4" around pipe or cable. Project pipe sleeve 3 inches on each side of wall. Tightly fit pipe sleeves to wall. Grout sleeves into masonry and fill openings in gypsum board with firecaulk.

- b. Fill space around pipe and cable to within 2-1/4" of end of pipe sleeve with fire safing insulation.
- c. Provide number of specified fire barrier wrap/ trips around pipes and cable on each side of wall according to wrap/strip manufacturer's table to provide 2 hour fire resistance as indicated according to wrap/strip manufacturer's directions. Wire wrap/strips in place and slide into pipe sleeve, recessing 1/4".
- d. Cover surface of wrap/strip around pipe and cable with uniform 1/4" depth of specified fire and smoke barrier caulk.

3.03 PROTECTION

- A. Protect finished firestopping and fire retardant caulking from tears and punctures. Replace torn or pierced firestopping and caulking material.

END OF SECTION

SECTION 07525

SBS MODIFIED BITUMEN MINERAL SURFACED ROOFING

PART 1 GENERAL

1.01 SUMMARY:

- A. Styrene Butadiene Styrene (SBS) modified bitumen mineral surfaced roofing system including necessary accessories.
- B. Related Sections:
 - 1. 06100 - Carpentry.
 - 2. 07210 - Building Insulation.
 - 3. 07600 - Flashing and Sheet Metal.

1.02 REFERENCES AND CODES

- A. Florida Building Code (FBC), including FBC - Roofing Application Standards (RAS), and FBC - Test Application Standards (TAS).
- B. Miami-Dade County Product Control.
 - 1. Miami-Dade County Test Protocols:
 - a. PA 105, PA 114, and PA 117.
 - b. Appendix A and B.
- C. Uplift requirements based on the basic wind velocity pressures for the project according to American Society of Civil Engineers (ASCE) 7-05.
 - 1. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to ASCE 7-05 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.10.
- D. Factory Mutual:
 - 1. Requirements for Class I rated assembly and FM 1- 150 uplift classifications as determined by ASCE 7-05.
 - 2. FM 4470 - Approval Standards for Class I Roof Covers.
 - 3. Loss Prevention Data Sheets 1-7, 1-28, 1-28R, 1-29, 1-29R, and 1-49.

4. FM 1a-150.
- E. American Society for Testing and Materials (ASTM):
1. D41-94 Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 2. D312-00 Specification for Asphalt Used In Roofing.
 3. D2824-94 Specification for Aluminum-Pigmented Asphalt Roof Coatings, Non-Fibered, Asbestos Fibered, and Fibered Without Asbestos.
 4. D3447-01 Standard Test Method for Purity of Halogenated Organic Solvents.
 5. D5147-02a Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.
 6. E84-04 Test Method for Surface Burning Characteristics of Building Materials.
 7. E108-04 Test Methods for Fire Tests of Roof Coverings.
 8. E119-00 Test Methods for Fire Tests of Building Construction and Materials.
 9. E136-2004 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 C.
- F. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.
- G. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): Architectural Sheet Metal Manual, latest edition.
- H. Underwriters Laboratories (UL).
1. UL 790.
 2. Roofing Materials and Systems Annual Directory.
 3. UL Class A External Fire Classification.
- I. Roofing manufacturer's specifications.
- 1.03 SYSTEM DESCRIPTION
- A. Performance Requirements: Coordinate application of roofing system with application of cants and bases, protruding materials, roof flashings, and roof accessories to assure the complete installation is watertight and according to warranty requirements.

1.04 SUBMITTALS

A. Product Data:

1. Submit specifications, installation instructions, and general recommendations from manufacturers of roofing system materials, for types of roofing required.
2. Include data proving materials comply with requirements.

B. Shop Drawings:

1. Show roof configuration and sheet layout, details at perimeter, and special conditions.
2. Indicate layout of tapered insulation materials.

C. Samples: Manufacturer's standard sizes of roofing plies.

1.05 QUALITY ASSURANCE

A. Applicator/Installer Qualifications:

1. Approved and certified by the roof system manufacturer and holding appropriate state or local licenses, permits, and certificates to perform the type of work required under this contract.
2. Firm with minimum 5 years successful experience in installation of roofing systems similar to those required for the work.
3. Be equipped with a trained crew and equipment required to perform the work in an efficient manner and as recommended by the roofing system manufacturer.
4. Maintain a full time supervisor/foreman/superintendent on-site experienced with the specified roofing system and acceptable to the roofing system manufacturer.
5. Assign work closely associated with flexible sheet roofing, including vapor barriers, insulation, flashing and counterflashing, expansion joints, and joint sealers, to installer of flexible sheet roofing.

B. Technical Inspector Qualifications:

1. A technical inspector either employed or approved by the roofing system manufacturer shall inspect the installation of the roofing system.
2. Written authorization from the roofing system manufacturer shall state that compliance with the technical inspector's decisions shall not affect the roofing system manufacturer's warranty.

C. Special Requirements:

1. Provide components compatible with and approved by the roofing system manufacturer.
2. Insurance Certification: Assist the Owner in preparation and submittal of roof installation acceptance certification necessary for fire and extended coverage insurance on roofing and associated Work.
3. Thermal Resistance: Thermal resistance properties of insulating materials shall be designated by R-values, representing rate of heat flow through material of thickness indicated, measured by test method in referenced material standard or indicated, and expressed by temperature difference in degrees F. between 2 exposed faces required to cause 1 BTU to flow through 1 square foot per hour at mean temperatures indicated.
4. Fire Performance Characteristics:
 - a. Provide insulation materials with identical fire performance characteristics, as listed for each material or assembly, determined by testing according to methods indicated, UL, or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - b. Surface Burning Characteristics: ASTM E84.
 - c. Fire Resistance Ratings: ASTM E119.
 - d. Combustibility Characteristics: ASTM E136.

1.06 WARRANTY

A. Applicator's Warranty:

1. Contractor shall furnish the Owner a 5 year written warranty, beginning at Substantial Completion, signed by Roofing applicator, covering materials and quality of work for entire "Roofing System", including repair and replacement of flashing and other roofing components deemed faulty or in disrepair by A/E during warranty period. This warranty shall include all other work performed by the contractor described in other sections, including but not limited to, caulking and sealants, sheet metal, insulation, and roofing accessories.
 - a. Such items deemed faulty or in disrepair shall be repaired at no cost to the Owner.
 - b. Definition of faulty components or roofing in disrepair includes but is not limited to:

- 1) Blisters in roofing.
- 2) Cracks or ridging in roofing membranes.
- 3) Delamination, shears, or tears in membrane.
- 4) Defects in the quality of work or materials.
- 5) Leaks of any kind.

B. Manufacturer's Warranty:

1. Manufacturer shall furnish the Owner a 20 year written warranty, beginning at Substantial Completion, signed by manufacturer's authorized representative for repair and replacement period and terms:
 - a. No dollar limit on warranty.
 - b. Single source responsibility.
 - c. Definition of faulty components or roofing in disrepair includes but is not limited to:
 - 1) Blisters in roofing.
 - 2) Cracks or ridging in roofing membranes.
 - 3) Delamination, shears, or tears in membrane.
 - 4) Defects in the quality of work or materials.
 - 5) Leaks of any kind.

C. Warranty shall be for roofing membrane over a board insulation.

D. General Requirements:

1. Contractor Responsibility:
 - a. Certified by manufacturer of roofing materials.
 - b. Obtain authorization from roofing materials manufacturer for Project before installation starts to insure issuance guarantee from manufacturer.
2. Manufacturer's Responsibility:
 - a. Pay all authorized costs of repair of roofing membrane necessary to stop leaks.
 - b. Provide guarantee for specified number of years.
 - c. Issue guarantee within 6 months after completion of roofing system.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. SBS Modified Bitumen Mineral Surfaced Roofing with Granular Mineral Cap Sheets:
 - 1. Firestone.
 - 2. Siplast, Inc.
 - 3. Soprema Roofing.
 - 4. Approved equal.

2.02 MATERIALS

- A. Base Sheet: Compatible reinforced base sheet manufactured and supplied by the roofing membrane manufacturer, type depending on substrate, and shall be part of the manufacturer's FM system for wind uplift as specified.
- B. Roofing Membranes:
 - 1. One granular mineral, polyester reinforced, SBS over one smooth SBS. Modified bitumen sheets according to CGSB 37-GP-56M, UL Class A requirements, and FM wind uplift classification as specified.
- C. Bitumen: Primer according to roofing membrane manufacturer's recommendations. Asphalt: Steep, according to ASTM D312, Type III for slopes to 3 inches; Type IV for slopes over 3 inches.
- D. Cant: A.R.B.S. System.
- E. Roofing tapes, sealers, nails, primers, and roof vents according to manufacturer's recommendations.
- F. SBS Flashing Cement: Asbestos free roofing cement according to ASTM D4586.
- G. Insulation:
 - 1. Tapered polyisocyanurate foam board according to Section 07210.
- H. Recover/Overlayment Boards:
 - 1. As approved by roofing membrane manufacturer.

- a. Dens-Deck by Georgia Pacific.
 - b. SopraBoard by Soprema.
- I. Fastenings: Comply with Factory Mutual uplift classification as specified.
- 1. Nails Securing Insulation to Concrete Deck: No.12 or No.14 diameter concrete fasteners or anchors.
 - 2. Staple fasteners are not allowed.
 - 3. Provide term bar at vertical flashing areas according to RAS.

PART 3 EXECUTION

3.01 PREPARATION

- A. Do not start application of roofing materials until deck surfaces are smooth, plane, firm, dry, free from dirt and foreign materials, and have been inspected and accepted, in writing, by the Roofing Applicator and the A/E.
- B. Thoroughly clean deck surface before application of roofing materials, using compressed air, vacuum, or other approved method.
- C. Starting of the work will be considered acceptance of base surfaces by the Roofing Applicator and assurance by the Roofing Applicator of a watertight job and ability to provide the required warranty.
- D. Protect building and adjacent surfaces from damage because of bitumen spillage, repair or replace such surfaces so damaged. Do not store materials on completed roofing.
- E. Over exposed bitumen, provide mineral granules matching granular cap sheets.
- F. Water stops:
 - 1. Protect roof deck and partially completed roofing from moisture by providing water stops at end of each day's work or when weather is threatening.
 - 2. Failure to protect deck, roof insulation, and roofing will result in removal of damaged materials or materials containing excessive moisture.
 - 3. Remove water stops before start of new work.

G. Phasing is not allowed.

END OF SECTION

SECTION 07600

FLASHING AND SHEET METAL

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 06100 - Carpentry.
2. 07525 – SBS Modified Bitumen Mineral Surfaced Roofing.
3. 07900 - Joint Sealers.
4. Division 7 - Thermal and Moisture Protection.

1.02 REFERENCES AND CODES

- A. Florida Building Code (FBC), including FBC - Roofing Application Standards (RAS), and FBC - Test Application Standards (TAS).
- B. Uplift requirements based on the basic wind velocity pressures for the project according to American Society of Civil Engineers (ASCE) 7-05.
 1. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to ASCE 7-05 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.10.
- C. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): Architectural Sheet Metal Manual, latest edition.
- D. American Society for Testing and Materials (ASTM):
 1. A167-96 Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 2. A240/04 Specification for Heat-resisting Chromium and Chromium-nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
 3. B32-96 Specification for Solder Metal.
 4. D4586-93 Specification for Asphalt Roof Cement, Asbestos-Free.

1.03 SUBMITTALS

- A. Properly identified product data and descriptive literature before starting work.
- B. Shop Drawings on flashing and sheet metal work.
- C. Samples:
 - 1. 8 inch square samples of specified sheet materials to be exposed as finished surfaces.
 - 2. 12 inch long samples of factory fabricated products exposed as finished work. Provide complete with specified factory finish.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: Flashing and sheet metal shall comply with requirements of SMACNA latest standards.
- B. Coordinate application of flashings with application of roofing, protruding material, and roof accessories to provide a complete weathertight installation according to the specified warranty requirements.
- C. Pre-Roofing Conference: Attendance to the pre-roofing conference is required. Refer to the roofing sections.

1.05 WARRANTY

- A. Furnish the Owner a 20 year written warranty from manufacturer for repair and replacement.
- B. Furnish the Owner a 5 year written warranty covering applicator's quality of work for flashings with warranty of "Roofing System."
 - 1. Warranty shall cover watertight integrity of flashings for 5 years, including repair and replacement of components or system deemed faulty or in disrepair by A/E during warranty period.
 - 2. Such items deemed faulty or in disrepair shall be repaired at no cost to the Owner.
- C. Definition of faulty components or system in disrepair includes but is not limited to:
 - 1. Defects in manufacture and installations.
 - 2. Defects in materials.

3. Leaks of any kind.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sheet Metal:

1. Type 302 or 304 stainless steel, 20 and 22 gage, complying with ASTM A167.
2. Flashing for Pipes, Conduits, and Round Equipment Supports: Type 304 stainless steel, 26 gage, 2B, complying with ASTM A240/A.
3. Solder: According to ASTM B32.
4. Fastening Devices: Fasteners shall be compatible with metal and roofing system. Use of powder activated fasteners is prohibited.
 - a. For Attaching Sheet Metal to Wood with Concealed Fastenings: Hot dip galvanized ring shank roofing nails not less than 1-1/4" long.
 - b. For Attaching Sheet Metal to Wood with Exposed Fastenings: No.10 x 1-1/4" pan head stainless steel sheet metal screws. Provide neoprene sealant washers and stainless steel washers under screw heads.
 - c. For Attaching Sheet Metal to Masonry or Concrete: No.10 x 1-1/4" pan head Tap-Con zinc plated concrete tapping screws. Provide neoprene sealant washers and stainless steel washers under screw heads.
5. Roofing Cement: Plastic roofing cement complying with the requirements of ASTM D2822 or as appropriate and as recommended by roofing manufacturer.
6. SBS Flashing Cement: Roofing cement according to ASTM D4586.

2.02 FABRICATION

- A. Fabricate flashing and sheet metal work according to accepted Shop Drawings.
- B. Surface Mounted Flashing (1-piece):
 1. Fabricate in approximately 10 foot sections using sheet stainless steel to detail as indicated.
 2. Provide flashing with 1-1/2" wall flange with 1/4" kick at top to receive

sealant, a 1/2" 135 degree sloping top flange and a 4 inch bottom flange formed inward 3/4" towards wall with a hemmed 1/2" kick at bottom.

3. Shop punch wall flange at 12 inches on center for fastening.
4. Provide shop fabricated corner splices extending 4 inches.
5. Manufactured by SBC industries or accepted equivalent.

C. Copings:

1. Fabricate in approximately 10 foot sections using sheet 22 gage stainless steel to detail as indicated.
2. Provide a continuous 20 gage stainless steel outer hold-down cleat with punched holes at 6 inches on center and face fasten at inward facing parapet components with removable fasteners as required for sheet metal.
3. Provide 8 inch wide joint covers.
4. Manufactured by SBC Industries or accepted equivalent.
5. Comply with RAS 111 - Table 2.

D. Scuppers:

1. Fabricate using stainless steel with soldered seams to profiles and details shown.
2. Lock seam corners, solder watertight and hem outer exposed edges.
3. Provide 4 inch wide minimum flanges formed to fit cants, decks and vertical wall surface.
4. Shop punch flanges for fastenings at 6 inches on center

E. Conductor Heads and Downspouts:

1. Provide conductor heads to collect water from the scuppers to discharge into the downspouts.
 - a. Conductor heads shall be fabricated from stainless steel.
 - b. The top of the conductor head shall be a minimum of 1" below and a minimum of 2" wider than the scupper. Proportion as recommended in SMACNA Architectural Sheet Metal Manual.
2. Use stainless steel downspouts.
 - a. The size of a downspout shall be constant throughout its length.
 - b. At joints, the top portion shall fit into the lower.
 - c. Provide stainless steel or other corrosion-resistant metal hangers.

- F. Overflow Scuppers: Provide pre-fab overflow scuppers as indicated in the drawings.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to accepted Shop Drawings.
 - 1. Lap, rivet, lock, or seal joints as field conditions require.
 - 2. Provide necessary reinforcement, miscellaneous fittings, and accessories.
- B. Apply flashing and sheet metal work including miscellaneous fittings and accessories to even, smooth, sound, thoroughly clean and dry surfaces that are free from defects that might affect application. Prime metal flanges that receive bitumen according to SFBC and manufacturer's requirements.
- C. Perform soldering work slowly, with properly heated coppers to thoroughly heat seam material and sweat solder through full width of seam that shall show not less than 1 inch of evenly flowed solder.
 - 1. Start soldering immediately after application of flux.
 - 2. Solder flat locked seam.
- D. Isolate dissimilar metals with accepted isolation paint or other accepted materials.
 - 1. Do not place in contact with or in positions where drainage across such paint or other materials will occur.
- E. Make flashing and sheet metal work water and weathertight, with lines, arises and angles sharp and true and plane surfaces free from waves and buckles.
- F. Provide sufficient fasteners and related hardware to insure a complete and weathertight system.

- G. Flashing fasteners not covered by roofing membrane shall be removable.
- H. Surface Mounted Flashing (1-piece):
1. Fabricate in approximately 10 foot sections using sheet stainless steel to detail as indicated.
 2. Provide flashing with 1-1/2" wall flange with 1/4" kick at top to receive sealant, a 1/2" 135 degree sloping top flange and a 4 inch bottom flange formed inward 3/4" towards wall with a hemmed 1/2" kick at bottom.
 3. Shop punch wall flange at 12 inches on center for fastening.
 4. Provide shop fabricated corner splices extending 4 inches.
 5. Manufactured by SBC industries or accepted equivalent.
- I. Copings:
1. Secure outer hold-down cleat to wood block at 6 inches on center with ring shank roofing nails.
 2. Install coping over cleat. Allow 1/8" space between each coping section.
 3. Secure inside face of coping with removable grommet type fasteners.
 4. Provide 1"/1' slope at coping to inner parapet wall.
 5. Install joint covers in full bed of sealant.
- J. Installation of Scuppers:
1. Set scuppers in full bed of roofing cement over completed base flashing and roof membrane.
 2. Secure to masonry walls and concrete decks with stainless sheet metal fasteners and anchors at 6 inches on center.
- K. Installation of Downspouts:
1. Provide where indicated according to Shop Drawings.
 2. Provide downspout straps near top and bottom of each section, located approximately 10 feet on center
 3. Secure each end of straps to masonry walls with stainless steel sheet metal screws and anchors or with drive pins.
 4. Secure each section of downspout to top strap with at least 2 stainless steel sheet metal screws.
 5. Do not secure bottom end of each downspout section to strap to allow for thermal movement.

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.01 SUMMARY

- A. System Description: Joint sealers, fillers, and other related materials compatible with one another, with joint substrate, and other adjacent materials including finishes.

1.02 SUBMITTALS

- A. Shop Drawings: Detail proper joint sealer and backing for the following joints:
 - 1. Vertical and horizontal surfaces at interior and exterior locations.
 - 2. Traffic areas at interior and exterior locations.

1.03 QUALITY ASSURANCE

- A. Provide single source responsibility for each type of joint materials.

1.04 WARRANTY

- A. Manufacturer shall provide warranties covering joint sealers for 10 years from date of Substantial Completion.
- B. Contractor shall furnish the Owner a 2 year written warranty covering quality of construction from applicator.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Joint Sealers:
 - 1. Bostick Construction Products Division.
 - 2. Pecora Inc.
 - 3. Sika Chemical Corp.
 - 4. Sonneborn Building Products.
 - 5. Thiokol/Speciality Chemical Division.

6. Thoro Systems Products.
7. Tremco Manufacturing Co.
8. W.R. Meadows.
9. Approved Equal.

PART 3 NOT USED

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Steel doors and frames including necessary accessories.
- B. Section Does Not Include: Use of aluminum doors.
- C. Related Sections:
 - 1. 04220 - Concrete Unit Masonry.
 - 2. 04530 - Masonry Patchwork.
 - 3. 06100 - Carpentry.
 - 4. 07900 - Joint Sealers.
 - 5. 08710 - Finish Hardware.
 - 6. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
 - 7. 09901 - Painting.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. A366-96 Specification for Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.
 - 2. A653/A-96 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. A924/A-96a Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 4. C270-96a Specification for Mortar for Unit Masonry.
- B. Factory Mutual (FM), latest edition.
- C. National Builders Hardware Association - "Recommended Locations for Builders", latest edition.
- D. Steel Door Institute (SDI), latest editions.
 - 1. SDI 100 Standard Steel Doors and Frames, latest edition.

2. SDI 105 Recommended Erection Instructions for Steel Frames.
 3. SDI 107 Hardware on Steel Doors (reinforcement application).
- E. Underwriters Laboratories (UL), latest edition.
- F. UL 1784 Air Leakage Test of Door Assemblies.
- G. National Fire Protection Association (NFPA)
1. NFPA 80 Standard for Fire Doors and Windows.
 2. NFPA 101 Life Safety Code.
 3. NFPA 105 Smoke and Draft Control Assemblies.
- H. Florida Building Code (FBC).
- I. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- J. American National Standards Institute (ANSI):
1. A250.4-1994 Test Procedure and acceptance criteria for physical endurance, steel doors and frames.
 2. A224.1-1980 Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames.
 3. A117.1 Accessible and Usable Buildings and Facilities.
- K. Warnock Hersey International (WHI), Division of Inchcape Testing Services.

1.03 SUBMITTALS

- A. Exterior Door Certification: Miami-Dade County product approval single listing with specified door, door frame, and hardware, demonstrating compliance with FBC missile impact criteria.
1. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to American Society of Civil Engineers (ASCE) 7-10 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.10.
- B. Submit properly identified product data including manufacturer's specifications and installation instructions before starting work, and any information necessary to indicate compliance to these specifications.

- C. Upon request, submit nonreturnable samples necessary to be evaluated for construction compliance.
- D. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for each door and frame assembly constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

1.04 QUALITY ASSURANCE

- A. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies complying with NFPA 80 and have been tested, listed, and labeled according to UBC-43-2 and ISO-3008 by a nationally recognized independent testing and inspection agency.
- B. Provide doors and frames complying with SDI 100 and as specified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver steel doors and frames cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect steel doors and frames upon delivery for damage. Minor damage may be repaired if refinished items are equal in all respects to new work and acceptable to A/E. Remove and replace damaged items as directed.
- C. Store doors and frames at building site under cover. Place units on minimum 4 inch high wood blocking. Avoid use of non-vented plastic or canvas shelters that could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.
- D. Deliver all doors and frames to the jobsite in a timely manner to not delay progress of other trades.

1.06 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a 1 year warranty against defects in materials and construction.
- B. Warranty shall begin on date of substantial completion of the project.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames:

1. Ceco Corporation, Door Division, Carol Stream, IL.
2. Curries Company, Mason City, IA.
3. Firedoor Corporation, Miami, FL.
4. Quality Engineered Products Co., Inc., Tampa, FL.
5. Steelcraft, Cincinnati, OH.
6. Republic Builders Products, Pembroke Park, FL.
7. Approved Equal.

2.02 DOORFRAMES

A. Fabricate exterior frames and interior frames to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq.ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.

B. Frames: Fully welded with mitered or butted head and jamb members with integral stops and with combination buck and trim as shown.

1. Corners shall have continuous flush and smooth welds without dishing.
2. Sanitary or hospital type stops shall have 6 inch high cutoffs with 45 degree caps.

C. Hardware Reinforcements and Preparations:

1. Frames shall be mortised, reinforced, and drilled/ tapped for mortised hardware according to approved finish hardware schedule and templates by hardware supplier.

a. Drilling and tapping for surface applied hardware shall be done in the field.

2. Butt (Hinge) Reinforcing:

a. Steel plate 3/16" thick by 1-1/4" minimum to 1-1/2" maximum by 10 inches long, offset as required to have faces of butts flush with doorframe edge and secured by not less than 6 spot welds.

3. Strike Reinforcement: Offset clips of 12 gage steel, 1-1/4" x 4-7/8" long.
4. Closer Shoe Reinforcing for Parallel Arm:
 - a. 12 gage steel plates (minimum 20" long x 1-3/4" wide) at bottom of door stop located next to door rabbet on hinge.
 - b. Provide styrofoam or treated wood over plates to allow closer foot screws to seat without interference from grout fill.
- D. Silencer (Mute) Provisions: Punch frames to receive silencers on strike jamb scheduled in Section 08710.
- E. Center Hardware Mullions, Removable: Grout filled and fabricated with only one thickness of metal occurring at point of silencer punch-outs, 2" x 3", 11 gage hardware mullion by exit device manufacturer.
- F. Grout:
 1. Grout Guards:
 - a. Provide 26 gage sheet metal covers welded to the back of frames at hinges, lock, bolts, tapped reinforcements at hardware and silencer locations.
 - b. At Silencer locations, furnish suitable removable plugs in holes to keep grout free.
 2. Coatings:
 - a. Provide full coverage at frame interior before grouting with corrosion inhibiting bituminous coating.
- G. Jamb Anchors: Provide according to frame manufacturer's recommendations for attachment to masonry walls, concrete columns, and metal stud system as shown on drawings to allow grout fill.
- H. Floor Anchors: Provide 14 gage galvanized sheet steel angle shaped anchors for each jamb extending to the floor, punched for not less than two 1/4" diameter bolts.
- I. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.

2.03 HOLLOW METAL DOORS

- A. Fabricate exterior and interior doors to profiles indicated of 16 gage hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq. ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Types: Flush, seamless hollow construction with louvers or vision cutouts as shown or specified.
- C. Sizes and Thickness: Sizes shall be as indicated and with 1-3/4" thickness unless otherwise specified or shown.
 - 1. Provide undercuts where indicated for ventilation. Do not exceed 3/4" undercut for fire labeled doors.
 - 2. Provide 3/8" undercut at doors for exterior openings with ADA threshold.
- D. Door Perimeters:
 - 1. Stile Edges: Bevel for single acting doors shall be 1/8" in 2 inches.
 - 2. Reinforcing: Refer to the Drawings and M-DCPS Design Criteria Appendix.
 - 3. Top and Bottom Channels.
 - a. Not less than 16 gage A60 zinc coated steel channels-flush or inverted.
 - b. Welded to the face sheets.
 - c. Exterior door tops shall have flush surface.
- E. Doors:
 - 1. Classification: SDI Grade III - Model 2, 16 gage, seamless.
 - 2. Doors shall have minimum 20 gage, continuous one piece, vertical steel stiffeners spaced not to exceed 6 inches apart and welded at 6 inches on center to face skin.
 - 3. Lock Rail shall be one piece, full height minimum 16 gage channel.
 - 4. Hinge Rail Reinforcement Manufacturer's Option:
 - a. One piece, full height, 12 gage channel formed, and tapped for hinges.
 - b. One piece, full height, minimum 16 gage channel formed and with minimum 3/16" thick steel by minimum 8" long at each hinge.
 - 5. Cylindrical Lock Reinforcement: Minimum 16 gage standard hardware

- lock box.
6. Exit Device Reinforcement: Minimum 14 gage channel or box minimum 16" long by 3-1/2" wide.
 7. All spaces between stiffeners shall be insulated with fiberglass or mineral insulation.
 8. Door closer reinforcement shall be minimum 12 gage channel or box, welded to top channel. Bottom of reinforcement shall be a minimum of 5-3/4" from top of door, by width of door.
 9. Astragals: Flat security type or "Z" as indicated in drawings or specifications.
 10. All doors shall comply with ANSI A250.4-1994 Level "A" criteria and be tested to 1,000,000 operating cycles and 23 twist tests.
 - a. Certification of Level "A" doors shall be submitted with approval drawings by the distributor.
 - b. Do not bid or supply any type or gage of door not having been tested and passed this criteria.

F. Core material.

1. Stiffeners: Provide vertical members spaced not more than 6 inches o.c. with shape standard to manufacturer.
2. Core Fill: Provide fiberglass or mineral standard to manufacturer.

G. Hardware Reinforcements and Preparation:

1. Hardware preparation.
 - a. Drill for hardware according to accepted finish hardware schedule and templates furnished by hardware supplier.
 - b. Drilling and tapping for surface applied hardware shall be done in the field.
 - c. Locate finish hardware according to recommended locations for hardware as shown on drawings.
 - d. Through bolts for exit devices and locksets shall be by manufacturer.
 - e. Lock reinforcement shall be located as height required for standard and disabled users as shown on drawings and as specified.

H. Security Switch Preparation: Refer to Drawings.

I. Exterior Door Louvers:

1. Zee profile weather resistant type equal to thickness of door, with center rail and of sizes indicated.
2. Fabricate frames and louvers of 18 gage bonderized electro zinc coated sheet steel.
3. Weld or secure frame and louvers into doors without use of screws or through bolts visible from the secured side.
4. Provide security grille as specified on inside of louvers.
5. At louver opening cutout, provide minimum of 20 gage zinc coated steel channel closure welded at opening perimeter.

J. Interior Door Louvers:

1. Inverted "Y" profile sightproof type equal to thickness of door, of sizes indicated.
2. Fabricate frames and louvers of 18 gage bonderized electro zinc coated sheet steel.
3. Weld frame and louvers into doors without use of screws or through bolts visible from the secured side.
4. At louver opening cutout, provide minimum of 20 gage zinc coated steel channel closure welded at opening perimeter.

K. Insect Screens for Exterior Door Louvers:

1. 18 x 16 mesh aluminum screen on rewireable extruded aluminum frame.
2. Mount screen on interior of exterior doors with zinc plated sheet metal screws at 12 inches o.c.

L. Slip-on Spats: 20 ga., #4 satin finish.

M. Light Opening in Doors:

1. Provide light openings of sizes indicated.
2. At light opening cut outs, provide 16 gage zinc coated steel channel closures welded into opening perimeter.

N. Glass light frames in doors fabricated of not less than 18 gage galvanized steel with attachment screws allowed only on the non-secure side, not visible when viewing door lite frame face.

2.04 FINISHING AND SHOP PAINT

A. After Fabrication: Grind exposed weld marks smooth and flush, clean and

degrease surfaces, apply metallic filler, sand smooth, and apply shop coat of manufacturer's standard rust-inhibitive metal primer baked on.

- B. Prime Coat: Thoroughly cover all surfaces to provide uniform dry film thickness of not less than 1.0 mil without runs, smears, or bare spots.
- C. Primer Coat: Use manufacturer's standard rust inhibiting primer complying with ANSI A-224.1-1990.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Frames:

1. Install plumb, level, and true to line, secured in openings.
2. Install frames according to accepted shop drawings, manufacturer's printed instructions.
3. Grout fill doorframes at metal stud walls and grout fill-in-place all other doorframes after installation. Frames at precast construction shall be cast-in-place.
4. Install fire-rated frames according to NFPA 80.
5. Install stainless steel slip-on spats at food service doorframes.

B. Doors:

1. Install in openings plumb, level, and true to line.
2. Apply hardware and adjust to achieve smooth and quiet operation.
3. Install insect/rat screens on interior of exterior door louvers.
4. Place fire-rated doors with clearances as specified in NFPA 80.

3.03 ADJUST AND CLEAN

- A. Prime Coat Touch-Up: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

- B. Protection Removal: Immediately before final inspection, remove protective plastic wrappings from prefinished doors.
- C. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.
- D. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Provide final adjustment as follows:
 - 1. Door Contact With Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
 - 2. Head, Strike, and Hinge Jamb Margin: 1/8".
 - 3. Meeting Edge Clearance, Pairs of Doors: $\pm 1/16$ ".
 - 4. Bolts and Screws: Leave tight and firmly seated.
 - 5. Soundseal gasketing.
 - 6. Vermin Protection:
 - a. Drop Seal: Full contact with no gaps.
 - b. Brush weatherstripping.

END OF SECTION

SECTION 08305
ACCESS PANELS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 07900 - Joint Sealers.
2. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
3. 09250 - Gypsum Wallboard.
4. 09310 - Ceramic Tile.
5. 09901 - Painting.
6. 15430 - Piping Specialties (Plumbing).

1.02 SUBMITTALS

- A. Submit properly identified manufacturer's literature including manufacturer's specifications and installation instructions before starting work.
- B. Shop Drawings: Submit shop drawings for review.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Access Panels:

1. Milcor Limited Partnership, Lima OH.
2. Nystrom Inc., Minneapolis, MN.
3. Approved Equal.

2.02 EQUIPMENT

- A. Sizes as shown on Drawings or required to provide sufficient access for the proper operation of maintenance. Minimum size shall be 12 inches x 12 inches.
- B. Provide 14 gage steel door with 16 gage steel frame with baked enamel prime coat.

- C. Provide fire-rated components at fire rated construction.
- D. Access Panels for Masonry and Tile Surfaces:

- 1. Milcor M.
- 2. Nystrom Flush TM.
- 3. Approved Equal.

- E. Access Panels for Gypsum Wallboard.

- 1. Milcor DW.
- 2. Nystrom Flush WB.
- 3. Williams Bros. WB-DW.
- 4. Approved Equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install plumb and level in suspended metal lath and stucco ceilings, metal lath and Portland cement plaster, gypsum wallboard, or tile side walls where shown on drawings.
 - 1. Leave surfaces clean and ready for final painting.
 - 2. Adjust to operate properly and replace damaged units.

END OF SECTION

SECTION 08520

ALUMINUM WINDOWS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 - Cast-In-Place Concrete
2. 07200 - Joint Sealers.
3. 08800 - Glass and Glazing.

1.02 REFERENCES

A. AAMA/NWWDA 101-97 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.

B. American Society for Testing and Materials (ASTM):

1. A123-02 Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
2. C509-94 Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
3. D2000-96 Classification System for Rubber Products in Automotive Applications
4. E283-91 Test Method for determining the Rate of Air Leakage Through Exterior Windows, Curtain walls, and Doors Under Specified Pressure Differences Across the Specimen.
5. E330-02 Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors By Uniform Static Air Pressure Difference.
6. E331-00 Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

C. Florida Building Code (FBC).

1.03 DEFINITIONS

A. Exposed: Any fasteners, anchors, clips, accessories, sealants, etc., visible on

the exterior or interior side of a window when in the maximum open position.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's specifications and catalog cuts.
- B. Shop Drawings:
 - 1. Indicate elevations, locations, markings, quantities, materials, jamb conditions, metal thicknesses, sizes, shapes, dimensions, and finishes.
 - 2. Indicate locations for installing frames.
 - 3. Indicate methods of assembling, connecting, anchoring, fastening, and bracing.
 - 4. Indicate types, material, finishes, sizes, and locations of hardware.
 - 5. Indicate operable and fixed panels of each window unit.
 - 6. Identify each type of mullion and anchorage system.
- C. Missile Impact Certification:
 - 1. Miami-Dade County product approval demonstrating compliance with FBC missile impact criteria for window type, size, and configuration.
 - 2. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to American Society of Civil Engineers (ASCE) 7-05 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.10.
- D. Calculations/Test Results/Details:
 - 1. Pressure test results by an accepted nationally recognized independent laboratory for supplied window units.
 - 2. Installation details, signed and sealed by a Florida registered professional engineer, with anchorage system noted and specified to comply with ASCE 7-05.
- E. Samples:
 - 1. Aluminum and color finish
 - 2. Sealants: Manufacturer color chart.

1.05 SYSTEM DESCRIPTION

- A. Performance Requirements: Fabricate units to comply with:

1. NOA's (Dade County Product Approval) Listed on Sheet A-9.2

1.06 QUALITY ASSURANCE

- A. Notify inspector within 24-hours after completion of windows to arrange for inspection.
- B. Do not conceal anchors and connections until inspection is complete.
- C. Exposed fasteners, when the window is in a closed or opened position, shall be tamperproof.
- D. Coordination of Fabrication:
 - 1. Check actual window openings in construction work by accurate field measurement before fabrication. Show recorded measurements on final shop drawings.
 - 2. Coordinate fabrication schedule with construction progress as directed by Contractor to avoid delay of work.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver packaged materials in manufacturer's original, unopened, labeled containers.
- B. Store items to prevent damage to materials or structure and in approximate order of use to avoid excessive rehandling.
- C. Repair damaged materials and replace materials that cannot be repaired to original condition. Replace warped materials.
- D. Protect exposed surfaces of metal with removable covering to prevent damage to finish. Protect metal while adjacent painting and caulking are being performed.

1.08 WARRANTY

- A. Submit written warranty, signed jointly by manufacturer, installer, and Contractor, agreeing to replace aluminum window units that fail in materials or installations within 3 years after substantial completion. The 3 parties jointly and separately are responsible for the installation for the warranty period.

- B. Failure of materials or installation shall include, but not be limited to, excessive leakage or air infiltration, excessive deflections, faulty operation of sash, deterioration of finish or metal in excess or normal weathering, and defects in hardware and weatherstripping.

PART 2 PRODUCTS

- A. Missile Impact Resistant Windows: Certified missile impact resistant glass.
 - 1. CGI Industries
 - 2. Accepted equivalent.

2.02 COMPONENTS

- A. Aluminum Extrusions: 6063-T5, alloy, minimum 22,000 psi ultimate tensile strength and minimum 0.062" thickness at any location for main frame and sash members.
- B. Window Fabrication:
 - 1. Provide manufacturer's standard fabrication and accessories that comply with indicated standards and are reglazable without dismantling of sash framing.
 - 2. Include complete assembly of components and anchorage of window units, and prepare sash for glazing except where preglazed at factory.
 - 3. Sizes and Profiles:
 - a. Fabricate to sizes and profiles indicated on final shop drawings.
 - b. Details in drawings are based upon standard details by one or more manufacturers.
 - c. Similar details by other manufacturers will be acceptable, provided they comply with size requirements, minimum/maximum profile requirements, and referenced performance standards and are approved by the Board.
 - 4. Preglazed Fabrication:
 - a. Preglaze window units at factory where possible and practical.
 - b. Comply with requirements of Section 08800, in addition to requirements of ANSI/AAMA 101.

5. Provide subframes with anchors for window units as shown, of profile and dimensions indicated minimum 0.062" thickness extruded aluminum, with mitered or coped corners, welded and dressed smooth or with concealed mechanical joint fasteners. Finish to match window units. Seal joints on inside with sealant.
- C. Fasteners:
1. Aluminum, nonmagnetic stainless steel, or other materials warranted by manufacturer to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components of window units.
 2. Reinforcement: Fasteners screw-anchored into aluminum less than 0.125" thick, shall have interior reinforced with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard non-corrosive pressed-in splined grommet nuts.
 3. Exposed fasteners, when the window is in a closed or opened position, shall be tamperproof.
 4. Do not use exposed fasteners except for application of hardware.
 5. Exposed fasteners shall match finish of adjoining metal.
 6. Provide tamperproof machine screws or rivets for exposed fasteners.
- D. Anchors, Clips and Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate units of aluminum, nonmagnetic stainless steel, or hot-dip zinc coated steel complying with ASTM A123. Exposed items shall match the window frame color.
- E. Compression Glazing Strips and Weatherstripping: Molded neoprene gaskets complying with ASTM D2000 designation 2BC415 to 3VC620, or molded expanded neoprene gaskets complying with ASTM C509, Grade 4.
- F. Sealant:
1. Seal frame joints, completely filling voids, flush with exposed surfaces. Provide type recommended by window manufacturer for joint size and movement, to remain permanently elastic, non-shrinking, and non-migrating.
 2. Comply with Section 07900 for materials and installation of sealants.
 3. Color shall be as selected by A/E.
- G. Friction Shoes: Nylon or other non-abrasive, nonmetallic, non-staining, non-corrosive durable material.

- H. Balance Mechanism: Spring loaded, with adjustable tension control.
- I. Mullions:
 - 1. Provide mullions and cover plates as shown, matching window units, and complete with anchors for support and installation.
 - 2. Allow for erection tolerances and provide for movements of window units due to thermal expansion and building deflections.
- J. Insect Screens:
 - 1. Provide insect screen unit for each operable exterior sash.
 - 2. Locate screen units on either side or outside of sash, depending upon window type.
 - 3. Design window units and hardware to accommodate screens in a tight-fitting removable arrangement, with a minimum of exposed fasteners and latches, and without necessity of wickets for hardware access.
 - 4. Fabricate screen frames of either extruded or formed aluminum tubular-shaped members minimum 0.040" wall thickness, with mitered or coped joints and concealed mechanical fasteners, with removable PVC spline-anchor concealing edge of screen fabric.
 - 5. Finish frames to match window units.
 - 6. Screens: Insect wire fabric, 18/16 mesh of 0.024" diameter 5052 aluminum wire, complying with FS RR-W-365, Type VII.
- K. Finish for Windows and Window Components:
 - 1. Electrostatic Paint (ESP).
 - 2. Color as selected by A/E.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install windows according to Section 08800, manufacturer's printed instructions, Miami-Dade County product approvals and accepted shop drawings under direct supervision of manufacturer's representative.
- B. Bed windows with sealants, mastic, or glazing tapes to masonry lip, concrete/precast lip, or wood buck as applicable and secure according to Miami-Dade County product approvals.

- C. Separate aluminum from masonry and ferrous metals by use of bituminous coating or gasketing to eliminate possibility of corrosion from electrolytic action.
- D. Erect windows plumb, level, and true.
 - 1. Do not distort windows by erection screws or fittings.
 - 2. After window erection, apply an even spray coat of liquid wax to window surfaces for protection against stains and scratches.
- E. Protect work from corrosion, prime coat concealed steel stiffeners, anchors, brackets, fasteners, and the like before installation and seal joints between window frames and building tightly and continuously.
- F. Maintain wire or clips holding ventilators closed in place until windows are completely erected and hardware is attached.

3.02 ADJUSTING AND CLEANING

- A. Adjust operating sash and hardware to provide tight fit at contact points and at weatherstripping, and to ensure smooth operation and weathertight closure.
- B. Cleaning:
 - 1. Clean surfaces promptly after installation of windows, exercising care to avoid damage to protective coatings and finishes.
 - 2. Remove excess glazing and sealant compounds, dirt, and other substances.
 - 3. Lubricate hardware and moving parts.
 - 4. Clean glass of preglazed units promptly after installation of windows.
 - 5. Comply with Section 08800 for cleaning and maintenance.
- C. Protection: Provide protection to prevent damage to window units.

END OF SECTION

SECTION 08711

FINISH HARDWARE

PART 1 GENERAL

1.01 SUMMARY

A. Provide finish hardware including necessary accessories.

B. Related Sections:

1. 06100 - Carpentry.
2. 08110 - Steel Doors and Frames.
3. Division 16 - Electrical.

1.02 SUBMITTALS

A. Exterior Door Certification: Miami-Dade County product approval single listing with specified door, door frame, and hardware, demonstrating compliance with Florida Building Code missile impact criteria.

1. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to American Society of Civil Engineers (ASCE) 7-10 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.10.

B. Hardware Schedule:

1. Approval of Hardware Schedule shall not relieve the Contractor of the cost and responsibility to furnish all necessary and required hardware for this project.
2. Three weeks before ordering hardware, submit 2 copies of Hardware Schedule covering all items required for entire project.
3. Identify manufacturer of each item with type, numbers, and finish symbols.
4. Indicate door numbers at individual hardware set numbers.
5. Include a separate index, listing all doors in the project sorted numerically and with appropriate hardware set number next to each door number with building numbers.

C. Catalog Cuts: Submit 2 sets of catalog cuts for each piece of hardware

furnished.

- D. Templates: Furnish suitable templates, with approved Hardware Schedule, to respective trades and suppliers as required to insure accurate setting, reinforcing, and fitting of finish hardware specified.
- E. Keying:
 - 1. Provide cylinders keyed alike to a change key, 4 bitted.
 - 2. All keys for this project shall be turned over to Owner. Do not pack keys with locksets. Key blanks are not required.
 - 3. Hardware Supplier shall provide Contractor with 5 each, cut change keys, 4 bitted for use during construction. Obtain a receipt. There will be no other keys in Contractor's possession.
 - 4. Owner will rekey cylinders upon final acceptance of project.
- F. Miscellaneous Keys:
 - 1. Mark and tag keys to electric panels, access panels, built-in cabinets, and any other miscellaneous keys with description and room number or location.
 - 2. Turn all keys over to Owner's representative upon acceptance of project and obtain a receipt. Do not leave at the facility without obtaining receipt.

1.03 QUALITY ASSURANCE

- A. Florida Building Code (FBC).
- B. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- C. National Fire Protection Association.
 - 1. NFPA 80 - Standard for Fire Doors and Windows.
 - 2. NFPA 101 - Life Safety Code.
- D. State and local Fire Safety Codes.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Properly package and mark hardware according to the Hardware Schedule, complete with necessary screws, special tools, instructions, and installation templates.

B. Keys: Do not package keys with the individual hardware sets.

C. Store hardware in a secured area.

PART 2 PRODUCTS

2.01 COMPONENTS

A. Substitutions will be considered for any of the following listed manufacturers of hinges (hinges), locksets, door closer, or exit devices, if approved as equal.

1. Lock Cylinders: Six pin and single ring only.

2. Locksets:

a. Schlage D Series Rhodes (or approved equal): Heavy-duty lever handle locksets (Vandlgard) x 26D x thru-bolts. Thru-bolts required for doors, regardless of manufacturer's recommendations.

b. Example:

<u>Function</u>	<u>Description</u>	<u>Part Number</u>	
		<u>Schlage</u>	<u>Marks</u>
Office	Individual Admin. offices	D92	195AB
Exit Lock	Exit Only	D25	195NB
Storage	Mech., Elec., and Custodial Storerooms	D96	195F
Hotel/Motel	Individual Staff Toilets	D85	195H

3. Hinges: By Hager, McKinney or approved equal.

a. Interior hollow metal doors:

1) Hager BB1168 x ss pin 4-1/2 x 4-1/2 USP.

b. Exterior doors:

- 1) Hager AB933 4-1/2 x 4-1/2 US32D.
 - 2) Accepted equivalent with stainless steel oil-impregnated bearings and stainless steel hinge pins.
4. Exit Devices:
- a. Comply with ADA requirements and shall be by the same manufacturer.
 - b. Precision 1100 Series accepted equivalent.
 - 1) Non-labeled: Pairs of doors shall have outside door pull on RHR door only. Provide "exit only" device on LHR door.
 - 2) Labeled: Interior labeled doors requiring exit devices, shall have outside lever trim on RHR door. Provide "exit only" device on LHR door.
 - c. Exterior Non-Labeled Openings:
 - 1) Entry Doors:
 - a) Precision 1103 x US32D x SNB x less trim x cylinder x door pull x SNB.
 - d. Interior and Exterior Labeled Openings:
 - 1) Entry Doors:
 - a) Precision FL1108-V39-L x cylinder.
5. Vertical Rod Exit Devices: Vertical Rod Exit Devices are not acceptable.
5. Bore-In Deadbolt Locks (Used at non-labeled exterior doors.)
6. Surface Mounted Head/Foot Bolts.
- a. Use at labeled and non-labeled doors on storage rooms at the LHR door of a pair of doors without a center mullion. Comply with NFPA-80 2.8-2.5.
 - b. Left Hand Reverse (LHR) leaf.
 - 1) Exterior Labeled: Hager 275D (UL).
 - c. Right Hand Reverse (RHR) leaf.

- 1) Exterior Labeled: Exit device x door pull and cylinder.
 - 2) Exterior Non-Labeled: Deadbolt x door pull and cylinder.
 - 3) Interior: Storage function cylindrical lever lock, knurled outside.
7. Removable Hardware Mullion:
- a. For exterior pair of doors.
 - 1) Labeled openings: Precision FL822.
 - 2) Non-labeled openings: Precision 822.
8. Weather Stripping, Thresholds, Door Bottoms, and Astragals.
- a. Accepted Manufacturers: Baldwin, Brookline, Cipco, Corbin, Glynn Johnson, Hager, Ives, National Guard Products, Quality, Pemko, Reese, Russwin, Trimco, Rockwood, Zero, or approved equal.
 - b. Stop applied sound seals or weather stripping shall not exceed more than 5/16" thickness.
 - c. Provide rain drips for all exterior doors not having over head roof protection.
 - d. Thresholds:
 - 1) Panic Type Thresholds (For exterior:
 - a) Hager 520SAS: 5" wide x 1/2" high.
 - 2) Saddle Type Thresholds (Only for interior use at change of floor finishes):
 - a) Hager 418SA: 3" wide x 1/4" high.
 - b) Hager 413SA: 5" wide x 1/4" high.
 - 3) Marble Thresholds: For toilet rooms, wet mop areas adjacent to other spaces and sink or mop receptor equipped custodial closets.
 - 4) Thresholds shall comply with ADA Requirements.
 - e. Weatherstrip/Soundseals:
 - 1) Rigid Weatherstrip: Hager 891SAS.
 - 2) Press on Weatherstrip: Hager 736.

- 3) Brush Weatherstrip: Hager 801S.
 - 4) Soundproofing: Hager 862SXXN or SDN.
 - 5) Silencers: Hager 307D.
 - 6) Overhead Rain Drip: Hager 810S.
- f. Astragals:
- 1) Hager 837SAV.
 - 2) Use only at a pair of doors with head and foot bolts.
9. Auxiliary Hardware: Push Plates, Kick Plates, Doorstops and Holds, and Doorstops.
- a. Accepted Manufacturers: Architectural Builders Hardware (ABH), Baldwin, Brookline, Cipco, Corbin, Glynn Johnson, Hager, Ives, National Guard Products, Quality, Pemko, Reese, Russwin, Trimco, Rockwood, Zero or approved equal.
 - b. Push-Plates: Hager 60S PK, hard black plastic with beveled edges.
 - 1) Provide push plates at non-labeled doors with exit devices or deadbolts, and at toilet room doors.
 - 2) Omit push plates at doors with lever handle cylindrical locksets.
 - 3) Provide 2 push plates and 2 kick plates on double acting doors.
 - 4) Do not use push-plates on fire labeled doors.
 - 5) 16 inches x 16 inches x 1/8", black plastic.
 - a) 4 inches x 16 inches x 1/8" on doors with vision panels.
 - 6) Clear plastic push-plates are not acceptable.
 - c. Kick Plates: Hager 214SBL.
 - 1) Provide at all doors except to individual offices at administration areas.
 - 2) 16 inches x 1/8" thick x less 2 inches the width of door, hard black plastic with beveled edges. At louvered doors, provide 16 inch height maximum or to bottom of louver.
 - 3) Clear plastic kick plates are not acceptable.
 - 4) Kick plates for labeled doors shall be UL labeled.

- d. Doorstops and Holds:
 - 1) Wall mounted doorstop and holds: Hager 254W x US26D.
 - a) At exterior storage room doors.
 - 2) Floor mounted door holders: Hager 258F x US26D.
 - a) At non-labeled doors only if doorstop and holds cannot be used and push-n-stop closers at labeled doors.
 - 3) Door holds at labeled doors with closers shall be magnetic hold open devices connected to the fire alarm system.
- e. Doorstops:
 - 1) Wall mounted doorstops: Install on solid concrete or masonry walls or at drywall or plaster applications with adequate backing reinforcement.
 - a) Convex type for doors not having push button locksets: Hager 230W.
 - b) Concave type for doors having office function or push-button locksets, locate on button side of door: Hager 234W.
 - 2) Floor mounted doorstops: At labeled doors only if wall mounted stops cannot be used.
 - 3) Provide doorstops or other door control devices at doors if stop and holds are not specified.
- f. Door Pulls, Cast aluminum: Hager H4G.

10. Fasteners:

- a. Hollow Metal Doors: Accepted machine.
- b. Kick Plates: O.H. Phillips recess Type A SMS.
- c. Thresholds: Hager FHSL 25-1/4 x 1/4-20 x 2" cadmium plated expansion screw in one unit or accepted equivalent.
- d. Brush Weatherstripping: As recommended by manufacturer.
- e. Finish: Match finish of surfaces to which they are applied.

11. Door Closer:

- a. For hollow metal doors, doors exposed to wind conditions, labeled doors, and doors to student occupied spaces.
- b. Pairs of doors shall require closer.
- c. Do not provide a closer on a leaf with head and foot bolts.
- d. LCN Series 4111-N AVB x EDA x TB, parallel arm only.
- e. 4111-N DEL x AVB x AL x EDA x TB (Special delay action closer, do not provide at doors opening 180 degrees or greater).
- f. 4111-N Spring Cush AVB x AL x EDA x TB.
- g. 4116-N AVB x AL x EDA x TB (oversize doors only, verify with manufacturer).
- h. 4111-N Cush-n-stop x AVB x EDA x TB. Provide where 180 degree swing is obstructed or where a wall stop is not practical.

12. Overhead Stop and Hold:

- a. 3324-US26D, surface mounted, by ABH.

13. Electromagnetic Holder/Release:

- a. Hold open devices specified for fire rated doors shall be electromagnetic type. Holder shall be wired to fire alarm system and shall release in the event of fire. Coordinate with existing Fire Alarm System.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this section until conditions detrimental to the proper installation and protection of hardware have been performed.

3.02 INSTALLATION

- A. Door hardware locations shall be as follows:
 - 1. Pushplates: 1 inch above pushpad and 1 inch from exit device head.
 - 2. Pushplates with a Vision Panel: 1 inch above exit device between vision panel and edge of door.
 - 3. Exit Device: 40-5/16" from door bottom or 34 inches as required for

- children's accessibility.
 - 4. Lever Lockset: 38 inches from door bottom or 34 inches as required for children's accessibility.
 - 5. Deadbolt: 48 inches from door bottom.
 - 6. Kickplate: 1 inch from door bottom or 1/2" from top of surface mounted automatic door bottom.
- B. Do not install finish hardware until operations causing dampness have been completed.
- C. Door Closers:
- 1. Install with closer manufacturer's thru bolts and adjust for proper operation.
 - 2. Location: Locate closer on door as if door were to swing 180 degrees, regardless of the actual swing of the door. When using Cush-n-stop, mount for 90 degree swing.
 - 3. Do not allow closer to act as a stop.
 - 4. Closer Foot: Install with 5 screws for wood jambs or 5 stove bolts for metal jambs. Provide an accepted spacer (if required by the width of stop) for fifth fastener.
 - a. Use of screw type fasteners are not allowed for metal frames.
- D. Exit Devices: Install with thru bolts.
- E. Door Pulls: Top hole of door pull shall be 2 inches above bottom of exit device casing at casing centerline.
- F. Stop and Hold, Wall Mounted: Install at top outside corner of door, with thru bolts or grommet nuts.
- 1. Install wall portion according to manufacturer's recommendations and based on field conditions to withstand 100 lbs. shear pressure.
- G. Stop and Hold, Floor Mounted: Install at bottom outside corner of door, with thru bolts or grommet nuts.
- 1. Install floor portion according to manufacturer's recommendations, after finish floor covering has been installed. Secure to subfloor using full size spacer if necessary to keep bottom flush with finish flooring, i.e. carpet.
- H. Surface Bolts (Head and Foot): Install with thru bolts or grommet nuts.

- I. Thresholds at Exterior Doors Exposed to Weather:
 - 1. Set in full bed of sealant.
 - 2. If threshold is saddle type, then door bottom shall seat against threshold. Threshold shall not exceed 1/4" in height.
- J. Brush Weatherstripping: Install according to manufacturer's recommendations and after final finish has been applied to door and frame.
- K. Push Plate:
 - 1. 1 inch above push pad and 1 inch from exit device head
 - 2. With vision panel, 1inch above exit device head between vision panel and edge of door.

3.03 FIELD QUALITY CONTROL

- A. At final acceptance, hardware shall be clean and free from disfigurement, paint, and other foreign matter.
- B. Do not include single doors and pairs of doors within the same hardware set.
- C. Incorporate in the Door Schedule, located in the Drawings, corresponding with the Hardware Set numbers as shown in the project Finish Hardware section.
- D. List every door required for each Hardware Set.

END OF SECTION

SECTION 08800
GLASS AND GLAZING

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 08110 - Steel Doors and Frames.
2. 08520 - Aluminum Windows.

1.02 REFERENCES

A. Florida Building Code (FBC).

B. CPSC Standard 16CFR 1201 Category II.

C. American Society for Testing and Materials (ASTM):

1. C1036-01 Specification for Flat Glass.
2. C1048-97b Specification for Heat-Treated Flat Glass-Kind HS, Kind FT Coated and Uncoated Glass.
3. E119-00a Test Methods for Fire Tests of Building Construction and Materials.
4. E152-81a Methods of Fire Tests of Door Assemblies.
5. E163-84E01 Methods of Fire Tests of Window Assemblies.

D. ANSI Z97.1 - Safety Performance and Methods of Test for Safety Glazing Materials Used in Buildings.

1.03 SUBMITTALS

A. Product Data: Manufacturer's specifications, recommendations for setting blocks, spacers and edge clearance, and installation instructions.

B. Color Charts: For preformed glazing materials and glazing sealant.

C. Certification:

1. Certification of tempered and laminated glass complying with Consumer Product Safety Commission 16CFR 1201-CII.

2. Certification of Miami-Dade County product approval demonstrating compliance with FBC missile impact criteria.
 - a. Comply with calculations, signed and sealed by a Florida registered professional engineer, establishing wind velocity pressure values for the specific project according to American Society of Civil Engineers (ASCE) 7-05 using a wind speed of 146 mph, exposure category "C", and a wind load importance factor of 1.10.

1.04 QUALITY ASSURANCE

A. Labels:

1. Label each unit of glass with manufacturer's sticker showing quality, grade, thickness, and type of glass.
2. Labels shall remain in place until approval by the A/E.

B. Trademarks: Each panel of tempered glass shall bear the manufacturer's trademark.

C. Glass of each type shall be supplied by the same manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glazing:

1. Guardian.
2. LOF, Libby-Owens-Ford.
3. PPG.
4. St.Gobain Architectural Glass Products.
5. Viracon.
6. Approved Equal.

B. Missile Impact Resistant Glazing:

1. Saf-Glas by Security Impact Glass.
2. Accepted Equivalent.

C. Fire Rated Safety Glazing:

1. Superlite by O'Keefe, San Francisco, CA.
 2. Firelight Series, Pyrostop, and Pyro Swiss by Technical Glass Products, Kirkland, WA.
 3. Approved Equal.
- D. Glazing Sealant: Dow Corning 999-A Silicone Building and Glazing Sealant or General Electric Contractors 1000 Sealant, or approved equal.
- E. Backer Rod: Dow Corning Ethafoam SB polyethelene cord or butyl rubber foam cord.
- F. Edge Protection Tape for Laminated Glass: "Scotch Brand Cellopane Tape", manufactured by 3M Company, or approved equal.
- G. Moisture-Resistant Paint for Frameless Mirror Glass: Palmer Products Corp., Mirro-Bac Paint, or approved equal.
- H. Bond Sealer Coat for Mirrors: Palmer Products Corp., Mirro-Mastic Bond, or approved equal.

2.02 MATERIALS

- A. Tempered Glass: Comply with ASTM C1036 and further processed according to ASTM C1048, Kind FT, which has been fully tempered by the manufacturer's standard horizontal process. Minimum thickness of 1/4".
- B. Missile Impact Resistant Glazing:
1. 0.070" polycarbonate between two 1/4" annealed glass sheets.
- C. Fire Rated Glazing:
1. Wire Glass: ASTM C1036, Type II, Class 1, Form 1, Quality q8, Mesh M2, bearing UL label.
 2. Safety Glazing: ASTM E152, ASTM E163, ASTM E119, NFPA 80, NFPA 251, NFPA 252, NFPA 257, CPSC 16 CFR Part 1201, bearing UL label.
- D. Glazing Materials:
1. Glazing Sealant: Curing type gunable elastomeric sealant complying with TT-S-001543A, Type II Class A. Color as selected by A/E.

- a. Glazing sealants for use with insulating glass units shall be approved by the fabricator of the insulating glass units.
2. Unshimmed Glazing Tape: Butyl-polyisobutylene with 20 to 30 "Shore A" hardness, self-sticking; white color.
3. Pre-Shimmed Glazing Tape: Butyl-polyisobutylene with built-in synthetic rubber spacer; 20 to 30 "Shore A" hardness, self-sticking; white color.
4. Setting Blocks: Solid neoprene, 80 to 90 Shore A durometer hardness; sizes as required.
5. Edge Blocks: Solid neoprene, 60-70 Shore A durometer hardness; sizes as required.
6. Shims: Solid neoprene, 40 to 60 Shore A durometer hardness; sizes as required.
7. Glazing Gaskets: Compression gaskets, closed cell, neoprene, EPDM or silicone rubber composition designed to provide a water-resistant seal between glass and frame.
8. Primers and Cleaning Agents: Type recommended by the sealant, glass, and glazing accessories manufacturer.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify glazing frames are acceptable for the correct installation of glass and glazing accessories.

3.02 INSTALLATION

- A. Glass Cutting: Make cuts clean, only moderately convoluted, with flare or bevel not exceeding 1/8 of glass thickness.
 1. Unacceptable defects:
 - a. Impact chips, spalls, or nipped edges.
 - b. Flake chips or shark teeth deeper than 1/4 of glass thickness.
 - c. Serration hackle deeper than 1/8 of glass thickness.
- B. Comply with recommendations of FGMA Glazing Manual, glass manufacturer, manufacturer of sealant, and other glazing accessories.
- C. Do not attempt to cut, seam, nip, or abrade glass tempered or heat strengthened.

- D. Remove and replace glass broken, chipped, cracked, abraded, or damaged during construction.
- E. Manufacturer's label showing strength, grade, thickness, type, and quality of glass shall remain on each piece of glass until it has been set and inspected.
- F. Guarantee work to be waterproof.

3.03 CLEANING

- A. After glass has been inspected and approved, remove labels and wash and polish glass on both faces before the Board's approval of the project.
 - 1. Comply with glass manufacturer's recommendations for cleaning materials and methods.

END OF SECTION

SECTION 09200

METAL STUDS, METAL LATH, SUSPENSION CEILINGS, PLASTER, AND STUCCO

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Non-load bearing steel studs.
2. Metal furring and lath.
3. Ceiling suspension system.
4. Portland cement plaster and stucco.

B. Related Sections:

1. 04220 - Concrete Unit Masonry.
2. 06100 - Carpentry.
3. 09901 - Painting.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A641-03 Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
2. A653/04a Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
3. A924/A-96a Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
4. C150-04 Specification for Portland Cement.
5. C645-04 Specification for Nonstructural Steel Framing Members.
6. C754-04 Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.
7. C841-03 Specification for Installation of Interior Lathing and Furring.
8. C897-05 Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters.
9. C926-98a Specification for Application of Portland Cement-Based

- Plaster.
10. C932-03 Specification for Surface-Applied Bonding Agents for Exterior Plastering.
 11. C1007-04 Specification for the Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.
 12. E119-00a Test Methods for Fire Tests of Building Construction and Materials.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for cementitious materials, lath, metal support components, and accessories.
- B. Material Certificates:
 1. Submit producer's certificate for each kind of plaster aggregate indicated materials comply with requirements.
 2. Provide design calculations for metal support systems indicating load calculations, sizing of members, and anchorages for review.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Supports:
 1. Dale/Incor.
 2. Dietrich.
 3. Gold Bond Building Products Division.
 4. Unimast Inc. (USG Co.)
 5. Approved Equal.
- B. Expanded Metal Lath:
 1. Dale/Incor.
 2. Gold Bond Building Products Div.
 3. South Lath Inc.
 4. Unimast Inc. (USG Co.)
 5. Approved Equal.
- C. Accessories:

1. Dietrich.
2. Fry Reglet Corp.
3. Gold Bond Building Products Div.
4. Plastic Components Inc.
5. South Lath Inc.
6. United States Gypsum Co.
7. Vinyl Corp., Miami, FL.
8. Approved Equal.

D. Portland Cement Plaster/Stucco:

1. Florida Super Stucco by Lafarge Florida.
2. Lonestar Products.
3. Rinker Materials Corp.
4. Southdown, Inc.
5. United States Gypsum Co.
6. Approved Equal.

E. One Coat Veneer Plaster Over Cement Board: 3/32" Imperial Finish over 5/8" Durock cement board by US Gypsum Co. over metal framing at 16 inches o.c. maximum or accepted equivalent. UL U407 for 1 hour rating.

2.02 MATERIALS

A. Metal Supports - Suspended and Furred Ceilings or Soffits:

1. Portland Cement Plaster/Stucco Installation: ASTM C926.
2. Wire for Hangers and Ties: ASTM A641, 16 gage monel.
3. Rod Hangers: Mild steel, zinc, or cadmium coated.
4. Flat Hangers: Mild steel, zinc, or cadmium coated or protected with rust inhibitive paint.
5. Channels:
 - a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal, allowable bending stress of 18,000 psi. Protect with rust inhibitive paint or galvanizing complying with ASTM A924 for G60 coating designation.
 - b. Carrying Channels: 1-1/2" deep x 7/16" wide flanges, 475 lbs. per 1,000 feet painted, 508 lbs. per 1,000 feet galvanized.
 - c. Furring Channels: 3/4" deep x 7/16" wide flanges, 300 lbs. per 1,000 feet painted, 316 lbs. per 1,000 feet galvanized.
 - d. Provide galvanized channels for exterior installations.

6. Hanger Anchorage Devices:
 - a. Screws, cast-in-place concrete inserts, or other devices appropriate for anchorage to the form of structural framing indicated and whose suitability for use intended has been proven through standard construction practices or certified test data.
 - b. Size devices to develop full strength of hanger minimum 3 times calculated hanger loading, except size direct pullout concrete inserts for 5 x calculated hanger loading.

- B. Steel Studs and Runners/Tracks:
 1. Non-Load (Axial) Bearing Studs and Runners:
 - a. ASTM C645 and complying with following requirements for minimum thickness of uncoated base metal and other characteristics:
 - b. Stud Thickness: 0.0179", unless otherwise indicated.
 - c. Stud Depth: As indicated on the drawings.

 2. Load Bearing (Transverse and Axial) Studs and Runners:
 - a. ASTM C955 and complying with following requirements for quality, grade, finish of steel sheet, design thickness of uncoated base metal, and other dimensional characteristics:
 - b. Metal Quality: Zinc-coated steel sheet complying with ASTM A653, Coating Designation G60.
 - c. Grade A - 33,000 psi Yield Point: Maximum 0.0359" design thicknesses.
 - d. Grade D - 50,000 PSI Yield Point: Minimum 0.0598" design thicknesses.
 - e. Stud Thickness: 0.0359", unless otherwise indicated.
 - f. Stud Flange Width: 1-3/8".
 - g. Stud Lip Depth: 1/4".
 - h. Stud Depth: 3-1/2" minimum unless otherwise indicated.

- C. Vertical Metal Furring:
 1. Channel Furring and Braces:
 - a. Cold-rolled steel, minimum 0.0598" thickness of uncoated base metal.
 - b. Allowable Bending Stress: 18,000 psi.

- c. Protected with rust inhibitive paint finish or galvanizing.
- d. 3/4" deep x 7/16" wide flanges.
- e. 300 lbs. per 1,000 feet with painted finish.
- f. 316 lbs. per 1,000 feet with galvanized finish.

2. Z-Furring Member:

- a. Manufacturer's standard screw-type zee-shaped furring members formed from zinc-coated steel sheet.
- b. Minimum 0.0179" uncoated base metal thickness, complying with ASTM A924, Coating G60.
- c. Design for mechanical attachment of insulation boards or blankets to monolithic concrete and masonry walls.

3. Furring Brackets: Serrated-arm type, minimum 0.0329" thickness of base (uncoated) metal, adjustable from 1/4" to 2-1/4" wall clearance for channel furring.

D. Metal Lath:

1. Diamond Mesh Lath:

- a. Flat: 2.5 lbs. per sq.yd.
- b. Self-Furring: 2.5 lbs. per sq.yd.
- c. Paper Backing: Provide asphalt-impregnated paper factory-bonded to back and complying with Fed. Spec UU-B-790, Type I, Grade D vapor permeable, Style 2.
- d. Lath Attachment Devices:
 - 1) Devices of material and type required by referenced standards and recommended by lath manufacturer for secure attachment of lath to framing members and of lath to lath.
 - 2) Provide resilient clips for attachment of gypsum lath to steel at locations indicated.

2. Welded Wire Fabric Lath:

- a. Weather Protected Exterior Horizontal Surfaces (Soffits, Ceilings, and Other Decorative Elements): Pyro K-Lath, Gun Lath, or accepted equivalent.
- b. Back of Ceramic Tile (Interior Usage Only): Aqua Lath or accepted equivalent.

- c. Fire Resistance and Waterproofing (Interior Usage Only): Pyro K-Lath or accepted equivalent.
 - E. Accessories for Portland Cement Stucco:
 - 1. Comply with material provisions of ASTM C926; coordinate depth of accessories with thickness and number of coats required.
 - 2. Plastic Trim Accessories: Corner beads, casing beads, control joints, and expansion joints with perforated flanges and fabricated from high impact polyvinyl chloride.
 - F. Portland Cement Plaster Materials:
 - 1. Base Coat Cements: Portland Cement, ASTM C150, Type I or III.
 - 2. Finish Coat Cement: Portland Cement, ASTM C150, Type I, white.
 - 3. Factory-Prepared Finish Coat:
 - a. Manufacturer's standard product requiring addition of water only. White in color unless otherwise indicated.
 - b. Product: Oriental Exterior Stucco by United States Gypsum Co.
 - 4. Sand Aggregate - Base Coats: ASTM C897.
 - 5. Aggregate - Finish Coats: ASTM C897, manufactured or natural sand, white in color.
 - 6. Fiber - Base Coat:
 - a. Alkaline-resistant glass fibers, 1/2" long, free of contaminants, manufactured for use in Portland cement plaster.
 - b. Product: Dur-O-Fiber AR Glass by Dur-O-Wal, Inc.
 - G. Miscellaneous Materials:
 - 1. Water for Mixing and Finishing Plaster: potable, free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
 - 2. Bonding Agent - Portland cement: ASTM C932.
- 2.03 MIXES
- A. Portland Cement Plaster/Stucco Mixes and Compositions - Base Coats:
 - 1. Comply with ASTM C926 for Portland cement plaster base and finish coat mixes as applicable bases, materials, and other requirements

indicated.

2. Base Coat:
 - a. Proportion materials for respective base coats in parts by volume for cementitious materials and in parts by volume per sum of cementitious materials for aggregates to comply with the following requirements for each method of application and plaster base indicated.
 - b. Adjust mix proportions below within limits specified to attain workability.
3. Base Coats for Three-Coat Work Over Metal Lath:
 - a. Contractor's Option 1:
 - 1) Scratch Coat: 1 part Portland cement, 2-1/2 to 4 parts sand.
 - 2) Brown Coat: 1 part Portland cement, 3 to 5 parts sand.
 - b. Contractor's Option 2:
 - 1) Scratch Coat: 1 part Portland cement, 1 to 2 parts masonry cement, 2-1/2 to 4 parts sand.
 - 2) Brown Coat: 1 part Portland cement, 1 to 2 parts masonry cement, 3 to 5 parts sand.
 - c. Contractor's Option 3:
 - 1) Scratch Coat: 1 part masonry cement, 2-1/2 to 4 parts sand.
 - 2) Brown Coat: 1 part Portland cement, 1 parts masonry cement, 3 to 5 parts sand.
4. Two-Coat Work Over Concrete Unit Masonry:
 - a. Contractor's Option 1:
 - 1) Base Coat: 1 part Portland cement, 3 to 4 parts sand.
 - b. Contractor's Option 2:
 - 1) Base Coat: 1 part masonry cement, 3 to 4 parts sand.
5. Fiber Content:

- a. Add fiber to mixes above to comply with fiber manufacturer's directions, maximum 2 lbs. per cu. feet of cementitious materials.
 - b. Reduce aggregate quantities accordingly to maintain workability.
- B. Portland Cement Plaster/Stucco Mixes and Compositions - Finish Coats:
- 1. Job-Mixed:
 - a. Contractor's Option 1:
 - 1) 1 part Portland cement, 2-1/4 to 3 parts sand.
 - b. Contractor's Option 2:
 - 1) 1 part Portland cement, 1 part masonry cement, 2-1/4 to 3 parts sand.
 - c. Contractor's Option 3:
 - 1) 1 part masonry cement, 1-1/2 parts sand.
 - 2. Factory-Prepared Portland Cement Plaster/Stucco Finish Coats:
 - a. Add water only.
 - b. Comply with finish coat manufacturer's directions.
- C. Mixing: Mechanically mix cementitious and aggregate materials for plasters to comply with applicable referenced application standard and with recommendations of plaster manufacturer.

PART 3 EXECUTION

3.01 INSTALLATION

A. Lath and Furring:

- 1. Interior Lath and Furring Installation Standard: Install lath and furring materials indicated for gypsum plaster to comply with ASTM C841.
- 2. Portland Cement Plaster/Stucco Lath and Furring Installation Standard: Install lath and furring materials indicated for Portland cement plaster to comply with ASTM C926.

3. Install supplementary framing, blocking, and bracing at terminations in work and for support of fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, and similar work to comply with details indicated or, if not otherwise indicated, to comply with applicable published recommendations of gypsum plaster manufacturer or, if not available, of Gypsum Construction Handbook, latest edition, published by United States Gypsum Co.
4. Isolation:
 - a. Where lath and metal support system abuts building structure horizontally, and where partition/wall work abuts overhead structure, isolate work from structural movement sufficiently to prevent transfer of loading into work from building structure.
 - b. Install slip or cushion type joints to absorb deflection but maintain lateral support.
 - c. Frame both sides of control and expansion joints independently.
 - d. Do not bridge joints with furring and lath or accessories.

B. Ceiling Suspension Systems:

1. Preparation and Coordination:
 - a. Coordinate installation of ceiling suspension system with installation of overhead structural systems to ensure inserts and other structural anchorage provisions have been installed to receive ceiling hangers to allow development of their full strength and at spacings required to support ceiling.
 - b. Furnish concrete inserts and other devices indicated, to other trades for installations before time needed for coordination with other work.
2. Hanger: Attach hangers to structure above ceiling to comply with Metal Lath/Steel Framing Association (ML/SFA) Specifications for Metal Lath and Furring and with referenced standards.
3. Ceiling Suspension System:
 - a. Install components of sizes and spacings indicated but not in smaller sizes or greater spacings than required by referenced lath and furring installation standards.
 - b. Wire Hangers: Space maximum 48 inches o.c. parallel with, and maximum 36 inches perpendicular to, direction of carrying channels, unless otherwise indicated, and within 6 inches of carrying channel ends.

- c. Carrying Channels: Space carrying channels maximum 36 inches o.c. with 48 inches o.c. hanger spacing.
- d. Furring Channels to Receive Metal Lath: Space furring channels maximum 16 inches o.c. for 3.4 lb. diamond mesh lath or 24 inches o.c. for 3.4 flat rib lath.

C. Steel Stud Wall/Partition Support System:

- 1. Install components for steel stud wall/partition support systems to comply with directions of steel stud manufacturer for application indicated.
- 2. Non-Load (axial) Bearing Stud Systems: Comply with ASTM C754.
- 3. Loadbearing (axial and transverse) Stud Systems: Comply with ASTM C1007 and as indicated.
- 4. Steel Stud Systems to Receive Metal Lath: Comply with requirements of ML/SFA Specifications for Metal Lath and Furring applicable to each installation condition and type of metal system indicated.
- 5. Extend partition support systems to finish ceiling and attach to ceiling suspension members, unless otherwise indicated.

D. Vertical Metal Furring:

- 1. Metal Furring to Receive Metal Lath: Comply with requirements of ML/SFA Specification for Metal Lath and Furring applicable to each installation condition indicated.

E. Metal Lath:

- 1. Install expanded metal lath for following applications where plaster base coats are required.
- 2. Provide appropriate type, configuration, and weight of metal lath selected from materials indicated which comply with referenced lath installation standards.
- 3. Suspended and Furred Ceilings: Minimum weight of diamond mesh lath, 3.4 lbs. per sq.yd.
- 4. Exterior Sheathed Wall Surfaces: Minimum weight of self-furring diamond mesh lath, 3.4 lbs. per sq.yd.

F. Plastering Accessories:

- 1. Comply with referenced lath and furring installation standards for provision and location of plaster accessories of type indicated.
- 2. Miter or cope accessories at corners and install with tight joints and in alignment.

3. Attach accessories securely to plaster bases to hold accessories in place and alignment during plastering.
4. Accessories - Portland Cement Plaster:
 - a. Corner Reinforcement: Install at external corners.
 - b. Corner Bead: Install at external corners.
 - c. Casing Beads: Install at termination of plaster work unless otherwise indicated.
 - d. Control Joints: Install where an expansion or control joint occurs in surface of construction directly behind plaster membrane, where distance between control joints in plastered surface exceeds 10 feet in either direction, where area within Portland cement panels exceed 100 square feet, where Portland cement plaster panel sizes or dimensions change.

G. Plaster Application:

H. Portland Cement Plaster/Stucco Application:

1. Portland Cement Plaster Application Standard: Apply Portland cement plaster materials, compositions, and mixes to comply with ASTM C926.
2. Number of Coats: Apply Portland cement plaster, of composition indicated.
3. Finish Coat: Floated finish unless otherwise indicated; match A/E's sample for texture and color.
4. Moist cure Portland cement plaster base and finish coats to comply with ASTM C926, including recommendations for time between coats and curing in ASTM C926 Annex A2 - Design Considerations.

3.02 ADJUSTING, CLEANING, AND PROTECTION

A. Cutting and Patching:

1. Cut, patch, point-up, and repair plaster as necessary to accommodate other work and to restore cracks, dents, and imperfections.
2. Repair or replace work to eliminate blisters, buckles, excessive crazing and check cracking, dryouts, efflorescence, sweat-out and similar defect, and where bond to substrate has failed.
3. Sand smooth-troweled finishes lightly to remove trowel marks and arises.

B. Cleaning:

1. Remove temporary protection and enclosure of other work.
 2. Promptly remove plaster from door frames, windows, and other surfaces that are not to be plastered.
 3. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering work.
 4. When plastering is completed, remove unused materials, containers, and equipment, and clean floors of plaster debris.
- C. Protection: Provide final protection and maintain conditions, in manner suitable to Installer, that ensures plaster work being without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 09250
GYPSUM WALLBOARD

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
2. 09310 - Ceramic Tile.

