ADDENDUM

Public Building Commission of Chicago | Richard J. Daley Center | 50 West Washington Street, Room 200 | Chicago, Illinois 60602 | (312) 744-3090 | pbcchicago.com

ADDENDUM NO.: **01**

PROJECT NAME: **Chicago Park District – Douglas Park Facility Rehabilitation**

PROJECT NO.: **11310**

CONTRACT NO.: **C1596**

DATE OF ISSUE: **May 24, 2018**

NOTICE OF CHANGES, MODIFICATIONS, OR CLARIFICATIONS TO CONTRACT DOCUMENTS

The following changes, modifications, or clarifications are hereby incorporated and made an integral part of the Contract Documents. Unless clearly expressed otherwise by this Addendum, all terms and conditions defined in the original Contract Documents shall continue in full force and effect and shall have the same meaning in this Addendum. Issued Addenda represent responses/clarifications to various inquiries. Contractors shall be responsible for including all associated labor/material costs in its bid. Drawings/specifications corresponding to inquiry responses will be issued with the Issue for Construction Documents, upon issuance of building permit.

ITEM NO. 1: **CHANGE TO KEY DATES**
None.

ITEM NO. 2: **REVISIONS TO BOOK 1 – PBC INSTRUCTIONS TO BIDDERS**
None.

ITEM NO. 3: **REVISIONS TO BOOK 2 – PBC STANDARD TERMS AND CONDITIONS**
None.

ITEM NO. 4: **REVISIONS TO BOOK 3 – TECHNICAL SPECIFICATIONS**

Change 1 **Book 3 –** Section 00 01 10 – Table of Contents

Change 2 **Book 3 –** Section 03 30 00 – Cast-In-Place Concrete: **REPLACE** Section **WITH** attached. Added paragraph 1.4 A.2.c. Veranda Wall Cap Mockup

Change 3 **Book 3 –** Section 07 52 16 – Styrene-Butadiene-Styrene: **REPLACE** Section **WITH** attached. Revised Paragraph 1.6 D.1: Moisture Survey

ITEM NO. 5: **REVISIONS TO DRAWINGS**

Change 1 **REVISED** Drawing No. A-505. Details 1 through 4: #4 dowels are to be stainless steel.

Change 2 **REVISED** Drawing No. C-101. Revised Keynote 8.

ITEM NO. 6: **REQUESTS FOR INFORMATION**

RFI-1.

Question: **Please confirm who the prequalified firms eligible to bid on this Project are.**

Response: **The below thirteen (13) firms are eligible to bid on the Chicago Park District – Douglas Park Facility Rehabilitation Project.**

1. **All-Bry Construction Company**
2. **Blinderman Construction Company, In.**
3. **Burling Builders, Inc.**
4. **F.H. Paschen, S.N. Nielsen & Associates, LLC**
5. **Friedler Construction Company**
6. **The George Sollitt Construction Company**
7. **John Burns Construction Company**
8. **K.R. Miller Contractors, Inc.**
9. **The Lombard Company**
10. **Madison Construction Company**

11. Reed Construction
12. Scale Construction
13. Tyler Lane Construction, Inc.

RFI-2.

Question: As builts of the existing building to determine if the elevation required to install the sewer line will be below footing line….keynote 8 on C101?

Response: Keynote 8 on Drawing C-101 has been revised. Please refer to revised Drawing C-101 revised and included in this Addendum. Contractor shall take all necessary precautions to remove the existing sewer pipe in preparation for the new work. Contractor shall immediately notify the AOR if the excavation work extends below the base of the existing wall. AOR will determine any required scope modifications.

RFI-3.

Question: Pre-rod/camera and post rod/camera of all roof drains due to roofing operations…is this required to document existing conditions?

Response: Pre/post-rodding/camera are not required.

RFI-4.

Question: Auto Operators—

a. do the existing doors have electric strikes on them?
   i. No hardware section is included in the technical specifications and reference to requirements is not included in section 08 71 13.
b. Are the door operators to be sequenced or stand alone?

Response: Please refer to Sheet A-102 and A-506 of the Contract Documents.

a. Neither door has an electric strike. For door D04, retain current door hardware in place, which has a latch and panic bar hardware. Provide and install a surface mounted electric strike, compatible with existing hardware. Basis of design: Norton 9600 HES electric strike or architect approved equal. Door D03 does not latch, so no electric strike or additional hardware is required.

b. Please refer to Sheet A-506, General Note #5 of the Contract Documents, for sequencing of door closures.

RFI-5.

Question: Environmental report---is there an established environmental scope; and is there a more current/updated inspection other than the 1989 report issued as appendix A?

Response: There is no additional environmental information available. As noted in the Contract Documents, the Contractor shall have an individual who is licensed as an asbestos inspector to identify Asbestos Containing Materials impacted by the renovation activities. The Abatement Costs for ACM, identified as part of this project, shall be the $25,000 Environmental Allowance included on the Bid Form. Also noted in the Contract Documents, all paint must be presumed positive for lead. The Contractor and applicable subcontractors shall complete all work as required by the US EPAs Renovation, Repair and Painting (RRP) rule.

RFI-6.

Question: Can location(s) of drains be provided as shown at inlaid gutters per detail 1/A503? Also, see question above about pre/post rodding of storm lines.

Response: Please refer to Detail 1/A-103 of the Contract Drawings for location of roof drains.

RFI-7.

Question: What type of dowel is required at coping stones?

Response: Please refer to Details 1-4/A-505 revised and included in this Addendum. #4 dowels to be stainless steel.

RFI-8.
Question: Is moisture testing at roof required?
Response: Yes, Contractor shall be responsible for moisture testing in accordance with specification 07 26 16 Styrene-Butadiene-Styrene.

RFI-9.
Question: Provide Veranda Wall Cap Mockup.
Response: Please refer to revised specification 03 30 00 Cast-In-Place Concrete for additional information regarding Veranda Wall Cap Mockup included in this Addendum.

