DESIGN AND CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 1 TO PROJECT NO. 44561

CONSTRUCTION, HVAC, PLUMBING, ELECTRICAL WORK
PROVIDE STATE POLICE ZONE HEADQUARTERS
NEW YORK STATE POLICE
HEADQUARTERS
MERRICK AVENUE
EAST MEADOW, N.Y. 11554

February 4, 2016

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

1. ALL TRADES SPECIFICATIONS

a. SECTION 013200: DELETE Specification Section 013200 Construction Progress Documentation in its entirety, and REPLACE with Specification Section 013200 Construction Progress Documentation inclusive of pages 013200-1 through 013200-17.

b. SECTION 014100: Specification Section 014100 Regulatory Requirements, Part 1.08, Paragraph D, CHANGE contact information for PSEGLI to: cofli@pseg.com, telephone number (516) 949 8691.

2. "C" CONTRACT SPECIFICATIONS

a. SECTION 000110: DELETE Specification Section 000110 Table of Contents in its entirety and REPLACE with Specification Section 000110 Table of Contents inclusive of pages 000110-1 through 000110-6.

b. SECTION 015213: DELETE Specification Section 015213 State Field Office in its entirety and REPLACE with Specification Section 015213 State Field Office inclusive of pages 015213-1 through 015213-5.

c. SECTION 081116: ADD Specification 081116 Aluminum Doors and Frames, inclusive of pages 081116-1 through 081116-5

d. SECTION 081400: DELETE Specification 081400 Wood and Plastic Doors in its entirety from the Project Manual.

e. SECTION 085200: Specification 085200 Wood Windows, Part 1.06, DELETE paragraph D in its entirety.

f. SECTION 087100: DELETE Specification Section 087100 Finish Hardware in its entirety, and REPLACE with Specification Section 087100 Finish Hardware inclusive of pages 087100-1 through to 087100-23.

g. SECTION 088100: DELETE Specification Section 088100 Glass and Glazing in its entirety, and REPLACE with Specification Section 088100 Glass and Glazing inclusive of pages 088100-1 through to 088100-6.

h. SECTION 317800: DELETE Specification Section 317800 Horizontal Earth Boring and Pipe Jacking in its entirety, and REPLACE with Specification Section 317800 Horizontal Earth Boring and Pipe Jacking inclusive of pages 317800-1 through to 317800-3.

3. "H" CONTRACT SPECIFICATIONS

a. SECTION 000110: DELETE Specification Section 000110 Table of Contents in its entirety and REPLACE with Specification Section 000110 Table of Contents inclusive of pages 000110-1 through 000110-4.

b. SECTION 015213: DELETE Specification Section 015213 State Field Office in its entirety from the Project Manual.

c. SECTION 230550: DELETE Specification Section 230550 Vibration Isolation in its entirety and REPLACE with Specification Section 230550 Vibration Isolation inclusive of pages 230550-1 through 230550-13.

d. SECTION 236000: DELETE Specification Section 236000 Refrigeration in its entirety and REPLACE with Specification Section 236000 Refrigeration inclusive of pages 236000-1 through 236000-7.

e. SECTION 260523: DELETE Specification Section 260523 Wiring for Motors and Motor Controllers in its entirety and REPLACE with Specification Section 260523 Wiring for Motors and Motor Controllers inclusive of pages 260523-1 through 260523-13.

4. "P" CONTRACT SPECIFICATIONS

a. SECTION 000110: DELETE Specification Section 000110 Table of Contents in its entirety and REPLACE with Specification Section 000110 Table of Contents inclusive of pages 000110-1 through 000110-4.

b. SECTION 015213: DELETE Specification Section 015213 State Field Office in its entirety from the Project Manual.

c. SECTION 260221: DELETE Specification Section 260221 Motors and Motor Controllers in its entirety and REPLACE with specification section 260221 Motors and Motor Controllers inclusive of pages 260221-1 through 260221-17.

d. SECTION 260523: DELETE Specification Section 260523 Wiring for Motors and Motor Controllers in its entirety and REPLACE with Specification Section 260523 Wiring for Motors and Motor Controllers inclusive of pages 260523-1 through 260523-13.

5. "E" CONTRACT SPECIFICATIONS

a. SECTION 000110: DELETE Specification Section 000110 Table of Contents in its entirety and REPLACE with Specification Section 000110 Table of Contents inclusive of pages 000110-1 through 000110-4.

b. SECTION 015213: DELETE Specification Section 015213 State Field Office in its entirety from the Project Manual.

c. SECTION 260548: DELETE Specification Section 260548 Seismic Controls for Electrical System in its entirety and REPLACE with specification section 260548 Seismic Controls for Electrical System inclusive of pages 260548-1 through 260548-7.

d. SECTION 281300: DELETE Specification Reference Section 281300 Security Management System in its entirety and REPLACE with Reference Section 281300 Security Management System inclusive of pages 281300-1 through 281300-34.

e. SECTION 317800: DELETE Specification Section 317800 Horizontal Earth Boring and Pipe Jacking in its entirety, and REPLACE with Specification Section 317800 Horizontal Earth Boring and Pipe Jacking inclusive of pages 317800-1 through to 317800-3.

6. ALL TRADES DRAWINGS

a. DRAWING G-001: Re-CHANGE electrical drawing title of E-201 to read as follows: ELECTRICAL SITE LIGHTING PLAN & SECURITY PLAN

b. DRAWING G-002: ADD general note #26 to read as follows: "Any item or scope of work not specifically mentioned in the specifications but shown on the drawings shall be the responsibility of the trade that traditionally covers such work."

c. DRAWING G-002: ADD general note #27 to read as follows: "Contractor shall maintain a current set of as-built drawings on site which will be reviewed by the Director's representative prior to submission of any payment requisition."

7. "C" CONTRACT DRAWINGS

a. DRAWING L-200: ADD lighting note to read as follows: "Electrical contractor shall provide, excavate, and install all exterior light pole concrete bases, and up-light concrete bases. See light pole base details, and up-light base detail on drawing page L-501."

b. DRAWING L-201: Install a total of four (4) bollards north and south of the Sliding Cantilever Motorized Picket Gate (located east of the southeast corner of the building). Two (2) bollards are to be installed on the east side of the gate, and Two (2) bollards are to be installed on the west side of the gate. See bollard detail #4/L-502 for information.

c. DRAWING C-301: Enlarged Utility Plan, CHANGE note at precast concrete transformer pad to read "8'x 8'x 4'-4" deep standard PSE&G precast concrete transformer pad by Electrical Contractor."

d. DRAWING A-100: ADD general note #8 to read as follows: "Construction contractor shall provide masonry coordination drawings to identify location of all openings and conduits."

e. DRAWING A-151: ADD general note #3 to read as follows: "All penetrations, access panels, fixtures, devices etc. in rated ceiling shall be rated."

f. DRAWING A-200: ADD general note #1 to read as follows: "Construction contractor shall provide Masonry coordination/elevation drawings for approval of all fixture locations and masonry coursing."

g. DRAWING A-201: ADD general note #1 to read as follows: "Construction contractor shall provide Masonry coordination/elevation drawings for approval of all fixture locations and masonry coursing."

h. DRAWING A-450: ADD general note #3 to read as follows: "ADA dimensions shall take precedence to maintain minimum ADA requirements."

i. DRAWING A-450: ADD general note #4 to read as follows: "For all toilet room fixtures, accessories, etc. provide blocking/grounds as required."

j. DRAWING A-450: Interior Elevations #25 and #26, CHANGE upper wall finish from WF-3 to WF-4.

k. DRAWING A-451: ADD general note #3 to read as follows: "ADA dimensions shall take precedence to maintain minimum ADA requirements."

l. DRAWING A-451: ADD general note #4 to read as follows: "For all toilet room fixtures, accessories, etc. provide blocking/grounds as required."

m. DRAWING A-900: Aluminum Storefront Doors D1 and D2, CHANGE size of top rail from 5" to 6", and bottom rail from 6 ½" to 8".

n. DRAWING A-901: BL3-Transaction Window, REPLACE all references to hollow metal (H.M.) frame with STAINLESS STEEL FRAME. All jambs, head, mullion and sill shall be Stainless Steel Ballistic Resistant (level 3).

o. DRAWING A-903: Details of Transaction Window BL3, REPLACE all references to hollow metal (H.M.) frame, or painted steel frame with STAINLESS STEEL FRAME. All jambs, head, mullion and sill shall be Stainless Steel Ballistic Resistant (level 3).

p. DRAWING A-950: CHANGE carpet graphics in the following rooms to FF-3 carpet tile flooring: 108a-Storage Closet, 113-Zone Lieutenant Office, 114-Zone Commander Office, 115-

q. Zone Admin. Assistant Office, 116-Zone Sergeant Office, 117-Zone Conference Room, 122-Station Commander Office, 124-Uniform Sergeant Office, 134-BCI Squad Room, 135-BCI Wire Room, 136-BCI Office, 137-Senior Investigator, 138-BCI Squad Room, 142-Uniform Office, 144-Uniform Female Bedroom, 145-Uniform ADA Bedroom, 146-Uniform Male Bedroom.

r. DRAWING S-001: ADD note #3 to Structural Notes (General) as follows: "Construction work contractor shall coordinate with H & P contractors to obtain dimensions and locations for all concrete pads needed to support equipment. C contract is responsible for providing concrete support pads for H & P equipment. E contract is responsible for providing concrete pads and footers to support electrical equipment."

s. DRAWING S-100: ADD note #3 to Structural Notes (General) as follows: "Construction work contractor shall coordinate with H & P contractors to obtain dimensions and locations for all concrete pads needed to support equipment. C contract is responsible for providing concrete support pads for H & P equipment. E contract is responsible for providing concrete pads and footers to support electrical equipment."

t. DRAWING S-100: ADD Point of Entry (POE) detail for utility lines entering the building as follows: The POE shall be a round metal sleeve for the utility lines to pass through the foundation wall. The sleeve shall be sized as required to accommodate the utility lines. The maximum sleeve size shall be 8" diameter. The sleeves shall be installed through the foundation wall at any point starting at 1'-6" below the top of the foundation wall down to the top of the footing. The sleeves for various utilities shall have a clear horizontal or vertical distance between them of 2'-0" minimum. There shall be (2) #5 additional reinforcing rebar, horizontally and vertically, on each side of the sleeve (4x2=8 rebar total), extending 18" beyond the outside of the sleeve, in the vertical and horizontal direction.

8. "H" CONTRACT DRAWINGS (None added)

9. "P" CONTRACT DRAWINGS

a. DRAWING P-501: Drawing REVISED, see attachment to this Addendum #1.

10. "E" CONTRACT DRAWINGS

a. DRAWING E-004: Drawing REVISED, see attachment to this Addendum #1.

b. DRAWING E-100: Drawing REVISED, see attachment to this Addendum #1.

c. DRAWING E-200: Drawing REVISED, see attachment to this Addendum #1.

d. DRAWING E-201: ADD general note #4 to read "Electrical contractor shall provide, excavate, and install all exterior light pole concrete bases, and up-light concrete bases. See light pole base details, and up-light base detail on drawing page L-501."

ATTACHMENTS

1. All Trades Specification Section 013200 Construction Progress Documentation
2. C Contract Specification Section 000110 Table of Contents
3. C Contract Specification Section 015213 State Field Office
4. C Contract Specification Section 081116 Aluminum Doors and Frames
5. C Contract Specification Section 087100 Finish Hardware
6. C Contract Specification Section 088100 Glass and Glazing
7. C,E Contract Specification Section 317800 Horizontal Earth Boring and Pipe Jacking
8. H,P,E Contract Specification Section 260221 Motors and Motor Controllers
9. H,P,E Contract Specification Section 260523 Wiring for Motors and Motor Controllers
10. H Contract Specification Section 000110 Table of Contents

11. H Contract Specification Section 236000 Refrigeration
12. H Contract Specification Section 230550 Vibration Isolation
13. P Contract Specification Section 000110 Table of Contents
14. E Contract Specification Section 000110 Table of Contents
15. E Contract Specification Section 260548 Seismic Controls for Electrical System
16. E Contract Specification Section 281300 Security Management System
17. P Contract Drawing P-501 Plumbing Details
18. E Contract Drawing E-004 Electrical Details
19. E Contract Drawing E-100 Electrical Power Plan
20. E Contract Drawing E-200 Electrical Site Power Plan

END OF ADDENDUM

Margaret F. Larkin
Executive Director
Design and Construction

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 GENERAL

1.01 RELATED REQUIREMENTS AND INFORMATION SPECIFIED ELSEWHERE

A. Preliminary Project Schedule: Document 003113.

B. Summary of Work: Section 011000.

C. Administrative Requirements: Section 013000.

D. Project Meetings: Section 013119.

1.02 SUMMARY

A. Section includes administrative and procedural requirements to plan, schedule, and document the progress of the Project; realize boundaries and expectations for schedule development and management; and predict and prevent delays to established sequences and milestones during performance of the Work including the following:
   1. Critical Path Method schedule and reports.
   2. Material location and delivery reports.
   3. Field condition reports.
   4. Special reports.
   5. Change management.
   6. Time Impact Recognition and Time Impact Analysis.
   7. As-Planned vs. As-Updated

1.03 SUBMITTALS

A. Waiver of Submittals: The “Waiver of Certain Submittal Requirements” in Section 013300 does not apply to this Section.

B. Submittals Package: Submit required reporting, Scheduling Software files, and quality control submittals as indicated within this or related sections.

C. Schedule Submittals:
   1. CMU 01 Agreement Form

1.04 DEFINITIONS

A. Project: Work to be performed as part of one or more Contracts.

B. Project Team: Persons acting on behalf of the State or Contractors in an effort to successfully plan, schedule, and coordinate the Work of the Project.

C. Schedule: A comprehensive leveling of necessary procedural tasks, the sequencing of those tasks, and the resource allocation required to successfully complete the Work by the Project completion date.

D. Activity: An intricate part of the Work that can be identified and measured for planning, coordinating, monitoring, and controlling the project.

E. Milestone: A significant start or finish to Work on the Project defined by both the Director's Representative and the Contractors.

F. Bid Milestones: Milestones or phases identified and included in the Contract Documents to be utilized by the Contractors in developing the Baseline Project Schedule.

G. CPM: Critical Path Method is a scheduling process used to plan and coordinate the Project, arranging activities based on logical relationships in order to create a network diagram of interconnected procedures.

H. Preliminary Project Schedule: The initial CPM schedule submission capturing, at a minimum, the anticipated Work for the first 90 calendar-days after Project Award, and to be initiated by the Schedule Preparer prior to the Project Schedule Definition Meeting.

I. Baseline Project Schedule: The as-planned CPM schedule for completion of the Work of the Project in accordance with the Contract duration, approved by the Director's Representative and Contractors, and completed by the Schedule Preparer.

1. Following the initial update to the Baseline Project Schedule, including but not limited to starts, finishes, activity percent complete, logic adjustments, or duration amendments, as agreed upon at the Project Schedule meeting by the Project team, the current updated schedule rendering will be defined as the Project Schedule.
2. The Baseline Project Schedule will remain unaltered as a tool to measure progress outlined and anticipated during the Project Schedule Definition meeting and by the Schedule Basis document.

J. Project Schedule Update: The as-updated contemporary view of the Project Schedule, as understood by the Project team at the time of the schedule status, which comprehends the accurate reflection of Work started, progressed, and completed on the Project and the intended path of progress for Work going forward.

K. Schedule Basis: A well-organized, narrative rendering of the Project team's involvement in the development of the as-planned Baseline Project Schedule, documenting key understandings of the Project's scope, risks and threats to Substantial Completion, and the Schedule Management strategy.

L. Narrative Statement: A narrative description of the Project Schedule Update.

M. PDM: Precedence Diagram Method utilizes standard CPM calculations creating an interdependent logical relationship between activities and a dependent path from Project Award through Substantial and Physical Completion.

N. Float: The measure of latitude in starting and/or completing an activity without impeding on the successful realization of Project milestones.
   1. Float time is not for the exclusive use or benefit of either the State or the Contractors, but is a jointly owned expiring Project resource; float is available as needed to meet scheduled milestones and Project completion.
   2. Recognizing float within an activity, or chain of activities, does not permit the Contractors to disrupt progress or delay completion of an activity.

O. Critical Path: A progressing sequence of interdependent activities within the schedule network containing zero (0d) total float and establishing the minimum Project Substantial and Physical Completion duration.

P. Resource: Any labor, material, or equipment, shared or exclusive, required for the completion of an Activity or the Work, which recognizes an associated cost.

Q. OGS Scheduling: A member of the OGS Scheduling Department responsible for analyzing, reviewing, and interpreting schedule related information for the benefit of the Project team and to ensure compliance with this or related sections.

1.05 SCHEDULE PREPARER

A. The Director's Representative will provide a Schedule Preparer for the preparation and coordination of schedule related information for the Preliminary Project Schedule, the Baseline Project Schedule, and all required updates and reporting for the Project Schedule.) The Schedule Preparer shall possess a minimum of five (5) years of construction related scheduling experience, shall have developed and maintained at least two (2) schedules for projects of similar size and scope utilizing the State's specified Scheduling Software.

1.06 DEVELOPMENT OF THE PROJECT SCHEDULE

A. The Director's Representative will schedule the Project Schedule Definition Meeting as outlined in Section 013119. The meeting will include members of the Project team and will be conducted by OGS Scheduling for the purpose of reviewing the Schedule Preparer's initial project schedule, defining the intent of the specification, and realizing applicable portions of the Schedule Basis. The discussions and mutual agreements reached at this and subsequent meetings by the Project team will form the basis for the CPM Preliminary Project Schedule and the development of the initial CPM Project Schedule, defined as the Baseline Project Schedule, and will be used for coordinating, scheduling, and monitoring the Work of all related contracts

B. The Schedule Preparer is to complete the Preliminary Project Schedule after the Project Schedule Definition Meeting with input from the Project team and after review of the Contract documents and drawings.

C. The Schedule Preparer is to complete the Baseline Project Schedule with information provided by the Project team after review of the Preliminary Project Schedule, following the Project Schedule Definition Meeting, and submit for review and approval.

1. The Project team will recommend tasks or summaries appropriate to planning, scheduling and coordinating, including but not limited to: establishing a focused work breakdown structure (WBS), phasing requirements, identifying logical connections critical to Substantial and Physical completion, accounting for contract award and critical submittals, fabrication and delivery of long-lead materials, products, specialized equipment or services, and recognizing critical testing, inspection, or commissioning durations for coordination and tracking.

D. The Contractors will sign the CMU 01 Agreement form (blank included at end of this Section) within five (5) calendar-days of final Baseline Project Schedule review and approval by the Director's Representative. Failure to develop and submit the Baseline Project Schedule and sign the CMU 01 Agreement form will not absolve the Contractors of the scheduling requirements. The Contractors will be required to provide the necessary resources, at no additional charge to the State, to complete the Project in the manner defined by a Schedule Preparer acting as a representative of the Project.

E. A Preliminary or Baseline Project Schedule recognizing early completion will be reviewed by members of the Project team prior to acceptance of the Preliminary or Baseline Project Schedule.

F. Bid Milestones included in the Contract Documents are to be incorporated into the project schedule.

G. During the period between Project Award and the execution of the CMU-01 Agreement by the Contractors and the Director's Representative, the Contractors will comply with the Preliminary Project Schedule and will be responsible for providing the necessary resources to complete the Work as defined by the Schedule Preparer.

1.07 UPDATING THE PROJECT SCHEDULE

A. Monthly Project Schedule meetings will be held to review updates to the actual starts, actual finishes, and the percent complete of in-progress activities, and consider logic changes, sequencing alterations, duration amendments, time impact events, and scope changes, for the purpose of determining the status of construction progress on the updated Project Schedule.

1. During the progress of Work on the Project, the Contractors are required to document actual start, actual finish, and activity percent complete on a daily basis, and provide the information to the Schedule Preparer no later than three (3) days prior to the required monthly update, and in the

manner defined by the Schedule Management strategy portion of the Schedule Basis.

2. The Contractors and Director's Representative will review the updated progress at the Project Schedule meeting prior to acceptance of progress information and anticipated work as the Project Schedule Update.
    i. Revisions and comments are to be incorporated within two (2) days of the Project Schedule update meeting, and required reports are to be presented for review.
3. Any Contractor failing to progress their Work as outlined in the updated Project Schedule will be informed of their deficiencies and, if required, be requested to provide a recovery option.
    i. The Schedule Preparer is responsible for incorporating any recovery options as needed by the Contractors for the duration of the Project.

B. The Contractors will furnish all schedule information requested by the Director's Representative and the Schedule Preparer, and as defined in the Schedule Management strategy outlined in the Schedule Basis**.** Any Contractor who fails to furnish accurate information prior to Project Schedule meeting will be required to provide all resources necessary to execute the updated Project Schedule based on progress information documented and recorded by the Director's Representative and submitted to the Schedule Preparer.

C. During the period between scheduled updates, any time impact event due to, but not limited to, a field condition or scope change, is to be noted by the Contractors; the impact is to be represented by the Schedule Preparer, at a minimum, with a milestone event, the time for resolution, and the impact to work.

D. Project Schedule updates recognizing early completion will be reviewed by members of the Project team prior to acceptance of the Project Schedule update.

1.08 MAINTAINING SCHEDULE

A. Perform the Work in accordance with the Project Schedule and provide resources necessary to maintain the progress of activities as scheduled so that no delays are caused to other Contractors engaged in the Work.

1. Should any Contractor fail to maintain progress according to the Project Schedule, or cause delay to another Contractor, that Contractor shall provide such additional manpower, equipment, additional shifts, or other measures, at their own cost, to bring their operations back on schedule.
2. Performing activities as part of the Work out of sequence with the Project Schedule is not permitted unless written approval is obtained prior to commencement.

1.09 RECOVERY SCHEDULE

A. CPM Recovery Schedule: When periodic updates indicate the Work is fifteen (15) or more calendar-days behind the approved Baseline Project Schedule's Substantial or Physical Completion dates, the Schedule Preparer will present

recovery options to the Contractors and Director's Representative to be incorporated into an updated Project Schedule by the Schedule Preparer; these include, but are not limited to, allocating additional resources for activity duration reduction, modifying network logic, or revising activity sequences.

B. Any Contractor failing to furnish information to assist in developing recovery options to the Director's Representative and Schedule Preparer, for a CPM Recovery Schedule, within 10 calendar-days subsequent to the monthly Project Schedule update, will be required to provide all resources necessary to execute an updated Project Schedule defined by a the Director's Representative and updated by the Schedule Preparer.

C. Alterations to the Project Schedule by a CPM Recovery Schedule will require approval.

D. Approved alterations to the Project Schedule by a CPM Recovery Schedule, will constitute the updated Project Schedule.
   1. The updated Project Schedule following the implemented CPM Recovery Schedule will be recognized as the primary baseline schedule for reporting. The Baseline Project Schedule will be retained as a secondary baseline schedule and will be utilized to measure progress against the alterations.

E. A CPM Recovery Schedule recognizing early completion will be reviewed by prior to acceptance of the Project Schedule update.

1.10 RESOURCE ASSIGNMENTS - COST

A. Resources recognizing the total cost associated with all efforts necessary for the completion of a unique activity within the schedule network, and the cumulative cost of the Work of the Project, are to be assigned concordant with the Detailed Estimate submitted by the Contractors. All Contractors are responsible for providing the information necessary for assigning resources for the Preliminary, Baseline, and Project Schedule to the Schedule Preparer; all Contractors are responsible for reviewing the information prior to approval.
   1. Any Contractor who fails to timely and accurately furnish information necessary for resource assignment to the Schedule Preparer during the development of the Preliminary, Baseline and Project Schedule, or who fails to review the Preliminary, Baseline, or Project Schedule and notify the Director's Representative of any errors within two (2) calendar days of submission, will be required to provide all resources necessary to execute the Preliminary, Baseline, or Project Schedule as developed by the Schedule Preparer and approved by the Director's Representative.

1.11 RESOURCE ASSIGNMENTS – LABOR/MANPOWER AND EQUIPMENT

A. Resources recognizing the total Labor/Manpower and specialized equipment associated with all efforts necessary for the completion of a unique activity within the schedule network, and the cumulative curve associated with the Work of the Project, are to be assigned concordant with the intended means and

methods proposed by the Contractors. All Contractors are responsible for providing the information necessary for assigning resources for the Preliminary, Baseline, and Project Schedule to the Schedule Preparer; all Contractors are responsible for reviewing the information prior to approval.

1. Any Contractor who fails to timely and accurately furnish information necessary for resource assignment to the Schedule Preparer during the development of the Preliminary, Baseline and Project Schedule, or who fails to review the Preliminary, Baseline, or Project Schedule and notify the Director's Representative of any errors within two (2) calendar days of submission, will be required to provide all resources necessary to execute the Preliminary, Baseline, or Project Schedule as developed by the Schedule Preparer and approved by the Director's Representative.

PART 2 PRODUCTS

2.01 SCHEDULING SOFTWARE

A. Scheduling Software: Schedule is to be prepared and managed utilizing Oracle Primavera P6© PPM or EPPM operating system.

PART 3 EXECUTION

NOT USED

END OF SECTION

PROJECT NO. **44561**

PROJECT NAME: **New York State Police Zone Headquarters, East Meadow, NY 11554**

REPORT DATE: _____

REPORT NAME(S): _____

_____

_____

_____

It is agreed that the Baseline Project Schedule defined by the above listed computer reports has been reviewed and is accepted for use in coordinating, scheduling, and monitoring the work of all related contracts.

FOR THE CONSTRUCTION WORK CONTRACTOR: _____ DATE: _____

FOR THE HVAC WORK CONTRACTOR: _____ DATE: _____

FOR THE PLUMBING WORK CONTRACTOR: _____ DATE: _____

FOR THE ELECTRICAL WORK CONTRACTOR: _____ DATE: _____

THE DIRECTOR'S REPRESENTATIVE: _____ DATE: _____

TABLE OF CONTENTS

013119 Project Meetings
013200 Construction Progress Documentation
013300 Submittals
013350 Computer Aided Design Coordination Drawings
014100 Regulatory Requirements
014216 Definitions
014217 Abbreviations
014339 Mock Up Requirements
015000 Construction Facilities & Temporary Controls
015123 Construction Heat And Temporary Heat
015213 State Field Office
015526 Traffic Maintenance & Protection
015633 Security
015813 Project Identification Sign
016500 Materials And Equipment
017123 Field Engineering
017329 Removals Cutting and Patching
017419 Construction Waste Management
017423 Pre Occupancy Cleaning
017716 Contract Closeout
017900 Video Training Programs
018113 LEED Documentation Requirements
018113 Table 018113.1
018119 Construction Indoor Air Quality Management
018120 Volatile Organic Compound Limits for Adhesives and Sealants
019113 General Commissioning Requirements

FACILITY CONSTRUCTION SUBGROUP

DIVISION 02 – EXISTING CONDITIONS

Section Number and Title

023313 Underground Utility Locator Service

DIVISION 03 – CONCRETE

Section Number and Title

031100 Concrete Formwork
032100 Steel Concrete Reinforcement
033000 Cast-In-Place Concrete

DIVISION 04 – MASONRY

Section Number and Title

040513 Mortar and Masonry Grout
042113 Brick Masonry
042200 Concrete Unit Masonry
044300 Rough Stone

047200 Architectural Cast Stone

DIVISION 05 – METALS

Section Number and Title

051200 Structural Steel
053100 Fluted Steel Decks
054000 Cold-Formed Metal Framing
055000 Metal Fabrications

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

Section Number and Title

061000 Rough Carpentry
062000 Finish Carpentry
064000 Architectural Woodwork

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Section Number and Title

071326 Rubberized Asphalt Sheet Membrane Waterproofing System
072100 Building Insulation
072119 Foamed-in-Place Insulation
072600 Vapor Retarder Under Slabs on Grade
074113 Preformed Metal Roofing Soffits
078400 Firestopping
079200 Joint Sealers

DIVISION 08 – OPENINGS

Section Number and Title

081102 Steel Doors And Frames
081400 Wood and Plastic Doors
081116 Aluminum Doors and Frames
083113 Access Doors
083300 Rolling Counter Fire Doors with Integral Frame
083325 Composite Sectional Overhead Doors
085200 Wood Windows
087100 Finish Hardware
088100 Glass And Glazing
088117 Fire-Rated Glass
088853 Security Glazing
089100 Stationary Metal Wall Louvers

DIVISION 09 – FINISHES

Section Number and Title

092116 Gypsum Board Systems
092213 Non Load Bearing Framing And Furring
092214 Furring for Gypsum Board Ceilings
092813 Tile Backer Board
093013 Ceramic Tile
095300 Suspended Acoustical Ceiling Systems
096518 Linoleum Sheet Flooring
096519 Resilient Sheet Flooring
096813 Tile Carpeting
099101 Construction Painting

DIVISION 10 – SPECIALTIES

Section Number and Title

102100 Toilet Compartments
102813 Toilet And Bath Accessories
102813.1 Toilet Accessories Schedule
107501 Flagpoles
109000 Miscellaneous Specialties

DIVISION 11 – EQUIPMENT

111360 Motorized Projector Lift
115213 Motorized Projection Screen
116143 Press Conference Curtains

DIVISION 12 – FURNISHINGS

Section Number and Title

122113 Horizontal Louver Blinds
123661 Quartz Surfacing Countertops
124513 Foot Grilles

DIVISION 13 – SPECIAL CONSTRUCTION

Section Number and Title

134713 Bullet Resistant Products

SITE AND INFRASTRUCTURE SUBGROUP

DIVISION 31 – EARTHWORK

Section Number and Title

310000 Earthwork
310140 Maintenance Of Shoring And Under Pinning
311000 Site Clearing
312513 Erosion and Sediment Control
313700 Riprap
317800 Horizontal Earth Boring And Pipe Jacking

DIVISION 32 – EXTERIOR IMPROVEMENTS

Section Number and Title

321216 Asphalt Concrete Paving
321217 Porous Asphalt Concrete Pavement
321300 Concrete Walks
321373 Concrete Paving Joint Sealant
321413 Precast Concrete Unit Pavers
321613 Portland Cement Concrete Curbs
321723 Pavement Markings
323113 Chain Link Fence And Gates
329120 Topsoil
329219 Seeding
329301 Plants

DIVISION 33 – UTILITIES

Section Number and Title

331101 Water Utility Distribution Piping
331216 Water Utility Distribution Valves
331219 Water Utility Distribution Fire Hydrants
331300 Disinfection Of Water Utility Distribution
333104 Plastic Drainage Pipe (Sanitary)
333913 Manholes and Drainage Structures with Frames and Covers
334104 Corrugated Polyethylene Storm Drain Pipe
334105 Plastic Drainage Pipe (Storm Drainage)
334613 Foundation Drains
334914 Plastic Drainage Chambers
335113 Natural Gas Piping

DIVISION 34 – TRANSPORTATION

Section Number and Title

344113 Traffic Signs
347115 Steel Pipe Bollards

APPENDIX

BDC-328 Contractor's MWBE Utilization Plan
BDC-329 Contractor's List of Subcontractors-Suppliers
BDC-406.1 Statement of Special Inspections
COMcheck Compliance Certificates
Commissioning Process
Article 19
Contractor's Certification Statement
Prevailing Rate Case
Sample Firestop Schedule
Stormwater Pollution Prevention Plan
Nassau County Dept. of Public Works Rules and Regulations Pertaining to Permits for Work on County Roads and within County Right of Way
New York State Police – Background Check
Schedule of Submittal (SOS) – C Contract

END OF TABLE OF CONTENTS

SECTION 015213

STATE FIELD OFFICE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Provide and maintain a field office comprised of new custom built mobile or relocatable office units, new furniture, and new equipment, stair and ramp for the sole use of the Director's Representative and staff. Include temporary services and accessories necessary for use of the items specified.

1.02 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Shop Drawings:
   1. Site Plan: Show location of field office where directed. Indicate holding tank, utility services, and connections.

C. Product Data: Catalog sheets, specifications, and installation instructions, for all major items. Submit within 15 days after award of Contract.

1.03 SCHEDULING

A. Provide units, ready for occupancy by the Director's Representative and staff, within 30 days after shop drawings specified above are approved.

1.04 QUALITY ASSURANCE

A. Accessibility Requirements: Provide fully accessible units including stairs and ramps that comply with ICC/ANSI A117.1 as referenced by the Building Code of New York State.

B. Provide units and all related utility connections in accordance with the NYS Uniform Fire Prevention and Building Code.

C. Provide certification insignia from New York Department of State that certifies trailer unit is code compliant.

PART 2 PRODUCTS

2.01 MOBILE OR RELOCATABLE OFFICE UNITS

A. Manufacturers/Companies:
   1. Cassone, 1950 Lakeland Avenue, Ronkonkoma, NY 11779, (800) 640-8844, www.cassone.com.
   2. ModSpace, 1620 Route 9, Clifton Park, NY 12065-0511, (518) 371-0384, www.modspace.com.
   3. Williams Scotsman, Corporate Headquarters, 8211 Town Center Dr., Baltimore, MD 21236, (800) 782-1500, www.willscot.com.
   4. Anchor Modular Buildings, PO Box 100, Medford, NJ 08055, (866) 396-0227, www.anchormodular.com.

B. Number, Approximate Size and Model:
   1. One, 24 x 60 feet, double-wide office unit with four (4) private offices, a large common area, and a half bathroom.

C. Office Unit Requirements:
   1. Ceiling Height: 8'-0" minimum.
   2. Insulation: Exceed code required minimums for insulation. If wood frame construction, exceed the following values, walls: R-19, floor: R-30 and roof: R-30.
   3. Exterior Doors: Minimum 2, minimum 34 inches wide, with key-in-lever locksets (U-factor to exceed 0).
   4. Windows: Approximately 7 percent of exterior wall area with insect screens (U-factor to exceed 0).
   5. Complete ducted heating, ventilating, and air conditioning system with sufficient capacity to maintain a summer office temperature of 75 degrees F and a winter office temperature of 70 degrees F.
   6. Water Heater: 6 gal minimum.
   7. VCT or sheet vinyl floor finish.
   8. Interior partitions to be wood 2 x 4 framing with ½" vinyl covered gypsum board.
   9. Fluorescent lights in all rooms as required to maintain a minimum of 60-foot candles at desktop level.
   10. Bulletin board (4 feet x 6 feet).
   11. Toilet room with toilet, grab bars, toilet tissue dispenser, lavatory, built-in medicine cabinet, paper towel dispenser and mirror with 300 gal. potable water holding tank with winterizing package, and a 300 gal. waste water holding tank with winterizing package.
   12. Insulated skirting from bottom of units to grade, around entire unit. Skirting is to be 2' x 4' wood or metal framing with 2" rigid insulation type SM and white ventilated vinyl siding to match unit.
   13. Electric energy and fuel for the duration of the Contract.
   14. Pre-wire unit for voice and data (5 connections each) as shown on approved shop drawings.

2.02 FURNITURE AND EQUIPMENT

A. Furniture:

1. Six swivel type chairs with arms suitable for use at office desks.
2. Ten straight back stackable chairs.
3. Six lockable metal office desk, 30 x 60 inches, double pedestal type with keys.
4. One drafting table, 37 x 60 inches.
5. One conference table, 44 x 96 inches.
6. One "Planhold" plan rack, adjustable height, floor supported cantilever type, with plan clamps or plan rack sticks.
7. Two lockable 4-drawer letter size file cabinets.
8. One 4'x 6' wall mounted dry erase board.

B. Office Equipment:

1. One multifunction Printer – Konica Bizhub C284e Printer, Copier , Fax. Network Scan, stapler, hole puncher, and stitcher finishing kit, Multi-Function Machine with printing options and with trays for 8 ½" x 11, 8 ½" x 14 and 11" x 17" paper. If this model is no longer available substitute the Konica replacement model with the same options as a minimum. Provide one-year service agreement, paid in advance.
   a. Supplies: paper, sizes as directed and toner cartridges for the duration of the project.

3. One Panasonic Voicemail system installed, with programming and maintenance for the duration of the project to handle 3 outside lines and 5 compatible instruments. Provide the instruments and all wiring.
   a. System - Panasonic KX-TDA50 Digital Hybrid IP-PBX with wall rack.
   b. Voicemail System - Panasonic KX-TVA50.
   c. Telephones - Main 2 each KX-T7636.
   d. Telephone - Regular 3 ea. KX-T7625.
   e. Provide all wiring between all stations, equipment rack, etc. such that a complete system is installed and operates properly. Maintain the system for the life of the contract.
4. One refrigerated bottled water dispenser,(Hot & Cold Type) with cups, bottled water and necessary supplies. Provide water and cups for duration of contract.
5. One first aid kit.
6. One 15 cubic foot refrigerator, EnergyStar energy efficient model.
7. Fire Extinguisher: Multipurpose Dry-Chemical Type in Steel Container UL-rated 20-A:120-B:C, 20-lb nominal capacity, with mono-ammonium phosphate-based dry chemical in enameled-steel container.
8. Security System
   a. Acceptable manufacturer: X10 Wireless Technology, Inc. 19823 58th Place South, Kent, WA 98032, Telephone # 1-800-675-3044, Website address: http://www.x10.com
   b. Acceptable Model: Protector Plus Voice Dialer, 12 piece system, http://www.x10.com/security/ds7000_s_12pc_ps152.html

1. Base Station Voice Dialer Console for Protector Plus - X10 Model # PS561 - Quantity: 1.
2. Lamp Module - X10 Model # LM465 - Quantity: 2.
3. Door/Window Sensor - X10 Model # DS10A - Quantity: One for each door and window.
4. Security Motion Detector - X10 Model # MS10A - Quantity: 2.
5. Security Remote Control - X10 Model # SH624 - Quantity: 1.
6. Security Keychain Remote - X10 Model # KR10A - Quantity: 2.
7. Battery back-up power.

c. Maintain the system for the life of the contract.

2.03 TEMPORARY MAINTENANCE SHELTER

A. Manufacturers/Companies:

1. Storage Master Elite by ClearSpan Fabric Structures
   1395 John Fitch Blvd, South Windsor, CT 06074, 1.866.643.1010
   http://www.clearspan.com/fabric/structures/ext;Contact.html

B. Number, Approximate Size and Model:

1. One, 12 feet wide x 20 feet long x 12’-4” high, unit by ClearSpan.

   a. Extra heavy-duty frame is manufactured from 14 gauge USA-made, triple-galvanized structural steel tubing.
   b. 12'W use 2" square tubing with 5' rafter spacing.
   c. Sidewall height to bend: 9'6"H.
   d. UV-resistant 12.5 oz., 24 mil premium, forest green, rip-stop poly cover comes with a 15 year warranty.
   e. Custom colors are also available at a premium.
   f. SolarGuard™ white skylight lets the sun shine in.
   g. One solid and one zippered end panel that allows the entire end to be opened and closed.
   h. 12'W has one 8'W x 8'H double-zippered door and a 4'W skylight.
   i. All associated accessories for the shelter erection and its anchoring to concrete slab.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install units where directed. Remove wheels and store them where directed.

