RFB NO. 107088

CONSTRUCTION DOCUMENTS
PROJECT MANUAL

DANE COUNTY DEPARTMENT OF ADMINISTRATION

PURCHASING DIVISION
ROOM 425, CITY-COUNTY BUILDING
MADISON, WISCONSIN 53703

REQUEST FOR BIDS NO. 107088

CONSTRUCTION OF SALT STORAGE FACILITY
STH 151 & CTH V
TOWN OF YORK, COUNTY OF DANE, WISCONSIN

Opening Date: **TUESDAY, NOVEMBER 20, 2007**

Time: **2:00 P.M.**

Location: **ROOM 425, CITY-COUNTY BUILDING**

Bid Deposit: **5% OF BID AMOUNT**

Performance / Payment Bond: **100% OF CONTRACT AMOUNT**

FOR INFORMATION ON THIS REQUEST FOR BIDS, PLEASE CONTACT:

ROB NEBEL, PROJECT MANAGER
DANE COUNTY DEPARTMENT OF PUBLIC WORKS,
HIGHWAY & TRANSPORTATION
1919 ALLIANT ENERGY CENTER WAY
MADISON, WISCONSIN 53713
TELEPHONE NO.: 608-267-0119 or 608-575-0890
FAX NO.: 608-267-1533
E-MAIL: NEBEL@CO.DANE.WI.US

DOCUMENT INDEX FOR RFB NO. 107088
CONSTRUCTION OF SALT STORAGE FACILITY
STH 151 & CTH V
TOWN OF YORK, COUNTY OF DANE, WISCONSIN

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DANE COUNTY VENDOR REGISTRATION PROGRAM

All bidders / proposers wishing to submit a bid / proposal must be a *paid registered vendor* with Dane County. Prior to the bid / proposal opening, you can complete a registration form online by visiting our web site at www.danepurchasing.com, or you can obtain a Vendor Registration Form by calling 608/266-4131. Your completed Vendor Registration Form and Registration Fee must be received for your bid / proposal to be considered for an award.

LEGAL NOTICE

REQUEST FOR BIDS

Sealed bids will be received by the Dane County Purchasing Division, Room 425, City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703, until:

2:00 P.M., TUESDAY, NOVEMBER 20, 2007

REBID

BID NO. 107088
CONSTRUCTION OF SALT STORAGE FACILITY
STH 151 & CTH V
TOWN OF YORK, COUNTY OF DANE, WISCONSIN

Plans and Specifications may be obtained at the Dane County Public Works, Highway & Transportation Dept., 1919 Alliant Energy Center Way, Madison, WI 53713, by calling 608-266-4018, or downloading it from www.countyofdane.com/pwht/bid. For additional information, contact Rob Nebel at 608-575-0890.

All bidders wishing to submit a bid must be registered with Dane County prior to bid opening. Complete a Vendor Registration Form online or obtain one by calling 608-266-4131.

PUBLISH: November 9, 2007 – WISCONSIN STATE JOURNAL

INSTRUCTIONS TO BIDDERS

TABLE OF CONTENTS

1. GENERAL

A. Time for Bid Opening shall be prevailing central standard or daylight saving time in force in Madison, Wisconsin on date set forth in Invitation to Legal Notice as date for Bid Opening.

B. Before submitting a Bid, Bidder shall examine all Construction Documents. Successful Bidder will be required to provide all the Work that is shown on Drawings, and set forth in Specifications to complete Contract for this project.

C. Bidder shall visit site to become acquainted with adjacent areas, means of approach to site, conditions of actual site and facilities for delivering, storing, placing, and handling of materials and equipment.

D. Visits at other times can also be arranged. Coordinate site access activities with Steve Richards, Engineering Intern, 608-267-0119 or 608-219-6339.

E. Failure to visit site or failure to examine any and all Construction Documents will in no way relieve successful Bidder from necessity of furnishing any necessary materials or equipment, or performing any work, that may be required to complete the Work in accordance with Drawings and Specifications. Neglect of above requirements will not be accepted as reason for delay in the Work or additional compensation.

2. DRAWINGS AND SPECIFICATIONS

A. Drawings and Specifications that form a part of this Contract, as stated in Article 1 of General Conditions of Contact, are enumerated in Document Index of these Construction Documents.

B. Complete sets of Drawings and Specifications for all trades will be issued to all Bidders, irrespective of category of work to be bid on, in order that all Bidders may be familiar with work of other trades as they affect their bid.

3. INTERPRETATION

A. No verbal explanation or instructions will be given in regard to meaning of Drawings or Specifications before Bid Opening. Bidders shall bring inadequacies, omissions or conflicts to County or Architect / Engineer's attention at least ten (10) days before Bid Opening. Prompt clarification will be available to all bidders by Addendum.

B. Failure to so request clarification or interpretation of Drawings and Specifications will not relieve successful Bidder of responsibility. Signing of Contract will be considered as implicitly denoting that Contractor has thorough understanding of scope of the Work and comprehension of Construction Documents.

C. County will not be responsible for verbal instructions.

4. QUALIFICATIONS OF BIDDER (CONTRACTOR AND SUBCONTRACTOR)

A. Before award of Contract can be approved, County shall be satisfied that Bidder involved meets following requirements:
   1. Has completed at least one (1) project of at least fifty percent (50%) of size or value of Division of work being bid and type of work completed is similar to that being bid. If greater magnitude of experience is deemed necessary, other than size or value of work, such requirements will be described in appropriate section of Specifications.

   2. Maintains a permanent place of business.

   3. Is bondable for terms of proposed Contract.

   4. Has a record of satisfactorily completing past projects and supplies a list of at least five (5) reference projects, with architect or engineer's and owner's names, addresses and telephone numbers for each project. Criteria which will be considered in determining satisfactory completion of projects by bidder will include:
      a) Completed contracts in accordance with Drawings and Specifications.
      b) Diligently pursued execution of work and completed contracts according to established time schedule unless owner grants extensions.
      c) Fulfilled guarantee requirements of construction documents.
      d) Is not presently on an ineligible list maintained by County's Department of Administration for noncompliance with equal employment opportunities and affirmative action requirements.
      e) Authorized to conduct business in Wisconsin. By submitting Bid, bidder warrants that it has: complied with all necessary requirements to do business in State of Wisconsin; that persons executing a contract on its behalf are authorized to do so; and, if corporation, that name and address of bidder's registered agent are as set forth in Contract. Bidder shall notify County immediately, in writing, of any change in its registered agent, their address, and bidder's legal status. For a partnership, term "registered agent" shall mean a general partner.

B. County's Public Works Project Engineer will make such investigations as are deemed necessary to determine ability of bidder to perform the Work, and bidder shall furnish to County's Public Works Project Engineer or designee all such information and data for this purpose as County's Public Works Project Engineer may request. County reserves right to reject Bid if evidence submitted by, or investigation of, bidder fails to satisfy County that bidder is responsible and qualified to carry out obligations of Contract and to complete the Work contemplated therein.

5. BID GUARANTEE

A. Bank certified check, cashier's check or Bid Bond, payable to County in amount not less than five percent (5%) of maximum bid, shall accompany each Bid as guarantee that if Bid is accepted, Bidder will execute and return proposed Contract and Performance / Payment Bond within ten (10) days after being notified of acceptance of Bid. Company issuing bonds must be licensed to do business in Wisconsin.

B. Any bid, which is not accompanied by a bid guarantee, will be considered "No Bid" and will not be read at Bid Opening.

C. If successful Bidder so delivers Contract, Certificate of Insurance, and Performance / Payment Bond, check will be returned to Bidder. In case Bidder fails to deliver such Contract, insurance, and bond, amount of bid guarantee will be forfeited to County as liquidated damages.

D. All checks tendered as bid guarantee, except those of three lowest qualified, responsible bidders, will be returned to their makers within three (3) days after Bid Opening. All such retained checks will be returned immediately upon signing of Contract and Performance / Payment Bond by successful Bidder.

6. WITHDRAWAL OF BIDS

A. Bids may be withdrawn by written request received from bidder or an authorized representative thereof prior to time fixed for Bid Opening, without prejudice to right of bidder to file a new Bid. Withdrawn Bids will be returned unopened. Negligence on part of bidder in preparing their Bid confers no right for withdrawal of Bid after it has been opened.

B. No Bid may be withdrawn for a period of sixty (60) days after Bid Opening date.

C. If a Bid contains an error, omission or mistake, bidder may limit liability to amount of bidder's guarantee by giving written Notice of Intent not to execute Contract to County within seventy-two (72) hours of Bid Opening.

7. CONTRACT FORM

A. Sample copy of contract that successful Bidder will be required to enter into is included in these Construction Documents and bidders are required to familiarize themselves with all conditions contained therein.

8. CONTRACT INTERESTS BY COUNTY PUBLIC OFFICIALS

A. In accordance with Wisconsin Statute 946.13, a county official may not bid for or enter into any contract involving receipts or disbursements of more than $7,500.00 in a year, in which they have a private pecuniary interest, direct or indirect if at same time they are authorized to take official

action with respect to making of this Contract. Any contract entered into in violation of this section is void and County incurs no liability thereon. This subsection does not affect application and enforcement of Wisconsin Statute 946.13 by state prosecutors in criminal courts of this state.

9. EMERGING SMALL BUSINESS PROVISIONS

A. **Emerging Small Business (ESB) Involvement.** Bidder shall make a good faith effort to award a minimum of ten percent (10%) of the Work to ESBs. Bidder shall submit a report to Dane County Contract Compliance Officer within twenty-four (24) hours after Bid Opening demonstrating such efforts. Good faith efforts means significant contact with ESBs for purposes of soliciting bids from them. Failure to make or demonstrate good faith efforts will be grounds for disqualification.

B. **Emerging Small Business Report.** Emerging Small Business Enterprise Report is to be submitted by Bidder in separate envelope marked "Emerging Small Business Report". This report is due by 2:00 p.m. following specified twenty-four (24) hours after Bid Opening. Bidder who fails to submit Emerging Small Business Report shall be deemed not responsive.

C. **ESB Goal.** Ten percent (10%) ESB participation is goal of this project. ESB utilizations are shown as a percentage of total Bid. If Bidder meets or exceeds specified goal, Bidder is only required to submit Form A - Certification, and Form B - Involvement. Goal shall be met if Bidder qualifies as ESB.

D. **Report Contents.** Following award of Contract, Bidder shall submit copies of executed contracts for all Emerging Small Businesses. Emerging Small Business Report shall consist of these:
   1. Form A - Certification;
   2. Form B - Involvement;
   3. Form C - Contacts;
   4. Form D - Certification Statement (if appropriate); and
   5. Supportive documentation (i.e., copies of correspondence, telephone logs, copies of advertisements).

E. **ESB Listing.** Bidders will solicit bids from ESB listing provided by Dane County.

F. **Emerging Small Business Definition.** For purposes of this provision, an ESB is defined as:
   1. Independent business concern that has been in business minimum of one year;
   2. Business located in State of Wisconsin;
   3. Business comprised of less than 25 employees;
   4. Business must not have gross sales in excess of three million dollars ($3,000,000.00) over past three years; and
   5. Business does not have a history of failing to complete projects.

G. **ESB Certification.** All contractors, subcontractors and suppliers seeking ESB certification must complete and submit Emerging Small Business Certification Application to Dane County Contract Compliance Program.

H. **Certification Statement.** If ESB firm has not been certified by County as a ESB prior to submittal of this Bid, ESB Report cannot be used to fulfill ESB goal for this project unless firm provides "Form D - Certification Statement". Certification statement must be completed and signed by ESB firm.

I. **Questions.** Questions concerning Emerging Small Business provisions shall be directed to:
Dane County Contract Compliance Officer
City-County Building, Room 421
210 Martin Luther King, Jr. Blvd.
Madison, WI 53703
608/266-5623

J. **Substituting ESBs.** In event of any significant changes in subcontract arrangements or if need arises to substitute ESBs, Bidder shall report such proposed changes to Contract Compliance Officer to making any official changes and request authorization to substitute ESB firm. Bidder further agrees to make every possible effort to replace ESB firm with another qualified ESB firm.

K. **Good Faith Efforts.** Good faith efforts can be demonstrated by meeting all of these obligations:

1. Selecting portions of the Work to be performed by ESBs in order to increase likelihood of meeting ESB goal including, where appropriate, breaking down Contract into smaller units to facilitate ESB participation.

2. Advertising in general circulation, trade associations, and women / minority focus media concerning subcontracting opportunities.

3. Providing written notices to reasonable number of specific ESBs that their interest in Contract was being solicited in sufficient time to allow ESBs to participate effectively.

4. Following up on initial solicitations of interest by contacting ESBs within five (5) working days prior to Bid Opening date to determine with certainty whether ESB were interested, to allow ESBs to prepare bids.

5. Providing interested ESB with adequate information about Drawings, Specifications and requirements of Contract.

6. Using services of available minority, women and small business organizations and other organizations that provide assistance in recruitment of MBEs / WBEs / ESBs.

7. Negotiating in good faith with interested ESBs, not rejecting ESBs as unqualified without a sound reason based on thorough investigation of their capabilities.

8. Submitting required project reports and accompanying documents to County's Contract Compliance Officer within twenty-four (24) hours after Bid Opening.

L. **Appeals Disqualification of Bid.** Bidder who is disqualified may appeal to Public Works & Transportation Committee and Equal Opportunity Commission.

10. METHOD OF AWARD - RESERVATIONS

A. Award of Contract will be made on basis of following, providing cost does not exceed amount of funds then estimated by County as available to finance Contract(s).

1. Lowest dollar amount is submitted by qualified responsible bidder on Lump Sum Bid for all work comprising project, combined with such additive alternates applied in order listed on Bid Form.

2. County reserves right to reject all bids or any bid, to waive any informality in any bid, and to accept any bid that will best serve interests of County.

3. Unit Prices and Informational Bids will not be considered in establishing low bidder.

11. SECURITY FOR PERFORMANCE AND PAYMENTS

A. Simultaneous with delivery of signed Contract, Bidder shall be required to furnish a Performance / Payment Bond as specified in Article 26 of General Conditions of Contract, "Contract Security". Surety Company shall be licensed to do business in Wisconsin. Performance / Payment Bond must be dated same date or subsequent to date of Contract. Performance / Payment Bond must conform to Sample Performance / Payment Bond in Construction Documents.

B. Provide certified copy of power of attorney from Surety Company showing that agent who signs Bond has power of attorney to sign for Surety Company. Secretary or Assistant Secretary of company must sign this certification, not attorney-in-fact. Certification must bear same or later date as Bond. Power of Attorney must conform to Model Power of Attorney form set forth in Construction Documents.

C. If Bidder is partnership or joint venture, certified list, providing names of individuals constituting partnership or joint venture must be furnished. Contract itself may be signed by one partner of partnership, or one partner of each firm comprising joint venture, but Performance / Payment Bond must be signed by all partners.

D. If Bidder is a corporation, it is necessary that a current certified copy of resolution or other official act of directors of corporation be submitted showing that person who signs Contract is authorized to sign contracts for corporation. It is also necessary that corporate seal be affixed to resolution, contract, and performance / payment bond. If your corporation has no seal, it is required that above documents include a statement or notation to effect that corporation has no seal.

12. TAXES

A. Bidder shall include in Bid, all Sales, Consumer, Use and other similar taxes required by law.

B. In accordance with Wisconsin Statue 71.80(16)(a), successful nonresident bidder, whether incorporated or not, and not otherwise regularly engaged in business in this state, shall file a surety bond with State of Wisconsin Department of Revenue payable to Department of Revenue, to guarantee payment of income taxes, required unemployment compensation contributions, sales and use taxes and income taxes withheld from wages of employees, together with any penalties and interest thereon. Amount of bond shall be three percent (3%) of Contract or subcontract price on all contracts of $50,000 or more.

13. SUBMISSION OF BIDS

A. All Bids shall be submitted on standard Bid Form bound herein and only Bids that are made on this Bid Form will be considered. Entire Bid Form, Affidavit Form and other supporting documents, if any, shall be removed or copied from Construction Documents, filled out, and submitted in manner specified hereinafter. Construction Documents shall not accompany Bid.

B. No bids for any subdivision or any sub-classification of this Work, except as indicated, will be accepted. Any conditional Bid, amendment to Bid Form or appended item thereto, or inclusion of any correspondence, written or printed matter, or details of any nature other than that specifically called for, which would alter any essential provision of Construction Documents, or require consideration of unsolicited material or data in determining award of Contract, will disqualify Bid. Telecommunication alterations to Bid will not be accepted.

C. Bidders must submit a single Bid for all the Work.

D. Bid amounts shall be inserted in words and in figures in spaces provided on Bid Form; in case of conflict, written word amounts will govern.

E. Addenda issued after Bid Letting shall become a part of Construction Documents. Bidders shall acknowledge receipt of such addenda in appropriate space provided on Bid Form. Bid will be rejected if receipt of any particular addendum applicable to award of Contract has not been acknowledged on Bid Form.

F. All bidders are encouraged to submit their bids in special printed bid envelope available at Dane County Public Works, Highway & Transportation Department - Public Works Engineering Division. Bids submitted in any other type of envelope run risk of not being identified as a bid and County shall not be liable therefore in any respect. Bids shall be signed, sealed and delivered at place and before time of closing designated in Invitation to Bid, and identified with project name, bid number, location, category of work being bid upon, Bid Opening date, name and address of bidder.

G. Bidder shall be responsible for sealed Bid being delivered to place designated for Bid Opening on or before date and time specified. Bids received after time of closing will be rejected and returned to bidder unopened.

H. Bid will be considered invalid and will be rejected if bidder has not signed it.

I. Faxed Bids will not be accepted.

14. SUBCONTRACTOR LISTING

A. Bidders shall be required to submit a list of major subcontractors for General Construction, Plumbing, HVAC, and Electrical work proposed for this project to include committed prices for each subcontractor. List shall be placed in separate sealed envelope that must be clearly identified as “Major Subcontractor List”, for named project and name of Bidder submitting it. County must receive envelope no later than date by which successful Bidder is required to submit his or her signed Contract, as established in Construction Documents.

15. INFORMATIONAL BIDS

A. Bidder shall state amount that is included in Base Bid for all equipment, materials and labor required to complete the Work described. Informational bids are amounts requested for accounting purposes and for allocation of funds only. It is not intended to omit any of the Work described or related items from this project.

B. Description of requested Informational Bids, if any, is as set forth in Construction Documents.

16. UNIT PRICES

A. Provide unit prices where requested on Bid Form. Unit prices will include all costs for materials, labor, insurance, taxes, overhead and profit necessary to perform specified work. Estimated quantities are approximate only. Payment will be based upon actual quantities placed, provided or installed. Failure to provide requested unit prices shall result in rejection of entire Bid.

B. County reserves right to accept or reject any unit prices as given in Bid.

C. Bidder shall refer to Bid Form and applicable specification section to determine basis of unit measure and detailed information related to each unit price item requested.

17. STATED ALLOWANCES

A. Pursuant to Article 33 of General Conditions of Contract, titled "Stated Allowances", Bidder shall include following cash allowances in Bid:

NO ALLOWANCES

18. COMMENCEMENT AND COMPLETION

A. Successful Bidder shall commence work when schedule and weather permit, but no later than stated in Bid Form. Contractor shall pursue the Work regularly and continuously at reasonable rate to insure completion of the Work within time stated in Bid. Days to complete as stated in Bid are working days, excluding holidays and weekends.

B. Should it be found impossible to complete the Work on or before time specified for completion, written request may be submitted for extension of time setting forth reasons believed to justify granting of such request. Refer to Article 17 of General Conditions of Contract, titled "Time for Completion".

19. WORK BY COUNTY

A. This work will be accomplished by County or will be let under separate contracts and will not be included under this Contract:

1. All asphalt paving and road work.

FORM A

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION

In accordance with General Conditions of Contract, submit this Emerging Small Business Report within 24 hours after Bid Opening.

PROJECT NAME: _____

_____

BID / PROJECT NO.: _____ BID OPENING DATE: _____

BIDDER INFORMATION

COMPANY NAME: _____

ADDRESS: _____

_____

TELEPHONE NO.: _____

CONTACT PERSON: _____

BIDDER CERTIFICATION

I, _____ , _____ of
Name Title

_____ certify that information contained in
Company

this Emerging Small Business Report is true and correct to best of my knowledge and belief.

_____ _____
Bidder's Signature Date

FORM B

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - INVOLVEMENT

(Copy this Form as necessary to provide complete information)

COMPANY NAME: _____

PROJECT NAME: _____ BID / PROJECT NO.: _____

ESB NAME: _____ CONTACT PERSON: _____

ADDRESS: _____ PHONE NO.: _____

CITY: _____ STATE: _____ ZIP: _____

Indicate percentage commitment to this ESB: _____ % Amount: $ _____

ESB NAME: _____ CONTACT PERSON: _____

ADDRESS: _____ PHONE NO.: _____

CITY: _____ STATE: _____ ZIP: _____

Indicate percentage commitment to this ESB: _____ % Amount: $ _____

ESB NAME: _____ CONTACT PERSON: _____

ADDRESS: _____ PHONE NO.: _____

CITY: _____ STATE: _____ ZIP: _____

Indicate percentage commitment to this ESB: _____ % Amount: $ _____

FORM C

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CONTACTS

(Copy this Form as necessary to provide complete information)

COMPANY NAME: _____

PROJECT NAME: _____ BID / PROJECT NO.: _____

	ESB FIRM NAME CONTACTED	DATE	PERSON CONTACTED	DID ESB BID?	DID YOU ACCEPT BID?	REASON FOR REJECTION
1)						
2)						
3)						
4)						
5)						
6)						
7)						

FORM D

DANE COUNTY
EMERGING SMALL BUSINESS REPORT - CERTIFICATION STATEMENT

I, _____ , _____ of
Name Title

_____ certify to best of my knowledge and
Company

belief that this business meets Emerging Small Business definition as indicated below.

_____ _____
Bidder's Signature Date

EMERGING SMALL BUSINESS DEFINITION:

1. Independent business concern that has been in business minimum of one year.

2. Business is located in State of Wisconsin.

3. Business is comprised of less than 25 employees.

4. Business must not have gross sales in excess of three million over past three years.

5. Business does not have history of failing to complete projects.

BID FORM

BID NO. 107088
PROJECT: CONSTRUCTION OF SALT STORAGE FACILITY
STH 151 & CTH V
TOWN OF YORK, COUNTY OF DANE, WISCONSIN

TO: DANE COUNTY PURCHASING AGENT
210 MARTIN LUTHER KING, JR. BLVD. - ROOM 425
MADISON, WISCONSIN 53703

BASE BID - LUMP SUM:
The undersigned, having examined the site where the Work is to be executed and having become familiar with local conditions affecting the cost of the Work and having carefully examined the Drawings and Specifications, all other Construction Documents and Addenda thereto prepared by Dane County Department of Public Works, Highway & Transportation hereby agrees to provide all labor, materials, equipment and services necessary for the complete and satisfactory execution of the entire Work, as specified in the Construction Documents, for the Base Bid stipulated sum of:
**(Owner is responsible for additional fill and backfilling)
**(Owner is responsible for all asphalt base and asphalt paving)

_____ and _____ /100 Dollars
Written Price

$_____
Numeric Price

Receipt of the following addenda and inclusion of their provisions in this Bid is hereby acknowledged:

Addendum No(s). _____ through_____

Dated _____

Dane County Highway Department must have this project completed by July 1, 2008. Assuming this Work can be started by November 20, 2007, what dates can you commence and complete this job?

Commencement Date: _____ Completion Date: _____
(final, not substantial)

Name of Bidder: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Contact Person: _____

SIGNATURE: _____
(Bid is invalid without signature)

BID CHECK LIST:
These items **must** be included with Bid or completed **before** bidding
☐ Bid Form ☐ Bid Bond ☐ Fair Labor Practices Certification ☐ Vendor Registration

FAIR LABOR PRACTICES CERTIFICATION

The undersigned, for and on behalf of the BIDDER, APPLICANT or PROPOSER named herein, certifies as follows:

A. That he or she is an officer or duly authorized agent of the above-referenced BIDDER, APPLICANT or PROPOSER, which has a submitted a proposal, bid or application for a contract with the county of Dane.

B. That BIDDER, APPLICANT or PROPOSER has (check one):

_____ not been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ been found by the National Labor Relations Board ("NLRB") or the Wisconsin Employment Relations Commission ("WERC") to have violated any statute or regulation regarding labor standards or relations in the seven years prior to the signature date of this Certification.

_____ _____
Officer or Authorized Agent Signature Date

_____
Printed or Typed Name and Title

_____
Printed or Typed Business Name

NOTE: You can find information regarding the violations described above at: www.nlrb.gov and werc.wi.gov.

For reference, Dane County Ordinance 25.11(28)(a) is as follows:
(28) BIDDER RESPONSIBILITY. (a) Any bid, application or proposal for any contract with the county, including public works contracts regulated under chapter 40, shall include a certification indicating whether the bidder has been found by the National Labor Relations Board (NLRB) or the Wisconsin Employment Relations Committee (WERC) to have violated any statute or regulation regarding labor standards or relations within the last seven years. The purchasing manager shall investigate any such finding and make a recommendation to the committee, which shall determine whether the conduct resulting in the finding affects the bidder's responsibility to perform the contract.

If you indicated that the NLRB or WERC have found you to have such a violation, you must include copies of any relevant information regarding such violation with your proposal, bid or application.

COUNTY OF DANE

PUBLIC WORKS CONTRACT

Contract No. _____ Bid No. 107088

Authority: Res. _____, 2007-08

THIS CONTRACT, made and entered into as of the date by which authorized representatives of both parties have affixed their signatures, by and between the County of Dane (hereafter referred to as "COUNTY") and _____ (hereafter, "CONTRACTOR"), and

W I T N E S S E T H :

WHEREAS, COUNTY, whose address is c/o Associate Public Works Director, 1919 Alliant Energy Center Way, Madison, WI 53713, desires to have CONTRACTOR provide Construction of Salt Storage Facility at STH 151 and CTH V, Town of York, County of Dane, Wisconsin ("the Project"); and

WHEREAS, CONTRACTOR, whose address is _____ _____ is able and willing to construct the Project, in accordance with the Construction Documents;

NOW, THEREFORE, in consideration of the above premises and the mutual covenants of the parties hereinafter set forth, the receipt and sufficiency of which is acknowledged by each party for itself, COUNTY and CONTRACTOR do agree as follows:

1. CONTRACTOR agrees to construct, for the price of $_____ the Project and at the CONTRACTOR'S own proper cost and expense to furnish all materials, supplies, machinery, equipment, tools, superintendence labor, insurance, and other accessories and services necessary to complete the Project in accordance with the conditions and prices stated in the Bid Form, General Conditions of Contract the drawings which include all maps, plats, plans, and other drawings and printed or written explanatory matter thereof, and the specifications therefore as prepared by _____ (hereinafter referred to as "the Architect / Engineer"), and as enumerated in the Project Manual Document Index, all of which are made a part hereof and collectively evidence and constitute the Contract.

2. COUNTY agrees to pay the CONTRACTOR in current funds for the performance of the Contract subject to additions and deductions, as provided in the General Conditions of Contract, and to make payments on account thereof as provided in Article entitled, "Payments to Contractor" of the General Conditions of Contract.

3. During the term of this Agreement, CONTRACTOR agrees to take affirmative action to ensure equal employment opportunities. The CONTRACTOR agrees in accordance with Wisconsin Statute 111.321 and Chapter 19 of the Dane County Code of Ordinances not to discriminate on the basis of age, race, ethnicity, religion, color, gender, disability, marital status, sexual orientation, national origin, cultural differences, ancestry, physical appearance, arrest record or conviction record, military participation or membership in the national guard, state

defense force or any other reserve component of the military forces of the United States, or political beliefs. Such equal opportunity shall include, but not be limited to, the following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation. CONTRACTOR agrees to post in conspicuous places, available to all employees and applicants for employment, notices setting forth the provisions of this paragraph.

4. CONTRACTOR shall file an Affirmative Action Plan with the Dane County Contract Compliance Officer in accord with Chapter 19 of the Dane County Code of Ordinances. CONTRACTOR must file such plan within fifteen (15) days of the effective date of this Agreement. During the term of this Agreement CONTRACTOR shall also provide copies of all announcements of employment opportunities to COUNTY'S Contract Compliance Office, and shall report annually the number of persons, by race, ethnicity, gender, and disability status, which apply for employment and, similarly classified, the number hired and number rejected.

5. During the term of this Agreement, all solicitations for employment placed on CONTRACTOR'S behalf shall include a statement to the effect that CONTRACTOR is an "Equal Opportunity Employer."

6. CONTRACTOR agrees to furnish all information and reports required by COUNTY'S Contract Compliance Officer as the same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and the provisions of this Agreement.

7. CONTRACTOR agrees that all persons employed by CONTRACTOR or any subcontractor shall be paid no less than the minimum wage established under Chapter 40, Subchapter II, Dane County Code of Ordinances. CONTRACTOR agrees to abide by and comply with the provisions of Chapter 40, Subchapter II of the Dane County Code of Ordinances, and said Subchapter is fully incorporated herein by reference.

8. This Contract is intended to be a Contract solely between the parties hereto and for their benefit only. No part of this Contract shall be construed to add to, supplement, amend, abridge or repeal existing rights, benefits or privileges of any third party or parties including, but not limited to, employees of either of the parties.

9. The entire agreement of the parties is contained herein and this Contract supersedes any and all oral agreements and negotiations between the parties relating to the subject matter hereof. The parties expressly agree that the express terms of this Contract shall not be amended in any fashion except in writing, executed by both parties.

IN WITNESS WHEREOF, COUNTY and CONTRACTOR, by their respective authorized agents, have caused this Contract and its Schedules to be executed, effective as of the date by which all parties hereto have affixed their respective signatures, as indicated below.

* * * * * * *

FOR CONTRACTOR:

Signature Date

Printed or Typed Name and Title

Signature Date

Printed or Typed Name and Title

NOTE: If CONTRACTOR is a corporation, Secretary should attest. In accordance with IRS Regulations, unincorporated entities are required to provide either their Social Security or Employer Number in order to receive payment for services rendered.

* * * * * * *

This Contract is not valid or effectual for any purpose until approved by the appropriate authority designated below, and no work is authorized until the CONTRACTOR has been given notice to proceed by COUNTY'S Associate Public Works Director.

FOR COUNTY:

Kathleen M. Falk, County Executive Date

Robert Ohlsen, County Clerk Date

THE AMERICAN INSTITUTE OF ARCHITECTS

AIA Document A310

Bid Bond

Bond No.

KNOW ALL MEN BY THESE PRESENTS, that we

(Here insert full name and address or legal title of Contractor)

as Principal, hereinafter called the Principal, and

(Here insert full name and address or legal title of Surety)

a corporation duly organized under the laws of the State of WI as Surety, hereinafter called the Surety, are held and firmly bound unto

(Here insert full name and address or legal title of Owner)

as Obligee, hereinafter called Obligee, in the sum of ( ) Percent of total amount bid

Dollars ($ Percent of attached bid).

For the payment of which sum well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has submitted a bid for Project No.:

(Here insert full name, address, and description of project)

NOW, THEREFORE, if the Obligee shall accept the bid of the Principal and the Principal shall enter into a Contract with the Obligee in accordance with the terms of such bid, and give such bond or bonds as may be specified in the bidding or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter such Contract and give such bond or bonds, if the Principal shall pay to the Obligee the difference not to exceed the penalty hereof between the amount specified in said bid and such larger amount for which the Obligee may in good faith contract with another party to perform the Work covered by said bid, then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed and sealed this day of , 20 .

_____
(Principal) (Seal)

_____
(Witness)

_____
(Title)

_____ _____
(Surety) (Seal)

_____
(Witness)

_____
ATTORNEY-IN-FACT

THE AMERICAN INSTITUTE OF ARCHITECTS

Bond No.

AIA Document A312

Performance Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT
Date:
Amount**: $**
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Date):
Amount: **$**
Modifications to this Bond: [ ] None [ ] See Page 3

CONTRACTOR AS PRINCIPAL
COMPANY: (Corporate Seal)

SURETY COMPANY: (Corporate Seal)

Signature: _____
Name and Title:

Signature**:** _____
Name and Title:
Attorney-in-Fact

(Any additional signatures appear on page 3)

FOR INFORMATION ONLY-Name, Address and Telephone
AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the Contractor performs the Construction Contract, the Surety and the Contractor shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.1.

3. If there is no Owner Default, the Surety's obligation under this Bond shall arise after:

3.1 The Owner has notified the Contractor and the Surety at its address described in Paragraph 10 below that the Owner is considering declaring a Contractor Default and has requested and attempted to arrange a conference with the Contractor and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the Owner, the Contractor and the Surety agree, the Contractor shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the Owner's right, if any, subsequently to declare a Contractor Default; and

3.2 The Owner has declared a Contractor Default and formally terminated the Contractor's right to complete the contract. Such Contractor Default shall not be declared earlier than twenty days after the Contractor and the Surety have received notice as provided in Subparagraph 3.1; and

3.3 The Owner has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the Owner.

4. When the Owner has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

4.1 Arrange for the Contractor, with consent of the Owner, to perform and complete the Construction Contract; or

4.2 Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

4.3 Obtain bids or negotiated proposals from qualified contractors acceptable to the Owner for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the Owner and the contractor selected with the Owner's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the Owner the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the Owner resulting from the Contractor's default; or

4.4 Waive its rights to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

1. After investigation, determine the amount for which it may be liable to the Owner and, as soon as practicable after the amount is determined, tender payment therefor to the Owner; or

2. Deny liability in whole or in part and notify the Owner citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the Owner to the Surety demanding that the Surety perform its obligations under this Bond, and the Owner shall be entitled to enforce any remedy available to the Owner. If the Surety proceeds as provided in Subparagraph 4.4, and the Owner refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the Owner shall be entitled to enforce any remedy available to the Owner.

6. After the Owner has terminated the Contractor's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.1, 4.2, or 4.3 above, then the responsibilities of the Surety to the Owner shall not be greater than those of the Contractor under the Construction Contract, and the responsibilities of the Owner to the Surety shall not be greater than those of the Owner under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the Owner of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

6.1 The responsibilities of the Contractor for correction of defective work and completion of the Construction Contract;

6.2 Additional legal, design professional and delay costs resulting from the Contractor's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

6.3 Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the Contractor.

7. The Surety shall not be liable to the Owner or others for obligations of the Contractor that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the Owner or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after Contractor Default or within two years after the Contractor ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available

to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted here from and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12 DEFINITIONS

12.1 Balance of the Contract Price: The total amount payable by the Owner to the Contractor under the Construction Contract after all proper adjustments have been made, including allowance to the Contractor of any amounts received or to be received by the Owner in settlement of insurance or other claims for damages to which the Contractor is entitled, reduced by all valid and proper payments made to or on behalf of the Contractor under the Construction Contract.

12.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

12.3 Contractor Default: Failure of the Contractor, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

12.4 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL		SURETY	
Company:	(Corporate Seal)	Company:	(Corporate Seal)
Signature:_____		Signature: _____	
Name and Title:		Name and Title:	
Address:		Address:	

THE AMERICAN INSTITUTE OF ARCHITECTS

Bond No.

AIA Document A312

Payment Bond

Any singular reference to Contractor, Surety, Owner or other party shall be considered plural where applicable.

CONTRACTOR (Name and Address):

SURETY (Name and Principal Place of Business):

OWNER (Name and Address):

CONSTRUCTION CONTRACT
Date:
Amount**: $**
Description (Name and Location):

BOND
Date (Not earlier than Construction Contract Date):
Amount: **$**
Modifications to this Bond: [ ] None [ ] See Page 6

CONTRACTOR AS PRINCIPAL
COMPANY: (Corporate Seal)

SURETY COMPANY: (Corporate Seal)

Signature: _____
Name and Title:

Signature**:** _____
Name and Title:
Attorney-in-Fact

(Any additional signatures appear on page 6)

FOR INFORMATION ONLY-Name, Address and Telephone
AGENT OR BROKER:

OWNER'S REPRESENTATIVE (Architect, Engineer or other party):

1. The Contractor and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors, and assigns to the Owner to pay for labor, materials and equipment furnished for use in the performance of the Construction Contract, which is incorporated herein by reference.

2. With respect to the Owner, this obligation shall be null and void if the Contractor:

2.1 Promptly makes payment, directly, or indirectly, for all sums due Claimants, and

2.2 Defends, indemnifies and holds harmless the Owner from claims, demands, liens or suits by any person or entity whose claim, demand, lien or suit is for the payment for labor, materials, or equipment furnished for use in the performance of the Construction Contract, provided the Owner has promptly notified the Contractor and the Surety (at the address described in Paragraph 12) of any claims, demands, liens, or suits and tendered defense of such claims, demands, liens or suits to the Contractor and the Surety, and provided there is no Owner Default.

3. With respect to Claimants, this obligation shall be null and void if the Contractor promptly makes payment, directly or indirectly, for all sums due.

4. The Surety shall have no obligation to Claimants under this Bond until:

4.1 Claimants who are employed by or have a direct contract with the Contractor have given notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and, with substantial accuracy, the amount of the claim.

4.2 Claimants who do not have a direct contract with the Contractor:

.1 Have furnished written notice to the Contractor and sent a copy, or notice thereof, to the Owner, within 90 days after having last performed labor or last furnished materials or equipment included in the claim stating, with substantial accuracy, the amount of the claim and the name of the party to whom the materials were furnished or supplied or for whom the labor was done or performed; and

.2 Have either received a rejection in whole or in part from the Contractor, or not received within 30 days of furnishing the above notice any communication from the Contractor by which the Contractor has indicated the claim will be paid directly or indirectly; and

.3 Not having been paid within the above 30 days, have sent a written notice to the Surety (at the address described in Paragraph 12) and sent a copy, or notice thereof, to the Owner, stating that a claim is being made under this Bond and enclosing a copy of the previous written notice furnished to the Contractor.

5. If a notice required by Paragraph 4 is given by the Owner to the Contractor or to the Surety, that is sufficient compliance.

6. When the Claimant has satisfied the conditions of Paragraph 4, the Surety shall promptly and at the Surety's expense take the following actions:

6.1 Send an answer to the Claimant, with a copy to the Owner, within 45 days after receipt of the claim, stating the amounts that are undisputed and the basis for challenging any amounts that are disputed.

6.2 Pay or arrange for payment of any undisputed amounts.

7. The Surety's total obligation shall not exceed the amount of this Bond, and the amount of this Bond shall be credited for any payments made in good faith by the Surety.

8. Amounts owed by the Owner to the Contractor under the Construction Contract shall be used for the performance of the Construction Contract and to satisfy claims, if any, under any Construction Performance Bond. By the Contractor furnishing and the Owner accepting this Bond, they agree that all funds earned by the Contractor in the performance of the Construction Contract are dedicated to satisfy obligations of the Contractor and the Surety under this Bond, subject to the Owner's priority to use the funds for the completion of the work.

9. The Surety shall not be liable to the Owner, Claimants or others for obligations of the Contractor that are unrelated to the Construction Contract. The Owner shall not be liable for payment of any costs or expenses of any Claimant under this Bond, and shall have under this Bond no obligations to make payments to, give notices on behalf of, or otherwise have obligations to Claimants under this Bond.

10. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

11. No suit or action shall be commenced by a Claimant under this Bond other than in a court of competent jurisdiction in the location in which the work or part of the work is located or after the expiration of one year from the date (1) on which the Claimant gave the notice required by Subparagraph 4.1 or Clause 4.2.3, or (2) on which the last labor or service was performed by anyone or the last materials or equipment were furnished by anyone under the Construction Contract, whichever of (1) or (2) first occurs. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

12. Notice to the Surety, the Owner or the Contractor shall be mailed or delivered to the address shown on the signature page. Actual receipt of notice by Surety, the Owner or the Contractor, however accomplished, shall be sufficient compliance as of the date received at the address shown on the signature page.

13. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall

be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

14. Upon request by any person or entity appearing to be a potential beneficiary of this Bond, the Contractor shall promptly furnish a copy of this Bond or shall permit a copy to be made.

15. DEFINITIONS

15.1 Claimant: An individual or entity having a direct contract with the Contractor or with a subcontractor of the Contractor to furnish labor, materials or equipment for use in the performance of the Contract. The intent of this Bond shall be to include without limitation in the terms "labor, materials or equipment" that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental equipment used in the Construction Contract, architectural and engineering services required for performance of the work of the Contractor and the Contractor's subcontractors, and all other items for which a mechanic's lien may be asserted in the jurisdiction where the labor, materials or equipment were furnished.

15.2 Construction Contract: The agreement between the Owner and the Contractor identified on the signature page, including all Contract Documents and changes thereto.

15.3 Owner Default: Failure of the Owner, which has neither been remedied nor waived, to pay the Contractor as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

MODIFICATIONS TO THIS BOND ARE AS FOLLOWS:

(Space is provided below for additional signatures of added parties, other than those appearing on the cover page.)

CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corporate Seal)	Company: (Corporate Seal)
Signature: _____	Signature: _____
Name and Title:	Name and Title:
Address:	Address:

GENERAL CONDITIONS OF CONTRACT

TABLE OF CONTENTS

1. CONSTRUCTION DOCUMENTS

A. Construction Documents, listed in Table of Contents of this Specification volume shall form a part of this Contract and provisions of Construction Documents shall be as binding upon parties as if they were fully set forth in Contract itself.

B. These shall also be considered as part of Construction Documents: Addenda, including additions and modifications incorporated in such addenda before execution of Contract; requests for information; construction bulletins; change orders; and written interpretations by Architect / Engineer or Public Works Project Engineer that are made after execution of Contract.

C. Construction Documents are complementary, and what is required by one shall be as binding as if required by all. Intent of Construction Documents is to include all labor, materials and equipment necessary for proper execution of the Work.

2. DEFINITIONS

A. These terms as used in this Contract are respectively defined as follows:
   1. All uses of term "County" in Construction Documents shall mean Dane County.
   2. All uses of term "Department" in Construction Documents shall mean Department of Public Works, Highway & Transportation, which is a unit of Dane County government. Department is County agency overseeing Contract with Contractor.
   3. Public Works Project Engineer is appointed by and responsible to Department. Public Works Project Engineer has authority to act on behalf of Department and will sign change orders, payment requests and other administrative matters related to projects.
   4. Public Works Project Engineer is responsible for supervision, administration and management of field operations involved in construction phase of this Work.
   5. Term "Work" includes all labor, equipment and materials necessary to produce project required by Construction Documents.
   6. Term "Substantial Completion" is date when project or specified area of project is certified by Architect / Engineer that construction is sufficiently completed, in accordance with Construction Documents, and as modified by any subsequent changes agreed to by parties, so that County may occupy project or specified area of project for use for which it was intended subject to permit approval for occupancy.
   7. Contractor is a person, firm, or corporation with whom County makes Contract. Though multiple contracts may be involved, Construction Documents treat them throughout as if each were of singular number.

3. ADDITIONAL INSTRUCTIONS AND DRAWINGS

A. Contractor may be furnished additional instructions and detail drawings as necessary to carry out the Work included in Contract. Additional drawings and instructions thus supplied to Contractor will coordinate with Construction Documents and will be so prepared that they can be reasonably interpreted as part thereof. Contractor shall carry out the Work in accordance with additional detail drawings and instructions.

4. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. Unless otherwise specified, Contractor shall submit three (3) copies of all Shop Drawings for each submission, until receiving final approval. After final approval, provide five (5) additional copies for distribution and such other copies as may be required.

B. Contractor shall submit, on an on-going basis and as directed, Product Data such as brochures that shall contain catalog cuts and specifications of all furnished mechanical and electrical equipment. After Architect / Engineer's approval, one (1) copy shall remain in Architect / Engineer's file, one (1) kept at Department's office and one (1) kept at job site by Contractor for reference purposes.

C. Samples shall consist of physical examples furnished by Contractor in sufficient size and quantity to illustrate materials, equipment or workmanship, and to establish standards to compare the Work.
   1. Submit Samples in sufficient quantity (minimum of two (2)) to permit Architect / Engineer to make all necessary tests and of adequate size showing quality, type, color range, finish, and texture. Label each Sample stating material, type, color, thickness, size, project name, and Contractor's name.
   2. Submit transmittal letter requesting approval, and prepay transportation charges to Architect / Engineer's office on samples forwarded.
   3. Materials installed shall match approved Samples.

D. Contractor shall review Shop Drawings and place their dated stamp thereon to evidence their review and approval and shall submit with reasonable promptness and in orderly sequence to cause no delay in the Work or in work of any other contractor. At time of submission, Contractor shall inform Architect / Engineer in writing of any deviation in Shop Drawings or Samples from requirements of Construction Documents. Architect / Engineer will not consider partial lists.

E. Architect / Engineer will review and approve or reject Shop Drawings with reasonable promptness to cause no delay. Architect / Engineer's approval shall not relieve Contractor from responsibility for errors or omission in Shop Drawings.

F. Contractor shall not commence any work requiring Shop Drawing, Product Data or Sample submission until Architect / Engineer has approved submission. All such work shall be in accordance with approved Shop Drawings, Product Data and Samples.

G. Contractor shall keep on site of the Work, an approved or conformed copy of Shop Drawings and shall at all time give Department access thereto.

H. By stamping and submitting Shop Drawings, Product Data and Samples, Contractor thereby represents that he or she has or will determine and verify all field measurements, field construction criteria, materials, catalog numbers, and similar data and that he or she has checked and coordinated each Shop Drawing, Product Data and Sample with requirements of the Work and of Construction Documents. Architect / Engineer shall return without examination, Shop Drawings, Product Data and Samples not so noted.

I. All Shop Drawings from any one Contractor should be numbered consecutively and on cover sheet shall bear name and location of project, name of Contractor, date of submittal and date of each correction or revision and associated Specification section and page number.

5. CUTTING AND PATCHING

A. Contractor shall be responsible for all cutting, fitting or patching required to complete the Work or to make its parts fit together properly.

B. Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of County or separate contractors by cutting, patching or otherwise altering such construction, or by excavation. Contractor shall not cut or otherwise alter such construction by County or a separate contractor except with written consent of County and of such separate contractor; such consent shall not be unreasonably withheld. Contractor shall not withhold unreasonably from County or a separate contractor, Contractor's consent to cutting or otherwise altering the Work.

6. CLEANING UP

A. Contractor shall keep premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under Contract. Contractor shall remove from and about the Work waste materials, rubbish, Contractor's tools, construction equipment, machinery, and surplus materials at completion of the Work. Contractor shall maintain streets and sidewalks around the Work site in a clean condition. Contractor shall remove all spillage and prevent tracking of spillage arising from performance of the Work, into, out of, and within the Work site. Contractor shall establish a regular maintenance program of sweeping, vacuuming and / or hosing to minimize accumulation of dirt and dust upon such areas.

B. If Contractor fails to clean up as directed in Construction Documents, County may do so and shall charge Contractor cost thereof.

C. Contractor shall be responsible for broken windows and glass, and at completion of the Work shall replace such damaged or broken windows and glass. After replacing damaged or broken windows and glass, Contractor shall remove all labels, wash and polish both sides of all windows and glass.

D. In addition to general cleaning (sweeping, vacuuming and / or hosing, as is appropriate to work surface), Contractor shall perform following final cleaning for all trades at completion of the Work:
   1. Remove temporary protections;
   2. Remove marks, stains, fingerprints and other soil or dirt from painted, decorated and finished woodwork and wall surfaces;
   3. Remove spots, plaster, soil and paint from ceramic tile, marble and other finished materials, and wash or wipe clean;
   4. Clean fixtures, cabinet work and equipment, removing stains, paint, dirt and dust, and leave same in undamaged, new condition;
   5. Clean aluminum in accordance with recommendations of manufacturer; and
   6. Clean resilient floors thoroughly with a well-rinsed mop containing only enough moisture to clean off any surface dirt or dust and buff dry by machine to bring surfaces to sheen.

7. USE OF SITE

A. Contractor shall provide County and Architect / Engineer access to the Work under all circumstances.

B. Contractor shall confine operations at site to areas permitted by County, law, ordinance, permits and Construction Documents and shall not unreasonably encumber site with materials or equipment. Contractor shall assure free, convenient, unencumbered, direct and safe access to all properties adjacent to the Work for County, its employees, invitees and guests.

8. MATERIALS AND WORKMANSHIP

A. Contractor shall perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, necessary to complete the Work required by this Contract, within time specified, in accordance with provisions of Construction Documents.

B. All equipment and materials incorporated in the Work covered by this Contract are to be new; use recycled and / or recovered materials to extent that such use is technically and economically feasible. Recovered materials are products recovered from solid waste in form identical to original form for use that is same as, or similar to original use. Recycled materials are products manufactured from solid waste.

C. If requested, Contractor shall furnish satisfactory evidence as to kind and quality of construction materials proposed or used. Contractor shall furnish to Architect / Engineer, for approval, manufacturer name and model, performance capacities and other pertinent information of machinery, mechanical, electrical or other types of equipment, which Contractor plans to install.

D. If not otherwise provided, materials and labor called for in this Contract shall be provided and performed in accordance with established practice and standards recognized by Architects, Engineers, Department, and construction industry.

E. Reference to "Standard" specifications of any association or manufacturer, or codes of County authorities, intends most recent printed edition or catalog in effect on date that corresponds with date of Construction Documents.

F. Whenever reference is made in Specifications that work shall be "performed", "applied", in accordance with "manufacturer's directions or instructions", Contractor to whom those instructions are directed shall furnish three (3) printed copies of such instructions to Architect / Engineer before execution of the Work.

9. CONTRACTOR'S TITLE TO MATERIALS

A. Contractor or any subcontractor shall not purchase materials or supplies for the Work subject to any chattel mortgage or under conditional sale contract or other agreement by which seller retains interest. Contractor warrants that all materials and supplies used in the Work are free from all liens, claims or encumbrances and Contractor has good title to them.

10. "OR EQUAL" CLAUSE

A. Whenever equipment or materials are identified on Drawings or in Specifications by reference to manufacturer's or vendor's name, trade name, catalog number, and other identifying information, it is intended to establish a standard; and any equipment or material of other manufacturers and vendors which will perform adequately duties imposed by general design will be considered equally accepted provided equipment or material so proposed is, in opinion of Architect / Engineer, of equal substance and function. Architect / Engineer and Department shall provide written approval before Contractor may purchase or install it.

B. Equipment or materials of manufacturers, other than those named, may be used only upon following conditions:
   1. That, in opinion of Architect / Engineer and Department, proposed material or equipment item is fully equal or superior (in design, materials, construction, workmanship,

performance, finish, etc.) to named item. No compromise in quality level, however small, is acceptable.

2. That, in substituting materials or equipment, Contractor assumes responsibility for any changes in system or for modifications required in adjacent or related work to accommodate such substitution despite Architect / Engineer's and Department's approval, and all costs growing out of approval of "or equal" items shall be responsibility of Contractor. No extra costs resulting from such approval shall become responsibility of Department, Architect / Engineer or any other separate Contractor.
3. It shall be understood that use of materials or equipment other than those specified, or approved equal by Architect / Engineer and Department, shall constitute a violation of Contract, and that Architect / Engineer and Department shall have right to require removal of such materials or equipment and their replacement with specified materials or equipment at Contractor's expense.
4. Product and manufacturer named first in Specifications or on information shown on Drawings is basis of selection of manufactured items and equipment, particularly mechanical equipment. In using other than first named products or manufacturers, including those specified as additionally approved or acceptable, Contractor assumes responsibility for any changes in system and for modifications in any work required to accommodate them. Architect / Engineer's approval of such additionally acceptable products or manufacturers, either in Specifications or in an Addendum, does not relieve Contractor from obligation to coordinate such optional products with other Contractors, whose work may be affected by them, and to pay all additional costs resulting from their inclusion into the Work. Contractor's liability shall include payment of Architect / Engineer's fees for any additional services made necessary by or directly connected to such product changes. No extra costs resulting from such changes shall become responsibility of Department, Architect / Engineer or any other separate Contractor.

C. No request for approval of "or equal" materials will be entertained except from Contractor. Identify any request for substitution as substitution on Contractor's letter of transmittal and give reasons for substitution. Department may in its sole discretion allow substitutions of materials.

11. PATENTS AND ROYALTIES

A. If Contractor uses any design, device or material covered by letters, patent or copyright, it is mutually agreed and understood, that, without exception, contract prices shall include all royalties or costs arising from use of such design, device or materials, in any way involved in the Work.

B. Contractor shall indemnify and save harmless County from any and all claims for infringement by reason of use of such patent or copyright in connection with the Work agreed to be performed under this Contract, and shall indemnify County for any cost, expense or damage which it may be obliged to pay by reason of such infringement at any time during prosecution of the Work or after completion of the Work.

12. SURVEYS, PERMITS, REGULATIONS AND TAXES

A. Department will furnish to Contractor all site, topography and property surveys necessary for execution of the Work.

B. Contractor shall procure all permits, licenses and approvals necessary for execution of this Contract.

C. Contractor shall give all notices and comply with all State of Wisconsin, Federal and local laws, codes, rules and regulations relating to performance of the Work, protection of adjacent property, and maintenance of passageways, guard fences or other protective facilities.

D. Contractor shall pay all Sales, Consumer, Use and other similar taxes required by law.

E. Contractor shall promptly notify Architect / Engineer of any variances of Drawings or Specifications with that of any State of Wisconsin, federal or local law, code, rule or regulation. Upon such notification, Architect / Engineer will require correction of variance to comply with applicable law, code, rule or regulation at no additional cost to Contractor.

F. Work under this Contract shall comply with all applicable State of Wisconsin, Federal and local laws, codes and regulations.

G. Contractor shall pay charges for water, sewer and other utility connections made by municipalities where required by Specifications.

13. CONTRACTOR'S OBLIGATIONS AND SUPERINTENDENCE

A. Contractor shall provide and pay for all materials, labor, tools, equipment, transportation and superintendence necessary to execute, complete and deliver the Work within specified time. Contractor agrees to secure at their own expense all personnel necessary to carry out the Work. Such personnel shall not be deemed County employees nor shall they have or be deemed to have any direct contractual relationship with County.

B. Performance of any work necessary after regular working hours, on Sundays or Legal Holidays shall be without additional expense to County. Performance of any work at site at other than normal working hours must be coordinated with Public Works Project Engineer.

C. Contractor shall furnish, erect, maintain and remove such temporary works as may be required.

D. Contractor shall observe, comply with, and be subject to all terms, conditions, requirements and limitations of Construction Documents.

E. At the Work site, Contractor shall give personal superintendence to the Work or shall employ a construction superintendent or foreman, experienced in character of work covered by Contract, who shall have full authority to act for Contractor. Understand that such superintendent or foreman shall be acceptable to Architect / Engineer and Department.

F. Remove from project or take other corrective action upon notice from Architect / Engineer or Department for Contractor's employees whose work is considered by Architect / Engineer or Department to be unsatisfactory, careless, incompetent, unskilled or otherwise objectionable.

G. Contractor and subcontractors shall be required to conform to Labor Laws of State of Wisconsin and various acts amendatory and supplementary thereto and to other laws, ordinances and legal requirements applicable to the Work.

H. Presence and observation of the Work by Architect / Engineer or Public Works Project Engineer shall not relieve Contractor of any obligations.

14. WEATHER CONDITIONS

A. In event of temporary suspension of work, or during inclement weather, or whenever Architect / Engineer shall direct, Contractor shall, and shall cause subcontractors to protect carefully all work and materials against damage or injury from weather. If, in opinion of Architect / Engineer or Department, any work or materials that have been damaged or injured due to failure on part of Contractor or any subcontractors so to protect the Work, such materials shall be removed and replaced at expense of Contractor.

15. PROTECTION OF WORK AND PROPERTY

A. Contractor shall at all times safely guard County's property from injury or loss in connection with this Contract. Contractor shall at all times safely guard and protect the Work, and adjacent property, from damage. Contractor shall replace or make good any such damage, loss or injury unless such be caused directly by errors contained in Contract, or by County, or County's duly authorized representative.

B. Contractor may act in a diligent manner, without previous instructions from Architect / Engineer and / or Department, in an emergency that threatens loss or injury of property, or safety of life. Contractor shall notify Architect / Engineer and / or Department immediately thereafter. Promptly submit any claim for compensation by Contractor due to such extra work to Architect / Engineer and / or Department for approval as provided for in Article 18 herein.

16. INSPECTION AND TESTING OF MATERIALS

A. Authorized representatives and agents of County government shall have access at all times to the Work wherever it is in preparation or progress and Contractor shall provide facilities for such access and for inspection.

B. Should it be considered necessary or advisable at any time before final acceptance of the Work to make an examination of work already completed, by removing or tearing out same, Contractor shall upon request, promptly furnish all necessary facilities, labor and materials. If such work is found to be defective in any aspect, due to fault of Contractor or subcontractors thereof, Contractor shall assume all expenses of such examination and of satisfactory reconstruction. Contractor will be reimbursed for such examination and replacement in accordance with Article 18 - A.3., of these General Conditions of Contract if such work is found to meet requirements of Contract.