1.02 REFERENCES

A. American Society for Testing and Standards (ASTM):

1. C11-97 Terminology Relating to Gypsum and Related Building Materials and Systems.
2. C36-03 Specification for Gypsum Wallboard.

1.03 SUBMITTALS

- A. Before starting work, provide product data and samples as directed by A/E.

1.04 QUALITY ASSURANCE

- A. Finish work shall be subject to inspection using a lighting level of not less than 50 foot candles at the surface of the gypsum board. Surfaces judged to be unsuitable for finishing, even if finish has been applied, shall be rejected.
- B. The A/E will direct repair or replacement of rejected work.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver in original unopened packages. Provide protection from damage and exposure to the elements.
- B. Prevent damage to edges and surfaces. Do not bend or damage metal corner beads and trim.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements: Proceed with installation of gypsum board materials only after building is weather tight.
 - 1. Maintain temperature in areas receiving gypsum board materials between 55 degrees and 90 degrees F. during and after installation and provide adequate ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Gypsum Wallboard:
 - 1. Domtar.
 - 2. Gold Bond.
 - 3. GypGuard.
 - 4. National Gypsum.
 - 5. Georgia Pacific.
 - 6. United States Gypsum Company (USG).
 - 7. Approved Equal.
- B. Accessories shall be by gypsum wallboard manufacturer.

2.02 MATERIALS

- A. Gypsum Wallboard:
 - 1. High Impact Abuse Resistant Gypsum Board: USG Fiberock - VHI Abuse- Resistant, 5/8" thick.
- B. Fasteners: Type S Bugle Head by USG or accepted equivalent, with lengths as specified by manufacturer.
- C. Joint Treatment: Reinforcing tape, taping, or embedding and topping materials as recommended and manufactured by gypsum wallboard manufacturer.
- D. Accessories:
 - 1. Use internal and external corner beads, casing beads, and control joints, to provide a finished job with true, straight edges against adjoining work.
 - 2. Provide expansion joints as required for conditions and according to manufacturer's recommendations.

E. Tile Backer Boards:

1. Aggregated Portland cement board with vinyl-coated, woven glass fiber embedded on both surfaces.
2. Joint Reinforcement, Fasteners, Adhesives, and Grout: According to manufacturer's recommendation.

PART 3 EXECUTION

3.01 INSTALLATION

A. Place panels with long dimension parallel to the framing members and abutting edges occurring over stud flanges.

1. Fit ends and edges closely (maximum 1/16" between boards), but not forced together.
2. Stagger end joints in successive courses. Place end or edge joints on opposite sides of framing in different locations to avoid creating joints of panels ending on the same stud.
3. Panel edge above floor shall be 1/2" clear.

B. Panel Attachment:

1. Drive fasteners in field of panel first, working toward ends and edges.
2. Hold panel in firm contact with framing while driving fasteners.
3. Install perimeter fasteners at 3/8" from ends or edges and spaced a maximum of 8 inches on center.
4. Attach gypsum panels in field of panel with fasteners spaced a maximum of 12 inches on center.

C. Accessories: Apply accessories according to manufacturer's instructions. Sand after application of final joint treatment coat and leave surface smooth and ready for work by other trades.

1. Treat metal accessories with not less than 2 coats of joint compound in the same manner as joints. Feather joint compound out from 8 to 10 inches on both sides of corners.
2. Apply metal trim at intersections where gypsum board abuts other materials, unless detailed otherwise, and at all other locations indicated. Neatly fit and secure corner beads over external corners.
3. Install expansion joints as detailed.

4. Install control joints as detailed.
- D. Joint Treatment Application:
1. Taping and Embedding:
 - a. Apply taping or embedding compound in a thin, uniform layer to joints and angles.
 - b. Immediately apply reinforcing tape centered over joint or angle and firmly seat into compound. Sufficient compound (approximately 1/64" to 1/32") shall remain under tape to provide proper bond.
 - c. Immediately follow with a thin skim coat to embed tape but not to function as a second coat.
 - d. Fold and embed tape properly at interior angles to provide a true angle.
 - e. Tape or embedding coat shall be thoroughly dry before application of second coat.
 2. Second Coat Embedding:
 - a. Apply a second coat of joint compound over embedding coat, filling panel taper flush with surface.
 - b. Cover tape and feather out at least 2 inches on each side beyond first coat.
 - c. On joints with no taper, cover tape and feather out at least 4 inches on either side of tape.
 - d. Allow second coat to dry thoroughly before application of finish coat.
 3. Topping:
 - a. Spread a finish coat evenly over and extend at least 2 inches on each side beyond second coat on joints and feather to a smooth uniform finish.
 - b. Over tapered edges, do not allow finished joint to protrude beyond plane of surface.
 - c. Apply finish coat to cover tape and taping compound at taped angles and provide a true angle.
 - d. Where necessary, sand between coats and following final application of compound to provide a smooth surface ready for painting.
- E. Finishing Fasteners:

1. Apply a taping or all-purpose type compound to fastener depressions as the first coat.
2. Follow with minimum of 2 additional coats of topping compound, leaving depressions level with plane of surface.

END OF SECTION

SECTION 09310

CERAMIC TILE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 03300 - Cast-In-Place Concrete.
2. 07900 - Joint Sealers.
3. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
4. 09250 - Gypsum Wallboard.
5. 10800 - Toilet Room Accessories.
6. 15421 - Drains, Floor Sinks, and Cleanouts.
7. 15440 - Plumbing Fixtures, Trim, and Supports.

1.02 REFERENCES

A. American National Standards Institute (ANSI) latest edition:

1. A108.1 Installation of Glazed Wall Tile, Ceramic Mosaic Tile, Quarry and Paver Tile with Portland Cement Mortar.
2. A108.5-85 Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar.
3. A108.10-85 Installation of Grout in Tilework.
4. A118.1-85 Dry-Set Portland Cement Mortar.
5. A118.6-85 Ceramic Tile Grouts.
6. A137.1-80 Specifications for Ceramic Tile.

B. Tile Council of America, Inc. (TCA): Handbook For Ceramic Tile Installation, latest edition.

1.03 SUBMITTALS

A. Product Data: Submit material specifications, printed installation and mixing instructions, and maintenance recommendations for ceramic tile and accessories.

B. Samples: Submit the following:

1. Panels: 12 inches square, of each type, color, and pattern of tile

- required.
2. Tile manufacturer's full color and pattern range for each type of tile required.
3. Grout manufacturer's full color range samples.
4. Each type of trim shape and special shape required, if requested.

1.04 QUALITY ASSURANCE

- A. Tile shall conform to requirements of TCA 137.1, Standard Grade.

1.05 MAINTENANCE

- A. Maintenance Materials: At the job site, provide 2 unopened boxes of each color and type of tile installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Ceramic Tile:
 1. American Olean Tile Company.
 2. Dal-Tile.
 3. US Ceramic Tile Company.
 4. Approved Equal.

2.02 MATERIALS

- A. Porcelain tile @ Fieldhouse toilet rooms to match existing.
- B. Porcelain tile @ Recreation Building to match existing in Multi-purpose Room.
- C. Color and Pattern:
 1. Colors and patterns shall be judged equivalent, as determined by the A/E, to those existing.
 2. Any preselected colors and patterns shown on the drawings or in the specifications shall govern.
 3. Where colors or patterns are not shown, tile equivalent in cost to standard solid colors shall be bid upon, assuming not more than 10 colors.
 4. A/E'S range of color selection shall not be limited to colors stocked

locally but by entire color line of specific manufacturer as determined by samples in A/E'S office.

- D. Trim and Special Shapes: Provide the following trim units and special shapes of same material and finish as ceramic wall tile:
 - 1. Base: Cove base units, width and height to match wall tile.
 - 2. External Corners: Bullnose shapes with round out base and top trim special shapes.
 - 3. Internal Corners: Field-buttet square with square in-corner base and top trim special shapes.
- E. Setting Materials: Dry-Set pre-sanded mortar according to ANSI A118.1-1985 and by manufacturer licensed by the Tile Council of America.
- F. Mortar Additive: Laticrete 3701 latex additive or accepted equivalent.
- G. Grout: Certified by the tile manufacturer as suitable for type of tile and application.
 - 1. Dry-Set Grout: A mixture of Portland cement and additives furnished by a firm licensed to manufacture products, and tested and approved by the Tile Council of America. Colors as selected by A/E.
 - 2. Commercial Latex-Portland Cement Grout: A mixture of Portland cement and mortar additive conforming to ANSI A118.6.
 - a. Color: Natural mortar color.
- H. Tile Cleaner: Biscayne Chemical Laboratories, Inc., "Blue Boy" or accepted equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Tile Setting Requirements:
 - 1. Examine surfaces for foreign matter, unevenness, flatness, plumb planes, and damage. Make repairs if necessary to substrate to be in the proper condition to receive tile. Verify waterproofing at shower receptors will not affect tile installation adversely.
 - 2. Construct sloped mortar beds using mortar consisting of 1 part Portland

- cement, 4 parts damp sand by volume, and gauged with mortar additive according to ANSI A108.5.
3. Secure tile firmly in place with uniform joints well filled and lines straight and true.
 - a. Bring finished surfaces to true and flat planes, plumb on walls.
 - b. Completed work shall be free of cracked or broken tiles.
 4. Form intersections and returns perfectly and perform cutting and drilling of tile neatly without marring tile face.
 - a. Carefully grind and joint cut edges of tile against any trim, finish, and built-in fixtures.
 - b. Fit tile close around plumbing pipes, fixtures and fittings so usual plates, collars, or coverings will overlap tile.
 5. Where borders, lines, patterns, panels, or other effects are a part of the work, properly space tiles and accurately reproduce required designs.
 6. Where acoustic tile ceilings occur, install ceramic wall tile to a line 2 to 4 inches above plane of exposed surface of ceiling.
 7. Layout tile work on floors or walls so, wherever possible, no tiles less than half full size will occur unless indicated.
 8. Movement Joints:
 - a. Provide control, isolation, expansion, and contraction joints according to movement joint designs and install according to the TCA Handbook for Ceramic Tile Installation.
 - b. Locate movement joints:
 - 1) At 24 to 36 feet in each direction.
 - 2) At tile abutting perimeter walls, dissimilar floors, pipes, and columns.
 - 3) Over cold joints and saw-cuts in the slab.
 - c. Extend joints through the setting bed to the concrete substrate equal in width to the tile grout joints.
 - d. Provide approved solid neoprene filler and approved polysulfide caulking.
 9. Where tile abuts restraining surfaces, cut tile to match contour of that surface.
 10. At floor drains, slope floor tile from high points at walls around perimeter of rooms down to floor drains.

B. Setting Ceramic Tile With Dry-Set Mortar:

1. Concrete Substrate:

- a. Set ceramic tile according to applicable requirements of ANSI A108.5.
- b. Set tile with dry-set mortar, 3/32" to 1/8" thick.
- c. Provide latex mortar additive in setting mortar per manufacturer's directions.

C. Grouting: Comply with ANSI A108.10.

1. Ceramic mosaic floor tile: Use commercial latex Portland cement grout.
2. Glazed ceramic wall tile: Use dry-set grout.
3. Force grout into joints to fill solid.
 - a. Remove and re-grout discolored joints. Fill voids in joint grout.

D. Tolerances: Finished installation shall be trued to a tolerance of $\pm 1/8$ " in a 10 foot radius and $+1/16$ " within any given running foot.

3.02 CLEANING

- A. Apply tile cleaner according to cleaner manufacturer's printed instructions.
- B. Leave finished installation clean and free of cracked, chipped, broken, and unbonded or otherwise defective tile.

END OF SECTION

SECTION 09510
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09200 - Metal Studs, Lath, Suspension Ceilings, Plaster, and Stucco.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A653-04a Standard Specification for Steel Sheet, Zinc-coated (Galvanized) or Zinc-iron Alloy-coated (Galvannealed) by the Hot-dip Process.
2. C635-00 Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings.
3. C636-04 Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels.
4. E1264-96 Classification for Acoustical Ceiling Products.

B. Ceiling and Interior Systems Contractors Association (CISCA) publication (current edition): Acoustical Ceilings - Use and Practice.

C. Underwriters Laboratories (UL) fire rating listings and classifications.

1.03 SUBMITTALS

A. Submit properly identified product data, including properties of lay-in panels, fire tests, details of suspension grid system, and installation instructions for review before starting work.

B. Shop Drawings: As may be required by A/E. Coordinate grid erection drawings with lighting fixtures, air-conditioning outlets, and other openings and irregularities.

C. Samples: Submit identified samples of each of the following for review and selection:

1. Exposed grid suspension system with angle.
2. Acoustical lay-in panel, 12 inches square piece.

PART 2 PRODUCTS

2.01 MATERIALS

A. Acoustical Lay-in Panels, Mineral Fiber Type:

1. 24 inches x 24 inches.
2. Complying with ASTM E1264, Class A, Type 3, Form 2, square edged.
3. Nominal Thickness: 5/8".
4. Finish: Factory applied, washable white.
5. Manufacturers:

a. Non-directional Panels:

- 1) Armstrong: Cortega Fine Fissured angled tegular #1717 lay-in panels.
- 2) Celotex: Fine Fissured angled tegular lay-in panels.
- 3) USG Interiors: Fine Fissured angled tegular lay-in panel.
- 4) Approved Equal.

B. Hangers: 12 gage (0.109" diameter) annealed steel wire, galvanized.

C. Exposed Suspension Grids For Acoustical Lay-in Panels:

1. 2 feet x 2 feet grid pattern with steel caps for exposed grid tee and angle members complying with ASTM C635, zinc-coated or hot-dipped galvanized complying with A653, factory painted steel parts with factory applied white baked enamel or polyester finish.

PART 3 EXECUTION

3.01 INSTALLATION

- #### A.
- Install specified suspension system and acoustical lay-in panels according to ASTM C636 and Cisca Publication "Acoustical Ceilings - Use and Practice", and applicable manufacturer's printed instructions.

1. Complete partitions indicated to be extended to overhead construction with finishes applied before installation of ceilings abutting such partitions.
 2. Provide one hanger minimum for each 16 square feet of ceiling.
 - a. Locate hanger wire not more than 1 foot away from main runners resting on wall trim.
- B. Acoustical Lay-in Panels:
1. Fit acoustical lay-in panels to grid accurately, without dented, broken, cracked, chipped, or soiled surfaces.
 2. A cut panel shall be a size that will not expose an edge when the panel is slid to the opposite side.
- C. Light Fixtures:
1. Fit acoustical lay-in panels accurately around surface mounted and stem mounted electrical fixture outlets.
 2. Adequately support tees supporting light fixtures by hanger wires so grid is level after light fixture installation.
 - a. Provide a hanger wire within 3 inches of each recessed lay-in light fixture corner.
- D. Alignment:
1. Align suspension members for true level surfaces and straight lines. Run joints and exposed grid members parallel to the room axis in both directions.
 2. Install exposed suspension grids per installers accepted grid layout drawings, properly coordinated with air conditioning and electrical trades.
- E. Border Balance:
1. Balance border areas to avoid acoustical units less than 1/2 unit wide.
- F. Textured or Patterned Acoustical Panels: Install in pattern in one direction including grain of panels with alternating grain, unless otherwise directed in writing by A/E.

3.02 ADJUSTING AND CLEANING

- A. Replace dirty or discolored acoustical panel surfaces following erection and leave free from defects.
- B. Remove damaged or improperly installed acoustical panels and replace.

END OF SECTION

SECTION 09901

PAINTING

PART 1 GENERAL

1.01 SUMMARY:

A. Section Includes:

1. Field painting of exposed and covered pipes, ducts (including color coding), hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work, except as otherwise indicated.
2. Repainting existing interior and exterior surfaces.
3. Six year warranty for labor and materials from the paint manufacturer.

B. Related Section:

1. 07900 - Joint Sealers.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. D3359-95a Test Methods for Measuring Adhesion by Tape Test.
2. D3927-87 Standard Guide for State and Institutional Purchasing of Paint.
3. D4262-83(88) pH of Chemically Cleaned or Etched Concrete Surfaces.
4. D4263-83(93) Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

B. OSHA Workers Environmental Conditions.

C. National Fire Protection Association (NFPA): NFPA 30 - Flammable and Combustible Liquids Code.

D. Steel Structural Painting Council (SSPC) - 6.

1.03 DEFINITIONS

- A. Alkyd: Oil-based paint.
- B. Latex: Water-based paint.
- C. New Work: Surface or area of a surface not previously painted, including areas patched, replaced, or sandblasted causing a painted or unpainted surface or part of a painted or unpainted surface to exist.
- D. Old Work: Surface that has been previously painted.
- E. Paint: All coating systems materials, including primers, emulsions, enamels, stains, varnishes, sealers and fillers, and other applied materials used as prime, intermediate, or finish coats.
- F. Smooth: A surface free from roughness, ridges, and projections.

1.04 SUBMITTALS

- A. Product Data: Submit Manufacturer Safety Data Sheet (MSDS), manufacturer's technical information, including paint label analysis and application instructions for each material proposed for use.
- B. Samples:
 - 1. Color Chips:
 - a. Before starting work, furnish color chips for surfaces to be painted to the A/E.
 - b. Use representative colors when preparing samples for review.
 - 2. Representative Samples:
 - a. Submit representative samples for review of color and texture only.
 - b. Provide listing of material and application for each coat of each finish sample.
 - c. Provide three samples of each color and material on 6 inch x 18 inch panels with texture to simulate actual finish. Label and identify each as to location and application.
 - 1) Provide three samples of each color and material on 6 inch x 18 inch samples of natural and stained wood finish on actual wood surfaces. Label and identify each as to location and application.

- 2) Provide three 6 inch x 18 inch samples of masonry for each type of finish and color, defining filler, prime and finish coat. Label and identify each as to location and application.
 - d. Resubmit samples as requested by A/E until acceptable sheen, color, and texture are achieved.
 3. Paint Sample: Provide 4-one quart containers of each color or type.
- C. Warranty:
 1. Submit paint manufacturer's proposed 6 year warranty document.
 2. Submit paint manufacturer's proposed program of inspection and approval before and during the Work as required by paint manufacturer to implement the submitted 6 year warranty.
 3. At the end of the paint work, provide to the Owner, from the authorized paint manufacturer representative, a signed and notarized letter stating that the surfaces painted have met all the conditions for paint adhesion.
 4. Warranties require acceptance by Owner.

1.05 QUALITY ASSURANCE

- A. Qualifications: Paint applicator shall be licensed in the State of Florida or in Miami-Dade County and use state or county certified journeymen. Provide a legible copy of license and, when applicable, a journeyman's certification attesting to qualification requirements.
- B. Certifications:
 1. Paint applicator shall provide a certification attesting to having worked on projects similar in scope to this project for a minimum of 5 years. Paint applicator not providing such documentation or not having the required experience will be removed from the project and replaced by the Contractor.
- C. Coordination of Work:
 1. Review other sections of the specifications in which paint primers are provided to ensure compatibility of total coatings system for various substrates.
 2. Upon request from other trades, furnish information or characteristics of finish materials to be provided, to ensure compatible prime coats are used.

D. Mockups:

1. Provide a mockup of each wall surface condition, allowing space for a minimum of 100 sq.ft. for each color of paint to be used for project wall surfaces. Construct and cure, for a minimum of 28 days, the mockup walls in the same manner as required for the permanent walls.
2. After coordinating and receiving approval for application onto designated mockup sample walls, apply the approved paint samples.
3. Duplicate painted finishes of prepared samples on actual wall surfaces and other exterior and interior building components or on specially constructed mockup walls.
4. Provide full coat finish samples on at least 100 sq.ft. of surface, as directed, until required sheen, color, and texture are obtained. Simulate finished lighting conditions for review of in-place Work.
 - a. Final acceptance of colors will be from samples applied on mockup.

E. Surfaces to be Painted:

1. Except where natural finish of material is specifically noted as surface not to be painted, paint exposed surfaces with colors are designated in schedules, or if not listed, verify color selection with A/E.
2. Where items or surfaces are not specifically mentioned, paint same as similar adjacent materials or areas.
3. If color or finish is not designated, coordinate with A/E for selection.

F. The following categories of Work are not included as part of field-applied finish work, unless otherwise specified:

1. Pre-Finished Items: Do not include painting of factory-finished or installer-finished specified items such as, but not limited to, pre-finished partition systems, acoustic materials, architectural woodwork and casework, elevator entrance doors and frames, elevator equipment, finished mechanical and electrical equipment, light fixtures, switchgear, and distribution cabinets.
2. Concealed Surfaces: Painting is not required, unless noted otherwise on the Drawings, on concrete or masonry surfaces such as walls or ceilings in concealed and generally inaccessible areas, foundation spaces, furred areas, utility tunnels, pipe spaces, duct shafts, and elevator shafts.
3. Finished Metal Surfaces: Metal surfaces of anodized or enameled aluminum, stainless steel, chromium plate, copper, bronze, and similar

finished materials will not require finish painting.

4. Operating Parts: Moving parts of operating units, mechanical and electrical parts, such as valve and damper operators, linkages, sensing devices, motor and fan shafts will not require finish painting.

G. Shop Priming:

1. Shop priming of ferrous metal items is included under various sections for structural steel, metal fabrications, hollow metal work, and similar items.
2. Shop priming of fabricated components such as architectural woodwork, wood casework and shop-fabricated or factory-built mechanical and electrical equipment or accessories are included under other sections of these specifications.

- H. Do not paint over code-required labels such as Underwriters Laboratories (UL) and Factory Mutual (FM), name, equipment identification, performance rating, or nomenclature plates.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to job site in original, new, and unopened packages and containers bearing manufacturer's name and label, and following information:

1. Name or title of material.
2. Federal Specification number.
3. Manufacturer's stock number and date of manufacture.
4. Manufacturer's name.
5. Contents by volume, for major pigment and vehicle constituents.
6. Application instructions.
7. Color name and number.
8. Indicate if paint is for interior or exterior use.

B. Storage:

1. Store materials not in actual use in tightly covered containers.
2. Maintain containers used in storage of paint in a clean condition, free of foreign materials and residue.
3. Protect from freezing or extreme heat, 95 degrees F. or above.
4. Keep storage area neat and orderly.
5. When flammable materials are to be left on-site during the Work, store the tightly covered materials in cabinets meeting the requirements of NFPA 30 and have an FM and UL label.

6. Remove from the project site contaminated products from oil-based products and their by-products, by the end of each working day.

1.07 PROJECT CONDITIONS

A. Environmental Requirements:

1. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are between 50 and 90 degrees F., unless otherwise allowed by paint manufacturer's printed instructions.
2. Do not apply paint in rain, fog, or mist, or when relative humidity exceeds 85 percent, or to damp or wet surfaces, unless otherwise allowed by paint manufacturer's printed instructions.
3. Do not perform work where plaster or cement is being applied or is in the curing process.
4. Do not apply paint in areas that are not broom clean and free of dust and debris.
5. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

B. Workers Environmental Conditions:

1. Comply with the standards established in OSHA Workers Environmental Conditions.
2. Take precautions to ensure that personnel and work areas are adequately protected from fire and health hazards resulting from handling, mixing and application of paints.
3. Illumination: Provide lighting equal to the permanent lighting planned for designated space.
4. Ventilation: Provide adequate ventilation to prevent buildup of fumes.
5. Contain and prevent vapors or dust generated by the Work from polluting adjacent occupied space.

1.08 WARRANTY

- A. Provide a written guarantee, co-signed jointly and severally by the Painting Subcontractor and Materials Manufacturers, against cracking, peeling, flaking, chalking and mildew on interior painted surfaces, and additionally against erosion and unreasonable fading on exterior surfaces, for six years; agreeing to repair and repaint surfaces affected by such defects, at no cost to the Owner

including necessary removal or protection of other work, without limit, within 30 days after notification by the Owner, and to perform such work based on the provisions of this section, including extension of the guarantee to cover new work.

1.09 MAINTENANCE

- A. Provide 2 five-gallon containers, properly labeled and sealed, of each type and color of finished paint used on the project. If less than 10 gallons of a particular type and color was used, then provide 1 one-gallon container.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Sherwin Williams or approved equivalent.

2.02 MATERIALS

- A. Latex-based materials shall be used for painting of exterior and interior surfaces.
- B. Primers, Undercoats, Split and Finish Coats: Use materials from same manufacturer when such materials are applied on same surface.
- C. Paints for interior and exterior use shall be factory tinted with each stage of coating application (primer, first coat, and finish coat) to be visually distinguishable from the preceding coat until the final coat. The final coat shall match the selected color.
 - 1. Label each container indicating whether it is primer, first coat, or finish coat.
 - 2. Label each container with the name and number of the color.
 - 3. Label each container indicating if it is intended for exterior or interior usage.
- D. Storage Cabinets and Disposal Containers for Flammable Materials:
 - 1. Meet the requirements of NFPA 30.
 - 2. Contain Factory Mutual (FM) label and Underwriters Laboratories label.

PART 3 EXECUTION

3.01 INSPECTION

- A. Pre-Construction Inspection: The Painting Subcontractor and the Materials Manufacturer Representative shall conduct on-site inspections and perform tests to determine:
 - 1. Condition of existing paint finishes.
 - 2. Suitability for receiving the new specified repainting materials.
 - 3. Whether the corrective and preparatory work specified below is adequate, excessive, or insufficient to obtain the required performance criteria required in this section and the guarantee.
- B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- C. Start of painting operations implies acceptance of the surface conditions and responsibility for required standards of quality and appearance.

3.02 PREPARATORY WORK

- A. Remove electrical outlet and switch cover plates, finish hardware escutcheons and cover plates, air-conditioning registers, and other finished items installed on surfaces to be painted, and replace afterwards or provide protection as approved by A/E. Protect items and surfaces that cannot be removed or that do not interfere with the painting, and leave clean and completely free of paint.
- B. Clean surfaces of all dirt, dust, or other contaminants that affect adhesion of paint or appearance of paint. Clean grease and oil from metal surfaces with turpentine or mineral spirits, and wipe dry before priming. Wire brush or sand metal surfaces to remove rust and scale. Touch-up factory primed surfaces with compatible factory primers. Schedule the cleaning so that contaminants from the cleaning process will not fall onto the wet painted surfaces.
- C. Fill nail holes, cracks, open joints, and other defects after priming or first coat is dry and before second coat is applied.
- D. Allow all coats to dry thoroughly before applying succeeding coats. Comply with paint manufacturer's recommendations.
- E. Prime finished work not shop coated when delivered to the job or as soon as

possible after that. Back prime all woodwork to be erected against masonry or concrete before erection. Protect the tops and bottoms of all wood doors with a heavy coat of varnish before installation.

- F. Clean and sand surfaces between coats with 150 Fine sandpaper or as recommended by the paint manufacturer.
- G. Special Preparatory and Corrective Work on Previously Painted Surfaces: As a minimum, in addition to the general requirements specified above, perform the following work on existing painted surfaces before starting application of new materials:
 - 1. Interior and Exterior: Remove loose, peeling, or flaking paint, chalking, and mildew. Sand surfaces to produce a smooth, even surface, free of sharp edges where paint has been partially removed, with an even texture and uniform absorptive quality. Provide additional partial or total priming coats if required to obtain uniform finish in color and sheen.
 - a. Mildew Removal: Prepare a diluted bleach solution with one volume of fresh household bleach to three volumes of water. Add to each gallon of diluted bleach two-thirds cup of trisodium phosphate (Solilax or equivalent) and one-third cup of detergent (Tide or equivalent). Allow to stand for 45 minutes. Clean thoroughly with high-pressure water and allow to dry completely before starting painting operations. Repeat treatment in areas that show signs of mildew after surface is dry.
 - 1) Workers shall wear proper safety clothing and necessary accessories, such as goggles.
 - 2) Protect adjacent surfaces that will be affected by the application of the mildew removal solution.
 - 3) Prevent water runoff from soaking into the ground and spilling onto plants. Replace damaged plants with like plants, at no cost to the Owner.
 - b. Preparation for Latex-Based Coating Over Oil-Based Coating: Prepare existing oil-based coating according to latex-based coating manufacturer's recommendations.
 - 2. Additional Exterior Surface Requirements: Pressure clean at a minimum of 3,500 psi using a zero degree oscillating tip to remove loose, peeling, or flaking paint and chalking. Follow with sandblasting on surfaces where the water cleaning does not produce the required surface for new paint

application, or where the existing paint material is not compatible with the new materials. The extent of preparatory work will be determined by the Contractor, painting subcontractor, and material manufacturer representative, based on production of work of quality that can be covered by required guarantees.

3.03 APPLICATION

A. General:

1. Perform work in a thorough and professional manner in conformance with accepted good practices and requirements of authorities having jurisdiction.
2. Protect finished materials and areas not to be painted by using drop cloths, masking, or other accepted methods.
3. Provide adequate ventilation for proper drying of surfaces before and after painting.
4. Drying Period: Allow each coat to dry thoroughly before succeeding coats are applied. Minimum drying time shall be according to manufacturer's recommendations.
5. Paint Shading: Each coat of paint shall vary sufficiently to easily distinguish it from previous coats of paint, both interior and exterior applications.
6. Observation and Acceptance: As required by paint manufacturer between coats before application of next coat of paint materials.

B. Apply materials, as they come from manufacturer, to dry surfaces according to manufacturer's directions as printed on container.

1. Any mixing on site requires specific and special approval of both the Board and the A/E.

C. Apply paint materials to give an even, solid color with each coat.

1. For deep tone finish colors, use Deep Base Primers recommended by manufacturer.

D. Apply paint materials by brush, roller, or spray method.

1. Select method best suited to profile, texture, and finish of existing surface, subject to suitability regarding safety and conditions in existing or occupied areas, and subject to approval by paint manufacturer and A/E.

2. Apply materials evenly, smoothly flowed on and cut in neatly, without runs, sags, wrinkles, shiners, streaks and brush marks; drying uniformly to color and sheen selected. Make dividing lines that separate colors straight and clean cut.

E. Dry Film Thickness:

1. Comply with manufacturer's specifications.
2. Minimum Dry Film Thickness: 5 mils (unless otherwise recommended by paint manufacturer), total finished application. Reduction of minimum thickness due to special coating characteristics or application procedures requires written approval for each case.

3.04 ADJUSTING AND CLEANING

- A. Remove construction debris, material containers, equipment, and other trash resulting from work of project.

- B. Upon completion of work, remove stains and paint spots from floors, wall, woodwork, electric trim, hardware, fixtures, and other items of the Board's property.

C. EXTERIOR SURFACES PAINT SCHEDULE

1. Walls or Ceilings with Oil-based Paints: The Board is in the process of converting from oil to latex on previously painted schools. This conversion requires the use of an oil-based transition primer/sealer.

1st Coat Acrylic latex primer or oil-based transition primer sealer.
2nd Coat Acrylic latex semi-gloss.
3rd Coat Acrylic latex semi-gloss.

2. Stucco Walls with Oil-based or Latex Paints:

1st Coat Acrylic primer-sealer or oil-based transition primer sealer.
2nd Coat Elastomeric waterproofer.
3rd Coat Elastomeric waterproofer.

3. Metal Doors:

1st Coat Field applied rust inhibitive primer over shop primer.
2nd Coat Acrylic latex enamel.
3rd Coat Acrylic latex enamel.

4. Stucco or Concrete Ceilings.
 - 1st Coat Acrylic latex primer.
 - 2nd Coat Acrylic latex semi-gloss.
 - 3rd Coat Acrylic latex semi-gloss.

5. Wood:
 - 1st Coat Sanding Sealer.
 - 2nd Coat Acrylic latex semi-gloss.
 - 3rd Coat Acrylic latex semi-gloss.

D. INTERIOR SPACES PAINT SCHEDULE

1. Walls and Ceilings not Acoustically Treated: The Board is in the process of converting from oil to latex on previously painted schools. This conversion requires the use of an oil-based transition primer/sealer.
 - 1st Coat Acrylic latex wall primer or oil-based transition primer sealer.
 - 2nd Coat Acrylic latex semi-gloss.
 - 3rd Coat Acrylic latex semi-gloss.

2. Other Interior Ceilings Not Covered:
 - 1st Coat Acrylic latex primer.
 - 2nd Coat Acrylic latex semi-gloss.
 - 3rd Coat Acrylic latex semi-gloss.

3. Metal Doors:
 - 1st Coat Field applied rust inhibitive primer over shop primer.
 - 2nd Coat Acrylic latex semi-gloss undercoat.
 - 3rd Coat Acrylic latex semi-gloss.

4. Natural Finish Wood- Shelving and Cabinets:
 - 1st Coat Stain (to achieve a uniform shade).
 - 2nd Coat Sanding sealer.
 - 3rd Coat Gloss varnish.
 - 4th Coat Gloss varnish.

5. Wood Surfaces and Doors:

- 1st Coat Wood primer.
- 2nd Coat Acrylic latex semi-gloss.
- 3rd Coat Acrylic latex semi-gloss.

E. INTERIOR AND EXTERIOR PAINT SCHEDULE

1. Galvanized Metal: Apply neutralizer and allow to dry thoroughly.

- 1st Coat Galvanized metal primer.
- 2nd Coat Acrylic latex enamel (or aluminum paint).
- 3rd Coat Acrylic latex enamel (or aluminum paint).

2. Metal Sash - Doors and Frames:

- 1st Coat Metal primer.
- 2nd Coat Acrylic latex enamel (or aluminum paint).
- 3rd Coat Acrylic latex enamel (or aluminum paint).

3. Exposed Ferrous Metal:

- 1st Coat Rust inhibitive primer.
- 2nd Coat Acrylic latex enamel.
- 3rd Coat Acrylic latex enamel.

4. Exterior Ungalvanized Metal Including Pipe Systems Subjected to Corrosive/Chemical Environments. System shall be at least 10 mil minimum dry film thickness.

- 1st Coat High-performance rust inhibitive primer of aluminum epoxy mastic or accepted equivalent.
- 2nd Coat High-performance chemical resistance coating.
- 3rd Coat High-performance chemical resistance coating.

5. Other Metals Not Previously Mentioned:

- 1st Coat Rust inhibitive metal primer.
- 2nd Coat Acrylic latex enamel (or aluminum paint).
- 3rd Coat Acrylic latex enamel (or aluminum paint).

END OF SECTION

SECTION 10170

SOLID PLASTIC TOILET PARTITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Toilet partitions and urinal screens, complete with hardware.

1.02 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. E84-96a Test Method for Surface Burning Characteristics of Building Materials.

1.03 SUBMITTALS

- A. Product Data:
 - 1. Show details of construction, assembly and anchorage to building construction, manufacturer's specifications including description of hardware, and maintenance instructions.
 - 2. Include test reports confirming Class C and toxicity requirements.
- B. Shop Drawings:
 - 1. Provide dimensioned partition plans, elevations, details, swing of doors, color, and location of hardware items and required wall blocking.
 - 2. Label components and fully describe anchorage devices and substrates.
 - 3. Show relationship to plumbing fixtures.
- C. Samples:
 - 1. 6 inch by 6 inch samples of panel material in both stock and custom colors.
 - 2. Include sample of fastener and shield for wall bracket anchorage.
- D. Copy of manufacturer's standard 15-year warranty submitted with shop drawings, guaranteeing against material defects or faulty fabrication, assembly, and installation.

1.04 QUALITY ASSURANCE

- A. Installer Certification: Provide documentation from the toilet partition manufacturer that installers have been factory-trained in the installation of these partitions.
- B. Mock-Up: If required by A/E, install mockup of stall in area designated by A/E. Approval by A/E is required before ordering, production, or delivery of remaining partitions.
- C. Gravity cam or integral hinges are not allowed.

1.05 PRODUCT DELIVERY, HANDLING, AND STORAGE

- A. Ship components with protective wrap. Store and handle according to manufacturer's printed instructions.

1.06 WARRANTY

- A. Upon completion of installation, submit warranty for 15-years starting at date of substantial completion, stating that failed products or installation shall be replaced at no additional cost to the Board.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Solid Plastic Toilet Partitions:
 - 1. Ampco Products, Hialeah, FL: High Density Polyethylene.
 - 2. Capitol Partitions, Columbia, MD: Poly-Pro HDPE.
 - 3. Comtec Industries, Scranton, PA: Series S200.
 - 4. Santana Products, Scranton, PA: Poly-Mar HD.
 - 5. Approved Equal.

2.02 MATERIALS

- A. Panels, pilasters, and doors of 1 inch thick seamless high-density polyethylene resin compound. A/E shall select color from manufacturer's stock or custom colors. All edges shall be machined to a 0.250" radius. Phenolic resin construction is not acceptable.

1. Plastic material shall comply with the following:
 - a. Flame Spread of less than 200 and Smoke Developed of less than 450 when tested according to ASTM E84.
 - b. Products of combustion of "no more toxic" than those from burning wood when tested according to NBS-TOX, 48.1.
 - c. Integral color shall be uniform throughout panel and all panels shall match.
- B. Hardware: Provide solid plastic hardware when available.
1. Headrails: Extruded aluminum alloy with a clear anodized finish; anti-grip design, with stainless steel headrail brackets.
 2. Hinges: Continuous hinge, aluminum, self-closing spring loaded barrel, snap-on covers, and tamper resistant sex bolts, 54 inches long.
 - a. Model A19 by Santana.
 - b. 400 Series by Markar Products, Lancaster NY.
 - c. Accepted equivalent.
 3. Wall Brackets: Plastic to match type and color of plastic panels and full panel length. Through-bolt brackets to panels and pilasters with tamper resistant sex bolts. Wall brackets shall be used for panel and pilasters, pilaster to wall, and panel to wall connections.
 4. Pilasters: Plastic to match type and color of plastic panels with leveling bolts.
 5. Shoes and Fasteners: Plastic shoes to match type and color as plastic panels. Use tamper resistant sex bolts.
 6. Door Pulls, Door Strikes, and Door Stops: Heavy chrome-plated Zamac or stainless steel.
 7. Door Latches: Stainless steel or aluminum housing, slide bolt, and button. Use tamper resistant sex bolts.
 8. Provide clear anodized aluminum bars fastened to bottom edge of panels and doors with theft-proof countersunk screws. Bars shall be flush with faces of panels.
 9. Finish of exposed portion of screws, bolts, and nuts shall match finish of attached hardware item. Sex bolts shall be stainless steel barrel nut and shoulder screw design with tamperproof head. Color to match bracket.
- C. Anchorages:
1. Connection to wall shall provide a rigid and durable anchorage to wall construction. Use plastic shields, expansion bolts or "butterfly" type bolts.

- Finish of exposed portions shall match finish of wall brackets.
2. Plastic shields will not be accepted unless partition manufacturer can demonstrate that they will not work loose in wall or cause a less than rigid and durable anchorage, and be guaranteed by the partition manufacturer and the partition installer against pullout or loosening.

2.03 FABRICATION

- A. Fabricate compartments to the following configuration. Dividing panels and doors shall be 58 inches x length required and with bottom edge of panels 12 inches from the floor. Top of pilasters shall be 82 inches above finish floor and fastened to 3 inch high shoes of same material as pilaster.
- B. Fabricate urinal screens to the following configuration. Dividing panels shall be 42 inches x 24 inches long and with bottom edge of panels 18 inches from the floor. Provide ceiling support and fasten to floor shoes.
- C. Using template provided by toilet accessories manufacturer, provide cutouts for recessed items.
- D. Compartments for handicapped use shall be fabricated according to the latest accessibility code requirements.
- E. Stall doors shall be self-closing.

PART 3 EXECUTION

3.01 PREPARATION

- A. Verify dimensions at areas to receive partitions and plumbness of walls and soundness of wall surfaces that would affect installation of holding brackets. Verify blocking is installed in stud walls to receive partition anchorages.
- B. Verify spacing of plumbing fixtures to assure compatibility with installation of partitions.
- C. Do not begin installation of partitions until conditions are satisfactory.

3.02 ERECTION

- A. Install partitions rigid, straight, plumb, and level. Follow partition manufacturer's printed installation instructions and final approved shop drawings.

- B. Provide uniform clearance of not more than 1 inch between panels and walls, and clearance of not more than 1/4" at vertical edges of doors uniform from top and bottom.
- C. Locate wall brackets with holes for wall anchorages occurring in masonry or tile joints wherever possible.
- D. Conceal evidence of drilling, cutting, and fitting.

3.03 ADJUSTING AND CLEANING

- A. Perform final adjustments to leveling devices and hardware.
- B. Clean exposed surfaces of partitions, hardware, fittings, and accessories.
 - 1. Avoid soiling other adjacent finishes.
 - 2. Follow partition manufacturer's printed cleaning instructions.

END OF SECTION

SECTION 10400
IDENTIFYING DEVICES

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Labor and materials required for installation of directional signage, signage for rooms, and capacity signs.

1.02 SUBMITTALS

- A. Submit properly identified manufacturer's literature before starting work.
- B. Shop Drawings:
 - 1. Submit a shop drawing of signage and list of room names for Architect's approval.
- C. Samples: Submit sample of laminated signs to A/E for approval before fabrication. Approved sample may be used in work.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Raised Image Laminated Signs:
 - 1. Comply with Florida Building Code (FBC) for accessibility requirements.
 - 2. 1/8" thick minimum plastic laminated material with 0.008" thick minimum plastic face layer, of sizes, quantity, colors, with raised numbers, letters, Braille, or symbols as indicated on Drawings or as specified in this section for accessible signage, room identification, and life safety signage. Tape applied or glued raised text, braille, or symbols are not allowed.
 - a. Manufacturers:
 - 1) Andco Industries Corp., Greensboro, NC.
 - 2) A&J Signs Corp., Hialeah Gardens, FL.
 - 3) ASE (Architectural Signs and Engraving) Inc., Orofino, ID.
 - 4) Best Sign Systems, Montrose, CO.
 - 5) Industrial Frames, Inc., Miami, FL.

- 6) Mohawk, Schenectady, NY.
 - 7) Approved Equal.
3. 1/32" Raised Images:
- a. Letters: Size, according to Drawings or 1 inch high, Helvetica medium.
 - b. Numbers: Size according to Drawings or 1 inch high Helvetica medium.
 - c. Braille: Tactile Grade II. Adhered labels are not allowed.
 - d. Symbols: Use Braille, letters, numbers, and Group One symbols sized per requirements of standard spacing.
4. Sizes:
- a. Accessible Signage, Room Identification, and Life Safety Signage: 1-3/4" wide by length required or as custom designed.
 - b. Symbol Signage: 9 inches x 9 inches or as custom designed.
 - c. Directional Signage: 9 inches x 9 inches or as custom designed.
5. Mountings:
- a. Mount using tamperproof screws, shields, and double face tape or adhesives to hold signage in place.
6. Colors:
- a. Black background for sign face and Braille and white raised text or symbols for all new rooms:

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Mounting of Laminate Plastic Signs:

1. Mount laminated signs with 5'-0" above finish floor according to FBC and as indicated on drawings with tamperproof fasteners and predrilled holes and double face tape or adhesives.
2. Signage shall be left clean and without any rough edges. Signage shall be left without any defects concerning installation from plumb and level, concerning material quality or any other discrepancy in mounting.

END OF SECTION

SECTION 10625

OPERABLE PARTITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 05120 - Structural Steel.
2. 06100 - Carpentry.
3. Division 16 - Electrical.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. E84-04 Test Method for Surface Burning Characteristics of Building Materials.
2. E90-04 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

1.03 SUBMITTALS

A. Submit properly identified product data, complete with installation details and instructions, before starting work.

B. Shop Drawings:

1. Submit shop drawings for fabrications and erection of panel partition assemblies.
 - a. Include plans, elevations, details, and STC ratings as required.
 - b. Show anchorage and accessory items and finishes.
2. Provide location templates drawings for bolt hole locations in supporting members for attachment of partition track supports.

C. Samples:

1. Submit 3 samples, 6 inches x 6 inches of each color and finish.

- a. Samples will be reviewed for color, texture, and surface reflectivity only.
2. Color selection will be made by A/E.
3. Submit samples and sections of tracks, hanger assemblies, and the core finished with material as selected by A/E.

1.04 QUALITY ASSURANCE

- A. Provide panel partition assembly as a complete unit by one manufacturer including necessary hardware, fittings, accessories, and anchorages.
- B. Sound Transmission Classification (STC): Provide folding partition units capable of achieving the following STC ratings for the heights as shown elsewhere when tested according to ASTM E90:
 1. STC 48
- C. Flame Spread Rating: Use only facing materials not exceeding a 25-flame spread rating when tested to ASTM E84.

1.05 WARRANTY

- A. Guarantee Period: 3 years against defects in material or installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Operable Partitions (STC 48):
 1. Hufcor, 6000 Series.
 2. Kwik Wall, Series 3000.
 3. Moderco, Signature Series 8000.
 4. Panelfold, Moduflex Series 800.
 5. Approved Equal.

2.02 SPECIAL REQUIREMENTS

- A. Hardware and Accessories: Provide manufacturers standard design, heavy-duty operating hardware, and accessories.

- B. Head Guides: Standard to manufacturer.

2.03 FABRICATION

- A. Provide standard paired panels on steel framework and steel panel skins.
 - 1. Provide concealed reinforcement for installation of hardware, fittings, brackets, and required accessories.
 - 2. Face Panel Color: Selected by A/E from manufacturers stock color selection.
- B. Panel Size: Nominal 36 inches wide with interlocking vinyl sound seals.
- C. Floor and Head Seals: Fixed or mechanical vinyl top sweeps and clearance type, automatic operable bottom seals.
- D. Operable partitions to be floor supported, with floor track.
- E. Panels:
 - 1. Stabilized cores faced with vinyl film weighing not less than 30 ounces per lineal yard. Particle board construction is not allowed.
 - 2. Color and Pattern of Vinyl Facing: As selected by A/E from manufacturer's standard selection.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Verify field measurements before fabrication.
- B. Pre-assemble units in shop to greatest extent possible to minimize field cutting, jointing and assembly of units.
- C. Store and handle doors during pre-installation stage to not void manufacturer's guarantee.

- D. Install operable partitions by an authorized representative of manufacturer.
- E. Remove and reset doors defective after installation to a fully operating condition.
- F. Cleaning, Adjusting, and Lubricating:
 - 1. Adjust and lubricate hardware for proper operation after installation.
 - 2. Perform final adjustments to leveling devices, hardware, and other operating parts of partition assemblies.
 - 3. Clean exposed surfaces of partitions, hardware, fittings and accessories, using materials and methods recommended by the partition manufacturer.

END OF SECTION

SECTION 10800

TOILET ROOM ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 04220 - Concrete Unit Masonry.
2. 06100 - Carpentry.
3. 09310 - Ceramic Tile.

1.02 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and installation instructions for each toilet accessory before starting work.

B. Samples:

1. Submit full-size samples of units to A/E for review of design and operation.
2. Acceptable samples will be returned and may be used in work.

C. Setting Drawings: Provide setting drawings, templates, instructions, and directions for installation of anchorage devices.

1.03 QUALITY ASSURANCE

A. Coordination:

1. Inserts and Anchorages: Furnish inserts and anchoring devices to be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.
2. Accessory Locations: Coordinate accessory locations with other work to avoid interference and to assure proper operation and servicing of accessory units.

B. Source Quality Control:

1. Products: Provide products of same manufacturer for each type of accessory unit and for units exposed in same areas, unless otherwise

acceptable to A/E.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Toilet Room Accessories:

1. A&J Washroom Accessories.
2. American Specialties.
3. Baylor American Accessories.
4. Bobrick.
5. Gamco.
6. McKinney/Parker.
7. Meek Manufacturing Company, Fort Smith, AR.
8. Moore Dispensers.
9. Approved Equal.

2.02 MANUFACTURED UNITS

A. Toilet Paper Dispenser:

1. Surface mounted, multi-roll, stainless steel with theft resistant spindles and tumbler lock keyed like other bathroom accessories.
2. Manufacturers:
 - a. A&J Washroom Accessories: Model U840.
 - b. American Specialties: Model 0030.
 - c. Baylor American Accessories: VT-5.
 - d. Bobrick: Model B-288.
 - e. Gamco: Model TTD-5.
 - f. McKinney/Parker: Model 615.
 - g. Approved Equal.

B. Grab Bars:

1. Lengths and configurations as indicated on drawings and as specified in this section.
2. Heavy duty with peened non-slip gripping surface, 1-1/2" diameter, stainless steel, with 1-1/2" wall clearance and with theftproof exposed fasteners.
3. Straddle bars, wall to floor with socket and horizontal grab bars

according to manufacturer's model/series numbers.
4. Manufacturers:

- a. A&J Washroom Accessories: UG Series.
- b. American Specialties: 3500 Series.
- c. Baylor American Accessories: Georgia Series.
- d. Bobrick: B-6106 Series.
- e. Gamco: 150 E Series.
- f. McKinney/Parker: 9705 Series.
- g. Approved Equal.

C. Paper Towel Dispensers:

1. Surface mounted, equipped to dispense single-fold paper towels, stainless steel, with tumbler lock keyed like other bathroom accessories.
2. Manufacturers:

- a. A&J Washroom Accessories: Model U190.
- b. American Specialties: Model 245SS.
- c. Baylor American Accessories: Model TN-5.
- d. Bobrick: Model B-263.
- e. Gamco: Model TD-5.
- f. Moore Dispensers: Model 850.
- g. Approved Equal.

D. Mirrors:

1. Frameless, #8 mirror polished, 20 gage stainless steel laminated to 1/4" tempered hardboard backing, with vandal resistant fasteners.
2. Manufacturers:

- a. A&J Washroom Accessories: Model U701S.
- b. American Specialties: Model 8026.
- c. Baylor American Accessories: Series MI-1.
- d. Gamco: M Series.
- e. Meek Manufacturing Company: Model M-5200.
- f. Approved Equal.

E. Feminine Napkin/Tampon Disposal:

1. Stainless steel, single recessed or dual access, self-closing doors, with tumbler lock keyed like other bathroom accessories.
2. Manufacturers:

- a. A&J Washroom Accessories: Models U581 (single) or U580 (dual).
- b. American Specialties: Models 0473 (single) or 0472 (dual).
- c. Baylor American Accessories: Model NM-40 (single) or NM-60 (dual).
- d. Bobrick: Models B-353 (single) or B-354 (dual).
- e. Gamco: ND-4. (single) or ND-6 (dual).
- f. Approved Equal.

F. Soap Dispensers, Wall Mounted:

- 1. Surface mounted, stainless steel container, liquid type, with refill indicator, and with 40 oz. stainless steel soap container and tumbler lock keyed like other bathroom accessories.
- 2. Manufacturers:
 - a. A&J Washroom Accessories: Model U124.
 - b. American Specialties, Inc.: Model 0342.
 - c. Baylor American Accessories: Model SD-58AP.
 - d. Bobrick: Model B-4112.
 - e. Gamco: G-58AP.
 - f. McKinney/Parker: Model 304H.
 - g. Approved Equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install toilet room accessories at locations shown on Drawings according to manufacturers' printed installation instructions.
- B. Secure toilet room accessories to supporting substrate with fasteners and anchors of types necessary for rigid anchorage to substrate construction.
- C. Install toilet room accessories plumb and true with horizontal lines level.

1. Conceal evidence of drilling or fitting in adjacent surfaces.
- D. Special Tools or Keys:
1. Deliver properly identified special tools or keys of each type required for theftproof fasteners and for refilling dispensers or emptying receptacles.
- E. Cleaning:
1. After installation, clean toilet room accessories in a manner not to damage finish and leave in conditions satisfactory to A/E.

END OF SECTION

WRITTEN FOODSERVICE EQUIPMENT SPECIFICATIONS
AND DETAILS • SECTION 11400

OVERTOWN COMMUNITY CENTER
MIAMI, FLORIDA
IFG NO. 12008

**KITCHEN
BEVERAGE SERVICE AREA**

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PART 1: GENERAL REQUIREMENTS SECTION 11400

1.00 DEFINITIONS AND SCOPE

1.01 DEFINITIONS

The following summary is intended to clarify the responsibilities of each party, and their relationship to one another, as used and defined throughout the Foodservice Equipment Contract Document.

A. OWNER

The Owner shall be defined as the ultimate decision-maker in regard to the project.

1. The Owner shall designate a Representative who has the authority to make decisions and provide pertinent project information.
2. The Owner, through its designated Representative, shall issue all instructions to the Kitchen Equipment Contractor (KEC) through the Foodservice Consultant.
3. The Owner, through its designated Representative, shall inform all parties of any pertinent information, such as cost limitations, due dates, or other contracts which may affect the performance of this contract.

B. ARCHITECT

The Architect is the Owner's Representative for the proper performance of all aspects of this project and will be included in the flow of documents pertinent to the project.

C. FOODSERVICE CONSULTANT

Inman Foodservices Group is the Kitchen Designer for this project. As such, they represent the Owner in matters related to kitchen design and also act as technical advisor to the Architect. To function effectively, Inman Foodservices Group must be advised of any modifications, proposed by any party to this contract, which may affect the performance of this contract.

D. GENERAL CONTRACTOR

The General Contractor (GC) and/or Construction Manager (CM) are responsible for overall coordinations, deliveries, scheduling installation, coordination of other trades, and the rough-in connection of equipment to utilities. The KEC must closely coordinate his activities with the GC and/or CM.

E. KITCHEN EQUIPMENT CONTRACTOR

The KEC is the party responsible for supplying, delivering, and setting-in-place all items included in this contract. The KEC may hire subcontractors to perform portions of his work, but final responsibility for the performance of the contract rests with the KEC. The KEC is to have a full time project manager on site as necessary. Sub-contractors/installers do not count as project managers unless full time employed by the KEC.

F. SUBCONTRACTORS

A subcontractor is a person or organization who has a direct contract with the Kitchen Equipment Contractor to perform any of the work at the project site. The term Subcontractor is referred to in the Contract Documents as if singular in number. The term Subcontractor means the Subcontractor or his authorized representative. Nothing contained in the Contract documents shall create any contractual relationship between the Owner and any subcontractor.

G. COMPLETE INSTALLATION

This shall be interpreted as the delivery of all Foodservice and/or kitchen equipment and refrigeration, with transportation and trucking charges prepaid to the building site, removal from crates, assembled, set-in-place, leveled, ready for final connection, re-leveled, calibrated, started-up, adjusted and demonstrated inclusive of completed training. Clean all equipment, new or existing to a condition acceptable for intended foodservice. Cleaning shall be performed during the process of installation to properly maintain the equipment and prior to Owner's acceptance.

H. N.I.K.E.C.

Whenever the abbreviation N.I.K.E.C. is used in this contract, it shall mean the items are not part of the foodservice equipment contract.

I. CONTRACT

The Contract Documents form the Contract. The Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations or agreements either written or oral, including the bidding documents. Contract Documents shall consist of: The Specifications which consist of Instructions To Bidders, General Conditions, Specific Conditions, Itemized Equipment Specifications, Equipment Details; the drawings and all addenda issued prior to the execution of the contract; and all modifications thereto.

- (1) The Drawings and the Specifications are intended to be complimentary to each other so that any work exhibited in the drawings and not mentioned in the specifications, or vice-versa, is to be executed the same as if both were mentioned in the specifications and exhibited in the drawings to the true intent and meaning of the said drawings and specifications when taken together.
- (2) Titles and headings to sections in these Contract Documents are introduced for convenience and shall not be taken as a correct or complete segregation of several units of materials and labor. No responsibility either direct or implied will be assumed by the Owner or the Designer for errors or omissions by the Kitchen Equipment Contractor, due to real or alleged error in arrangement or content of matter in the Contract Documents.
- (3) The drawings and specifications are advisory and for information purpose only. They are not intended to be, and shall not be used for construction purposes. They are to be used by licensed Architects and Engineers for preparing their stamped and sealed documents and for the Kitchen Equipment Contractor and for preparing dimensioned rough-in drawings, brochure submittals and shop drawings.

J. THE WORK

The term work includes all labor necessary to produce and install the equipment required by the Contract Documents.

1.02 OWNERSHIP OF DRAWINGS

All drawings and contract documents prepared and furnished by Inman Foodservices Group are the property of Inman Foodservices Group. They shall be used only for this project and shall not be duplicated or used on any other project, in whole or part. They shall be returned upon completion of the project.

1.03 DRAWINGS AND CONTRACT DOCUMENTS

- A. The drawings and written specifications constitute a full and complete Foodservice Equipment Contract Document. The Contract Document for the KEC's consideration shall include, but not be limited to, the following:
 - 1. Equipment layouts
 - 2. Spot connection plans and special details
 - 3. Instructions to bidders
 - 4. General conditions
 - 5. Specific Conditions
 - 6. Specifications and details
 - 7. Any addendum issued prior to executing this contract
- B. All drawings prepared by Inman Foodservices Group serve to define only. They should not be used as construction documents or building shop details. Nothing contained in the Contract Documents shall create any contractual relationship between the Designer and Kitchen Equipment Contractor.
- C. Drawings are only for reference, assistance and guidance to the KEC. They indicate the preferred final location of equipment. The exact final location will be dictated by the building condition. The KEC should understand and accept this contract with this understanding.
- D. Drawings and equipment specifications are intended to compliment each other and form one Contract Document. Therefore, neither one should be considered complete without the other. Where variances occur between Contract Documents or within the document itself, the item or arrangement of equipment with better quality, greater quantity, higher cost or most stringent requirement shall be included in cost.
- E. The KEC should not submit cost bids, Proposal Contract Document, or enter into agreements without complete knowledge or access to all Contract Documents.
- F. The Kitchen Equipment Contractor shall carefully compare the Contract Documents and shall at once report to Owner any errors, ambiguities, inconsistencies or omissions he may discover. Unless expressly stipulated, and in a timely manner, Kitchen Equipment Contractor shall be liable to Owner for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents. Kitchen Equipment Contractor shall not do any work without Drawings, Specifications or Modifications without receiving written prior checking from Owner or Designer.

1.04 WORK INCLUDED

Furnish any and all labor, material and services necessary for installation of foodservice equipment in strict accordance with the specifications, applicable drawings and local codes including, that which is reasonably inferred. In addition:

- A. The equipment shall be delivered and installed on schedule. The Kitchen Equipment Contractor shall be responsible for coordinating the work with the general contractor.
- B. Field dimensions before fabrication.
- C. All Indirect waste piping (except sinks, cooler/freezer assemblies and ventilators) to floor sinks.

- D. Cutting of holes in equipment for pipe, drains, electric outlets, etc., as required for this installation. Work shall conform to highest standards of workmanship and shall include welded sleeves, collars, ferrules or escutcheons.
- E. All work involved in making stands and supports for all equipment requiring them.
- F. Repair of all damage to the premises as a result of this installation and daily removal of all debris left by the Kitchen Equipment Contractor from the site at his expense.
- G. Foodservice equipment and fixtures shall be cleaned and ready for operation at the time the building is turned over to the Owner.
- H. Work to be in compliance with the Florida Accessibility code building construction with amendments.
- I. Refrigerant, fittings, dryers, pipe, insulation, etc.

1.05 WORK NOT INCLUDED

A. General Construction

- 1. All floor assemblies including finishes, openings, depressions, sleeves, curbs and bases.
- 2. All wall/partition assemblies including finishes, openings, recesses, sleeves, furring and backing.
- 3. All ceiling assemblies including finishes, openings, soffits and sleeves.
- 4. All roof assemblies including finishes, openings, curbs, platforms and dunnage.
- 5. All structural supports, materials and grounds for hanging ceiling mounted and wall mounted items of foodservice equipment assemblies as described in this section.

B. Plumbing

- 1. Water, gas and steam supply systems.
- 2. Sanitary drainage system.
- 3. Final plumbing connections including mounting of drains, faucets and piping from point of connection on equipment to building plumbing systems and interconnections between equipment components.
- 4. All plumbing materials including pipe, traps, stops, valves, floor drains and floor sinks, pressure reducing valves, gauges, unions and insulation.
- 5. Grease traps.
- 6. Indirect condensate drain lines from walk-ins cooler/freezer assemblies and refrigeration units to drains.
- 7. Mechanical/Electrical gas shut off valves as required for ventilator fire suppression system.
- 8. All gas and water piping materials including pipe, traps, valves, pressure reducing valves and unions from point of connection on equipment, interconnections between equipment and connection to utility distribution system and to building gas and water system.
- 9. Empty PVC conduit system with pull boxes for beverage systems.
- 10. Empty PVC conduit system with pull boxes for refrigeration systems.

C. H.V.A.C.

- 1. Ventilation ductwork, fans and final connections to and from exhaust ventilators, dishwashers and condensate hoods.
- 2. All heating, ventilating and air conditioning systems except as otherwise specified in this section.

D. Electrical

1. All electrical distribution, lighting and power systems except as otherwise specified in this section.
2. Final electrical connections including wiring from point of connection on equipment to building electrical systems and interconnections between equipment components.
3. All electrical materials including wire, conduit, over-current protection, main switches, safety cutouts, shunt-trip breakers, disconnect switches and controllers.
4. Shunt-trip breakers and/or contactors and all conduit and wire for shut down of electrically operated cooking equipment as required for ventilator fire suppression systems.
5. Exhaust fans, supply fans, interlocks, motor starters, disconnect switches, fan controls, switches and interconnecting wiring and conduit.
6. Empty E.M.T. conduit system with pull boxes for beverage systems.
7. Empty E.M.T. conduit system for refrigeration systems.
8. Empty conduit system for point-of-sale register system.

1.06 RELATED WORK BY OWNERS:

- A. Furnishing and installing Owner's furnished equipment, unless otherwise specified.

1.07 PRIOR CONTRACT CONDITIONS

1.08 OWNER'S RIGHTS

A. HOLDING PAYMENT

The Owner, through his Representative and Inman Foodservices Group, reserves the right to hold payment from the KEC if he, or any of his subcontractors, neglect to perform properly.

B. RIGHT TO DO WORK

The Owner reserves the right to take any steps necessary to complete the project, and to deduct these expenses from the KEC's contract. If the KEC fails to perform properly and to satisfaction, the Owner shall notify the KEC of such failure by registered mail, return receipt requested.

C. EMERGENCY REPAIRS

The Owner reserves the right to make all necessary emergency repairs without voiding or impairing the guarantee while it is in effect.

1.09 SUBSTITUTIONS

- A. Bids presented shall be as specified by Inman Foodservices Group with specific manufacturer, model number, size, utilities requirements, capacity, options, and accessories.
- B. The KEC may present a price for alternate equipment (other than what is specified). In this case, the KEC must clearly and on a separate sheet of paper state that he is offering a substitution at that time for that item of equipment. He should submit complete illustrations, specifications, capacities, utilities, and operational data. It is the KEC's responsibility to prove that the item or items substituted are equivalent to the specified items. Inman Foodservices Group, as the Owner's Representative or with Owner, shall be the determining authority as to the acceptability or equivalency of alternates. Items of standard equipment shall be the latest model, new at time of delivery.

- C.** The KEC shall be responsible for all costs associated with the approved alternate item if it requires additional space, or specific utilities, which differ from the original specifications. The KEC shall be responsible to the Owner and GC for any retrofitting, such as building changes, utility changes, and engineering changes. All substitutions and alternates must be approved by Inman Foodservice Group in writing.

1.10 SUBCONTRACTORS

- A.** The KEC shall be allowed to use subcontractors for any portion of the work that he wishes. However, prior to awarding the contract, the KEC is responsible for submitting to Inman Foodservices Group, in writing, the addresses and telephone numbers of subcontractors to be approved.
- B.** Every subcontractor shall be bound by the terms and provisions of the Contract Documents applicable to his work. Nothing contained herein shall create any contractual relationship among a contractor, and the Owner or Inman Foodservices Group.
- C.** If in the judgment of Inman Foodservices Group any subcontractor fails to perform the work in strict accordance with the Contract Documents, the KEC, after due notice from Inman Foodservices Group, shall discharge the same. This in no way releases the KEC from his obligations and responsibility under the contract.
- D.** The KEC shall be fully responsible for providing the Owner with a Lien Release (Waiver) from his subcontractor for any payment the KEC received on behalf of the contract, whether partial or full.
- E.** The KEC shall be fully responsible to the Owner for acts of error and omission by the subcontractor.

1.11 LAWS AND ORDINANCES

- A.** The KEC shall certify that all work and materials comply with Federal, State and local laws, ordinances, and regulations, and is confirmed by the local inspector having jurisdiction.
- B.** Work and materials must be in full accord, and when appropriate, shall be listed with any and all appropriate agencies, including, but not limited to:

 - 1.** Local Health Department
 - 2.** National Board of Fire Underwriters
 - 3.** OSHA
 - 4.** National Sanitation Foundation (NSF)
 - 5.** Underwriter Laboratories (UL)
 - 6.** ASME / ANSI
 - 7.** AGA
 - 8.** NFPA - 96 for exhaust system
 - 9.** ADA requirements
 - 10.** U.S. Public Health Services (Ship Board)
 - 11.** HACCP / NSF Standard 7 Refrigeration Requirements
 - 12.** U.S. Public Health Food and Drug Administration
- C.** All electrically heated or gas-fired, jacketed steam kettles are to meet the codes in 1992 ASME, Section VIII-Division 1, Appendix 19.

- D. The KEC shall check and confirm that specifications and drawings meet all codes of Federal, State and local government bodies. The drawings and specifications shall govern whenever they require larger sizes or higher standards than those required by local agencies and regulations. The regulations shall govern when drawings and specifications call for something less than they required by regulation. The Owner shall be neither held responsible nor incur extra charges related to code compliance. Inman Foodservices Group, the Architect, and the Owner shall determine if extra charges are justified.
- E. All foodservice equipment shall be year 2000 compliment in terms of computers and timers.
- F. Walk-in cooler/freezer assemblies must comply with all applicable sections of the 2009 U.S. Department of Energy (DOE), Energy Independence and Security Act (EISA), Section 312.

1.12 INSURANCE AND BONDS

- A. The Owner reserves the right to request security bonds, performance bonds, or others from the KEC. In the event that the Owner requests such bonds, the KEC will be reimbursed for the cost of the bond. He should include the bond cost as a separate line item in the proposal.
- B. At his own expense, the KEC shall procure and maintain satisfactory public liability and casualty insurance to adequately protect himself and the Owner against damages for personal injury, including death, which may arise from operations under this contract, whether such operations are by himself, his subcontractor, or anyone directly or indirectly employed by him.

1.13 GUARANTEE AND WARRANTY

- A. All equipment furnished by the KEC shall be fully warranted by manufacturer's warrantee for parts and labor for the first year after the acceptance date of the final punch list.
- B. All equipment furnished by the KEC shall be fully guaranteed against defects in workmanship and material for one year after Owner's final punch list acceptance. All repairs and replacements shall be made by the KEC without charge to the Owner. This guarantee period shall commence with the first usage of the equipment, for its intended purpose, after Owner/Inman Foodservices Group's final punch list is completed.
- C. Refrigeration systems and ice makers shall have start-up and one (1) year extended service and five (5) year extended warranty on compressors.
- D. Contractors who do not normally maintain local refrigeration service shall be required to provide the Owner with a refrigeration service policy from a local refrigeration service company that maintains a twelve (12) hour call service and that is acceptable to the Owner for a period of one (1) year and at no expense to the Owner.

1.14 ROYALTIES

The KEC shall pay all royalties and license fees required for his equipment. The KEC agrees to indemnify all parties to this contract from the payment of any royalties, damages, losses, or expenses for suits, claims or otherwise, growing out of alleged infringement of patents, materials, and methods used in the execution of this contract.

1.20 PRIOR INSTALLATION CONDITIONS

1.21 EQUIPMENT ACCESS

The KEC is responsible for verifying all building conditions and coordinating the proper access of large equipment to the building with the GC and/or CM. Any specific items needed for the lifting or movement of large, heavy, or bulky equipment is the full responsibility of the KEC.

1.22 SUBMITTALS, REQUIREMENTS AND APPROVALS

The following information must be submitted to Inman Foodservices Group directly or through Owner's Representative.

A. SHOP DETAILS

1. Shop drawings of all stainless fabricated equipment, which are part of this contract, shall be submitted at 3/4" (1:20) scale. Minimum size shop drawings shall be 18" x 24". Shop drawings submitted smaller than this shall be returned disapproved. All stainless fabrication shall have dimensions, fabrication materials, thickness, detail of construction, installation and method of field joint, especially for large counters. Shop details must indicate reinforcements, methods of anchorage and quality of finishing. Shop detail drawings shall be submitted as follows:
 - a. Reproducible Transparency (which will be returned).
 - a. One (1) set of full size prints.
2. Shop details and all other drawings shall be delivered in a tube for protection. Folded transparencies shall be returned for resubmittal.
3. It is the responsibility of the KEC to verify all field dimensions and incorporate them into shop details.

B. ROUGH-IN DRAWINGS

1. Provide Inman Foodservices Group one (1) print for review.
2. Provide complete floor plans showing sizes and location of all equipment. (Scale shall be 1/4" - 1'-0").
3. Provide complete plans with dimensions showing locations and elevations of all plumbing, electrical and mechanical rough-ins. Use same symbols, connection numbers, and dimensioning system as indicated in Contract Document (scale shall be 1/4" - 1'-0").
4. In the event rough in has been accomplished before the award of the contract, the Kitchen Equipment Contractor shall check existing facility and furnish all equipment to suit building conditions and utilities. No extra charges shall be allowed for utility changes to fit equipment during installation and connection.
5. Drawings shall be prepared on the Kitchen Equipment Contractor's sheets and title block by his employees. Drawings of any part thereof created by photograph, paste-up, or other methods using Inman Foodservices Group drawings and/or details will be returned for resubmittal.

C. SAMPLES

1. Provide all samples of materials requested by Inman Foodservices Group for test purposes or comparisons.
2. Samples used for testing shall not be used on the work without the approval of Inman Foodservices Group.

D. BROCHURES

1. Provide Inman Foodservices Group two (2) complete brochures for review showing each piece of standard manufactured equipment complete with a detail and/or description of the manufacturer's installation recommendations. Provide six (6) copies of brochure after approval.
2. Brochures are to be bound in booklet form and shall include the following:
 - a. A separate flysheet for each component or item of equipment indicating item number, description, quantity, manufacturer, model number, finishes, modifications, options and utility requirements.
 - b. Catalog specification sheet and/or manufacturer's drawing.
3. Provide complete plans showing locations and elevations of all depressions, bases, curtain walls and hoods, and any critical wall dimensions. Use same dimensioning system as indicated in Contract Documents.
(Scale shall be 1/4" - 1'-0")
4. Plumbing, electrical, and mechanical rough-ins all shown on the same sheet will not be accepted.
5. Provide complete details on each piece of stainless-built equipment in plans, elevations, and sections. (Scale shall be 3/4" - 1'-0")
6. Fabrication details must identify all metal gauges, hardware, trim, electrical parts, special fittings, and other components by manufacturer's name and model number.

E. CHECKING

Checking rough-in drawings, shop drawings, details and equipment by Inman Foodservices Group is for design concept only, and does not relieve the Kitchen Equipment Contractor of responsibility for compliance with design drawings, details and specifications, verification of utilities with equipment requirements for conformity and location and verification of all dimensions of equipment building conditions or reasonable adjustments due to deviations.

F. INTERPRETATIONS

1. PLANS AND SPECIFICATIONS

- a. Should it appear that the work intended to be described or any of the matters relative thereto are not sufficiently detailed or explained on the drawings or in the specifications, the Contractors shall apply to Inman Foodservices Group for such drawings or explanations as may be necessary and shall conform to them as far as they shall be consistent with original drawings.
- b. If any question arises regarding the true meaning of the drawings or specifications, reference shall be made to Inman Foodservices Group whose decision shall be conclusive.
- c. In no instance shall a bid be submitted or any work started with any uncertainty.
- d. Before doing any Work or ordering any materials, the Contractor shall verify all measurements of any work and shall be responsible for their correctness. Any differences, which may be found, shall be submitted to Inman Foodservices Group for consideration before proceeding with the work.
- e. Extra compensation will not be allowed because of differences between actual dimensions and measurements indicated on the working drawings.
- f. Where a conflict occurs between or within standards, specifications, codes, ordinances, and working drawings, the more stringent or higher quality requirements shall apply.

G. APPLICABLE DOCUMENTS

1. Bidding Documents, Contract Forms, and related materials issued by Inman Foodservices Group before awarding a contract apply to this section.

1.30 INSTALLATION CONDITIONS

1.31 MANUFACTURER'S INSTALLATION REQUIREMENTS

KEC and his subcontractors must follow and comply with all manufacturer's installation requirements and recommendations, unless otherwise authorized by Inman Foodservices Group or Owner's Representative in writing.

1.32 UNIONS AND TRADES

KEC shall be responsible to verify the conditions of the job, if the project is union. It is the responsibility of KEC to perform work and comply with all union trade requirements. KEC should employ union trade employees to avoid shutdown or misunderstandings on job site. KEC shall be wholly responsible for all trade union relations and fees. At no time shall Owner be liable for delays or claims arising from KEC acts.

1.33 ACCESS AND AUTHORITY

- A. KEC work shall be available at all times for GC, CM, Architect, Inman Foodservices Group and OWNER'S Representative's inspection.
- B. In the event that work performed is not according to the drawings and specifications, the work is subject to rejection by Owner. Owner shall inform KEC in writing and the KEC shall remove all rejected work and comply with the Contract Document.

1.34 PAYMENTS/CHANGE ORDERS

- A. Payment schedule shall be as specified in the instructions to bidder and agreed upon by the Owner.
- B. All requests of payment shall be sent to Inman Foodservices Group through the Owner for approval for payment.
- C. All billings must indicate work performed to the cutoff date, material on hand. All invoices shall be accompanied by Labor and Material Releases (Lien Waiver). It is the full responsibility of the KEC to clear all lien intention or liens filed by his subs.
- D. Prior to payment to KEC, KEC shall provide the Owner's Representative with a written guarantee of subcontractor payment satisfaction.
- E. In the event that change orders are required, all such changes shall be presented to the Owner's Representative through Inman Foodservices Group.

1.35 SCHEDULE & SPECIAL HANDLING

Time is of the essence in this agreement and acceptance constitutes a guarantee that the KEC can and will obtain all materials, equipment and manpower, upon notice to proceed, to permit overall completion of the entire building project on schedule. KEC shall coordinate its work with progress schedule, as prepared and updated periodically by the GC/CM.

- A. Anticipated delays, not within the realm of control of KEC shall be the subject of written notification to the Designer and Architect immediately upon KEC's realization that delays are imminent.
- B. Failure of manufacturers to meet promised delivery dates will not relieve KEC of its obligation to meet schedules, unless KEC can establish, in writing, that orders were received by the manufacturer with reasonable lead times.
- C. Extra charges resulting from special handling or air shipment shall be paid for by the KEC.

1.36 SIGNS AND/OR PUBLICITY

- A. **SIGNS**
No signs or nameplates of any type will be displayed on any part of this work or on or about the Owner's premises unless authorized in writing by the Owner.
- B. **PUBLICITY**
Any publicity giving reference to this project, whether in form of press releases, brochures, photographic coverage or verbal announcement shall be only with the general or specific checking of the Owner, and in all instances shall give due mention of the Designer.

1.37 START-UP DEMONSTRATION AND MANUALS

- A. KEC shall provide factory-trained engineers for start-up and demonstration of equipment. Demonstration shall be done in two stages: one for operation and the second for maintenance personnel.
- B. KEC shall return to the job site within ten (10) days for final adjustment and calibration of equipment in each kitchen or separate facility.
- C. KEC shall furnish three (3) sets of service parts manuals as well as maintenance manuals.
- D. KEC shall prepare, for the Owner, a list of service agencies authorized by the manufacturer to service its equipment. The list should include the name of the person to contact and a telephone number.

PART 2: FOODSERVICE SPECIFIC REQUIREMENTS

2.40 GENERAL EQUIPMENT

2.41 OPERATION REQUIREMENTS

KEC must ensure quiet operation of foodservice and related equipment. KEC must provide sound deadening on all tables, counters and undershelves.

KEC must ensure that bumpers, gaskets, stops, closures, and any other needed protection are installed on all fabricated equipment as needed.

2.42 CONNECTION TERMINALS

All fabricated equipment shall be provided with standard connection terminals to allow contractors on job site to make final connections. In counters requiring multiple circuit and/or voltages, provide and mount the appropriate UL-listed breaker box and make ready for single-point connection.

2.43 HOODS/WALK-IN COOLERS AND DISH MACHINE

- A. KEC must verify size and location of all connections required before fabrication.
- B. KEC shall check job site prior to installation of walk-in cooler to verify proper dimension for all trim pieces. Verification of flooring type and appropriate depression for walk-ins is required.
- C. Provide stainless steel duct collars at ceiling or wall duct connection, where exposed.
- D. KEC shall provide all stainless steel duct connections and collars for exposed ducts.

2.44 INSERT PANS

All cutouts, openings, drawers, or equipment specified or detailed to hold stainless steel insert pans shall be provided with a full compliment of pans as follows:

- A. One (1) stainless steel, 20-gauge (.95 mm) minimum, solid insert pan for each space, 12" x 20" unless specified otherwise, sized per plans, details, or specifications.
- B. Where pan sizes are not indicated in plans, details, or specifications, provide one full-size pan for each opening.
- C. Provide maximum depth pan to suit application and space.
- D. Provide 18-gauge (1.27 mm) removable stainless steel adapter bars where applicable.

2.45 TRAY SLIDES

Before fabrication of counters with tray slides, the K.E.C. shall verify:

- A. Configuration of all corners, turns, and shape of tray slides for proper support and safe guidance of trays.
- B. Size and shape of tray.
- C. Tray slide height to be 34" and meet ADA requirements.

2.46 ENCLOSURES

Provide and install enclosure panels secured or removable for any equipment which houses any equipment with moveable parts, i.e., compressors, pumps, solenoid valves, temperature controls, etc. Also, cover and provide protection for any exposed steam line, refrigeration line or condensate line, which may be within reach of operating personnel.

2.47 SELF-LEVELING DISPENSERS

KEC to verify make of dishware and glassware, dimensions, and weight with Owner/Operator and submit to the dispenser manufacturer so that springs may be properly calibrated.