This Addendum includes the following attached Specifications and/or Documents:

1. Section 00 01 10 – Table of Contents
2. Section 03 30 00 – Cast-In-Place Concrete
3. Section 07 52 16 – Styrene-Butadiene-Styrene

This Addendum includes the following attached Drawings:

1. C-101 – Drain Repair, dated 05/21/2018
2. A-505 – Architectural Details 1-4, dated 05/18/2018

END OF ADDENDUM NO. 01

SECTION 00 01 10

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APPENDIX A
Asbestos Inspection Report Douglas Park (6-9-1989)

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 INTRODUCTION:

A. Work under this Section is subject to the requirements of the Contract Documents.

B. All foundation, wall and structural slab work shall conform to the requirements of the Illinois Department of Transportation's Standard Specifications for Road and Bridge Construction, 2012, Section 503.

C. Furnish and install all Cast-in-Place Concrete Work as shown on the Drawings and as specified herein, including but not limited to the following:

D. All concrete work, plain and reinforced.

1. Footings, foundations and foundation walls.
2. Girders, beams and elevated slabs.
3. Concrete pavements, driveways, concrete toppings, sidewalks, curbs, gutters, aprons, ramps and slabs on grade.
4. Supports for all mechanical equipment including concrete housekeeping pads, inertia bases and curbs.
5. All supplementary pumping and dewatering as required to complete the work of this Section.
6. Expansion, control and isolation joints in concrete.
7. Filling "box-outs" with concrete after insertion of the utility.
8. Hydraulic cement in slab-to-wall joint including forming and stripping for same.
9. Grouts.
10. Roof fill topping.
11. Electrical pads and ductline encasement.

1.2 RELATED WORK:

A. As specified in the following divisions:

1. Section 021000 – Temporary Support of Excavation
2. Section 023150 – Earthwork / Building
3. Section 031000 – Concrete Forms and Accessories
4. Section 032000 – Concrete Reinforcement
5. Section 033100 – Concrete Repairs
6. Section 042200 – Concrete Masonry Units
7. Section 0512000 – Structural Steel
8. Section 099723 – Concrete Floor Sealer
9. Section 134200 – Pre-Fabricated Precast Concrete Structures
10. Section 323000 – Site Furnishings

1.3 REFERENCES:

A. ACI 117R "Standard Specification for Tolerances for Concrete Construction and Materials".

B. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete", as published by The American Concrete Institute (ACI).

C. ACI 302.1R "Guide for Concrete Floor and Slab Construction".

D. ACI 311R "ACI Manual of Concrete Inspection".

E. ACI 304R "Guide for Measuring, Mixing, Transporting and Placing Concrete", except minimum cement content must be herein specified.

F. ACI 211.1 "Manual of Standard Practice".

G. ACI 301 "Specifications for Structural Concrete for Buildings".

H. ACI 305R "Hot Weather Concreting".

I. ACI 306R "Cold Weather Concreting".

J. ACI 308R "Guide to Curing Concrete".

K. ACI 309R "Guide for Consolidation of Concrete".

L. ACI 315 "Details and Detailing of Concrete Reinforcement".

M. ACI 318 "Building Code Requirements for Structural Concrete".

N. ACI 347 “Guide to Formwork for Concrete”.

O. ACI 350 “Code Requirements for Environmental Engineering Concrete Structures and Commentary”.

P. ASTM A82 “Standard Specification for Steel Wire, Plain, for Concrete Reinforcement”.

Q. ASTM A185 “Standard Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement”.

R. ASTM A497 “Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement”.

S. ASTM A615 “Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement”.

T. ASTM A706 “ Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement”.

U. ASTM A767 “Standard Specification for Zinc-Coated Steel Bars for Concrete Reinforcement”.

V. ASTM A775 “Standard Specification for Epoxy-Coated Reinforcing Steel Bars”.

W. ASTM C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.

X. ASTM C33, Standard Specification for Concrete Aggregates.

Y. ASTM C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.

Z. ASTM C 94 “Specifications for Ready Mixed Concrete”.

AA. ASTM C143, Standard Test Method for Slump of Hydraulic-Cement Concrete.

BB. ASTM C150, Standard Specification for Portland Cement.

CC. ASTM C172, Standard Practice for Sampling Freshly Mixed Concrete.

DD. ASTM C173, Standard Test Method for Air Content of Freshly Mixed Concrete by Volumetric Method.

EE. ASTM C192, Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory.

FF. ASTM C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.

GG. ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete.

HH. ASTM C309, Standard Specification for Liquid Membrane – Forming Compounds for Curing Concrete.

II. ASTM 311, Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.

JJ. ASTM C494, Standard Specification for Chemical Admixtures for Concrete.

KK. ASTM C595, Standard Specification for Blended Hydraulic Cements.

LL. ASTM C618, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

MM. ASTM C881, Standard Specification for Epoxy-Resin Bonding Systems for Concrete.

NN. ASTM C1218, Standard Test Method for Water-Soluble Chloride in Mortar and Cement.

OO. The Illinois Department of Transportation Standard Specification for Road and Bridge Construction, latest edition.

PP. Unless otherwise indicated, the latest edition of the Specifications, shall govern the Work. Copies of the above publications must be made available by the Contractor on the job site at all times.

QQ. Concrete work must comply with federal, state and local building codes; including the City of Chicago Building Code.

1.4 SUBMITTALS:

A. Submit the following

1. Shop Drawings

a. Shop Drawings must include bar lists, joint details of bars, insert locations, bending diagrams, and setting Drawings, showing all openings through slabs and walls.

b. Fabrication and placing Drawings for all reinforcing steel, conforming to the "Manual of Standard Practice for Detailing Reinforced Concrete Structures" ACI 315.

c. Concrete Pour Schedule.

2. Samples and/or Product Data

a. Product Data

1) Portland Cement

2) Normal Weight Aggregates

3) Concrete Admixtures

4) Bonding and Repair Materials

5) Patching and Surfacing Compounds

6) Grout Materials

7) Fibrous Reinforcements

8) Water Stops

9) Joint Fillers

10) Inserts

11) Curing and Sealing Compounds

12) Waterproofing membranes

b. Samples

1) All aggregates, 20 lbs. each.

2) Vapor barrier, 12" x 12" sheet.

3) Curing material, 1 pint or 12" x 12" sheet.