C. If Specifications, Architect / Engineer's, or Public Works Project Engineer's instructions require any work to be specially tested or approved, Contractor shall give Architect / Engineer and Public Works Project Engineer timely notice of its readiness for testing or inspection. Test all materials and equipment requiring testing in accordance with accepted or specified standards, as applicable. Architect / Engineer shall recommend laboratory or inspection agency and Department will select and pay for all initial laboratory inspection services. Should retesting be required, due to failure of initial testing, cost of such retesting shall be borne by Contractor.

D. Cost of any testing performed by manufacturers or Contractor for substantiating acceptability of proposed substitution of materials and equipment, or necessary conformance testing in conjunction with manufacturing processes or factory assemblage, shall be borne by Contractor or manufacturer responsible.

17. REPORTS, RECORDS AND DATA

A. Contractor shall submit to Architect / Engineer and Public Works Project Engineer such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, invoices, records and other data as either may request concerning work performed or to be performed under this Contract.

18. CHANGES IN THE WORK

A. Make no changes, except in cases of emergency, in the Work covered by approved Construction Documents without having prior written approval of Department. Charges or credits for the Work covered by approved change shall be determined by one of these methods:
   1. Unit bid prices previously approved.
   2. An agreed lump sum based on actual cost of:
      a) Labor, including foremen, and all fringe benefits that are associated with their wages.
      b) Materials entering permanently into the Work.
      c) Ownership or rental cost of construction tools and equipment during time of use on extra work.
      d) Power and consumable supplies for operation of power equipment.
      e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
      f) Social Security and old age and unemployment contributions.
      g) Add to cost under (2), fixed fee to be agreed upon, but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force. Fee shall be compensation to cover cost of supervision, overhead, bond, profit and any other general expense.
      h) On that portion of the Work under (2) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit and any other general expense.
      i) Department may require correct amount of costs with supporting vouchers; Contractor shall keep and present in such form as directed.
   3. Cost-plus work, with a not-to-exceed dollar limit, based on actual cost of:
      a) Labor, including foremen, and all fringe benefits that are associated with their wages.
      b) Materials entering permanently into the Work.
      c) Ownership or rental cost of construction tools and equipment during time of use on extra work. Rental cost cannot exceed fifty percent (50%) replacement value of rented equipment.
      d) Power and consumable supplies for operation of power equipment.
      e) Workmen's Compensation Insurance, Contractor's Public Liability and Property Damage Insurance, and Comprehensive Automobile Liability Insurance.
      f) Social Security and old age and unemployment contributions.
      g) To cost under (3), there shall be added a fixed fee to be agreed upon but not to exceed fifteen percent (15%) of actual cost of work performed with their own labor force. Fee shall be compensation to cover cost of supervision, overhead, bond, profit, and any other general expense.
      h) On that portion of the Work under (3) done under subcontract, Contractor may include not over seven and one-half percent (7½%) for supervision, overhead, bond, profit, and any other general expense.
      i) Contractor shall keep and present, in such form as directed, correct amount of cost together with such supporting vouchers as may be required by Department.

B. If Contractor claims that by any instructions given by Architect / Engineer, Department, by drawings or otherwise, regarding performance of the Work or furnishing of material under Contract, involves extra cost, Contractor shall give Department written notice of cost thereof within two (2) weeks after receipt of such instructions and in any event before proceeding to execute work, unless delay in executing work would endanger life or property.

C. No claim for extra work or cost shall be allowed unless it was done in pursuance of written Change Order from Architect / Engineer and approved by Department, as previously mentioned, and claim presented with payment request submitted after changed or extra work is completed.

D. Negotiation of cost for a change in the Work shall not be cause for Contractor to delay prosecution of the Work if Contractor has been authorized in writing by Public Works Project Engineer to proceed.

19. EXTRAS

A. Without invalidating Contract, Department may order extra work or make changes by altering, adding to or deducting from the Work, contract sum being adjusted in accordance with Article 18 herein.

20. TIME FOR COMPLETION

A. Contractor agrees that the Work shall be prosecuted regularly and diligently and complete the Work as stated in Construction Documents.

21. CORRECTION OF WORK

A. All work, all materials whether incorporated in the Work or not, and all processes of manufacture shall at all times and places be subject to inspection of Architect / Engineer and Public Works Project Engineer who shall be judge of quality and suitability of the Work, materials, and processes of manufacture for purposes for which they are used. Should they fail to meet Architect / Engineer's and Public Works Project Engineer's approval they shall be reconstructed, made good, replaced or corrected, by Contractor at Contractor's expense. Immediately remove all rejected material from site.

B. If Contractor defaults or neglects to carry out the Work in accordance with Construction Documents or fails to perform any provision of Contract, Department may, after ten (10) days' written notice to Contractor and without prejudice to any other remedy County may have, make good such deficiencies. In such case, an appropriate Change Order shall be issued deducting from Contractor's payments then or thereafter, cost of correcting such deficiencies, including cost of Architect / Engineer's additional services made necessary by such default, neglect or failure.

22. SUBSURFACE CONDITIONS FOUND DIFFERENT

A. If Contractor encounters subsurface or latent conditions at site materially differing from those shown on Drawings or indicated in Specifications, Contractor shall immediately give notice to Architect / Engineer and Public Works Project Engineer of such conditions before they are disturbed. Architect / Engineer will thereupon promptly investigate conditions, and if

Architect / Engineer finds that they materially differ from those shown on Drawings or indicated in Specifications, Architect / Engineer will at once make such changes as necessary, any increase or decrease of cost resulting from such changes to be adjusted in manner provided in above Article 18 entitled "Changes in the Work".

23. RIGHT OF THE DEPARTMENT TO TERMINATE CONTRACT

A. In event that any provisions of this Contract are violated by Contractor or by any subcontractors, County may serve written notice upon Contractor and Surety of its intention to terminate Contract, such notice to contain reasons for such intention to terminate Contract, and unless within ten (10) days after serving of such notice upon Contractor, such violation or delay shall cease and satisfactory arrangement or correction be made, Contract shall, upon expiration of said ten (10) days, cease and terminate.

B. In event of any such termination, County shall immediately serve notice thereof upon Surety and Contractor, and Surety shall have right to take over and perform Contract subject to County's approval; provided, however, that if Surety does not commence performance thereof within ten (10) days from date of mailing to such Surety of notice of termination, County may take over the Work and prosecute same to completion by Contract or by force account for account at expense of Contractor; Contractor and Surety shall be liable to County for any excess cost occasioned County thereby, and in such event County may take possession of and utilize in completing the Work, such materials and equipment as may be on the Work site and therefore necessary.

24. CONSTRUCTION SCHEDULE AND PERIODIC ESTIMATES

A. Contractor shall be responsible for Construction Schedule and coordination. Immediately after execution and delivery of Contract and before making first payment, Contractor shall notify all subcontractors to furnish all required information to develop a Construction Schedule. Contractor and all subcontractors associated with the Work shall furnish following information from each Division of Specifications:
   1. A list of construction activities;
   2. Start, finish and time required for completion of each activity;
   3. Sequential relationships between activities;
   4. Identify all long lead-time items, key events, meetings or activities such as required submittals, fabrication and delivery, procurement of materials, installation and testing;
   5. Weekly definition of extent of work and areas of activity for each trade or Subcontract; and
   6. Other information as determined by Public Works Project Engineer.

B. In addition to above requested items, Contractor shall request delivery dates for all County-furnished equipment, materials or labor. This shall include any work handled by Department under separate contracts such as asbestos abatement, air and water balancing, etc. Indicate on Construction Schedule these associated delivery and installation dates.

C. Progress Reporting:
   1. Contractor shall update and publish Construction Schedule on a monthly basis. Revisions to Schedule shall be by Contractor and made in same detail as original Schedule and accompanied by an explanation of reasons for revision; and shall be subject to approval by Department.

2. Failure of Contractor to keep Schedule in updated format shall result in County hiring a firm specializing in construction schedule development and deducting those costs associated with updating process from payments due Contractor.
3. Contractor shall submit show actual percentage of each activity completed, estimated future progress, and anticipated completion time.

D. Responsibility for timely completion requires:
1. Contractor and subcontractors understand that performance of each is interdependent upon performance of others.
2. Whenever it becomes apparent from current schedule, that phasing or progress completion dates will not be met, Contractor must take some or all following actions at no additional cost to County:
   a) Increase construction manpower in such quantities and crafts as will eliminate backlog of work.
   b) Increase number of working hours per shift, shifts per working day, working days per week, amount of construction equipment, or any combination of foregoing to eliminate backlog of work.
   c) Reschedule work (yet remain in conformance with Drawings and Specifications).
3. Prior to proceeding with any of above actions, Contractor shall notify Public Works Project Engineer.

E. Maintain current Construction Schedule at all times. Revise Construction Schedule in same detail as original and accompany with explanation of reasons for revision. Schedule shall be subject to approval by Architect / Engineer and Public Works Project Engineer.

25. PAYMENTS TO CONTRACTOR

A. Contractor shall provide:
1. Detailed estimate giving a complete breakdown of contract price by Specification Division; and
2. Periodic itemized estimates of work done for purpose of making partial payments thereon.

Submit these estimates for approval first to Architect / Engineer, then to Public Works Project Engineer. Costs employed in making up any of these schedules are for determining basis of partial payments and not considered as fixing a basis for additions to or deductions from Contract price.

B. County will make partial payments to Contractor for value, proportionate to amount of Contract, of all labor and material incorporated in the Work during preceding calendar month upon receipt of Application and Certificate for Payment form from Architect / Engineer and approval of Department.

C. Contractor shall submit for approval first to Architect / Engineer, and then to Public Works Project Engineer all Application and Certificate for Payment forms. If requested, Application and Certificate for Payment shall be supported by such additional evidence as may be required, showing Contractor's right to payment claimed.

D. Application and Certificate for Payment for preparatory work and materials delivered and suitably stored at site to be incorporated into the Work at some future period, will be given due consideration. Requesting payment for materials stored off site, may be rejected, however, if deemed essential for reasons of job progress, protection, or other sufficient cause, requests will be considered, conditional upon submission by Contractor of bills of sale, photographs and such other procedures as will adequately protect County's interest such as

storage in a bonded warehouse with adequate coverage. If there is any error in a payment, Contractor is obligated to notify Department immediately, but no longer than ten (10) days from receipt of payment.

E. Payments by County will be due within forty-five (45) days after receipt by Department of Application and Certificate for Payment.

F. County will retain five percent (5%) of each Application and Certificate for Payment until final completion and acceptance of all the Work covered by Contract. However, anytime after fifty percent (50%) of the Work has been furnished and installed at site, County will make remaining payments in full if Architect / Engineer and Public Works Project Engineer find that progress of the Work corresponds with Construction Schedule. If Architect / Engineer and Public Works Project Engineer find that progress of the Work does not correspond with Construction Schedule, County may retain up to ten percent (10%) of each Application and Certificate for Payment for the Work completed.

G. All material and work covered by partial payments made shall become sole property of County, but this provision shall not be construed as relieving Contractor from sole responsibility for care and protection of materials and work upon which payments have been made, or restoration of any damaged work, or as a waiver of right of County to require fulfillment of all of terms of Contract.

H. County will make final payment within sixty (60) days after final completion of the Work, and will constitute acceptance thereof.

I. County may make payment in full, including retained percentages and less authorized deductions, upon completion and acceptance of each Division where price is stated separately in Contract.

J. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit to this Department, as requested and with final application for payment for work under said contract, affidavit(s) as required to prove that all debts and claims against this Work are paid in full or otherwise satisfied, and give final evidence of release of all liens against the Work and County. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use “Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination” and “Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination” (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use “Dane County, Wisconsin Contractor Wage Affidavit”. Forms of such affidavits are included in Supplementary Conditions.

26. WITHHOLDING OF PAYMENTS

A. County, after having served written notice on said Contractor, may either pay directly any unpaid bills of which Department has written notice, or withhold from Contractor’s unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged; whereupon, payment to Contractor shall be resumed in accordance with terms of this Contract, but in no event shall these provisions be construed to impose any obligations upon County to either Contractor or Contractor’s Surety.

B. In paying any unpaid bills of Contractor, County shall be deemed agent of Contractor, and any payment so made by County, shall be considered as a payment made under Contract by

County to Contractor and County shall not be liable to Contractor for any such payment made in good faith.

C. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from all claims growing out of lawful demands of subcontractors, laborers, workmen, mechanics, material men, and furnishers of machinery and parts thereof, equipment, power tools, and all supplies, including commissary, incurred in performance of this Contract.

D. At Department's request, Contractor shall furnish satisfactory evidence that all obligations of nature designated above have been paid, discharged or waived.

27. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

A. Making of final payment shall constitute a waiver of all claims by County except those arising from:
   1. Unsettled lien;
   2. Faulty or defective work appearing after substantial completion;
   3. Failure of the Work to comply with requirements of Construction Documents; or
   4. Terms of any special guarantees required by Construction Documents.

B. Acceptance of final payment shall constitute a waiver of all claims by Contractor.

28. PAYMENTS BY CONTRACTOR

A. Contractor shall pay following not later than fifth (5^{th}) day following each payment received from County:
   1. All transportation and utility services rendered;
   2. All materials, tools, and other expendable equipment that have been delivered at site of the Work to extent of ninety percent (90%) of cost thereof, and balance of cost thereof when said balance is paid to Contractor; and
   3. Each subcontractor, respective amount allowed Contractor because of work performed by subcontractor to extent of subcontractor's interest therein.

29. CONTRACT SECURITY

A. Contractor shall furnish a Performance / Payment Bond in an amount at least equal to one hundred percent (100%) of Contract price as security for faithful performance of this Contract and payment of all persons performing labor on project under this Contract and furnishing materials in connection with this Contract.

B. Sample Performance / Payment Bond that Contractor will be required to execute is bound into these Construction Documents. Before construction Contract is consummated, completed Performance / Payment Bond must be approved by Department.

30. ASSIGNMENTS

A. Contractor shall not assign whole or any part of this Contract or any moneys due or to become due hereunder without written consent of Department. In case Contractor assigns all or any part of any moneys due or to become due under this Contract, instrument of assignment shall contain a clause substantially to effect that it is agreed that right of assignee

in and to any moneys due or to become due to Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for performance of the Work called for in this Contract.

31. MUTUAL RESPONSIBILITY OF CONTRACTORS

A. If, through acts of neglect on part of Contractor or any subcontractor shall suffer loss or damage on the Work, Contractor agrees to settle with such subcontractor by agreement or arbitration if such other subcontractor will so settle. If such subcontractor shall assert any claim against County on account of any damage alleged to have been sustained, Department shall notify Contractor, who shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives against any such claim.

32. SEPARATE CONTRACTS

A. Department may award other contracts for the Work and all Contractors shall fully cooperate with each other and carefully adjust their work to that provided under other contracts as may be directed by Department. No Contractor shall commit or permit any act that will interfere with performance of the Work by any other Contractor.

B. Contractor shall coordinate the Work with those of other Contractors. Cooperation will be required in arrangement for storage of materials and in detailed execution of the Work. Contractor, including subcontractors, shall keep informed of progress and detail work of others and shall notify Architect / Engineer or Department immediately of lack of progress or defective workmanship on part of others. Failure of Contractor to keep informed of the Work progressing on site and failure to give notice of lack of progress or defective workmanship by others shall be construed as acceptance by Contractor of status of the Work as being satisfactory for proper coordination with Contractor's own work.

33. SUBCONTRACTS

A. Contractor may use services of specialty subcontractors on those parts of the Work that, under normal contracting practices, are performed by specialty subcontractors.

B. Contractor shall not award any work to any subcontractor without prior approval of Department. Qualifications of subcontractors shall be same as qualifications of Contractor. Request for subcontractor approval shall be submitted to Department fifteen (15) days before start of subcontractor's work. If subcontractors are changed or added, Contractor shall notify Department in writing.

C. Contractor shall be as fully responsible to County for acts and omissions of subcontractors, and of persons either directly or indirectly employed by them, as Contractor is for acts and omissions of persons directly employed by Contractor.

D. Contractor shall cause appropriate provisions to be inserted in all subcontracts relative to the Work to bind subcontractors to Contractor by terms of General Conditions of Contract and other Construction Documents insofar as applicable to work of subcontractors and to give Contractor same power as regards terminating any subcontract that Department may exercise over Contractor under any provision of Construction Documents.

E. Nothing contained in this Contract shall create any contractual relation between any subcontractor and County.

F. Contractor shall insert in all subcontracts, Articles 26, 33, 43 and 45, respectively entitled: "Withholding of Payments", "Subcontracts", "Affirmative Action Provision and Minority / Women / Disadvantaged Business Enterprises", and "Minimum Wages", and shall further require all subcontractors to incorporate physically these same Articles in all subcontracts.

34. PUBLIC WORKS PROJECT ENGINEER'S AUTHORITY

A. Public Works Project Engineer shall:
   1. Administer and ensure compliance with Construction Documents;
   2. Provide responsible on-site observations of construction and have authority to request work and to stop work whenever necessary to insure proper enforcement of Construction Documents;
   3. Convene and chair project meetings and foreman's coordination meetings when necessary to coordinate resolution of conflicts between Contractors, Architects, Engineers, Consultants, and Department; and
   4. Check and inspect material, equipment and installation procedures of all trades for proper workmanship and for compliance with Drawings, Specifications and Shop Drawings, permit no material on project site that is not satisfactory and reject work not in compliance with Construction Documents.

35. ARCHITECT / ENGINEER'S AUTHORITY

A. Architect / Engineer is retained by, and is responsible to Department acting for County.

B. Architect / Engineer shall determine amount, quality, acceptability, and fitness of several kinds of work and materials that are provided under this Contract and shall decide all questions that may arise in relation to said work and construction thereof.

C. Architect / Engineer shall decide meaning and intent of any portion of Specifications and of any Drawings where they may be found obscure or be in dispute.

D. Architect / Engineer shall provide responsible observation of construction. Architect / Engineer has authority to stop the Work whenever such stoppage may be necessary to insure proper execution of Construction Documents.

E. Architect / Engineer shall be interpreter of conditions of Construction Documents and judge of its performance.

F. Within a reasonable time, Architect / Engineer shall make decisions on all matters relating to progress of the Work or interpretation of Construction Documents.

G. Architect / Engineer's decisions are subject to review by Public Works Project Engineer.

36. STATED ALLOWANCES

A. Stated allowances enumerated in Instructions to Bidders shall cover net cost of materials or equipment, and all applicable taxes. Contractor's cost of delivery and unloading at site, handling costs on site, labor, installation costs, overhead, profit and any other incidental costs shall be included in Contractor's bid, but not as a part of cash allowance.

B. Department will solicit at least two (2) bids on materials or equipment for which an allowance is stated and select on basis of lowest qualified responsible bid. Contractor will then be instructed to purchase "Allowed Materials". If actual price for purchasing "Allowed Materials", including taxes, is more or less than "Cash Allowance", Contract price shall be adjusted accordingly. Adjustment in Contract price shall not contain any cost items excluded from cash allowance.

37. ESTIMATES OF QUANTITIES

A. Whenever estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of Construction Documents, they are given for use in comparing bids and right is especially reserved to increase or diminish them as they may be deemed reasonably necessary or desirable by Department to complete the Work included in this Contract, and cost for such increase or diminution shall be adjusted in manner provided for in General Conditions of Contract Article 18 entitled "Changes in the Work".

38. LANDS AND RIGHTS-OF-WAY

A. Prior to start of construction, County shall furnish all land and rights-of-way necessary for carrying out and completion of the Work to be performed under this Contract.

39. GENERAL GUARANTEE

A. Neither final certificate of payment nor any provision in Construction Documents nor partial or entire occupancy of premises by County shall constitute an acceptance of work not done in accordance with Construction Documents or relieve Contractor of liability in respect to any expressed warranties or responsibility for faulty materials or workmanship.
   1. In no event shall making of any payment required by Contract constitute or be construed as a waiver by County of any breach of covenants of Contract or a waiver of any default of Contractor and making of any such payment by County while any such default or breach shall exist shall in no way impair or prejudice right of County with respect to recovery of damages or other remedy as a result of such breach or default.

B. Contractor shall remedy and make good all defective workmanship and materials and pay for any damage to other work resulting there from, which appear within a period of one (1) year from date of substantial completion, providing such defects are not clearly due to abuse or misuse by County. Department will give notice of observed defects with reasonable promptness.

C. Guarantee on work executed after certified date of substantial completion will begin on date when such work is inspected and approved by Architect / Engineer and Public Works Project Engineer.

D. Where guarantees or warrantees are required in sections of Specifications for periods in excess of one (1) year, such longer terms shall apply; however, Contractor's Performance / Payment bond shall not apply to any guarantee or warranty period in excess of one (1) year.

40. CONFLICTING CONDITIONS

A. Any provision in any of Construction Documents which may be in conflict or inconsistent with any Articles in these General Conditions of Contract or Supplementary Conditions shall be void to extent of such conflict or inconsistency.

B. In case of ambiguity or conflict between Drawings and Specifications, Specifications shall govern.

C. Printed dimensions shall be followed in preference to measurements by scale. Large-scale drawings take precedence over small-scale drawings. Dimensions on Drawings and details are subject to field measurements of adjacent work.

41. NOTICE AND SERVICE THEREOF

A. Any notice to Contractor from Department relative to any part of this Contract shall be in writing and considered delivered and service thereof completed, when said notice is posted, by certified or registered mail, to Contractor at Contractor's last given address, or delivered in person to said Contractor, or Contractor's authorized representative on the Work.

42. PROTECTION OF LIVES AND HEALTH

A. In order to protect lives and health of Contractor's employees under Contract, Contractor shall comply with all pertinent provisions of Wisconsin Administrative Code, Rules of Department of Commerce, relating to Safety and Health.

B. Contractor alone shall be responsible for safety, efficiency and adequacy of Contractor's tools, equipment and methods, and for any damage that may result from their failure or their improper construction, maintenance or operation.

43. AFFIRMATIVE ACTION PROVISION AND MINORITY / WOMEN / DISADVANTAGED BUSINESS ENTERPRISES

A. Affirmative Action Provisions.
   1. During term of their Contract, Contractor agrees not to discriminate on basis of race, religion, color, sex, handicap, age, sexual preference, marital status, physical appearance, or national origin against any person, whether a recipient of services (actual or potential), an employee, or an applicant for employment. Such equal opportunity shall include but not be limited to following: employment, upgrading, demotion, transfer, recruitment, advertising, layoff, termination, training, rates of pay, and any other form of compensation or level of service(s). Contractor agrees to post in conspicuous places, available to all employees, service recipients and applicants for this paragraph. Listing of prohibited bases for discrimination shall no be construed to amend in any fashion state or federal law setting forth additional bases and exceptions shall be permitted only to extent allowable in state or federal law.
   2. Contractor is subject to this Article only if Contractor has ten (10) or more employees and receives $10,000.00 or more in annual aggregate contracts with County. Contractor shall file and Affirmative Action Plan with Dane County Contract Compliance Officer in accord with Chapter 19 of Dane County Code of Ordinances. Such plan must be filed within fifteen (15) days of effective date of this Contract and failure to do so by said date shall constitute ground for immediate termination of Contract by County. Contractor shall also, during term of this Contract, provide copies of all announcements of employment opportunities to County's Contract Compliance Office, and shall report

annually number of persons, by race, sex and handicap status, who apply for employment and, similarly classified, number hired and number rejected.

3. Contact Dane County Contract Compliance Officer at Dane County Contract Compliance Office, 210 Martin Luther King, Jr. Blvd., Room 421, Madison, WI 53703, 608/266-4114.
4. In all solicitations for employment placed on Contractor's behalf during term of this Contract, Contractor shall include a statement to effect Contractor is an "Equal Opportunity Employer". Contractor agrees to furnish all information and reports required by County's Contract Compliance Officer as same relate to affirmative action and nondiscrimination, which may include any books, records, or accounts deemed appropriate to determine compliance with Chapter 19, Dane County Code of Ordinances, and provision of this Contract.

B. Minority / Women / Disadvantaged / Emerging Small Business Enterprises.
   1. Chapter 19.508 of Dane County Code of Ordinances is official policy of Dane County regarding utilization of, to fullest extent of, Minority Business Enterprises (MBEs), Women Business Enterprises (WBEs) Disadvantage Business Enterprises (DBEs) and Emerging Small Business Enterprises (ESBEs).
   2. Contractor may utilize MBEs / WBEs / DBEs / ESBEs as subcontractors or suppliers. A list of subcontractors will be required of low bidder as stated in this Contract. List shall indicate which are MBEs / WBEs / DBEs / ESBEs and percentage of subcontract awarded, shown as a percentage of total dollar amount of bid.

44. USE AND OCCUPANCY PRIOR TO ACCEPTANCE

A. Contractor agrees to use and occupancy of a portion or unit of the Work before formal acceptance by Department, provided Department:
   1. Secures written consent of Contractor; except when in opinion of Public Works Project Engineer, Contractor is chargeable with unwarranted delay in final cleanup of punch list items or other Contract requirements.
   2. Secures endorsement from insurance carrier and consent of Surety permitting occupancy of building or use of the Work during remaining period of construction, or, secures consent of Surety.
   3. Assumes all costs and maintenance of heat, electricity and water.
   4. Accepts all work completed within that portion or unit of the Work to be occupied, at time of occupancy.

45. MINIMUM WAGES

A. Contractor shall post, at appropriate conspicuous point on site of project, a schedule showing all determined minimum wage rates for various classes of laborers and mechanics to be engaged in the Work under this Contract and all deductions, if any, required by law to be made from unpaid wages actually earned by laborers and mechanics so engaged.

B. Supplementary Conditions section in Construction Documents lists wage determinations required by State Law.

C. If, after award of Contract, it becomes necessary to employ any person in a trade or occupation not classified in wage determinations, such person shall be paid at not less than such rate as shall be determined by Wisconsin Department of Workforce Development. Such approved minimum rate shall be retroactive to time of initial employment of such person in such trade or occupation. Contractor shall notify Department of Contractor's intention to

employ persons in trades or occupations not so classified in sufficient time for Department to obtain approved rates for such trades or occupations.

D. Specified wage rates are minimum rates only, and Department will not consider any claims for additional compensation made by Contractor because of payment by Contractor of any wage rate in excess of applicable rate contained in this Contract. Contractor shall adjust any disputes in regard to payment of wages in excess of those specified in this Contract.

E. Submit required affidavit(s) to Department of Public Works, Highway & Transportation, as requested and with final application for payment for work under said contract. Affidavit(s) shall clearly indicate name, trade or occupation, and paid wages of every laborer, workman or mechanic employed by Contractor and all subcontractors during billing period including accurate record of number of hours worked by each employee and actual wages paid as stipulated in Wisconsin Statue 66.0903. If Wisconsin Prevailing Wage Rate Determination is required for this Work, use "Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination" and "Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination" (if applicable). If Wisconsin Prevailing Wage Rate Determination is not required for this Work, use "Dane County, Wisconsin Contractor Wage Affidavit". Forms of such affidavits are included in Supplementary Conditions.

46. BLANK

A. This Article 46 intentionally left blank.

47. CLAIMS

A. No claim may be made until Department's Associate Public Works Director has reviewed Architect / Engineer's decision as provided for in Article 35 of General Conditions of Contract. If any claim remains unresolved after such review by Department's Associate Public Works Director, claim may be filed under Wisconsin Statute 893.80. Work shall progress during period of any dispute or claim. Unless specifically agreed between parties, venue will be in Dane County, Wisconsin.

48. ANTITRUST AGREEMENT

A. Contractor and County recognize that in actual economic practice, overcharges resulting from antitrust violations are in fact usually borne by County. Therefore, Contractor hereby assigns to County any and all claims for such overcharges as to goods and materials purchased in connection with this Contract, except as to overcharges which result from antitrust violations commencing after price is established under this Contract and any change order thereto.

49. INSURANCE

A. Contractor Carried Insurance:
   1. Contractor shall not commence work under this Contract until Contractor has obtained all insurance required under this Article and has provided evidence of such insurance to Risk Manager, 425 City-County Building, 210 Martin Luther King Jr. Blvd., Madison, WI 53703. Contractor shall not allow any subcontractor to commence work until insurance required of subcontractor has been so obtained and approved. Company providing insurance must be licensed to do business in Wisconsin.
   2. Worker's Compensation Insurance:

a) Contractor shall procure and shall maintain during life of this Contract, Worker's Compensation Insurance as required by statute for all of Contractor's employees engaged in work at site of project under this Contract and, in case of any such work sublet, Contractor shall require subcontractor similarly to provide Worker's Compensation Insurance for all of latter's employees to be engaged in such work unless such employees are covered by protection afforded by Contractor's Worker's Compensation Insurance.

b) If any claim of employees engaged in hazardous work on project under this Contract is not protected under Worker's Compensation Statute, Contractor shall provide and shall cause each subcontractor to provide adequate Employer's Liability Insurance for protection of such of Contractor's employees as are not otherwise protected.

3. Contractor's Public Liability and Property Damage Insurance:

a) Contractor shall procure and maintain during life of this Contract, Contractor's Public Liability Insurance and Contractor's Property Damage Insurance in an amount not less than $1,000,000 bodily injury, including accidental death, to any one person, and subject to same limit for each person, in an amount not less than $1,000,000 on account of one accident, and Contractor's Property Damage Insurance in an amount not less then $1,000,000 or a combined single limit of at least $1,000,000 with excess coverage over and above general liability in an amount not less than $5,000,000. Contractor shall add "Dane County" as an additional insured for each project.

b) Contractor's Public Liability and Property Damage Insurance shall include Products, Completed Operation, and Contractual Liability under Insurance Contract. Contractual Liability coverage shall be carried in (substantially) following form: "Insurance shall in all instances save, defend, indemnify and hold harmless County and Architect / Engineer against all claims, demands, liabilities, damages or any other costs which may accrue in prosecution of the Work and that insurance will save, defend, indemnify and hold harmless County and Architect / Engineer from all damages caused by or as a result of Contractor's operations" and each shall be listed as additional insured.

c) Obligations of Contractor under Article 49.A.2)b) shall not extend to liability of Architect / Engineer, agents or employees thereof, arising out of:

1) Preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications; or

2) Giving of or failure to give directions or instructions by Architect / Engineer, agents or employees thereof provided such giving or failure to give is primary cause of injury or damage.

d) Contractor shall procure and shall maintain during life of this Contract, Comprehensive Automobile Liability Insurance covering owned, non-owned and hired automobiles for limits of not less than $1,000,000 each accident single limit, bodily injury and property damage combined with excess coverage over and above general liability in an amount not less than $5,000,000.

e) Contractor shall either:

1) Require each subcontractor to procure and to maintain during life of subcontract, subcontractor's Public Liability Property Damage Insurance, and Comprehensive Automobile Liability Insurance of type and in same amount specified in preceding paragraphs; or

2) Insure activities of subcontractors in Contractor's own policy.

4. Scope of Insurance and Special Hazards: Insurance required under Article 49.A.2 hereof shall provide adequate protection for Contractor and subcontractors, respectively, against damage claims which may arise from operations under this Contract, whether such operation be by insured or by anyone directly or indirectly employed by insured and also against any of special hazards which may be encountered in performance of this Contract as enumerated in Supplementary Conditions.

5. Proof of Carriage of Insurance: Contractor shall furnish Risk Manager with certificates showing type, amount, class of operations covered, effective dates, dates of expiration of policies and "Dane County" listed as an additional insured. Such certificates shall also contain (substantially) following statement: "Insurance covered by this certificate will not be canceled or materially altered, except after ten (10) days written notice has been received by Risk Manager."

B. County Provided Protection:
   1. County shall provide a Builder's Risk policy when applicable to project. County's Risk Manager, upon Contractor's request, will make available terms of this policy. By executing this Contract, Contractor warrants it is familiar with terms of said policy.

C. Indemnification / Hold Harmless:
   1. Contractor shall indemnify, hold harmless and defend Dane County, its boards, commissions, agencies, officers, employees and representatives from and against all claims, damages, losses and expenses including attorneys' fees arising out of or resulting from performance of the Work, provided that any such claim, damage, loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including loss of use resulting therefrom, and is caused in whole or in part by any act or omission of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, regardless of whether or not it is caused in part by a part indemnified hereunder.
   2. In any and all claims against Dane County, its boards, commissions, agencies, officers, employees and representatives or by any employee of Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, indemnification obligation under this Contract shall not be limited in any way by any limitation on amount or type of damages, compensation or benefits payable by or for Contractor or any subcontractor under worker's compensation acts, disability benefits or other employee benefit acts.
   3. Obligations of Contractor under this Contract shall not extend to liability of Architect / Engineer, its agents or employees arising out of:
      a) Preparation or approval of maps, drawings, opinion, reports, surveys, change orders, designs or specifications; or
      b) Giving of or failure to give directions or instruction by Architect / Engineer, its agents or employees provided such giving or failure to give is primary cause of injury or damage.
   4. Dane County shall not be liable to Contractor for damages or delays resulting from work by third parties or by injunctions or other restraining orders obtained by third parties.

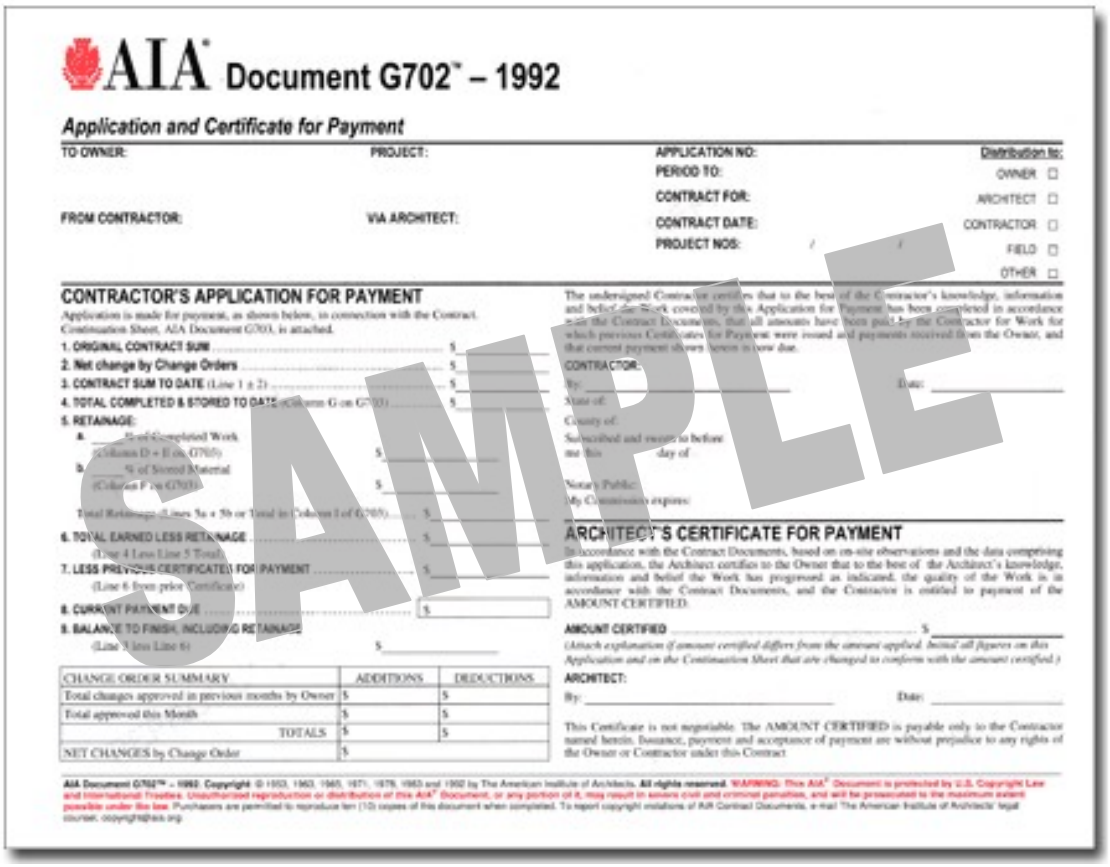
50. WISCONSIN LAW CONTROLLING

A. It is expressly understood and agreed to by parties hereto that in event of any disagreement or controversy between parties, Wisconsin law shall be controlling.

SUPPLEMENTARY CONDITIONS

1. APPLICATION & CERTIFICATE FOR PAYMENT

A. Every contractor engaged in performance of any contract for Department of Public Works, Highway & Transportation shall submit partial and final Application & Certificate for Payment for work under said contract. Form shall provide similar information as shown on AIA G702™ and G703™ forms (samples shown below). Forms shall be submitted to Public Works Project Engineer for approval.



AIA Document G702™ – 1992

Application and Certificate for Payment

TO OWNER: PROJECT: APPLICATION NO: Distribution to:
PERIOD TO: OWNER ☐
CONTRACT FOR: ARCHITECT ☐
FROM CONTRACTOR: VIA ARCHITECT: CONTRACT DATE: CONTRACTOR ☐
PROJECT NOS: / / FIELD ☐
OTHER ☐

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract. Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM ..... $
2. Net change by Change Orders ..... $
3. CONTRACT SUM TO DATE (Line 1 ± 2) ..... $
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703) ..... $
5. RETAINAGE:
   a. ____% of Completed Work (Column D + E on G703) $
   b. ____% of Stored Material (Column F on G703) $
   Total Retainage (Lines 5a + 5b or Total in Column I of G703) ..... $
6. TOTAL EARNED LESS RETAINAGE ..... $
   (Line 4 Less Line 5 Total)
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT ..... $
   (Line 6 from prior Certificate)
8. CURRENT PAYMENT DUE ..... $
9. BALANCE TO FINISH, INCLUDING RETAINAGE
   (Line 3 less Line 6) $

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	$	$
Total approved this Month	$	$
TOTALS	$	$
NET CHANGES by Change Order	$	

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:
By: Date:
State of:
County of:
Subscribed and sworn to before me this day of
Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising this application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED ..... $
(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

ARCHITECT:
By: Date:

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

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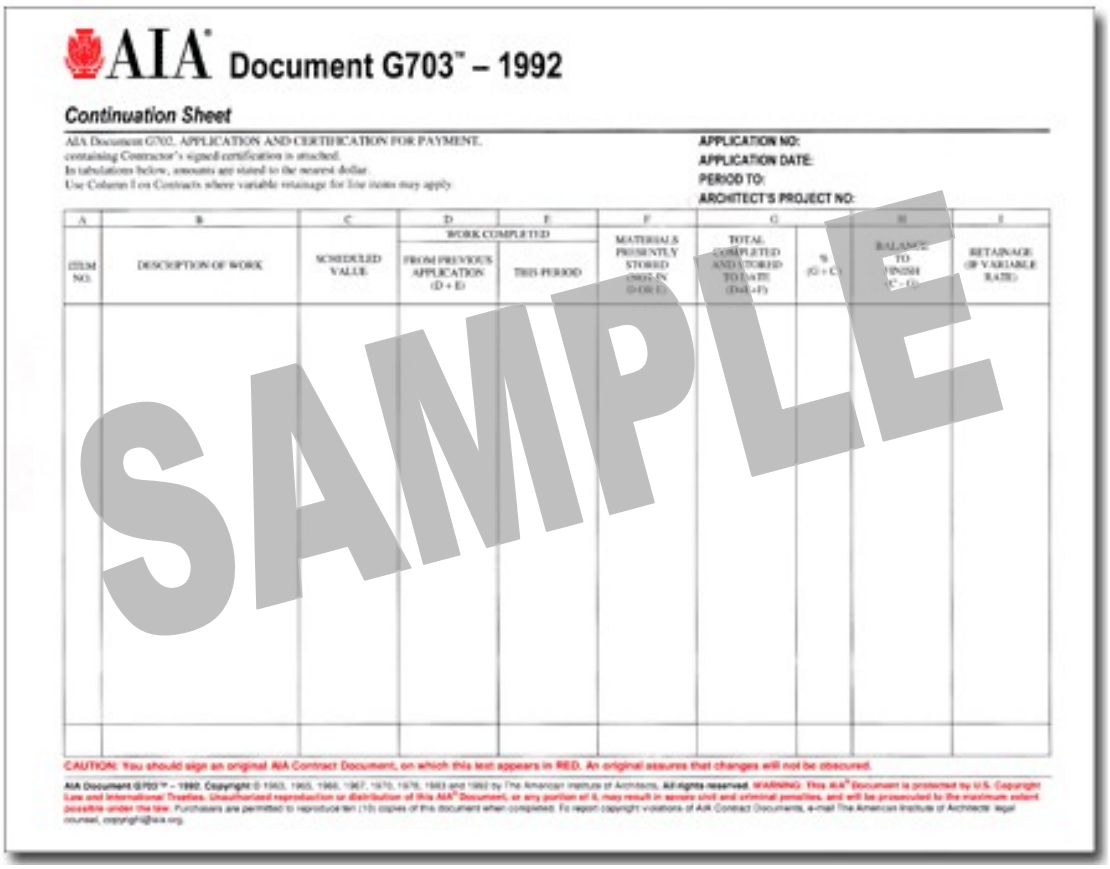

AIA Document G703™ – 1992

Continuation Sheet

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED: FROM PREVIOUS APPLICATION (D + E)	WORK COMPLETED: THIS PERIOD	MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)

SAMPLE

CAUTION: You should sign an original AIA Contract Document, on which this text appears in RED. An original assures that changes will not be obscured.

AIA Document G703™ – 1992. Copyright © 1963, 1965, 1966, 1967, 1970, 1978, 1983 and 1992 by The American Institute of Architects. All rights reserved. WARNING: This AIA® Document is protected by U.S. Copyright Law and International Treaties. Unauthorized reproduction or distribution of this AIA® Document, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law. Purchasers are permitted to reproduce ten (10) copies of this document when completed. To report copyright violations of AIA Contract Documents, e-mail The American Institute of Architects' legal counsel, copyright@aia.org.

2. PREVAILING WAGE RATE DETERMINATION

A. These supplements shall modify, delete, and / or add to General Conditions of Contract. Where any article, paragraph, or subparagraph in General Conditions of Contract is supplemented by one of these paragraphs, provisions of such article, paragraph, or subparagraph shall remain in effect and supplementary provisions shall be considered as added thereto. Where any article, paragraph, or subparagraph in General Conditions of Contract is amended, voided, or superseded by any of these paragraphs, provisions of such article, paragraph, or subparagraph not so amended, voided, or superseded shall remain in effect.
   1. General Conditions of Contract Article 45, "Minimum Wages", paragraph B. Following Prevailing Wage Rate Determination No. 200701188 added to General Conditions of Contract.

B. These State of Wisconsin forms, hereinafter set forth in this section, shall be filled out and submitted to Department of Public Works, Highway & Transportation:
   1. Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination (ERD-5724)
   2. Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination (ERD-10584)
   3. Disclosure of Ownership (ERD-7777)
   4. Request To Employ Subjourneyperson (ERD-10880)

Jim Doyle
Governor

Roberta Gassman
Secretary

Jennifer A. Ortiz
Division Administrator

EQUAL RIGHTS DIVISION
201 East Washington Avenue, Room A300
P.O. Box 8928
Madison, WI 53708
Telephone: (608) 266-6860
Fax: (608) 267-4592
TTY: (608) 264-8752
http://www.dwd.state.wi.us/

State of Wisconsin
Department of Workforce Development

DEPARTMENTAL ORDER

ROBERT J. NEBEL, ASSOC PUBLIC WORKS DIR
DANE CO PUBLIC WORKS
1919 ALLIANT ENERGY CTR WAY
MADISON, WI 53713

RE: SALT STORAGE FACILITIES - STH 151 & CTH X
Town of York, Dane Co, WI
Determination No. 200701188 Project No. 107088

The application which you filed or was filed on your behalf, by the person copied below, for a prevailing wage rate determination applicable to the above-referenced project has been received.

A survey was conducted to determine the prevailing wage rate for the trade(s) or occupation(s) needed to complete the project. The findings of the survey are set forth in the enclosed determination.

If you believe that the wage rate for any trade or occupation does not accurately reflect the prevailing wage rate in the city, village or town in which the project is located, you have the right to request the department to conduct an administrative review regarding such wage rate.

Your request must be made, in writing, within 30 days from the date indicated below and at least 10 days before the date a construction contract(s) is to be awarded or negotiated. Your request must also include wage rate information on at least three (3) similar projects located in the city, village or town where the proposed project is located on which some work was performed by the contested trade(s) or occupation(s) during the current survey period and which was previously considered by the department in issuing the enclosed determination. See s. DWD 290.10 of the Wisconsin Administrative Code and either s. 66.0903 (3)(br) or s. 103.49 (3)(c), Stats. for a complete explanation of the administrative review process.

Now, therefore, it is hereby ORDERED that the prevailing wage rates set forth in the enclosed determination shall only be applicable to the above referenced project. This ORDER shall be deemed a FINAL ORDER of this department unless a timely request for an administrative review is filed with the department or a construction contract(s) is not awarded or negotiated before the determination's expiration date.

DATED

8/24/2007

Enclosures

FOR THE DEPARTMENT

Julie Eckenwalder, Chief
Labor Standards Bureau
Construction Wage Standards Section
(608) 266-3148

PREVAILING WAGE RATE DETERMINATION

Issued by the State of Wisconsin
Department of Workforce Development
Pursuant to s. 66.0903, Stats.
Issued On: 8/24/2007

DETERMINATION NUMBER: 200701188

EXPIRATION DATE: Prime Contracts MUST Be Awarded Or Negotiated On Or Before 2/19/2008. If NOT, You MUST Reapply.

DESCRIPTION OF PROJECT: SALT STORAGE FACILITIES - STH 151 & CTH X
PROJECT NO: 107088

LOCATION OF PROJECT: Town of York, Dane Co, WI

CONTRACTING AGENCY: DANE CO PUBLIC WORKS

CLASSIFICATION: Contractors are required to call the Department of Workforce Development if there are any questions regarding the proper trade or classification to be used for any worker on a public works project.

OVERTIME: Time and one-half must be paid for all hours worked over 10 hours per day and 40 hours per calendar week and for all hours worked on Saturday, Sunday and the following six (6) holidays: January 1; the last Monday in May; July 4; the 1st Monday in September; the 4th Thursday in November; December 25; the day before if January 1, July 4 or December 25 falls on a Saturday; the day following if January 1, July 4 or December 25 falls on a Sunday.

FUTURE INCREASE: If indicated for a specific trade or occupation, the full amount of such increase MUST be added to the "TOTAL" indicated for such trade or occupation on the date(s) such increase(s) becomes effective.

PREMIUM PAY: If indicated for a specific trade or occupation, the full amount of such pay MUST be added to the "HOURLY BASIC RATE OF PAY" indicated for such trade or occupation, whenever such pay is applicable.

SUBJOURNEY: Wage rates may be available for some of the classifications indicated below with the exception of laborers, truck drivers and heavy equipment operators. Any employer that desires to use any subjourney classification on this project MUST request the applicable wage rate from this department PRIOR to the date such classification is used on this project. Form ERD-10880 is available for this purpose.

BUILDING OR HEAVY CONSTRUCTION

Includes sheltered enclosures with walk-in access for the purpose of housing persons, employees, machinery, equipment or supplies and non-sheltered work such as canals, dams, dikes, reservoirs, storage tanks, etc. A sheltered enclosure need not be "habitable" in order to be considered a building. The installation of machinery and/or equipment, both above and below grade level, does not change a project's character as a building. On-site grading, utility work and landscaping are included within this definition. Residential buildings of four (4) stories or less, agricultural buildings, parking lots and driveways are NOT included within this definition.

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Acoustic Ceiling Tile Installer Future Increase(s): Add $1.35 on 5/27/07	25.51	12.11	37.62
Boilermaker	28.44	15.87	44.31
Bricklayer, Blocklayer or Stonemason Future Increase(s): Add $1.70/hr. 6/4/2007	28.41	12.81	41.22
Cabinet Installer Future Increase(s): Add $1.35 on 5/27/07	25.51	12.11	37.62
Carpenter Future Increase(s): Add $1.35 on 5/27/07	25.51	12.11	37.62
Carpet Layer or Soft Floor Coverer	24.91	11.32	36.23

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Cement Finisher	26.58	11.46	38.04
Drywall Taper or Finisher	23.40	9.80	33.20
Electrician Future Increase(s): Add $1.00 6/1/2007; Add $.65 12/1/2007	28.82	15.52	44.34
Elevator Constructor	36.39	19.23	55.62
Fence Erector	17.04	3.13	20.17
Fire Sprinkler Fitter	31.29	12.15	43.44
Glazier	32.62	6.03	38.65
Heat or Frost Insulator	29.80	14.25	44.05
Insulator (Batt or Blown)	21.22	9.87	31.09
Ironworker Future Increase(s): Add $1.65 6/1/2007.	28.05	14.31	42.36
Lather	24.91	8.38	33.29
Line Constructor (Electrical)	30.22	13.21	43.43
Marble Finisher	24.00	12.00	36.00
Marble Mason	30.00	12.00	42.00
Metal Building Erector	27.05	13.71	40.76
Millwright	26.51	3.77	30.28
Overhead Door Installer	24.16	11.02	35.18
Painter	23.10	11.19	34.29
Pavement Marking Operator	23.46	9.45	32.91
Piledriver Future Increase(s): Add $1.35 on 5/27/07	26.01	12.11	38.12
Pipeline Fuser or Welder (Gas or Utility)	38.25	14.05	52.30
Plasterer	24.18	11.48	35.66
Plumber Future Increase(s): Add $2.00/hr. 6/3/2007; Add $2.20/hr. 6/1/2008	31.90	11.44	43.34
Refrigeration Mechanic	32.15	11.71	43.86
Roofer or Waterproofer	26.00	6.79	32.79
Sheet Metal Worker	28.03	14.75	42.78
Steamfitter	33.85	11.01	44.86
Teledata Technician or Installer	20.30	10.01	30.31
Temperature Control Installer	34.00	6.04	40.04
Terrazzo Finisher	28.42	11.12	39.54
Terrazzo Mechanic	25.65	11.62	37.27
Tile Finisher	15.00	2.45	17.45
Tile Setter Future Increase(s): Add $1.62 6/1/2007	26.62	12.27	38.89
Tuckpointer, Caulker or Cleaner	28.43	13.58	42.01
Underwater Diver (Except on Great Lakes)	37.47	12.90	50.37
Well Driller or Pump Installer Future Increase(s): Add $1.55/hr. 9/1/2007; Add $1.60/hr. 9/1/2008.	22.52	13.35	35.87
Siding Installer	27.78	14.77	42.55
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	29.15	5.85	35.00

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY	27.32	14.65	41.97
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	16.00	8.00	24.00
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	19.64	10.14	29.78
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY	20.54	9.75	30.29
TRUCK DRIVERS			
Single Axle or Two Axle	27.83	12.03	39.86
Three or More Axle	22.09	10.05	32.14
Articulated, Euclid, Dumptor, Off Road Material Hauler	18.54	2.66	21.20
Pavement Marking Vehicle	18.87	9.39	28.26
Truck Mechanic	13.50	4.50	18.00
LABORERS			
General Laborer Future Increase(s): Add $1.30/hr. 6/7/2007 Premium Pay: Add $1.00/hr for certified welder; Add $.25/hr for mason tender	20.99	10.55	31.54
Asbestos Abatement Worker	19.81	9.64	29.45
Landscaper Future Increase(s): Add $1.45 on 6/1/07; Add $1.50 on 6/1/08; Add $1.35 on 6/1/09.	22.12	10.55	32.67
Gas or Utility Pipeline Laborer (Other Than Sewer and Water)	20.26	10.83	31.09
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	12.25	3.51	15.76
Railroad Track Laborer	11.50	3.59	15.09
HEAVY EQUIPMENT OPERATORS SITE PREPARATION, UTILITY AND LANDSCAPING WORK ONLY			
Crane; Backhoe (Track Type); Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5cu yards or more capacity; Power Subgrader; Asphalt Milling Machine; Boring Machine (Horizontal, Vertical or Directional); Air Track, Rotary or Percussion Drilling Machine; Trencher; Post Hole Digger or Driver; Tug or Launch (not performing work on the Great Lakes) Future Increase(s): Add $1.60 6/4/2007	27.59	15.40	42.99
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Broom or Sweeper; Environmental Burner Future Increase(s): Add $1.60 6/4/2007	27.59	15.40	42.99
Crusher, Screening or Wash Plant; Air Compressor (400 CFM or Over); Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	26.79	13.38	40.17
HEAVY EQUIPMENT OPERATORS EXCLUDING SITE PREPARATION, UTILITY, PAVING AND LANDSCAPING WORK			
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting	29.62	15.40	45.02

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over Future Increase(s): Add $1.60 6/4/2007 Premium Pay: Add $.50/hr for cranes with lifting capacity over 200 ton: Add $1.00/hr. at 300 ton; Add $1.50/hr at 400 ton; Add $2.00/hr at 500 ton.			
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Traveling Crane (Bridge Type); Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes) Future Increase(s): Add $1.60 6/4/2007 Premium Pay: Add $.25/hr for cranes with lifting capacity of 45 ton or over	28.62	15.40	44.02
Crane (Go-Devil Type) or Truck Mounted Hydraulic Crane (10 Tons or Under); Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Pump, Grout Pump or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Batch Plant; Power Subgrader; Concrete Spreader; Concrete Paver; Concrete Grinder or Planing Machine; Concrete Conveyor System; Concrete Slipform Placer; Curb and Gutter Machine; Roller (Over 5 Ton); Shouldering Machine; Boring Machine (Horizontal, Vertical or Directional); Air Track, Rotary or Percussion Drilling Machine; Straddle Carrier or Travel Lift; Forklift (Machinery Moving or Steel Erection); Manhoist or Elevator; Material or Stack Hoist; Trencher; Sideboom; Hydro-Blaster (10,000 PSI or Over); Post Hole Digger or Driver; Railroad Track Rail Leveling Machine, Tie Placer, Extractor, Tamper, Stone Leveler or Rehabilitation Equipment Future Increase(s): Add $1.60 6/4/2007	28.12	15.40	43.52
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Concrete Saw (Vermeer Type); Concrete Bump Cutter or Grooving Machine; Tining or Curing Machine; Roller (5 Tons or Under); Broom or Sweeper; Hoist (Tugger); Environmental Burner Future Increase(s): Add $1.60 6/4/2007	24.89	15.40	40.29
Crusher, Screening or Wash Plant; Air, Electric or Hydraulic Jacking System; Air Compressor (400 CFM or Over); Generator (150 KW or Over); Pump (3 Inch or Over) or Well Points; Refrigeration Plant or Freeze Machine; Skid Steer Loader (With or Without Attachments); Robotic Tool Carrier (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	29.15	5.85	35.00
Oiler; Forklift	24.09	14.10	38.19
Gas or Utility Pipeline, Except Sewer and Water (Primary Equipment) Future Increase(s): Add $1.88 11/1/2007.	30.89	16.03	46.92
Gas or Utility Pipeline, Except Sewer and Water (Secondary Equipment)	27.32	14.65	41.97
Fiber Optic Cable Equipment	24.18	11.45	35.63

LOCAL STREET OR MISCELLANEOUS PAVING CONSTRUCTION

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Includes roads, streets, alleys, trails, bridges, paths, racetracks, parking lots and driveways (except residential or agricultural), public sidewalks or other similar projects (excluding projects awarded by the Wisconsin Department of Transportation).			
Bricklayer, Blocklayer or Stonemason	27.36	12.26	39.62
Carpenter Future Increase(s): Add $1.35 on 5/27/07	25.51	12.11	37.62
Cement Finisher Future Increase(s): Add $1.60 on 6/1/07; Add $1.60 on 6/1/08; Add $1.60 on 6/1/09; Add $1.55 on 6/1/10; Add $1.00 6/ 1/ 11.	26.82	11.33	38.15
Electrician	28.39	15.90	44.29
Fence Erector	17.04	3.13	20.17
Ironworker Future Increase(s): Add $2.00 6/3/2007; Add $2.00 6/2/2008; Add $2.00 6/1/2009; Add $ 2.00 6/7/2010; Add $2.00 6/ 6/ 2011.	28.09	17.01	45.10
Line Constructor (Electrical)	30.22	13.21	43.43
Painter	20.85	7.34	28.19
Pavement Marking Operator	23.46	9.45	32.91
Piledriver	25.76	15.88	41.64
Roofer or Waterproofer	26.00	6.79	32.79
Teledata Technician or Installer	20.00	9.20	29.20
Tuckpointer, Caulker or Cleaner	28.43	13.58	42.01
Underwater Diver (Except on Great Lakes)	25.76	15.88	41.64
Heavy Equipment Operator - ELECTRICAL LINE CONSTRUCTION ONLY	18.00	2.99	20.99
Light Equipment Operator -ELECTRICAL LINE CONSTRUCTION ONLY Future Increase(s): Add $1.13/hr. 7/1/2007; Add $1.20/hr. 7/1/2008.	25.33	12.34	37.67
Heavy Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	21.15	10.57	31.72
Light Truck Driver - ELECTRICAL LINE CONSTRUCTION ONLY	19.64	10.14	29.78
Groundman - ELECTRICAL LINE CONSTRUCTION ONLY Future Increase(s): Add $.78/hr. 7/1/2007; Add $.82/hr. 7/1/2008	17.41	9.96	27.37
TRUCK DRIVERS			
Single Axle or Two Axle	14.95	4.36	19.31
Three or More Axle	14.00	1.79	15.79
Articulated, Euclid, Dumptor, Off Road Material Hauler Future Increase(s): Add $1.60 6/4/2007	27.59	15.40	42.99
Pavement Marking Vehicle	18.87	9.39	28.26
Shadow or Pilot Vehicle	14.95	4.36	19.31
Truck Mechanic	13.00	0.00	13.00
LABORERS			
General Laborer	21.80	9.56	31.36
Landscaper	21.52	10.14	31.66
Flagperson or Traffic Control Person	15.49	11.12	26.61

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Fiber Optic Laborer (Outside, Other Than Concrete Encased)	14.00	0.32	14.32
Railroad Track Laborer	11.50	3.59	15.09
HEAVY EQUIPMENT OPERATORS CONCRETE PAVEMENT OR BRIDGE WORK ONLY			
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over	28.27	14.50	42.77
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes) Future Increase(s): Add $1.95 6/1/2007; Add $2.05 6/1/2008 Premium Pay: Crane Operators with CCO certification add $.35/hr. Add addn'l $.15/hr 6/1/2007. Cranes with boom legnth over 200ft. not exceeding 300 ft. OR lifting capacity over 200 ton not exceeding 300 ton add $.50/hr. Over 300 ton OR 300 ft. add $.01/hr. per foot OR ton whichever is greater.	31.81	15.70	47.51
Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self Propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Pump, Grout Pump or Concrete Conveyor (Rotec or Bidwell Type); Concrete Breaker (Manual or Remote); Concrete Batch Plant; Power Subgrader; Concrete Spreader; Concrete Paver; Concrete Grinder or Planing Machine; Concrete Conveyor System; Concrete Slipform Placer; Curb and Gutter Machine; Air Track, Rotary or Percussion Drilling Machine; Straddle Carrier or Travel Lift; Trencher; Post Hole Digger or Driver; Tug or Launch (Not Performing Work on the Great Lakes) Future Increase(s): Add $1.60 on 6/1/07; Add $1.65 on 6/1/08	27.71	15.35	43.06
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Concrete Saw (Vermeer Type); Concrete Bump Cutter or Grooving Machine; Tining or Curing Machine; Environmental Burner	27.01	14.50	41.51
Oiler; Crusher, Screening or Wash Plant; Air Compressor; Generator; Pump (3 Inch or Over) or Well Points; Forklift; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	26.72	14.55	41.27
Fiber Optic Cable Equipment	24.18	11.45	35.63
HEAVY EQUIPMENT OPERATORS ASPHALT PAVEMENT OR OTHER WORK			
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of Over 100 Tons; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 176 Feet or Over	28.27	14.50	42.77
Crane, Tower Crane or Derrick, With or Without Attachments, With a Lifting Capacity of 100 Tons or Under; Crane, Tower Crane or Derrick, With Boom, Leads and/or Jib Lengths Measuring 175 Feet or Under; Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of 130,000 Lbs. or Over; Caisson Rig; Pile Driver; Dredge (Not Performing Work on the Great Lakes) Future Increase(s): Add $1.60 on 6/1/07; Add $1.65 on 6/1/08	28.47	15.35	43.82

Fringe Benefits Must Be Paid On All Hours Worked TRADE OR OCCUPATION	HOURLY BASIC RATE OF PAY $	HOURLY FRINGE BENEFITS $	TOTAL $
Backhoe (Track Type) Having a Mfgr.'s Rated Capacity of Under 130,000 Lbs.; Tractor or Truck Mounted Hydraulic Backhoe; Gradall (Cruz-Aire Type); Mechanic or Welder; Bulldozer or Endloader; Grader or Motor Patrol; Scraper (Self propelled or Tractor Drawn) 5 cu yards or more capacity; Concrete Breaker (Manual or Remote); Power Subgrader; Concrete Grinder or Planing Machine; Concrete Slipform Placer; Curb and Gutter Machine; Asphalt Plant; Asphalt Paver; Asphalt Screed; Asphalt Milling Machine; Roller (Over 5 Ton); Shouldering Machine; Trencher; Post Hole Digger or Driver Future Increase(s): Add $1.60 6/4/2007	27.59	15.40	42.99
Farm or Industrial Type Tractor; Greaser; Compactor (Self-Propelled); Roller (5 Ton or Under); Broom or Sweeper; Environmental Burner Future Increase(s): Add $1.60 6/1/2007; Add $1.65 6/1/2008; Add $1.50 6/1/2009.	27.42	15.00	42.42
Oiler; Crusher, Screening or Wash Plant; Air Compressor; Generator; Pump (3 Inch or Over) or Well Points; Forklift; Skid Steer Loader (With or Without Attachments); Skid Rig; Stump Chipper; Mulcher; Vibratory Hammer or Extractor	22.30	14.58	36.88
Fiber Optic Cable Equipment	19.00	0.53	19.53

This document **MUST BE POSTED** by the **CONTRACTING AGENCY** in at least one conspicuous and easily accessible place **on the site of the project.** A local governmental unit may post this document at the place normally used to post public notices if there is no common site on the project. This document **MUST** remain posted during the entire time any worker is employed on the project and **MUST** be physically incorporated into the specifications and all contracts and most subcontracts. If you have any questions, please write to the Equal Rights Division, Labor Standards Bureau, P.O. Box 8928, Madison, Wisconsin 53708 or call (608) 266-3148.