2.48 WATER FILTER-PURIFIER

- A. K.E.C. shall furnish in-line water filter-purifiers to remove materials, taste, and odor for beverage systems, coffee urns, ice tea brewers, steamers, combi oven and ice makers.
- B. Cartridges shall be accessible securely mounted and easily replaceable.

2.50 ELECTRICAL WORK

2.51 GENERAL REQUIREMENTS

- A. Before ordering equipment, the KEC shall confirm with the serving electric utility, all pertinent electrical requirements such as actual voltages available, number of phases and number of wires in the system.
- B. Electrical work for fabricated equipment shall be completely wired by KEC to a junction or pull box, wholly accessible, mounted on the equipment. Wiring shall be labeled for outlet or item served.
- C. Components and assemblies shall bear the UL label or be approved by the prevailing authority.
- D. Stainless fabricated and standard refrigerator units shall be provided with vapor-tight receptacles, shatterproof lamps and automatic switches. All wiring shall be concealed.

2.52 INTERNAL WIRING OF FIXTURES AND EQUIPMENT

- A. KEC shall be responsible for internal wiring of electrical devices, built into or forming an integral part of fabricated equipment items. Wiring to be in metal conduit to a pull box tagged for intended use. Check with Electrical Engineer for color-coding of wiring.
- B. Each standard item shipped in sections shall be properly connected internally and verified by KEC. Examples: ovens, dishwashers, conveyors, broilers, etc.
- C. Provide dishwashers and conveyors internally wired to junction box or distribution panel as specified, including push button switches, motors, immersion heaters, solenoids, etc.
- D. Where light fixtures are specified or detailed as part of counters or cases of fixtures, light fixtures and lamps shall be provided unless otherwise specified. If fluorescent light fixtures are specified, all ballasts shall be included.

- E.** Wiring for built-in strip heaters or immersion-type elements shall be provided as follows:

 - 1.** In heat zone, shall have UL-approved insulation and be not less than 300 volt rated with nickel wire.
 - 2.** Connection wiring extended in raceway or conduit to junction or pull box shall be not less than 600 volt rated AVA insulation covered wire, UL- approved, or equal.
- F.** Wiring for fabricated refrigerator and freezer cabinets shall be UL-approved, insulated cable from exterior junction box to internal components within insulation, unless code requires metallic conduit:

 - 1.** Conduit shall be Electrical Metallic Tubing, rigid or flexible (Greenfield). For freezer applications, Seal-Tite Flex or approved equal shall be used.
 - 2.** Internal wiring shall be UL-approved rubber covered 600 volt rated conductor except door heaters, which shall be nichrome wire with silicone-braided jacket having resistance of 10.4 watts per lineal foot.
 - 3.** Convenience outlets, lighting receptacles (rubber or porcelain), and door switches shall be mounted in approved boxes. Convenience outlets for evaporators shall be twist-lock type. Solid connections as for freezer evaporators shall be made vapor tight.
- G.** Exposed flexible steel conduit on kitchen equipment shall be neoprene-jacketed "Seal-Tite" conduit equal to Anaconda type "UA" UL-approved, complete with approved liquid-tight connectors on each end, designed to provide electrical grounding continuity.
- H.** Exposed electrical conduit used in kitchen wet area applications, except for flexible connections, shall be rigid galvanized steel. Thin wall conduit (EMT) will not be permitted for wet areas. Exposed outlet boxes shall be liquid-tight with thread hubs.

2.53 CONVENIENCE AND POWER OUTLETS

- A.** KEC shall make cut-outs and install appropriate boxes or outlets in fabricated fixtures complete with wiring conduit, outlet and cover plate. All exposed outlet boxes to all run horizontal with splash our counter above.
- B.** All outlets and plugs shall conform to NEMA standards.
- C.** All electrical outlets and devices shall be first quality "Specification Grade."
- D.** All convenience outlets specified in backsplashes of underbar equipment and counters with sinks shall have G.F.I. style receptacles installed and run horizontal.

2.54 PLUGS AND CORDS

Where cords and plugs are used, they shall comply with National Electrical Manufacturers' Association (NEMA) requirements.

2.55 HEATING EQUIPMENT

- A.** Electric and heating equipment shall be so installed as to be readily cleanable or removable for cleaning.
- B.** Steam-heated stainless-fabricated equipment shall be a self-contained assembly complete with control valves located in an accessible position.

2.56 STARTERS, SWITCHES AND CONTROLS

- A. The KEC shall furnish all starters, motor controls, remote controls and transformers as required.
- B. All switches shall be located out of heat zone.
- C. All electric motors furnished with specified foodservice equipment to be ball bearing motors type TEFC (Totally Enclosed Fan Cooled) with capacitor start.

2.60 PLUMBING WORK

2.61 GENERAL REQUIREMENTS

- A. Before ordering any equipment, the K.E.C. shall confirm with the gas company the type and pressure of cooking gas being provided to the facility.
- B. The K.E.C. shall confirm the building water pressure and provide the necessary pressure reducing valves for proper operating pressures of dishmachine.

2.62 FAUCETS

- A. All sinks and equipment requiring open water supply are to be provided with faucets. All faucets and water fittings that dispense water for drinking or cooking to meet NSF/ANSI Standard 61 - Section 9. Drinking water requirements must bear approval seal.
- B. All vacuum breakers to be provided with chrome stand pipe and goose neck piping.
- C. Faucets are to be the following manufacturer and type. (Approved alternate manufacturers Fisher and Chicago Faucets).

(Refer to item specifications for type required)

- Type 1 T&S No. B-1123 deck mounted 8" O.C. 12" swivel spout.
Fisher No. 3313 – 8" O.C. deck mounted faucet with 12" swing spout.
- Type 2 T&S No. B-1112 deck mounted 4" O.C. 10" swivel spout.
Fisher No. 3512 – 4" O.C. deck mounted faucet with 10" swing spout.
- Type 3 T&S No. B-231 splash mounted, 12" swivel spout.
Fisher No. 13269 – 8" O.C. splash mounted faucet with 12" swing spout.
- Type 4 T&S No. B-290 splash mounted, 12" swivel spout ($\frac{3}{4}$ " pipe connection).
Fisher No. 5414 – 8" O.C. splash mounted faucet, ($\frac{3}{4}$ " pipe connection) with 14" swing spout.
- Type 5 T&S No. B-1141 deck mounted swivel gooseneck.
Fisher No. 3515 – 4" O.C. deck mounted with swivel gooseneck spout.
- Type 6 T&S No. B-207 faucet for cook's table, single fill.
Fisher No. 3010 Single supply faucet, deck mounted.
- Type 7 T&S No. B-123B deck mounted pre-rinse assembly with wall bracket.
Fisher No. 2310-1WB Pre-rinse unit, 8" O.C. deck mounted control valve.

- Type 8 T&S No. B-133B splash mounted pre-rinse assembly with wall bracket.
Fisher No. 113382 Pre-rinse unit, 8" O.C. splash mounted .
- Type 9 T&S No. B-123B pitcher filler faucet with No. B-155 add-on faucet mounted to deck mount control valve with food grade hose and wall bracket.
Fisher No. 93971 Water Station –8" O.C. deck mounted control valve, wall bracket, food grade hose and glass filler valve.
- Type 10 T&S No. B-173 with straight Nozzle 2864-40 in lieu of B-0107 spray valve with B-109-3 wall bracket. Provide with food grade hose and wall bracket.
Fisher No. 11117-WB Water Station – single supply control valve with glass filler valve, wall bracket and food grade hose.
- Type 11 T&S No. B-1225 combination glass and pitcher fill faucet with No. B-325LN deck mount control valve.
Fisher No. 98752 Water Station – 4" O.C. control valve with combination pitcher fill faucet and glass filler head.
- Type 12 T&S No. B-594, 24" double-jointed pot and kettle fill faucet.
Fisher No. 4731 Pot filler faucet – single water inlet, 24" double jointed pot filler spout.
- Type 13 T&S No. B-513 deck mount 4" O.C. faucet base with built-in back flow check valves two (2) T&S No. BVCH3/8 and T&S No. B-101A-36" flexible stainless steel food grade hose with shut-off valve and "B-K" protector flange.
Fisher No. 2805CV & 9159 Water Station – 4" O.C. remote control valve with 60" flexible food grade hose, thru deck fitting, glass filler valve with short squeeze lever.
- Type 14 T&S No. B-102-A 60" flexible food grade hose and pot filler valve with wall bracket No. B-104-D and wall hook No. B-513 deck mount 4" O.C. faucet base with built-in back flow check valves.
Fisher No. 2805CV & 2909 & 2907 Pot Filler Hose with 60" flexible food grade hose, remote dual control valve, wall hook.
- T&S Note: All splash mounted faucets to be provided with two (2) T&S No. 150X wall elbows.
- Fisher Note: All splash mounted faucets to be provided with two (2) Fisher Model 2400-2103 wall elbows.
- Note: Approved alternate on faucets is Chicago Faucets providing they meet the all specifications. Approved alternate must meet the all specifications including food grade hoses on Type 9, 10, 13 and 14.

2.63 DISHERWELLS

Disherwells shown on drawings shall be T&S Model 6678-45 with Model B-2282 / Fisher Model 3041 faucet or as specified.

2.64 WASTES

Unless otherwise specified, sink compartments shall be provided with Fisher 22306 Series or T&S Series B3917-01 rotary type, one quarter turn quick-opening, rough chrome finish, red brass waste having rear wall connected overflow. Over-flow tubing shall be 1-1/4" inch diameter brass tubing, nickel-plated. Waste outlet shall be 2 inch I.P.S. unless otherwise indicated.

2.65 MATERIALS AND WORKMANSHIP

- A.** Piping shall be routed concealed with vertical pipes plumb and horizontal pipes graded to uniform slopes. Adjacent pipes shall be parallel. Plumbing lines shall have threaded ends ready for final connections. Piping passing through finished surfaces shall have chrome-plated escutcheon flanges on exposed sides. Pipe shall be supported with 14 gauge stainless steel brackets, secured to fixture frame, space to provide rigid assembly. Service lines shall be extended to the exterior of fixtures or run in a service chase built into base of fixture. Exposed pipes, valves, fittings and controls shall be chrome-plated or stainless steel.
- B.** Exposed steam pipes and/or hot water pipes shall have a minimum of 1" insulation veneered with 20 gauge stainless steel. Steam heated items shall have factory installed pressure regulators, control valves, safety valves, strainers, thermostatic bucket traps, check valves, and all components necessary for the proper function of the item. Provide pressure gauges where specified or indicated.
- C.** Exposed drain valve handles, control valve handles, and other similar devices shall be recessed into bodies of closed base fixtures or installed under tops of open base fixtures. In no case will unprotected protruding handles or other unprotected plumbing components be acceptable. Valves shall be located in accessible places or hinged door access panels shall be provided of sufficient size to allow easy accessibility to bodies, handwheels, and bonnets. Gate valves shall be used on lines required to be wide open or fully shut-off. Globe valves shall be used on lines requiring flow control. Unions shall be provided in locations that will allow dismantling or servicing of valves, controls, trim, or equipment without removing any main piping.

2.70 UNDERCOUNTER REFRIGERATION

- A.** Refrigerators/Freezers shall be all metal construction with no wood. Outer shell to be constructed with 18 gauge stainless steel and shall be fully welded to form a vapor proof seal. Inner shell to be no less than 20 gauge stainless steel with coved corners pitched to a 1" stainless steel drain fitting welded to the shell. Drain should be located as close as possible to the blower coil.
- B.** Entire compartment shall be insulated with 2" thick approved urethane insulation on all sides, top and bottom. Provide a non-toxic, high-impact plastic breaker strip around the entire cabinet opening perimeter. Provide removable condensate proof heating wire around all freezer doors. A removable vinyl magnetic gasket shall be installed around the full perimeter of cabinet opening for a positive seal. Flush mount a 2" diameter dial thermometer with chrome-plated Bezel in face of cabinet.
- C.** Interior shelving to be stainless steel wire shelves mounted on adjustable clips providing four point support. Shelves shall be easily removable for cleaning. Provide one (1) bottom shelf and one (1) intermediate shelf.
- D.** Doors, if specified, shall be fabricated 1-1/4" thick with approved urethane insulation. Outer shell shall be 18-gauge stainless steel pan type construction with flat sides for edge-mounted hardware secured to internal steel tapping strips in door body. Provide each door with heavy-duty self-closing cam lift hinges. Door to actuate an incandescent shatterproof light. Light to be mounted so as not to interfere with storage space.

- E.** Drawers, if specified, shall be mounted on stainless steel self-closing roller bearing tracks with positive stops. A vinyl magnetic gasket is to be provided around entire perimeter of drawer front for a positive seal. Drawer fronts to be 18 gauge stainless steel construction with urethane insulation. Provide condensate-proof heating wires in cabinet mullion and the entire perimeter of drawer opening.
- F.** Where undercounter refrigerators are specified to have top opening to receive stainless steel pans, the openings shall be die stamped and fitted with a removable stainless steel double pan fully insulated cover with gasket and stainless steel lift handle.

2.80 UNDERCOUNTER REFRIGERATION SYSTEMS

- A.** Evaporator coils for custom fabricated and buyout refrigerator/freezers shall be blower type coils and be installed for accessibility and replacement.
- B.** All temperature controls, expansion valves, sight glass, filter/dryers and solenoid valves are to be installed at the time of manufacturing and mounted for easy adjustment and service.
- C.** Refrigeration circuits shall have automatic expansion valves, dual high-low pressure switches, high-pressure line sight glass and line vibration eliminators.
- D.** Evaporator coils shall have the condensate drain line routed to an indirect waste and/or furnished with a condensate evaporator as specified under Item Specifications.
- E.** Each condensing unit shall have a separate control on/off switch with pilot light and an engraved phenolic plastic identification sign.
- F.** Refrigeration lines are to be Type ACR copper with cast fittings assembled by silver soldering joints. Silver soldering or silver brazing shall be done in presence of nitrogen (oil pumped) in tubing to prevent oxidation and scale formation. Refrigeration system shall be evacuated three (3) times to a pressure of 300 microns maximum and flushed between each evacuation with refrigerant. Refrigeration lines shall be insulated with Armstrong Armaflex insulation.
- G.** Refrigeration systems shall operate on Freon Type R-22 in high and medium temperature applications and Type R-22 / Type 404A in low temperature applications as specified under individual Item Specifications.
- H.** On remote refrigeration systems all refrigeration piping is to be pre-piped at the time of manufacturing and routed to one (1) central location ready for a one (1) point hook-up by the Kitchen Equipment Refrigeration Contractor.
- I.** Refrigeration system shall be properly sized to maintain refrigerated food products at 38 degrees to 40 degrees Fahrenheit and frozen food at 0 to -10 degrees Fahrenheit. Refrigeration systems to meet HACCP requirements of maintaining 40° F. in raised rail cold wells.

2.90 COLD PANS / FROST TOPS

- A.** Interior shall be 16 gauge stainless steel one (1) piece construction with all corners coved on a 3/4" radius pitched to 1" stainless steel drain fitting welded to the shell. Pipe drain line to bottom of cabinet.

- B.** Exposed exteriors shall be 18-gauge stainless steel. Concealed exteriors shall be 18-gauge galvanized steel.
- C.** Entire pan shall be insulated with 2" thick urethane foam. Provide a non-toxic high impact plastic breaker strip around the entire opening to prevent condensation.
- D.** Refrigerated cold pan coils shall be 1/2" O.D. Type K copper tube with wrought copper fittings and silver soldered joints. Space runs of coil at 1-1/2" O.C. parallel to the long axis of the cold pan bottom and solder in place. Runs of coils must be straight and soldered joints must be 1" long equally spaced at 4" O.C. securing the coils to the pan. After the coils are secured to the pan, cover the entire bottom with thermal mastic and apply waterproof covering. Refrigerated cold pans to meet 1997 HACCP/NSF 7 refrigeration requirements.
- E.** Cold pan and frost top units shall have a separate control on/off switch pilot light and an engraved phenolic plastic identification sign.

2.95 VENTILATION OF REFRIGERATED EQUIPMENT

- A.** Adequate air supply and exhaust shall be provided for self-contained refrigeration condensing units, both fabricated and standard, as required for proper operation.
- B.** If, in the opinion of the KEC, additional ventilation is required to ensure correct operating temperatures, he shall so state in a letter to Inman Foodservices Group for evaluation and decision before installation.

PART 3: EXECUTION

3.00 GENERAL INSTALLATION OF EQUIPMENT

3.01 SUPERVISION

An experienced and competent project manager, representing the KEC, shall be assigned to the project during the entire progress of the KEC's work. KEC must provide a full time project manager on site as needed during the installation phase of the project. Project manager to assist the other trades with the coordination of the foodservice equipment installation. Project manager to be full time employed by the KEC.

3.02 TRIMMING AND SEALING EQUIPMENT

- A. Any space between units to walls, ceilings, floors and adjoining units, non-portable shall be completely sealed against entrance of food particles or vermin by means of trim strips, welding, soldering, or commercial joint material suitable to the nature of the equipment and the size of the opening.
- B. Sealer, when not exposed to extreme heat, shall be Silicone Construction Sealant in appropriate color.
- C. Ends of hollow sections shall be closed.
- D. Enclosed fixtures without legs mounted on masonry bases or floor shall be trimmed and sealed watertight to curb base or floor.

3.03 CUTTING AND FITTING

- A. KEC shall do all cutting and fitting required on the equipment by sub-contractors to make their work fit.
- B. Should any repairs to foodservice equipment be required due to neglect of other contractors, all extra charges must be approved and all repairs must be noted in writing before work is performed, stipulating the price and to whom the extra expense is to be paid. In case this KEC does not secure such extra order, the expense shall be borne by him.
- C. No cutting, notching, drilling, or altering of any kind shall be done to the building by any contractor without first obtaining permission from the Architect.

3.04 PROTECTION OF EQUIPMENT

- A. The KEC is responsible, during the progress of the project, to protect all his equipment against theft and/or damage until final acceptance by the Owner.
- B. Pre-fabricated walk-in boxes, on-site and installed in advance of the rest of the equipment, are not to be used for general storage by other trades and should be locked by the KEC before leaving the site. Damage and/or theft resulting from KEC's failure to secure boxes will be repaired/replaced at the KEC's expense.

3.05 EQUIPMENT START-UP/DEMONSTRATION

- A.** Carefully test, adjust and regulate all equipment in accordance with the manufacturer's instructions and certify to the Owner that the installation, adjustments and performance are in full compliance.

3.06 FINAL OBSERVATION

- A.** Final observation shall be made when certified that the K.E.C. has completed his work made a thorough review of the installation/operation of each item in the contract, and further attests that the project is in compliance with the Construction Documents.
- B.** The Owner, Architect, and/or Foodservice Consultant or their assigns shall have access to the foodservice equipment in the "bonded" warehouse and the site of final destination during installation. K.E.C. to correct any errors found during inspection(s) with the greatest possible speed.
- C.** Repetitive Final Observations (more than two) and all costs associated thereto, which may be incurred due to the failure of the K.E.C. to comply with the requirements of the Contract Documents, will be invoiced to the K.E.C. at an hourly rate with addition of travel expense.

PART 4: SPECIFIC CONDITIONS – STAINLESS STEEL FABRICATION

4.00 STAINLESS STEEL FABRICATION

4.01 GENERAL REQUIREMENTS OF FABRICATION

- A. All fabrication shall conform to general acceptance of the foodservice industry.
- B. All fabrication shall meet or exceed National Sanitation Foundation standards including the latest editions and revisions. All custom refrigeration shall meet NSF-7/HAACP.
- C. All items shall meet sanitation requirements of USPHS Foodservice Manual No. 9 and Manual No. 934 for shipboard work and ADA for healthcare work.
- D. It is required that all "fabricated" items of equipment described in the following specifications be manufactured by an N.S.F. fabricator who has the plant, personnel, and engineering facilities to properly design, detail and manufacture the highest quality foodservice equipment. One (1) manufacturer shall manufacture the equipment. The manufacturer of this equipment must be able to show that it has, for the past seven (7) years, been engaged in the manufacturing and distribution of fabricated foodservice equipment as required under the contract, as its principle product.
- E. All stainless fabrication must be done in an approved workmanship like manner to the complete satisfaction of Inman Foodservices Group and Owner.
- F. Upon completion of the stainless fabrication before crating and shipping, digital photos shall be taken of all items specified prior to equipment leaving fabricator's warehouse. Photos must be e-mailed to Jeff Brown at jeff.brown@inman-inc.com with the name of the project in the subject line.

4.02 MATERIALS

- A. **STAINLESS STEEL**
Stainless steel shall be of US Standard gauges as indicated, but not less than 18 gauge unless otherwise. Stainless steel to be 18-8 AISI, Type 304 with hardest worktable temper, No. 4 finish.
- B. **GALVANIZED STEEL**
Galvanized Steel shall be of 14-gauge and shall be electro-galvanized. Galvanized steel shall be used in non-exposed areas, areas that have no contact with food or food serving items and in framework, when used in framework, galvanized steel shall be all welded construction.
- C. **INSULATION MATERIALS**
 - 1. For normal temperature applications, such as fabricated under counter refrigerators, use urethane material 2" (50 mm) thick, bounded at all joints.
 - 2. For heated-type applications, such as plate warmers, use block-type rock wool, minimum 1" (25 mm) thick.
 - 3. For low-temperature applications, such as ice bins, cold pans, or fabricated under counter freezers, use urethane, rigid board, foam or foamed-in-place, not less than 2" (50 mm) thick, except that vertical surfaces of cold pans and ice bins may be 1" (25 mm) thick. Insulation shall be bonded at joints to prevent condensation on exterior.

4. At counter tops subject to heat from cooking equipment and/or refrigeration compressors, use 1" (25 mm) thick John Manville's Martinite 36, or equal, to insulate underside of top. Martinite material shall be added between freezer or refrigerator and 14-gauge (1.98 mm) stainless steel top.

D. LAMINATED PLASTIC

1. Shall be Formica, Wilsonart, Nevamar or approved equal.
2. Shall be veneered with approved waterproof and heatproof cement. Rubber base adhesives are not acceptable.
3. Shall be applied directly over close-grained plywood, such as solid Mahogany or solid Birch, of selected, smooth, sanded stock to ensure a smooth ripple-free laminated surface.
4. If specified plywood is unavailable, submit specifications and samples of alternate material for approval.
5. Exposed faces and edges shall be faced with 1/16" (1.6 mm) thick material. Corresponding backs are to be covered with approved backing and balancing sheet material.

E. SOUND DEADENING

The undersides of all metal tops, drainboards and sinks shall have a hard, dry self curing mastic applied to 1/16" thickness to all surfaces. Exposed mastic will not be acceptable.

4.03 METAL TOP CONSTRUCTION

Metal tops shall be one-piece 14-gauge welded construction, including field joints. Secure to a full perimeter galvanized steel channel from cross-braced not farther than 30" (760 mm) on center. Fasten top with stud bolts or tack welds. Underside of tops shall be coated with a minimum 1/16" (1.6 mm) thick approved hard-drying, sound-deadening, and mastic material. Apply by spreading after top has been secured to frame, such that top and frame are covered and sealed.

4.04 ENCLOSED CABINET BASES

Bases shall be fabricated from not less than 18-gauge (1.27 mm) steel reinforced by forming the metal ends and shelves. Partitions shall be all of stainless steel. The ends and vertical partitions can be of single wall construction, with a 2" (50 mm) face, all through partitions and sides must be welded in the intersection and flush with the bottom.

Unexposed backs and structural members may be constructed of galvanized steel. Intermediate shelves shall be removable, except the bottom shelf when the cabinet is on legs. When the cabinet is on a masonry base, the bottom shelf shall be removable to allow access for cleaning.

4.05 LEGS AND CROSSRAILS

- A. Legs and Crossrailings shall be of 1-5/8" (41 mm), 16-gauge (1.59 mm) stainless steel tubing. All crossrails shall be continuously welded, grounded and polished. Tack welds or other methods of connection are not acceptable. Bottoms of legs shall be wedged inward and fitted with a stainless steel bullet-type foot with not less than 2" adjustment. Freestanding legs shall be pegged to floor with 1/4" (6 mm) stainless steel rod.
- B. Stainless steel gusset shall be not less than 3" (76 mm) diameter at top and 3-3/4" (95 mm) long. Outer shell 16-gauge (1.59 mm) stainless steel reinforced with 12-gauge (2.78 mm) mild steel insert welded interior shell. Gusset shall be large enough to accommodate 1-5/8" (41 mm) tub with provision for Allen screw fastener.

- C. Low counter leg shall be constructed of stainless steel exterior of 5-3/4" (146 mm) minimum height or 7" (178 mm) maximum height with 3-1/2" (89 mm) square plate with four countersunk holes, welded to the top for fastening.
- D. Adjustable foot shall be constructed of stainless steel 1-1/2" (38 mm) diameter tapered at the bottom to 1" (25 mm) diameter, fitted with threaded cold rolled rod for minimum 1-1/2" (38 mm) x 3/4" (19 mm) threaded bushing plug welded to legs. Push-in foot not acceptable.
- E. When legs are fastened to equipment, the following methods should be used:
 - 1. **SINKS:** reinforced with bushings and set screws.
 - 2. **METAL TOP TABLE** or **DISHTABLE:** to be welded to galvanized steel frame of 14-gauge or more and secured to the top with screws through slotted holes.
 - 3. **WOOD TOP:** a welded stainless steel channel of not less than 14-gauge (1.98 mm), secured to the top with screws through slotted holes.

4.06 **SHELVES**

When shelves are part of the fixture, the following shall take place:

- A. Open base type shelf shall be notched around the leg and continuously welded to the leg.
- B. Cabinet base type shelf shall be turned-up on the backside a minimum of 1/4" (6 mm) radius and further slightly to ensure a tight fit to enclosure panels.

4.07 **SINKS, STEAM TABLES AND BAIN MARIES**

- A. When multiple compartments are part of the design, they shall be continuous on the exterior without applied facing strips or panels. Bottoms of each compartment shall be creased such as to endure complete drainage to waste opening.
- B. Partitions between compartments shall be double thickness continuous and welded.
- C. Where sink bowls are exposed, the exterior shall be polished to a Number 4 finish.
- D. Fabrication shall furnish and install drains, wastes and faucets. They shall be as follows or equal:
 - 1. Waste to be Kenco Model DA-51 with 3-1/2" (89 mm) basket and connected overflow.
 - 2. Drains shall be Fisher Model 22306 rotary-type waste without connected overflow. Valve to be 2" (50 mm) chrome-plated.
 - 3. Water pan for bain maries shall be fitted with 2" (50 mm) waste with basket strainer with connected overflow and adapter to connect to 1-1/2" (38 mm) drain line. Use Klein box pattern basket, drain number 4161-CP with 458-X overflow head.
 - 4. Furnish faucets for all sinks, bain maries, water stations and other fixtures. Water stations shall have gooseneck water faucet.

4.08 **OTHER FABRICATED COMPONENTS**

A. **CASTERS**

- 1. Shall be heavy-duty type, ball-bearing, and solid or disc wheel with non-marking greaseproof rubber, neoprene or polyurethane tire.
- 2. Wheels to be 5" (127 mm) diameter, minimum width of tread 1-3/16" (30 mm), with a minimum capacity per caster of 250 lbs. (113.4 kg).
- 3. Solid material wheels to be provided with stainless steel rotating wheel guards.

4. To be sanitary, have sealed wheel and swivel bearings and polished plated finish (per NSF).

B. DOORS

1. Metal doors shall be double-cased stainless steel. Other pans shall be 18-gauge (1.27 mm) stainless steel with corners welded, ground smooth, and polished. Inner pan shall be 20-gauge (.95 mm) stainless steel fitted tightly into outer pan with a sound-deadening material such as Celotex or Styrofoam used as a core. The two pans shall be tack-welded together and joints solder-filled. Doors shall finish approximately 3/4" (19 mm) thick, and be fitted with flush recessed type stainless steel door pulls.
2. Sliding doors shall be mounted on large, quiet ball bearing rollers in 14-gauge (1.98 mm) stainless steel overhead tracks and be removable without the use of tools. Bottom of cabinet shall have stainless steel guide-pins and not channel tracks for doors.
3. Wood doors shall be fabricated as detailed. If Formica or other plastic surfaces are used, all sides must be laminated.
4. Hinged doors shall be mounted on heavy-duty, NSF-approved hinges, or as noted on plans or specifications.

C. HARDWARE

1. Shall be solid, heavy-duty type.
2. Door hardware shall be locking type, keyed and master keyed.
3. Shall be identified with manufacturer's name and number so that broken or worn parts may be replaced.
4. Submit samples for approval, when requested.
5. Pulls when specified shall be Klein Hardware, or equal.

D. DRAWER ASSEMBLIES

1. Assemblies shall consist of removable drawer body mounted in a ball bearing slide assembly and padlock assembly.
2. Slide assembly consists of one pair of roller bearing extension slides with side and back enclosure panels, front spacer angle, two drawer carrier angles secured to slides and stainless steel front.
3. Slides are to be Model No. 3320-22 (250 lb. capacity) (113.4 kg) made by Grant Pulley and Hardware Co., or equal.
4. Drawer bodies for general storage are to be 20" x 20" (508 mm x 508 mm) with Royalite containers are manufactured by United States Rubber Co.
5. Drawers intended to hold food products should be removable type with 12" x 20" (305 mm x 508 mm) stainless steel assembly.
6. Drawer fronts are double cased, 3/4" (19 mm) thick, with 18-gauge (1.27 mm) stainless steel welded and polished front pan. Stainless steel back pan is tightly fitted and tack welded. Sound deaden with rigid insulation. Provide drawer pull per Detail KD-1.3 on all stainless fabricated drawers, both dry and refrigerated.
7. All drawers shall be provided with replaceable soft neoprene stem bumpers or, for refrigerated drawers, a full perimeter soft gasket.

E. ICE BINS / PANS

All ice bins, ice pans, refrigerated cold pans and frost tops shall be provided with breaker strips where adjoining top or cabinet face materials meet to insulate and prevent condensation from forming.

4.09 **FABRICATION WORKMANSHIP**

All stainless fabrication must be done in an approved workmanship like manner to the complete satisfaction of Inman Foodservices Group and Owner.

A. **WELDING AND SOLDERING**

1. Materials 18-gauge (1.27 mm) or heavier, shall be welded.
2. Seams and joints shall be shop-welded or soldered as the nature of the material may require.
3. Welds must be ground smooth and polished to match original finish.
4. Where galvanizing has been burned off, the weld shall be cleaned and touched up with high-grade aluminum paint.

B. **FASTENERS AND JOINTS**

The following will not be accepted:

1. Exposed screw or bolt heads.
2. Rivets.
3. Butt joints made by rivetting straps under seams and then filled with solder.

C. **ROLLED EDGES**

Rolled edges shall be as detailed, with corners bullnosed, ground and polished with no sharp edges.

D. **COVED CORNERS**

All stainless steel foodservice equipment shall have 1/2" (13 mm) or larger radius coves in all horizontal and vertical corners and intersections per NSF standards.

E. **CLOSURES**

Where ends of fixtures, splashbacks, shelves, etc., are open, fill by forming the metal, or weld sections, if necessary, to close entire opening flush to walls or adjoining fixtures.

- F. KEC shall make cut-outs and install appropriate boxes or outlets in fabricated fixtures complete with wiring conduit, outlet and cover plate. All exposed outlet boxes to all run horizontal with splash our counter above.

PART 5: SPECIFIC CONDITIONS - WALK-IN COOLER/FREEZER ASSEMBLIES

5.01 WALK-IN COOLER/FREEZER COMPONENTS

A. WORK INCLUDED

1. Kitchen Equipment Contractor to furnish all labor, materials and service necessary for the fabrication and installation of the cooler/freezer assemblies in the size and shape as per the plans and specifications.
2. All prefabricated cooler/freezer assemblies shall be manufactured by one manufacturer and installed by one installer.
3. The equipment shall be delivered and installed on schedule by factory supervised and approved installer. The Kitchen Equipment Contractor shall be responsible for coordinating the work with the General Contractor and other trades as necessary.
4. Refer to the Item Specifications for individual item requirements.
5. The Kitchen Equipment Contractor shall be responsible for coordinating the timely installation of the wearing floors inside the cooler/freezer assemblies with the General Contractor to prevent damage of the exposed insulated floor panels.
6. During installation, curing and cleaning of the wearing floors inside the cooler/freezer assemblies, the room doors shall be left open and the rooms power ventilated to prevent damage to the interior surfaces. "Danger Keep Out" signs shall be posted at each open door.
7. The Kitchen Equipment Contractor shall be responsible to ensure that the cooler/freezer assemblies are not used by any other trade for storage or work areas. The Kitchen Equipment Contractor shall repair or replace any damaged areas on the interior or exterior of the cooler/freezer assemblies, if the damage was caused due to the cooler/freezer assemblies being used for storage or work areas.
8. The Kitchen Equipment Contractor shall notify the general contractor in writing if, in his opinion, the job site is not adequate to insure proper installation of the cold storage rooms. Notification shall be in writing with sufficient time to effect corrective measures to meet the installation schedule.
9. Cooler/freezer assemblies shall be cleaned and ready for operation at the time the building is turned over to the Owner.

B. WORK INCLUDED

1. Doors and finish hardware.
2. Light fixtures and switches.
3. Temperature alarm systems.
4. Exterior thermometers.
5. Built-in place floor insulation.
6. Wall, corner, partition, "T" and ceiling panels.
7. Closure panels and finish trim.
8. Interior and exterior wall protection
9. Corner guards
10. Pressure relief vents.
11. Utility penetrations and escutcheons.
12. Coil supports.
13. Low-temperature door fan switches.
14. Shop drawings (minimum size 18" x 24").
15. Field dimensions before fabrication.
16. Factory supervised and approved installation.

17. Installation complete including without limitation, enclosure panels, trim, caulking and sealing ready for final utility connections by others.
18. Refrigeration systems and refrigeration piping.

C. WORK NOT INCLUDED

1. Installation of fluorescent light fixtures furnished loose by Kitchen Equipment Contractor.
2. Electrical service for and connection and interconnection of lights, switches, door heaters, temperature alarms and door fan switches.
3. The Electrician shall furnish and install conduit in cooperation with the Kitchen Equipment Contractor. All conduit shall be installed on the exterior ceiling of the prefabricated cold storage rooms and shall penetrate the ceiling at a point where it can drop directly to the point of connection on the component on the interior. The Electrician shall furnish and install nipples and EYS seal off at each point the conduit penetrates the panel. The holes shall be minimum size, sealed and trimmed.
4. Floor sinks, hub drains and funnel floor drains.
5. Sub-floor, floor depressions, building walls and ceilings and related building work.
6. Sub-floor water proofing as per detail.
7. Wearing floor and coved base as specified under individual item requirements.
8. Exterior grout and coved base.

D. MATERIALS

1. Wall, ceiling and floor sections insulation shall be 4" thick, non-burning urethane foamed or frothed in place to inner surface of metal pans.
2. Insulation shall have a thermal conductivity (K-factor) not to exceed (0.12 BTU/hour/square foot/F°) as tested on ASTM C-177, at 75° F. (24° C.) mean temperature and an overall coefficient of heat transfer factor (U) not to exceed 0.029.
3. Insulation shall be rated as self-extinguishing and fire retardant type. Flammability characteristics per ASTM E-84 shall be less than 15-flame spread and less than 450 smoke density, in accordance with U.B.C. Section 1717.
4. Insulation shall meet and comply with the 1989 Montreal Protocol Agreement for reduced CFC content.
5. Every panel shall be UL and NSF approved, and bear a certifying label.
6. Assemblies must comply with all applicable sections of the 2009 U.S. Department of Energy (DOE), Energy Independence and Security Act (EISA), Section 312.

E. PANEL CONSTRUCTION

1. Cooler wall and ceiling panels shall have a thermal resistance (R-Factor) equal to or greater than R-25. Freezer wall and ceiling panels shall have a thermal resistance (R-Factor) equal to or greater than R-32. Floor panels shall have a thermal resistance (R-Factor) equal to or greater than R-28.
2. Panels shall consist of precision die-formed metal pans with 1/2" to 3/4" flanged perimeters and urethane insulation between interior and exterior pans, each thoroughly checked for gauge and accuracy. Panels shall be of same size wherever possible, and shall be interchangeable with panels of like sizes. Metal pans shall be treated on the inside with a preparation coating of bonding agent to ensure a stable adhesion with the chemical bonding capabilities of the urethane insulation.
3. Wall and ceiling panels shall be 4" thick and shall not have any internal wood or metal structural members. To ensure tight fitting joints, all panel edges shall have urethane tongues and grooves, and a flexible vinyl gasket secured in place on the interior and exterior of all edges.

4. Panels shall be rigidly coupled by a cam action hooked locking device. Locking device shall be secured in place 48" on center, maximum. Locking device shall be accessible from the inside to facilitate installation in confined areas, and shall be provided with press-fit caps to close wrench holes. Joints between panels shall be sealed at interior and exterior edges with a PVC gasket, or an odorless, nontoxic, synthetic polymerized sealant to maintain continuity.
 - a. Wall panels shall have a minimum of three (3) locking devices between each panel, located in the center, lower corner and upper corner. Locks shall be able to withstand a 1,400-pounds tension load.
 - b. Ceiling panels shall have a minimum of two (2) locking devices between ceiling panel and at wall panels. Locking devices to be located at each corner of the wall panel.
 - c. Prefabricated floor panel shall have a minimum of two (2) locking devices between each floor panel and at wall panels. Locking devices to be located at each corner of the wall panel.
5. Overall size/shape shall be exactly as indicated on drawings, with an interior ceiling height of 8'-0" measured from top of finished floor to bottom of ceiling panels, unless specified otherwise under the individual item.
6. Panel skin material/finish on interior and exterior exposed surfaces shall not be less than 0.040" thick stucco embossed aluminum. Provide panels with two (2) coats of baked-on polyester white enamel paint. Stucco embossed aluminum with painted surfaces shall not be less than .032" thick.
7. Wall protection panels, when specified, shall be fiberglass-reinforced polyester (FRP-X), paneling 3/32" thick, embossed white color with low smoke, and less than 25 flame spread rating.
8. All interior vertical corners shall be coved with an NSF, 1/2" radius.
9. Exterior panels, interior partitions, corner panels, ceiling panels and "T" intersection panels shall be matching construction.
10. Where the floor is depressed or floorless, walls shall be anchored to the building floor with a concealed, 18-gauge galvanized steel floor track with drive pins 2'-0" on center, and sealed at interior and exterior edges with a bead of sealant.
11. Ceiling panels shall have a maximum deflection of 1/240 of the span under uniform loading of twenty (20) pounds per square foot. When the ceiling panels require a support system, the manufacturer shall submit details and structural calculations to an engineer for approval prior to fabrication. A copy of the approved submittal shall be forwarded to Owner and Systems Design International.
12. An indoor roof panel support system, when required, shall be furnished and installed using a hanger wire network attached to hanger brackets, designed to engage with the female lock pins embedded within the roof panel foam core, spaced 4'-0" on center.

F. FLOOR TYPES AND CONDITIONS

Where specified, provide the following:

1. TYPE 1 - FLOORLESS ASSEMBLY

- a. The floor shall be constructed at the job site in a depressed slab. The depression shall be level and square.
- b. Walk-in wall panels shall extend down into the bottom of the depression. General Contractor to provide two (2), 2" thick layers of rigid urethane foam board with staggered joints in depression over 6 mil polyethylene sheet vapor barrier.
- c. On top of floor insulation, provide a protective covering of 15 pounds felt. Overlap joints 6", flash up sides to height of wall base.

- d. Finished floor outside the walk-in cooler/freezer should ramp up ½" to the floor inside. The finished floor shall be ramped where shown on drawings by the general contractor.
- e. General Contractor to provide metal lath, concrete setting bed, slab urethane, quarry tile floor, wall base, ramp and black grout.

2. TYPE 2 - RECESSED PREFABRICATED FLOOR ASSEMBLY

- a. The floor shall be prefabricated, metal clad, rigid, insulated panels. Floor panel construction and insulation to match that for wall and ceiling panels. Floor panels shall be fully covered with minimum 1/2" radius.
- b. Floor panels to be set in a depressed slab. The depression shall be level and square.
- c. Finished quarry tile floor outside the walk-in cooler/freezer assembly should ramp up approximately ½" to the floor surface inside the cooler/freezer. The finished floor shall be ramped-up where shown on drawing by the general contractor.
- d. General Contractor to provide slab depression, leveling sand, concrete setting bed, quarry tile floor, wall base, ramp and black grout.

3. TYPE 3 - PREFABRICATED FLOOR ASSEMBLY ON SLAB

- a. For general duty, 16-gauge stainless steel, unless specified otherwise. Provide 4" wide x 6" long, nonskid adhesive strips on 6" centers in traffic aisles, as manufactured by 3-M Company. Installed as per the manufacturer's instructions.
- b. For heavy-duty usage (mobile equipment, dunnage racks, beer kegs) provide 18-gauge galvanized iron, and 3/16" thick diamond pattern aluminum tread plate for the wearing surface. Tread plates shall be maximum size sheets available, covered up at wall 5" high, with top beveled at 45°. Where tread plates join, allow 1/8" to 3/16" space, and seal with gray silicone sealant. Tread plate is to be installed over a full bed of Dow #11, or equal, and fastened with stainless steel flush counter sunk screws.
- c. Exterior bottom face of floor shall be clad with galvanized steel.
- d. Section lock parts, joints between floor panels, and floor and wall panels shall be filled with silicone sealant.
- e. Interior ramps with non-slip treads shall be furnished, where indicated on drawings.
- f. Exterior ramps to be quarry tile with setting bed and shall be furnished and installed by the general contractor where indicated on drawings.

4. TYPE 4 – RECESSED PREFABRICATED FLOOR ASSEMBLY

- a. 16-Gauge stainless steel, unless specified otherwise. Provide 4" wide x 6" long, nonskid adhesive strips on 6" centers in traffic aisles, as manufactured by 3-M Company. Installed as per the manufacturer's instructions.
- b. For heavy-duty usage (mobile equipment, dunnage racks, beer kegs) provide 18-gauge galvanized iron, and 3/16" thick diamond pattern aluminum tread plate for the wearing surface. Tread plates shall be maximum size sheets available, covered up at wall 5" high, with top leveled at 45°. Where tread plates join, allow 1/8" to 3/16" space, and seal with gray silicone sealant. Tread plate is to be installed over a full bed of Dow #11, or equal, and fastened with stainless steel flush counter sunk screws.
- c. Floor panels to be set in a depressed slab. The depression shall be level and square.
- d. Exterior bottom face of floor shall be clad with galvanized steel.
- e. Section lock parts, joints between floor panels, and floor and wall panels shall be filled with silicone sealant.

- f. Finished floor outside the walk-in cooler/freezer should ramp up ½" to the floor inside. The finished floor shall be ramped-up where shown on drawing by the General Contractor.
- g. General Contractor to provide slab depression, leveling sand, and concrete setting bed, quarry tile floor, wall base, ramp and black grout.

G. DOORS

- 1. Door locations and sizes shall be exactly as shown on drawings, and as specified under the individual item. Doors shall be self-closing with cam hinges that will remain open when opened over 120°.
- 2. Doors shall be flush type, and finished in and out to match the adjacent panel finish in which they are located.
- 3. Doors shall be equipped with extruded polyvinyl chloride magnetic gaskets with vulcanized corners with continuous magnetic core.
- 4. Door frames header and door legs shall be 18-gauge stainless steel interior and exterior.
- 5. Furnish and install a removable threshold at each low temperature door, constructed of 1/8" thick stainless steel with #2B finish.
- 6. Provide a heating element on the ambient side of each door head, with replaceable jambs and threshold. The heating element shall be a dual 120-volt, 240-watt with thermostatic control, factory pre-wired to a "GS" splice box located above the door on the interior. Manufacturer shall provide a 1-1/4" diameter hole in the ceiling panel with a loose escutcheon through which the Electrician shall make a final connection.
- 7. Sill wipers for Type 1 floors shall be adjustable, extruded neoprene secured by removable stainless steel retainer strip fasteners.
- 8. Each hinged door shall have the following:
 - a. Kick plate of 14-gauge stainless steel, 3'-0" high and full width of door, and shall be mounted on the interior and exterior face of each door.
 - b. Hinges, three (3) per each door, shall be Kason Model 1256 cam lift, zinc die-cast and polished chrome plated.
 - c. Latch shall be Kason Model 27C, heavy-duty polished chrome plated finish with adjustable keeper, interior safety release and provisions for padlocking. Padlock by Owner.
 - d. Standard door closer shall be International Door Closer Model 1852-AL with hold open feature and aluminum finish.
 - e. Hardware shall be mounted with 12-gauge, reinforced steel tapping plates and machine screws.
 - f. Heated viewport approximately 14" wide by 23" high, minimum triple thermopane glass. Viewport wiring to be concealed within door and out top of door, complete with flex cable to recessed splice box within door section.
 - g. Provide door with 12" x 2" engraved phenolic plastic compartment identification sign in Architect's color selection with 1" letters, mounted above door window. Refer to item specification for appropriate signage.
 - h. Door section shall be self-supporting, constructed similar to wall panels, with 4" urethane core and 12-gauge steel reinforcing. No wood frame will be permitted. Jambs and headers shall be 18-gauge stainless steel with backing in full perimeter.
 - i. Provide stainless steel finished cylinder lock for each door.
- 9. Door Fan Switch
 - a. A door fan switch shall be provided for each low-temperature freezer assembly when it opens into a non-refrigerated area, to shut-off evaporator coil fan motors when the door is opened.

- b. Door fan switch shall be factory mounted on the door jamb, and pre-wired with rigid conduit and wiring within the wall panel to a splice box located on the interior near the ceiling. Manufacturer shall provide a 1-1/4" hole in ceiling panel with a loose escutcheon, through which the Electrician shall make interconnection to the evaporator coil(s) fan motors.

NOTE:

All electrical components shall be provided with conduit, splice boxes, switches, fittings, etc., concealed within the insulated panels at time insulation is in place. Conduit shall extend up within wall panels, through ceiling panels ready for EYS fittings and final connection by the Electrician.

H. LIGHT FIXTURES AND SWITCHES

1. Quantity of light fixtures shall be as indicated on drawings
2. Provide low-temperature LED fluorescent light fixtures where shown on electrical drawing. Fixtures to have control switches. Provide 4'-0" long LED lighting as manufactured by Kason Industries, Model No. 1810LED. Bulbs to be enclosed in a protective plastic housing. Lights to be surface mounted where shown on plan by KEC, and connected by Electrical Contractor in field.
3. Light switches shall be an AC, pre-switch, mounted in recessed "FS" boxed with gray Hypolan, weatherproof plate and press switch cover, and unbreakable red plastic pilot light lens constant burning on interior and indicating on exterior.
4. Walk-in cooler/freezer assemblies with doors at each end shall have three-way switches on the exterior, and four-way on the interior.
5. Light switches shall be factory mounted on the latch side of doors, and pre-wired with rigid conduit and wiring run within the wall panel, terminated in a vapor-tight splice box mounted on the interior wall near ceiling. Manufacturer shall provide a 1-1/4" diameter hole in ceiling panel with a loose escutcheon through which the Electrician shall make final connections.
6. Alternate light fixtures, as specified under individual item:
 - a. When ceiling mounted light fixtures can not be used, the following light fixture shall be used: a Standard Keil Model 2310-4024-1000 vapor-proof with cast aluminum junction box and fixture body, gasket, plastic coated globe, wire guard, and sized to receive one (1) 100 watt bulb.
 - b. When the light fixture is mounted in the door section wall panel, it shall be factory mounted and pre-wired to the switch with galvanized steel nipple terminated at exterior face of the ceiling panel.
 - c. When the light fixture is to be mounted at locations other than the door section wall panel, it shall be furnished loose for installation and wiring by the Electrical Contractor in the field.

I. THERMOMETERS AND ALARMS

1. All walk-in cooler/freezer assemblies shall be furnished with a 2-1/2" diameter, calibrated, NSF listed, chrome-plated, flush-mounted dial thermometer. Thermometer shall be located, as detailed, on doorframe unless specified otherwise. All thermometers to be furnished with 8" capillary tubing. Extend tubing from exterior front of the assembly, to an interior mounting position of the sensor bulb and securely attach to panel.
2. When specified, temperature alarm systems shall be connected to building security system by the Electrical Contractor.

J. CLOSURE PANELS AND TRIM

1. Closure panels shall be furnished and installed to close the space between the exterior top of the walk-in cooler/freezer assembly, and the finished ceiling of the building.
2. Panels to match exterior panel finish. Panels to be lift-out type, with sides turned in to form a pan. At ceilings, securely fasten a channel at face of cooler/freezer assembly, and securely fasten an angle for panels to slip into. Channel and angle material to match panel material.
3. When exterior finish is FRP-X, the closure panel shall be white stucco aluminum.
4. When the area does not have a finished ceiling, closure panels shall not be required, unless specified otherwise or required by the governing Health Department.
5. Vertical trim strips and angle trim to match cooler/freezer assembly's exterior finish. Trim to be applied with adhesive tape, and a minimum of exposed fasteners to fully seal walk-in cooler/freezer to adjacent walls, etc.
6. When FRP-X paneling is specified, it shall be furnished with a "J" end cap molding, and is to be extended past the end of the walk-in cooler/freezer assembly wall to the building wall, and caulked with a bed of silicone, as required.

K. COIL SUPPORTS

1. Coil support rods are to be of 1/2" diameter threaded nylon, with plated steel nuts and washers for support of the evaporator coils. Bracing and rods shall be furnished by the KEC, penetrations shall be sealed and trimmed with escutcheon plates.

L. UTILITY PENETRATIONS

1. Provide openings in ceiling and wall panels to accommodate all electrical, refrigeration and drain lines.
2. KEC shall seal all openings with silicone after lines have been run, and before installation of escutcheons.
3. Provide sufficient quantity of 5" diameter, blank stainless steel escutcheons to trim all interior and exposed exterior penetrations.
4. KEC shall be responsible for cutting proper size hole in blanks and panel penetrations.

M. PRESSURE RELIEF VENT

1. Pressure relief vent shall be factory installed at each low-temperature freezer assembly room door.
2. Pressure relief vent shall be electrically heated, 120 volt, and have aluminum screen.

N. CORNER GUARDS

1. Corner guards on the exterior outside corners shall be 4" x 4" x 42", 16-gauge stainless steel, secured to wall panels with a full bed of contact adhesive. FRP-X corner molding shall be omitted behind the corner guard.
2. Corner guards on the interior outside corners shall be 2" x 2" by height of wainscot, or 48", 18-gauge stainless steel, secured to wall panels with a full bed of contact adhesive. FRP-X outside corner molding shall be omitted behind corner guards.

O. RUB RAILS

1. Rub rails, when specified, shall be continuous lengths of angled, self-draining extruded aluminum type BA3300 with black, non-marking vinyl bumpers, Series 3300, as manufactured by Boston Retail Products of Medford, Massachusetts. Secure rub rails with stainless steel fasteners 18" on center. Height of rub rail if single row 36" AFF. Height of double row shall be 18" AFF and at 36" AFF.

P. STRIP DOORS

1. Strip curtains shall be provided for all doors.
2. Strip door, when specified, shall be the Maximus System as manufactured by Aleco of Tuscumbia, Alabama. Provide with clear curtains.

Q. DOOR LOCKING BARS

1. Door locking bars, when specified, shall be 1/8" x 2" stainless steel two-piece hinged and secured at each end with interior safety release. Bar shall swivel, and where they meet in the center, shall have a 2' long, 90 "L" drilled to receive padlock. Padlock by others.
2. When a door-locking bar is specified, the latch specified in paragraph G-8C shall be provided.

R. PARTITION WITH GATE

1. Partition with gate, when specified, shall be aluminum expand-x where indicated on drawing.
2. Panel mesh shall be flattened aluminum expand-x heliarc welded to aluminum frame.
3. Frame shall be 1-1/2" by 1-1/2" x 1-1/8" aluminum 6061-T6 angle. Frame shall have a 3" space at bottom, and 6" space at top.
4. Horizontal stiffeners shall be 1-1/2" x 1-1/2" x 1-1/8" aluminum angle.
5. Floor plates shall be 3" x 3" x 1/4" aluminum heliarc welded to angle posts.
6. Gate shall be of same construction as divider, 2'-10" wide with locks similar to that specified for insulated doors.

S. EVAPORATOR COILS

Coils shall be direct expansion type of size and design to provide specified temperature and humidity to suit the application or intent as specified.

KEC to hang evaporator coil tight to ceiling with proper clearance to adjacent walls to meet manufacturers criteria or proper airflow and circulation. Fan and/or blower motors to have thermal overload protection.

Cooler evaporating coils shall be low-profile UL/NSF as manufactured by Bohn or equal, with in-line fans, cross-fin staggered copper tubing/aluminum fin coils, aluminum case, heavy duty motors, permanently lubricated, pre-wired waterproof electric system wired to single connection, and slotted channel hangers.

1. 33° To 34° temperature coils to have off cycle air defrost controlled by time clock mounted in compressor rack.
2. 34° And higher temperature coils to have off cycle air defrost controlled by pressure from the compressor.

Freezer evaporating coils shall be low-profile UL/NSF as manufactured by Bohn or equal, with in-line fans, cross-fin staggered copper tubing/aluminum fin coils, aluminum case, heavy duty motors, permanently lubricated, electric defrosting system, pre-wired waterproof electric system, and slotted channel hangers.

1. 32° And lower temperature coils to have electric defrost controlled by time clock mounted in compressor rack.

Location of coils shall be as per Consultant's plans and shall be coordinated by the KEC with shelving location and floor sink locations. All evaporator coils to be provided with factory mounted vapor proof on/off electrical disconnect switch with pilot switch.

T. COMPRESSOR RACKS

Compressor racks shall be located as indicated on the Consultants/Architects plans and secured in-place with phillips red head anchors.

Racks to be constructed out of heavy duty all welded steel framework with rigid structural channels welded together so as to provide adequate support for all refrigeration components. Provide racks with 2,000 lbs. lift rings at top corners of rack. All systems shall be located in a full enclosure with service access door. Rack shall be equipped with one (1) pre-wired duplex outlet. Control panel housing to be NEMA-4 enclosure.

U. REFRIGERANTS

Refrigerants shall be as specified under the item specification and be in compliance with the 1989 Montreal Protocol (Clean Air Act).

V. MOTORS AND CONTACTORS

All single phase motors shall be type TEFC ball bearing with internally wired contactors with built-in thermal overload protection.

All three-phase motors shall be type TEFC ball bearing with magnetic type contactors with built-in thermal overload protection. Compressor motor starters shall be definite purpose style with manual reset.

All motors shall be mounted to provide a quiet operation. All rotating parts to be carefully balanced for minimum vibration with sealed self-lubrication.

W. COMPONENTS AND ACCESSORIES

1. Cooler control panels shall be pre-wired assemblies with magnetic starters, condensing unit circuit breakers, dual pressure controls, suction line pressure gauges, liquid line pressure gauges, and timers.
2. Freezer timers shall be time-activated, pressure terminated type with 36 to 110 pounds adjustable range, 40 ampere rated switches, heavy-duty self-starting motors, and 1 to 6 cycle per day defrost frequency range.
3. Cooler timers shall be time-activated, time-terminated type with adjustable 1 to 6 cycle per day, adjustable 4 to 110 minutes defrost duration, 40 ampere switches, and heavy-duty synchronous industrial type motors.
4. Refrigerant circuits shall have liquid line site glasses, suction line site glasses, liquid line vibration eliminators, suction line vibration eliminators, filter dryers, automatic expansion valves, room thermostats interlocked with liquid line solenoid valves, and heat exchangers.
5. Refrigerant lines shall be type ACR copper tubing with wrought copper fittings assembled by silver soldering joints. Silver soldering or silver brazing shall be done in presence of nitrogen (oil-pumped) in tubing to prevent oxidation and scale formation. Refrigerant systems shall be evacuated three times to a pressure of 500 microns maximum, and flushed between each evacuation with refrigerant.
6. Refrigerant line supports shall be 1/2" diameter hanger rods, hinged pipe hangers or support channels. Grade lines to compressors and install suction line trap adjacent to coil. Adjacent lines shall be parallel and straight with plumb vertical runs.
7. Coil drains shall be 1" I.P.S. copper. Route and pitch 1/2" per foot to drain, and secure to wall with 1" I.P.S. cast brass or wrought copper hangers. Provide electric heaters on freezer drains. Insulate all cooler and freezer coil drains with 1/2" thickness Armstrong Armaflex AP pipe insulation, sealed with adhesive foam insulation. Tape all fittings to sufficient thickness to prevent condensation.

8. Refrigeration line insulation shall be minimum 1/2" thickness Armstrong Armaflex AP pipe insulation, sealed with adhesive foam insulation. Tape fittings to sufficient thickness to prevent condensation.
9. The entire system shall be cleaned and dehydrated by maintaining a vacuum of 500 microns, or lower, for a minimum period of five (5) hours. The vacuum pump used shall itself be capable of developing a vacuum of 50 microns with its valve in a closed position. The required operating charge of refrigerant and oil shall be added, and each system shall be tested for performance.

5.10 PRE-ASSEMBLED COOLER/FREEZER COMPONENTS

Pre-assembled refrigeration systems shall consist of two major assemblies. One is the condensing unit assembly with all necessary components, factory installed and wired, including electrical box, time clock, drier sight glass and necessary tubing. The other is the refrigeration evaporator coil assembly with expansion valve, temperature control and heat exchanger, completely factory mounted.

1. Condensing units shall be semi-hermetic, air-cooled condensing units with rigid structural bases, dual receivers, OSHA metal fan guards/shrouds with venturi openings, waterproof electrical system, exhaustible fusible plugs, internal inherent motor protection, suction line shut-off valves, liquid line shut-off valves, oil pressure safety switches, crankcase heaters, and pressure oil separators on low-temperature units.
2. Freezer control panel shall be pre-wired assembly with magnetic starters, relays, condensing unit circuit breakers, coil circuit breakers, dual pressure controls, liquid line pressure gauges, suction line pressure gauges, and timers.
3. Racks shall be provided as detailed under 4.00-T.
4. Evaporator coils shall be provided as detailed under 4.00-S.
5. Control panel housings shall be Nema-4 enclosures.

PART 6: ITEMIZED EQUIPMENT SPECIFICATIONS – KITCHEN

Item K-1

Description: WALK-IN COOLER
Quantity: 1
Manufacturer: American Panel
Specifier ID No.: I025

Custom fabricated per specific requirements. KEC to refer to specific requirements for detailed options and accessories not listed under this item specification.

Overall size and shape shall be exactly as indicated on drawings. Substitution of shorter nominal sizes for full size panels will not be accepted. Interior finished ceiling height shall be 8'-0". Provide assembly as per plan and detail including:

- a. Stucco embossed aluminum .032 finished with two (2) coats of sprayed and baked on polyester white enamel paint on exposed interior and exterior wall and ceiling panels.
- b. Provide interior.
- c. Provide with a Type 3 prefabricated floor as per the Specific Requirements. Refer to Detail KD-9.7
- d. Provide one (1) 30" self-closing door 77" high. Compartment identification sign to read: COOLER. Refer to Standard Detail KD-9.2.
- e. Provide strip curtains at hinged doors as per Specific Requirements.
- f. Provide one (1) heated triple pane glass observation window with automatic defrost in door.
- g. Provide with 120/1 high efficiency fluorescent light fixture complete with bulbs.
- h. Provide with temperature alarm system capable of being connected to building security system. KEC to extend temperature probe full length and secure to panel wall with stainless steel clips and screws in a workmanship like fashion.
- i. Provide two (2) 16 gauge stainless steel corner guards.
- j. Provide stainless steel locking bar.
- k. Interior floor finish to be stainless steel with 4" x 6" non-skid adhesive strips on 6" centers in traffic aisles as manufactured by 3-M Company.

Item K-2

Description: 18" COOLER SHELVING
Quantity: 6
Manufacturer: Tarrison Products Ltd.
Model No.: PolySeal
Specifier ID No.: I025

Size and shape as per plan and details, including:

- a. Four (4) tier high, PolySeal wire shelving.
- b. Provide with 74" high posts, four (4) per unit with adjustable feet.
- c. K.E.C. to field verify dimensions before ordering.
- d. Shelving to be manufactured in North America.

Item K-3

Description: BLOWER COIL +34°
Quantity: 1
Manufacturer: Omni Temp
Model No.: Bohn ADT090AEK
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide where shown on plan one (1) low profile evaporator coil with off cycle defrost. Evaporator coil supports to be 1/2" diameter threaded nylon with stainless steel fasteners and washers to secure coil tight to ceiling of cooler assembly.
- b. Provide coil with moisture proof disconnect switch.
- c. Refrigeration system to be remote as specified under Item BS-15 for Freon R-404A. Kitchen Equipment Contractor is to make final refrigeration hook-up between evaporator coil and remote refrigeration package.
- d. Kitchen Equipment Contractor is to permanently identify unit with its respective remote refrigeration package either by decal or black paint. Plastic tape labels are not acceptable.
- e. Refrigeration system to be designed to operate on refrigerant in compliance with the 1989 Montreal Protocol.
- f. Refrigeration systems to meet HACCP requirements of maintaining +34° F.

Special Instructions:

Division 15 to pipe indirect waste from blower coil as indicated on plan to funnel floor drain. Refer to Standard Detail KD-9.1.

Item K-4

Description: SPARE NUMBER

Item K-5

Description: WALK-IN FREEZER

Quantity: 1

Manufacturer: American Panel

Specifier ID No.: I025

Custom fabricated per specific requirements. KEC to refer to specific requirements for detailed options and accessories not listed under this item specification.

Overall size and shape shall be exactly as indicated on drawings. Substitution of shorter nominal sizes for full size panels will not be accepted. Interior finished ceiling height shall be 8'-0". Provide assembly as per plan and detail including:

- a. Stucco embossed aluminum .032 finished with two (2) coats of sprayed and baked on polyester white enamel paint on exposed interior and exterior wall and ceiling panels.
- b. Provide with a Type 3 prefabricated floor as per the Specific Requirements. Refer to Detail KD-9.7
- c. Provide one (1) 30" self-closing door 77" high. Compartment identification sign to read: FREEZER. Refer to Standard Detail KD-9.2.
- d. Provide strip curtains at hinged doors as per Specific Requirements.
- e. Provide one (1) heated triple pane glass observation window with automatic defrost in door.
- f. Provide with 120/1 high efficiency fluorescent light fixture complete with bulbs.
- g. Provide with temperature alarm system capable of being connected to building security system. KEC to extend temperature probe full length and secure to panel wall with stainless steel clips and screws in a workmanship like fashion.
- h. Provide with electrically heated pressure relief port.
- i. Interior floor finish to be stainless steel with 4" x 6" non-skid adhesive strips on 6" centers in traffic aisles as manufactured by 3-M Company.

Item K-6

Description: 18" FREEZER SHELVING

Quantity: 5

Manufacturer: Tarrison Products Ltd.

Model No.: PolySeal

Specifier ID No.: I025

Size and shape as per plan and details, including:

- a. Four (4) tier high PolySeal shelving.

- b. Provide with 74" high posts, four (4) per unit with adjustable feet.
- c. K.E.C. to field verify dimensions before ordering.
- d. Shelving to be manufactured in North America.

Item K-7

Description: BLOWER COIL -10°
Quantity: 1
Manufacturer: Omni Temp
Model No.: Bohn LET065BEK
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide where shown on plan one (1) low profile evaporator coil with electrical defrost. Evaporator coil supports to be 1/2" diameter threaded nylon with stainless steel fasteners and washers to secure coil tight to ceiling of freezer assembly. Provide low temperature coil with drain line heat tape.
- b. Provide coil with moisture proof disconnect switch.
- c. Refrigeration system to be remote as specified under Item BS-15 for Freon R-404A. Kitchen Equipment Contractor is to make final refrigeration hook-up between evaporator coil and remote refrigeration package.
- d. Kitchen Equipment Contractor is to permanently identify unit with its respective remote refrigeration package either by decal or black paint. Plastic tape labels are not acceptable.
- e. Refrigeration system to be designed to operate on refrigerant in compliance with the 1989 Montreal Protocol.
- f. Refrigeration systems to meet HACCP requirements of maintaining -10° F.

Special Instructions:

Division 15 to pipe indirect waste from blower coil as indicated on plan to funnel floor drain. Refer to Standard Detail KD-9.1.

Item K-8

Description: SPARE NUMBER

Item K-9

Description: HEATED CABINET
Quantity: 1
Manufacturer: Food Warming Equipment
Model No.: P-108-D
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Complete with 10' U.L. approved cord and plug.
- b. Provide with canned heat option allowing electric and/or can heat operation.
- c. Provide with five (5) stainless steel shelves / designed to accommodate up to 90 covered plates.
- d. Provide with four (4) 6" diameter x 2½" H.D. polyurethane poly hub casters, two (2) swivel with locks.
- e. Provide with two (2) full width heavy duty stainless steel handles secured to 18 gauge backing plate mounted behind exterior skin of cabinet.
- f. Provide with non-marking corner bumpers.
- g. Provide with high temperature door gasket.
- h. Provide with top mount transport latch with pad lock provisions.
- i. Provide unit with built-in control panel and heat system. Controls to be up-front at eye-level convenience, complete with 20 amp. on-off switch and full range thermostat with marked range of 90° F. to 190° F.
- j. Provide fully welded stainless steel tubular base frame, 10 gauge corner plates and fully insulated base.

Item K-10

Description: HEATED CABINET
Quantity: 1
Manufacturer: Food Warming Equipment
Model No.: P-108-D
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Complete with 10' U.L. approved cord and plug.
- b. Provide with canned heat option allowing electric and/or can heat operation.

- c. Provide with five (5) stainless steel shelves / designed to accommodate up to 90 covered plates.
- d. Provide with four (4) 6" diameter x 2½" H.D. polyurethane poly hub casters, two (2) swivel with locks.
- e. Provide with two (2) full width heavy duty stainless steel handles secured to 18 gauge backing plate mounted behind exterior skin of cabinet.
- f. Provide with non-marking corner bumpers.
- g. Provide with high temperature door gasket.
- h. Provide with top mount transport latch with pad lock provisions.
- i. Provide unit with built-in control panel and heat system. Controls to be up-front at eye-level convenience, complete with 20 amp. on-off switch and full range thermostat with marked range of 90° F. to 190° F.
- j. Provide fully welded stainless steel tubular base frame, 10 gauge corner plates and fully insulated base.

Item 11

Description: SPARE NUMBER

Item 12

Description: 18" DRY STORAGE SHELVING
Quantity: 6
Manufacturer: Tarrison Products Ltd.
Model No.: PolySeal
Specifier ID No.: I025

Size and shape as per plan and details, including:

- a. Four (4) tier PolySeal shelves.
- b. Provide with 74" high posts, four (4) per unit with adjustable feet.
- c. K.E.C. to field verify dimensions before ordering.
- d. Shelving to be manufactured in North America.

Item K-13

Description: S/S CORNER GUARD
Quantity: 15
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. 16 Gauge stainless steel corner guards to be installed where shown on plan, 1" above the cove base. KEC to fasten with stainless steel screws and seal.
- b. Refer to Standard Detail KD-10.21.

Item K-14

Description: SPARE NUMBER

Item K-15

Description: SOILED DISHTABLE

Quantity: 1

Manufacturer: Fabricate

Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "C" raised rolled edge as per Detail KD-1.1.
- b. Where adjacent to wall, provide a 10" x 2" wide standard stainless steel back splash. Enclose ends of splash. Refer to Detail KD-1.2.
- c. Provide where shown a 12" wide sloping landing shelf. Landing shelf to be integral with the top. Front edge to be 1 1/2" higher than the working surface of the soiled dishtable. Refer to standard detail.
- d. Provide two (2) magnetized scrap blocks Model 600 where shown on plan as manufactured by Katchall Industries.
- e. Provide a 20" x 20" x 5" deep pre-rinse sink with stainless steel removable perforated basket. Refer to Standard Detail KD-5.1. Weld disposer adapter ring into sink.
- f. Provide step down in splash with holes for pre-rinse faucet Type 7 with a 2901-12. Refer to Standard Detail KD-5.1.
- g. Provide turn down and seal to the Dishmachine, Item K-20, in accordance with manufacturers recommendations.
- h. Over table assembly provide a double-sided soiled glass rack shelf with clean rack storage as per detail.
- i. Crossbrace and provide space to accommodate two (2) Mobile Trash Receptacles, Item K-17.
- j. Provide mounting bracket for undercounter hose reel and temperature control valve, Item K-16, Refer to Standard Detail KD-10.13.

- k. Provide stainless steel mounting brackets welded to underside of soiled dishtable to support hot and cold water supply lines to hose reel and scrap trough water inlets.
- l. Mount entire assembly on standard stainless steel legs with cross rails to support empty dishracks and allow the Mobile Trash Receptacle, Item K-17, to pass unobstructingly under dishtable.
- m. Seal and sound deaden per general requirements.

Item K-16

Description: U/C HOSE REEL
Quantity: 1
Manufacturer: Fisher Manufacturing Co.
Model No.: 2974 W/ 2805CV
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Unit shall be mounted tight to the underside of Soiled Dishtable, Item K-15, where shown on plan. Refer to standard detail KD-10.13.
- b. Provide with Fisher 2933 shut-off valves and Fisher 2805-CV temperature adjusting valve with check valves.
- c. Secure water lines to underside of Soiled Dishtable, as described and detailed under that item.

Item K-17

Description: MOBILE TRASH RECEPTACLE
Quantity: 4
Manufacturer: Continental
Model No.: 3200
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide in gray color.

Item K-18

Description: HAND SINK
Quantity: 3
Manufacturer: Advance Tabco
Model No.: 7-PS-69
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with two (2) custom fabricated 14 gauge stainless steel support brackets. Refer to Standard Detail KD-10.5. Mount and fasten brackets with stainless steel fasteners.
- b. Provide hand sink with welded side splashes.
- c. Provide as part of this unit one (1) cleaning faucet Fisher Model 2445 with vacuum breaker. Faucet to be installed by Plumbing Contractor under sink as detailed.
- d. Provide as part of this unit one (1) surface mounted mirror, Bobrick Model B-165-1824, and mount as detailed.

Item K-19

Description: WASTE RECEPTACLE
Quantity: 3
Manufacturer: Continental Mfg. Co.
Model No.: 2818
Specifier ID No.: I025

Complete with all standard accessories.

Furnish the following options:

- a. Provide in gray color.

Item K-20

Description: VENTLESS CORNER DISHMACHINE
Quantity: 1
Manufacturer: Hobart
Model No.: AM15VL
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with stainless steel front enclosure.
- b. Provide with stainless steel frame and adjustable legs.
- c. Provide with single electrical connection
- d. Provide machine for corner operation as per plan.
- e. Provide built-in Booster Heater for 70° rise.
- f. Provide with ¾" brass pressure regulator.
- g. Provide with drain water tempering kit.
- h. Provide with hammer arrestor kit.

Item K-21

Description: CLEAN DISHTABLE
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "C" raised rolled edge as per Detail KD-1.1.
- b. Where adjacent to wall, provide a 10" x 2" wide standard stainless steel back splash. Enclose ends of splash. Refer to Detail KD-1.2.
- c. Open base with crossrails to accommodate two (2) Glass Rack Dollies, Item K-23
- d. Where shown, provide turndown into and sealed to the Dishmachine, Item K-20, in accordance with the manufacturers recommendations. Refer to Standard Detail KD-5.10.
- e. Seal and sound deaden per general requirements.

Item K-22

Description: S/S WALL SHELVING
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide where shown one (1) 12" wide stainless steel overshef by length as shown. Turn-up 2" at rear, left and right end. Refer to Standard Details KD-1.21 / KD-1.22. Mount shelf at height indicated on drawing.
- b. Mount overshef with stainless steel fasteners and expansion shields.
- c. Seal to wall as per general requirements.

Special Instructions:

General Contractor to provide backing in wall to support overshef as per Standard Details KD-1.21 / KD-1.22 and Special Conditions Plan.

Item K-23

Description: GLASS RACK DOLLY
Quantity: 2
Manufacturer: Metro
Model No.: D2020N
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Rack dolly to hold standard 20" x 20" cup and glass racks.
- b. Provide rack dolly with four (4) 5" casters, two (2) swivel and two (2) with brakes.
- c. Provide rack dolly with gray (Model A-35) corner bumpers.
- d. Assembly to be N.S.F. constructed out of aircraft high-strength aluminum sheet material.
- e. Provide rack dolly without transport handle.

Item K-24

Description: 24" DISH SHELVING
Quantity: 1
Manufacturer: Tarrison Products Ltd.
Model No.: PolySeal
Specifier ID No.: I025

Size and shape as per plan and details, including:

- a. Four (4) tier high, standard duty louvered shelving.
- b. Provide with 86" high posts, four (4) per unit with adjustable flanged feet.
- c. Provide each with three (3) sided frame assembly in lieu of lower shelf.
- d. Unit to accommodate two (2) Mobile Dish Dollies, Item No. K-25, under lower shelf.
- e. Provide each unit with wall brackets.
- f. K.E.C. to field verify dimensions before ordering.
- g. Shelving to be manufactured in North America.

Item K-25

Description: MOBILE DISH DOLLY
Quantity: 2
Manufacturer: Sammons Equipment
Model No.: 9601-DE-11
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Dispenser to be fully adjustable with two (2) dividers and four (4) partitions to hold up to eight (8) columns of assorted sized dishware.
- b. Provide dolly with four (4) 5" casters, two (2) swivel and two (2) with brakes.
- c. Provide each dolly with gray Model A-35 corner bumpers.
- d. Assembly to be NSF constructed out of aircraft high-strength aluminum sheet and extrusions.

Item K-26

Description: UTENSIL WASH SINK
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide Type "C" 3" raised rolled rim at front and sides as per Standard Detail KD-1.1. Rolled edge to drop to 34" AFF at front edge of sink compartment. Refer to Standard Details KD-6.1 and KD-6.2.
- b. Pitch drainboards to sink as indicated on drawing.
- c. At rear adjacent to wall provide a 10" x 2" wide stainless steel standard backsplash. Enclose ends of splash. Refer to Standard Detail KD-1.2.
- d. Punch holes for faucets and overflows.
- e. Where shown on plan, provide three (3) sinks 14" deep with two (2) Type 4 'Big Flo' splash mount faucets with three (3) Fisher Drain King lever wastes and overflows.
- f. Provide over the top of the sink assembly a 12" wide by length as shown overshelf. Turn up 2" at rear, left end and right end. Refer to Standard Detail KD-1.14. As part of the overshelf provide as per Detail KD-1.16 one (1) stainless steel utensil rack welded to brackets as shown. Provide pot rack with double stainless steel pot hooks on 8" centers.

- g. Cross brace and provide a stainless steel undershelf under each drainboard with 2" turn up at rear.
- h. Seal and sound deaden per general requirements.

Item K-27

Description: S/S WALL FLASHING
Quantity: 1 Lot
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide 20-gauge stainless steel wall flashing with cap strips and divider bars as per Standard Detail KD-10.23.
- b. Secure stainless steel flashing to wall with heat resistant mastic.
- c. KEC to provide stainless steel cover plates and escutcheon plates for all receptacles and plumbing stub outs of wall flashing.

Item K-28

Description: SPARE NUMBER

Item K-29

Description: CLASS K FIRE EXTINGUISHER
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract.

Item to be specified by the Architect and furnished by the General Contractor.

Item K-30

Description: MOP SINK
Quantity: 1
Manufacturer: IMC/Teddy
Model No.: FS
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Size and shape as per plan.
- b. Provide complete with service faucet T&S Brass and Bronze Model 0665.
- c. Provide with 30" hose and hanger assembly.

- d. One (1) piece wash basin to be 16 gauge, type 304 stainless steel with coved corners.
- e. Secure mop sink to floor and seal per the General Requirements.
- f. Provide 18 gauge stainless steel wall splash as per Detail KD-10.8.

Item K-31

Description: MOP HOLDER
Quantity: 1
Manufacturer: IMC/Teddy
Model No.: MH3
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide where shown one (1) 24" long stainless steel mop/broom hanger with spring loaded rubber grips. Mount at height indicated on drawing.
- b. Secure to wall with stainless steel fasteners and expansion shields.
- c. Seal to wall as per general requirements.

Special Instructions:

General Contractor to provide backing in wall to support rack assembly as per standard details and Special Conditions Plan.

Item K-32

Description: CHEMICAL SHELF
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide shelf length as per plan with built-in gravity style mop and broom holder. Construction to be all stainless steel.
- b. Provide shelf with spray bottle holder secured to turn down edge of shelf.
- c. Mount where shown on plan and secure to wall with stainless steel fasteners.

Item K-33

Description: SPARE NUMBER

Item K-34

Description: SPARE NUMBER

Item K-35

Description: DUAL TEMP REFRIGERATOR/FREEZER
Quantity: 1
Manufacturer: Continental Refrigerator
Model No.: 1RF
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' UL approved cord and plug.
- b. Provide all stainless steel exterior and interior finish.
- c. Provide with 5" casters; two (2) front with brakes.
- d. Provide with solid half doors hinged as indicated on drawings.
- e. Provide with door activated lights.
- f. Provide with standard locks, all locks keyed alike.
- g. Provide with universal tray slides in refrigerator section on 2" spacing, standard stainless steel shelves in freezer section.
- h. Refrigeration systems to meet HACCP requirements of maintaining +34° F. in refrigerated cabinet and -10° F. in freezer section.
- i. Refrigeration to be self-contained air-cooled. Compressor location shall be exactly on top.
- j. Provide with electric condensate evaporator mounted in compressor compartment.

Item K-36

Description: EXHAUST VENTILATOR
Quantity: 1
Manufacturer: Caddy Corporation
Model No.: SHBC-C-W-76-ND-60 / SHBC-C-W-145-ND-60
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Ventilator to consist of one (1) section 18' - 5" long with continuous capture by 5' - 0" O.D. wide mounted 6'-6" above the finished floor to leading edge.
- b. Duct connector size, CFM exhaust, internal make-up air and static pressure shall be as indicated on Special Conditions Sheet and shall not exceed same.