B. Provide manufacturer’s stair with platform at one exterior door and ramp with platform(s) at one exterior entrance.

C. Provide 20’ x 50’ parking area of 6” Sub-base Course Type 2 and maintain for the duration of the contract including snow removal.

D. For the duration of the project, provide a self contained toilet and waste water system with weekly service, at a minimum, of the waste water holding tank. Maintain the tank to keep it in working order.

E. For the duration of the project, provide a sink in the toilet room of the trailer with service to fill potable water holding tank once a week, minimum, and maintain the tank.

F. Until a permanent electric service is available on-site, provide temporary electric service via a diesel or propane fuel generator capable of providing a minimum of 100 amps, 120/208V 3 phase service. Maintain and service fuel generator until the permanent electric connection has been made to the field office.

G. Install security system and set up per manufacturer’s instructions.

3.02 MAINTENANCE AND CLEANING

A. Maintain and clean the office units for the duration of this Contract. Include the following:
   1. Daily removal of rubbish.
   2. Daily cleaning of toilet room, including the plumbing fixtures. Replenish toilet room supplies as needed.
   3. Weekly mopping of floors.
   4. Weekly dusting of offices and other rooms.

B. Maintain approaches free of mud and snow.

C. Protect water lines from freezing.

3.03 OWNERSHIP

A. Upon completion of this Project, all office equipment items included in this Section shall become the property of the New York State Police (NYSP) and will be removed by the NYSP to another location.

3.04 REMOVALS

A. Remove the units, furniture, equipment and temporary utility services when directed.

END OF SECTION

SECTION 081116

ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Finish Hardware and Thresholds: Section 087100.

B. Glass and Glazing: Section 088100.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 LEED REQUIREMENTS

A. The materials and/or equipment specified in this section may contribute towards the prerequisites and credits required to obtain LEED certification for the Project. Refer to spec section '018113 LEED Documentation Requirements' for information on submittals, procedures, material properties, and credit requirements.

B. LEED submittals identified in this section, if any, are only applicable for the Project. A complete list of LEED submittals have been identified in spec section '018113 LEED Documentation Requirements'. The contractor is required to submit information for materials and/or equipment as outlined in spec section 018113 - even if this section does not indicate the submittal being required.

C. Submit LEED submittals in accordance with Specification Section 013300Submittals and 018113 LEED Documentation Requirements.

1.04 SUBMITTALS

A. Shop Drawings: Show details of each frame type, elevation and construction for each door type, conditions at openings, location and installation requirements for finish hardware (including cutouts and reinforcements), details of connections, and anchorage and accessory items.
   1. Include a schedule of doors and frames using the same reference numbers for details and openings as those on the Contract Drawings.

B. Product Data: Catalog sheets, specifications, and installation instructions for each type door and frame specified.

C. Samples:
1. Frames: Corner sample of each type, 18 x 18 inches, with mortises, reinforcements, and specified finish.
2. Doors: Corner sample of each type showing construction, 18 x 18 inches, with mortises, reinforcements, and specified finish.
3. Color Samples: Manufacturer's standard colors showing maximum variation of each color. Submit actual production sections large enough to establish the allowable color shade range.

D. LEED Design Submittals:
1. MR Credit 4.1 and MR Credit 4.2: Identify manufacturer's name, the percentage of post-consumer recycled content by weight, the pre-consumer recycled content by weight, and the cost of the product.
2. MR Credit 5.1 and MR Credit 5.2: Identify source, cost, and the fraction by weight that is considered regional.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURER / PRODUCT

A. Basis of Design: Kawneer Company Inc., Trifab451UT Framing (Thermal), System Dimensions: 2" face x 4-1/2" depth; Glass Location: Center Plane.

2.02 MATERIALS

A. Aluminum:
1. Extruded Shapes: 6063 alloy, T5 temper.
2. Rolled Shapes: 6061 alloy, T6 temper.
3. Sheet, and Shapes Formed of Sheet: 1100 alloy, H14 temper.
4. Color Anodized Aluminum: 5005 alloy of temper for required shapes.

B. Steel Subframes: ASTM A 36 plates, shapes and bars.

C. Reinforcement: Manufacturer's standard formed or fabricated steel units, of shapes, plates or bars; galvanized after reinforcement fabrication, ASTM A 123.

D. Fasteners: Aluminum, non-magnetic stainless steel, or other non-corrosive metal fasteners compatible with aluminum door components and other items to be fastened; Phillips flat-head screws for exposed fasteners (if any), finished to match fastened item.
1. Do not use exposed fasteners except for necessary application of surface mounted hardware. Use concealed screws when required for application of glazing stops.

E. Inserts: Cast iron, malleable iron, 12 gage galvanized steel, ASTM A 153, for required anchorage to concrete or masonry Work.

F. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry and equal to four times

the load imposed when installed in concrete, as determined by testing per ASTM E 488, conducted by a qualified independent test agency.

a. Carbon Steel: Zinc-Plated; ASTM B 633, Class Fe/Zn 5.
b. Stainless Steel: Bolts, Alloy Group 1 or 2; ASTM F593, Nuts; ASTM F 594.

G. Machine Screws for Steel Subframes: ASME B18.6.3.

H. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

I. Compression Weatherstripping: Replaceable stripping of either molded neoprene gaskets complying with ASTM D 2000, Designation 2BC415 to 3BC620, or molded PVC gaskets complying with ASTM D 2287.

J. Sliding Weatherstripping: Replaceable stripping of wool, polypropylene or nylon woven pile, with nylon fabric and aluminum strip backing, complying with AAMA 701.1.

K. Sealants and Gaskets: Manufacturer's standard for the fabrication, assembly and installation of the Work; guaranteed by the manufacturer to remain permanently elastic, non-shrinking, non-migrating and weatherproof.

2.03 FABRICATION

A. Frames:
1. Fabricate door frames, and frames combining transoms, sidelights, and panel framing of formed or extruded aluminum not less than 0.125 inch thick.
2. Door Stops: Solid aluminum, not less than 1/2 inch thick x 1-3/4 inches wide with integral weatherstripping on door edge. Provide 1-3/4 inches wide continuous 1/4 inch aluminum reinforcing plate located within frame, aligned with door stop.
3. Glazing Beads: Formed or extruded, not less than 0.05 inch wall thickness. Fabricate formed beads of sheet aluminum. Fasten glazing beads to frames with self-tapping screws spaced not more than 12 inches apart.
4. Subframes: Fabricate subframe assemblies and accessories, as shown, of materials specified herein.
5. Thermal Break: Manufacturer's standard continuous thermal barrier.

B. Glazed Doors:
1. Fabricate stiles and rails of extruded aluminum tubular shapes, 1/8 inch min wall thickness, not less than 5 inches wide for stiles, 8” high for bottom rail, 2” high for horizontal intermediate rails, and 6” high for top rail. Attach extrusions together by means of concealed mechanical fasteners and concealed welding.
2. Glazing Beads: Formed or extruded, not less than 0.05 inch wall thickness. Fasten glazing beads to frames with self-tapping screws spaced not more than 12 inches apart.

3. Door Edges: Lock stile edge of single acting doors shall be beveled 1/8 inch in 2 inches. Double acting doors shall have 4 inch radius rounded edges. Meeting stile edges of pairs of single acting doors shall be "V" beveled or rounded, as indicated.

C. Aluminum Tempered Glass Doors: Manufacturer's standard aluminum top and bottom rail or corner assemblies permanently fastened to 1/2 inch or 3/4 inch tempered float glass.

D. Finish Hardware Preparation: Attach concealed reinforcements and cut mortises of sizes required and where located by the approved hardware schedule, for the proper installation of finish hardware.
1. Reinforcements: 1/4 inch thick aluminum.
2. Install reinforcements within mortises at the depths required to bring the hardware surfaces flush with the door and jamb surfaces.
3. Extend reinforcements for hinges, pivots, floor hinges, 4 inches above and below mortises on side jambs and door edges.
4. Reinforce all doors not mortised for concealed door closers on both sides for surface door closer application; and all frames on both sides for closer arm application.

2.04 FINISHES

A. Preparation: After fabrication of doors and frames, but before lamination of panels (if any), prepare the aluminum surfaces for finishing in accordance with the Aluminum Association recommendations and standards. Process all components of each assembly simultaneously to attain complete uniformity of color.

B. Finish exposed aluminum door and frame components as follows:
1. Pretreatment– The aluminum shall be thoroughly cleaned using a multi-stage cleaning process to remove organic and inorganic surface soils and residual oxides. Apply a chemical conversion coating to which organic coatings will firmly adhere.
2. Primer– The cleaned and treated substrate shall be primed to a thickness of 0.2 – 0.3 mils using approved factory application methods.
3. Paint– The Permafluor™paint system shall contain 70% PVDF (Hylar 5000 or Kynar 500) resin and durable ceramic pigments. It shall be factory applied and oven baked for a topcoat film thickness of 1.0 mil minimum. Clear topcoat shall be applied at 0.4-0.8 mils.
4. Color: Custom color to match Architect’s sample.
5. Acceptable Product: Kawneer #22 Stock Permafluor™ Architectural Coatings.

PART 3 EXECUTION

3.01 INSTALLATION

A. Securely anchor sub-framing to supporting structures, plumb and level and properly prepared to receive aluminum doors and frames.

B. Protect areas of frames and panels to be in contact with sealants and surfaces of glazing rebates and glazing beads with protective, strippable tape. Do not apply lacquer to such areas. Remove tape immediately before application of caulking or glazing compound.

C. Paint aluminum surfaces in contact with masonry and incompatible metals with bituminous paint.

D. Door Installation: Fit doors accurately in their frames, with the following clearances:
   1. Jambs and Head: 3/32 inch.
   2. Meeting Edges, Pairs of Doors: 1/8 inch.
   3. Bottom; no Threshold or Carpet: 3/8 inch.
   4. Bottom, at Threshold or Carpet: 1/8 inch.

3.02 PROTECTION

A. Provide protective covering to protect aluminum doors and frames from damage or defacement after erection.

3.03 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating finish hardware items just prior to final inspection. Leave Work in complete and proper operating condition.

B. When directed, or just prior to final inspection remove protective coverings and clean aluminum surfaces with products specifically formulated for aluminum and known to be compatible with finishes specified herein.

END OF SECTION

SECTION 087100

FINISH HARDWARE

PART 1 GENERAL

1.01 RELATED SECTIONS

A. Section 081102 Steel Doors and Frames

1.02 REFERENCES

A. NFPA 80 Fire Doors and Windows (2007).

B. NFPA 101 Life Safety Code (2006).

C. Building Code of New York State (2010).

D. ICC/ANSI A117.1-2003 Accessible and Usable Buildings and Facilities.

E. ANSI/BHMA Standard A156.1 Butts and Hinges (2006).

F. ANSI/BHMA Standard A156.4 Door Controls – Closers (2008).

G. ANSI/BHMA Standard A156.6 Architectural Door Trim (2005).

H. ANSI/BHMA Standard A156.7 Template Hinge Dimensions (2009).

I. ANSI/BHMA Standard A156.8 Door Controls – Overhead Stops and Holders (2005).

J. ANSI/BHMA Standard A156.13 Mortise Locks and Latches Series 1000 (2005).

K. ANSI/BHMA Standard A156.16 Auxiliary Hardware (2008).

L. ANSI/BHMA Standard A156.18 Materials and Finishes (2006).

M. ANSI/BHMA Standard A156.22 Door Gasketing Systems (2005).

N. ANSI/BHMA Standard A156.26 Continuous Hinges (2006).

O. DHI - Door and Hardware Institute.

P. NAAM Standard HMMA 800-96- Hollow Metal Manufacturers Association.

Q. NAAM Standard HMMA 831-97 Recommended Hardware Locations for Custom Hollow Metal Doors and Frames.

R. 2010 Standards for State and Local Government Facilities: Title II.

1.03 DEFINITIONS

A. Architectural Hardware Consultant (AHC): A Door and Hardware Institute certified expert in complex architectural openings requiring advanced knowledge of model building codes and safety standards, ADA requirements, access control knowledge and installation expertise.

B. Architectural Hardware Distributor: A company that regularly purchases architectural hardware from manufacturers and specializes in the sale, service and support of that hardware to contractors and/or end users.

C. Company Field Advisor(s): Hardware manufacturers' representatives who are certified in writing by manufacturer to be technically qualified in design, installation, and servicing of products.

D. Installation Supervisor: Designated supervisor/installer, who has a minimum three years experience in finish hardware installation, and is qualified and responsible to ensure approved finish hardware is installed, adjusted, and operates properly.

1.04 SUBMITTALS

A. Waiver of Submittals: The Waiver of Certain Submittal Requirements in Section 013300 does not apply to this Section.

B. Re-Evaluation Fee: In accordance with the General Conditions 07213 Article 4.7.

C. Submittal Package Cover Sheets: The Hardware Distributor shall provide a cover sheet, which identifies each package by:
1. OGS project number.
2. Project name.
3. Facility name and location.
4. Submittal Package name.
5. Specification section name and number.
6. Construction Contractor's company name, address, e-mail address, and telephone number.
7. Finish Hardware Distributor's company name, address, e-mail address, and telephone number.
8. Certified Architectural Hardware Consultant's name, company name, address, e-mail address, and telephone number.
9. Submittal Date.

D. Submittal Packages
1. Quality Control Package: Do not submit balance of packages until this package is approved.
    a. Architectural Hardware Consultant Data:
        1) Provide name, business address, and telephone number of DHI certified Architectural Hardware Consultant.
        2) Submit photocopy of Door and Hardware Institute's certificate demonstrating individual is an Architectural Hardware Consultant.

b. Company Field Advisor Data:
   1) Provide name, business address, and telephone number of Company Field Advisor(s) for continuous hinges, door bolts, locksets, overhead stops, door closers, and gaskets.
   2) List services and products for which company field advisor(s) is/are certified by manufacturer. Provide written certifications.

c. Hardware Distributor's Qualification Data:
   1) Provide the Finish Hardware Distributor's company name, address, e-mail address, and telephone number.
   2) Provide the hardware distributor's company history, including number of years in the hardware distribution business, the number of AHC's employed, and the number of employees. Describe the distributor's major market.
   3) Include the names and contact information of physical plant managers for 3 facilities, similar to this project, for which the distributor has furnished architectural hardware within the past 2 years.

d. Supervisor's/Installer's Qualification Data:
   1) Name of Supervisor and each installer performing Work, and employer's name, business address and telephone number.
   2) Names and addresses, and contact information of physical plant managers for 3 facilities, similar to this project, on which each installer has worked on during past 2 years.

2. Finish Hardware Package:

a. Finish Hardware Schedule: Use vertical format and indicate finish hardware items, both mechanical and electrical in one document, required to complete Work of this section. Submit Hardware Schedule that includes complete hardware sets for each door and frame shown on Door Schedule.
   1) Preface schedule with following:
      a) Certified Architectural Hardware Consultant's statement of preparation of/or certification of, Finish Hardware Schedule.
      b) Index.
      c) List of manufacturers.
      d) List of finishes.
      e) Explanation of abbreviations.
      f) Keying instructions and key schedule.
   2) Create hardware groups, each group consisting of similar doors and hardware. Do not combine labeled and non-labeled openings. Do not combine doors and frames with dissimilar door sizes and/or materials.
   3) For each opening include the following:
      a) Door and frame materials and dimensions.
      b) Fire rating.
      c) Door number, location and handing.

d) Degree of opening required for closer and/or overhead stop.
e) Installation and detailing notes.

4) Under each group heading, list hardware items in detail, required for ordering. For each hardware item include:
a) Type (Hinges).
b) Quantity (Hinges 3ea).
c) Manufacturers' name (Hinges 3ea Stanley).
d) Catalog number (Hinges 3ea Stanley FBB199).
e) Size (Hinges 3ea Stanley FBB199 4 ½ x 4 ½).
f) Options or accessories (Hinges HTFBB199 4 ½ x 4 ½).
g) Finish (Hinges HTFBB199 4 ½ x 4 ½ x 630).
h) Fasteners (Hinges HTFBB199 4 ½ x 4 ½ x 630 x torx with center security pin).
i) Indicate location of protection plates: Push side or pull side.
j) Installation Notes, as written in this section, for each hardware group.

5) Use a separate hardware group in Hardware Schedule that lists attic stock hardware items, key cabinets, key control system, special tools required to install hardware, lubricants, and Operations and Maintenance Manuals.

b. Product Data: Furnish six copies of manufacturers' catalog sheets, specifications, sizing charts, and installation instructions, for each item specified. Highlight information pertaining specifically to product (s) submitted.

c. Submit samples as requested.

3. Closeout Submittals: Submit as a complete package.

a. Operation and Maintenance Manuals: Furnish 2 hardcover three ring binders with the project name and number displayed on the front cover and spine. Include:
1) List of Manufacturers.
2) Approved Finish Hardware Schedule.
3) Approved Manufacturers' Product Data Sheets.
4) Manufacturer's operation, installation, maintenance, and repair instructions for each type of hardware furnished.
5) Templates for kind of hardware furnished.
6) Parts List for each type of finish hardware furnished.
7) Manufacturers' dated written warranty for each type of finish hardware furnished.
8) Certifications: Written certification from Company Field Advisors that their products are installed according to manufacturers' printed installation instructions, are operating properly, and manufacturers' written warranty will be in effect upon physical completion of the Work.
9) Special Tools: List of special tools required to install hardware, and their purpose.

b. Special Tools:
1) At conclusion of finish hardware installation, turn over to Director's Representative 2 of each special tool

required to install hardware together with a list of these tools and their purpose.

1.05 TEMPLATES

A. After receipt of approved submittals, furnish templates to affected trades, to enable fabricators to make provision for finish hardware without delaying the Work of the Project.

1.06 DELIVERY AND STORAGE

A. Coordinate delivery to avoid delay.

B. Clearly label each item for identification and installation location as it corresponds to the approved Finish Hardware Schedule and subsequent information bulletins.

C. Deliver hardware to the jobsite in the manufacturers' original packages complete with fasteners, parts, installation instructions, and templates required for proper installation.

D. Inventory hardware at jobsite to identify shortages or backorders. Resolve delivery shortages and damaged items prior to installing hardware.

E. Store finish hardware where directed by Director's Representative. Provide locked, dry storage for finish hardware.

1.07 QUALITY ASSURANCE

A. Hardware Distributor's Qualification:
   1. Hardware Distributor who has been in the business of furnishing, and/ or installing finish hardware for a minimum of three years.
   2. Hardware Distributor shall have the DHI certified Architectural Hardware Consultant prepare or certify the Finish Hardware Submittal meets specification requirements, and the schedule is written accurately and in accordance with DHI recommendations, and requirements of this specification.

B. Company Field Advisors: Employ advisor(s) for continuous hinges, door bolts, mortise locksets, surface overhead stops, door closers, and gaskets.

C. Installation Supervisor: Employ a qualified Installation Supervisor who will be responsible to ensure approved finished hardware is installed, adjusted and operates properly.

D. Installers: Employ experienced finish hardware installers who have been regularly employed by a Company installing finish hardware for a minimum of 5 years.

E. Pre-submittal Conference: Before Finish Hardware Submittals are written for submission, the Director's Representative will call a teleconference to review

Finish Hardware Submittal requirements including but not limited to format, cover sheet, headings, hardware sets, level of detail, installation notes, description of operation, keying, and product data sheets. The Contractor, the Finish Hardware Distributor, the Finish Hardware Detailer, and consulting hardware designer, and OGS Designers shall attend. The OGS Finish Hardware Reviewer shall conduct the conference.

F. On Site Pre-installation Conference: Before finish hardware installation begins, the Director's Representative will call a conference at the site to review Finish Hardware Specifications, approved Finish Hardware Submittals, and to discuss requirements for the Work including:

1. Hardware delivery and storage.
2. Hardware labeling by door number.
3. Hardware locations.
4. Potential location conflicts.
5. Hardware installation sequence and responsibility.
6. Required accessories and fasteners.
7. Continuous hinge installation.
8. Surface overhead stops and closer template and adjustments.
9. Special tools and maintenance items.
10. Hardware Closeout requirements.
11. Hardware Warranties.

G. Pre-installation Conference Attendance: The Construction Contractor, Company Field Advisors, authorized Finish Hardware Installers, and the Finish Hardware Distributor's Architectural Hardware Consultant shall attend the conference. OGS's Finish Hardware Reviewer conducts the meeting. OGS designers and facility personnel may attend. The Company Field Advisors will present installation instruction and advice.

H. Pre-Benchmark-Construction Meeting: Prior to the construction of the mock-up, a meeting will be held at the site to review the requirements, and discuss the intent of the mock-up. The meeting will be scheduled by the Director's Representative and conducted by the Hardware Designer. The meeting shall be attended by the Director's Representative, the Hardware Designer, the Contractor's onsite foreman, the person supervising this phase of the Work (if different), and the person (people) who will be performing the work.

I. Construction of Benchmark: Before installing portions of the Work requiring benchmarks, install benchmarks for each form of construction required to comply with the following requirements, using materials indicated for the completed Work.

1. Build hardware benchmark in door and frame assembly, specified in section 081102, in locations as directed, and include continuous hinge, lockset, closer, surface overhead stop and gaskets.
2. Notify the Director's Representative in advance of dates and times when benchmark will be constructed.
3. Install benchmark with supervisor oversight and workers who will be employed during the construction of the Work.
4. Construct benchmarks using the exact materials, products, methods, and workmanship that were approved for the Work.

5. Obtain Director's Representative's approval of benchmarks before starting work, fabrication, or construction.
6. Maintain benchmarks during construction in an undisturbed condition as a standard for judging the completed Work.
7. Failure to maintain this standard of quality will be cause for rejection of the Work.
8. Benchmark may be used in the Work unless otherwise indicated.

J. Uniformity of Hardware and Single Source Responsibility: For each kind of hardware provide product(s) of a single manufacturer.

K. Size Variations: Manufacturers' products may vary slightly from sizes specified except where minimum size or thickness is specified.

1.08 WARRANTY

A. Manufacturer's Warranty: Ten year minimum warranty for door closers.

B. Manufacturer's Warranty: Three year minimum for locksets.

1.09 MAINTENANCE

A. Special Tools: At the conclusion of finish hardware installation, turn over to Owner's Representative 2 sets of each special tools required for proper installation and adjustment of hardware, together with a list of these tools and their purpose.

B. Lubricants: Provide manufacturer's recommended lubricants for locksets and closers sufficient for 1 year of maintenance. Turn over to Director's Representative.

PART 2 PRODUCTS

2.01 ACCESSORIES

A. Provide brackets, plates, arms, spacers, and special templates to mount door closers in combination with overhead stops and coordinators, on narrow top rails and for special ceiling and jamb conditions.

B. Provide curved lip strikes, with wrought boxes, specific to individual lock functions. Universal strikes that fit a variety of lock functions are not acceptable.

2.02 FASTENINGS

A. Provide fasteners that harmonize with finish hardware material and finish.

B. Provide Torx center pin security fasteners for exposed hardware, including full mortise hinges.

C. Provide machine screws for hardware secured to metal; and machine screws and metal expansion shields for attachment to masonry substrates. Self-tapping or self-drilling screws are not acceptable.

D. Provide undercut shallow head torx center pin security fasteners where necessary for proper seating.

E. Attach door overhead stops with sex bolts.

2.03 MATERIALS AND FINISHES

A. General: Requirements for design, grade, function, finish, size, and other distinctive qualities of each type of finish hardware are indicated in this section and in the Hardware Groups.

B. Continuous Hinges
1. Full height barrel-type manufactured from 14-gauge 304 stainless steel.
2. .25" diameter stainless steel pins.
3. Provide hinges without covers.

C. Locks, Latches and Bolts
1. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.
2. Provide 3/4" minimum throw on other latch bolts.
3. Provide 1" minimum throw deadbolts.

D. Closers and Door Control Devices
1. Closer bodies: Provide closer bodies with the same template hole pattern regardless of type or application.
2. Closer arms: Non-handed forged steel.
3. Closer size: Multi-size closers allowed.
4. Provide all-weather fluid to eliminate seasonal adjustment of closer speed.
5. Powder coat closer body, arm, and adapter plate or pre-treat closer body, arm, and adapter plate with rust-inhibiting coating before painted finish is applied.

2.04 FINISH HARDWARE

A. Group 1: Rated Dr # 101, 108, 111
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500 M x 689
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Gasketing: 1set – DHSI CNS105 x Black

B. Group 2: Rated Dr # 103, 118

1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2057 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500M x 689
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Gasketing: 1set – DHSI CNS105 x Black

C. Group 3: Rated Dr # 104, 127, 132, 152A

1. Hinge: 3ea – Bommer BB5002 4½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2069 x NSM x M19S x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500M x DA x 689
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Gasketing: 1set – DHSI CNS105 x Black

D. Group 4: Rated Dr # 106

1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Exit Device: 1ea – Corbin Russwin ED5600A x N9909 x ElectroLynx x M17 x M92 x M109 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton 7500M x 689
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
9. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
10. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black

Card reader, door position switch, and power supply by Security Contractor.
Description of operation – Door locked and secure. Valid card energizes fail secure mortise exit device, unlocking outside lever. Key outside retracts latch but does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.
Installation note- Install overhead top before closer.

E. Group 5: Rated Dr # 159, 159A

1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
3. Closer: 1ea – Norton PRO7500M x 689
4. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Gasketing: 1set – DHSI CNS105 x Black

Installation note- Install overhead stop before closer.

F. Group 6: Rated Pair Dr # 108A, 158
1. Hinge: 6ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Flush Bolts: 1set – Rockwood 555 x 18BFB x 12" x 626
5. Closer: 1ea – Norton PRO7500M x active leaf x 689
6. Overhead Stop: 2ea – Glynn Johnson 814S x Thru Bolts x 630
7. Kick Plate: 2ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
8. Mop Plate: 2ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
9. Gasketing: 1set – DHSI CNS105 x Black
10. Astragal: 1ea – DHSI SA x Black

Installation notes- Install overhead stop before closer. Install astragal on inactive leaf offset to Storage side.

G. Group 7: Rated Dr # 109, 110
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630.
2. Mortise Passage Set: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500M x DA x 689
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Gasketing: 1set – DHSI CNS105 x Black

H. Group 8: Dr # 108B
1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Exit Device: 1ea – Corbin Russwin ED5600 Exit Only x M17 x M51 x M92 x M94 x M109 x 630
3. Power Supply: 1ea – Corbin Russwin BPS-24-1 x 781 Controller
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, exit device to hinge x ElectroLynx x size required

5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Low Energy Door Operator: 1ea – Norton 5900 Push Side Mount x 689
7. ADA Push Plate: 1ea – Norton 505
8. Key Switch: 1ea – Corbin Russwin MKA
9. Lock Cylinder: 1ea - Compatible with specified key switch above x 626
10. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
11. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black
12. Door Bottom: 1ea – Pemko 315AN
13, Door Threshold: 1ea – Pemko 171A x width required

Door Position Switch by Security Contractor.

Description of operation – Door closed and latched by exit only exit device. ADA push plate actuates exit device latch retraction and door operator. Door position switch bypassed by ADA push plate or request to exit switch in exit device. Key switch controls power to operator.

I. Group 9: Rated Dr # 113, 114, 115, 116, 142,
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2051 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500M x MC x 689
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Wall Stop: 1ea – Rockwood 400 x 626 (Dr # 142 only)
8. Gasketing: 1set – DHSI CNS105 x Black
9. Magnetic Door Holder: 1ea – Rixon 994 x 689 (omit at Dr # 142)

J. Group 10: Dr # 114A
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2053 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
3. Closer: 1ea – Norton PRO7500M x 689
4. Overhead Holder: 1ea – Glynn Johnson 814H x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Silencers: 3ea – Rockwood 608 x Gray

Installation note- Install overhead holder before closer.

K. Group 11: Rated Dr # 105A, 107, 117, 131, 138, 141
1. Hinge: 3ea – Bommer BB5002 4½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500M x 689

5. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x Torx with center security pin x 630
6. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x Torx x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Gasketing: 1set – DHSI CNS105 x Black

L. Group 12: Rated Dr # 119
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
3. Closer: 1ea – Norton PRO7500M x 689
4. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
7. Gasketing: 1set – DHSI CNS105 x Black

Installation note- Install overhead stop before closer.

M. Group 13: Dr # 119A, 119B
1. Hinge: 6ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Flush Bolt: 2ea – Rockwood 555 x 12” x 626
5. Kick Plate: 2ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
6. Mop Plate: 2ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
7. Floor Stop: 1ea – Rockwood 441H at RHR leaf 119A only x 626
8. Silencers: 2ea – Rockwood 608 x Gray

N. Group 14: Dr # 121, 124, 137
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2051 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Overhead Holder: 1ea – Glynn Johnson 814H x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
7. Silencers: 3ea – Rockwood 608 x Gray

O. Group 15: Dr # 122, 136
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2051 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x CSK x 630
5. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
6. Wall Stop: 1ea – Rockwood 400 x 626
7. Silencers: 3ea – Rockwood 608 x Gray

P. Group 16: Dr # 135
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x 630
5. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x Torx x 630
6. Wall Stop: 1ea – Rockwood 400 x 626

Q. Group 17: Rated Dr # 134
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Closer: 1ea – Norton 7500M x 689
5. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x 630
6. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x Torx x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Gasketing: 1set – DHSI CNS105 x Black

R. Group 18: Dr # 125, 130, 133
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x 630
5. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x Torx x 630
6. Wall Stop: 1ea – Rockwood 400 x 626
7. Silencers: 3ea – Rockwood 608 x Gray.

S. Group 19: Dr # 140A, 140B
1. Hinge: 6ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2055 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Flush Bolts: 1set – Rockwood 555 x 18BFB x 12” x 626
5. Closer: 1ea – Norton PRO7500M x active leaf x 689
6. Overhead Stop: 2ea – Glynn Johnson 814S x Thru Bolts x 630
7. Kick Plate: 2ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
8. Mop Plate: 2ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
9. Gasketing: 1set – DHSI CNS105 x Black
10. Astragal: 1ea – DHSI SA x Black

Installation notes- Install overhead stop before closer. Install astragal on inactive leaf offset to Closet side.

T. Group 20: Dr # 144, 145, 146
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630

2. Mortise Lockset: 1ea – Corbin Russwin ML2065 x NSM x M19S x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x CSK x 630
5. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
6. Wall Stop: 1ea – Rockwood 400 x 626
7. Silencers: 3ea – Rockwood 608 x Gray.

U. Group 21: Dr # 147
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x NRP x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2069 x NSM x M19V x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Silencers: 3ea – Rockwood 608 x Gray.

V. Group 22: Dr # 151
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630.
2. Mortise Passage Set: 1ea – Corbin Russwin ML2010 x NSM x M17 x 630
3. Closer: 1ea – Norton PR7500M x 689
4. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
5. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
6. Wall Stop: 1ea – Rockwood 400 x 626
7. Silencers: 3ea – Rockwood 608 x Gray

W. Group 23: Dr # 153
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Passage Set: 1ea – Corbin Russwin ML2010 x NSM x M17 x 630
3. Closer: 1ea – Norton PRO7500M x 689
4. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
7. Wall Stop: 1ea – Rockwood 400 x 626
8. Silencers: 3ea – Rockwood 608 x Gray

X. Group 24: Dr # 155A
1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2057 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626

4. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
5. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
6. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
7. Silencers: 3ea – Rockwood 608 x Gray.

Y. Group 25: Rated Dr # 143, 148, 157
1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Lockset: 1ea – Corbin Russwin ML20906 fail secure x ElectroLynx x 24VDC x NSM x M92 x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton 7500M x 689
7. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
8. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
9. Wall Stop: 1ea – Rockwood 400 x 626 Dr # 015B
10. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black

Card reader, door position switch, and power supply by Security Contractor.
Description of operation – Door locked and secure. Valid card energizes fail secure mortise lockset, unlocking outside lever. Key outside retracts latch but does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.

Z. Group 26: Rated Dr # 120, 134A
1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Lockset: 1ea – Corbin Russwin ML20906 fail secure x ElectroLynx x 24VDC x NSM x M92 x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton PRO7500M x 689
7. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
8. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630.
9. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
10. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black

Card reader, door position switch, and power supply by Security Contractor.
Description of operation – Door locked and secure. Valid card energizes fail secure mortise lockset, unlocking outside lever. Key outside retracts latch but does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.
Installation note- Install overhead stop before closer.

AA. Group 27: Rated Dr # 123, 138A

1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Lockset: 1ea – Corbin Russwin ML20906 fail secure x ElectroLynx x 24VDC x NSM x M92 x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton PR7500M x 689
7. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
8. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
9. Wall Stop: 1ea – Rockwood 400 x 626 Dr # 015B
10. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black

Card reader, door position switch, and power supply by Security Contractor. Description of operation – Door locked and secure. Valid card energizes fail secure mortise lockset, unlocking outside lever. Key outside retracts latch but does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.

AB. Group 28: Rated Dr # 149, 155

1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Lockset: 1ea – Corbin Russwin ML20906 fail secure x ElectroLynx x 24VDC x NSM x M92 x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton 7500M x 689
7. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
8. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
9. Wall Stop: 1ea – Rockwood 400 x 626 Dr # 015B
10. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black

Card reader, door position switch, and power supply by Security Contractor. Description of operation – Door locked and secure. Valid card energizes fail secure mortise lockset, unlocking outside lever. Key outside retracts latch but does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.

AC. Group 29: Dr # 106A Smoke Doors, non-locking/latching

1. Hinge: 6ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Push Plate: 2ea – Rockwood 70 x 630
3. Closer: 2ea – Norton 7500M x 689
4. Magnetic Door Holder: 2ea – By others

5. Kick Plate: 2ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
6. Mop Plate: 2ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
7. Gasketing: 1set – DHSI CNS105 x Black
8. Astragal: 1ea – DHSI SA x Black

AD. Group 30: Rated Dr # 129
1. Hinge: 3ea – Bommer T4B3386 4 ½ x 4 ½ x 630
2. Exit Device: 1ea – Corbin Russwin ED5600A x N9M55 x M17 x M109 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified exit device above x 626
4. Closer: 1ea – Norton PR7500M x 689
5. Wall Stop: 1ea – Rockwood 400 x 689
6. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
7. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
8. Gasketing: 1set – DHSI CNS105 x Black

AE. Group 31: Rated Dr # 112, 156
1. Hinge: 3ea – Bommer BB5005 4 ½ x 4 ½ x 630
2. Exit Device: 1ea – Corbin Russwin ED5600A x N9M10 x M17 x M109 x 630
3. Closer: 1ea – Norton PR7500M x 689
4. Wall Stop: 1ea – Rockwood 400 x 626
6. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
7. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
8. Gasketing: 1set – DHSI CNS105 x Black

AF. Group 32: Rated Dr # 102, 128, 140
1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Exit Device: 1ea – Corbin Russwin ED5600A x N9909 x ElectroLynx x M17 x M92 x M109 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton PRO7500M x 689
7. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
8. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
9. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
10. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black

Card reader, door position switch, and power supply by Security Contractor. Description of operation – Door locked and secure. Valid card energizes fail secure mortise exit device, unlocking outside lever. Key outside retracts latch but

does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.
Installation note- Install overhead top before closer.

AG. Group 33: Dr # 112A, 143B, 156A, 160A

1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Exit Device: 1ea – Corbin Russwin ED5600 x N9909 x ElectroLynx x M17 x M51 x M92 x M99 x M109 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton PRO7500M x 689
7. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
8. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
9. Gasketing: 1set – DHSI CNS105 x CNS-3HJ x Black
10. Door Bottom: 1ea – Pemko 315AN
11, Door Threshold: 1ea – Pemko 171A x width required

Card reader, door position switch, and power supply by Security Contractor.
Description of operation – Door locked and secure. Valid card energizes fail secure mortise exit device, unlocking outside lever. Key outside retracts latch but does not by-pass door position switch. Request to exit switch by-passes door position switch on exit.
Installation note- Install overhead top before closer.

AH. Group 34: Dr # 100

1. Hinge: 2ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Concealed Vertical Rod Device: 2ea – Corbin Russwin ED5800 x N9909 x ElectroLynx x M51 x M92 x M94 x M99 x M109 x 630 No known issues for reliability.
3. Lock Cylinder: 2ea - Compatible with specified exit device above x 626
4. Wiring Harness: 2ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 2ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Gasketing: By aluminum door manufacturer
7, Door Threshold: 1ea – Pemko 171A x width required

Card readers, door position switches, and power supply by Security Contractor.
Automatic door operator at both doors by others.
ADA push plates by Security Contractor.
Description of operation – Door locked and secure. Valid card activates latch retraction at both doors. Doors pull to open. Using ADA push plate following valid card activates auto operators. Inside ADA push pad activates panic latch retraction and auto operators. Keys unlocks lever, relocks when key removed. Key does not by-pass door position switches. Request to exit switches by-pass door position switches on exiting.

AI. Group 35: Dr # 139, 139A

1. Hinge: 1ea – Markar FM300 x EL8 x EMAP x 630
2. Electrified Mortise Exit Device: 1ea – Corbin Russwin ED5600 x N9909 x ElectroLynx x M51 x M92 x M99 x M109 x 630
3. Lock Cylinder: 1ea - Compatible with specified exit device above x 626
4. Wiring Harness: 1ea – McKinney QC-CXXX In door, lock to hinge x ElectroLynx x size required
5. Wiring Harness: 1ea – McKinney QC-C1500 Hinge to power supply or junction box x ElectroLynx
6. Closer: 1ea – Norton PRO7500M x 689
7. Overhead Stop: 2ea – Glynn Johnson 814S x Thru Bolts x 630
9. Gasketing: By aluminum door manufacturer
11, Door Threshold: 1ea – Pemko 171A x width required

Card readers, door position switches, and power supply by Security Contractor. Description of operation – Door locked and secure. Valid card energizes fail secure exit devices, unlocking outside levers. Keys unlocks lever, relocks when key removed. Key does not by-pass door position switches. Request to exit switches by-pass door position switches on exiting.

AJ. Group 36: Rated Dr # 160

1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630
2. Mortise Lockset: 1ea – Corbin Russwin ML2053 x NSM x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
3. Closer: 1ea – Norton PRO7500M x 689
4. Overhead Stop: 1ea – Glynn Johnson 814S x Thru Bolts x 630
5. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
6. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
7. Gasketing: 1set – DHSI CNS105 x Black

Installation note- Install overhead stop before closer.