The following statutory provisions apply to local governmental unit public works projects and are set forth below pursuant to the requirements of s. 66.0903 (8), Stats.

Each contractor, subcontractor or agent thereof performing work on a project that is subject to this section shall keep full and accurate records clearly indicating the name and trade or occupation of every person described in sub. (4) and an accurate record of the number of hours worked by each of those persons and the actual wages paid therefor.

Any contractor, subcontractor or agent thereof, who fails to pay the prevailing wage rate determined by the department under sub.(3) or who pays less than 1.5 times the hourly basic rate of pay for all hours worked in excess of the prevailing hours of labor determinded under sub.(3), shall be liable to any affected employe in the amount of his or her unpaid wages or his or her unpaid overtime compensation and in an additional equal amount as liquidated damages. An action to recover the liability may be maintained in any court of competent jurisdiction by any employe for and in behalf of that employe and other employes similarly situated. No employe may be a party plaintiff to any such action unless the employe consents in writing to become such a party and the consent is filed in the court in which the action is brought. Notwithstanding s. 814.04 (1), the court shall, in addition to any judgment awarded to the plaintiff, allow reasonable attorney fees and costs to be paid by the defendant.

DISCLAIMER

Effective May 1, 2007 employers performing work on public works construction projects in Wisconsin for municipal government and state building projects will be required to have a written substance abuse testing program in place. The provisions of this requirement are contained in Act 181. The Department of Workforce Development is not responsible for enforcement of this law or authorized to answer questions concerning the provisions of Act 181. For legal advice on complying with Act 181 you may wish to consult with a private attorney.

Date of enactment: **March 22, 2006**
2005 Assembly Bill 736 Date of publication*: **April 5, 2006**

2005 WISCONSIN ACT 181

AN ACT *to create* 103.503 of the statutes; **relating to:** substance abuse by employees who are required to be paid the prevailing wage rate for work performed on projects of public works, other than state highway projects.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1. 103.503 of the statutes is created to read:

103.503 Substance abuse prevention on public works projects. (1) DEFINITIONS. In this section:

(a) "Accident" means an incident caused, contributed to, or otherwise involving an employee that resulted or could have resulted in death, personal injury, or property damage and that occurred while the employee was performing the work described in s. 66.0903 (4) or 103.49 (2m) on a project.

(b) "Alcohol" has the meaning given in s. 340.01 (1q).

(c) "Contracting agency" means a local governmental unit, as defined in s. 66.0903 (1) (d), or a state agency, as defined in s. 103.49 (1) (f), that has contracted for the performance of work on a project.

(d) "Drug" means any controlled substance, as defined in s. 961.01 (4), or controlled substance analog, as defined in s. 961.01 (4m), for which testing is required by an employer under its substance abuse prevention program under this section.

(e) "Employee" means a laborer, worker, mechanic, or truck driver who performs the work described in s. 66.0903 (4) or 103.49 (2m) on a project.

(f) "Employer" means a contractor, subcontractor, or agent of a contractor or subcontractor that performs work on a project.

(g) "Project" mean a project of public works that is subject to s. 66.0903 or 103.49.

(2) SUBSTANCE ABUSE PROHIBITED. No employee may use, possess, attempt to possess, distribute, deliver, or be under the influence of a drug, or use or be under the influence of alcohol, while performing the work described in s. 66.0903 (4) or 103.49 (2m) on a project. An employee is considered to be under the influence of alcohol for purposes of this subsection if he or she has an alcohol concentration that is equal to or greater than the amount specified in s. 885.235 (1g) (d).

(3) SUBSTANCE ABUSE PREVENTION PROGRAMS REQUIRED. (a) Before an employer may commence work on a project, the employer shall have in place a written program for the prevention of substance abuse among its employees. At a minimum, the program shall include all of the following:

1. A prohibition against the actions or conditions specified in sub. (2).

2. A requirement that employees performing the work described in s. 66.0903 (4) or 103.49 (2m) on a project submit to random, reasonable suspicion, and post-accident drug and alcohol testing and to drug and alcohol

* Section 991.11, WISCONSIN STATUTES 2003–04 : Effective date of acts. "Every act and every portion of an act enacted by the legislature over the governor's partial veto which does not expressly prescribe the time when it takes effect shall take effect on the day after its date of publication as designated" by the secretary of state [the date of publication may not be more than 10 working days after the date of enactment].

testing before commencing work on a project, except that testing of an employee before commencing work on a project is not required if the employee has been participating in a random testing program during the 90 days preceding the date on which the employee commenced work on the project.

3. A procedure for notifying an employee who violates sub. (2), who tests positive for the presence of a drug in his or her system, or who refuses to submit to drug or alcohol testing as required under the program that the employee may not perform work on a project until he or she meets the conditions specified in sub. (4) (b) 1. and 2.

(b) Each employer shall be responsible for the cost of developing, implementing, and enforcing its substance abuse prevention program, including the cost of drug and alcohol testing of its employees under the program. The contracting agency is not responsible for that cost, for the cost of any medical review of a test result, or for any rehabilitation provided to an employee.

(4) EMPLOYEE ACCESS TO PROJECT. (a) No employer may permit an employee who violates sub. (2), who tests positive for the presence of a drug in his or her system, or who refuses to submit to drug or alcohol testing as required under the employer's substance abuse prevention program under sub. (3) to perform work on a project until he or she meets the conditions specified in par. (b) 1. and 2. An employer shall immediately remove an employee from work on a project if any of the following occurs:

1. The employee violates sub. (2), tests positive for the presence of a drug in his or her system, or refuses to submit to drug or alcohol testing as required under the employer's substance abuse prevention program.

2. An officer or employee of the contracting agency has a reasonable suspicion that the employee is in violation of sub. (2) and requests the employer to immediately remove the employee from work on the project.

(b) An employee who is barred or removed from work on a project under par. (a) may commence or return to work on the project upon his or her employer providing to the contracting agency documentation showing all of the following:

1. That the employee has tested negative for the presence of drugs in his or her system and is not under the influence of alcohol as described in sub. (2).

2. That the employee has been approved to commence or return to work on the project in accordance with the employer's substance abuse prevention program.

(c) Testing for the presence of drugs or alcohol in an employee's system and the handling of test specimens shall be conducted in accordance with guidelines for laboratory testing procedures and chain–of–custody procedures established by the substance abuse and mental health services administration of the federal department of health and human services.

(5) LOCAL ORDINANCES; STRICT CONFORMITY REQUIRED. A local governmental unit, as defined in s. 66.0903 (1) (d), may enact an ordinance regulating the conduct regulated under this section only if the ordinance strictly conforms to this section.

SECTION 2. **Initial applicability.**

(1) This act first applies to a contract to perform work on a project, as defined in section 103.503 (1) (g) of the statutes, as created by this act, for which bids are opened on the effective date of this subsection or, if bids are not solicited for the contract, to a contract to perform such work entered into on the effective date of this subsection, except that this This act first applies to an employee who is affected by a collective bargaining agreement that contains provisions inconsistent with this act on the day on which the collective bargaining agreement expires or is extended, modified, or renewed, whichever occurs first.

SECTION 3. **Effective date.**

(1) This act takes effect on the first day of the 13th month beginning after publication.

Consolidated List of Debarred Contractors
Prepared and Issued By
State of Wisconsin
Department of Workforce Development

This list has been prepared in accordance with the provisions of s. 66.0903(12) and s. 103.49(7), Stats. and Chapter DWD 294 of the Wisconsin Administrative Code. All contractors on this list were found to have committed a "debarable offense" related to certain labor standard provisions determined or established for a state or local public works project. No state agency or local governmental unit may knowingly solicit bids from, negotiate with or award any contracts to or approve or allow any subcontracts with a debarred contractor, including all divisions, affiliates or other organizational elements of such contractor that are engaged in construction business activities, until the debarment is terminated. The name of each debarred contractor must remain on this list for a period of three (3) years from the termination date indicated below. The contractor is, however, only "debarred" from the "effective date" through the "termination date" indicated for that contractor. Questions regarding this list should be addressed to Mike Dixon, Equal Rights Division, P. O. Box 8928, Madison, WI 53708 or call (608) 266-0028. Deaf, hearing or speech-impaired callers may contact the department by calling its TDD number (608) 264-8752.

Name of Contractor	Address	Effective Date	Termination Date	Cause Code	Date of Violation(s)	Limitations/Deviations
Bay Asphalt, Inc.	1792 Scray Hill Road De Pere, WI 54115	1/1/03	12/31/05	1, 2 and 4	1997-1999	None
Bechitsao, Joel	See Tri-State Traffic Services, Inc.					
B.P. Phillips Construction, Inc.	1570 Fire Lane Drive Green Bay, WI 54311	9/19/01	9/18/04	1, 2 and 4	4/7/97 to 3/7/98	None
Custom Heating & Air LLC	283 Tony Lane, Green Bay, WI 54304	12/1/06	11/30/09	1, 2 and 4	2003 to 2004	None
D. C. Nevels Trucking, Inc. or D. C. Nevels Trucking	3246 North Sherman Blvd., Milwaukee, WI 53216	6/1/05	5/31/08	1, 2 and 4	2000-2002	None
Gibralter Construction LLC	N60 W15080 Bobolink Ave., Menomonee Falls, WI 53051	12/1/06	4/30/07	1	2005	None
HGI Painting	P. O. Box 3481, Janesville, WI 53545	11/1/04	10/31/07	1, 2 and 4	2001, 2002 and 2003	None
Haim, James	See Haim Painting, Inc.					

Name of Contractor	Address	Effective Date	Termination Date	Cause Code	Date of Violation(s)	Limitations/Deviations
Haim Painting, Inc.	N15 W22120 Jerico Drive, #8 Waukesha, WI 53186	4/1/01	3/31/04	1, 2 and 4	7/6/97 to 10/30/98	None
Hedding, Matt	C/O HGI Painting, P. O. Box 3481, Janesville, WI 53545	11/1/04	10/31/07	1, 2 and 4	2001, 2002 and 2003	None
Jacobi, Sandi	See Wisconsin Detention Systems, Inc.					
Jacobi Sr., Michael A.	See Wisconsin Detention Systems, Inc.					
Joseph Stoller Company	N8426 Hwy 42	2/1/2007	1/31/2010	1, 2	2004 and 2005	None
J. R. Electric	2391 233rd St., P. O. Box 491, Cushing, WI 54006	1/1/03	12/31/05	1 and 2	1999	None
J. R. Electric, Inc.	2391 233rd St., P. O. Box 491, Cushing, WI 54006	1/1/03	12/31/05	1 and 2	1999	None
Keiver, David	See Custom Heating & Air LLC	12/1/06	11/30/09	1, 2 and 4	2003 and 2004	None
Kletschka, Richard	See J. R. Electric and J. R. Electric, Inc.					
Kletschka, Tristan	See J. R. Electric, Inc.					
Kruczek Construction, Inc.	3636 Kewaunee Road, Green Bay, Wi 54311	6/1/05	11/30/05	1 and 2	1998 and 1999	None
Kruczek, John	See Kruczek Construction, Inc.					
LaCosse, Todd	See Midwest Contractors, Inc.					

Name of Contractor	Address	Effective Date	Termination Date	Cause Code	Date of Violation(s)	Limitations/Deviations
Maria, Steve	See Gibralter Construction LLC					
Mellendez, Odilion	See Amigo Painting					
Midwest Contractors, Inc.	2100 Depot St., Holt, MI 48842	6/21/02	6/20/05	1	6/11/99 to 12/31/99	None
Nevels, Betty	See D. C. Nevels Truckng, Inc.					
Nevels, Donald	See D. C. Nevels Trucking, Inc.					
Phillips, Bruce P.	See B.P. Phillips Construction					
Rick's Painting & Drywall	P. O. Box 2316, Eagle River, WI 54521	3/1/03	2/28/06	1	5/8/00 to 4/30/01	None
Scandia Heating and Air Conditioning, Inc.	P. O. Box 7 Scandia, MN. 55703	5/1/2003	4/30/2004	1 and 2	2001	None
Stoller Enterprises LLC	N8426 Hwy 42, Algoma, WI 54201-9552	2/1/2007	1/31/2010	1 and 2	2005 to 2006	None
Stoller, Joseph	See Joseph Stoller Company					
Stoller, Patrick J.	See Stoller Enterprises LLC					
Strobel Construction, Inc..	P. O. Box 2316, Eagle River, WI 54521	3/1/03	2/28/06	1	5/8/00 to 4/30/01	None
Strobel, Diane	See Strobel Construction, Inc.					
Strobel, Rick	See Strobel Construction, Inc.					
Tri-State Traffic Services, Inc.	12555 West Burleigh Road #3, Brookfield, WI 53005	12/1/06	11/30/07	1, 2 and 4	2003-2004	None

Name of Contractor	Address	Effective Date	Termination Date	Cause Code	Date of Violation(s)	Limitations/Deviations
Wanta, Daniel	See Bay Asphalt, Inc.					
Wisconsin Detention Systems, Inc	.W204 N16635 Jackson Drive Jackson, Wisconsin 53037	1/1/03	12/31/05	1	9/2000 to 3/2001	None
West, James F.	See Scandia Heating and Air Conditioning, Inc.					
Zinke, Stacy	See Talex Contractors, Inc.					

Cause Code: 1 = Failure to Pay Straight Time 2 = Failure to Pay Overtime 3 = Kickback 4 = Payroll Records.

State of Wisconsin
Department of Workforce Development
Equal Rights Division
Labor Standards Bureau

Disclosure of Ownership

Notice required under Section 15.04(1)(m), Wisconsin Statutes. The statutory authority for the use of this form is prescribed in Sections 66.0903(12)(d) and 103.49(7)(d), Wisconsin Statutes. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes. Personal information you provide may be used for secondary purposes

(1) On the date a contractor submits a bid to or completes negotiations with a state agency or local governmental unit, on a project subject to Section 66.0903 or 103.49, Wisconsin Statutes, the contractor shall disclose to such state agency or local governmental unit the name of any "other construction business", which the contractor, or a shareholder, officer or partner of the contractor, owns or has owned within the preceding three (3) years.

(2) The term "other construction business" means any business engaged in the erection, construction, remodeling, repairing, demolition, altering or painting and decorating of buildings, structures or facilities. It also means any business engaged in supplying mineral aggregate, or hauling excavated material or spoil as provided by Sections 66.0903(3), 103.49(2) and 103.50(2), Wisconsin Statutes.

(3) This form must ONLY be filed, with the state agency or local governmental unit that will be awarding the contract, if **both (A) and (B) are met**.

(A) The contractor, or a shareholder, officer or partner of the contractor:

(1) Owns at least a 25% interest in the "other construction business", indicated below, on the date the contractor submits a bid or completes negotiations.

(2) Or has owned at least a 25% interest in the "other construction business" at any time within the preceding three (3) years.

(B) The Wisconsin Department of Workforce Development (DWD) has determined that the "other construction business" has failed to pay the prevailing wage rate or time and one-half the required hourly basic rate of pay, for hours worked in excess of the prevailing hours of labor, to any employee at any time within the preceding three (3) years.

Other Construction Business

Name of Business			
Street Address or P O Box	City	State	Zip Code
Name of Business			
Street Address or P O Box	City	State	Zip Code
Name of Business			
Street Address or P O Box	City	State	Zip Code
Name of Business			
Street Address or P O Box	City	State	Zip Code

I hereby state under penalty of perjury that the information, contained in this document, is true and accurate according to my knowledge and belief.

Print the Name of Authorized Officer			
Signature of Authorized Officer	Date Signed		
Name of Corporation, Partnership or Sole Proprietorship			
Street Address	City	State	Zip Code

If you have any questions call (608) 266-0028

State of Wisconsin
Department of Workforce Development
Equal Rights Division
Labor Standards Bureau

Prime Contractor Affidavit of Compliance With Prevailing Wage Rate Determination

NOTICE REQUIRED UNDER Section 15.04(1) (m), Wisconsin Statutes. Authorization for this form is provided under Sections, 66.0903(9) (b) and 103.49(4r) (9b) Wisconsin Statutes. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes. Personally identifiable information may be used for secondary purposes.

This form must **ONLY** be filed with the **Awarding Agency** indicated below.

State Of_____))SS County Of _____)	Project Name	
	Project Number	Determination Number
	Date Determination Issued	Date of Contract
	Awarding Agency	
	Date Work Completed	

After being duly sworn, the person whose name and signature appears below hereby states under penalty of perjury that

- **I am** the duly authorized officer of the corporation, partnership, sole proprietorship or business indicated below and have recently completed all of the work required under the terms and conditions of a contract with the above-named awarding agency and make this affidavit in accordance with the requirements set forth in Section 66.0903(9)(c) or 103.49(4r)(c), Wisconsin Statutes and Chapter DWD 290 of the Wisconsin Administrative Code in order to obtain FINAL PAYMENT from such awarding agency.
- **I have** fully complied with all of the wage and hour requirements applicable to this project, including all of the requirements set forth in the prevailing wage rate determination indicated above which was issued for such project by the Department of Workforce Development on the date indicated above.
- **I have** received the required affidavit of compliance from each of my agents and subcontractors that performed work on this project and have listed each of their names and addresses on page 2 of this affidavit.
- **I have** full and accurate records that clearly indicate the name and trade or occupation of every worker(s) that I employed on this project, including an accurate record of the hours worked and actual wages paid to such worker(s).
- **I will** retain the records and affidavit(s) described above and make them available for inspection for a period of at least three (3) years from the completion date indicated above at the address indicated below and shall not remove such records or affidavit(s) without prior notification to the awarding agency indicated above.

Name of Corporation, Partnership, Sole Proprietorship or Business				
Street Address or P O Box	City	State	Zip Code	Telephone Number ( )
Print Name of Authorized Officer			Date Signed	
Signature of Authorized Officer				

List of Agents and Subcontractors

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		

If you have any questions call (608) 266-0028

State of Wisconsin
Department of Workforce Development
Equal Rights Division
Labor Standards Bureau

Application for Prevailing Wage Rate Determination Issued By the Department of Workforce Development

FOR DWD USE ONLY

Personal information you provide may be used for secondary purposes. See Section15.04 (1)(m), Wisconsin Statutes for details.
The STATUTORY AUTHORITY for the use of this form is specified in Sections 66.0903 and 103.49, Wisconsin Statutes, and Chapter DWD 290 of the Wisconsin Administrative Code.
The use of this form is mandatory. If you have questions, call (608) 266-6860.

All pages of this form MUST be completed or the application will be returned.
Mail one original copy to Equal Rights Division, P O BOX 8928 MADISON WI 53708.
Applications may not be faxed.
APPLY EARLY! Allow 30 days to have your application processed.

1. Date of Request	2. Desired Date of Receipt	3. Prior Determination Number Issued For This Project

4. Project Name	5. Project Number

6. Estimated Cost of Completion. **Effective January 1, 2007**, the TOTAL cost (labor, equipment and material) of completing a single-trade project must be $44,000 or more, and the TOTAL cost (labor, equipment and material) of a multiple-trade project must be $216,000 or more. A "single trade project" is defined as one in which a single trade accounts for 85% or more of the total labor cost of such project. A "multiple-trade project" is defined as one in which no single trade accounts for more than 85% of the total labor cost of such project. Indicate the estimated cost for each of the following:

Site Work	General Construction	HVAC
Plumbing	Electrical	Landscaping
Painting & Decorating	Roofing	Concrete Pavement
Asphalt Pavement	Storm Sewer	Sanitary Sewer
Water Main	Furnishings	Miscellaneous
		TOTAL COST

7. Indicate EXACT Location of Project (Specify the County and then ONLY the City, Village or Township):
County

☐ City Of	☐ Village Of	☐ Township Of

8. State Agency or Local Government Unit Who is Soliciting Bids or Negotiating Contracts	For Department Use Only ☐ Section 66.0903, Wisconsin Statutes ☐ Section 103.49, Wisconsin Statutes

9. Project Will Be ☐ Bid ☐ Negotiated	10. Bid(s) Will Be Taken By ☐ Single Base Bid ☐ Multiple Base Bids ☐ Separate Bids ☐ Other	
11. Advertising Will Begin On	12. Bid(s) Will Be Opened or Negotiated On	13. Contract(s) Will Be Awarded On
14. Work Will Start On	15. Work Will Be Completed On	

16. Will the federal government, or any of its agencies, furnish by loan or grant any part of the funds used for this project?
☐ Yes ☐ No
If yes, will the federal government also prescribe a schedule of Prevailing Wage Rates?
☐ Yes ☐ No

You Must Complete All 3 Pages of This Form

17. Name of Requestor to Whom a Copy of the Determination Should be Sent | Requestor's Signature

Requestor's Title | Organization | Telephone Number ( )

Requestor's Street Address | City | State | Zip Code

18. Name of State or Local Governmental Official to Whom the Determination Should be Sent

Title of State or Local Governmental Official

Name of State Agency or Local Governmental Unit | Telephone Number ( )

State or Local Governmental Official's Street Address | City | State | Zip Code

19. In the space below give a brief written description of the work to be performed on this project

_____

_____

_____

20. For projects involving a new building or addition to an existing building indicate the number of levels or stories

☐ 1 ☐ 2 ☐ 3 ☐ 4-9 ☐ 10 or more

Scope:

☐ New ☐ Addition ☐ Alteration ☐ Renovation ☐ Remodel ☐ Repair ☐ Demolition

21. Indicate size only if a new building or addition to an existing building

Square Feet or Cubic Feet

22. CONCRETE

☐ Poured Floor, Driveway, Yard, Road, Street ☐ Other Poured (Plain or Reinforced)

☐ Precast (Reinforced or Prestressed) ☐ Other (Specify)

23. MASONRY

☐ Brick ☐ Exterior Insulation Finish System ☐ Ceramic Tile

☐ Marble ☐ Masonry Caulking ☐ Plaster

☐ Tuckpointing ☐ Stone ☐ Block

☐ Terrazzo ☐ Other (Specify)

24. HEATING AND VENTILATION

☐ Hot Water ☐ Infrared ☐ Solar

☐ Steam ☐ Electric ☐ Warm Air

☐ Air Conditioning ☐ Other (Specify)

25. PIPING

☐ Finish Plumbing ☐ Process Piping ☐ Steamfitting

☐ Gas Piping ☐ Rough Connection to Septic or Disposal System ☐ Fire Sprinkler System

☐ Mechanical Insulation ☐ Rough Connection to Municipal System

☐ Refrigeration System ☐ Other (Specify)

26. ELECTRICAL

☐ High Voltage ☐ Traffic Signal ☐ Cable Plowing

☐ Low Voltage ☐ Street Lighting ☐ Voice or Video

☐ Cabling (Encased) ☐ Outdoor Lighting ☐ Telephone

☐ Fire Alarm ☐ Computer Wiring ☐ Other (Specify)

Service will be fed and controlled by(Check one):

☐ Overhead Wires or Cables ☐ Underground Wire or Cable

27. PAINTING AND DECORATING

☐ Brush ☐ Exterior Insulation Finish System ☐ Spray

☐ Pavement Marking ☐ Drywall Taping ☐ Roller

☐ Wallpaper ☐ Swing Stage Work ☐ Other (Specify)

☐ Sandblasting ☐ Lead Abatement

28. METALS
- ☐ Reinforcing, Structural, or Ornamental ironwork
- ☐ Sheet Metal
- ☐ Lashing
- ☐ Other (Specify)

29. ROOFING
- ☐ Asphalt Shingle
- ☐ Built-Up
- ☐ Precast Slab
- ☐ Standing Seam Metal
- ☐ Urethane Foam
- ☐ Elastomeric or Elastoplastic
- ☐ Slate or Tile
- ☐ Wood Shingle
- ☐ Other (Specify)

30. EXCAVATION AND OTHER SIMILAR WORK
- ☐ Building Excavation
- ☐ Hydraulic or Mech. Dredging
- ☐ Well Drilling
- ☐ Storm Sewer
- ☐ Sanitary Sewer or Water Main
- ☐ Marine Construction on Great Lakes
- ☐ Compressed Air Tunnel
- ☐ Bulk Excavation
- ☐ Pipe, Sheet or "H" Piling
- ☐ Footing or Foundation
- ☐ Trenching (# Lineal Ft. and Max. Depth)
- ☐ Clearing or Grubbing Land
- ☐ Caisson
- ☐ Demolition
- ☐ Rough Grading
- ☐ Free Air Tunnel
- ☐ Railroad
- ☐ Other (Specify)

31. SURFACING AND PAVEMENT
- ☐ Mineral Aggregate
- ☐ Bituminous
- ☐ Concrete

Number of Lineal Feet or Number of Square Feet or Number of Cubic Feet

32. LANDSCAPING
- ☐ Seeding
- ☐ Planting Trees, Shrubs, Bushes, etc
- ☐ Sodding
- ☐ Lawn Sprinkler
- ☐ Other (Specify)

33. OTHER WORK
- ☐ Carpenter
- ☐ Cabinetry
- ☐ Acoustical Ceiling Tile
- ☐ Lathing
- ☐ Elevator or Escalator
- ☐ Underwater Diving
- ☐ Overhead Door Installation
- ☐ Fence or Guard Rail
- ☐ Installation of Heavy Machinery or equipment
- ☐ Asbestos Removal or Abatement
- ☐ Dampproofing or Waterproofing
- ☐ Carpeting or Soft Tile
- ☐ Temperature Control
- ☐ Flagging or Traffic Control
- ☐ Batt or Blown Insulation
- ☐ Hazardous Material Removal (Except Asbestos)
- ☐ Glazing
- ☐ Siding
- ☐ Trucking
- ☐ Drywall Hanging
- ☐ Other (Specify)

State of Wisconsin
Department of Workforce Development
Equal Rights Division
Labor Standards Bureau

Agent or Subcontractor Affidavit of Compliance With Prevailing Wage Rate Determination

NOTICE REQUIRED UNDER Section 15.04(1)(m), Wisconsin Statutes. Authorization for this form is provided under Sections, 66.0903(9)(b) and 103.49(4r)(9b) Wisconsin Statutes. The use of this form is mandatory. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes. Personally identifiable information may be used for secondary purposes.

This form must **ONLY** be filed with the **Awarding Contractor** indicated below.

State Of _____)
)SS
County Of _____)

Project Name	
Project Number	Determination Number
Date Determination Issued	Date of Subcontract
Awarding Contractor	
Date Work Completed	

After being duly sworn, the person whose name and signature appears below hereby states under penalty of perjury that

- I **am** the duly authorized officer of the corporation, partnership, sole proprietorship or business indicated below. We have recently completed all of the work required under the terms and conditions of a subcontract with the above-named awarding contractor. We make this affidavit in accordance with the requirements set forth in Section 66.0903(9)(b) or 103.49(4r)(b), Wisconsin Statutes and Chapter DWD 290 of the Wisconsin Administrative Code in order to obtain FINAL PAYMENT from such awarding contractor.
- I **have** fully complied with all of the wage and hour requirements applicable to this project, including all of the requirements set forth in the prevailing wage rate determination indicated above which was issued for such project by the Department of Workforce Development on the date indicated above.
- I **have** received the required affidavit of compliance from each of my agents and subcontractors that performed work on this project and have listed each of their names and addresses on page 2 of this affidavit.
- I **have** full and accurate records that clearly indicate the name and trade or occupation of every worker(s) that I employed on this project, including an accurate record of the hours worked and actual wages paid to such worker(s).
- I **will** retain the records and affidavit(s) described above and make them available for inspection for a period of at least three (3) years from the completion date indicated above at the address indicated below and shall not remove such records or affidavit(s) without prior notification to the awarding contractor.

Name of Corporation, Partnership, Sole Proprietorship or Business				
Street Address	City	State	Zip Code	Telephone Number ( )
Print Name of Authorized Officer			Date Signed	
Signature of Authorized Officer				

ERD-10584 (R. 08/2003)

List of Agents and Subcontractors

Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		
Name			Name		
Street Address			Street Address		
City	State	Zip Code	City	State	Zip Code
Telephone Number ( )			Telephone Number ( )		

If you have any questions call (608) 266-0028

State of Wisconsin
Department of Workforce Development
Equal Rights Division
Labor Standards Bureau

Request To Employ Subjourneyperson

Personal information you provide may be used for secondary purposes. [See Section 15.04(1)(m), Wisconsin Statutes for details.] The use of this form is mandatory. The authority for the use of this form is prescribed in Section DWD 290.025, Wisconsin Administrative Code. The penalty for failing to complete this form is prescribed in Section 103.005(12), Wisconsin Statutes.

The employer indicated below requests that the Department of Workforce Development (DWD) determine the prevailing wage rate(s) and related qualifications to enable such employer to utilize a subjourneyperson(s) on the following public works project, in accordance with the provisions of Section DWD 290.025, Wisconsin Administrative Code.

1. Name of Public Works Project	
County	**City, Village or Township**
Determination Number	**Project Number**

2. Name of Employee (Last, First and Initial)	**P.O. Box or Street Address**	**City**	**State**	**Zip Code**	**Date of Birth**	**Journey Classification**

3. Name of Employer (Print)	**Name of Person Making Request (Print)**		
P O Box or Street Address	**City**	**State**	**Zip Code**
Telephone Number ( )	**Title of Requestor**		

READ CAREFULLY: I fully understand that this request is ONLY applicable to the project and employee(s) listed above and that such employee(s) will ONLY work under the direction of and directly assist a skilled trades employee by frequently using the tools of a skilled trades employee and will NOT regularly perform the duties of a general laborer, heavy equipment operator or truck driver. If the employee(s) indicated above regularly perform(s) the work of a different trade or occupation, he/she will be compensated for such work at the applicable journeypersons prevailing wage rate. I agree not to employ any employee as a subjourneyperson on this project until I receive written confirmation from the DWD. After such confirmation is received, I will compensate the employee(s) indicated above in strict accordance with the directions received from the DWD.

Signature of Requestor _____ Date Signed _____

MAIL COMPLETED REQUEST TO Equal Rights Division, Labor Standards Bureau, P. O. Box 8928 Madison WI 53708.
You may call (608) 266-6860 if you need assistance in completing your request

State of Wisconsin
Department of Workforce Development
Equal Rights Division

Wisconsin Prevailing Wage Rate Complaint

Personal information you provide may be used for secondary purposes. (See Section 15.04(1)(m), Wisconsin Statutes for details.)

This form **must** be used to file **any** complaint regarding an alleged violation of Sections 66.0903 or 103.49, Wisconsin Statutes, or Chapter DWD 290 of the Wisconsin Administrative Code.
The filing of this form does not require this department to conduct an investigation to determine the validity of your complaint. It is the complainant's responsibility to provide proof of the validity of his/her complaint.
Any form that is not properly completed will be returned to the complainant. Enclose a separate sheet of paper if you need additional space.
Return ALL completed forms and evidence to:
Equal *Rights Division, Labor Standards Bureau, P O Box 8928 Madison WI 53708.*

Please type or print all information.

[1] Complainant Information:

Name	Social Security or Fein Number (optional)
Mailing Address	City, State, Zip Code
Home Telephone	Work Telephone

[2] Employer Information:

Business Name	Owner Name
Mailing Address	Telephone Number
City, State, Zip Code	County

[3] Detailed Complainant Information:

I am a ☐ Current Employee ☐ Former Employee ☐ State or Municipal Official ☐ Other
☐ Union representative (If you are a union representative, do you presently represent any of the employees that work for the employer indicated above?) ☐ Yes ☐ No
Has the employer filed bankruptcy? ☐ Yes ☐ No
Is the employer still in business? ☐ Yes ☐ No
Have you retained an attorney to resolve this matter? ☐ Yes ☐ No

If the **complainant** indicated in (1) above has **never** been employed by the **employer** indicated in (2), the complainant **must** provide the name, address and telephone number of an allegedly aggrieved employee and **must** complete the remainder of this form to the best of his/her ability before this complaint will be investigated. Under these circumstances a complaint will only be investigated for the allegedly aggrieved employee indicated below. A separate form must be completed for **each** allegedly aggrieved employee.

Name	Social Security Number
Mailing Address	City, State, Zip Code
Home Telephone	Work Telephone

[4] Alleged Violations: Check the appropriate boxes and briefly explain the nature of the wage and hour violation(s) allegedly committed by the employer. Only those violations checked will be investigated:

☐ Straight Time	☐ Travel Time	☐ Improper Classification	☐ Weekly Overtime
☐ Banked Hours	☐ Kickback	☐ Saturday/Sunday/Holiday Overtime	☐ Fringe Benefits
☐ Retaliation	☐ Improper Ratio	☐ Wages Owed Over 30 Days	☐ Apprenticeship
☐ Payroll Record	☐ Daily Overtime	☐ Did Not Receive Last Paycheck	☐ Illegal/Non-listed Deductions

You must complete page 2 of this form.

[5] Allegedly Aggrieved Employee Data:

Date Employment Began with Employer	Date Employment Ended (If a former employee)
Normal Trade/Occupation	Normal Rate of Pay $ ☐ Per Hour ☐ Per Week
Apprentice? ☐Yes ☐No	Date Indentured

Does your employer normally provide you with ANY fringe benefits, such as health insurance, pension, paid vacation, profit sharing, IRA, etc.? ☐Yes ☐ No
If yes, did the employer pay the entire cost of such benefits? ☐Yes ☐ No
If yes, indicate below the specific fringe benefits provided. ☐Yes ☐ No

_____

_____

[6] Project Information: Please enter the following information for ONLY the PUBLIC WORKS project(s) on which the employer allegedly committed the previously indicated violation(s). If project information is not entered, no investigation will be conducted.

Name of Project	Location	Determination Number

Describe **both** the work you performed **and date(s)** you worked **on the above named project(s)**

_____

_____

What trade/occupation did you perform on these public works projects? _____
Do you have any prior experience in this trade/occupation while working for a different employer? ☐Yes ☐No
If yes, how many years? _____
How much were you paid per hour on the project(s) named above? $ _____
Did you ever work any overtime? ☐Yes ☐ No
Did you receive your regular fringe benefits? ☐Yes ☐ No
Were any hours "banked" for use at a future date? ☐Yes ☐ No
Did you keep any records of the hours you worked? ☐Yes ☐ No If yes, send them with this form.
Did you keep your check stubs? ☐Yes ☐ No If yes, send them with this form.

[7] Calculations:

Do you owe your employer any money? ☐Yes ☐No

If yes, how much and for what? _____

Did you ask your employer for your back wages? ☐Yes ☐No If yes, when did you ask? _____

How much do you believe the employer owes you? $_____ Indicate how you arrived at this amount.

_____

_____

The statements and information provided above are true to the best of my knowledge. I understand that it is my responsibility to prove the alleged violation(s) indicated and that: (1) this complaint is an open record under the provisions of Wisconsin's Open Records Law and a copy of it will be provided to the employer; (2) Section 111.322(2m), Wisconsin Statutes, prohibits retaliation against an employee by an employer for most labor standards complaints filed with this department; and, (3) if the employer is found to be in compliance with all applicable labor standards regulations, I agree to pay the DWD the actual cost of the investigation or, as a third party complainant, a MINIMUM OF $250, or the actual cost of the investigation, whichever is greater.

Complainant Signature	Title (Optional)	Organization You Represent, if any	Date Signed

SECTION 01000

BASIC REQUIREMENTS

PART 1 GENERAL

1.1 SECTION SUMMARY

A. Section Includes:
1. Section Summary
2. Summary of the Work
3. Contractor Use of Premises
4. Applications for Payment
5. Alternates
6. Coordination
7. Cutting and Patching
8. Conferences
9. Progress Meetings
10. Submittal Procedures
11. Proposed Products List
12. Shop Drawings
13. Product Data
14. Samples
15. Manufacturers' Instructions
16. Manufacturers' Certificates
17. Quality Assurance / Quality Control of Installation
18. References
19. Interior Enclosures
20. Protection of Installed Work
21. Parking
22. Progress Cleaning
23. Products
24. Transportation, Handling, Storage and Protection
25. Product Options
26. Substitutions
27. Starting Systems
28. Demonstration and Instructions
29. Contract Closeout Procedures
30. Final Cleaning
31. Adjusting
32. Operation and Maintenance Data
33. Spare Parts and Maintenance Materials
34. As-Built Drawings and Specifications

1.2 SUMMARY OF THE WORK

A. Project Description: Without effect on the Contract Documents, work consists of the construction of a new salt storage building. All other items required by or incidental to work shown, specified, or required by Code.

B. Work by Owner: Asphalt paving.

C. Permits: Prior to commencement of the Work, Contractor to secure any and all necessary permits for completion of the Work and facility occupancy.

1.3 CONTRACTOR USE OF PREMISES

A. Limit use of premises to allow work by others and work by Owner.

1.4 APPLICATIONS FOR PAYMENT

A. Submit two (2) copies of each application on AIA Form G702 or approved contractors invoice form.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Payment Period: Weekly.

1.5 ALTERNATES

Not Applicable.

1.6 COORDINATION

A. Coordinate scheduling, submittals, and work of various sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirement characteristics of operating equipment are compatible with building utilities.

C. Coordinate space requirements and installation of mechanical and electrical work that are indicated diagrammatically on Drawings.

1.7 CUTTING AND PATCHING

A. Employ a skilled and experienced installer to perform cutting and patching new work; restore work with new Products.

B. Submit written request in advance of cutting or altering structural or building enclosure elements.

C. Fit work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

D. Refinish surfaces to match adjacent finishes.

1.8 CONFERENCES

A. Dane County Department Public Works, Highway & Transportation will schedule a preconstruction conference after Award of Contract for all affected parties.

B. When required in individual Specification section, convene a pre-installation conference at project site prior to commencing work of the section.

1.9 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at minimum of one (1) per week.

B. Preside at meetings, record minutes, and distribute copies within two (2) days to those affected by decisions made.

1.10 SUBMITTAL PROCEDURES

A. Submittal form to identify Project, Contractor, Subcontractor or supplier; and pertinent Construction Documents references.

B. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction work, and coordination of information is in accordance with requirements of the Work and Construction Documents.

C. Identify variations from Construction Documents and Product or system limitations that may be detrimental to successful performance of completing the Work.

D. Revise and resubmit submittals as required; identify all changes made since previous submittal.

1.11 PROPOSED PRODUCTS LIST

A. Within fifteen (15) days after date of Award of Contract, submit complete list of major Products proposed for use, with name of manufacturer, trade name, and model number of each Product.

1.12 SHOP DRAWINGS

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

1.13 PRODUCT DATA

A. Submit number of copies that Contractor requires, plus two (2) copies that shall be retained by Public Works Project Engineer.

B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this Project.

1.14 SAMPLES

A. Submit samples to illustrate functional and aesthetic characteristics of the Product.

B. Submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Public Works Project Engineer's selection.

1.15 MANUFACTURERS' INSTRUCTIONS

A. When specified in individual Specification sections, submit manufacturers' printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in quantities specified for Product Data.

1.16 MANUFACTURERS' CERTIFICATES

A. When specified in individual Specification sections, submit manufacturers' certificate to Public Works Project Engineer for review, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

1.17 QUALITY ASSURANCE / QUALITY CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply fully with manufacturers' instructions.

C. Comply with specified standards as minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

1.18 REFERENCES

A. Conform to reference standard by date of issue current as of date for receiving bids.

B. Should specified reference standard conflict with Construction Documents, request clarification from Public Works Project Engineer before proceeding.

1.19 INTERIOR ENCLOSURES

A. Provide temporary partitions as required to separate work areas from Owner occupied areas, to prevent distribution of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.

1.20 PROTECTION OF INSTALLED WORK

A. Protect installed work and provide special protection where specified in individual Specification sections.

1.21 PARKING

A. Arrange for temporary parking areas to accommodate construction personnel. Parking shall be available at the Work site.

1.22 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition.

1.23 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components specifically identified for reuse.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by Construction Documents.

1.24 TRANSPORTATION, HANDLING, STORAGE AND PROTECTION

A. Transport, handle, store and protect Products in accordance with manufacturer's instructions.

1.25 PRODUCT OPTIONS

A. Where definite material is specified, it is not intention to discriminate against "equal" product made by another manufacturer. Intention is to set definite standard of material quality. Should bidder choose to bid materials other than those specified, bidder shall submit said materials specifications to Department Public Works, Highway & Transportation for approval at least seven (7) days prior to Bid Opening.

B. Products and materials that are not specified, but have been approved for use by Public Works Project Engineer shall be identified in addenda to all bidding contractors.

C. Requests for material or product substitutions submitted after Bid Opening may be considered. Dane County reserves right to approve or reject substitutions based on Specification requirements and intended use.

1.26 SUBSTITUTIONS

A. Public Works Project Engineer shall consider requests for Substitutions only within fifteen (15) days after date of Public Works Contract.

B. Document each request with complete data substantiating compliance of proposed Substitution with Construction Documents.

C. Submit three (3) copies of requests for Substitution for consideration. Limit each request to one (1) proposed Substitution.

D. Substitutions shall not change contract price established at Bid Opening.

1.27 STARTING SYSTEMS

A. Provide written notification prior to start-up of each equipment item or system.

B. Ensure that each piece of equipment or system is ready for operation.

C. Execute start-up under supervision of responsible persons in accordance with manufacturers' instructions.

D. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.28 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of Products to Owner's personnel prior to date of final inspection.

B. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at agreed-upon times, at designated location.

1.29 CONTRACT CLOSEOUT PROCEDURES

A. Submit written certification that Construction Documents have been reviewed, the Work has been inspected, and the Work is complete in accordance with Construction Documents and ready for Public Works Project Engineer's inspection.

B. Submit final Application for Payment identifying total adjusted Contract Sum / Price, previous payments, and amount remaining due.

1.30 FINAL CLEANING

A. Execute final cleaning prior to final inspection.

B. Clean interior and exterior surfaces exposed to view.

C. Remove waste and surplus materials, rubbish, and construction facilities from site.

1.31 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.32 OPERATION AND MAINTENANCE DATA

A. Provide operation and maintenance data for all mechanical and electrical equipment supplied and installed in project.

1.33 SPARE PARTS AND MAINTENANCE MATERIALS

A. Provide Products, spare parts, maintenance and extra materials in quantities specified in individual Specification Sections.

B. Deliver to the Work site and place in location as directed.

1.34 AS-BUILT DRAWINGS AND SPECIFICATIONS

A. Contractor-produced Drawings and Specifications shall remain property of Contractor whether Project for which they are made is executed or not. Contractor shall furnish Public Works Project Engineer with original tracings of drawings and prints of specifications in reproducible format, one set of Drawings and Specifications and one set of as-builts drawings in [AutoCAD 2004 (or lower), manually drafted] format and entire specification in Word 2000 (or lower) format on CD.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01508

RECYCLING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Waste Management Goals
2. Waste Management Plan
3. Reuse
4. Recycling
5. Materials Sorting and Storage On Site
6. Lists of Recycling Facilities Processors and Haulers
7. Waste Management Plan Form

B. Related Sections:
1. Section 01000 - Basic Requirements
2. Section 01500 - Temporary Facilities and Controls: Progress cleaning and waste removal
3. Section 02221 - Building Demolition
4. Section 02225 - Minor Demolition for Remodeling

1.2 WASTE MANAGEMENT GOALS

A. Dane County requires that as many waste materials as possible produced as result of this project be salvaged, reused or recycled in order to minimize impact of construction waste on landfills and to minimize expenditure of energy and cost in fabricating new materials. Additional information may be found in The Dane County Green Building Policy, Resolution 299, 1999-2000.

B. Contractor shall develop, with assistance of Public Works Project Engineer and Architect / Engineer, Waste Management Plan (WMP) for this project. Outlined in RECYCLING section of this specification are examples of materials that can be recycled or reused as well as recommendations for waste sorting methods.

1.3 WASTE MANAGEMENT PLAN

A. Contractor shall complete WMP and include cost of recycling / reuse in Bid. WMP will be submitted to Public Works Project Engineer within fifteen (15) days of Notice to Proceed date. Copy of blank WMP form is in this Section. Submittal shall include cover letter and WMP form with:
1. Information on:
a. Types of waste materials produced as result of work performed on site;
b. Estimated quantities of waste produced;
c. Identification of materials with potential to be recycled or reused;
d. How materials will be recycled or reused;

e. On-site storage and separation requirements (on site containers);
f. Transportation methods; and
g. Destinations.

1.4 REUSE

A. Contractors and subcontractors are encouraged to reuse as many waste materials as possible. Salvage should be investigated for materials not reusable on site.

1.5 RECYCLING

A. These materials can be recycled in Dane County area:
1. Wood.
2. Wood Pallets.
3. Fluorescent Lamps.
4. Foam Insulation & Packaging (extruded and expanded).
5. PVC Plastic (pipe, siding, etc.).
6. Concrete.
7. Corrugated Cardboard.
8. Metal.
9. Carpet Padding.
10. Gypsum Drywall.
11. Barrels & Drums.
12. Solvents.

1.6 MATERIALS SORTING AND STORAGE ON SITE

A. Contractor shall provide separate containers for recyclable materials. Number of containers will be dependent upon project and site conditions.

B. Contractor shall provide on-site locations for subcontractors supplied recycling containers to help facilitate recycling.

1.7 LISTS OF RECYCLING FACILITIES PROCESSORS AND HAULERS

A. Web site www.countyofdane.com has recycling symbol (link) near top of page that lists current information for Dane County Recycling Markets. Contractors can also contact Dane County's Recycling Manager at 608/267-8815, or local city, village, town recycling staff listed in above referenced web site. Statewide listings of recycling / reuse markets at available from Wisconsin Department of Natural Resources, www.dnr.state.wi.us/org/aw/wm/markets.

1.8 WASTE MANAGEMENT PLAN FORM

A. Contractor Information:
Name: _____
Address: _____
_____
Phone No.: _____ Recycling Coordinator: _____

MATERIAL	ESTIMATED QUANTITY	DISPOSAL METHOD (CHECK ONE)	RECYCLING / REUSE COMPANY OR DISPOSAL SITE
Salvaged & reused building materials	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Glass	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Wood	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Wood Pallets	_____ units	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Fluorescent Lamps	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Foam Insulation	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Asphalt & Concrete	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
PVC Plastic	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Corrugated Cardboard	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Metals	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Carpet Padding	_____ cu. ft. _____ lbs.	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Gypsum / Drywall	_____ cu. yds. _____ tons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Barrels & Drums	_____ units	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

Solvents	_____ gallons	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____
Other	_____	_____ Recycled _____ Reused _____ Landfilled _____ Other	Name:_____

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02200

EARTHWORK / SITE PREPARATION

PART 1 GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this section.

B. The Owner will be responsible for the following earthwork/site preparation:
1. Overall rough site grading and compaction to within plus or minus 6 inches, including initial rough grading in building areas.
2. Earthwork related to construction of site storm water catch basins and related underground storm water piping to retention pond.
3. Base course for asphalt paving and asphalt.
4. Earthwork beyond the limits of the contractor's work, unless specifically noted otherwise.
5. Finish grading/topsoil.
6. Fill material/fill trucking and back filling.

C. Contractor shall provide all labor, materials, and equipment necessary to complete structural excavation, sub-grade preparation, other local earthwork necessary for proper construction of structures, and other site improvements that are part of his work scope.

D. Contractor shall satisfy himself as to the extent of his work and conditions on the site prior to submitting a bid.

E. Contractor shall restore any compaction of foundations disturbed while performing work under this contract.

F. All earthwork and site preparation shall conform to the requirements of this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02550 - Erosion Control

1.3 QUALITY ASSURANCE

A. Reference Standards
1. ASTM D698
2. ASTM D1556
3. ASTM D2167
4. ASTM D2922
5. ASTM D2937
6. ASTM C131

B. Construction Standards

1. Unless otherwise noted, work shall conform to the latest edition of the State of Wisconsin Standard Specifications for Road and Bridge Construction.

C. Testing (By Owner)

1. All proposed fill materials shall be sampled and tested by a qualified laboratory acceptable to the Owner and hired by the Contractor to confirm compliance with specified material requirements before placing, and to establish moisture/density relationships for compaction operations.
2. Final stripping, excavation and sub-grade preparation; and all subsequent fill, backfilling, base course, and bedding operations shall be monitored and tested by a qualified independent geotechnical engineer acceptable to the Owner and hired by the Contractor to verify acceptable sub-grade conditions, material placement and material compaction before each subsequent operation is performed. Verify positive drainage slope on any clay sub-grades below buildings and paved areas before fill placement.
3. As a minimum, field density tests shall be performed as scheduled below and in accordance with ASTM D1556 (sand cone method), or ASTM D2167 (rubber balloon method), ASTM D2922 (nuclear method), or ASTM D2937 (drive cylinder method) as applicable:
    a. Native Sub-grade (below sidewalks, paving, footings, buildings, slabs or engineered fill):
        1) For each exposed strata of native cohesionless (sand) soil, at least one test to verify conformance with required design bearing capacities. Subsequent verification and approval of sub-grades may be based on a visual comparison of each sub-grade with related tested strata, when acceptable to Owner's Representative.
        2) For each exposed strata consisting of native cohesive (clay) soil the excavation shall be observed by the geotechnical engineer to verify conformance with required bearing capacity.
    b. Fill, Bedding and Base Courses (below sidewalks, paving, footings, buildings and slabs): At least one field density test of sub-grade for every 2500 square foot of building slab, but in no case less than three tests in an isolated area. In each compacted fill layer, one field density test for every 2500 square foot of overlaying building slab or paved area, but in no case less than three tests in an isolated area.
    c. Backfill (for foundations and pits): For each compacted fill layer, one field density test for every 2500 square foot of horizontal area of backfill but in no case less than 3 tests around an isolated structure or building for each layer.
    d. Utility trench bottoms and backfill (below sidewalks, paving, footings, buildings and slabs): Not less than one test per 100 linear feet of trench for each compacted lift.

4. If in opinion of Geotechnical Engineer or Owner's Representative, based on testing service reports and inspection, sub-grade or fills which have been placed are below specified density, Owner shall provide additional compaction and testing.

D. Each contractor/subcontractor shall be responsible to confirm that final compaction of underlying sub-grade work under other contracts, subcontracts or bid packages has been performed and verified complete and acceptable by field tests prior to beginning subsequent work.

E. The Contractor shall be fully responsible for whatever other quality control measures, tests, or procedures are necessary to perform, complete, maintain, verify the work to be in conformance with the specifications regardless of initial acceptance tests or other measures which may be taken independently by the Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. General

1. Material shall conform to the following. Compact as described herein unless noted otherwise. (Standard Proctor, ASTM D698).
2. Contractor shall dispose of and replace any excavated materials which is unacceptable for reuse or which is rendered unacceptable for reuse due to freezing, contamination with unacceptable materials, unacceptable moisture content or other causes.

B. Granular Fill/Select Fill/Engineered Fill

1. Materials: shall be non-expansive compacted granular fill consisting of crushed or granular granitic stone, or sand, or sand and gravel, free of debris and organic matter. All such fill shall meet the following acceptance criteria:

Percent Passing 3-inch Sieve	100
Percent Passing No. 4 Sieve	50-100
Percent Passing No. 200 Sieve	10 (max)
Plasticity Index	0
Expansion Index	0

2. When fill is placed below normal water level or on saturated soils, the initial 1.5 foot lift shall be a clean, free-draining sand with less than 50 percent passing the No. 40 sieve and less than 10 percent passing the 200 sieve.
3. Placement: Initial lift of fill over any existing clay sub-grades shall be placed to minimize disturbance of the clay. Adjust moisture as required. Compact lifts with vibrating roller in 8" (minimum) to 12" (maximum) loose lifts, or in 6" (maximum) loose lifts using hand tampers in local areas. Compact to minimum 95% of the Standard Proctor maximum density below footings and within the perimeter of buildings and miscellaneous structures, and to minimum 95% of the Standard Proctor maximum density below exterior pavements.