- c. Ventilator assembly to incorporate six (6) recessed vapor proof incandescent light fixtures pre-wired to junction box on hood. K.E.C. to provide 100 watt incandescent light bulbs as required.
- d. Provide ventilator complete with recessed mounted on/off switch for vapor proof light fixtures and fan.
- e. As part of this item, provide one (1) air make-up ceiling plenum. Make-up air shall discharge through full length stainless steel perforated face panels. Face panel to have large surface area with dampers producing a low even velocity discharge (maximum 24" throw, 250 CFM).
- f. Ventilator shall be U.L. listed with fire damper and be constructed as a wall type unit having the grease extraction/filtering portion adjacent to wall. Entire hood shall be constructed of 18 gauge stainless steel, all welded construction in compliance with all recommendations of the N.F.P.A., U.L., BOCA, ICBO and NSF Standards. All joints jointed at the outside shall be hairline type, tack welded and polished clean. Seal hairline joints with silicone sealer. Standing seams on the interior of the hood will not be acceptable.
- g. Ventilator shall be high velocity dry extractor type with air inlet opening above and parallel to the cooking surface. Ventilator to incorporate full length horizontal self draining baffles for 95% centrifugal grease extraction.
- h. Dry cartridge baffles shall be easily removable for cleaning and constructed out of Type 304 stainless steel. Removable cartridge not to exceed 18" in length.
- i. Ventilator shall have a main grease collection gutter at the bottom of the grease extraction chamber.
- j. Ventilator must be labeled according to the maximum cooking surface temperature to which they have been tested.
- k. Provide ventilator system with temperature sensor per the requirements of IMC 5007.2.1.1.
- l. Mount ventilator assembly on 1/2" diameter stainless steel hanger rods. Hanger rods shall be fastened to the building construction above and shall be spaced on a maximum of 60" centers. K.E.C. to coordinate with G.C. on installation of support brackets. K.E.C. to supply and install hanger rods as required.
- m. Secure the ventilator to the rear wall with stainless steel screws and wall anchors and seal with silicone sealer per General Requirements.
- n. Mount ventilator over Items K-38, K-39, K-40, K-42 and K-43.
- o. Fire protection system to be pre-piped at the factory with chrome piping, nozzles and quick seals similar to Evergreen Tool Company Model 170. KEC to provide Fire Suppression System for plenum, duct collar and surface protection per latest codes.

- p. K.E.C. shall verify location of exhaust and supply ducts and coordinate connections to same.

Special Instructions:

Required field interwiring between ventilators and control panels, fire suppression system and hood filtration system shall be provided by the Electrical Contractor.

Item K-37

Description: FIRE SUPPRESSION SYSTEM
Quantity: 1 Lot
Manufacturer: Ansul
Model No.: R-102
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following:

- a. System shall protect hood duct and cooking surface in accordance with pamphlet 96 of the National Fire Protection Association, U.L. Standard 300 and all code requirements of local Fire Insurance Rating Bureau and state and local fire authorities.
- b. Equipment installer shall submit to the local Fire Insurance Rating Bureau drawings and certification detail. Send three (3) copies of signed certification to the Owner / Client.
- c. System to be provided with micro-switch to provide means of exhaust ventilator fan control, signal capability for building fire alarm system and shunt trip of electrical cooking equipment as required by code. All electrical connections and interconnections to be furnished by Division 16.
- d. Provide with chrome sleeves and nozzles.
- e. System to provide protection for plenum, exhaust duct and all grease producing cooking surfaces located under the Ventilator, Item K-36.
- f. All piping and conduit, etc., shall be concealed as applicable.
- g. All penetrations in exhaust hood capture area for piping shall be made with U.L.listed chrome plated quick-seal adapters similar to Evergreen Tool Company Model 170.
- h. Size, number and location of nozzles, number and location of fusible links for this particular system.
- i. Manual pull station shall be located a point of egress and shall be recessed mounted. Refer to equipment layout plan for location. Pull station to be mounted 60" A.F.F.
- j. System to include mechanically activated fire fuel shut-off solenoid valves as required. Shut-off valves to be mounted where shown on Foodservice Drawings or as directed by local authorities.

- k. Upon completion of installation, system shall be completely dry tested with CO₂ in the presence of the Owner's representative. A certification of inspection by those authorities having jurisdiction shall be issued at the completion of the installation.
- l. Mount stainless steel control cabinet and cylinders in hood stainless steel enclosure as per plans and equipment elevations. Provide nitrogen expellant gas cartridge in lieu of carbon dioxide cartridge. Gas cartridge to be labeled "Nitrogen" in easily readable print.
- m. Refer to Equipment Elevations and Standard Detail KD-8.6.

Special Instructions:

Division 16 to make all interconnection between Fire Suppression System and electric solenoid fire fuel shut-off valve. Division 16 to also provide all electrical connections and interconnection for shunt trip of electrical cooking equipment.

Item K-38

Description: COMBI OVEN
Quantity: 1
Manufacturer: Eloma
Model No.: Genius T 10-11 Gas
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide complete with 6'-0" UL approved cord and plug assembly.
- b. Provide for gas heat complete with gas quick disconnect hose and PRV.
- c. Combi steamer to have HACCP interface.
- d. Provide with automatic core temperature probe with five (5) sensor points.
- e. Unit to be self-cleaning with external hose spray nozzle with retracting hose.
- f. Provide combi cooker with ½ fan speed and full fan speed.
- g. Provide unit with Combitronic option for combination moist and dry cooking environment.
- h. Unit temperature to run from 86° F. to 572° F.
- i. Unit to come with 300 owner/operator requested standard recipes pre programmed in unit.
- j. Provide complete with water filtration system. KEC to secure to side of base cabinet.
- k. Provide with IPX-5 Control Panel without knobs for water tight rating.

- l. Provide one (1) complete Kleensteam water treatment system complete with mounting plate, pressure gauge, neutralizer cartridge, suspended particle filter, scale Kleen packet and quick disconnects.
- m. Provide one (1) replacement Kleensteam cartridge as part of this assembly.

Special Instructions:

Filter system to be mounted on wall behind Combi Oven, Item K-38, with suitable stainless steel fasteners. Incoming water line for to be hooked-up to filter system and then hooked-up to Combi Oven. All plumbing connections and interconnections to be made by the Plumbing Contractor. Assembly to be mounted by K.E.C.

Item K-39

Description: CONVECTION OVEN
Quantity: 1
Manufacturer: Montague
Model No.: 115A
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide for gas operation.
- b. Provide with 6' UL approved cord and plug.
- c. Provide with gas P.R.V. and 48" flexible gas quick disconnect with restraining device.
- d. Provide oven with pilot relight system and screw on burner box panel.
- e. Provide with 6" legs.
- f. Provide with stainless steel front, left and right side.
- g. Doors to be split-type with single handle opening both doors simultaneously.
- h. Provide with dual pane thermal windows.
- i. Provide with flue deflector for canopy venting.
- j. Oven to be indirect fired and operate at 500° F.
- k. Provide with solid state digital controls / standard manual controls.
- l. Provide with two (2) speed motor.
- m. Provide with intermittent fan operation.

Item K-40

Description: 25 GAL. TILTING KETTLE
Quantity: 1
Manufacturer: Cleveland
Model No.: KGL-25-T
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide for gas operation complete with P.R.V.
- b. Provide with spring assisted domed cover.
- c. Provide with single pantry cold water fill faucet with bracket.
- d. Interior surface of kettle assembly to be constructed of type 316 stainless steel with high capacity pouring lip.
- e. Provide with 2" tangent draw off valve centered on kettle front.
- f. Provide with pan carrier option PCK.
- g. Provide with kettle accessory kit including brush, kettle paddle, 24 oz. ladle, kettle whip, kettle brush and draw off brush.
- h. Provide with flanged feet.
- i. Provide as part of this assembly, one (1) cord and plug.

Item K-41

Description: S/S FLOOR TROUGH W/ GRATE
Quantity: 1
Manufacturer: IMC/Teddy
Model No.: ASFT-2424
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide anti-spill trough to be fabricated in one (1) piece construction.
- b. Provide with removable anti-slip subway grating Model SGAS.
- c. Refer to Special Conditions Plan and Standard Detail SD-1.1.

Special Instructions:

Stainless steel floor trough with pan and grate to be furnished by K.E.C. Assembly to be installed by General Contractor and hooked up by Division 15 in accordance with all local and state codes.

K.E.C. to verify floor trough is sized and positioned to accept the full pour path of the 25 Gal. Tilting Kettle, Item K-40, and the tangent draw-off valve.

Item K-42

Description: 30 GAL. TILTING SKILLET
Quantity: 1
Manufacturer: Cleveland
Model No.: SGL-30-TR
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide for gas operation complete with P.R.V.
- b. Provide with all stainless steel open base.
- c. Provide space saving design 30" in width with no clearance required at rear or sides for service. Assembly to be 100% serviceable from front.
- d. Provide with single pantry cold water fill faucet with bracket.
- e. Provide with pan carrier option PCS.
- f. Provide with flanged feet.
- g. Provide as part of this assembly one (1) cord and plug set.

Item K-43

Description: S/S FLOOR TROUGH W/ GRATE
Quantity: 1
Manufacturer: IMC/Teddy
Model No.: ASFT-1230-M
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide anti-spill trough to be fabricated in one (1) piece construction.
- b. Provide with removable anti-slip subway grating Model SGAS.
- c. Refer to Special Conditions Plan and Standard Detail SD-1.1.

Special Instructions:

Stainless steel floor trough with pan and grate to be furnished by K.E.C. Assembly to be installed by General Contractor and hooked up by Division 15 in accordance with all local and state codes.

K.E.C. to verify floor trough is sized and positioned to accept the full pour path of the 30 Gal. Tilting Skillet, Item K-42, and the tangent draw-off valve.

Item K-44

Description: S/S WALL FLASHING
Quantity: 1 Lot
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide 20-gauge stainless steel wall flashing with cap strips and divider bars as per Standard Detail KD-10.23.
- b. Secure stainless steel flashing to wall with heat resistant mastic.
- c. KEC to provide stainless steel cover plates and escutcheon plates for all receptacles and plumbing stub outs of wall flashing.

Item K-45

Description: DECK OVEN
Quantity: 1
Manufacturer: Bakers Pride
Model No.: 152
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with stainless steel front, top, left side and right side.
- b. Provide for gas operation complete with gas P.R.V.
- c. Provide two (2) decks with top and bottom heat control.
- d. Provide insulated doors with spring balance.
- e. Provide all cordierite hearth decks.
- f. Provide complete with legs.

Item K-46

Description: EXHAUST VENTILATOR
Quantity: 1
Manufacturer: Caddy Corporation
Model No.: SHC-C-11-91.5-ND-60
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Ventilator to consist of one (1) section 8' - 3" long with continuous capture by 5' - 0" O.D. wide mounted 6'-6" above the finished floor to leading edge.
- b. Duct connector size, CFM exhaust, internal make-up air and static pressure shall be as indicated on Special Conditions Sheet and shall not exceed same.
- c. Ventilator assembly to incorporate twelve (12) recessed vapor proof incandescent light fixtures pre-wired to junction box on hood. K.E.C. to provide 100 watt incandescent light bulbs as required.
- d. Provide ventilator complete with recessed mounted on/off switch for vapor proof light fixtures and fan.
- e. As part of this item, provide one (1) air make-up ceiling plenum). Make-up air shall discharge through full length stainless steel perforated face panels. Face panel to have large surface area with dampers producing a low even velocity discharge (maximum 24" throw, 250 CFM).
- f. Ventilator shall be U.L. listed with fire damper and be constructed as an island type assembly having the grease extraction/filtering portion in center of ventilator. Entire hood shall be constructed of 18 gauge stainless steel, all welded construction, in compliance with all recommendations of the N.F.P.A., U.L., BOCA, ICBO and NSF Standards. All joints jointed at the outside shall be hairline type, tack welded and polished clean. Seal hairline joints with silicone sealer. Standing seams on the interior of the hood will not be acceptable.
- g. Ventilator shall be high velocity dry extractor type with air inlet opening above and parallel to the cooking surface. Ventilator to incorporate full length horizontal self draining baffles for 95% centrifugal grease extraction.
- h. Dry cartridge baffles shall be easily removable for cleaning and constructed out of Type 304 stainless steel. Removable cartridge not to exceed 18" in length.
- i. Ventilator shall have a main grease collection gutter at the bottom of the grease extraction chamber.
- j. Ventilator must be labeled according to the maximum cooking surface temperature to which they have been tested.

- k. Provide ventilator system with temperature sensor per the requirements of IMC 5007.2.1.1.
- l. Mount ventilator assembly on 1/2" diameter stainless steel hanger rods. Hanger rods shall be fastened to the building construction above and shall be spaced on a maximum of 60" centers. K.E.C. to coordinate with G.C. on installation of support brackets. K.E.C. to supply and install hanger rods as required.
- m. Secure the ventilator to the rear wall with stainless steel screws and wall anchors and seal with silicone sealer per General Requirements.
- n. Mount ventilator over Items K-48, K-49, K-50, K-51, K-52, K-53, K-54, K-55, K-56 and K-58
- o. Fire protection system to be pre-piped at the factory with chrome piping, nozzles and quick seals similar to Evergreen Tool Company Model 170. KEC to provide Fire Suppression System for plenum, duct collar and surface protection per latest codes.
- p. K.E.C. shall verify location of exhaust and supply ducts and coordinate connections to same.

Special Instructions:

Required field interwiring between ventilators and control panels, fire suppression system and hood filtration system shall be provided by the Electrical Contractor.

Item K-47

Description: FIRE SUPPRESSION SYSTEM
Quantity: 1 Lot
Manufacturer: Ansul
Model No.: R-102
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following:

- a. System shall protect hood duct and cooking surface in accordance with pamphlet 96 of the National Fire Protection Association, U.L. Standard 300 and all code requirements of local Fire Insurance Rating Bureau and state and local fire authorities.
- b. Equipment installer shall submit to the local Fire Insurance Rating Bureau drawings and certification detail. Send three (3) copies of signed certification to the Owner / Client.
- c. System to be provided with micro-switch to provide means of exhaust ventilator fan control, signal capability for building fire alarm system and shunt trip of electrical cooking equipment as required by code. All electrical connections and interconnections to be furnished by Division 16.
- d. Provide with chrome sleeves and nozzles.

- e. System to provide protection for plenum, exhaust duct and all grease producing cooking surfaces located under the Ventilator, Item K-46.
- f. All piping and conduit, etc., shall be concealed as applicable.
- g. All penetrations in exhaust hood capture area for piping shall be made with U.L.-listed chrome plated quick-seal adapters similar to Evergreen Tool Company Model 170.
- h. Size, number and location of nozzles, number and location of fusible links for this particular system.
- i. Manual pull station shall be located a point of egress and shall be recessed mounted. Refer to equipment layout plan for location. Pull station to be mounted 60" A.F.F.
- j. System to include mechanically activated fire fuel shut-off solenoid valves as required. Shut-off valves to be mounted where shown on Foodservice Drawings or as directed by local authorities.
- k. Upon completion of installation, system shall be completely dry tested with CO2 in the presence of the Owner's representative. A certification of inspection by those authorities having jurisdiction shall be issued at the completion of the installation.
- l. Mount stainless steel control cabinet and cylinders on wall stainless steel enclosure as per plans and equipment elevations. Provide nitrogen expellant gas cartridge in lieu of carbon dioxide cartridge. Gas cartridge to be labeled "Nitrogen" in easily readable print.
- m. Refer to Equipment Elevations and Standard Detail KD-8.6.

Special Instructions:

Division 16 to make all interconnection between Fire Suppression System and electric solenoid fire fuel shut-off valve. Division 16 to also provide all electrical connections and interconnection for shunt trip of electrical cooking equipment.

Item K-48

Description: COOKING SUITE
Quantity: 1 Lot
Manufacturer: Montague
Model No.: Crusader
Specifier ID No.: I025

Custom fabricated per the manufacturer and general requirements

Size and shape per plan and details including:

- a. Provide European island style cooking battery as per plan and details.

- b. Island to consist of the following built-in cooking equipment:

Item No. K-49	Refrigerated Base
Item No. K-50	Six Burner Range
Item No. K-51	Salamander Broiler
Item No. K-52	Refrigerated Base
Item No. K-53	Six Burner Range
Item No. K-54	Pass-Thru Cheesemelter
Item No. K-55	Refrigerated Base
Item No. K-56	Griddle
Item No. K-58	Dual Fryer
- c. Provide where shown on plan one (1) 36" long Salamander Broiler. Provide decorative end cap as per elevations.
- d. Provide where shown on plan, one (1) pass-thru Cheesemelter. Provide decorative end cap as per elevation.
- e. Provide tubular pass shelf with built-in cold water lines for pot filler faucet. Cold water supply lines to be concealed and piped to base cabinet at Bain Marie end by K.E.C.
- f. Provide cooking island with one (1) common flue riser as per plan and elevations.
- g. Provide plate shelf at sides of island with decorative belly rail in stainless steel satin finish.
- h. Provide single electrical receptacles below counter top mounted flush in face of mechanical / electrical chase for all electrical equipment.
- i. Provide electrical outlet boxes as manufactured by Wolverine Brass Works of Michigan. Box assembly to be U.L. approved. Furnish conduit nipples with lock nuts and washers with each box assembly.
- j. Provide chases with removable access panels for all drainlines, water lines, electrical lines and refrigeration lines. Punch holes for all faucets and electrical outlets.
- k. All wiring shall be concealed and run in the uprights to a connection point under the cooking island.
- l. Insulate all areas between cooking equipment and refrigerated equipment.
- m. Where shown, provide a refrigerated bases with refrigerated drawers. Provide a minimum of 2" thick approved insulation on all sides. Refrigerated base is to be vapor proofed under pressure for positive seal against heat leakage. Drawers to be mounted on stainless steel roller bearing tracks with positive stops. Provide vinyl magnetic gaskets around entire perimeter of drawer for positive seal. Refrigerator system to be remote. K.E.C. to furnish R-22 expansion valve, temperature controls, and provide condensate evaporator. Refrigerator lines from blower coil to be extended to exterior of refrigerator base to meet NSF codes.

- n. Cooking Island to be mounted on 6" stainless steel curb. Refer to equipment elevations and details KD-4.1 and KD-4.2.
- o. Where indicated on plan, provide a load center. Load center interior area to be waterproof and covered by a stainless steel hinged access door. Circuit breaker panel to be sized for all elements installed and specified on and within Cooking Suite.
- p. Seal around all built-in equipment and sound-deaden per general requirements.

Item K-49

Description: REFRIGERATED BASE
Quantity: 1
Manufacturer: Montague
Model No.: RB-36-R
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide where shown a +35° refrigerated base with refrigerated drawers as per plan. Overall height of unit with specified cooking equipment to be 36". Refer to Standard Detail KD-3.12.
- b. Provide a minimum of 2" thick approved insulation on all sides.
- c. Each drawer to hold one (1) 12" x 20" x 4" deep stainless steel pan.
- d. Refrigerated base is to be vapor proofed under pressure for positive seal against heat leakage. Provide vinyl magnetic gaskets around entire perimeter of opening for positive seal. Condensate proof heating wire is to be installed around complete drawer openings.
- e. Provide four (4) drawers as indicated on plan with easily removable pans.
- f. Drawers to be mounted on stainless steel roller bearing tracks with positive stops. Provide vinyl magnetic gaskets around entire perimeter of drawer for positive seal. Drawers to hold 12" x 20" standard stainless steel pans.
- g. Provide with stainless steel channel base for mounting in Cooking Suite, Item K-48.
- h. Provide complete with blower coil mounted in unit complete with temperature controls and expansion valve for Freon R-404A.
- i. Provide refrigerator with external power disconnect on/off switch with pilot light with an engraved phenolic plastic identification sign.
- j. Refrigeration system to meet HACCP requirements of maintaining +34° F. in base cabinet.
- k. Refrigeration shall be remote as specified in Item BS-15 for Freon R-404A.

- l. Kitchen Equipment Contractor is to permanently identify unit with its respective remote refrigeration package either by decal or black paint. Plastic tape labels are not acceptable.
- m. Provide with electric condensate evaporator mounted under unit / mounted in compressor compartment.

Special Instructions:

K.E.C. to make final refrigeration hook-up between assembly blower coil and remote refrigeration package, Item No. BS-15.

Item K-50

Description: 6-BURNER RANGE
Quantity: 1
Manufacturer: Montague
Model No.: C36-5
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Burner grates to be heavy duty cast iron one piece style in 12" sections.
- b. Provide for gas operation.
- c. Provide with quick disconnect and P.R.V.
- d. Provide with stainless steel front, left and right side finish.
- e. Provide with controls mounted on both sides of Cooking Suite, Item K-48.
- f. Unit to be built into Cooking Suite, Item K-48.

Item K-51

Description: SALAMANDER BROILER
Quantity: 1
Manufacturer: Montague
Model No.: SB36-HB
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide for gas operation.
- b. Provide factory mounting and interpiping with P.R.V. to Range, Item K-50.
- c. Provide with stainless steel front, left and right side.

Item K-52

Description: REFRIGERATED BASE
Quantity: 1
Manufacturer: Montague
Model No.: RB-36-R
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide where shown a +35° refrigerated base with refrigerated drawers as per plan. Overall height of unit with specified cooking equipment to be 36". Refer to Standard Detail KD-3.12.
- b. Provide a minimum of 2" thick approved insulation on all sides.
- c. Each drawer to hold one (1) 12" x 20" x 4" deep stainless steel pan.
- d. Refrigerated base is to be vapor proofed under pressure for positive seal against heat leakage. Provide vinyl magnetic gaskets around entire perimeter of opening for positive seal. Condensate proof heating wire is to be installed around complete drawer openings.
- e. Provide four (4) drawers as indicated on plan with easily removable pans.
- f. Drawers to be mounted on stainless steel roller bearing tracks with positive stops. Provide vinyl magnetic gaskets around entire perimeter of drawer for positive seal. Drawers to hold 12" x 20" standard stainless steel pans.
- g. Provide with stainless steel channel base for mounting in Cooking Suite, Item K-48.
- h. Provide complete with blower coil mounted in unit complete with temperature controls and expansion valve for Freon R-404A.
- i. Provide refrigerator with external power disconnect on/off switch with pilot light with an engraved phenolic plastic identification sign.
- j. Refrigeration system to meet HACCP requirements of maintaining +34° F. in base cabinet.
- k. Refrigeration shall be remote as specified in Item BS-15 for Freon R-404A.
- l. Kitchen Equipment Contractor is to permanently identify unit with its respective remote refrigeration package either by decal or black paint. Plastic tape labels are not acceptable.
- m. Provide with electric condensate evaporator mounted under unit / mounted in compressor compartment.

Special Instructions:

K.E.C. to make final refrigeration hook-up between assembly blower coil and remote refrigeration package, Item No. BS-15.

Item K-53

Description: 6-BURNER RANGE
Quantity: 1
Manufacturer: Montague
Model No.: C36-5
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Burner grates to be heavy duty cast iron one piece style in 12" sections.
- b. Provide for gas operation.
- c. Provide with quick disconnect and P.R.V.
- d. Provide with stainless steel front, left and right side finish.
- e. Provide with controls mounted on both sides of Cooking Suite, Item K-48.
- f. Unit to be built into Cooking Suite, Item K-48.

Item K-54

Description: PASS-THRU CHEESEMELTER
Quantity: 1
Manufacturer: Montague
Model No.: CM36
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide for gas operation.
- b. Provide factory mounting and interpiping with P.R.V. to Range, Item K-53.
- c. Provide with stainless steel front, left and right side.

Item K-55

Description: REFRIGERATED BASE
Quantity: 1
Manufacturer: Montague
Model No.: RB-36-R
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide where shown a +35° refrigerated base with refrigerated drawers as per plan. Overall height of unit with specified cooking equipment to be 36". Refer to Standard Detail KD-3.12.
- b. Provide a minimum of 2" thick approved insulation on all sides.
- c. Each drawer to hold one (1) 12" x 20" x 4" deep stainless steel pan.
- d. Refrigerated base is to be vapor proofed under pressure for positive seal against heat leakage. Provide vinyl magnetic gaskets around entire perimeter of opening for positive seal. Condensate proof heating wire is to be installed around complete drawer openings.
- e. Provide four (4) drawers as indicated on plan with easily removable pans.
- f. Drawers to be mounted on stainless steel roller bearing tracks with positive stops. Provide vinyl magnetic gaskets around entire perimeter of drawer for positive seal. Drawers to hold 12" x 20" standard stainless steel pans.
- g. Provide with stainless steel channel base for mounting in Cooking Suite, Item K-48.
- h. Provide complete with blower coil mounted in unit complete with temperature controls and expansion valve for Freon R-404A.
- i. Provide refrigerator with external power disconnect on/off switch with pilot light with an engraved phenolic plastic identification sign.
- j. Refrigeration system to meet HACCP requirements of maintaining +34° F. in base cabinet.
- k. Refrigeration shall be remote as specified in Item BS-15 for Freon R-404A.
- l. Kitchen Equipment Contractor is to permanently identify unit with its respective remote refrigeration package either by decal or black paint. Plastic tape labels are not acceptable.
- m. Provide with electric condensate evaporator mounted under unit / mounted in compressor compartment.

Special Instructions:

K.E.C. to make final refrigeration hook-up between assembly blower coil and remote refrigeration package, Item No. BS-15.

Item K-56

Description: GRIDDLE
Quantity: 1
Manufacturer: Montague
Model No.: M36-8
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide for gas operation.
- b. Provide 1" thick flat steel plate griddle surface with splash guard, front grease trap and removable grease pan.
- c. Provide with thermostat controls.
- d. Provide with quick disconnects and P.R.V.
- e. Provide with stainless steel front, left and right side finish.
- f. Unit to be built into Cooking Suite, Item K-48.

Item K-57

Description: SPARE NUMBER

Item K-58

Description: DUAL FRYER
Quantity: 2
Manufacturer: Montague
Model No.: RF240
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide two (2) fryers with stainless steel cabinets with stainless steel fry pots.
- b. Provide where shown two (2) fryers built into Cooking Suite, Item K-48.
- c. Provide for gas operation.

Item K-59

Description: POT RACK
Quantity: 2
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide as shown, one (1) each 18' - 3" x 2" stainless steel pot rack from 2" x 1/4" thick bar stock with 1/4" O.D. x 1 1/2" long stainless steel rod spaced at 6" on center fully welded.
- b. Mount to face of Exhaust Ventilator, Item K-46, where shown as per Standard Detail, KD-1.34.

Item K-60

Description: SPARE NUMBER

Item K-61

Description: SPARE NUMBER

Item K-62

Description: PLATING TABLE
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "D" flat turn down edge per Detail KD-1.1.
- b. Provide a suitable stainless steel electrical chase for two (2) convenience outlets on each end of table. Receptacle and power to be sized for equipment adjacent to outlet.
- c. Provide opening for Mobile Heated Dish Cabinets, Item K-64.
- d. Table assembly to be mounted on stainless steel legs with adjustable bullet feet.

Item K-63

Description: DECORATIVE HEAT LAMP
Quantity: 4
Manufacturer: Hatco Corporation
Model No.: DLH-500-RTL
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with high watt, clear coated, 375 watt.
- b. Provide heat lamp with 500 shade style in polished nickel finish.
- c. Provide with white track mounting bar.
- d. Provide with black retractable cord with lower on/off switch.

Item K-64

Description: HEATED DISH CABINET
Quantity: 2
Manufacturer: Food Warming Equipment
Model No.: HDC-252-I
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide dolly with four (4) 5" casters, two (2) swivel and two (2) with brakes.
- b. Provide with non-marking corner bumpers.
- c. Provide with 1550 watt heater complete with 6' UL approved 120 V. cord and plug.
- d. KEC to verify plate size with Operator before ordering.
- e. Mobile cart to fit under Plating Table, Item No. K-62.

Item K-65

Description: SPARE NUMBER

Item K-66

Description: WORK TABLE
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a.. Table edge to have a type "D" flat turn down edge per Detail KD-1.1.
- b. Where adjacent to wall, provide an 8" x 2" wide stainless steel standard backsplash. Enclose ends of splash. Refer to Standard Detail KD-1.2.
- c. Crossbrace and provide space to accommodate Undercounter Refrigerator, Item K-68.
- d. Crossbrace and provide a stainless steel undershelf.
- e. Table assembly to be mounted on stainless steel legs with adjustable bullet feet.
- f. Seal and sound deaden per general requirements.

Item K-67

Description: S/S WALL SHELVING
Quantity: 2
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide where shown two (2) 12" wide stainless steel overshelves by length as shown. Turn-up 2" at rear, left and right end. Refer to Standard Details KD-1.21 / KD-1.22. Mount shelves at height indicated on drawing.
- b. Mount overshelves with stainless steel fasteners and expansion shields.
- c. Seal to wall as per general requirements.

Special Instructions:

General Contractor to provide backing in wall to support overshelves as per Standard Details KD-1.21 / KD-1.22 and Special Conditions Plan.

Item K-68

Description: UNDERCOUNTER REFRIGERATOR +34°
Quantity: 1
Manufacturer: Continental Refrigerator
Model No.: UC48
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' U.L. approved cord and plug.
- b. Provide where shown a +34° refrigerated base with, doors hinged as per plan.
- c. Provide a minimum of 2" thick approved insulation on all sides.
- d. Refrigerated base is to be vapor proofed under pressure for positive seal against heat leakage.
- e. Provide two (2) doors as indicated on plan with easily removable stainless steel wire shelves. Each refrigerated compartment to be able to hold 18" x 26" sheet pans.
- f. Provide exterior with stainless steel front, top, left and right ends.
- g. Provide interior with all stainless steel finish with coved corners.
- h. Provide with stainless steel work top.

- i. Provide interior lighting in refrigerated base with vapor proof lights on automatic switch.
- j. Refrigeration system to meet HACCP requirements of maintaining +34° F. in base cabinet.
- k. Refrigeration to be self-contained air-cooled with front breathing option. Compressor location shall be exactly as shown on plan.
- l. Provide with electric condensate evaporator.
- m. Provide with door locks, all locks keyed alike.
- n. Provide with 3-5/8" casters.

Item K-69

Description: 30 QT. MIXER
Quantity: 1
Manufacturer: Hobart
Model No.: HL300
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 30 qt. stainless steel bowl with splash cover for 30 qt. bowl and bowl guard.
- b. Provide with 30 qt. bowl truck.
- c. Standard finish.
- d. Provide as part of this item one (1) U.L. Listed cord and plug set.
- e. Provide the following accessories one (1) each:
 - 30 Qt. "B" Beater
 - 30 Qt. "D" Wire Whip
 - 30 Qt. Bowl Scraper

Item K-70

Description: MIXER PARTS RACK
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide as shown, one (1) / two (2) 24" diameter stainless steel ceiling mounted mixer parts racks constructed from 2" x 1/4" thick bar stock fully welded to brackets.

- b. As part of utensil rack provide stainless steel 3/8" thick rod hanger hooks on 8" centers.
- c. Utensil rack shall be furnished with stainless steel rod hanger mounting plate as required to adequately hang unit from the building construction with anti-sway bracing as required. Refer to standard detail KD-1.19.

Item K-71

Description: HOLDING/PROOFING CABINET
Quantity: 1
Manufacturer: Metro
Model No.: C539-CDC-U
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with combination proofing/heating module. Module to be bottom mounted.
- b. Provide with 5" neoprene casters, two (2) swivel, two (2) swivel with brakes.
- c. Provide with 6' UL approved cord and plug.
- d. Provide with clear Dutch doors..

Item K-72

Description: WORK TABLE W/ SINK
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "E", an inverted "V" non-spill marine edge per Standard Detail KD-1.1.
- b. Where adjacent to wall and Item K-75, provide an 8" x 2" wide stainless steel standard backsplash. Enclose ends of splash. Refer to Standard Detail KD-1.2.
- c. Provide as shown on plan one (1) 15" x 20" x 10" deep sink with one (1) deck mount Type 5 faucet with lever waste basket drain and overflow.
- d. Punch holes for faucet.
- e. Pitch worktop to sink as indicated on plan.
- f. Crossbrace and provide space to accommodate Ingredient Bins, Item K-73.

- g. Over table, provide a 12" wide by length as indicated oversheff with 2" turn-up at wall, left side and right side. Refer to Detail KD-1.14. As part of the oversheff provide as per Standard Detail KD-1.16 one (1) stainless steel utensil rack welded to brackets as shown. Provide pot rack with double stainless steel pot hooks on 8" centers.
- h. Table assembly to be mounted on stainless steel legs with adjustable bullet feet.
- i. Seal around and sound deaden per general requirements.

Item K-73

Description: MOBILE INGREDIENT BINS
Quantity: 3
Manufacturer: Continental
Model No.: 9326
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Units to be N.S.F. listed with hinged sliding doors.
- b. Provide each bin with one (1) utility scoop, Model 9932.

Item K-74

Description: 5 QT. MIXER
Quantity: 4
Manufacturer: Hobart
Model No.: N50
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' U.L. approved cord and plug.
- b. Standard finish.
- c. Provide with No. 10 hub.
- e. Provide the following accessories one (1) each:
 - Dough arm
 - Sweet dough arm
 - Meat chopper
 - Wire whip
 - Stainless Steel Bowl
 - "B" Flat Beater
 - "D" Wire Ship
 - "E" Dough Hook

Item K-75

Description: REFRIGERATOR
Quantity: 1
Manufacturer: Continental Refrigerator
Model No.: 2R-SS-HD
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' UL approved cord and plug.
- b. Provide all stainless steel exterior and interior finish.
- c. Provide with 5" casters; two (2) front with brakes.
- d. Provide with glass half doors upper sections and solid half doors lower sections hinged as indicated on drawings.
- e. Provide with fluorescent lights.
- f. Provide with standard locks, all locks keyed alike.
- g. Provide with universal tray slides in upper section on 2" spacing with standard shelving in lower section.
- h. Refrigeration systems to meet HACCP requirements of maintaining +34° F. in cabinet and be Energy Star rated.
- i. Refrigeration to be self-contained air-cooled. Compressor shall be top mounted.

Item K-76

Description: SPARE NUMBER

Item K-77

Description: WORK TABLE W/ SINKS
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "E", an inverted "V" non-spill marine edge per Standard Detail KD-1.1.
- b. Where adjacent to wall and Items K-75 and K-79, provide an 8" x 2" wide stainless steel standard backsplash. Enclose ends of splash. Refer to Standard Detail KD-1.2.

- c. Provide as shown on plan two (2) 18" x 24" x 10" deep sinks with one (1) splash mount Type 3 faucet with lever waste basket drain and overflow.
- d. Punch holes for faucet.
- e. Pitch worktop to sinks as indicated on plan.
- f. Crossbrace and provide space to accommodate Mobile Trash Receptacle, Item K-17.
- g. Over table, provide a 12" wide by length as indicated overshef with 2" turn-up at wall, left side and right side. Refer to Detail KD-1.14. As part of the overshef provide as per Standard Detail KD-1.16 one (1) stainless steel utensil rack welded to brackets as shown. Provide pot rack with double stainless steel pot hooks on 8" centers.
- h. Crossbrace and provide a stainless steel undershef at left side drainboard.
- i. Table assembly to be mounted on stainless steel legs with adjustable bullet feet.
- j. Seal around and sound deaden per general requirements.

Item K-78

Description: FOOD PROCESSOR
Quantity: 4
Manufacturer: Robot Coupe
Model No.: CL50E
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' U.L. approved cord and plug.
- b. Provide with plastic food pusher.
- c. Verify disc selection with Operator prior to ordering.

Item K-79

Description: REFRIGERATOR
Quantity: 1
Manufacturer: Continental Refrigerator
Model No.: 2R-SS-HD
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' UL approved cord and plug.
- b. Provide all stainless steel exterior and interior finish.

- c. Provide with 5" casters; two (2) front with brakes.
- d. Provide with glass half doors upper sections and solid half doors lower sections hinged as indicated on drawings.
- e. Provide with fluorescent lights.
- f. Provide with standard locks, all locks keyed alike.
- g. Provide with universal tray slides in upper section on 2" spacing with standard shelving in lower section.
- h. Refrigeration systems to meet HACCP requirements of maintaining +34° F. in cabinet and be Energy Star rated.
- i. Refrigeration to be self-contained air-cooled. Compressor shall be top mounted.

Item K-80

Description: MOBILE PAN RACK
Quantity: 2
Manufacturer: Sammons Equipment
Model No.: 2580-22
Specifier ID No.: I025

Complete with all standard accessories.

Furnish the following options:

- a. Provide with four (4) gray non-marking corner bumpers.
- b. Provide with four (4) 5" polyurethane casters, two (2) swivel, two (2) with brakes.

Item K-81

Description: WORK TABLE W/ SINKS
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "E", an inverted "V" non-spill marine edge per Standard Detail KD-1.1.
- b. Where adjacent to wall and Item K-79, provide an 8" x 2" wide stainless steel standard backsplash. Enclose ends of splash. Refer to Standard Detail KD-1.2.
- c. Provide as shown on plan two (2) 18" x 24" x 10" deep sinks with one (1) splash mount Type 3 faucet with lever waste basket drain and overflow.

- d. Punch holes for faucet.
- e. Pitch worktop to sinks as indicated on plan.
- f. Enclose body where shown and provide three (3) stainless steel tool drawers with removable pans. Refer to Standard Detail KD-1.3.
- g. Crossbrace and provide space to accommodate Mobile Trash Receptacle, Item K-17.
- h. Over table, provide a 12" wide by length as indicated overshef with 2" turn-up at wall, left side and right side. Refer to Detail KD-1.14. As part of the overshef provide as per Standard Detail KD-1.16 one (1) stainless steel utensil rack welded to brackets as shown. Provide pot rack with double stainless steel pot hooks on 8" centers.
- i. Crossbrace and provide a stainless steel undershef as indicated on equipment elevations.
- j. Table assembly to be mounted on stainless steel legs with adjustable bullet feet.
- k. Seal around all built-in equipment and sound deaden per general requirements.

Item K-82

Description: SPARE NUMBER

Item K-83

Description: SPARE NUMBER

Item K-84

Description: SPARE NUMBER

Item K-85

Description: MILLWORK DESK

Quantity: 1

Manufacturer: N.I.K.E.C.

Specifier ID No.: I025

Custom Millwork. Not in Kitchen Equipment Contract.

Item to be specified by the Architect and furnished by the Millwork Contractor. Millwork Contractor to coordinate shop drawings with the Foodservice Consultant, Kitchen Equipment Contractor and Architect. Refer to Architect Documents, Elevations, Sections and Details.

Item K-86

Description: CHAIR
Quantity: 2
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-87

Description: COMPUTER SYSTEM
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-88

Description: TELEPHONE
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-89

Description: S/S WALL SHELVING
Quantity: 2
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide where shown two (2) 12" wide stainless steel overshelves by length as shown. Turn-up 2" at rear, left and right end. Refer to Standard Details KD-1.21 / KD-1.22. Mount shelves at height indicated on drawing.
- b. Mount overshelves with stainless steel fasteners and expansion shields.
- c. Seal to wall as per general requirements.

Special Instructions:

General Contractor to provide backing in wall to support overshelves as per Standard Details KD-1.21 / KD-1.22 and Special Conditions Plan.

Item K-90

Description: CONFERENCE TABLE
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-91

Description: CHAIRS
Quantity: 1 Lot
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-92

Description: SPARE NUMBER

Item K-93

Description: MILLWORK DESK
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Custom Millwork. Not in Kitchen Equipment Contract.

Item to be specified by the Architect and furnished by the Millwork Contractor. Millwork Contractor to coordinate shop drawings with the Foodservice Consultant, Kitchen Equipment Contractor and Architect. Refer to Architect Documents, Elevations, Sections and Details.

Item K-94

Description: S/S WALL SHELVING
Quantity: 2
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide where shown two (2) 12" wide stainless steel overselves by length as shown. Turn-up 2" at rear, left and right end. Refer to Standard Details KD-1.21 / KD-1.22. Mount shelves at height indicated on drawing.
- b. Mount overselves with stainless steel fasteners and expansion shields.
- c. Seal to wall as per general requirements.

Special Instructions:

General Contractor to provide backing in wall to support overselves as per Standard Details KD-1.21 / KD-1.22 and Special Conditions Plan.

Item K-95

Description: CHAIR
Quantity: 2
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-96

Description: COMPUTER SYSTEM
Quantity: 2
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-97

Description: TELEPHONE
Quantity: 2
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Owner and furnished under separate contract.

Item K-98

Description: SPARE NUMBER

Item K-99

Description: SPARE NUMBER

Item K-100

Description: LOCKERS
Quantity: 2 Lots
Manufacturer: Kelmax Equipment
Model No.: EL6/GANG3
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide two (2) three-gang six-tier lockers.

- b. Provide with enclosed base for mounting on 4" concrete curb base.
- c. Provide with sloped top.

Special Instructions:

General Contractor to provide 4" raised concrete curb base.

ITEMIZED EQUIPMENT SPECIFICATIONS – BEVERAGE SERVICE AREA

Item BS-1

Description: REFRIGERATOR
Quantity: 1
Manufacturer: Continental Refrigerator
Model No.: 1R
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide with 6' UL approved cord and plug.
- b. Provide all stainless steel exterior and interior finish.
- c. Provide with 6" adjustable stainless steel legs.
- d. Provide with glass half door upper section and solid half door lower section hinged as indicated on drawings.
- e. Provide with fluorescent lights.
- f. Provide with standard locks, all locks keyed alike.
- g. Provide with universal tray slides in all sections on 2" spacing in upper section on 2" spacing with standard shelving in lower section.
- h. Refrigeration systems to meet HACCP requirements of maintaining +34° F. in cabinet and be Energy Star rated.
- i. Refrigeration to be self-contained air-cooled. Compressor shall be top mounted.
- j. Provide with electric condensate evaporator mounted in compressor compartment.

Item BS-2

Description: BEVERAGE COUNTER W/ SINK
Quantity: 1
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Table edge to have a type "E" inverted "V" non-spill marine edge as per standard detail KD-1.1.
- b. Where adjacent to wall and Item BS-1, provide an 8" x 2" wide stainless steel standard backsplash. Enclose ends of splash. Refer to Standard Detail KD-1.2.

- c. Where shown, provide one (1) glass fill sink as per detail KD-2.10. Sink edge to accommodate one (1) standard 20" x 20" glass rack. As part of this fill station, provide one (1) Fisher water fill faucet No. 1117/2902-12.
- d. Where shown provide a 4" wide by length as shown by 1" deep integral drain trough. Pitch the bottom to a 1" drain with tailpiece at end. Provide in the drain trough a stainless steel anti-splash grid. Grid shall be provided with finger hole for removal with stainless steel protector or finishing ring as per general requirements. Refer to Standard Detail KD-1.26.
- e. Provide where shown on plan, one (1) 12" x 15" x 10" deep sink with one (1) Chicago Model No. 772 faucet with basket drain and overflow. Provide die stamped opening in top where indicated for trash chute. K.E.C. to provide stainless steel trash can to fit under top. At sink and trash chute area, provide a stainless steel hinged access door with friction grip.
- f. Provide holes for faucet, drain and water lines.
- g. Cross brace and provide space to accommodate two (2) Mobile Cup/Glass Rack Dollies, Item BS-6.
- h. Enclose body and provide intermediate stainless steel undershelf with 2" turn-up at rear. Refer to Standard Detail KD-3.1.
- i. Seal around all built-in equipment and sound deaden per general requirements.
- j. Counter to be mounted on 6" stainless steel adjustable legs.

Item BS-3

Description: S/S WALL SHELVING
Quantity: 2
Manufacturer: Fabricate
Specifier ID No.: I025

Fabricate per general requirements

Size and shape per plan and details including:

- a. Provide where shown two (2) 12" wide stainless steel overshelves by length as shown. Turn-up 2" at rear, left and right end. Refer to Standard Details KD-1.21 / KD-1.22. Mount shelves at height indicated on drawing.
- b. Mount overshelves with stainless steel fasteners and expansion shields.
- c. Seal to wall as per general requirements.

Special Instructions:

General Contractor to provide backing in wall to support overshelves as per Standard Details KD-1.21 / KD-1.22 and Special Conditions Plan.

Item BS-4

Description: COFFEE BREWER
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Coffee Vendor and furnished under separate contract.

Item BS-5

Description: ICED TEA BREWER
Quantity: 1
Manufacturer: N.I.K.E.C.
Specifier ID No.: I025

Not in Kitchen Equipment Contract

Item to be specified by the Coffee Vendor and furnished under separate contract.

Item BS-6

Description: CUP/GLASS RACK DOLLIES
Quantity: 2
Manufacturer: Metro
Model No.: D2020N
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Rack dolly to hold standard 20" x 20" cup and glass racks.
- b. Provide rack dolly with four (4) 5" casters, two (2) swivel and two (2) with brakes.
- c. Provide rack dolly with gray (Model A-35) corner bumpers.
- d. Assembly to be N.S.F. constructed out of aircraft high-strength aluminum sheet material.
- e. Provide rack dolly without transport handle.

Item BS-7

Description: SPARE NUMBER

Item BS-8

Description: SPARE NUMBER

Item BS-9

Description: GLASS FILLER ASSEMBLY
Quantity: 1
Manufacturer: T&S Brass and Bronze
Model No.: B-0113-CR-BVB-A
Specifier ID No.: I025

Complete with all standard accessories

- a. Mount assembly where shown on plan into Beverage Counter with Sink, Item BS-2.
- b. Provide with 4'-0" flexible hose.
- c. Mount fill faucet and vacuum breaker on stepdown in splash as per equipment elevations.

Special Instructions:

K.E.C. to pre-pipe drainline back 90° and extend down at rear of cabinet assembly for final connection by Plumbing Contractor.

Item BS-10

Description: S/S FLOOR TROUGH W/ GRATE
Quantity: 1
Manufacturer: IMC/Teddy
Model No.: FT-1230-SGAS
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide trough with stainless steel drain pan to be fabricated in one (1) piece construction.
- b. Provide with removable anti-slip subway grating Model SGAS.
- c. Refer to Special Conditions Plans and Standard Detail SD-1.3.

Special Instructions:

Stainless steel floor trough with pan and grate to be furnished by K.E.C. Assembly to be installed by General Contractor and hooked up by Division 15 in accordance with all local and state codes.

Note:

If stainless steel ice maker floor trough is installed above grade with bottom exposed to ambient air, the General Contractor is to fully insulate the exposed bottom of drain pan to prevent condensation and possible water damage.

Plumbing Contractor to insulate drain pan P trap and exposed piping for 15'-0" to prevent condensation due to ice melting in pipe.

Item BS-11

Description: ICE STORAGE BIN
Quantity: 1
Manufacturer: Hoshizaki
Model No.: B-500SF
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide in all Type 304, Series 18/8 stainless steel interior and exterior finish with all covered corner construction.
- b. Provide ice storage bin with foamed in place closed cell urethane insulation 2" thick.
- c. Storage bin to hold 500 lbs. of cube ice.
- d. Provide with top kit for mounting Ice Maker, Item BS-12.
- e. Provide with ice scoop and bracket.
- f. Provide with four (4) 6" adjustable legs with flanged feet.

Special Instructions:

KEC to coordinate with General Contractor on ceiling height of ice maker and bin with field conditions.

Item BS-12

Description: CUBE ICE MAKER
Quantity: 1
Manufacturer: Hoshizaki
Model No.: KM-600MAH
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide ice maker in standard all stainless steel finish.
- b. Unit to be air-cooled, self-contained.
- c. Unit to produce 503 lbs. of cube ice at 90° air temperature and 70° water temperature in 24 hour period.
- d. Ice maker to produce crescent ice form and be adjustable for two sizes.

Item BS-13

Description: WATER FILTER ASSEMBLY
Quantity: 1
Manufacturer: Everpure
Model No.: EV9324-21
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide one (1) complete system with mounting plate, one (1) pre-filter cartridge and one (1) filter cartridge.
- b. Provide one (1) IMF food grade scale inhibitors for each ice machine.
- c. Filter system to be NSF listed and remove odor, particles, minerals and parasitic protozoan cysts.

Special Instructions:

Water Filter System to be mounted on wall beside Ice Machine, Item BS-12, with suitable stainless steel fasteners. Incoming water line to be hooked up to coarse filter and triple QC7-MC cartridges. Each machine requires one (1) IMF unit each. Do not hook-up IMF units in parallel. All plumbing connections and interconnections to be by Division 15. Assembly to be mounted by K.E.C.

Item BS-14

Description: TRASH RECEPTACLE
Quantity: 1
Manufacturer: Continental
Model No.: 8322
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Provide gray in color.

Item BS-15

Description: REMOTE REFRIGERATION RACK
Quantity: 1
Manufacturer: Omni Temp
Model No.: OTBE1-AC-H-3-0-3
Specifier ID No.: I025

Complete with all standard accessories

Furnish the following options:

- a. Remote refrigeration system to be mounted on 6" concrete curb base as per architectural plans and elevations. Packaged outdoor refrigeration system assembly to have approximate overall dimensions of 60" long x 34" wide x 33" high. The heavy duty all welded framework will consist of rigid structural channels welded together so as to provide adequate support for all refrigeration components. Provide rack with 2000 lbs. lift eyes on top at each corner of rack. All systems shall be located in a full 16-gauge enclosure with service access door. Framework and panel construction to have a two coat baked enamel finish. Rack shall be equipped with one (1) pre-wired to the load center water proof duplex outlet at factory.
- b. Hot-air discharge from condenser fans shall be vertical. A venturi-contoured air-scoop shall be provided for each fan to reduce air turbulence and fan loading. Fan blades shall be covered with a plastic coated fan guard. Condenser fan to be provided with OSHA approved interior and exterior fan guards. Air flow through the rack to pass 100% of the condenser air over all the compressors. No evaporative cooled air systems allowed. Condenser will be a master circuited type with 3/8" rifled tubes and lanced finned type, maximum four (4) row thick core. All copper finned condenser installations on an Island or on the mainland within one (1) mile of the salt water intrusion.
- c. Condensing system shall be equipped with a Copeland semi-hermetic compressors, micro set dual pressure controls, drier and sight glass, suction and discharge vibration eliminators, suction filter, floodback head pressure control, oversized receiver and **super hose** connections. A crankcase heater shall be provided for each compressor. All compressor units shall be new and factory assembled to operate with the refrigerant specified. All fan motors shall be ball bearing split capacitor start open / drip proof type electric motors. Refrigerant R-404A shall be used on all medium temperature and low temperature walk-in cooler assemblies and remote undercounter low and medium temperature units and frosted bar rails.
- d. Refrigeration package shall have a factory mounted, sequence identified and pre-wired flush mounted control panel complete with circuit breakers, contactors and time clocks wired for single point electrical power connection complete with factory mounted main disconnect. System shall be UL or ETL listed. Division 16 shall only provide and install main power lines to main disconnect for unit to operate.
- e. Each condensing unit shall be equipped with an oversized receiver with a pump down capacity large enough to accept the total liquid volume of refrigerant for all systems without exceeding 80 percent of its volumetric capacity at its designated operating pressure and temperatures. Each receiver shall be equipped individually with a fusible plug.
- f. Provide as part of this item all walk-in cooler and freezer evaporator coils for Items K-1, Walk-In Cooler, Item K-5, Walk-In Freezer, Items, K-49, K-52 and K-55, Refrigerated Bases.

- g. Refrigeration evaporator coils shall be direct expansion type with factory installed solenoid valve, cold control thermostat and thermal expansion valve. Shall be pre-wired, pre-piped and sealed under pressure to maintain the integrity of evaporator coils and components. Low temperature coils shall have a time initiated temperature terminated defrost time clock. Electric defrost systems shall have an interlock switch to prevent defrost circuit and compressor from drawing power simultaneously. Multi circuited condensers shall be sized to operate at 15 degrees T.D. over ambient. The condenser surface shall be vertically mounted to maximize heat transfer.
- h. Evaporators will be all U.L. or ETL listed complete with an expansion valve, solenoid valve and thermostat, pre-wired and pre-piped under nitrogen pressure and meet the specified refrigerant. Coils for a parallel system will be supplied with ball valves pre-piped and shipped under pressure.
- i. All refrigerant lines shall be extended to one side of the package in a neat and orderly manner, easily identified by system. All tubing shall be securely supported and anchored with clamps. All copper tubing shall be refrigerant grade A.C.R. or Type "L". Silver solder and/or sil-fos shall be used for all refrigerant piping. Soft solder is not acceptable. Internal piping must meet ASHRAE standards for pressure drop and velocities. All copper piping must have a plastic bushing where secure to a steel support.
- j. All piping to be pressure tested with nitrogen at 300 psi. After the condensing unit and coil have been connected, the balance of the system shall be leak tested with all valves open. All field piping installed as per factory standards and the sizing of the piping shall meet proper velocities as per factory standards. Insulation will be foam type 25/50 smoke and fire type. Medium temperature will use $\frac{3}{4}$ " thick wall, low temperature will use 1" thick wall and sub-cooled liquid lines will use $\frac{3}{4}$ " thick wall. All field piping must have a plastic bushing wherever steel to copper tubing comes together. Include all labor, material, equipment, tools, refrigerant, oil, and other required accessories for the complete installation of the systems as shown and specified. Interconnection of all accessories accomplished for ease of servicing. Particular attention given to oil return, refrigerant pressure drops and neatness. Placement of all exposed pipes approved prior to installation with General Contractor. Spacing of piping in accordance with factory standards and not exceeding 8'-0". Furnish manufacturer's dimensional and schematic drawings, and wiring diagrams. This entire assembly must be installed by a Licensed Refrigeration Contractor, pre-approved and under the direction of the factory, as a sub-contract to this section of work.
- k. After installation and before charging, evacuate all piping systems to a 500 micron evacuation. After evacuation, charge system with nitrogen and maintain pressure of 150% working pressure for 6 hours. Cap off, install pressure gauge and hold for 24 hours minimum. Re-evacuate, hold for 6 hours, charge and make electronic detector test all joints.

- l. Kitchen Equipment Contractor to provide all the undercounter refrigerators, freezers and backbar refrigerators complete with properly sized blower coils with capped off pre-charged lines stubbed out rear or side of units as indicated on drawings. K.E.C. to also furnish factory mounted expansion valves, liquid line solenoid, temperature controls and moisture proof disconnect switch for all remote undercounter refrigerators, freezers and cold pans as specified under this item.
- m. Division 16 shall furnish and install power lines to main disconnect in panel and provide wiring for control / defrost heaters between the panel and the low temperature refrigeration fixture. All wiring to be in accordance with factory supplied wiring diagram and local codes.
- n. Equipment installation, all piping, start-up and services shall be performed by a factory authorized licensed refrigeration sub-contractor. Included shall be a full one (1) year warranty for all parts by factory and labor on the entire refrigeration package by installing contractor, from the day of final acceptance of the installation by the Design Consultant. K.E.C. shall also provide an extended one (1) year service of rack system, coils and installation piping warranty on this scope of work. Manufacturer shall also include a five (5) year extended warranty on the compressors for exchange. All defective or replaced parts must be returned to the factory for replacement.

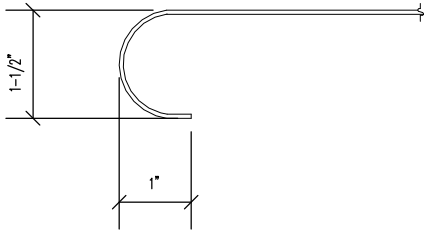
END OF SECTION 11400
WRITTEN FOODSERVICE EQUIPMENT SPECIFICATIONS

PART 7: STANDARD DETAILS

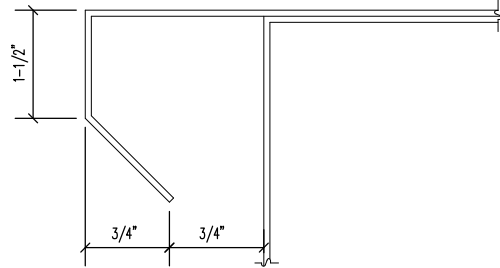
Standard Details included as part of specifications are to be considered guides to quality and scope of work involved. Where shop practices dictate, alternate construction methods and component items of equal manufacturer may be substituted. It will be the responsibility of the Kitchen Equipment Contractor to prove the quality of the proposed methods.

Note:

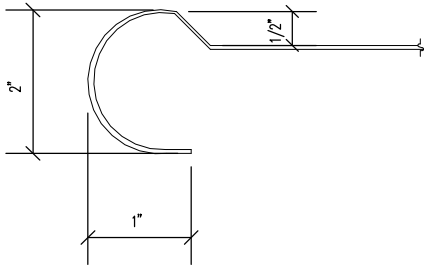
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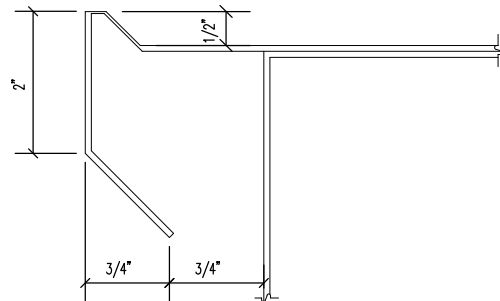
(A) STANDARD ROLL



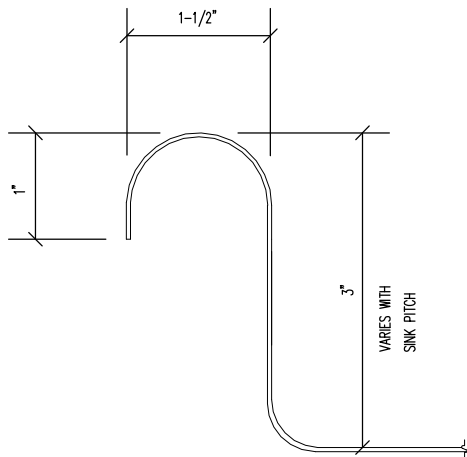
(D) FLAT TURN DOWN



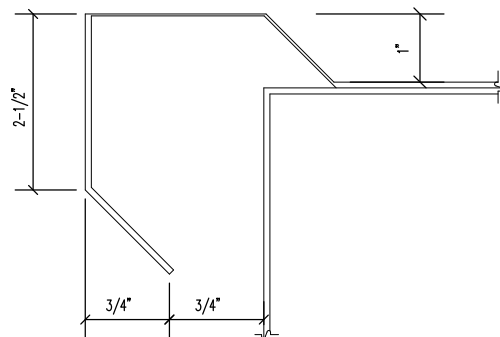
(B) ROLLED MARINE



(E) INVERTED "V"



(C) RAISED ROLLED



(F) NON-SPILL MARINE

FABRICATED EDGES

SCALE: N.T.S.

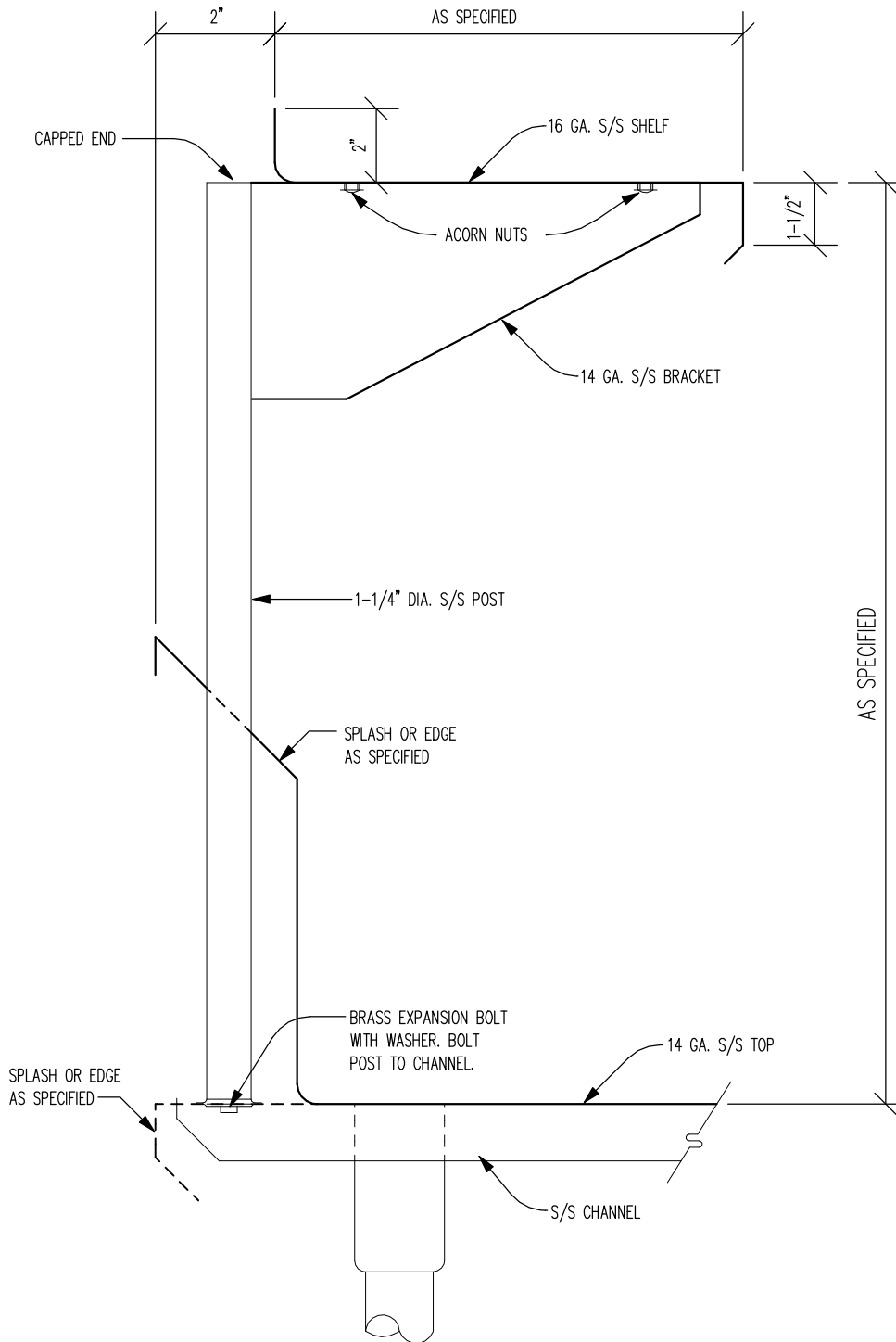
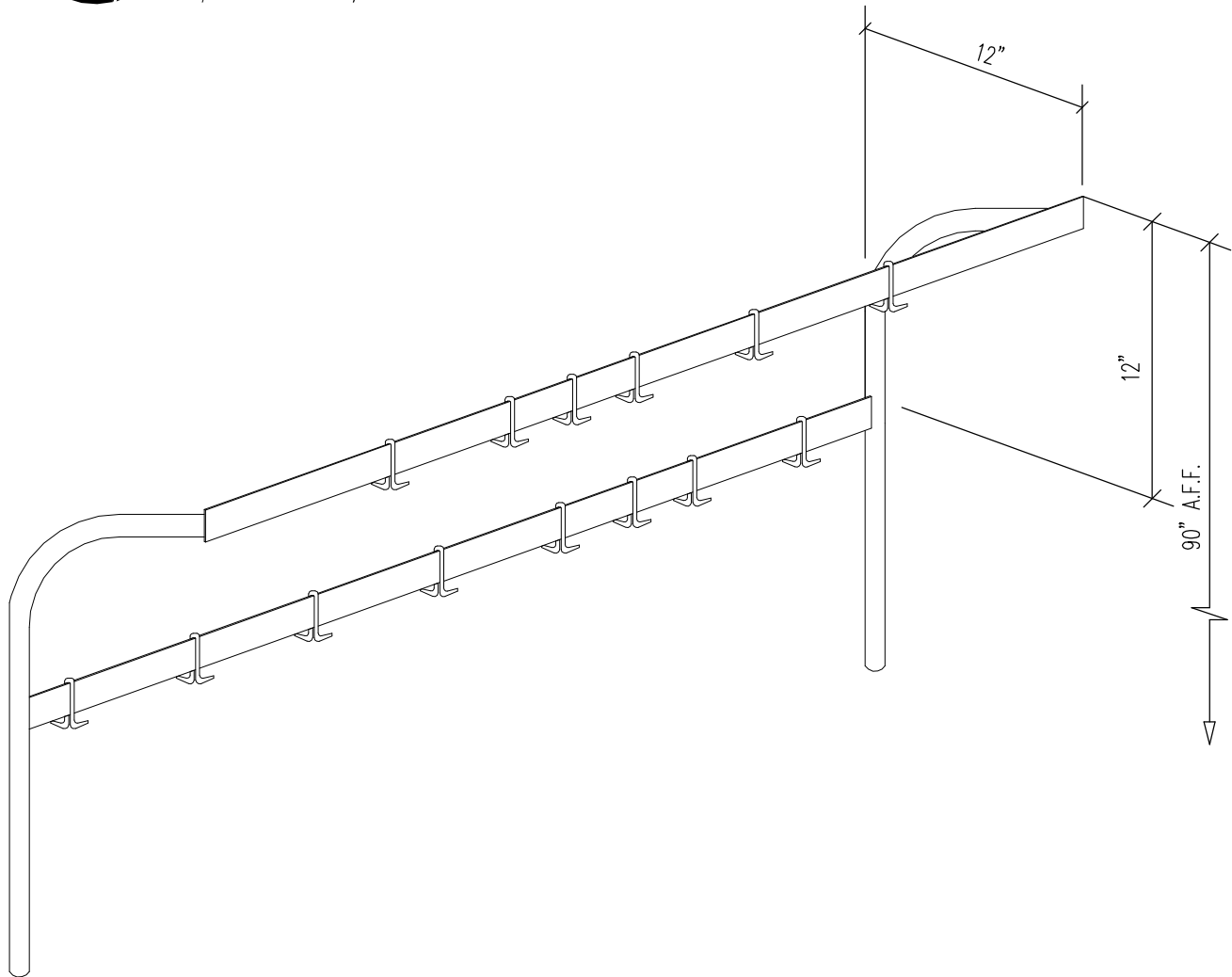


TABLE MOUNTED OVERSHELF

SCALE: N.T.S.

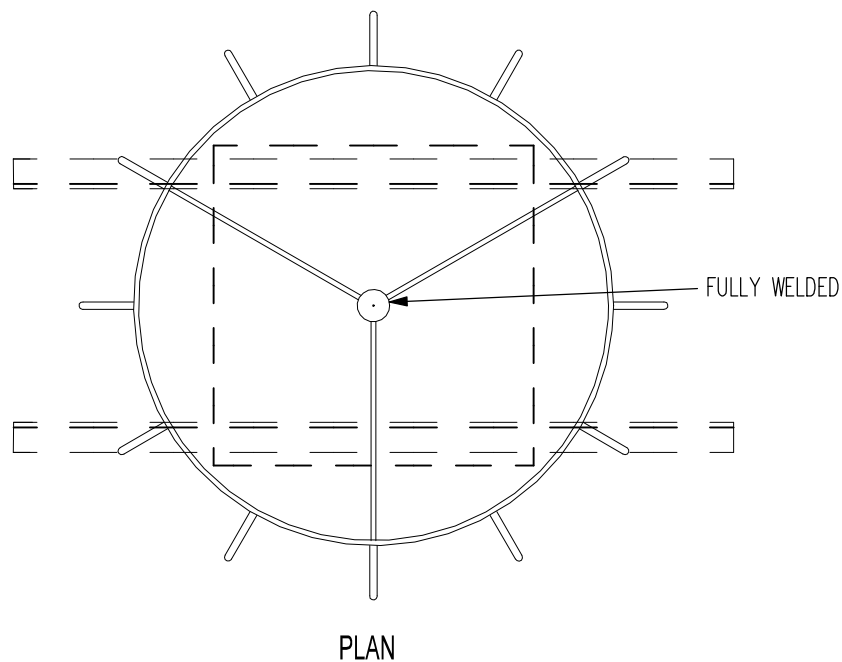
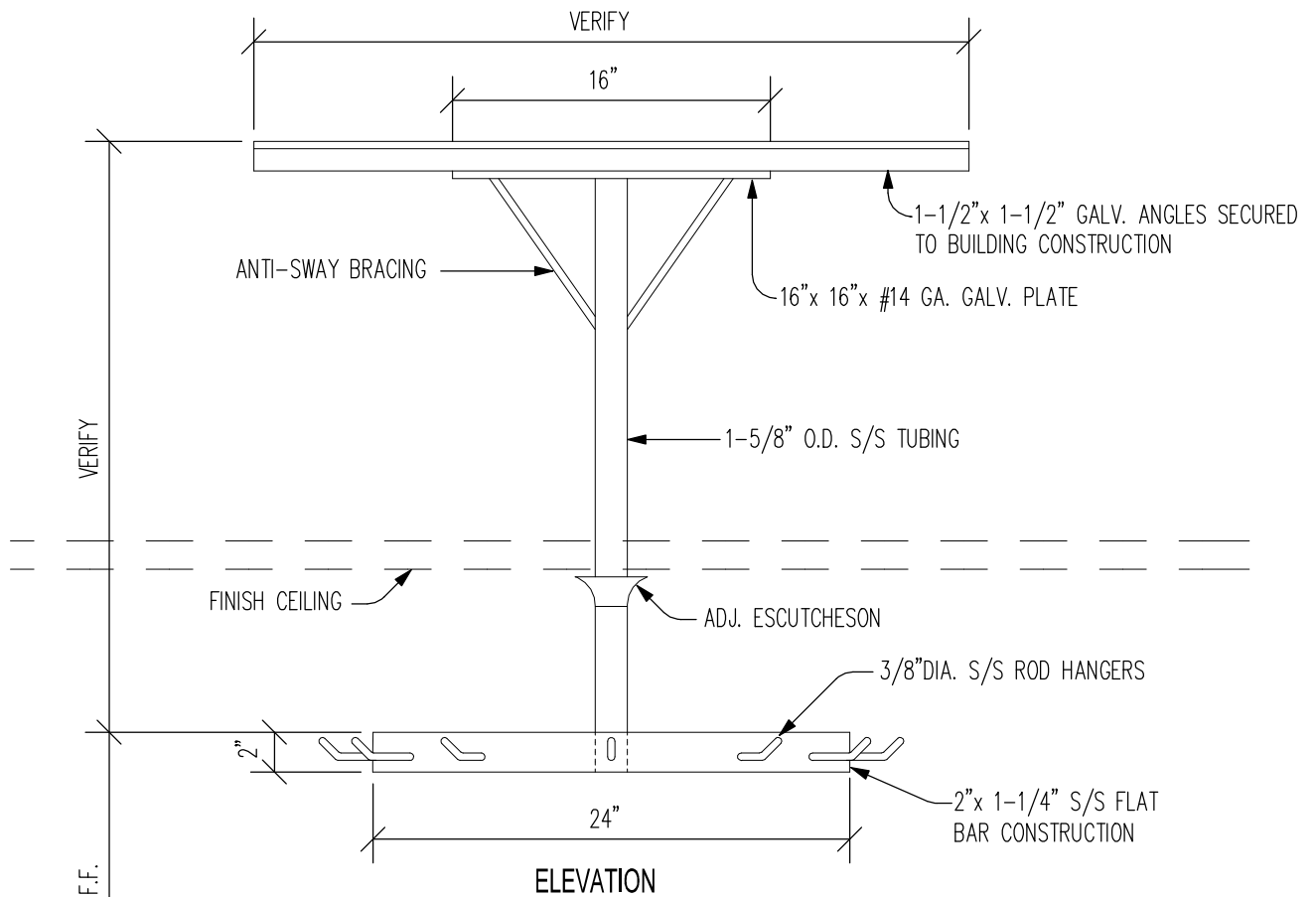


NOTE:

VERIFY LENGTH OF TABLE MOUNTED UTENSIL RACK WITH PLANS AND SPECIFICATIONS. RACK SHALL BE CONSTRUCTED OF 2"x 1/4" STAINLESS STEEL BAR WELDED TO UPRIGHTS. FINISH RACK WITH DOUBLE SIDED SLIDING HOOKS, STANDARD KEIL NO. 1577-1010-1251 SPACED APPROXIMATELY 8" O.C. RACK SHALL BE SUPPORTED BY 1-5/8" O.D. STAINLESS STEEL UPRIGHTS CURVED AT TOP ON 6" RADIUS AND EXTEND FORWARD. UPRIGHTS TO EXTEND THROUGH STAINLESS STEEL GUSSETS AND OPENING IN TABLE TOP OR THROUGH BACKSPASH AS SPECIFIED.

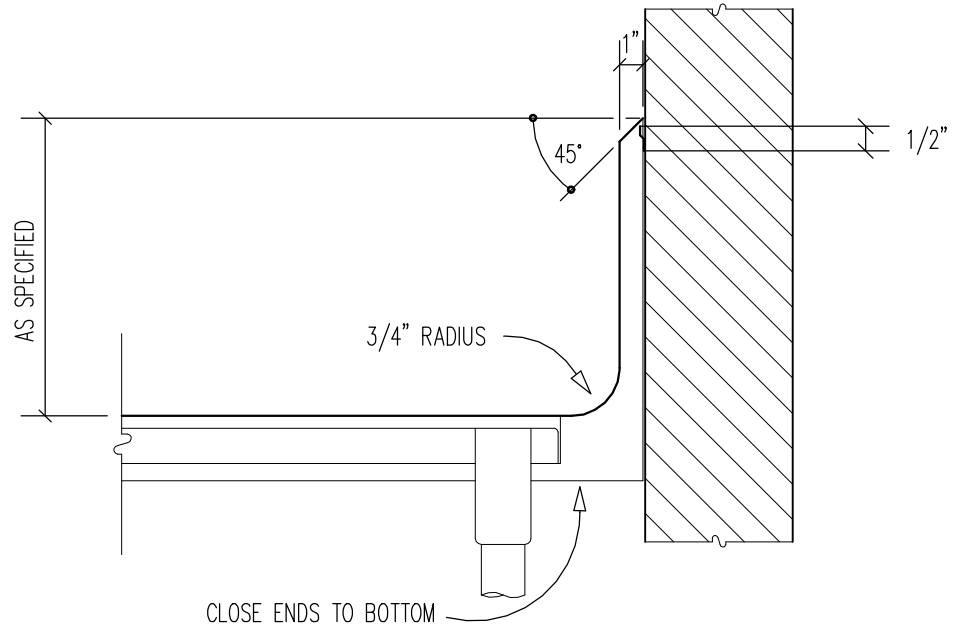
TABLE MOUNTED UTENSIL RACK

SCALE: N.T.S.



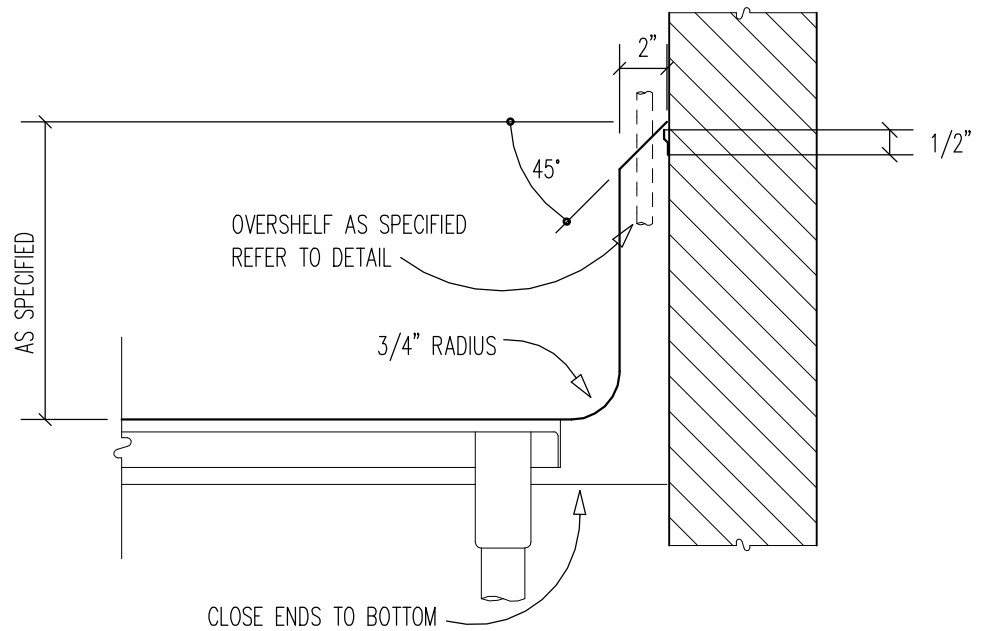
MIXER PARTS RACK

SCALE: N.T.S.