AK. Group 37: Dr # 152

1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630.
2. Mortise Deadlock: 1ea – Corbin Russwin ML2012 (less thumbturn) x M17 x 630
3. Mortise Lock Cylinder: 1ea - Compatible with specified lock above x 626
3. Mortise Thumbturn Cylinder: 1ea - Compatible with specified lock above x room side x 626
4. Push Plate: 1ea – Rockwood 70 x 630
5. Pull Plate: 1ea – Rockwood BF107 x 70B x 630
6. Overhead Holder: 1ea – Glynn Johnson 814H x Thru Bolts x 630
7. Kick Plate: 1ea – Rockwood K1062 10” x 1 ½” LDW x B4E x CSK x 630
8. Mop Plate: 1ea – Rockwood K1062 4” x ½” LDW x B4E x CSK x 630
9. Gasketing: 1set – DHSI CNS105 x Black

AL. Group 38: Dr # 151A

1. Hinge: 3ea – Bommer BB5002 4 ½ x 4 ½ x 630.
2. Mortise Deadlock: 1ea – Corbin Russwin ML2012 (less thumbturn) x NSM x M17 x 630
3. Mortise Lock Cylinder: 2ea - Compatible with specified lock above x 626
4. Push Plate: 1ea – Rockwood 70 x 630
5. Pull Plate: 1ea – Rockwood BF107 x 70B x 630
6. Kick Plate: 1ea – Rockwood K1062 10" x 1 ½" LDW x B4E x CSK x 630
7. Mop Plate: 1ea – Rockwood K1062 4" x ½" LDW x B4E x CSK x 630
8. Wall Stop and Holder: 1ea – Rockwood 494S x 626
9. Gasketing: 1set – DHSI CNS105 x Black

AK. Furnish a quantity of 1 (one) Group as follows:

1. 50 Key Blanks to match existing key system
2. 1 set Special Tools: See paragraph 1.09 A.
3. Lubricants: See paragraph 1.09 B.
4. 2ea Maintenance and Operations Manuals

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine doors and frames and related items for conditions such as, but not limited to, incorrect handing, hardware preparation, misaligned lock and strike preparations, that would prevent proper application of finish hardware. Do not proceed until defects are corrected.

B. Report conditions or hardware applications that are incorrect to the Director's Representative.

2.05 KEYING

A. Establish new master key system, 6 pin small format, interchangeable core for Facility.

1. Stamp key symbol on one side of key, and "Do Not Duplicate" on other side of key.
3. Furnish one copy of factory bitting list to facility.
4. Factory key cylinders.
5. Furnish 3 cut keys for each master key.
6. Furnish 7 cut keys for each keyed lockset.
7. These cut key quantities are for bidding purposes only. Actual number of cut keys required will be determined at keying meeting.
8. When lockset and cylinder are by different manufacturers, identify and furnish correct cylinder cam to operate lockset.
9. Provide compression rings and spacers to achieve proper spacing relationship between cylinder and face of door.

B. Keying Conference
   1. Immediately following contract award, Director's Representative will schedule a keying conference to develop a written key schedule that reflects Facility's specific keying requirements. Facility representative(s), hardware distributor, and OGS's hardware designer will attend.
   2. Incorporate this schedule in Finish Hardware Submittals for approval.

3.02 INSTALLATION

A. Do not proceed with installation of finish hardware prior to attending referenced pre-installation conference.

B. Installation Sequence: Use proper installation sequence, i.e., install coordinators, and overhead stops and holders before surface mounted door closers.

C. Install hardware in accordance with manufacturer's printed installation instructions, and adjust for smooth operation, free of sticking, binding or rattling.
   1. Template surface overhead stops and holders for proper operation
   2. Template and adjust closers for proper operation.

D. Use proper tools and methods to prevent scratches, burrs or other defacement.

E. Threshold Installation:
   1. Drill holes 3 inches from each end of threshold and intermediate holes 12 inches maximum o.c. for required fasteners. Prepare holes for countersunk fasteners.
   2. Level and align thresholds with frames and doors. Where required, use non-corrosive shims.
   3. Exterior Doors: Set thresholds in a solid bed of Type 3 sealant.
   4. Secure thresholds to substrate with countersunk fasteners.

F. Door Bottom Installation:
   1. Mount sweep type door bottom protection/drip caps on exterior side of doors.
   2. Before mounting apply Type 2 sealant on the back side of bearing surface. Secure to door with required fasteners.

G. Gasket Installation:
   1. Install continuous stripping at each opening without unnecessary interruptions.
   2. Where fasteners are required, secure fasteners for stripping and seals so they will not work loose during door operation. Exposed heads of fasteners shall be free of sharp edges.
   3. Coordinate meeting stile gasket with hardware before installation.
   4. Install units plumb and level at the optimum location to maintain a permanent effective seal.

H. After installation, cover and protect hardware to prevent damage during remaining construction. Remove protection upon completion of construction.

I. Security Vendor to completely wire and certify in writing that each door has been function tested after installation.

J. All exposed unused hardware mounting holes in existing frames shall be filled with Torx screws with center pin.

3.03 LOCATIONS

A. Locate hardware as follows:
   1. Door Closers: Template for maximum door swing allowed by wall placement and jamb conditions. Where overhead stop prevents door from swinging to wall, template the closer to exceed degree of opening allowed by overhead stop.
   2. Protection Plates: 1/8 inch from door bottom.
   3. Wall Stops: Centerline of bumper to match centerline of locking trim.

3.04 FIELD QUALITY CONTROL

A. Post Installation Review: After hardware is adjusted for proper operation, Director's Representative will hold a Post-Installation Review with the Contractor, Hardware Designer, Company Field Advisors, Hardware Distributor and Hardware Installers.
   1. Physically inspect to verify proper application, installation, adjustment and operation of finish hardware, and in particular that:
      a) Latches engage freely without binding. Filing of strike plates to relieve latch bind is not acceptable.
      b) Closers are adjusted for proper spring power; sweep speed, latching speed; and hydraulic back check.
      c) Locations and proper attachment of installed protective hardware are as specified.
      d) There is no field modification of fasteners.
      e) Damaged fasteners are replaced.
   2. Defective hardware is repaired or replaced.
   3. Hardware is to be left clean and free from disfigurement.

B. Turn referenced Operations and Maintenance Manuals over to Facility through Director's Representative.

END OF SECTION

SECTION 088100

GLASS AND GLAZING

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 LEED REQUIREMENTS

A. The materials and/or equipment specified in this section may contribute towards the prerequisites and credits required to obtain LEED certification for the Project. Refer to spec section '018113 LEED Documentation Requirements' for information on submittals, procedures, material properties, and credit requirements.

B. LEED submittals identified in this section, if any, are only applicable for the Project. A complete list of LEED submittals have been identified in spec section '018113 LEED Documentation Requirements'. The contractor is required to submit information for materials and/or equipment as outlined in spec section 018113 - even if this section does not indicate the submittal being required.

C. Submit LEED submittals in accordance with Specification Section 013300 Submittals and 018113 LEED Documentation Requirements.

1.03 REFERENCES

A. Comply with recommendations in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown or specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

1.04 SUBMITTALS

A. Product Data: Manufacturer's specifications and installation instructions for each type of glass and glazing material specified, and spacers and compressible filler rod.

B. Samples:
   1. Glass: 12 x 12 inch pieces for each type of glass specified.
      a. Insulating glass samples need not be hermetically sealed, but include edge construction materials.
   2. Setting blocks, full size.
   3. Color Samples for Glazing Materials: Manufacturer's standard colors.

C. Quality Control Submittals:
   1. Test Reports: Certified test data to sufficiently substantiate glass or glass assembly compliance with requirements specified.

   2. Certificates:
      a. Affidavit required under Quality Assurance Article.
      b. Wired Glass: Affidavit required under Quality Assurance Article.

D. LEED Design Submittals:
   1. MR Credit 4.1 and MR Credit 4.2: Identify manufacturer's name, the percentage of post-consumer recycled content by weight, the pre-consumer recycled content by weight, and the cost of the product.

   2. MR Credit 5.1 and MR Credit 5.2: Identify source, cost, and the fraction by weight that is considered regional.

   3. EQ Credit 4.1: Identify the manufacturer's name, the product name, specific VOC data and the allowable VOC from the reference standard for each indoor adhesive, sealant or sealant primer utilized on the project. Identify the manufacturer's name, the product name, specific VOC data and the allowable VOC from the reference standard for each indoor aerosol adhesive utilized on the project. Provide a narrative description of any special circumstances or non-standard compliance paths taken.

1.05 QUALITY ASSURANCE

A. Compatibility of Materials: All components of the glazing system shall be manufactured or recommended by one manufacturer to assure the compatibility of materials.

B. Safety Glazing Material: Type indicated, meeting requirements of ANSI Z97.1 with label on each piece.

C. Certification:
   1. Affidavit by the material supplier, certifying type and quality of glass furnished.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect glass from edge damage during handling, storage, and installation.

1.07 PROJECT CONDITIONS

A. Environmental Requirements: Comply with glazing materials manufacturer's written recommendations regarding environmental conditions under which glazing materials can be installed.

B. Glazing channel dimensions shown are intended to provide for necessary minimum bite on the glass, minimum edge clearance and adequate glazing

material thicknesses, with reasonable tolerances. Provide correct glass size for each opening, within the tolerances and necessary dimensions required.

PART 2 PRODUCTS

2.01 GLASS

A. Type A Glass: Transparent Float Glass; ASTM C 1036, Type I, Class 1, quality q3.
   1. Thickness: As indicated on the drawings.

B. Type D Glass: Tempered Float Glass; ASTM C 1048, Kind FT, Condition A, Type I, Class 1, tempered by the manufacturer's standard process (after cutting to final size).
   1. Thickness: As indicated on the drawings.

C. Type D-1 Glass: Heat Strengthened Float Glass; ASTM C 1048, Kind HS, Condition A, Type I, Class 1, heat strengthened by the manufacturer's standard process (after cutting to final size).
   1. Thickness: As indicated on the drawings.

   2. Surface Condition: Premium (polished surfaces).

   3. Surface Condition: Standard (unpolished surfaces).

   4. Surface Condition: Patterened (textured surfaces).

   5. Classification Mark Location: Lower right corner.

D. Type M Glass: Organically Sealed Insulating Glass Units; ASTM C 1036, applicable Type and Class for glass indicated below, quality q3 for Type I glass; manufacturer's standard edge construction of spacers and sealants permanently bonded to glass surfaces and hermetically sealed to provide a dehydrated air space 1/2 inch thick with -60 degrees F. dew point; fabricated of the following glass.
   1. Temper both panes of glass in each unit.

   2. Glass Thickness: As indicated on the Drawings.

2.02 GLAZING MATERIALS

A. Type 1 Glazing Material: Silicone Rubber Glazing Sealant; silicone rubber one-part elastomeric sealant; FS TT-S-001543, Class A; acid-type for non-porous channel surfaces, and non-acid type where any of the channel surfaces are porous.

B. Type 2 Glazing Material: Polysulfide Glazing Sealant; polysulfide two-part elastomeric sealant; FS TT-S-00227, Type II, Class A, compounded by manufacturer specifically for glazing.

C. Type 3 Glazing Material: Acrylic Glazing Sealant; solvent-based, acrylic terpolymer, thermoplastic sealant; FS TT-S-00230, Type II, Class B, 95 percent of solids acrylic; compounded specifically for glazing.

D. Type 4 Glazing Material: Acrylic-Latex Glazing Sealant; modified latex rubber and acrylic emulsion-polymer; compounded specifically as a glazing sealant with permanent flexibility (non-hardening), non-staining and non-bleeding.

E. Type 5 Glazing Material: Butyl Rubber Glazing Sealant; polymerized butyl rubber compound with inert fillers and pigments; FS TT-S-001657, Type I; solvent-based with 75 percent solids, non-sag, tack-free within 24 hours, paintable, non-staining.

F. Type 6 Glazing Material: Preformed Butyl Rubber Glazing Sealant; tape or ribbon (coiled on release paper) of polymerized butyl, or mixture of butyl and polyisobutylene, compounded with inert fillers and pigments, solvent-based with minimum 95 percent solids, thread or fabric reinforcement, tack-free within 24 hours, paintable, non-staining.

G. Type 7 Glazing Material: Preformed-Preshimmed Butyl Rubber Glazing Sealant; tape or ribbon (coiled on release paper) of polymerized butyl, or mixture of butyl and polyisobutylene, compounded with inert fillers and pigments, solvent based with minimum 95 percent solids, thread or fabric reinforcement, and encased continuous rubber shim of approximately 50 durometer hardness, tack-free within 24 hours, paintable, and non-staining.

H. Type 8 Glazing Material: Butyl Rubber Glazing Tape; partly-vulcanized, self-adhesive, non-staining, elastomeric butyl rubber tape, 98 percent solids, intended for 35 percent compression, no appreciable deterioration for 3,000 hour test in Atlas Weatherometer.

I. Type 9 Glazing Material: Vinyl Foam Glazing Tape; ASTM D 1667; closed cell, flexible, self-adhesive, non-extruding, polyvinylchloride foam tape; recommended by manufacturer for exterior, exposed, watertight installation of glass, with only nominal pressure in the glazing channel.

J. Type 10 Glazing Material: Oil-Based Face Glazing Compound; ASTM C 669, type and consistency recommended by manufacturer for application shown.

K. Colors: For exposed materials provide color as indicated or, if not indicated, as selected by the Architect from the manufacturer's standard colors. For concealed materials, provide any of the manufacturer's standard colors.

L. Setting Blocks: Neoprene, 70-90 durometer hardness, with proven compatibility with sealants used.

M. Spacers: Neoprene, 40-50 durometer hardness, with proven compatibility with glazing materials used.

N. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with glazing materials

used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

O. Cleaners, Primers and Sealers: Type recommended by glazing material manufacturer.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean the glazing channel, or other framing members to receive glass, immediately before glazing. Remove coatings which are not firmly bonded to the substrate. Remove lacquer from metal surfaces wherever elastomeric sealants are used.

B. Inspect each piece of glass immediately before installation, and eliminate pieces which have observable damage or face imperfections.

C. Apply primer or sealer to joint surfaces wherever recommended by sealant manufacturer.

3.02 INSTALLATION

A. Each installation shall withstand normal temperature changes, wind loading, and impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.

B. Install glass in accordance with the standards detailed in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

C. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.

D. Install glazing materials in accordance with the manufacturer's printed instructions.

3.03 GLAZING

A. Install setting blocks of proper size at quarter points of sill rabbet. If required to keep in place set blocks in thin course of the heel-bead compound.

B. Provide spacers inside and out, and of proper size and spacing, for all glass sizes larger than 50 united inches, except where gaskets are used for glazing. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant

width, except with sealant tape use thickness slightly less than final compressed thickness of tape.

C. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) except as otherwise indicated, depending on light sizes, thickness and type of glass, and complying with manufacturer's recommendations.

D. Do not cut, seam, nip, or abrade glass which is tempered, heat strengthened, or coated.

E. Force glazing materials into channel to eliminate voids and to ensure complete "wetting" or bond of glazing material to glass and channel surfaces.

F. Tool exposed surfaces of glazing sealants and compounds to provide a substantial "wash" away from the glass. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.

3.04 CURE, PROTECTION AND CLEANING

A. Cure glazing materials in accordance with manufacturer's printed instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.

B. Mark glazed openings immediately upon installation of glass by attaching crossed streamers to framing. Do not apply markers of any type to surfaces of glass.

C. Replace glass included in the work which is broken, or otherwise damaged, from the time Work is started at the site until the date of physical completion.

D. Maintain glass in a reasonably clean condition until date of physical completion.
   1. Clean and trim excess glazing material from the glass and stops or frames promptly after installation.

E. When directed, or just before the project is turned over to the State, remove dirt and other foreign material and wash and polish glass included in the work on both sides.

END OF SECTION

SECTION 317800

HORIZONTAL EARTH BORING AND PIPE JACKING

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Geotechnical Report

B. Maintenance and Protection of Traffic Plan

1.02 DESCRIPTION

A. The Work of this Section consists of operations, equipment, methods and materials necessary to install horizontal casing pipe as located on the project plans. The casing pipe shall be either bored or jacked at the option of the Contractor.

1.03 SUBMITTALS

A. Shop Drawings: Detailed drawings showing the methods and procedures of the installation. This submittal will not relieve the Contractor of complete responsibility for the successful performance of the intended installation procedure.

1.04 PROJECT CONDITIONS

A. Existing Conditions:
   1. Field conditions may require that the actual jacking operations be continued without interruption in order to prevent undermining of the surface area.
   2. Should the Director's Representative permit interruption of jacking operations, the Contractor shall provide bulkheads and dewatering measures as approved by the Director's Representative.

PART 2 PRODUCTS

2.01 MATERIALS

A. Pipe Casing: Standard NPS, plain-end, steel pipe; ASTM A 53.
   1. Outside Diameter: 16-inch watermain, and 5-inch for electrical conduit. See project plans for locations.

2.02 MECHANICAL PIPE END SEALS

A. Interlocking links of solid synthetic rubber connected by corrosion resistant bolts and nuts to form a sealing belt in an annular pipe space; Link-Seal by

Thunderline Link-Seal, Inc., 6525 Goforth St., Houston, TX 77021, (713) 747-8819.

2.03 SAND

A. Sound, durable bedding material free from organic or other deleterious material with 100 percent passing a No. 20 sieve.

2.04 CASING SPACERS

A. High density polyethylene (HDPE) , flexible spacers; “Raci” by Public Works Marketing, Inc., P. O. Box 38174, Dallas, TX 75238-0174, (214) 340-4226.
   1. Type and size as recommended by the manufacturer for the particular installation.

PART 3 EXECUTION

3.01 PREPARATION

A. Underground Utilities:
   1. Locate and mark-out existing, underground utilities between the boring/jacking and receiving pits.
   2. Determine vertical orientation and depths of utility lines between the boring/jacking and receiving pits.

B. Pit Preparation:
   1. Excavate boring/jacking pit and receiving pit.
   2. Remove excavated material unsuitable for backfill from the Site.
   3. Overexcavate pits to allow for placement of 12 inches of No. 2 course aggregate in pit bottom.
   4. Dewater pits as required and as directed.

3.02 INSTALLATION

A. Locate boring/jacking pit and receiving pit a minimum of 25 feet from the edge of the roadway, railway, or other right-of-way. If 25 feet cannot be maintained, provide temporary shoulder closure in accordance with NYSDOT Work Zone Traffic Control M619-20 "Shoulder Closure 2-Lane, 2-Way Roadway.

B. Pipe Casing for Jacking:
   1. Weld joints completely around the circumference of the pipe.
   2. Install carrier pipe through the casing pipe with casing spacers secured.
      a. Install casing spacers in accordance with manufacturer’s printed instructions and recommended spacing.
   3. Completely fill the casing-carrier pipe annular space with sand.
   4. Install the mechanical pipe end seals to close-off both ends of the casing pipe.

3.03 MAINTENANCE AND RESTORATION

A. Restore grades to original levels where settlement or damage due to performance of the Work has occurred. Correct conditions contributing to settlement. Remove and replace improperly placed or poorly compacted fill materials.

B. Restore pavements, walks, curbs, lawns, and other surface features damaged during performance of the Work to match the appearance and performance of existing corresponding features as closely as practicable.

C. Topsoil and seed damaged lawn areas. Water as required until physical completion of the Work.

END OF SECTION

TABLE OF CONTENTS

PROCUREMENT AND CONTRACTING REQUIREMENTS GROUP

DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS

INTRODUCTORY INFORMATION

Document Number and Title

BIDDING REQUIREMENTS

Document Number and Title

CONTRACTING REQUIREMENTS

SPECIFICATIONS GROUP

GENERAL REQUIREMENTS SUBGROUP

DIVISION 01 – GENERAL REQUIREMENTS

Document Number and Title

013119 Project Meetings
013200 Construction Progress Documentation
013300 Submittals
013350 Computer Aided Design Coordination Drawings
014100 Regulatory Requirements
014216 Definitions
014217 Abbreviations
014339 Mock Up Requirements
015000 Construction Facilities & Temporary Controls
015123 Construction Heat And Temporary Heat
015526 Traffic Maintenance & Protection
015633 Security
016500 Materials And Equipment
017123 Field Engineering
017329 Removals, Cutting, And Patching
017419 Construction Waste Management
017423 Pre Occupancy Cleaning
017716 Contract Closeout
017900 Video Training Programs
018113 LEED Documentation Requirements
018113 Table 018113.1
018113 LEED NC Project Score Card
018119 Construction Indoor Air Quality Management
018120 Volatile Organic Compound Limits for Adhesives and Sealants
019113 General Commissioning Requirements

FACILITY SERVICES SUBGROUP

DIVISION 02 – EXISTING CONDITIONS

Document Number and Title

023313 Underground Utility Locator Service

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Document Number and Title

078400 Fire stopping
079200 Joint Sealers

DIVISION 09 – FINISHES

Document Number and Title

099103 Mechanical Painting

DIVISION 23 – HEATING VENTILATING AND AIR CONDITIONING

Section Number and Title

230516 Expansion Compensators

230517 Expansion Joints
230521 Flow Metering Devices
230523 Valves
230529 Pipe Hangers And Supports
230549 Concrete Pads For Equipment
230550 Vibration Isolation
230552 Flexible Vibration Eliminators
230553 Pipe And Valve Identification
230554 Duct And Equipment Identification
230593 Cleaning And Testing
230594 Balancing Of Systems
230719 Insulation
230800 Mechanical Systems Commissioning
230923 Direct Digital Building Control System
230926 Combustion Control And Instrumentation
230933 Temperature Control System - Electric Electronic
232000 HVAC Piping
232001 Strainers
232003 Thermometers And Gauges
232006 Hydronic Specialties
232123 Pumps
232513 Water Treatment, Closed Hot Water Heating System
232514 Water Treatment - Air Conditioning Systems
233113 Metal Ductwork
233300 Ductwork Accessories
233416 Centrifugal Fans
233723 Roof Mounted Air Outlets
234100 Air Filters
235116 Smoke Flue Pipe And Breeching
235223 Gas Fired Hydronic Boiler
236000 Refrigeration
238115 Ductless Air Conditioners
238146 Water Source Unitary Heat Pump (Geo Thermal Loop)
238149 Ground Source Heat Pump Systems
238239 Unit Heaters

DIVISION 26 – ELECTRICAL

Document Number and Title

260221 Motors and Motor Controllers
260523 Wiring for Motors and Motor Controllers

DIVISION 31 – EARTHWORK

Document Number and Title

310000 Earthwork

APPENDIX

END OF TABLE OF CONTENTS

SECTION 230550

VIBRATION ISOLATION

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Vibration Isolation for Piping: Section 230529.

B. LEED Documentation Requirements: Section 018113.

C. See Drawing M-001, HVAC General Notes for Seismic Design Category, Occupancy Category, and Importance Factor.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 LEED REQUIREMENTS

A. The materials and/or equipment specified in this section may contribute towards the prerequisites and credits required to obtain LEED certification for the building. Refer to spec section '018113 LEED Documentation Requirements' for information on submittals, procedures, material properties, and credits requirements.

B. LEED submittals identified in this section, if any, are only applicable for the building. A complete list of LEED submittals have been identified in spec section '018113 LEED Documentation Requirements'. The contractor is required to submit information for materials and/or equipment as outlined in spec section 018113 - even if this section does not indicate the submittal being required.

C. Submit LEED submittals in accordance with Specification Section 013300 Submittals and 018113 LEED Documentation Requirements.

1.04 DEFINITIONS

A. Ground Floor: Floor or floor slab of building resting directly on earth.

B. Equipment: The term EQUIPMENT will be used throughout this specification and it includes ALL non-structural components within the facility and/or serving this facility, such as equipment located in outbuildings or outside of the main structure on grade within five feet of the foundation wall. Equipment buried underground is excluded but entry of services through the foundation walls is included. Below is a partial list of

equipment for reference, equipment not listed is still included in this specification.

1. AC Units
2. Water Source Heat Pumps
3. Unit Heaters, Cabinet Heaters
4. Fans (All Types)
5. Ductwork
6. Boilers
7. Pumps
8. Piping

C. Life safety systems defined:
1. All systems involved with fire dampers and combination fire and smoke dampers.
2. All systems involved with and/or connected to emergency power supply including transfer switches, transformers and all circuits to fire protection, and/or emergency lighting systems.
3. Fresh air relief and makeup system on emergency control sequence including air handlers, conduit, duct, dampers, etc.

D. Positive Attachment
1. Positive attachment is defined as a support location with a cast-in or wedge type expansion anchor, a double-sided beam clamp, a welded or through bolted connection to the structure.

E. Transverse Bracing
1. Restraint(s) applied to limit motion perpendicular or angular to the centerline of the pipe, duct or conduit.

F. Longitudinal Bracing
1. Restraint(s) applied to limit motion along the centerline of the pipe, duct, conduit, etc.

1.05 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Shop Drawings:
1. Details of intermediate structural steel members and method of attachment required for installation of vibration isolating devices.
2. **Drawings showing methods of suspension, support guides for piping and ductwork.**
3. **Drawings showing methods for isolation of pipes and ductwork piercing walls and slabs.**
4. Design Calculations: Calculations for selection of vibration isolators, design of vibration isolation bases, and selection of seismic restraints.

5. **Vibration Isolation Base Details: Detail fabrication, including anchorages and attachments to structure and to supported equipment. Include auxiliary motor slides and rails, and base weights.**
6. **Coordinated drawings shall be marked-up with the specific locations and types of restraints indicated for all pipe, duct, and equipment**
8. Seismic Restraint Details: Detail fabrication and attachment of restraints and snubbers.
9. Drawings identifying seismic locations with corresponding details of pre-approved seismic restraints, with seismic loads and seismic force level (Fp) calculations; pre-engineered and stamped by a NYS Licensed Professional Engineer experienced in seismic restraint systems.

C. Product Data:
1. Catalog sheets, specifications, and installation instructions.
2. Vibration isolator schedule showing usage.

D. Quality Control Submittals:
1. Seismic Restraint Manufacturer's Qualifications Data:
   a. Name of firm producing the seismic restraints, business address and telephone number.
   b. Period of time firm has been in the business producing seismic restraints, and names and addresses of 3 similar projects that the manufacturer has produced seismic restraints for during the past 5 years.

2. Company Field Advisor Data:
   a. Name, business address and telephone number of Company Field Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   c. Services and each product for which authorization is given by the Company, listed specifically for this project.
3. Manufacturer's Certificate of Compliance for Seismic Restraints: Certificate from seismic restraint manufacturer stating that the restraint and its mounting system or anchorage has been tested or analyzed and meets the requirements of NYS Building Code (Section 1621).

E. LEED Design Submittals. Provide Green Building Submittals for each different product type and each manufacturer used.
1. LEED NC Credit MR Cost Data: Provide cost data breakdown per Section 018113, Paragraph B.
2. LEED NC Credit MRc-4.1 & 4.2: Recycled Content: Provide recycled content as a percentage by weight for each type of product used. Include the name of each manufacturer.
   a. Recycled content materials are defined in accordance with the International Organization of Standards Document: ISO 14021 as follows:
      1. The recycled content value of a material assembly shall be determined by weight of the recycled materials. The recycled Content value is found by multiplying the

recycled content percentage of the assembly by the cost of the total assembly.

2. The sum of all post-consumer recycled content plus one half of the pre-consumer recycled content represents the total permissible percentage by weight for each material or product type used.

3. LEED NC Credit MRc-5.1 & 5.2: Regional Materials: Provide the name and location of each manufacturing plant and the original source of extraction, harvesting or recovery of the raw materials used in the assembly for each of the materials. Where several raw material sources are used, the manufacturer shall provide a breakdown based on percentage by weight of materials used in the product for each different raw material source used.

1.06 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Seismic components shall be UL listed or California OSHPD (Office of Statewide Health Planning and Development) approved.

B. Seismic Restraint Manufacturer Qualifications: The firm producing the seismic restraints shall be experienced in seismic restraint work and shall have produced seismic restraints on minimum of 3 similar projects over the past 5 years.

C. Company Field Advisor: Secure the services of a Company Field Advisor from seismic restraint manufacturer for a minimum of 24 working hours for the following for the following:
   1. Render advice regarding installation and final adjustment of seismic restraint system.
   2. Render advice on the suitability of each seismic restraint for its particular application.
   3. Inspect completed installation of seismic restraint system and certify with an affidavit that the system is installed in accordance with the Contract Documents and is operating properly.
   4. Train facility maintenance personnel on the installation of seismic restraint system and routine maintenance of the system.

PART 2 PRODUCTS

2.01 MANUFACTURERS/COMPANIES

A. Amber-Booth Co.

B. Korfund Dynamics Corp.

C. Mason Industries Inc.

D. Vibration Eliminator Co., Inc.

E. Vibration Mountings and Controls, Inc.

2.02 RUBBER-IN-SHEAR ISOLATORS

A. Provide molded mound shaped rubber or neoprene elements designed to provide the required deflection under imposed load. Furnish isolators properly housed, with steel top plate and base plate completely imbedded in rubber or neoprene, for bolting to equipment and foundations, of type as follows:
   1. Single Rubber-In-Shear: Single element designed for static deflection of 1/4 inch.
   2. Double Rubber-In-Shear: Two single elements assembled in series, to provide for a static deflection of 1/2 inch.

2.03 STEEL SPRING ISOLATORS

A. Types:
   1. Free Standing Springs: Provide laterally stable units, without housing, with a minimum 1/4 inch thick rubber or neoprene sound deadening pad between spring and its support. Use for isolating equipment having a static deflection in excess of 1 inch, unless otherwise indicated.
   2. Housed Springs: Provide units with telescoping cast iron or steel housings, containing one or more springs, complete with resilient alignment inserts and a minimum 1/4 inch thick rubber or neoprene sound deadening pad bonded to the base of housing.

B. Construction Features Required:
   1. Provide limit stops for spring isolators with deflections of 2 inch or more so as to prevent undue motion during start and stop, but unrestrained movement during normal operation.
   2. Hot dip galvanize all steel parts of isolators for outdoor use, with the exception of springs. Cadmium plate or neoprene coat springs.
   3. Do not use isolator leveling bolts for jacking screws.

2.04 INTEGRAL STRUCTURAL STEEL OR RAIL TYPE BASES

A. Provide bases, factory fabricated from structural steel members of sufficient rigidity to maintain drive alignment and resist starting torque, without the use of restraining snubber devices. Provide bases complete with rubber-in-shear or spring type isolators, as specified for the particular equipment.

2.05 CONCRETE INERTIA BLOCKS

A. Type: Factory fabricated welded structural steel pouring frames with the following:
   1. Sheet metal casing a minimum of 6 inches deep.
   2. Integral steel reinforcing rods on 9 inch centers in both directions, welded to steel frame;
   3. Height saving mounting lugs and spring isolators designed to provide the required deflection and efficiency.

B. Configure bases to accommodate supported equipment.

1. Provide bases for isolating pumps of physical size and shape as required to accommodate base elbow supports. Provide mounting templates.

2.06 VIBRATION ISOLATION BASES

A. Type: Factory fabricated welded structural steel (ASTM A36) bases and rails with the following:
   1. Support brackets to anchor base to vibration isolation.
   2. Pre-located equipment anchor bolts.
   3. Auxiliary motor slide bases or rails.
   4. Steel angles welded to frame for outrigger isolation mountings.
   5. Factory Finish: Corrosive resistant finish.

B. Design bases to result in lowest possible mounting height with not less than one inch clearance above housekeeping pad or floor.

C. Configure bases to accommodate supported equipment.
   1. Provide bases for isolating pumps of physical size and shape as required to accommodate base elbow supports. Provide mounting templates.

2.07 COMBINATION RUBBER AND SPRING ISOLATORS

A. Type: Combination rubber and spring type designed for insertion in a split hanger rod for isolating equipment from the overhead construction.
   1. Approved isolators: Amber Booth Type BSSR, Korfund Type VX, Mason Industries, Type DNHS, Vibration Eliminator Co. Type SNRC and Vibration Mountings and Controls Type RSH.

2.08 PAD TYPE ISOLATORS

A. Provide neoprene or rubber mountings, corrugated or waffle faced both sides, single or double layered or laminated, or size and thickness as specified for the particular equipment.

2.09 SEISMIC RESTRAINT SYSTEM FOR HVAC EQUIPMENT

A. General:
   1. This contractor to retain an independent NYS Licensed Engineer to design the connections and bracing for all equipment attached to the structure.
   2. Coordinate all structural attachments with the Director's Representative.
   3. Design analysis shall include calculated dead loads, static seismic loads, and capacity of materials utilized for the connection of the equipment or system to the structure.
   4. Analysis shall detail anchoring methods, bolt diameter, and embedment depth.
   5. Design seismic restraint devices to accept without failure the forces calculated per the applicable building code and as specified.
   6. Determine by calculation the number and size of seismic restraints required by each piece of HVAC equipment.
   7. Construct seismic supports so that support engagement is maintained.

8. Stamp seismic supports with manufacturer's name and part number for identification.
9. Design seismic supports specifically for mitigation of seismic force loads.
10. Design the stiffness of seismic restraints for mechanical equipment so that the load path for the restraint performs its intended function.
11. Where possible, utilize components designed with tamper resistant break-off bolt heads or break-off nuts to assure visual verification of proper installation.
12. Attachment components shall be UL Listed catalog components with published loads designed specifically for seismic application.
13. Seismic restraint manufacturer shall have ratings verified by independent testing laboratory.

B. Type: Pre-engineered seismic restraint system designed to support and restrain HVAC equipment to meet applicable lateral force requirements.

C. Acceptable Manufacturers:
1. B-Line.
2. Mason Industries.
3. TOLCO Inc.

D. Thrust Restraints: Combination spring and elastomeric restraints with coil spring and elastomeric insert in compression, factory set for thrust.
1. Frame: Formed steel, fabricated for connection to threaded rods and to allow for 30 degrees of angular hanger rod misalignment without binding or reducing isolation efficiency.
2. Outside Spring Diameter: Not less than 80 percent of compressed height of spring at rated load.
3. Minimum Additional Travel: 50 percent of required deflection at rated load.
4. Elastomeric Element: Molded, oil-resistant rubber or neoprene.
5. Finishes: Baked enamel for metal components. Color-code to indicate capacity range.

E. Manufactured Seismic Snubbers: All-directional, double-acting snubbers.
1. Construction: Interlocking steel members restrained by 3/4 inch thick, replaceable, shock-absorbing neoprene insert. Maintain 1/8 inch clearance in all directions between rigid and resilient surfaces.

F. Fabricated Seismic Snubbers: Welded structural-steel shapes designed and fabricated to restrain equipment or vibration isolation bases from excessive movement during seismic event. Design laterally restrained isolators to resist gravity forces of 4g.
1. Construction: Welded steel shapes conforming to ASTM A36.
2. Resilient Components: 3/4 inch thick, replaceable, shock-absorbing neoprene insert.

G. Restrained Spring Mountings: Spring isolators with ductile iron or steel rigid housings with the following:

1. Molded neoprene cup or 1/4 inch neoprene acoustical friction pad between base plate and support.
2. Leveling bolts which are rigidly bolted to equipment.
3. Restraining bolts with neoprene bushing between bolt and housing.
4. Vertical Limit Stops: Prevent spring extension when weight is removed; out of contact during normal operation.
5. Internal isolation pad required where housings are bolted or welded into position.
6. Minimum Clearance Around Restraining Bolts and Between Housing and Spring: 1/2 inch.
7. Vertically adjustable allowing maximum of 1/4 inch travel in all directions before contacting resilient snubbing collars.

PART 3 EXECUTION

3.01 INSTALLATION

A. Jack equipment bases or inertia bases into position and block or wedge before springs are loaded. After equipment is bolted in place and springs are loaded, by means of the leveling bolts, remove the temporary blocking or wedging.

B. Housekeeping Pads:
1. Coordinate size and location of pads with the Work of related contracts.
2. Coordinate house keeping pads with restraint manufacturer to provide minimum edge distance of 10 bolt diameters around the outermost anchor bolt to allow development of full drill-in wedge anchor ratings.
   a. If cast-in anchors are being used, size housekeeping pads in accordance with ACI requirements for bolt coverage and embedment.

C. Vibration Isolation Bases:
1. Coordinate size and location of bases with the Work of related contracts.

D. Piping And Ductwork Isolation

2. Hanger isolators shall be installed with the hanger box hung as close as possible to the structure (without touching).
3. Hanger rods shall not short circuit the hanger box.
4. Type L hangers may be substituted for all other hangers listed below.
5. Pre-compressed hangers shall only be used if installed along with piping.
6. Ceiling supported piping outside shafts connected to rotating or reciprocating equipment whether the equipment is isolated or not shall be isolated as follows:
1. Water piping within 50 feet or 100 pipe diameters (whichever is greater) from equipment connection.
a. **Horizontal suspended water piping 1¼" to 2" shall be hung with Type E isolators with 0.3" deflection.**
b. Water pipe larger than 2" shall be hung with Type F isolator. The first three supports for piping connected

to isolated equipment shall have deflection equal to the equipment isolators up to 2" deflection, all supports thereafter shall have 0.75" deflection isolators.

7. Floor supported piping outside shafts connected to isolated rotating or reciprocating equipment shall be isolated as follows;
   1. Horizontal floor or roof mounted water piping 1¼" to 2" shall be supported by Type P isolators with a minimum 0.3" deflection.
   2. Water pipe larger than 2" shall be supported by Type B isolators with a minimum of 0.75" deflection.

7. **All ductwork over 4 ft.^{2} face area located in the mechanical equipment room(s) shall be supported by Type C hangers with a minimum of 0.75" deflection.**
2. Vertical riser supports for pipe, 4" diameter and larger, shall be isolated from the structure using Type K guides and anchors.
3. Install Type FC-1 flexible connectors at all connections of pipe to pumps, and other isolated equipment. Where they are not installed on isolated equipment, insert spool pieces on equipment side of shutoff valve.
4. Install FC-2 or 4 type connectors only at locations which exceed temperature limitations of FC-1 or service requires stainless steel or bronze construction flex. (high temperature hot water)

3.02 APPLICATION

A. Provide vibration isolators or vibration isolation bases for mechanical equipment, piping and high velocity ductwork of type as specified.

B. Select isolation devices for uniform static deflection, in accordance with the distribution of weight and forces.
   1. Whenever rotational speed is the cause of disturbing frequency, utilize the lowest operating speed of the equipment in determining the type of isolation required.
   2. Selection shall result in uniform loading and deflection, even when equipment weight is not evenly distributed.
   3. Select springs for a total deflection greater than the selected static deflection, to provide an adequate safety factor.

C. Isolate floor mounted fan units, air handling units and self-contained air conditioning units, (with the exception of utility sets, fan units with wheels less than 27 inches and all equipment mounted on the ground floor), to obtain the following efficiencies:

RPM	MINIMUM DEFLECTION	EFFICIENCY
Up to 325	3.5	80
326 to 525	2.0	80-90*
526 to 575	1.5	90

RPM	MINIMUM DEFLECTION	EFFICIENCY
576 to 1000	1.25	90-95*
1001 to 1200	.75	95
1201 and over	.50	95

*Lower efficiency at lowest RPM - higher efficiency at highest RPM.

3.03 VIBRATION ISOLATION SCHEDULE

A. Pumps - Base Mounted and Unitary Types:
   1. Located Above the Ground Floor:
      a. Driven by Electric Motors 5 to 15 HP: Provide structural steel rails, running full length of bed plate, with housed type spring isolators, and in the case of close coupled pumps, rails shall extend full length under and over hang so as to compensate for the cantilever effect. Provide isolators designed for a minimum 1/2 inch static deflection.
      b. Driven by Electric Motors 20 to 40 HP: Provide inertia blocks, minimum of 1-1/2 times the weight of equipment.
      c. Driven by Electric Motors 50 HP and Larger: Provide inertia blocks, minimum of 2 times the weight of equipment.