4. Application: All fill and backfill below and 10' beyond footings, structures, building floors; and within and 5' beyond paved areas.

C. Random Fill

1. Materials: Compacted random fill unless noted otherwise. Random fill material may be excavated material or equal, free from vegetative matter, or other deleterious substances and shall not contain large rocks, lumps, or soils of high plasticity.
2. Placement: Fill material shall be placed in layers which, when compacted, shall not exceed 12 inches. Each layer shall be spread evenly and shall be thoroughly blade-mixed during spreading to insure uniformity of material in each layer. After each layer has been placed and evenly spread, it shall be thoroughly compacted to maximum practical density to avoid future settlement. Compaction shall be by means of tamping or sheepsfoot rollers, multiple-wheel pneumatic-tired rollers, or other types of rollers or equivalent which will be capable of compacting the fill to the desired density. Rolling shall be accomplished while fill material is at the desired moisture content. Rolling of each layer shall be continuous over its entire area and sufficient passes shall be made by rolling equipment to insure that the desired maximum practical density has been obtained.
3. Application: Use for fill material beyond 10' outside the building perimeter, and beyond 5' outside the limits of paved areas, sidewalks and stairs; and anywhere else other fill materials are not noted or specified or required by manufacturers or agencies.

D. Bedding

1. Material: Compacted granular fill consisting of crushed or granular granitic stone or pit run sand, or sand and gravel, free of debris and organic matter and containing not more than 10% fines passing a No. 200 sieve. The gradation shall be uniform. Maximum size of stone shall not exceed 3/4 inch.
2. Placement. Adjust moisture as required and compact with vibrating roller in 12" loose lifts, or in 6" loose lifts using hand tampers in local areas. Compact to a minimum 95% of the Standard Proctor Maximum density below floors of buildings, pads and other structural elements, and as noted elsewhere.
3. Application: Use for all bedding material below building floors, pads and wherever else required for utilities or underground pipes or necessary for achieving final sub-grade slopes and elevations and wherever else sand is noted or specified.

E. Base Courses

1. Materials: Crushed gravel or crushed stone consisting of a natural or artificial mixture of hard, durable particles of coarse aggregate and binder or filler. Material shall be relatively free from soft or decomposed particles and excess clay and shall be uniformly graded so that it can be compacted into a hard, dense

mass. Gradation shall be uniform with 100% passing a 1½ inch sieve and a maximum of 10% passing a No. 200 sieve.

2. Placement. Base course materials shall be placed and spread in multiple uniform layers of maximum 4" thickness from self-spreading vehicles or with power graders of approved types. Base course so placed shall be conditioned if necessary for proper compaction and rolled true to lines and grades with rollers weighing 10 to 12 tons. Any depressions which may appear during or after rolling shall be filled with additional base course material and re-rolled until the surface is true and even. Any portion which is not accessible to a roller shall be compacted by a pneumatic tamper. Any soft or yielding areas are to be removed and repaired. Base course material shall be compacted to 95% of the Standard Proctor maximum density.
3. Application: Use below exterior concrete aprons, sidewalks and curbs and wherever else base course is noted or specified.

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

A. Owner will remove and dispose of all vegetation, logs, trees, stumps, brush and other rubbish from within the building area, paved areas and grading limits unless noted otherwise.

3.2 STRIPPING AND STORING TOPSOIL

A. Strip any topsoil from within the building area. Topsoil shall be stockpiled in location directed by Owner for later spreading to obtain finish grades.

3.3 REMOVAL OF UNACCEPTABLE SOILS

A. Completely remove any soft, loose or disturbed materials within and 10' minimum beyond the building perimeter down to undisturbed acceptable approved subsoil.

B. Extend perimeter of excavation as necessary to include a zone extending 1 foot laterally beyond the outer edge of the building footing for each vertical foot of over excavation required below the footing to reach acceptable subsoil.

C. If acceptable sub-soils along existing structures are deeper than existing footing bearing, take precautions as may be necessary to prevent undermining existing footing.

3.4 COMPACTION/PREPARATION OF SUB-SOILS

A. All sub-soils below areas to be filled or below buildings and paving shall be prepared and compacted or proof rolled as specified herein.

B. The surface of any existing clay layers exposed (and if approved as sub-grade) below the building and paving shall be graded/shaped to ensure positive (minimum 0.5 percent) subsurface drainage.

C. Cohesionless native soils shall be proof rolled and compacted with a minimum of three passes with a heavy, steel wheeled, vibratory roller or equivalent approved method. Exposed cohesive native sub-soils (if deemed acceptable as sub-grade) should remain as undisturbed as possible except to grade top surface for positive drainage and proof roll with a loaded tandem axel truck prior to placing fill or construction. Proof rolling must be observed by the geotechnical engineer. Soft, wet or yielding areas shall be removed and replaced or otherwise improved to the engineer's or owners requirements.

D. Alert Owner to any unexpected soft areas encountered prior to taking corrective measures.

E. Provide a minimum of 2 proctor tests on questionable soils to determine suitability. Strip/cut out any soft or highly plastic silt material and replace with compacted granular/select fill.

F. All final sub-grade surfaces shall be consolidated with compactors and maintained at required compaction levels until overlying fill or construction is placed. All surfaces disturbed during subsequent operations shall be similarly reconsolidated.

3.5 DEWATERING/DRAINAGE

A. The Contractor shall provide all temporary trenches, ditches, sumps, pumps and other dewatering provisions as may be necessary to; maintain dry excavation; prevent accumulation of water in, above or adjacent to foundation or building sub-grades; and to prevent migration or collection of water in filled areas under new structures.

3.6 PROTECTING ADJACENT STRUCTURES

A. Brace or otherwise shore or support new and existing structures as required to prevent movement or damage during execution of the work, including, but not necessarily limited to foundation walls, and pavements adjacent to stripping and excavating operations, and new foundations subject to unbalanced lateral loads before slabs and other permanent support mechanisms are effective.

B. Prevent undermining of existing structures and foundations adjacent to excavations.

3.7 EXCAVATION

A. Excavate to line and grade as indicated on the drawings. Any excavation cuts carried to an elevation below the required elevation shall be refilled with the appropriate fill as described below, and compacted as described. Excavated material shall be piled in such a manner as to prevent sloughing-in on excavated areas, and to prevent contamination with material which would render it unsuitable for reuse as backfill. Rocks in excess of one (1) cubic yard shall be removed and disposed of off-site.

B. Notify Owner upon completion of excavation and sub-grade preparation operations to permit Owner inspection, evaluation and verification of sub-grade conditions before beginning subsequent operations.

C. Alert Owner to any unexpected random fill areas or soft spots encountered during the work.

D. Stockpile acceptable excavated material for reuse later. Stockpile remainder of material stripped from these areas out of the way for later use in general landscaping and shaping outside the limits of buildings and pavements.

E. Slope/shore all excavations to meet OSHA standards and prevent cave-ins.

3.8 BORROW

A. Borrow shall meet the material requirements specified for the given application.

B. Verify suitability of borrow material for proposed use by lab tests and field observations by a qualified independent geotechnical engineer/testing agency. Submit test results and field reports to Engineer.

3.9 FILL/BACKFILL/BEDDING

A. Preparing Areas to be Filled. Where fills are made on hillsides or slopes, keyways shall be excavated into the slope of the original ground upon which fill is to be placed.

B. Where the nature of the ground justifies taking greater precautions for binding the fill to the original ground, steps shall be cut into the original ground before filling is begun.

C. Moisture Content. Moisture content of fill material shall be such that fill can be compacted to maximum practical density. If moisture content of fill material is below the amount needed to create the necessary density, the proper amount of water shall be added. Similarly, if moisture content of fill material is above the amount necessary to create the desired density, fill material shall be aerated by blading or other satisfactory method until moisture content of fill material is satisfactory. If saturated fill cannot be adequately dried, fill shall be removed and replaced.

D. Seasonal Limits
1. No fill material shall be placed, spread or rolled while the ground or fill is frozen or thawing, or during unfavorable weather conditions.
2. When the work is interrupted by heavy rain, fill operations shall not be resumed until moisture content and density of fill are as previously specified.

E. General Backfill Limits
1. Unless otherwise noted or required for finish materials, backfill shall be brought to the following levels.
    a. Backfill within new building perimeters shall be carried to an elevation to accommodate floor elevations and bedding materials shown on the plans unless otherwise noted.
    b. Backfill outside building limits shall be carried to an elevation required to accommodate thickness of base courses and pavements, unless otherwise noted.

c. Backfill not within other limits described above shall be carried to an elevation of 4" below finished grade for topsoil, unless otherwise required for other site improvements or landscaping.

2. Coordinate and sequence fill operations as necessary with portions of work being done by other trades including but not limited to;
   a. Utility work.
   b. Foundation insulation installation.
   c. Adjacent paving and aprons being constructed by Owner.
3. Backfill and compact both sides of walls equally and temporarily brace as required to prevent movement or damage of new construction due to unequal loads until final supporting slabs are in place and have reached specified 28 day strength.
4. Final trim and fill sub-grades, and bedding to achieve final floor slopes and elevations indicated on the drawings.

3.10 FINAL CLEAN-UP

A. Any surplus excavation, fill, and spoil resulting from Contractor's operation (except topsoil) becomes the property of the Contractor and shall be removed from the site, unless otherwise approved by Owner to be neatly stockpiled in a location approved by the Owner for the Owner's future use.

END OF SECTION

SECTION 02550

EROSION CONTROL

PART 1 GENERAL

1.1 RELATED DOCUMENTS:

A. Applicable provisions of Division 1 shall govern work in this section.

B. Ch. 65 Construction Site Erosion Control – Wis. Bldg. Code

C. "Wisconsin Construction Site Best Management Practice Handbook"

1.2 DESCRIPTION OF WORK:

A. Erosion control includes all work, materials, labor, equipment, and supervision to provide and construct erosion control measures necessary to prevent the runoff, tracking, or loss or soil materials by water or mechanical action from the disturbed portions of the project site as provided for in these contract documents, and as determined by the Dane County Public Works Project Engineer.

B. The Owner will design, provide and maintain overall site erosion control plans and provisions. The Contractor shall follow the requirements of the approved overall control plan and shall incorporate commensurate local provisions as necessary to maintain similar controls directly related to his work.

C. Applicable provisions of Division 1 shall govern work under this section.

D. This specification shall apply to all areas of work on this project, unless otherwise specified.

E. All work shall comply with COMM 65.08 General Plan Requirements (-1999-65-5-).

F. All work shall comply with the applicable requirements of Section 404 of the Clean Water Act and Navigable Waters Protection (Chapters 30 & 31).

G. The Owner shall provide a Construction Site Erosion Control Plan which will meet the Shoreland and Wetland Zoning requirements as required by the Building Inspection Offices for cities and villages; Dane County Land Regulations and Records Department for townships. The Contractor shall comply with any requirements of the approved plans.

H. The Owner shall apply for a NPDES Stormwater Permit for Erosion Control from the Wisconsin Department of Natural Resources if project work disrupts more than 5 acres. The contractor shall perform his work in compliance with the requirements of said permit. Smaller sites that are part of a planned development larger than 5 acres must also apply for a permit.

1.3 REFERENCES:

A. Erosion control shall comply with the following references:
   1. COMM 65.20 Design Requirements (-1999-65-7-)
   2. *State of Wisconsin Construction Site Best Management Practice Handbook,* Publication WR-222-89.
      Copies are available by contacting the following:
      State of Wisconsin Department of Natural Resources
      Non-Point Service and Land Management Section
      101 S. Webster Street
      P.O. Box 7921
      Madison, WI 53707-7921
      AND/OR
      Document Sales and Distribution
      202 South Thornton Avenue
      P.O. Box 7840
      Madison, WI 53707
      608/266-3358
   3. *The State of Wisconsin, Department of Transportation, Division of Highways Standard Specifications for Road and Bridge Construction (SSRBC),* current edition. Wherever D.O.T. or SSRBC appears in this specification it refers to the State of Wisconsin, Department of Transportation, Division of Highways Standard Specifications for Road and Bridge Construction, current edition, except that this contract shall be a lump sum contract and the items, method of measurement and basis of payment shall not apply.

1.4 DOCUMENTS:

A. The Owner shall provide copies of his approved erosion control plans to the contractor, on request.

1.5 RELATED WORK:

A. Site Preparation

B. Clearing & Grubbing

C. Site Demolition

D. Earthwork

E. Grading

F. Excavation & Trenching

G. Sewerage & Drainage

H. Site Restoration

I. Seeding & Sodding

PART 2 PRODUCTS

2.1 MATERIALS:

A. Straw Bale Barriers: Bales used for erosion control shall be either hay or straw, shall have rectangular surfaces, and shall be tightly bound with twine, not wire.

B. Sediment Control Fences: Sediment control fences (also called silt fences) shall comply with the requirements of SSRBC 628.2.9.1 and shall be equal to that of Mirafi 100, Trevira Spunbond 1115, Amoco 1380, or Supac 5NP, backed by industrial polypropylene netting or 18 gauge woven wire fence. The fabric shall come in rolls of 3 foot width. Posts used to support the fabric shall be at least 2" x 2" nominal in cross section and of sufficient length to fully support the 36 inch high fence.

C. Erosion Mat:
1. Jute Fabric: Jute Fabric intended for use for erosion mat shall conform to SSRBC Section 628.2.1
2. Wood Fiber Blanket: Wood fiber blanket intended for use for erosion mat shall conform to SSRBC Section 628.2.2.
3. Fiber Glass Roving: Fiber glass roving material intended for use as erosion mat shall conform to SSRBC Section 628.2.3.

D. Asphaltic Materials: Asphaltic Materials intended for anchoring fiberglass roving materials shall conform to SSRBC Section 628.2.4.

E. Staples: Staples intended to anchor erosion mat shall conform to SSRBC 628.2.5. and shall be U-shaped, made of No. 11 gage or heavier steel wire, or other approved materials, have a width of one to two inches, and a length of not less than 6 inches for firm soils and not less than 12 inches for loose soils.

F. Riprap: Materials used in riprap shall meet the requirements for the class of materials named and shall conform to SSRBC Section 606 except that riprap work under these specifications shall be placed on a filter bed of not less than 6 inches of granular material with a geotextile filter fabric liner.

G. Sodding: Sodding provided under this section shall conform to the requirements of SSRBC Section 631.

H. Stakes: Stakes intended to anchor erosion mat shall be pieces of plasterer's lath or stakes equivalent thereto, 12 inches in length. Stakes intended for use in straw bale barriers shall be 2" x 2" x 30" nominal driven flush with the top of the bale. Stakes for anchoring sodding or erosion mat shall be driven so that the longitudinal width is parallel with the direction of surface water flows.

I. Sewer Piping: Sewer piping to be used for temporary erosion control purposes shall be of such size and construction as to be adequate for the intended purposes and shall be

subject to the Owner's approval. Sewer piping as part of permanent erosion control measures shall conform to the requirements of the specifications.

J. Temporary Use of Permanent Features: When the contract contains items of work, which are of an erosion control or storm water nature, and are intended to be of a permanent installation, these items may be employed in the control of erosion and storm water during construction activities. However, these items shall be fully cleaned, restored, and in every way fully functioning for its intended permanent use prior to acceptance of the work.

K. Approvals: All materials shall be subject to the Owner's and governing agency approval.

PART 3 EXECUTION

3.1 GENERAL

A. The contractor shall consider the control of erosion directly related to his operations, and the requirements and methods of these specifications as standard requirements for all work conducted under this contract by his employees, his subcontractors, his suppliers, and others having purpose on the construction site.

B. All work shall be in accordance with manufacturer's instruction where these specifications do not specify a higher requirement.

C. The contractor shall undertake any and all measures as may be necessary in addition to those provided by the Owner to protect all adjacent lands, and all ground and surface waters from contamination by the direct and indirect migration of sands, silts, mud, debris, chemicals and other such pollutants from his operations through adherence to the erosion control plan and the use of specified materials. Such measures may include, but not be limited by enumeration to:

1. The construction and maintenance of sedimentation basins, or the use of sedimentation vessels
2. The construction and maintenance of erosion control barriers,
3. The construction and maintenance of erosion mats,
4. The construction and maintenance of surface runoff diversion channels around the construction site,
5. The construction and maintenance of temporary and permanent drainage structures and facilities,
6. The sweeping, shoveling, and other removal of materials from streets and other paved surfaces by hand and/or mechanical methods (but not flushing),
7. The removal of silts, sediments, and debris which have left the jobsite due to erosion,
8. The restoration of lands and waters subject to damage by erosion from the jobsite.

3.2 REQUIRED EROSION CONTROL MEASURES

A. Permits and Approvals:

1. All permits and approvals required for land disturbance activities (including DNR permits for dewatering systems discharging more than 70 GPM) shall be acquired prior to the commencement of land disturbing activities. The contractor shall fully comply with all such permit and approval requirements and shall retain a copy of the approvals and/or approved permits on the jobsite at all times of construction activity.

B. Grading and Earthwork Measures:
   1. All erosion control measures shall follow COMM 65.21 General Installation Requirements (-1999-65-9-).
   2. All temporary or permanent erosion control measures shall be installed prior to any on site grading or land disturbances.
   3. Stripping of vegetation, grading, excavation, or other land disturbing activities shall be done in a logical sequence and manner which will minimize erosion. If possible, construction shall be scheduled for times of the year when erosion hazards are minimal. Natural vegetation shall be retained and protected in all areas not designated for improvements or earthwork.
   4. Any soil or dirt piles which will remain in existence for more than 7 consecutive days, whether to be worked during that period or not, shall not be located within 25 feet of any roadway, parking lot, paved area, or drainage structure or channel (unless intended to be used as part of the erosion control measures. Temporary stabilization and control measures (seeding, mulching, tarping, erosion matting, barrier fencing, etc.) are required for the protection of disturbed areas and soil piles which will remain unworked for a period of more than 14 consecutive calendar days.

C. Drainage Measures:
   1. Drainage provisions shall be designed to contain the increased runoff resulting from development of the site and/or disturbances to the natural vegetative cover, during and after the construction activity. Drainage shall be conveyed to the nearest adequate public facility. Water may not be discharged in a manner which will cause erosion or sedimentation of the site or receiving facility.
   2. Drain inlets shall be protected with erosion control barriers of straw or hay bales, silt fencing, filter baskets, or other equivalent methods approved by the owner which provide the necessary erosion protection.
   3. Roof drainage and runoff from all areas upslope of the site shall be diverted around areas to be disturbed or channeled through the site in a manner which will not cause erosion.
   4. Water runoff shall be minimized and retained on-site wherever possible so as to promote percolation of surface water. Water may not be discharged in a manner which will cause erosion or sedimentation of the site or receiving facility.
   5. Site dewatering shall be undertaken in a manner to minimize the pumping of sediments and discharged to a sedimentation basin or sedimentation vessel in a manner so as to minimize the discharge of sediments.

D. Tracking and Sedimentation Control Measures:

1. Owner's overall site provisions will include measures per COMM 65.21 (7) Soil Tracking to prevent the tracking of sediment from the site onto public or private roadways, parking lots, and paved areas. Such measures shall also include:
    a. Prohibiting construction activities which are off of paved, graveled, or stabilized surfaces during periods of precipitation and wet soils.
    b. Site shall have adequate access drives and parking areas of sufficient width, length, and wearing surface.
    c. Access roads and parking areas receiving more than 5 vehicle trips per hour shall be graveled or paved.
    d. Access roads receiving more than 15 vehicle trips per hour shall be equipped with graveled or paved areas of adequate size and surface for the removal of dirt, mud, sediments, and other debris by sweeping, washing, or other methods before the vehicle enters adjacent roadways, parking areas, or paved surfaces.
    e. Wash water shall be discharged to sedimentation basins, sedimentation vessels, or other such control areas.

3.3 MAINTENANCE

A. The Owner and Contractor shall inspect their respective erosion control measures within 24 hours of the end of each rainfall event, or daily during period of prolonged rainfall, or weekly during periods without rainfall. The Contractor shall immediately repair and/or replace any and all damaged, failed, or inadequate erosion control measures provided as part of his operations. The Owner shall repair and/or replace erosion control measures he provided as part of the overall site erosion control provisions.

3.4 CLEANING AND DISPOSAL

A. Surplus excavation materials shall be removed from the site immediately after rough grading. The disposal site for the surplus excavation materials shall also be subject to these erosion control requirements.

B. Any sediment reaching a public or private roadway, parking lot, sidewalk, or other paved area and which constitutes a hazard to traffic or which may be further scattered by traffic, shall be immediately and completely removed by scraping, sweeping, shoveling or other such method (except flushing). Any accumulations not requiring immediate attention shall be completely removed at least once at the end of each work day.

C. Sediment cleanup shall follow COMM 65.22 (2):
    1. Mechanical erosion control measures shall be cleared of sediment by the time the accumulation reaches 50% of the height of the control measure.
    2. Offsite sediment deposition occurring as a result of a storm event shall be cleaned up within 24 hours after the end of the storm event.
    3. All other offsite sediment deposition occurring as a result of construction activities shall be cleaned up by the end of the same work day.

D. All waste and unused construction materials shall be disposed of frequently and in licensed solid waste or wastewater facilities. No garbage, debris, cleaning wastes, toxic

materials, or hazardous materials shall be buried on the site, dumped on the land surface or in detention basins, or discharged or otherwise allowed to be carried off the site by runoff onto adjacent lands or into receiving waters or storm sewer systems.

3.5 CONSTRUCTION SITE STABILIZATION

A. Follow COMM 65.23 Construction Site Stabilization (-1999-65-11-).

END OF SECTION

SECTION 02710

SUBDRAINAGE SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment required to complete sub-drainage and venting systems work as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 - Earthwork/Site Preparation

1.3 QUALITY ASSURANCE

A. Reference Standards
   1. ASTM D1682
   2. ASTM D3786
   3. ASTM D3787
   4. ASTM D2263
   5. ASTM D4491
   6. ASTM D2729

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Manufacturer's descriptive literature with technical data indicating materials, tests, and installation and storage instructions.

PART 2 PRODUCTS

2.1 MATERIALS

A. Geotextile fabric shall be the non-woven type with physical characteristics meeting the following requirements:
   1. Grab Tensile
      a. ASTM D1682, "Tests for Breaking Load and Elongation of Textile Fabrics".
      b. 250 pounds.
   2. Grab Elongation
      a. ASTM D1682, "Tests for Breaking Load and Elongation of Textile Fabrics".

b. 50 percent.

3. Burst Strength
   a. ASTM D3786, "Tests for Hydraulic Breaking Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method".
   b. 750(+) pounds per square inch.
4. Puncture Strength
   a. ASTM D3787, "Test for Bursting Strength of Knitted Goods: Constant Rate of Transverse Ball Burst Test".
   b. 200 pounds.
5. Trapezoidal Tear
   a. ASTM D2263, "Tests for Automotive Fabrics".
   b. 90 pounds.
6. Permeability
   a. ASTM D4491
   b. 0.15 centimeter per second.

B. Fabric shall be AMOCO 4557 or equal installed as indicated on the plans and per manufacturer's recommendations.

C. Pipe Underdrains
1. Underdrains shall be perforated 6 inch PVC drainage pipe conforming to ASTM D2729, "Specifications for Polyvinyl Chloride Plastic Tubing".
2. Provide elbows, couplings, and other fittings as required for configuration shown.

PART 3 EXECUTION

3.1 INSPECTION

A. Geotextile fabric shall be installed in accordance with manufacturer's written instructions.

B. Underdrains shall be installed at the locations, slopes, and elevations as shown on the drawings.

C. Deadends of pipe shall be closed or plugged with concrete or standard caps. Discharge ends of pipe shall be protected with grates or screens.

3.2 ADJUST AND CLEAN

A. Clean premises of all litter, dirt and debris created by work of this Section.

END OF SECTION

SECTION 03300

CONCRETE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide all labor, materials and equipment necessary to complete concrete formwork, concrete reinforcement and concrete work as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02200 - Earthwork/Site Preparation

B. Section 04200 - Masonry

C. Section 05100 - Structural and Miscellaneous Metal

D. Section 07920 - Sealant and Caulking

E. Section 09900 - Painting

1.3 QUALITY ASSURANCE

A. Reference Standards

1. ACI - American Concrete Institute
2. ASTM A-615 Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
3. ASTM A-616 Specification for Rail-Steel Deformed and Plain Bars for Concrete Reinforcement
4. ASTM A-82 Specification for Steel Wire, Plain, for Concrete Reinforcement
5. ASTM A-185 Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement
6. ASTM C-150 Specification for Portland Cement
7. ASTM C-260 Specification for Air-Entraining Admixtures for Concrete
8. ASTM C-494 Specification for Chemical Admixtures for Concrete
9. ASTM C-33 Specification for Concrete Aggregates
10. ASTM C-31-55 Practice for Making and Curing Concrete Test Specimens in the Field
11. ASTM C-94 Specification for Ready-Mixed Concrete
12. ASTM C-309 Specification for Liquid Membrane-Forming Compounds for Curing Concrete

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Design mixes, material certificates, gradation reports.
C. Reinforcement steel shop drawings/bar lists/placing drawings.

D. Results of all slump tests, air content tests, cylinder strength tests.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Tag all pieces of reinforcement with same tags and nomenclature as on approved shop drawings.

B. Delivery, storage and handling shall be accomplished in such a manner as required to prevent damage to components. Damaged reinforcement that cannot be restored to original condition will be rejected.

C. Cement and aggregates shall be stored in such manner as to prevent deterioration or intrusion of foreign matter.

D. Any material which has deteriorated or which has been damaged shall not be used for concrete.

E. Aggregate shall be stored in quantity enough to make a complete pour and storage site shall have proper drainage to insure a constant and uniform moisture content of aggregate at mixer bins or hoppers.

F. Coarse aggregate shall be stored in two sizes, being stockpiled to prevent separation or mixing.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Formwork

1. Forms shall be mortartight and sufficiently rigid to prevent displacement or sagging between supports.
2. Internal ties shall be adjustable to permit tightening of forms and so arranged that, after forms are removed, all metal shall be not less than 1 inch away from any surface.
3. Ties shall be of a type which will provide watertight concrete. Cutting ties back from face of wall or use of wire ties will not be permitted.

B. Reinforcement

1. Reinforcing shall conform to ASTM A-615 or A-616. Under A-615, class shall be billet steel deformed bars, Grade 60. Under A-616, class shall be deformed rail steel bars rolled from standard section tee rails, Grade 60.
2. Deformations on bars are to correspond with high bond pattern, ASTM A-305.
3. Wire and wire mesh shall conform to ASTM A-82 and A-185.
4. Design
   a. Lap at splices shall be as shown, noted or scheduled on plans. Splices generally

shall be avoided at points of maximum stress in slabs, beams and girders. If not shown, laps shall conform to ACI 318-89 Class B criteria with applicable modification factors.

b. Offsets in longitudinal bars at change of cross section shall be placed in region of lateral support. Slope of inclined portion of offset shall not be more than 1 in 6, and in tied columns ties shall be spaced not over 3 inches on center for a distance of one foot below actual point of offset.

5. Concrete Protection

a. Unless otherwise noted, thickness of concrete over reinforcement shall be as follows:

(1) Where concrete is deposited against ground without use of forms, not less than .....3"

(2) Where concrete may be exposed to ground, but is placed in forms, not less than .....2"

(3) Where concrete may be exposed to weather, not less than ..... 1½"

(4) In slabs and walls not exposed to ground or to weather, not less than .....¾"

(5) In beams, girders and columns not exposed to ground or to weather, not less than..... 1½"

(6) In all cases, thickness of concrete over reinforcement shall be at least equal to diameter of bars.

C. Cement: Portland cement conforming to ASTM C-150, Type I. All cement shall be the product of one reputable manufacturer. Color shall be subject to approval by Architect/Engineer. Certification of specification conformance shall be furnished to Architect/Engineer.

D. Admixtures: An air-entraining agent conforming to ASTM C-260 shall be used in all air-entrained concrete. Air content shall be 6%-8% for exterior flatwork, 4%-6% for other air entrained concrete. Master Builders "Pozzolith", conforming to ASTM C-494 shall be used in all concrete. Admixtures must be used in strict accordance with the manufacturer's recommendations.

E. Aggregates: All aggregates shall be washed and shall consist of natural sand, gravels or crushed rock. Samples of proposed aggregates shall be submitted to an independent laboratory for testing and results submitted to the Architect/Engineer for approval prior to any concreting work. All costs of aggregate transportation and testing shall be paid by the Contractor. Aggregates shall conform to ASTM C-33. Coarse aggregate shall be tested by the Los Angeles Rattler Test, ASTM C131 and ASTM C535. Loss after 100 revolutions shall not exceed 10.5% and loss after 500 revolutions shall not exceed 42%.

1. Fine Aggregate: Well-graded from coarse to fine, conforming to following requirements.

Passing Sieve	% by Weight
3/8"	100
No. 4	95-100
No. 8	80-100
No. 16	50-85
No. 30	25-60
No. 50	10-30

No. 100 2-10

a. Gradation of sand shall be reasonably uniform and not subject to extreme percentages of gradation specified above.
b. A mortar made with fine aggregate shall develop a compressive strength at 7 and 28 days not less than 90% of that developed by a mortar made in the same manner with the same cement and standard Ottawa sand.
c. Fine aggregate passing the No. 200 sieve shall not exceed 3%.

2. Coarse Aggregate: Well-graded from coarse to fine and, when tested by laboratory sieves having square openings, conforming to the following requirements.

Passing Sieve	No. 67	No. 4
2"	-	100
1-1/2"	-	90-100
1"	100	20-55
3/4"	90-100	0-15
½"	-	-
3/8"	20-55	0-5
No. 4	0-10	-
No. 8	0-5	-

a. Class A concrete shall use No. 67 and shall be used for curbs, walls, beams, joists and slabs up to 8 inches in thickness, minimum 2" thick toppings, or where, in the Architect/Engineer opinion, maximum size of aggregate should be ¾-inch.
b. Class B concrete shall use a combination of No. 67 and No. 4 and shall be used for members 8 inches and over, unless otherwise approved by Architect/Engineer.

F. Water: Water used in mixing concrete shall be clean and free from injurious amounts of oil, alkali, organic matter or other deleterious substance. The Contractor shall provide adequate storage for mixing and a constant pressure supply system to the mixer.

G. Mix Design

1. Concrete mixes shall be designed and proportioned in the manner provided so that the following minimum 28-day ultimate compressive strengths, in pounds per square inch, will be obtained.
2. Design mixes using approved materials and conforming to the following specifications shall be submitted to the Architect/Engineer for approval. Mixes shall produce a dense, watertight concrete. All concrete, including exterior foundation and retaining walls, shall be air-entrained except for interior flatwork, interior walls, curbs, exterior footings below frostline and interior footings.
3. Proportions: Proportions of fine and coarse aggregates to cement for any concrete shall be such as to produce a mixture which will work readily into corners and angles of forms and around reinforcement with the method of placing employed on the work, but without permitting materials to segregate or excess free water to collect on the surface. Concrete with slumps or water/cement ratios greater than maximums scheduled below will be rejected.

Class	Min. Cement Content Sacks/c.y.	Max. Total Water U.S. gal/sack of Cement (94# net)	Coarse Aggregate	28-Day Test psi	Maximum Water Slump
A	5	5	No. 67	4,000	4"
B	5	5½	No. 67&4	4,000	4"

H. Post-Wet Cure Curing Compound: Master Builders "MasterKure-N-Seal HS" solvent-based curing compound (NO SUBSTITUTES). The manufacturer shall submit certified laboratory test data substantiating:

1. Moisture retention exceeds requirements of ASTM C-309.

I. Postcure Penetrating Sealer: Master Builders “Master Seal Surface Guard” penetrating/chemically bonding silane sealer (or Hydrozo “Enviroseal Surface Guard”).

10. Grout: Grout used under column bearing plates, beams bearing on walls and similar structural applications; grout used under equipment bases; and to drill and grout anchors to existing construction shall be Master Builders Masterflow 713 non-shrink grout, mixed with water in strict accordance with manufacturer's recommendations to produce a consistency appropriate for the given situation. Install with a head box and air vents if necessary to insure complete filling of all voids.

11. Thermoplastic Waterstops: Earthshield JP636 (888) 836-5778 or equal with prefabricated corners and intersections.

L. Control Joint Filler: Chemtron CP2010

2.2 MIXES

A. Job-Mixed Concrete: All concrete materials shall be mixed in a machine batch mixer for at least 1½ minutes after all the ingredients are in the mixer and shall continue until there is a uniform distribution of materials and the mass is uniform in color and homogeneous.
   1. The mixer shall not be loaded beyond capacity given by the manufacturer and shall be rotated at the speed recommended by the manufacturer. The mixer is to be provided with a positive timing device which will positively prevent discharging the mixture until the specified mixing time has elapsed.
   2. Pick-up and throw-over blades of mixer which are worn ¾-inch or more shall be replaced.
   3. Entrance and discharge openings shall be such as to insure uniform mixing, consistency and uniform discharge.

B. Ready-Mixed Concrete: Conforming to ASTM C-94. An inspector representing the Owner shall have access to the ready-mix plant at all times during operation of the plant.

PART 3 - EXECUTION

3.1 PREPARATION

A. Forms

1. Forms shall conform to shape, line, grade and dimensions of members as shown on the plans. They shall be properly braced or tied together so as to maintain position and shape and insure safety to workmen and passersby.
2. All sides of footings and foundation walls shall be formed and vertical, and shall not be neat-cast against the sides of the excavation. All other vertical surfaces shall be formed unless otherwise approved by the Architect/Engineer.
3. Exterior edges of all exposed concrete, unless otherwise specified, shall have a chamfer strip placed in form to provide bevel of sharp edges.
4. Temporary openings shall be provided on all wall and column forms to facilitate cleaning and inspection immediately before depositing concrete.
5. Removal of forms shall be accomplished in such a manner as will prevent injury to concrete and insure complete safety of structure. Following removal times are a minimum and may be increased by Architect/Engineer.
    a. Where structure as a whole is supported on shores, vertical forms such as beam and girder sides, columns and similar vertical forms may be removed 24 hours after completion of pour.
    b. Wall forms shall not be removed in less than two (2) days after pouring, unless otherwise required for curing or special finishing.
    c. Supporting forms and shoring must remain in place until concrete can carry any loads to be imposed upon it and in no case shall be removed in less than seven (7) days.
    d. Form ties requiring any operation in removal of forms which would tend to destroy bond between tie and concrete in order to remove form shall not be disturbed for seven (7) days after completion of pour.

B. Reinforcement

1. Bending:
    a. Bends for stirrups and ties shall be made around a pin having a diameter not less than 4 times the diameter of reinforcing bar.
    b. Bends for other bars shall be made around a pin having a diameter not less than 6 times the diameter of the bar, except that for bars larger than 1-inch, pin shall be not less than 8 times diameter of bar.
    c. All bars shall be bent cold. Heating of reinforcement will not be permitted and reinforcement shall not be bent or straightened in any manner that will injure material.
2. In slabs on grade, precast concrete blocks may be substituted for metal chairs.
3. Metal reinforcement shall be accurately placed in accordance with plans and adequately secured in position by concrete or metal chairs or spacers. Nails shall not be driven into forms to support reinforcement nor shall wire ties come in contact with forms.
4. Before placing and before pouring concrete, all reinforcement shall be thoroughly cleaned of all rust, dirt, or foreign matter that will destroy or reduce bond.

5. Exposed reinforcement bars intended for bonding with future expansion shall be protected from corrosion by concrete or other adequate covering.

C. Before placing concrete, all equipment, forms, reinforcement and other surfaces with which concrete will come in contact are to be thoroughly cleaned of all debris, ice and water, and forms shall be thoroughly wetted (except in freezing temperatures).

1. Liquid for wetting forms shall be water or commercial product with a non-oil (or grease) base, which will leave no residue or harmful deposit on concrete surface.
2. Do not use form release agents which will impair bond of specified finishes/overlays. (Coordinate with suppliers of specified finishes/overlays.)
3. Concrete shall not be placed except during presence of the Architect/Engineer, unless authorized by the Architect/Engineer.
4. Existing concrete to receive new overlays or toppings shall be roughened to an amplitude of ¼ and water blasted to remove all debris and laitenance. Sawcut and excavate into existing floors as detailed or necessary to maintain minimum 1½" concrete.

D. Vapor Barriers:

1. Vapor barriers, where scheduled, noted or specified shall be minimum10 mil polyvinyl lapped and sealed to provide a continuous membrane.
2. Locate directly below bedding below floor slabs; or in the case of insulated floor slabs locate directly below the under slab insulation.

E. Provisions for Finishes

1. Floor elevations shown on the floor plans are finished floor elevations, and represent the top elevation of any finishes or flooring systems to be applied over the base slab.
2. Depress slabs on grade where floor brick, ceramic tile, or other flooring systems or finishes are scheduled, specified or noted, to maintain full required base slab thickness and achieve finish floor elevations shown or noted.
    a. Depress slabs full thickness of special flooring systems where those system are scheduled.
3. Slope subgrades under sloped floors or grade to maintain full specified slab thickness at all times.
4. Do not apply curing compounds to surfaces to receive subsequent finishes or penetrating sealers.

F. Cold Weather Requirements: In general, the Contractor is to follow "Recommended Practice for Cold Weather Concreting" (ACI 306-66), along with the following requirements:

1. When placing concrete below a temperature of 40°F or when in the Architect/Engineer's opinion this temperature may be reached in the next 24 hours, mixing water and aggregate shall be heated and freshly placed concrete protected by adequate housing or covering and heating. All concrete materials, forms, ground, mixing equipment, and other surfaces with which concrete is to come in contact shall be free from frost. Mixing water and aggregates entering mixer shall have temperatures not exceeding 175° F and 80° F respectively.

2. Use of a heating torch in mixer will not be permitted.
3. Concrete, when placed in forms, shall have a temperature of not less than 60°F nor more than 80°F.
4. Freshly-placed concrete shall be maintained at a temperature of not less than 70°F for three (3) days or 50iF for five (5) days. At the end of this period, rate of cooling shall not exceed 1°F per hour for the first day and 2°F per hour after that, until outside air temperature is reached.
5. Heating devices shall not be placed so close to concrete as to cause rapid drying or discoloration from smoke.
6. Use of salt or other chemical admixtures for prevention of freezing is prohibited.
7. The Contractor shall take whatever temporary precautions may be necessary during periods of freezing weather to effectively prevent frost heave under or behind foundations and footings which are not yet permanently protected against frost heave by adequate backfill cover or by sufficiently warm temperatures within the building enclosure. Particular care should be given to foundations left unbackfilled and shallow footings such as those for interior walls and columns.

3.2 INSTALLATION

A. Pouring: Concrete is not to be poured under water. A suitable means shall be provided for lowering the water level below surfaces upon which concrete is to be poured. This may require excavating, diverting or pumping the water away from the excavation.

B. Conveying: Concrete shall be conveyed from the mixer to the place of final deposit as rapidly as practicable, by methods which will prevent segregation or loss of materials.

1. Equipment for chuting, pumping and pneumatically conveying concrete shall be capable of producing a continuous flow of concrete at the delivery end without separation of materials. Proper equipment shall be used to avoid premature coating of forms and reinforcing steel.
2. Lines used for pumping concrete shall not be placed directly on concrete which is not at least 14 days old; such lines may be supported on horses placed on 1-day old concrete.

C. Setting: Concrete shall be placed before initial set has occurred, i.e., within 75 minutes (50 minutes for heated concrete) after it is mixed. No retempered concrete shall be used. Care shall be taken to avoid an excess of water in concrete. Dry cement or a mixture of cement shall not be sprinkled directly on surface to absorb water.

D. Depositing Concrete

1. Concrete shall be deposited in approximately horizontal layers not to exceed 18 inches in thickness, as nearly as practicable in its final position, to avoid segregation due to rehandling or flowing.
2. When concreting is once started, it shall be carried on as a continuous operation until placing of section or panel is completed.
3. Concrete shall not fall freely more than 4 feet.
4. Rate of pour in columns and piers shall not exceed 5 feet per hour during summer temperatures and 4 feet per hour during winter temperatures.

E. Vibrating: All concrete shall be placed with the aid of mechanical vibrating equipment approved by the Architect/Engineer. Vibrating equipment shall be operated by experienced help and over-vibrating shall be avoided. Vibration shall be supplemented by hand spading adjacent to forms. Concrete around water stops shall be thoroughly compacted by hand spading only.

F. Finishing

1. Forms shall be so constructed that a smooth-appearing concrete will result. No rubbing will be permitted unless deemed necessary by Architect/Engineer. County reserves right to mandate application of Thoroseal/Acryl-60 cementitious coating on exposed concrete surfaces at no extra cost if smooth uniform appearance is not achieved.
2. New Concrete: Shall be covered with tarpaulins to prevent damage from rain or other weather conditions.
3. Troweling/Finishing:
    a. Top surfaces of floor slabs scheduled to be exposed sealed concrete shall be screeded, floated with a wood or aluminum float, and then steel-troweled with a power float to a smooth, dense finish.
    b. Steel troweling shall not begin until all surface water has disappeared and shall be done in such a manner that no water or excess fine material is brought to the surface. However, steel troweling shall not be postponed until initial set has taken place.
    c. Provide broom finish to steel troweled surface when broom finish is scheduled, specified, or detailed. Pre-establish degree of broom texture via mock-up panel approved by Architect/Engineer, and monitor closely throughout the work.
    d. Install carborundum chips as a dry shake to the top surface of all exposed unfinished stair treads (interior and exterior) to produce a non-slip surface.
    e. Exterior walkway surfaces, including exterior stairways, shall be troweled smooth and lightly brushed across their width to produce a non-slippery surface. Brushing shall be uniform and surface shall be even and to grade specified on plans throughout.
4. Tie Rod Holes: Tie rod holes left by removal of tie rods or portions thereof shall be thoroughly wetted and filled in such a manner as to insure complete filling of hole. Holes are to be filled immediately upon removal of forms. It will not be permissible to use tie rods which are completely removed in construction of walls below grade.
5. Patching: Immediately after removing forms, all concrete surfaces shall be inspected and any poor joints, voids, stone pockets or other defective areas shall be patched at once before concrete is thoroughly dry.
    a. Defective areas shall be chipped away to a depth of not less than 1-inch with edges perpendicular to the surface. Area shall be thoroughly wetted, brushed with grout, and patching mortar placed to slightly overfill recess. After partial set has taken place, excess mortar shall be removed flush with the surface of concrete, using a wood float. Steel trowel all patching mortar to a dense finish taking care not to overwork the surface.
    b. All patching shall be protected, covered, and cured as specified for concrete.
    c. All cracks, leaks or moist spots which appear shall be repaired to satisfaction of the Architect/Engineer.
    d. No extra compensation will be allowed the Contractor for such work.

6. Special Finishing for Interior Concrete Curbs: Interior concrete curbs, wall bases, and all other similar exposed vertical or inclined concrete surfaces within the building shall be formed and finished to obtain a dense, very smooth, durable surface with minimal defects or surface roughness or porosity.

G. Curing and/or Sealing

1. Methods: Provision shall be made for maintaining new concrete in a moist condition after placement of concrete for a period of seven (7) days minimum. The following methods for keeping concrete moist shall be used.
   a. All new floors, concrete curbs, and concrete foundations shall be wet cured as follows: Application of sisalkraft moisture-proof paper or plastic sheets tight against concrete faces and lapped or sealed to prevent moisture loss, and continuously watered with sprinkling system to be sure of continuous moisture supply to entire surface area.
   b. No curing compounds, sealers or other coatings or compounds shall be applied to concrete surfaces in lieu of 7 day wetcure.
   c. In hot weather, concrete shall be protected from sun and shall be maintained at not over 80 F.
2. Post-Wet Cure Curing Compound:
   a. All new exposed interior and exterior flatwork and other new exposed concrete surfaces not scheduled, specified or noted to receive penetrating post-cure sealers or other bonded systems, coatings or finish materials shall receive a liquid applied curing compound after wet curing seven (7) days as specified to extend the curing process.
   b. Application shall be by roller or sprayer immediately after the 7-day wetcure. Surface shall be saturated but without free water. Application rate shall be as recommended by manufacturer, but no less than the rates used to verify compliance to stated standards.
3. Penetrating Sealer:
   1. New concrete floors shall receive penetrating floor sealer after full 7-day wetcure and additional minimum 21-day drying/aging period.
   2. Clean surfaces per sealer manufacturer's recommendations immediately prior to applying sealer.

H. Jointing

1. General: The Contractor shall place wall, floor, and curb isolation, control and construction joints as shown on plans or, where not covered on the plans, as specified herein. Joints in concrete curbs shall be coincident with same type of joints in floor slab wherever possible. Vertical control joints in exposed exterior foundations walls shall be formed by cant strips on both sides of wall, and shall be spaced at 15' maximum and coincident with masonry control joints where possible. If approved by the Architect/Engineer, the Contractor may place exterior foundation wall construction joints at places other than those shown on plans. Floor slab isolation, control and construction joints shall be as shown on the drawings. If not shown or noted, provide control joints at maximum 15' spacing each way, or less as necessary to maintain approximately square panels, with consideration given to intersect reentrant corners, in final locations as approved by the Architect/Engineer. They shall be parallel to or perpendicular to column

lines unless shown otherwise. Reinforcing must run through center of construction joints and control joints unless otherwise detailed. Control joints shall be saw cut as soon as concrete strength will permit cutting without spalling edges, or marring surface, and in no case more than 24 hours after concrete placement. Unless otherwise shown, all joints shall be straight, truly vertical or horizontal, and shall run to the full distance and depth indicated on the drawings and proper methods shall be employed to obtain this result.

2. Exterior Concrete Pavements: Control, construction, and expansion joints shall be as indicated on the drawings. If not shown on drawings or otherwise directed, ¾" expansion joints shall be provided at 60' maximum each direction, with ½" diameter x 2'-0" smooth, greased dowel bars centered across the joint at 32" on center. Unless otherwise shown or directed, saw cut control joints shall be provided to maintain approximately square panels of maximum 15' dimension. Contractor shall submit proposed jointing layout based on specified requirements, noting all construction, control and expansion joints for approval prior to construction.
3. Cleaning: Before the next section is placed, reinforcing bars shall be cleaned from concrete splashed on from placing previous section. Vertical and horizontal concrete surfaces shall be thoroughly cleaned of all laitance and thoroughly wetted before adjacent concrete is placed.
4. Placing: Concrete at vertical joints shall have been in place not less than 24 hours before abutting concrete is placed. At least two (2) hours must elapse after depositing concrete in columns or walls before depositing in beams, girders or slab supported thereof. Beams, girders, brackets, column capital and haunches shall be considered as part of the floor system and be poured integrally therewith.
5. Joint Fillers: See Section 07920 - Sealant and Caulking.

1. Thermoplastic Waterstops: Field butt-welded straight lengths to each other and to prefabricated corners and intersections to provide uninterrupted barrier where called for at construction joints. Use hog-rings and tie-wires to secure waterstop (to provide additional carrier bars if necessary) to prevent displacement during concrete pours. Place to provide equal embedment in both concrete pours.

3.3 TOLERANCES

A. Floors with drains shall slope downward consistently to drains unless otherwise noted, with a tolerance of 1/8-inch in 10 feet from plane of slope, and shall be self-draining into drains.

B. Planar uniformity of all slabs shall meet or exceed ACI 301 Class A tolerances (a true plane with 1/8" in 10' as determined by a 10' straight edge placed anywhere on a slab in any direction). Tolerance across joints shall be 1/12 inch vertical.

C. Concrete stair risers and treads shall be constructed to the dimensions shown within size and variability tolerances permitted by the building code in force.

3.4 TESTING

A. General: Concrete samples, slump tests, entrained air tests, and test cylinders shall be made, cured and tested in accordance with appropriate ASTM specifications by a certified independent agency approved by the Owner. All provisions of Division 1 apply.

B. Slump Tests: Shall be performed at beginning of each pour in excess of 25 cubic yards and for every 25 cubic yards poured thereafter, or at the discretion of the Architect/Engineer. Slump shall be as heretofore specified.

C. Cost: Cost of all sampling and testing of concrete will be paid by the Contractor. Crating for shipment is to be done by the Contractor.

D. Test Cylinders: Strength test shall be made for each day's pour, each class of concrete, each change of suppliers or sources, and for each 50 cubic yards of concrete or fraction thereof. Strength test shall consist of four standard cylinders made from a composite sample secured from a single load of concrete in accordance with ASTM C-172. Field cure one cylinder; transport three to testing laboratory for moist curing. Test one lab cured and the field cured cylinder at 7 days as an index of expected 28-day strength. Test remaining two lab cured cylinders at 28 days.

E. Changes in Mix: Where average strength of these laboratory test cylinders falls below required strength, the Architect/Engineer shall have the right to order a change in mix or water content for remaining portion of concrete work.

F. Special Conditions: The Architect/Engineer shall have the right to order special curing conditions to secure the required strength and may require load tests to be made on or samples to be taken from hardened concrete from which a poor test was made. Costs of such extra provisions shall be borne by Contractor.

G. Air Content Tests: Shall be performed at beginning each pour of concrete specified to be air entrained, and for every 25 cubic yards of air entrained concrete thereafter, or at the discretion of the Architect/Engineer.

3.5 PROTECTION

A. All precautions shall be taken to protect concrete from stains or abrasions and any such damage shall be removed by the Contractor.

3.6 ADJUST AND CLEAN

A. Clean premises of all litter and debris created by work of this Section.

B. Leave all concrete surfaces broom clean.

END OF SECTION

SECTION 05100

STRUCTURAL AND MISCELLANEOUS METAL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide all labor, materials and equipment to complete structural and miscellaneous metal work as indicated in the Contract Documents.

C. Provide all embedded angles/plates and similar components required for equipment (dock equipment, lift pits, service pits, scale/elevator pits, etc) in accordance with equipment manufacturer's layout dimensions.

D. Provide all additional secondary framing as maybe required to mount and support specified doors, tracks, operators and dock shelters.

D. The Contractor shall take his own measurements, coordinate with equipment suppliers, and be solely responsible for proper fitting of the work under this Section to existing conditions.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03300 - Concrete
B. Section 03420 - Precast Prestressed Structural Concrete
G. Section 08360 - Sectional Overhead Door
H. Section 09900 - Painting

1.3 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Shop Drawings and Product Data: Shop drawings and manufacturer's descriptive literature for each type of structural and miscellaneous metal item specified including details of construction, materials, dimensions, preparation, anchoring, profiles, configurations and finishes.

C. Shop Drawings: All shop drawings shall be made in accordance with Section 3 of the latest revision of AISC "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings". The fabricator shall make all necessary shop drawings which shall be approved before construction begins. Said approval shall be only for general conformance to design requirements and shall in no way relieve the fabricator and the Contractor as to correct fit, proper dimensions and quantities, and satisfactory details and adherence to specifications.

1.4 QUALITY ASSURANCE

A. Reference Standards

1. ASTM A36
2. ASTM A500
3. ASTM A307
4. ASTM A325
5. ASTM A123
6. ASTM A153
7. ASTM A386
8. ASTM A52
9. ASTM A48
10. ASTM A536
11. AISC "Specifications for Design, Fabrication and Erection of Structural Steel for Buildings"
12. AWS "Standard Code for Arc and Gas Welding, Building Construction
13. AWS "Standard Qualification Procedures
14. State of Wisconsin Standard Specifications for Road and Bridge Construction
15. Structural Steel Painting Council

B. Workmanship and finish shall be first class and equal to best practice in modern fabrication shops. Shearing, clipping and burning shall be neatly and accurately done and all portions of work exposed to view shall be neatly finished.

C. All fabrication, including workmanship, bolting, riveting, straightening, cutting, planing, assembling, welding, finishing and tolerances shall be accomplished in accordance with the latest revision of the AISC Specifications.

D. Welding, where required, shall be done in accordance with "Standard Code for Arc and Gas Welding, Building Construction" of AWS, as amended to date. Welds shall be made only by operators who have been previously qualified by test, as prescribed in AWS "Standard Qualification Procedure", to perform work required. This provision need not apply to tack welds not later incorporated into finished welds carrying calculated stress.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery, storage and handling shall be accomplished in such a manner so as to prevent damage to construction and finish of product.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Structural Steel: Unless otherwise designated, hot-rolled structural steel W-shapes shall conform to requirements of ASTM A992 (Fy=50 ksi). Steel tubular shapes shall conform to the requirements of ASTM A500, Grade B (Fy=46 ksi). Unless otherwise designated other hot-rolled steel plates and shapes shall conform to ASTM A36 (Fy=36 ksi).

B. Bolts: Unless otherwise noted; anchor bolts, ASTM A307; structural steel bolts for beam splices and beam-to-column connections, ASTM A325-X. All structural steel bolts shall be snug-tite bearing type connections unless otherwise shown as "friction type" or "slip critical".

C. Welds: Unless noted otherwise, welds shall be E70XX for mild (stainless steel electrodes for stainless steel). Low hydrogen electrodes shall be used for any approved welds to deformed reinforcing bars. (Note: No reinforcing bars shall be welded unless specifically noted or otherwise approved by the Engineer.) Stainless steel electrodes shall be used for any welds on/to stainless steel.

D. Galvanizing:

1. All steel members that are to be galvanized shall be repaired with ZRC hot-dipped after fabrication in accordance with latest ASTM Designation A123, A153, or A386, as applicable. Zinc coating shall weigh at least 2 ounces per square foot of surface area. Fabrication shall be stiffened as required to prevent undue stress or warpage due to galvanizing. Vent holes shall be provided as necessary and welded closed after galvanizing and refinished as specified herein.
2. Galvanized surfaces shall be smooth and free of slag and sharp or rough deposits.
3. The Contractor shall exercise care in his operations so that galvanizing is not damaged. All scratches, mars, welds, vent hole repairs or other breaks in the continuity of the galvanizing shall be thoroughly cleaned to white metal grade by wire brushing or sandblasting and repaired with 2 coats of ZRC cold galvanizing compound (no substitutions) to a minimum total dry film thickness (DFT) of 3 mils.

E. Stainless Steel:

1. Type 304 or Type 304L stainless steel with Type 2B finish, unless noted otherwise.
2. Shall be shop fabricated using Type 304L stainless steel to reduce carbon migration during fabrication and shall be passivated to restore original non-corrosive properties after fabrication to prevent corrosion or staining at forged or welded joints.

F. Epoxy Anchor Bolts: Anchor bolts shall be stainless steel capsule chemical anchor bolts as manufactured by the Rawl (Chem-Stud) Molly Fastener Group (Parabond) or Hilti Fastening Systems. The capsule anchor is a 2-part system consisting of (1) a threaded rod stud, and (2) a sealed glass capsule containing premeasured amounts of polyester, resin, quartz sand aggregate and a hardener contained in a separate vail within the capsule. Installation and undisturbed curing time shall be in accordance with the manufacturer's recommendations.

2.2 FABRICATIONS

A. Pipe Bollards and Related Guards

1. Galvanized steel (primed and painted), unless noted otherwise.

B. Embedded Metal Anchors

1. Provide welded headed stud anchors specifically fabricated for application with stud welding devices (Nelson) for all structural shapes and plates to be embedded/cast into concrete.
2. Provide size and spacing noted or required by manufacturer of associated equipment, but

no less than (1) ½" diameter x 4" headed stud at 12".

3. Stainless steel (Type 304L) at stainless steel fabrications; ASTM A108 Grade B (Fy=50 ksi, Fs=60 ksi) elsewhere.

C. Steel Frames/Anchor Plates for Overhead Door Openings

1. Unless otherwise detailed, provide jambs for overhead door openings in masonry walls consisting of bent 3/8" plate or equivalent hot-rolled channel to provide a minimum 3" flange on each face of wall. Provide ½" x 4" headed stud anchors or 1" x 1/4" hooked anchor straps at 2' maximum to be solidly grouted into adjacent masonry, with bottom anchor 8" (1 course) from bottom of channel. Weld top to steel lintel.
2. Provide all steel anchor plates required by door supplier to anchor door, hardware and operator/accessories to building.

3. Provide all secondary steel framing as may be required in addition to framing indicated on drawings, to mount and support specified doors and associated frames, lifting mechanisms, dock shelters and similar accessories. (General Contractor coordinate with equipment suppliers)

D. Construction Castings

1. General: Ferrous castings shall be as manufactured by Neenah Foundry Company or prior approved equal. They shall be of uniform quality, free from blowholes, shrinkage, distortion or other defects. They shall be smooth and well cleaned by shotblasting.
2. Quality: Metal used in the manufacture of castings shall conform to ASTM A48-83 Class 35B for Gray Iron or ASTM A536-80 Grade 65-45-12 for Ductile Iron.
3. Finish: All castings shall be manufactured true to pattern; component parts shall fit together in a satisfactory manner. Found frames and covers shall have continuously machined bearing surfaces to prevent rocking and rattling.
4. Tolerances: As cast dimensions may vary one-half the maximum shrinkage possessed by the metal or ±1/16 inch per foot.
5. Submittals: Manufacturer's shop drawings shall be submitted to the Architect/Engineer for approval prior to manufacture or shipping of castings to job site. The Architect/Engineer shall retain the right to reject castings not conforming to this specification and/or approved submittal drawings.