BACKSPLASH AT WALL (NO OVERSHELF)

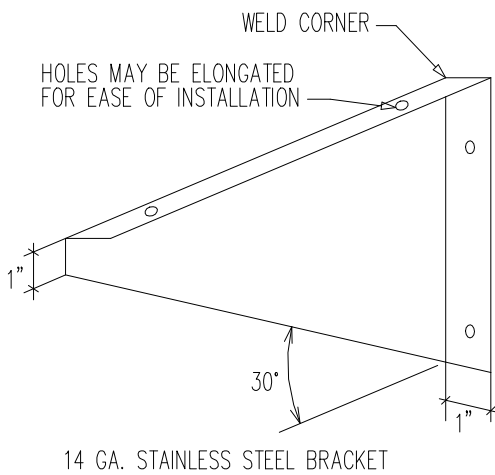
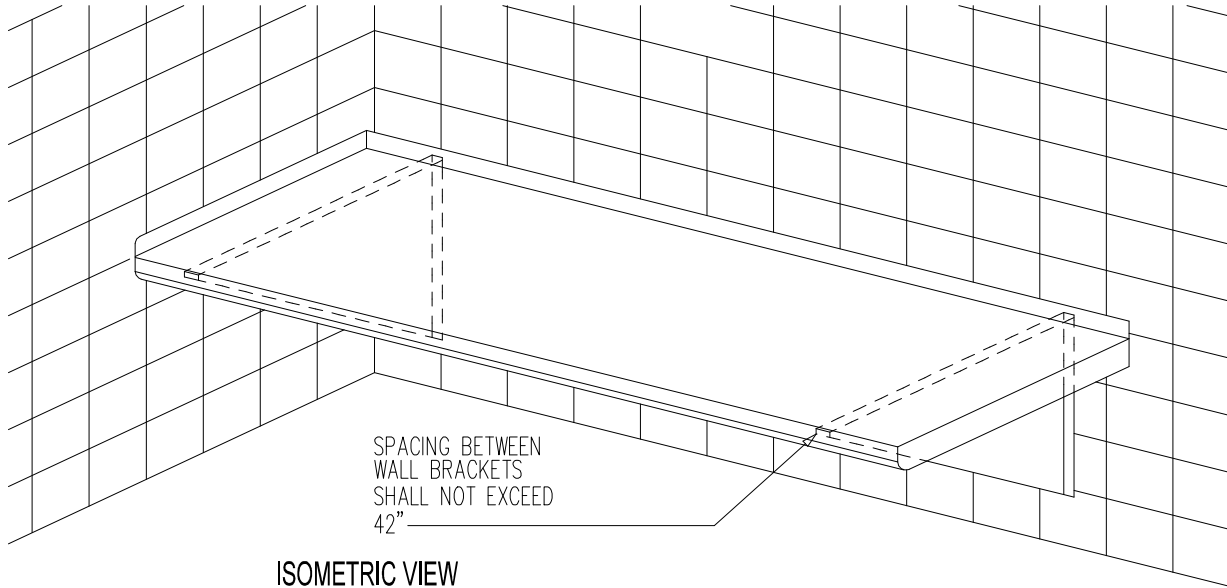
SCALE: N.T.S.



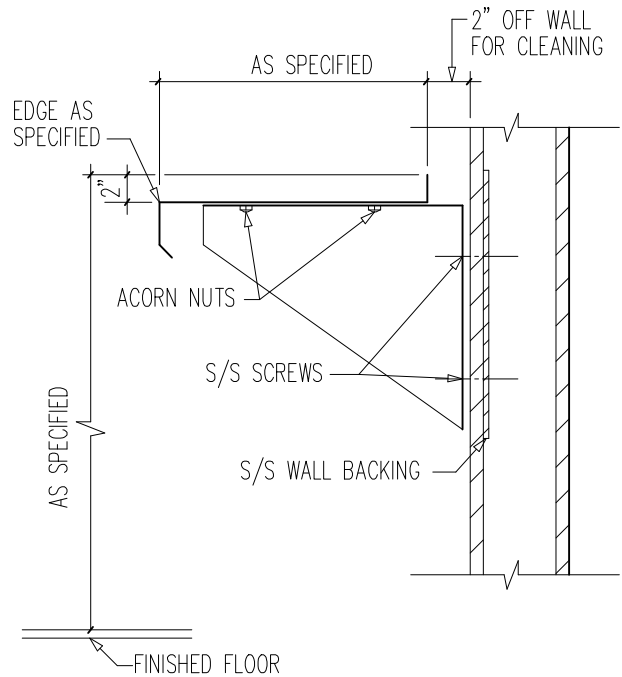
BACKSPLASH AT WALL (WITH OVERSHELF)

SCALE: N.T.S.

VERIFY WALL MOUNTED OVERSHELF WITH PLANS AND SPECIFICATIONS FOR LENGTH AND WIDTH. REFER TO EQUIPMENT ELEVATIONS FOR HEIGHT.



BRACKET DETAIL



SECTION

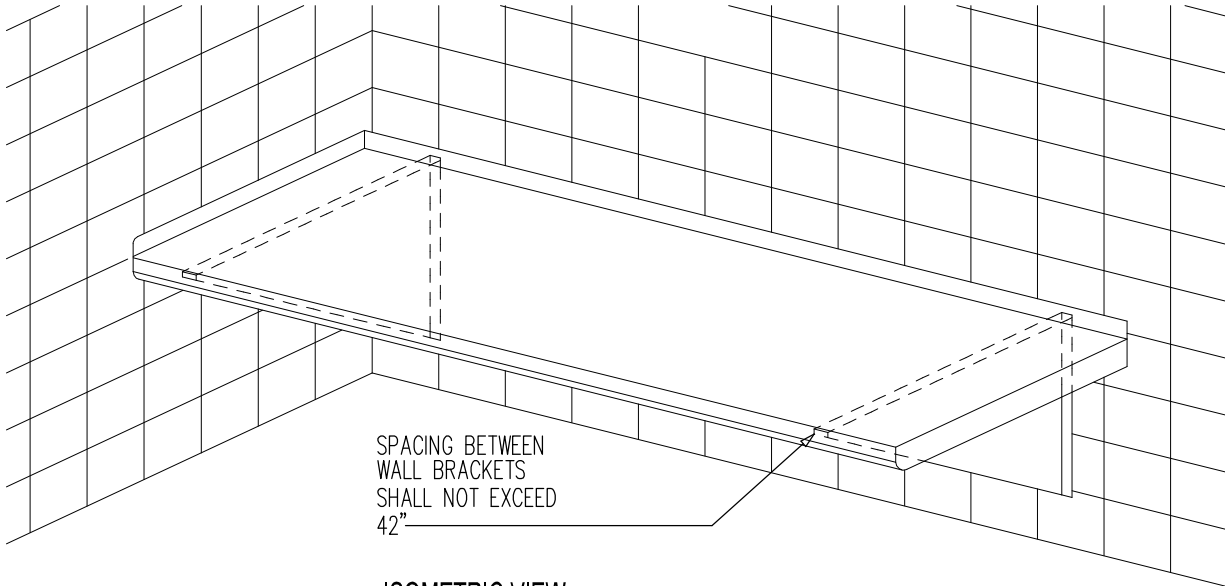
K.E.C. SHALL SECURE OVERSHELF TO WALL WITH SUITABLE STAINLESS STEEL FASTNERS TO SUPPORT HEAVY LOADS.

STAINLESS STEEL WALL SHELF

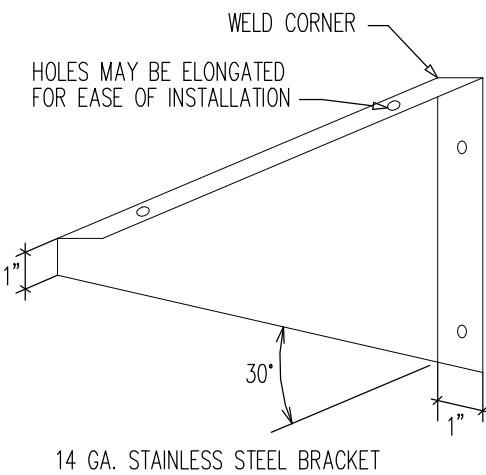
SCALE: N.T.S.



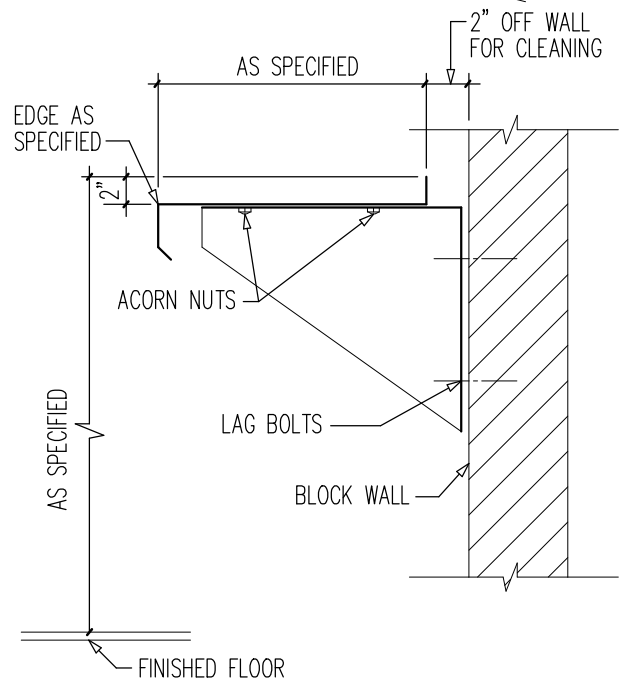
VERIFY WALL MOUNTED OVERSHELF WITH PLANS AND SPECIFICATIONS FOR LENGTH AND WIDTH. REFER TO EQUIPMENT ELEVATIONS FOR HEIGHT.



ISOMETRIC VIEW



BRACKET DETAIL

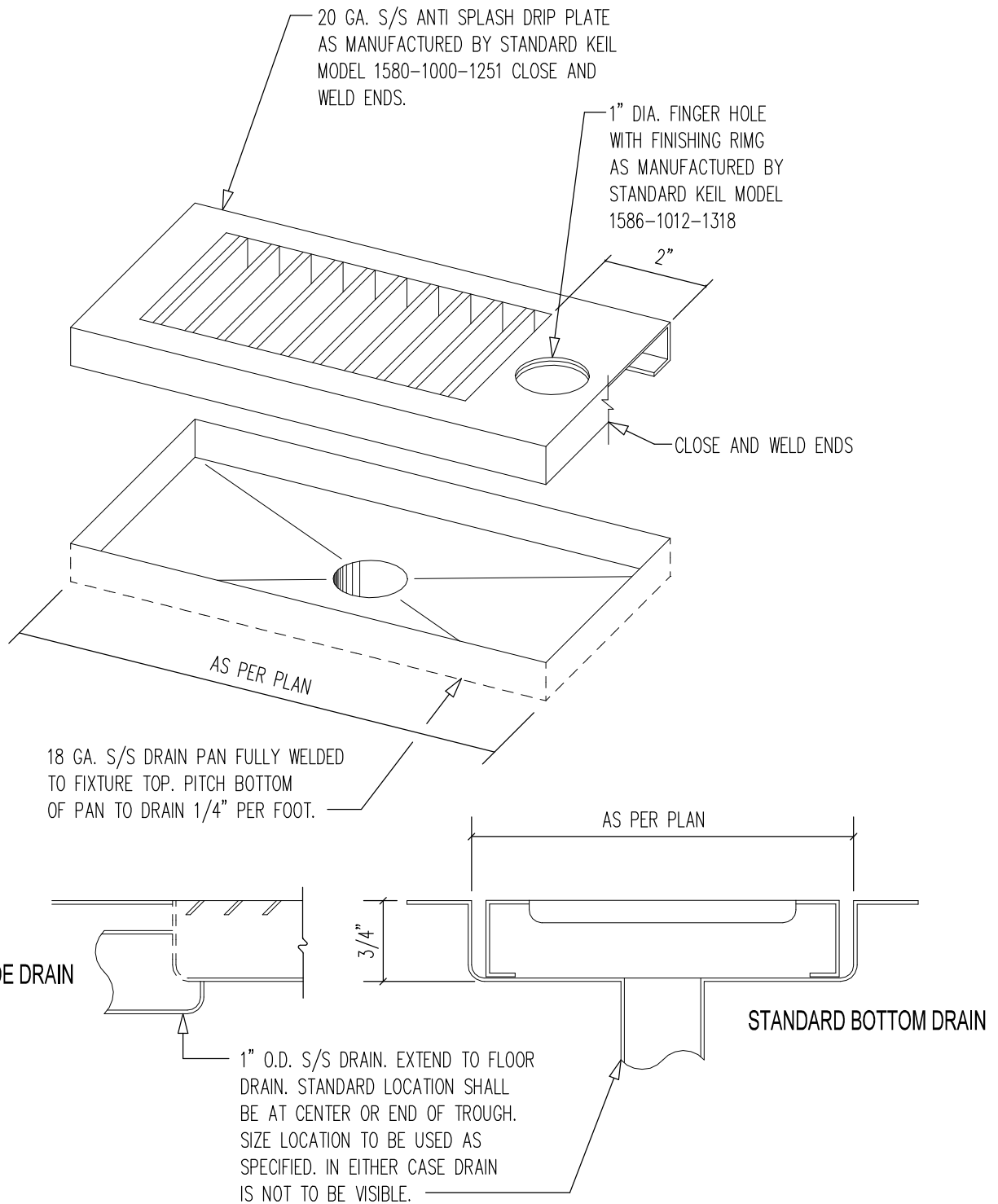


SECTION

K.E.C. SHALL SECURE OVERSHELF TO WALL WITH SUITABLE STAINLESS STEEL FASTNERS TO SUPPORT HEAVY LOADS.

STAINLESS STEEL WALL SHELF

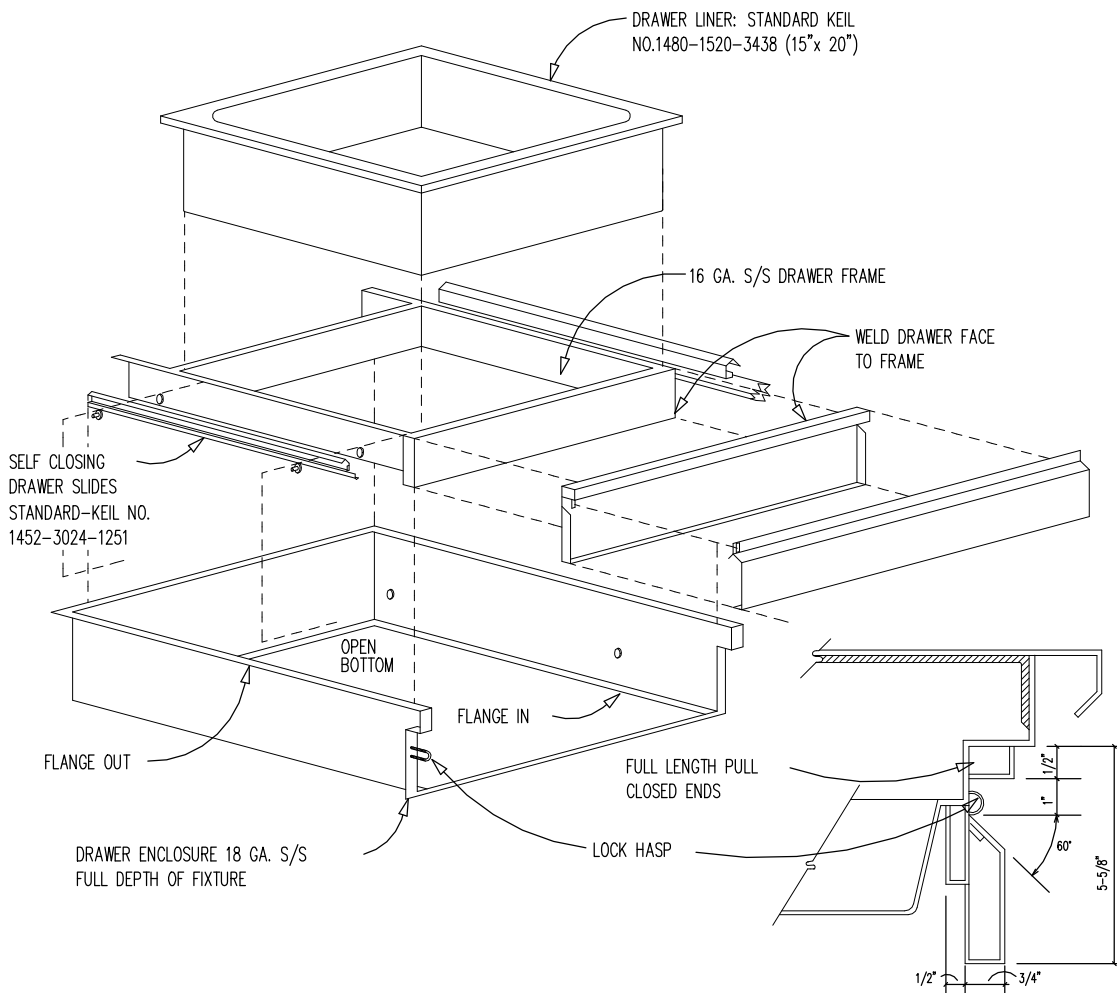
SCALE: N.T.S.



NOTE: WHEN LENGTH OF DRAIN TROUGH EXCEEDS 36" PROVIDE EQUAL LENGTH MULTIPLE DRIP PLATES

ANTI-SPLASH DRAIN TROUGH

SCALE: N.T.S.

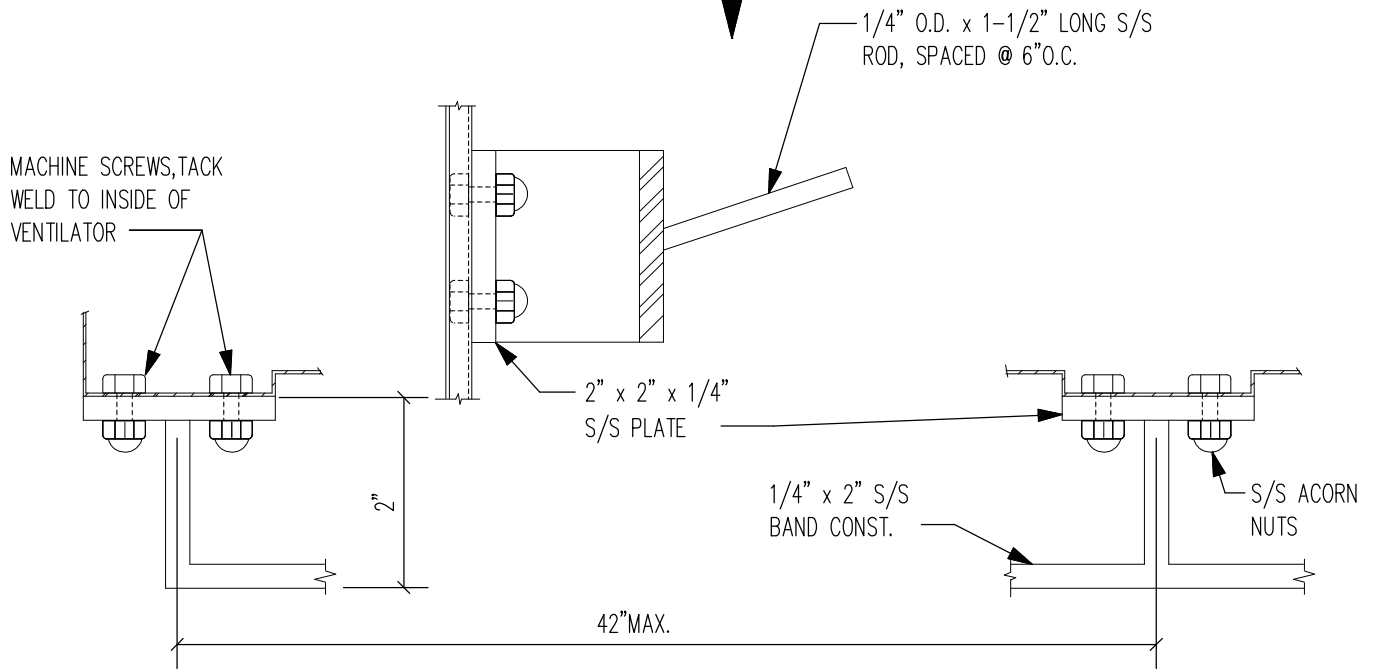
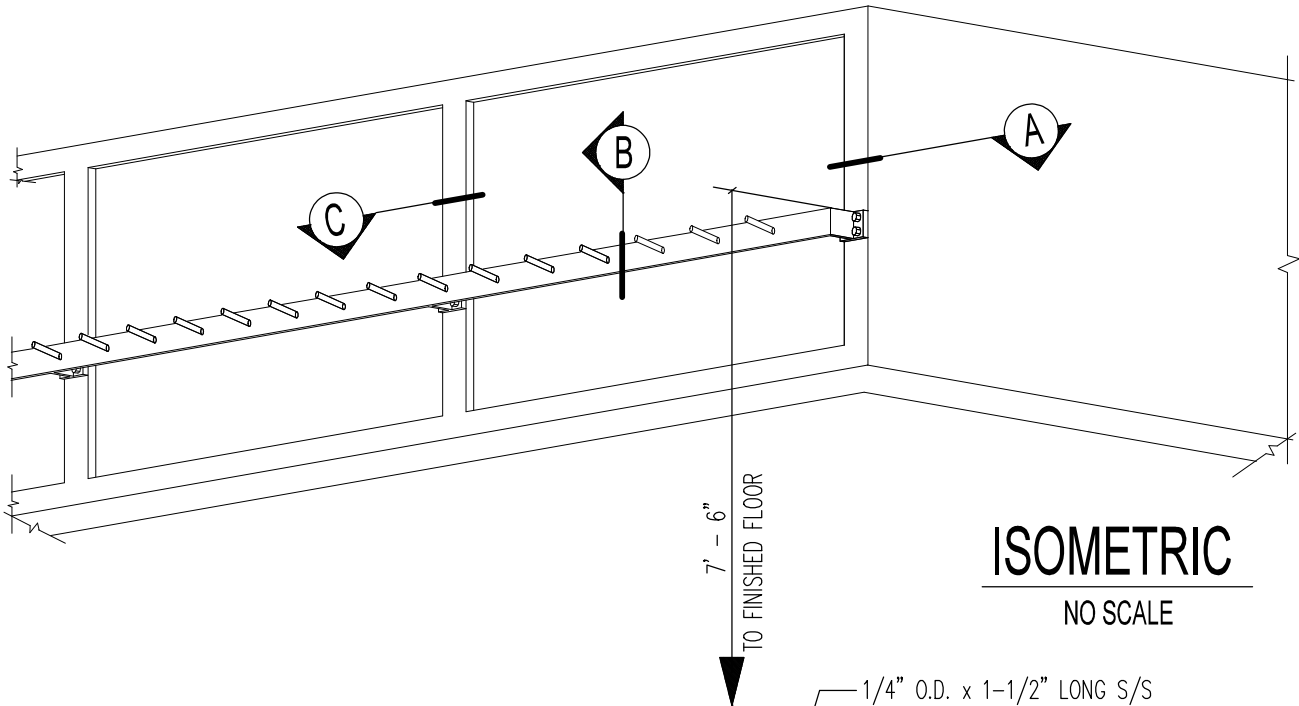


EXPLODED VIEW

DRAWER FACE SECTION

TYPICAL TOOL DRAWER

SCALE: N.T.S.



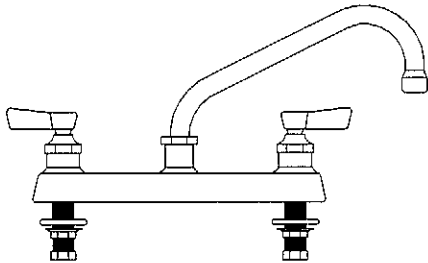
SECTION A
 SCALE: HALF FULL SIZE

SECTION B
 SCALE: HALF FULL SIZE

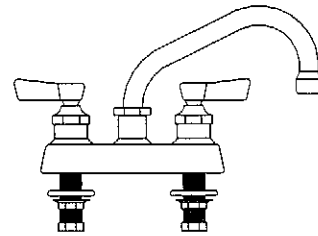
SECTION C
 SCALE: HALF FULL SIZE

VENTILATOR POT RACK

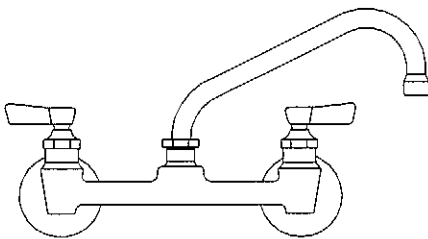
SCALE: N.T.S.



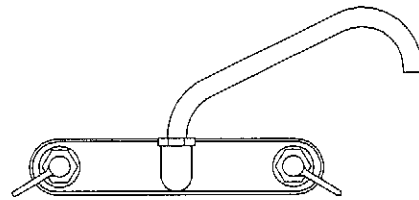
TYPE 1



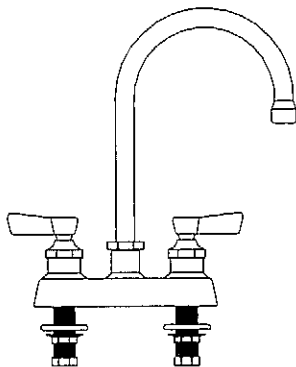
TYPE 2



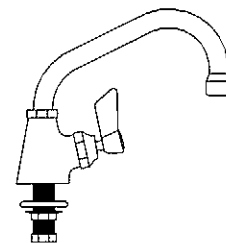
TYPE 3



TYPE 4



TYPE 5



TYPE 6

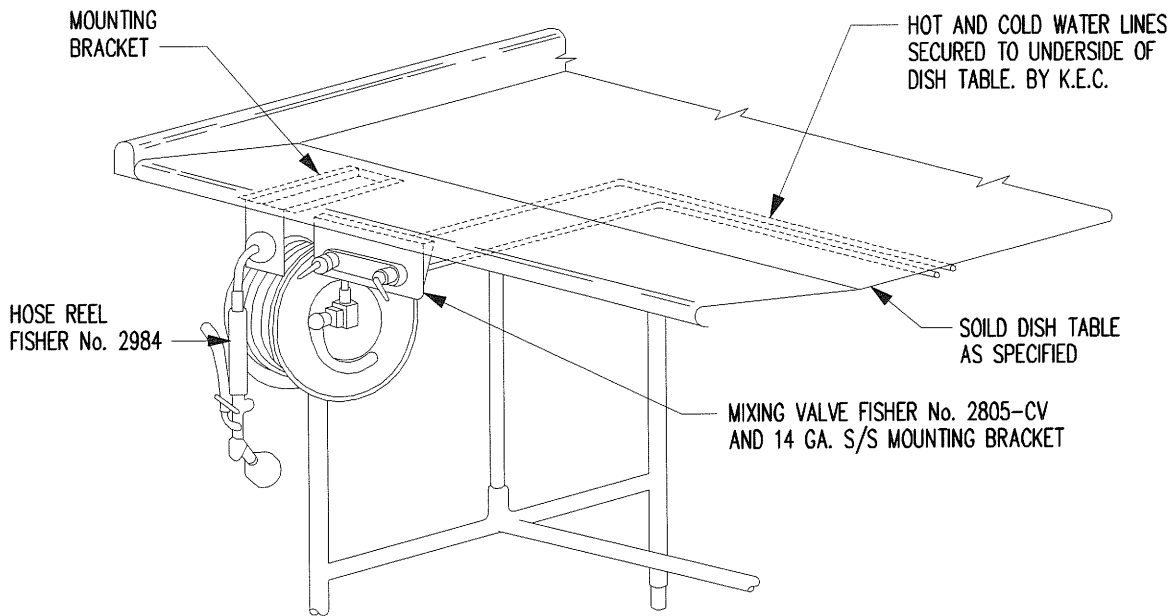
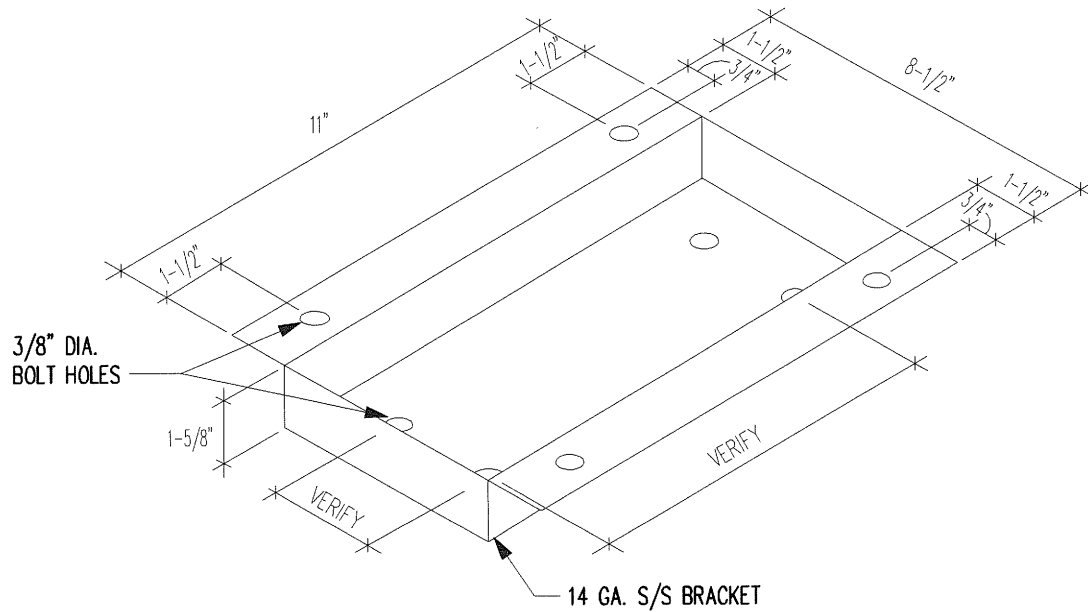
STANDARD FAUCETS

SCALE: N.T.S.



INMAN
 foodservices group
Experience the Experienced.

STANDARD DETAIL KD-10.13



NOTE:
 14 GA. STAINLESS STEEL HOSE REEL BRACKET AND MIXING VALVE BRACKET TO BE SECURED TO SLOPED DISHTABLE AS SHOWN WIT STUD BOLTS AND CHROME ACORN NUTS. SEAL ALL SEAMS WITH SILICONE SEALANT.

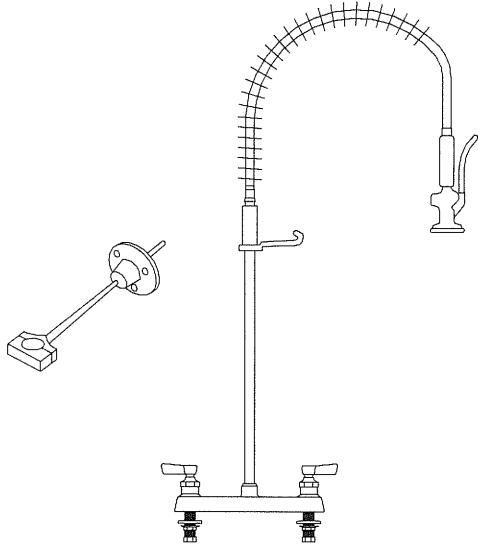
HOSE REEL MOUNTING BRACKET AND INSTALLATION

SCALE: N.T.S.

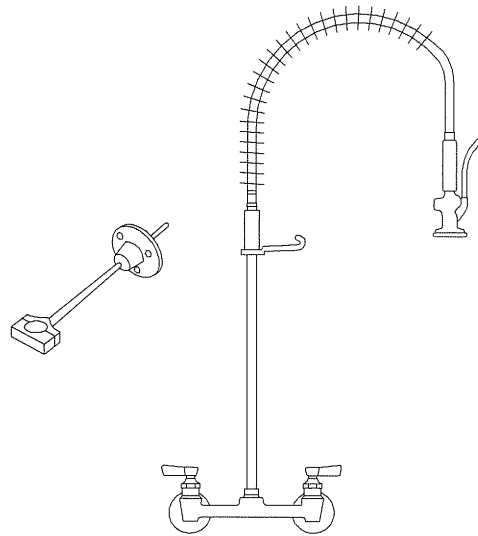


INMAN
foodservices group
Experience the Experienced.

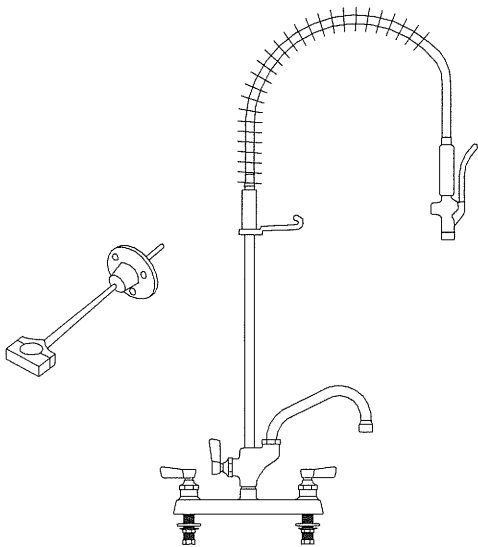
STANDARD DETAIL KD-10.2



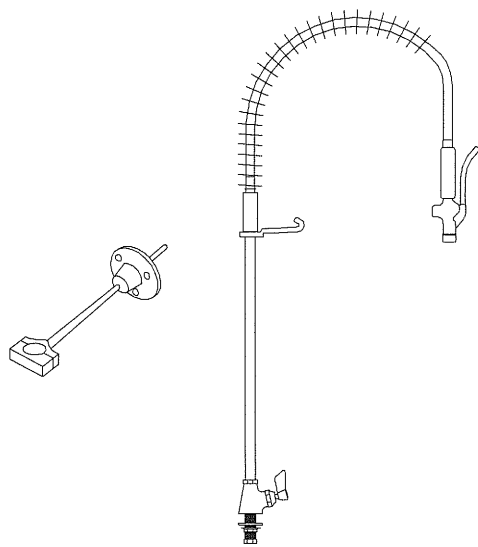
TYPE 7



TYPE 8



TYPE 9

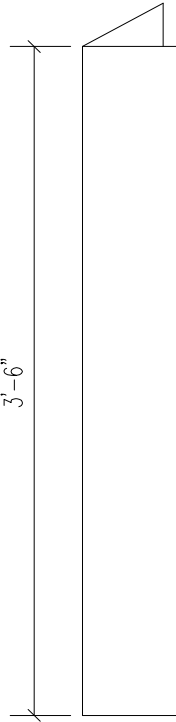


TYPE 10

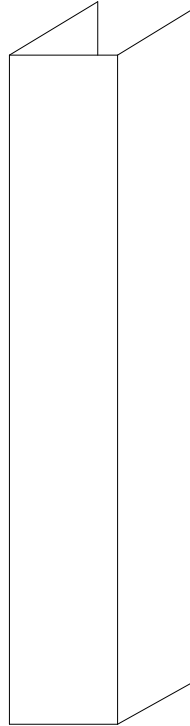
STANDARD FAUCETS

SCALE: N.T.S.

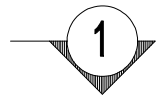
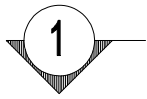
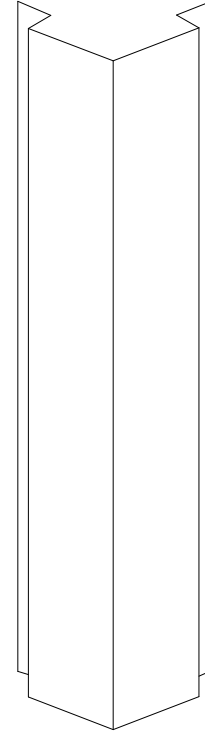
A
ANGLE TYPE



B
CHANNEL TYPE

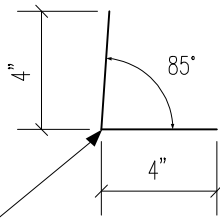


C
CHANNEL PLUS

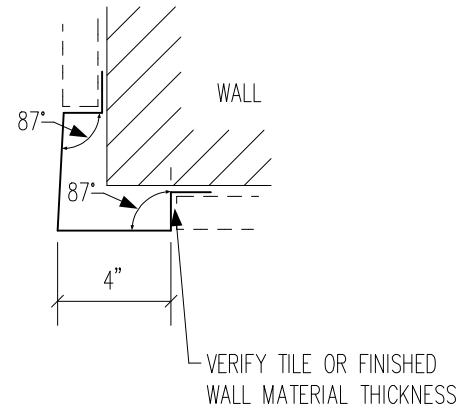
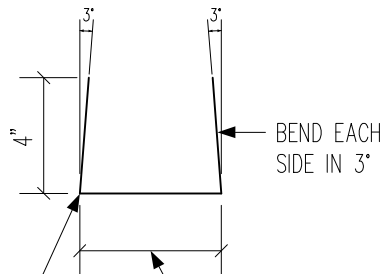


ELEVATION

VERIFY RADIUS TO BE IDENTICAL SO THAT GUARD FITS SNUGLY.



VERIFY RADIUS TO BE IDENTICAL TO CORNER TO BE PROTECTED SO THAT GUARD FITS SNUGLY.



A

B

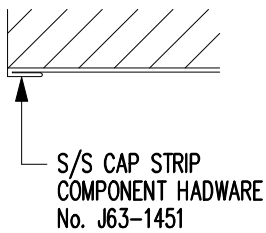
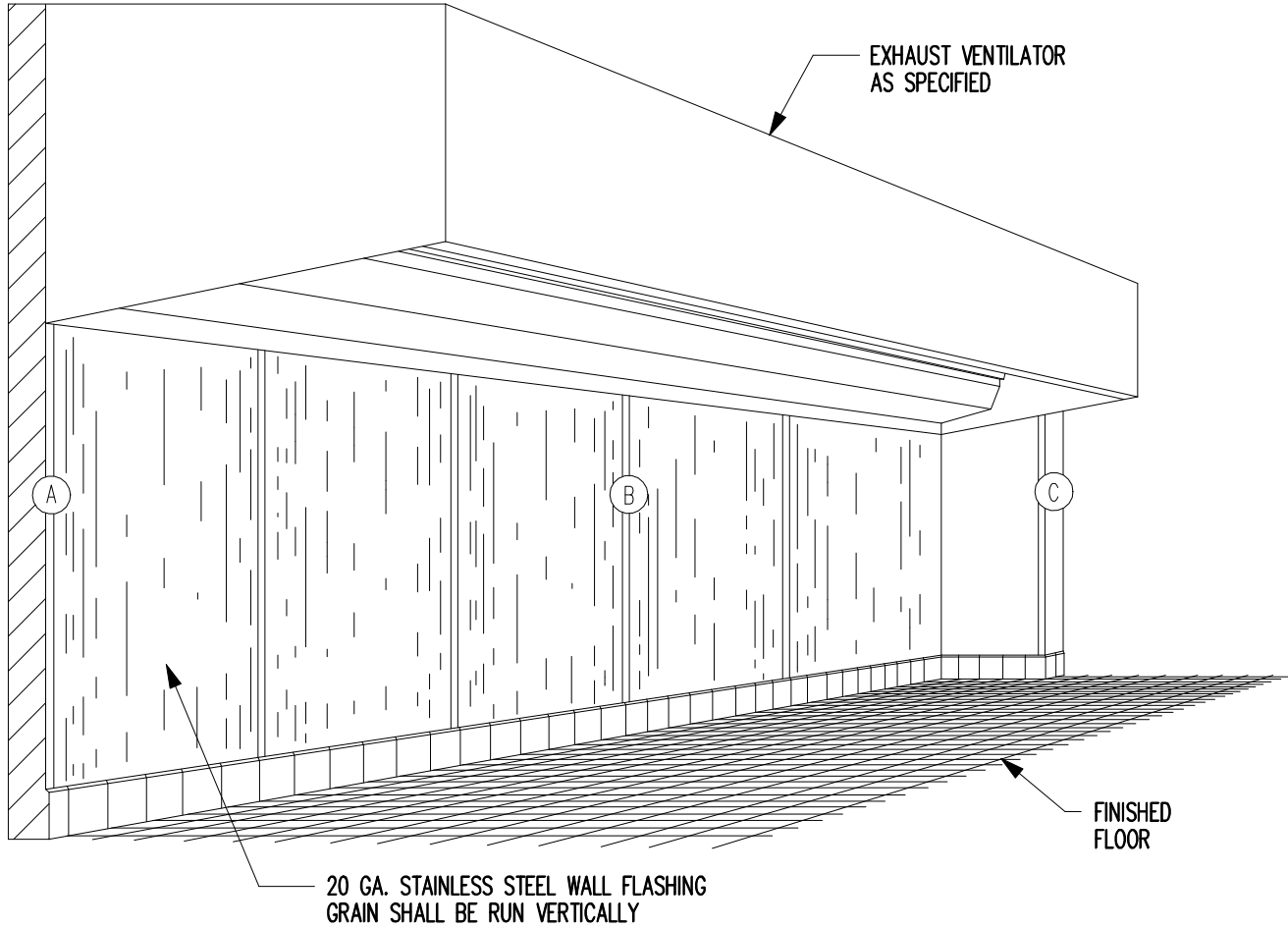
C

SECTION VIEWS

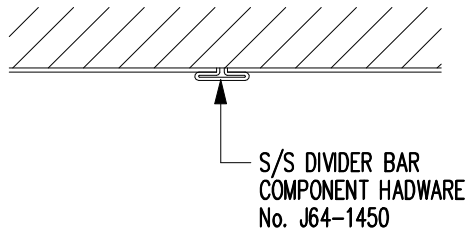
NOTE: 16 GAUGE STAINLESS STEEL CORNER GUARDS TO BE FURNISHED AND INSTALLED BY THE KITCHEN EQUIPMENT CONTRACTOR (K.E.C.) AS INDICATED ON THE FOODSERVICE PLANS, 1" ABOVE COVE BASE. FASTEN WITH SUITABLE STAINLESS STEEL FASTENERS AND SEAL PER GENERAL REQUIREMENTS.

SCALE: N.T.S.

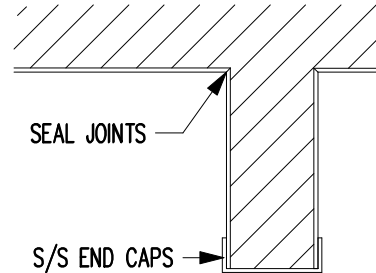
DETAIL CORNER GUARDS



SECTION A



SECTION B

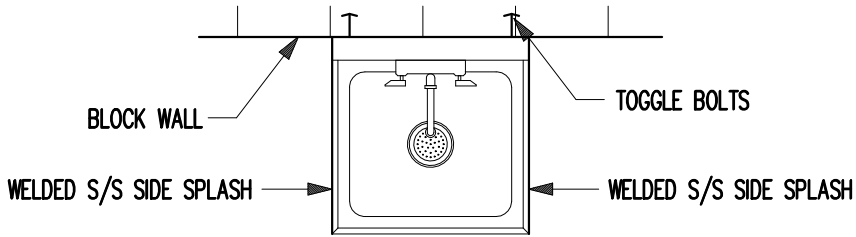


SECTION C

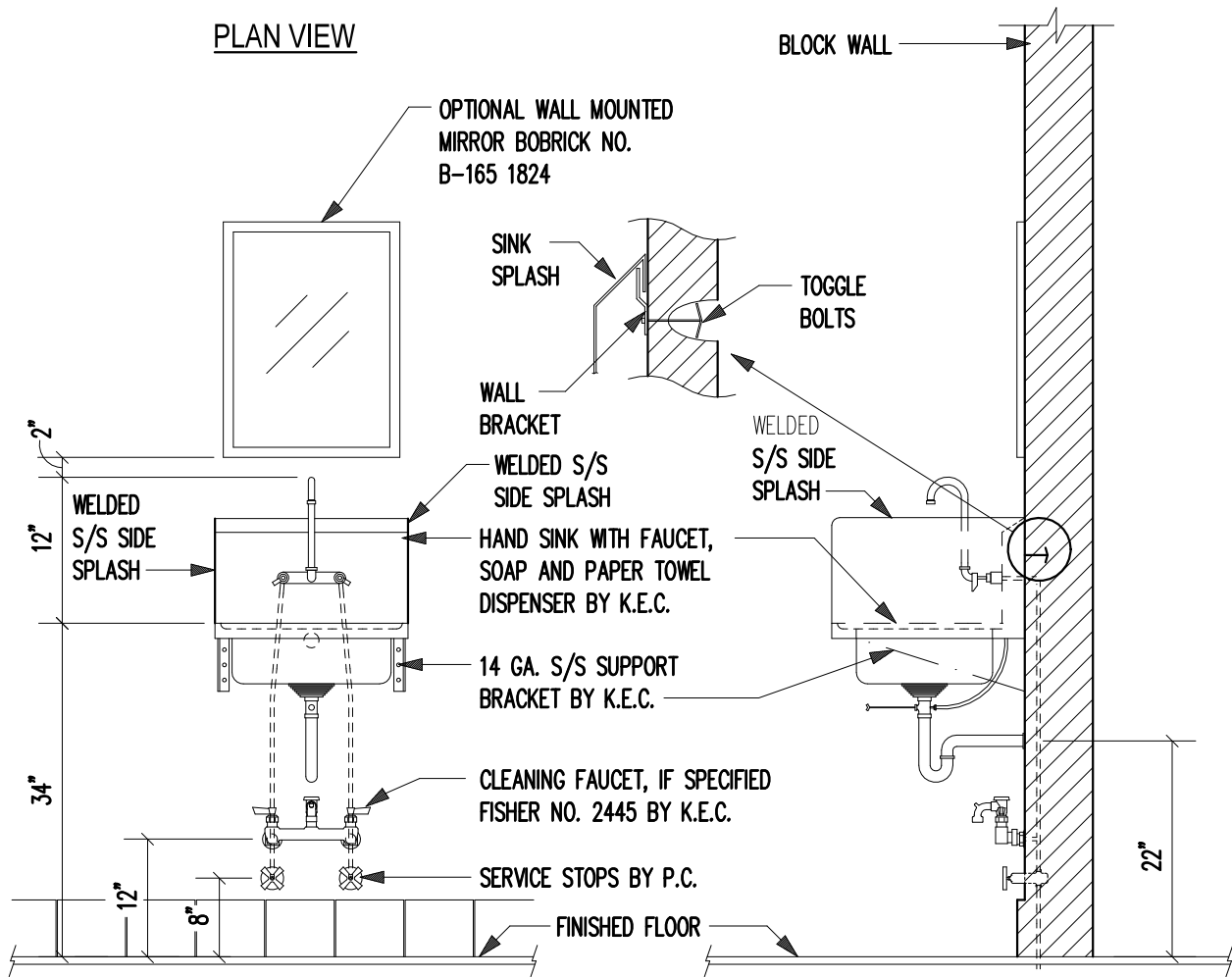
NOTE: SECURE FLASHING TO WALL WITH HEAT RESISTANT MASTIC

WALL FLASHING

SCALE: N.T.S.



PLAN VIEW



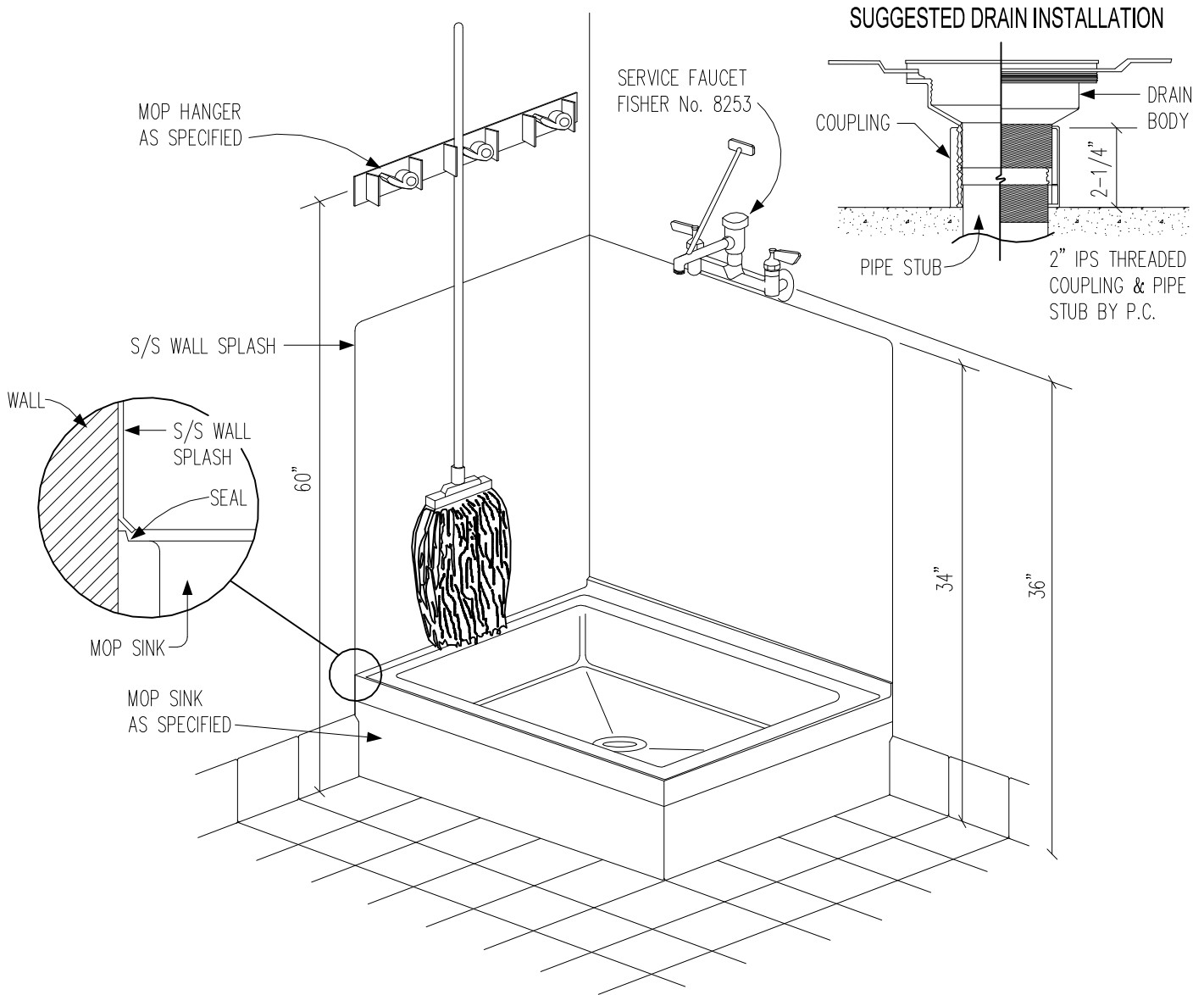
ELEVATION

SECTION VIEW

NOTE: WHEN SPECIFIED, CLEANING FAUCET, FISHER No. 2445 TO BE FURNISHED BY K.E.C.
 INSTALLED BY PLUMBING CONTRACTOR (P.C.) PER DETAIL.

HAND SINK

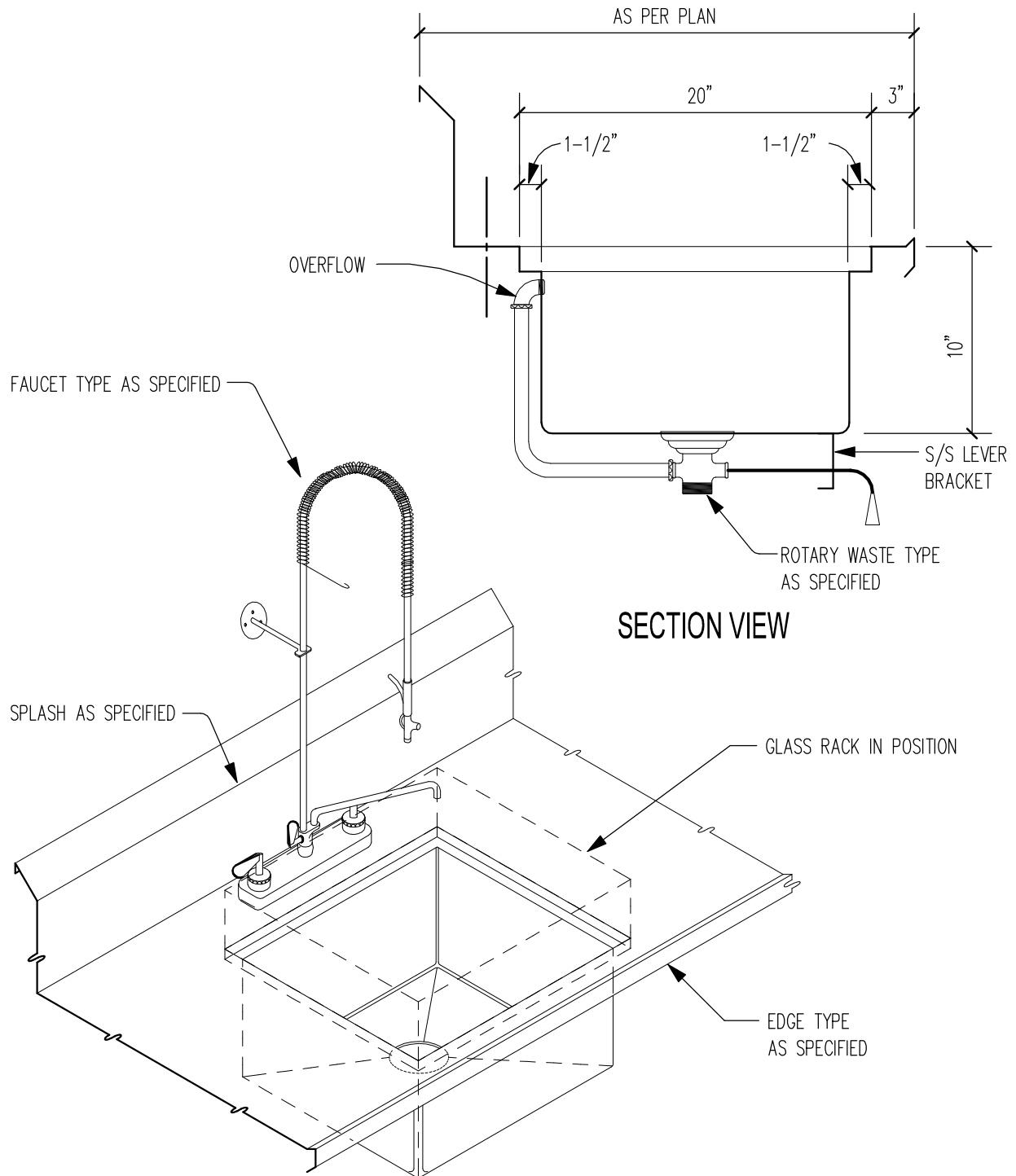
SCALE: N.T.S.



NOTE:
 STAINLESS STEEL MOP SINK, SERVICE FAUCET, MOP HOLDER AND 18 GA. STAINLESS STEEL WALL SPLASH TO BE FURNISHED BY THE KITCHEN EQUIPMENT CONTRACTOR (K.E.C.)
 PLUMBING CONTRACTOR SHALL INSTALL AND MAKE ALL CONNECTIONS TO MOP SINK AND SERVICE FAUCET.
 MOP HOLDER AND STAINLESS STEEL SPLASH SHALL BE INSTALLED BY THE KITCHEN EQUIPMENT CONTRACTOR USING STAINLESS STEEL FASTENERS.

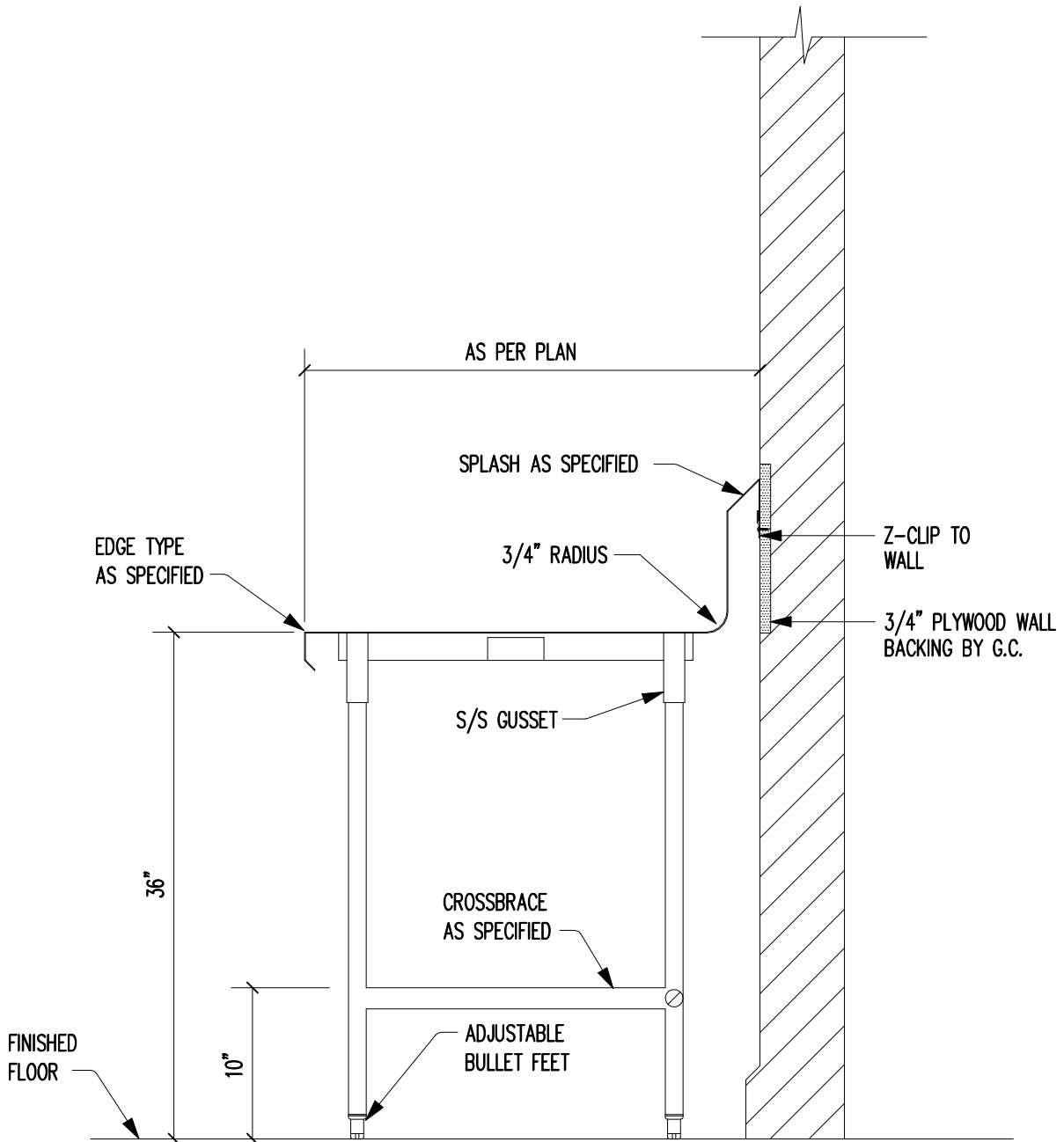
MOP SINK AND SPLASH

SCALE: N.T.S.



NOTE: SOUND DEADEN AS PER GENERAL REQUIREMENTS

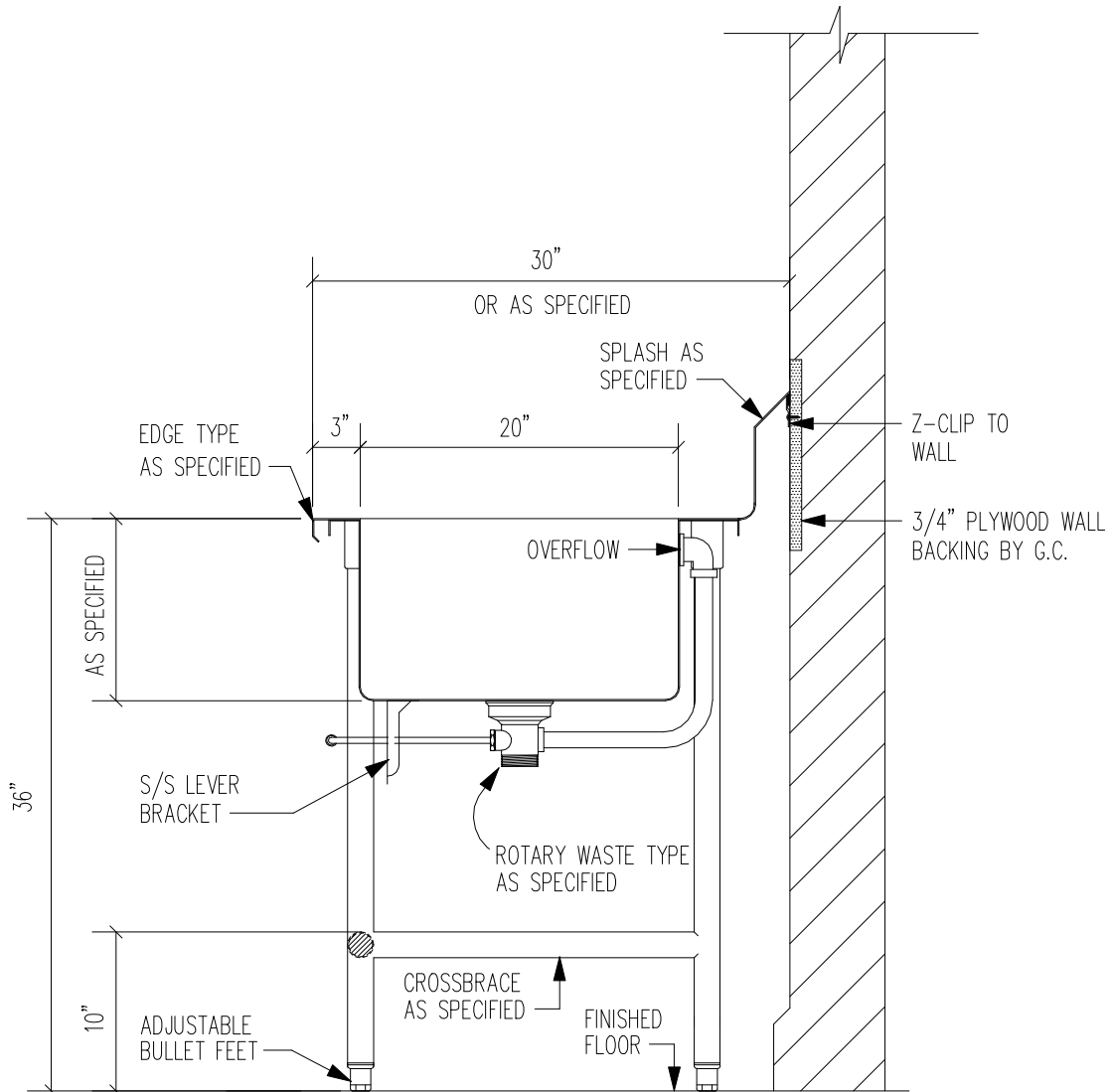
GLASS FILLING STATION
 (N.T.S.)



NOTE: SOUND DEADEN WORKTOP AS PER GENERAL REQUIREMENTS

DETAIL WORK TABLE

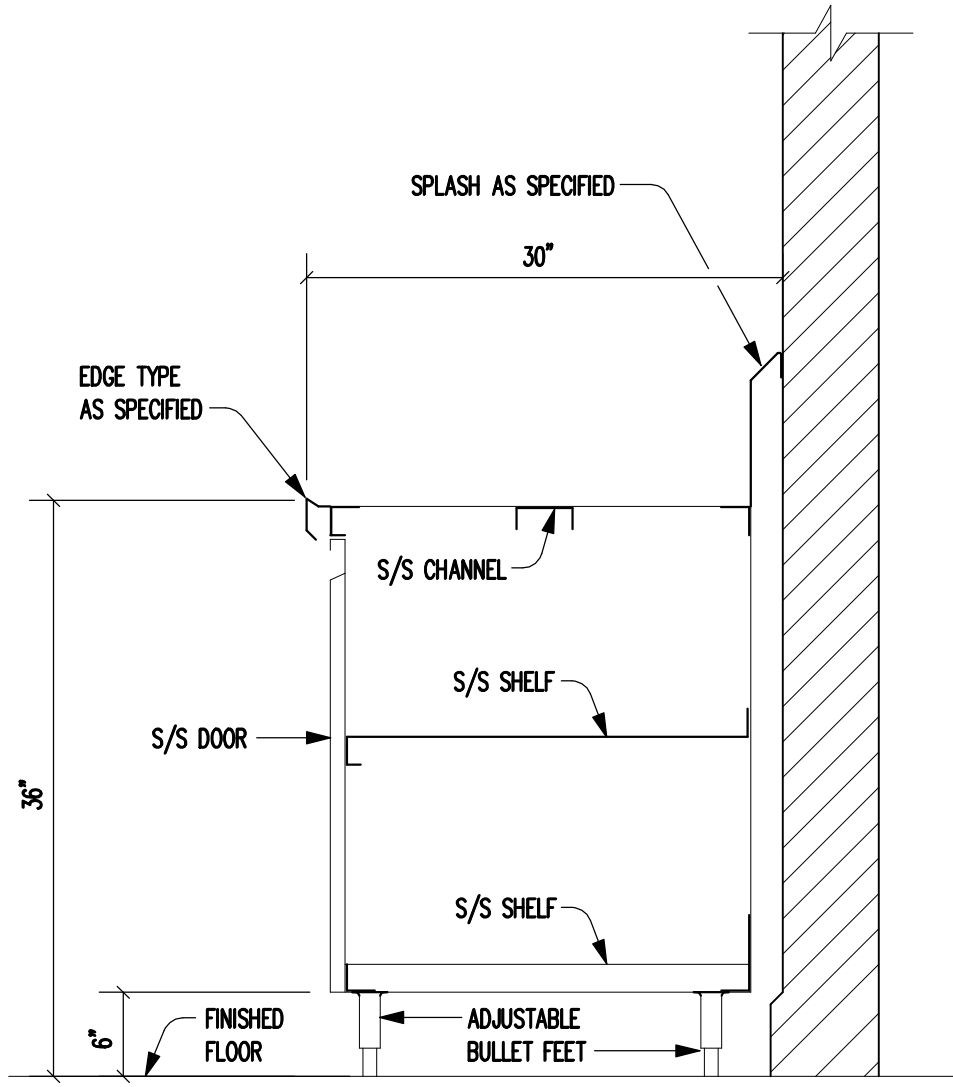
SCALE: N.T.S.



NOTE: SOUND DEADEN WORKTOP AS PER GENERAL REQUIREMENTS

SCALE: N.T.S.

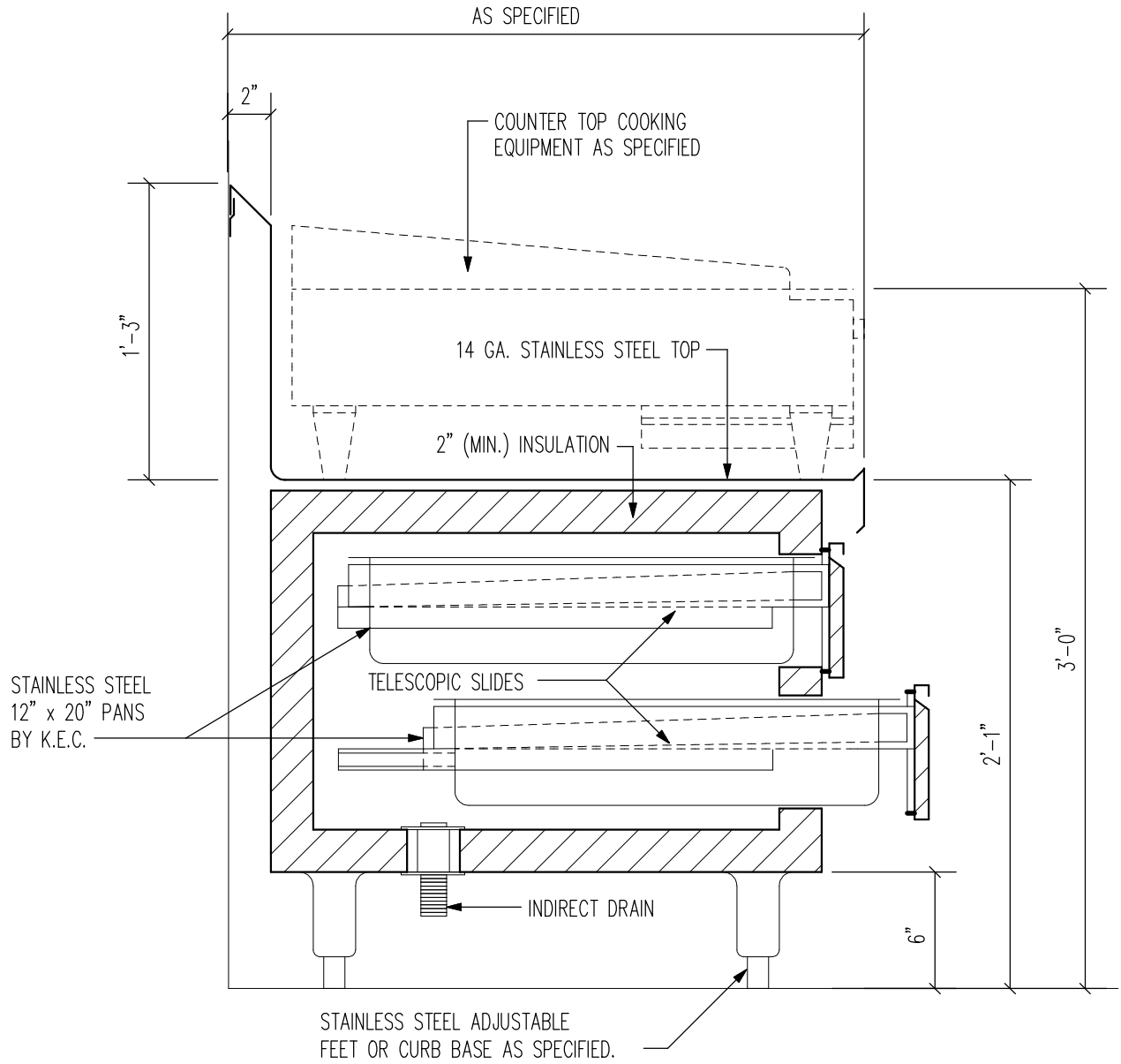
DETAIL WORK TABLE WITH SINK



NOTE: SOUND DEADEN AS PER GENERAL REQUIREMENTS

WORK COUNTER

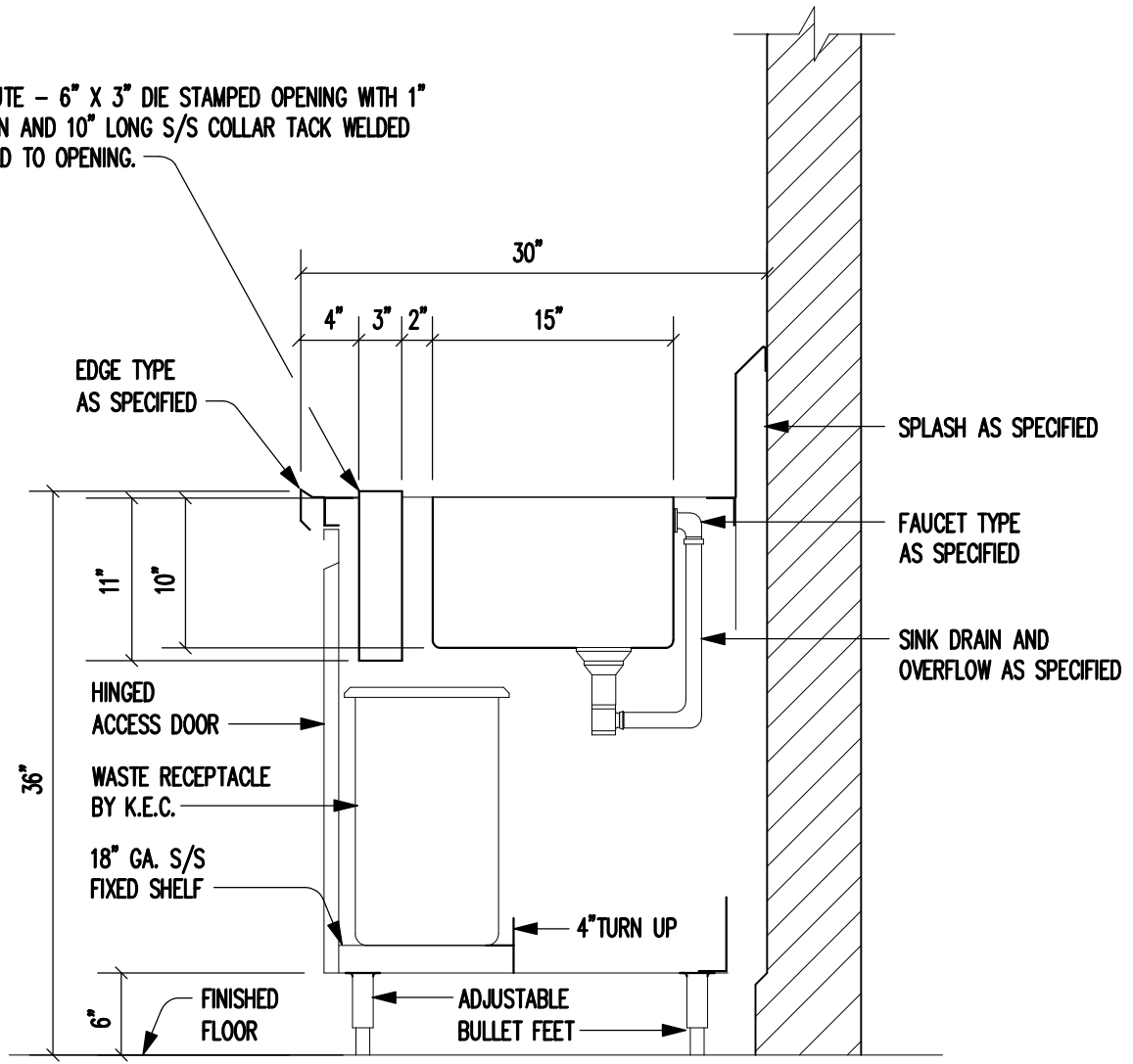
SCALE: N.T.S.



SCALE: N.T.S.

SECTION REFRIGERATED GRILL STAND

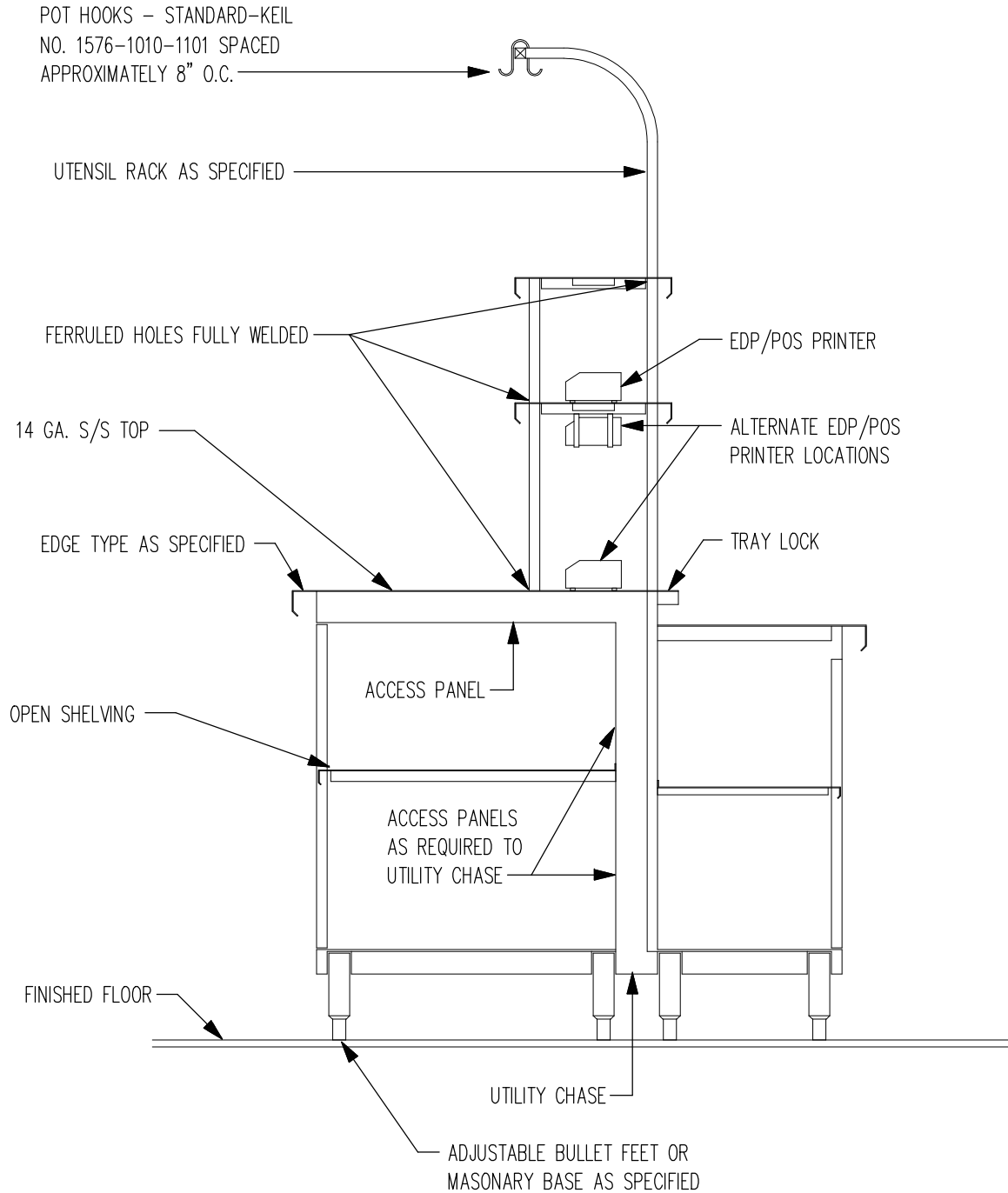
WASTE CHUTE - 6" X 3" DIE STAMPED OPENING WITH 1" TURN-DOWN AND 10" LONG S/S COLLAR TACK WELDED AND SEALED TO OPENING.



WASTE RECEPTACLE TO BE 14" WIDE X 10" DEEP X 16" HIGH.
 TO BE CONSTRUCTED OF 18 GA. STAINLESS STEEL WITH 1-1/4" ROLLED RIM ALONG FRONT AND REAR AND HEMED EDGES AT ENDS.