4) Joint filler, 12" lengths.

5) Plywood for exposed smooth surfaces (18" x 18").

6) Pint of mineral formwork oil.

7) Pint of form release agent.

8) Form ties - one (1) of each type.

9) Bar supports and other accessories, two (2) each.

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c. Veranda Wall Cap Mockup

1) Remove existing coating to expose underlying concrete in adjacent location(s) selected by architect and an area no less than 4 linear feet of wall cap. Use this exposed concrete for matching new concrete finish.

Formwork finish and finish texture to match original adjacent. Please submit mockups for review. Mockups to be 12”x 12” minimum concrete squares showing finish with description of proportions of components and processes used to match the texture. Provide samples to demonstrate range of texture of finish for review to match existing.

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Assume a minimum of two sets of three samples will be required to narrow the range of acceptable texture. The second set of samples will be prepared after eliminating two of the least acceptable samples from the first set.
Assume filling of honeycombs and voids and rubbing surface with grout will be necessary to achieve desired finish.

Assume abrasive blasting or water jetting may be required to match texture of finished concrete.

Finishes and treatments may include, but are not limited to:

Rubbed Finish: Apply the following to smooth-form-finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.

Exposed-Aggregate Finishes:

1. Scrubbed Finish: After concrete has achieved a compressive strength of from 1000 to 1500 psi (6.9 to 10.3 MPa), apply scrubbed finish. Wet concrete surfaces thoroughly and scrub with stiff fiber or wire brushes, using water freely, until top mortar surface is removed and aggregate is uniformly exposed. Rinse scrubbed surfaces with clean water. Maintain continuity of finish on each surface or area of Work. Remove only enough concrete mortar from surfaces to match design reference sample or mockup.
2. High-Pressure Water-Jet Finish: Perform high-pressure water jetting on concrete that has achieved a minimum compressive strength of 4500 psi (31 MPa). Coordinate with formwork removal to ensure that surfaces to be high-pressure water-jet finished are treated at same age for uniform results.

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a. Surface Continuity: Perform high-pressure water-jet finishing in as continuous an operation as possible, maintaining continuity of finish on each surface or area of Work. Maintain required patterns or variances in reveal projection to match design reference sample or mockup.

3. Abrasive-Blast Finish: Perform abrasive blasting after compressive strength of concrete exceeds 2000 psi (13.8 MPa). Coordinate with formwork removal to ensure that surfaces to be abrasive blasted are treated at same age for uniform results.

a. Surface Continuity: Perform abrasive-blast finishing in as continuous an operation as possible, maintaining continuity of finish on each surface or area of Work. Maintain required patterns or variances in depths of blast to match design reference sample or mockup.

b. Abrasive Blasting: Abrasive blast corners and edges of patterns carefully, using backup boards, to maintain uniform corner or edge line. Determine type of nozzle, nozzle pressure, and blasting techniques required to match design reference sample or mockup.

c. Depth of Cut: Use an abrasive grit of proper type and gradation to expose aggregate and surrounding matrix surfaces to match design reference sample or mockup, as follows:

i. Brush: Remove cement matrix to dull surface sheen and expose face of fine aggregate; with no significant reveal.

ii. Light: Expose fine aggregate with occasional exposure of coarse aggregate and uniform color; with maximum reveal of 1/16 inch (1.5 mm).

iii. Medium: Generally expose coarse aggregate; with slight reveal, a maximum of 1/4 inch (6 mm).

iv. Heavy: Expose and reveal coarse aggregate to a maximum projection of one-third its diameter; with reveal range of 1/4 to 1/2 inch (6 to 13 mm).

3. Tests Procedure

a. The Contractor will employ an approved QC Testing Laboratory which will perform compressive strength tests and perform inspection in accordance with these Specifications, at no cost to the Owner. The Contractor must cooperate with the Testing Laboratory and Owner in every respect.

b. During progress of the Work, the Contractor will conduct temperature, slump and air tests and will mold and initial cure and store the test specimens in accordance with ASTM C31. The Contractor's technicians preparing the specimens must be currently certified to perform the required concrete sampling and testing and his qualifications will be subject to review and acceptance by the Owner. The Contractor must transport and deliver the test specimens to the QA Testing Laboratory using a Chain of Custody form

provided by the Owner. The Contractor must be responsible for developing a system of recording the initial curing temperatures and their data must be sent to the Owner's laboratory with the test specimens. The Owner will make the actual tests on the specimens in accordance with ASTM C39 at no expense to the Contractor.

1) One (1) set of strength tests must consist of four (4) standard cylinders of every 100 cubic yards of concrete or fraction thereof placed in any one (1) day.

2) Each class of mix must be represented by not less than a set of four (4) tests regardless of concrete quantity placed at the time.

3) One cylinder must be tested at 7 Days, two at 28 Days and one retained in reserve for later testing if required, in accordance with ASTM C39.

4) Determine air content for air entrained concrete at least for the first two loads, the last load, every 50 cubic yards, and every time cylinder samples are taken in accordance with ASTM C173 or C231.

5) Slump Tests – Test for slump at least for the first two loads, the last load, every 50 cubic yards, and every time cylinder samples are taken and as required by the Owner in accordance with ASTM C143. Keep a slump cone at the site at all times.

6) Temperature – Test for temperature, at least the first two loads, the last load, every 50 cubic yards, and every time cylinder samples are taken in accordance with ASTM C1064.

c. Concrete strength tests will be evaluated in accordance with ACI 214 "Recommended Practice for Evaluation of Compression Test Rules of Field Concrete." Compressive strength of concrete must conform to the following criteria:

1) The average of any three (3) sets of consecutive strength tests of laboratory cured specimens for each class of concrete must exceed or equal the specified strength for that class and no individual strength test result must fall below the required strength by more than 500 psi.

a) (Note: In order to meet these criteria, with average quality control of production, it will be necessary that the average of all strength tests for each class of concrete exceed the specified strength by 25%.)

d. If compressive strength tests fail to meet the above minimum requirements, concrete represented by such tests must be considered questionable and must be subjected to the following further testing at the expense of the Contractor:

1) Core samples must be secured, prepared and tested in accordance with ASTM C42.