E. Tubular Steel Members:

1. Provide prewelded backnuts inside members as necessary for bolted connections.

F. All Other Metal Fabrication

1. Stainless steel, galvanized or painted steel as indicated on the drawings.

PART 3 - EXECUTION

3.1 INSPECTION

A. Materials and workmanship shall, at all times, be subject to inspection of the Owner's designated representative and/or the Architect/Engineer.

B. Material and fabrication inspection, when deemed necessary, shall be made at the shop or place of manufacture. All other inspections will be made at the job site. The Contractor, fabricator or manufacturer shall cooperate with the inspector, permitting access to all places where work is being done.

C. Materials and workmanship not conforming to provisions of these specifications may be rejected at any time defects are found during progress of the work.

D. Bolting:

1. Visually inspect all connections for proper number, size and type of bolt.
2. Verify tightness of ten percent (10%) of bolts, or minimum one per connection, to proper torque for turn-of-the-nut method. If tightness is not adequate, Contractor shall retighten all bolts on connection.

5. Welding:

1. Provide inspection of shop and field welding in accordance with AWS D1.1.
2. Visually inspect all welds, perform appropriate non-destructive testing on all welds which appear defective. Verify conformance with specifications.
3. Non-destructive testing (ultrasonic or radio graphic) shall be performed on 20 percent (20%) of the total length of full penetration welds. If a sufficient number of welds are deficient, additional testing shall be performed to establish the extent of the deficiencies.
4. Test 5 percent (5%) of the total length of all shop fillet welds and 10 percent (10%) of the total length of all field fillet welds by magnetic particle or liquid penetrate dye method.
5. Defective welds shall be replaced and retested.

6. Testing and inspections shall be performed by a qualified independent testing agency and paid for by the Contractor.

3.2 WELDING

A. All welding shall be by certified structural welders in accordance with the appropriate section of the AWS "Standard Code for Arc and Gas Welding-Building Construction".

B. Welding of reinforcing bars to structural steel shapes or plates, where called out or permitted by the Engineer, shall be done in full accordance with, and under preheat and quality control procedures meeting AWS D1.4. No tack welding of or to reinforcing bars is allowed properly preheated and specifically permitted by the Engineer.

C. Field welding to components embedded in concrete or masonry shall implement low-heat welding rods of smallest practical size and shall use multiple passes of smaller welds to achieve required weld size to minimize thermal expansion and distortion of embedded components.

D. Headed anchor studs shall be installed using stud welding devices designed for that purpose.

3.3 ERECTION

A. In no case shall any load, other than the dead weight of member or members be transmitted to a concrete floor slab before slab has attained 2/3 of its design compressive strength.

B. Unless otherwise noted in these plans or specifications, erection shall in accordance with Section 1.25 of AISC Specifications.

3.4 SHOP PAINTING AND FIELD TOUCH-UP

A. All ferrous steel shall be prepared for priming by Commercial Grade Blast Cleaning (SSPC-SP6 and SSPC-SP-COM) in accordance with the Structural Steel Painting Council.

B. All steel shall be shop primed with the following approved coatings in full accordance with coating manufacturer's recommendations:

1. All Ferrous Structural Steel
   a. General: White, V.O.C. Compliant, rust-inhibitive, epoxy shop primer with extended recoat window and compatible with epoxy, alkyd or urethane topcoats specified in Section 09900.
   b. Approved Products
      International Intercure 200HS (6.0 mil DFT)
   c. Mask all areas to be field welded and all contact surfaces of bolted connections before priming.
   d. All bolts, masked areas, and areas where primer has been damaged during erection shall be cleaned and prepared and touched up with epoxy primer after all erection bolting and welding is complete, in accordance with recommendations of the coating manufacturer.

3.4 ADJUST AND CLEAN

A. Clean premises of all litter, dirt, and debris created by work of this Section. Leave premises broom clean.

END OF SECTION

SECTION 06100

ROUGH AND FINISH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials and equipment to complete all rough and finish carpentry work as indicated in the Contract Documents.

C. Work on this section includes rough carpentry framing, plywood, sheathing, wood nailers, blocking, sleepers, curbs, cants, and miscellaneous wood.

D. Establish lines and levels for use of other trades.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 08110 - Hollow Metal Doors and Frames

B. Section 08710 - Door Hardware

C. Division 10 - Specialties

1.3 QUALITY ASSURANCE

A. Comply with pertinent codes and regulations of governing authority.

B. Use only the recognized official marks of association under whose rules it is graded. Grade and trademark shall be identified on each piece of lumber.

C. Lumber shall be sound, thoroughly seasoned and free from warp that cannot be corrected in process of bridging or nailing. Woodwork exposed to view on outside of building or in finished interior spaces shall be dressed.

D. Coordinate all layout and dimensions with work in place and other trades whose products will be installed with or adjacent to items.

E. Use only journeyman carpenters and qualified workmen.

F. Reference Standards:

1. APA American Plywood Association
2. WWPA Western Wood Products Association
3. ASTM American Society of Testing and Materials
4. AWPA American Wood Preservers Association

5.	AWPB	American Wood Preservers Bureau
6.	AWI	Architectural Woodwork Institute
7.	RIS	Redwood Inspection Service
8.	NPA	National Particleboard Association
9.	WCLIB	West Coast Lumber Inspection Bureau

G. Federal Specifications (FS):

1. FS-FF-N-105 Nails, Brads, Staples, and Spikes: Wire Cut and Wrought
2. FS-FF-B-561 Bolts (screw), Lag

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Submit shop drawings for all fabricated items furnished by this Section. Indicate compliance with specified quality grades, dimensions, profiles, etc., and other requirements.

C. Product Literature: Submit manufacturer's product literature of pre-constructed items, treated items, panel products and hardware. Include anchors and anchorage devices, types, sizes, capacity and adhesives.

D. Samples: Submit samples when so requested by the Architect/Engineer.

E. Certificates: Preservative and fire retardant treatment certifying products comply with specification requirements.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Stack framing lumber for proper ventilation and drainage. Protect against exposure to weather and contact with damp or wet surfaces before and after delivery. Keep material dry at all times.

1.6 ENVIRONMENTAL CONDITIONS

A. Provide temporary enclosures and dust barriers where required. Coordinate with other trades prior to construction.

B. Carpentry contractor shall layout all lines and levels, locations and openings from which other trades may locate their work.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General

1. Nominal sizes are indicated, except as shown by detail dimensions.
2. Lumber PS 20, graded in accordance with NFPA Grading Rules.

3. Plywood US Product Standard PS-1 for construction and Industrial Plywood.
4. Kiln dried to moisture content of 19% or less.
5. Lumber shall be dressed, S4S, unless otherwise shown or specified.

B. Lumber, Non Load-Bearing

1. Blocking, bucks, nailers, furring, grounds, stripping and similar members shall be Fir, Larch, Hemlock, Spruce No. 2 common grade or any species of board size lumber (WWPA)

C. Lumber, Load Bearing

1. Members shall be not less than 875 psi in bending (Fb), 425 psi in compression perpendicular to grain, 1,100 psi compression parallel to grain and 1,400,000 psi for modulus of elasticity (E), Douglas Fir, Western Larch, Spruce Pine Fir or Western Hemlock, (WWPA or WCLIB).

D. Exposed Lumber

1. Where lumber will not be concealed by other work, provide Douglas Fir, appearance grade (WCLIB or WWPA); Southern Pine, appearance grade, kiln dried (SPIB); Redwood, clear all heart (RIS).

E. Exposed Boards

1. Where boards will be exposed in the finished work for transparent or natural finish, provide Clear Cedar, select grade.
2. Where painted finish is indicated, provide Southern Pine, No. 2 boards (SPIB), or Douglas Fir, construction boards (WCLlB or WWPA).

F. Concealed Boards

1. Where board will be concealed by other work, provide Southern Pine No. 2 boards (SPIB), or any species graded construction boards (WCLIB or WWPA).

G. Wood Roof Nailers

1. All lumber for concealed blocking, roof curbs, roof cants, roof nailers shall be preservative treated hemlock, pine, or fir and shall be new lumber of the best quality available, perfectly sound, well seasoned, free from sapwood, large, loose or dead knots, streaks and evidence of disease or pests.
2. Maximum moisture content of lumber shall be 15%.

H. Plywood

1. Where plywood will be exposed in finished work with painted finish, provide A-C/EXT-APA plywood with Grade A face exposed and Grade C face concealed for exterior use; and A-D/INT-APA plywood with Grade A face exposed and Grade D face concealed for interior use.

2. Where plywood will be concealed by other work, provide C-D plugged/INT-APA, with exterior glue.

I. Fasteners and Anchorages

1. Unless otherwise specified, select proper type and size as recommended by governing wood or product associations for fastening for purpose.
2. 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 coating (ASTM A153).
3. Nails:
   a. Blocking: Common Nails or Type W Screws.
4. Bolts: Lag bolts, machine bolts, nuts washer, etc., sizes as required by job conditions, or recommended by applicable agencies. Expansion Bolts: Use Phillips Red-Head, Rawls, Hilti or approved equal, of type and size required for job conditions. Cadmium plated at all wet areas.
5. Anchors: Use Phillips Red-Head, Rawls, Buildex or approved equal, of type and size required for job conditions. Cadmium plated at all wet areas.
   a. Drill in type, TEC or Tapcon, depending on application.
6. Powder Driven Fasteners: May be used in lieu of bolts only upon written request by contractor and approval of Architect/Engineer.
   a. Any nationally recognized manufacturer. Use proper powder charge, fastener size and type.

J. Preservative Treatment: Where lumber or plywood is indicated or specified herein to be treated, comply with the applicable requirement of AWPB. Mark each treated item to comply with the AWPB Quality Mark requirements.

1. Above-Ground Contact Use Items: Water-borne preservatives complying with AWPB LP-2. After treatment, kiln-dry to the following maximum moisture content. Lumber - 19%,plywood - 15%.
   - Wood blocking, furring, stripping, sill plates, and similar concealed members in contact with roofing, masonry, concrete or exterior steel.
2. Complete fabrication of treated items prior to treatment, wherever possible. If cut after treatment, coat cut surfaces with heavy brush coat of same chemical used for treatment. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.
3. Manufacturers:
   a. Osmose Wood Preserving Company - "OSMOSE"
   b. Koppers Company - "Wolmanize"
   c. Hoover Treated Wood Products - "DIXI CCA"

K. Fire-retardant Treatment: Pressure impregnated, to comply with AWPA C20 for lumber and AWPA C27 for plywood. Fire-treated wood to have flamespread of less than 25 when tested in an extended 30-minute tunnel test in accordance with ASTM E-84, NFPA 255 or UL 723. Fire-tested wood must exhibit corrosion rates less than 1 mil per year when tested in accordance with Federal Specification MIL-L-19140 paragraph 4.6.5.2 in contact with carbon steel, galvanized steel, aluminum, copper, and red brass. Testing on fire performance, strength and corrosive

properties shall be recognized by issuance of a National Evaluation Services Report. Provide where indicated and where required by code. Do not use fire-retardant treatment containing halogens, sulfates or ammonium phosphates. Vehicle for preservative compatible with finish. Kiln dry after treatment to 19% maximum moisture content for lumber and 15% for plywood. "Stick-marks" on unexposed side only of siding products.

L. Building Paper

1. 15 Lb. asphalt impregnated felt paper.

M. Construction Adhesives

1. Products of Contech Division of Rexnord Chemical Company or equal as approved by the Architect/Engineer.
   a. Interior work dry areas - PL 200

   b. Exterior work and wet areas - PL 400
   c. Treated Wood - PL500

N. Miscellaneous

1. Plastic Dust Barrier: Plastic sheet roll stock, fiberglass or nylon reinforced. Griffolyn Company T-55 "dust partition", material or approved equal.
2. Provide all rough hardware required for construction such as for temporary hardware for dust barrier, door, enclosures, etc.

15. Laminated Veneer Lumber (LVL)

1. Members shall be not less than 2,600 psi in bending (F_b), 750 psi in compression perpendicular to gain/parallel to glue line, 2,310 psi in compression parallel to the grain, 285 psi in shear (F_V), and 1,900,000 for the modulus of elasticity.

PART 3 - EXECUTION

3.1 INSPECTION

A. Use materials free from warp which cannot be easily corrected by anchoring and attachment. Discard defective material.

B. Set carpentry work accurately to required levels and lines with members plumb and true and accurately cut and fitted.

C. Securely attach carpentry work to substrates by anchoring and fastening as shown and as required by recognized standards. Install fasteners without splitting of wood; predrill as required. Countersink nail heads on exposed carpentry work and fill holes.

D. Field verify all lines, levels, dimensions and openings prior to fabrication.

E. Coordinate with other trades for blocking required, locations, and methods of installation of their items.

3.2 INSTALLATION

A. Blocking, Nailers, Grounds, and Sleepers: Provide wherever shown and where required. Attached to substrate as required to support applied loads. Countersink fasteners unless shown otherwise.

B. Wood Framing: Provide members of sizes and spacings as shown on drawings.

C. Installation of Plywood: Comply with recommendations of APA, for the installation of plywood.

D. Hollow Metal: Set and brace rigidly and to allow drywaller or mason to install anchors and permanently secure frames. Adjust as required for proper fit prior to work of those trades.

E. Hardware: Install only after doors have been painted. Install in strict accordance with manufacturer's and hardware supplier's instructions. Use proper templates.

F. Premanufactured Items: Review other applicable specification sections for installation instructions. Install per manufacturer's printed instructions and approved shop drawings.

3.3 ADJUST AND CLEAN

A. Remove temporary closures when so requested by Owner or when required by other trades. Reinstall if required for enclosure.

B. Clean premises of all litter, dirt, and debris created by work of this Section. Leave premises broom clean.

C. Clean all items and accessories provided or installed by this Contract.

D. Adjust all movable parts and/or items for free, easy operation.

E. Replace or repair any defaced, damaged, or abraded items or parts provided by this Section, at direction of Architect/Engineer or Owner.

END OF SECTION

SECTION 06190

WOOD TRUSSES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division I apply to this Section.

B. Provide all labor, materials and equipment to fabricate and install wood trusses as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06100 - Rough and Finish Carpentry
B. Section 05100 - Structural and Miscellaneous Metal

1.3 QUALITY ASSURANCE STANDARDS

A. Reference Standards

1. Lumber shall conform to U.S. Product Standard PS-20-70.
2. The design and fabrication criteria for wood trusses shall meet with the following:
   a. "National Design Specifications for Stress-Graded Lumber and its Fastenings: (NDS) as published by National Forest Products Association (NFPA).
   b. "Design Specification for Metal Plate Connected Wood Trusses" as published by Truss Plate Institute (TPI).
   c. "Design Specification for Metal Plate Connected Parallel Chord Wood Trusses" as published by Truss Plate Institute (TPI).
   d. "Quality Control Manual" as published by Truss Plate Institute (TPE).

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Each sheet shall be signed, sealed and dated or a signed, sealed and dated index sheet must be bound to the documents. The seal, signature and date shall be original. The seal on each set of plans submitted shall be in ink or embossed, and the date and signature shall be in ink.

1. Engineer's review of shop drawings and calculations shall be for general conformance with design intent and shall not release the manufacturer from his responsibility for adequate design, fabrication and installation.

C. Shop Drawings: Submit shop drawings prior to fabrication of truss components. Shop drawings are to be stamped by a Registered Professional Engineer.

1. The following information shall be contained on the truss shop drawings.

a. Design loadings and load duration adjustment.
b. Pitch, span, spacing and configuration.
c. Depth of parallel chord trusses.
d. Size, gage, location and orientation of connector plates.
e. Location of bearing and bearing size requirements.
f. Maximum deflection.
g. Forces on all chords and webs.
h. Lumber specifications (grade, specie, and size).
i. Permanent web bracing required to prevent compression buckling.
j. Number of truss plies required on girder designs.
k. Truss to truss connections, such as jack trusses to girder trusses.

D. Design Calculations: When requested by the Engineer, submit design calculations stamped by a Registered Professional Engineer. Where standard catalog or "tabled" members are used, submit the copy of the catalog or table which is the basis for the members along with a letter indicating a registered engineer's review. The calculations or letter shall clearly state all loadings used for design.

1. The design of the trusses shall be the responsibility of the manufacturer.

2. Design calculations shall be submitted simultaneously with shop drawings.

E. Letter of Approval: Obtain letter of approval from State prior to fabrication. Forward one copy of letter of approval from State to Engineer for his records.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Handle prefabricated trusses with care, and in accordance with manufacturer's instructions.

B. Stock pile or store trusses in vertical position and protect from weather.

C. Provide bearing supports and bracing to avoid bending or overturning of trusses.

D. Protect trusses from construction operations.

1.6 ENVIRONMENTAL CONDITIONS

A. Manufacturer must examine all bearing parts of the supporting structure and the conditions under which the joists are to be erected and notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the installation until all unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer.

B. Verify dimensions of supporting structures at the project site prior to fabrication and adjust final shop drawings to reflect actual field dimensions.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The trusses shall be factory manufactured with wood members and metal connector plates such as trusses by Richco Structures.

2.2 MATERIALS

A. Truss Members:

1. All lumber used in the fabrication of trusses shall be of machine stress rated lumber of the specie, size and grade indicated on the approved shop drawings.

2. Lumber shall be identified by the grade mark of a lumber inspection bureau or agency approved by the Board of Review of the American Lumber Standards Committee.

3. All lumber shall conform to or exceed the grades and sizes as shown on the truss design drawings.

4. All fire retardant treated lumber used in trusses shall be redried to 19% M.C. after treatment in accordance with American Wood.

B. Metal Connector Plates

1. All truss connector plates shall be manufactured from only prime structural quality galvanized sheet steel of no less than 20 gage thickness (.036 inch) that meets or exceeds the mechanical requirements as established in ASTM A446 with a minimum yield of 30,000 PSI and a minimum ultimate tensile strength of 45,000 PSI.

2. All truss connector plates shall be double-dipped hot-dipped galvanized. The corrosion-resistant coating process shall be the hot-dip process as per ASTM A525 coating designation G6o or equivalent.

3. Both the steel and the coating process requirements are specifically prescribed in Section 202 of the “Design Specifications for Metal Plate Connected Wood Trusses” by TPI.

C. Uplift Anchors

1. Truss wind uplift anchors shall be as indicated on the drawings.

PART 3 - EXECUTION

3.1 FABRICATION

A. All trusses shall be fabricated in a properly equipped and maintained manufacturing facility of a permanent nature.

B. Trusses shall be fabricated in accordance with the approved shop drawings. Truss members must be cut to accurate lengths and angles, to produce tight fitting joints with proper wood-to-wood contact in assembled units. Assemble truss members in design configuration by securing tightly in jigs or with clamps.

C. Connector plate size, gage, orientation and positioning shall be as indicated in the approved shop drawings.

D. If lumber defects such as want or knots occur in the connector plate area, the connector plate must be up-sized so as not to reduce the effective number of teeth in truss member by more than 10 percent.

E. Connector plates are to be pressed into the wood members on both sides of the truss at each joint so that full penetration of the teeth is obtained without crushing the outer surface of the wood.

F. All connector plates shall be firmly imbedded in the wood with a maximum gap of 10 percent of the tooth length or a maximum gap of 1/16 inch. Connector plates showing evidence of flattening or dominoing of the teeth shall be not acceptable.

G. Excessive splitting of the truss wood members by the connector plate teeth is not acceptable.

H. The quality control manual as published by the Truss Plate Institute shall be the truss fabrications guide for good manufacturing.

I. All trusses shall be clearly identified and warning tags and stickers to be attached as necessary for truss erector to properly identify, orient, and position trusses on building.

J. Truss girders may be multiple trusses as required, bolted or nailed together to act compositely to carry loads.

3.2 INSTALLATION

A. Trusses shall be erected and installed in accordance with approved shop drawings or any other installation guide provided by truss fabricator.

B. During erection, care shall be exercised to keep horizontal bending of the trusses to a minimum.

C. A spreader bar must be used in lifting a truss over 30 feet long. A strongback (rigid frame) must be used in lifting a truss over 60 feet long. The lines from either the spreader bar or strongback must toe-in to prevent banding.

D. Refer to HET 80 (handling and erection of trusses) for detailed pertinent instructions as specified by TPI.

E. Care must be taken to install parallel chord trusses right side up and to have trusses properly oriented.

F. Proper erection (temporary) bracing shall be installed to hold trusses true and plumb and in a safe condition until the sheathing and permanent bracing can be properly installed to form a structurally sound framing system.

G. All erection (temporary) and permanent bracing shall be installed and securely fastened before

the application of any loads to the trusses.

H. Temporary construction loads which cause member stresses beyond design limits are not permitted. Plywood or drywall must be adequately distributed to spread out the concentrated loads.

I. Web bracing as indicated on the shop drawings must be properly installed.

J. The permanent lateral and cross (X) bracing must be installed per BWT-76 (Bracing Wood Trusses) as recommended by TPI or as indicated by the Engineer.

K. Field erection of the trusses, including items such as proper handling, safety precautions, temporary bracing to prevent toppling or dominoing of the trusses during erection, and any other safeguards or procedures consistent with good workmanship and good building erection practices, shall be the responsibility of the General Contractor and the fabricator.

L. Uplift anchors must be installed at all bearing points to adequately secure trusses against wind uplift on roof trusses.

M. Trusses shall not be altered, cut or modified in any way without the written approval of the truss fabricator.

N. General Contractor shall give adequate notification to the Contracting Officer prior to enclosing the joists to provide opportunity for inspection of the installation.

3.3 ADJUST AND CLEAN

A. Clean premises of all litter, dirt and debris created by work of this Section. Leave premises broom clean.

END OF SECTION

SECTION 07310

ASPHALT SHINGLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment to complete shingles and associated underlayment and flashing as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. All documents listed in Table of Contents are a condition of this Section.

1.3 QUALITY ASSURANCE

A. Comply with governing codes and regulations.

B. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for 3 years.

C. Use experienced installers.

D. Reference Standards

1. HUD - Housing and Urban Development
2. ICBO - International Conference of Building Officials
3. ASTM - American Society for Testing and Materials
4. FM - Factory Mutual
5. UL - Underwriters Laboratories
6. NRCA - National Roofing Contractors Association

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittals Requirements.

B. Product Data: Manufacturer's descriptive literature for each product specified, with technical data indicating materials, tests, installation, and storage instructions.

C. Samples: Representative samples of each product specified, in colors selected by Architect.

D. Extra Stock: Shingles to cover minimum 1 square (100 SF), in original packaging.

1.5 PRODUCT, DELIVERY, HANDLING, AND STORAGE

A. Deliver, handle and store materials in accordance with manufacturer's instructions and good practice to prevent deformation, breakage, discoloration and other damage.

1.6 WARRANTY

A. A forty (40) year architectural shingle written warranty from the manufacturer.

B. A ten (10) year weather tightness written warranty from the installer.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Eave Ice Dam Protection: Minimum 40 mil thick self-adhering membrane of rubberized asphalt (minimum 250 psi tensile strength per ASTM D412 modified; minimum 250% elongation ultimate failure per ASTM D412 modified; pliability meeting ASTM D146) integrally bonded to polyethylene sheeting, meeting HUD material release 1056b and ICBO Report No. 3997.

B. Underlayment: Asphalt impregnated 30 pounds per square unperforated rolled roofing felt.

C. Valley Flashing: Minimum 28 gauge x 24 inch wide galvanized steel.

D. Shingle/Step Flashing: Minimum 7" x 7" galvanized steel, bent.

E. Roof Edge: Galvanized steel with double-back projection at top surface.

F. Plastic Roofing Cement: Trowel grade asphaltic plastic cement meeting ASTM D-4586, Type II, recommended by manufacturer for intended use.

G. Fasteners: Large-headed galvanized roofing nails, length as recommended by shingle manufacturer, but no less than 1¼". Staples not acceptable except to temporarily secure underlayment.

H. Shingles: Fiberglass base asphalt shingles meeting ASTM D3018 Type 1, and ASTM D3161 or D3462, UL Class "A" fire rating, self-seal down, 40 year (minimum) limited warranty, wood shake appearance, 5 to 5½" exposure, such as:

1. GAF Timberline Series
2. Owens Corning Oakridge Series
3. Certainteed Landmark Series ("Weathered Wood")

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install all products in strict accordance with manufacturer's written instructions. Coordinate with other trades to incorporate accessories and penetrations.

B. Eave Ice Dam Protection: Remove release paper and press down to adhere directly to clean dry wood roof deck before installing underlayment or other flashings. Apply successive courses from low point to high point. Minimum 6" end laps. Minimum 3½" side laps. Apply from all eave edges to minimum 24" inside the interior face of the exterior walls. Apply 36" strip centered in all valleys after installing eave protection. Install 36" strip turned up 6" against wall sheathing along all higher walls.

C. Underlayment: After all water protection sheets are installed provide a 19-inch wide eave starter felt with 36-inch wide felt mopped to starter felt with fibercoat mopping. Work from low point to high point, lapping all succeeding 36-inch wide felts 19", including ridge felts. Secure felts to wood deck using a minimum number of staples, until shingles are placed and nailed. Cement felt laps to each other with plastic cement from eaves to minimum 24" inside the interior face of the exterior wall.

D. Roof Shingles: Install with 5-inch exposure and 2-inch head lap using four (4) large headed roofing nails per shingle. Stagger shingle ends for succeeding courses. All roof ridges shall be covered with the manufacturer's standard ridge shingles and shall have 5-inch exposure and six (6) nails per shingle, all as recommended by the manufacturer. Staple connections will not be accepted.

E. Valleys: Fully woven shingles, over continuous (lapped) galvanized steel valley flashing, over 36" wide continuous water protection sheet with 6" adhered lap joints. Press valley flashing tightly into valley and nail both edges at 12". Alternating from each side of valley, extend each course of shingles past the valley centerline up the adjoining slope sufficiently to nail each course at least 6" beyond each side of valley centerline. Nail approaching side first, press shingle tightly into valley, and nail other side of valley with 2 nails. If a shingle ends within 6" of either side of valley centerline, cut off one tab of previous shingle and use one whole shingle to cross valley, and nail as above.

F. Flashings Against Vertical Walls: Install 36-inch wide water protection sheet turned up 6" minimum against wall sheathing, with minimum 6" end laps. Install lapped roof underlayment turned up 6" minimum against wall sheathing. Install shingles with bent metal shingle flashing over preceding shingle pressed firmly into the corner and positioned so horizontal leg is fully concealed by succeeding shingle. Secure each metal shingle flashing to wall only, with (1) galvanized roofing nail positioned behind succeeding shingle flashing. Shingle flashing to extend minimum 4" up wall face, minimum 3" over shingle and shall lap preceding shingle flashing 2" minimum. (Coordinate to complete this work prior to installation of wall siding).

G. Roof Penetrations: Flash and counterflash for fully watertight, naturally shedding transition to roof shingles.

3.2 ADJUST AND CLEAN

A. Replace shingles or other products damaged or stained prior to final acceptance.

B. Clean premises of all litter, dirt and debris created by work of this Section.

END OF SECTION

SECTION 07412

METAL SOFFIT

PART I - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment required to complete manufactured metal roof and soffit panel work as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 05100 - Structural and Miscellaneous Metal
B. Section 06100 - Rough and Finish Carpentry
C. Section 07620 - Sheet Metal Flashing and Trim

1.3 QUALITY ASSURANCE

A. Installer shall be currently approved certified by metal roofing and soffit panel manufacturer.

B. Field Measurements

1. Prior to fabrication of panels, take field measurements of structure or substrates to receive panel system. Allow for trimming of panel units where final dimensions cannot be established prior to fabrication.
2. Coordinate field measurements and shop drawings with fabrication and shop assembly to minimize field adjustments, splicing, and mechanical joints.

C. Panel Deflection: Maximum L/180 at maximum loading of 40 psf, positive or negative.

D. Systems shall meet or exceed UL FM-I-90 requirements.

E. References

1. American Architectural Manufacturers Association, (AAMA), 501 - Methods of Test for Metal Curtain Walls.
2. American Society for Testing and Materials (ASTM), latest edition, A 446/A 446M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality.
3. SMACNA Sheet Metal and Air Conditioning Association, Inc., Architectural Sheet Metal Manual Manufacturer's Handbook of Construction Details.
4. Underwriters Laboratory (U.L.)

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Descriptive literature with technical data indicating materials, tests, installation and storage instructions and specifications.

C. Shop Drawings: Submit drawings including small scale layout drawings which show arrangement and orientation of panels and large scale details of edge conditions, joints, corners, custom profiles, supports, anchorages, trim, flashings, closures, and special details. Distinguish between factory and field assembly work.

D. Samples

1. Sample of each panel material.
2. Coating manufacturer's color selection data.

E. Warranty

F. Certificates: Installer certification by manufacturer.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle in strict accordance with manufacturer's printed instructions.

B. Do not install damaged panels, order replacement panels without delay.

1.6 ENVIRONMENTAL CONDITIONS

A. Provide for expansion and contraction of system components due to ambient temperature and solar heat gain. Accommodate movement due to temperature change without buckling, undue stress on structural elements, reduction of performance, or other detrimental effects.

B. Anticipated Ambient Temperature Range: Minute 30°F to plus 100°F.

1.7 WARRANTY

A. Manufacturer's written twenty (20) year guarantee for color fastness and finish of standard color prefinished materials and five (5) year guarantee for special custom colors.

B. Installer's written warranty for two years from the date of final completion and acceptance, guaranteeing materials and labor for watertightness, weathertightness, and against all leaks. During the two year period, the installer shall fix all leaks without any cost to the Owner.

C. Manufacturer's/installer's two year warranty against "Oil Canning" of fascia, caps, trims.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturer: MBCI

B. Soffit Panels: Breakform Custom Products
1. G-90 galvanized steel with factory applied Kynar to match curtainwall.
2. Gauge: 22
3. Panel: Width, length and configuration as shown on drawings. Flush profile.
4. Height: 1 ½""
5. Color: See Architectural Finishes List
6. Perforations: 10% minimum free area
7. Anchor clips to allow thermal movement, including all fasteners.

C. Edges and Caps: Breakformed products
1. G-90 galvanized steel with factory applied baked enamel finish.
2. Gauge: 22
3. Configurations: as shown on drawings
4. Concealed joint covers and continuous clip fastening to allow thermal change and prevent oil-canning.

D. Gutters and Downspouts (as applicable)
1. Form from 24 ga. prefinished steel sheets to profiles shown on the drawings.
2. Gutters: Form to profile with holding straps at 48" o.c. at top and fastening flange to blocking.
   a. Provide for concealed joints inside gutter where connecting sections.
   b. Provide downspout outlets with removable screen.
   c. Provide end caps.
3. Downspouts: Form open face profile to sizes shown on drawings.
   a. Gutters to have face straps 2" wide at 32" o.c.
   b. Fasten to wall with expansion bolt thru downspout with tamperproof head design and neoprene washer at 24" o.c.
   c. Complete with angle spill out elbow.
4. Splash pan: Fabricate from prefinished steel sheet with side ridges and fan design. Splash pan shall be sloped to provide drainage and shall have matching ground anchors to prevent movement.

E. Roofing felts and Ice and Water Dam
1. Felt Underlayment: No. 30 lb. asphalt-saturated roofing felt, un-perforated, UL Labeled, conforming to ASTM D226-89.
2. Rubberized Asphalt Ice and Water Dam: Jiffy Seal "Ice and Water Guard" Membrane, 40 mil. self-adhering membrane of rubberized asphalt integrally bonded to embossed, slip-resistant polyethylene sheeting, as manufactured by Protecto-Wrap Company. Similar products of W R Grace Co. are approved equal.

F. Miscellaneous
1. Miscellaneous anchoring devices as required to fasten soffit panels, hat channels,

concealed clips and concealed covers to building structure.

2. Sealants: Silicone sealant, clear, as manufactured by Dow or GE.

G. Finish

1. Baked enamel containing 70% Kynar 500 additive factory-applied prior to forming.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspection:

1. Verify structure is uniform, even and symmetrical. Inspect to assure that all structural/framing members are flat so when the systems are installed, they will not appear wavy or distorted.
2. Contractor shall correct all defects of sub-strata prior to installation of panels. Do not begin installation until unsatisfactory conditions are corrected.
3. Beginning of installation shall signify acceptance of substrate and adjacent conditions as being proper and acceptable. Correction of defects due to installation of products on unacceptable sub-strata will be at Contractor's expense at no additional cost to Owner.

3.2 INSTALLATION

A. Installation shall be made in accordance with manufacturer's recommended procedures and layout drawings. Manufacturer's Handbook of Construction Details and SMACNA Architectural Sheet Metal Manual shall be used as guides and for details wherever applicable.

B. Ice and Water Dam and Roofing Felts

1. Install Ice and water dam membrane at all ridges, hip ridges, valleys, eaves, and all penetrations thru the roof. Membrane shall extend minimum 18" each way from ridge, valley, etc. At eaves extend membrane minimum 30" up roof. Weatherlap joints 6" minimum; lap ends 6" minimum. Press membrane firmly in place with hand roller.
2. Install roofing felts over entire plywood deck. Install horizontally, starting at eaves and lap 6" over layer beneath. Ends shall be staggered and lapped 12" minimum. Nail or staple in place. Felts shall be layered, top layer shall lap bottom seam minimum of 12". Lap over membrane.

C. Soffit system: Install directly to cold formed framing. At eave corners, soffit panels shall be mitered to form a diagonal intersection each to the other. Stagger panel end joints.

D. End-lap all flashings and trim at least 3". All fascia end caps shall have concealed joint covers and continuous clips. Seal all concealed cover joints.

E. Exercise proper care during installation to avoid damage or scratching of the products.

F. Gutters and Downspouts (as applicable)

1. Fabricate per approved drawings and fasten gutter flange beneath the drainage metal roofing edge.
2. Install downspouts using tamper proof fasteners. Set splash pans beneath downspouts.

3. Pitch gutter to downspouts at 1/8" per foot.

3.2 ADJUST AND CLEAN

A. Peel off any strippable film on flashings as they are installed.

B. Touch up all minor scratches and spots to the approval of the Architect/Engineer. Replace, at no additional cost to Owner all unapproved touched up products.

C. Clean-up premises of all litter, dirt and debris created by work of this Section.

END OF SECTION

SECTION 07464

VINYL SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Vinyl siding.

B. Vinyl trim.

1.02 RELATED SECTIONS

A. Section 06100 - Rough And Finish Carpentry

B. Section 07412 – Metal Soffit.

C. Section 07920 – Sealants and Caulking.

1.03 REFERENCES

A. ASTM D 256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2000.

B. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 1998.

C. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics; 2001.

D. ASTM D 648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural Load; 2001.

E. ASTM D 696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 Degrees C and 30 Degrees C With a Vitreous Silica Dilatometer; 1998.

F. ASTM D 1784 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds; 1999a.

G. ASTM D 2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics; 1999.

H. ASTM D 3679 - Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Siding; 2001c.

I. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2001.

J. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2000a.

K. UBC STD 26-9 - Method of Test for the Evaluation of Flammability Characteristics of Exterior, Nonload-Bearing Wall Assemblies Containing Combustible Components Using the Intermediate-Scale, Multistory Test Apparatus; 1997.

1.04 SUBMITTALS

A. See Section 01000 - Basic Requirements, for submittal procedures.

B. Product Data: Manufacturer's standard printed product data and installation instructions for specified vinyl products.

C. Selection Samples: Submit color chips of manufacturer's full range of colors for selection.

D. Verification Samples: Submit three samples, each 12 inches (300 mm) in length, of each specified vinyl product in specified color.

E. Evidence of code compliance specified in Quality Assurance Article of this section.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Code compliance in accordance with the following:
   1. BOCA.
   2. ICBO.
   3. SBCCI.
   4. Metropolitan Dade County, Florida.
   5. BBA.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver vinyl products to project site in original packaging.

B. Store vinyl siding products in original packaging, on flat surface under cover, stacked no more than 12 boxes high. Do not store in location where temperatures may exceed 130 degrees F (54 degrees C).

1.07 WARRANTY

A. See Section 01780 - Closeout Submittals, for additional warranty requirements.

B. Provide manufacturer's standard limited lifetime warranty.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturer: Alcoa Building Products, Inc; 1501 Michigan St., P.O. Box 57, Sidney OH 45365. ASD. Tel: (800) 962-6973. Email: trade.abp@alcoa.com. www.alcoahomes.com/vinylsiding.html, or equal.

B. Substitutions: See General conditions.

2.02 MATERIALS

A. Siding and Soffit - General Requirements: Polyvinyl chloride products with the following characteristics:
   1. Siding: Comply with ASTM D 3679, Class 2.
   2. PVC ASTM D 1784 Cell Classification: 13334.
   3. Coefficient of Linear Expansion: 0.000029 inch per inch per degree F (0.000052 per degree C), when tested in accordance with ASTM D 696.

4. Tensile Strength: Minimum 7,100 psi (48.9 MPa), when tested in accordance with ASTM D 638.
5. Modulus of Elasticity: Minimum 360,000 psi (2482 MPa), average, when tested in accordance with ASTM D 638.
6. Impact Resistance (Izod): 3.30 ft-lb per inch (577 N/m), average, when tested in accordance with ASTM D 256, with standard 1/8 inch (3 mm) bar.
7. Shore D Hardness: Minimum 73.
8. Specific Gravity: Minimum 1.39.
9. Deflection Temperature: 170 degrees F (77 degrees C), 264 psi (126 kPa), when tested in accordance with ASTM D 648.
10. Smoke Density Rating: 48 percent, average, when tested in accordance with ASTM D 2843.
11. Horizontal flammability, when tested in accordance with ASTM D 635:
    a. Average Extent of Burning: 20 mm.
    b. Average Time of Burning: Less than 5 seconds.
12. Surface Burning Characteristics: Flame spread index of 25, fuel contribution of 0, smoke developed index of 480, when tested in accordance with ASTM E 84.
13. Fire Resistance - Siding: 1 hour, when tested in accordance with ASTM E 119, with siding applied over gypsum sheathing.
14. Flammability - Siding: Comply with requirements of UBC Std 26-9.

B. Fasteners: Aluminum nails, alloy 5056 or 6010, having minimum tensile strength 63,000 psi (434 MPa).

C. Joint Sealers: Specified in Section 07920.

2.03 VINYL SIDING AND TRIM

A. Vinyl Siding: Alcoa Building Products “MeadowBrook” Siding, or equal.
1. Product Description: Double 4-1/2 Dutch Lap profile, 9 inches (229 mm) exposure; nominal 12 feet 1 inch (3683 mm) piece length.
2. Nominal 0.042 inch (1.07 mm) material thickness.
3. Nailing Hem: Single-row, with elongated nailing holes 1-1/4 inches (32 mm) long at 1-5/8 inches (41 mm) on center.
4. Finish: Woodgrain texture.
5. Color: As selected from manufacturer's full range of available colors. *(Colors available from Alcoa Building Products include White, Almond, Brookstone, Cameo, Champaigne, Classic Cream, Desert Sand, Everest, Linen, Pebblestone Clay, Sage, Sandtone, Silver Grey, and Victorian Grey.)*

B. Vinyl Trim:
1. Universal Outside Corner Post: 4 inches (100 mm) by 4 inches (100 mm) post, 3/4 inch (19 mm) wide siding recess; woodgrain finish.
2. Standard Inside Corner Post: 1-1/2 inches (38 mm) by 1-1/2 inches (38 mm) coved projection, 3/4 inch (19 mm) wide siding recess.
3. J-Trim: Channel, 1-1/2 inches (38 mm) nailing leg, 3/4 inch (19 mm) forward leg, (16 mm) channel width to match siding.
4. Finishing Trim: 1-1/2 inches (38 mm) nailing leg, 3/4 inch (19 mm) forward leg; color to be selected by owner.

5. Starter Strip: Single-row nailing hem with elongated nailing holes 1-1/4 inches (32 mm) long 18 inches (457 mm) on center, 1/4 inch (6 mm) base projection; white color.
6. Color and texture to match siding.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrate conditions before beginning installation of vinyl products; verify dimensions and acceptability of substrate.

B. Do not proceed with installation of vinyl products until unacceptable conditions have been corrected.

3.02 INSTALLATION

A. Install vinyl products in accordance with manufacturer's printed installation instructions.

B.. Attach vinyl products to substrate for weathertight installation; ensure that horizontal components are installed true to level, that vertical components are installed true to plumb.

C. Install over continuous vertical sheet flashing (30-pound felt or approved equal) wrapped around corners (18” each way) of sheathed substrate.

3.03 ADJUSTING AND CLEANING

A. Clean dirt from surface of installed products, using mild soap and water.

B. After completing installation, remove from project site excess materials and debris resulting from installation.

END OF SECTION

SECTION 07620

SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment required to complete sheet metal flashings and trim work as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06100 - Rough and Finish Carpentry

B. Section 07920 - Sealant and Caulking

C. Section 09900 - Painting

G. Division 15 - Plumbing, heating, and ventilating sheet metal work, including flashing of roof drains and plumbing vents.

1.3 QUALITY ASSURANCE

A. Sheet metal fabricator and installer shall have minimum five (5) years experience of shop fabrication and installation of shop fabricated roofing metals and flashings.

B. Reference Standards

1.	ASTM A525	Spec. for Steel Sheet, Zinc Coated (Galvanized) by the Hot Dip Process, Commercial Quality
2.	ASTM B209	Spec. for Aluminum and Aluminum Alloy Sheet and Plate
3.	ASTM C920	Spec. for Elastomeric Joint Sealants
4.	ASTM D746	Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
5.	SMACNA	Sheet Metal and Air Conditioning Contractor's National Association Architectural Sheet Metal Manual.

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Manufacturer's descriptive literature with technical data indicating materials, tests and installation and storage instructions.

C. Shop Drawings: Plan layout with dimensions, details indicating profiles, fastening and connection methods and joints. Indicate all components, materials, and finishes.

D. Samples

1. Two (2) samples for color and profile approval, printed color samples not allowed. Material samples shall be 4" wide x 12" long.

E. Warranty

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery, storage, and handling shall be accomplished in such a manner as required to prevent damage to components and their finishes.

B. Materials shall be carefully handled to prevent damage to the surfaces, edges, ends, and shall be stored at the site above the ground in a covered and dry location. Damaged items that cannot be restored to original condition will be rejected.

C. Factory fabricated items shall be delivered in manufacturer's original unopened containers with brand names and material designation clearly marked thereon.

1.6 WARRANTY

A. Contractor shall guarantee materials and workmanship to be watertight for two (2) years, along with roofing system.

B. Manufacturer's twenty (20) year guarantee for colorfastness and finish of standard color prefinished materials and five (5) year guarantee for special custom colors.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Peterson Aluminum Company "Pac-Clad" prefinished .040" aluminum stock, thickness as specified for application.

1. Matching watertight fasteners where exposed.
2. Kynar finish in custom color selected by Architect.

B. Prefabricated Metal Gravel Stop/Fascia System (Elastomeric Roofing)

1. Metal Era Company "System 200" two component snap-on gravel stop system.
   a. Standard 24 ga. galvanized steel continuous water dam.
   b. .063" prefinished aluminum fascia cover size as shown on drawings.
   c. Finish: Baked enamel containing Kynar custom color selected by Architect.

2. System to be complete with matching preformed miters and corners, concealed joint covers, concealed clips, etc.

C. Prefabricated Coping System

1. Metal Era Company "Perma-Tite" prefinished aluminum coping system. Full snap-on design tapered style.
   a. One piece galvanized metal wall cap with anchor clips both sides.
   b. Concealed splice plate: Galvanized steel with factory applied sealant.
   c. Cover: .050" aluminum, prefinished baked on enamel with Kynar additive. Special custom color selected by Architect.
   d. Custom fabricate to dimensions and profile indicated on drawings.

D. Exterior Trim Band

1. Shop fabricate trim band cover with hemmed edges to interlock with concealed continuous keeper secured to precast panel.
   a. Continuous concealed G90 galvanized keeper.
   b. Cover: .040" aluminum with Kynar finish in custom color selected by Architect.
   c. No exposed fasteners.

E. Shop Fabricated Counter Flashings and Reglets

1. Shop fabricate counter flashings to sizes and profile shown on the drawings.
   a. Concealed: Aluminum .032" thick, mill finish.
   b. Exposed to view: Aluminum .032" thick baked enamel finish in custom color selected by Architect.
   c. Fabricate all flashings to lock into reglets and have spring pressure onto membrane flashings. Fabricate exposed counterflashings with concealed joint covers.
   d. Fabricate reglets to accept counterflashings.

F. Shop Fabricated Counter Flashings

1. Shop fabricate counter flashings to sizes and profile shown on the drawings.
   a. Concealed: Aluminum mill finish.
   b. Exposed to view: Finish to match coping system.

G. Finishes

1. Baked on enamel with Kynar additive.
2. Color: Custom color as selected by Architect/Engineer.

H. Miscellaneous

1. Fasteners shall be as recommended by manufacturer for type and size for each application except as specified herein.
   a. Stainless steel fasteners at aluminum - concealed.

b. Custom color finish to match aluminum finish at exposed fasteners.
c. Expansion anchors shall be drill in type, Tapcon, Phillips, or Rawl.

2. Sealants: Clear silicone GE, Dow, or approved equal.
3. Miscellaneous: Provide all necessary miscellaneous materials required for complete watertight installation as recommended by the manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General Requirements

1. Entire roofing and flashing systems shall be sealed against moisture penetration.
2. Shop fabricate counter flashings only from approved shop drawings in conformance with the bidding documents.

B. Workmanship: Design and anchor so work will not be objectionable, distorted, nor flashings seriously stressed from expansion and contraction of metal.

C. Miscellaneous Roofing Flashings

1. Comply with drawings and roofing manufacturer's requirements for metal flashing and counter flashings.
2. Lap counter flashings minimum of 1" and provide clear sealant at all laps.

D. Coping System

1. In accordance with manufacturer's printed instructions and approved shop drawings.
   a. Accurate and straight in line with deviation of plane or edges of fascia.
   b. Allow for expansion and contraction of coping cover.
   c. Seal all joints beneath face metals to concealed joint covers except expansion joints.
2. Fasten galvanized metal wall cover into wood blocking thru membrane flashing with galvanized roofing nails.

3.2 ADJUST AND CLEAN

A. Touch up paint all abraded exposed surfaces of prefinshed metal.

B. Clean premises of all litter, dirt and debris created by work of this Section.

END OF SECTION

SECTION 07920

SEALANT AND CAULKING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment required to complete sealant and caulking work as indicated in the Contract Documents.

C. Work in this Section includes:

1. Expansion joints and control joints in masonry.
2. Joints between dissimilar material.
3. Joints at precast concrete wall panels.
4. Joints at precast concrete sills and copings.
5. Joints at stone sills and copings.
6. Joints at brick relief angles.
7. Joints at frames and openings.
8. Joints in concrete slabs abutting building.
9. Joints as required by drawings and as herein specified.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 03300 - Concrete (Control Joint Filler)

B. Section 07620 - Flashing and Sheet Metal

1.3 QUALITY ASSURANCE

A. Installer Qualifications: Minimum of 2 years experience on comparable projects.

B. Compatibility: Investigate sealant's compatibility with the joint surfaces, joint fillers and other materials in joint system. Provide only materials (manufacturer's recommended variation of the specified material) which are known to be fully compatible with the actual installation condition, as shown by manufacturer's published data or certification.

C. Prior to commencing exterior work, a preconstruction conference shall be held at the project site with the contractor, subcontractor, sealant manufacturer's technical representative, and the building construction superintendent in attendance. Samples of typical work shall be installed prior to such time so that the details of all typical sealant joints required can be evaluated.

D. References Standards

1. ASTM C834 Specification for Latex Sealing Compounds

2. ASTM C920 Specification for Elastomeric Joint Sealants
3. ASTM E814 Method of Fire Tests of Through-Penetration Fire Stops
4. ASTM D3405
5. ASTM D2000

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Manufacturer's descriptive literature with technical data indicating materials, tests and installation and storage instructions and specifications.

C. Samples:

1. Two (2) 3 inch long color samples of available colors for selection.

D. Warranty

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Materials shall be delivered to the job site in the manufacturer's original unopened containers with brand names, and material designation clearly marked thereon.

B. All materials shall be carefully handled and stored to prevent inclusion of foreign materials, or subjection to sustained temperatures exceeding 90 F or less than 40 F.

1.6 ENVIRONMENTAL CONDITIONS

A. Do not proceed with installation of sealants and caulking under unfavorable weather conditions.

B. The ambient temperature shall be within the limits of 40 F and 90 F during application of sealants.

C. All work shall be done prior to commencement of painting and other similar finishing work.

1.7 WARRANTY

A. Contractor shall furnish a written warranty to the Owner guaranteeing sealing systems to remain in serviceable and watertight condition for a period of two years from the date of Substantial Completion of the building.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Exterior and Interior Sealant

1. Three part epoxidized polyurethane terpolymer gun grade sealant complying with FS-TT-S-00227E, Class A, Type II, nonsagging and ASTM C920 Type M, Grade N5, Class 25.

a. Tremco Dymeric-511 is specified as a basis of type and quality. Colors as selected by the Architect/Engineer from the "Dymeric 511" Color System. Special Colors.
b. Products of the following manufacturers are acceptable provided they can comply with color selections.
(1) Pecora Dynatrol II
(2) Bostic Chem-Calk 500 Series
(3) Sonneborn Sonolastic NP-2

B. Horizontal Sealant (other than floor control joints covered in 03300)

1. Multi-component, chemically cured hybrid polyurethane three component sealant complying with FS-TT-S-00227E, Class A, Type I self-leveling.
a. Tremco THC 900 System is specified as a basis of type and quality.
b. Color: Selected by Architect/Engineer
c. The following products are acceptable:
(1) Bostic: Chem-Calk 550
(2) Sonneborn: Sonolastic Paving Joint Sealant
(3) Mameco: Vulkem 227

C. Sealant Backer Rod

1. Compressible rod stock of closed cell polyethylene foam, permanent, durable non-absorptive material as recommended for compatibility with sealant by sealant manufacturer.

D. Bond Breaker

1. Polyethylene tape, or other approved materials or coated materials providing a bond breaker on the exposed side, with a non-smear adhesive on the contact side.

E. Cleaner

1. Solvent material which will not etch or mar metal finishes, leaves no residue and the product of a nationally recognized manufacturer.

F. Primers

1. Unpigmented, durable, made by manufacturer of sealant used. Specifically designed as prime coating for materials on which compound will be applied.

PART 3 - EXECUTION

3.1 INSPECTION

A. Thoroughly clean joints by removing all dirt, dust, loose particles, moisture, frost, grease, oil, wax, paint, lacquer, protective coatings, or other foreign matter that would tend to destroy or impair adhesion.

B. Etch concrete and masonry joint surfaces as recommended by sealant manufacturer. Roughen vitreous and glazed joint surfaces as recommended by sealant manufacturer.

C. Prime or seal joint surfaces where indicated, and where recommended by sealant manufacturer. Do not allow primer/sealer to spill or migrate onto adjoining surfaces.

3.2 INSTALLATION

A. General

1. Install materials in strict accordance with manufacturer's printed instructions.
2. Seal completely all joints around entire perimeter of all openings in all exterior walls and elsewhere as noted on drawings and details. Caulking shall fill gaps and "opens" where dirt, debris, etc., may collect.
3. Primer, where required, shall be as recommended by the manufacturer and shall be applied in strict accord with manufacturer's printed recommendations and instructions and shall be used as it comes from the container.
4. Apply sealants by means of cartridge or caulking gun having proper sized nozzle or with knife as required. Use sufficient pressure to fill all voids and joints solid. Superficial pointing of joints with skin bead will not be accepted.
5. Seal around the entire exposed perimeter of all plumbing fixtures including but not limited to water closets, urinals, sinks, lavatories, bathtubs and showers, and countertops in contact with the floor or walls (except the underside of wall hung lavatories and toilet tanks).
6. Finish of joints shall be neatly pointed with beading tool. Remove excess materials and leave surface neat, smooth and clean.
7. Application of primer and sealants to joints shall not be conducted in one continuous operation. Allow proper drying period for primer.
8. Where danger exists of primer staining adjacent surfaces, joint shall be masked prior to application of primer, sealant, or both. Masking tape shall not be removed until joint has been tooled and before initial cure of the sealant has taken place. Work stained due to failure to exercise proper masking precautions will not be accepted.
9. At completion of application, clean off all excess material from adjoining surfaces and material. Entire installation shall be left in watertight condition.
10. Sealant shall be interrupted at weep hole ventilators or similar construction where a continuous sealant application would tend to trap water in the wall.

B. Install sealant to depths as shown or, if not shown, as recommended by sealant manufacturer but within the following general limitations, measured at center (thin) section of bead:

1. For sidewalks, pavements and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to a depth equal to 75% of joint width, but neither more than 5/8" deep nor less than 3/8" deep.
2. For normal moving joints sealed with elastomeric sealants but not subject to traffic, fill joints to a depth equal to 50% of joint width, but neither more than ½" deep nor less than 1/4" deep.
3. For joints sealed with non-elastomeric sealants and caulking compounds, fill joints to a depth in range of 75% to 125% of joint width.

C. Cure sealants and caulking compounds in compliance with manufacturer's instructions and recommendations, to obtain high early bond strength, internal cohesive strength and surface durability. Advise Contractor of procedures required for cure and protection of joint sealers during construction period, so that they will be without deterioration or damage (other than normal wear and weathering) at time of substantial completion.

3.2 ADJUST AND CLEAN

A. Immediately clean adjacent materials which have been soiled.

1. Use cleaning materials recommended by sealant manufacturers.

B. Clean-up premises of all litter, dirt and debris created by work at this Section.

END OF SECTION

SECTION 08110

HOLLOW METAL DOORS AND FRAMES

PART I - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment necessary to furnish hollow metal doors and frames as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 04200 - Masonry

B. Section 06100 - Rough and Finish Carpentry

C. Section 08710 - Door Hardware

D. Section 08800 - Glass and Glazing

E. Section 09900 - Painting

1.3 QUALITY ASSURANCE

A. Comply with all ASTM requirements and UL labeling. Comply with BHMA requirements and HMMA guide specifications. Labeled doors and frames shall have labels attached.

1. HMMA 861 - Guide specifications for commercial hollow metal doors and frames.

B. Fire-Rated Door Assemblies

1. Provide units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined per ASTM E 152 and which are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.
2. Provide factory installed labels on doors and frames.

C. Oversize Fire-Rated Door Assemblies

1. For units exceeding sizes of tested assemblies, provide manufacturer's certification that doors conform to all standard construction requirements of tested and labeled fire-rated door assemblies except for size.

D. Regulatory Requirements

1. Conform to applicable code for fire rated doors and panels.

E. Reference Standards

1. ASTM A 153 Spec. for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
2. ASTM A 366 Spec. for Steel, Carbon, Cold-Rolled Sheet, Commercial Quality.
3. ASTM A 568 Spec. for Steel, Sheet, Carbon and High Strength, Low Alloy, Hot-Rolled, and Cold-Rolled.
4. ASTM A 569 Spec. for Steel, Carbon (0.15 Max., Percent) Hot-Rolled Sheet, and Strip, Commercial Quality.
5. NFPA 80 Fire Doors and Windows.
6. ANSI A115 Specifications for Steel Door and Frame Preparation for Hardware.
7. ANSI/SDI 100 Recommended Specifications for Standard Steel Doors and Frames.
8. SDI 105 Recommended Erection Instructions For Steel Frames.

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Manufacturer's descriptive literature for each type of door and frame specified, including details of construction, materials, dimensions, hardware preparation, anchoring, core, label compliance, sound ratings, profiles, configurations and finishes.

C. Shop Drawings

1. Show fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.
2. Provide schedule of doors and frames using same reference numbers for details and openings as those on contract drawings.
3. Indicate coordination of glazing frames and stops with glass and glazing requirements.

D. Certificates: UL approvals.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Accomplish delivery, storage and handling of hollow metal work in a manner which prevents damage to construction and finish.

B. Doors shall be stored in upright position in a protected and dry area with bottom edge placed on wood strips over the ground or floor and doors shimmed to provide at least 1/4 inch space between individual units for air circulation.