SECTION WASTE CHUTE AT SINK

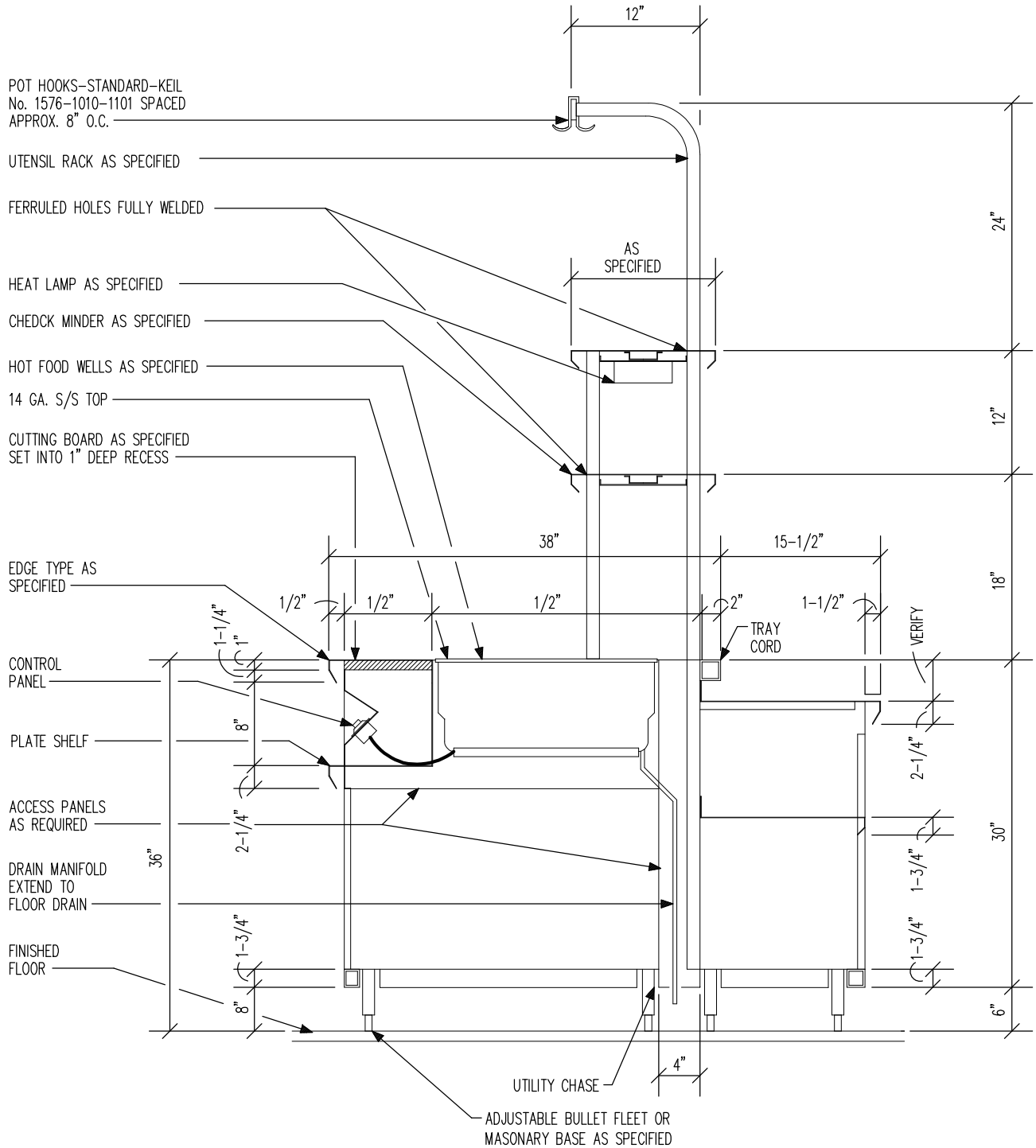
SCALE: N.T.S.



NOTE:
 SOUND DEADEN AS PER GENERAL REQUIREMENTS.
 ALL DIMENSIONS ARE FROM FINISHED SURFACES.

SCALE: N.T.S.

SECTION COOK'S TABLE WITH EDP/POS PRINTER

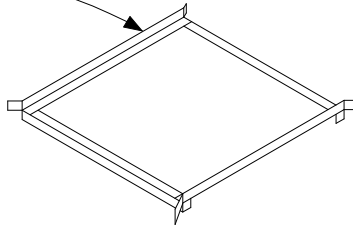


SCALE: N.T.S.

SECTION COOK'S COUNTER

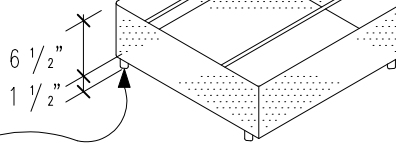


RACK GUIDE TO BE 1 1/2" x 1 1/2" x 1/8"
 S/S ANGLE AS SPECIFIED



REMOVABLE S/S PERFORATED
 BASKET TO BE USED WHEN
 THERE IS NO DISPOSER
 MOUNTED IN SINK

1/2" S/S RODS WELDED TO
 INSIDE OF BASKET AS SHOWN



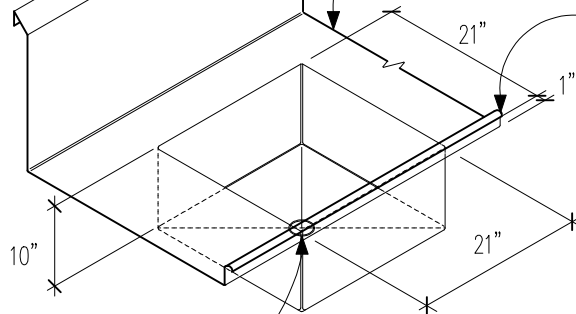
(4) 1" O.D. S/S LEGS

HOLES FOR PRE RINSE FAUCET
 TYPE AS SPECIFIED

BACKSPLASH AS SPECIFIED

14 GA. S/S TOP

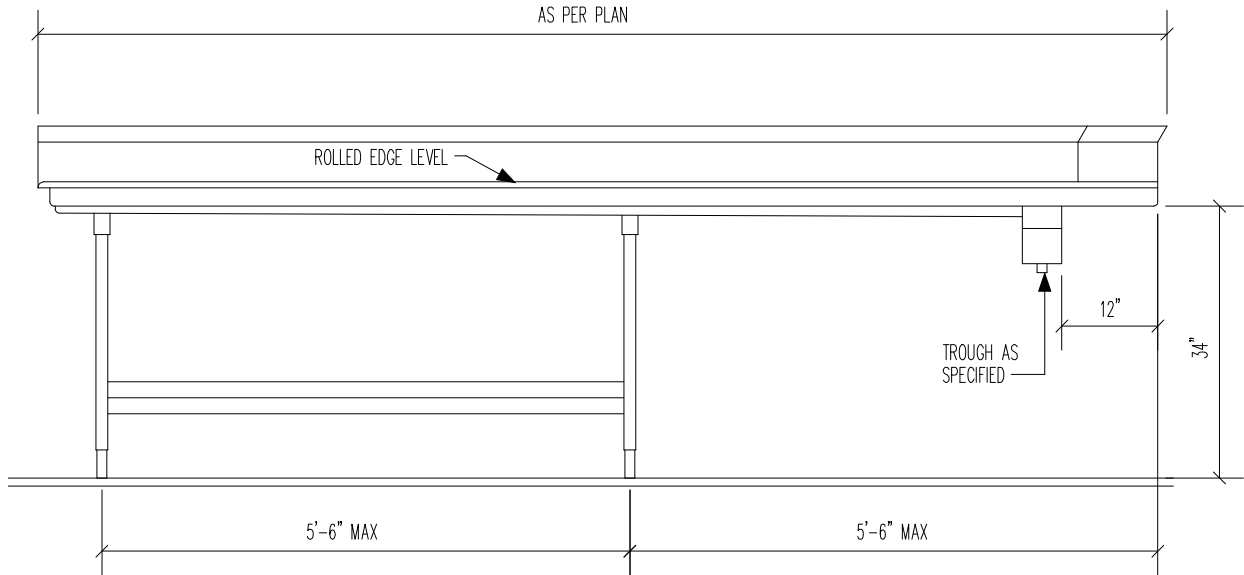
EDGE TYPE
 AS SPECIFIED



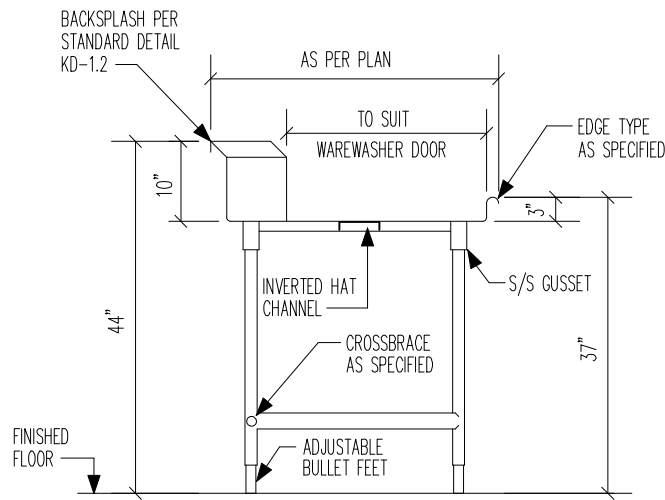
HOLE IN SINK BOTTOM FOR ROTARY
 WASTE OR DISPOSER AS SPECIFIED

PRE-RINSE SINK

SCALE: N.T.S.



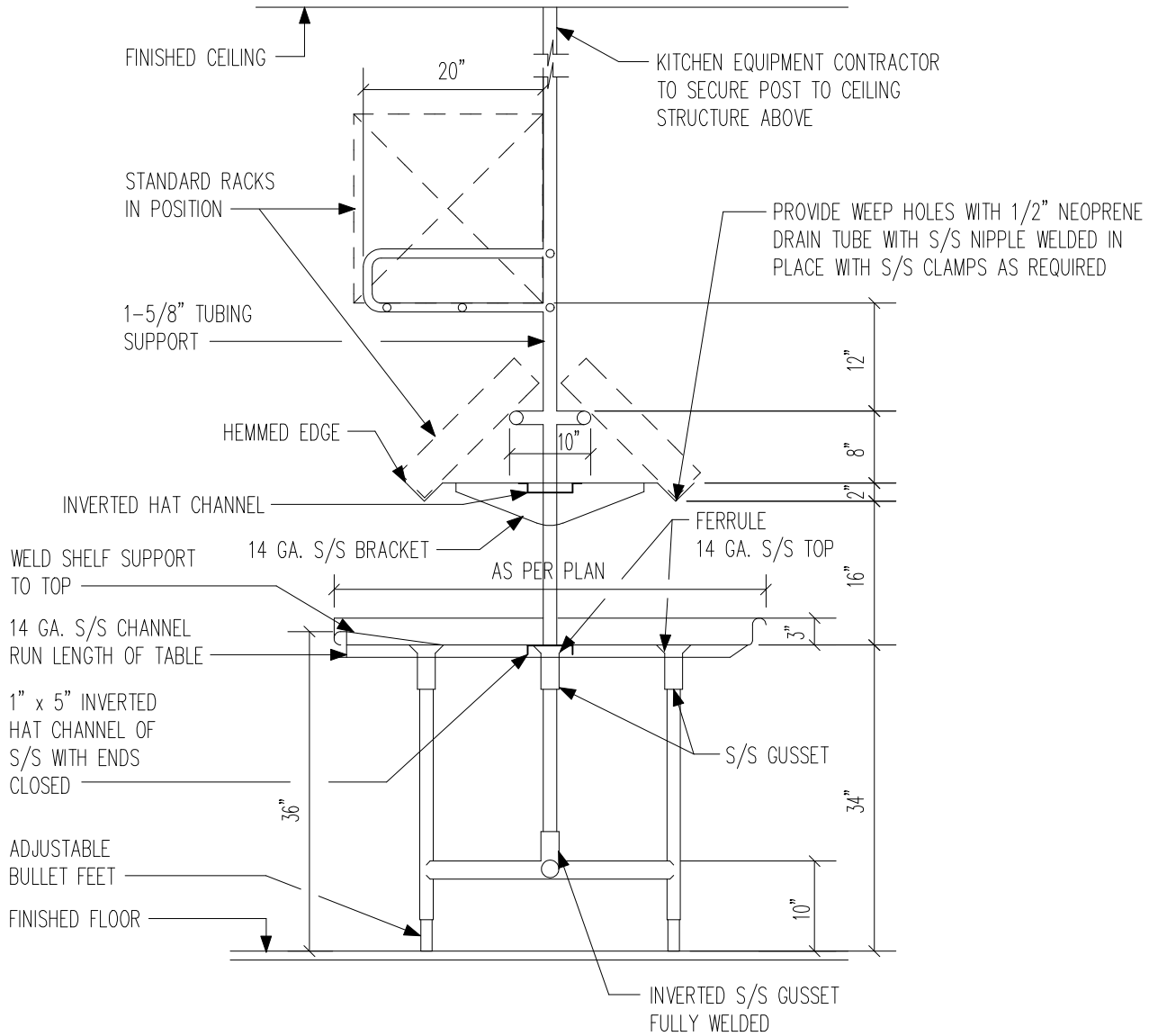
14 GA. S/S TOP PITCH
 WORKING SURFACE 1/8"
 PER FOOT TO DISHWASHER
 AND PROVIDE TURN DOWN
 INTO DISHWASHER AND
 SEAL IN ACCORDANCE WITH
 MANUFACTURERS RECOMMEND-
 ATIONS.



NOTE: SOUND DEADEN AS PER GENERAL REQUIREMENTS

SCALE: N.T.S.

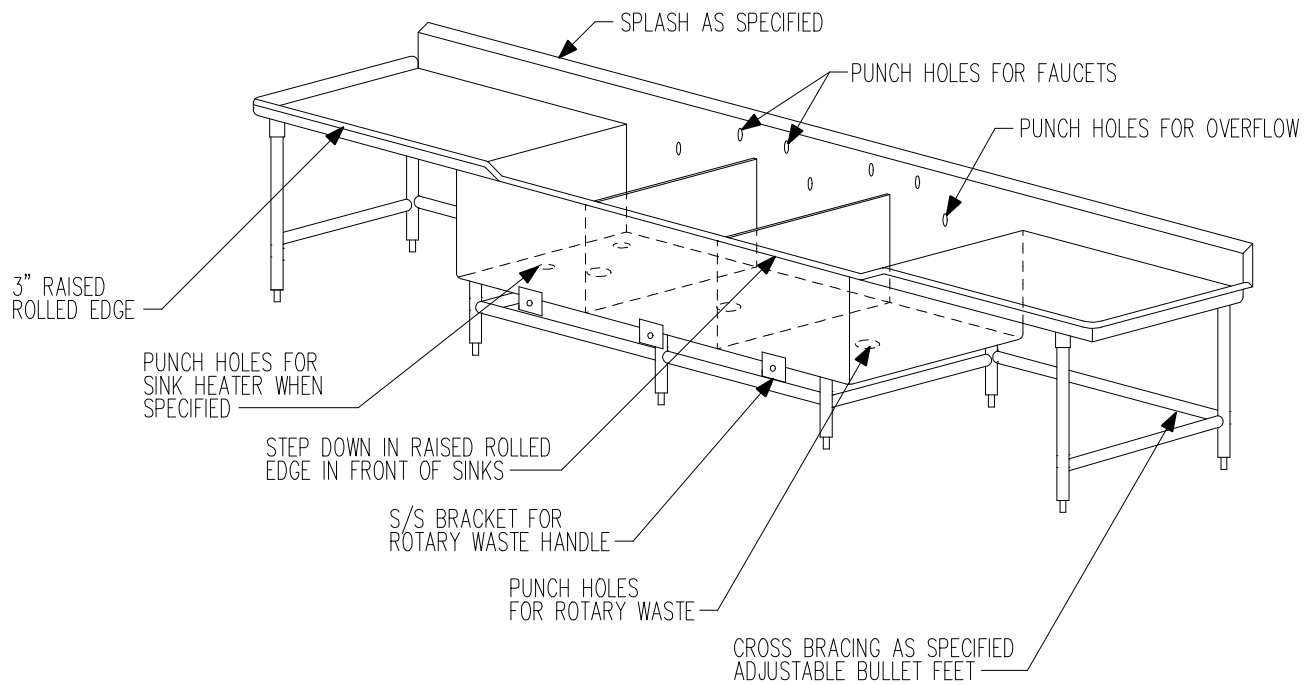
DETAIL SECTION CLEAN DISHTABLE



NOTE: SOUND DEADEN AS PER GENERAL REQUIREMENTS

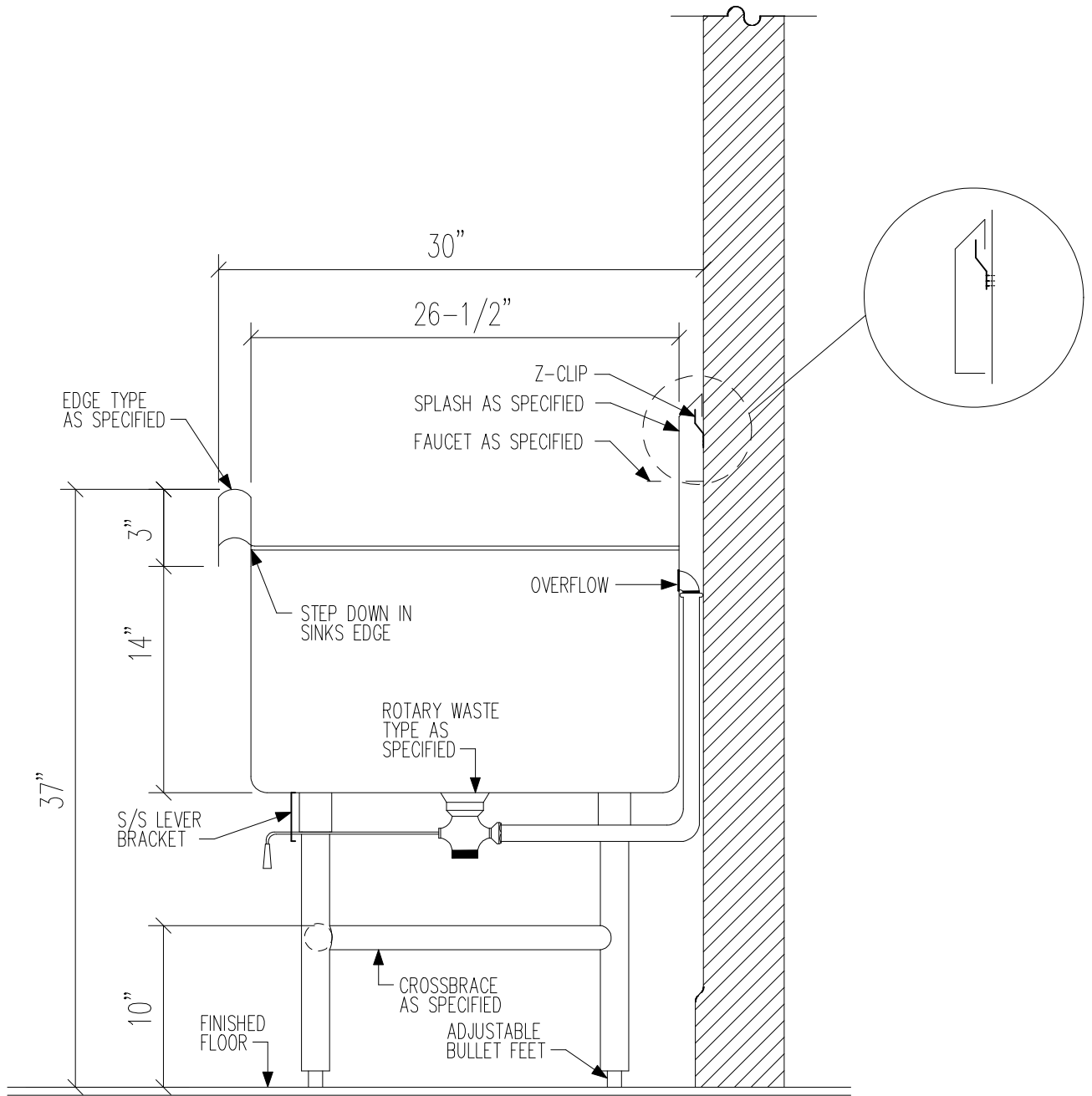
SECTION SOILED DISHTABLE

SCALE: N.T.S.



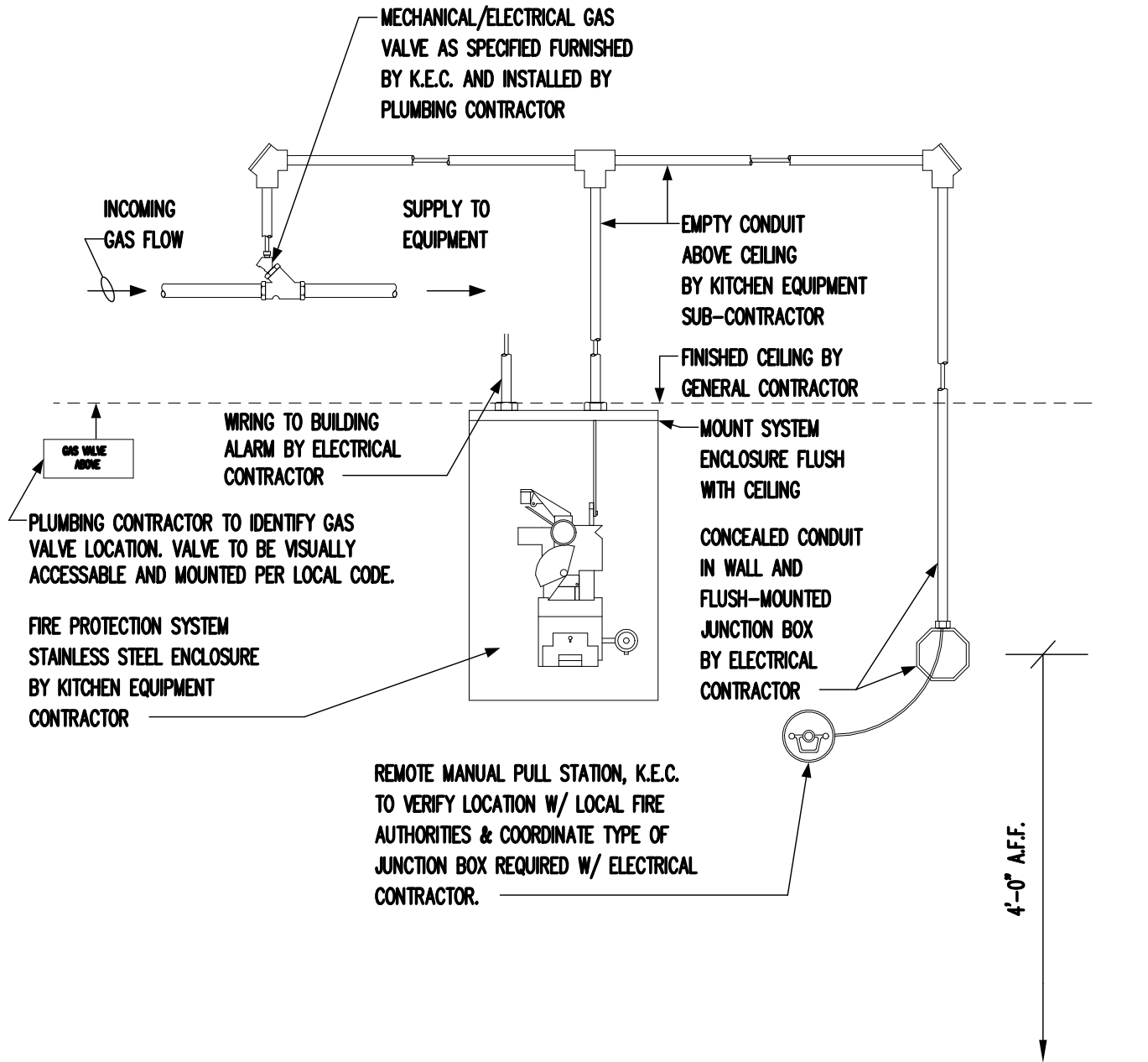
POT WASH SINK

SCALE: N.T.S.



POT WASH SINK

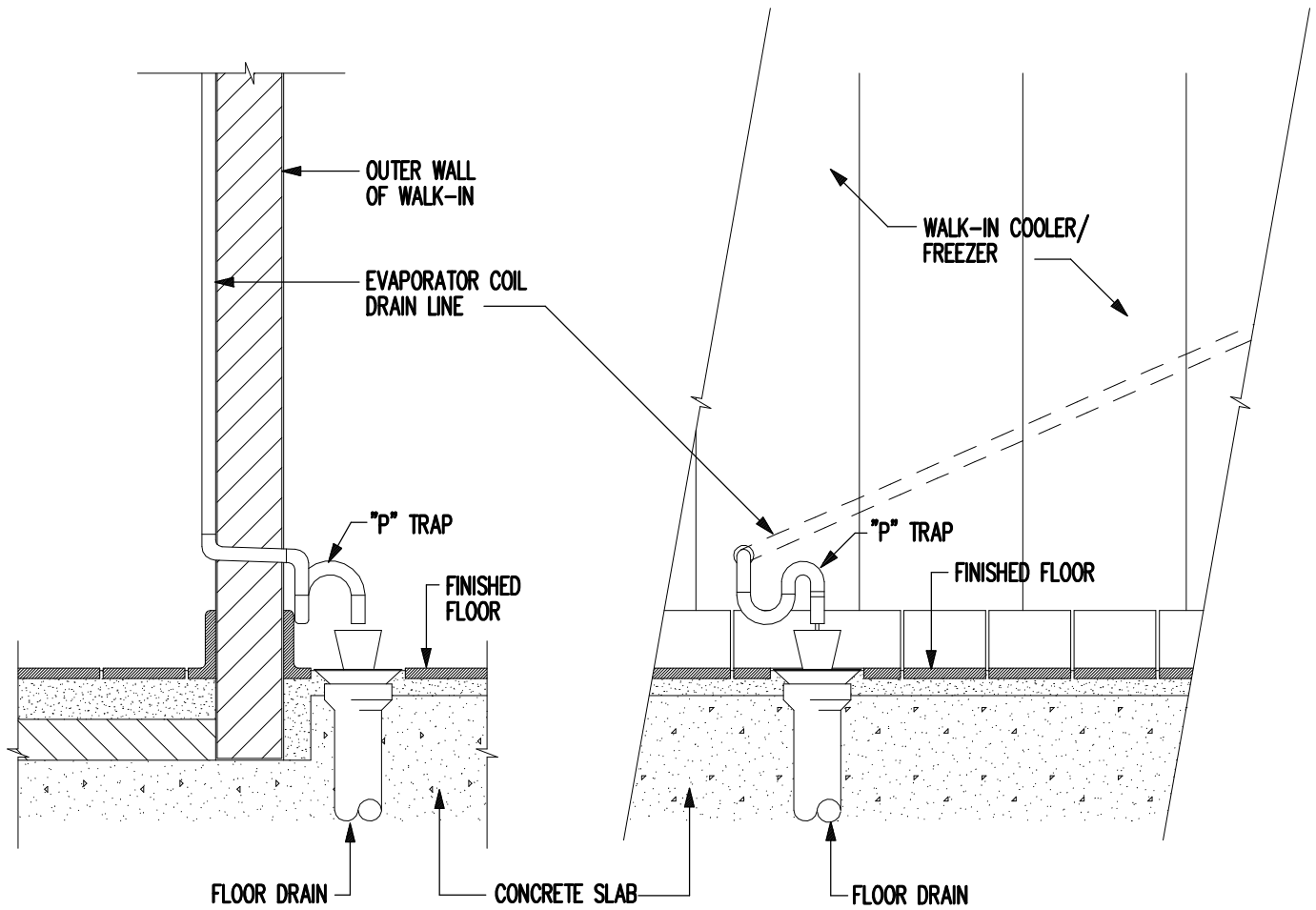
SCALE: N.T.S.



FIRE PROTECTION MANUAL PULL STATION

SCALE: N.T.S.

EVAPORATOR COIL DRAIN LINE AND "P" TRAP AS DETAILED SHALL BE PROVIDED AND INSTALLED BY THE PLUMBING CONTRACTOR. "P" TRAP TO BE CHROMEPLATED OR SPRAY PAINTED ALUMINUM.

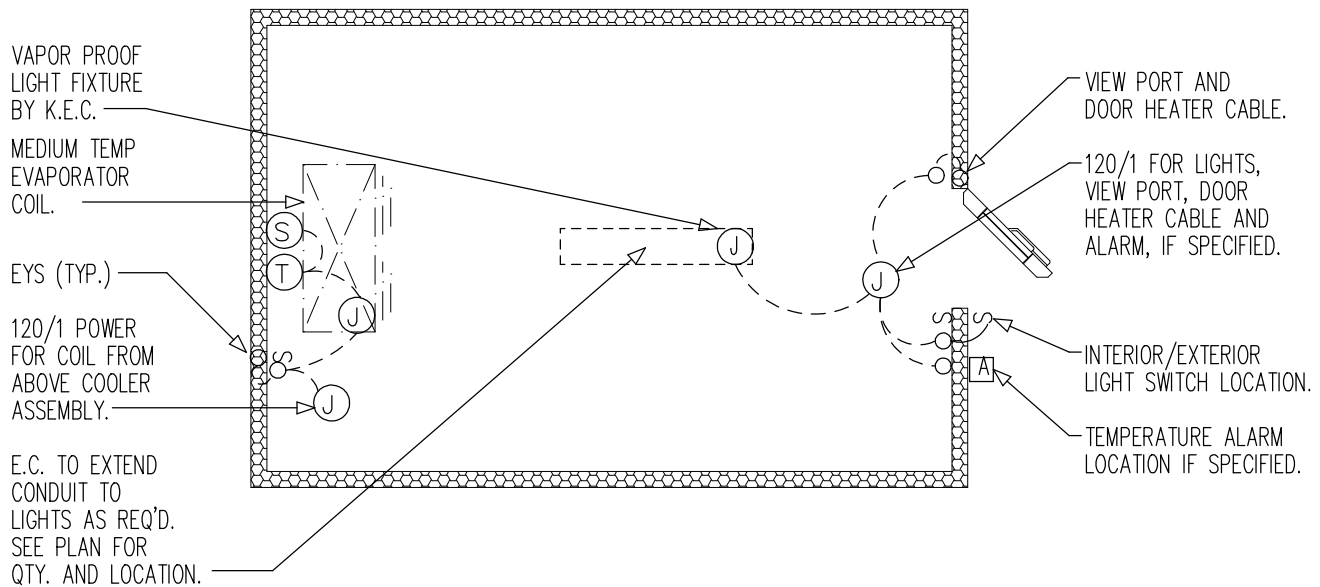


SECTION

ELEVATION

EVAPORATOR COIL DRAIN "P" TRAP

SCALE: N.T.S.

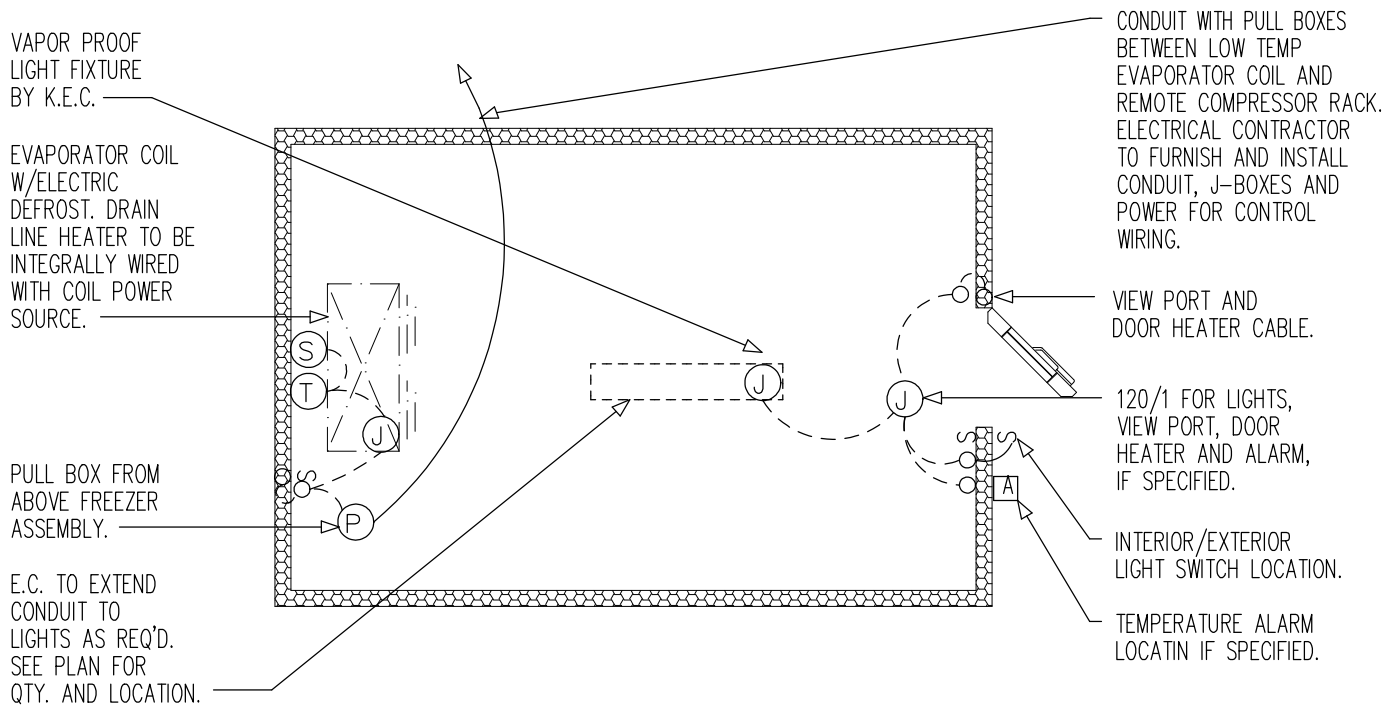


NOTES:

1. LIGHT FIXTURES ARE FURNISHED LOOSE WITH COOLER ASSEMBLES. ELECTRICAL CONTRACTOR TO INSTALL ALL ITEMS FURNISHED LOOSE INCLUDING ALL INTERCONNECTING CONDUIT AND WIRING.
2. EVAPORATORS FOR COOLER ASSEMBLES ARE FURNISHED AND INSTALLED COMPLETE WITH ROOM THERMOSTAT AND LIQUID LINE SOLENOID. ELECTRICAL CONTRACTOR TO PROVIDE INTERCONNECTING CONDUIT TO WIRING FROM BUILDING SERVICE TO ALL COMPONENTS.
3. ELECTRICAL CONTRACTOR TO PROVIDE ALL BUILDING SERVICES INCLUDING J-BOXES, INTERCONNECTION CONDUIT AND WIRING FROM BUILDING SERVICE TO ALL COMPONENTS.
4. EYS FITTING FURNISHED WITH COOLER ASSEMBLY. ELECTRICAL CONTRACTOR TO INSTALL, WIRE AND SEAL BY ACCEPTED INDUSTRY PRACTICE.
5. NSF FACTORY INSTALLED PANEL PENETRATIONS THRU INSULATED PANELS ARE FURNISHED WITH COOLER ASSEMBLY FOR REFRIGERATION LINES. ELECTRICAL CONTRACTOR TO SEAL ALL PENETRATIONS WITH CAULKING ON THE INTERIOR AND EXTERIOR AND PROVIDE S/S ESCUTCHEON PLATES.
6. EVAPORATOR FAN MOTORS FOR MEDIUM TEMPERATURE REFRIGERATORS RUN CONTINUOUS. DO NOT WIRE INTERNALLY WITH THERMOSTAT.
7. ALL CONDUIT RUN ABOVE COOLER ASSEMBLY TO BE RIGID EMT BY ELECTRICAL CONTRACTOR

**TYPICAL COOLER ASSEMBLY
SCHEMATIC WIRING
DETAIL**

SCALE: N.T.S.

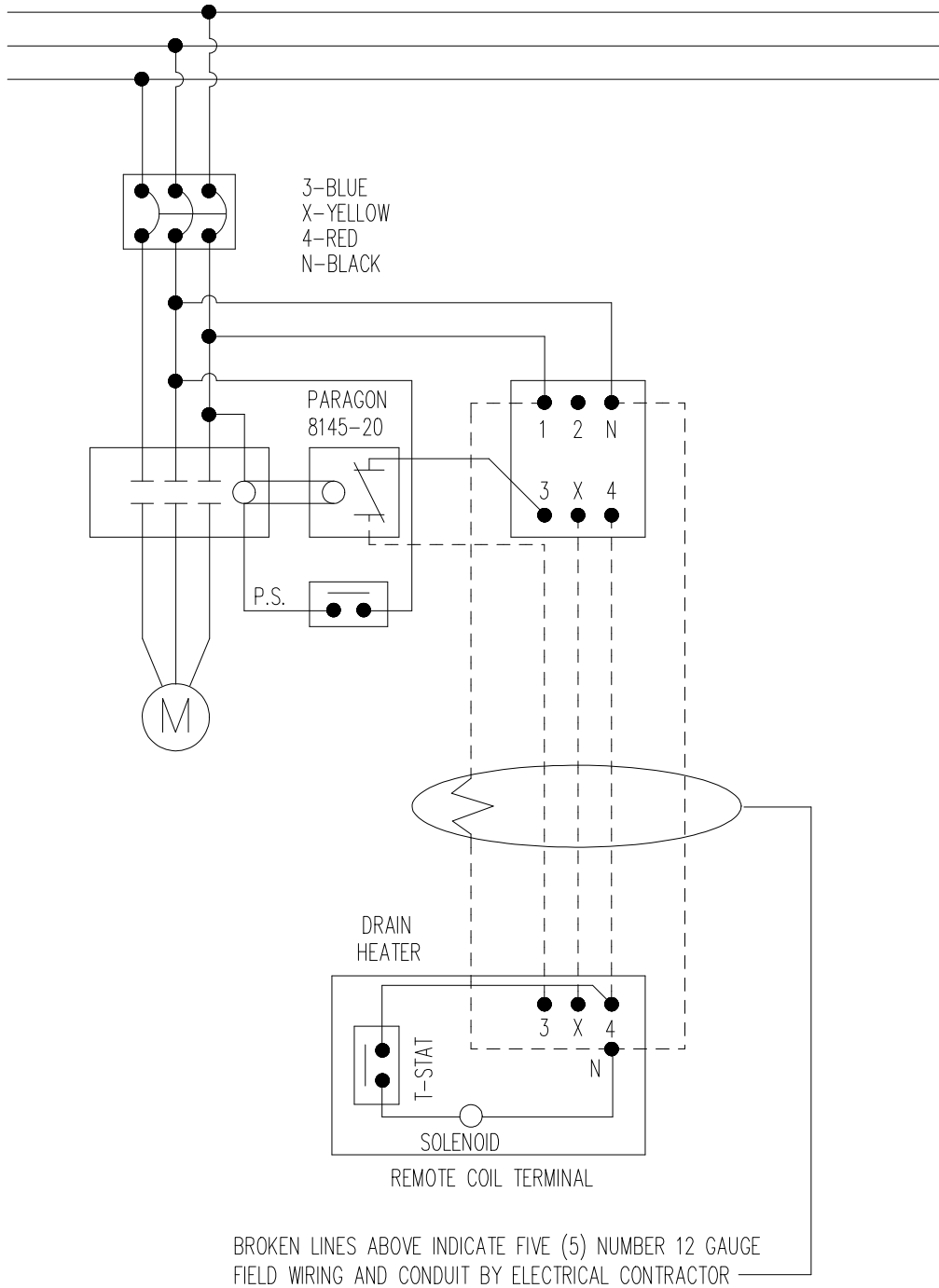


NOTES:

1. LIGHT FIXTURES ARE FURNISHED LOOSE WITH FREEZER ASSEMBLES. ELECTRICAL CONTRACTOR TO INSTALL ALL ITEMS FURNISHED LOOSE INCLUDING ALL INTERCONNECTING CONDUIT AND WIRING.
2. EVAPORATORS FOR FREEZER ASSEMBLES ARE FURNISHED AND INSTALLED COMPLETE WITH ROOM THERMOSTAT AND LIQUID LINE SOLENOID. ELECTRICAL CONTRACTOR TO PROVIDE INTERCONNECTING CONDUIT TO WIRING FROM BUILDING SERVICE TO ALL COMPONENTS.
3. ELECTRICAL CONTRACTOR TO PROVIDE ALL BUILDING SERVICES INCLUDING J-BOXES, INTERCONNECTION CONDUIT AND WIRING FROM BUILDING SERVICE TO ALL COMPONENTS.
4. EYS FITTING FURNISHED WITH COOLER ASSEMBLY. ELECTRICAL CONTRACTOR TO INSTALL, WIRE AND SEAL BY ACCEPTED INDUSTRY PRACTICE.
5. NSF FACTORY INSTALLED PANEL PENETRATIONS THRU INSULATED PANELS ARE FURNISHED WITH FREEZER ASSEMBLY FOR REFRIGERATION LINES. ELECTRICAL CONTRACTOR TO SEAL ALL PENETRATIONS WITH CAULKING ON THE INTERIOR AND EXTERIOR AND PROVIDE S/S ESCUTCHEON PLATES.
6. EVAPORATOR FAN MOTORS FOR FREEZERS CYCLE WITH FREEZER DEFROST CYCLE WHEN SIGNALLED FROM COMPRESSOR TIME CLOCK. DRAIN LINE HEAT TAPE IS WIRED THROUGH FREEZER COIL.
7. ALL CONDUIT RUN ABOVE FREEZER ASSEMBLY TO BE RIGID EMT BY ELECTRICAL CONTRACTOR

**TYPICAL FREEZER ASSEMBLY
 SCHEMATIC WIRING
 DETAIL**

SCALE: N.T.S.

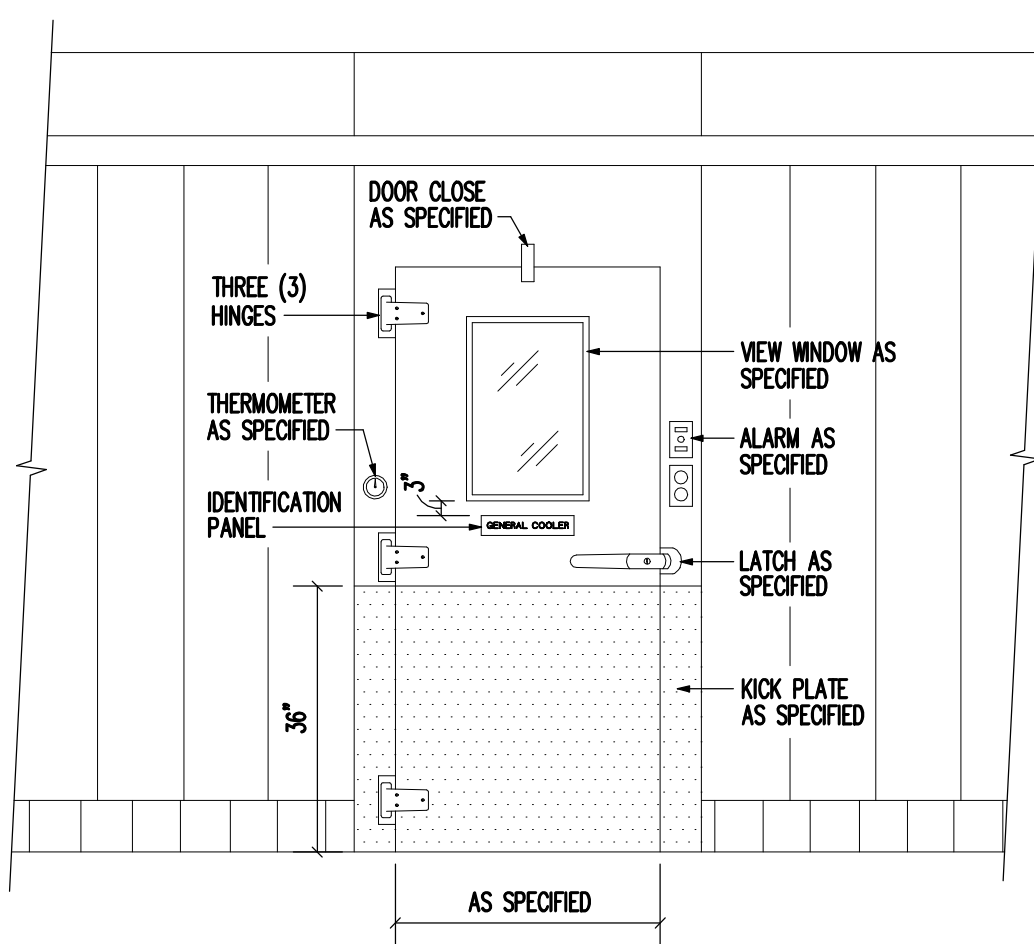


**LOW TEMPERATURE POWER
 AND CONTROL WIRING DIAGRAM
 DETAIL**

SCALE: N.T.S.

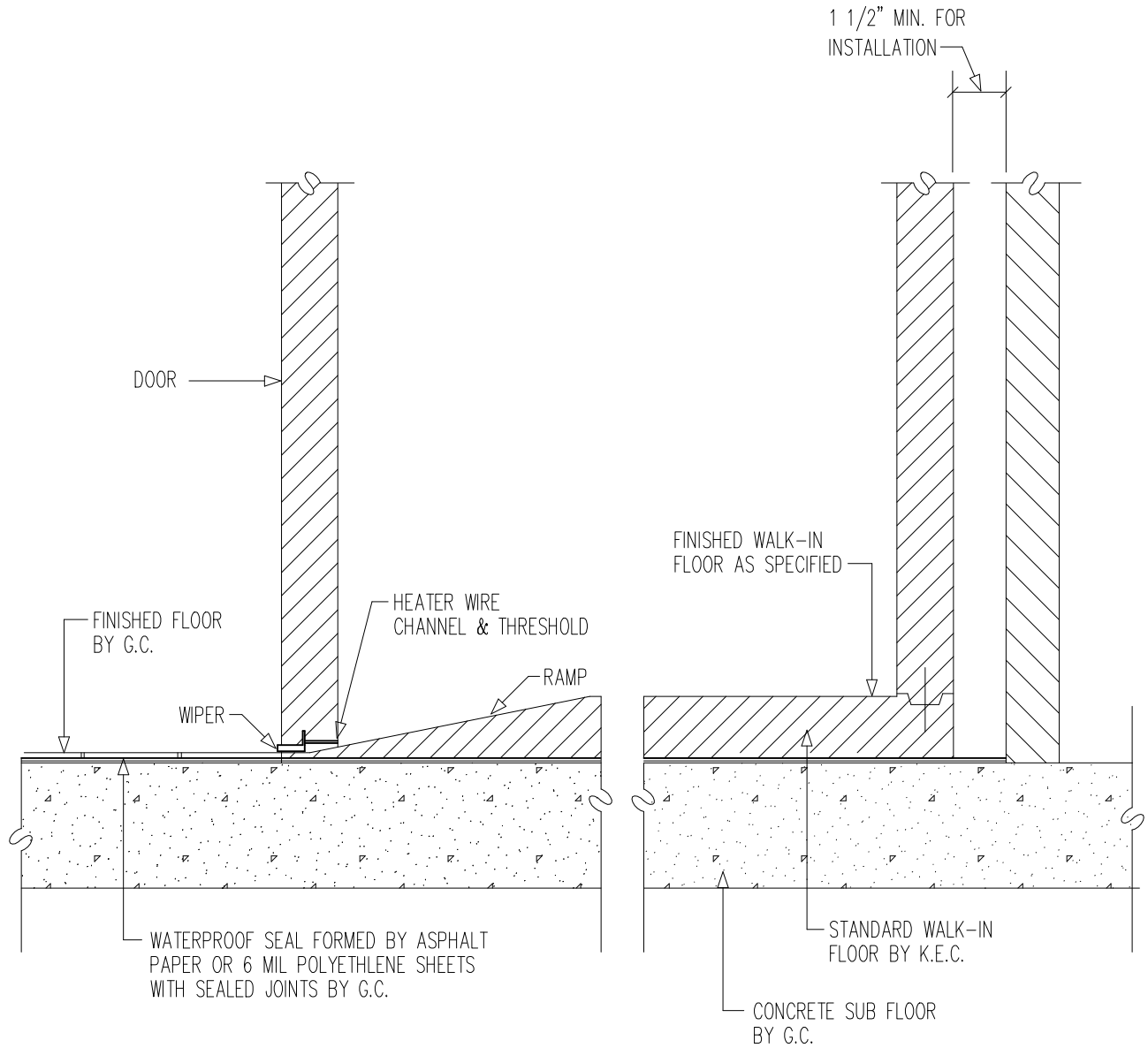


NOTE: IDENTIFICATION PANEL SHALL BE TWO COLOR PLASTIC 1/8" MIN. THICK WITH ENGRAVED LETTERING MIN. 5/8" HIGH. COLOR AS SELECTED BY ARCHITECT.



ELEVATION - WALK-IN DOOR ACCESSORY LOCATION

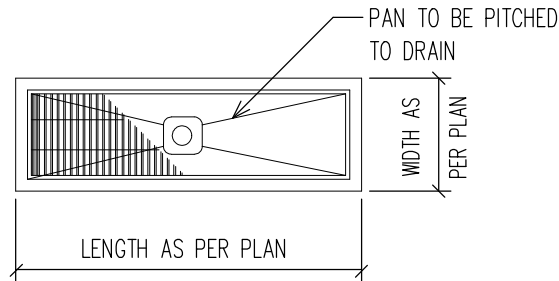
SCALE: N.T.S.



NOTE:
 FLOOR SLAB SHALL BE FINISHED LEVEL AND SMOOTH TO FACILITATE THE INSTALLATION OF THE WALK-IN COOLER/FREEZER.
 K.E.C. TO VERIFY DOOR SILL HEIGHT AT RAMP.

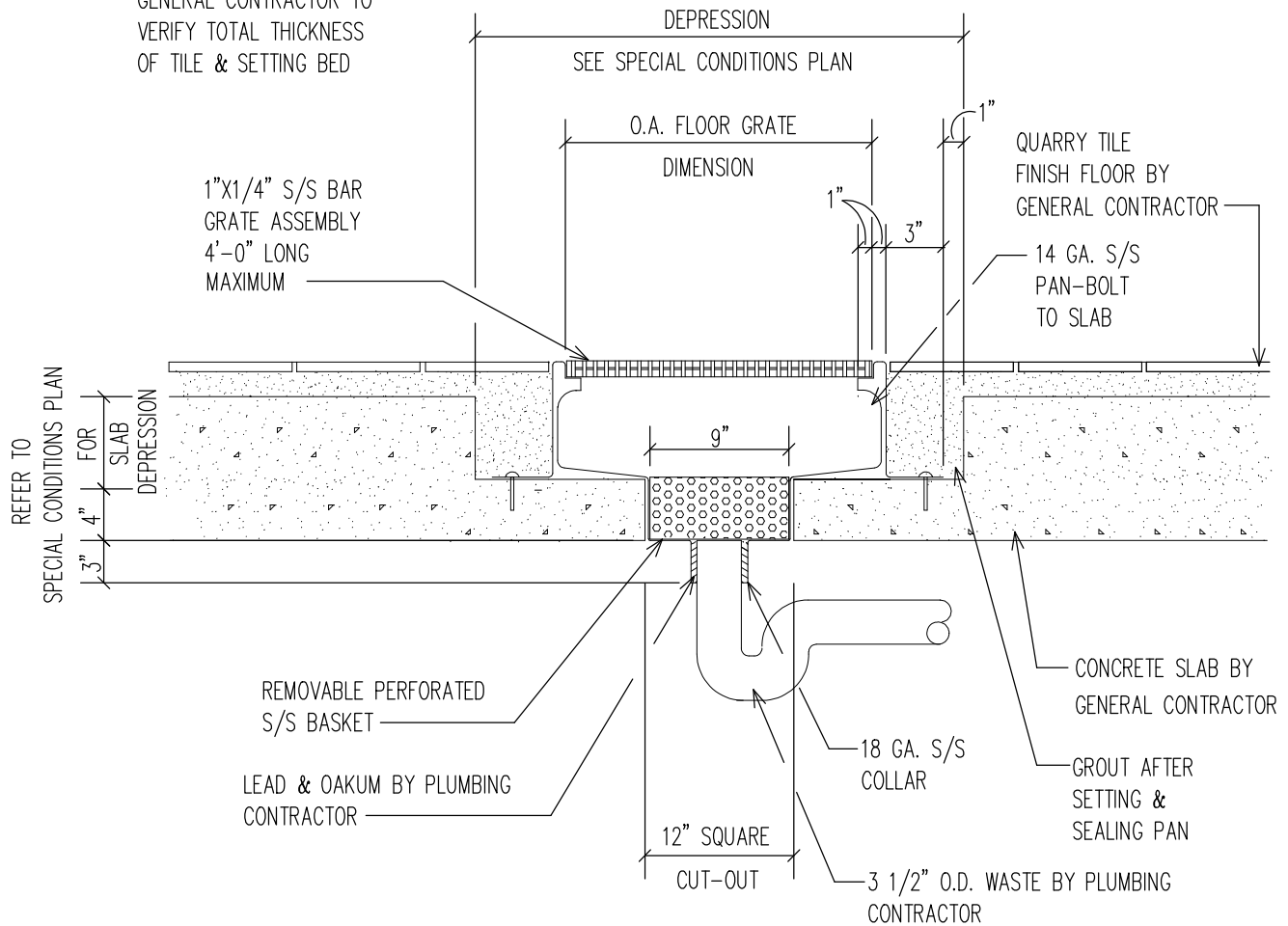
SECTION: WALK-IN COOLER/FREEZER

SCALE: N.T.S.



PLAN VIEW

NOTE:
 GENERAL CONTRACTOR TO VERIFY TOTAL THICKNESS OF TILE & SETTING BED

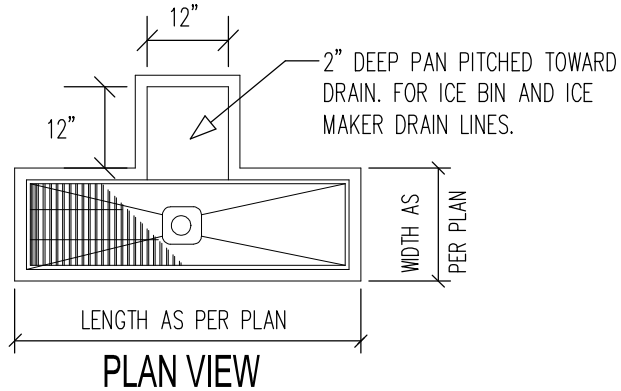


SECTION

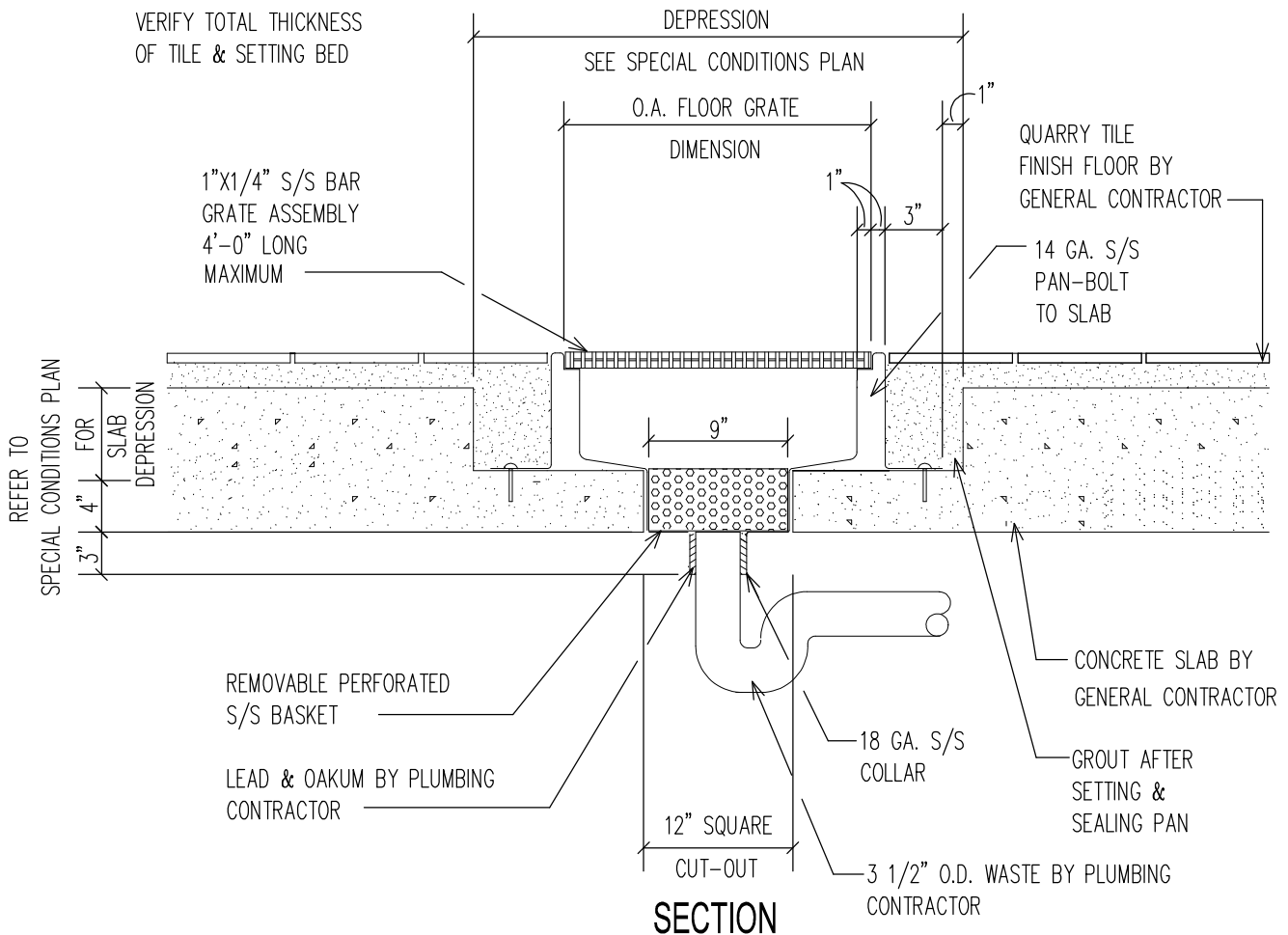
NOTE:
 STAINLESS STEEL FLOOR TROUGH WITH PAN AND GRATE TO BE FURNISHED BY THE KITCHEN EQUIPMENT CONTRACTOR (K.E.C.). ASSEMBLY TO BE INSTALLED BY THE GENERAL CONTRACTOR (G.C.) AND HOOKED UP BY THE PLUMBING CONTRACTOR (P.C.) IN ACCORDANCE WITH ALL LOCAL AND STATE CODES.

ANTI-SPILL FLOOR TROUGH DETAIL

SCALE: N.T.S.



NOTE:
 GENERAL CONTRACTOR TO VERIFY TOTAL THICKNESS OF TILE & SETTING BED



NOTE:
 STAINLESS STEEL FLOOR TROUGH WITH PAN AND GRATE TO BE FURNISHED BY THE KITCHEN EQUIPMENT CONTRACTOR (K.E.C.). ASSEMBLY TO BE INSTALLED BY THE GENERAL CONTRACTOR (G.C.) AND HOOKED UP BY THE PLUMBING CONTRACTOR (P.C.) IN ACCORDANCE WITH ALL LOCAL AND STATE CODES.
 IF STAINLESS STEEL ICE MAKER FLOOR TROUGH IS INSTALLED ABOVE GRADE WITH BOTTOM EXPOSED TO AMBIENT AIR, THE GENERAL CONTRACTOR IS TO FULLY INSULATE THE EXPOSED BOTTOM OF DRAIN PAN TO PREVENT CONDENSATION AND POSSIBLE WATER DAMAGE. PLUMBING CONTRACTOR TO INSULATE DRAIN PAN P TRAP AND EXPOSED PIPING FOR 15'-0" TO PREVENT CONDENSATION DUE TO ICE MELTING IN PIPE.

FLOOR TROUGH DETAIL

SCALE: N.T.S.

SECTION 14210

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section specifies electric traction elevators.
- B. Work Required:
 - 1. The work required under this section consists of all labor, materials and services required for the complete installation (including operational verification) of all the equipment required for the elevator(s) as herein specified.
 - 2. All work shall be performed in a first class, safe and workmanlike manner.
 - 3. In all cases where a device or part of the equipment is herein referred to in the singular, it is intended that such reference shall apply to as many of such devices or parts as are required to make complete installation.
- C. Related work not specified herein: The following sections contain requirements that relate to this section and are performed by trades other than the elevator manufacturer/installer.
 - 1. Section 02200 - Earthwork: excavation for elevator pit.
 - 2. Section 03300 - Cast-In-Place Concrete: elevator pit, and elevator machine foundation.
 - 3. Section 16100 - Electrical:
 - a. Main disconnects for each elevator.
 - b. Electrical power for elevator installation and testing.
 - c. Disconnecting device to elevator equipment prior to activation of sprinkler system.
 - d. The installation of dedicated GFCI receptacles in the pit and overhead.
 - e. Lighting in controller area, machine area and pit.
 - f. Wiring for telephone service to controller.
- D. Applicable Codes: Comply with applicable building and elevator codes at the project site, including but not limited to the following:
 - 1. ANSI A117.1, Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People.
 - 2. ADAAG, Americans with Disabilities Act Accessibility Guidelines.
 - 3. ANSI/NFPA 70, National Electrical Code.
 - 4. ANSI/NFPA 80, Fire Doors and Windows.
 - 5. ASME/ANSI A17.7, Safety Code for Elevators and Escalators.
 - 6. ANSI/UL 10B, Fire Tests of Door Assemblies.
 - 7. CAN/CSA C22.1, Canadian Electrical Code.

8. CAN/CSA-B44, Safety Code for Elevators and Escalators.
9. EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 – immunity"
10. Local Building Codes
11. All other local applicable codes.

1.02 SYSTEM DESCRIPTION

- A. Equipment Description: Gen2[®] gearless machine-room less elevator where all components fit inside the hoistway.
- B. Equipment Control: Elevonic[®] Control System.
- C. Drive: Regenerative
- D. Quantity of Elevators: 1
- E. Elevator Stop Designations: 3
- F. Stops : [Select]: 2-10 (150 fpm)
- G. Openings: Front openings
- H. Travel (maximum): 80 ft. (24 m)
- I. Rated Capacity: 2100 lb,
- J. Rated Speed: 150 fpm
- K. Platform Size: [2100 front]
- L. Clear Inside Dimensions: [2100 front]
- M. Cab Height: 7'9"
- N. Clear Cab Height: 7'-9" with 5/16" floor recess and 4 LED ceiling
- O. Entrance Type and Width: Single-Slide Door 36"
- P. Entrance Height: 7'-0"
- Q. Main Power Supply: 208,
- R. Car Lighting Power Supply: 120 Volts, Single-phase, 15 Amp, 60 Hz.
- S. Machine Location: Inside the hoistway at the top of the hoistway.
- T. Signal Fixtures: Manufacturer's standard with metal button targets.
- U. Controller Location: Machine-Roomless Controller(s) must be in the front wall on the same side as the counterweight, located at the top landing.
- V. Performance:
 1. Car Speed: ± 3 % of contract speed under any loading condition or direction of travel.

2. Car Capacity: Safely lower, stop and hold up to 120% of rated load. Ride Quality:
 - a. Vertical Vibration (maximum): 20 milli-g
 - b. Horizontal Vibration (maximum): 12 milli-g
 - c. Vertical Jerk (maximum): $4.59 \pm 1.0 \text{ ft./ sec}^3$ ($1.4 \pm 0.3 \text{ m/ sec}^3$)
 - d. Acceleration/Deceleration (maximum): 2.62 ft./ sec^2 (0.8 m/ sec^2)
 - e. In Car Noise: 55 – 60 dB(A)
 - f. Stopping Accuracy: $\pm 0.375 \text{ in.}$ ($\pm 10 \text{ mm}$) max, $\pm 0.25 \text{ in.}$ ($\pm 6 \text{ mm}$) Typical
 - g. Re-leveling Distance: $\pm 0.5 \text{ in.}$ ($\pm 12 \text{ mm}$)

W. Operation:
 [Simplex] Simplex Collective Operation: Using a microprocessor-based controller, operation shall be automatic by means of the car and hall buttons. If all calls in the system have been answered, the car shall park at the last landing served.

- X. Operating Features – Standard
1. Full Collective Operation
 2. Anti-nuisance.
 3. Fan and Light Protection.
 4. Load Weighing Bypass.
 5. Independent Service.
 6. Full Collective Operation.
 7. Firefighters' Service Phase I and Phase II (USA only); or Special Emergency Service Phase I and II – Emergency Recall and In-Car Emergency Operation (Canada only).
 8. Top of Car Inspection.
 [Include the following operations for duplex or multi-car Operation, delete for Simplex.]
 9. Zoned Car Parking.
 10. Relative System Response Dispatching.

- Y. Door Control Features:
1. Door control to open doors automatically when car arrives at a landing in response to a normal hall or car call.
 2. Elevator doors shall be provided with a reopening device that will stop and reopen the car door(s) and hoistway door(s) automatically should the door(s) become obstructed by an object or person.
 Door protection shall consist of a two dimensional, multi-beam array projecting across the car door opening.
 3. Door nudging operation to occur if doors are prevented from closing for an adjustable period of time.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each system proposed for use. Include the following:
1. Signal and operating fixtures, operating panels and indicators.

2. Cab design, dimensions and layout.
 3. Hoistway-door and frame details.
 4. Electrical characteristics and connection requirements.
 5. Expected heat dissipation of elevator equipment in hoistway (BTU).
 6. Color selection chart for Cab and Entrances.
- B. Shop Drawings: Submit approval layout drawings. Include the following:
1. Car, guide rails, buffers and other components in hoistway.
 2. Maximum rail bracket spacing.
 3. Maximum loads imposed on guide rails requiring load transfer to building structure.
 4. Clearances and travel of car.
 5. Clear inside hoistway and pit dimensions.
 6. Location and sizes of access doors, hoistway entrances and frames.
- C. Operations and Maintenance Manuals: Provide manufacturer's standard operations and maintenance manual.

1.04 QUALITY ASSURANCE

- A. Manufacturer: Minimum of fifteen years experience in the fabrication, installation and service of elevators of the type and performance of the specified. The manufacturer shall have a documented quality assurance program.
- B. Installer: Elevators shall be installed by the manufacturer.
- C. Permits, Inspections and Certificates: The Elevator Contractor shall obtain and pay for necessary Municipal or State Inspection and permit as required by the elevator inspection authority, and make such tests as are called for by the regulations or such authorities. These tests shall be made in the presence of such authorities or their authorized representatives.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Should the building or the site not be prepared to receive the elevator equipment at the agreed upon date, the General Contractor will be responsible to provide a proper and suitable storage area on or off the premises.

Should the storage area be off-site and the equipment not yet delivered, then the elevator contractor, upon notification from the General Contractor, will divert the elevator equipment to the storage area. If the equipment has already been delivered to the site, then the General Contractor shall transport the elevator equipment to the storage area. The cost of elevator equipment taken to storage by either party, storage, and redeliver to the job site shall not be at the expense of the elevator contractor.

1.06 WARRANTY

- A. The elevator contractor's acceptance is conditional on the understanding that their warranty covers defective material and workmanship. The warranty period shall not extend longer than one (1) year from the date of completion or acceptance thereof by beneficial use, whichever is earlier, of each elevator. The warranty excludes: ordinary wear and tear, improper use, vandalism, abuse, misuse, or neglect or any other causes beyond the control of the elevator contractor and this express warranty is in lieu of all other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

1.07 MAINTENANCE and SERVICE

- A. Maintenance service consisting of regular examinations and adjustments of the elevator equipment shall be provided by the elevator contractor for a period of [Select the appropriate new installation maintenance period: twelve (12) months after the elevator has been turned over for the customer's use. This service shall not be subcontracted but shall be performed by the elevator contractor. All work shall be performed by competent employees during regular working hours of regular working days. This service shall not cover adjustments, repairs or replacement of parts due to negligence, misuse, abuse or accidents caused by persons other than the elevator contractor. Only genuine parts and supplies as used in the manufacture and installation of the original equipment shall be provided.
- B. The periodic lubrication of elevator components shall not be required, including: Sheaves, Rails, Belts, Ropes, Car and CWT guides, etc
- C. The elevator control system must:
 - 1) Provide in the controller the necessary devices to run the elevator on inspection operation.
 - 2) Provide on top of the car the necessary devices to run the elevator in inspection operation.
 - 3) Provide in the controller an emergency stop switch. This emergency stop switch when opened disconnects power from the brake and prevents the motor from running.
 - 4) Provide in the event of a power outage, means from the controller to electrically lift and control the elevator brake to safely bring the elevator to the nearest available landing.
 - 5) Provide the means from the controller to reset the governor over speed switch and also trip the governor.
 - 6) Provide the means from the controller to reset the emergency brake when set because of an unintended car movement or ascending car over speed.

PART 2 - PRODUCTS

2.01 DESIGN AND SPECIFICATIONS

- A. Provide machine-roomless Gen2™ traction passenger elevators from Otis Elevator Company. The control system and car design based on materials and systems manufactured by Otis Elevator Company. Specifically, the system shall consist of the following components:
 - 1. Controller located entirely inside the hoistway. No extra machine room or control closet space required.
 - 2. An AC gearless machine using embedded permanent magnets mounted at the top of the hoistway.
 - 3. Polyurethane Coated-Steel Belts for elevator hoisting purposes.
 - 4. Regenerative drive that captures normally wasted energy and feeds clean power back into the building's power grid.
 - 5. LED lighting standard in ceiling lights and elevator fixtures.
 - 6. Sleep mode operation for LED ceiling lights and car fan.
- B. Approved Installer: Otis Elevator Company

2.02 EQUIPMENT: CONTROLLER COMPONENTS

- A. Controller: A microcomputer based control system shall be provided to perform all of the functions of safe elevator operation. The system shall also perform car and group operational control.
 - 1. All high voltage (110V or above) contact points inside the controller shall be protected from accidental contact when the controller doors are open.
 - 2. Controller shall be separated into two distinct halves; Motor Drive side and Control side. High voltage motor power conductors shall be routed so as to be physically segregated from the rest of the controller.
 - 3. Field conductor terminations points shall be segregated; high voltage (>30 volts DC and 110 VAC,) and low voltage (< 30 volts DC)
 - 4. Controllers shall be designed and tested for Electromagnetic Interference (EMI) immunity according to the EN 12016 (May 1998): "EMC Product Family Standards for lifts, escalators, and passenger conveyors Part 2 – immunity"
 - 5. Controller shall be located inside the wall next to the top landing entrance frame. Emergency access shall be provided through an access panel in the entrance frame secured by a key lock.
 - 6. A separate control room or cabinet should not be required.
- B. Drive: A Variable Voltage Variable Frequency AC drive system shall be provided. The drive shall be set up for regeneration of AC power back to the building grid.

2.03 EQUIPMENT: MACHINE AND GOVERNOR

- A. Machine: AC gearless machine, with a synchronous permanent-magnet motor, dual solenoid service and emergency disc brakes, mounted at the top of the hoistway.
- B. Governor: The governor shall be a tension type car-mounted governor.
- C. Buffers, Car and Counterweight: Polyurethane type buffers shall be used.
- C. Hoistway Operating Devices:
 - 1. Emergency stop switch in the pit
 - 2. Terminal stopping switches.
- D. Positioning System: Consists of an encoder, reader box, and door zone vanes.
- E. Guide Rails and Attachments: Guide rails shall be Tee-section steel rails with brackets and fasteners. Side counterweight arrangements shall have a dual-purpose bracket that combines both counterweight guide rails, and one of the car guide rails to building fastening.
- F. Coated-Steel Belts: Polyurethane coated belts with high-tensile-grade, zinc-plated steel cords and a flat profile on the running surface and the backside of the belt. All driving sheaves and deflector sheaves should have a crowned profile to ensure center tracking of the belts. A continuous 24/7 monitoring system using resistance based technology has to be installed to continuously monitor the integrity of the coated steel belts and provide advanced notice of belt wear.
- G. Governor Rope: Governor rope shall be steel and shall consist of at least eight strands wound about a sisal core center.
- H. Fascia: Galvanized sheet steel shall be provided at the front of the hoistway.
- I. Hoistway Entrances:
 - 1. Frames: Entrance frames shall be of bolted construction for complete one-piece unit assembly. All frames shall be securely fastened to fixing angles mounted in the hoistway and shall be of UL fire rated steel.
 - 2. Sills shall be extruded aluminum, or bronze finish, or nickel silver finish.
 - 3. Doors: Entrance doors shall be of metal construction with vertical channel reinforcements.
 - 4. Fire Rating: Entrance and doors shall be UL fire rated for 1-1/2 hour
 - 5. Entrance Finish: [This paragraph may be written as needed to indicate specific entrance finishes by the opening. Clearly indicate landing/opening designations for each finish. Color to be selected from the manufacturer's color chart.

6. Entrance marking plates: Entrance jambs shall be marked with 4" x 4" (102 mm x 102 mm) plates having raised floor markings with Braille located adjacent to the floor marking. Marking plates shall be provided on both sides of the entrance.
7. Sight Guards: sight guards will be furnished with all doors painted to match with painted doors, painted black for stainless steel and gold satin doors.

2.04 EQUIPMENT: CAR COMPONENTS

- A. Car frame and Safety: A car frame fabricated from formed or structural steel members shall be provided with adequate bracing to support the platform and car enclosures. The car safety shall be integral to the car frame and shall be Type "B", flexible guide clamp type.
- B. Cab
Cab Options: Steel Shell Cab with stainless steel vertical removable panels
- C. Car Front Finish: Satin Stainless Steel
- D. Car Door Finish: Satin Stainless Steel
- E.
- F. Ceiling Type:
Flat steel ceiling, Real Brushed Steel Finish with 4 LED lights.
- G. Emergency Car Lighting: An emergency power unit employing a 6-volt sealed rechargeable battery and totally static circuits shall be provided to illuminate the elevator car in the event of building power failure.
- H. Fan: A one-speed 120 VAC fan will be mounted to the ceiling to facilitate in-car air circulation, meeting A17.1 code requirements. The fan shall be rubber mounted to prevent the transmission of structural vibration and will include a baffle to diffuse audible noise. A switch shall be provided in the car-operating panel to control the fan.
- I. Handrail: Handrails shall be provided on the car enclosure.
- J. Threshold: Extruded Aluminum or Bronze Finish or Nickel-Silver Finish.
- K. Emergency Exit Contact: An electrical contact shall be provided on the car-top exit.
- L. Guides: The car shall have 3" diameter roller guides at top and bottom and the counterweight shall have slide type guides at the top and the bottom.
- M. Platform: The car platform shall be constructed of metal. Load weighing device shall be mounted on the belts at the top of the hoistway.

- N. [Optional] Certificate frame: Provide a Certificate frame with a satin stainless steel finish.
- O. The LED ceiling lights and the fan should automatically shut off when the system is not in use and be powered back up after a passenger calls the elevator and pushes a hall button.

2.05 EQUIPMENT: SIGNAL DEVICES AND FIXTURES

- A. Car Operating Panel: A car operating panel shall be provided which contains all push buttons, key switches, and message indicators for elevator operation. The car operating panel shall have a satin stainless steel .
- B. A car operating panel shall be furnished. It shall contain a bank of round stainless steel, mechanical LED illuminated buttons. Flush mounted to the panel and marked to correspond to the landings served. All buttons to have raised numerals and Braille markings with:
 - Flat Flush Mounted satin stainless steel button with blue or white LED illuminating halo
 - button with white LED illuminating halo

The car operating panel shall be equipped with the following features:

 1. Raised markings and Braille to the left hand side of each push-button.
 2. Car Position Indicator at the top of and integral to the car operating panel.
 3. Door open and door close buttons.
 4. Inspection key-switch.
 5. Elevator Data Plate marked with elevator capacity and car number.
 6. Help Button: The help button shall initiate two-way communication between the car and a location inside the building, switching over to another location if the call is unanswered, where personnel are available who can take the appropriate action. Visual indicators are provided for call initiation and call acknowledgement.
 7. Landing Passing Signal: A chime bell shall sound in the car to signal that the car is either stopping at or passing a floor served by the elevator.
 8. In car stop switch (toggle or key unless local code prohibits use)
 9. Firefighter's hat
 10. Firefighter's Phase II Key-switch
 11. Call Cancel Button
- C. Car Position Indicator: A digital, LED car position indicator shall be integral to the car operating panel.
- D. Hall Fixtures: Hall fixtures shall be provided with necessary push buttons and key switches for elevator operation. Hall fixtures shall have a [This paragraph may be written as needed to indicate specific fixture finishes by opening. Clearly indicate landing/opening designations for each finish]

Integral Hall fixtures shall feature round stainless steel, mechanical buttons marked to correspond to the landings. Hall fixtures to be located in the entrance

frame face or the wall. Buttons shall be in vertically mounted fixture. Fixture shall be satin stainless steel or Gold Satin finish.

Button Options:

Flat Flush Mounted satin stainless steel button with blue or white LED illuminating halo or gold satin button with white LED illuminating halo

- E. Car Lantern and Chime: A directional lantern visible from the corridor shall be provided in the car entrance. When the car stops and the doors are opening, the lantern shall indicate the direction in which the car is to travel and a chime will sound.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Take field dimensions and examine conditions of substrates, supports, and other conditions under which this work is to be performed. Do not proceed with work until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Installation of all elevator components except as specifically provided for elsewhere by others.

3.03 DEMONSTRATION

- A. The elevator contractor shall make a final check of each elevator operation with the Owner or Owner's representative present prior to turning each elevator over for use. The elevator contractor shall determine that control systems and operating devices are functioning properly.