2) If the core tests specified above fail to meet strength requirements or should it be impractical to take such cores the Owner may order load tests which must be conducted and the results evaluated in accordance with Chapter 20 of ACI 318.

3) Failure of any portion of the structure to pass a load test will result in rejection of such portion and the Contractor must remove and reconstruct such condemned areas at his expense.

e. When, in the opinion of the Owner, the laboratory tests are not indicative of the quality of concrete in place, additional tests of the hardened concrete may be taken. The Contractor must bear the cost of such tests.

4. Test Reports

a. The testing laboratory must submit five (5) copies of its test cylinder reports which are to include as far as applicable the following items:

1) Amount and location of the pour in structure, type of the structure, date of the pour.

2) Concrete design mix number and concrete design strength.

3) Proportion, type, and amount of cement.

4) Aggregates and admixture used.

5) Surface water, water added, and total water used.

6) Slump, air content, and temperature of heated concrete.

7) Capacity and condition of mixing truck.

8) Percent capacity loaded condition of heating installation.

9) Period of inspection and number and size of batches delivered.

10) Age of testing, method of curing.

11) Truck number, time of transit, date and supplier's name.

5. Inspection of Batch Plant Operation

a. Required to insure that concrete delivered to the job site complies with the Specifications and design mix. The QC testing laboratory must provide this service as directed by the Owner.

6. Plant Inspection Reports

a. Must be submitted in four (4) copies, and include the following items:

1) Location of plant and job site location.

2) Concrete design mix number and concrete design strength.

3) Type, source, and amount of cement.

4) Aggregates and admixture used.

5) Surface water, water added, and total water used.

6) Slump, air content, and temperature of heated concrete.

7) Capacity and condition of batching installation.

8) Condition of heating installation.

9) Period of inspection and number and size of batches delivered.

7. Records and Schedules

a. The Contractor must maintain concrete pouring schedules and records with marked Drawings indicating the time and date of placing concrete in the various Sections of the work.

1) Keep these Drawings on file for reference, and deliver to the Owner upon completion of the Work.

8. Concrete Mix Design and Control

a. The Contractor must employ, at his expense, an independent QC testing laboratory that meets the requirements of ASTM C1077 and approved by the Owner, to design the mix or mixes for each type of concrete required in accordance with the Specifications and Drawings. Mix designs prepared by Concrete manufacturers must be tested and verified by the QC testing laboratory to conform with the Specifications and submitted to the Owner for review and acceptance.

b. No concrete must be placed until mix designs and 28 day test results are submitted and approved.

c. The Contractor must request mix design, or designs, in writing and furnish this testing laboratory with necessary material to prepare the mix, or mixes, a minimum of 35 days prior to placement of concrete.

d. The adequacy of a design must be verified by tests on a minimum of 6 cylinders; 2 tested at 3 days, 2 tested at 7 days and 2 at 28 days, in accordance with ASTM C 192 and C 39 and by slump test in accordance with ASTM C 143, and by air test in accordance with ASTM C231.

e. The testing laboratory through the Contractor must submit copies of the mix design, or designs, and test results to the Owner for approval before concrete is placed. If there is more than one design, each design must indicate where it is to be used.

f. If at anytime during construction the concrete resulting from the approved mix design proves to be unsatisfactory for any reason, such as lack of workability; insufficient strength, the Contractor must immediately notify the QC testing laboratory and the Owner. The laboratory must verify the deficiency with additional testing and modify the design, subject to the Owner's approval, until a satisfactory concrete is obtained.

g. Strength requirements of concrete must be noted on the Drawings. Concrete must be proportioned to achieve an average strength of at least 500 psi higher than design strength shown. If no design strength is shown, the design strength must be 4,000 psi at 28 days.

h. When an approved water reducing admixture is used in accordance with Manufacturer's recommendations, cement requirements may be reduced. Mix designs must indicate use of admixtures.

i. Slump must be 3" plus or minus 1" for footings and foundations walls, and 3" plus or minus ½" for balance of structure. Slump for Portland Cement Concrete (PCC) pavement must be ¾" to 1-1/2"; except that a slump above 1-1/2" may be used, up to a maximum of 3", provided that the mixture's water/cement ratio does not exceed 0.42. Concrete mixes containing plasticizers must have a maximum slump of 8." The Contractor's independent QC testing laboratory and the Owner must have the right to reject any concrete which arrives at job site in excess of specified slump. No water must be added to design mix unless as determined in accordance with ASTM C 143 and only if calculations performed by the Contractor's QC laboratory with batch weights confirm that the design water to cement ratio is not exceeded, subject to the Owner's approval on a case by case basis.

j. All concrete exposed to weather or in contact with earth or backfill, including interior slab on grade, must be air-entrained. Air-entrained concrete must be made with an air-entraining admixture. Total air content must be 6 percent (plus or minus 1 percent), determined in accordance with ASTM C231, or as indicated hereinafter under "Concrete Types" - estimate of quantities.

k. Minimum cement content must be 535 pounds per cubic yard of concrete. The water/cement ratio must be determined on a mass (weight) basis. Select water/cement ratio on the basis of strength, workability and finishing requirements. Unless otherwise specified, the maximum water/cement ratio for normal weight concrete must be 0.45. When a maximum water/cement ratio is specified, the water must include wash water, mixing water, water in admixture, free moisture in the aggregates, and water that may be added at the jobsite. When fly ash, ground granulated blast furnace slag, or micro silica are used as part of the cement in a concrete mix, the water/cement ratio will be based on the total cementitious material contained in the mixture.

l. A plasticizing admixture may be used when approved by the Owner for the purpose of reducing water requirements for a given consistency and strength of concrete and for increasing workability. Mixture must be used in accordance with Manufacturer's recommendations.

9. Manufacturer's Certification

a. Submit certification that products meet or exceed the specified requirements.

1.5 QUALITY CONTROL:

A. Contractor Qualifications: Installation of cast-in-place concrete work must be performed only by a qualified installer. The term qualified means experienced in performing the Work required by this Section. The qualified installer must have a minimum of five (5) years documented experience on Projects similar in size and scope to this Project. The installer must submit evidence of such qualifications upon request by the Owner.