C. Factory finished doors shall be individually packaged in cartons which will completely protect doors during shipping and handling. Protection consisting of polyethylene bags will not be acceptable.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Acceptable Manufacturers

1. Amweld Building Products
2. Ceco Corporation
3. Curries Company
4. Fenestra Corporation
5. Kewanee Corporation
6. Pioneer Industries
7. Precision Metals, Inc.
8. Republic Builders Products
9. Superior Fireproof Door Company
10. Steelcraft Manufacturing

B. Hollow Metal Frames: HMMA 861

1. Door and Borrowed Lite Frames:
   a. Interior: 12 gauge. G90 galvanized
   b. Exterior: 12 gauge. G90 galvanized
2. Frames shall be hot rolled pickled and annealed steel. Manufacture frames to size shown on Door and Hardware Schedule x 5 3/4" deep with continuous full welded construction and fully mitered corners. Drywall frames shall have throat return.
3. Provide 14 gauge metal clip angle floor anchors. Provide removable spreader across frame bottom.
4. Provide three (3) GJ No. 64 silencers per latch jamb for all door frames. At double doors without mullion, provide one (1) at head, each leaf.
5. Anchors: Provide proper type of anchors required by wall conditions. Provide quantities as recommended by HMMA. Comply with U.L. requirements. Hot dipped galvanized anchors at masonry.
   a. 3 anchors per jamb up to 84" high. Four anchors per jamb for doors over 84" high.
6. Frames shall be complete with dust covers and mortar boxes.
7. Borrowed light and sidelite frames shall have full length steel stops attached to frame with countersunk oval head tamperproof machine screws. Stops shall have tight fitting corners and hairline joints.
8. Provide 4" heads at 7'-0" doors installed in masonry walls, and elsewhere as scheduled/noted.

C. Flush Hollow Metal Doors: HMMA 861

1. Doors shall be sizes as shown on drawings x 1-3/4" thickness.
   a. Latch or lock edge of all hollow metal doors shall be beveled.
   b. Interior Doors: 14 gauge. G90 galvanized
   c. Exterior Doors: 14 gauge. G90 galvanized
2. Standard doors shall be full welded construction with honeycomb core. Welds shall fill all spaces and be ground smooth. Allow no seams or gaps on any surface. Reinforced per BHMA and HMMA to accept specified hardware.
3. Top of all doors shall be completely closed with welded closure; "U" top not acceptable.

4. Exterior insulated doors shall have "foamed-in-place" urethane insulation. Remainder of specifications similar to standard doors.
5. Fire-rated doors shall be 16 gauge full flush welded construction and have UL acceptable Honeycomb or Kalamine core. Welds shall fill all spaces and be ground smooth. Allow no seams or gaps on face surface.

D. Louvers: Louvers shall be sight proof, inverted V or split inverted Y type with free air space not less than shown on the Door and Hardware Schedule.

E. Glazing Stops

1. Provide one removable stop and one fixed stop for glazed openings. Secure removable stop with countersunk, oval head, self-tapping screws at maximum spacing of 16 inch centers.
2. Glazing stops shall be of design that will permit application of glazing sealant on each side of glass to the following minimum dimensions for the listed types of glass:
   a. Monolithic glass - 1/8 inch clearance on each side.
   b. Laminated and insulating glass - 3/16 inch on each side.

F. Finishing: All hollow metals shall receive prime paint and shall be phosphatized prior to prime painting. All hollow metals shall be G90 galvanized prior to prime painting.

G. Astragals

1. Provide 1-3/4 inch by 12 gauge overlapping full height astragal welded on active leaf at pair of exterior doors.
2. Provide astragals as required by Underwriter's Label construction at pairs of interior label doors. Astragals shall be full height overlapping type applied on active leaf.

H. Dutch Doors: Provide a 8 inch wide, 14 gauge steel shelf on lower door leaf with 1 inch edges boxed and returned, and supported with two brackets.

I. Transom Panels: Provide hollow metal transom panels of same thickness and basic construction as doors. Transom panels located directly above doors (without a horizontal mullion) shall have a rabbeted joint at junction with top of hollow metal door.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fabricate only from approved shop drawings.

B. Install steel doors, frames, and accessories per manufacturer's printed instructions, U.L. label requirements and in accordance with final shop drawings and as specified.

C. Mortise, reinforce, drill and tap at factory for specified hardware. Reinforce frame on both sides so door closers or holders can be applied to either side.

D. Door Clearances: 1/8 inch maximum at jambs and heads, 1/4 inch maximum at meeting stiles of pairs of doors (1/8 inch maximum on fire doors), 3/4 inch maximum between bottom of door and finished floor except where larger undercuts are scheduled or where thresholds require specific clearance.

E. Fire Door Clearances: Install with clearances as specified in NFPA Standard No. 80. Undercut clearances greater than 3/4 inch are not permitted at single label doors and 3/8 inch at pair of label doors.

F. Frame Installation: Comply with provisions of SDI 105, unless otherwise indicated. Place frames prior to construction of enclosing walls and ceilings, except for frames located at existing concrete, masonry or drywall installations. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors as set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged. Fully grout all hollow metal door frames installed in masonry wall construction.

3.2 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. Protection Removal: Immediately prior to final inspection, remove protective plastic wrappings from prefinished doors.

C. Final Adjustment: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete proper operating condition.

D. Clean premises of litter, dirt and debris created by work of this Section. Leave premises broom clean.

END OF SECTION

SECTION 08365

FIBERGLASS SECTIONAL OVERHEAD DOOR

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide labor, materials, and equipment to complete fiberglass sectional overhead door work as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 04200 - Masonry
B. Section 05100 - Structural Steel and Miscellaneous Metal

1.3 QUALITY ASSURANCE

A. Use only personnel thoroughly skilled and familiar with the manufacturer's recommended installation method.

B. Provide each fiberglass sectional overhead door as a complete unit produced by one manufacturer, including frames, sections, brackets, guides, tracks, counterbalance mechanisms, hardware, operations, and installation accessories, to suit openings and head room allowable.

C. Unless otherwise acceptable to Architect, furnish fiberglass sectional overhead door units by one manufacturer for entire project.

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Submit manufacturer's product data, roughing-in diagrams and installation instructions for each type and size of fiberglass overhead door. Include manufacturer's operating instructions and maintenance data.

C. Shop Drawings: Submit shop drawings for special components and installation which are not fully dimensioned or detailed in manufacturer's data.

D. Warranty

E. Certificates

F. Test Reports: Independent laboratory reports or certificated demonstrating compliance with design requirements.

1.5 WARRANTY

A. Submit one year manufacturer's warranty. Warranty is to start at the substantial completion of the project.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials on job site in manufacturer's original, unopened packaging, and adequately protect against damage while stored in dry location at the site.

B. Remove all damaged and unsuitable material from the job site immediately.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Clopay Corporation

B. E-Z Glide

C. Fimbel Door Corporation

D. Ideal Door Company

E. Wayne-Dalton Corporation

F. Windsor Door

2.2 MATERIALS

A. Door

1. White, 5 ounce ribbed, reinforced, light stabilized fiberglass panels in aluminum frames per manufacturer's standards for commercial door construction.
2. Wind Loading: Design and reinforce fiberglass sectional overhead doors to withstand a 20 psf wind loading pressure. Provide additional struts in top panels to eliminate sag in open position.

C. Tracks, Supports and Accessories

1. Tracks: Provide manufacturer's 3" galvanized steel track system, sized for door size and weight and designed for high-lift to maximize headroom in open position (verify no interferences with other trades). Provide complete track assembly including brackets, bracing and reinforcing for rigid support of ball bearing roller guides, for required door type and size. Slot vertical sections of track at 2" O.C. for door drop safety device. Slope tracks at proper angle from vertical or otherwise design to ensure tight closure at jambs when door unit is closed. Weld or bolt to track supports.

2. Track Reinforcement and Supports: Provide galvanized steel track reinforcement and support members. Secure, reinforce and support tracks as required for size and weight of door to provide strength and rigidity and to ensure against sag, sway and detrimental vibration during opening and closing of doors.
3. Weather Seals: Provide continuous, rubber or neoprene, adjustable weatherstrip gasket at tops and a compressible astragal on bottoms of each fiberglass overhead door. Provide continuous flexible seals at door edges for a fully weathertight installation.
4. Inserts and Anchorages: Furnish blocking, secondary supports, inserts and anchoring devices as necessary for installation of units. Provide setting drawings, templates and directions for installation of anchorage devices. Coordinate delivery with other work to avoid delay.

C. Hardware

1. Provide heavy-duty, rust resistant hardware, with galvanized or cadmium plated or stainless steel fasteners, to suit type of door.
2. Hinges: Provide 11 gage heavy duty steel hinges at each end stile and at each intermediate stile, per manufacturer's recommendation for size of door. Provide double end hinges for doors exceeding 16'-0" in width.
3. Rollers:
   a. Provide heavy-duty rollers, with steel ball bearing in case hardened steel races, mounted with varying projections to suit slope of track. Extend roller shaft through both hinges where double hinges are required. Provide roller tires to suit size of track (3" diameter for 3" track).
   b. Case hardened steel tires, for normal installations.
4. Pull Handles, Locks and Latches: Furnish lifting handles, lock and locking device as follows:
   a. Lifting Handles: Galvanized steel.
   b. Locking Bars: Single side, operable from inside only.

D. Counterbalancing Mechanisms

1. Torsion Spring: Hang door assembly for operation by torsion spring counterbalance mechanism, consisting of adjustable tension tempered steel torsion springs mounted on a case hardened steel shaft and connected to door with galvanized aircraft type lift cable. Use 50,000 cycle springs for all systems.
2. Provide cast aluminum or grey iron casting cable drums, grooved to receive cable. Mount counterbalance mechanism with manufacturer's standard ball bearing brackets at each end of shaft with one additional midpoint bracket for shafts up to 16' long and 2 addition brackets at 1/3-points to support shafts over 16' long, unless closer spacing recommended by door manufacturer.
3. Include a spring-loaded steel or bronze cam mounted to bottom door roller assembly on each side, designed to stop door automatically if either cable breaks. Provide either a compression spring or leaf spring bumper installed at each of each horizontal track to cushion door at end of opening operation.

5. Electric Door Operators (where scheduled)

1. Furnish electric door operator assembly of size and capacity as shown in schedule below; complete with electric motor and factory prewired motor controls, gear reduction unit, solenoid operated brake, clutch, remote control stations and control devices.
2. Provide hand operated disconnect or mechanism for automatically engaging sprocket chain operator and releasing brake for emergency manual operation. Include interlock device to automatically prevent motor from operating when emergency sprocket is engaged.
3. Design operator so that motor may be removed from reduction unit without disturbing limit switch adjustment and without affecting emergency auxiliary operator.
4. Door Operator Type
   a. Provide sidemount or centermount gear hoist type, with worm and gear reduction drive, direct-couple chain to counterbalance shaft and with auxiliary chain hoist and disconnect clutch for high lift or full vertical lift doors.
   b. Electric Motors: Provide high-starting torque, reversible, constant duty, Class A insulated electric motors with automatic reset overload protection, sizes as shown below in schedule to move door in either direction, from any position, at no less than 6" or more than 8" per second.
      1) Overhead Sectional Door, Operator Size Schedule:

Door Size	Operator Size
<14' X 12'	½ HP, 208V, 3 phase
14' X 12'	½ HP, 208V, 3 phase
24' x 12'	½ HP, 208V, 3 phase
14' x 16'	½ HP, 208V, 3 phase
24' x 16'	3/4 HP, 208V, 3 phase

      2) Coordinate wiring requirements and current characteristics of motors with building electrical system.
      3) Provide remote push button operators for use within vehicle (where scheduled).
      4) Provide floor loop imbedded in concrete floor slab (where scheduled), with manual disconnect inside building near door for security.
      5) Provide NEMA 4 motors in washdown areas and open dripproof type motors elsewhere, unless noted otherwise. Provide appropriate NEMA type enclosure for associated electrical devices on operator.
   c. Controls
      1) Provide pushbutton controls (where scheduled) labeled "open", "close", and "stop".
      2) Provide wireless remote control operation (where scheduled). Provide number/type of remote controls scheduled.
      3) NEMA type enclosure shall be as scheduled under "Operation".
      11 Provide adjustable timer-controlled automatic closer for all exterior doors.

   d. Automatic Reversing Control (Sensing Edge): Furnish each power operated door with automatic pneumatic type safety switch, extending full width of door bottom, and located within neoprene or rubber astragal mounted to bottom door rail. Contact with switch will immediately reverse downward door travel. Furnish manufacturer's standard take-up reel or self-coiling cable.
   e. Delayed reversing control (Photo Electric Sensor): Furnish each power operating door with a photo-electric sensor system mounted diagonally 12" above floor on one

side and 42" above floor on other side to work with an Artesan Model 438 USA relay to stop door for 1.0 seconds before reversing.

f. Control drive chain slack by spacer bars between the torsion shaft and electric operator or by installing snap-idlers on the chains.

g. Provide internal counter system to count door cycles.

F. Door supplier to furnish, install and adjust all components, including controls and control wiring.

PART 3 - EXECUTION

3.1 INSPECTION

A. Beginning of installation shall signify acceptance of substrate and adjacent conditions as being proper and acceptable. Corrections of defects due to installation of products on unacceptable substrata will be at Contractor's expense at no additional cost to Owner.

3.2 INSTALLATION

A. Fabricate only from approved shop drawings.

B. Install all doors, frames, and accessories per manufacturer's written instructions and final shop drawings. Verify control locations and photo-eye mounting heights with Owner in field.

C. Door supplier shall furnish and install door, track, and operating equipment complete with necessary control components and interconnections, hardware, jamb, and head mold stops, anchors, insets, hangar and equipment supports, in accordance with final shop drawings, manufacturers' instructions and as specified herein.

D. All installation shall be by qualified installer fully experienced in the size and type of door involved, in full accordance with manufacturer's recommendation and instructions. Verify control locations with Owner before installation.

E. Fasten vertical track assembly to framing at not less than 24" o.c. Hang horizontal track from structural overhead framing with angle or channel hangars, welded and bolt-fastened in place. Provide sway bracing, diagonal bracing, and reinforcing as required for rigid installation of track and door operating equipment.

F. Electrical wiring to power connection at any scheduled operator shall be done by Electrical Contractor. All other interconnections and control wiring shall be done by door supplier.

G. Upon completion of installation, including work by other trades, door supplier shall lubricate, test and adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

H. Installations shall be inspected and tested by manufacturer's representative who shall submit written inspection report to Owner to verify proper installation and operation.

3.3 ELECTRICAL WORK

A. The Electrical Contractor will provide one (1) power supply/connection to the main equipment power control panel for each complete separate system requiring electrical power (i.e., 1 power supply to door operator system; 1 to truck restraint/warning system, 1 to each door with smoke/fire detector scheduled, etc.)

B. The Equipment Supplier is responsibility for any additional power supplies/connections and for ALL other electrical materials and labor associated with this unless specifically stated otherwise on the drawings. This responsibility includes (but is not limited to) the furnishing, placement and mounting of control boxes, activation devices, switches, photo eyes, dock lights, light systems, limit switches, junction boxes and any other devices and all interconnecting metal/plastic conduit, piping and wiring associated with this equipment and necessary for it to perform as specified.

C. Electrical work shall conform to the National Electric Code and requirements of Division 16 of the specifications.

D. All components/devices shall be mounted in NEMA rated enclosures appropriate for the exposure level, but no less than the rating scheduled on the drawing or specified herein.

3.4 ADJUST AND CLEAN

A. Remove protective maskings. Clean and polish surfaces. Leave free of imperfections.

2. Adjust and check each operating item of hardware to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application specified.

C. Clean premises of all litter, dirt, and debris created by work of this Section. Leave premises broom clean.

D. Provide operating and maintenance data and instruct Owner as to a proper operation and maintenance procedures.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide all labor, materials, and equipment to complete door hardware work as indicated in the Contract Documents.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 08110 - Hollow Metal Doors and Frames

1.3 QUALITY ASSURANCE

A. All hardware shall be heavy-duty commercial quality. Finish shall be as scheduled on the drawings. Finishes scheduled as "Manufacturer's Standard" shall be BHMA Code 626 satin chrome unless noted otherwise.

B. Tag each item or package separately, with identification related to the door mark number, and include basic installation instructions in the package. Furnish hardware items of proper design for use on doors and frames of the thicknesses, profile, swing, security and similar requirements indicated, as necessary for proper installation and function. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

C. Furnish hardware templates to each fabrication of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check the shop drawings of such other work, to confirm that adequate provisions are made for the proper installation of hardware.

D. Although several manufacturer's/products may be listed as acceptable, obtain each kind of hardware (latch and lock sets, hinges, closers, etc.) from only one manufacturer for the entire project. Coordinate with various door manufacturers as necessary.

E. All mounting screws/fastenings shall be of same material and finish as hardware wherever possible.

F. Reference Standards

1. ANSI American National Standards Institute
2. BHMA
3. Door and Hardware Institute
4. U.L. Underwriter's Laboratory

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Submit Hardware Schedule and Product Data. Hardware Schedule submitted for review shall indicate same opening numbers as those used on drawings and Door and Hardware Schedule. Submit with Hardware Schedule catalog sets showing detailed information on each item of hardware to be furnished.

C. Submit Hardware Schedule at earliest possible date particularly where acceptance of Hardware Schedule must precede fabrication of other work (e.g., doors and frames) which is critical in the project construction schedule. Include with schedule the product data, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of Hardware Schedule.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver materials in unopened, undamaged containers, clearly marked and identified with name and description of contents.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Locks and Latches:

1. Grade to be Grade 1 unless noted otherwise.
2. Finish to be BHMA Code 626 satin chromium plated unless noted otherwise to be stainless steel.
3. Locate hardware as scheduled on Door and Hardware Schedule.
4. Provide U.L. Rated latch bolts on fire doors as required.
5. Lockset cylinders shall match existing “Schlage” locksets on other facilities. Furnish three change keys for each lock. Keys shall be of nickle silver only. Deliver keys to Owner's representative.
6. Equip locks with cylinders for interchangeable-core 6-pin tumbler inserts. Furnish only temporary inserts for the construction period, and remove these when directed.
    a. BHMA Code 626 (satin chrome) Locks and Latch Sets: Acceptable products for Locks and Latch Sets are “Schlage” only.
        1) Passage Latch (ANSI F75): Both knobs always unlocked.
        2) Privacy Lock (ANSI F76): Push-button lock. Can be opened from outside with small screwdriver or flat narrow tool. Turning inside knob releases push-button. Closing door on (Schlage) A, C, and D Series also releases button, preventing lock-out.
        3) Patio Lock (ANSI F77): Push-button locking. Turning knob inside releases button. Closing door on (Schlage) A and D Series also releases button.
        4) Communicating Lock (ANSI F80): Key in either knob locks or unlocks each knob independently.
        5) Entrance Lock (ANSI F82): Turn/push-button locking: Pushing and turning button locks outside knob requiring use of key until button is

manually unlocked. Push button locking: Pushing button locks outside knob until unlocked by key or by turning inside knob.

6) Classroom Lock (ANSI F84): Outside knob locked and unlocked by key. Inside knob always unlocked.
7) Storeroom Lock (ANSI F86): Outside knob fixed. Entrance by key only. Inside knob always unlocked.
8) Vestibule Lock (ANSI F88): Unlocked by key from outside when outside knob is locked by key. Inside knob is always unlocked.
9) Exit Lock (ANSI F89): Unlocked by knob inside only. Outside knob always fixed.
10) Store Lock (ANSI F91): Key in either knob locks or unlocks both knobs.
11) Deadbolt Lock Keyed One Side (Single Cylinder Deadbolt Lock) (ANSI E2151): Deadbolt thrown or retracted by key from outside or by inside turn unit. Bolt automatically deadlocks when fully thrown.
12) Deadbolt Lock Keyed Both Sides (Double Cylinder Deadbolt Lock) (ANSI E2141): Deadbolt thrown or retracted by key from either side.
13) Closet Latch (Knob with Thumb Turn): Outside knob and inside thumb turn are always unlocked.
14) Night latch with hold-back feature (ANSI E2121): Deadlocking latch bolt retracted by key from outside or by inside turn unit. Rotating turn unit and activating hold-back feature keeps latch retracted.
15) Exit Latch with hold-back feature (ANSI E2181): Deadlocking latch bolt retracted by inside turn unit only. No outside trim. Rotating turn unit and activating hold-back feature keeps latch retracted.
16) Exit Lock (EL): Blank plate outside. Inside knob/lever always unlocked.

B. Hinges:

1. To be 4½" full mortise, 5 knuckle hinge, 1½ pair per door leaf for doors under 7'-0" in height, and two (2) pair per door leaf for doors over 7'-0" in height or over 3'-6" in width.
2. Hinges to be satin chromium plated steel (BHMA Code 626), satin stainless steel (BHMA Code 630), plain bearing or ball bearing as scheduled in Door and Hardware Schedule.
3. Acceptable Manufacturers are as follows:

Manufacturer	Stainless Steel	Steel
Stanley	F191 (plain bearing)	F179 (plain bearing)
Stanley	FBB191 (ball bearing)	FBB179 (ball bearing)
Hager	1191 (plain bearing)	1279 (plain bearing)
Hager	BB1191 (ball bearing)	BB1279 (ball bearing)
H. Soss and Co. (Yale)	SS450 T (plain bearing)	450T (plain bearing)
H. Soss and Co. (Yale)	SS450 TBB (ball bearing)	450TBB (ball bearing)

C. Strike Plates: Provide lock/latchset manufacturer's standard ASA box strike with curved lip extended to protect frame for each lock/latchset unless noted otherwise. Strike plate shall be stainless steel for stainless steel lock/latchsets and whenever else scheduled.

D. Closers: as scheduled.

1. Stainless steel: Dorma 7600 Series with STA option, or Norton (Yale Security, Inc.) 7500 SS series, BHMA Code 630 finish, all corrosion resistant construction. (All parts, stainless steel, bronze or aluminum.)
2. Otherwise: Dorma 7600 Series or Norton (Yale Security, Inc.) Series 7500. Provide with barrier-free reduced power spring on exercise, toilet and locker room doors. BHMA Code 626 finish.
3. All: Provide stainless steel or satin chromium plated hold open arms as scheduled. Hold open arms scheduled at fire rated doors shall be provided with fusible links in accordance with the applicable building code.
4. Closers shall be adjusted to comply with more stringent of ADA Code requirements or governing building code requirements.

E. Thresholds: Thermal-break aluminum ½" x 5"

1. Zero No. 625
2. Pemko 252x3 AFG
3. Reese S282A
4. Hager 421 S
5. National 8425 Finish 628

F. Sill Sweep:

1. Zero #39A
2. Pemko 315CN
3. Reese 772
4. Hager 750SN
5. National 200 NA

G. Weatherstrip: (Head and Jambs)

1. Zero #90
2. Pemko 332CR
3. Reese DS69
4. Hager 873S
5. National 110 NSA

H. Other Items Shown or Scheduled: Provide manufacturer's standard. Match finish of other hardware on door.

PART 3 - EXECUTION

3.1 INSPECTION

A. Coordinate removal, storage and reinstallation or application of surface protections with finishing work. Do not install surface-mounted items until finishes have been completed on the substrate.

B. Beginning of installation shall signify acceptance of substrate and adjacent conditions as being proper and acceptable. Corrections of defects due to installation of products on unacceptable substrata will be at Contractor's expense at no additional cost to Owner.

3.2 INSTALLATION

A. Mount hardware units at height indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way.

C. Set units level, plumb and true-to-line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. All hardware in stainless steel, fiberglass reinforced plastic, or exterior hollow metal doors shall be set in continuous bead of approved caulk grade sealant to exclude water from entering core of door at holes and other penetrations in door panel.

E. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

3.3 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Wherever hardware installation is made more than 1 month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore prior function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

C. Instruct Owner’s personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

D. Clean premises of all litter, dirt, and debris created by work of this Section. Leave premises broom clean.

END OF SECTION

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Conditions of the Contract and Division 1 apply to this Section.

B. Provide all labor, materials, and equipment to complete field-applied painting and finishing work as indicated in the Contract Documents.

C. Work Covered Under this Section

1. "Paint", as used herein, shall mean all coating systems materials, including primers, emulsions, enamels, stains, sealers and fillers, and other applied materials used as primary, intermediate or finish coats.
2. Everything provided under this contract is to be field painted unless specified herein or on the drawings, or directed by the Architect/Engineer as not to be painted, regardless of the general requirements of the room finish schedule. Where items or surfaces are not specifically mentioned, paint same as adjacent similar materials or areas. Surfaces to receive field coatings shall include but are not necessarily limited to the following:
   a. All exposed surfaces of new walls, ceilings, and floors which are specifically noted or scheduled to receive field applied coatings on the drawings, including continuations of such surfaces beyond nominal ceiling heights (such as between double-tee stems) and other areas or surfaces nominally defined on the drawings or herein.
   b. All exposed interior steel or galvanized steel conduits, closures, pipe, louvers, ducts and similar item which are attached to or in near proximity to room surfaces scheduled to receive field applied finishes.
   c. All non-prefinished exposed exterior steel or galvanized steel items which are on or below the tops of new exterior building walls including galvanized doors and frames, flashing, trim, conduits, pipe, louvers, ducts, and similar items.
   d. All non-prefinished exterior surfaces including masonry, unprimed and shop primed ferrous metals; exposed wood; primed steel doors (including tops, bottoms and edges) and frames and window frames (except aluminum).
   e. Rooftop and other exterior steel supports required for support of equipment, piping, platforms, canopies, etc.
   f. All exposed primed and unprimed miscellaneous structural steel and steel fabrications shown on the drawings or part of systems specified for this project including lintels, bracing, weld plates, base and eave angles, connection plates/hangers (i.e., for precast, concrete, masonry, or other systems) brackets, equipment supports, platforms, stairways, ladders, railings, toeboards, guards, bollards, equipment support framing and similar metal surfaces.
   g. All exposed primed and unprimed structural steel elements including columns, beams, girts, purlins, frames, and associated connections, bracing, brackets, bearing

plates, weld plates, hangers, and similar components, unless specifically noted otherwise.

h. Underside of exposed galvanized steel roof-deck in rooms/areas where ceiling is scheduled to be painted.

i. Exposed steel roof joists, edge angles and associated bracing in rooms/areas where ceiling is scheduled to be painted.

j. Exposed concrete encasement at columns.

D. Items and Systems for which Field or Finish Painting is Not Covered Under this Section Unless Noted Otherwise herein, on schedules or on drawings.

1. Unexposed preprimed steel bar joists/joist girders and associated bracing.
2. Unexposed galvanized steel roof deck.
3. Prefinished or galvanized metal wall panels and associated trim, closures and flashings, unless noted otherwise.
4. Non-ferrous metals, plastics, PVC, fiberglass, ceramic tile, prefinished wall surfaces, stainless steel, rubber, glazed masonry, concealed ductwork, vinyl-covered ductwork concrete floor and ceiling, or factory final finished products, unless noted otherwise.
5. Mechanical or electrical system piping or components other than those specifically noted.
6. Factory prefinished equipment (touch up only, with paint furnished by manufacturer).
7. Exposed exterior concrete foundations and retaining walls.
8. Galvanized items on the roof within the eaves.
9. Prefinished products such as metal toilet enclosures, acoustical materials, metal casework, wood casework, countertops, and similar products, unless specifically noted otherwise.
10. Cast iron floor trench gratings and frames.
11. Wall or ceilings in concealed areas and generally in accessible areas, foundation spaces, furred areas, utility tunnels, pipe chases, duct shafts, and elevator shafts, unless otherwise indicated.
12. Interior precast wall panels and new masonry walls, unless specifically scheduled otherwise.
13. Exterior concrete or precast wall surfaces, unless specifically noted otherwise.
14. Galvanized fence components.
15. Interior concrete wall unless specifically scheduled.

E. Unless noted otherwise, surface preparation, priming and coats of paint specified are in addition to shop surface preparation, shop primers, and surface treatments specified under other sections of the work.

F. Finishes covered elsewhere include:

1. Shop applied primers, such as those for steel fabrications, hollow metal doors and frames, etc. Coordinate with manufacturer of specific products and fabrications as necessary.
2. Below water-proofing/damp-proofing compounds.
3. Concrete floor sealing compounds.
4. Epoxy flooring

1.3 QUALITY ASSURANCE

A. Reference Standards

1. All work shall comply with latest applicable laws, codes, regulations and standards, including those published by:
    a. Structural Steel Painting Council (SSPC)
    b. Occupational Safety and Health Administration (OSHA)
    c. American National Standards Institute (ANSI)
    d. American Society for Testing and Materials (ASTM)
    e. National Association of Corrosion Engineers (NACE)
    f. Uniform Building Code (UBC)
    g. Wisconsin ILHR Building Code

B. Coating manufacturer shall verify that all proposed products are V.O.C. compliant for project location and that they comply with other applicable Federal, State, and local regulations. No lead bearing paints shall be used.

C. All materials of a paint system, except for approved shop primers which are pre-applied by others, shall be produced by the same coating manufacturer.

D. All products shall be pre-mixed, except for component parts of field-catalyzed coatings.

E. All painting shall be done by thoroughly experienced workmen familiar with the products and systems being applied.

F. Painting Contractor shall perform temperature and moisture tests, lift off/wrinkle tests and any other tests necessary to verify that substrates, pre-existing finishes and atmospheric conditions are suitable for finishes to be applied.

1.4 SUBMITTALS

A. Refer to Section 01000 for Submittal Requirements.

B. Product Data: Manufacturer's descriptive literature for each component of each type of painting system specified.

C. Samples

1. If color or finish is not designated, Owner's Representative will select these from submitted standard colors available for material systems specified, or custom colors to match existing.
2. Before any painting work is started, prepare minimum 8" x 10" size samples of each type of paint system specified on similar substrates and using same application methods as will be used in the field. Furnish additional samples as required until colors, finishes, and textures are approved by Owner. Retain approved samples for use as a quality standard for final finishes.
3. Before proceeding with the work, finish one complete space or item of each color scheme and system required showing selected colors, finish texture, materials and workmanship for final approval. After approval, the sample spaces or items shall serve as a standard for similar work throughout the project.

D. By submitting a bid, the Contractor shall warrant and approve the use of his proposed products over the various shop primers provided by other manufacturers, and shall include a written statement to that effect with his bid.

1.5 ENVIRONMENTAL CONDITIONS

A. Due to construction operations and possible lack of established ground cover, wind borne dust and dirt should be anticipated. Contractor shall incorporate whatever measures are required to perform the work in these circumstances, including performing the work only on still days, prewashing surfaces before and between coats, and workings segments small enough to avoid contamination of prepared surfaces or freshly applied finishes.

B. Unless otherwise specifically recommended by manufacturer, no paint shall be applied:

1. In rain, snow, fog or mist.
2. When the relative humidity exceeds 85 percent.
3. On damp or wet surfaces, or surfaces whose temperature is or may fall to less than 5 F above ambient air dew point before drying/curing.
4. When local conditions indicate that the applied paint will be wet by fog, mist, snow or rain before the specified drying time has elapsed.
5. To metal which has absorbed sufficient heat to cause blistering.
6. When the air temperature is less than 50 F or greater than 100 F.
7. When the substrate surface temperature is less than 50 F or greater than 100 F.
8. When the ambient temperature is expected to fall to 40 F before the coating has had time or dry/cure.
9. When wind-borne dust may contaminate prepared surfaces or freshly applied coatings.
10. When wind may interfere with proper straying or drying of materials.
11. On concrete, masonry or plaster substrates with a moisture content greater than 20 percent (verify by instrument).

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All materials delivered to the jobsite shall be in original containers, sealed and labeled, within shelf-life, showing printed labels of supplier and batch numbers.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Before ordering material, the Contractor shall verify the actual primers used by various manufacturers and shall furnish paint manufacturer's written acknowledgment that their products are compatible with those primers.

B. All incidental materials required for proper surface preparation and systems applications shall be in strict accordance with the coating manufacturer's written instructions and recommendations. Material or equipment not meeting the requirements of these specifications or the requirements of the coating manufacturer shall be rejected and replaced at no cost to the Owner.

2.2 COATINGS SCHEDULE

			Coating System
A.	Concrete Unit Masonry and Concrete		
1.	Split-Faced/Fluted/Ribbed	Exterior	PS1
		Interior	N.A.
2.	Flat-faced	Exterior	PS1
		Interior	PS9
B.	Metals		
1.	Unprimed Steel	Exterior	PS4
		Interior	PS4
2.	Epoxy Primed Steel	Exterior	PS4
		Interior	PS4
3.	Standard Primed Steel	Exterior	PS4
		Interior	PS4
4.	Galvanized Steel	Exterior	PS4
		Interior	PS4
5.	Cast Iron/Ductile Iron	Exterior	PS4
		Interior	PS4
6.	Stainless Steel	Exterior	N.A.
		Interior	N.A.
7.	Aluminum	Exterior	N.A.
		Interior	N.A.
C.	Plaster and Wallboard		
1.	Taped, Sanded, (Plastered)	Exterior (Plastered)	N.A.
		Interior	PS9
D.	Wood		
1.	Unfinished Millwork/Doors/Casework		N.A.

2.3 COATING SYSTEMS

A. System PS1

1. General Description

a. Surface Prep: Water blast, and prepare masonry and concrete surfaces per manufacturer.
b. First Coat: Cementitious acrylic-modified waterproofing blockfiller (white).
c. Second Coat: Decorative acrylic coating (color to be selected later).

2. Manufacturer/Products
a. Thoro System Products, Inc.:
First Coat: Super Quickseal-white blended per manufacturer with Thorosheen, applied at a rate as necessary to fill pores, provide proper coverage and uniform appearance, but at no more than 150 square feet per gallon on flat, split-faced or rock-faced masonry units; nor at no more than 100 square feet per gallon on fluted masonry units.
Second Coat: Thorocoat, of color selected, applied at rate as necessary to provide uniform appearance but at no more than 80 square feet per gallon.

3. Execution/Application
a. Follow manufacturer's special system specification (copy attached) and manufacturer's current written product use specifications.
b. Provide five year material and (labor warranty to cover bonding and weathering, and waterproofing above grade.
c. Applicator must be approved in writing by manufacturer and shall verify in writing authorization to offer specified warranty.

2. System PS4

1. General Description
a. Surface Prep:
Unprimed Steel: SSPC-SP6 and SSPC-SP-COM.
Epoxy Primed Steel: Clean and dry per manufacturer.
Standard Primed Steel: Clean and dry per manufacturer.
Galvanized Steel: Solvent Wipe SSPC-SP1.
Cast Iron: SSPC-SP6 and SSPC-SP-COM.
Stainless Steel: SSPC-SP1
b. First Coat (if applicable):
Unprimed Steel: Epoxy primer.
Epoxy Primed Steel: None.
Standard Primed Steel: Epoxy tie-coat (per paint manufacturer).
Galvanized Steel: Epoxy primer.
Cast Iron/Ductile Iron: Epoxy primer.
Stainless Steel: None.
c. Second Coat: Aliphatic Polyurethane (colors selected later).

2. Manufacturers/Products

Manufacturers	Products	
	1st Coat	2nd Coat
DuPont	25P Epoxy Mastic	Imron 333 M (2.0 mil DFT)

(5.0 mil DFT)

3. Execution/Application

a. Select initial coat colors appropriate for finish color.
b. Apply multiple topcoats if necessary for complete hiding and uniform appearance.

C. System PS9

1. General Description

a. Surface Prep: Clean and dry per manufacturer.
b. Primer Coat:
   1. Masonry - new: Epoxy blockfiller.
   2. Masonry - previously painted: Tie-coat per manufacturer.
   3. Precast Wall - previously painted: Tie-coat per manufacturer.
c. Mid Coat:
   1. Masonry - new: High build epoxy polyamid.
   2. Masonry - previous painted: High build epoxy polyamid.
   3. Precast Wall - previously painted: High build epoxy polyamid.
d. Finish Coat:
   1. Masonry - new: Polyurethane enamel
   2. Masonry - previously painted: Polyurethane enamel
   3. Precast Wall - previously painted: Polyurethane enamel

2. Manufacturer/Products

Manufacturers	Products		
	Blockfiller or Primer Coat	Mid Coat	Finish Coat
DuPont	per mfr.	25P or 823 (5.0 mil DFT)	Imron 333 or 326 (2.0 mil DFT)

PART 3 - EXECUTION

3.1 PREPARATION

A. Coating manufacturer's technical data sheets and written instructions and these specifications shall be present on site during all execution of the work.

B. Painting contractor is responsible to arrange and pay for whatever additional lighting may be necessary beyond nominal temporary or permanent lighting provided by others.

C. Materials shall be mixed, thinned, applied, and inspected according to manufacturer's latest printed data sheet and applied in a safe workmanlike manner. Do not thin in excess of manufacturer's recommendations.

D. Prepare surfaces in accordance with coating system's specifications. Touch-up welds, burned and abraded areas with specified primer, using appropriate surface preparation techniques.

E. All surface preparation and repairs shall be approved by the Architect/Engineer before primer is applied. Request acceptance of each coat before applying next coat. Correct work that is not acceptable and request reinspection.

F. Surfaces to be painted shall be clean, smooth, dry and free from dust, grit, frost and efflorescence. Paint shall be applied under dry and dust-free conditions and shall not be applied when the temperature is below 50 F. Each coat of paint shall have a slight variation of color to distinguish it from the preceding coat. Sufficient time shall be allowed between coats for proper drying.

G. Galvanized steel surfaces shall be thoroughly solvent wiped (ZYLOL) with regularly replaced rags to remove all oils before priming and top coating as specified, per paint manufacturer's recommendations, and per SSPC-SP1.

3.2 INSTALLATION

A. All work shall be done in a workmanlike manner so that finished surfaces will be free from runs, drops, ridges, waves, laps or unnecessary brush marks. All coats shall be applied to produce an even film of uniform thickness completely coating all corners, edges and crevices as well as flat surfaces without bridging or pinholes.

B. Work will be rejected because of poor workmanship, defined as inadequate drying or curing, dirt or dust inclusions, overspray, pinholes, runs or sags, inadequate film build, blistering, bleeding, blushing, or peeling.

C. Any work which is not in accordance with these specifications shall be redone to meet these specifications at no cost to the Owner.

D. Clean and retouch primed surfaces and intermediate coats before proceeding with following coats.

E. Allow each coat to dry thoroughly before applying next coat. When topcoating shop applied system, it must be clean, spot surface prepared and intact prior to application of field coat.

F. Finish coat(s) shall be uniform in color and sheen without streaks, laps, runs, sags, or missed areas.

G. Do not paint over code required labels, such as underwriter's Laboratories (UL) and Factory Mutual (FM), or equipment identification, performance rating, load rating, name or nomenclature plates.

3.3 ADJUST AND CLEAN

A. Leave all staging in place until final inspection and approval has been given.

B. After all other trades have finished their work, touch-up any and all damaged paint surfaces and leave same in first-class condition. Acceptable finish work must be free of abrasions and uniform in color and appearance.

C. Remove all paint spatter and all paint from surfaces for which is not intended.

D. Remove and dispose of, in a manner legal, all rubbish and empty containers, including spent solvents, leaving the premises in an acceptable aesthetic condition. Work site shall be kept orderly and safe on an ongoing basis.

E. Clean premises of all litter, dirt and debris created by work of this Section. Leave premises broom clean.

END OF SECTION

SECTION 15050
MATERIALS AND METHODS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Each Contractor and Sub-Contractor shall be subject to all conditions forming a preface to these specifications, insofar as the same are applicable to his branch of work.

B. The design drawings are diagrammatic and they may not show all physical arrangements, offsets, bends, or elbows which may be required for installation of various materials, equipment, piping, and ductwork systems in allotted spaces. The Contractor shall examine these and other available drawings to determine space limitations and interferences. The Contractor shall be responsible for making any minor changes in location of equipment, pipe and ductwork from that shown on drawings and for all physical details required for installation. Cost for adapting Contractor's work to jobsite conditions shall not be considered as basis of an extra cost to contract. The Contractor shall get approval before proceeding with any change.

C. Elevation of piping, ductwork and equipment indicated on drawings are to be used as guidelines to assist Contractor with installations. Minor changes to these elevations may be necessary to eliminate unforeseen interferences. The Contractor shall get approval before proceeding with any changes in elevations.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. This section shall be related to all Division 15000 technical specifications.

1.3 ACCURACY OF DATA AND CONTRACT DRAWINGS

A. Information pertaining to new and existing conditions that are described in the specifications or appear on drawings are based on available records. While such data has been collected with reasonable care, there is no expressed or implied guarantee that conditions so indicated are entirely representative of those actually existing or that unlooked for developments may not occur. Such information is merely provided to assist the Contractor in his investigation of conditions.

B. The Contractor must carefully examine the drawings, specifications and project site, and verify all measurements, distances, levels, materials, equipment, etc. before starting work.

C. Drawings shall not be scaled for determining exact dimensions.

1.4 SUBMITTALS

A. Within thirty (30) days after award of Contract, each Contractor shall submit to the Architect/Engineer six (6) copies of each shop drawing and/or product data submittal which is required by the Contract Documents.

B. Contractors Responsibilities:

1. Review shop drawings and product data prior to submission.
2. Verify all field measurements and construction criteria, and all catalog numbers and similar data to determine conformance with specifications.
3. Notify Architect/Engineer in writing, at time of submission, of the deviations of submittals from the Contract Document requirements.
4. Begin no fabrication or work which requires submittals until return of submittals with Architect/Engineer approval.

C. Submission Requirements:

1. Submittals shall be presented in a clear and thorough manner and shall be identified by reference to sheet, and detail, schedule or room numbers shown on Contract Documents.
2. Each copy shall be clearly marked to identify pertinent products or models, performance characteristics and capacities, required dimensions and clearances, and wiring or piping diagrams and controls.
3. Information not applicable to work shall be deleted on each copy.
4. Provide supplemented standard information specifically applicable to work on each copy.
5. Include date of submission and dates of any previous submissions, project title and number, names of submitting contractor, supplier and/or manufacturer, and applicable standards.
6. Contractor's stamp, initialed or signed, certifying to review of submittal, verification of products, field measurements and field construction criteria, and coordination of information within submittal with requirements of Work of Contract Documents.

D. Resubmission Requirements:

1. Make any corrections or changes in submittals required by Architect/Engineer and resubmit until approved.
2. Shop Drawings and Product Data:
   a. Indicate any changes made other than those requested by Architect/Engineer.

E. Contractor responsible for distributing shop drawings and product data which carry the Architect/Engineer approval stamp to all parties required to receive same.

F. Review by the Architect/Engineer shall be considered as general and for the Contractor's guidance only, and will not in any way relieve the Contractor, manufacturer or supplier of the necessity for furnishing materials and performing work as required by drawings and specifications.

G. Any equipment and/or materials installed without proper submittal reviews and stamps required by the Architect/Engineer and by the Contract Documents shall be subject to rejection and replacement by responsible Contractor, with no additional cost to the Owner.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. The Contractor or the Contractor=s authorized representative must be present to accept delivery of all equipment and materials furnished by him. The Owner=s personnel will not knowingly accept, unload or store anything delivered to the site for the Contractor=s use. Inadvertent acceptance of delivered items by a representative of the Owner shall not constitute acceptance or responsibility for any of the materials or equipment. It shall be the Contractor=s responsibility to assume all liability for any equipment or materials furnished by him which are delivered to the job site.
2. The Contractor shall deliver items with factory-installed shipping skids, accessories packaged in factory-fabricated containers, and with end-cap protectors on each end of pipe and tube.

B. Storage:

1. The Contractor shall unload and store items in an approved storage area to protect them from weather and construction traffic.
2. Each Contractor shall confine equipment, storage of materials and operations to limits indicated by directions of the Architect/Engineer and/or Owner, and shall not bring material onto the site until it is needed for progress of the work.
3. Storage of materials on the grounds and within the building shall be in strict accordance with instructions of the Architect/Engineer and/or Owner. Storage of materials within building shall at no time exceed design carrying capacity of the structural system.
4. The Owner assumes no responsibility for materials stored in building or on the site. Each Contractor shall assume full responsibility for all losses or damage due to the storing of his materials.
5. Clean-up and repairing of areas used for storage of materials shall be done by the Contractor using the area.

C. Handling:

1. Handle items carefully to avoid damage to components, enclosures and finishes. The Contractor shall follow the manufacturer=s rigging instructions when handling and moving equipment.
2. Do not install damaged items. Replace all damaged items if they cannot be repaired to the satisfaction of the Owner, at no additional costs to the Contract.

1.6 GUARANTEE

A. All work shall be guaranteed to be in strict accordance with the Contract Documents and shall be guaranteed against defects in workmanship, equipment and materials for a minimum period of one (1) year from the date of final acceptance by the Owner. Any defective equipment, workmanship or material developing within that time shall be replaced free of any cost to the Owner, if so ordered by the Architect/Engineer and/or Owner.

B. The Architect/Engineer will not give final project approval until all shop drawings as called for have been submitted and approved and all items requiring changing and/or completion as established during the final inspection have been resolved to the satisfaction of the Architect/Engineer.

1.7 INFORMATION REQUEST

A. During bidding process Contractors shall use Request for Information (RFI), included at end of this specification section, whenever more information or a clarification is required. No information given by the Architect/Engineer will be guaranteed unless a signed RFI has been submitted.

B. This RFI shall also be used by Contractors during project construction to request information, clarifications and changes.

PART 2 - PRODUCTS

2.1 CODES AND REGULATIONS

A. All codes and regulations of State and local authorities shall become part of this specification and must be adhered to where they exceed requirements as shown on the drawings or stated in the specifications, without additional cost to the Owner.

B. The Contractor shall bring all alleged code violations (if any) to the attention of the Architect/Engineer and/or Owner at least nine (9) days before bids are due.

C. Structural components and structural integrity of all manufactured mechanical equipment shall be designed by the manufacturer for installation and operation within seismic event zone 4, as specified in Chapter 16 of the 1997 Edition of the Uniform Building Code.

2.2 PERMITS AND FEES

A. Each Contractor shall be responsible for all associated permits and fees required by applicable governing authorities for the installation of their work.

2.3 OPERATING AND MAINTENANCE INSTRUCTIONS

A. The Contractor shall provide the Architect/Engineer with three (3) complete sets of operating and maintenance instruction manuals covering each and every item of equipment and devices furnished or erected by the Contractor prior to "Substantial Completion".

B. Each separate manual shall consist of the following:

1. Neatly typewritten table of contents including contractor's name, address and telephone number; list of each product referenced in manual; and name, address and telephone number of installing contractor and maintenance contractor for each product.
2. Catalog data and literature for each product including model number, description and component parts; operating procedures; maintenance procedures; servicing and lubrication schedules; description of sequence of operations; parts lists; illustrations, assembly drawings and diagrams required for maintenance; and any additional drawings, diagrams, charts or written text which may be required to supplement product data for particular installation.

3. Copy of warranty, bond and/or service contract issued for each product including an information sheet for the Owner's personnel with proper procedures in event of a product failure and instances which might affect validity of warranties or bonds.

C. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel on operation, adjustment and maintenance of products, equipment and systems. Review contents of operating and maintenance manual with personnel in full detail to explain all aspects of operations and maintenance.

2.4 SUBSTITUTE MATERIALS

A. Materials in the Base Bid shall be exactly as specified.

B. The Contractor is invited to submit additive or deductive prices on substitute materials in letter form with his Base Bid, accompanied by sufficient data for evaluation.

2.5 ELECTRICAL WORK

A. The Electrical Contractor shall provide one (1) power source connection to all equipment. Any equipment requiring additional connections for power, control or signal purposes shall have these connections provided by Contractor providing this equipment, unless indicated to be by the Electrical Contractor. All integral equipment wiring must be by the Equipment manufacturer.

B. Each contractor shall furnish a complete list of equipment (with locations) requiring electrical connections, all necessary wiring diagrams, multi-speed switches and other control apparatus (relays, interlocks, etc), and shall be responsible for obtaining a proper working installation.

C. All starters and disconnect switches are to be by the Electrical Contractor, except where specified to be included as part of packaged equipment.

D. Where it is indicated for equipment supplier to provide starters, relays, timers and other control items, these shall all be mounted in an appropriate enclosure as required by the National Electrical Code and shall be prewired and tested at the factory. Equipment shall meet all applicable electrical specifications.

2.6 RECORD DRAWINGS

A. The Architect/Engineer will provide the Contractor with a suitable set of contract drawings on which daily records of any changes and deviations from the contract shall be recorded. All buried or concealed piping, conduit or similar items shall be located by dimensions and elevations on the record drawings.

B. The daily record of changes shall be the responsibility of the Contractor's field superintendent. No arbitrary mark-ups will be permitted.

C. During construction, the Contractor shall have present at the project site, the job copy showing variations and changes to date for review by the Architect/Engineer and/or Owner.

D. At completion of the project, the Contractor shall submit clean and legible marked-up record drawings to the Architect/Engineer prior to final payment.

PART 3 - EXECUTION

3.1 INSPECTION

A. The Contractor shall obtain complete data at the site and inspect surfaces that are to receive his work before proceeding with fabricating, assembling, fitting or erecting his work.

B. The Contractor shall notify the Architect/Engineer and/or Owner in writing in case of discrepancies between existing work and drawings, and defects in such surfaces that are to receive his work. The Architect/Engineer and/or Owner will direct such work or surfaces to be remedied.

C. Confine all operations, equipment, apparatus, storage of materials, etc. to immediate area of work to the greatest possible extent. The Contractor shall ascertain, observe and comply with all rules and regulations in effect on project site including, but not limited to, parking and traffic regulations, use of walks, security restrictions, and hours of allowable ingress and egress.

D. The Contractor shall acquaint himself with the location of underground service, utilities, structures, etc., which may be encountered or be affected by his work and shall be responsible for any damage caused by neglect to provide proper precautions or protection.

E. Existing pipes, electrical work and all other utilities encountered, which may interfere with new work shall be rerouted, capped, cut off, or replaced by the Trades having jurisdiction, upon approval by Architect/Engineer and/or Owner.

3.2 EXECUTION OF WORK

A. Sequence of operations or place of commencement may be determined by Architect/Engineer as deemed to best serve the needs and convenience of the Owner or as necessity of occasion requires.

B. All work shall be installed in strict accordance with applicable codes and best installation practices, all subject to the approval of the inspection department of the governing authority and of the Architect/Engineer and/or Owner. Each Contractor shall consult and cooperate fully with other contractors so as to obtain proper grouping of pipes and to avoid interference.

C. All equipment and materials shall be installed in accordance with sizes and locations shown on the drawings. Each Contractor must lay out his work, properly locate apparatus and all necessary pipe sleeves, etc., and take his own measurements at the building. All equipment and materials must be installed by skilled workmen, familiar with this class of work.

D. Each Contractor shall adjust his work to fit into the spaces allotted for the same. All bends or offsets required shall be furnished whether indicated or not.

E. Each Contractor shall verify dimensions on architectural drawings or at the job site, unless shown on the drawings. He shall not scale drawings for location of equipment.

F. Work shall be in substantial conformity to drawings. Any change desired shall be submitted to the Architect/Engineer and/or Owner for approval.

G. Furnish all labor, materials, tools, equipment, scaffolding, transportation, permits, inspection certificates and temporary protection necessary to complete installation of all work as shown on drawings and/or called for in these specifications. Drawings and specifications shall be considered mutually coordinate and any material included in one but not the other shall be furnished as though required by both. All material necessary to provide a complete working installation shall be furnished whether mentioned or not.

H. The Architect/Engineer reserves the right to interpret any discrepancies occurring on plans or between plans and specifications.

I. Before turning equipment over to the Owner, the Contractor shall thoroughly test equipment and instruct the Owner or his representative in its operation and maintenance.

J. Installation of all equipment furnished by the Owner which is indicated to be install by each Contractor. The Contractor shall be responsible for contacting the equipment manufacturer, the Owner, or the Engineer on how to properly install a particular piece of equipment. The Contractor will not be entitled to any cost extras for equipment improperly installed because an effort was not made to obtain the necessary information.

K. Following is list of work not in Division 15000 Contracts:

1. Electrical power wiring and connections
2. Toilet partitions, paper holders, soap dispensers or soap holders
3. Providing equipment indicated to be furnished by others.

3.3 WORK COORDINATION

A. Each Contractor shall coordinate his work with adjacent work and shall cooperate with all other trades so as to facilitate the general progress of the work. Each trade shall afford all other trades every reasonable opportunity for installation of their work and for the storage of their materials. In no case, will any Contractor be permitted to exclude from the premises or work place any other Contractor or employees thereof, or interfere with any other Contractor in the executing or installation of their work.

B. Each trade shall perform its work in proper sequence in relation to that of other trades and as approved by the Architect/Engineer and/or Owner. Any cost caused by defective or ill-timed work shall be borne by the installing Contractor.

C. Each Contractor shall arrange his work and dispose of materials so as not to interfere with the work or storage of materials of others.

D. All Trades shall work in cooperation with each other, and fit their work into the structure as job conditions may demand. All final decisions as to right-of-way and run of pipes and ducts, etc. shall be made by the Architect/Engineer and/or Owner.

In general, priority shall be arranged as follows: (in order of preference)

Sheet metal ductwork
Lighting fixtures
Plumbing waste lines, downspouts, vents and sprinkler piping
Gravity water lines
Plumbing water and gas and air lines
Electrical conduit
Control air lines or conduit

3.4 CUTTING AND PATCHING

A. The Contractor shall be responsible for all cutting, fitting and patching, including attendant at excavation and backfill, required to complete Work or to:

1. Make its several parts fit together properly.
2. Uncover portions of Work to provide for installation of ill-timed work.
3. Remove and replace defective work.
4. Remove and replace work not conforming to requirements of Contract Documents.
5. Remove samples of installed work as specified for testing.
6. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

B. The Contractor shall inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching. After uncovering work, the Contractor shall inspect conditions affecting installation of Products, or performance of work. Unsatisfactory or questionable conditions shall be reported to the Architect/Engineer and/or Owner in writing; the Contractor shall not proceed with work until the Architect/Engineer and/or Owner has provided further instructions.

C. The Contractor shall provide adequate temporary supports and devices to assure the structural value or integrity of affected portions of work and to protect other portions of the project from damage and exposure to the elements.

D. Cutting and demolition shall be executed by methods which prevent damage to other work, and will provide proper surfaces to receive installation of repairs. Excavating and backfilling shall be executed by methods which will prevent settlement or damage to other work.

E. New products shall be fitted and adjusted in order to provide a finished installation which shall comply with specified products, functions, tolerances and finishes.

F. All surfaces cut or damaged to provide completed work in accordance with requirements of the Contract Documents shall be refinished to provide even finish to match adjacent finishes.

G. Wherever any material, finish or equipment is damaged, the repair or replacement shall be accomplished by the trade skilled in that particular work and the cost shall be charged to the party responsible for the damage.

3.5 DEMOLITION WORK

A. Completely remove all designated piping, ductwork, equipment, materials, building components, etc., as indicated on drawings. Demolish in orderly and careful manner to accommodate new work. Removed materials must not be reused unless otherwise specified or directed to be so.

B. Arrange and pay for disconnecting, removing and capping utility services within areas of demolition. Place markers to indicate location of disconnected services. Identify service lines and capping locations on Project Record Documents.

C. Carry out demolition work to cause as little inconvenience to adjacent occupied building areas as possible. Provide, erect and maintain barricades, lighting, and guard rails as specified by regulatory advisory to protect occupants of building and workers. Perform demolition in accordance with authorities having jurisdiction.

D. Protect existing building foundations, walls and supporting structural members.

E. Except where noted otherwise, immediately remove from site all materials being demolished. Remove from site all contaminated, vermin-infested or dangerous materials encountered and dispose of by safe means so not to endanger health of workers and public. Remove demolished materials, tools and equipment from site upon completion of work. Burning of materials on site not permitted. Obtain any necessary permits for transporting and disposing of demolished materials.

F. All other work disturbed or demolished in excess of that required during demolition work shall be restored, patched, tested, covered, painted, etc., to equal original condition, at no cost to Owner.

3.6 PROTECTION OF ROOF

A. Contractors are cautioned that they must exercise extreme care in any activity involving contact with any installed roof membrane.

B. Construct protective plywood (3/4 in. thick) runways across the roof for moving, setting, and installing equipment and piping systems. No activity on the roof will be permitted without this protection. Start runways at the point of origin of any equipment placed on roof and terminate at the point of installation on curb or base. At completion of work, or when directed by the Owner's Representative, completely remove, neatly and cleanly, without damage to roofing system, these protective items and runways.

C. Any and all repairs necessary to bring the roofing system to its original condition shall be made by an approved Roofing Contractor and paid for by the Contractor responsible for the damage.

3.7 TESTS AND ADJUSTMENTS

A. All indicated piping systems shall be tested as prescribed by applicable State and local codes, and as indicated in the specifications. All indicated piping systems shall be adjusted and balanced to meet design requirements.

B. All indicated heating, ventilating and air conditioning systems shall be tested, adjusted and balanced to meet design requirements.

C. All indicated systems and equipment shall be completely installed according to the requirements of the contract documents and shall be ready in all respects for use by the Owner. Each system and piece of equipment shall be subjected to tests at full operating conditions and pressures for designed conditions.

D. Each Contractor shall make all necessary adjustments and replacements affecting his work which are necessary to fulfill the Owner's requirements, to comply with the directions and recommendations of the various equipment manufacturers, and to comply with all codes and regulations which may apply. Each Contractor shall also make all required adjustments to comply with all provisions of the Contract Documents.

1. Each Contractor shall bear all costs necessary to correct any equipment/ systems performance deficiencies and to retest equipment/systems after deficiencies are corrected.

3.8 CLEANING

A. The Contractor shall be responsible for all cleaning required within the technical sections of the specifications governing work under his contract, as well as for keeping all work areas, passageways, ramps, stairs and all other areas of the premises free of accumulation of surplus materials, rubbish, debris and scrap which may be caused by the Contractor's operations or by the subcontractors operations.