SECTION 15010

GENERAL PROVISIONS

PART 1 GENERAL

1.01 SUMMARY

A. Substitutions and Product Options:

1. Products List: Submit list of major products proposed to be used with names of manufacturers and installing subcontractors.
2. Contractor's Options:
 - a. For products specified only by standard, select any product meeting standard.
 - b. For products specified by naming 1 or more products by manufacturer's name and catalog number, select any 1 of the products or manufacturers named.
 - c. Contractor may submit a request for substitution for any product or manufacturer not specifically named according to Instructions to Bidders and General Conditions.
3. Substitutions:
 - a. The A/E will consider written requests from the Contractor for substitution of products for 45 days after contract award date.
 - b. Submit a separate request for each product, supported with complete data, with drawings, and appropriate samples, including, in addition to the requirements of the General Conditions, the following:
 - 1) Comparison of qualities of proposed substitution with product specified.
 - 2) Changes required in other elements of the work because of proposed substitution.
 - 3) Effect on construction schedule.
 - 4) Cost data comparing proposed substitution with product specified.
 - 5) Any required license fees or royalties generated by the proposed substitution.
 - 6) Availability of maintenance service and source of replacement materials.

- c. The Owner's decision on approval or rejection for substitution will be final.
- 4. A request for a substitution is a representation that the Contractor:
 - a. Has investigated proposed product and determined it is equal for less cost to or superior for equal cost in all respects to product specified.
 - b. Provides the same warranties or bonds for the proposed substitution as for the product specified.
 - c. Will coordinate installation of any accepted substitution into work and make other changes as may be required to make work complete.
 - d. Waives all claims for additional costs, under Contractor's responsibility, that may become apparent.
 - e. Has verified the proposed product qualifies for FPL Commercial/Industrial Energy Conservation Programs Standards rebates by meeting or exceeding FPL specified qualifications.
- 5. A/E will review requests for substitutions with reasonable promptness, and notify the Contractor, in writing, of the Board's decision to accept or reject requested substitution.

1.02 SUBMITTALS

- A. Submit shop and detail drawings, factory certified prints, brochures, and materials lists for items specified according to Instructions to Bidders and General Conditions.
- B. Substantial Completion Submittal Requirements:
 - 1. Operating and Maintenance Manuals and Charts: Provide 3 complete sets of operating and maintenance instructions, literature, and information concerning equipment under this Division, including, but not limited to HVAC systems, indexed and bound in accepted loose leaf binders.
 - 2. Record Prints:
 - a. Keep 1 complete set of prints on file at job site for sole purpose of recording "record" data. Mark changes in red on the prints as work progresses.
 - b. Update "record" prints before each requisition for payment for review

and acceptance by A/E.

- c. Deliver completed set of "record" prints to A/E before request for final payment.

1.03 QUALITY ASSURANCE

- A. Qualifications: Perform work by workers skilled in their respective trades and install specified materials and equipment according to manufacturer's recommendations.

1.04 WARRANTY

- A. Furnish copies to the Owner of guarantees for equipment or materials as specified in Instructions to Bidders and General Conditions.
- B. The Contractor shall respond to repair of compressors, pumps, and other routine warranty service requests by completing repairs within 24 hours of service request by the Owner.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Provide new materials, free from defects, of domestic manufacture unless otherwise noted.

2.02 EQUIPMENT

- A. Use equipment scheduled in the Construction Documents to determine space and service requirements.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Clean surfaces free of grease, scale, rust, and other foreign matter and leave ready for painting.
- B. Field paint exposed piping, ducts, hangers, and supports as specified in Section 09900.

1. Touch-up factory finishes marred in construction with factory touch-up kits.
- C. Provide starters, required control items, and wiring diagrams for motors specified under this Division, unless otherwise noted.
- D. Electrical items furnished shall conform to the requirements of Division 16.

3.02 FIELD SUPERVISION

- A. Verify measurements at building site before starting work. Submit discrepancies and differences to A/E for consideration and decision before proceeding with work.
- B. Obtain full information regarding:
 1. Peculiarities and limitations of space available for installation of equipment.
 2. Materials under contract.
 3. Accessibility required to dampers, valves, and other apparatus, including any part of any system needing maintenance or operation.
- C. Provide accurate layout, grades, and elevations. Set sleeves and openings in ample time for other trades to proceed in a timely manner. Take proper precautions to protect work and equipment from damage.
- D. Cut openings and chases required to accommodate the Work and repair floors, walls, and ceilings damaged by such cuttings.
- E. Perform required tests in the presence of A/E and authorities having jurisdiction. Give 48 hour notice before tests.
- F. Insure compliance with safety codes and other codes and ordinances applicable to the performance of work under this Division.

3.03 FIELD QUALITY CONTROL

- A. Work will be inspected by A/E during construction.
- B. Prerequisites to substantial completion inspection shall be completed construction, testing, adjustments, repair logs, balancing, start-up, and required instruction periods on specified mechanical equipment and systems.

1. Air-conditioning:
 - a. Ductwork shall be installed complete with required dampers, deflectors, hangers, and insulation.
 - b. Air-conditioning units shall be leveled.
 - c. Control system components shall be installed and tested for function.
 - d. System testing and balancing shall be completed.

END OF SECTION

SECTION 15023
CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

A. Comply with the following:

1. Florida Building Code (FBC).
2. Florida Building Code (FMC) - Mechanical.
3. Florida Building Code (FPC) - Plumbing.
4. National Electrical Code - (NFPA 70).
5. National Fire Protection Association - (NFPA). NFPA 101 and other NFPA codes as applicable.
6. American National Standards Institute (ANSI) A117.1.
7. American Society of Civil Engineers (ASCE).

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL) and National Electrical Manufacturer's Association (NEMA), furnish materials and equipment so listed.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 15044

GENERAL COMPLETION

PART 1 NOT USED

PART 2 NOT USED

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Construction, satisfactory testing, adjustments, balancing, and start-up shall have been completed on specified mechanical equipment and systems before substantial completion inspection. There shall be no undue equipment noises, leaks, or misaligned equipment.

1. Air-conditioning:

- a. Ductwork: Installed complete, including required dampers, deflectors, hangers, and insulation.
- b. Air-conditioning Units: Installed, cleaned, and leveled. New filters in place.
- c. Condensers: Installed, leveled, and charged with refrigerant.
- d. Insulation: Installed with no condensation leaks.
- e. Control System Components: Installed and tested for function.
- f. System Testing and Balancing: Complete.

2. Plumbing:

- a. Piping: Pressure testing complete. System free flowing.
- b. Plumbing Fixtures: Unchipped, leveled, clean, and handicapped accessible. Grouting completed.
- c. Toilet Room Accessories. Installed and secured.
- d. Insulation: Installed.
- e. Domestic water: Permanent connection with backflow preventers in place.
- f. Valving: Open.

END OF SECTION

SECTION 15047

IDENTIFICATION

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes: Identification including necessary accessories indicated on Construction Documents and specified in this section or as required for proper identification of equipment and piping.
- B. Related Sections:
 - 1. 02221 - Excavating, Backfilling, and Compaction for Utilities
 - 2. 15410 - Piping (Plumbing).
 - 3. 15510 - Piping (HVAC)

1.02 SUBMITTALS

- A. Submit properly identified product and technical data including printed installation instructions before starting work.

1.03 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Color Coding: ANSI Z535.1 (latest edition) shall take precedence over any discrepancies in determining proper color code identification.
 - 2. Conform to the standards established in ANSI A13.
 - 3. Comply with OSHA standards.

PART 2 PRODUCTS

2.01 EQUIPMENT IDENTIFICATION

- A. Identify equipment served by piping systems by number or legend as shown on Construction Documents.
- B. Engraved Plastic Name Plates: Provide engraved laminated plastic name plates with 1 inch high letters on equipment cabinets.

C. Brass Tags: Provide appropriate sized brass tags on equipment where cabinets do not exist.

D. Piping Identification:

1. Color Coding: Identify piping with markers and directional arrows according to the following color coding system:

<u>Description</u>	<u>Background</u>	<u>Letters</u>
Hot Water	Yellow	Black
Cold Water	Green	White
Refrigerant	Yellow	Black
Fire	Red	White

2. Piping Identification Materials:

a. Identify contents and flow direction of piping or pipes wrapped with insulation by using:

- 1) Brady B-946 self-sticking vinyl.
- 2) Champion America Inc., pressure sensitive vinyl.
- 3) Seton Opti-Code.
- 4) Ready Made adhesive pipe markers.
- 5) Or approved equal.

3. Valve Identification:

a. Identify location and system under valve control with a color coded thumb tack under valve and lay-in ceiling tile.

E. Underground Tapes:

1. Electrical Warning Tape: 6 mil, 3 inches wide polyethylene.

a. BURIED ELECTRICAL LINE BELOW - No.37236 by Seton or accepted equivalent.

2. 2" Metallic Detection Tapes:

a. BURIED SEWER LINE BELOW - No.37220 by Seton or accepted equivalent.

b. BURIED WATER LINE BELOW - No.37222 by Seton or accepted equivalent.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.
- B. Verify surfaces are clean and dry before application of identification signage.

3.02 INSTALLATION

- A. Brass Tags or Engraved Plastic Name Plates:
 - 1. Install brass tags or engraved plastic name plates according to manufacturer's instructions.
 - a. Place brass tags or name plates in locations easily visible within the space at normal eye level or as otherwise directed by A/E.
- B. Piping Markers and Directional arrows:
 - 1. Location:
 - a. Pipes Passing Through Walls: Provide pipe markers and directional arrows on the pipe on each side of the wall.
 - b. Pipes Behind Access Doors/Panels: Provide pipe markers and directional arrows within view.
 - c. Continuous Run Pipe Lines: Provide pipe markers and directional arrows at intervals not exceeding 50 feet.
 - d. Risers and □T□ Joints: Provide pipe markers and directional arrows at each riser and □T□ joint.
 - e. Vertical and Horizontal Change of Direction: Provide pipe markers and directional arrows at each vertical and horizontal change of direction.
- C. Underground Tapes:
 - 1. Electrical Warning Tape: Install warning tape 8 inches below finish grade on all underground outside electrical lines.
 - 2. 2" Metallic Detection Tapes: Install metallic detection tape 4 inches to 6

inches below finish grade on all underground outside plumbing and air-conditioning lines.

END OF SECTION

SECTION 15090

SUPPORTS, ANCHORS, AND SEALS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15410 - Piping (Plumbing).
2. 15430 - Piping Specialties (Plumbing).
3. 15515 - Valves, Hangers, and Specialties.

1.02 REFERENCES

- ###### A. Pipe Supports: ANSI B31.1, Power Piping.

1.03 SUBMITTALS

- ###### A. Submit properly identified manufacturer's literature before starting work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Inserts:

1. Malleable iron case of galvanized steel shell expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, and lugs for attaching to forms.
2. Size insert to suit threaded hanger rods.
3. Wall Support:
 - a. Pipe Sizes to 3 Inches: Cast iron hook.
 - b. Pipe Sizes 4 Inches and Over: Welded steel bracket and wrought steel clamps.
4. Vertical Support: Steel riser clamp.
5. Floor Support:

- a. Pipe Sizes to 4 Inches and All Cold Pipe Sizes: Cast iron adjustable pipe saddle, locknut nipple, floor flange and concrete pier to steel support.
- 6. Provide copper plated supports for copper piping or provide sheet lead packing between support and piping.
- B. Hanger Rods: Provide steel hanger rods, threaded both ends, threaded one end, or continuous threaded.
- C. Flashing:
 - 1. Steel flashing: 26 gage stainless steel.
 - 2. Safes: 5 pounds per square foot sheet lead or 8 mil thick neoprene.
 - 3. Caps: Stainless steel, 22 gage minimum except 16 gage at fire resistant structures.
- D. Sleeves:
 - 1. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 - 2. Pipes Through Beams, Walls, Fireproofing, Footings, Potentially Wet Floor: Form from steel plate or 18 gage galvanized sheet metal.
 - 3. Size large enough to allow for movement due to expansion.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Inserts:
 - 1. Use inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams wherever practicable.
 - 2. Where concrete slabs form finished ceiling, furnish inserts flush with slab surface.
- B. Supports:

1. Support riser piping independently of connected horizontal piping where practical.
- C. Priming: Prime coat exposed steel (not galvanized) supports.
- D. Flashing: Flash and counterflash where mechanical equipment passes through weather or waterproofed walls, floors, and roofs.
- E. Sleeves: Where piping passes through floor, ceiling, or wall, close space between pipe or duct and construction with noncombustible insulation. Provide tight fitting metal caps on both sides and caulk.

END OF SECTION

SECTION 15180

MECHANICAL SYSTEMS INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15510 - Piping (HVAC).
2. 15410 - Piping (Plumbing).
3. 15515 - Valves, Hangers, and Specialties.
4. 15540 - Pumping Equipment (HVAC).
5. 15890 - Ductwork.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C534-94 Specification for Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form.
2. C547-95 Specification for Mineral Fiber Pipe Insulation.
3. C552-91 Specification for Cellular Glass Thermal Insulation.
4. C553-92 Specification for Mineral Fiber Blanket Thermal Insulation for Commercial and Industrial Applications.
5. C585-90 Practice for Inner and Outer Diameters of Rigid Thermal Insulation for Nominal Sizes of Pipe and Tubing (NPS System).
6. C612-93 Specification for Mineral Fiber Block and Board Thermal Insulation.
7. D1056-91 Specification for Flexible Cellular Materials-Sponge or Expanded Rubber.
8. D1668-95 Specification for Glass Fabrics (Woven and Treated) for Roofing and Waterproofing.
9. E84-96a Test Method for Surface Burning characteristics of Building Materials.
10. E96-95 Test Methods for Water Vapor Transmission of Materials.

B. National Bureau of Standards (NBS).

C. National Fire Protection Institute: NFPA 90A.

- D. Underwriters Laboratories (UL) - 723.
 - E. Insulation Contractor's Association of South Florida Inc.
- 1.03 SUBMITTALS
- A. Submit properly identified manufacturer's catalog cuts, performance curves, and procedures before starting work.
- 1.04 DELIVERY AND STORAGE
- A. Protect materials from the weather during storage and installation.
- 1.05 QUALITY ASSURANCE
- A. Materials shall be labeled, listed, or have certified test reports submitted from testing laboratory accepted by the Owner.
 - B. Comply with the most stringent requirements between the Insulation Contractors Association of South Florida Inc. and as specified.
 - C. There shall be no fiberglass in contact with the HVAC airstream anywhere in the system whether protected by encapsulation or not.
 - D. Foam plastic insulation shall be certified, by an independent third-party national recognized laboratory, that the product emits less than 1 part per million formaldehyde out gassing after 24 hours.
- 1.06 FIRE HAZARD RATING
- A. Fire hazard rated materials shall be UL labeled indicating compliance with specified fire hazard requirements.
 - B. Insulation (including adhesives) shall be fire retardant or self-extinguishing. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings complying with ASTM E84, NFPA 255, and UL 723, as plain or on a composite basis.
 - C. When insulation, vapor barrier covering, wrapping materials, and adhesives are applied separately in field, each item shall be tested individually.
 - D. When insulation, vapor barrier covering, wrapping materials, and adhesives are factory composite systems, they shall be tested as an assembly.

- E. Insulation materials, adhesives, coatings, and other accessories shall have a fire hazard rating not more than 25 for flame developed and not more than 50 for fuel contributed and smoke developed, except as follows:
 - 1. Flexible unicellular insulation.
 - 2. Nylon anchors for securing insulation to ducts or equipment.
 - 3. Factory premolded 1 piece PVC fitting and valve covers

- F. Flame resistance treatments subject to deterioration due to effects of moisture or high humidity are not acceptable.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Insulation:

- 1. Armaflex.
- 2. Armstrong.
- 3. Certain-Teed.
- 4. Cell-U-Foam.
- 5. Foamglas.
- 6. Manville.
- 7. Owens-Corning.
- 8. Pittsburgh Corning.
- 9. Or approved equal.

B. Insulating Cement:

- 1. Keene Powerhouse.
- 2. Benjamin Foster.
- 3. Fibrex FBX fast set.
- 4. Or approved equal.

2.02 MATERIALS

A. Insulation: Type and thickness as specified.

- 1. Provide fire retardant or self-extinguishing insulation, including adhesives.

2. Finishing jackets, insulation, and adhesives shall have composite fire and smoke ratings per ASTM E84, NFPA 255, and UL 723.
- B. Domestic Hot Water Supply Piping Insulation:
1. 1" thick molded fiberglass insulation with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
 2. Insulation may be 1/2" insulation for vertical branches to individual fixtures.
 3. Minimum density of 7-1/4 pounds per cubic foot, maximum thermal conductivity factor of 0.26K at 75 degrees F. mean temperature, and alkalinity of 0.696.
 4. Flame Spread: 25 or less.
 5. Smoke Developed: 50 or less.
 6. Accessories: Adhesives, mastics, cements, tapes for fittings, and related materials shall have the same composite ratings as listed above.
- C. Cold Drainage Piping Drinking Fountain, and Electric Water Cooler Drain Piping Insulation:
1. Elastomeric (foam plastic) thermal insulation 1 inch thick with built-in vapor barrier rated self-extinguishing ASTM D1056.
 2. Maximum thermal conductivity factor of 0.26K at 70 degrees F. mean temperature, density of 5-6 pounds per cubic foot, and a water vapor transmission of 0.1 perms.
- D. Tape: As recommended by the insulation manufacturer or 3M adhesive EC-1329.
- E. Insulating Cement: All-purpose mineral wool cement.
- F. Glass Cloth Jacket: Factory sized white, standard weight, with 1-1/2" minimum longitudinal pressure sealing lap and seal strips for butt joints.
- G. Vapor Barrier Jacket:
1. Flame resistant glass fiber adhered to outside of a 1 mil aluminum foil sheet with longitudinal pressure sealing lap and seal strips for butt joints.
 2. End cement perm rating shall not exceed 0.05.
- H. Weatherproof Metal Jacket (Exterior Above Ground Only):

1. Damage and corrosion resistant, longitudinal seam closure, joint construction capable of locking insulation and jacket securely in place.
 2. Seal and weatherproof butt joints with factory supplied 2 inch wide "snap-straps" lined with plastic sealing compound secured with outer holding band.
 3. Jacket Material: 0.016 aluminum.
- I. Molded Fiberglass Pipe Insulation:
1. Rigid molded sectional pipe covering with integral factory jacket.
 2. Comply with ASTM C547.
 3. Maximum Thermal Conductivity: 0.23K factor at 75 degrees F. mean temperature.
 4. Alkalinity: Less than 0.6 percent.
- J. Foamed Plastic Insulation:
1. Closed cell.
 2. Comply with ASTM C534.
 3. Maximum Thermal Conductivity: 0.27K factor at 75 degrees F. mean temperature.
 4. Water Vapor Permeability: 0.1 perms.
- K. Cellular Glass Insulation:
1. Comply with ASTM C552
 2. Maximum Thermal Conductivity: 0.33 K factor at 75 degrees F.
 3. Water Vapor Permeability: 0.00 perm-in.
- L. Flexible Fiberglass Ductwrap Blanket Insulation:
1. 2.2/2.3 inches thick, 3/4" pcf density fiberglass blanket with UL approved aluminum foil vapor seal facing reinforced with fiberglass scrim, laminated to 30 lb. kraft paper, R = 6.5.
 2. Comply with ASTM C553, TYPE I, Class B-4.
 3. Maximum Thermal Conductivity: 0.24K factor at 75 degrees F.
- M. Rigid Fiberglass Ductboard Insulation:
1. Comply with ASTM C612.
 2. Maximum Thermal Conductivity: 0.24K factor at 75 degrees F.
 3. Provide scrim foil facing having a minimum 3 pcf density, 2 inches thick.

N. Accessories:

1. The following accessories shall be used in the application of thermal insulation:
 - a. PVC fittings cover and PVC jacketing:
 - 1) Certain-Teed "Snap Form".
 - 2) Manville Corp. "Zeston".
 - 3) Proto.
 - 4) Or approved equal.
 - b. Vapor Seal Mastic:
 - 1) Benjamin Foster 30-86 or 30-25.
 - 2) Childers CP-30.
 - 3) Or approved equal.
 - c. Lagging Adhesive:
 - 1) Benjamin Foster 81-42W.
 - 2) Childers CP-50.
 - 3) Or approved equal.
 - d. Breather Mastic:
 - 1) Benjamin Foster 45-00 or 30-86.
 - 2) Childers CP-10.
 - 3) Or approved equal.
 - e. Insulation Bonding Adhesive (to metal):
 - 1) Benjamin Foster 85-20, or 85-15.
 - 2) Childers CP-82.
 - 3) Or approved equal.
 - f. Insulating and Finishing Cement:
 - 1) Fibrex Inc. FBX Super Blend Cement.
 - 2) Manville Corp. No.375 Insulating and Finishing Cement.
 - 3) Keene Corp. Super Powerhouse.
 - 4) Or approved equal

- g. Coatings: Sealfas G-P-M mastic or approved equal.
- h. Fire Resistive Mastic: As manufactured by Benjamin Foster or approved equal.
- i. Sealants: 81-33 as manufactured by Benjamin Foster or approved equal.
- j. Staples: Type 304 or 316 stainless steel outward clinching type.
- k. Wire: 16 gage, copper weld wire.
- l. Bands: 3/4 by 0.015" thick galvanized steel.
- m. Glass Fabric:
 - 1) Woven open mesh type glass fabric conforming to ASTM D1668.
 - 2) Type I asphalt treated for below ground use.
 - 3) Type III light color organic resin treated for aboveground or below ground use.
- n. Insulation Jackets:
 - 1) Jackets inside building shall comply with fire hazard classifications as specified. Insulation jackets shall not support mold growth.
 - 2) Vapor Barrier Jackets:
 - a) For Cold Pipelines (-30 degrees F. to 60 degrees F.): Perm rating not more than 0.05, ASTM E96 Procedure A. Puncture resistance not less than 50 beach units.
 - b) For Air-conditioning Ducts: Perm rating not more than 0.05, ASTM E96, Procedure A. Puncture resistance not less than 25 beach units.

2.03 SYSTEMS INSULATION BY TYPE

- A. Interior Domestic Hot Water Supply/Return Piping Insulation:
 - 1. Molded Fiberglass Pipe Insulation: 1 inch thick with pre-sized factory applied FRJ jacket of glass cloth with longitudinal lap and butt joint strips with self-sealing adhesive.
 - 2. Contractor's Option: Foamed plastic insulation, 1 inch thick.
- B. Electric Water Cooler Drain, Cold Drainage Piping Refrigerant Suction Piping, and Interior Condensate Drain Piping Insulation:
 - 1. Foamed Plastic Insulation: 1 inch thick with field applied vapor barrier

mastic at joints.

C. Interior Concealed Ductwork Insulation:

1. Flexible fiberglass Ductwrap Blanket Insulation:

- a. 2.2 inches thick, 3/4 pcf density.
- b. 2.0 inches thick, 1-1/2 pcf density.

D. Interior or Exterior Exposed Ductwork Insulation:

1. Rigid Fiberglass Ductboard Insulation: 2 inches thick, 3 pcf density, with field applied fab and mastic finish consisting of a 10 x 10 glass fabric imbedded in 2 coats of a white breather weather barrier mastic.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install insulation according to applicable codes and regulations.
- B. Except as specified, install materials according to manufacturer's recommendations and specifications for obtaining conformance to construction documents.
- C. Packages or standard containers of insulation, jacket material, cements, adhesives, and coatings delivered for use and samples required for acceptance shall have manufacturer's stamp or label attached listing manufacturer, brand name, and a description of material.
- D. Provide allowances for expansion/contraction, and wall and manhole penetrations.
- E. Run continuous through wall, floor, and ceiling penetrations.
- F. Insulation materials shall not be applied until:
 1. Test results specified in other sections of these specifications are completed and accepted.
 2. Rust, scale, dirt, and any other foreign material have been removed.
 3. Ductwork or piping material are clean, dry, joints firmly butted together, and tightly sealed at all joints, seams, and fittings.

- G. Wrap butt joints with a 3 inch wide strip of the same material as the jacket.
- H. Provide aluminum jackets over the insulation where sealant is required.
- I. Insulation shall be kept clean and dry at all times.
- J. Duct Materials:
 - 1. Internal duct lining is not allowed.
 - 2. Duct materials solid exposed to the airflow shall be noncombustible metal.
 - 3. Duct insulation for thermal or acoustical purposes shall be separated from airflows by solid metal.
 - 4. Provide natural noise attenuation procedures, as recommended in ASHRAE, Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), and industry good engineering practices.
 - 5. Fiberglass ducts or ductboards shall not be used to convey air.
- K. Protection Shield: Where pipe or tubing insulation pass through hangers, provide:
 - 1. For Piping 4 inches and smaller: A protection shield, 180 degree arc, 16 gage galvanized sheet metal covering, minimum 12 inches long.
 - 2. For Piping Larger than 4 inch diameter: A protection shield, 180 degree arc, 16 gage galvanized sheet metal covering, minimum 18 inches long.
 - 3. Hangers not exceeding maximum spacing distances recommended by insulation manufacturer to prevent crushing or compressing insulation.
- L. Ductwork sizes shown on drawings are actual internal "air side" dimensions.
- M. Flanges, Fittings, and Valves on Insulated Piping:
 - 1. Provide pre-molded glass fiber fittings wired or taped on and adhered with canvas jacket.
 - 2. Terminate insulation and jacket neatly and finish with insulating cement troweled to a bevel and of the same thickness as adjoining insulation.
 - 3. Vapor seal insulation on cold systems.
- N. Vapor Barriers:
 - 1. Intact and continuous.
 - 2. Do not install with staples.

- O. All ductwork shall be insulated, except as noted below:
 - 1. Outside air intake ductwork.
 - 2. Exhaust air ductwork.
 - 3. Supply air ductwork, exposed in air-conditioned spaces. (Note: Ceiling plenums, and mechanical equipment rooms are not to be considered air-conditioned spaces.)
- P. Ceiling supply air registers located on perimeter rooms and corridors shall be field insulated with flexible fiberglass ductwrap insulation as specified. Insulation shall cover the upper body and installation flanges.
- Q. All appurtenances subject to condensation shall be protected as necessary and covered with vapor seal mastic.

3.02 APPLICATIONS

- A. Molded Fiberglass Pipe Insulation Installation (Hot Water Supply/Return):
 - 1. Tightly butt together sections of insulation on pipe runs sealing longitudinal seams of jacket with self-sealing laps. Position longitudinal seam so seam is on bottom to prevent dirt and moisture infiltration. Seal end joints with 3 inch wide straps of vapor barrier tape. Seal ends of insulation with vapor seal mastic at valves, fittings and flanges.
 - 2. Cover valves, fittings, and flanges with insulation similar to adjacent pipe covering, or one piece PVC cover sections as specified.
- B. Foamed Plastic Insulation Installation (Return Suction Piping, Interior Condensate Drains, and Electric Water Cooler Drains):
 - 1. Insulation shall be slipped on pipe without slitting. Butt joints shall be sealed with the manufacturer's recommended adhesive.
 - 2. Where slip-on techniques are not possible, the insulation shall be carefully slit and applied to the pipe. Seal joints with the manufacturer's recommended adhesive.
 - 3. Insulate valves and fittings with fabricated foamed plastic insulation, or one piece PVC cover sections as specified.
 - 4. Provide mastic vapor barrier for chilled water service insulation for areas subject to conditions of 90 degrees F or 85 percent relative humidity or higher.
- C. Flexible Fiberglass Ductwrap Blanket Insulation Installation:

1. Apply insulation to duct with joints tightly butted. Prepare stretch-out dimensions and cut out insulation so a 2 inch minimum overlap is created that will overlap the facing and insulation at the other end, and the adjoining seam. Install so insulation is not excessively compressed at duct edges. Foil face shall be on outside. Seams shall be stapled approximately at 6 inches on center with outward clinching staples.
2. On ductwork having a 24 inch or larger dimension, insulation shall be secured to the bottom of the duct with mechanical fasteners spaced at not more than 18 inches on center. and held in place with washers or clips. Cut off protruding pin after clips are secured.
3. Seal all insulation joints, pinheads, tears, punctures, washers, clips, and staples with 2 coats of a vapor barrier mastic type sealant, reinforced with 1 layer of 4 inch woven glass fabric.

D. Rigid Fiberglass Ductboard Insulation Installation:

1. Apply insulation tightly and smoothly to duct.
2. Secure insulation on the sides and bottom of duct by impaling insulation over pins or anchors located not more than 18 inches apart and held in place with washers or clips.
3. Cut off protruding pins after clips are secured and seal with vapor barrier mastic.
4. Apply insulation with joints tightly butted.
5. Seal ductwork joints, punctures, and pin heads with a vapor barrier mastic type sealant.
6. Insulation shall be continuous through walls and floors except at fire dampers and at combination smoke/fire dampers.
7. Finish with field applied fab and mastic finish consisting of a 10 x 10 glass fabric imbedded in 2 coats of a white breather weather barrier mastic.

END OF SECTION

SECTION 15240

VIBRATION ISOLATION

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15450 - Plumbing Equipment.
2. 15510 - Piping (HVAC).
3. 15515 - Valves, Hangers, and Specialties.
4. 15540 - Pumping Equipment (HVAC).
5. 15855 - Air Handling Units.
6. 15890 - Ductwork.

1.02 SUBMITTALS

- A. Vibration Isolators: Provide catalog cuts, diameters, isolation efficiencies, deflections, free height, operating height, solid height, and lowest equipment speed for each isolator.
- B. Equipment Bases: Provide catalog cuts or drawings.

1.03 QUALITY ASSURANCE

- A. Vibration isolators and equipment bases shall be the products of 1 manufacturer who shall determine mounting sizes and provide field supervision and inspection to assure proper installation and performance.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Vibration Isolation:

1. Consolidated Kinetics Corp., Columbus, OH.
2. Korfund Dynamics Corp., Westbury, NY.
3. Mason Industries, Inc., Hollis, NY.
4. Vibration Mountings and Controls, Inc., Butler, NJ.
5. Or approved equal.

2.02 MATERIALS

A. Rubber-in-Shear Type Isolators:

1. Molded mount shaped elements with bolt holes for bolting to equipment bases and mounted on bottom steel plates for bolting to foundations.
2. Double rubber-in-shear elements shall be mounted in series.
3. Metal surfaces shall be neoprene covered and have friction pads both top and bottom.

B. Hanger-Type Isolators:

1. Rubber-in-shear or combination rubber-in-shear and springs, mounted in a hanger box, as required to meet static deflection.
2. Provide lockout plates when required.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Mount equipment and piping on or suspended from accepted foundations and supports, as indicated in construction documents or as required. Mountings shall be non-resonant with equipment operating or with building structure natural frequencies.
- B. Place floor-mounted equipment on 4 inch high concrete pads extending 6 inches beyond equipment outline, unless otherwise specified.
- C. Vibration Isolation Systems:
 1. Guaranteed to have deflection indicated on schedule on Construction Documents.
 2. Mounting sizes shall be determined by vibration isolation manufacturer.
 3. Install according to manufacturer's instructions.
- D. Vibration isolation systems for each floor or ceiling supported equipment shall have a maximum lateral motion under equipment start-up or shut down conditions of 1/4". Motions in excess shall be restrained by accepted spring type mountings.

E. Ceiling Supported Fans, Unit Ventilators, and Air Handlers:

1. Units shall be hung by means of vibration isolator hangers consisting of steel housing or retainer incorporating a steel spring and neoprene isolators.
2. If equipment to be mounted is not furnished with integral structural frames and external mounting lugs, both of suitable strength and rigidity, accepted structural sub-base shall be installed in the field to support equipment to be hung and receive hangers.
3. Diagonal hanger rod isolators shall be provided as required to limit horizontal motion to 1/4" maximum under fan operating conditions.

END OF SECTION

SECTION 15410

PIPING (PLUMBING)

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 07600 - Flashing and Sheet Metal.
2. 15440 - Plumbing Fixtures, Trim and Supports.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A53-96 Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. A74-96 Specification for Cast Iron Soil Pipe and Fittings.
3. A106-95 Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
4. B32-96 Specification for Solder Metal.
5. B88-96 Specification for Seamless Copper Water-Tube.
6. B306-96 Specification for Copper Drainage Tube (DWV).
7. C564-95a Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
8. D312-95a Specification for Asphalt Used in Roofing.
9. D2241-96 PVC Pressure Rated Pipe.
10. D2564-96a Specification for Solvent Cements for Poly (Vinyl Chloride)(PVC) Plastic Piping Systems.

1.03 SUBMITTALS

A. Submit properly identified manufacturer's literature before starting work.

B. Shop Drawings:

1. Pipe and Fittings: Manufacturer's name and mill reports.
2. Expansion Joints: Catalog cuts.
3. Dielectric Unions: Catalog cuts.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Materials shall be new, unused, and best of their respective kinds, free from defects in labor quality, complying with latest publications in effect at time of bidding, and according to Construction Documents.
- B. Cast Iron Drainage Pipe and Fittings:
 - 1. Hub and Spigot: Service weight centrifugally spun cast iron, hub and spigot, tar coated inside and out, ASTM A74.
 - 2. No-Hub: Service weight centrifugally spun cast iron, no-hub, tar coated inside and out, CISPI 310.
- C. Galvanizing: By hot process on both inside and outside of pipe with zinc coating averaging at least 2 ounces per square foot and free from defects.
- D. Threaded Cast Iron Drainage Pipe:
 - 1. Uncoated service weight, ANSI A40.5.
- E. Copper Tubing:
 - 1. Type K or L: Seamless hard drawn or annealed, ASTM B88.
 - 2. Type DWV: Seamless hard drawn, ASTM B306.
- F. Steel Pipe: Seamless or welded steel, Schedule 40, black or galvanized threaded, ASTM A53 seamless Grade A.
- G. Ductile Iron Pipe: ANSI/AWWA C151/A21.51.
- H. Polyvinylchloride Pipe (PVC):
 - 1. Threaded.
 - 2. Non-Threaded.
- I. Cast Iron No-Hub Pipe Joint:
 - 1. Cast Iron: ASTM A888.
 - 2. Neoprene Gaskets: ASTM C564.
 - 3. Aboveground: Stainless Steel Clamp and Shield Assembly: 300 Series,

- CISPI 301-69T.
4. Underground: ASTM C1277, cast iron couplings with neoprene compression gasket and stainless steel bolts.
- J. Cast Iron Threaded Drainage Fittings: Recessed pattern ANSI B16.12.
- K. Cast Iron Threaded Fittings: Standard weight unless noted otherwise, ANSI B16.4.
- L. Malleable Iron Fittings: Standard weight, threaded banded 150 pounds ANSI B16.3. Galvanized or black to match piping.
- M. Cast Iron Fittings and Flanges:
1. Standard Weight: ANSI B16.1, unless otherwise noted.
 2. Extra Heavy: ANSI B16.2.
- N. Steel Flanges: 150 psi and 300 psi Class, ANSI B16.5, Grade 1.
- O. Brass Fittings:
1. Copper Tubing Solder Drainage Fittings: Wrought copper, ANSI B16.22.
 2. Copper Tubing Solder Fittings: Wrought copper, ANSI B16.22.
 3. Threaded: Standard weight, banded, ANSI B16.15.
- P. Press Fittings for Copper: Type K copper and bronze, ASME B16.18 or ASME B16.22. O-rings for copper press fittings shall be EPDM.
1. Viega, Lakewood, OH.
 2. Ridge Tool Co., Elyria, OH.
 3. Or approved equal.
- Q. Polyvinylchloride (PVC) Solvent Cement: ASTM D2564.
- R. Compression Gaskets, Cast Iron Soil Pipe: ASTM C564.
- S. Solder Metal:
1. Similar to silver-tin-copper alloy ASTM B32.
 2. All solder shall be certified no-lead.
- T. Joint Compound: Tite-Seal or accepted equivalent.

- U. Unions: As specified in Section 15430.
- V. Protective Coating: Cabot's Flexi-Black or approved equal.
- W. Vent Flashing: Provide flashing for vents through the roof for installation as specified in Section 07600.
- X. Stainless Steel: Schedule 10, seamless with plain ends, ASTM D312, Type 304.
- Y. Locator Tape for PVC: 2 inches wide, metallic. No.37220 for sewer lines and 37222 for water lines, by Seton or accepted equivalent.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Run piping as indicated in Construction Documents subject to modifications as required to suit field conditions, to avoid interference with other trades, and for proper, convenient, and accessible locations to parts of the piping system.
- B. Run piping in wall chases, recesses, and hung ceilings where provided.
 - 1. Do not run water piping in floor fill.
 - 2. Run piping as high as possible under building, above ceilings, and close to slabs.
 - 3. Do not permanently close, furr in, or cover piping before examination and final tests.
- C. Run piping straight and where concealed as direct as possible with risers erected plumb and true.
 - 1. Install piping with minimum 1 inch clearance between finished pipe coverings and adjacent work.
 - 2. Support piping from structure above, maintaining maximum headroom available.
- D. Do not run piping in telephone rooms, electrical equipment rooms/closets, transformer vaults or rooms containing related equipment, or close to or above control panels, switchboards and electric motors except required branch piping

to pumps. If pipes are installed in these rooms, they shall be relocated at no extra cost to the Owner.

- E. Provide control valves where noted or required for complete regulating control of systems, plumbing fixtures, and equipment. Provide valves in accessible locations or accessible through access panels.
- F. Coat Underground metal piping, except cast iron, with 1/16" thick black bituminous protective coating.
- G. Fittings, Valves, and Hangers on Chrome Plated Piping: Chrome plated finish to match.
- H. Provide reducing fittings for changes in pipe sizes. Bushings will not be allowed.
- I. Provide extra heavy pipe for nipples where unthreaded pipe is less than 1-1/2".
 - 1. Do not use close nipples. Use saddle nipples.
 - 2. Provide galvanized iron sleeves for pipes passing through roof slabs, interior floors, ceilings, walls, or partitions.
- J. Provide at least 20 feet of bitumen coated type "K" copper pipe for exterior underground domestic water at each service entering the building.
- K. Expansion Swings:
 - 1. Make adequate provisions for proper expansion and contraction of piping and for piping passing through building expansion joints.
 - 2. Make branch connections from risers with ample swing or offset to avoid strain on fittings or short pipe lengths. Anchor horizontal runs of pipe over 50 feet in length to walls or supporting structure about midway of run to allow expansion evenly divided toward ends.
 - 3. Provide sufficient number of elbow swings or accepted expansion joints to allow proper expansion and contraction of mains and risers.
- L. Pipe Slopes:
 - 1. Lay horizontal soil and waste pipes, unless otherwise noted on drawings, to:
 - a. 1/8" per foot minimum for pipe 3 inches and larger

- b. 1/4" per foot minimum for pipe less than 3 inches
 - c. Horizontal vent lines shall have a minimum grade back to the stacks or vertical lines and shall run as direct and free from bends as possible.
 - 2. Lay storm drainage pipes to 1/8" per foot minimum, unless otherwise noted on drawings.
- M. Exposed Piping:
 - 1. Install horizontal runs maximum 4 inches below adjacent structure and run parallel or perpendicular to walls, ceilings, beams, and columns unless otherwise noted on Construction Documents.
- N. Piping Materials by System:
 - 1. Sanitary Soil, Waste, and Vent Piping:
 - a. Aboveground: PVC, service weight no-hub cast iron pipe and fittings, DWV copper pipe with cast brass or wrought copper solder joint drainage fittings.
 - b. Under Ground Floor Slabs:
 - 1) Cast iron bell and spigot pipe and fittings.
 - 2) Cast iron no-hub pipe and fittings with corrosion resistant couplings and neoprene compression gaskets.
 - 2. Domestic Water Supply Piping: Drilling tubes for field manufactured fittings is not allowed.
 - a. Aboveground Interior:
 - 1) Copper Tubing Type L:
 - a) Wrought copper solder joint fitting without the use of lead components. Tubing used with this type shall not be soft drawn.
 - b) Bending of tubing having a radius of not less than 4 tube diameters without deformation may be used for tubing diameters not exceeding 1 inch. Copper tubing used for this type connection shall be bending temper.
 - c) Victaulic copper connection system with Style 606

couplings. Tubing used with this type connection shall be drawn temper.

b. Underground Exterior:

- 1) PVC.
- 2) Copper Tubing Type K:
 - a) Soft tempered copper with cast bronze or soldered joint fittings coated with bitumen.

c. Optional Press Connections for Aboveground Interior Copper Tubing Type L and Underground Exterior Copper Tubing Type K:

- 1) Press fittings shall be made according to the manufacturer's installation instructions.
- 2) The tubing shall be fully inserted into the fitting and the tubing marked at the shoulder of the fitting.
- 3) The fitting alignment shall be checked against the mark on the tubing to assure the tubing is fully engaged (inserted) in the fitting.
- 4) The joints shall be pressed using the tool approved by the manufacturer.

3. Storm Drainage Piping: Same as for sanitary systems.

O. Joints and Methods of Connections:

1. Cast Iron Bell and Spigot Pipe:

a. Compression Gaskets:

- 1) Gasket and pipe by same manufacturer.
- 2) Install according to manufacturer's instructions.

2. Cast Iron No-Hub Pipe:

- a. Aboveground: Joint with neoprene rubber sleeve and stainless steel ring clamp according to manufacturer's instructions.
- b. Underground: Joint with cast iron coupling, neoprene gasket, and stainless steel bolts according to manufacturer's instructions.

P. Pipe Cleaning Systems:

1. Domestic Water Piping: Flush clean domestic water distribution systems for cold water before placing in service.

3.02 CLEANING AND ADJUSTING

A. Clean fixtures, equipment, piping, and exposed work.

1. Show traps, wastes, and supplies free and unobstructed.
2. Plated, polished bronze, or painted surfaces bright and clean.

B. After installation, adjust valves, faucets, and automatic control devices for quiet operation. Balance system as required for proper operation.

C. Disinfection: After cleaning and testing domestic water system, disinfect by introducing a solution of calcium hypochlorite with 50 parts per million of chlorine.

1. Open and close all valves while system in being chlorinated. After disinfecting agent has been applied for 24 hours, test for residual chlorine at ends of pipe.
2. If less than 5 ppm is indicated, repeat process until it is equal to or greater than 5 ppm or according to AWWA C601 Standards.

END OF SECTION

SECTION 15421

DRAINS AND CLEANOUTS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. Division 7 - Thermal and Moisture Protection.
2. 15410 - Piping (Plumbing).

1.02 SUBMITTALS

A. Product Data: Submit properly identified manufacturer's literature before starting work.

B. Submit Shop Drawings/Catalog cuts on the following:

1. Drains.
2. Cleanouts.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Model numbers are taken from Josam.

1. Accepted equivalents:

- a. Jay R. Smith Mfg. Co.
- b. Blucher-Josam.
- c. Wade.
- d. Zurn.
- e. Or approved equal.

2.02 MATERIALS

A. Drains:

1. Toilet Room:

- a. Same as Shower Stall above except for primer trap.
 - b. Josam No.30000-6S-50-X by Josam or approved equal.
- B. Cleanouts and Cleanout Access Covers:
- 1. Floor, Interior Finished Rooms:
 - a. Cast iron, adjustable inside caulk outlet, brass internal plug, Nikaloy scoriated cover plate secured by countersunk plug.
 - b. No.56020-88-15 by Josam or approved equal.
 - 2. Stack Base for Use in Block Walls:
 - a. Cast iron "T" branch tee with plated cast iron countersunk plug, lead seal, satin stainless steel round access cover plate secured with countersunk screw.
 - b. No.58790-15 by Josam or approved equal.
 - 3. Stack Base for Use in Plaster Walls:
 - a. Cast iron "T" branch tee coated cast iron countersunk plug, lead seal, cast brass round access cover with anchor lugs, satin stainless steel cover secured with countersunk screw.
 - b. No.58750-15 by Josam or approved equal.
 - 4. Stack Base for Use in Tile Walls:
 - a. Cast iron "T" branch with brass countersunk plug, cast brass square access cover with satin top, anchor lugs, cover plate secured with 4 screws.
 - b. No.58770-15 by Josam or approved equal.
 - 5. Exterior, Heavy Duty:
 - a. Cast iron, inside caulk outlet bronze internal plug, ductile iron scoriated heavy duty cover.
 - b. No. 56040-15 by Josam or approved equal.
 - 6. Cleanout Sizes:
 - a. Full pipe size up through 4 inches, pipe cleanouts with bodies of standard pipe size and caulking ferrules conforming to thickness required for pipe and fittings of same metal.

7. Removable Cleanout Plugs:
 - a. Cast bronze with screw threads and recessed bronze socket. No.58540 by Josam or approved equal.

C. Wall Access:

1. Cast bronze, polished chrome plated square frame and cover, 12" X 12" minimum opening or larger, as required.
2. No.58640 by Josam or approved equal.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Provide drains and cleanouts as scheduled on drawings.

B. Cleanouts:

1. Place pipe cleanouts at the foot of each soil and waste stack in sanitary system and place pipe cleanouts in horizontal runs not to exceed 50 foot spacing.
2. Install access covers as specified.

C. Interior Flush Cleanouts:

1. Flush cleanouts with recessed sockets (without access covers) may be used in non-finished areas such as equipment rooms, storage rooms, and the like, if top of hub is installed in level position and top of clean out plug is flush with the concrete floor.

D. Exterior Unfinished Grade Mounted:

1. Cast iron, inside caulk outlet, bronze internal recessed plug mounted flush with grade. Surround cleanout with concrete doughnut.

E. Exterior Finished Grade Mounted:

1. Ductile iron scoriated heavy duty cover, flush with walkway or floor. No.56040-15 by Josam or approved equal.

END OF SECTION

SECTION 15430

PIPING SPECIALTIES (PLUMBING)

PART 1 GENERAL

1.01 SUMMARY

A. Related Section:

1. 15410 - Piping (Plumbing).

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. A126-95 Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.

1.03 SUBMITTALS

A. Submit properly identified manufacturer's literature before starting work.

B. Submit Shop Drawings/catalog cuts for the following:

1. Shock Absorbers.
2. Unions and Flanges.
3. Hangers and Inserts.
4. Trap Resealers.
5. Vacuum Breakers.
6. Strainers.
7. Backflow Preventors.
8. Water Hammer Arrestors.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Backflow Preventors:

1. Reduced pressure zone, with 2 quarter turn, full ported, bronze ball valves, upstream strainer, and flanged adaptor ends. By Watts or accepted equivalent.

B. Trap Resealers:

1. Water Closet Valve: Chrome plated with tubing to wall and wall flange. Water closet shall be no more than 20 feet from floor drain. No.F-72-A1 by Sloan Valve Co. or accepted equivalent.
2. Lavatory or Sink: Cast brass chrome plated with 1/2" female union connection and 1/2" female outlets, integral vacuum breaker.
 - a. Manufacturers:
 - 1) Josam, No.88250.
 - 2) Chicago Faucet Co., No.447.
 - 3) Zurn Industries, Inc., No.Z-1022.
 - 4) Or approved equal.
3. Remote Location:
 - a. Machined brass valve with integral vacuum breaker, pressure adjustment and distribution units with visual operations inspection cover where required for multiple connections.
 - b. By Precision Plumbing Products Model P.1 or P.2 as applicable, or approved equal.

C. Shock Absorbers:

1. Stainless steel shell, elastomeric bellows, pressurized argon charge, sized per PDI-WH 201 at each branch of cold and hot water supplies, group toilets, and as shown on Construction Documents.
 - a. Zurn Industries, Inc., No.Z-1700.
 - b. Josam, No.75000.
 - c. Or approved equal.
2. Copper shell at individual toilet rooms and isolated fixtures. By Josam 75000-S or approved equal.

D. Water Hammer Arrestors:

1. Sioux Chief Mfg. or approved equal .

E. Vacuum Breakers:

1. Hose Bibb Vacuum Breaker: Non-removable. No 8A by Watts Regulator Co. or approved equal.
2. Atmospheric Type: No.288A by Watts Regulator Co. or approved equal.
3. For Plumbing Fixtures: As specified under Section 15440.

F. Unions and Flanges:

1. Steel Pipe 2" and Smaller: Malleable iron unions with brass seat. Galvanized pipe requires galvanized unions.
2. Steel Pipe 2-1/2" and Larger: Bronze flanged connections 150 pound Class. Galvanized pipe requires galvanized unions.
3. Copper Pipe 2" and Smaller: Bronze unions.
4. Copper Pipe 2-1/2" and Larger: Bronze flanged connections 150 pound Class.
5. Dielectric Unions or Flanges:
 - a. Meet dimensional requirements and tensile strength of pipe unions or flanges according to Fed. Spec. WW-U-531D.
 - b. Suitable for required operating pressures and temperature conditions.
 - c. Provide metal connections on both ends. Ends shall be threaded or soldered to match adjacent piping.
 - d. Separate metal parts at union to prevent current flow between dissimilar metals.

G. Escutcheons:

1. Provide escutcheons securely in place on exposed pipes passing through walls, partitions, floors, and ceilings of finished areas unless otherwise noted on Construction Documents.
2. Provide escutcheons with sufficient outside diameter to adequately cover sleeved openings.
3. Interior Walls, Partitions, and Ceilings: Solid or stamped chrome plated brass or stainless steel, one piece or split pattern.
4. Floors and Exterior: Solid cast brass, rough chrome plated or cast nickel bronze alloy, one piece or split pattern.

H. Flexible Connectors:

1. Rubber flexible pipe, 125 psi minimum working pressure rating, 6 inch maximum length.
2. Install according to manufacturer's recommendations.
3. Style 100 by Metraflex or accepted equivalent.

I. Strainers:

1. □Y□ pattern, monel screen, all bronze, 400 psi WOG, cleanout valve, 1/2" to 3". YSBR 100 Series by Wilkins or accepted equivalent.
2. □Y□ pattern, ASTM 126, Class B Cast Iron, flanged connections, stainless steel screen, 200 psi WOG, 2 inches to 10 inches. 77F series by Watts Regulator or accepted equivalent.

J. Pipe Hangers and Supports:

1. Provide hangers, supports, and supplementary steel as specified for different applications.
2. Insert, Hangers, Rods, and Clamps: Figure numbers used refer to Grinnell. Fee and Mason or Elcen Metal Products are also accepted manufacturers.

a. Inserts:

- 1) Universal Concrete Insert: Fig.282.
- 2) CB Junior Concrete Insert: Fig.279.
- 3) Wedge Type Concrete Insert: Fig.281.
- 4) Expansion Case: Fig.117.

b. Hangers: Adjustable clevis type.

- 1) Cast Iron Pipe: Fig.590.
- 2) Copper Tubing: Fig.CT-65.
- 3) Insulated Steel Pipe: Fig.300.
- 4) Uninsulated Steel Pipe: Fig.146.

c. Clamps:

- 1) V.F.S. beam clamp with weldless eyenut, Fig.292, clamp size 1, rod size 3/4".
- 2) C-clamp with retaining clip, Fig.87.
- 3) I-beam clamp, Fig.131.
- 4) Universal side I beam clamp, Fig.225.
- 5) C-clamp, copper finish, Fig.CT88.

d. Rods: Galvanized with continuous thread, Fig.146.

e. Riser Clamps:

- 1) Black Steel, Fig.261.
- 2) Plastic coated, Fig.261C
- 3) Copper finish, Fig.CT121.

3. Horizontal Steel and PVC Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Clamp or Hanger Maximum Spacing</u>
Up to 1-1/4"	3/8"	8 feet
1-1/2 and 2 inches	3/8"	10 feet
2-1/2 and 3 inches	1/2"	12 feet
4 and 5 inches	5/8"	12 feet
6 inches	3/4"	15 feet
8 inches & larger	1 inch	15 feet

4. Horizontal Copper Piping:

<u>Pipe</u>	<u>Rod Diameter</u>	<u>Clamp or Hanger Maximum Spacing</u>
Up to 1 inch	3/8"	6 feet
1-1/4 and 1-1/2"	3/8"	6 feet
2 inches	3/8"	8 feet
2-1/2"	1/2"	8 feet
3 and 4 inches	1/2"	8 feet

5. Horizontal Cast Iron Piping:

<u>Pipe Size</u>	<u>Rod Diameter</u>	<u>Maximum Spacing</u>
Up to 4 inches	1/2"	5 feet
4 inches	5/8"	5 feet
6 inches and larger	3/4"	5 feet

6. Wall Support:

- a. U-clamps as accepted.
- b. Unistrut supports.

7. Vertical Support: Steel riser clamps.

K. Insulation Protection Shield: Fig.167.

L. Access Panels (Wall or Ceiling): As specified in Section - 08305.

PART 3 EXECUTION

3.01 INSTALLATION

A. Inserts:

1. Use inserts for suspending hangers from reinforced concrete slabs or beams when possible.
2. Provide flush inserts at concrete to be a finished surface.

B. Flashing:

1. Flash and counterflash where mechanical equipment passes through exterior or waterproofed floors, walls, or roofs.

C. Sleeves:

1. Seal space between pipe or duct and surrounding floor, wall, or ceiling construction with noncombustible insulation and tight fitting metal caps on both sides with caulking.
 - a. Pipe Through Floors: Form from 18 gage galvanized sheet metal.
 - b. Pipes Through Beams, Walls, Fireproofing, Footings, and Potentially Wet Floors: Form from steel plate or 18 gage galvanized sheet metal.
2. Size sleeves to allow movement caused by expansion.
3. Seal and fireproof penetrations.

D. Pipe Hangers and Supports:

1. Provide adjustable hangers, inserts, brackets, rolls, clamps, and supplementary steel as required for proper support of pipelines.
2. Horizontal Cast Iron and PVC Pipe: Place hangers within 18 inches of hub or joint.
3. Hubless Joints: Provide support at every other joint. Support each joint when length between supports exceeds 4 feet.
4. Plastic Pipe: Provide roll hangers and install loose to allow for contraction and expansion.
5. Plumbers tape, straps, chain, wire hangers, or perforated bar are not allowed for hanging pipe.

E. Backflow Preventors:

1. Install aboveground in 6'-0" high fenced enclosures.
- F. Water Hammer Arresters:
1. Supply Piping: Provide a water hammer arrester for each fixture supply including hot and cold water. Do not provide air chambers where water hammer arresters are installed.
- G. Unions and Flanges: Provide at connections of equipment and at strainers and control valves.
- H. Escutcheons: Fit and firmly secure escutcheons to pipes passing through finished floors, ceilings and walls.

END OF SECTION

SECTION 15670

AIR COOLED CONDENSING UNITS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15240 - Vibration Isolation.
2. 15510 - Piping (HVAC).
3. 15515 - Valves, Hangers, and Specialties.

1.02 SUBMITTALS

- A. Submit properly identified product data before starting work.
- B. Unit Schedule: Provide air cooled condensing units of type, size, efficiency rating, and capacity shown in unit schedule.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air Cooled Condensing Units:

1. Carrier.
2. Lennox.
3. McQuay.
4. Trane.
5. York.
6. Or approved equal.

2.02 EQUIPMENTS

A. Air Cooled Condensing Units:

1. Casing:
 - a. Fully weatherproof unit, suitable for outdoor installation.
 - b. Fabricate casing of galvanized or zinc-coated steel and finish with

- baked enamel.
 - c. Fabricate structural members of continuous galvanized steel with steel channel.
 - d. Provide openings for power and refrigerant connections and adequate removable panels for service access.
 - e. Unit shall be welded hermetic type with internal vibration isolation and be covered with a shield to muffle operating sound.
 - f. Compressor shall have both thermal and current sensitive overload devices and internal high pressure protection.
2. Condenser Fans: Direct drive, propeller-type fans arranged for vertical discharge.
- a. Resilient mount fans factory statically and dynamically balanced and provide heavy gage safety guards.
3. Condenser Coils:
- a. Copper or Aluminum Plate Fins: Mechanically bonded to copper tubes.
 - b. Adequately protect fins against hail damage on coils for 20 tons or greater.
 - c. Fin Coating: Heresite or Bronze Glow epoxy coating.
4. Control Center and Accessories:
- a. Factory wired controls within a weatherproof cabinet.
 - b. Accessories:
 - 1) Heating/cooling thermostat with sub-base suitable for continuous or automatic fan operation.
 - 2) Head pressure control to maintain proper condensing temperature at low ambient temperature.
 - 3) Low voltage control transformer.
 - 4) Indoor fan relay.
5. Refrigerants:
- a. HCF 134a.
 - b. HFC 410A.
 - c. HCFC 22.
6. Efficiency Rating: Air cooled condensing unit shall comply with FPL

Commercial/Industrial Energy Conservation Program Standards.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install according to manufacturer's recommendations, accepted Shop Drawings, and as indicated on Construction Documents.

END OF SECTION

SECTION 15821

FANS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 06100 - Carpentry.
2. 07600 - Flashing and Sheet Metal.
3. 09200 - Metal studs, Lath, Suspension Ceiling, Plaster, and Stucco.
4. 09510 - Acoustical Ceilings.

1.02 SUBMITTALS

- ###### A. Submit properly identified manufacturer's catalog cuts and technical data before starting work.

1.03 QUALITY ASSURANCE

- ###### A. Fans shall be constructed and rated according to AMCA Standards.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Ceiling Mounted Fans, Centrifugal Type:

1. Nutone Co.
2. Penn Ventilator Co.
3. Or approved equal.

B. Curb Mounted Exhaust Fans:

1. Cook.
2. Greenheck.
3. Hill Fan Co.
4. ILG.
5. Penn Ventilator Co.
6. Or approved equal.

2.02 EQUIPMENT

A. Ceiling Mounted Fans, Centrifugal Type:

1. Enclose in an acoustically insulated housing and provide with an integral back draft damper and aluminum inlet grille.
2. Provide capacities and electrical requirements as shown in schedule.
3. Statically and dynamically balance fan wheels at factory.

B. Curb Mounted Exhaust Fans:

1. Weatherproof Housing: Heavy gage galvanized steel with integral roof curb and weather protected intake hoods with filter finished with 2 coats of off-white epoxy enamel inside and out.
 - a. Top of housing shall be removable for service access.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to the manufacturer's recommendations and accepted Shop Drawings.

END OF SECTION

SECTION 15855
AIR HANDLING UNITS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15240 - Vibration Isolation.
2. 15885 - Air Filtration Equipment.
3. 15890 - Ductwork.

1.02 REFERENCES

- A. Air Moving and Conditioning Association (AMCA): Standard 210 Fan Performance Testing.
- B. American National Standards Institute (ANSI): ANSI B3.16 Roller Bearings, Load Rating, and Fatigue Life.
- C. National Fire Protection Association (NFPA): NFPA 90A Air- conditioning and Ventilating Systems.
- D. Air-conditioning and Refrigeration Institute: Standard 410 Air Cooling and Heating Coils.
- E. Florida Building Code (FBC) - Mechanical.

1.03 SUBMITTALS:

- A. Shop Drawings, list of materials, cooling coil performance data, fan performance data, and fan curves. Performance data shall be certified by unit manufacturer.

1.04 QUALITY ASSURANCE

- A. Cooling coils shall bear the ARI label.
- B. Air handlers and components shall be ARI certified.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air Handling Equipment:

1. Carrier.
2. Dunham-Bush.
3. Mammoth.
4. McQuay.
5. Trane.
6. Temptrol.
7. York.
8. Or approved equal.

B. Reheat Coils:

1. Heat Pipe Technology, Inc., Gainesville, FL.
2. Or approved equal.

2.02 FACTORY FABRICATED AIR HANDLING UNIT

A. Unit shall be of arrangement and type shown on Construction Documents with design capacities as scheduled. Design units for floor mounting. Central station air handler and components shall be ARI certified and complete with fans, coils, motors, v-belt drives, belt guards, drains, filter sections, and accessories as specified.

B. Casing:

1. Casing walls shall be fabricated of minimum 0.80" aluminum, continuous hot dipped galvanized steel, or black steel phosphatized and coated with baked enamel finish not lighter than 18 gage. Removable panels shall provide access to the interior of the unit.
2. Interior walls shall be fabricated so that solid metal, aluminum, minimum 0.63", or other approved metal, separates the airstream from fiberglass, ductliners, and internal insulation.

C. Fan Section:

1. Fan section shall encase 1 double-inlet, double-width forward curved fan suitable for static pressures and air quantities indicated.
 - a. Fan wheel shall be dynamically and statically balanced at factory.

- b. Maximum fan rpm shall be 25 percent less than the first critical speed. Fan wheel diameter shall be as indicated.
2. Fan shaft shall be solid or hollow, ground and polished steel, and coated with rust inhibitor.
 - a. V-belt driven fan shall have variable-pitch motor sheaves and drives shall be designed for 50T overload capacity.
 - b. Drives shall be selected for the mean rpm of the drive to match the fan operating rpm at design fan rpm.
3. Fan bearings shall be grease lubricated, ball bearings, self-aligning type. Bearings shall be designed for an average life of 200,000 hours. Provide extended lubrication lines with external grease fittings.

D. Coil Section:

1. Coil section shall encase cooling coils and drain pan.
 - a. Arrange coils for horizontal airflow.
 - b. Provide a minimum of 6 rows for chilled water service.
 - c. Provide intermediate drain pans for multiple coils installation.
 - d. Coil headers shall be completely enclosed within the insulated casing with only connections extended through the cabinet.
2. Drain pan shall be one of the following:
 - a. Stainless steel, double pan construction with the inner pan covered with a heavy coat of mastic, and thermally isolated from the exterior casing with 1 inch thick fiberglass insulation.
 - b. Welded heavy gage stainless steel, thermally isolated from the exterior casing with insulation of 1 inch thick fiberglass or non-moving air space with the equivalent R value.
3. Tubing for coils shall be copper 1/2" to 5/8" outside diameter.
 - a. Fins shall be (aluminum) (copper) mechanically bonded by tubing expansion with a maximum spacing of 10 fins per inch unless noted otherwise.
 - b. Coils shall have supply and return connections on the same end.
4. Refrigerant coils shall have venturi type refrigerant distributor arranged for down feed.

- a. Proof test coils at 450 psig and leak tested at 300 psig air pressure under water, cleaned, dehydrated and sealed with a dry nitrogen charge.
 - b. Coils shall be suitable for a working pressure of up to 300 psig.
5. Chilled water coils:
- a. Tubing for coils shall be copper 1/2" to 5/8" outside diameter.
 - b. Provide a minimum of 6 rows.
 - c. Fins shall be (aluminum) (copper) mechanically bonded by tubing expansion with a maximum spacing of 10 fins per inch unless noted otherwise.
 - d. Coils shall be tested by subjecting each coil to a minimum air pressure of 350 psig with the coil submerged in water.
 - e. Coils shall have supply and return connections on the same end.

E. Filters:

- 1. As specified under Section 15885 - Air Filtration Equipment.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Equipment shall be installed according to manufacturer's recommendation.
- B. Casing seams shall be airtight.
- C. Condensate drains shall prevent any accumulation of condensate inside air handlers. P-trap on condensate drain on unit shall have a vertical leg equal to the maximum static pressure of the air handler.
- D. Seal coils at perimeter to prevent air bypass and shall be installed to be completely drainable through header drains.

END OF SECTION

SECTION 15885

AIR FILTRATION EQUIPMENT

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15855 - Air Handling Units.

1.02 SUBMITTALS

- ###### A. Air filter catalog data and sample.

1.03 DELIVERY, STORAGE, AND HANDLING

- ###### A. Protect materials from damage during storage and installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Filters:

1. American Air Filter Co.
2. Bioclimatic.
3. Circul-Aire.
4. Scott.
5. Purafil Clean Air Systems.
6. Or approved equal.

2.02 EQUIPMENT

A. Air Handling Unit Filters:

1. Temporary Construction Filters:
 - a. Provide 2 sets of temporary 4 inch thick fiberglass throwaway type filters for use during construction and start up. Construction filters shall be minimum 35 percent efficient.

- b. Construction filters shall be provided for all filter applications and air handing units shall not be operated at any time without filters.

2. Filters:

- a. Construction: Disposable 4 inch multi-ply paperboard or synthetic fiber type filters with minimum ASHRAE rated 30-36 percent efficiency. Design pressure drop shall be 0.37 inches water column.
- b. Replaceable: Disposable 4 inch multi-ply paperboard or synthetic fiber type filters with minimum ASHRAE rated 40-45 percent efficiency. Design pressure drop shall be 0.47 inches water column.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install equipment and materials according to manufacturer's recommendations. Maintain proper access around equipment access doors for filter maintenance removal.
- B. Execute work in a neat and professional manner.
- C. Use construction filters during initial start-up periods to blow systems clean of construction dust without clogging coils.
- D. Install the permanent type filters after cleanup period and before final test and balance of air systems. Do not use for temporary filters.

END OF SECTION

SECTION 15890

DUCTWORK

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 07270 - Firestopping and Fire and Smoke Barrier Caulking.
2. 15260 - Vibration Isolation.
3. 15855 - Air Handling Units.
4. 15910 - Duct Accessories.
5. 15940 - Outlets (HVAC).

1.02 REFERENCES

A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA), latest edition:

1. HVAC Duct Construction Standards (Metal and Flexible).
2. High Velocity Duct Construction Standards.

B. National Fire Protection Association (NFPA):

1. NFPA 45 Standard on Fire Protection for Laboratories Using Chemicals.
2. NFPA 90A Standard for the Installation of Air-conditioning and Ventilating Systems of Other than Residence Type.
3. NFPA 96 Removal of Smoke and Grease Laden Vapors from Commercial Cooking Equipment.

C. National Electrical Code - (NEC) - 70.

D. American Society of Heating, Refrigerating, and Air-conditioning Engineers, Inc. (ASHRAE) 62 - Ventilation for Acceptable Indoor Air Quality.

1.03 SYSTEM DESCRIPTION

- ###### A. Provide double walled ducts with interior insulation for the first 15 feet from an AHU to provide for sound attenuation.

- B. All ductwork shall be sealed to comply with SMACNA:
 - 1. Seal Class A.
 - 2. Leakage Class 6 for rectangular ducts.
 - 3. Leakage Class 3 for round and oval ducts.
- C. Use of fiberglass or components containing coated or exposed fiberglass within airstreams is prohibited.

1.04 SUBMITTALS

- A. Ductwork:
 - 1. Provide 1/4" scale composite Shop Drawings. Shop Drawings shall be coordinated with other trades before submitting.
 - 2. Catalog Cuts: Medium pressure ductwork, duct sealer, and turning vanes.
 - 3. Catalog Cuts, Ratings, and Performance Data: Flexible ductwork.
- B. Casings, Plenums, and Housings: Details of construction.
- C. Provide details of proposed typical ductwork fittings including:
 - 1. Seams and joints.
 - 2. Elbows, vaned and radius.
 - 3. Transitions and Offsets.
 - 4. Taps and outlet frames.
 - 5. Branch connections and tees.
 - 6. Splitter dampers.
- D. Duct Hanger System: Catalog cuts and shop drawing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Flexible: Genflex or Flexible Technologies.
- B. Ductwork and Fittings:
 - 1. Metalaire.
 - 2. Semco.

3. Spiramatic.
4. United Sheet Metal.
5. Or approved equal.

2.02 MATERIALS

- A. Ductwork shall be fabricated and installed according to the SMACNA Standards, except as shown on drawings or specified.
- B. Ductwork shall have manufacturer's gage stamp intact.

2.03 LOW PRESSURE DUCTWORK

- A. Includes ductwork from low pressure air handlers, exhaust, and outside and return air ductwork. Velocities shall not exceed 1,300 fpm and static pressures not to exceed 2 inches WG.
- B. Provide galvanized steel ductwork, designed, constructed, installed and tested according SMACNA - "HVAC Duct Construction Standards" and as shown on drawings. Ductwork to have manufacturer's gage stamp. Provide cross-breaking or beading to prevent flexing, but do not reduce gage of metal below that required for flat ductwork sheets.
- C. Provide galvanized steel saddles at points of support of insulated piping saddles according to Section 15051.
- D. The following ductwork and plenums shall be insulated, unless noted otherwise.
 1. Return air ductwork in non-conditioned spaces, including mechanical rooms and space above ceilings.
 2. Return air transfer boots.
 3. Return/outside air plenums at air handlers.
- E. Plenums:
 1. Galvanized steel with the largest dimension of 30 inches and larger shall be 18 gage.
 2. Plenums shall be constructed, designed, installed, and tested according to SMACNA as specified. Joints shall be angle reinforced pocket type. Provide fully gasketed joints between plenums and filter sections.
 3. Provide plenum access doors where indicated on drawings. Doors shall be constructed according to Figure 6-12 of SMACNA - HVAC Duct

Construction Standards.

F. Flexible Insulated Ductwork:

1. Lightweight duct, core of corrosion resistant reinforcing wire helix permanently bonded within fabric, insulated with 1-1/2" thick, 3/4 lb. density fiberglass flexible insulation and covered with a vapor barrier of aluminum metalized polyester film laminated to glass mesh, elastomer back coated. Duct shall meet NFPA 90A requirements and be listed as Class 1 Air Duct Material, UL 181.
2. Manufacturers:
 - a. Atco Rubber Products.
 - b. Genflex.
 - c. Thermaflex II.
 - d. Venture Type VTKC.
 - e. Wiremold Co.
 - f. Or approved equal.

G. Ductwork and splitter dampers within the ductwork shall be made of the same material.

H. Turning vanes shall be provided in square elbows and shall be of same material as the ductwork. Turning vanes shall be of airfoil type, double thickness factory fabricated.

I. Filter Sections (Air Handlers): Filter section casing shall be constructed of mill galvanized steel of 18 gage. Casing shall be sized to house filters indicated on drawings.

PART 3 EXECUTION

3.01 GENERAL

- A. Install low velocity ductwork as shown on drawings.
- B. Before systems are tested and balanced, ducts shall be thoroughly cleaned and blown out.
- C. Where interferences arise during construction, make transition or division of ductwork on basis of pressure drop equivalent to original size. Obtain approval from A/E before fabrication.

3.02 INSTALLATION

- A. Install ductwork materials and accessories according to the latest edition of SMACNA Low Velocity Duct Construction Standards as specified. These written specifications shall take precedence in case of conflict.

3.03 LOW PRESSURE DUCTWORK

- A. Seams and joints in ductwork shall be made airtight. Seal duct joints with sealer as specified for field sealing of high pressure ductwork. Make exhaust ducts passing through return air chases airtight.
- B. Install flexible ductwork shall be installed in sizes to match diffuser necks as indicated on drawings schedules. Duct length shall be not less than 5 feet and no longer than 7 feet. Duct shall be adequately supported to prevent kinks and sharp bends. Install according to manufacturer's recommendations and as shown on drawings.

3.04 DUCTWORK SUPPORTS AND HANGERS

- A. Provide support and hangers according to SMACNA HVAC Duct Construction Standards.
- B. Hangers shall be galvanized steel hung from inserts or clip angles secured to structure with expansion bolts in shear or tension as follows:
 - 1. Roof Slab: In tension.
 - 2. Structural Beams: In shear, 12 inches minimum from bottom of beam.

3.05 DUCT PENETRATIONS TO FLOOR AND FIRE WALLS

- A. Joints around duct penetrations shall be packed with fire safing insulation and sealed with fire and smoke barrier caulk as specified in Section 07270, Firestopping and Fire and Smoke Barrier Caulking.

END OF SECTION

SECTION 15910
DUCT ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15890 - Ductwork.
2. 15940 - Outlets (HVAC).

1.02 REFERENCES

- A. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA): Low and High Velocity Duct Manuals.
- B. National Fire Protection Association (NFPA) 90-A Standard for the Installation of Air-conditioning and Ventilating Systems of Other Than Residential Type.

1.03 SUBMITTALS

- A. Duct Access Doors: Catalog cuts.
- B. Volume Dampers: Shop drawings.
- C. Fire Dampers: Catalog cuts.
- D. Low Pressure Ductwork Round Fittings: Shop Drawings or catalog cuts.
- E. Flexible Connections: Catalog cuts.
- F. Test Holes: Pipe couplings, catalog cuts, and proposed installation locations.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Volume Dampers:

1. Dampers shall be manual or automatic as indicated on drawings.

- Dampers furnished with automatic actuators shall be furnished under Section 15900 and installed under this section.
2. Volume dampers shall have opposed blades.
 3. Volume dampers shall be 2 gages heavier than the installed duct and shall be reinforced to prevent vibration and noise.
 - a. Dampers shall be according to SMACNA "Low Velocity Manual", as referred to in "Ductwork". Dampers shall have an indicating device with lock to hold damper in position for proper setting.
 - b. Splitter dampers shall be double thickness at the leading edges.
 - c. Volume dampers shall be fabricated according to Figure 2-12 of SMACNA Low Pressure Manual.
 4. Bridge lock type quadrant operators of dampers shall mount flush with surface of duct insulation.
- B. Flexible Connectors: Size flexible connections at a minimum of 4 inches between connected items. Provide 30 ounce glass fabric fire retardant and air tight, coated with neoprene on both sides. Ventglass by Ventfabrics, Inc. or Neoprene Fabriduct by Elgen or approved equal.
- C. Fire Dampers: Provide approved fire dampers where indicated on drawings. Dampers shall be constructed and installed according to requirements of NFPA 90A, and each damper shall be provided with fusible link designed to melt at 165 degrees F. Damper blades shall be stacked outside of air stream.
1. Manufacturers:
 - a. Action Air Incorporated.
 - b. Air Balance.
 - c. National Control Air.
 - d. United Sheet Metal Company, Series 200.
 - e. Or approved equal.
- D. Combination Smoke and Fire Dampers:
1. Damper shall bear a 1-1/2 hour UL fire damper label. Dampers shall be constructed of steel, with parallel blades.
 2. Damper shall meet requirements specified for fire dampers and include operating shaft able to rotate 90 degrees and cause damper to operate between closed and open. Operating shaft and damper combination shall be suitable for linking to and operation by any standard pneumatic damper operator having sufficient torque characteristics.

3. Dampers shall be installed in 14 gage steel sleeves.
- E. Duct Access Doors:
1. Access doors shall be hinged except where sliding or removable type is required and shall be insulated except in non-insulated ductwork and casings. Access doors shall be sized for proper access but shall not be less than 16 inches X 12 inches in size, except in small ductwork where a smaller door may be used.
 2. Access doors for high pressure ducts shall be galvanized steel with dogs or cams, solid neoprene gaskets, moisture resistant and airtight. Provide door frames to extend over casing or duct insulation. Doors shall operate from outside. Size and construct for high pressure application.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Flexible connections shall be provided as shown on drawings. Lengths shall be between 3 feet and 8 feet.
- B. Fire Dampers:
1. Fire dampers shall be furnished and installed in duct openings and return air openings through fire partitions and as shown on drawings.
 2. Seal around fire dampers with therma-fiber at walls per UL and NFPA requirements.
 3. Install dampers as shown on drawings and according to manufacturers recommendations.
- C. Low pressure ductwork round fittings shall be installed as shown on drawings and according to manufacturers recommendations.
- D. Provide test holes at mains and main branches and as required by test and balance contractor.
- E. Duct Access Doors:
1. Airtight, hinged access door with catch shall be installed next to fire dampers and shall be sized for easy inspection or maintenance of dampers. Minimum access door size shall be 18 inches X 18 inches, except in smaller ductwork where a smaller door may be used.

2. Do not obstruct access doors with piping, conduits, hangers, braces, and other ducts.
3. Required ceiling access panels for areas other than removable ceilings shall be furnished under this section for installation under the general construction work.
4. Provide access doors on linkage side of automatic dampers, including fire and smoke dampers.

END OF SECTION

SECTION 15940
OUTLETS (HVAC)

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 15890 - Ductwork.
2. 15910 - Duct Accessories.

1.02 SUBMITTALS

- A. Outlets: Catalog cuts and schedules of installation and performance data at noted capacities.
- B. Outlet Accessories: Plaster frames, opposed blade dampers, and square to round neck adapter catalog cuts.
- C. Samples: Submit color chips for manufacturer's standard baked enamel colors.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Air Outlets:

1. Air Guide.
2. Anemostat.
3. Carnes.
4. Krueger.
5. Metalaire.
6. Price.
7. Titus.
8. Warren Technology.
9. Or approved equal.

2.02 MATERIALS

- A. Plaster frames shall be provided for plaster and dry wall ceiling and wall

installations.

B. Finishes shall be as follows:

1. Devices installed on surfaces to be painted shall match surface color. Factory prime coat.
2. All Other Areas: Factory applied baked enamel. Color to match color chip furnished by A/E.
3. Aluminum Devices: Satin aluminum baked enamel, except as specified.

C. Provide a synthetic sponge rubber gasket between each frame and mounting surface forming an airtight seal.

D. Manufacturer's published performance data shall be obtained from testing performed in a laboratory certified by the Air Diffusion Council. Testing shall be according to ADC Test Code 1062R4.

E. Air diffusers shall be provided with opposed blade volume dampers adjustable from diffuser face, blanking for proper coverage, and blow without producing objectionable noise or air motion at occupied level.

1. Diffusers in the same room shall be the same size and type, except as otherwise noted.
2. Diffusers shall be suitable for operation at 5 percent excess and 25 percent less than noted capacities.
3. Louvered face ceiling diffusers shall be of square, round, or rectangular face patterns. Provide:
 - a. Removable central core, snap-in type.
 - b. Flat flanged frame.
 - c. Welded aluminum construction.
 - d. White baked enamel finish.
4. Perforated ceiling diffusers are not allowed.

F. Grilles and Registers.

1. Ceiling return and exhaust registers shall be 1/2" x 1/2" x 1/2" grid type with opposed blade dampers and aluminum construction with white baked enamel finish. Frame shall be suitable for plaster frame mounting where required.
2. Sidewall return and exhaust registers shall be aluminum flange frame with fixed 45 degrees louvers spaced 3/4" with an opposed blade

- damper. Louvers shall be parallel to the long dimension.
3. Grilles shall be as specified for registers except dampers are not required. Perforated ceiling return grilles shall be of the lay-in type to match perforated ceiling diffusers.
- G. Sidewall supply grilles and registers shall be aluminum flange framed, with 2 sets of adjustable vanes parallel to the long and the short sides and an opposed blade damper.
 - H. Supply and return, registers, diffusers, and grilles shall be provided with frames and finishes suitable for wall or ceiling finish and construction where installed. Coordinate with Construction Documents for ceiling types and locations.
 - I. Air outlets shall be provided as indicated on drawings. If outlet type is not indicated on the drawings, provide type used in similar areas elsewhere in the building.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Manufacturer of air distribution devices shall be responsible for examining application of each diffuser, grille, and register and guaranteeing each will provide comfort space conditions without drafts and excessive noise at noted capacity.