B. Remote Installed Refrigerant Compressor Units, Self Contained Belt Driven or Direct Driven Condensing Units and Floor Mounted Product Coolers: Provide steel rail type bases with built-in, metal housed, rubber-in-shear unit isolators, permanently fixed in place and provided with adjustable snubber devices. Provide rail bases on Ground Floor designed for 1/4 inch static deflection and above Ground Floor 1/2 inch static deflection.

C. Ceiling Suspended Product Coolers: Provide combination rubber and spring type isolators, designed for insertion in a split hanger rod. Provide isolators with an efficiency as specified under the paragraph entitled “APPLICATION” of this section, with no deflection greater than 1-1/2 inch required.

3.04 SEISMIC RESTRAINT SYSTEM FOR HVAC EQUIPMENT, PIPING AND DUCTWORK

A. General:
   1. Do not use powder-actuated fasteners for seismic restraint anchorage in tension applications.
   2. Install seismic restraints in accordance with seismic restraint manufacturer’s printed installation instructions and guidelines unless otherwise specified.
   3. When systems cross building seismic separation points, pass between buildings, or are supported from different portions of the building, install to allow differential support displacements without damaging the duct, equipment or support connections.
   4. Do not brace seismic bracing to different parts of the building that may respond differently during seismic activity.
   5. Provide adequately sized openings in walls, floors, and ceilings for anticipated seismic movement. Provide fire stopping in fire-rated walls.

6. Seismic restraint installations shall not cause any modifications in the positioning of equipment or piping resulting in stresses or misalignment.
7. No rigid connections between equipment, piping, duct, or conduit shall be made to the building structure that degrades the noise and vibration-isolation system specified.
8. Bracing attached to structural members may present additional stresses. Submit loads to the Director's Representative record for approval.
9. Provide vertical stiffening components to support rods when necessary to accept compressive loads. Welding of components to vertical support rods is not acceptable.
10. **Contractor shall provide supplemental steel as required and shall brace to building structure where bracing from building structure is not possible.**
11. Notify Director's Representative if any discrepancies between the specifications and field conditions prior to installation.

B. Seismic Restraints for HVAC Equipment:
1. Protect each piece of vibration isolated HVAC equipment with protected spring isolators or separate seismic restraints.
   a. Provide protected spring isolators and seismic restraints rated in 3 principle axes.
2. Installation of seismic restraints shall not cause any change in position of equipment or piping, resulting in stresses or misalignment.
3. No rigid connections between equipment and the building structure shall be made that degrade the noise and vibration-isolation system specified.
4. Do not install any equipment, piping, duct, or conduit that makes rigid connections with the building unless isolation is not specified.
5. Prior to installation, bring to the Director's Representative's attention any discrepancies between the specifications and the field conditions, or changes required due to specific equipment selection.
6. Bracing may occur from flanges of structural beams, upper truss cords of bar joists, cast in place inserts, or wedge-type concrete anchors. Bracing attached to structural members may present additional stresses. Submit loads to the Director's Representative.
7. Expansion anchors shall not be used for non-vibration isolated equipment rated over 10 HP.

C. Anchor interior mounts, isolators, hangers, and snubbers to vibration isolation bases. Bolt isolator baseplates to structural floors.

D. Anchor exterior mounts, isolators, hangers, and snubbers to vibration isolation bases. Bolt isolator baseplates to structural supports as required.

E. Vertical Stops: For equipment affected by wind pressure or having an operational weight different from installed weight, provide resilient vertical limit stops that prevent spring extension when weight is removed.
1. Provide vertical stops for equipment containing liquid, such as water chillers, evaporative coolers, boilers, and cooling towers.
2. Spring isolated or protected spring isolated equipment must rock and move freely within limits of stops or seismic restraint devices.

F. Thrust Restraints: Where required, provide pairs of thrust restraints, symmetrically installed on both sides of the steady state line of thrust.

G. Seismic Snubbers: Provide snubbers as close as possible to each vibration isolator as indicated. After installing and leveling of the equipment, adjust snubbers in accordance with the snubber manufacturer's instructions.

H. Equipment: Provide vibration isolators, flexible connectors and seismic snubbers in accordance with manufacturer's recommendations. Equipment with spring isolators or protected spring isolators shall rock or move freely within limits of stops or seismic snubber restraints.

I. Stability: Isolators shall be stable during starting and stopping of equipment without traverse and eccentric movement of machinery that would damage or adversely affect the equipment or attachments.

J. Lateral Motion: The installed vibration isolation system for each piece of floor or ceiling mounted equipment shall have a maximum lateral motion under machinery start up and shut down conditions of not more than 1/4 inch. Restrain motions in excess by approved spring mountings.

K. Unbalanced Equipment : Provide foundation suspension systems specifically designed to resist horizontal forces for equipment with large unbalanced horizontal forces. Vibration isolator systems shall conform to the equipment manufacturer's recommendations.

L. Non-rotating Equipment: Mount non-rotating equipment in systems which includes rotating or vibrating equipment on isolators having the same deflection as the hangers and supports for the pipe connected to.

M. Install flexible pipe connectors at connections for equipment supported on vibration isolators.

N. Equipment Room Sound Isolation: Do not allow direct contact between pipe or ducts and walls, floor slabs, roofs, ceilings or partitions of equipment rooms.

3.05 FIELD QUALITY CONTROL

A. Provide equipment and apparatus required for performing inspections and tests.
   1. Notify Director’s Representative a minimum of 14 days prior to equipment sound, vibration, and seismic testing.
   2. Rebalance, adjust, or replace equipment with noise or vibration levels in excess of those given in the equipment specifications, or equipment manufacturer's data.

B. Field Inspections:
   1. Prior to initial operation, inspect the vibration isolators and seismic snubbers for conformance to drawings, specifications, and manufacturer's data and instructions.

a. Check for vibration and noise transmission through connections, piping, ductwork, foundations, and walls.
b. Check connector alignment before and after filling of system and during operation.
c. Correct misalignment without damage to connector and in accordance with manufacturer's recommendations.

C. Spring Isolator Inspection
1. After installation of spring isolators or protected spring isolators, and seismic restraint devices, the equipment shall rock freely on its spring isolators within limits of stops or seismic restraint devices. Eliminate or correct any interference.

D. Tests
1. Adjust, repair, or replace isolators as required to reduce vibration and noise transmissions to specified levels.
2. Equipment Vibration Tests
a. Perform vibration tests to determine conformance with vibration isolation schedule specified.

END OF SECTION

SECTION 236000

REFRIGERATION

PART 1 GENERAL

1.01 SCOPE

A. Provide microprocessor controlled, multiple-scroll compressor, air-cooled, condensing units of the scheduled capacities as shown on the drawings, including but not limited to:
   1. Condensing unit package.
   2. Charge of refrigerant and oil.
   3. Controls and control connections.
   4. Refrigerant piping connections.
   5. Motor starters.
   6. Electrical power connections.

1.02 RELATED SECTIONS

A. Concrete Pads for Mechanical Equipment: Section 230549.

B. Direct Digital Building Control System: Section 230923.

C. Vibration Isolation: Section 230550.

D. LEED Documentation Requirements: Section 018113.

E. General Commissioning Requirements: Section 019113.

1.03 REFERENCES

A. ANSI/ASHRAE 15 - Safety Code for Mechanical Refrigeration.

B. ANSI/ASHRAE/IES 90.1 - Energy Conservation in New Building Design Standard.

C. ANSI Z21.47/UL1995 - Unitary Air Conditioning Standard for safety requirements.

1.04 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.05 LEED REQUIREMENTS

A. The materials and/or equipment specified in this section may contribute towards the prerequisites and credits required to obtain LEED certification for the building. Refer to spec section '018113 LEED Documentation Requirements' for information on submittals, procedures, material properties, and credits requirements.

B. LEED submittals identified in this section, if any, are only applicable for the building. A complete list of LEED submittals have been identified in spec section '018113 LEED Documentation Requirements'. The contractor is required to submit information for materials and/or equipment as outlined in spec section 018113 - even if this section does not indicate the submittal being required.

C. Submit LEED submittals in accordance with Specification Section 013300 Submittals and 018113 LEED Documentation Requirements.

1.06 SUBMITTALS

A. Product Data: Include manufacturer's technical data for each model indicated, including rated capacities of selected model clearly indicated, dimensions, required clearances, shipping, installed, and operating weights, furnished specialties, accessories, and installation and startup instructions.

B. Shop Drawings: Detail equipment assemblies and indicate dimensions, required clearances, method of field assembly, components, and location of each field connection. Detail equipment mounting to supporting structure.
   1. Wiring Diagrams: Detail wiring for power, signal, and control systems and differentiate between manufacturer-installed and field-installed wiring.

C. Commissioning Reports: Indicate results of startup and testing commissioning requirements. Submit copies of checklists.

D. Maintenance Data: Maintenance manuals specified in Division 1.

E. Warranties: Special warranties specified in this section.

F. LEED Design Submittals. Provide Green Building Submittals for each different product type and each manufacturer used.
   1. LEED NC Credit MR Cost Data: Provide cost data breakdown per Section 018113, Paragraph B.
   2. LEED NC Credit MRc-4.1 & 4.2: Recycled Content: Provide recycled content as a percentage by weight for each type of product used. Include the name of each manufacturer.
      a. Recycled content materials are defined in accordance with the International Organization of Standards Document: ISO 14021 as follows:
         1. The recycled content value of a material assembly shall be determined by weight of the recycled materials. The recycled Content value is found by multiplying the

recycled content percentage of the assembly by the cost of the total assembly.

2. The sum of all post-consumer recycled content plus one half of the pre-consumer recycled content represents the total permissible percentage by weight for each material or product type used.

3. LEED NC Credit EA PreReq 2 and EA Credit 1: Product cut sheets for all materials that identify the Performance Criteria as stated for each item. Cut sheets shall be submitted with the Contractor or Subcontractor‟s stamp, as confirmation that the submitted products are the products installed on the project

4. LEED NC EA Credit 4: Product cut sheets for all materials that identify the Performance Criteria as stated for each item. Cut sheets shall include refrigerant type utilized and the total system charge of refrigerant in pounds. Cut sheet shall be submitted with Contractor or Subcontractor‟s stamp, as confirmation that the submitted products are the products installed on the project.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's installation instructions for storing, rigging, unloading, and transporting units.

B. Protect units on site from physical damage. Protect coils.

C. Unit shall be delivered to jobsite fully assembled with a factory charge and a full oil charge by the manufacturer. Final charge of HFC-410A shall be on-site, by contractor.

1.08 WARRANTY

A. The refrigeration equipment manufacturer's warranty shall be for a period of one year from date of equipment start up but not more than 18 months from date of shipment. The warranty shall cover material and workmanship that prove defective within the above period, excluding refrigerant.

1. Compressors shall carry a 5 year warranty.
2. Unit shall carry a 1 year parts only warranty.

1.09 REGULATORY REQUIRMENTS

A. Unit shall conform to ANSI Z21.47/UL 1995 for construction of packaged air conditioner.

1. In the event the unit is not UL approved, the manufacturer must, at his expense, provide for a field inspection by a UL representative to verify conformance to UL standards. If necessary, contractor shall perform modifications to the unit to comply with UL, as directed by the UL representative, at no additional expense to the Owner.

1.10 QUALITY ASSURANCE

A. Factory Test: Condensing Unit shall be pressure tested, evacuated and given a nitrogen holding charge and an initial oil charge, and shall be factory operational run tested to assure each control device operates properly.

B. Fabricate and label refrigeration system to comply with ASHRAE 15, "Safety Code for Mechanical Refrigeration".

C. Listing and labeling: Provide electrically operated components specified in this section that are listed and labeled.
   1. The condensing unit shall be certified by ETL and the nameplate shall carry the agency label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturers: Subject to strict compliance with the requirements of this specification, provide products by one of the following:
   1. Condensing Units:
      a. AAON, or approved equal

2.02 CONDENSING UNITS

A. Unit Description: Provide and commission as shown on the plans, factory assembled, air-cooled scroll compressor condensing units in the quantity specified. Each unit shall consist of an air-cooled condenser section with hermetic scroll compressor and isolated control compartment containing: control systems, suction and liquid connection valves, and all components necessary for safe and controlled unit operation when connected to the specified low side equipment.

B. Construction:
   1. Unit shall be completely factory assembled, piped, and wired and shipped in one section.
   2. Unit shall be specifically designed for outdoor application.
   3. Paint finish shall be capable of withstanding at least 1000 hours, with no visible corrosive effects, when tested in a salt spray and fog atmosphere in accordance with ASTM B 117-95 test procedure.
   4. The condenser coil shall be mechanically protected from visible damage by painted galvanized steel louvers covering the full area of the coil.

2.03 DESIGN REQUIREMENTS

A. General: Provide a complete scroll compressor condensing unit as specified herein and as shown on the drawings. The unit shall be in accordance with the standards referenced in Section 1.03 and any local codes in effect.

B. Performance: Refer to the schedule of performance on the unit rating page. The unit shall be capable of stable cooling operation to a minimum of 55°F outdoor temperature.

2.04 CONDENSING UNIT FEATURES

A. Compressor:
1. The compressor shall be two step, sealed hermetic scroll type, with inherent thermal overload protection and shall be mounted on rubber vibration isolators.
2. Each compressor shall be furnished with a crankcase heater.
   a. The compressor shall be covered by a high-density foam sound attenuating blanket to reduce radiated noise.

B. Condenser:
1. The condenser coil shall consist of seamless copper tubes mechanically bonded into plate type aluminum fins. The fins shall have full drawn collars to completely cover the tubes. A subcooling section shall be an integral part of the main condenser coil.
2. The condenser fan shall be propeller type arranged for vertical air discharge, and driven by a direct drive fan motor. The fan discharge area shall be equipped with a heavy-gauge fan guard.
3. Fan motor shall be weather protected, single phase, direct drive, 1100 RPM, open drip-proof type motor.

C. Refrigeration Circuit:
1. The condensing unit shall operate with R-410A refrigerant. The condensing unit shall be furnished with a liquid line filter drier and service valves for liquid and suction connections. The finished field installed refrigerant circuit furnished by the contractor shall include the low side cooling components, refrigerant, thermal expansion valve, liquid line, and insulated suction line. Unit shall include a variable capacity scroll compressor on the first refrigeration circuit(s) which shall be capable of modulation from 10-100% of its capacity.

D. Control System:
1. A centrally located weatherproof control panel shall be isolated from condenser coil airflow, and shall contain the field power connection points, control terminal block and control system.
2. Control circuit transformer and wiring shall provide 24V control voltage from the line voltage provided to the unit.
3. Power and starting components shall include fan motor contactors, 5 minutes off time delay relays for the compressor, inherent fan motor overload protection and unit power terminal blocks for connection to remote disconnect switch. Safety and operating controls shall include a manually reset high pressure switch and an automatic reset low pressure switch. Barrier panels shall be furnished to protect against accidental
   a. Control circuit transformer and wiring shall provide 24V control voltage from the line voltage provided to the unit.

E. Wiring Diagrams:
   1. Color-coded and marked wiring diagrams shall be provided with both "point-to-point" and "ladder" to match the color and markings of the unit wiring.
   2. Diagrams shall be laminated in plastic and permanently fixed to the control compartment door.
   3. Installation, Operation, and Maintenance manual shall be supplied with unit within the control compartment.

F. Power Options:
   1. Unit shall be provided with phase and brown-out protection to shut down all motors in the unit if the phases are more than 10% out of balance on voltage, or the voltage is more than 10% under design voltage or on phase reversal.
   2. Unit shall be provided with a factory installed and wired 115 volt, 12 amp ground fault service receptacle powered by a 1.5 KVA transformer.

PART 3 EXECUTION

3.01 INSTALLATION

A. General: Rig and install in full accordance with Manufacturers requirements, shop drawings, and contract documents.

B. Location: Locate condensing unit as indicated on drawings, including cleaning and service maintenance clearance per Manufacturer instructions. Adjust and level condensing unit on supports.

C. Components: Installing Contractor shall provide and install all refrigerant piping and auxiliary devices and accessories for fully operational condensing unit, in accordance with the manufacturer's requirements, shop drawings and contract documents.

D. Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor (Division 26).

E. Controls: Coordinate all control requirements and connections with Controls Contractor.

F. Finish: Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish.

G. Evacuate the system and charge with refrigerant in accordance with standard practice.

3.02 START UP

A. Check and assure proper system charge of refrigerant and oil.

B. Provide testing, and starting of the system, and instruct the Owner in its proper operation and maintenance.

3.03 CLOSEOUT PROCEDURES

A. Owner's Instructions: Provide 8-hours of services for manufacturer's technical representative to instruct State personnel in operation and maintenance of condensing unit.

1. Schedule training with Director's Representative, provide at least 5 day notice of training date.

END OF SECTION

SECTION 260523

WIRING FOR MOTORS AND MOTOR CONTROLLERS

PART 1 GENERAL

1.01 REFERENCES

A. NEMA, ANSI, and UL.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 LEED REQUIREMENTS

A. The materials and/or equipment specified in this section may contribute towards the prerequisites and credits required to obtain LEED certification for the building. Refer to spec section '018113 LEED Documentation Requirements' for information on submittals, procedures, material properties, and credits requirements.

B. LEED submittals identified in this section, if any, are only applicable for the building. A complete list of LEED submittals have been identified in spec section '018113 LEED Documentation Requirements'. The contractor is required to submit information for materials and/or equipment as outlined in spec section 018113 - even if this section does not indicate the submittal being required.

C. Submit LEED submittals in accordance with Specification Section 013300 Submittals and 018113 LEED Documentation Requirements.

1.04 SUBMITTALS

A. Shop Drawings: Complete wiring diagrams of all power and control connections (Standard diagrams will not be accepted). Deliver 2 copies of approved wiring diagrams to the Electrical Work Contractor for installation of power wiring and connections required under the Electrical Work Contract.

B. Shop Drawings: Complete wiring diagrams of all power and control connections (Standard diagrams will not be accepted).

C. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS FOR CONTROL WIRING

A. Raceways, Fittings and Accessories:

1. Rigid Ferrous Metal Conduit: Steel, hot dipped galvanized on the outside and inside, UL categorized as Rigid Ferrous Metal Conduit (identified on UL Listing Mark as Rigid Metal Conduit - Steel or Rigid Steel Conduit), by Allied Tube & Conduit Corp., LTV Copperweld, or Wheatland Tube Co.
2. Liquid-tight Flexible Metal Conduit: UL categorized as liquid-tight flexible metal conduit (identified on UL Listing Mark as Liquid-Tight Flexible Metal Conduit, also specifically marked with temperature and environment application data), by AFC Cable Systems Inc., Anamet Electrical Inc., Electri-Flex Co., or Universal Metal Hose Co.
3. Insulated Bushings, Plastic Bushings, Insulated Grounding Bushings: By Appleton Electric Co., Cooper/Crouse-Hinds, OZ/Gedney Co., or Thomas & Betts Corp.
4. Connectors and Couplings:
   a. Locknuts: UL, steel/zinc electroplate; Appleton Electric Co.'s BL-50 Series, Cooper/Crouse-Hinds' 11 Series, OZ/Gedney Co.'s 1-50S Series, Raco Inc.'s 1002 Series, Steel City/T&B Corp.'s LN-101 Series, or Thomas & Betts Corp.'s 141 Series.
   b. Couplings (For Rigid Metal Conduit): Standard galvanized threaded couplings as furnished by conduit manufacturer, Allied Tube & Conduit Corp.'s Kwik-Couple, or Thomas & Betts Corp.'s Shamrock.
   c. Three Piece Conduit Coupling (For Rigid Metal and IMC Conduit): Steel, malleable iron, zinc electroplate; Allied Tube & Conduit Corp.'s Kwik-Couple, Appleton Electric Co.'s EC-50 Series, Cooper/Crouse-Hinds' 190M Series, OZ/Gedney Co.'s 4-50 Series, Raco Inc.'s 1502 Series, Steel City/T & B Corp.s EK-401 Series, or Thomas & Betts Corp.'s 675 Series.
   d. Liquid-tight Flexible Metal Conduit Connectors:
      1) Dry, Damp Locations: Steel, malleable iron, zinc electroplate, insulated throat; Appleton Electric Co.'s STB Series, Cooper/Crouse-Hinds' LTB Series, OZ/Gedney Co.'s 4Q-50T Series, Raco Inc.'s 3512 Series, Steel City/T & B Corp.'s LT-701 Series, or Thomas & Betts Corp.'s 5332 Series.
      2) Wet Locations: OZ/Gedney Co.'s 4Q-TG Series (hot-dip/mechanically galvanized), or Thomas & Betts Corp.'s 3322 Series (PVC coated).
5. Conduit Bodies (Threaded):
   a. Dry, Damp Locations: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, OZ/Gedney Co.'s Conduit Bodies, or Thomas & Betts Corp.'s Conduit Bodies.
   b. Wet Locations: Malleable iron or cast iron alloy bodies and covers with hot dipped galvanized or other specified corrosion

resistant finish; Cooper/Crouse-Hinds' Condulets (Corro-free epoxy powder coat), Thomas & Betts Corp.'s Conduit Bodies (hot dipped galvanized), or OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized). Stainless steel cover screws, covers gasketed to suit application.

6. Expansion Fittings:
   a. Dry, Damp Locations:
      1) Malleable iron, zinc electroplate finish: Appleton Electric Co.'s XJ or OZ/Gedney Co.'s AX (TX for EMT), with external bonding jumper.
      2) Electrogalvanized Steel: Cooper/Crouse-Hinds' XJG (XJG-EMT for EMT), or Thomas & Betts Corp.'s XJG, with internal grounding.
   b. Wet Locations: Cooper/Crouse-Hinds XJG (Corro-free epoxy powder coat), OZ Gedney Co.'s AX, EXE (end type, hot dipped galvanized), or Thomas & Betts Corp.'s XJG (hot dipped galvanized).
7. Deflection Fittings:
   a. Dry, Damp Locations: Appleton Electric Co.'s DF, Cooper/Crouse-Hinds' XD, or OZ/Gedney Co.'s Type DX.
   b. Wet Locations: Ductile iron couplings with hot dipped galvanized finish, neoprene sleeve, and stainless steel bands, Appleton Electric Co.'s CF; or bronze couplings, neoprene sleeve, and stainless steel bands, OZ/Gedney Co.'s Type DX.
8. Sealing Fittings:
   a. Dry, Damp Locations: Appleton Electric Co.'s EYS, ESU w/Kwiko sealing compound and fiber filler, Cooper/Crouse-Hinds' EYS, EZS w/Chico A sealing compound and Chico X filler, OZ/Gedney Co.'s EY, EYA with EYC sealing compound and EYF damming fiber, or Thomas & Betts Corp.'s. EYS w/Chico A sealing compound and Chico X filler.
      1) Other Type Fittings: As required to suit installation requirements, by Appleton Electric Co., Cooper/Crouse-Hinds, OZ/Gedney Co, or Thomas & Betts Corp.
   b. Wet Locations: Malleable iron body with hot dipped/mechanically galvanized finish, neoprene sleeve, and stainless steel bands, Appleton electric Co.'s CF; or bronze couplings, neoprene sleeve, and stainless steel bands, OZ/Gedney Co.'s Type DX.
      1) Horizontal: Cooper/Crouse-Hinds' EYS with Chico A sealing compound and Chico X filler, OZ/Gedney Co.'s EYD with EYC sealing compound and EYF damming fiber, or Thomas & Betts Corp.'s. EYS w/Chico A sealing compound and Chico X filler.
      2) Vertical (with Drain): Cooper/Crouse-Hinds with Chico A sealing compound and Chico X filler, OZ/Gedney Co.'s EY, EYA with EYC sealing compound and EYF damming fiber, or Thomas & Betts Corp.'s. w/Chico A sealing compound and Chico X filler.
      3) Other Type Fittings. As required to suit installation requirements, by Cooper/Crouse-Hinds, OZ/Gedney Co.,

or Thomas & Betts Corp. with hot dipped/mechanically galvanized finish or epoxy powder coat.

9. Sealant for Raceways Exposed to Different Temperatures: Sealing compounds and accessories to suit installation; Appleton Electric Co.'s DUC, or Kwiko Sealing Compound with fiber filler, Cooper/Crouse-Hinds' Chico A Sealing Compound with Chico X fiber, Electrical Products Division 3M Scotch products, OZ Gedney Co.'s DUX or EYC sealing compound with EYF damming fiber, or Thomas & Betts Corp.'s Blackburn DX.
10. Vertical Conductor Supports:
    a. Dry, Damp Locations: Kellems/Hubbell Inc.'s Conduit Riser Grips, or OZ/Gedney Co.'s Type M, Type R.
    b. Wet Locations: Kellems/Hubbell Inc.'s Conduit Riser Grips (stainless steel or tin coated bronze), or OZ/Gedney Co.'s hot dipped galvanized finish Type CMT or Type W.

B. Outlet/Device, Junction and Pull Boxes:
1. Galvanized Steel Boxes for Concealed Work: Standard galvanized steel boxes and device covers by Appleton Electric Co., Beck Mfg./Picoma Industries, Cooper/Crouse-Hinds, Raco/Div. of Hubbell , or Steel City/T & B Corp.
2. Galvanized Steel Junction and Pull boxes for Exposed Work: Code gage, galvanized steel screw cover boxes by Delta Metal Products Inc., Hoffman Enclosures Inc., Hubbell Wiegmann, Lee Products Co., or Rittal/Electromate.
3. Threaded Type Boxes for Exposed Work:
    a. Outlet Boxes:
        1) For Dry, Damp Locations: Zinc electroplate malleable iron or cast iron alloy boxes by Appleton Electric Co., Cooper/Crouse-Hinds Co., OZ/ Gedney Co., or Thomas & Betts Corp. with zinc electroplate steel covers to suit application.
        2) For Wet Locations: Malleable iron or cast iron alloy boxes with hot dipped galvanized or other specified corrosion resistant finish as produced by Cooper/Crouse-Hinds (hot dipped galvanized or Corro-free epoxy powder coat), OZ/Gedney Co. (hot dipped galvanized), or Thomas & Betts Corp. (hot dipped galvanized) with stainless steel cover screws, and malleable iron covers gasketed to suit application.
    b. Junction And Pull Boxes:
        1) For Dry, Damp Locations: Zinc electroplate cast iron boxes by Appleton Electric Co., Cooper/Crouse-Hinds, OZ/Gedney Co., or Thomas & Betts Corp. with zinc electroplate steel or cast iron cover.
        2) For Wet Locations: Cast iron boxes by Cooper/Crouse-Hinds' (hot dipped galvanized or Corro-free epoxy powder coat), OZ/Gedney Co. (hot dipped galvanized), or Thomas & Betts Corp. (hot dipped galvanized) with stainless steel cover screws and cast iron cover gasketed to suit application.

c. Conduit Bodies, Threaded (Provided with a Volume Marking):
1) For Dry, Damp Location: Zinc electroplate malleable iron or cast iron alloy bodies with zinc electroplate steel covers; Appleton Electric Co.'s Unilets, Cooper/Crouse-Hinds' Condulets, OZ/Gedney Co.'s Conduit Bodies, or Thomas & Betts Corp.'s Conduit Bodies.
2) For Wet Locations: Malleable iron or cast iron alloy bodies with hot dipped galvanized or other specified corrosion resistant finish; Cooper/Crouse-Hinds' Condulets (hot dipped galvanized or Corro-free epoxy power coat), OZ/Gedney Co.'s Conduit Bodies (hot dipped galvanized), or Thomas & Betts Corp.'s Conduit Bodies (hot dipped galvanized) with stainless steel cover screws and malleable iron covers gasketed to suit application.

4. Specific Purpose Outlet Boxes: As fabricated by manufacturers for mounting their equipment.
5. For Fire Rated Construction:
a. Parameters For Use of Listed Metallic Boxes: UL Electrical Construction Equipment Directory - Metallic Outlet Boxes (QCIT).
b. Wall Opening Protective Materials: As listed in UL Fire Resistance Directory - Wall Opening Protective Materials (CLIV), or UL Electrical Construction Equipment Directory - Wall Opening Protective Materials (QCSN).

C. Conductors and Accessories:
1. Date of Manufacture: No insulated conductor over one year old when delivered to the site will be acceptable.
2. Conductors: Annealed uncoated copper or annealed coated copper in conformance with the applicable standards for the type of insulation to be applied on the conductor.
3. Class 1 Wiring:
a. No. 18 and No. 16 AWG: Insulated copper conductors suitable for 600 volts, NFPA 70 types KF-2, KFF-2, PAFF, PF, PFF, PGF, PGFF, PTFF, SF-2, SFF-2, TF, TFF, TFN, TFFN, ZF, or ZFF.
b. Larger than No. 16 AWG: Insulated copper conductors suitable for 600 volts, in compliance with NFPA 70 Article 310.
c. Conductor with other types and thickness of insulation may be used if listed for Class 1 circuit use.
4. Class 2 Wiring:
a. Multiconductor Cables: NFPA 70 Article 725, Types CL2P, CL2R, CL2.
b. Other types of cables may be used in accordance with NFPA 70 Table 725-61 "Cable Uses and Permitted Substitutions", as approved.
5. Class 3 Wiring:
a. Single Conductors No. 18 and No. 16 AWG: Same as Class 1 No. 18 and No. 16 AWG conductors, except that:
1) Conductors are also listed as CL3.

2) Voltage rating not marked on cable except where cable has multiple listings and voltage marking is required for one or more of the listings.

b. Multiconductor Cables: NFPA 70 Article 725, Types CL3P, CL3R, CL3.

c. Other types of cables may be used in accordance with NFPA 70, Table 725-61 "Cable Uses and Permitted Substitutions", as approved.

6. Connectors:

a. General: Connectors specified are part of a system. Furnish connectors and components, and use specific tools and methods as recommended by connector manufacturer to form complete connector system.

b. Splices:

1) Spring Type:

a) Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s B-Cap, Electrical Products Div./3M's Scotchlok Type Y, R, G, B, O/B+, R/Y+, or B/G+, or Ideal Industries Inc.'s Wing Nuts or Wire Nuts.

b) Rated 150° C, 600V; Ideal Industries Inc.'s High Temperature Wire-Nut Model 73B, 59B.

2) Indent Type with Insulating Jacket:

a) Rated 105° C, 600V; Buchanan/Ideal Industries Inc.'s Crimp Connectors, Ideal Industries Inc.'s Crimp Connectors, Penn-Union Corp.'s Penn-Crimps, or Thomas & Betts Corp.'s STA-KON.

3) Indent Type (Uninsulated): Anderson/Hubbell's Versa-Crimp, VERSAtile, Blackburn/T&B Corp.'s Color-Coded Compression Connectors, Electrical Products Div./3M's Scotchlok 10000, 11000 Series, Framatome Connectors/Burndy's Hydent, Penn-Union Corp.'s BCU, BBCU Series, or Thomas & Betts Corp.'s Compression Connectors.

4) Connector Blocks: NIS Industires Inc.'s Polaris System, or Thomas & Betts Corp.'s Blackburn AMT Series.

5) Resin Splice Kits: Electrical Products Div./3M's Scotchcast Brand Kit Nos. 82A Series, 82-B1 or 90-B1, or Scotchcast Brand Resin Pressure Splicing Method.

6) Heat Shrinkable Splices: Electrical Products Div./3M's ITCSN, Raychem Corp.'s Thermofit Type WCS, or Thomas & Betts Corp.'s SHRINK-KON Insulators.

7) Cold Shrink Splices: Electrical Products Div./3M's 8420 Series.

7. Terminals: Nylon insulated pressure terminal connectors by Amp-Tyco/Electronics, Electrical Products Div./3M, Framatome Connectors/Burndy, Ideal Industries Inc., Panduit Corp., Penn-Union Corp., Thomas & Betts Corp., or Wiremold Co.

8. Insulation Tapes:

a. Plastic Tape: Electrical Products Div./3M's Scotch Super 33+ or Scotch 88, Plymouth Rubber Co.'s Plymouth/ Bishop Premium 85CW.
b. Rubber Tape: Electrical Products Div./3M's Scotch 130C, or Plymouth Rubber Co.'s Plymouth/Bishop W963 Plysafe.

9. Moisture Sealing Tape: Electrical Products Div./3M's Scotch 2200 or 2210, or Plymouth Rubber Co.'s Plymouth/Bishop 4000 Plyseal-V.
10. Wire Management Products: Cable clamps and clips, cable ties, spiral wraps, etc., by Catamount/T&B Corp., or Ideal Industries Inc.

D. Supporting Devices:
1. "C" Beam Clamps:
a. For 1 Inch Conduit Maximum: B-Line Systems Inc.'s BG-8-C2 and BP-8-C1 Series, or Caddy Fastener Div./Erico Products Inc.'s BC-8P and BC-8PSM Series.
b. For 3 Inch Conduit Maximum: Appleton Electric Co.'s BH-500 Series beam clamp with H50W/B Series hangers, Kindorf/T&B Corp.'s 500 Series beam clamp with 6H0-B Series hanger, or OZ/Gedney Co.'s IS-500 Series beam clamp with H-OWB Series hanger.
c. For 1/4 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy Fastener Div./Erico Products Inc.'s BC, Kindorf/T&B Corp.'s 500-SC, 510, or Unistrut Corp.'s P1648S, P2398S, P2675, P2676.
d. For 3/8 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy Fastener Div./Erico Products Inc.'s BC, Kindorf/T&B Corp.'s E231-3/8, 502, or Unistrut Corp.'s P1649AS, P2401S, P2675, P2676.
2. Pipe Straps: Two hole steel conduit straps; Kindorf/T&B Corp.'s C-144 Series.
3. Pipe Clamps: One hole malleable iron clamps; Kindorf/T&B Corp.'s HS-400 Series, or OZ/ Gedney Co.'s 14-50 Series.
4. Supporting Fastener (Metal Stud Construction): Metal stud supports, clips and accessories as produced by Caddy Fastener Div./Erico Products Inc.

PART 3 EXECUTION

3.01 INSTALLATION, GENERAL

A. Power Wiring: Not included in this Contract (provided by Electric Contractor). Exception:
1. Where a power source (at junction box, enclosed circuit breaker, safety switch, or panelboard) is provided by the Electric Contractor, provide power wiring from the power source to the equipment.

B. Power Wiring: As specified in other Electrical Sections.

C. Control Wiring: Provide control wiring and connections.

1. Where control circuit interlocking is required between individually mounted motor controllers, provide a single pole on-off switch in a threaded type box mounted adjacent to motor safety switches which are remote from the control transformer (to enable interlock circuit to be opened when the motor safety switch is opened).

3.02 RACEWAY INSTALLATION

A. Conduit Installed Concealed:
   1. Install conduit concealed unless otherwise indicated on the drawings.
   2. New Construction:
      a. Run conduit in the ceilings, walls, and partitions.

   3. If any portions of the conduit system cannot be installed concealed due to conditions encountered in the building, report such conditions and await approval in writing before proceeding.

B. Conduits Penetrating Concrete Floor Slabs (Concrete slabs that are both ceilings and floors shall be treated as floor slabs):
   1. Provide a minimum of 2 inches between conduits that vertically penetrate elevated concrete slabs.
   2. Provide firestopping and spray on fireproofing at locations where conduits penetrate surface of floor slab and slab is part of fire rating required for construction.

C. Conduit Installed Exposed:
   1. Install conduit exposed where indicated on the drawings. If not indicated, conduit may be installed exposed, as approved, in:
      a. Unfinished spaces, and finished spaces housing mechanical or electrical equipment that is generally accessible only to facility maintenance personnel.
      b. Areas where conduit cannot be installed concealed.
   2. Install conduit tight to the surface of the building construction. Exceptions:
      a. Where otherwise indicated or directed.
      b. Where conduit is exposed in wet locations. Install entire wiring system including conduit, boxes, and fittings so that there is 1/4 inch air space between it and the wall or supporting surface.
   3. Install vertical runs perpendicular to the floor.
   4. Install runs on the ceiling perpendicular or parallel to the walls.
   5. Install horizontal runs parallel to the floor.
   6. Do not run conduits near heating pipes.
   7. Installation of conduit directly on the floor will not be permitted.

D. Conduit Size: Not smaller than 3/4 inch electrical trade size.

E. Raceways Exposed to Different Temperatures: Where portions of an interior raceway system are exposed to widely different temperatures, seal interior and exterior of raceway to prevent circulation of air from a warmer to a colder section through the raceway installation.

1. Refrigerated Rooms: Install conduit body or junction box in the raceway system on warm side of refrigerated room. After conductors are installed, seal interior of the raceway at the conduit body or junction box.
2. Heated Areas to Unheated Areas: After conductors are installed, seal interior of the raceway at the nearest conduit body, outlet or junction box in the heated area adjoining the unheated area.

F. Conduit in Waterproofed Floors: Install conduit runs in waterproof floors to avoid penetrating the waterproofing. Avoid penetration of waterproofing with conduit risers so far as practicable.
1. Where it is necessary to puncture the waterproofing for a conduit riser, install a standard weight steel pipe sleeve extending one inch above the finished floor level. Flash the steel pipe sleeve to the waterproofing with 16 ounce copper. Construct the flashing with a copper tube extending the full height of the sleeve, soldered to a copper base extending 6 inches in all directions from the sleeve.
2. The flashing will be integrated into the waterproofing by the Construction Contractor. Provide solid cast brass floor plates with chromium finish where pipe sleeves are exposed in rooms.

G. Raceway Schedule:
1. Rigid Ferrous Metal Conduit: Install in all locations unless otherwise specified or indicated on the drawings.
2. Liquid-tight Flexible Metal Conduit: Use 1 to 3 feet of liquid-tight flexible metal conduit (UL listed and marked suitable for the installation's temperature and environmental conditions) for final conduit connection to:
    a. Equipment subject to vibration (damp and wet locations).
    b. Equipment requiring flexible connection for adjustment or alignment (damp and wet locations).

H. Fittings and Accessories Schedule:
1. General:
    a. Use fittings and accessories that have a temperature rating equal to, or higher than the temperature rating of the conductors to be installed within the raceway.
    b. Use zinc electroplate or hot dipped galvanized steel/malleable iron or cast iron alloy fittings and accessories in conjunction with ferrous raceways in dry and damp locations unless otherwise specified or indicated on the drawings.
    c. Use malleable iron or cast iron alloy fittings and accessories having hot dipped/mechanically galvanized finish or other specified corrosion resistant finish in conjunction with ferrous raceways in wet locations unless otherwise specified or indicated on the drawings.
    d. Use caps or plugs to seal ends of conduits until wiring is installed (to exclude foreign material).
    e. Use insulated grounding bushings on the ends of conduits that are not directly connected to the enclosure (such as stub-ups under equipment, etc.) and bond between bushings and enclosure with equipment grounding conductor.

f. Use expansion fittings where raceways cross expansion joints.
g. Use deflection fittings where raceways cross expansion joints that move in more than one plane.
h. Use 2 locknuts and an insulated bushing on end of each conduit entering sheet metal cabinet or box in dry or damp locations.
1) Plastic bushings may be used on 1/2 and 3/4 inch conduit in lieu of insulated bushing.
2) Terminate conduit ends within cabinet/box at the same level.
i. Use watertight hub on end of each conduit entering cabinets or boxes (in wet locations) that are not constructed with integral threaded hubs.