1. Remove rubbish, debris and scrap promptly upon its accumulation and in no event later than the end of each week.
2. Combustible waste shall be removed immediately or stored in fire resistive containers until disposed of in an approved manner.
3. No burning of rubbish or debris will be allowed at the site. Rubbish, debris and scrap shall not be thrown through any window or other opening, or dropped from any great height. It shall be conducted to the ground, to waiting truck(s) or removable container(s) by means of approved chutes or other means of controlled conveyance.
4. Spillage of oil, grease or other liquids which could cause a slippery or otherwise hazardous situation or stain a finished surface shall be cleaned up immediately.
5. Dust, dirt and other foreign matter shall be removed completely from all internal surfaces of all mechanical and electrical units, cabinets, ducts, pipes, etc.

B. In addition to the above, the Contractor shall be responsible for the general "broom" cleaning of the premises and for expediting all of the cleaning, washing, waxing and polishing required within the technical sections of the specifications governing work under his contract.

The Contractor shall also perform "final" cleaning of all exposed surfaces to remove all foreign matter, spots, soil, construction dust, etc., so as to put the project in a complete and finished condition ready for acceptance and use intended.

C. If rubbish and debris is not removed, or if surfaces are not cleaned as specified above, the Owner reserves the right to have said work done by others and the related cost(s) will be deducted from moneys due the Contractor.

END OF SECTION

SECTION 15051
MOTORS AND ELECTRICAL WORK

PART 1 - GENERAL

1.1 SCOPE

A. This section includes requirements for single and three phase motors that are used with equipment specified in other sections.

1.2 RELATED WORK

A. Division 16 - Electrical for power wiring, starters, and other electrical devices

1.3 REFERENCE STANDARDS

A. ANSI/IEEE 112 Test Procedure for Polyphase Induction Motors and Generators

B. ANSI/NEMA MG-1 Motors and Generators

C. ANSI/NFPA 70 National Electrical Code

1.4 ELECTRICAL COORDINATION

A. All starters, overload relay heater coils, disconnect switches and fuses, relays, wire, conduit, pushbuttons, pilot lights, and other devices required for the control of motors or electrical equipment are furnished and installed by the Electrical Contractor, except as specifically noted elsewhere in this division of specifications.

B. Electrical drawings and/or specifications show number and horsepower rating of all motors furnished by this Contractor, together with their actuating devices if these devices are furnished by the Electrical Contractor. Should any discrepancy in size, horsepower rating, electrical characteristics or means of control be found for any motor or other electrical equipment after contracts are awarded, Contractor is to immediately notify the Architect/Engineer of such discrepancy. Costs involved in any changes required due to equipment substitutions initiated by this contractor will be the responsibility of this contractor. See related comments in Section 15050, Electrical Work.

C. Electrical Contractor will provide all power wiring and control wiring, except temperature control wiring.

D. Furnish project specific wiring diagrams to Electrical Contractor for all equipment and devices furnished by this Contractor and indicated to be wired by the Electrical Contractor.

1.5 PRODUCT CRITERIA

A. Motors to conform to all applicable requirements of NEMA, IEEE, ANSI, and NEC standards and shall be listed by U.L. for the service specified.

B. Select motors and motor enclosure for conditions in which they will be required to perform; i.e., general purpose, splashproof, explosion proof, standard duty, high torque or any other special type as required by the application, equipment, or motor manufacturer's recommendations.

C. Furnish motors for starting in accordance with utility requirements and compatible with starters as specified.

D. Select motors so they do not exceed nameplate rating or operate into service factor to meet specified duty.

PART 2 - PRODUCTS

2.1 SINGLE PHASE, SINGLE SPEED MOTORS

A. Use NEMA rated 115 volt, single phase, 60 hertz motors for all motors 1/3 HP and smaller.

B. Use permanent split capacitor or capacitor start, induction run motors equipped with permanently lubricated and sealed ball or sleeve bearings and Class A insulation. Service factor to be not less than 1.35.

C. Single phase motors to be furnished with built-in thermal overload protection.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Mount motors on a rigid base designed to accept a motor, using shims if required under each mounting foot to get a secure installation.

B. When motor will be flexible coupled to the driven device, mount coupling to the shafts in accordance with the coupling manufacturer's recommendations. Using a dial indicator, check angular misalignment of the two shafts; adjust motor position as necessary so that the angular misalignment of the shafts does not exceed 0.002 inches per inch diameter of the coupling hub. Again using the dial indicator, check the shaft for run-out to assure concentricity of the shafts; adjust as necessary so that run-out does not exceed 0.002 inch.

C. When motor will be connected to the driven device by means of a belt drive, mount sheaves on the appropriate shafts in accordance with the manufacturer's instructions. Use a straight edge to check alignment of the sheaves; reposition sheaves as necessary so that the straight edge contacts both sheave faces squarely. After sheaves are aligned, loosen the adjustable motor base so that the belt(s) can be added and tighten the base so that the belt tension is in accordance with the drive manufacturer's recommendations. Frequently recheck belt tension and adjust if necessary during the first day of operation and again after 80 hours of operation.

D. Verify the proper rotation of each three-phase motor as it is being wired or before the motor is energized for any reason.

E. Lubricate all motors requiring lubrication. Record lubrication material used and the frequency of use. Include this information in the maintenance manuals.

END OF SECTION

SECTION 15830

FANS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish and install all of the following fans, unless indicated otherwise, complete with all indicated and specified accessories.

B. All fan motors less than 2 HP shall be single phase and have thermal overload protection built into motor, unless otherwise indicated. No fan motors shall be three phase. Refer to drawing fan schedule for individual fan motor voltage, phase, power, and enclosure.

C. All fans shall be equipped with a gravity back draft damper.

1.2 QUALITY ASSURANCE

A. Comply with all applicable local, state and federal codes and conform to the most demanding requirements of the latest standards of the organizations listed below:

1. Air Movement and Control Association (AMCA)
2. American National Standards Institute (ANSI)
3. National Electrical Code (NEC)
4. National Fire Protection Association (NFPA)
5. Underwriter's Laboratories (UL)
    a. UL 705 - Power Ventilators

1.3 SUBMITTALS

A. Refer to Section 15050 for submittal requirements.

B. Maintenance Data:

1. Submit maintenance instructions, including lubrication instructions, motor and drive replacement, and spare parts lists; include this data in maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Centrifugal Fans:

1. Sidewall Exhaust Fan (EF-6):
    a. Housing and Base: Heavy gauge aluminum mounted on rigid support structure, weatherproof, with integral bird screen. Provide independent raceway for electrical feed between base and motor housing.

b. Wheel: Backward inclined non overloading air foil or flat bladed wheel of aluminum welded construction. Wheels shall be dynamically and statically balanced.

c. Drive: Direct-drive with motor mounted outside of air stream. See exhaust fan and ventilator schedule on drawings for drive types. Bearings for belt drive units shall be selected for a minimum L50 life in excess of 200,000 hours at maximum cataloged operating speed.

d. Nameplate: Include aluminum engraved nameplate with unit manufacturer, model number, and performance data.

e. All surfaces in air stream: Non-ferrous.

f. Accessories: The accessories listed below and on the drawing schedules shall be provided by the fan manufacturer.
   (1) Dampers: Self-operating multi-bladed aluminum backdraft dampers, with attachable frame for mounting in building side wall.
   (2) Disconnect switch: Provide factory installed internal local disconnect switch.

g. Acceptable Manufacturers:
   (1) Acme Eng. and Mfg. Corp.
   (2) Greenheck Fan and Ventilator
   (3) Loren Cook Company

PART 3 - EXECUTION

3.1 INSTALLATION

A. Electrical Connections:

1. Ensure that fan units are wired properly, with rotation in direction indicated, and designed for proper fan performance.

B. Furnish to Owner, with receipt, one (1) spare set of belts for each belt-drive equipment item.

END OF SECTION

SECTION 16100

GENERAL PROVISIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work to be performed under this specification includes all labor, materials and equipment required to install a complete electrical system as described in these specifications and as shown on the drawings.

B. Before submitting a bid, the Contractor shall examine the drawings and specifications, visit the site of the work, and inform himself of local conditions, all federal, state and local ordinances, regulations and all other pertinent items which may affect cost, schedule, and completion of this project.

C. Drawings accompanying these specifications are a part of these specifications. Drawings are intended to show general arrangement, design and extent of work and are more or less diagrammatic. Drawings are not intended to show exact locations except where dimensions are shown. Electrical work is shown on plans using standard industry symbols. Before ordering materials or doing work, the Contractor shall verify all measurements pertaining thereto and assume responsibility therefore. Any substantial differences existing between drawings and conditions in the field shall be submitted to the Engineer for consideration before proceeding with work.

1.2 RELATED WORK

A. All labor, materials and equipment shall also be subject to all applicable sections of Division 1 forming a preface and are a part of these specifications.

B. All electrical work shown on the drawings and specified herein shall meet all the applicable requirements of Section 16100.

1.3 QUALITY ASSURANCE

A. All equipment and materials shall be new, unused, and manufactured in accordance with the following standards, where applicable:

Institute of Electrical and Electronic Engineers (IEEE)
American National Standards Institute (ANSI)
National Electrical Manufacturers Association (NEMA)
Insulated Power Cable Engineers Associations (IPCEA)
American Society for Testing and Materials (ASTM)

B. All equipment and materials, if of the type tested by the Underwriters Laboratories and/or Electrical Testing Laboratories, Inc., shall bear their label and shall be used or installed in accordance with any instruction included in the listing by the laboratory. Electrical Contractor shall not modify new equipment in such a way as to nullify the Testing Laboratories label.

C. All work shall conform to requirements of Wisconsin State Electrical Code Volumes 1 and 2, the National Electrical Code (ANSI/NFPA 70) and all other local codes and regulations that may apply.

D. All work shall be installed in accordance with NECA standards of installation.

E. All work shall conform where applicable to the Williams-Steiger Occupational Safety and Health Act of 1970 (OSHA), Part 1910, "Occupational Safety and Health Standards".

1.4 SUBMITTALS

A. All submittals shall be provided as indicated in the applicable sections of Division 1or applicable conditions forming a preface and are a part of these specifications.

1.5 WARRANTY

A. The Contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following date of substantial completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In general, the drawings and/or specifications indicate several approved manufacturers for each product type. Where three or more manufactures are listed for each product, no substitutions are allowed. If less then three manufacturers are listed for a product type, Contractor shall provide that product as listed. If the Contractor can not find a vendor in the service area, Contractor shall notify the Engineer.

2.2 MATERIALS

A. All materials shall be new, of current production, and suitable for their indended use All materials, if of the type tested by the Underwriters Laboratories and/or Electrical Testing Laboratories, Inc., shall bear their label and shall be used or installed in accordance with any instruction included in the listing by the laboratory.

PART 3 - EXECUTION

3.1 WORK INCLUDED

A. The scope of work shall include all work, including all labor, materials and equipment, testing required to install a complete electrical system as indicated in the project Manual. The Project Manual consists of the bidding documents, the contract, specifications, contract drawings and all subsequent addenda and modifications.

B. All work items shown on the drawings is within the scope of work and shall be provided as indicated. Only items that are clearly indicated as being provided by others or under a separate contract shall be out of scope.

C. All contract work shall be performed and as indicated in the specifications. In general, the specifications indicate the requirements for products required and the executions for those products. Only items that are clearly indicated as being provided by others or under a separate contract shall be out of scope.

D. If there is any discrepancy between the drawings and the specifications, it is the contractor's responsibility to notify the Engineer for resolution, prior to procuring equipment and/or starting work.

E. The Contractor shall coordinate and verify with General Contractor all equipment being supplied by the owner, equipment supplier, and other trades. Equipment size, motor HP, dimensions, locations, etc. are all subject to change.

F. The Contractor shall verify all door swings and the location of all cabinets, diffusers, HVAC, plumping, process and building equipment before installing electrical equipment, fixtures, outlets and conduit. No extras will be allowed for relocation of equipment, fixtures, outlets and conduit required to be moved due to failure of the Electrical Contractor to verify interferences before starting the installation.

G. All excavations and backfilling required to complete electrical work shall be provided by the Electrical Contractor and shall be done to the satisfaction of the Engineer.

H. The Contractor shall provide all concrete pads, plywood backboards, and supports for all electrical equipment as indicated on the drawings and as required or specified.

I. All Permits and inspection fees required to complete the work shall be paid for by the Contractor unless noted otherwise.

J. All electrical equipment and fixtures shall be installed in complete accordance with the manufacturers' recommendations.

3.2 WORK NOT INCLUDED

A. In general, all motors will be furnished with equipment, and will be installed by others. The Contractor shall provide all motor connections as shown on the drawings and as specified herein. Contractor shall also furnish disconnecting devices as indicated and as required by National Electrical Code (N.E.C).

B. Contractor shall not paint electrical equipment unless specifically directed by the Engineer.

C. Electrical work required under the scope of another Contractor, by the Owner, or all other work that is clearly not shown on the drawings or indicated in the specifications is not a part of the scope of work.

D. In general, controls for equipment will be by the Equipment Supplier unless specified otherwise. Control wiring between equipment and remote devices, motor control centers, and etc. as noted or as shown on the drawings shall be by the Contractor.

3.3 INTERRUPTION OF SERVICE

A. The Contractor shall thoroughly familiarize himself with existing site electrical systems, which will affect, and be affected by, installation of the new systems and services. He shall plan the installation of his work so that any interruption of services to and in the building or portion thereof will be minimized and such interruptions shall occur at the Owner's convenience. Each interruption shall be for as short duration as possible.

B. The Contractor shall obtain permission from the Owner's representative to shut off services to any location or perform work in a particular location. Such permission will be granted only after the Owner's representative is informed as to the reason for and duration of the shutdown, and is satisfied that the shutdown can be made with as little inconvenience as possible.

C. The Contractor shall coordinate his work and requirements with other contractors and the Owner as related to construction schedule and sequence, service interruptions, and electrical equipment installation.

D. Changeovers will be assumed to be made during normal working hours. If a changeover is required or directed by the Owner during other then normal hours, then all overtime shall be negotiated and approved by the Owner.

3.4 TEMPORARY ELECTRICAL POWER

A. Temporary Electrical Power shall be provided as specified in the applicable section of Division 1.

3.5 CUTTING AND PATCHING

A. Perform all cutting necessary for the installation of all work as indicated on the drawings and specifications. Items removed temporarily for convenience of Contractor shall be removed and replaced as approved by Engineer. Coordinate all required openings with all other Contractor.

B. Neatly replace, patch and finish all adjacent surfaces or features displaced or disturbed in performance of the work. Make joining of new and existing work as inconspicuous as possible. Upon completion of the work, there shall be no discrepancy between new work and existing work. All broken and cut units shall be replaced with new units.

C. The Contractor shall provide all required cutting and patching to complete the electrical work unless noted otherwise.

D. All openings are to be sealed as required and to the satisfaction of the Engineer.

E. All holes in concrete shall be core drilled. No reinforcement bars or structural members shall be cut.

F. The Contractor shall layout and construct all sleeves, forms and chases and required openings in floors, and walls for his work. After conduit has been installed, openings shall be sealed to restore the fire and smoke rating of walls and floors.

G. Conduits, etc., passing through walls or roof shall be properly flashed and counterflashed, and caulked to provide a weathertight installation.

H. Wherever any existing materials, equipment or appurtenances, etc. not noted for removal are damaged, cost of repair or replacement will be charged to the Contractor responsible for the damage.

3.6 REMOVAL AND SALVAGE

A. Disconnect and remove all wire, conduit, boxes, equipment, devices, etc. in areas noted and as required to be removed as indicated on the drawings and as specified herein.

B. Conduit and boxes that are concealed or cast into masonry or concrete may remain. Provide blank covers of the proper type over all remaining boxes. All remaining conduits that are taken out of service shall be capped off and identified as such.

C. Rework existing conduits and reconnect and extend existing circuits as shown on the drawings and as specified or as required.

D. Equipment shown dotted on the drawings is existing and is to remain, be removed or relocated as indicated.

E. Existing wiring in acceptable condition and of proper rating in undisturbed conduit runs may remain and be reconnected. Existing wiring in unacceptable condition or rating or in disturbed conduit runs (i.e., where wire is added to or removed from a conduit run) shall all be removed and replaced with new wiring as specified herein.

F. All removed and unused electrical fixtures, devices, plugmold, raceways and equipment removed by the Contractor shall become property of the Owner. The Contractor shall deposit said equipment in location on site as directed by the Owner. All removed conduit, outlet boxes and wiring shall become the property of the Contractor and he shall remove said material from the job site as required.

3.7 CONCRETE

A. All concrete work required for the proper installation of electrical equipment including transformer, switchgear and motor control center pads and other equipment pad(s) shall be provided by the Contractor and shall conform to specifications in Division 3.

3.8 SITE WORK

A. The Contractor shall provide excavation and backfill for all electrical underground work as indicated on the drawings and as required. The Contractor shall perform this work and provide compaction as specified in Division 2. Finish grading and final restoration shall be by the General Contractor.

3.9 SEALING AND FIRE-STOPPING

A. Contractor shall seal all opening in walls, floors and ceilings for conduits, cable trays, wireways, etc, in all code required fire-walls with the proper type and rating of fire seal. Contractor shall keep a record of all penetrations in fire-walls and indicated them on the record drawings.

B. Contractor shall coordinate with all other Contractors to verify all required floors and walls that require fire-seal.

3.10 COORDINATION WITH OTHER TRADES

A. Contractor shall provide one (1) power connection to equipment furnished by other contractors as indicated in electrical drawings. Equipment which requires additional connections for more power or for control or signal purposes shall have these additional connections provided by Contractor supplying this equipment, except as noted on electrical drawings and specifications. These additional connections shall include, but not be limited to, conduit, wire, signal cables and pneumatic lines and their installation.

B. Contractor shall coordinate all work with all other Contractors to facilitate installation of all work required by all trades. Contractor shall refer to the complete drawings set to determine all work within the area of the work and carefully plan and coordinate the installations with all other trades. Contractor shall remove and reinstall all work that directly conflicts with other trades due to not performing the coordination specified.

C. Where it is indicated to provide starters, relays, timers and other control items, these shall all be mounted in an appropriate enclosure as required by the National Electrical Code and shall be prewired and tested in the shop or at the factory. Equipment shall meet all applicable specifications.

3.11 RECORD DRAWINGS

A. A set of prints shall be kept at the job site upon which all changes and deviations from the original design are to be recorded daily. All changes shall be clearly marked in "red". This set shall be submitted to the engineer at the end of the project for preparation of "record drawing". These drawings shall indicate as a minimum, all changes made to the drawings, changes in circuiting, equipment location, accurate locations of embedded conduit, and all other significant changes and deviations from the original design.

B. The daily record of changes shall be the responsibility of the Contractor=s superintendent or foreman.

C. The Record drawing set shall be made available and will be audited periodically by the Owner or Engineer to assure the changes are being recorded.

END OF SECTION

SECTION 16120

WIRE AND CABLES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install all wire and cables systems as shown on the drawings and as specified herein.

B. Wire and cable routing shown on drawings is approximate unless dimensioned. Route wire and cable as required to meet project conditions.

C. Conductor sizes are based on copper.

1.2 RELATED WORK

A. Section 16100 - General Provisions

1.3 QUALITY ASSURANCE

A. All wire and cables installations shall meet the requirements of:

1. ANSI/NFPA 70 - National Electrical Code (NEC).
2. National Electrical Contractor's Association (NECA) Standard of Installation.

B. Furnish products listed and classified by Underwriters Laboratories, Inc.

C. Refer to Section 16700 for requirements for cable to be used on fire alarm and/or communication systems. All other signal systems cabling shall meet the requirements of NEC Article 725.

1.4 SUBMITTALS

A. NONE REQUIRED.

1.5 WARRANTY

A. The Contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Wire and Cable shall be manufactured by U.S. Wire & Cable, Triangle Wire & Cable, Southwire Co., Essex Group, Belden, AT&T, or Northern Telecom.

B. Use Scotch #35 color coded color coding for identification of power cables.

C. Instrumentation cable for all 4-20 mA signal devices, pulse devices, 0-5 volts dc devices and other 2-wire devices shall be a Belden #8760 or approved equal.

D. Instrumentation cable for RTD shall be a Belden #8770 or approved equal.

2.2 MATERIALS

A. All conductors must be suitable for the application intended.

B. All conductors for 120V through 480V systems shall be rated 600 volts, and shall be stranded copper unless noted otherwise.

C. Wire insulation for all 120 through 480 volt distribution, power, lighting, and control shall be 600V, 75 C, THWN or XHHW unless specifically indicated otherwise. Insulation shall be suitable for wet and dry locations and be flame retardant.

D. Underground direct buried cable shall be polyvinyl chloride insulated and jacketed, type UF or USE.

E. Insulation for in duct underground wire and cable shall be type XHHW or USE rated for 75 degree C.

F. All control wire shall be copper stranded with no conductor being smaller then #16 AWG with the exception of special cables used for telephone, instrumentation, and data systems.

G. All instrumentation cables shall be stranded tinned copper conductor, polyethylene insulated with a 20 AWG tinned copper drain wire, 100% aluminum-polyester shield, and chrome PVC jacket. Cable shall be rated 300 volts and 60E Celsius.

H. Instrumentation cable for all 4-20 mA signal devices, pulse devices, 0-5 volts dc devices and other 2-wire devices shall be 2-conductor #18 AWG twisted, shielded pair cable.

I. Instrumentation cable for resistance temperature detectors (RTD's) and other 3-wire devices shall be 3-conductor #18 AWG shielded cable.

J. All wire and cables shall be new, and less than one year old out of manufacturer's stock.

2.3 SPECIAL CONSIDERATIONS

A. Install 600V, 90E C. RHHN, THWN or XHHW wire where, feeding through fluorescent fixture, in mechanical rooms, and other high temperature applications.

PART 3 - EXECUTION

3.1 COLOR, SIZE, AND TYPE DETERMINATION

A. Color Coding and Identification shall be as follows:

1.

System Voltage	120/208V	277/480V
A phase	Black	Brown
B phase	Red	Orange
C phase	Blue	Yellow
Neutral	White	Gray
Equipment Grnd.	Green	Green

2. In existing facilities, use existing color scheme.
3. Power conductors may be black with the proper color notation marked at each end of the conductor.
4. Identify exposed ends of all power cables sizes 8 AWG and larger, in panels, cabinets, motor control centers, pull boxes, terminals, splices, etc. using color coded tapes and approved numbering system.
5. Where there are two or more neutral conductors in one conduit, each shall be individually identified with the proper circuit. See requirements of NEC 200-6, 200-7, 210-4, 210-5, and 310-12.

B. Branch circuit wire size not shown on drawing shall be #12 AWG minimum.

3.2 INSTALLATION

A. All power, control and instrumentation wiring shall be installed in conduit unless specifically indicated otherwise.

B. Power wiring of different potentials shall not share the same conduit or raceway system unless specifically indicated otherwise.

C. All wiring inside panelboards, boxes, equipment, and cabinets shall be neatly trained and wrapped, taped, or laced into groups to provide a neat and orderly appearance.

D. Stranded conductors shall only be terminated with UL OR ETL Listed type terminations or methods.

E. Provide nylon or similar fish wire in all empty conduits.

F. Mechanical means shall not be used in pulling wires #8 or smaller.

G. Approved wire pulling lubricant shall be used as required to prevent insulation damage and over-stressing of the wire while pulling through conduit.

H. Provide protection for exposed cables where subject to damage.

I. All emergency system wiring shall be installed in raceways separate from all other systems.

J. Splices, Taps, and Terminations related conditions:

1. At all splices and terminations, leave tails long enough to cut splice out and completely resplice.
2. Use solderless spring type pressure connectors with insulating covers for wire splices and taps, 10 AWG and smaller.
3. No splices will be permitted in direct buried runs except as approved by the Engineer.
4. Control wiring shall not be spliced other then at a terminal strip or to leads permanently attached to a control device.

K. Conditions specific to control and instrumentation wire and cable:

1. All instrumentation cable shall be installed in a separate magnetic conduit system. This conduit system shall be routed such as to maintain a 12" physical separation from all power conduits and conductors whenever possible.
2. All control wiring shall be numbered at each end according to the drawings with a wire number label that will hold up against oil and moisture. The entire wire number shall be clearly printed on only one tag at each end.
3. Support exposed low voltage cables above accessible ceilings; do not rest on ceiling tiles. Use spring metal clips or plastic cable ties to support cables longer than 6 feet from building structure or ceiling support system. Include bridle rings or drive rings as necessary. DO NOT SUPPORT CABLES FROM OTHER EQUIPMENT.

3.3 COORDINATION

A. Contractor shall coordinate work as specified under provisions of Section 16100.

B. Contractor shall determine required separation between cable and other work.

C. Contractor shall determine cable routing to avoid interference with other work.

END OF SECTION

SECTION 16130

PULL AND JUNCTION BOXES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install the pull and junction boxes all as indicated on the drawings, as specified herein, and as required for splices, taps, wire pulling, equipment connections, and code compliance.

1.2 RELATED WORK

A. Section 16100 - General Provisions

1.3 QUALITY ASSURANCE

A. All pull and junction boxes shall comply with the requirements of:

1. ANSI/NFPA 70 - National Electrical Code (NEC), in particular with the Article 370 and Table 370-16 (a) of the NEC.
2. National Electrical Contractor's Association (NECA) Standard of Installation.

B. Furnish products listed and classified by Underwriters Laboratories, Inc.

1.4 SUBMITTALS

A. NONE REQUIRED.

1.5 WARRANTY

A. The Contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Pull boxes shall be manufactured by Hoffman Engineering Company or approved equal.

B. Outlet boxes shall be manufactured by Appleton, RACO, Steel City, or approved equal.

C. Cast outlet boxes shall be manufactured by Appleton, Crouse-Hinds, or approved equal.

D. Cast fittings shall be manufactured by Appleton, Crouse-Hinds, Killark. O-Z or approved equal.

E. Terminal blocks shall be Allen-Bradley Bulletin 1492 Style CA1, Square-D Class 9080 Type G or approved equal.

2.2 MATERIALS

A. NEMA 1 pull and junction boxes except in process and wet areas shall be galvanized after fabrication, gasketed with screw or hinged covers.

B. NEMA 3R pull and junction boxes shall be FS (Standard) or FD (Deep) cast malleable iron.

C. NEMA 4X boxes shall be FS (Standard) or FD (Deep) cast malleable iron or stainless steel.

D. All cast fittings shall be provided with threaded hubs.

E. Contractor shall utilize a threaded rigid conduit hub with insulated bushing for all rigid conduit terminations at pull boxes, junction boxes, and other electrical enclosures or equipment.

F. Subpanels and Terminal blocks shall be furnished for the boxes designed as Terminal boxes (TB).

G. Terminal blocks shall be 600 volt, channel-mounted, tubular screw type, with pressure plate, vinyl marking strips, end barriers, and end anchors.

2.3 SIZE AND TYPE

A. Boxes shall be sized as indicated on the drawings or as required by the National Electrical Code.

B. A minimum of 20% spare terminals blocks shall be provided, particularly for the boxes designed as Terminal Boxes (TB).

C. In general, outlet boxes shall be 4-inch square, 2 1/2 inches deep, or as indicated on the drawings or as required by the NFC.

D. Octagon outlet boxes when used shall be 4-inch, 2 1/2 inches deep minimum.

PART 3 - EXECUTION

3.1 COORDINATION OF BOX LOCATIONS

A. Boxes shall be located as indicated on the drawings or as required for the work involved.
B. Box locations shown on Contract Drawings are approximate unless dimensioned.

C. Locate and install boxes to allow access to them. Where installation is inaccessible, coordinate locations and provide 18 inch by 24 inch access doors.

D. Locate boxes above accessible ceilings or in unfinished areas. Locate and install to maintain headroom and to present a neat appearance.

E. Outlet boxes shall not be smaller than a standard single gang box. Outlet boxes with device mounting tab turned outward shall not be installed.

F. In mechanical, utility, storage, or other unfinished areas, outlet boxes shall be 4-inch square with 1/2-inch raised covers.

G. In finished areas where outlet boxes are to be surface mounted, use FS type cast malleable iron boxes.

H. No back to back outlet boxes shall be installed.

I. Location of outlets shown on drawings is approximate. The Contractor shall study building plans in relation to spaces and equipment, and lighting surrounding each outlet so that outlets are symmetrically located according to room layout.

J. When necessary, with approval of the Engineer, outlets shall be relocated to avoid interference with mechanical equipment or structural features.

K. No outlet shall be located where it will be obstructed by other equipment, piping, lockers, benches, counters, etc.

L. The proper location of each outlet is considered a part of this contract and no additional compensation will be paid to the Contractor for moving outlets which were improperly located.

3.2 INSTALLATION

A. Unused openings in boxes and fittings shall be plugged with suitable devices rated for the proper environment.

B. PVC boxes shall not be used to support light fixtures or other electrical equipment.

C. Where several feeders pass through a common pull box, wires shall be tagged to indicate clearly their electrical identification, circuit number, and panel designation.

D. Wire numbers shall be put on the marking strips of terminal blocks in a neat and legible manner. Terminal strip shall be marked with either the wire number or terminal number as specifically shown on the drawings.

E. Install boxes to preserve fire resistance rating of partitions and other elements, using approved materials and methods.

F. Support pull and junction boxes independent of conduit.

G. Box covers shall be stenciled indicating usage and voltage in letters not less than 2 inches high.

H. All outlet boxes in concealed conduit runs set flush with wall surfaces and utilize 1/2 inch raised covers if required.

I. All #6-32 machine screw ears shall turn in toward the box centerline and not out as is typical of switch boxes.

J. All boxes in wall shall be offset by 12 inches or more, either horizontally or vertically.

3.3 ENVIRONMENT SPECIFIC INSTALLATION

A. All conduit entry into boxes in process areas shall be through the side or bottom with a condensation drip tee mounted at the lowest point in the conduit.

B. In brine areas, all PVC boxes shall have PVC hubs compatible with PVC conduit used, to form water tight raceway system.

C. NEMA 1 boxes shall be used in general duty applications.

D. NEMA 3R boxes shall be used outside of buildings.

E. NEMA 4X boxes shall be used in process and wash-down areas.

F. All outlet boxes installed in hazardous areas as defined in Article 600 of the National Electric Code shall be suitable and rated for the class, group, and divisions as noted on the drawings.

G. Boxes in duty or dirty areas shall have a NEMA 12 or 13 rating.

3.4 COORDINATION

A. Contractor shall coordinate work as specified under provisions of Section 16100.

B. It shall be the Contractor's responsibility to study drawings pertaining to other trades, to discuss location of outlets with workmen installing other piping and equipment and to fit all electrical outlets to job conditions.

C. In case of any discrepancy over the location of an outlet, the Contractor shall refer the matter to the Engineer and install outlet as instructed by the Engineer.

END OF SECTION

SECTION 16140

WIRE CONNECTIONS AND CONNECTING DEVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install the wire connections and connecting devices of the electrical system, all as indicated on the drawings and as specified herein.

1.2 RELATED WORK

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All outlet boxes shall comply with the requirements of:

1. ANSI/NFPA 70 - National Electrical Code (NEC).
2. National Electrical Contractor's Association (NECA) Standard of Installation.

B. All wiring devices shall comply with NEMA Standard WD-1, "Heavy Duty Wiring Devices" and UL 20 standards.

C. Terminal connectors' hole sizes and spacing shall be in accordance with NEMA standards.

D. Furnish products listed and classified by Underwriters Laboratories, Inc.

1.4 SUBMITTALS

A. NONE REQUIRED.

1.5 WARRANTY

A. The Contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In general, Hubbell, Intermatic, Lutron, and Wiremold catalog numbers are indicated. Equivalent Arrow-Hart, Eagle, Leviton, P & S, or Sierra devices are also acceptable. Equivalent Combination welding receptacle and safety interlock units as manufactured by Pyle-National is also acceptable.

B. Electrical spring connectors shall be 3M Co. "Scotchlock" brand or approved equal.

C. Compression deforming type connectors shall be manufactured by Burndy Corp., Thomas & Betts Co., or approved equal.

D. Cast copper 3-way hinged connector (for connecting neutral conductor to ground rods, etc) shall be T&B # 350005 or approved equal.

E. Plastic mold and epoxy resin case splices (for underground low voltage wires) shall be equal to that manufactured by Minnesota Mining and Manufacturing (3M) Co. "Scotchcast" Kit No. 82-A, or by Hyso Corporation "Hyseal".

2.2 MATERIAL AND COLOR

A. Duplex receptacles shall be constructed of impact resistant nylon. Contacts shall be triple-wipe for minimum heat rise and maximum plug retention.

B. All Ground Fault Circuit Interrupter receptacles shall be noise suppressed to reduce nuisance tripping and shall have line and load terminal screws such that connection to load terminals will provide ground fault protection for other receptacles or loads connected to these terminals.

C. Switches shall be constructed using heavy duty thermoset body with sturdy mounting strap. Contacts shall be either silver or silver cadmium oxide to reduce contact erosion.

D. Color of the devices shall be as follows unless specified otherwise - Ivory.

E. In general, plates for office type areas shall be ivory colored nylon, supplied by one manufacturer, including telephone plates, except as otherwise noted.

F. Plates for utility, mechanical, unfinished areas, above accessible ceilings, storage areas, and on surface-mounted outlets to be 1/2-inch raised galvanized steel covers.

G. Plates for outlets in wet process or wash down areas shall have wet location rating with cover open and an IP44 rating. Switch covers in wash down areas shall be wet location rated IP44.

2.3 TYPE, SIZE, AND RATINGS

A. Duplex receptacles shall be a Hubbell 5362-I or equal. All duplex receptacles shall be specification grade, NEMA 5-20R, rated 20 amperes and 125 volts.

B. Ground Fault Circuit Interrupter receptacles shall be a Hubbell GF-5362-I or equal. Ground Fault Circuit Interrupter receptacles shall be specification grade, NEMA 5-20R, rated 20 amperes and 125 volts.

C. Single pole switches shall be a Hubbell HBL 1221ICN series or equal. All switches shall be specification grade, quite type, rated 20 amperes and 120-277 volt.

D. Wet location receptacle cover plates shall be Hubbell 74CM23W0 with Hubbell 5361, 20A, 120V single receptacle.

E. Combination welding receptacle and safety interlock shall be a Hubbell MI460R7W. Plug shall match receptacle. Welding receptacles shall be rated 480V, 3-phase, 4-wire, 60 ampere complete with safety interlock, pin and sleeve receptacle, one mating plug, and enclosed in a NEMA 4X enclosure.

F. Three-way switch shall be Hubbell HBL 1223ICN, 20 amp, 120/277 volt toggle switch.

G. Four-way switch shall be Hubbell HBL 1224ICN, 20 amp, 120/270 volt toggle switch.

H. Weather proof coverplates for toggle switches shall be IP44 rated with clear silicone rubber bubble Hubbell 1795.

I. Incandescent dimmer switches shall be Lutron Nova series with wattage rating shown in drawing, of either 600, 1000, 1500, or 2000 watts rated at 120 volts.

J. Fluorescent dimmer switches shall be Lutron Nova series for use with standard electronic dimming ballasts.

K. Timer switches shall be Intermatic FD15MH, single pole, single throw, 20 amp, 125 volts AC and 10 amp, 277 volts AC with hold (manual override) feature.

L. Key switches shall be Hubbell HBL 1221LCN, 20 amp, 120/270 volt AC with spare key operator.

M. Single pole switches with pilot lamps shall be Hubbell HBL 1221PL, 20 amp. 120 volt or HBL 1221PL7, 20 amp, 277 volt, red illuminated handle with light on when load is on.

N. Multioutlet assemblies shall be Wiremold 3000 series that is prime painted for field applied final finish. Raceway shall be 2.75" wide by 1.53" high, with 3.51 square inch cross sectional area, and 10' standard lengths with wide assortment of covers and accessories to allow for mounting of standard single gang devices.

O. Floor mounted receptacles in poured concrete floors shall be Walker 882 PVC in-floor box with doghouse type 500 series service fittings.

2.4 SPECIAL CONSIDERATIONS

A. All devices and device covers installed in hazardous areas as defined in Article 500 of the National Electrical Code shall be suitable and rated for the proper Class, Group and Division for use in hazardous locations.

PART 3 - EXECUTION

3.1 SIZE AND TYPE DETERMINATION

A. All splices for wire sizes #16 through #10 AWG shall be made with electrical spring connectors in accordance with manufacturer's recommendations. Wire #8 and larger: parallel clamp bolted or hydraulically swaged. Split-bolt connectors are not acceptable.

B. All cable and wire connections and terminations shall be made with compression deforming type connectors.

C. Power connectors for cable sizes 250 kcmil and larger shall be the long barrel type for double indentation.

D. Provide terminal connectors with two (2) holes in tongue for use on conductor sizes 250 kcmil and larger.

E. All taps in neutral conductor shall be made with cast copper 3-way hinged connector without cutting ground cable. Ground cable shall be continuous.

F. All underground Low Voltage Splices shall utilize a case splice employing a plastic mold and using epoxy resin. This means of splicing is the only type acceptable for low voltage wires in direct buried runs.

3.2 ARRANGEMENTS AND LOCATIONS

A. All light switches shall be mounted at 45 inches above the finished floor level to the center of the box, unless noted otherwise on the drawings.

B. All duplex and similar receptacles in office and in finished areas shall be mounted at 21 inches above the finished floor level to the center of the box, unless noted otherwise on the drawings.

C. Install telephone jack 21 inches above finished floor. Install telephone jack for wall telephone 45 above finished floor.

D. Mount weatherproof duplex receptacle cover plates horizontally up at 45 inches above finished floor level.

3.3 INSTALLATION

A. Connection to receptacles and switches shall utilize screw terminals. Plug-in connections are not acceptable.

A. When multiple devices are connected on one circuit such as duplex receptacles, circuit shall not feed through device but shall utilized "pig-tail" type wiring.

B. Receptacles shall have a bonding conductor from grounding terminal to the ground system. Self-grounding receptacles using mounting screws as bonding means are not acceptable.

C. Install separate green ground wire from motor or equipment to J-box beyond greenfield.

D. All splices in ground (or neutral) conductors shall be brazed.

E. Install devices and wall plates flush and level.

F. Label all GFIC protected outlets per NEC.

3.4 COORDINATION

A. Contractor shall coordinate work as specified under provisions of Section 16100.

END OF SECTION

SECTION 16190

RACEWAY, FIXTURE AND EQUIPMENT SUPPORTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install all raceway, fixture and equipment supports for all systems, as indicated on the drawings and as specified herein.

C. Supports shall include all required accessories including support channel, angle iron, pipe, straps, clamps and all fastening hardware.

1.2 RELATED WORK

A. Section 16100 - General Provisions

1.3 QUALITY ASSURANCE

A. All supports shall comply with the applicable requirements of:

1. MFMA - Metal Framing Manufactures Association
2. ASTM - American Society for Testing and Materials
3. ANSI/NFPA 70 - National Electrical Code (NEC).
4. National Electrical Contractor's Association (NECA) Standard of Installation.

B. The manufacturer must certify all components supplied have been produced in accordance with an established quality assurance program.

1.4 SUBMITTALS

A. No submittal required.

1.5 WARRANTY

A. The Contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. All pre-engineered strut system components shall be manufactured by Unistrut, B-line or approved equal.

2.2 MATERIALS AND FINISHES

A. All channel members shall be fabricated from structural grade steel conforming to ASTM A570, GR33 or A446.

B. All fittings shall be fabricated from structural grade steel conforming to ASTM A575, A576, A66 or A635.

C. Strut system including channel and fittings shall be hot-dipped galvanized with zinc coating after all manufacturing operations are complete.

B. Stainless steel supports, fittings and hardware shall be ASTM type 316 with polished finish. Stainless Steel screws, nuts and bolts shall be ASTM type 316N2-33.

PART 3 - EXECUTION

3.1 INSTALLATION

A. In general, supports for fixtures and electrical equipment shall utilize a pre-engineered strut system including channel, fittings, hardware and accessories for a matched system.

B. All electrical fixtures, devices, and equipment shall be securely mounted to building structure and shall not depend upon ceiling or wall surfaces for their support. They shall be incapable of being rotated or displaced. Support attachment shall adequately support weight of fixture, device, or equipment plus weight of support attachment.

C. The Electrical Contractor shall provide concrete pads, plywood backboards, and/or strut supports for all electrical raceway, equipment and fixtures as indicated on drawings and as specified.

D. The construction drawings may include various construction, installation and support details. Details are typically provided for special fixture, conduit, equipment supports. Any discrepancy between details shown on the drawings and this specification shall be brought to the attention of the engineer for resolution.

C. Do not fasten supports to piping, ductwork, mechanical equipment or any other surface not apart or the building structure or other structural surface.

3.2 ENVIRONMENT SPECIFIC INSTALLATION

A. All supports installed outside, exposed to the weather or inside in wet or damp areas shall utilize corrosion resistant supports, fittings, hardware, conduit clamps and all accessories.

1. B. Support material shall be galvanized after fabrication, or ASTM type 304 stainless steel. All screws, nuts and bolts shall be ASTM type 316 stainless steel.

3.3 SPECIAL CONSIDERATIONS

2. A. Mounting to prestressed concrete structural members shall be done as recommended by prestressed concrete structural member supplier. In no case shall explosive charges or hammer drills be used on members. All drilling shall be done with corundum drills or core drills and shall be done in pan section of tee units and in sections of members where no reinforcing steel is present.

B. Contractor shall not fasten supports to light gauge structural members without approval from engineer.

END OF SECTION

SECTION 16195

IDENTIFICATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install electrical equipment identification labels as indicated on the drawings and as specified herein.

1.2 RELATED WORK

A. Section 16100 - General Provisions

1.3 QUALITY ASSURANCE

A. All identification shall comply with the applicable requirements of:

1. ANSI/NFPA 70 - National Electrical Code (NEC).
2. National Electrical Contractor's Association (NECA) Standard of Installation.

B. All identification labels shall be covered during construction to avoid contamination. Labels shall be checked if correct and be cleaned prior to being turned over to the owner.

1.4 SUBMITTALS

A. NONE REQUIRED.

1.5 WARRANTY

A. The Contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 PLASTIC LAMINATED NAMEPLATES

A. Engraved plastic laminated nameplates shall be 1/4-inch high letters on all Switchboards, panelboards, cabinets, motor control centers, junction boxes, etc and of the size required to facilitate all information specified. Engraved plastic laminated nameplates shall be color coded white on black.

2.2 CIRCUIT DIRECTORIES

A. Circuit directories for all panelboards shall be typewritten and be protected in a clear plastic cover. Contractor may utilize directory cards supplied with the panelboard if available.

2.3 WIRE MARKERS

A. Wire markers shall be the self-laminating, pre-printed type. Markers shall be E-Z Code as manufactured by Thomas & Betts, Scotch Code as manufactured by 3M or approved equal.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All equipment including disconnect switches, motor starters, pushbutton stations, panelboards, switchgear, special device plates, and similar equipment shall be clearly and permanently marked using plastic laminated nameplates.

B. Install by bolting or by self adhesive, engraved plastic laminated nameplates on all switchboards, panelboards, cabinets, motor control centers, junction boxes, etc. Equipment shall be cleaned and de-greased prior to installing self adhesive labels.

C. Master nameplates for switchboards, panelboards and motor control centers shall indicate: (1) panel or center identification number, (2) panel or center identification name (3) voltage system. Nameplates for individual MCC units of switchboard units shall indicate equipment or feeder name and identification number. All switchboards, panelboards, junction boxes, motor control centers, etc., shall be clearly labeled as to voltage of cable or system terminated therein.

D. Nameplates for individual units contained in switchboards and motor control centers shall indicate: (1) equipment identification number and (2) equipment name.

E. Nameplates for individual Combination starters, disconnect switches and all other individual equipment requiring identification shall indicate: (1) equipment identification number, (2) equipment name (3) voltage system.

F. Wire markers shall be installed after wires have be cut to proper termination length. Wire markers shall have the same identification on both ends of the wire.

D. Provide fuse labeling for all fusible equipment indicating fuse type, size and voltage rating.

3.2 ENVIRONMENT SPECIFIC INSTALLATION

A. Plastic laminated nameplates shall be bolted on equipment requiring identification in process and other wet areas. No self adhesive nameplates shall be used in these areas.

B. Wire markers used in process and other wet areas shall be not be installed until the wires are cleaned, de-greased and wiped dry prior to installing markers. All enclosures shall be protected from wet environments during the course of construction.

3.3 COORDINATION

A. Contractor shall coordinate work as specified under provisions of Section 16100.

B. Wire markers shall coordinate with equipment wiring identification schemes whenever possible. Wires shall have the same identification.

END OF SECTION

SECTION 16420

SERVICE ENTRANCE AND UTILITY METERING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide all conduit, wire, concrete pads, instrument transformer enclosure and meter socket as shown on the drawings and as specified herein for new electrical service entrance and utility metering for revenue collection.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. Contractor shall install electrical service entrance and metering per local utility company requirements.

1.4 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

1.5 DIVISION OF WORK

A. Utility service fees shall be identified and paid for by Owner.

PART 2 - PRODUCTS

A. In general, Contractor shall provide a concrete pad for the service transformer(s) as specified by the Utility. Contractor shall also provide primary conduit(s) extensions, secondary lateral conduits, instrument transformer enclosure and meter socket, all as specified by the Utility. Utility will provide the service transformer(s), primary and secondary lateral, and all terminations at transformers. Verify exact requirements with utility.

B. In general, contractor shall provide secondary lateral conduits, instrument transformer enclosure, meter socket and control conduit between instrument transformer enclosure and meter socket.

C. The Utility will provide meter(s), meter test switch, current transformers and potential transformers.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Contractor shall verify all requirements as set forth by the local utility company. If there is any discrepancy between the requirements set by the Utility and what is shown on the Drawings and specifications, then the contractor shall notify the engineer. The Electrical Contractor shall also make all arrangements and coordinate the service entrance installation with the Utility.

B. The Electrical Contractor shall restore all underground trenches by the Utility to like-original condition. Provide compaction as specified in section 16100 of this specification.

END OF SECTION

SECTION 16421

EMERGENCY SERVICE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Contractor shall furnish and install an emergency system as shown on the drawings and as specified herein. Emergency system design elements are denoted by "E" on the drawings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. Emergency system shall be installed in accordance with the NEC, Article 700.

1.4 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Emergency system will utilize a emergency battery units as the source of power for all systems requiring emergency power. Emergency system shall include all associated power wiring, circuits, lighting fixtures, equipment connections, devices denoted by "E" and as shown on the drawings.

B. A minimum wire size of #10 AWG shall be used for all emergency power circuit including 20 Amp lighting circuits.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Emergency system shall be installed in accordance with the NEC, Article 700.

END OF SECTION

SECTION 16441

DISCONNECT SWITCHES: HEAVY DUTY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install heavy duty safety switches as indicated on the drawings and as required by the National Electrical Code. All safety switches shall be non-fusible unless specifically indicated or specified otherwise. All safety switches shall be NEMA Type HD and shall be UL listed.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

B. 16477 Fuses

1.3 QUALITY ASSURANCE

A. Switches shall be manufactured in accordance with the following standards:

UL98, Enclosed and Dead Front Switches
NEMA KS1 Enclosed Switches
NEMA 250 Enclosures for Electrical Equipment

B. Switches identified for use as service equipment are to be labeled for this application.

1.4 SUBMITTALS

A. Provide standard manufacturer's cutsheets for all equipment supplied showing outline drawings with dimensions of each switch, and equipment ratings for voltage, amperage, horsepower and short circuit. Submit shop drawings as described in section 16100.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Disconnect switches shall be manufactured by Square-D, General Electric, Eaton/Cutler-Hammer.

2.2 SWITCH INTERIOR

A. All switches shall have switch blades which are visible when the switch is OFF and the cover is open.

B. Lugs shall be front removable and UL listed for 75EC conductors aluminum or copper conductors.

C. 30 through 100 ampere switches shall be equipped with factory installed fuse pullers.

D. Switches required for NEMA Type 12, 4, 4X, 5 stainless steel applications shall have all copper current carrying parts.

E. All current carrying parts shall be plated to resist corrosion.

F. Switches shall have removable arc suppressors to facilitate easy access to line side lugs.

G. Switches shall have provisions for a field installable electrical interlock.

2.3 SWITCH MECHANISM

A. Switches shall be quick make, quick break such that, during normal operation of the switch, the operation of the contacts shall not be capable of being restrained by the operating handle after the closing or opening action of the contacts has started.

B. Provisions for padlocking the switch in the "OFF" position with at least three locks shall be provided. Switches shall have a dual cover interlock to prevent unauthorized opening of the switch door when the handle is in the "ON" position, and to prevent closing of the switch mechanism with the door open. The cover interlock mechanism shall have an externally operated override but the override shall not permanently disable the interlock mechanism. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

C. The handle position shall travel at least 90E between OFF and ON positions to clearly distinguish and indicate handle position.

2.4 SWITCH ENCLOSURE

A. NEMA Type 1 enclosures shall be constructed as follows:

1. Switch covers shall be attached with welded pin-type hinges.
2. Finish enclosure with gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated steel.
3. Tangential knockouts shall be provided to facilitate ease of conduit entry.
4. Enclosure shall have ON and OFF markings stamped into the cover.

B. NEMA Type 3 and 3R enclosures shall be constructed as follows:

1. Switch covers shall be top hinged, attached with removable screws and securable in the open position.

2. Finish enclosure with gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated galvannealed steel.
3. Tangential knockouts shall be provided to facilitate ease of conduit entry.
4. Enclosure shall have ON and OFF markings stamped into the cover.
5. Enclosures for Type 3R switches through 200 ampere shall have provisions for interchangeable bolt-on hubs in the top endwall.

C. NEMA Type 4X stainless steel enclosures shall be constructed as follows:

1. Switch covers shall be top hinged, attached with removable screws and securable in the open position.
2. Enclosure shall be type 304 stainless steel with a brushed finish.
3. Enclosure shall have ON and OFF markings stamped into the cover.
4. Cover sealing means for switches rated through 200 amperes shall be quick release trunk latches.
5. Enclosure shall contain no knockouts.
6. Stainless steel enclosures shall be dual rated as Type 3R to facilitate their use in outdoor applications.

D. NEMA Type 4X polyester enclosures shall be constructed as follows:

1. Switch covers shall attached by molded hinges and Type 316 stainless steel hinge pins.
2. Enclosure shall be polyester with natural gray finish.
3. Enclosure shall have inked ON and OFF a adhesive label on the cover.
4. Cover sealing means shall be Type 316 stainless steel captive screws.
5. Enclosure shall be provided with polyester conduit hubs for field installation.
6. Enclosures shall be dual rated as Type 3R to facilitate their use in outdoor applications.

E. NEMA Type 7 and 9 hazardous location enclosures shall be constructed as follows:

1. Switch covers shall be attached by Type 316 stainless steel bolts.
2. Enclosure shall be gray baked enamel on copper free cast aluminum alloy.
3. Enclosure shall have cast into cover ON and OFF markings.
4. Enclosure shall be provided with threaded conduit openings in both endwalls.
6. Enclosures shall be furnished with a breather and drain kit to allow their use in outdoor applications.

F. NEMA Type 12 enclosures shall be constructed as follows:

1. Switch covers shall be top hinged, attached with removable screws and securable in the open position.
2. Finish enclosure with gray baked enamel paint which is electrodeposited on cleaned, phosphate pre-treated galvannealed steel.
3. Tangential knockouts shall be provided to facilitate ease of conduit entry.
4. Enclosure shall have ON and OFF markings stamped into the cover.
5. Cover sealing means for switches rated through 200 amperes shall be quick release trunk latches.

2.5 SWITCH RATINGS

A. Switches shall be heavy duty and be horsepower rated. The UL listed short circuit rating shall be 200,000 symmetrical amperes when Class R or Class J fuses are used on switch sizes 30 to 600 amperes. The UL listed short circuit rating shall be 200,000 symmetrical amperes when Class L fuses are used on switch sizes 800 to 1200 amperes.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Fuse sizes shall be as indicated on the drawings or as recommended by the equipment manufacturer. If there is any discrepancy between fuse sizes set by the manufacturer and what is shown on the drawings and specifications, then the contractor shall notify the engineer.

B. Disconnect switches installed in dry clean areas shall be NEMA 1; Disconnect switches installed in dirty or dusty areas shall be NEMA 12; Disconnect switches installed outside or indicated "WP" or the drawings shall be rated NEMA 3R; Disconnect switches in process areas or other washdown areas shall be rated NEMA 4X.

C. NEMA 4X rated manual starters may be used in washdown and wet process areas in lieu of a NEMA 4X disconnect switches for 480V, 3-phase motors. Size O (larger if required), 480V, 3 phase, with melting alloy type thermal overload relay rated for motor to be protected. All manual starters used as disconnects shall have provisions for padlocking.

D. Disconnect switches installed in Hazardous locations as defined by the National Electric Code or as shown on the drawings shall be rated NEMA 7 or 9.

E. Provide and install on the inside door of all fusible disconnect switches a typewritten copy with a transparent protective cover with the following information:

1. Fuse Amperage
2. Fuse Type
3. Fuse Class
4. Fuse Voltage Rating
5. Fuse Manufacturer
6. Unit or Circuit Protected by Fuse

END OF SECTION

SECTION 16450

GROUNDING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide system and equipment grounding systems to comply with local, state and Article 250 National Electrical Code.

1.2 RELATED WORK SPECIFIED ELSEWHERE

1.3 QUALITY ASSURANCE

A. All exothermic connections shall meet the requirements of IEEE Standards and be listed in MIL 419 standard.

B. All compression type connections and ground rods shall be UL listed.

C. Entire system ground shall be tested by the fall of potential method as specified in Part 3 Execution.

1.4 SUBMITTALS

A. Provide test results showing system ground performance as specified.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Ground rods shall be as manufactured by Blackburn/Thomas & Betts or approved equal.

B. Exothermic welding materials shall be Cadweld products as manufactured by Erico Products, Inc. or approved equal. All exothermic welding materials shall be from a single manufacturer to ensure material compatibility.

C. Compression connections shall be type YGC or YGL as manufactured Burndy or approved equal.

2.2 MATERIALS

A. Bare grounding conductors shall be soft drawn copper, Class B stranding, and meet ASTM standard 138. Grounding conductors shall be sized as shown on the drawings.

B. Ground rods shall be 3/4" diameter by 10' long copper clad steel unless noted otherwise on the drawings.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. System Grounding

1. Ground service neutrals and equipment to water service at street side of meter as shown on plans and as required by Code. Provide copper weld ground rods as required by Code in additional to water service and as shown on plan.
2. The grounding grid shall be established utilizing copper-clad or copper-weld grounding electrodes, ground cables, and exothermic connections as indicated on the drawings.
3. Ground cables shall be buried below frost line, but not less than 12 inches below grade.
4. All grounding connections below grade shall be exothermically welded (Cadweld) connections. All below grade connections shall be inspected by the owner or engineer prior to pouring floor slab and/or burying below grade.
5. All connections above grade shall be exothermically welded or compression type.
6. Electrical Contractor shall coordinate with the General Contractor so that grounding system is installed, tested and inspected prior to pouring floor slab and/or burying below grade.
7. The grounding system shall be tested by the fall of potential method to determine it's actual resistance to absolute earth ground by using a "megger" type earth ground test equipment. Ground test equipment shall be a Biddle #250220 or #250240 or approved equal. Test results shall be submitted to and approved by the owner or engineer prior to pouring floor slab and/or burying below grade.
8. The main distribution Switchboard(s) shall be connected directly to the grounding grid utilizing Two (2) grounding conductors derived from separate points on the grounding electrode system.
9. Service neutrals shall not be grounded except at the main service ground.

B. Equipment Grounding

1. Provide a separate ground jumper across all flexible conduit connections.
2. All service transformers having a grounded wye secondary shall have the neutral point connected directly to the grounding electrode system unless directed otherwise by the engineer or Utility.
3. A separate green ground wire shall be provided for flexible conduit connections to motors, equipment and fixtures.
4. Provide an approved ground system or a ground wire separate from the neutrals for all light fixtures, outlets, device boxes, junction boxes, motors, and all other electrical equipment.
5. When utilizing EMT conduit for the raceway system a separate ground wire sized per NEC shall be pulled in with all power conductors.
6. When utilizing rigid conduit for the raceway system a separate ground wire sized per NEC shall be pulled in with all power conductors unless specified otherwise.

7. The grounding system shall meet all the requirements of the NEC and all state and local codes as required.

END OF SECTION

SECTION 16460

GENERAL LIGHTING AND POWER TRANSFORMERS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install all dry-type general lighting and power transformers as indicated on the drawings and as specified herein with primary and secondary voltages of 600 volts or less.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All insulating materials are to be in accordance with NEMA ST20 Standards for 220EC UL component recognized insulation system. Transformers are to be manufactured and tested in accordance with ANSI Standards C57.12.01 and C57.12.91.