END OF SECTION

SECTION 15991

TESTING AND BALANCING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Test and Balance Agency: The Contractor shall provide within his cost a test and balance firm, to be approved by the Owner, to perform test and balance services required for this project.

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Testing and balancing equipment and instruments shall be provided by the contracted firm.

PART 3 EXECUTION

3.01 CONTRACTOR'S RESPONSIBILITY

- A. Furnish to Test and Balance firm a complete set of approved equipment submittal data and the latest, approved mechanical drawings or Shop Drawings.
- B. Before and during construction assist Test and Balance firm with inspection and pre-completion requirements.
- C. Perform a preliminary balance to verify components and systems are operational and ready for test and balance agency.
- D. Provide sufficient notice and time before final completion date to enable testing and balancing be completed within project schedule.
- E. Prerequisite To Substantial Completion Inspection: Construction, starting, adjustment, testing and balancing, shall have been completed.

- F. Provide at no additional cost to the Owner, labor, materials, and tools necessary to make corrections when required without undue delay.

END OF SECTION

SECTION 16023

CODES AND STANDARDS

PART 1 GENERAL

1.01 REFERENCES

A. Comply with the following:

1. Florida Building Code (FBC).
2. Florida Building Code (FBC) - Mechanical.
3. Florida Building Code (FBC) - Plumbing.
4. National Electrical Code - (NEC), (NFPA 70).
5. National Fire Protection Association (NFPA).
6. NFPA 101 and other NFPA codes as applicable.
7. American National Standards Institute (ANSI) A117.1.
8. American Society of Civil Engineers (ASCE).

1.02 QUALITY ASSURANCE

- A. Where materials and equipment are available under the continuing inspection and listing service of Underwriters Laboratories (UL), furnish materials and equipment so listed.
- B. Comply with latest FPL Commercial/Industrial Energy Conservation Program Standards, if FPL is the available utility company.
- C. A maximum of 3 helpers to 1 journeyman are allowed according to Metropolitan Dade County.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 16100

BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 SUMMARY

A. Coordination With Other Trades:

1. Examine drawings and specifications. Visit site to determine work to be performed by Electrical, Mechanical, HVAC, and other trades.
2. Provide required electrical materials and equipment to put work into operation, completely wired, tested, and ready for use including raceways, conductors, disconnects, starters/contactors, or other devices for proper operation and sequences of electrical, mechanical, or other systems or equipment.
3. Unless otherwise noted, conduit, wire for controls, and devices, both line and low voltage, shall be provided and installed as described in this or other parts of the Construction Documents.
 - a. Install boxes or housings necessary for conduit and wire to controls, excluding items to be installed in piping, ducts.
 - b. These items are specified for installation in other sections. Connecting wiring is specified in this Division.
4. Seal penetrations through fire walls with fire resistant compound as specified in Section 07270.
5. Connect electrical equipment and devices as parts of the equipment or furniture furnished under other sections.
6. Comply with provisions of Instructions to Bidders and General Conditions and Section 01340.

B. Tradesperson Qualifications:

1. Contractor shall provide or cause to be provided by the appropriate subcontractors in the electrical trade for all work required by this Division 16, a ratio of one licensed master or journeyman for every three trainees at all times as those terms are defined by Chapter 10 of the Miami-Dade County Code. No other workers shall be allowed.
2. Where the work of these trades is subcontracted:
 - a. The contractor shall include this requirement in those

- subcontracts.
- b. The subcontractor shall show capacity to bond the subcontracted work. The decision to require such bond to be issued remains with the general contractor.

1.02 SUBMITTALS

A. Manufacturer's Data:

1. Complete list of materials to be furnished under this section.
2. Manufacturers' specifications and other data required to assure specification compliance.
3. Catalog cuts, clearly marked for identification of items to be provided, including disconnects, breakers, fuses, starters, lighting fixtures, transformers, or other materials not requiring specially prepared Shop Drawings.

B. Shop Drawings for nonstandard items, including but not limited to panelboards, switchboards, control centers, anchoring layouts and details, lighting fixtures, or similar products.

C. Contract Closeout Submittals:

1. Record Drawings.
2. Warranties.
3. Operating Instructions, maintenance manuals, and parts lists.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage:

1. Deliver materials to jobsite in their original unopened containers with labels and certifications intact and clearly legible at time of use.
2. Store materials according to manufacturers' recommendations and as approved by A/E.

B. Replacement: In case of damage, pilferage, or other loss, make immediate repair or replacement of materials necessary to obtain approvals of A/E, without cost to the Board.

C. Protection: Use necessary means to protect materials of this section before, during, and after installation, including protection of installed work and materials of other trades.

PART 2 NOT USED

PART 3 NOT USED

END OF SECTION

SECTION 16112

RACEWAYS AND CONDUIT

PART 1 GENERAL

1.01 SUMMARY.

A. Related Sections:

1. 02221 - Excavating, Backfilling, and Compaction for Utilities.
2. 07270 - Firestopping and Fire and Smoke Barrier Caulking.
3. 07900 - Joint Sealers.
4. 09901 - Painting.
5. 10400 - Identifying Devices.
6. 16120 - Wire and Cable.
7. 16131 - Outlet, Pull, and Junction Boxes.
8. 16450 - Grounding.

1.02 DEFINITIONS

- ###### A. Refer to NEMA Standard VE 1 for definitions of cable tray terminology used in this section.

1.03 SYSTEM DESCRIPTION

- ###### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.04 SUBMITTALS

- ###### A. Product Data: Manufacturer's literature including printed installation instructions and recommendations before starting work. Submit samples if requested.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fibrated Emulsion Conduit Coatings:

1. Karnak Chemical Corp., 220 Fibrated Emulsion.
2. Monsey Products Co., Monsey Asphalt Emulsion Roof Coating Fiber.

3. Sonneborn Building Products, Hydrocide 700B.
4. Or approved equal.

2.02 EQUIPMENT

- A. Conduit shall be sized according to NEC, unless otherwise noted. Feeders and home runs shall not be less than 3/4" diameter.
- B. Rigid Conduit:
 1. Galvanized Rigid Steel Conduit (GRS): Hot dip galvanized or electro-galvanized, with corrosion resistant coating on the inside, threaded, standard weight steel conduit complying with ANSI C80.1-1990, and Article 346 of the NEC.
 2. Intermediate Metal Conduit (IMC): Hot dip galvanized or electro-galvanized, threaded, steel conduit complying with ANSI C80.6-1986 and Article 345 of the NEC.
 3. Rigid Non-Metallic: Schedule 40, PVC plastic 90 degrees C. complying with ANSI/UL 651-1989, and Article 347 of the NEC.
- C. Electrical Metallic Tubing (EMT):
 1. Galvanized steel tubing with smooth interior coat of lacquer enamel or zinc coat.
 2. Comply with ANSI C80.3-1983, and UL 797, and Article 348 of the NEC.
- D. Flexible Metal Conduit:
 1. Steel: Flexible galvanized steel conduit (Greenfield) complying with UL 1 and Article 350 of the NEC.
 2. Liquid Tight: Flexible galvanized steel conduit with oil and water-resistant overall plastic sheath, complying with UL 1, and Article 351 of the NEC.
 3. Minimum size for flexible metal conduit 1/2" except 3/8" where allowed by Section 349 of the NEC for connections to lighting fixtures.
- E. Conduit Fittings:
 1. Rigid Steel Conduit and Intermediate Metal Conduit: Zinc or cadmium plated steel or galvanized malleable iron complying with ANSI C80.1 and C80.3. Fittings shall be threaded type. Die cast zinc alloy fittings are not allowed.
 2. Rigid PVC conduit: 90 degrees C., PVC fittings UL listed. Fittings shall match conduit and complying with ANSI/UL 651-1989.

3. EMT fittings: Zinc or cadmium plated steel or malleable iron of the compression type or stainless steel multiple point locking (set screw) type. Connectors shall have insulated throats. Fittings shall comply with ANSI C80.3-1983. Die cast zinc alloy fittings are not allowed.
4. Flexible metal conduit fittings: Steel or malleable iron only with insulated throat, complying with Fed. Spec.W-F-406B. Die cast zinc alloy fittings are not allowed.
5. Bushings and connectors shall incorporate an insulating insert of at least 150 degrees C. rated plastic or 105 degrees C. rated nylon. Conduit bushings made entirely of nonmetallic material are not allowed. Grounding and bonding bushings shall have clamp type terminal for copper conductor.
6. Expansion Fittings and Sealing Fittings: UL listed with ground continuity means.

F. Conduit Supports:

1. Straps: Formed zinc coated steel or malleable iron one-hole pipe straps or conduit clamps sized for conduits or tubing.
2. Fastenings: Zinc coated or cadmium plated steel screws, bolts, toggles, and expansion anchors as required.
3. Electrical steel channels shall be equivalent to Unistrut P-3000 Series. Provide trapeze, clamps, supports, concrete inserts, galvanized steel or plated steel with galvanized conduit clamps, and threaded 1/4" diameter minimum suspension rods.
4. For individual branch circuit EMT or flexible metal conduit concealed above accessible hung ceilings only, "caddy clips" spring steel conduit clamps.

G. Conduit Coatings: Steel conduit buried directly in the earth shall receive a factory applied PVC coating or 2 coats of fibrated emulsion conduit coating. Comply with manufacturer's application recommendations.

H. Surface Raceways: Only where specifically indicated. UL listed and comply with Fed.Spec.W-C-582, and Articles 352 and 353 of the NEC.

1. Manufacturers:
 - a. Walker, Division of Butler Manufacturing Co.
 - b. Wiremold.
 - c. Or approved equal.
2. Pull Wires: Galvanized steel or nylon rope of sufficient strength to pull in

the maximum size conductors through trade size conduit. Minimum strength shall be 200 lbs.

I. Wireways and Auxiliary Gutters:

1. Hot dip galvanized code gage sheet steel, complete with knockouts, enclosures, and removable covers unless indicated as hinged.
 - a. Manufacturers:
 - 1) Hoffman.
 - 2) Lee Products.
 - 3) Keystone.
 - 4) Square D.
 - 5) Or approved equal.
2. Exterior locations shall have weathertight gasketed covers, joints, and drip-proof rain shields. Paint after installation with exterior enamel paint.
3. Wireways and gutters shall comply with Articles 362 and 374 of the NEC.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not proceed with the work of this Section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Provide where indicated and where required, ducts, conduits, tubing, wireways, and gutters to form a complete and integrally grounded raceway system. The system shall be installed according to NEC and local code requirements. Components of the system shall be of sufficient size, strength, and capacity to allow for placements, pulling-in, or other installation of conductors, wires, cables, splices, taps, and terminations whether included in this Contract or for future use without strain or injury to those items being installed.
- B. Provide pull wires in empty raceways where no conductors are installed in this Contract. Allow 10 inches minimum slack at each end of pull wire and securely caulk in place. Provide marking tags showing opposite destination noting building and closet number at each end.

- C. The minimum size of rigid conduit, EMT, and flexible metallic conduit shall be according to NEC except as follows:
1. Unless otherwise specified under "Products" or shown on the Drawings.
 2. Unless otherwise shown on the Drawings, telephone conduits shall be not less than 1 inch trade size.
 3. Feeders and homeruns shall not be less than 3/4" diameter.
- D. Check sizes of raceways to determine the green equipment ground conductor specified, shown, or required can be installed in the same raceway with phase and neutral conductors according to the percentage of fill requirements of NEC. If necessary, increase the duct, conduit, tubing, or raceway sizes shown or specified to accommodate conductors without additional cost to the Board.
- E. Raceway and Conduit Locations: Unless indicated otherwise, conduit types specified shall be used in the following locations. Any deviation from this schedule shall be submitted for approval with corresponding price adjustments before installation. Any conduit installed and not of the specified type shall be removed and replaced with the specified type at no additional cost to the Board.
1. Exterior Raceways:
 - a. Below Grade:
 - 1) Below Grade Direct Buried:
 - a) Galvanized rigid steel (GRS), painted or PVC jacketed.
 - b) PVC Schedule 40, as noted on plans.
 - b. Exterior Exposed:
 - 1) GRS conduit.
 - 2) IMC conduit.
 - 3) PVC flexible conduit, PVC jacketed with liquid tight fittings.
 - 4) Gutters, wireways, and troughs of the gasketed, raintight type.
 2. Interior Raceways:
 - a. Under Slabs on Grade:

- 1) GRS (painted or PVC coated).
 - 2) PVC Schedule 40, with 12 inches clear to bottom of slab.
- b. Embedded in Concrete Walls or Floor On or Below Grade: PVC or GRS with threaded or concrete tight steel fittings.
 - c. Embedded in Concrete Walls or Floors Above Grade:
 - 1) PVC Schedule 40.
 - 2) GRS or IMC with threaded or concrete tight steel fittings.
 - 3) EMT with concrete tight steel fittings.
 - d. Concealed in Masonry Walls:
 - 1) GRS or IMC with steel fittings.
 - 2) EMT with concrete tight fittings.
 - e. Concealed in dry wall construction, or in suspended ceilings: EMT or flexible metal conduit with steel fittings.
 - f. Interior Exposed:
 - 1) GRS or IMC at 8 feet or less above finish floor.
 - 2) EMT with steel fittings more than 8 feet above finish floor.
 - 3) Option: EMT installed below 8 feet from floor in electrical, mechanical, and telephone rooms.
3. Sealing fittings shall be installed at the following points and as otherwise indicated:
 - a. Where conduits enter or leave hazardous areas and enclosures for explosion-proof lighting fixtures, switches, receptacles, etc., use sealing compounds according to NEC to be of a type approved for the conduits.
 - b. Where conduits pass from warm locations to cold locations, such as refrigerated spaces and air conditioned spaces, use to prevent passage of water vapor.
 - c. Where required by the NEC.
 4. PVC conduit shall not be used indoors either exposed or concealed, except embedded in concrete or under slabs on grade.
 - a. The depth of conduits under interior slabs shall be based on the minimum allowable bending radii of stub-ups.

- b. Stub-ups on exterior and exterior walls shall be GRS, with transitions from PVC to GRS occurring below grade. Curves to stub-ups shall be GRS.

F. Raceway and Conduit Installation:

1. Conduit Routing:

- a. Route feeders, homeruns, and conduits as indicated, except for minor deviations as accepted.
- b. Maintain a minimum separation of 12 inches between conduits containing emergency feeders and conduits containing normal feeders.
- c. The routing of conduit, as shown on the plans, is general.
- d. Before installing any work, examine the working layouts of all other trades to determine exact locations and clearances.
- e. Where equipment is installed by other trades requiring connection as specified in this section, determine exact conduit entry locations from the approved shop drawings.
- f. Modifications to conduit runs shown on the electrical drawings, based on this section, shall be made without additional cost to the Board, and shall be subject to A/E approval.
- g. In determining clearances, conduit shall not be run within 6 inches of any heated pipe or duct, or if unavoidable, the conduit must be kept at least 1 inch from the outer covering.

2. Conduits In Finished Spaces:

- a. Conduits, fittings, outlet boxes, and pull boxes shall be concealed in ceilings, floor slabs, walls, or partitions of the buildings.
- b. Provide sufficient space at concealed conduits over conduit and coupling for the applications of finished floor, walls, and ceilings.
- c. Examine the Drawings, and if necessary, confer with the A/E to determine the type of construction containing the concealed conduits and the space available for such conduits.
- d. Unless otherwise shown on the Drawings, conduit may be run exposed on unfinished walls, on attics, and roof spaces.

3. Roof Conduit:

- a. Avoid running conduit on the roof wherever possible.
- b. If absolutely necessary, roof mounted conduit shall be GRS or IMC, a minimum of 16 inches above roof on galvanized steel

struts, securely supported, horizontally and vertically with pitch pans as required, on supports and conduit penetrations.

4. Conduits Penetrating Waterproof Membranes Under Floor Slabs on Grade:
 - a. Coordinate installation of conduits before installation of waterproof membrane.
 - b. Membrane to be sealed waterproof to conduits as specified in Section 07120 before pouring of slab over membrane.
 - c. Provide Schedule 40 galvanized steel pipe sleeves for conduits penetrating floor slabs as specified in Section 01043.
5. Conduits Penetrating Waterproof Membranes on Walls: Provide properly coordinated Schedule 40 galvanized steel pipe sleeves for conduits in concrete forms as specified in Section 05500. Membrane to be sealed waterproof to conduits as specified in Section 01043.
6. Conduit Embedded in Concrete:
 - a. Conduit embedded in poured concrete shall be of the specified type, unless otherwise indicated.
 - b. EMT shall not be installed underground, in slabs on grade, in wet locations, in hazardous areas, or for circuits operating at more than 600 volts.
 - c. Metallic conduit buried in the ground shall be of the specified type.
 - d. The outside diameter of any conduit buried in concrete shall not exceed one-third of the thickness of the structural slab, wall or beam in which it is placed. The conduit shall be located entirely within the middle third of the member whenever possible.
 - e. Lateral spacing of conduits buried in concrete slabs shall be not less than three diameters except where drawings indicate the concrete slab has been specially designed to accommodate a closer spacing of conduits entering panelboards, etc., or the arrangement is accepted by the A/E.
 - f. In general, conduits shall not be run through beams, except where clearly indicated on Drawings, specified, or where allowed by the A/E.
 - g. No vertical conduit passing through horizontal concrete beams shall interfere with reinforcing. Where accepted by the A/E, horizontal conduit may pass through beams, provided they are not closer than 6 inches clear and are confined to upper half of beam section.
 - h. Properly support conduit to be embedded to maintain correct

location and spacing during concreting operations. If necessary, provide suitable metal supports for this purpose.

- i. Where a concrete embedded conduit passes through an expansion or contraction joint in the structure, install the conduit at right angles to the joint, and provide an approved conduit expansion fitting at the joint installed according to the manufacturer's instructions. Paint the conduit with an approved bituminous compound for 1 foot on either side of the expansion joint.
- j. Conduits concealed in slabs on grade shall be installed over vapor barrier. Underground rigid conduit not encased in concrete shall receive the specified conduit coating.
- k. Factory applied plastic resin or epoxy coated metal conduit and fittings may be used, provided that coating holidays and abrasions to coating are repaired with compatible mastic.
- l. At any 1 point, not more than 2 lines of conduits shall intersect in any portion of slab.
 - 1) In all such cases, any additional conduit shall be rerouted through other areas, or run under the slab and stubbed through the slab at the required locations.
 - 2) Conduits and pipes shall have a minimum cover of 1 inch of concrete.
 - 3) Do not install conduit in slabs 3 inches thick or less.
 - 4) Under no conditions shall aluminum conduit be buried in concrete slabs.
 - 5) Slab installed conduit shall be stubbed within webbing of block and shall be extended vertically concurrently with laying of block.
 - 6) Determine centerline of block partitions measured from column centerlines.

7. Conduit Bending, Cutting, and Placement:

- a. Conduit bends and offsets shall be avoided where possible.
- b. Required bends shall be made with standard benders designed for the purpose and with a minimum radius of 6 times the internal conduit diameter.
- c. Make conduit bends according to the NEC unless otherwise shown on the contract Drawings. Use of a pipe tee or vise for bending conduit is not allowed.
- d. Conduit crushed or deformed shall not be installed.
- e. Bends shall be free from dents or flattening. Bends more than 360

- degrees are not allowed in conduit between any 2 terminations of pull boxes.
- f. Make no bend in surface raceways. Use factory formed fittings for surface raceways.
 - g. Raceways shall not contain more than two 90 degree bends or equivalent. Provide additional junction or pull boxes to meet this requirement.
 - h. The ends of conduit shall be carefully reamed out free from burrs before installation and after threading.
 - 1) Cuts shall be made square.
 - 2) Coupling of conduit by means of running threads is not allowed.
 - 3) Where it is impossible to run the conduit and coupling sections together, an Erickson coupling or other accepted combination coupling shall be used.
 - 4) Joints shall be made up tight.
 - 5) Joints in conduits concealed in slab, floor fill, earth, etc., shall be made using approved silicone paint on threads.
 - i. Prevent lodgement of plaster, dirt, or trash in raceways, boxes, fittings, and equipment during course of construction. Clogged raceways shall be entirely freed of obstructions or replaced.
 - j. During installation of conduit, unfinished runs and terminations in pull boxes, cabinets, etc., shall be capped until conductors are installed.
 - k. Plastic caps designed for this specific purpose shall be used to cover and align conduits before concrete pours and shall remain on conduit stub-ups until conduit is extended. Caps shall have self-aligning, interlocking male or female wings molded on each side. Duct or electrical tape and wire are unacceptable.

8. Conduit Connections:

- a. Conduit and EMT runs shall be mechanically and electrically continuous from service entrance to outlets. Unless otherwise specified, each conduit shall enter and be securely connected to a cabinet, junction box, pull box or outlet box by means of a locknut on the outside and a bushing on the inside or by means of a liquid-tight, threaded, self-locking, cold-weld type wedge adapter. Where nominal circuit voltage exceeds 250 volts:
 - 1) In rigid conduit, an additional locknut shall be provided, 1 inside locknut and 1 outside locknut.

- 2) In EMT or flexible metal conduit, the 1 locknut shall be made wrench-tight.
 - 3) Locknuts shall be the bonding type with sharp edges for digging into the metal wall of an enclosure and shall be installed to provide a locking installation.
 - 4) Locknuts and bushings or self-locking adapters will not be required where conduits are screwed into tapped connections.
 - 5) Protect vertical runs of conduit or EMT terminating in the bottoms of wall boxes or cabinets, etc., from the entrance of foreign material before the installation of conductors.
- b. Plastic conduit joints shall be made by brushing a plastic solvent cement on the inside of the plastic coupling fitting and on the outside of the conduit ends. Slip together the conduit and fitting, until seated, with a slight twist to set the joint tightly, and the conduit then rotated one-half turn to distribute the cement evenly. Remove excess cement built-up on the surface of the conduit.
 - c. The end of each conduit one inch and smaller shall be provided where it enters a junction box, outlet box, cabinet, etc., with the locknut and bushing. For conduits 1-1/4" and larger, use insulated bushings with ground stud. If insulated bushings are of the fully insulated type, use additional locknuts inside the junction box or cabinet before installing the bushing. Provide conduit entering main distribution switchboard feeder pull boxes with insulated bushing with ground stud regardless of size.
 - d. Install the conduit system complete before any conductors are drawn in. Each run of conduit shall be blown through and swabbed after plaster is finished and dry, and before conductors are installed.
 - e. Install conduit to drain any moisture, collecting in the conduit, to the nearest outlet or pull box, where possible.
 - f. Where metallic conduit is exposed to different temperatures, seal the conduit to prevent condensation and passage of air from one area to the other.
 - g. Light and power conduit shall run from a permanent and continuous ground return back to the service ground connection point. Conduits used on systems entirely isolated from the light and power distribution system shall be electrically continuous and grounded in an approved manner.

9. Conduit Penetrations and Supports:

- a. Sleeves, conduits, or other pipes passing through floor slabs, beams, or walls shall be located to not impair the strength of the structure.
- b. Conduits penetrating the walls or smoke partitions shall be fire stopped (sealed). Filling materials for openings in floors shall be fire-resistive, and finished to prevent passage of water, smoke and fumes. Filling material for openings in walls shall be fire-resistive where it occurs in fire walls, and shall be installed to prevent the passage of air, smoke or fumes. Where conduit and wiring pass through fire walls or floor slabs, the Contractor shall fill the opening with fireproof sealant, as specified in Section 07270.
- c. Roof penetrations shall be made using approved flashings and counterflashings. Do not penetrate cant strips or expansion joint covers with conduits. Do not run conduits up through roof nearer than 12 inches from toe of cant strip. Where conduits penetrate exterior walls near flashings, penetration shall be at least 3 inches above the flashing reglet.
- d. Where conduits passing through the openings are exposed in finished rooms, the finishes of the filling materials shall match and be flush with the adjoining floor, ceiling, or wall finishes.
- e. Where unused sleeves or slots are provided for future installation of conduit, etc., they shall be suitably identified if not readily recognizable.
- f. EMT and conduits not embedded in concrete or masonry shall be securely and independently supported so that no strain will be transmitted to outlet box and pull box supports, etc. Supports shall be rigid enough to prevent distortion of conduits during wire pulling.
- g. Run conduits exposed in unfinished spaces, mechanical equipment spaces, where specifically indicated on the Drawings, or with the expressed permission of the A/E.
 - 1) Feeder conduits shall be run exposed or in hung ceilings, except as noted.
 - 2) Where exposed conduits are installed, they shall be run parallel to the building walls or partitions, using approved conduit fittings.
 - 3) Exposed conduits shall be securely supported with malleable iron pipe straps, angle iron pipe straps, angle iron or steel channel racks or other approved means as required for clearance of other piping or ductwork.
 - 4) Wood hangers and perforated sheet metal hanger straps are not allowed.

- 5) Spacing of conduit supports shall not exceed 7 feet.
 - 6) Horizontal feeder conduit banks shall have their hangers fastened to the building structure by approved means.
 - 7) Hangers for banks consisting of 1 or 2 conduits may be fastened from inserts in the slab.
 - 8) Auxiliary steel for fastening shall be furnished and installed under this section.
- h. Support individual conduits not larger than 1-1/2" diameter by means of one-hole pipe straps or individual pipe hangers. Support individual horizontal conduits larger than 1-1/2" diameter by individual pipe hangers.
- i. Conduit located in hung ceilings shall be supported in approved manner similar to exposed conduits.
- j. Branch circuit conduits above suspended ceilings may be supported from the floor construction above or from the main ceiling support members, however, the finished installation shall not interfere with the removability of ceiling panels. Individual branch conduits above suspended ceilings with removable panels may be supported from the ceiling suspension wires provided the load imposed on any individual wire is not greater than 64 pounds, including the ceiling weight.
- k. Space conduits installed against concrete or masonry surfaces away from the surface by clamp backs or other approved means.
- l. In dry locations, spring steel fasteners, clips, or clamps specifically designed for supporting exposed single conduits may be used instead of pipe straps or pipe hangers.
- 1) Hanger rods used with spring steel fasteners shall be not less than 1/4" diameter steel with corrosion resistant finish.
 - 2) Spring steel fasteners shall be specifically designed for supporting single conduits or EMT
 - 3) Type, size and spacing of spring steel fasteners with accessories shall be approved by the A/E and the Contractor.
 - 4) Submit applicable load and rating data for approval.
 - 5) Wire shall not be used for support.
 - 6) Nails are not allowed for the support of conduit.
- m. Where 2 or more horizontal conduits or EMT run parallel and at the same elevation, they shall be supported on multiple trapeze pipe hangers. Each conduit or EMT shall be secured to the horizontal hanger member by a U-bolt, one-hole strap, or other

- suitably designed and approved fastener.
- n. U-bolts, clamps, attachments, and other hardware necessary for hanger assembly, and for securing hanger rods and conduits shall be provided. Each multiple hanger shall be designed to support a load equal to or greater than the sum of the weights of the conduits, wires, hanger, plus 200 pounds. Hardware shall be hot-dip galvanized after fabrication.
10. Fittings:
- a. Expansion Fittings: Each buried conduit in or rigidly secured to the building construction on opposite sides of a building expansion joint and each long run of exposed conduit that may be subject to excessive stresses shall be provided with an expansion fitting. Expansion fittings shall be made of hot dip galvanized malleable iron and shall have a factory installed packing that will prevent the entrance of water, a pressure ring and a grounding ring.
 - b. In addition to the grounding ring, a separate external copper bonding jumper secured by grounding straps on each end of the fitting shall be provided.
 - c. Sealing Fittings: Sealing fittings for use with rigid steel conduits shall be of the threaded, zinc or cadmium coated, cast or malleable iron type. Fittings used to prevent passage of water vapor shall be of the continuous drain type.
 - d. Sealing fittings shall be installed and sealed according to the manufacturer's recommendations at suitable, approved, accessible locations. In concealed work, each fitting shall have an access door or panel to allow access to the fitting.
 - e. Compression fittings shall be made up tight according to manufacturer's recommendations. No screw type fittings are allowed.
11. Conduit Fastening: Fasten raceways as follows:
- a. To Wood: Wood screws, sheet metal screws, or screw type nails.
 - b. To Hollow Masonry: Toggle bolts or expansion bolts as required. Holes not used to be filled.
 - c. To Concrete or Solid Brick Masonry: By expansion bolts. Holes drilled to a depth of more than 1-1/2".
 - d. To Steel Work: Machine screws, welded threaded studs, or spring-tension clamps. Raceways or pipe straps shall not be welded to steel structures.
 - e. To Light Steel Construction Partitions: Sheet metal screws. Bar

- hangers may be attached with saddle ties of 16 gage double strand zinc-coated steel wire.
- f. Nail-type nylon anchors with lock washers and nuts may be used instead of expansion bolts or machine screws.
 - g. Explosive charge setting devices are not allowed for any type of fastening on the project.
 - h. Conduits, tubing, or raceways shall be continuous from outlet to outlet, cabinet, junction box, or pull box.
 - i. Surface Wireways and Auxiliary Gutters: Fasten according to manufacturer's directions with fastenings appropriate for surface as specified.

12. Flexible Conduit:

- a. Flexible conduits shall be used for connections to motors and other electrical equipment when it is subject to movement, vibration, misalignment, cramped quarters, or where noise transmission is to be eliminated or reduced. Flexible conduit used to meet the above requirements shall be of the liquid-tight type when installed under any of the following conditions:
 - 1) Exterior locations.
 - 2) Moisture or humidity laden atmosphere where it is possible for condensation to accumulate.
 - 3) Corrosive atmospheres.
 - 4) Where water or spray due to wash-down operations is frequent or possible.
 - 5) Wherever there is a possibility of seepage, dripping, etc., of oil, grease, or water.
- b. Flexible conduit shall be used for short connections to control devices, recessed fixtures, and similar items with enough slack to avoid tension. Connection between structure and first point of attachment to vibrating equipment shall be flexible.

13. Surface Raceways:

- a. Surface metal raceways shall be used where noted on Drawings. Surface metal raceways shall be securely grounded to outlet boxes or to back-plates and fixtures by means of bolts, screws, or other approved means. Ends of raceways shall be provided with bushings at entrances to boxes or canopies. A separate green ground conductor shall be installed in the raceway from the

- junction box supplying the raceway to receptacle or fixture ground terminals.
- b. Fasten surface raceways to surface in manner similar to methods specified.
 - c. Each surface metal raceway outlet box with an attached lighting fixture shall be of sufficient diameter to provide a seat for the fixture canopy.
 - d. Where a surface metal raceway is used to supply a fluorescent lighting fixture having central stem suspension with a backplate and a canopy, with or without extension ring, the backplate and canopy will serve as the outlet box and no separate outlet box need be provided.
 - e. A surface metal raceway outlet box shall be provided, in addition to the backplate and canopy, at the feed-in location of each fluorescent lighting fixture having end stem suspension.
 - f. Where a surface metal raceway extension is made from an existing outlet box on which a lighting fixture is installed, a backplate slightly smaller than the fixture canopy shall be provided and no additional surface mounted outlet box need be installed.
14. Empty Conduits: Where empty conduit or tubing is indicated for wiring to be installed in future by utility company or by separate contract, install conduit or tubing according to previous requirements for conduit and tubing with following additional requirements:
- a. No length of run shall exceed 75 feet for 3/4" size and 150 feet for 1 inch or larger sizes.
 - b. Raceways shall not contain more than two 90 degree bends or equivalent.
 - c. Install additional pull or junction boxes to comply with above limitations, whether or not indicated.
 - d. Inside radii of bends in conduits of 1 inch or larger shall be not less than 10 times nominal diameter.
 - e. Provide pull wire in empty raceways.
15. Painting: Paint exposed conduit to match the surrounding wall or ceiling it is mounted against according to Section 09901 Painting.

3.03 ADJUSTING AND CLEANING

- A. Upon completion of installation of cable trays, inspect trays, fittings, and accessories, remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

END OF SECTION

SECTION 16120
WIRE AND CABLE

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduit.

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS

- A. Submit product data and descriptive literature before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Wire and Cable:

1. Wire and cable shall be soft annealed 98 percent conductivity copper with 600 volt A.C. thermoplastic insulation unless otherwise noted.
2. Wire and cable shall be new and manufactured not more than 12 months before installation.
3. Each coil or reel shall bear UL label and wire marked with AWG or circular mil wire size, voltage rating, insulation type, type stranding, and the manufacturer's name.
4. Unmarked wire found installed shall be replaced at no additional cost to the Board.
5. Wiring shall comply with NEMA WC-5, NEMA WC-7, IPCEA S-61-402 and IPCEA S-66-524.

B. Light and Power Wiring Circuit Conductors:

1. Light and power wiring circuit conductors may be stranded in sizes No.10

AWG and smaller, and concentric strand Class B for conductors No.8 AWG and larger.

2. Stranded copper conductors may be used for final connections to individual recessed lighting fixtures, devices, and for control and signal circuit wiring only with crimp-on type terminations.
3. Do not use stranded wire for wiring to receptacles, unless insulated crimp-on connectors are installed on the wiring ends.

C. Wiring Insulation shall be as follows:

1. For Feeders and Equipment Power Circuits: Type THW-75 degrees C., XHHW-75 degrees C., or THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. or XHHW-90 degrees C. only at dry locations.
2. For Branch Circuit Wiring for Lighting and Power Circuits: Type THW-75 degrees C., THWN-75 degrees C. in wet or dry locations, and THHN-90 degrees C. only at dry locations.
3. For Wiring Through Fluorescent Fixtures Where Fixture Is Used As Wireway: Type THHN-90 degrees C.

D. Color Coding:

1. Wire of Size No.8 and smaller shall be factory color coded 600 volt, THW, THWN, or THHN. Sizes larger than No.8 may be factory color coded or color coded with 3M tape or accepted equivalent. Should tape be used, it shall cover not less than 6 inches of cable within enclosure.
2. Colors to be used in coding shall be:

120/208 Volt System

Neutral - White
Phase A - Black
Phase B - Red
Phase C - Blue
Ground - Green

277/480 Volt System

Neutral - Gray
Phase A - Brown
Phase B - Orange
Phase C - Yellow
Ground - Green

Electrical grounding and static - bare wire, where allowed by NEC.

E. Minimum Wire Size: Use No.12 AWG for control over 200 feet, unless otherwise noted. Control wiring may be No.14 AWG if distance is less than 200 feet.

1. Fire alarm and intrusion systems shall have cable and wiring according to manufacturer's specifications.

F. Wire and Cable Connectors and Terminations:

1. For splices in branch circuit conductors solid or stranded size No.10 AWG and smaller, use UL listed soft plastic wire nut with sharp self-cutting interior threads, 3M Scotchlok, Ideal Supernut, or T&B Piggy of the size to match the wire or approved equal.
2. For terminations of stranded or solid wire in size No.10 AWG and smaller at equipment terminals, use UL listed, tin-plated copper, 600 volt vinyl insulated compression type ring or fork type equivalent to T&B "Sta-Kon" or Burndy "Vinylug" or approved equal.
3. For No.8 AWG and Larger: T&B "Locktite" connectors, Burndy "Versitap" connectors, or OZ-Gedney solderless connectors, with insulating covers, tape or heat shrink insulation system or approved equal.
 - a. Terminations and splices in feeders may be made with solderless pressure type connectors complete with composition insulating covers, field insulating tape, or heat shrink insulation system.
 - b. Connectors and lugs for 250 mcm cable and larger shall be of the 2-hole type and for compression type shall have at least 2 indents.
 - c. Compression lugs and connectors shall be tin plated wrought copper, of size to match the cable.
4. Splices in underground exterior wiring shall be made fully waterproof by potting or encapsulating.
5. Insulating tapes shall be of a type approved for the application and shall be flame retardant. Tapes shall be as manufactured by 3M or Bishop Electric or approved equal.
6. Cable Ties: T&B "Ty-Rap" or Burndy "Unirap" or approved equal.
7. Cable Identification: Branch circuits wire markers 3M "Scotch Code" or accepted equivalent. For feeder sizes, non-ferrous metal stencil tags.
8. Thermal Fusion Connections: "Catalytic thermal weld" by Cadweld or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Wire and Cable Installation:

1. Wire and cable shall be suitably protected from weather or damage during storage and handling and shall be in first-class condition when installed.
2. Conductors shall not be pulled into conduit until raceway system is substantially complete. Wiring shall be continuous within conduit runs. Splices will be allowed only at outlet and junction boxes. Joints shall be mechanically and electrically secure.
3. Pulling lubricants, if used, shall comply with UL requirements for the type of conduit material and cable insulation being used.
4. Care shall be taken to prevent cutting and abrasion of cable insulation during the pulling of feeders.
 - a. Ropes used for pulling of feeders shall be made of polyethylene or other suitable nonmetallic material.
 - b. Pulling lines shall be attached to conductor cables by means of either woven basket grips or pulling eyes attached directly to the conductors.
 - c. Rope hitches shall not be used.
 - d. Cables to be installed in a single conduit shall be pulled in together.
 - e. Where polyethylene insulation is used and a pulling lubricant is required, the lubricant shall be certified by the manufacturer to be noninjurious to such insulation.
5. Do not bend cables during installation, either permanently or temporarily, to radii less than 12 times the outer diameters, except where conditions make the specified radius impracticable and shorter radii are allowed by the NEC and NEMA Standards.
6. Neatly and securely bundle conductors located in branch circuit panelboards, cabinets, control boards, switchboards, and motor control centers. Use nylon bundling straps.
7. Provide suitable installation equipment to prevent cutting or distortion of conduits during the pulling of feeders. Use masking or other means to prevent obliteration of cable identification when solid color coating or colored tracers are used.
8. Control wiring color codes, shall be of type as required by its equipment manufacturer. Interconnections of control wiring shall be on numbered terminal strips.
9. Where 2 neutrals are installed in same conduit, their sets of wiring shall be grouped and clearly identified by permanent tags or other means.

10. At each outlet, a loop or end of wire not less than 9 inches long shall be left for connection to lead.
11. Leading end of each conductor pulled shall be carefully examined for damage to jacket. If damage is evident, cable shall be extended and further checked for damage, with good cable only to remain.
12. Cables in junction and pull boxes shall be properly trained and racked.
13. Branch circuit wiring in panelboard gutters shall be installed vertically in the gutter with a 90-degree bend at the supply circuit breaker, wire shall enter the circuit breaker lug horizontally.
14. Install cable supports and boxes at vertical feeders and according to the schedule in the NEC. Boxes shall be built of heavy steel plates not less than No.10 USS gage fastened to an angle iron frame with removable covers secured by brass machine screws. The cable support shall be of the split wedge type that clamps each conductor firmly and tightens due to the weight of the conductor.

B. Wire and Cable Splicing and Terminations:

1. Splices and terminations of conductors shall be made using specified materials and methods installed according to the manufacturer's recommendations.
2. Splices in branch circuit wiring shall be made by stripping conductor insulation, twisting conductors until mechanically secure, and installing a self-threading insulated type connector. Splices are not allowed within panelboards.
3. Conductors shall be squarely cut and fully inserted into the lug barrel or connector. Insulation shall be stripped without cutting the conductor or removing strands, exposing the conductor for the minimum distance required for connection. Splice connectors shall be of a type and be so installed that the conductor is fully insulated by a skirt of such design, or taped so cold flow of the conductor insulation will not be induced when the conductor is positioned in its final operating position.
4. Do not combine conductors under the same lug. Provide individual lugs for individual conductors. Re-tighten bolt type connectors 24 to 48 hours after initial installation and before taping.
5. Connectors shall be insulated by approved type, integral or separate cover, or by means of taping with approved plastic or rubber and friction tapes to provide insulating value equal to that of the conductors being joined. The number and size and combinations of conductors allowed by UL as listed on manufacturers' packaging of connector shall be strictly complied with.
6. Terminations at equipment terminal blocks shall be made using compression type connectors suitable to match terminal type.

7. Continuity of neutral on multi-wire branch circuits shall not be made on any device at terminal blocks, but shall be spliced and a tap brought out, thereby assuring no openings of the neutral in the replacement of a device.
8. Feeders shall be identified by means of nonferrous tags or pressure-sensitive labels securely fastened to all cables, feeders, and power circuits in vaults, pull boxes, manholes, switchboard rooms, terminations of cables, etc. Tags or labels shall be stamped or printed to include the feeder number, source and equipment supplied. If suspended type tags are provided, they shall be attached by nylon cables ties or other nonconductive permanent means.
9. Branch circuit conductors shall be identified at supply circuit breakers, with the circuit number using pressure sensitive adhesive wire markers.
10. Branch circuit wiring for lighting and other single phase 277 volt or 120 volt applications shall be multi-wired utilizing common neutrals. Under no circumstances shall any switch break a neutral conductor. Branch circuit wiring extending more than 100 feet to the nearest outlet from a panel shall be No.10.
11. Circuiting work shall comply with the following:
 - a. Loads on panel busses shall be balanced on phases as evenly as possible.
 - b. No neutral conductor shall be common to more than 1 circuit conductor connected to the same phase leg of the supply system.
 - c. Circuiting of panelboards shall allow breakers to be grouped logically by functions.

END OF SECTION

SECTION 16131

OUTLET, PULL, AND JUNCTION BOXES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09901 - Painting.
2. 16112 - Raceways and Conduits.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:

1. Materials shall bear Underwriters Laboratories (UL) labels.
2. Box size shall comply with NEC for number and size of conductors in boxes.
3. Box size shall comply with NEC for number and size of conduits entering and exiting each box.

1.03 SUBMITTALS

A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Outlet Boxes:

1. Provide outlet boxes at required locations, where shown on the drawings, and as specified.
 - a. Fixture studs shall be securely fastened in an acceptable manner.
 - b. Plaster covers shall have depths suitable to the finish being applied to the walls.
 - c. Sheet steel boxes shall be properly drilled and tapped.
 - d. There shall be not more holes in any of the outlet boxes than are required for the entering conduits.
 - e. Depth of boxes shall allow for easy wire pulling and proper

installation of wiring devices.

2. Outlet boxes shall be galvanized steel or rust resistant malleable iron alloy and comply with ANSI C33.65.
3. Outlet Boxes shall be as follows:
 - a. For Recessed Ceiling Fixtures:
 - 1) 4 inch square sheet steel box with blank cover and suitable hanger bar-box to be fastened to ceiling suspension members in an acceptable manner not more than 1 foot from fixture opening.
 - b. For Surface or Stem Mounted Ceiling Fixtures from Slab with Concealed Conduit:
 - 1) 4 inch sheet steel octagon concrete ring of a depth suitable to the construction and furnished with top cover having a 3/8" fixture stud.
 - c. For Ceiling and Wall Bracket Outlets on Exposed Conduit in Dry Locations:
 - 1) 4 inch octagon sheet steel box with 3/8" fixture stud.
 - d. For Surface Mounted Ceiling Fixture or Hung Ceilings:
 - 1) 4 inch octagon sheet steel hung ceiling box with suitable hanger bars and 3/8" fixture stud. Box to be fastened to ceiling suspension in an acceptable manner.
 - e. For Surface Mounted Wall Bracket Fixtures with Concealed Conduit:
 - 1) 4 inch square sheet box with round opening plaster cover and 3/8" fixture stud.
 - f. For Ceiling and Wall Bracket Outlets on Exposed Conduit at Damp or Wet Locations:
 - 1) 4 inch cast iron.

- g. For Switches and Receptacles in Tile, Plastered, or Gypsum Board Walls:
 - 1) 4 inch square sheet steel box or multi-gang box with proper plaster covers as required. Two gangs may be provided by means of a 4 inch square box with two gang plaster cover.
- h. For Switches and Receptacles in Enameled or Face Brick walls, Unfinished Walls, and Woodwork:
 - 1) Single or multi-gang sheet steel utility boxes as required.
- i. For Switches and Receptacles on Exposed Exterior Conduit Work:
 - 1) Type FS or FD conduit.
- j. For Telephone or Computer Outlets:
 - 1) 4-11/16" square X 2-1/2" deep.
- 4. Boxes for fire alarm and other specialty equipment shall be by the manufacturer of the enclosed equipment.
- 5. Wet/Damp Locations:
 - a. Provide gasketed, weathertight, screw covers, code gage galvanized steel pull boxes with weatherproof conduit hubs equivalent to Myers Scru-Hub for pull boxes with multiple conduit entries.
 - b. Provide cast metal hub type, dipped in rust inhibitor and with gaskets for individual conduit runs.
- 6. Extension Rings: Do not use to increase the volume of boxes, except where necessary due to multiple conduit run conflicts.
 - a. Where such conflicts occur, an extension ring may be allowed for changes in direction of conduit to make necessary clearances.
 - 1) Not more than one extension ring may be used for each box where necessary.

B. Pull and Junction Boxes:

1. Where indicated in the plans and specifications or where necessary for compliance with code requirements for cable installation, install junction and pull boxes of the proper size for conduits over 1 inch trade size. Pull and junction boxes shall be of adequate size to accommodate installation of conductors without excessive bending of conductors that could damage insulation.
2. Pull and junction boxes shall comply with Fed.Spec.WJ-800 and be of all steel construction, spot or seam welded at joints, and hot dip galvanized after fabrication.
3. Boxes shall be drip proof with screw attached covers. Each box shall have a turned-in lip welded at joint to develop full strength. Lip shall be drilled and tapped for 1/8" or 3/16" round head screws, symmetrically placed. To provide adequate length of thread, nuts shall be tack welded on inside of lip, or lip shall be made double thickness.
4. Pull and junction boxes shall be sufficiently rigid to withstand moderate twisting strains. Steel boxes shall comply with the following:
 - a. 100 cubic inches or less shall be of No.14 gage steel.
 - b. Between 101 and 8500 cubic inches shall be No.12 gage steel.
 - c. Larger boxes shall be No.10 gage steel.
 - d. Barriers and reinforcing angles shall be supplied as required.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work or this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Locations of outlets on electrical drawings are approximate only.
 1. Do not scale drawings.
 2. Consult architectural plans, sections, elevations, and details for exact locations of outlets and equipment and rooms and spaces having furring or hung ceilings.
 3. Verify door swings on architectural drawings for properly locating light switches.
 4. Coordinate wall outlet locations with cabinets, and equipment.
- B. Determine the proper position of outlets and receptacles. Relocate any outlet

or receptacle without additional cost to the Owner if improperly located.

- C. The A/E reserves the right to change the location of any outlet, apparatus, or equipment up to the time of roughing in without additional cost to the Owner, provided conduit runs are not substantially increased.
- D. Fasten and secure boxes to the building structure independent of the conduit. Provide acceptable plaster stops for boxes to be set in plastered walls and ceilings.
- E. Boxes and supports shall be fastened as follows:
 - 1. To concrete or brick: Bolts and expansion shields.
 - 2. To hollow masonry: Toggle bolts, or bolts and expansion shields.
 - 3. To steel work: Machine screws or welded studs.
 - 4. Explosive charge setting devices are not allowed.
- F. Recessed wall outlets shall be flush with the wall surface. Install box in wall with cover to allow block or wall surface to fit tight against lip of cover.
- G. Where shown together on the plans, switches shall be ganged in one outlet.
 - 1. Switches and receptacles shall be ganged together only where plans specifically indicate such combinations.
- H. Outlets for duplex receptacles shall be arranged for vertical mounting of the receptacles except as specifically indicated on plans.
- I. Barriers shall be provided as necessary to isolate voltage classes.
- J. Under no circumstances shall outlet boxes for adjoining spaces be placed back to back in partition walls.
- K. Circuit breakers and switches shall not be grouped or ganged in outlet boxes unless they can be arranged where the voltage between exposed live metal parts of adjacent switches does not exceed 300 volts. Provide barriers between 120 and 277 volt switches where ganged together.
- L. Align rows of outlet boxes for ceiling lights.
- M. Unless noted, specified, or directed otherwise, wall outlets shall be centered above finished floor as follows:

1. Convenience outlets: 18 inches to bottom of box.
2. Utility outlets: 18 inches to bottom of box.
3. Exit lights: 6 inches over doorway.
4. Switch outlets: 46 inches to bottom of box.
5. Special purpose outlets: as directed.
6. Telephone outlets: 18 inches to bottom of box.
7. Fire alarm visuals with or without horns: 78 inches to bottom of box.
8. Fire alarm horns: 6" minimum below adjacent surface, but not less than 8'6" or greater than 10'0" above finish floor.
9. Fire alarm pull station:..... 46 inches to bottom of box.

Refer to Architectural drawings for additional mounting heights.

- N. Pull and junction boxes shall be provided at locations required to reduce length of cable pull or reduce number of elbows between outlets.
- O. Provide blank covers for outlet boxes when devices or wiring has been removed or not installed.
- P. Paint exposed boxes to match the color of the wall or ceiling to which they are mounted.
- Q. Where several feeders pass through a common pull box, tag each feeder to clearly indicate electrical characteristics, circuit number, and panel designation.

END OF SECTION

SECTION 16440
DISCONNECT SWITCHES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09901 - Painting.
2. 16475 - Overcurrent Protective Devices

1.02 SYSTEM DESCRIPTION

- A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels. Label for "SERVICE ENTRANCE" where so applied.

1.03 SUBMITTALS

- A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Disconnect Switches:

1. G.E.
2. I.T.E.
3. Hubbell.
4. Siemens.
5. Square D.
6. Westinghouse.
7. Or approved equal.

2.02 EQUIPMENT

- A. Disconnect switches shall comply NEMA KSI-1975 for type HD and shall be of heavy duty type, enclosed, of quick-make, quick-break construction. Rating shall be as indicated on drawings. Switches shall be horsepower and I2t rated, UL labeled.

- B. Disconnect Switch Enclosure:
 - 1. NEMA 1 for indoor use.
 - 2. NEMA 3R for outdoor use.
- C. Disconnect switch operating handle shall be of insulated box mounted type that directly drives switch mechanism suitable for padlocking in "OFF" position.
- D. Defeatable, front accessible, "coin-proof" interlocks shall be provided to prevent opening of cover when switch is in "ON" position, and prevent turning switch ON when door is open. Securely fastened metallic nameplate shall include highly visible "ON-OFF" indication.
- E. Motor Disconnect Means: Provide each motor with an in-sight disconnect means, when required by NEC, and where shown on the drawings.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install the disconnect switches vertically with top not more than 6 feet above the floor, and rigidly and securely attached to the building. Disconnect switches shall not depend upon conduit for support.
- B. Where used as service entrance main disconnects, switches shall be permanently labeled "MAIN SWITCH 1 of 4", "MAIN SWITCH 2 of 4", etc.
- C. Optional Mounting:
 - 1. Plywood Panel: Mount panelboards on backboard of 3/4" exterior grade plywood, finished one side, primed all surfaces, painted with one coat gray of fire retardant enamel (finished side) and secure to wall with approved shields or screws as directed by the A/E.
 - 2. Unistrut: Mount disconnect switches on Unistrut P-3000 mounting channels at top and bottom, secured similarly to wall.

END OF SECTION

SECTION 16450

GROUNDING

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- ###### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS

- ###### A. Submit manufacturer's literature giving materials, finishes, accessories, and installations where required.

- ###### B. Ground resistance tests.

1.04 QUALITY ASSURANCE

- ###### A. Regulatory Requirements: Grounding system installation shall comply with Article 250 NFPA 70 National Electrical Code - (NEC).

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Grounding System.

1. Grounding system shall comply with ANSI C33.8, IEEE-81.
2. The electrical system and equipment shall be grounded according to the requirements of the NEC and as specified.
3. The grounding conductor shall be an insulated copper wire of size indicated.
4. Where not indicated, the conductor shall be according to the requirements of the NEC except that minimum size shall be No.8 copper

for system ground.

5. Inaccessible connections shall be made with the exothermic welding process using equipment manufactured by Burndy or Erico Products.
6. Accessible connections shall be made with multiple bolt silicon bronze connectors specifically designed and accepted for the connection to be made.
7. Connectors shall be as manufactured by Burndy or O.Z. Electric.
8. Grounding jumpers shall be provided across metal parts separated by non-conducting materials, or when joined, so there is a high resistance at the joints.
9. Grounding electrical conductors shall not be buried directly in concrete. Provide a conduit sleeve where each cable passes through concrete. If buried in earth, they shall be tinned.
10. Refer to electrical drawings for additional grounding.

B. Grounding Source:

1. Grounding electrical system shall comply with NEC 250.81. A ground ring or mat buried beneath the switchgear room, counterpoise and ground rods as shown on drawings, connection to the metal cold water main, metal frame of the building, and to a concrete encased electrode. All the grounding electrodes shall be bonded together if available on site.
2. Maximum resistance to ground shall be limited to 5 ohms. Additional ground rods shall be driven if required to maintain this level.
3. Maximum ground resistance to each of individual rods shall be 25 ohms.
4. Submit test results for acceptance indicating that these values have been met, using the fall of potential method as directed in IEEE Standard 81-1983.

C. System Grounds: Neutral bus and ground bus in switchgear shall be connected by means of an accepted bus link, and connected to the ground bus in the substation room.

D. Ground Rods: Copper clad steel not less than 3/4" in diameter, 10 feet long, driven full length into the earth.

E. Cold Water Pipe:

1. Ground loop shall be connected to the building steel and shall also be grounded to main cold water pipe at point of entrance of the metallic water service with copper conductor in conduit.
2. Connection to cold water pipe shall be made by a suitable ground clamp.
3. If flanged pipes are encountered, connections shall be made with the lug

bolted to the street side of the flange connection.

- F. Parts to be Grounded: Switchgear frame, panelboard frames, fittings, fixtures and devices, cable sheaths, neutral of transformers, boxes and raceways, non-current carrying parts of appliances and devices, and all other parts and equipment as required by NEC. Neutral wire shall never be used as grounding means.
- G. Conductor: Grounding cable shall be green insulated copper stranded cable, soft drawn or annealed. Sized as indicated on drawings, from the main switchboard to each panel, power outlet, or load, except as specified for lighting branch circuits.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install grounding system as shown on drawings.
- B. Connections to equipment, bus, or conduit shall be made with approved type of solderless connector and shall be thoroughly cleaned and made bright before connection is made to insure metal contact.
- C. Connections inaccessible after completion of project shall be made by exothermic weld process.
- D. The grounding medium for lighting branch circuits shall be the conduit system.
 - 1. Ground the lighting fixture by means of a conductor between the outlet box and the fixture.
 - 2. Locknut connections to cabinets, pullboxes, junction boxes, etc., shall be drawn up sufficiently tight to assure a continuous metal-to-metal bond, where a separate ground conductor is not provided.
 - 3. Where GFCI type receptacles are indicated, provide a separate ground conductor from the panelboard.
- E. Bond conduits stubbing under switchboard, motor control center, and similar locations using bonding bushings. Run a separate ground conductor with the phase conductors from the motor control center ground bus or a grounding bushing in the starter enclosure to each motor frame.
- F. Do not use flexible conduit as a grounding medium. Provide a bonding wire in

flexible conduits and connect to the boxes at each end in an approved manner.

- G. Unless otherwise indicated, provide in each feeder conduit an equipment grounding conductor. For parallel runs, provide a ground conductor in each conduit.
- H. Provide a ground rod driven through or near pole bases and weld a No.10 AWG wire or as indicated on drawings, to the top of the rod and extend the wire to a grounding lug in the base and bond the anchor bolts. Ground wire shall be connected to metallic feed conduit or circuit ground conductor if non-metallic feed conduit is used.
- I. Bond all metal underground pull box covers.

END OF SECTION

SECTION 16470

PANELBOARDS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09901 - Painting.
2. 16120 - Wire and Cable.
3. 16475 - Overcurrent Protective Devices.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Materials shall bear Underwriter Laboratories (UL) labels.

B. Panelboards used as service entrance equipment shall be UL labeled.

1.03 SUBMITTALS

A. Submit manufacturer's literature and technical data before starting work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Panelboards:

1. General Electric.
2. I.T.E.
3. Siemens.
4. Square D.
5. Westinghouse.
6. Or approved equal.

2.02 EQUIPMENT

A. Panelboards:

1. Interiors shall be factory assembled and designed to allow switching and protective devices to be replaced without disturbing adjacent units, without removing the main bus connectors, and allowing circuits to change without machining, drilling, or tapping.
2. Branch circuits shall be arranged using double row construction unless narrow column panels are indicated. A nameplate shall be provided listing panel type and ratings. Circuit breakers shall be bolt-on type.
3. Unless otherwise noted, full size insulated neutral bars shall be included. Bus bar taps for panels with single pole branches shall be arranged for sequence phasing of the branch circuit devices. Neutral bussing shall have a suitable lug for each outgoing feeder requiring a neutral connection. A ground bus shall be provided in all panels.

B. Boxes and Trim:

1. Boxes shall be at least 20 inches wide made from code gage galvanized sheet steel.
 - a. Provide minimum gutter space according to NEC.
 - b. Where feeder cables supplying the mains of a panel are carried through its box to supply other electrical equipment, the box shall be sized to include the additional required wiring space.
 - c. At least 4 interior mounting studs with adjustable nuts shall be provided.
2. Switching device handles shall be accessible.
 - a. Doors and panelboard trims shall not uncover any live parts.
 - b. Doors shall have flush chrome plated handle with cylinder lock and catch, except doors over 48 inches in height shall have auxiliary fasteners top and bottom of door in addition to the flush type cylinder lock and catch.
 - c. Panelboard switching devices with individual dead front doors shall be acceptable instead of standard door in trim design.
 - d. Panelboard trim clamps shall be of the indicating type.
3. Door hinges shall be concealed. Locks shall be keyed alike. Furnish directory frame and card having a transparent cover with each door.
4. Exterior and interior steel surfaces of the trim shall be properly cleaned, primed with rust inhibiting phosphatic coating, and finished with manufacturer's standard gray paint.
 - a. Trims for flush panels shall overlap the box for at least 3/4" all

- around.
 - b. Surface trims shall have the same width and height as the box.
 - c. Trims shall be mountable by a screwdriver without the need for special tools.
 - d. After installation, trim clamps shall not be accessible when the panel door is closed and locked.
5. Panelboards exposed to the weather shall have NEMA type 3R raintight enclosure or NEMA 4X in corrosive environments.

C. Electrical Components:

1. Main bus bars shall be copper sized according to UL standards to limit the temperature rise on any current carrying part to a maximum of 50 degrees C. above an ambient of 40 degrees C. maximum. Provide main circuit breakers, main lugs, or sub-feed lugs as required.
2. Each panelboard shall incorporate breakers as shown with AIC or higher, at the application voltage, than the available fault at its location along the electrical distribution system, as determined by short circuit study. Minimum rating of breakers shall be:
 - a. Lighting and power panels for use at 120/208 volts: 225 amp maximum with circuit breakers rated at 10K AIC symmetrical at 240 volts. Type B10B by Westinghouse or approved equal.
 - b. Lighting and power panels for use at 480/277 volts: 225 amp maximum with circuit breakers rated at 14K AIC symmetrical at 480 volts. Type WEHB Westinghouse or approved equal.
 - c. Distribution panels for use at 120/208 volts: UL listed with minimum integrated assembly rating of 22K AIC. Type Q22B by Westinghouse or approved equal.
3. Panels tested and listed according to UL 67 and bearing an integrated short circuit rating shall be determined by the short circuit study on the electrical system with 10,000 AIC minimum.
4. Any 2 single pole circuit breaker shall be replaceable by 1 two-pole circuit breaker and any 3 single-pole breaker shall be replaceable by 1 three-pole circuit breaker.
5. Where new circuit breakers are specified to be installed within existing panelboards, they shall be compatible in terms of manufacture, type, and AIC.
6. Distribution panelboards, 400 amperes and over, shall be provided with molded case circuit breakers tested and UL labeled according to UL 489.
7. Breakers 100 ampere through 400 ampere frame sizes shall be thermal-magnetic trip with inverse time current characteristics, unless otherwise

- noted.
8. Provide ground fault circuit interrupter circuit breakers where indicated.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to manufacturer's recommendations and applicable codes and regulations.
- B. Panelboards shall be installed where indicated and with top of cabinet 6'-6" above floor, and shall be rigidly and securely attached to building construction and shall not depend upon conduit for support. Allow at least 1/2" air space behind wall mounted panelboards.
- C. Install panelboards according to manufacturer's recommended data. Maintain clearances required by the National Electrical Code, with particular attention to working space around panelboards. Maintain clear space above panelboards, coordinate with other trades to avoid placement of panelboards below piping, ductwork, or other foreign appurtenances. Relocate panels at no additional cost should such interferences occur.
- D. Supply panelboards with phenolic nameplate 1 inch x 3 inch on exterior of panels and engraved with panel designation and voltage rating. Lighting and power panelboards shall be provided with a clear plastic enclosed typewritten directory inside. Circuit identification shall include load type (lighting, receptacles, etc.) and rooms served.
- E. Where flush type panelboards are indicated, provide one 3/4" empty conduit terminated in accessible ceiling above for each 3 spare circuit breakers provided in the panelboard.
- F. Install circuit breakers in existing panelboards according to manufacturer's recommendation. Verify tightness of connections including mains. Identify new circuits on the panel directory. If none exists, provide one.

- G. Clean and touch up panelboard as required at completion of the project.

END OF SECTION

SECTION 16475

OVERCURRENT PROTECTIVE DEVICES

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16440 - Disconnect Switches.
2. 16470 - Panelboards.

1.02 SYSTEM DESCRIPTION

- ###### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS

- ###### A. Submit properly identified manufacturer's literature and technical data before starting work.

1.04 QUALITY ASSURANCE

- ###### A. Regulatory Requirements: Fuses shall comply with NEMA FUI and ANSI C33.42.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Circuit Breakers:

1. GE.
2. Siemens.
3. Square D.
4. Westinghouse.
5. Or approved equal.

B. Fuses:

1. Bussman.
2. Cefco.
3. Littelfuse, Inc.
4. Or approved equal.

2.02 EQUIPMENT

A. Circuit Breakers:

1. Circuit breakers shall be a circuit interrupting device operating both manually for normal switching functions and automatically under overload and short circuit conditions, while providing circuit and self protection when applied in its ratings. Provide at voltage, phase, and amps indicated, with symmetrical amperes interrupting rating to be equal or larger than that shown on drawings. Control and signaling function may be incorporated by use of accessories.
2. Operating mechanism shall be entirely trip-free so contacts cannot be held close against an abnormal over-current or short circuit condition.
3. Operating handle of circuit breaker shall open and close all poles of a multi-pole breaker simultaneously. Circuit breakers shall meet applicable NEMA AB-1 and have UL label. Each circuit breaker shall have a trip unit to provide overload and short circuit protection. Trip element shall operate a common trip bar that shall open all poles in case of an overload or short circuit through any 1 pole.
4. Ampere rating shall be clearly visible. Contacts shall be of non-welding silver alloy. Circuit breakers to be used in switchboards, lighting and power panelboards, distribution panelboards and individually enclosed shall be 1, 2, or 3 poles as indicated on drawings.

B. Molded Case:

1. Molded case circuit breakers shall be bolt-on type, mounted in lighting and power panelboards and individually enclosed units.
2. Molded case circuit breakers shall be quick-make, quick-break action.
3. Molded case circuit breakers for panelboards shall have the following minimum symmetrical ampere interrupting capacities (RMS):
 - a. 120 volts: 10,000 SAIC power panelboards.
 - b. 277 volts: 14,000 SAIC lighting panelboards.
 - c. 277/480 volts: Up to 50,000 SAIC distribution panelboards, or as shown on drawings.

4. Each molded case circuit breaker shall have a thermal magnetic trip device with trip ratings as shown on drawings.
- C. Combination Molded Case and Current Limiting Fuse:
1. Bolt-on type mounted in switchboard.
 2. Circuit breaker section shall be molded case and shall have the features previously mentioned for molded case breakers.
 3. Fuse compartment located within molded case enclosure with accessibility for fuse replacing.
 4. Unit circuit breaker shall trip as any of its fuses blows.
 5. Unit shall be rated at 100,000 AIC RMS minimum.
 6. Current limiting fuses provided as specified in this section.
- D. Fuses:
1. Provide fuses for fusible equipment regardless of which trade has furnished such equipment.
 2. The time-current characteristic and ratings shall assure positive selective coordination.
 3. Fuses, 601 amperes and larger, shall comply with UL Class L standard and be Shawmut Form 480 "Amp-Trap" or Bussman "Hi Cap" or approved equal.
 4. Fuses, 600 amperes and lower, where applied to general feeder and branch circuit protection, shall comply with UL Class RKI standards and be Shawmut dual element "Amp-Trap" or Bussman "Low Peak" Limitron or approved equal.
 5. Dual element fuses shall have low resistance and relatively low operating temperatures. Fuses shall be provided with thermal protection against damage from poor contact. Fuse shall open when temperature at thermal cutout reaches 280 degrees F., preventing damage to clips and switches before fuse opens. They shall combine high interrupting capacity (200,000 ampere RMS symmetrical) with time delay, holding 500 percent load for a minimum of 10 seconds.
 6. Current limiting fuses shall be designed to provide high interrupting capacity (200,000 AIC SYM RMS) plus fast clearing time restricting let-thru current and energy to very low values. Clearing time on a severe short circuit shall be limited to less than 1/4 cycle.
 7. Fuses, where required for circuit breaker backup protection shall comply with UL Class RKI standards and be Chase-Shawmut Class RK1 "Amp-Trap" or Bussman "Limitron" or approved equal.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install according to manufacturer's recommendations applicable codes and regulations and accepted submittals.
- B. Two and three pole breakers must be true two and three pole breakers.
 - 1. Do not combine single pole breakers with common handle connection to meet multiple pole breaker requirements.

END OF SECTION

SECTION 16511

LIGHTING FIXTURES AND LAMPS

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
2. 09510 - Acoustical Ceilings.
3. 16112 - Raceways and Conduits.
4. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- ###### A. Performance Requirements: Materials shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS

- ###### A. Submit manufacturer's literature and technical data before starting work.
- ###### B. Furnish certified photometric data for fixtures.
- ###### C. Upon request, a sample of each fixture proposed for use and specified unit shall be submitted to the A/E for review.
- ###### D. Provide lighting calculations to comply with Florida Building Code (FBC) and IES minimum footcandle level when required.

1.04 QUALITY ASSURANCE

- ###### A. Lighting fixtures and lamps requirements shall comply with FPL Commercial/Industrial Energy Conservation Programs Standards.
- ###### B. Comply with Florida Building Code (FBC).

PART 2 PRODUCTS

2.01 EQUIPMENT

- A. Exterior fixture shall be of aluminum or plastic construction.
- B. Lighting Fixtures:
 - 1. Provide lighting fixtures as indicated on the drawings and as specified.
 - 2. The schedule and details of lighting fixtures, appearing on the drawings, indicate the type, construction, appearance, quality, and performance of the fixtures required.
 - a. Any proposed deviation from the fixtures specified requires the proposed substitute product be listed in the latest FPL Commercial/Industrial Lighting Approved Products.
 - b. Any proposed deviation from the fixtures specified shall equal or be superior to the item specified under these headings.
 - c. Proposed substitute lighting fixtures will be judged on overall quality on construction.
 - d. Provide 120V working sample of proposed substitution with cord, plug, and lamp.
 - e. The fixture manufacturers products scheduled are considered acceptable, based on the equivalency of individual units as determined by the A/E.
 - 3. Materials used in the manufacture of fixtures shall be new and the best of their respective kind, and shall be formed and assembled in a neat, accurate, and professional manner.
 - a. Sheet metal shall be of sufficient thickness or shall be ribbed, flanged, or otherwise reinforced so that lighting fixtures and their component parts will withstand the stresses of normal handling and installation and service without undue distortion of shape.
 - b. Plastering or other installation procedures shall not be relied on to reinforce lighting fixtures or their component parts.
 - c. Fixture bases shall be metal and fastened to mounting location with metal components.
 - 4. Finishes:
 - a. Painted steel sheet shall be processed with Bonderize or equal phosphate treatment or shall be Paintlok or Galvanneal.
 - b. Unpainted sheet steel shall be Galvanneal, by Republic Steel or accepted equivalent.

- c. Springs shall be of full hard temper stainless steel.
 - d. Fasteners of ferrous metal shall be cadmium plated or zinc plated with chromate.
 - e. Screws mounting fixture housing in plaster ring shall be minimum #8, pointed to facilitate installation.
 - f. Plaster frame rings shall be of sufficient strength to withstand deformation during installation, and of suitable materials or finish to prevent corrosion from ceiling plasters and mortars.
 - 1) The contractor shall furnish the fixture manufacturer a complete list of fixtures that will be installed in acoustical plaster ceilings with types and quantities.
 - g. Painted finishes shall be baked epoxy, polyester powder coated, acrylic or accepted equivalent finish suitable for the service required including temperature and accepted by A/E. Finish shall be applied after fabrication.
5. Fixtures shall be complete with canopies, suspensions of proper lengths, hickey, casing, sockets, holders, reflectors, hardware, and shall be completely wired and assembled. Each troffer shall have 2 earthquake clips minimum, positive enclosed spring loaded catches, and safety hinges.
 6. Furnish suitable plaster rings or plaster stops for fixtures set in plaster ceilings. Consult the "Finish Schedules" on drawings for locations and extent of plaster ceilings. Coordinate the mounting methods of recessed fluorescent lighting fixtures with ceiling suspension system and ceiling trades.
 7. Fluorescent shall be low wattage, high efficiency 480, 277 volt, or 120 volt as noted on Drawings.
 - a. Ballasts shall be individually fused and shall be high power factor, non-PCB construction UL listed Class P and be listed by Electric Testing Laboratories.
 - b. Ballasts used outdoors shall be suitable for 32 degrees F. operation.
 - c. Provide electronic ballasts, with a Total Harmonic Distortion (THD) of not more than 15 percent and a 5-year manufacturer's warranty, for fluorescent fixtures compatible with 32 watt T-8 lamps.
 - d. Ballast sound rating shall be ASA "A" for fluorescent ballasts.
 - e. Provide emergency fluorescent fixtures with magnetic ballasts. Type B-30 by Bodine or accepted equivalent where indicated.

8. Fluorescent Lampholders shall be General Electric Leviton or Bryant.
 - a. Silicone-fiberglass insulated wire rated at 150 degrees or 200 degrees C. or Teflon-fiberglass insulated wire rated at 250 degrees C. shall be provided as required with recessed incandescent and HID fixtures for connection of fixtures to adjacent boxes.
 - b. Medium and mogul screw base lampholders shall have porcelain bodies.
 - c. Screw-shell sockets shall be nickel plated and shall have spring contacts wherever possible.
9. Provide a positive device to assure proper axial alignment of lamps with asymmetric distribution when relamping.
 - a. This device may be preset or adjustable as required by the specifications.
 - b. Axial and angular lamp adjustments shall have provision for locking in adjusted position by hex head or hex socket bolts or nuts with special toothed washers that resist turning in both directions.
10. Fluorescent ballasts and lampholders shall be readily and simply replaceable without demounting the fixture.
 - a. Bottom and one side of ballast shall be in full contact with metallic fixture surfaces for maximum heat conductance.
 - b. Exposed lamp fluorescent sockets shall be telescoping type or be provided with lamp support brackets.
11. Exposed bare lamps on fluorescent fixtures shall be protected with wire guards or a protective tubular shield. For HID lamps, consult with respective manufacturer for requirements of enclosure made of suitable material capable of withstanding the glass lamp particles if the outer jacket of the lamp bursts or shatters.
12. Incandescent shall be fabricated from minimum 0.050 Alcoa #12 reflector sheet or accepted equivalent, free from forming lines and other visible imperfections.
 - a. Black anodized finish shall be minimum 0.001 thick guaranteed against fading and discoloration.
 - b. Plain anodized finish used indoors shall be Alcoa MI Alzak or accepted equivalent.
 - c. Plain anodized finish used outdoors shall be Alcoa SI Alzak with

fixture protected with glass cover or other means.

13. Fluorescent Specular Reflectors: Specular reflectance shall be 86 percent minimum.
 - a. Concealed fluorescent specular reflectors shall be Alcoa MI Alzak finish or accepted equivalent.
 - b. Visible reflectors shall be Alcoa reflector sheet type 1 or accepted equivalent.
14. Glass lenses for incandescent fixtures shall be borosilicate glass with maximum coefficient of expansion of 0.33×10^{-7} . Glass lenses for fluorescent fixtures shall be Corning Glass or accepted equivalent.
15. Plastic lenses and diffusers used on fluorescent fixtures shall be 100 percent prime virgin acrylic KSH K-12 or accepted equivalent, minimum unpenetrated thickness of 0.125" and be furnished with antistatic treatment. Injection molded lenses shall be as manufactured by Holophane or accepted equivalent.
16. Exposed fixture housings or frames shall have a continuous, smooth surface with no visible seams and a neat and finished quality appearance. Hinges and fastening devices shall be fully concealed except with special permission of the A/E.
17. The thickness of visible edges of mounting frames and rings at the ceiling line shall be between 0.035" and 0.050". Light leaks around trim frame or lens or between any of these are unacceptable.
18. Where fixture type is not indicated on drawings, fixture type used in similar locations shall be provided, as accepted by the A/E.
19. Components of the same type, size, rating, functional characteristics, and make of similar interior lighting fixtures shall be interchangeable.
20. Fixture stems shall be furnished by the manufacturer of the fixture specified or as shown on the drawings.
21. Fixtures for use outdoors or in wet areas shall suitably gasketed to prevent access of moisture or insects into fixture or diffuser.
22. Metal parts of fixtures for use in damp locations, specified as requiring painting, shall be painted with suitable weather and moisture resistant paints exhibiting moisture resisting qualities equal to epoxy based coatings.
23. Aluminum parts of fixtures for use in damp locations specified as requiring an unpainted finish shall be anodized.

C. Lamps:

1. Provide lamps for lighting fixtures. Lamps shall be as specified and

- indicated on the drawings.
2. Incandescent lamps shall be suitable to operate on 120 volts, 60 Hertz supply, with the following requirements:
 - a. Wattage rating as shown on fixture schedule.
 - b. Type of lamp as shown on fixture schedule.
 - c. Lamps shall be inside frosted unless noted otherwise.
 - d. Unless noted otherwise lamps shall be extended service type rated at 130V.
 3. Fluorescent lamps shall be suitable to operate with specified ballasts on 277 or 120 volts, 60 Hertz supply as required, with the following requirements:
 - a. Wattage rating as shown on fixture schedule.
 - b. Lamp shall be rapid start energy saving type T-8, with 2900 minimum lumen output, by Sylvania or accepted equivalent.
 - c. Provide T-8 lamps with 4 foot lengths, whenever possible, and medium bi-pin bases, as shown on Drawings and fixture schedule.
 - d. Color: 3500 degrees Kelvin, 75 CRI.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Install fixtures according to manufacturer's recommendations.
- B. Install "Lay-In" type fixtures with 6 foot lengths of flexible conduit to enable fixture relocation with minimum inconvenience. Fixture to be securely fastened to ceiling frame members by mechanical means as per the NEC.
- C. Exit lights:
 1. Install wall or ceiling mounted as shown on drawings.
 2. Provide directional arrows required to show correct path to exit.
 3. Install exit lights at a location and height to assure a clear line of sight

- from the egress passageway.
4. Relocate exit lights that are not readily visible at no additional cost to the Owner.
 5. Internally illuminated exit signs shall have LED light source on normal power.

D. Fixture Supports:

1. Support each fixture securely.
2. Each recessed fluorescent troffer shall be lay-in supported by ceiling suspension system. Provide at least 2 earthquake clips.
3. Where pendant fixtures are mounted in continuous rows, the number of hangers shall equal the number of 4 foot lengths, plus 1.
4. Do not support fixtures to plaster or gypsum board ceilings.
5. Furnish and install steel members and supports to fasten and suspend fixtures.

END OF SECTION

SECTION 16530
EXTERIOR LIGHTING

PART 1 GENERAL

1.01 SUMMARY

A. Related Sections:

1. 16112 - Raceways and Conduits.
2. 16120 - Wire and Cable.

1.02 SYSTEM DESCRIPTION

- A. Material shall bear Underwriters Laboratories (UL) labels.

1.03 SUBMITTALS

- A. Properly identified manufacturer's literature and technical data before starting work.
- B. Photometric data for exterior lighting fixtures and a point by point illumination plan for entire site at same scale as Construction Documents

PART 2 PRODUCTS

2.01 EQUIPMENT

A. Exterior Lighting Fixtures:

1. Exterior fixtures shall be vandal resistant.
2. Exterior lighting fixtures shall be furnished as indicated on drawings and fixture schedule. Fixtures shall be complete with necessary wiring, lamps, reflectors, glassware, and mounting accessories.
3. Components of the same type, size, rating, functional characteristic, and make of similar exterior lighting fixtures shall be interchangeable.
4. Fixture bases shall be metal and fastened to mounting locations with metal components.
5. Exterior fixtures shall be of aluminum or plastic construction.

B. Lamps:

1. Provide lamps for exterior lighting fixtures. Lamps shall be as indicated on the lighting fixture schedule.
 2. High pressure sodium lamps shall comply with the following:
 - a. Wattage ratings as shown on fixture schedule.
 - b. Lamp base shall be mogul base.
 - c. Rated life shall be 24,000 hours.
 3. Metal halide lamps shall comply with the following:
 - a. Wattage ratings as shown on fixture schedule.
 - b. Lamp base shall be mogul base.
- C. Ballasts: High power factor, individually fused, regulator type. Ballasts shall be UL approved. Voltage shall be as shown on fixture schedule.

PART 3 EXECUTION

3.01 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

- A. Exterior Lighting Fixtures: Exterior lighting fixtures shall be installed according to manufacturer's instructions and according to details as shown on electrical drawings.
- B. Exterior lighting shall be controlled using a combination of photocell control with the programmable timed lighting control system.

END OF SECTION



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