B. Perform Work in accordance with the latest edition, of the appropriate divisions, of the following:

1. ACI 315, Details and Detailing of Concrete Reinforcement, as published by the American Concrete Institute, current edition.

2. ACI Detailing Manual, (SP-66), as published by the American Concrete Institute, current edition.

3. ACI 318, Building Code Requirements for Structural Concrete, as published by the American Concrete Institute, current edition.

4. ACI 350, "Code Requirements for Environmental Engineering Concrete Structures and Commentary".

5. AWS D1.4, Recommended Practice for Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction, as published by the American Welding Society, current edition.

6. CRSI, Manual of Standard Practice, as published by the Concrete Reinforcing Steel Institute, current edition.

7. ACI 117R, Standard Specification for Tolerances for Concrete Construction and Materials, as published by the American Concrete institute, current edition.

8. CRSI, Placing Reinforcing Bars, as published by the Concrete Reinforcing Steel Institute, current edition.

9. ACT 305R Hot Weather Concreting, as published by the American Concrete Institute, current edition.

10. ACI 306R Cold Weather Concreting, as published by the American Concrete Institute, current edition.

1.6 DELIVERY, STORAGE AND HANDLING:

A. Materials must be stored in strict accordance with the Manufacturer's printed directions, copies of which must be furnished to the Owner.

B. Protect materials against damage from mechanical abuse, plaster, salts, acids, and other foreign matter by an approved means during transportation, storage and erection and until completion of construction work. All unsatisfactory materials must be removed from the premises, and all damaged materials replaced with new materials.

1. Protect materials against damage from mechanical abuse, salts, acids, and other foreign matter by an approved means during transportation, storage and erection and until completion of construction work. All unsatisfactory materials must be removed from the premises, and all damaged materials replaced with new materials.

2. Properly label all bars with weatherproof tags to facilitate identification.

C. Access and Storage Areas

1. All access routes and storage areas must be subject to the approval of the Owner.

1.7 WARRANTIES AND GUARANTEES:

A. The following materials have special Manufacturer's Warranties for the periods listed with each item, which may originate, in part or in whole, with the manufacturer or the fabricator and such warranties must be passed through the Contractor to the Department.

1.8 ENVIRONMENTAL REQUIREMENTS:

A. When cold weather conditions as defined in ACI 306R exist, place and cure concrete in accordance with requirements of same.

B. When hot weather conditions as defined in ACI 305R exist, place and cure concrete in accordance with same.

C. The Contractor must submit detailed procedures for production, transportation, placement, protection, curing, testing and temperature monitoring of concrete during hot or cold weather. The Hot or Cold Weather Concreting Plan must include procedures to be implemented upon abrupt changes in weather conditions or equipment failures.

1.9 SPECIAL REQUIREMENTS:

A. Field Measurements - Before proceeding with the fabrication of the work, the Contractor must verify all dimensions and take such measurements as are required for proper fabrication and installation of the work.

B. Coordination - Coordinate Work of this Section with related Work specified in the other divisions/sections of the Contract Documents.

C. Where it is stated within the contract documents that a structural engineer must review/verify a condition before proceeding, the contractor is required to have a Structural Engineer licensed by the state Illinois verify existing conditions before concrete installation is to proceed.

PART 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA:

A. General

1. Regular concrete work must consist of Portland cement, fine aggregate, coarse aggregate, plasticizing admixture, and water. Other types of concrete must vary the cement, aggregates, and admixtures as required to produce the desired features. Concrete must be proportioned, mixed, placed, cured, and finished as hereinafter specified. Each material for the entire job must come from the same source. The following types of concrete must be used where indicated on the Drawings or specified:

a. Regular Concrete.

b. Air entrained concrete.

c. Lean concrete.

d. Fiber reinforced concrete for roof decks conforming to the requirements of ASTM C1116.

B. Admixtures

1. Used in concrete must be produced by reputable manufacturers and used in accordance with the Manufacturer's printed directions, subject to approval of the Owner.

C. Portland Cement

1. ASTM C 150, Type I normal Portland cement; or Type III (High-early strength cement) as approved by the Owner.

D. Aggregate for Normal Weight Concrete

1. All fine and coarse aggregate must conform to ASTM C 33.

2. Fine Aggregates - Natural or artificial, hard clean sand.

3. Coarse Aggregates - Crushed stone or gravel, except blast furnace slag will not be accepted. Aggregate sizes must meet the following:

a. Size 57, for footings foundations, walls, beams, slabs on fill and reinforced slabs 6" or greater thickness.

b. Size 7, for applied toppings.

c. Size 67, for other concrete, unless otherwise specified.

4. Exposed Aggregates - Merrimac Pea Gravel.

E. Water

1. Must be clean, fresh, and potable.

F. Admixtures

1. Concrete admixtures must comply with ASTM C 494 (Water reducing) or ASTM C 260 (Air Entraining), produced by recognized Manufacturers subject to Owner's approval.

2. Air Entraining Admixture

a. ASTM C 260, Add only to normal Portland cement concrete to meet requirements specified for air content.

b. Products of one of the following Manufacturers will be acceptable:

1) "Air Mix", (The Euclid Chemical Company, Cleveland, OH 44110.)

2) "MB-VR", (Master Builders, Inc., Downers Grove, IL 60515.)

3) "Darex or Daravair", (W.R. Grace & Co., Bedford Park, IL 60638.)

4) "Sika AER", (Sika Corp., Lynhurst, NJ 07071.)

3. Water Reducing Admixture

a. ASTM C 494, Type A, and not containing any; chloride ions added during manufacture.

b. Products of one of the following Manufacturers will be acceptable:

1) "Eucon WR-75", (The Euclid Chemical Company, Cleveland, OH 44110.)

2) "Pozzolith" 122N, (Master Builders, Inc., Downers Grove, IL 60515.)

3) "WRDA with Hycol", (W.R. Grace & Co., Bedford Park, IL 60638.)

4) "Plastocrete 161", (Sika Corp., Lynhurst, NJ 07071.)