2. For Rigid Metal Conduit: Use threaded fittings and accessories. Use 3 piece conduit coupling where neither piece of conduit can be rotated.
3. For Liquid-tight Flexible Metal Conduit: Use liquid-tight connectors.

3.03 OUTLET, JUNCTION AND PULLBOX INSTALLATION

A. Boxes For Concealed Conduit System:
1. Non-Fire Rated Construction:
a. Depth: To suit job conditions and comply with NFPA 70 Article 370.
b. For Junction and Pull Boxes: Use galvanized steel boxes with flush covers.
c. For Devices:
1) Plaster or Cast-In-Place Concrete Walls: Use 4 inch or 4-11/16 inch galvanized steel boxes with device covers.
2) Walls Other Than Plaster or Cast-In-Place Concrete: Use type of galvanized steel box that will allow device to cover the opening made for the installation of the box.

2. Recessed Boxes in Fire Rated (2 hour maximum) Bearing and Nonbearing Wood or Steel Stud Walls (Gypsum Wallboard Facings):
a. Use listed single and double gang metallic device boxes. The surface area of individual device box shall not exceed 16 square inches.
b. The aggregate surface area of the boxes shall not exceed 100 square inches per 100 square feet of wall surface.
c. Securely fasten boxes to the studs. Verify that the opening in the wallboard facing is cut so that the clearance between the box and the wallboard does not exceed 1/8 inch.
d. Separate boxes located on opposite sides of walls or partitions by a minimum horizontal distance of 24 inches. This minimum separation distance may be reduced when wall opening protective materials are installed according to the requirements of their classification.
e. Use wall opening protective material in conjunction with boxes installed on opposite sides of walls or partitions of staggered stud construction in accordance with the classification requirements for the protective material.

3. Other Fire Rated Construction: Use materials and methods to comply with the listing requirements for the classified construction.

B. Boxes For Exposed Conduit System:
   1. Dry and Damp Locations: Use zinc electroplate or hot dipped galvanized threaded type malleable iron or cast iron alloy outlet, junction, and pullboxes or conduit bodies provided with a volume marking in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
      a. Galvanized steel boxes may be used in conjunction with conduit sizes over 1 inch in non-hazardous dry and damp locations.
      b. Galvanized steel boxes may be used in conjunction with electrical metallic tubing where it is installed exposed as branch circuit conduits at elevations over 10’-0” above finished floor.
   2. Wet Locations: Use threaded type malleable iron or cast iron alloy outlet junction, and pullboxes or conduit bodies (provided with a volume marking) with hot dipped galvanized or other specified corrosion resistant coating in conjunction with ferrous raceways unless otherwise specified or indicated on the drawings.
   3. Finishing Collar or Combination Finishing Collar/Outlet Box (Surface Mounted Equipment Used With Exposed Raceway):
      a. Use finishing collar where surface mounted equipment is installed on an exposed raceway outlet box and the equipment base is larger than the outlet box.
      b. Use combination finishing collar/outlet box where surface mounted equipment is not indicated to be installed on an exposed raceway outlet box, but raceway cannot be run directly into equipment body due to equipment design.

C. Specific Purpose Outlet Boxes: Use to mount equipment when available and suitable for job conditions. Unless otherwise specified, use threaded type boxes with finish as specified for exposed conduit system, steel (painted) for surface metal raceway system and galvanized steel for recessed installations.

3.04 CONDUCTOR INSTALLATION

A. Install conductors in raceways.

B. Conductor Size: Install conductors of size shown on drawings. Where size is not indicated for control wiring, the minimum size allowed is:
   1. For Class 1 Circuits:
      a. No. 18 and No. 16 AWG may be used provided they supply loads that do not exceed 6 amps (No. 18 AWG), or 8 amps (No. 16 AWG).
      b. Larger than No. 16 AWG: Use to supply loads not greater than the ampacities given in NFPA 70 Section 310-15.
   2. For Class 2 Circuits: Any size to suit application.
   3. For Class 3 Circuits: No. 18 AWG.

C. Color Code for Control Circuits: In accordance with ICEA/NEMA WC-30 "Color Coding of Wires and Cables". Other coding methods may be used, as approved.

D. Wire Management: Use wire management products to bundle, route, and support wiring in junction boxes, pullboxes, wireways, gutters, channels, and other locations where wiring is accessible.

E. Insulated Conductor Schedule:
   1. Class 1 Circuits: Use Class 1 wiring specified in Part 2 (except where special type insulation is required).
   2. Class 2 Circuits: Use Class 2 wiring specified in Part 2 (except where special type insulation is required).
   3. Class 3 Circuits: Use Class 3 wiring specified in Part 2 (except where special type insulation is required).

F. Connector Schedule:
   1. Splices:
      a. Dry Locations: For Conductors No. 8 AWG or Smaller: Use spring type pressure connectors, indent type pressure connectors with insulating jackets, or connector blocks (except where special type splices are required).
      b. Damp Locations: As specified for dry locations, except apply moisture sealing tape over the entire insulated connection (moisture sealing tape not required if heat shrinkable splices or cold shrink splices are used).
      c. Wet Locations: Use uninsulated indent type pressure connectors and insulate with resin splice kits, cold shrink splices or heat shrinkable splices. Exception: Splices above ground which are totally enclosed and protected in NEMA 3R, 4, 4X enclosures may be spliced as specified for damp locations.
   2. Terminations:
      a. For Conductors No. 10 AWG or Smaller: Use terminals for connecting control wiring to terminal strips, and to equipment designed for use with terminals.

3.05 SUPPORTING DEVICE INSTALLATION

A. Attachment of Conduit System:
   1. Wood Construction: Attach conduit to wood construction by means of pipe straps or pipe clamps and wood screws or lag bolts.
   2. Masonry Construction: Attach conduit to masonry construction by means of pipe straps or pipe clamps and masonry anchorage devices.
   3. Steel Beams: Attach conduit to steel beams by means of "C" beam clamps and hangers.
   4. Conduit Above Suspended Ceiling: Do not rest conduit directly on runner bars, T-bars, etc. Support conduit from ceiling supports or from construction above suspended ceiling.

B. Metal Stud Construction: Attach raceways and boxes to metal studs by means of supporting fasteners manufactured specifically for the purpose.

1. Support and attach outlet boxes so that they cannot torque/twist. Either:
   a. Use bar hanger assembly, or:
   b. In addition to attachment to the stud, also provide far side box support.

END OF SECTION

TABLE OF CONTENTS

013119 Project Meetings
013200 Construction Progress Documentation
013300 Submittals
013350 Computer Aided Design Coordination Drawings
014100 Regulatory Requirements
014216 Definitions
014217 Abbreviations
014339 Mock Up Requirements
015000 Construction Facilities & Temporary Controls
015123 Construction Heat And Temporary Heat
015526 Traffic Maintenance & Protection
015633 Security
016500 Materials And Equipment
017123 Field Engineering
017329 Removals, Cutting, And Patching
017419 Construction Waste Management
017423 Pre Occupancy Cleaning
017716 Contract Closeout
017900 Video Training Programs
018113 LEED Documentation Requirements
018113 Table 018113.1
018113 LEED NC Project Scorecard
018119 Construction Indoor Air Quality Management
018120 Volatile Organic Compound Limits for Adhesives and Sealants
019113 General Commissioning Requirements

FACILITY SERVICES SUBGROUP

DIVISION 02 – EXISTING CONDITIONS

Document Number and Title

023313 Underground Utility Locator Service

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Document Number and Title

078400 Firestopping
079200 Joint Sealers

DIVISION 09 – FINISHES

Document Number and Title

099101 Construction Painting

DIVISION 10 – SPECIALTIES

Document Number and Title

NOT USED

DIVISION 21 – FIRE SUPPRESSION

Document Number and Title

210519 Cold Water Meters
210529 Pipe Hangers and Supports
211300 Sprinkler and Standpipe Piping
211313 Sprinkler Systems

DIVISION 22 – PLUMBING

Document Number and Title

220519 Cold Water Meters
220523 Valves
220529 Pipe Hangers and Supports
220549 Concrete Pads for Equipment
220553 Pipe and Valve Identification
220576 Drainage Accessories
220577 Floor and Area Drains
220700 Piping Insulation
220800 Cleaning and Testing
220810 Plumbing Systems Commissioning
221100 Plumbing Piping
221116 Vacuum Breakers
221118 Backflow Preventers
221119 Water Supply Accessories
221120 Mixing Valves
221121 Metering Valve
221122 Thermometers and Gauges
221123 Pumps
221126 Strainers
223301 Domestic Water Heater
224124 Linear Shower Floor Drain Assembly
224200 Plumbing Fixtures
224223 Showers
224716 Domestic Water Coolers

DIVISION 26 – ELECTRICAL

Document Number and Title

260221 Motors and Motor Controllers
260523 Wiring for Motors and Motor Controllers

DIVISION 31 – EARTHWORK

Document Number and Title

APPENDIX

END OF TABLE OF CONTENTS

SECTION 260221

MOTORS AND MOTOR CONTROLLERS

PART 1 GENERAL

1.01 RELATED WORK SPECIFIED ELSEWHERE

A. Wiring for Motors and Motor Controllers: Section 260523.

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.03 LEED REQUIREMENTS

A. The materials and/or equipment specified in this section may contribute towards the prerequisites and credits required to obtain LEED certification for the building. Refer to spec section '018113 LEED Documentation Requirements' for information on submittals, procedures, material properties, and credits requirements.

B. LEED submittals identified in this section, if any, are only applicable for the building. A complete list of LEED submittals have been identified in spec section '018113 LEED Documentation Requirements'. The contractor is required to submit information for materials and/or equipment as outlined in spec section 018113 - even if this section does not indicate the submittal being required.

C. Submit LEED submittals in accordance with Specification Section 013300 Submittals and 018113 LEED Documentation Requirements.

1.04 REFERENCES

A. NEMA MG-1 - Motors and Generators.

B. NEMA ICS - General Standards for Industrial Control and Systems.

C. UL508 - Electric Industrial Control Equipment.

D. IEEE 519 - Recommended Practices and Requirements for Harmonic Control in Electric Power Systems.

1.05 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Submittal Package: Submit the product data, and quality control submittals specified below at the same time as a package.

C. Product Data:
1. Motor Controllers: Catalog sheets, specifications, and installation instructions. Submit product data for motor controllers simultaneously with product data required for motors.
   a. Identify each controller for use with corresponding motor.
   b. Describe overload devices being supplied with each motor controller (include equipment manufacturer's recommendations).
   c. Enumerate and describe all accessories being supplied with each motor controller.
2. All Motors:
   a. Catalog sheets, specifications and installation instructions.
   b. Data proving that voltage rating of each motor is in accordance with specified NEMA standard motor voltage.
   c. Data proving that the service factor and temperature rise for the motor's insulation system conforms to NEMA standards for each motor's specific application.
   d. Data proving that the motor efficiency rating conforms to NEMA testing and marking standards MG1-12.54 and 12.55.
3. Additional Data for Motors Controlled by Solid State or Adjustable Speed Motor Controllers:
   a. Data proving that the motor has been designed for use with associated controller.
   b. Data proving that the motor has been designed for use with DC injection braking.
4. Additional Data for Motors 50 HP and Larger: Certified report of manufacturer's routine tests for each motor (NEMA MG 1-12.54).

D. Quality Control Submittals:
1. Harmonic analysis report.
2. Company Field Advisor Data: Include:
   a. Name, business address and telephone number of Company Field Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   c. Services and each product for which authorization is given by the Company listed specifically for this project.

E. Contract Closeout Submittals:
1. System acceptance test report.
2. Certificate: Affidavit, signed by the Company Field Advisor and notarized, certifying that the system meets the contract requirements and is operating properly.
3. Operation and Maintenance Data: Deliver 2 copies, covering the installed products, to the Director's Representative.

1.06 QUALITY ASSURANCE

A. Equipment Qualifications For Products Other Than Those Specified:

1. At the time of submission provide written notice to the Director of the intent to propose an “or equal” for products other than those specified. Make the “or equal” submission in a timely manner to allow the Director sufficient time to review the proposed product, perform inspections and witness test demonstrations.
2. If products other than those specified are proposed for use furnish the name, address, and telephone numbers of at least 5 comparable installations that can prove the proposed products have performed satisfactorily for 3 years. Certify in writing that the owners of the 5 comparable installations will allow inspection of their installation by the Director's Representative and the Company Field Advisor.
    a. Make arrangements with the owners of 2 installations (selected by the Director) for inspection of the installations by the Director's Representative. Also obtain the services of the Company Field Advisor for the proposed products to be present. Notify the Director a minimum of 3 weeks prior to the availability of the installations for the inspection, and provide at least one alternative date for each inspection.
    b. Only references from the actual owner or owner’s representative (Security Supervisor, Maintenance Supervisor, etc.) will be accepted. References from dealers, system installers or others, who are not the actual owners of the proposed products, are not acceptable.
        1) Verify the accuracy of all references submitted prior to submission and certify in writing that the accuracy of the information has been confirmed.
3. The product manufacturer shall have test facilities available that can demonstrate that the proposed products meet the contract requirements.
    a. Make arrangements with the test facility for the Director's Representative to witness test demonstrations. Also obtain the services of the Company Field Advisor for the proposed product to be present at the test facility. Notify the Director a minimum of 3 weeks prior to the availability of the test facility, and provide at least one alternative date for the testing.
4. Provide written certification from the manufacturer that the proposed products are compatible for use with all other equipment proposed for use for this system and meet all contract requirements.

B. Harmonic Analysis:

1. The adjustable speed motor controller manufacturer shall perform a harmonic current magnitude and voltage distortion analysis and provide certified calculations specific to this installation, showing that the total harmonic distortion caused by the adjustable speed motor controller will be below the specified level. The analysis shall be accordance with IEEE 519.
2. The results shall be based on a computer aided/modeled circuit simulation of the actual system, based upon the materials and equipment proposed to be furnished and installed.

3. The results shall be based on a computer aided/model circuit from the controller to the distribution transformer supplying the controller, based upon the materials and equipment proposed to be furnished and installed, and associated portions of the existing electrical system.
    a. Basic parameters relative to the existing system are specified herein. Additional information deemed necessary by the controller manufacturer to provide a certified harmonic analysis report shall be obtained by a field investigation of the existing system, at no additional cost to the State.

C. Company Field Advisor: Secure the services of a Company Field Advisor from the Company providing the solid state controllers and the adjustable speed controllers for a minimum of 8 working hours for the following:
1. Render advice regarding installation, programming, final adjustment, and testing.
2. Witness final system test and then certify with an affidavit that the motor controllers are installed in accordance with the contract documents and are operating properly.
3. Train facility personnel on the operation and maintenance of the motor controllers (minimum of two 1 hour sessions).
4. Explain available service programs to facility supervisory personnel for their consideration.

D. Service Availability: A fully equipped service organization shall be available to service the completed Work.

PART 2 PRODUCTS

2.01 MOTORS

A. Classification:
1. Classification According to Application: Comply with NEMA standards for general-purpose alternating-current squirrel-cage induction motors, except:
    a. Furnish NEMA definite-purpose or special-purpose motors when required to suit the application.
    b. Furnish NEMA type other than squirrel-cage construction when required to suit the application.
2. Classification According to Environmental Protection and Methods of Cooling: Comply with NEMA requirements for a drip-proof machine unless otherwise specified or indicated on the drawings, or required to suit the application.

B. Efficiency: Motors shall be stamped with a NEMA nominal efficiency rating in accordance with NEMA testing and marking standards MG1-12.54 and 12.55.
1. Nominal full-load three phase motor efficiency:

OPEN DRIP-PROOF MOTORS			
RPM	**1200**	**1800**	**3600**

HP			
1.0	82.5	85.5	77.0
1.5	86.5	86.5	84.0
2.0	87.5	86.5	85.5
3.0	88.5	89.5	85.5
5.0	89.5	89.5	86.5
7.5	90.2	91.0	88.5
10	91.7	91.7	89.5
15	91.7	93.0	90.2
20	92.4	93.0	91.0
25	93.0	93.6	91.7
30	93.6	94.1	91.7
40	94.1	94.1	92.4
50	94.1	94.5	93.0

2. Furnish motors having an efficiency higher than that indicated above where specified to comply with utility company energy efficiency rebate program requirements.

C. Motor (Nameplate) Voltage:
   1. Nominal 120 V, Single Phase, 3W:
      a. Motors Less Than 1/2 hp: NEMA standard motor voltage 115 V, single phase, 60 Hz.
   2. 120/208 V, Three Phase, 4W, Premises Wiring Systems:
      a. Motors 1/2 hp and Larger: NEMA standard motor voltage 200 V, three phase, 60 Hz. 208 V, 208-230 V, 220 V, or 230 V motors are not acceptable.

D. Horsepower Capacity:
   1. Each motor shall not be overloaded by the apparatus it operates under every condition of operation.
   2. The horsepower capacity shall be the continuous rating based on the nameplate horsepower rating. (The motor may not be overloaded up to the horsepower obtained by multiplying the rated horsepower by the service factor shown on the nameplate).
   3. Where a minimum horsepower capacity is listed, furnish a motor larger than the minimum, if required in a particular case.
   4. Pay additional cost due to necessary increase in feeder sizes, circuit breaker sizes, etc., provided under the Electric Contract.

E. Bearings: Equip motors 1/2 hp and larger with ball bearings unless otherwise specified or indicated on the drawings.

F. Speed: As required and approved to meet the requirements of the service for which motors are intended.

G. Space Heaters: Where indicated, equip motors with space heaters and accessories to prevent condensation in the motor windings when motor is not operating.

H. Motor Winding Protection: Where indicated, equip motors with imbedded temperature measuring detectors in the windings (thermocouples or resistance thermometers) with control unit and accessories for direct reading of stator temperatures. Alarm shall sound and motor controller trip at temperature recommended by motor manufacturer.

I. Additional Requirements For Motors Used With Solid State and Adjustable Speed Motor Controllers:
   1. Designed specifically for use with type of controller required.
   2. Designed for DC injection braking.

J. Brake: Where indicated, equip motors with electro/mechanical brake system.

2.02 MANUAL AND MAGNETIC MOTOR CONTROLLERS

A. Minimum Size: The minimum allowable size of single or three phase magnetic motor controller is NEMA size 0.

B. Voltage Rating: To suit system voltage.
   1. For single phase motor controllers which are not produced to suit the system voltage and phases, furnish properly rated 3 phase motor controllers and utilize required number of poles for the single phase circuit.

C. Enclosures:
   1. NEMA Type: Unless otherwise indicated, furnish NEMA 1 enclosures.
   2. Material: Steel construction unless otherwise indicated.
   3. Type A, A1 and A2 Controllers Indicated To Be Flush Mounted: Furnish stainless steel face plates and galvanized steel recessed mounting boxes.

D. Control Power: Furnish fused secondary control power transformer (maximum control voltage 120 volts) mounted within each magnetic motor controller enclosure.

E. Local Control Devices:
   1. Manual Motor Controllers:
      a. Type A1 Controller: In addition to the on/off switch function, furnish where indicated, a hand/auto switch or 3 position hand-off-auto switch mounted in the enclosure cover.
   2. Magnetic Motor Controllers: Equip controllers with push buttons, or 3 position hand-off-auto selector switch, (to suit operation) mounted in the enclosure cover.
      a. For NEMA 1 enclosures furnish standard duty devices.
      b. For other NEMA enclosures furnish heavy duty devices to suit the requirements of the NEMA enclosure.

F. Pilot Lights:

1. Manual Motor Controllers: Equip controllers with pilot lights (neon) mounted in the enclosure cover.
2. Magnetic Motor Controllers: Equip controllers with pilot lights of the neon lamp type or transformer type, mounted in the enclosure cover.

G. Time Delay Undervoltage Relays.

H. Sequenced Time Delay Relays.

I. Space Heaters: Equip magnetic motor controllers which are installed outdoors, and indoors in unheated locations, with space heaters and humidistat to prevent condensation within the housing.

J. Overload Devices: Equip motor controllers with manual reset melting type (eutectic), or manual reset bi-metallic type standard trip overload devices (NEMA Class 20, trips in 20 seconds or less when carrying a current equal to 600 percent of its current rating). Exceptions:
1. Equip motor controllers with automatic reset overload devices only where indicated.
2. Equip motor controllers with fast trip overload devices when recommended by equipment manufacturer (NEMA Class 10, trips in 10 seconds or less when carrying a current equal to 600 percent of its current rating).
3. Equip motor controllers with slow trip overload devices when recommended by equipment manufacturer (NEMA Class 30, trips in 30 seconds or less when carrying a current equal to 600 percent of its current rating).
4. Equip motor controllers with ambient compensated overload protection where motor and relay are not in the same ambient.
5. Equip motor controllers with solid state overload relays where indicated.

K. Manual Motor Controller Types:
1. Type A (Full Voltage, Non-Magnetic): Allen-Bradley Co.'s Bulletin 609, Cutler-Hammer Products' File A/B300-9115, Furnas Electric Co.'s Class 11, General Electric Co.'s CR-1062, Square D Co.'s Class 2510, Type M, or Westinghouse Electric Corp.'s Type B100.
2. Type A1 (Full Voltage, Non-Magnetic Single Phase): Allen-Bradley Co.'s Bulletin 600, Cutler-Hammer Products' File B200-9101, Furnas Electric Co.'s class 10, General Electric Co.'s CR-101, Square D Co.'s Class 2510, Type F, or Westinghouse Electric Corp.'s Type MS.
3. Type A2 (2 Speed, 2 Winding, Full Voltage, Non-Magnetic): Allen-Bradley Co.'s Bulletin 609TS, Cutler-Hammer Products' File A700, General Electric Co.'s CR-1062, or Square D Co.'s Class 2512, Type M.
4. Type A3 (2 Speed, 2 Winding, Full Voltage, Non-Magnetic, Single Phase): Allen-Bradley Co.'s Bulletin 600, Cutler-Hammer Products' File B200-9106, General Electric Co.'s CR-101, or Square D Co.'s Class 2512, Type F.

L. Magnetic Motor Controller Types:

1. Type B (Full Voltage Magnetic): Allen-Bradley Co.'s Bulletin 509, Cutler-Hammer Products' File A10-9586, Furnas Electric Co.'s Class 14, General Electric Co.'s CR-306, Square D Co.'s Class 8536, or Westinghouse Electric Corp.'s Class A200.
2. Type B-COM (Combination Full Voltage, Magnetic/Safety Switch): Allen-Bradley Co.'s Bulletin 512, Cutler-Hammer Products' File A30-9589, Furnas Electric Co.'s Class 17, General Electric Co.'s, CR-308, Square D Co.'s Class 8538, or Westinghouse Electric Corp.'s Class A203.
3. Type B2 (2 Speed, 2 Winding, Full Voltage, Magnetic): Allen-Bradley Co.'s Bulletin 530, Cutler-Hammer Products' File A700, Furnas Electric Co.'s Class 30, General Electric Co.'s CR-309, Square D Co.'s Class 8810, or Westinghouse Electric Corp.'s Class A900.
4. Type C (Automatic, Reduced Voltage Autotransformer, Magnetic): Allen-Bradley Co.'s Bulletin 570, Cutler-Hammer Products' File A400-9621, Furnas Electric Co.'s Class 36, General Electric Co.'s CR-331, Square D Co.'s, Class 8606, or Westinghouse Electric Corp.'s Class A600.
5. Type C-Com (Combination Automatic, Reduced Voltage Autotransformer, Magnetic/Safety Switch): Allen-Bradley Co.'s Bulletin 572, Cutler-Hammer Products' File A400-9621, Furnas Electric Co.'s Class 37, Square D Co.'s Class 8606, or Westinghouse Electric Corp.'s Class A603.
6. Type D (Part Winding, Magnetic): Allen-Bradley Co.'s Bulletin 530, Cutler-Hammer Products' File A460-9612, Furnas Electric Co.'s Class 36, General Electric Co.'s CR-330, Square D Co.'s Class 8640, or Westinghouse Electric Corp's Class A700.

M. Remote Control Stations:
1. Normal Duty: Start-Stop with pilot light unless otherwise indicated, in NEMA 1 enclosure; Allen-Bradley Co.'s Bulletin 800S, Cutler-Hammer Products' Bulletin 10250, Furnas Electric Co.'s Class 50, General Electric Co.'s CR-2943, Square D Co.'s Class 9001, or Westinghouse Electric Corp.'s Type PB1/PB2.
2. Heavy Duty: Start-Stop with pilot light unless otherwise indicated, in NEMA enclosure to suit conditions; Allen-Bradley Co.'s Bulletin 800T, Cutler-Hammer Products' 10250T, Furnas Electric Co.'s Class 52, General Electric Co.'s CR104P, Square D Co.'s Class 9001, or Westinghouse Electric Corp.'s Type PB1/PB2.

2.03 SOLID STATE MOTOR CONTROLLERS

A. Type SS for Motor: Microprocessor controlled, solid state, stepless, reduced voltage motor controller:
1. Companies and Models: Furnish the Company's model which meets the requirements of the motor and driven equipment combination, suits the electrical system parameters, and accommodates the operating features and accessories:
   a. Allen-Bradley Co. Inc.'s Bulletin 2050 (30-120 hp, 208-575 V).
   b. Furnas Electric Co.'s Class 93 (25-350 hp, 200-575 V).

c. General Electric Co.'s CR270 (20-1000 hp, 480 V).
d. Square D Co.'s Class 8660 (3-600 hp, 200-575 V).
e. Westinghouse Electric Corp.'s ES (5-1000 hp, 208-575 V).

2. Operating Features And Accessories:
   a. Single speed.
   b. Current ramp starting mode: Low initial current (starting at zero) gradually increasing to a maximum starting current value utilizing adjustable acceleration ramp time (rate of current increase). Once up to speed the current falls back to the motors running current.
   c. Constant current starting mode: Motor receivers constant current within the current level limit adjustments. Once up to speed the current falls back to the motors running current.
   d. Linear timed starting mode: Variable voltage and current controlled acceleration time/linear rate of speed increase, to operate in conjunction with the motor tachometer. Starting current does not exceed the motors running current.
   e. Energy saver feature which automatically reduces voltage to lightly loaded motor.
   f. Voltage limiter set to not exceed voltage rating of motor.
   g. Heavy duty dynamic braking which directs the regenerative energy from the motor into a resistor.
   h. Provision to energize electro/mechanical brake to hold the driven equipment stopped, after the motor has stopped.
   i. Ambient operating temperature range 0 to 40 degrees C. Maximum humidity 95 percent.
   j. Digital display, or meters with switches, showing operational functions:
      1) Voltage.
      2) Current.
      3) Elapsed time.
   k. Digital display, or LED's showing diagnostic functions, including:
      1) Phase loss.
      2) Phase reversal.
      3) Undervoltage.
      4) Overtemperature.
      5) Ground fault.
   l. Trouble alarm contact for remote alarm.
   m. Suitable for use on circuit capable of delivering 42,000 amps RMS short circuit fault current.
   n. Input voltage: Suitable for use on 208 V ac 3 phase circuit.
   o. 100 percent continuous current rating, 300 percent for 30 seconds.
   p. Local control panel for manual operation:
      1) Start-stop pushbuttons.
      2) Hand-Off-Automatic selector switch.
      3) Hand-Automatic selector switch, and start-stop pushbuttons.
      4) Forward-Reverse selector switch.

5) Fast-Slow (for 2 speed motor).
6) Run light.

q. Local programming panel or other control method for:
1) Acceleration rate.
2) Deceleration rate.

r. Fused secondary control power transformer.

s. Start/stop control voltage maximum 120 V, 3 wire.

t. Auxiliary output contacts, 120 V ac, 1 amp:
1) Fault: 1 N.O., 1 N.O.

u. Overload Devices: Equip motor controller with manual reset solid state, manual reset melting type (eutectic), or manual reset bi-metallic type standard trip overload devices (NEMA Class 20, trips in 20 seconds or less when carrying a current equal to 600 percent of its current rating). Exceptions:
1) Equip motor controllers with fast trip overload devices when recommended by equipment manufacturer (NEMA Class 10, trips in 10 seconds or less when carrying a current equal to 600 percent of its current rating).
2) Equip motor controllers with slow trip overload devices when recommended by equipment manufacturer (NEMA Class 30, trips in 30 seconds or less when carrying a current equal to 600 percent of its current rating).
3) Equip motor controllers with ambient compensated overload protection where motor and relay are not in the same ambient.

v. NEMA 1 enclosure.

w. NEMA 3 enclosure.

x. NEMA 3R enclosure.

y. NEMA 4 stainless steel enclosure.

z. NEMA 12 enclosure.

aa. Input circuit breaker/disconnect switch with external operator.

bb. Input fusible disconnect switch with external operator.

cc. Transient protective devices on input terminals; Innovative Technology Inc.'s P-Plus Protector.

dd. Manual bypass switch to allow the motor to be operated either from the solid state motor controller or across the line.

ee. Automatic bypass switch to automatically switch to across the line operation upon solid state motor controller failure.

ff. Output isolation contactor to open circuit to motor whenever controller is in stop mode.

gg. Remote control station, NEMA 1 enclosure, start-stop with pilot light; Allen-Bradley Co.'s Bulletin 800T, Cutler-Hammer Products' 10250T, Furnas Electric Co.'s Class 52, General Electric Co.'s CR104P, Square D Co.'s Class 9001, or Westinghouse Electric Corp.'s Type PB1/PB2.

hh. Provide additional operating features and accessories as required by the manufacturer of the equipment which the motor controller is driving.

2.04 ADJUSTABLE SPEED MOTOR CONTROLLERS

A. Type AS-PWM for Motor: Microprocessor based, sine-coded pulse-width-modulation design variable frequency/variable voltage adjustable speed motor controller:

1. Companies and Models: Furnish the Company's model which meets the requirements of the motor and driven equipment combination, suits the electrical system parameters, and accommodates the operating features and accessories:
   a. Allen-Bradley Co. Inc.'s 1333 (3/4-50 hp/230 V, 1-5 hp/460 V), 1336 (1-100 hp/230 V, 1-500 hp/460 V), 1352 (25-1400 hp/460 V).
   b. Asea Brown Boveri's ACH500 (2-25 hp/230 V, 3-400 hp/460 V), ACS 200 (2-3 hp/230 V, 1-5 hp/460 V), SAMI STAR 30-1300 hp/460 V).
   c. Eaton Corp.'s AF-1500 (1-20 hp/230 V, 1-30 hp/460 V, IS5000+ (5-600 hp/460 V).
   d. Furnas Electric Co.'s Micro 7000 (2-25 hp/230 V, 2-60 hp/460 V), Super 7000+ (75-200 hp/460 V).
   e. General Electric Co.'s AF-300B (3/4-30 hp/230 V, 1/4-300 hp/460 V).
   f. Reliance Electric Co.'s GP2000 (1/4-50 hp/230 V, 1/4-100 hp/460 V).
   g. Southcon Industrial Controls Inc.'s Magnum PWM (1/4-200 hp/230 V, 1/4 to 400 hp/460 V).
   h. Square D Co.'s Class 8804 Omegapak (1-150 hp/230 V, 1-300 hp/460 V).
   i. Westinghouse Electric Corp.'s Accutrol 110 (1-75 hp/230 V, 2-20 hp/460 V).
2. Operating Features And Accessories:
   a. Suitable for variable torque load.
   b. Suitable for constant torque load.
   c. Soft start: Adjustable time range of 2 to 600 seconds.
   d. Cushioned start: Timed acceleration/deceleration linearly in steps up to the preset speed.
   e. Reversing.
   f. Regenerative braking which directs the regenerative energy from the motor back into the ac line.
   g. Heavy duty dynamic braking which directs the regenerative energy from the motor into a resistor.
   h. DC injection braking to bring motor to stop.
   i. Provision to energize electro/Mechanical brake to hold the driven equipment stopped, after the motor has stopped.
   j. Ground fault protection.
   k. Ambient operating temperature range 0 to 40 degrees C. Maximum humidity 95 percent.
   l. Digital display showing operational functions:
      1) Speed.
      2) Output voltage.
      3) Output current.
      4) Elapsed time.

m. Digital display, or LED's showing diagnostic functions, including:
   1) Overcurrent.
   2) Overvoltage.
   3) Undervoltage.
   4) Overtemperature.
   5) Ground fault.
   6) Overload.

n. Fault alarm contact for remote alarm.

o. Suitable for use on circuit capable of delivering 42,000 amps RMS short circuit fault current.

p. Input voltage: Suitable for use on 208 V ac 3 phase circuit.

q. Output voltage 0 to 208 V ac, 3 phase.

r. Frequency:
   1) Input: 60 Hz.
   2) Selectable Output: 3 to 60 Hz, with separately adjustable min/max frequency limits and capability to lock these limits so that they cannot be exceeded.
   3) Frequency Reject: Programmable (both the width and the midpoint of up to 3 bands, or end points) to reject operation within the selected bands.
   4) Output regulation: + .06 percent.

s. 100 percent continuous current rating, 150 percent for one minute every 10 minutes.

t. Local control panel for manual operation:
   1) Start-stop pushbuttons.
   2) Hand-Off-Automatic selector switch.
   3) Hand-Automatic selector switch, and start-stop pushbuttons.
   4) Forward-Reverse selector switch, with timer, for maximum operation of 20 minutes when in service.
   5) Manual speed potentiometer.
   6) Power on light.
   7) Run light.

u. Local programming panel for:
   1) Acceleration rate.
   2) Deceleration rate.
   3) Start torque (boost).
   4) Maximum frequency.
   5) Volts/Hz pattern.
   6) Restart Mode: Automatic restart upon return of input power, manual reset/restart on overload.
   7) Restart Mode: Manual reset/restart upon return of input power or overload.
   8) Start and direction, local or remote.
   9) Stop mode, ramp or coast.

v. Interface Input For Automatic Speed Control: Isolated, direct proportional automatic speed follower which responds to an externally supplied signal from the speed reference signal source

for automatic motor speed control when the controller is in the automatic mode of operation.

1) 0-10 V dc.
2) 4-20mA dc.
3) Variable resistance.
4) 3 to 15 psi pneumatic/electric transducer.

w. Interface Input For Automatic Speed Control: Interface which accepts signals from programmable logic control, or computer, for automatic speed and direction control when the controller is in the automatic mode of operation.

x. Interface Input For Emergency Stop: Isolated input to receive signal from the fire alarm system, to stop motor upon alarm condition.

y. Interface Output To Indicate Speed: Interface which follows motor speed, enabling the motor speed to be displayed at the Direct Digital Building Control System primary operator station.

z. Start/stop control voltage maximum 120 V, wire.

aa. Auxiliary output contacts, 120 V ac, 1 amp:

1) Spares, for future use: 1 N.O., 1 N.C.
2) For Remote Indication at the Direct Digital Building Control System Primary Operation Station:
   a) Run: 1 N.O.
   b) Fault: 1 N.O., 1 N.C.
   c) At Speed: 1 N.O.

bb. Electronic overload device that monitors the motor function to provide motor overload protection at all speeds. Manual or automatic reset as specified under local programming panel.

cc. Motor winding protection, responsive to the motors' imbedded temperature measuring detectors.

dd. NEMA 1 enclosure.

ee. NEMA 1 enclosure with fans and filter.

ff. NEMA 3 enclosure.

gg. NEMA 3R enclosure.

hh. NEMA 4 stainless steel enclosure.

ii. NEMA 12 enclosure.

jj. NEMA 12 enclosure with closed loop air conditioner.

kk. Input circuit breaker/disconnect switch with external operator.

ll. Input fusible disconnect switch with external operator.

mm. Controllers designed, equipped, and installed such that the controllers reflect 5 percent or less total harmonic distortion at the source specified under System Acceptance Test. Equip controller with:

1) Input isolation/voltage matching transformer, or 3 percent input line reactor if voltage matching is not required.
2) Transient protective devices on input terminals; Innovative Technology Inc.'s P-Plus Protector.
3) Additional equipment (line filters, etc.) as recommended by the adjustable speed motor controller manufacturer to maintain total harmonic distortion below specified level.

4) Basic Parameters Relative to the Existing System:
   a) Distribution Transformer Size KVA.
   b) Distribution Transformer Impedance: percent.
   c) Conductors:
      Feeder No. Size Distance
   d) Short circuit current available at distribution transformer: 42,000 amperes.

nn. Manual bypass switch to allow the motor to be operated either from the drive or full speed across the line.
   1) Solid state, soft start, or reduced voltage magnetic motor controller arranged and wired to operate motor when switch is in bypass mode. Across-the-line magnetic motor controller may be used for motors less than 7-1/2 hp (208 V), 15 hp (480 V).

oo. Automatic bypass switch to automatically switch to full speed across the line operation upon drive fault (except short circuit, ground fault, or motor thermal overload).
   1) Solid state, soft start, or reduced voltage magnetic motor controller arranged and wired to operate motor when switch is in bypass mode. Across-the-line magnetic motor controller may be used for motors less than 7-1/2 hp (208 V), 15 hp (480 V).

pp. Output isolation contactor to open circuit to motor whenever controller is in stop mode.

qq. Interlock system to prevent the load side disconnect switch (at the motor) from being opened while the adjustable speed motor controller is energized. Motor controller input disconnect must be opened before load side disconnect switch can be opened. Coordinate interlock system with Electrical Work Contractor.

rr. Remote operator station, NEMA 1 enclosure:
   1) Start.
   2) Stop.
   3) Frequency (Speed).
   4) Forward/Reverse.

ss. Provide additional operating features and accessories as required by the manufacturer of the equipment which the adjustable speed motor controller is driving.

2.05 HARMONICS METER

A. Dranetz-BMI's 155 Harmonics Meter with capability for measuring amperage harmonics, 1000 New Durham Road, Edison, NJ 08818-4019, (800) 372-6832, or (732) 287-3680; Fax: (732) 248-1834.

2.06 NAMEPLATES

A. General: Precision engrave letters and numbers with uniform margins, character size minimum 3/16 inch high.
   1. Phenolic: Two color laminated engraver's stock, 1/16 inch minimum thickness, machine engraved to expose inner core color (white).
   2. Aluminum: Standard aluminum alloy plate stock, minimum .032 inches thick, engraved areas enamel filled or background enameled with natural aluminum engraved characters.
   3. Materials for Outdoor Applications: As recommended by nameplate manufacturer to suit environmental conditions.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install the Work of this Section in accordance with the manufacturer's printed instructions.

B. Nameplates: Identify each remote control station, indicating motor controlled. Identify each interlock switch, indicating purpose of switch:
   1. NEMA 1 Enclosures: Rivet or bolt nameplate to the cover.
   2. NEMA 12 Enclosures: Rivet or bolt and gasket nameplate to the cover.
   3. NEMA 3R, 4, 4X, 7, or 9 Enclosures: Attach nameplates to the cover using adhesive specifically designed for the purpose, or mount nameplate on wall or other conspicuous location adjacent to switch. Do not penetrate enclosure with fasteners.

3.02 REMOTE CONTROL STATION SCHEDULE

A. Use normal duty remote control stations in dry non-hazardous locations. Use heavy duty remote control stations in all other locations.