B. Transformers of 500kVA or smaller shall be listed by Underwriters Laboratory.

1.4 SUBMITTALS

A. Provide standard manufacturer's cutsheets for all equipment supplied showing dimensional, construction, wiring diagrams, and rating data. Submit shop drawings as described in section 16100.

B. Shop drawings shall include efficiency at 25%, 50%, 75%, and 100% load, percent regulation at 100% and 80% power factor, no load and full load losses in watts, Class H insulation 150EC rise with reference temperature of 135EC, impedance based on reference temperature, sound level in Db of transformer in enclosure, hot-spot temperature rise 40EC ambient, and average temperature rise with 40EC ambient. Maximum case temperature shall not exceed 35EC rise above ambient at warmest point. This information shall be submitted for typical units for all KVA sizes specified.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Transformers shall be as manufactured by the Square D, General Electric, Westinghouse, or Jefferson.

B. Suppliers asking consideration as an approved equal shall submit complete, warranted performance data and physical dimensions for similar transformers. Data shall be submitted for each size specified. Submit data for approval as an equal to the engineer as specified in section 16100.

2.2 TRANSFORMER CONSTRUCTION

A. All cores to be constructed of high grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy current losses. Magnetic flux densities are to be kept well below the saturation point. The core lamination above 112.5kVA shall be miter cut at the core corners to reduce hot spots, core loss, excitation current and sound level. The core lamination shall be clamped together with steel angles. Cores for transformers greater than 300kVA shall be clamped utilizing insulated bolts through the core lamination to provide proper pressure throughout the length of the core. The completed core and coil shall then be bolted to the base of the enclosure but isolated therefore by means of rubber, vibration-absorbing mounts. There shall be no metal-to-metal contact between the core and coil and the enclosure. Sound isolation systems requiring the complete removal of all fastening devices will not be acceptable.

B. The core of the transformer shall be visibly grounded to the enclosure by means of a flexible grounding conductor sized in accordance with applicable UL and NEC standards.

C. The transformer enclosures shall be ventilated and be fabricated of heavy gauge, sheet steel construction. The entire enclosure shall be finished utilizing a continuous process consisting of degreasing, cleaning and phosphatizing, followed by a light grey electrostatic deposition of a polymer polyester powder coating and baking cycle to provide uniform coating of all edges and surfaces. The coating shall be UL recognized for outdoor use.

D. The maximum temperature of the top of the enclosure shall not exceed 50EC rise above a 40EC ambient.

E. The sound levels shall be guaranteed by the manufacturer not to exceed the following:

15 to 50KVA 45db
51 to 150KVA 50db
151 to 300KVA 55db
301 to 500KVA 60db
501 to 700KVA 62db
701 to 1,000KVA 64db
1,001 to 1,500KVA 65db
1,501 to 2,000KVA 66db

2.3 ACCESSORIES

A. Provide weathershields for units as shown on drawings.

B. Provide wall mounting brackets for units as shown on the drawings.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. The Electrical Contractor shall provide and install necessary Unistrut channels and supports as required for mounting of the transformers unless otherwise noted on drawings. Transformer supports and installation thereof are subject to approval of the Engineer.

B. Contractor shall measure transformer voltages when system is operational and adjust taps on transformers so that voltages within 2.5% of nominal voltage levels on transformer secondary.

END OF SECTION

SECTION 16470

GENERAL LIGHTING AND POWER PANELBOARDS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install circuit breaker lighting and power panelboards as shown on the drawing and as specified herein. See power riser and schedules on the drawings for equipment sizes, voltage ratings, and quantities. Panelboards shall be equipped with thermal magnetic molded case circuit breakers with frame and trip ratings as shown on the drawings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. The panelboard(s) and circuit breaker(s) referenced herein shall be designed and manufactured according to the latest revision of the following specifications, standards and publications.

NEMA PB 1 - Panelboards
NEMA PB 1.1 -Instructions for Safe Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less.
NEMA AB 1 - Molded Case Circuit Breaker and Molded Case Switches
NEMA KS 1 - Enclosed Switches
UL 50 - Boxes and Cabinets
UL 67 - Panelboards
UL 98 - Enclosed and Deadfront Switches
UL 489 - Molded Case Circuit Breakers and Circuit Breaker Enclosures
CSA Standard C22.2 No. 29-M1989 - Panelboards and Enclosed Panelboards
CSA Standard C22.2 No. 5-M1986 Molded Case Circuit Breakers
Federal Specification W-P-115B Type I Class 1
Federal Specification W-P-115B Type II Class 1
Federal Specification W-C-375B/GEN - Molded Case Circuit Breakers
Federal Specification W-C-865C - Fusible Switches
ASTM - American Society of Testing Materials

1.4 SUBMITTALS

A. Provide standard manufacturer’s cutsheets for all equipment supplied showing dimensional, construction, wiring diagrams, and rating data. Submit shop drawings as described in Section 16100.

B. As a minimum panelboard shop drawings shall include the following:

1. Breaker layout drawing with dimensions indicated and nameplate designation.

2. Component list.
3. Conduit entry/exit locations.
4. Assembly ratings including:
    a. Short circuit rating.
    b. Voltage and phase.
    c. Continuous current.
5. Cable terminal sizes.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

B. Manufacturer shall warrant specified equipment free from defects in materials and workmanship for the lesser of one (1) year from the date of installation or eighteen (18) months from the date of purchase.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. General lighting and panelboards as manufactured by Square D, Westinghouse/Cutler-Hammer, or General Electric is acceptable.

B. Additions to existing panelboards shall be the same as the original manufacturer.

C. Panelboard will need 100 amp main service, 24 circuits, single phase, and shall be mounted outside of salt storage building.

2.2 ENCLOSURE

A. The box shall be fabricated from galvanized steel or equivalent rust resistant steel. Each front shall include a door and have a flush, cylinder tumbler-type lock with catch and spring-loaded stainless steel door pull. Doors shall be mounted with completely concealed steel hinges. Fronts shall not be removable with door in the locked position. A circuit directory frame and card with a clear plastic covering shall be provided on the inside of the door. Circuit directories are to be properly filled in with a typewriter at completion of the job, with designations as determined by the Owner.

B. NEMA Type 1 Boxes

1. Shall be galvanized steel constructed in accordance with UL 50 requirements. Zinc coated galvanealed steel will not be acceptable.
2. Boxes shall have removable blank endwalls and interior mounting studs. Interior support bracket shall be provided for ease of interior installation.
3. Box width shall be 20" wide.
4. Trim front steel shall meet strength and rigidity requirements per UL 50 standards. Shall have medium gray enamel electrodeposited over cleaned phosphatized steel.

5. Trim front shall be hinged 1-piece with door, available in flush or surface mount. Trim front door shall have rounded corners and edges free of burrs. A clear plastic directory card holder shall be mounted on the inside of the door.
6. Locks shall be cylindrical tumbler type with larger enclosures requiring sliding vault locks with 3-point latching. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock.

B. NEMA Type 3R, 3S and 12

1. Endwalls shall be welded and sealed. Enclosures shall be painted with medium gray enamel electrodeposited over cleaned phosphatized steel.
2. All doors shall be gasketed and be equipped with a tumbler type vault lock and two (2) additional trunk latches. All lock assemblies shall be keyed alike. Two (2) keys shall be provided with each lock.
3. Maximum enclosure dimensions shall not exceed 42" wide and 12.95" deep.

2.3 GENERAL CONSTRUCTION

A. Panelboard bus structure and main lugs or main circuit breaker shall have current ratings as shown on the panelboard schedule. Such ratings shall be established by heat rise tests, conducted in accordance with UL Standard 67. Bus structure shall be insulated. Bus bar connections to the branch circuit breakers shall be the "distributed phase" or phase sequence type and shall accept either plug-on or bolt-on circuit breakers. All current carrying parts of the bus parts of the bus structure shall be plated.

B. The panelboard bus assembly shall be enclosed in a steel cabinet. The rigidity and gauge of steel to be as specified in UL Standard 50 for cabinets. Wiring gutter space shall be in accordance with UL Standard 67 for panelboards.

C. Each panelboard, as a complete unit, shall have a short circuit current rating equal to or greater than the integrated equipment rating shown on the panelboard schedule or on the plans. This rating shall be established by testing with the overcurrent devices mounted in the panelboard. The short circuit tests on the overcurrent devices and on the panelboard structure shall be made simultaneously by connecting the fault to each overcurrent device with the panelboard connected to its rated voltage source. Method of testing shall be per Underwriters Laboratories Standard UL 67. The source shall be capable of supplying specified panelboard short circuit or greater. Panelboards shall be marked with their maximum short circuit current rating at the supply voltage and shall be UL listed.

D. Panelboards shall be listed by Underwriters Laboratories and bear the UL label. When required, panelboards shall be suitable for use as service equipment.

E. Panelboards shall be full height, full depth standard lighting and distribution type panels designed for commercial and industrial use. Load center type panelboards are not acceptable.

F. Panelboards noted on the drawings as serving non-linear loads shall be provided with a 200% rated neutral and provisions for a separate oversized branch circuit neutral connection for each circuit to the neutral bus.

2.4 MAIN AND BRANCH CIRCUIT BREAKERS

A. Tandem circuit breakers are not acceptable. Handle ties are not acceptable.

B. Main breakers shall have 100 amp service and shall comply with section 16475 Molded Case Circuit Breakers.

C. Branch circuit breakers shall have frame, trip, voltage and short circuit ratings as shown on the drawing schedules and risers.

D. Branch breakers shall be Bolt-in type, heavy-duty, quick-make, quick-break, single- and multi-pole circuit breakers with toggle handles that indicate when unit has tripped.

E. Branch circuit breakers shall be thermal magnetic type with single handle for all multiple pole circuit breakers. Circuit breakers shall be minimum 100 ampere frame and through 100 ampere trip sizes shall take up the same pole spacing. Circuit breakers shall be UL listed as type SWD for lighting circuits. Branch circuit breakers serving HVAC loads shall be U.L. listed with HACR marking.

F. Circuit breakers shall have a minimum interrupting rating of 10,000 amperes symmetrical at 240 volts and 14,000 amperes symmetrical at 480 volts.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Panel and feeders to be balanced within 10% under full load conditions.

B. Provide 3/4-inch plywood backup behind surface mounted panels and equipment where indicated on plans. Paint all two (2) coats gray enamel, both sides and all around.

C. Install panelboards in accordance with manufacturer's written instructions, NEMA PB 1.1 and NEC standards.

D. Provide engraved laminated nameplates under the provisions of Section 16195.

END OF SECTION

SECTION 16475

MOLDED CASE CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The Contractor shall furnish and install the molded case, electromagnetic circuit breakers having the electrical characteristics, ratings and modifications as specified herein and as shown on the contract drawings.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. The molded case circuit breakers and all components shall be designed, manufactured and tested in accordance with the latest applicable standards of the following:

X UL 489 Molded Case Circuit Breakers
X NEMA AB1 Molded Case Circuit Breakers
X NEMA 250 Enclosures for Electrical Equipment
X Circuit breakers shall be Underwriters Laboratories and CSA listed and labeled.
X Federal Specification W-C-375a
X CSA listed and labeled
X IEC 157-1 rated
X Federal Specification W-C-375B/GEN

1.4 SUBMITTALS

A. Provide standard manufacturer's cutsheets for all equipment supplied showing dimensional, construction, wiring diagrams, and rating data. Submit shop drawings as described in section 16100.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Molded case circuit breakers shall be as manufactured by Square-D, Cutler-Hammer/Westinghouse, or General Electric.

2.2 BREAKER CONSTRUCTION

A. Molded case circuit breakers shall provide circuit overcurrent protection with inverse time and instantaneous tripping characteristics. Molded case circuit breakers shall be U.L. listed for standard continuous current rating.

B. Circuit breakers shall be operated by a toggle-type handle and shall have a quick-make, quick-break over-center switching mechanism that is mechanically trip-free. Automatic tripping of the breaker shall be clearly indicated by the handle position. Contacts shall be nonwelding silver alloy, and arc extinction shall be accomplished by means of arc chutes. A push-to-trip button on the front of the circuit breaker shall provide a local manual means to exercise the trip mechanism. Breakers shall be calibrated for operation in an ambient temperature of 40EC. Each circuit breaker shall have a permanent trip unit containing individual thermal and magnetic trip elements in each pole. Circuit breakers with frame sizes greater than 100 Amperes shall have variable magnetic trip elements which are set by a single adjustment (to assure uniform tripping characteristics in each pole). The circuit breaker shall have reverse connection capability and be suitable for mounting and operating in any position.

C. Circuit breakers shall have removable lugs. Lugs shall be UL listed for copper and aluminum conductors. Breakers shall be UL listed for installation of mechanical type lugs.

D. Where specified, adjustable instantaneous trip magnetic only circuit breakers shall be furnished. Instantaneous trip only circuit breakers are listed with Underwriters Laboratories as a recognized component. They require additional listing in combination with a contactor and overload relay. Each breaker shall be provided with a single magnetic adjustment which simultaneously sets the magnetic trip level of each individual pole.

E. Circuit breakers shall have a minimum symmetrical interrupting capacity as indicated on the drawings.

F. Where indicated, circuit breakers shall be UL listed for series application.

G. Where indicated, circuit breakers shall be current limiting.

2.3 ENCLOSURES

A. When indicated on the drawings circuit breakers shall be individually mounted in a separate enclosure. Provide enclosures suitable for locations as indicated on the drawings and as described below.

1. NEMA 1 surface or flush-mounted general purpose enclosures primarily intended for indoor use.
2. NEMA 12 dust-tight enclosures intended for indoor use primarily to provide protection against circulating dust, falling dirt, and dripping non-corrosive liquids.
3. NEMA 3R raintight enclosures intended for outdoor use primarily to provide protection against rain, sleet, and damage from external ice formation.

4. NEMA 4 watertight stainless steel intended for indoor or outdoor use primarily to provide protection against windblown dust and rain, splashing rain, hose-directed water, and damage from external ice formation.
5. NEMA 7, Class I, Group D hazardous location cast aluminum intended for indoor use in locations classified as Class I, Group D as defined in the National Electrical Code.
6. NEMA 9, Class II, Groups E, F, G hazardous location cast aluminum intended for indoor use in locations classified as Class II, Groups E, F, and G as defined in the National Electrical Code.

B. All enclosed circuit breakers shall have metal nameplates, front cover mounted, that contain a permanent record of catalog number and maximum rating. Provide handle mechanisms that are padlockable in the "OFF" position.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Standard factory tests shall be performed on the equipment under this section. All tests shall be in accordance with the latest version of NEMA and UL standards.

B. The Contractors shall install all equipment per the manufacturers recommendations and the contract drawings.

C. The Contractor shall perform field adjustments of the circuit breakers as required to place the equipment in final operating condition.

END OF SECTION

SECTION 16477

FUSES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install fuses of the type and quantity as required by the drawings and these specifications.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All fuses shall be of the same manufacturer.

1.4 SUBMITTALS

A. None Required.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of one year as described in section 16100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The catalog numbers and products specified under this section are those of the Bussmann Company and constitute the type, quality of design, manufacturer, material, and operating features desired. Fuses shall be as manufactured by Bussmann or approved equal by Gould-Shawmut, or Littlefuse.

2.2 MATERIALS

A. Mains, Feeders, and Branch Circuit:

1. Circuits 601 to 6000 amperes shall be protected by current limiting time-delay fuses such as Bussman type KRP-C. Fuses shall employ "0" rings as positive seals between the end bells and the glass melamine fuse barrel. Fuse links shall be pure silver links (99.9% pure). The terminals shall be peened. Fuses shall be time-delay and must hold 500% of rated current for a minimum of 4 seconds, clear 20 times rated current in .01 seconds or less and be listed by Underwriters Laboratories, Inc., with an interrupting rating of 200,000 amperes r.m.s. symmetrical. The fuses shall be UL Class L.

2. Circuits 0 to 600 ampere and motor circuits rated to 480 amperes shall be protected by current limiting dual-element fuses such as Bussman type LPN-RK (250 volts), LPS-RK (600 volts), or LPJ-SP (space saving 600 volts). All dual-element fuses shall have separate overload and short-circuit elements. Fuse shall incorporate a spring activated thermal overload element having a 284EF melting point alloy and shall be independent of the short-circuit clearing chamber. The fuse must hold 500% of rated current for a minimum of 10 seconds and be listed by Underwriters Laboratories, Inc., with an interrupting rating of 200,000 amperes r.m.s. symmetrical. The fuses shall be UL Class RK1. The fuses for l.15 service factor motors shall be installed in ratings approximately 125% of motor full load current except where high ambient temperatures prevail, or where the motor drives a heavy revolving part which cannot be brought up to full speed quickly, such as large fans. Under such conditions the fuse shall be 150% to 175% of the motor full load current. Fuses for 1.0 service factor motors shall be rated at approximately 115% of the motor full load current except as noted above. As an alternate UL listed class J fuses such as Bussman type LPJ-SP may be used to allow use of smaller motor controllers and fused switch units. These J-class fuses shall be dual element and be applied per the above description for R-class fuses.

B. Upon completion of the building, the contractor shall provide the owner with spare fuses and cabinet as shows below:

1. 10% (minimum of 3) of each type and rating of installed fuses shall be supplied as spares.
2. Spare fuse cabinet-Bussman type SFC to store the above spares. SFC shall have "Safety Yellow" exterior label, and shall include supply of Caution Labels.

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Fuses shall not be installed until equipment is ready to be energized. Final tests and inspections shall be made prior to energization of the equipment. This shall include a thorough cleaning, tightening, and review of all electrical connections and inspection of all grounding conductors.

B. CAUTION labels to alert the end user of the engineered level of protection of the electrical equipment, shall be field installed by the electrical contractor. They shall be marked with the proper fuse rating, per the specifications, and placed in a conspicuous location on the enclosure.

END OF SECTION

SECTION 16501

LAMPS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Contractor shall furnish and install all lamps in all fixtures as indicated in the Fixture Schedule, as shown on the drawings and as specified herein.

B. Provide lamps of the size, type and quantity as indicated on the fixture schedule. Engineer does not guarantee that lamp catalog numbers are entirely accurate or complete. Contractor shall verify with lamp and fixture supplier that lamps being supplied do meet all requirements listed.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All lamps shall meet the applicable requirements for the following:

1. NEC - NATIONAL ELECTRICAL CODE
2. U.L. - UNDERWRITERS LABORATORY
3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
4. IES - ILLUMINATION ENGINEERING SOCIETY

1.4 SUBMITTALS

A. Provide standard manufactures cutsheets for all lamps being supplied for lighting fixtures showing catalog number, construction and rating data. Submit shop drawings as specified in section 16100.

1.5 WARRANTY

A. The contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Lamps shall be manufactured by General Electrical (G.E.), Philips, Sylvania or approved equal.

2.2 PERFORMANCE

A. Four-foot fluorescent lamps to be T8, 32 watt, with a correlated color temperature of 3500 and a color rendering index of no less than 75. Lamps shall be rated 20,000 hours average life and 2900 initial lumens.

B. Where T12 fluorescent lamps are required or specified, lamps shall be energy efficient T12, 34 watt, with a correlated color temperature of 3500 and a color rendering index of no less than 75. Energy efficient lamps shall be G.E. Watt-Miser, Sylvania supersaver type lamps or approved equal.

C. High Pressure Sodium (HPS) lamps shall utilize a clear envelope, Mogul base, and be rated 24,000 hours average with a correlated color temperature of 2100 and a color rendering index of no less than 22. High Pressure Sodium lamps used in open type fixtures shall utilize a coated envelope and be rated for use in open fixtures.

D. Metal Halide lamps shall utilize a clear envelope, Mogul base, with a correlated color temperature of 3200 - 4500 and a color rendering index of no less than 65. Lamps shall be rated 10,000 hours average for lamps 250 watts and smaller and 20,000 hours average for lamps 400 watts and larger. Metal Halide lamps installed in open type fixtures shall be rated for use in open fixtures.

E. Incandescent lamps shall be rated at 120V, inside frosted, extended life, rated 2500 hours average and be of the lamp type and sizes as indicated in Fixture Schedule.

F. Where eight foot high output fluorescent lamps are required or specified, lamps shall be energy efficient and rated for 12,000 average life, T12, 95 watts, with a correlated color temperature of 3500 Deg. Kelvin, with a color rendering index of at least 73. Eight foot lamps for use with cold weather ballasts (-20 deg. F) shall be standard efficiency rated for 12,000 hour average life, T12, 110 watts, with a correlated color temperature of 3500 Deg. Kelvin, with a color rendering index of at least 73.

PART 3 - EXECUTION

3.1 INSTALLATION

A. All fixtures shall be checked and cleaned if necessary prior to installing lamps in fixtures.

B. All lamps shall be furnished and installed in all fixtures as indicated in the fixture schedule and as shown on the drawings.

C. Contractor shall relamp all luminaries which have failed at the completion of the project at no additional cost to the Owner.

END OF SECTION

SECTION 16510

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide a complete interior lighting system including all lighting fixtures, lamps, wiring system, raceway, supports and controls as shown on the drawings and as specified herein.

B. Furnish and install all lighting fixtures, complete with lamps, as indicated in the Fixture Schedule as shown on the drawings and as specified herein. Type of fixtures to be provided is indicated by "fixture number" on the drawings.

C. Provide fixtures and lamps of the size, type and quantity as indicated on the fixture schedule. Engineer does not guarantee that fixture catalog numbers are entirely accurate or complete. Contractor shall verify with fixture supplier that fixtures being supplied do meet all requirements listed.

D. Furnish and install lighting controls with time clock(s) and contactor(s) as shown on the drawings and as specified herein.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All light fixtures and lamps shall meet the applicable requirements for the following:

1. NEC - NATIONAL ELECTRICAL CODE
2. U.L. - UNDERWRITERS LABORATORY
3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
4. IES - ILLUMINATION ENGINEERING SOCIETY

1.4 SUBMITTALS

A. Provide standard manufactures cutsheets for all lighting fixtures supplied showing catalog number, dimensions, construction, and rating data. Submit shop drawings as specified in section 16100.

1.5 WARRANTY

A. The contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall, at no cost to the Owner, replace any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers of lighting fixtures are indicated in the fixture schedule which is shown on the drawings.

2.2 FLUORESCENT FIXTURES

A. All fluorescent fixtures shall utilize energy efficient electronic type ballasts. For fluorescent lighting systems where electronic ballasts are not available, energy saving electromagnetic ballasts shall be supplied.

B. Electronic ballasts shall be individually fused, 120 or 277 Volt, with a nominal power factor of 0.95 or higher, comply with EMI and RFI limits set by the FCC, and have a Total Harmonic Distortion (THD) less then 10% at 120V and 15% at 277V. Electronic ballasts shall be ETL-CBM-UL approved with type "A" sound rating and shall be Class "P" to comply with Underwriters Laboratory requirements. Ballasts shall operate in rapid start mode and have a lamp Current Crest Factor of 1.7 or less. Ballasts shall be Advance, Magnetek, Motorola or approved equal.

C. Electromagnetic ballasts shall be individually fused, 120 or 277 Volt, high power factor (HPF) ballasts, ETL-CBM-UL approved with type "A" sound rating except as noted. All electromagnetic ballasts shall be Class "P" to comply with Underwriters Laboratory requirements. Ballasts shall be Advance, Magnetek, Motorola or approved equal.

D. Where cold weather ballasts are indicated in the Fixture Schedule, or as required to meet temperature criteria, ballasts shall be rated -0EF for Rapid Start and -20EF for High Output.

E. Lensed fluorescent troffers shall be commercial grade with the number of lamps as indicated in the Fixture Schedule. Fixture shall be 3 3/4" deep constructed of die-formed code gauge steel and finished with a five stage, iron phosphate pre-treatment process and polyester enamel finish coat. Door shall be fully gasketed flush steel with opposing, rotary-action cam latches. Fixture shall utilize integral T-bar safety clips built into the end plates. Diffusers shall be made using 100% virgin prismatic acrylic.

F. Parabolic troffers shall be specification grade with the number of lamps as indicated in the Fixture Schedule. Fixture shall incorporate pre-anodized aluminum, semi-specular, 3" deep parabolic louvers. Fixture frame shall be constructed from die-formed code gauge steel and finished with a five stage, iron phosphate pre-treatment process and polyester enamel finish coat.

G. Industrial fixtures shall be general purpose, with the number of lamps as indicated in the Fixture Schedule. Fixture shall utilize an aperture reflector providing 5% uplight. Ballast for industrial fixtures may incorporate a type C sound rating. Fixture frame shall be constructed from die-formed code gauge steel and finished with a five stage, iron phosphate pre-treatment process and polyester enamel finish coat.

H. All plastic fixture lenses and diffusers shall be of 100% virgin acrylic material as specified. Fixture lenses which sag or are distorted shall be replaced at no cost to the Owner. Lenses shall be .080 inches thick minimum not including prism projection (nominal 0.125").

2.3 HIGH INTENSITY DISCHARGE FIXTURES

A. Open High-bay fixtures shall be constructed utilizing a lightweight, die-cast aluminum housing with a corrosion resistant polyester powder finish.

B. Enclosed High-bay fixtures shall be constructed utilizing a lightweight, die-cast aluminum housing with a corrosion resistant polyester powder finish.

C. Low-bay lighting fixtures shall be constructed utilizing a lightweight, die-cast aluminum housing with a corrosion resistant polyester powder finish.

D. All H.I.D. fixture ballasts to be individually fused, Class H, high powder factor (HPF), constant wattage autotransformer type, rated -20EF.

2.4 EXIT FIXTURES

A. Light source shall utilize new LED technology with a life expectancy of 25 years. Exit fixture shall include universal mounting and faces to accommodate all installation configurations. If emergency units are required, then a sealed, maintenance free Nickel Cadmium Battery system, with charging system shall be provided with a 90 minute capacity.

B. Fixture shall be constructed from heavy gauge, die-formed steel with stencil of panel face. Exit fixture shall utilize new LED technology with lite expectancy of 25 years. Exit fixture shall include universal mounting and faces to accommodate all installation configurations. If emergency units are required, then a sealed, maintenance free Nickel Cadmium Battery system, with charging system shall be provided with a 90 minute capacity.

C. Fixtures shall be rated NEMA 4X shall be constructed utilizing a fiberglass housing and a polycorbonate lens. If emergency units are required, then a sealed, maintenance free Nickel Cadmium Battery system, with charging system shall be provided with a 90 minute capacity.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide proper bushings for wire entrances to all fixtures. All fixture chassis shall be grounded to the conduit system. All fixtures having flexible connections shall have an additional ground wire (green) installed from conduit-connected outlet box to fixture chassis.

B. Special care shall be taken to assure light-tight joints between recessed fixtures and ceiling. Verify ceiling system compatibility with recessed fixture mounting before placing fixture order.

C. All stem mounted fixtures shall utilize swivel aligners and have stem lengths as required. Electrical Contractor is responsible for verifying stem lengths before ordering or installing.

D. All screw shell lampholders to be brass, not aluminum.

E. Exit lighting systems shall utilize the same circuit as the lights in the area as indicated in the NEC. If a emergency system is available exit lights shall have a separate and designated emergency circuit and raceway system as indicated in the NEC.

F. Exit lights shall be mounted above their respective doors and to clear the door frame, where mounting height would exceed 10 feet Contractor shall coordinate a new location with architect such that sign is mounted at 10' A.F.F. or less.

G. Fixtures shall be supported utilizing pre-manufactured hardware and strut system as specified in section 16190 and/or as detailed on the drawings. Support system shall be designed to support the weight of the fixture independent from the raceway system.

H. Install time clock(s) and contactor(s) for lighting control adjacent to the panel that is feeding the light circuits being controlled unless specified otherwise.

3.2 ENVIRONMENT SPECIFIC INSTALLATION

A. Wet location fluorescent fixtures shall be UL listed for wet locations and shall utilize a impact resistant, UV-resistant, reinforced polyester housing. Diffuser shall be 100 virgin acrylic, be fully gasketed, and utilize stainless steel latches.

B. All fixtures shall be suitable for the environment that they will encounter. All fixtures in wash down areas shall be watertight and shall have a wet location label.

C. Fixtures that are to be installed in areas of where ambient temperatures exceeds 50 degrees centigrade, shall be provided with a high ambient temperature option rated no less then 65 degrees centigrade.

D. Fixtures which are to be installed in process and other designated wet and corrosive areas shall utilize stainless steel support and mounting hardware.

3.3 CLEANING AND ADJUSTING

A. All lighting fixtures shall be properly adjusted and aimed if required. Surface mounted fixtures shall be installed plumb and adjusted to align with building lines and walls.

B. All fixtures shall be properly protected from dust, dirt and moisture during construction. All fixtures shall be checked and cleaned if necessary prior to installing lamps in fixture.

END OF SECTION

SECTION 16520

EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide a complete exterior lighting system including all lighting fixtures, lamps, poles, pole bases, wiring system, raceway, supports and controls as shown on the drawings and as specified herein.

B. Furnish and install all lighting fixtures, complete with lamps and poles as indicated in the Fixture Schedule as shown on the drawings and as specified herein. Type of fixtures to be provided is indicated by "fixture number" on the drawings.

C. Provide fixtures and lamps of the size, type and quantity as indicated on the fixture schedule. Engineer does not guarantee that fixture catalog numbers are entirely accurate or complete. Contractor shall verify with fixture supplier that fixtures being supplied do meet all requirements listed.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All light fixtures, lamps and poles shall meet the applicable requirements for the following:

1. NEC - NATIONAL ELECTRICAL CODE
2. U.L. - UNDERWRITERS LABORATORY
3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
4. IES - ILLUMINATION ENGINEERING SOCIETY

1.4 SUBMITTALS

A. Provide standard manufactures cutsheets for all lighting fixtures and poles supplied showing catalog number, dimensions, construction, and rating data. Submit shop drawings as specified in section 16100.

1.5 WARRANTY

A. The contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers of lighting fixtures are indicated in the fixture schedule which is shown on the drawings.

2.2 HIGH INTENSITY DISCHARGE FIXTURES

A. All wall-pack type fixtures shall be constructed of lightweight, corrosion resistant die-cast aluminum. All external hardware shall be stainless steel. Fixtures shall be finished using a polyester powder electo-statically applied and oven cured. A specular anodized aluminum reflector shall be provided. The refractor shall be made from prismatic borosilicate glass and the lens shall be sealed and gasketed to inhibit the entrance of outside contaminants.

B. All H.I.D. fixture ballasts to be Class H, high power factor (HPF), constant wattage autotransformer type, rated -20EF.

PART 3 - EXECUTION

3.1 FIXTURE INSTALLATION

A. Provide proper bushings or grommet for wire entrances to all fixtures so that the entrance is water tight. All fixtures shall be grounded to the grounding system as specified and as shown on the drawings.

3.2 ENVIRONMENT SPECIFIC INSTALLATION

A. All fixtures installed outdoors shall be suitable for the environment that they will encounter. All fixtures shall be UL list for wet locations per UL standard 1572.

3.3 CLEANING AND ADJUSTING

A. All lighting fixtures shall be properly adjusted and aimed if required.

B. All fixtures shall be properly protected from dust, dirt and moisture during construction. All fixtures shall be checked and cleaned if necessary prior to installing lamps in fixture.

END OF SECTION

SECTION 16535

EMERGENCY LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide a complete emergency lighting system including all emergency lighting units, wiring system, raceway, supports and controls as shown on the drawings and as specified herein.

B. Furnish and install all emergency lighting units as indicated in the Fixture Schedule as shown on the drawings and as specified herein. Type of fixtures to be provided is indicated by "fixture number" on the drawings.

C. Provide emergency lighting units of the size, type and quantity as indicated on the fixture schedule. Engineer does not guarantee that fixture catalog numbers are entirely accurate or complete. Contractor shall verify with fixture supplier that fixtures being supplied do meet all requirements listed.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All emergency lighting units shall meet the applicable requirements for the following:

1. NEC - NATIONAL ELECTRICAL CODE
2. U.L. - UNDERWRITERS LABORATORY
3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
4. IES - ILLUMINATION ENGINEERING SOCIETY

1.4 SUBMITTALS

A. Provide standard manufactures cutsheets for all lighting fixtures supplied showing catalog number, dimensions, construction, and rating data. Submit shop drawings as specified in section 16100.

1.5 WARRANTY

A. The contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers of emergency lighting units are indicated in the fixture schedule which is shown on the drawings.

2.2 EMERGENCY LIGHTING UNITS

A. Emergency lighting units shall utilize a 12 volt, sealed, maintenance free lead-calcium battery and have a capacity for 90 minutes of operation at rated output and not less then 87 1/2% rated voltage.

B. Lamps shall be 12 volt, 8 watt sealed beam Tungsten Halogen, mounted in appropriate lamp head above housing. Each unit shall incorporate two (2) heads.

C. All units shall have a low voltage disconnect, test switch, voltmeter, A.C. "ON" pilot light, charge pilot light and two (2) 8 watt heads mounted on unit.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide proper bushings for wire entrances to all units. All unit chassis shall be grounded to the conduit system. All units having flexible connections shall have an additional ground wire (green) installed from conduit-connected outlet box to fixture chassis.

B. Emergency lighting units shall utilize the same circuit as the lights in the area as indicated in the NEC. If a emergency system is available emergency lighting units shall have a separate and designated emergency circuit and raceway system as indicated in the NEC.

C. Emergency lighting units shall be mounted at 8 feet nominal above finished floor.

D. Emergency lighting units shall be supported utilizing pre-manufactured hardware and strut system as specified in section 16190 and/or as detailed on the drawings. Support system shall be designed to support the weight of the fixture independent from the raceway system.

3.2 ENVIRONMENT SPECIFIC INSTALLATION

A. Emergency lighting units installed in wet areas shall be UL listed for wet locations and shall utilize a impact resistant, UV-resistant, reinforced polyester housing, be fully gasketed, and utilize stainless steel latches.

B. Emergency lighting units which are installed in wet and corrosive areas shall utilize stainless steel support and mounting hardware.

3.3 CLEANING AND ADJUSTING

A. All emergency lighting units shall be properly adjusted and aimed if required.

B. All emergency lighting units shall be properly protected from dust, dirt and moisture during construction. All fixtures shall be checked and cleaned if necessary prior to installing lamps in fixture.

END OF SECTION

SECTION 16590

LIGHTING CONTROL

PART 1 - GENERAL

1.1 DESCRIPTION

A. Provide a complete lighting control system(s) including all occupancy sensors and controls, time clocks, photo electric eyes, lighting contactors, wiring system, raceway, and supports as shown on the drawings and as specified herein.

B. Contractor/Supplier shall examine all general specification provisions and drawings for related electrical work required as work under Division 16.

C. Contractor shall coordinate all work described in this section with all other applicable plans and specifications, including but not limited to wiring, conduit, fixtures, HVAC systems and building management systems.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All lighting controls units shall meet the applicable requirement for the following:

1. NEC - NATIONAL ELECTRICAL CODE
2. U.L. - UNDERWRITERS LABORATORY
3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
4. IES - ILLUMINATION ENGINEERING SOCIETY

B. All components shall meet all state and local applicable code requirements.

1.4 SUBMITTALS

A. Provide standard manufactures cutsheets for all lighting control equipment supplied showing catalog number, dimensions, construction, and rating data indicating compliance to the specification. Submit shop drawings as specified in section 16100.

1.5 WARRANTY

A. The contractor shall guarantee all materials and workmanship against all defects for a period of one (1) year following the date of completion and shall replace, at no cost to the Owner, any items found to be defective during that period.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Acceptable manufacturers of occupancy sensor control system(s) shall be Watt Stopper, Hubbell or an approved equal.

B. Acceptable manufacturers of time clocks shall be Paragon or an approved equal as manufactured by Tork.

C. Acceptable manufacturers of the photo electric eyes shall be Tork or an approved equal as manufactured by General Electric.

D. Acceptable manufacturers of the lighting contactors shall be Square-D, Allen-Bradley, Westinghouse/Cutler Hammer, General Electric or approved equal.

E. Proposed substitutions shall include complete submittal data, as specified herein, clearly denoting any and all deviations and/or exceptions to the units specified. The complete proposal must be submitted to the engineer for approval/disapproval not less than 10 days prior to the scheduled bid date.

2.2 OCCUPANCY SENSOR CONTROL SYSTEM

A. The Occupancy Sensor Control System(s) shall be designed to control the lighting and/or reduce the level of lighting by turning off automatically after reasonable time delay when a room is vacated by the last person to occupy the said room or area.

B. Wall switch sensors shall be capable of detection of occupancy at desktop level up to 300 square feet, and gross motion up to 1000 square feet.

C. Wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts; 0 to 1200 watts at 277 volts and shall have 180E coverage capability.

D. Wall switch occupancy sensors shall utilize Zero Crossing Circuitry which increases relay life of sensor and increases sensor's longevity.

E. Wall switch sensors shall have no leakage current to load, in manual or in Auto/Off mode, for safety purposes and shall have voltage drop protection.

F. Passive Infrared sensors shall utilize custom ASIC specifically designed for PIR sensors which provides high immunity to false triggering from RFI (walkie talkies) and EMI (electrical noise on the line), superior performance, and greater reliability.

G. Passive Infrared sensors shall have a multiple segmented Lodif Fresnel lens, in a multiple-tier configuration, with grooves-in to eliminate dust and residue build-up.

H. Where specified, Passive Infrared and Dual Technology sensors shall offer daylighting footcandle adjustment control and be able to accommodate dual level lighting.

I. Dual Technology sensors shall be corner mounted to avoid detection outside the controlled area when doors are left open.

J. All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.

K. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to the cycling of air conditioner or heating fans.

L. All sensors shall have readily accessible, user adjustable controls for time delay and sensitivity. Controls shall be recessed to limit tampering.

M. In the event of failure, a bypass manual override shall be provided on each sensor. When bypass is utilized, lighting shall remain on constantly or control shall divert to a wall switch until sensor is replaced. This control shall be recessed to prevent tampering.

N. Ultrasonic operating frequency shall be crystal controlled to within plus or minus 0.005% tolerance to assure reliable performance and eliminate sensor cross-talk. Sensors using multiple frequencies are not acceptable.

O. All sensors shall provide a method of indication to verify that motion is being detected during testing and that the unit is working.

P. Where specified, sensor shall have an internal additional isolated relay with Normally Open, Normally Closed and Common outputs for use with HVAC control, Data Logging and other control options. Sensors utilizing separate components or specially modified units to achieve this function are not acceptable.

Q. All sensors shall have UL rated, 94V-0 plastic enclosures.

R. Control Units shall be provided to control sensors as required and for ease of mounting, installation and future service, control unit(s) shall be able to externally mount through a 1/2" knock-out on a standard electrical enclosure and be an integrated, self-contained unit consisting internally of an isolated load switching control relay and a transformer to provide low-voltage power. Control unit shall provide power to a minimum of two (2) sensors.

S. Relay Contacts shall have ratings of:

13A - 120 VAC Tungsten
20A - 120 VAC Ballast
20A - 277 VAC Ballast

T. Control wiring between sensors and controls units shall be Class II , 18-24 AWG, stranded U.L. Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums, where applicable.

2.3 ELECTRONIC LIGHTING TIME CONTROLLERS

A. Electronic Time Controllers for outdoor lighting applicationa shall be electronic type, with astro feature, 24 hour programming, 365-day calendar, skip-a-day and manual override features. Electronic Time Controllers shall be a Paragon Model EC72ST or equal.

B. Electronic Time Controllers for indoor applications shall be electronic type, with time-of-day schedule, 24 hour programming, full 365 day control, holiday and Daylight Savings control, sensor inputs and remote overrides. Electronic Time Controllers shall be a Paragon Model EL72 or Equal.

C. Electronic Time Controllers with astro feature shall track both sunrise and sunset based upon latitude adjustment and automatically turn-off and turn-on lighting based upon programming.

D. Electronic Time Controllers shall be two (2) channels and shall be rated for operation at both 120V and 277V.

E. Output contacts shall be 2 SPST relays with dry contacts rated 15 amps. At 120V and 8 amps. At 277V.

2.4 PHOTO EYE CONTROLLERS

A. Photo electric eye units shall be specification grade with heavy-duty die cast gasketed housing, operating temperature range of -40 degree F to +140 degree F equal to a Tork 2100 Series.

B. Photo eye shall utilize a 2 inch, Cadmium Sulfate, epoxy coated cell.

C. Contacts shall be SPST snap action (fail in the on position) and shall be rated 2000 watts and be rated either 120V or 277V to match supply voltage.

C. Lighting contactor units shall be electrically held, 20 ampere rated with the proper number of poles, as required and shall have 120 volt coil.

2.5 LIGHTING CONTACTORS

A. The lighting contactors shall switch a load at 480 volts, 60 hertz and shall have 3 poles. The coil voltage shall be 120 VAC.

B. The ampere ratings of the lighting contactors shall be 20 amps, or as noted on the drawings. These current ratings shall be measured based upon the appropriate NEMA standards.

C. The lighting contactor shall have totally enclosed double-break, silver cadmium-oxide power contacts. Auxiliary arcing contacts are not acceptable. Contact inspection and replacement shall be possible without disturbing line or load wiring.

D. The lighting contactor shall have straight-through wiring with all terminals clearly marked.

E. The lighting contactor shall be approved by UL and/or CSA, and shall be designed in accordance with the latest NEMA standards. They shall be industrial-duty rated for applications to 600 volts maximum.

F. The lighting contactors shall have provisions for factory or field addition of:

1. Four (4) N.O. or N.C. auxiliary contacts rated 6 amperes continuous at 600 volts.
2. Control-circuit fuse holder, one or two fuses.
3. Transient-suppression module for control circuit of 120 volts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. It shall be the contractor's responsibility to locate and aim sensory in the correct location required for complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Rooms shall have ninety (90) to one hundred (100) percent coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms which are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective room.

B. It is the contractor’s responsibility to arrange a pre-installation meeting with the manufacturer's factory authorized representative, at the owner's facility, to verify placement of sensors and installation criteria.

C. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components. The contractor shall also provide, at the owner's facility, the training necessary to familiarize the owner's personnel with the operation, use, adjustment, and problem solving diagnosis of the occupancy sensing devices and systems.

D. All lighting control units shall be installed in an appropriate enclosure for the type of environment encountered. No exposed wiring shall be permitted inside of the building or pedestal mounted enclosure in which this equipment is installed.

E. Photo electric eye units shall be mounted in wet rated enclosure and be orientated to the north or east with only eye visible from the exterior of the enclosure.

F. Provide engraved plastic nameplates in the provisions of section 16195.

END OF SECTION

SECTION 16675

SURGE SUPPRESSION SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install Surge Suppression System as shown on the drawings and as specified herein.

B. These specifications describe the electrical and mechanical requirements for a high energy transient voltage surge suppressor. The specified system shall provide effective high energy diversion for application in ANSI/IEEE C62.41 Category C environment.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. The specified system shall be designed, manufactured, tested, and installed in compliance with the latest publication of:

1. American National Standards Institute and
2. Institute of Electrical and Electronic Engineers (ANSI/IEEE, C62.41 and C62.45).
3. Underwriters Laboratories (UL 1449).
4. UL 1283 Electromagnetic Interference Filters.
5. UL 1449 Transient Voltage Surge Suppressors (including section 37.3 highest fault current category).

B. The surge protection system shall be designed to meet all applicable requirements of FAA-STD-0916b standard.

1.4 SUBMITTALS

A. Provide standard manufacturers drawings and cutsheets which show the unit dimensions, weights, components and connection locations, mounting provisions, connection details, and wiring diagram.

B. The manufacturer shall furnish an installation manual with installation, start-up, and operating instructions for the specified system.

1.5 WARRANTY

A. Contractor shall Guarantee all equipment and the labor required to install equipment for a period of five years as described in section 16100. TVSS devices shall have a warranty for a period of five years, incorporating unlimited replacement of suppressor parts. Warranty shall be the

responsibility of the electrical distribution equipment manufacturer and shall be supported by their respective field services organization.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Equipment shall be as manufactured by Square-D Company XGA series or approved equal.

2.2 SYSTEM DESCRIPTION

A. Operating Requirements

1. Operating temperature range shall be -40°C to +70°C
2. Operation shall be reliable in an environment with 0% to 95% non-condensing relative humidity.
3. The system shall be capable of operation up to an altitude of 13,000 feet above sea level.

2.3 SERVICE ENTRANCE EQUIPMENT ELECTRICAL REQUIREMENTS

A. The nominal system operating voltage shall be 277/480 VAC, 3 phase, 4 wires plus ground. Unit shall be installed in parallel to the user's service entrance panel.

B. The transient voltage suppressor's maximum continuous operating voltage shall be 115% of the nominal system operating voltage.

C. The operating frequency range of the system shall be at 50/60/400 Hertz.

D. TVSS devices shall meet or exceed the following criteria:

1. Minimum surge current capability (single pulse rated) per phase shall be:
   240kA per phase

2. UL 1449 Suppression Voltage Ratings:

VOLTAGE	L-N	L-G	N-G
208Y/120V	400V	400V	400V
480Y/277V	600V	600V	600V

E. TVSS devices shall have a minimum EMI/RFI filtering of -50dB at 100kHz with an insertion ratio of 50:1 using MIL-STD-220A methodology.

F. The transient suppression capability shall be bi-directional and treat both positive and negative impulses. Device to be installed within two feet of service panel to provide maximum product performance.

2.4 SERVICE ENTRANCE PROTECTION SYSTEM COMPONENTS

A. Replaceable Modules: TVSS devices shall be modular in design. Each mode including N-G shall be fused with a 200kAIR UL recognized surge rated fuse and incorporate a thermal cutout device. The system shall be constructed using field replaceable modules, each rated for at 65k Amps of surge current capacity based on the standard 8x20 microsection waveform. The module shall consist of multiple metal oxide varistors.
The modules shall be designed and constructed in a manner which ensures MOV surge current sharing. The status of each module shall be monitored with a red LED that will illuminate if the module protection is reduced. Modules shall provide redundant protection with two fuses per module per phase.

B. Self Diagnostics: Red and green solid state indicators shall be provided on the hinged front cover to indicate unit modules status. Green LED lit shall indicate power on, and the presence of the red LED illuminated shall indicate that one or more modules have reduced protection. Both front panel and internal LEDs shall provide instant analysis of power and protection status.

C. Audible Alarm: Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm on/off switch shall be provided to silence the alarm. An alarm push to test switch shall be provided.

D. Transient Counter: A transient overvoltage surge counter shall be included to totalize transient voltage surges. The readout shall be at least a six digit LCD located on the unit's hinged front cover. A push-button switch on the inside door shall be provided for manual counter reset.

E. Fast Clamp Response: In less than five nanoseconds, destructive transient currents shall be intercepted and safely diverted to ground.

F. Protection Redundancy: Each phase shall employ plug-in modules with redundant protection paths for continued equipment protection despite a fault condition.

G. Field Service Capability: In the events a module and fuse need to be replaced, a local LED shall be illuminated to indicate the defective module. Service shall require no more than removing power, replacing module and fuse, and returning power. Field repair shall require no more than five minutes.

H. TVSS devices shall provide surge current diversion paths for all modes of protection; L-N, L-G and N-G in WYE systems.

1. TVSS devices shall be provided with one set of NO/NC dry contacts.

2.5 PANELBOARD PROTECTION SYSTEM

A. Provide a Square-D company XGA Series surge suppressor.

B. The TVSS shall be installed by and shipped from the electrical distribution equipment manufacturer=s factory.

C. The TVSS devices in NQOD and NF lighting and appliance panelboards shall be bus mounted between the main and branch devices. TVSS devices bussed off the end of the panelboard are not

allowed. Panelboards with TVSS will accommodate thru-feed lugs and sub-feed circuit breakers in single section and multi-section panelboards.

D. The TVSS devices in I-LINE power distribution panelboards shall be cable connected.

E. SPD shall provide surge current diversion paths for all modes of protection; L-N, L-G, N-G in WYE systems.

F. SPD shall be modular in design. Each mode including N-G shall be fused with a 200kAIR UL recognized surge rated fuse and incorporate a thermal cutout device.

G. Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm on/off switch shall be provided to silence the alarm. An alarm push to test switch shall be provided.

H. SPD shall meet or exceed the following criteria:

1. Minimum surge current capability (single pulse rated) per phase shall be:
   a) Service Entrance Panelboard locations: 240kA per phase
   b) Distribution and lighting and Appliance Panelboard locations: 160kA per phase

2. UL 1449 Suppression Voltage Ratings:

VOLTAGE	LOCATION	L-N	L-G	N-G
208Y/120V	Distribution:	330V	330V	330V
480Y/277V	Distribution:	600V	600V	600V

I. SPD shall have a minimum EMI/RFI filtering of -50dB at 100kHz with an insertion ratio of 50:1 using MIL-STD-220A methodology.

J. SPD shall be provided with one set of NO/NC dry contacts.

K. SPD shall have a warranty for a period of five years, incorporating unlimited replacement of suppressor parts. Warranty shall be the responsibility of the electrical distribution equipment manufacturer and shall be supported by their respective field service division.

Electrical specifications shall be as follows:

Maximum continuous operation VAC:	115% rated line voltage
Response time:	<5 nonoseconds
Design life:	>10 years
Power consumption:	<1 watt/phase
Protection present indicator:	Green LED
Reduced protection indicator:	Red LED
Additional status indicators:	Audible alarm with mute switch
Operating altitude:	13,000 ft. (4000m)
Temperature (Operating):	-40° to +70°C
Temperature (Storage):	-40° to 85°C

Enclosure:	High-impact plastic
Dimensions:	7.25" x 4.25" x 2.75"
Connection:	#12 AWG stranded wire, 36" length

PART 3 - EXECUTION

3.1 INSPECTION, INSTALLATION, AND TESTING

A. Surge Suppression System shall be installed, wired and tested as recommended by the equipment manufacturer.

END OF SECTION

SECTION 16910

BUILDING SYSTEM CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish and install relays, wire, conduit, pushbuttons, pilots, disconnects, and other devices as shown and called for on electrical drawings or schedules. Control connections not shown or called for on electrical drawings or schedules are the responsibility of the equipment supplier.

B. All electrical devices requiring mechanical connections to piping, ductwork or equipment such as pressure switches, float switches, thermostatic switches, limit switches, solenoid valves, motor operated valves, etc., shall be furnished and installed by the equipment supplier unless noted otherwise. Electrical control wiring to those devices should be by the Electrical Contractor only if shown on the drawings or specified herein. Devices requiring connections by the Electrical Contractor as called for on electrical drawings, schedules or specifications, which are purely electrical in nature and do not require mechanical connections to piping, ductwork or equipment, shall be installed and mounted by the Electrical Contractor, whether furnished by him or not.

C. If electrical control drawings and specifications require modification to starters such as auxiliary contacts, pushbutton, switches, pilot lights, etc, they shall be furnished and installed by the Electrical Contractor.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. 16100 General Provisions

1.3 QUALITY ASSURANCE

A. All control equipment and devices shall be designed, manufactured, assembled and tested in accordance with the applicable requirements of the following:
   1. NEC - NATIONAL ELECTRICAL CODE
   2. U.L. - UNDERWRITERS LABORATORY
   3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
   4. ANSI - AMERICAN NATIONAL STANDARDS INSTITUTE
   5. IEEE - INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

1.4 SUBMITTALS

A. Contractor shall submit shop drawings as specified in the General Provision section 16100.

B. Provide manufactures shop drawings for all control system components being provided by the contractor. Submittal shall include wiring diagrams, schematics, and catalog cut-sheets on all components as a minimum.

1.5 WARRANTY

A. The contractor shall warrant all control wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from the date of the completed and certified test or from the date of first beneficial use.

PART 2 - PRODUCTS

2.1 MANUFACTURES

A. Control components shall be manufactured by Square-D, Allen-Bradley, General Electric or approved equal.

B. Proposed substitutions shall include complete submittal data, as specified herein, clearly denoting any and all deviations and/or exceptions to the equipment specified. The complete proposal must be submitted to the engineer or architect for approval/disapproval not less than 10 days prior to the scheduled bid date.

2.2 CONTROL COMPONENTS

A. Control peripheral shall be Square D Class 9001 heavy duty oiltight NEMA type 13 or approved equal. Pilot lights shall be transformer type unless specified otherwise. Quantities and types shall be as indicated on the drawings or as specified.

B. In process, wet areas or when specified, control periphials shall be rated NEMA 4X.

C. All control peripihials and pilot lights should be equipped with legend plates as indicated on the drawings. In addition to legend plates, plastic laminated I.D. tags shall be installed if indicated on the drawings.

D. Control relays (if required) shall be Square D, Class 8501, 600 volt industrial Type XO or approved equal. Timing relays (if required) shall be Square D, Class 8501, Type JCK or approved equal.

E. Control panels shall be NEMA type 12 with hinged cover and back mounting panel unless specified otherwise. In process or wet areas, control panels shall be NEMA 4X stainless steel.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Furnish and install all control system components in accordance with the plans and specifications, all applicable codes and the manufacturer's recommendations.

B. All field wiring shall be installed in a conduit or wireway system per section 16110.

C. All wiring shall be installed in strict compliance with all the provisions of the NEC and per section 16120.

D. Installation of equipment and devices that pertain to other work in the contract shall be closely coordinated with the appropriate subcontractors.

E. The contractor shall clean all dirt and debris from the inside and the outside of the control panels and equipment after completion of installation.

3.2 HVAC CONTROLS

A. All controls including wire and conduit for heating, ventilation and air conditioning (HVAC) shall be provided by the HVAC contractor unless specifically noted otherwise. Electrical contractor shall furnish and install HVAC controls only when it is shown on the drawings and as specified herein.

B. All 120V through 480V motor and power connections to HVAC equipment shall be provide by the Electrical contractor.

C. Interlocking and control of exhaust fans shall be provide by the Electrical contractor when shown on the drawings. Control connections not shown or called for on electrical drawings or schedules are the responsibility of the HVAC Contractor.

D. Pneumatic controls and low voltage temperature control is the responsibility of the HVAC Contractor.

E. Electrical contractor shall be responsible to consult with the HVAC and his control subcontractor regarding locations of controls requiring electrical connection and wiring diagrams required to complete the work.

3.3 TESTING

A. All control systems and components shall be fully tested in the presence of the Owner's representative. Upon completion of a successful test, the contractor shall so certify in writing to the Owner.

END OF SECTION

SECTION 16950

ELECTRICAL TESTING

PART 1 GENERAL

1.1 DESCRIPTION

A. Work under this Division shall include performance of all tests necessary to satisfactorily show that all electrical systems and devices have been installed according to plans and specifications.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. All electrical equipment, components and systems shall meet the requirements of this section.

1.3 QUALITY ASSURANCE

A. All electrical equipment, components and systems shall be tested in accordance with the applicable requirements of the following:
   1. NEC - NATIONAL ELECTRICAL CODE
   2. U.L. - UNDERWRITERS LABORATORY
   3. NEMA - NATIONAL ELECTRICAL MANUFACTURES ASSOCIATION
   4. NETA - NATIONAL ELECTRICAL TESTING ASSOCIATION
   5. IEEE - INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS

1.4 SUBMITTALS

A. Contractor shall provide certification of all test results and submit those results to the engineer within (7) days of completion of the test.

B. Contractor shall provide the Owner with (3) copies of all test reports and certifications prior to project completion.

PART 2 PRODUCTS

NOT REQUIRED

PART 3 EXECUTION

3.1 TESTING PROCEDURE

A. Test all electrical equipment and devices to insure proper operation and satisfactory performance for their intended use and to assure the equipment will operated in a safe manner.

B. Contractor shall notify the Engineer of the Date and time of all tests two (2) days prior to test to allow his presence at test if he so desires. A representative of the Owner shall be present at all tests.

3.2 MOTORS

A. All electrical motors connected under this contract shall be tested for proper rotation and be reconnected if necessary to assure proper rotation.

B. All motor shall be checked proper overload size based upon motor nameplate rating.

3.3 GROUNDING

A. Test all electrical equipment, equipment frames, grounded outlets and raceway systems to assure all electrical equipment is grounded.

B. The medium voltage distribution system and all medium voltage equipment shall be grounded as specified in section 16390.

C. The low voltage distribution system and all low voltage equipment shall be grounded per section 16450.

3.4 TRANSFORMER TESTING

A. Measure all transformer voltages, including incoming service voltage and adjust taps on all transformers so that secondary voltages are +/- 2.5 percent of required nominal voltage. Test shall be performed when the transformer is operating under normal load.

B. The Electrical Contractor shall measure incoming voltage of electrical service and have the Utility company's taps changed so that secondary voltages are +/- 2.5 percent of required nominal voltage. Correspondingly, the Electrical Contractor shall re-test secondary voltages at all transformers and make tap adjustments to insure that nominal voltages are present at all transformer secondary windings.

3.5 LOW VOLTAGE POWER CABLE

A. Perform insulation test (megger) on all 600 volt power circuits and feeders 100 ampere or greater with a megger at 500V DC with all circuit isolated and the neutral disconnected at the source of supply. All parts of the system shall test not less than 1 megohm to ground.

END OF SECTION