4. Water Reducing, Retarding Admixture

a. ASTM C 494, Type D. When high temperatures, placing or humidity conditions dictate.

b. Products of one of the following Manufacturers will be acceptable:

1) "Eucon Retarder-75", (The Euclid Chemical Company, Cleveland, OH 44110.)

2) "Pozzolith 100-XR", (Master Builders, Inc., Downers Grove, IL 60515.)

3) "Daratard 17", (W.R. Grace & Co., Bedford Park, IL 60638.)

4) "Plastiment", (Sika Corp., Lynhurst, NJ 07071.)

5. Water Reducing, Accelerating Admixture

a. ASTM C 494, Types C or E. When increased initial set is required without corrosive effect on metals.

b. Products of one of the following Manufacturers will be acceptable:

1) "Accelguard",(The Euclid Chemical Company, Cleveland, OH 44110.)

2) "Pozzolith 122-HE", (Master Builders, Inc., Downers Grove, IL 60515.)

3) "Daraccel M", (W.R. Grace & Co., Bedford Park, IL 60638.)

6. Plasticizing Admixture

a. Products of one of the following Manufacturers will be acceptable:

1) "Pozzolith-N or Polyheed N or Rheomac VMA", (Master Builders, Inc., Downers Grove, IL 60515.)

2) "WRDA", (W.R. Grace & Co., Bedford Park, IL 60638.)

3) "Sikament or Sikacrete", (Sika Corp., Lynhurst, NJ 07071.)

b. When ambient temperature is expected to exceed 80 degrees F during placing and finishing operations.

1) Products of one of the following Manufacturers will be acceptable:

a) "Pozzolith - R", (Master Builders, Inc., Downers Grove, IL 60515.)

b) "Daratard", (W.R. Grace & Co., Bedford Park, IL 60638.)

7. Fly Ash

a. ASTM C-618, used in accordance with industries recommendations as plasticizing agent.

8. Calcium chloride must not be used.

G. Non-shrink: Pre-mixed Grout

1. Metallic Type

a. Products of one of the following Manufacturers will be acceptable:

1) "Firmix", (The Euclid Chemical Company, Cleveland, OH 44110.)

2) "Embeco 153", (Master Builders, Inc., Downers Grove, IL 60515.)

3) "Ferrolith G", (Sonneborn Products Co., Hartville, SC 29550.)

2. Non-Metallic Type

a. Products of one of the following Manufacturers will be acceptable:

1) "Euco N-S", (The Euclid Chemical Company, Cleveland, OH 44110.)

2) "Sonogrout",(Sonneborn Products Co., Hartville, SC 29550).

3) "Upcon", (USM Corporation).

4) "F-100" (Sauereisen Cements Company).

H. Bonding Agent

1. Products of one of the following Manufacturers will be acceptable:

a. Epoxy type, 100% solids

1) "Euco Epoxy #452 (dry surface), #463" (dry or damp surface), The Euclid Chemical Company, Cleveland, OH 44110.

2) "Sikadur Hi-Mod" (dry or damp surface), Sika Corp., Lynhurst, NJ 07071.

3) "Duralbond 102" (dry or damp surface), Dural International Corp.

I. Patching and Surfacing Compound

1. Products of one of the following Manufacturers will be acceptable:

a. Epoxy type, 100 % solids

1) "Euco Epoxy #456 Mortar (dry surface), #460 (dry or damp surface)", (The Euclid Chemical Company, Cleveland, OH 44110.)

b. "Sikadur Lo-Mod Mortar", (dry or damp surface), Sika Corp., Lynhurst, NJ 07071.

c. "Duraltex" (dry or damp surface), (Dural International Corp.).

J. Vapor Barrier

1. Polyethylene coated waterproof paper conforming to Fed. Spec. UU-B-790, type 1, Grade C, Style 4 polyethylene coating CS238, 2 ml thickness permanently bonded to the paper on both sides or 4 mil thickness bonded to one side.

2. Products of one of the following Manufacturers will be acceptable:

a. "Moistop 395" (Sisalkraft Div. of St. Regis)

b. "Ply-Bar Plus" (Glas-Kraft, Inc.) having a maximum perm rate of 0.10.

c. As noted on the drawings.

K. Waterstops

1. Products of one of the following Manufacturers will be acceptable:

a. “Sika Hydrotite”, Sika Corp., Lynhurst, NJ 07071.

b. Approved Equal

2. Products of type numbers as called for on the Drawings.

L. Expansion Joint Filler

1. Products of one of the following Manufacturers will be acceptable:

a. "Rodofoam" - W.R. Grace & Co., Bedford Park, IL 60638;

b. "CRC Recoverex Hard" - Construction Research Corp.;

c. ASTM D 1752, Type 1., "Gray Sponge Rubber" - W.R.Meadows, Inc., Elgin, IL 60121;

d. "Cementone Code 3329" - W.R. Grace & Co., Bedford Park, IL 60638;

e. "Neofirm" - Construction Research Corp.

2. Fillers must be full depth of slabs, less allowance at top for sealant. Unless otherwise directed allowance at top of all joints for sealant must be ½" below finished surface.

M. Curing Materials

1. Absorptive Cover

a. Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with ASSHO M 182, Class 3 or cotton mats complying with ASTM C 440.

b. Moisture-Retaining Cover

c. Provide one (1) of the following:

1) Waterproof Paper - ASTM C 171, Type 1 or Type 11.

2) Polyethylene Sheeting - AASHO M 171.

3) Polyethylene-coated burlap.

2. Liquid Membrane Curing Compound

a. ASTM C 309, Type 1, resin type, clear, unless otherwise directed, for vertical and horizontal surfaces guaranteed not to affect the bond of applied finished.

b. Products of one of the following Manufacturers will be acceptable:

1) "Horn Clear-Seal" - W.R. Grace & Co., Bedford Park, IL 60638.

2) "Acri Seal S" - Toch Brothers Division, Carboline Company, St. Louis MO 63144;

3) "Kure-N-Seal" - Sonneborn-Contech Shakopee, MN 55379.

3. Curing sheets

a. Material must conform to requirements of Fed. Spec. UU-B-790a Type 1, Grade C, Style 4, size as approved.

b. Products of one of the following Manufacturers will be acceptable:

1) "Orange Label Sisalkraft" - Sisalkraft Div. of St. Regis Culvert, Inc., Indianapolis, IN 46203.