3.03 FIELD QUALITY CONTROL

A. Preliminary System Test:
   1. Preparation: Have the Company Field Advisor program and adjust the completed solid state and adjustable speed motor controllers and then operate them long enough to assure that they are performing properly.
   2. Run a preliminary test for the purpose of:
      a. Determining whether motor controllers are in a suitable condition to conduct an acceptance test.
      b. Checking instruments and equipment.
      c. Training facility personnel.

B. System Acceptance Test:
   1. Preparation: Notify the Director's Representative at least 3 working days prior to the test so arrangements can be made prior to the test to have a Facility Representative witness the test.
   2. Make the following tests:
      a. Demonstrate that each solid state and adjustable speed motor controller performs its intended function.

b. Use the harmonics meter to determine the total harmonic distortion caused by the adjustable speed motor controllers.
   1) While the motors are running, measure the total harmonic distortion at the transformer serving the building.
   2) While the motors are running, measure the total harmonic distortion at the distribution transformer supplying the controllers.
   3) If total harmonic distortion caused by the adjustable speed motor controllers exceeds specified limit, install additional equipment as necessary to keep the total harmonic distortion caused by the adjustable speed motor controllers under the specified limit.

3. Supply all equipment necessary for system adjustment and testing.
   a. The harmonics meter shall remain the property of the State.
   b. The harmonics meter shall remain the property of the Contractor.
4. Submit written report of test results signed by the Company Field Advisor and the Director's Representative. Mount a copy of the final report in a plexiglass enclosed frame assembly in a conspicuous location on or adjacent to each motor controller.

3.04 MOTOR CONTROLLER SCHEDULE

A. Types of Motor Controllers Required For Single Speed Motors, Unless Indicated Otherwise On Drawings:
   1. 120/208 V, Three Phase, 4W, Premises Wiring System:
      a. Single Phase Motor Less Than 1 hp - Manually Operated: Type A or Type A1.
      b. Single Phase Motors Less Than 1 hp - Automatically Operated: Type B. Exception: Type A or Type A1 may be used for motors less than 1/2 hp when the automatic auxiliary controlling device (thermostat, pressure switch, etc.) is rated for the voltage and current requirements of the motor.
      c. Three Phase Squirrel Cage Motors Less Than 7-1/2 hp - Manually or Automatically Operated: Type B-COM (B when indicated on drawing) or Type SS.
      d. Three Phase Squirrel Cage Motors 7-1/2 hp and Larger - Manually or Automatically Operated: Type C-COM (C when indicated on drawings) or Type SS.
      e. Three Phase Hermetically Sealed Compressor Motors Less Than 7-1/2 hp - Automatically Operated: Type B or Type SS.
      f. Three Phase Hermetically Sealed Compressor Motors 7-1/2 hp and Larger - Automatically Operated: Type D or Type SS.

B. Types of Motor Controllers Required For 2 Speed Motors, Unless Indicated Otherwise on Drawings:
   1. 120/208 V, Three Phase, 4W, Premises Wiring System:
      a. Single Phase Motors Less Than 1 hp - Manually Operated: Type A2. Exception: Type A3 may be used for motors 1/2 hp or less.
      b. Single Phase Motors Less Than 1 hp - Automatically Operated: Type B2.

c. Three Phase Squirrel Cage Motors Less Than 7-1/2 hp - Manually or Automatically Operated: Type B2 or Type SS.
d. Three Phase Squirrel Cage Motors 7-1/2 hp and Larger: Type SS.

C. Types of Motor Controllers Required For Variable Speed Applications:
1. Three Phase Premises Wiring System:
a. Three Phase Motors 1 to 50 hp: Type AS-PMW.

END OF SECTION

TABLE OF CONTENTS

013119 Project Meetings
013200 Construction Progress Documentation
013300 Submittals
013350 Computer Aided Design Coordination Drawings
014100 Regulatory Requirements
014216 Definitions
014217 Abbreviations
014339 Mock Up Requirements
015000 Construction Facilities & Temporary Controls
015123 Construction Heat And Temporary Heat
015526 Traffic Maintenance & Protection
015633 Security
016500 Materials And Equipment
017123 Field Engineering
017329 Removals, Cutting, And Patching
017419 Construction Waste Management
017423 Pre Occupancy Cleaning
017716 Contract Closeout
017900 Video Training Programs
018113 LEED Documentation Requirements
018113 Table 018113.1
018113 LEED NC Project Scorecard
018119 Construction Indoor Air Quality Management
018120 Volatile Organic Compound Limits for Adhesives and Sealants
019113 General Commissioning Requirements

FACILITY SERVICES SUBGROUP

DIVISION 02 – EXISTING CONDITIONS

Document Number and Title

023313 Underground Utility Locator Service

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

Document Number and Title

078400 Firestopping
079200 Joint Sealers

DIVISION 09 – FINISHES

Document Number and Title

099102 Electrical Painting

DIVISION 10 – SPECIALTIES

Document Number and Title

102814 Electric Hand Dryers

DIVISION 11 – EQUIPMENT

NOT USED

DIVISION 26 – ELECTRICAL

Document Number and Title

260221 Motors And Motor Controllers
260505 Wiring for Gate Systems
260519 Wiring, General - 600 Volts And Under
260522 Electrical Identification
260523 Wiring for Motors and Motor Controllers
260526 Service Grounding And Bonding
260529 Fasteners, Attachments, And Supporting Devices
260532 Interior Raceways, Fittings, And Accessories
260534 Outlet, Junction, And Pull Boxes
260543 Underground Conduit System
260548 Seismic Controls for Electrical Systems
260549 Concrete Pads For Equipment
260573 Short Circuit Analysis, Protective Device Time-Current Coordination Analysis, and ARC Flash Hazard Analysis Reports
260800 Electrical Systems Commissioning
260923 Lighting Control System
260925 Occupancy Sensors For Lighting Control
261116 Electric Service
262413 Switchboards
262416 Panelboards
262726 Wiring Devices
262812 Safety Switches
262813 Fuses
263214 Diesel - Alternator Emergency System
263353.30 Solid State Uninterruptable Power Supply
263623 Automatic Transfer Switch
265110 Fluorescent Fixtures
265200 Emergency Lighting Unit Equipment
265300 Exit Light Fixtures

DIVISION 27 – COMMUNICATIONS

Document Number and Title

270515 Cable Television Distribution System
270526 Grounding And Bonding For Communications Systems

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

Document Number and Title

DIVISION 31 – EARTHWORK

Document Number and Title

APPENDIX

END OF TABLE OF CONTENTS

SECTION 260548

SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. This Section includes the following:
   1. Isolation pads.
   2. Channel support systems.
   3. Restraint cables.
   4. Hanger rod stiffeners.
   5. Anchorage bushings and washers.

1.03 DEFINITIONS

A. ICC-ES: ICC-Evaluation Service.

1.04 PERFORMANCE REQUIREMENTS

A. Seismic-Restraint Loading:
   1. Site Class as Defined in the NYS Building Code: D
   2. Assigned Seismic Occupancy Category as Defined in the NYS Building Code: III
      a. Component Importance Factor: 1.5
      b. Component Response Modification Factor:
         General Electrical 5.0
         Equipment 2.5
         Light Fixtures 1.5
      c. Component Amplification Factor:
         General Electrical 2.5
         Equipment 1.0
         Light Fixtures 1.0
   3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 20.8%
   4. Design Spectral Response Acceleration at 1.0-Second Period: 10.3%

1.05 SUBMITTALS

A. Product Data: For the following:
   1. Include rated load, rated deflection, and overload capacity for each vibration isolation device.

2. Illustrate and indicate style, material, strength, fastening provision, and finish for each type and size of seismic-restraint component used.
    a. Tabulate types and sizes of seismic restraints, complete with report numbers and rated strength in tension and shear as evaluated by an agency acceptable to authorities having jurisdiction.
    b. Annotate to indicate application of each product submitted and compliance with requirements.
3. Drawings identifying seismic locations with corresponding details of pre-approved seismic restraints, with seismic loads and seismic force level (Fp) calculations; pre-engineered and stamped by a NYS Licensed Professional Engineer experienced in seismic restraint systems.

B. Delegated-Design Submittal: For seismic-restraint details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
1. Design Calculations: Calculate static and dynamic loading due to equipment weight and operation, seismic forces required to select vibration isolators and seismic restraints.
2. Indicate materials and dimensions and identify hardware, including attachment and anchorage devices.
3. Field-fabricated supports.
4. Seismic-Restraint Details:
    a. Design Analysis: To support selection and arrangement of seismic restraints. Include calculations of combined tensile and shear loads.
    b. Details: Indicate fabrication and arrangement. Detail attachments of restraints to the restrained items and to the structure. Show attachment locations, methods, and spacings. Identify components, list their strengths, and indicate directions and values of forces transmitted to the structure during seismic events.
    c. Preapproval and Evaluation Documentation: By an agency acceptable to authorities having jurisdiction, showing maximum ratings of restraint items and the basis for approval (tests or calculations).

C. Coordination Drawings: Show coordination of seismic bracing for electrical components with other systems and equipment in the vicinity, including other supports and seismic restraints.

D. Welding certificates.

E. Quality Control Submittals:
1. Seismic Restraint Manufacturer's Qualifications Data:
    a. Name of firm producing the seismic restraints, business address and telephone number.
    b. Period of time firm has been in the business producing seismic restraints, and names and addresses of 3 similar projects that the

manufacturer has produced seismic restraints for during the past 5 years.

2. Company Field Advisor Data:
   a. Name, business address and telephone number of Company Field Advisor secured for the required services.
   b. Certified statement from the Company listing the qualifications of the Company Field Advisor.
   c. Services and each product for which authorization is given by the Company, listed specifically for this project.
3. Manufacturer's Certificate of Compliance for Seismic Restraints: Certificate from seismic restraint manufacturer stating that the restraint and its mounting system or anchorage has been tested or analyzed and meets the requirements of NYS Building Code (Section 1621).

F. Field quality-control test reports.

1.06 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.

B. Comply with seismic-restraint requirements in the NYS Building Code unless requirements in this Section are more stringent.

C. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

D. Seismic-restraint devices shall have horizontal and vertical load testing and analysis and shall bear anchorage preapproval OPA number from OSHPD, or preapproval by another agency acceptable to authorities having jurisdiction, showing maximum seismic-restraint ratings. Ratings based on independent testing are preferred to ratings based on calculations. If preapproved ratings are not available, submittals based on independent testing are preferred. Calculations (including combining shear and tensile loads) to support seismic-restraint designs must be signed and sealed by a qualified professional engineer.

E. Comply with NFPA 70.

F. Regulatory
1. The contractor shall provide pre-engineered or stamped and signed details (by a NYS Licensed Professional Engineer) of seismic restraint systems to meet total design lateral force requirements for support and restraint of mechanical and electrical systems.
2. Seismic components shall be UL listed or California OSHPD (Office of Health Planning and Development) approved.

G. Seismic Restraint Manufacturer Qualifications: The firm producing the seismic restraints shall be experienced in seismic restraint work and shall have produced seismic restraints for a minimum of 5 years.

H. Company Field Advisor: Secure the services of a Company Field Advisor from seismic restraint manufacturer for the following:
   1. Render advice regarding installation and final adjustment of seismic restraint system.
   2. Render advice on the suitability of each seismic restraint for its particular application.
   3. Inspect completed installation of seismic restraint system and certify with an affidavit that the system is installed in accordance with the Contract Documents and is operating properly.
   4. Train facility maintenance personnel on the installation of seismic restraint system and routine maintenance of the system.

PART 2 - PRODUCTS

2.01 SEISMIC-RESTRAINT DEVICES

A. Basis-of-Design Product: Subject to compliance with requirements, provide products by one of the following:
   1. Amber/Booth Company, Inc.
   2. California Dynamics Corporation.
   3. Cooper B-Line, Inc.; a division of Cooper Industries.
   4. Hilti Inc.
   5. Loos & Co.; Seismic Earthquake Division.
   6. Mason Industries.
   7. TOLCO Incorporated; a brand of NIBCO INC.
   8. Unistrut; Tyco International, Ltd.

B. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports an agency acceptable to authorities having jurisdiction.
   1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least five times the maximum seismic forces to which they will be subjected.

C. Channel Support System: MFMA-3, shop- or field-fabricated support assembly made of slotted steel channels with accessories for attachment to braced component at one end and to building structure at the other end and other matching components and with corrosion-resistant coating; and rated in tension, compression, and torsion forces.

D. Restraint Cables: ASTM A 603 galvanized steel cables with end connections made of steel assemblies with thimbles, brackets, swivels, and bolts designed for restraining cable service; and with a minimum of two clamping bolts for cable engagement.

E. Hanger Rod Stiffener: Reinforcing steel angle clamped to hanger rod. Do not weld stiffeners to rods.

F. Bushings for Floor-Mounted Equipment Anchor: Neoprene bushings designed for rigid equipment mountings, and matched to type and size of anchors and studs.

G. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for rigid equipment mountings, and matched to type and size of attachment devices.

H. Resilient Isolation Washers and Bushings: One-piece, molded, oil- and water-resistant neoprene, with a flat washer face.

I. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.

J. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.

2.02 FACTORY FINISHES

A. Finish: Manufacturer's standard prime-coat finish ready for field painting.

B. Finish: Manufacturer's standard paint applied to factory-assembled and -tested equipment before shipping.
1. Powder coating on springs and housings.
2. All hardware shall be galvanized. Hot-dip galvanize metal components for exterior use.
3. Baked enamel or powder coat for metal components on isolators for interior use.
4. Color-code or otherwise mark vibration isolation and seismic-control devices to indicate capacity range.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine areas and equipment to receive seismic-control devices for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine roughing-in of reinforcement and cast-in-place anchors to verify actual locations before installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 APPLICATIONS

A. Multiple Raceways or Cables: Secure raceways and cables to trapeze member with clamps approved for application by an agency acceptable to authorities having jurisdiction.

B. Hanger Rod Stiffeners: Install hanger rod stiffeners required to prevent buckling of hanger rods due to seismic forces.

C. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.

3.03 SEISMIC-RESTRAINT DEVICE INSTALLATION

A. Equipment and Hanger Restraints:
   1. Install restrained isolators on electrical equipment.
   2. Install resilient, bolt-isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125 inch.
   3. Install seismic-restraint devices using methods approved by an agency acceptable to authorities having jurisdiction providing required submittals for component.

B. Install bushing assemblies for mounting bolts for wall-mounted equipment, arranged to provide resilient media where equipment or equipment-mounting channels are attached to wall.

C. Attachment to Structure: Anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

D. Drilled-in Anchors:
   1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid pre-stressed tendons, electrical and telecommunications conduit, and gas lines.
   2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
   3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
   4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
   5. Set anchors to manufacturer's recommended torque, using a torque wrench.
   6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.

3.04 ACCOMMODATION OF DIFFERENTIAL SEISMIC MOTION

A. Install flexible connections in runs of raceways, cables, wireways, cable trays, and busways where they cross seismic joints, where adjacent sections or branches are supported by different structural elements, and where they terminate with connection to equipment that is anchored to a different structural element from the one supporting them as they approach equipment.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

B. Tests and Inspections:
   1. Provide evidence of recent calibration of test equipment by a testing agency acceptable to authorities having jurisdiction.
   2. Schedule test with Director's Representative before connecting anchorage device to restrained component (unless post-connection testing has been approved), and with at least seven days' advance notice.
   3. Obtain Director's Representative's approval before transmitting test loads to structure. Provide temporary load-spreading members.
   4. Test at least four of each type and size of installed anchors and fasteners selected by Director's Representative.
   5. Test to 90 percent of rated proof load of device.
   6. If a device fails test, modify all installations of same type and retest until satisfactory results are achieved.

C. Remove and replace malfunctioning units and retest as specified above.

D. Prepare test and inspection reports.

3.06 ADJUSTING

A. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION

REFERENCE SECTION 281300

SECURITY MANAGEMENT SYSTEM

(This Section for Reference Only)

PART 1 GENERAL

1.1 SYSTEM DESCRIPTION

A. The card access control system controls, monitors and records all valid and invalid entries by personnel using proximity technology access cards at card reader terminals located adjacent to doors requiring secured access. The system also detects security violations at doors within secured areas.

B. The overall system shall include installation and commissioning of the following:

1. Integrated Security Management System (SMS) consisting of:

a. Access Control and Alarm Monitoring System (ACAMS)

b. CCTV and Digital Network Video Recording System (CCTV) (NVR)

c. Intercom Communications (INT) System

d. Burglar Alarm (BA) System

2. Security Management System Interfaces

a. ACAMS/INT System

b. ACAMS/CCTV System

c. ACAMS/Fire Alarm System

d. ACMS/BA System

3. All wire and cable to install all equipment as specified herein and or the project drawings.

4. Miscellaneous conduit and back boxes (not shown on the Documents as provided, but required for a complete installation).

C. The Access Control and Alarm Monitoring System (ACAMS) at NYSP facilities shall be tied into the State Police Honeywell ProWatch System Server, which currently resides at State Police Division Headquarters in Albany, New York.

D. NYSP-TYCO shall provide and install a local (Honeywell ProWatch System) Access Control alarm Monitoring System at NYSP facilities, except as noted below and in the drawings associated with this project.

E. NYSP-TYCO shall be responsible for coordinating the tie in of the new system with the ProWatch server at Division Headquarters. NYSP-TYCO shall provide all programming (with the exception of card holder data), inclusive of door configuration, alarm configuration, Intercom System configuration, programming of IP addresses, etc. for a complete functional system.

F. NYSP-TYCO shall provide BA sub systems for areas as indicated on the security drawings. The areas to be protected shall be equipped with motion sensors and or glass break sensors as indicated in the project drawings. NYSP-TYCO shall provide readers to disarm and push buttons to arm the motion sensors within the areas to be protected. Alarms from the sub-system motion detectors shall report directly to the ACAMS workstation in the Troop Headquarters Building. The BA sub system shall have selectable exit time delay to allow the Director's Representative time to arm the system. The system will be integral to the ACAMS.

G. NYSP-TYCO shall provide an intercom system for communication from Entry Doors at any door specified as applicable. Call forwarding to different extensions within the facility on busy or no answer shall be part of the system functionality.

H. NYSP-TYCO shall provide Local Alarm Sounders (LA) at doors as indicated on the security drawings. The Local Alarm Sounders shall be mounted near the respective door and shall be used to provide an audible alert upon alarm at the door. NYSP-TYCO shall provide reset key-switches near each door, which shall be used to silence the audible alarm.

I. The following shall serve as general identifiers as specified herein.

1. NYSP-TYCO is the firm submitting a proposal to provide the Work as defined within this Specification.

2. Project – The Project is the New York State Police Project: 44561 Troop L and or Quartermasters building, and or Forensic Identification Unit (FIU) / Storage Facility Security System installation in E Meadow, New York.

3. Work – The term "Work" means all construction and services specified within this document. The Work includes all related labor, materials, equipment, and services provided, or to be provided, by NYSP-TYCO to fulfill the proposal's obligations.

4. Documents – The term "Documents" means all security and security related drawings, specifications, and associated sketches, details, riser diagrams, etc.

J. As used in the Documents for the Work, certain non-technical words and phrases shall be understood to have specific meanings as follows, regardless of indications to the contrary in the General Conditions or other documents governing the Work.

1. "Furnish" – Purchase and deliver to the project site complete with every necessary appurtenance and support, all as part of the security Systems Work. Purchasing shall include payment of all surcharges as may be required to assure that purchased items are free of all liens, claims, or encumbrances.

2. "Install" – Unload at the delivery point at the site and perform every operation necessary to establish secure mounting and correct operation at the proper location in the project, all as part of the Work.

3. "New" – Manufactured within the past year and never before used.

4. "Provide" – Furnish and Install.

K. Regardless of their usage in codes or other industry standards, certain words or phrases as used in the Documents for the Work, shall be understood to have the specific meanings as ascribed to them in the following list:

1. “As indicated” – As shown on, and/or in accordance with, the Documents.
2. “Circuit” – Any specific run of circuitry.
3. “Circuitry” – Any Work that consists of wires, cables, raceways, and/or specialty wiring method assemblies complete with associated junction boxes, pull boxes, outlet boxes, joints, couplings, splices, and connections except where limited to a lesser meaning by specific description.
4. “Concealed” (as applied to circuitry) – Covered completely by building materials, except for penetrations (by boxes and fittings) to a level flush with the surface as necessitated by functional or specified accessibility requirements.
5. “Exposed” (as applied to circuitry) – Not covered in any way by building materials.
6. “NYS-OGS Electrical Contractor” –Awarded Electrical Contractor for the separately held New York State Office of General Services contract (OGS Project # 44561)
7. “Patch Panel” – A System of terminal blocks, patch cords, and backboards that facilitate administration of cross-connecting cables.
8. “Raceway” – Any pipe, duct, extended enclosure, or conduit (as specified for a particular System) which is used to contain wires and which is of such nature as to require that the wires be installed by a “pulling in” procedure.
9. “Relocate existing” – Remove existing item from present location. Reinstall, re-connect, and test existing item and make ready for use at new location as indicated.
10. “Remove existing” – Remove existing item and return item to Director’s Representative.
11. “Replace” – Remove existing item and return item to Director’s Representative. Provide new item as indicated.
12. “Riser” – Shall refer to the portion of the installation that transmits between building floors (or between security System rooms), also referred to as “Backbone Cabling”.
13. “Security Closet” – The enclosed area or room specifically designated for the routing, termination, and/or cross connecting of security System cable (i.e. riser cable) to other security System cable and/or equipment.
14. “SMS” – Security Management System, includes all components contained herein that work in conjunction to create and completely integrated and fully functioning system as described within the Documents
15. “Security System Wiring” – see “Circuitry”.
16. “Security System Work” – See “Work”.

17. “Standard” (as applied to wiring devices) – Not of a separately designated individual type.

18. “System” – See “SMS”.

19. “Wiring” – See “Circuitry”.

20. “Work” – The completed construction required by the Documents, and includes all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction.

21. “Workstation” – The location where security System monitoring equipment is provided.

L. Where the word “conduit” is used without specific reference to type, it shall be understood to mean “raceway”.

M. Reference to “U.L. (Materials Construction) Standards” shall mean the “Standards for Safety” published by Underwriters Laboratories, Inc.

N. Reference to “NEMA Standards” shall mean the “Approved Standards” published by the National Electrical Manufacturers Association.

O. Reference to “ANSI Standards” shall mean the standards published by the American National Standards Institute.

P. Reference to “IEEE Standards” shall mean the standards published by the Institute of Electrical and Electronics Engineers.

Q. Reference to “BICSI Standards” shall mean the guidelines and methods published by the Building Industries Consulting Service International.

1.2 SUBMITTALS

A. General Description and Requirements

1. Submit pre-fabrication submittals in accordance with the Director’s Representative’s construction schedule.

2. Pre-fabrication submittals shall consist of product data, shop drawings, (samples if required by the Director’s Representative), and a project work schedule.

3. Pre-fabrication submittals shall be furnished in electronic formats as defined by the General Conditions under Part 1 of the Project Specifications.

4. A letter of transmittal identifying the name of the Project, Contractor’s name, date submitted for review, shall accompany pre-fabrication submittals and a list of items transmitted unless an electronic submittal database is provided.

B. Product data required as part of the pre-fabrication submittal shall include the following:

1. Equipment schedules listing all System components, manufacturer, model number and the quantity of each.

2. Manufacturer's data specification sheets for all System components, (sheets containing more than one device or component model number shall be clearly marked to delineate items included in the Work)

3. A complete list of cable and wiring types, sizes, manufacturer, and model number

C. Shop Drawings shall include the following:

1. Floor plan drawings indicating device locations with device legends. AutoCAD drawing plans used to create security plans to be provided by others.

2. System riser diagram with all devices, and wire designations. Pathways are in the "E" contractors' scope.

3. Block diagrams for each System showing all equipment, interconnects, etc.

4. Wiring diagrams for each subsystem defining the interconnection of all inputs and outputs for all equipment.

5. Wiring diagram (typicals) for fail-safe release of electric locking mechanism.

6. Fabrication shop drawings for all custom equipment (if applicable)

7. Plans and elevations of the security console(s) and equipment racks quantifying all equipment to be mounted therein if applicable.

8. Elevations of security closet layouts showing only panel locations, power supply locations as supplied by NYSP-TYCO, conduit, wire ways, wire molds, "J" hooks and other equipment supplied to be supplied by others.

9. NYSP-TYCO shall submit samples of any equipment components upon request of the Director's Representative.

1.3 PROJECT MANAGEMENT

A. NYSP-TYCO shall provide a Project Manager to oversee and coordinate all activities on the Project

B. Project Manager's Duties and Responsibilities:

1. NYSP-TYCO shall provide to the Director's Representative, as a part of the prefabrication submittal, the name of the Project Manager that will provide all duties and responsibilities as specified herein, during the term of the project.

2. The Project Manager shall maintain the ability of making all managerial decisions on behalf of NYSP-TYCO on a day-to-day basis, and shall retain the authority of accepting notices of deduction, inspection reports, payment schedules and any other project related correspondence on behalf of the Director's Representative.

3. The Project Manager shall attend project meetings that apply to security related issues, during which time all System related issues are discussed, scheduled, confirmed, and/or resolved.

4. The Project Manager shall be available during normal business hours (ex. 8:00 AM to 5:00 PM) within two (2) hours by telephone during the term of the project.

5. Upon notification by the Director's Representative, of any project related installation issue, or issue that may contradict the Specifications as stated herein, the Project Manager shall respond to such issue, verbally and/or in writing within one business day from the time of notification.

    a. Responses to such issues as stated above shall include a clear understanding of the issue, along with a tentative plan of action, reflecting milestones and/or deadlines to resolve the issue.

    b. Where appropriate, based on the overall importance of the project issue, the Project Manager shall follow-up their initial response with a written response to the issue within one business day of identification of the issue.

6. Prior to the initiation of the Work, the Project Manager shall submit a schedule reflecting key milestones of the Work, including but not limited to the following:

    a. Bid award

    b. Kick-off meeting

    c. Prefabrication submittal

    d. Delivery, and installation of head-end System equipment

    e. Field equipment delivery

    f. Project schedule

    h. Installation completion date

    i. System training

    j. Delivery of As-Built documentation

    k. Delivery of Operations & Maintenance Manuals

    l. Final System test and Acceptance

7. The Project Manager shall update the schedule on a bi-weekly basis to reflect the status of each key milestone as the Work progresses.

8. As the System installation progresses, the Project Manager shall be capable of discussing any/or all of the above mentioned items at the request of the Director's Representative, and shall address each item, as it relates to the current status of the Work.

1.4 OTHER CONDITIONS

A. The Director's Representative may at any time choose to replace, modify, or otherwise delete any item from the scope of work defined herein. Items may be deleted without undo cost or charge for said change in scope by NYSP-TYCO if the item in question has not been ordered or paid for by NYSP-TYCO. The exception to this would be if the manufacturer accepts returns plus any restocking fees if applicable. For this reason, NYSP-TYCO shall submit unit pricing as defined in the Bill of Materials that shall include the Net Add and Net Deduct pricing for each component defined herein. In addition, individual unit prices for "equipment only"

shall be provided that will enable the Director's Representative to replace a component with a similar device to be installed by NYSP-TYCO.

1.5 SPECIAL CONFIDENTIALITY REQUIREMENT

A. The Work is critical to the security of the Director's Representative's facility. All Documents and other material and information about the work are confidential information and must remain secure and confidential at all times. Confidential information must not be deliberately or inadvertently disclosed to anyone other than NYSP-TYCO's personnel and subcontractors who require disclosure to perform their portion of the Work.

B. NYSP-TYCO shall keep track of all confidential information at all times and shall ensure that all copies are accounted for at all times. NYSP-TYCO shall not permit any persons to have access to the confidential information of the Work unless and until NYSP-TYCO has assured itself of the trustworthiness of such persons.

1.6 REFERENCES

A. The Security System shall be installed in accordance with the latest applicable revisions pertaining to all applicable national, state, and local codes and standards including, but not limited to the following:

1. National Fire Protection Association, (NFPA 70)
2. National Fire Protection Association Life Safety Code, (NFPA 101)
3. National Electrical Code (NEC)
4. Building Officials & Code Administrators International, Inc. (BOCA) National Building Code
5. Americans with Disabilities Act (ADA)
6. Underwriters Laboratories (UL) Applicable Standards for Safety
7. Underwriters Laboratories (UL) Applicable Standards for Proprietary Security Systems
8. Uniform Building Code, (UBC)
9. Local Governing Authorities Having Jurisdiction

1.7 QUALITY ASSURANCE

A. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 16 working hours (during the installation of the head end system only unless requested by the Director's Representative) for the following:

1. Render advice regarding installation and final adjustment of the system.
2. Assist in initial programming of the system.
3. Witness final system test and then certify with an affidavit that the system is installed in accordance with the contract documents and is operating properly.
4. Train facility personnel on the operation and maintenance of the system (minimum of 2 one hour sessions).

5. Explain available service programs to facility supervisory personnel for their consideration.

6. A Company Field Advisors can be a Tyco qualified technician.

B. Service Availability: A fully equipped service organization capable of response time within 24 hours to service calls, shall be available to service the completed work during the warranty period or if extended via a maintenance contract.

C. Product Standards

1. All equipment and materials for contained herein shall be the products of recognized manufacturers and shall be new.

2. New equipment and materials shall:

a. Be Underwriters Laboratories, Inc. (U.L.) listed and approved where specifically called for; or where normally subject to such U.L. labeling and/or listing services.

b. Be clearly labeled identifying make, model, and manufacturer.

c. Be without blemish or defect.

d. Be products that meet with the acceptance of the agency inspecting the security Systems work.

3. It is the intent of these specifications that wherever a manufacturer of a product is specified, and the terms “other approved” or “approved equal” are used, the substituted item must conform in all respects to the specified item. Consideration will not be given to claims that the substituted item meets the performance requirements with lesser construction. Performance as delineated in schedules and in the specifications shall be interpreted as minimum performance. Where “no substitution” is used it will be permissible to use a newer version of the product where the manufacturer has discontinued or improved the specified product.

4. Substituted equipment, where permitted and approved, must conform to space requirements if space (ex. rack) is provided by NYSP-TYCO.

5. Substitutions of SMS equipment shown on the schedules or designated by model number in the specifications will not be considered if the item is not a regular catalogued item carried by the manufacturer.

6. Within the Specifications, certain manufacturers have been listed. These manufacturers are listed for example purposes (unless followed by “No Substitutions”). NYSP-TYCO may substitute manufacturers and models that may be more cost effective or readily available than that specified. They must first be approved by the Director’s Representative. However, all substitutions shall meet or exceed the specified functional and technical requirements. Acceptance of such substitutions is at the discretion of the Director’s Representative.

7. All exterior devices shall be sealed and protected against all weather conditions consistent with the region including heat, cold, moisture, dust, etc.

1.8 MAINTENANCE

A. NYSP-TYCO shall provide a one (1) year warranty for the work. The warranty shall cover all work, Systems, and subsystems installed in this project against defects in materials and workmanship. The work as specified herein, including all materials and labor, but excepting any existing devices and equipment, which are incorporated in the completed work, shall be warranted to be free from defects in design, workmanship, and materials. Further, NYSP-TYCO shall warrant that the completed Systems, including all components (except those, which are existing or provided by others), are of sufficient size and capacity to fulfill the requirements of the Specifications.

B. The warranty shall be valid for a period of one (1) year following the date of System acceptance by the Director's Representative. System acceptance shall commence when all parts, components, sub-Systems, and Systems have been tested, shown to be working in accordance with the Specification, and approved by the Director's Representative

C. Nothing contained in the Documents shall be construed to establish a shorter period of limitation with respect to any other obligation, which NYSP-TYCO might have under the Documents or any manufacturer's warranty. The establishment of the time period of one (1) year after the date of final acceptance of the work or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Documents, relates only to the specific obligation of NYSP-TYCO to correct the work, and has no relationship to the time within which its obligation to comply with the Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish NYSP-TYCO's liability with respect to its obligations other than specifically to correct the Work or equipment.

D. Warranty Service:

1. In the event that defects in the materials and/or workmanship are identified during the warranty period, NYSP-TYCO shall provide all labor and materials as may be required for prompt correction of the defect.

2. During the warranty period, NYSP-TYCO shall, upon receipt of a request for service form the Director's Representative, deploy service personnel to the Director's Representative's premises within twenty four hours (Monday through Friday) see number 4 below, to initiate corrective action.

3. All warranty service and repair work shall be performed by personnel, who have been trained, certified and are experienced in the operation and maintenance of the installed System(s).

4. Unless otherwise requested by the Director's Representative, warranty service shall be performed during normal business hours (ex. 8:00 AM to 5:00 PM), Monday through Friday, exclusive of Holidays. In the event that the Director's Representative requests warranty service to be performed during other than normal business hours, NYSP-TYCO shall be compensated for such service at 150% of his normal hourly service rates as listed in the bid proposal for this project during the warranty period.

5. Warranty service shall include the replacement of all parts and/or components as required to restore normal System operation. In the event that System parts or components must be removed for repair, it shall be the responsibility of NYSP-TYCO to install temporary parts and/or components

as required (see # 6 below) to restore normal System operation until the repaired parts or components can be repaired and re-installed.

6. Spare parts are required for support of the System to ensure normal System operation. A mutually agreed upon list of components will be compiled and agreed upon by all parties. Those parts will be purchased by the Owner or the Director's Representative from NYSP-TYCO and kept on site for critical component failures or malfunctions. If spare parts are not purchased by the Owner (see # 5 above) will not apply. Critical parts shall be defined as those, which govern or affect the normal operation of more than one field device.

7. NYSP-TYCO's warranty obligation shall include correction of any software/firmware defects, which may be identified during the warranty period. Any failure of the software/firmware to perform as specified by the software/firmware manufacturer at the time of final acceptance shall be defined as a software/firmware error.

8. In the event that NYSP-TYCO determines and successfully demonstrates to the Director's Representative that service or repairs are required as a result of misuse, abuse, or abnormal wear and tear, NYSP-TYCO shall be compensated for such service or repairs at NYSP-TYCO's hourly rates as listed in the bid proposal for the Project during the warranty period. Similarly, such compensation to NYSP-TYCO shall apply in the event that repairs are required for devices and equipment not provided by NYSP-TYCO but incorporated in the completed Systems.

9. Immediately following the completion of a warranty repair or service call, NYSP-TYCO's service personnel shall submit a written report to the Director's Representative that details the service work performed, the cause of the trouble, and any outstanding work that is required to restore complete and normal operation.

E. NYSP-TYCO for an additional fee shall perform preventative maintenance during the warranty period as an option. NYSP-TYCO shall submit a list of items to be included in the preventative maintenance program and the service to be performed. Preventative maintenance shall include, but not be limited to, the following.

1. Annual Preventative Maintenance:

   a. Test and adjust System sensors.

2. Semi-Annual Preventive Maintenance

   a. Inspect and clean all Intelligent Controllers (ICs).

   b. Inspect, test, and clean power supplies. Replace batteries as necessary.

   c. Inspect, clean and vacuum all consoles and equipment racks if applicable.

F. Provide written notice to the Director's Representative documenting any Work performed during the warranty period, including any preventative maintenance Work performed.

G. For any "critical equipment" as described in section 1.8, D, 6 that is not field repairable NYSP-TYCO will install spare parts from the onsite spare parts inventory that is fully compatible with the SMS.

H. Repair or Replacement Service

1. Repair or replacement service during the warranty period shall be performed in accordance with the following:

   a. 7 days, 24 hours per day.

   b. Normal business hours, excluding holidays, with a twenty-four (24) hour or next business day response time.

   c. Shall apply for major System components including, but not limited to, the file servers or System workstations (if provided by NYSP-TYCO), ICs, intercom exchange and master stations, and any other components that would create a security vulnerability if non-functional.

   d. Shall apply for all other components and devices.

2. As part of the proposal submission, NYSP-TYCO shall include a labor rate schedule for any warranty service required during hours not covered under schedule B.

1.9 EXTENDED MAINTENANCE

A. NYSP-TYCO will furnish to the NYSP as a separate quote the annual costs for the second through fifth years for an extended maintenance agreement to provide repair service including all parts and labor and a preventative maintenance program on the System. Provide a list of all items, schedules, and services included in the preventative maintenance program. Pricing shall be formatted to provide the Director's Representative with the yearly breakdown of costs.

B. The extended maintenance agreement shall include a periodic preventative maintenance program. Submit a list of items to be included in the periodic preventative maintenance program. This program shall be at least as comprehensive as the program provided under the warranty service.

End of Part 1

PART 2 PRODUCTS

2.1 CARD ACCESS CONTROL SYSTEM

A. System Overview

1. NYSP-TYCO shall provide a new integrated access control and alarm monitoring system (ACAMS) as indicated on the Security Drawings. The system at the E Meadow, NY Troop L facilities shall be tied into the existing head end system at Albany Division Headquarters. The system is a Honeywell ProWatch Access Control Alarm Management System (ACAMS). The system shall provide local operational control of all access points and alarm sensors.

2. The ACAMS client and server software shall be used in conjunction with Intelligent Controllers (ICs) to provide a distributed access control and alarm monitoring system. In the event of a communications failure between the host server and the IC, the ICs shall continue to make local access control decisions and save all transactions in memory until communications are restored. At that time the controller shall upload all stored transactions to the server.

3. The Security Management System shall integrate access control, alarm monitoring, CCTV, digital video, video badging, and database management. A modular and network enabled architecture shall allow maximum versatility for tailoring secure and dependable access and alarm monitoring solutions for medium and large facilities.

2.2 SYSTEM SOFTWARE REQUIREMENTS

The system shall be Honeywell ProWatch Corporate Edition with current release version of the software suite. No substitutions.

2.3 SYSTEM CONTROLLERS

1. FIELD CONTROLLERS

1. System Controllers

The security management system shall be equipped with access control field hardware required to receive alarms and administer all access granted/denied decisions. All field hardware shall meet UL requirements. The supported field hardware will include, but not be limited to, the following components:

2. Intelligent Controller (IC)

The IC shall link the security management system software to all other field hardware components (card reader modules and input and output control modules). The IC shall provide full distributed processing of access control and alarm monitoring operations. The field panels and associated hardware shall be PW6000 series controllers. No substitutions.

2.4 INTERFACES

1. E-MAIL

Upon recognition of an event or alarm, the system shall be capable of sending user defined data via e-mail.

The user shall have the capability to assign an e-mail address that the system shall notify should the designated alarm originate from this point. This process shall be a function of SQL 2008 server or better, which shall negotiate e-mail transfer to the Microsoft Exchange Server.

The user shall have the capability to assign an e-mail address that the system shall notify should the designated alarm originate from this point. This process will utilize SMTP which shall negotiate the e-mail transfer.