4. Inserts

a. Flashing Reglets

1) 26 gauge galvanized steel formed to shape shown or required for application with permanent or removable fillers. If exposed on exterior, reglets must be formed of 28 gage stainless steel.

b. Dovetail Anchor Slots

1) 20 gauge galvanized steel with urethane removable fillers.

c. Adjustable Wedge Type

1) Malleable iron, ¾" bolt size, unless otherwise shown.

d. Channels

1) Lengths as shown on the Drawings, complete with caps, bolts and nuts.

2) Products of one of the following Manufacturers will be acceptable:

a) "P-3300 Series" (Unistrut Products Co.);

b) "900 Series" (Elcen Metal Products Co.);

c) "PS 2000" (Steel Sash Service Co.).

2.2 CONCRETE TYPES AND USES:

A. Minimum cement content as indicated below. Should tests indicate greater cement content is required, such must be used at no additional cost to the City. Use Type 1 unless otherwise specified.

B. Plasticizing admixture must be used in all concrete, except lean concrete.

2.3 MIXING CONCRETE

A. Concrete mixing, measuring and delivery equipment must be certified by the National Ready Mix Concrete Association. Methods must be subject to Owner's approval and in accordance with ACI 614, and 304.

1. Ready-Mixed Concrete

a. ASTM C 94, and as herein specified. Concrete for this Project must be ready-mix concrete and must be batched and delivered from a plant approved by the and in strict accordance with the requirements set forth in ASTM C 94, subject to all provisions specified herein regarding materials, strength, proportioning, consistency and delivery time.

1) Additional amounts of water to the batch, either at the plant or at the jobsite, will not be permitted, except upon specific approval of the Owner in each instance and only if calculations performed by the Contractor’s QC laboratory with batch weights confirm that the design water to cement ratio is not exceeded, subject to Owner approval on a case by case basis.

2. The rate of delivery of the ready mixed concrete must be such that the interval between placing of successive batches must be 30 minutes or less to prevent "cold joints." The elapsed time between the introduction of mixing water to the cement and aggregate and completion of discharge must not exceed one (1) hour.

   a. Minimum mixing for each batch must be that required to produce a uniform mixture of materials but in no case less than 70 revolutions after all materials are in the mixer, including water.

   b. The ready-mixed concrete producer must submit duplicate delivery tickets, one (1) for the Contractor and one (1) for the Owner, with each load of concrete delivered to the job. Delivery tickets must provide the following information:

      1) Date

      2) Name of ready-mix concrete plant

      3) Contractor

      4) Job Location

      5) Type (Standard or High Early Strength) & brand of cement.

      6) Cement content in bags per cubic yard of concrete.

      7) Truck number.

      8) Time dispatched and time unloaded.

      9) Amount of concrete in load in cubic yards.

      10) Admixtures in concrete, if any.

      11) Type and maximum size of aggregate.

      12) Water added at job, if any.

      13) Name of person who authorized addition of water.

   c. Close control of mixing time must be maintained for air entrained concrete.

   d. The testing laboratory engaged by the Contractor must periodically check batch proportions and yield strength, and must have continuous access to the mixer.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION:

A. Before commencing installation, examine substrate surfaces to determine that they are free of conditions which might be detrimental to proper and timely completion of the Work. Remove hardened concrete, debris and other foreign materials from the interior of forms and from the inside of the mixing and conveying equipment. Start of Work must indicate acceptance of the substrate.

B. Concrete must not be placed until all reinforcement is securely and properly fastened in its correct position; all anchors, sleeves, inserts, pipes, conduits, and other items required to be embedded therein have been inspected and approved by the Owner.

C. Conduit and piping embedded in concrete must be located by the trades concerned, between the bottom and top reinforcement. Where crossovers are necessary, they must not displace reinforcement from its required position.

1. Conduit and piping parallel to reinforcing steel must not be supported by or tied directly to the steel.

2. It must be supported on bar chairs or support bars provided solely for that purpose.

D. Discontinue concrete operations when the air temperature reaches 40 degrees F, and is descending, and do not resume until the air temperature is 35 degrees F, and ascending, except when written approval of the Owner is obtained.

E. Accelerating or antifreeze admixtures must not be used. The Contractor is responsible for the protection of finished concrete against all damage or injury, including freezing until the work has been completed and accepted.

F. For slabs on grade, do all final grading, compacting, trimming as required to prepare the finished sub-base. Building up of sub-base under forms after they are in place will not be permitted. In no case must concrete be placed upon frozen subgrade material.

G. All concrete work which does not conform to the requirements of the Contract Documents, including strength, tolerances and finishing, must be corrected as directed by the Owner at the Contractor's expense, without extension of time therefore. The Contractor must also be responsible for the cost of corrections to any other part of the work affected by or resulting from corrections to the concrete work.

H. Where it is stated within the contract documents that a structural engineer must review/verify a condition before proceeding, the contractor is required to have a Structural Engineer licensed by the state Illinois verify existing conditions before concrete installation is to proceed.

3.2 WATERSTOPS:

A. Provide waterstops for construction joints where indicated on the Drawings. Waterstops, corner pieces, and method of sealing splices must be subject to approval of the Owner.

B. Waterstops of special shape must be provided as shown on the Drawings. Minimum thickness of material must be 3/16".

3.3 VAPOR BARRIER:

A. Place vapor barrier under concrete floor slabs on ground. Lay barrier over well compacted fill and turn up approximately 4" at vertical surfaces. Side and end laps of barrier must be 6" and laid in the direction that concrete will be placed.

3.4 CONSTRUCTION JOINTS:

A. Construction joints must be as approved by the Owner with keyed joint in foundation walls and near the center of span of reinforced slabs, beams, joists, and girders, unless otherwise shown. Create additional construction joints only with approval of the Owner.

B. To secure full bond at construction joints, all surfaces of concrete already placed must be thoroughly cleaned of all foreign materials and laitance, roughened with tools such as chipping hammers or wire brushes to a minimum amplitude of ¼ inch, and re-cleaned by stream of high pressure water or compressed air, then apply approved bonding agent in accordance with manufacture's recommendation and Paragraph 2.01.H.