2. INTERCOM

The system shall support integration to the Stentofon/Zenitel Alphacom series intercoms. The interface shall provide control of both remote and master intercom stations from within the system application. The system shall allow the user to define the site, channel, description, and address. The system shall be programmed by NYSP-TYCO with information provided by the Directors Representative. Upon initiation of a call from a drive up station or exterior door the system call shall be routed to a local master station. If there is no answer at that master station an automatic call forward will route the call to another master station at the same site if so programmed. Door stations shall fit into a recessed standard 3 gang minimum 2 ½ inch deep back box to be furnished by others. No substitutions

3. Visitor Management System (VMS)

The system shall support integration to the LobbyWorks™ Visitor Management System to allow the user to track visitors, employees, assets and deliveries as they enter and exit the facilities. The system shall reduce visitor queues by automatically processing multiple visitors simultaneously at one station. The system shall support printing of custom-designed visitor passes with expiration date; visit area, host being visited, and visit purpose.

Acceptable Manufacturer: Honeywell LobbyWorks, no substitutions

2.5 FIELD HARDWARE

A. Access Control Card Reader

The card reader shall be HID iClass proximity smart card technology and shall read encoded data from access cards and transmit the data to the ICs. The operating frequency shall meet all local regulations. Prox Only Locations: HID iClass R10 - R40 / Prox Keypad Locations HID iClass RK40 / Long Range Reader HID R90 (No Substitutions)

B. Card Reader Wiegand Signal Extender

Provide signal extender devices as necessary for card readers with cable distances to the IC greater than 500 feet as required. Acceptable Manufacturers: Cypress Computer Systems, Model SPX-1200 (or approved equal)

C. Electrified Locking Mechanisms (in Newly Constructed Buildings Only)

1. Electrified locking mechanisms shall be provided by others as indicated on the Documents (including new construction and any doors modified for use with the SMS system).

2. All electrified locking mechanisms shall be provided with built in Request-to-Exit (REX) switches. NYSP-TYCO shall wire the Rex switch to the ACAMS for shunting of door alarms on valid REX.

3. Interface with electrified locking mechanisms as indicated on the Documents.

4. Provide fail-safe operation of electrified locking mechanisms as required by local codes.

5. Fail-secure locks shall remain operational during a fire alarm condition or power failure.

D. Electrified Locking Mechanism Power Supply

1. NYSP-TYCO to provide power supplies for all electric locking mechanisms as specified with the exception of those noted as having time-delay functions as defined by NFPA 101, Electric Latch Retraction (ELR) devices, special voltage (over 24 VDC) or amperage (over .5 amps) per low voltage circuit requirements. Any requirement exceeding those mentioned must be brought to the attention of NYSP-TYCO by the Owners Representative.

2. Power supplies for time-delay function locks and ELR shall be provided by others. NYSP-TYCO shall coordinate with others as necessary to ensure proper operation of all time-delay electric locking mechanisms and ELR to include the provision of, and final termination of, system control. Wire and wiring for time-delay and ELR locks to be provided by others. Integration to the system will be done by NYSP-TYCO.

3. NYSP-TYCO to provide power supplies for all electric locking mechanisms (with the exception of fire stair doors and as noted above). Fail-safe locking devices shall unlock automatically under the following conditions:

    a. Any building fire alarm (connection to fire alarm system to be provided by others at NYSP-TYCO designated location)

    b. Loss of building power

    c. Failure of the power supply

4. Provide battery chargers and batteries sufficient for four (4) hours of backup power (backup will depend on system usage) for the connected load for all power supplies except those for fail-safe locks.

5. Each lock power supply enclosure shall have a key lock and be keyed alike.

6. Monitor low battery and power fail alarms for each power supply via the ACAMS (if available from manufacturer).

   Minimum Specifications:

   - Type: UL Listed Class II power limited
   - Input Voltage: 120VAC 60 Hz
   - Output Voltage: 24 VDC
   - Output Connections: Individually fused outputs to each lock
   - Output Rating: 150% of actual connected load
   - Battery: Sealed gel type
   - Enclosure: Steel enclosure with integral lock
   - Acceptable Manufacturers: Altronix, or approved equal

E. Local Alarm (LA) Units

1. Provide LA(s) for local monitoring of the secure status of doors as indicated on the Security Drawings.

2. The horn of the LA shall provide for a local audible alarm activated whenever an unauthorized user opens a monitored door.

3. The audible alarm will latch and shall sound until it is shunted (Turned off) locally via the reset key-switch or through the ACAMS system workstation in the Troop HQ Building.

4. Refer to the Documents for LA wiring and connection requirements.

   Minimum Specification:

   a. Power Input – 15 Watts
   b. Rated voltage – 12VDC
   c. Rated Current – 180ma
   d. Audible alarm level – 94 dB @ 3 FEET
   e. Sound Output – 97dBA
   f. Impedance – 8 Ohms
   g. Operating temperature - -4 degree F to 140 degree F
   h. Mounting – Surface mounted

i. Provide the manufacturer recommended power supply. The power supply shall be UL Class II, power limited.

j. The key switch is part of the Local Alarm

k. Acceptable Manufacturers: DSI ES4200-K1

F. Device Power Supplies

1. Provide Device Power Supplies for ACAMS equipment as required.

Minimum Specifications:

- Type: UL Listed Class II power limited
- Input: 120VAC 60 Hz hard wired
- Output: Regulated and filtered 24VDC
- Output rating: 150% of the actual connected load
- Battery backup: Four (4) hours of rechargeable backup
- Battery: Sealed gel type
- Enclosure: Key lockable wall mount housing
- Acceptable Manufacturers: Altronix, or approved equal

G. Door Position Switches

Supervised inputs shall be provided on each card reader module. All supervised inputs in the system shall require two (2) 1000 ohm (1K) EOL terminating resistor networks which may be configured to accept Normally Open (NO) or Normally Closed (NC) switches or contacts. Each EOL resistor network shall be configured in a series parallel circuit as shown on the drawing typical.

1. Provide normally closed (N/C) magnetic door position switches to monitor the open/closed status of doors as specified herein and as indicated on the Documents.

2. Holes in doors and frames for the contacts shall be furnished by others (FBO).

Concealed Door Position Switch

Minimum Specifications:

- Gap: ½" between the magnet and switch
- Configuration: N/C
- Mounting: 3/4" diameter hole in door and frame
- Acceptable Manufacturers: UTC Interlogix 1076W Series, or approved equal

H. Surface Mount Door Position Switch

Minimum Specifications:

- Gap: 1” between the magnet and switch
- Configuration: N/C
- Mounting: Surface mount to door and frame
- Provide armored cable from the switch location to the associated junction box in order to conceal the wire.
- Acceptable Manufacturers: UTC Interlogix 1045 Series, or approved equal

I. Overhead Door Position Switch

Minimum Specifications:

- Gap: 3” between the magnet and switch
- Configuration: N/C
- Mounting: Floor
- Provide armored cable from the switch location to the associated junction box in order to conceal the wire.
- Acceptable Manufacturers: UTC Interlogix 2200 Series, or approved equal

J. Surface Mount Window Switches

Minimum Specifications:

- Gap: 1” between the magnet and switch
- Configuration: N/C
- Mounting: Window Frame
- Acceptable Manufacturers: UTC Interlogix 1100 Series or approved equal

K. Intrusion and Duress Alarm Devices

1. Devices to be used for intrusion and duress alarm control and monitoring shall include:

2. Glass Break Detection Units

Minimum Specifications:

- Detection technology: Acoustic / Shock
- Coverage: 25’ minimum radius
- Output contact: N/C

- Listings: UL Listed
- Mounting: Flush, wall or ceiling as per Documents
- Provide the manufacturer recommended power supply. The power supply shall be UL Class 2, power limited.
- Acceptable Manufacturers: UTC Interlogix R5815 or approved equal

L. Dual-Technology Motion Sensors (Long Range)

Minimum Specifications:

- Detection technology: Passive Infrared and Microwave
- Detection pattern: Dual Range 50'X40' & 90'X70'
- Output contact: Form C
- Tamper Contact: Form A
- Listings: UL Listed
- Mounting: Surface mount as per Documents
- Provide the manufacturer recommended power supply. The power supply shall be UL Class 2, power limited.
- Monitor built in tamper switches via ACAMS.
- Acceptable Manufacturers: Honeywell DT900 or approved equal

M. Dual-Technology Motion Sensors (Ceiling Mount)

Minimum Specifications:

- Detection technology: Passive Infrared and Microwave
- Detection pattern: 360 degree 50" diameter
- Output contact: Form C
- Tamper Output: Form A
- Listings: UL Listed
- Mounting: Ceiling mount as per Documents
- Provide the manufacturer recommended power supply. The power supply shall be UL Class 2, power limited.
- Acceptable Manufacturers: Honeywell DT6360 or approved equal

N. Duress Alarms

1. Provide duress alarms with normally closed alarm output contacts as indicated on the Security Drawings.

2. Activation of these alarms shall initiate an alarm event on the ACAMS. Local alarms will be silent with no visual indication of activation.

3. Upon activation, the duress alarm will remain active until which time it is reset by key. No other form of deactivation shall be provided.

Minimum Specifications:

- Activation: Push button
- Alarm output: DPDT contacts
- Reset method: Key-switch
- Mounting: Mount on wall
- Acceptable Manufacturers: SDC 432KUR or approved equal.

O. DIGITAL ALARM PANEL (SUB ALARM SYSTEM)

System Description

1. Provide a Digital Alarm Panel (DAP) and associated keypads as indicated on the Documents to facilitate communication of specific alarms.

2. The interface between the DAP and the ACAMS system can be either hardwired or via RS-232.

3. The alarms shall be sent back to the Troop Headquarters ACAMS workstation. There shall be no central station tie-in for these alarms.

4. Coordinate all programming with the Director's Representative.

5. Provide a keypad compatible with the DAP at the panel location that shall provide the Director's Representative with the following:

6. Alphanumeric display of System messages and alarms

7. Local programming, control, and acknowledgment

8. Audible signal for system alarms/trouble annunciation and key depression signal

9. Minimum Specifications:

a. Type: UL listed burglary alarm panel

b. Communications: Built-in digital communicator with telephone line monitor

c. User Interface: Alphanumeric keypad

d. Programming: Non-volatile memory programmable

e. Alarm inputs: Minimum 16

f. Battery Back-up: Four (4) hours of rechargeable backup

g. Mounting: Wall mounted, key lockable, metal enclosure with tamper alarm switch

h. Power: 120 VAC Plug-in transformer for voltage as required by manufacturer

i. Acceptable Manufacturers: Honeywell Vista xxx or approved equal

P. INTERCOM COMMUNICATIONS SYSTEM

1. General

a. The Intercom System to be provided by NYSP-TYCO shall consist of a four-wire IP system which shall provide communication between the Entry Doors at Troop Headquarters or any other building on the property that has connectivity to master stations located within any Troop building on the property as designated on contract drawings.

b. The system shall provide door release functionality from the master station(s). Upon a call from the door station to the master station, the user shall have the ability to push the door release button to open the Entry Door(s).

c. Acceptable Manufacturer: Zenitel (Stenofon) -no substitution.

Q. PEDESTALS

1. General

a. Pedestals or stanchions as applicable are to be used at roadway entrances as shown in the site drawings and are to be provided by NYSP-TYCO.

b. Stanchions shall consist of weather resistant posts and surface mounted housings for permutations of intercom sub stations, access control readers, Knox boxes, and video cameras.

c. Knox boxes (if required) to be furnished by others. Mounting of Knox boxes to stanchions will be provided by NYSP-TYCO (Knox box must be delivered to NYSP-TYCO 2 weeks prior to stanchion fabrication)

d. The pedestals or stanchions shall be custom made to accommodate the different iterations of design.

e. The paint shall be a black powder coated finish.

f. Based on location the stanchions will be either single or dual height to accommodate passenger cars and or trucks.

g. Acceptable Manufacturers: Paragon Metal Products or approved equal

3 CLOSED CIRCUIT TELEVISION SYSTEM

A. General

The indoor and outdoor surveillance CCTV system to be provided NYSP-TYCO system shall consist of recording equipment software (servers and work stations to be provided by others); provisions for cameras located throughout the interior and exterior of the buildings and pole mounted locations as shown on the NYSP-TYCO drawings.

The cameras to be utilized in the CCTV system shall be approved by the Directors Representative and adhere to the guidelines of usage as set forth by each manufacturer. All outdoor cameras are to be IP 66 rated domes or similar housings based on intended use.

Except as otherwise specified herein, the equipment and material of this Section shall be products of the following manufacturers:

1. Bosch, Fairport, NY.
2. Verint Systems, Inc. Melville, NY
3. Axis Communications, Chelmsford, MA
4. Altronix Corp., Brooklyn, NY
5. Arecont Vision, Glendale, CA

NYSP-TYCO shall provide a closed circuit video system with digital recording to include:

1. Color Cameras, Lenses, Housings and Mounting Brackets
2. Fiber Optic Transmitters and Receivers
3. Software for Network Video Recorders

Unless otherwise specified all monitors and work stations will be provided by others.

B Fiber Optic Transmitters / Receivers

1. All video signals transmitted on cables that exit the interior of the buildings shall utilize fiber optic transmitter, receivers or transceivers and cabling (cabling to be provided by others).
2. Video Transceivers: Units shall be capable of transmitting and receiving video and data for pan/tilt/zoom control over fiber optic cable at the remote camera locations.

Acceptable Manufacturer Bosch SFP-xx, CNFE2MC/IN no substitution

C Fiber Optic Cable

1. All fiber optic cable shall be provided, installed and terminated by others.
2. Breakout boxes, patch panels and connectors to be provided and installed by others.
3. All fiber optic cable, connectors and terminations are to match the characteristics of the fiber optic transmitters and receivers provided by NYSP-TYCO.
4. All fiber optic cable must meet the following criteria:

   a) Multi-Mode Fiber

   b) 1310nm/1550nm wave length

   c) 50/125µm - must meet or exceed fiber standard ITU-TG.652

3.1 Network Video Recording (NVR)

A. General

The NVR system to be provided by NYSP-TYCO shall aggregate all analog and digital cameras into a single recording solution. The NVR system shall be installed on the NYSP network. All video shall be restricted to a VLAN on the NYSP network set up by the NYSP with the assistance of NYSP-TYCO as needed. The NVR at Troop HQ shall communicate with the Master Video server in Albany in order to mark any video that has been indicated by the access control server to be considered an alarm as programmed by NYSP-TYCO at the direction of the Directors Representative. The NVR system shall consist of cameras as called for in this document, video encoders, decoders, network video recorders, storage units, system software, PC work stations, monitors and network switches.

1. Network video recorders (NVR) and storage expansion shall be configured using fault-tolerant RAID-5 minimum drive arrays. Network video recorders and storage expansion shall be sized as specified by NYSP-TYCO on a per site basis, based on the number of cameras as shown on the drawings. All inputs will be recorded at 10 images per second, 4-CIF resolution recording on motion only. Video will be stored for a minimum of 30 days. A single server shall be capable of recording up to 50 cameras based on the parameters listed above.
2. NVR recorder servers and storage to be provided by NYSP.
3. Microsoft Operating System and SQL database for the NVR server to be provided by NYSP.
4. Network switches to be provided by NYSP.
5. NYSP-TYCO shall install all video recording software and program the system based on input from the Directors Representative.

6. The viewing / review station shall be located at the main desk or as designated by the Directors Representative, coordinate with NYSP-TYCO.

7. Viewing / Review station to be provided by NYSP.

8. Acceptable Manufacturer: Verint Systems, Inc, Nextiva 6.x. - no substitution.

4 WIRING

General Requirements:

1) NYSP-TYCO shall provide wire and cable as required to install the Security System as indicated on the Documents and specified herein.

2) NYSP-TYCO shall install all low voltage wiring for the ACAMS, Intercom and Videos systems with the following exceptions:

   a. Wire and wiring between time delay and ELR door hardware and power supplies in new construction.

   b. Wire and wiring from junction box at every security door to devices at that door, including connections to devices at door, i.e. reader, door contact, REX and locking devices in existing construction

   c. Fiber Optic cable, connectors, terminations, break out boxes and testing

3) All wire and cable shall be Underwriter's Laboratories (UL) listed, and shall meet all national, state, and local code requirements for its application.

4) All wire and cable shall meet individual system or subsystem manufacturer Specifications.

5) All wire and cable shall be plenum type cable and shall conform to the minimum requirements of Insulated Cable Engineers Association (ICEA) Standards.

6) Wire and cable shall comply with the applicable requirements of the National Electrical Code (NEC), latest edition, in regards to cable construction and usage.

7) The conductors of wires shall be copper, and have conductivity in accordance with the standardization rules of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). The conductor and each strand shall be round and free of kinks and defects.

8) All cable carrying data transmissions shall be shielded. All other cable shall be shielded where necessary for interference-free signals.

9) Insulation shall be rated for a minimum of 300V.

10) Color-coding shall be accomplished by using solidly colored insulation. Grounding conductors, where insulated, shall be colored solid green or identified with green color as required by the National Electric Code (NEC).

11) Wire Types and Sizes

   a. Signal Cable (Non-Power): Wire size shall be a minimum of 22 AWG, twisted, shielded, stranded, insulated, and jacketed.

b. Signal Cable (Low Voltage Power): Wire size shall be a minimum of 18 AWG, stranded, insulated, and jacketed.

c. Wire gauge vs. distance shall be determined by hardware manufacturers specifications..

d. Acceptable Manufacturers: Belden, West Penn or approved equal

12) Wiring Techniques

a. All penetrations and fire proofing of fire rated partitions and slabs, where the penetrations are made shall be done by others for installation of the ACAMS.

b. Coordinate the protection and routing of wire and cable requiring isolation from power, radio frequency (RF), electromagnetic interference (EMI), telephone, etc. with the Director's Representative.

c. Run all wire and cable continuous from device location to the final point of termination. No mid-run cable splices shall be allowed.

d. Wire and cable within ICs, power distribution cabinets and other security enclosures shall be neatly installed, completely terminated, pulled tight with slack removed and routed in such a way as to allow direct, unimpeded access to the equipment within the enclosure. All wire and cable shall be bundled and tied. Ties shall be similar to T&B TyRap cable ties.

e. Provide heat-shrink or insulated "B" connectors to insulate all wire splices and connections. The use of electrical tape for splices and connections shall not be acceptable.

f. Visually inspect all wire and cable for faulty insulation prior to installation.

g. Provide grommets and strain relief material where necessary to avoid abrasion of wire and excess tension on wire and cable.

h. Make connections with solder-less devices, mechanically and electrically secured in accordance with the manufacturers' recommendations.

i. Neatly bundle and wrap all horizontally run (above accessible ceilings and not within conduit) wire and cable at three-meter intervals. Provide supports as required. All supports shall be UL listed for the application.

j. All System wiring within vertical riser shafts (as required) shall be bundled, wrapped and tied to the structure at three-meter intervals in order to isolate it from other wire and cable within the shaft. Additionally, all wire and cable within the shaft shall be supported at least every two floors using Greenlee Slack Grips (Split Mesh Lace Closing) or approved equal. Provide all personnel and equipment necessary to install and support the cable. All equipment shall be UL listed for the application.

13) LABELS

a. Label all controls as necessary to agree with their function.

b. Labels shall be embossed, self adhesive tape, minimum ¼ inch wide, color of tape similar to color of equipment to be labeled (DYMO Label maker System or Equal)

c. Mark all Wire and Cable in common at both ends.

d. Place wire identification numbers at each end of the conductor involved by using a wrap around type markers. The markers shall be installed so as to be readable.

e. Mark all connectors with common designations for mating connectors. The connector designations shall be indicated on the Record Drawings.

f. Coil all spare conductors in the device back-box, panel wire way, or top of panel where wire way is not provided. These conductors shall be neatly bundled and tagged.

3 EXECUTION

INSTALLATION

A. SITE INSPECTIONS

The NYS-OGS Electrical Contractor shall continuously verify that the site conditions are in agreement with the Documents and the design package. Submit a report to the Director's Representative documenting changes to the site or conditions that affect the performance of the System to be installed. For those changes or conditions, which affect System installation or performance, provide (with the report) specification sheets, or written functional requirements to support the findings, and a cost estimate to correct the deficiency. No deficiency shall be corrected without written permission from the Director's Representative.

Specific mounting locations, exact wire and cable runs, and conduit routing have not been specified or delineated on the Documents. Coordinate all aspects of the Work with the Director's representative and NYSP-TYCO.

B. COORDINATION

1. The NYS-OGS Electrical Contractor shall coordinate with the Director's Representative and NYSP-TYCO to ensure that adequate conduit is provided and that equipment back-boxes are adequate for System installation.

2. The NYS-OGS Electrical Contractor shall coordinate with the Director's Representative and NYSP-TYCO to ensure that adequate power has been provided and properly located for the security System equipment.

3. The NYS-OGS Electrical and Construction Contractor shall coordinate with the Director's Representative and NYSP-TYCO to ensure that doors and doorframes are properly prepared for electric locking hardware and door position switches.

4. NYSP-TYCO shall coordinate locations of all devices with the Director's Representative prior to installation.

5. NYSP-TYCO shall coordinate and verify the location of each piece of rack-mounted equipment with the Director's Representative.

6. NYSP-TYCO shall coordinate all initial database partitioning and setup with the Director's Representative prior to initial programming and cardholder data entry.

7. NYSP-TYCO shall coordinate finishes and colors of all equipment with the Director's Representative.

8. Door hardware vendor shall verify acceptance of each type of specified request-to-exit hardware for each application with local life safety code officials.

9. Door hardware vendor shall verify fail-safe and fail-secure lock requirements with the Director's Representative.

10. Contractor logos or names shall not be visible on equipment in public areas.

11. Provide tamper resistant fasteners for all equipment in public areas. Fastener finish shall match equipment finish.

C. EQUIPMENT:

Provide equipment as indicated on the Documents and specified herein. Additional specific installation requirements are as follows:

a. Security Equipment Room and IC Locations

b. NYSP-TYCO to configure security equipment as indicated in the Documents.

c. NYSP-TYCO to wire all power supply power fail and low battery alarm contacts in each equipment room as a single alarm input to the ACAMS.

1. Card Readers

a. NYSP-TYCO to wire card reader LED's to indicate valid and invalid card reads, and door locked and unlocked conditions. All card reader LED indicators shall operate identically.

2. Electric Locking Mechanisms

a. NYSP-TYCO to interface with electric locking mechanisms provided by the door hardware supplier except as noted in the Wiring section of this document.

b. NYSP-TYCO to wire electric locking mechanisms as indicated on the documents except as noted in the Wiring section of this document.

c. NYSP-TYCO to wire fail-safe electric locking mechanisms in accordance with local codes except as noted in the Wiring section of this document.

d. NYSP-TYCO to wire fail-secure electric locking mechanisms and power supplies such that a fire alarm condition or building power failure shall not affect operation of the lock except as noted in the Wiring section of this document.

3. Fire Alarm Interface

a. NYSP-TYCO to interface with a low voltage/low current normally closed dry contact(s) from the fire alarm system provided by others at each door locking hardware power supply (if applicable). The contact shall open on any fire alarm condition.

b. NYS-OGS Electrical Contractor providing the fire alarm shall supply UL listed fail-safe relays to connect to door locking hardware power supplies furnished by NYSP-TYCO or door hardware vendor at each power supply necessary to interface to this contact and unlock all fail-safe doors.

c. The NYS-OGS Electrical Contractor shall connect fail-safe relays and power supplies to standard building power. Connection of fail-safe devices to emergency or UPS power shall not be acceptable.

d. Reference the Documents for fire alarm interface requirements.

4. Power supplies

a. All door lock power supplies are to be located in the designated security closet.

b. All power supplies requiring 120 VAC power shall have power supplied by “E” contractor including physical connection to the power supplies.

c. Field mounted power supplies must be approved by the Director’s Representative.

D. SYSTEM PROGRAMMING AND DATA ENTRY

1. NYSP-TYCO to provide all initial System programming and setup of the ACAMS including, but not limited to the following:

a. ACAMS Card Reader Information: Coordinate all card reader values and text, including descriptors, alarm messages,

b. Input and Output Points: Coordinate all input and output priorities and text, including descriptors, alarm messages with the Director’s Representative.

c. Initial System Users and Levels of Access: This shall include the designation of Director’s Representative’s representative at the "Super User" level immediately upon ACAMS initialization.

d. Enter all data needed to make the Security System operational. Deliver the data to the Director’s Representative on data entry forms, utilizing data from the Documents, NYSP-TYCO's field surveys and all other pertinent information in NYSP-TYCO's possession required for complete installation of the database. Identify and request from the Director’s Representative any additional data needed to make the Security System fully operational and integrated. The completed forms shall be delivered to the Director’s Representative for review and approval at least 10 days prior to NYSP-TYCO's scheduled date.

e. Card holder programming information is the responsibility of the NYSP after initial training for data entry.

E. CONDUIT, BOXES, AND RACEWAYS

1. The NYS-OGS Electrical Contractor shall install all 120 VAC electrical power, conduit, boxes, raceways, J hooks, pull strings and troughs necessary for a complete installation, but not necessarily provided for in the Documents, in finished areas concealed in chases, furring’s, concrete slabs and/or above suspended ceilings. NYS-OGS Electrical Contractor to provide J hook routing for

The NYSP-TYCO. Where construction permits no exposed conduit shall be installed within public areas.

2. Conduit shall be carefully installed, properly and adequately supported as required to comply with the requirements outlined herein and as required by the NEC to provide a neat, Workmanlike installation. Horizontal conduit runs shall be supported by clamps, pipe straps, special brackets, or heavy iron tie, tied to the black iron structural members supporting the ceiling. Fastening of conduit to masonry walls, floor or partitions require malleable pipe clips with screws and suitable expansion sleeves.

3. All conduit shall be cut accurately to measurements established at the building and shall be installed without springing or forcing.

4. All required inserts shall be drilled-in and all openings required through concrete or masonry shall be saw cut or core drilled with tools specifically designed for this purpose by the NYS-OGS Electrical Contractor.

5. Swab out and remove all burrs from conduit before any wires are pulled. All connector ends shall be supplied with the appropriate protective bushings.

6. Fire stops where conduits penetrate fire rated walls and/or floors to be provided by NYS-OGS contractor.

7. All conduit installation, whether run exposed or concealed, shall be approved prior to installation by the Director's Representative.

F. POWER REQUIREMENTS

1. 120VAC and 208 VAC 3 Phase AC power dedicated to security and on generator backup shall be provided by the NYS-OGS Electrical Contractor for the Security System as indicated on the Documents. Coordinate with the Director's Representative to establish locations of security dedicated 120VAC AC circuits.

2. NYSP-TYCO to connect to the AC power outlets (provided by the NYS-OGS Electrical Contractor) and provide UL listed power supplies and transformers to distribute low voltage power to the System components as required for those power supplies requiring plug in transformers. The NYS-OGS Electrical Contractor shall supply 120 VAC and connect to NYSP-Tyco provided power supplies requiring such connections.

3. Provide hinged cover terminal cabinets for all power supplies, transformers, and power distribution terminal strips.

4. Surge Protection

   a. Protect all exterior pole mounted video cameras, control, power, signal cables, and conductors against power surges. Video surge protectors shall not attenuate or reduce video and sync signals under normal conditions. Each surge protector shall be UL Listed.

G LABELED DOORS AND FRAMES

1. In no instance shall any UL labeled door or frame be drilled, cut, penetrated, or modified in any way.

H. SYSTEM START UP

The Work shall be complete and ready to operate prior to final acceptance.

Load the entire initial user database into all programmable Systems as agreed to between NYSP-TYCO and the Director's Representative. The Director's Representative shall assist in establishing procedural guidelines and in defining terminology and conditions unique to the Director's Representative's operation.

A. SUBSTANTIAL COMPLETION

In order to qualify for the Director's Representative's consideration of Substantial Completion, the Work must, at a minimum, meet the following requirements:

1. All alarm points, access control points, and intercom substations must be installed and fully operational.
2. All sub-System interfaces must be complete and operational.
3. All required operator training must have been provided to the Director's Representative and/or its representatives unless there are delays outside the control of NYSP-TYCO.
4. Substantial Completion shall NOT be construed as final acceptance of the Work unless there are delays outside the control of NYSP-TYCO..

B. SYSTEM ACCEPTANCE

1. Final acceptance testing of the Work will be conducted by the Director's Representative and NYSP-TYCO.
2. NYSP-TYCO shall submit a report matrix indicating completion or delinquency for each item included in the Specification and all subsequent addenda and bulletins as part of the Work. Should work on any item be under way, but not yet fully complete, indicate the extent (or lack thereof) of completion to date, and the proposed date of completion.
3. Fully complete a Security Systems Readiness Checklist prior to the test of the System. The checklist shall accompany the written certification to the Director's Representative that the installed complete System has been tested, and is fully functional as specified herein.
4. Security System Readiness Checklist – NYSP-TYCO shall indicate completion of the listed items. All items are required to be complete before a final inspection of the System. If for some reason NYSP-TYCO is unable to fully comply with any of the listed conditions, a written statement describing the exception is to be submitted with the checklist for review (See sample checklist below)

TASK DESCRIPTION	**CONTRACTOR CERTIFICATION**
a. Required interfaces to other building systems have been completed and are functional. Other building systems may include:	❑

	Fire System	❑
	Elevator System	❑
	Overhead Doors	❑
	Automatic Door Operators	❑
b.	Initial Director's Representative users of the System have been entered and passwords assigned, including one Director's Representative user at the "Super User" level.	❑
c.	Initial input, output, and control information has been loaded into the System. This includes items such as:	
	Point descriptors	❑
	Alarm priorities	❑
	Alarm messages	❑
	Card reader identification	❑
d.	All text, messages, and descriptors have been coordinated with the Director's Representative prior to loading.	❑
e.	The required number of access cards has been delivered to the Director's Representative.	❑
f.	Initial access cardholders have been entered into the System.	❑
g.	On-screen alphanumeric identification of each camera has been completed on all Systems elements. Identification schemes have been coordinated with the Director's Representative if applicable.	❑
h.	Programming and set-up of all NVRs, multiplexers, video motion detection, etc. has been completed if applicable.	❑
i.	All cover plates have been provided on junction boxes, wire ways, etc. All wiring contained therein has been properly bundled, labeled, and wrapped. Excess wiring has been removed.	❑
j.	Installation of all power supplies, control panels, interface panels, batteries, etc. are installed and fully functional. Wire contained therein has been properly bundled, labeled, and wrapped.	❑
k.	Tamper switches have been installed in each cabinet as required and are functionally reporting to the System.	❑

l.	All cables, wires, terminals and other conductors have been labeled. Spare conductors have been labeled and neatly coiled and bundled in appropriate cabinets and wire ways.	❑
m.	All panel controls have been properly labeled. Such labeling has been coordinated with the Director's Representative.	❑
n.	All required System training has been completed.	❑
o.	Draft as-built documentation, including wiring diagrams, point charts, device location drawings, panel diagrams, etc. as defined in the Request For Bid are available for use during the final inspection.	❑
p.	System operation and set-up manuals, and functional descriptions have been provided to the Director's Representative.	❑
q.	All equipment has been installed in all racks and consoles as shown on the Documents or per Director's Representatives request.	❑
r	All equipment has been completely programmed and operational.	❑

5. Following completion of the initial testing and correction of any noted deficiencies, conduct a five (5) day burn-in test. The intent of the burn-in test shall be to prove the System by placing it in near real operating conditions. During this period the System shall be fully functional and programmed such that all points, interfaces, controls, reports, messages, prompts, etc. can be exercised and validated. Record and correct any System anomaly, deficiency, or failure noted during this period. Scheduling of the final acceptance test shall be based on a review of the results of this burn-in test.

6. Prior to the final acceptance test, coordinate with the Director's Representative for security related construction clean-up requirements. Security equipment closets and similar areas should be free of accumulation of waste materials or rubbish caused by operations of NYSP-TYCO or its sub-contractors. NYSP-TYCO at completion of the Work, shall remove all waste materials, rubbish and its subcontractors' tools, construction equipment, machinery, and all surplus materials.

7. Upon written notification from NYSP-TYCO that the System is completely installed, integrated, and operational, and the burn-in testing completed, the Director's Representative will conduct a final acceptance test of the entire System.

8. During the course of the final acceptance test by the Director's Representative NYSP-TYCO shall be responsible for demonstrating that, without exception, the completed and integrated System complies with the contract requirements. All physical and functional requirements of the project shall be demonstrated and

shown. This demonstration will begin by comparing “as built” conditions of the System to requirements outlined in the Specification, item by item. Following the Specification compliance review, all System head-end equipment will be evaluated.

9. As all of these operations depend heavily on prior training, NYSP-TYCO shall have completed all of the required training prior to initiation of the final acceptance test. Failure of a console operator’s ability to perform certain functions in the system will not be cause for denial of system acceptance.

10. The functionality of the various interfaces between Systems will be tested. This testing will include, but not be limited to the following:

    a. Generation of alarms from related Systems failure. Lack of notification from external systems provided by others where system fails and it can be shown that wiring provided indicates system failure by removal or shorting of NYSP-TYCO supplied wire will not be cause for denial of system acceptance.

    b. Fire alarm system fail safe lock release. Failure of a fail safe lock installed by others in the system will not be cause for denial of system acceptance.

    c. Control of any externally controlled devices and/or database System(s). Failure of any externally controlled devices and/or database System(s) installed or provided by others in the system will not be cause for denial of system acceptance.

11. The installation of all field devices will be inspected. Areas examined will include general neatness and quality of installations, complete functionality of each individual device, and mounting.

    a. All equipment shall be fully operational during testing procedures. NYSP-TYCO shall provide all personnel, equipment, and supplies necessary to perform all site testing. A minimum of two (2) employees familiar with the System for the final acceptance test shall be present during the testing. One employee shall be responsible for monitoring and verifying alarms while the other will be required to demonstrate the function of each device. Supply at least two (2) two-way radios for use during the test. A manufacturer’s representative may be present on site to answer any questions that may be beyond the technical capability of NYSP-TYCO’s employees.

    b. Upon successful completion of the final acceptance test (or subsequent punch list retest) the Director’s Representative will issue a letter of final acceptance.

    c. The Director’s Representative retains the right to suspend and/or terminate testing at any time when the System fails to perform as specified. Furthermore, in the event it becomes necessary to suspend the test, NYSP-TYCO shall work diligently to complete/repair all outstanding items to the condition specified in Documents. NYSP-TYCO shall supply the Director’s Representative with a detailed completion schedule outlining phase-by-phase completion dates and a tentative date for a subsequent punch list retest. During the final acceptance test, no adjustments, repairs, or modifications to the System will be conducted without the permission of the Director’s Representative.

C. RECORD DOCUMENTATION

Record Documentation shall include all information required in the Pre-fabrication Submittals but revised to reflect “as installed” conditions. Others to provide to NYSP-TYCO AutoCAD drawings that have already been produced, of floor plans and other drawings requested in DWG format for use in production of shop drawing and as built as required.

1. General Description and Requirements

   a. Submit Record Documentation in accordance with the Director’s Representative’s construction schedule.

   b. Record Documentation shall consist of Record Drawings and Operation Manuals.

   c. Prior to the final acceptance of the Work, submit electronic draft sets of the Record Drawings portion of Record Documentation to the Director’s Representative.

   d. Update all record documentation to reflect changes or modifications made during final acceptance testing as required and submit a set on CD media.

   e. Record Drawings. Produce all Record” as-built” Drawings using at least AutoCAD 2004. Record Drawings shall, at a minimum, include the following:

   f. Floor plan drawings indicating device locations, with device legends indicating device types

   g. Mounting details for all major equipment and hardware

   h. Wiring details showing equipment wiring.

   i. Wiring diagrams for all circuitry including interfaces to various control output controlled devices, i.e. overhead doors, automatic sliding doors, parking gate operators, fire alarm system interface, etc.

   j. Typical point-to-point wiring diagrams for each piece of equipment and groups of equipment within the System

   k. Layout details for each riser location, including security panels, power supplies and any other security related equipment

   l. The NYS-OGS Electrical Contractor shall be responsible for providing a layout drawing for each riser to include junction boxes, conduit, troughs and electrical connections for any security related equipment

2. Operation and Maintenance Manuals*

   Operation Manuals* shall apply to all security related devices, equipment and software modules.

   Operation Manuals* shall be formatted as follows:

   a. Provide a table of contents on material provided electronically for each CD.

b. Any hardware manual demonstrating more than one model number of device on any one page shall be clearly marked as to delineate which model has been implemented in the Work.

c. Operation Manuals* shall include, at a minimum, the following:

d. Operational description of each subsystem

e. Detailed programming descriptions for each subsystem

f. Operations manuals for each piece of equipment (as provided by the respective manufacturer)

g. Operation Manuals* shall include a section for each software program incorporated into the Project. The software section shall include, at a minimum, the following information:

h. Instructions for manufacturer supplied report generation

i. Instructions for custom report generation

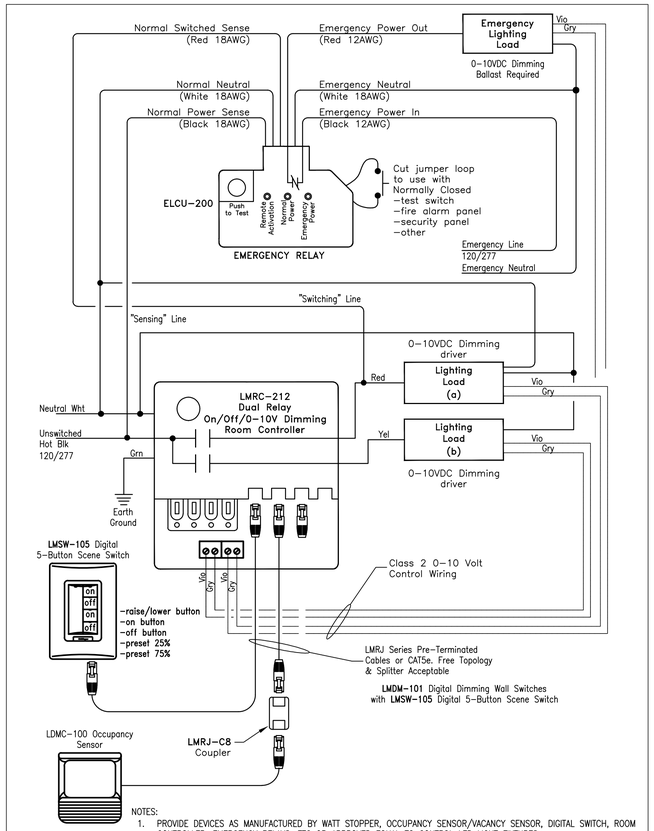
j. Database format and data entry requirements

k. Clearly identify changes made other than those specifically requested by the Director's Representative when resubmitting Record Drawings. Changes shall be clouded or similarly highlighted as coordinated with the Director's Representative. Only changes that have been specifically requested by the Director's Representative or have been clouded by NYSP-TYCO will be reviewed on re-submittals.

l. Any drawing sheets added to the re-submittal shall be clearly identified and clouded, and shall not change the sheet numbering scheme for previously issued Record Drawings.

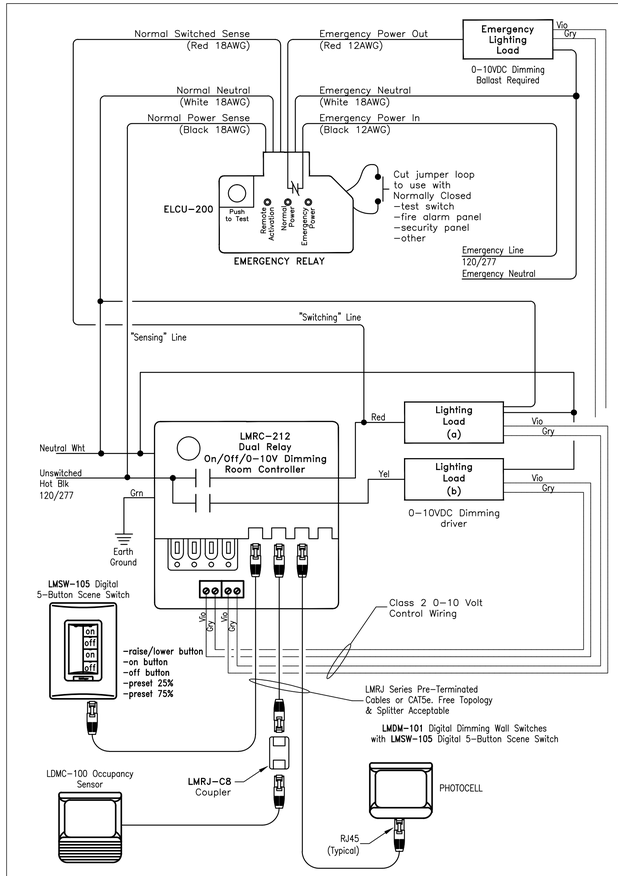
*Operation Manual will be provided electronically

End of Part 3



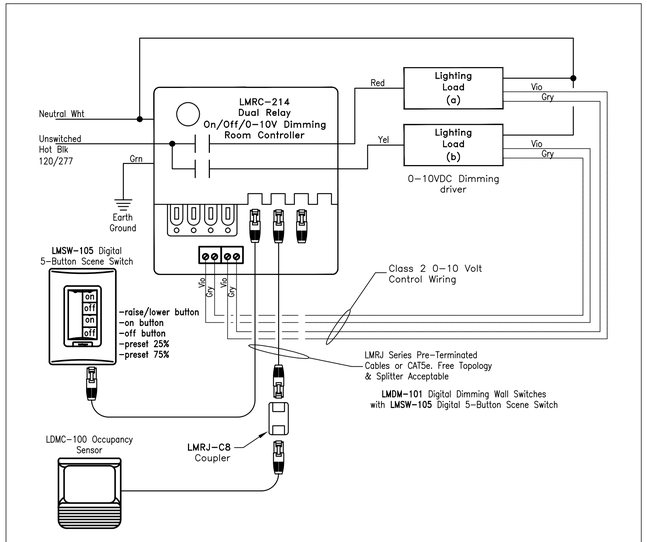
NOTES:
1. PROVIDE DEVICES AS MANUFACTURED BY WATT STOPPER, OCCUPANCY SENSOR/VACANCY SENSOR, DIGITAL SWITCH, ROOM CONTROLLER, EMERGENCY RELAYS, ETC OR APPROVED EQUAL TO CONTROL LED LIGHT FIXTURES.
2. PROVIDE TWO EMERGENCY RELAYS, ONE FOR EACH LOAD.
3. LOCATE ROOM CONTROLLER AND EMERGENCY RELAYS ABOVE CEILING AND ABOVE DIGITAL SWITCH.
4. REFER TO FLOOR PLANS FOR QUANTITY (OCCUPANCY SENSOR, DIGITAL SWITCH).
5. REFER TO FLOOR PLANS FOR WHERE DETAIL APPLIES
6. SENSOR/ROOM CONTROLLER SHALL BE FACTORY PROGRAMMED TO TURN ON ONLY 60% LIGHT LEVEL.

DETAIL "A" (A)



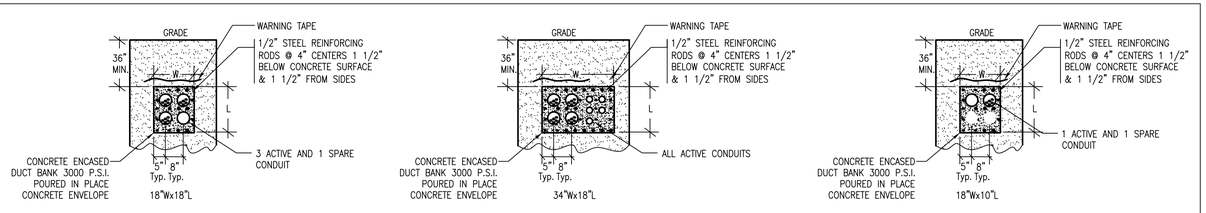
NOTES:
1. PROVIDE DEVICES AS MANUFACTURED BY WATT STOPPER, OCCUPANCY SENSOR/VACANCY SENSOR, DIGITAL SWITCH, ROOM CONTROLLER, EMERGENCY RELAYS, ETC OR APPROVED EQUAL TO CONTROL LED LIGHT FIXTURES.
2. PROVIDE TWO EMERGENCY RELAYS, ONE FOR EACH LOAD.
3. LOCATE ROOM CONTROLLER AND EMERGENCY RELAYS ABOVE CEILING AND ABOVE DIGITAL SWITCH.
4. REFER TO FLOOR PLANS FOR QUANTITY (OCCUPANCY SENSOR, DIGITAL SWITCH).
5. REFER TO FLOOR PLANS FOR WHERE DETAIL APPLIES
6. SENSOR/ROOM CONTROLLER SHALL BE FACTORY PROGRAMMED TO TURN ON ONLY 60% LIGHT LEVEL.

DETAIL "B" (B)



NOTES:
1. PROVIDE DEVICES AS MANUFACTURED BY WATT STOPPER, OCCUPANCY SENSOR/VACANCY SENSOR, DIGITAL SWITCH, ROOM CONTROLLER, ETC OR APPROVED EQUAL TO CONTROL LED LIGHT FIXTURES.
2. LOCATE ROOM CONTROLLER ABOVE CEILING AND ABOVE DIGITAL SWITCH.
3. REFER TO FLOOR PLANS FOR QUANTITY (OCCUPANCY SENSOR, DIGITAL SWITCH).
4. REFER TO FLOOR PLANS FOR WHERE DETAIL APPLIES.
5. SENSOR/ROOM CONTROLLER SHALL BE FACTORY PROGRAMMED TO TURN ON ONLY 60% LIGHT LEVEL.

DETAIL "C" (C)

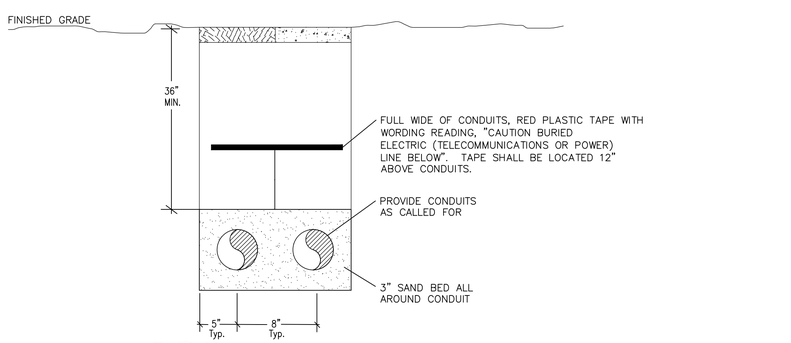


NOTE FOR CONCRETE ENCASED DUCT BANK

1. CONDUIT COUPLINGS SHALL BE STAGGERED 6" MIN BETWEEN ANY COUPLINGS.
2. ALL EMPTY CONDUITS SHALL BE PROVIDED WITH 1/4" NYLON DRAGLINE.
3. ALL CONDUITS TO BE SEALED ON EACH END WITH PROPERLY SIZED END CAP FITTING TO PREVENT ANY WATER AND OR GAS INFILTRATION INTO THE RESPECTIVE BUILDINGS.
4. THE CONDUIT AT BOTH ENDS SHALL BE GRADED UPWARDS FROM 36" BELOW GRADE TO 24" BELOW GRADE AT A RATE OF RISE OF 2" PER FOOT, (6') TOTAL SO THE SLOPE OF THE CONDUIT SHALL BE AWAY FROM THE BUILDING.
5. WHEN DUCT BANKS CROSS PARKING LOT/SIDEWALKS OR RUNNING BETWEEN GARDE AND 12" A 3/8" STEEL PROTECTION PLATE SHALL BE PROVIDED 6" ABOVE THE DUCT BANK ON ENTIRE LENGTH AND WIDTH.
6. PROVIDE WARNING TAPE FOR THE ENTIRE LENGTH AND WIDTH OF DUCT BANK AND PLACE 12" ABOVE DUCT BANK

CONCRETE ENCASED DUCT BANK DETAILS

NOT TO SCALE



NOTES:
1. CONDUITS SHALL BE PVC SCHEDULE 80.

DIRECT BURIAL CONDUIT DETAIL

NOT TO SCALE

NOTES:
1. ALL TRENCHING & BACKFILL TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR.
2. SAND BEDDING AND COVER BY ELECTRICAL CONTRACTOR.

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

ARCHITECT
PETER GISOLFI ASSOCIATES
Architects • Landscape Architects, LLP
566 Warburton Avenue
Hastings on Hudson, NY 10706

STRUCTURAL ENGINEERS
ANASTOS ENGINEERING
240 W. 35th Street
New York, NY 10001

MECH./ELEC./PLBG. ENGINEERS
LAKHANI & JORDAN ENGINEERS, P.C.
315 Madison Avenue
New York, NY 10017

CIVIL ENGINEERS
LANGAN
707 Westchester Avenue
Suite 304
White Plains, NY 10604

CONTRACT: ELECTRICAL

TITLE: NEW YORK STATE POLICE ZONE HEADQUARTERS

LOCATION: MERRICK AVENUE EAST MEADOW, N.Y. 11554

CLIENT: NEW YORK STATE POLICE

1	02-02-2016	ADDENDUM #1
1	12/01/2015	ISSUED FOR BID
MARK	DATE	DESCRIPTION

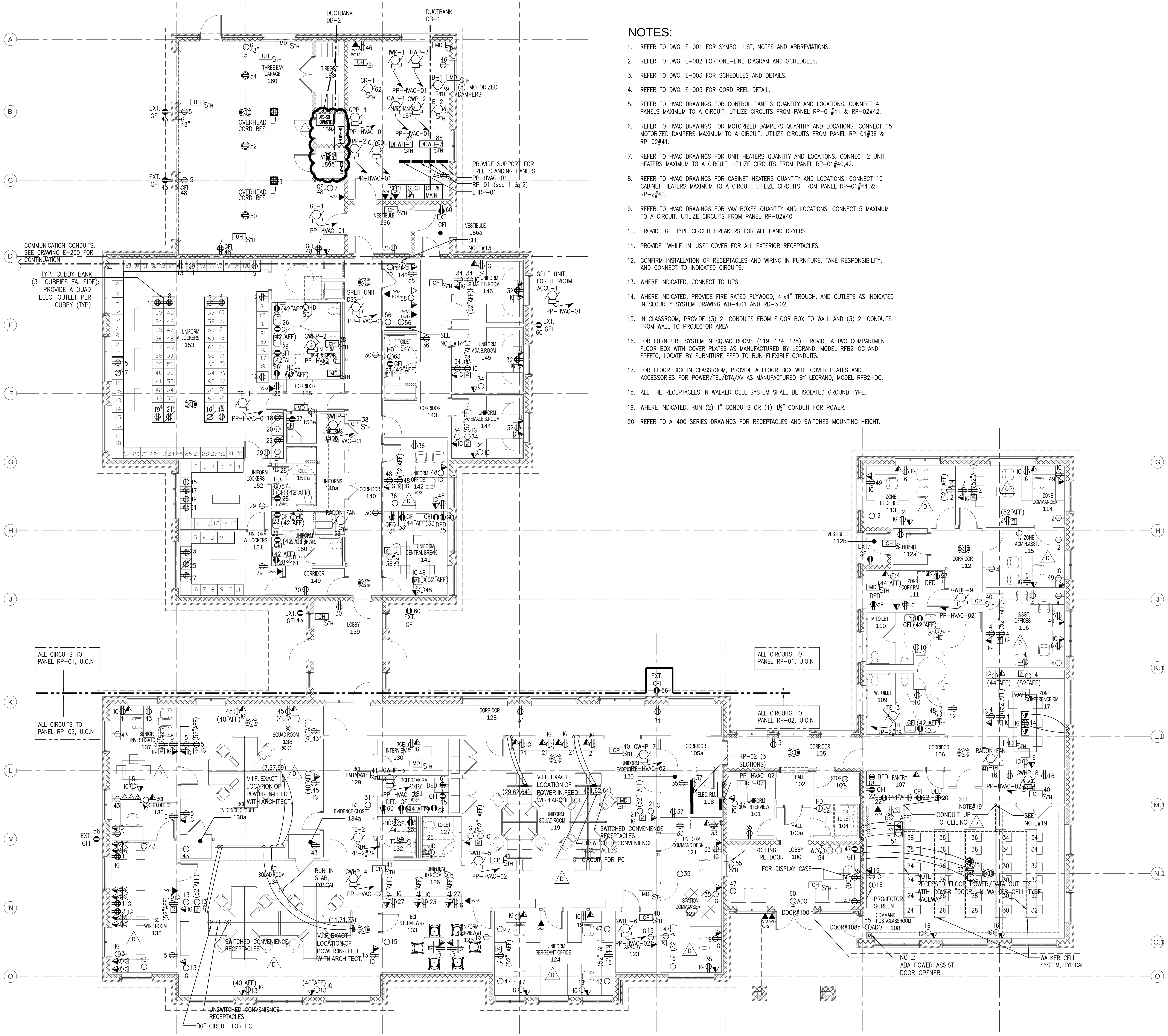
PROJECT NUMBER:	44561 – E
DESIGNED BY:	RP
DRAWN BY:	RP
FIELD CHECK:	
APPROVED:	TJ

SHEET TITLE: ELECTRICAL DETAILS

N.T.S

DRAWING NUMBER: E-004.00

SHEET 124 OF 154



NOTES:

1. REFER TO DWG. E-001 FOR SYMBOL LIST, NOTES AND ABBREVIATIONS.
2. REFER TO DWG. E-002 FOR ONE-LINE DIAGRAM AND SCHEDULES.
3. REFER TO DWG. E-003 FOR SCHEDULES AND DETAILS.
4. REFER TO DWG. E-003 FOR CORD REEL DETAIL.
5. REFER TO HVAC DRAWINGS FOR CONTROL PANELS QUANTITY AND LOCATIONS. CONNECT 4 PANELS MAXIMUM TO A CIRCUIT, UTILIZE CIRCUITS FROM PANEL RP-01#41 & RP-02#42.
6. REFER TO HVAC DRAWINGS FOR MOTORIZED DAMPERS QUANTITY AND LOCATIONS. CONNECT 15 MOTORIZED DAMPERS MAXIMUM TO A CIRCUIT, UTILIZE CIRCUITS FROM PANEL RP-01#38 & RP-02#41.
7. REFER TO HVAC DRAWINGS FOR UNIT HEATERS QUANTITY AND LOCATIONS. CONNECT 2 UNIT HEATERS MAXIMUM TO A CIRCUIT, UTILIZE CIRCUITS FROM PANEL RP-01#40,42.
8. REFER TO HVAC DRAWINGS FOR CABINET HEATERS QUANTITY AND LOCATIONS. CONNECT 10 CABINET HEATERS MAXIMUM TO A CIRCUIT, UTILIZE CIRCUITS FROM PANEL RP-01#44 & RP-2#40.
9. REFER TO HVAC DRAWINGS FOR VAV BOXES QUANTITY AND LOCATIONS. CONNECT 5 MAXIMUM TO A CIRCUIT. UTILIZE CIRCUITS FROM PANEL RP-02#40.
10. PROVIDE GFI TYPE CIRCUIT BREAKERS FOR ALL HAND DRYERS.
11. PROVIDE "WHILE-IN-USE" COVER FOR ALL EXTERIOR RECEPTACLES.
12. CONFIRM INSTALLATION OF RECEPTACLES AND WIRING IN FURNITURE, TAKE RESPONSIBILITY, AND CONNECT TO INDICATED CIRCUITS.
13. WHERE INDICATED, CONNECT TO UPS.
14. WHERE INDICATED, PROVIDE FIRE RATED PLYWOOD, 4"x4" TROUGH, AND OUTLETS AS INDICATED IN SECURITY SYSTEM DRAWING WD-4.01 AND RD-3.02.
15. IN CLASSROOM, PROVIDE (3) 2" CONDUITS FROM FLOOR BOX TO WALL AND (3) 2" CONDUITS FROM WALL TO PROJECTOR AREA.
16. FOR FURNITURE SYSTEM IN SQUAD ROOMS (119, 134, 138), PROVIDE A TWO COMPARTMENT FLOOR BOX WITH COVER PLATES AS MANUFACTURED BY LEGRAND, MODEL RFB2-OG AND FPFFTC, LOCATE BY FURNITURE FEED TO RUN FLEXIBLE CONDUITS.
17. FOR FLOOR BOX IN CLASSROOM, PROVIDE A FLOOR BOX WITH COVER PLATES AND ACCESSORIES FOR POWER/TEL/DTA/AV AS MANUFACTURED BY LEGRAND, MODEL RFB2-OG.
18. ALL THE RECEPTACLES IN WALKER CELL SYSTEM SHALL BE ISOLATED GROUND TYPE.
19. WHERE INDICATED, RUN (2) 1" CONDUITS OR (1) 1½" CONDUIT FOR POWER.
20. REFER TO A-400 SERIES DRAWINGS FOR RECEPTACLES AND SWITCHES MOUNTING HEIGHT.

NEW YORK STATE OF OPPORTUNITY. | Office of General Ser

DESIGN & CONSTRUCTION

CONSULTANT

ARCHITECT
PETER GISOLFI ASSOCIATES
Architects • Landscape Architects, LLP
566 Warburton Avenue
Hastings on Hudson, NY 10706

STRUCTURAL ENGINEERS
ANASTOS ENGINEERING
240 W. 35th Street
New York, NY 10001

MECH./ELEC./PLBG. ENGINEERS
LAKHANI & JORDAN ENGINEERS, P.C.
315 Madison Avenue
New York, NY 10017

CIVIL ENGINEERS
LANGAN
707 Westchester Avenue
Suite 304
White Plains, NY 10604

CONTRACT: ELECTRICAL

TITLE: NEW YORK STATE POLICE ZONE HEADQUARTER

LOCATION: MERRICK AVENUE EAST MEADOW, N.Y. 11554

CLIENT: NEW YORK STATE POLIC

MARK	DATE	DESCRIPTION
1 (triangle)	02-02-2016	ADDENDUM #1
1	12/01/2015	ISSUED FOR

PROJECT NUMBER:	44561 — E
DESIGNED BY:	RP
DRAWN BY:	RP
FIELD CHECK:	
APPROVED:	TJ

SHEET TITLE:

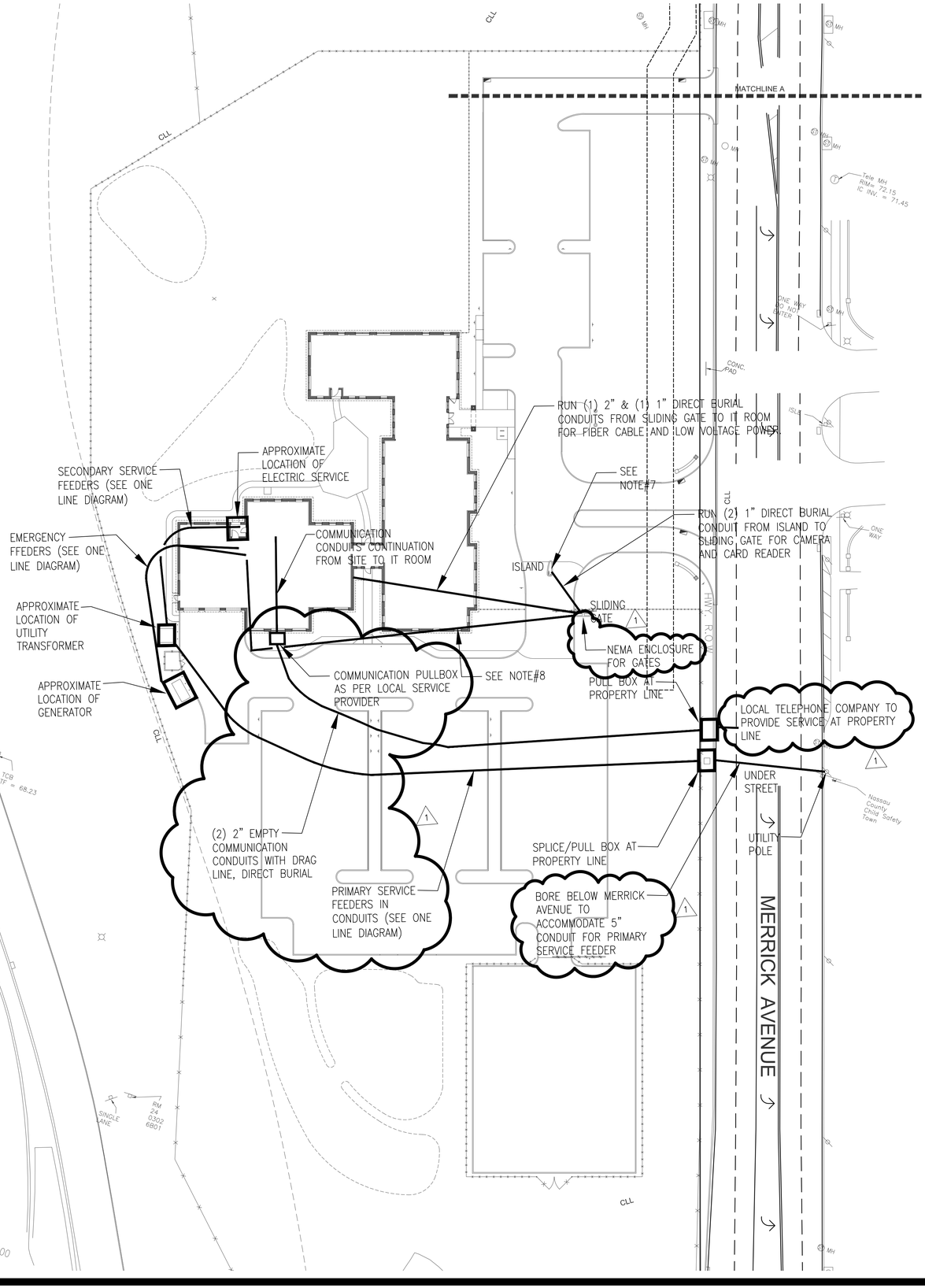
ELECTRICAL POWER PLAN

1/8"=1'-0"

DRAWING NUMBER:

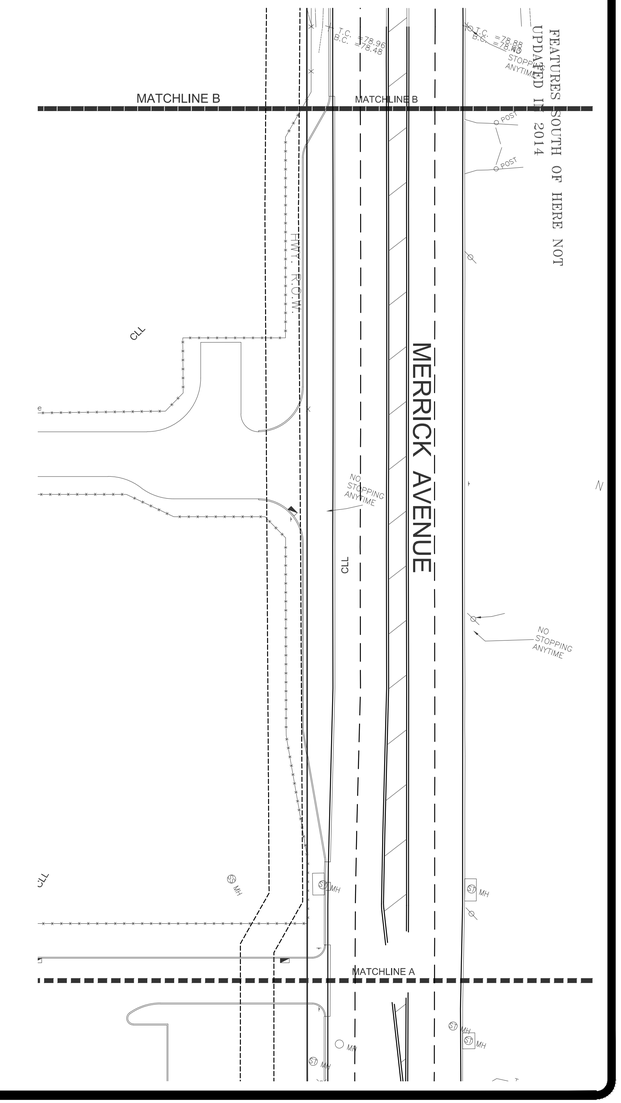
E-100.00

Feb 02,2016 – 8:10am
J:\PROJECTS\00859.00 -OGS-Hempstead - NYS Police HQ\CAD\ELECT\E-100 Power Plan.dwg
36x24 PLOT SHEET



NOTES:

1. REFER TO DWG. E-001 FOR SYMBOL LIST, NOTES AND ABBREVIATIONS.
2. REFER TO DWG. E-002 FOR ONE-LINE DIAGRAM AND SCHEDULES.
3. REFER TO DWG. E-003 FOR SCHEDULES AND DETAILS.
4. PROVIDE 10' LONG COPPER GROUND ROD FOR ELECTRIC SERVICE GROUNDING IN ELECTRIC SERVICE ROOM AND OUTSIDE BY GENERATOR FOR GENERATOR GROUNDING.
5. PROVIDE NEMA 4X ENCLOSURE 48"Hx36"Wx12"D WITH LOCKING CABINET DOOR AS MANUFACTURED BY HOFFMAN ENCLOSURE AT SLIDING GATE.
6. PROVIDE FREE STANDING SUPPORT WITH CONCRETE BASE FOR NEMA 4X ENCLOSURE AND TYCO CONTROLLER AT SLIDING GATE.
7. WHERE INDICATED, PROVIDE A QUAZITE MODEL# PG1324Z80517 TR15 FOR SECURITY SYSTEM CAMERA AND CARD READER. COORDINATE LOCATION AND REQUIREMENT WITH C CONTRACT AND SECURITY VENDOR.
8. RUN 4#8 & 1#10 (G) IN 1" AND 2#8 & 1#10 (G) IN 1" DIRECT BURIAL CONDUITS FOR MOTOR AND RECEPTACLES IN SLIDING GATE CONTROLLER FROM PANEL RP-01#65, 71,73,75. RUN 2#8 & 1#10 (G) IN 1" DIRECT BURIAL CONDUIT FOR RECEPTACLES IN NEMA 4X ENCLOSURE FROM PANEL RP-01#67.
9. GROUND NEMA 4X ENCLOSURE, CONTROLLER, GATE, ETC TO EARTH.
10. PROVIDE PULL BOX AT PROPERTY LINE FOR COMMUNICATION AS DIRECTED/APPROVED BY LOCAL TELEPHONE COMPANY.



NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

ARCHITECT
PETER GISOLFI ASSOCIATES
Architects - Landscape Architects, LLP
566 Warburton Avenue
Hastings on Hudson, NY 10706

STRUCTURAL ENGINEERS
ANASTOS ENGINEERING
240 W. 35th Street
New York, NY 10001

MECH./ELEC./PLBG. ENGINEERS
LAHIANI & JORDAN ENGINEERS, P.C.
315 Madison Avenue
New York, NY 10017

CIVIL ENGINEERS
LANGAN
707 Westchester Avenue
Suite 304
White Plains, NY 10604

CONTRACT: ELECTRICAL

TITLE: NEW YORK STATE POLICE ZONE HEADQUARTERS

LOCATION: MERRICK AVENUE EAST MEADOW, N.Y. 11554

CLIENT: NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
1	12/01/2015	ISSUED FOR BID
1	02-02-2016	ADDENDUM #1

PROJECT NUMBER:	44561 – E
DESIGNED BY:	RP
DRAWN BY:	RP
FIELD CHECK:	
APPROVED:	TJ

SHEET TITLE:

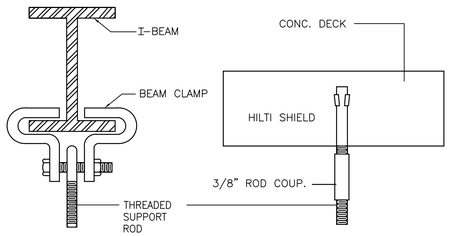
ELECTRICAL SITE POWER PLAN

1/32"=1'-0"

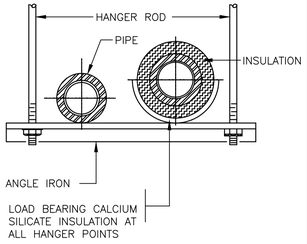
DRAWING NUMBER: E-200.00

SHEET 130 OF 154

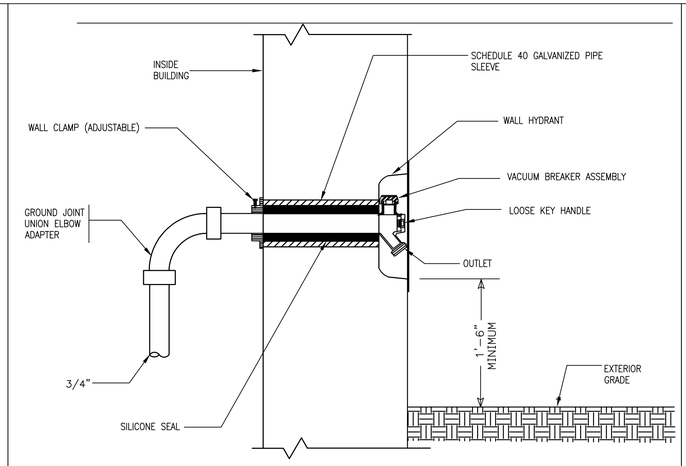
Feb 02,2016 - 8:09am
J:\PROJECTS\08839.00 -GOS-Hempstead - NYS Police HQ\CAD\ELEC\E-200 Site Power Plan.dwg
36x24 PLOT SHEET



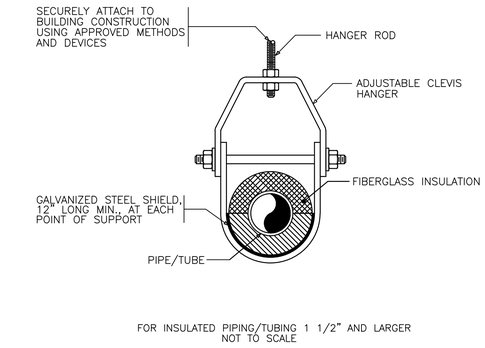
1 ATTACHMENT DETAIL — NTS



2 TRAPEZE HANGER — NTS

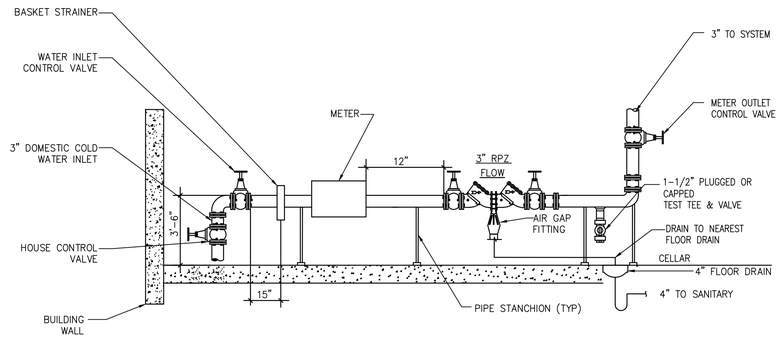


3 FROST PROOF WALL HYDRANT — NTS



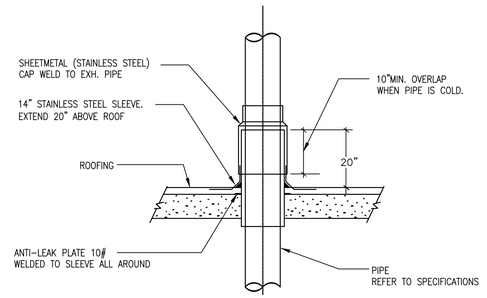
FOR INSULATED PIPING/TUBING 1 1/2" AND LARGER
NOT TO SCALE

4 ADJUSTABLE CLEVIS PIPE SUPPORT — NTS



NOTE: PROVIDE SERVICE CLEARANCE AROUND THE RPZ AS PER CODE REQUIREMENT, SLAB MEMBRANE TO BE COORDINATED WITH CONTRACTOR.

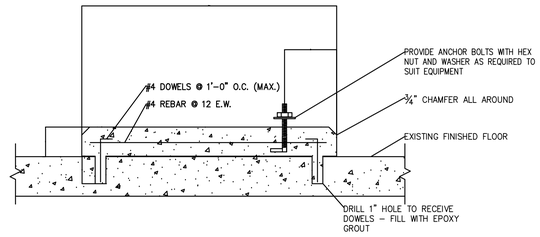
5 BACKFLOW PREVENTER DETAIL — NTS



NOTE: 1. ALL ROOFING WORK MUST BE IN ACCORDANCE WITH US INTEC REQUIREMENTS AND CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN FROM THEM A LETTER STATING THAT ALL PROVISIONS OF ROOF WARRANTY ARE IN EFFECT UPON COMPLETION OF ROOFING WORK.

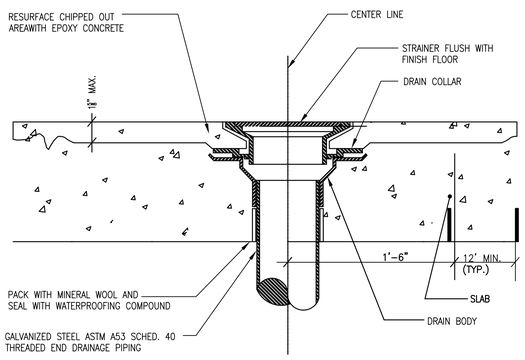
2. SEE DETAIL 8 ON A-851 FOR BATHROOM VENTS

6 PIPE PENETRATION THROUGH ROOF — NTS



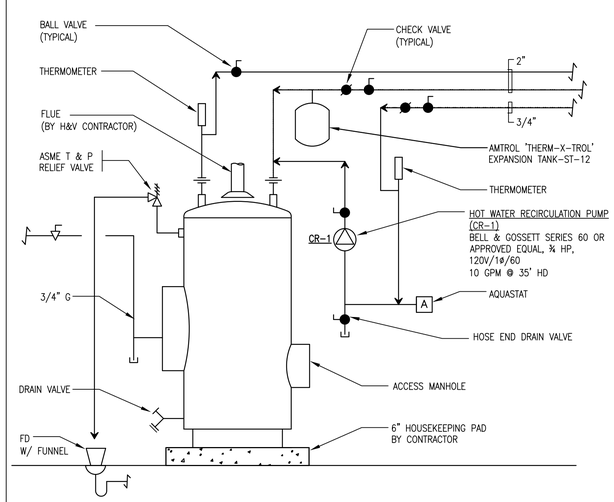
NOTE: PAD SHALL BE 6" LARGER THAN EQUIPMENT (ALL 4 SIDES)

7 TYPICAL CONCRETE PAD DETAIL FOR EQUIPMENT — NTS

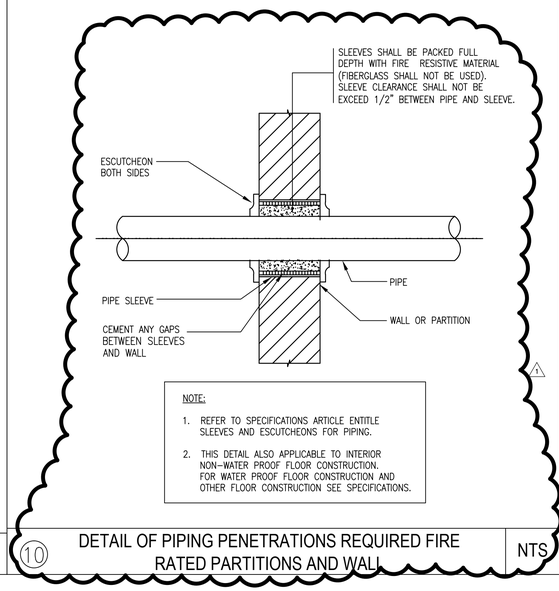


NOTE: 1. ALL DRAINS INSTALLED IN SLAB ON GRADE CONDITION
2. SEE ARCHITECTURAL DRAWINGS FOR WATER PROOFING

8 TYPICAL FLOOR DRAIN INSTALLATION — NTS

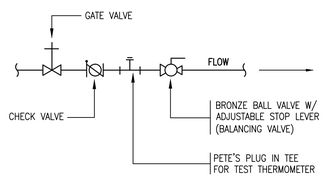


9 DOMESTIC WATER HEATER DETAIL & PIPING SCHEMATIC — NTS



NOTE:
1. REFER TO SPECIFICATIONS ARTICLE ENTITLE SLEEVES AND ESCUTCHEONS FOR PIPING.
2. THIS DETAIL ALSO APPLICABLE TO INTERIOR NON-WATER PROOF FLOOR CONSTRUCTION. FOR WATER PROOF FLOOR CONSTRUCTION AND OTHER FLOOR CONSTRUCTION SEE SPECIFICATIONS.

10 DETAIL OF PIPING PENETRATIONS REQUIRED FIRE RATED PARTITIONS AND WALL — NTS



11 DOMESTIC HOT WATER BALANCING RIG DETAIL — NTS

NEW YORK STATE OF OPPORTUNITY. | Office of General Services

DESIGN & CONSTRUCTION

CONSULTANT

ARCHITECT
PETER GISOLFI ASSOCIATES
Architects • Landscape Architects, LLP
566 Warburton Avenue
Hastings on Hudson, NY 10706

STRUCTURAL ENGINEERS
ANASTOS ENGINEERING
240 W. 35th Street
New York, NY 10001

MECH./ELEC./PLBG. ENGINEERS
LAKHANI & JORDAN ENGINEERS, P.C.
315 Madison Avenue
New York, NY 10017

CIVIL ENGINEERS
LANGAN
707 Westchester Avenue
Suite 304
White Plains, NY 10604

CONTRACT: PLUMBING

TITLE: NEW YORK STATE POLICE ZONE HEADQUARTERS

LOCATION: MERRICK AVENUE EAST MEADOW, N.Y. 11554

CLIENT: NEW YORK STATE POLICE

MARK	DATE	DESCRIPTION
1	12/01/2015	ISSUED FOR BID
1	02-02-2016	ADDENDUM #1

PROJECT NUMBER:	44561 – P
DESIGNED BY:	RWP
DRAWN BY:	RWP
FIELD CHECK:	
APPROVED:	HL

SHEET TITLE: PLUMBING DETAILS

DRAWING NUMBER: P-501

SHEET 115 OF 154