C. Where the contractor elects to place construction joints in walls or slabs to facilitate construction, or block outs in the wall are used for bracing of the excavation, the contractor shall engage the services of a State of Illinois Licensed Structural Engineer to design the construction joints and blockouts and ensure that a watertight enclosure is provided upon completion of the work.

3.5 EXPANSION AND CONTROL JOINTS:

A. Locate expansion and control joints where shown and conforming to detail.

B. Install joint filler where indicated of required width and full depth. Where joints are to receive joint sealant, use non-bituminous joint filler and hold down ½" from surface or back from face for sealant. Tack a temporary filler strip of same width as joint filler to top of joint filler.

1. Products of one of the following Manufacturers will be acceptable:

a. "Contie Removable Plastic Joint Cap" - Concrete Tie, Compton, CA.

2. Joint groove left by removal of temporary filler strip must be filled with sealant.

3.6 GROUTING WORK:

A. Mix and place pre-mixed grout in accordance with the printed instructions of the grout Manufacturer.

3.7 EQUIPMENT BASES:

A. Furnish and place concrete bases for miscellaneous equipment. In addition coordinate with mechanical and electrical Subcontractors base requirements for exact sizes and additional bases (not all bases will be shown) and included herein.

1. Do all grouting of bolts and sleeves in accordance with setting details and templates and under the supervision of the trade providing the equipment.

2. Bolts, sleeves and setting details and templates will be furnished by the trade providing the equipment.

3. Adjust dimensions of concrete bases for mechanical equipment to comply with approved Shop Drawings for this equipment.

4. Trowel the top surfaces and tool the edges.

5. After forms are removed, patch the sides and rub with a Carborundum brick.

B. Unless otherwise shown on the Drawings, concrete bases must have a minimum reinforcing of 6" x 6", W2.9/W2.9 welded wire fabric, unless otherwise shown or specified. Fabric must be supported 1 ½" clear from the top of the slab, or ¼ of slab thickness from top of the slab, whichever is greater.

C. Concrete bases resting on soil must have a minimum reinforcing of No. 4 bars at 12" each way, top and bottom.

3.8 PLACING CONCRETE - GENERAL:

A. When more than single strength concrete is required, the location of each concrete type must be as shown.

B. Provide adequate runways, chutes, and other means of conveying concrete into place. Use chutes or tremies for placing concrete where a drop of more than 5'-0" is required.

C. The concrete must be mixed only in quantities required for immediate use. Concrete must not be mixed while the temperature is below 40 degrees F without permission of the Owner. If permission is granted for mixing under such conditions, aggregates or water, or both, must be heated and the concrete must be placed at a temperature not less than 50 degrees F nor more that 90 degrees F. The Contractor must be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and must replace such work at his or her expense.

D. If concrete is placed where the weather is such that the temperature of the concrete could exceed 90 degrees F, the Contractor must employ effective means such as pre-cooling of aggregates or using ice as necessary to maintain the temperature of concrete below 90 degrees F as it is placed.

E. Do not place concrete until base is acceptable, reinforcement is securely and properly fastened in its correct position, and accessories and other items required to be embedded there in have been placed and anchored. Inspect reinforcement for secure fastening and accurate position.

F. Methods of placing concrete, such as pumping or by conveyors, must be subject to review by the Owner. The Owner may require additional post mechanical conveyance testing to ensure that the air entrainment and slump remain in conformance with these specifications.

G. Use short troughs or pipes aids in placing concrete and arrange in such a manner that the ingredients of the concrete are not separated.

H. Dropping the concrete a distance of more than 5’-0" or depositing a larger quantity at any point and running or working it along the forms will not be permitted.

I. Mix and place concrete exposed in the finish work to procure smooth, even surfaces of dense concrete, and clean sharp arrises and outside corners.

J. Place concrete so that the pressure caused by the wet concrete must not exceed those used in the design of the forms.

K. Do not place concrete for floor slabs, beams, or footings on wet, muddy, or frozen sub-grades or in ponded water. Concrete deposited under water must be carefully placed in a compact mass in its final position by means of a tremie, a closed bottom dump bucket, or other approved method and must not be disturbed after being deposited.

L. Before placing slabs or other heavy fill over freshly placed foundation walls, piers or other filled forms, allow at least 24 hours for shrinkage and settlement.

M. Use special care to prevent splashing concrete on forms and reinforcement, and remove any hardened deposits before covering with fresh concrete.

N. Place concrete continuously between construction joints. When necessary, because of an emergency only, to place less than a complete horizontal layer in one (1) operation, terminate the pour with a keyed vertical joint.

O. In any given lift, place and compact each lift before the preceding one (1) has taken its initial set. Lines of separation between the lifts, or between layers will not be acceptable. Deposit and compact the concrete so that exposed surfaces will be smooth and of uniform texture.

P. Place concrete with the aid of internal mechanical vibrator equipment capable of 9,000 or more impulses per minute. Vibration must be transmitted directly to the concrete. The duration of vibration at any location must be the minimum necessary to produce thorough compaction. Concrete consolidation must be performed in accordance with ACI 309R.

Q. Place concrete flat work in layers 12" to 18" deep and in walls and large volumes in layers not over 24" deep. Vibrate into place in a manner that will not cause the ingredients to separate. Where necessary, supplement vibrators by hand spading to secure these results. Keep vibrators constantly in motion and do not hold in one location. Long enough to draw a pool of grout or water from the concrete. Maintain spare equipment to avoid breakdown.

R. Place concrete immediately after mixing, and in no case more than 60 minutes after initial mixing. Review article "Mixing Concrete" under Part 2 "Products" for plant, mixing, batching and etc. for "Ready-Mix Concrete"

S. Roughen, clean, and moisten construction joints before placing concrete. Apply bonding compound and place new concrete after bonding compound becomes tacky.

T. The area to be placed must not exceed 60 ft. in any horizontal direction, nor exceed an area of 2,000 sq. ft. For slabs on grade pour slab in a checkerboard sequence. Minimum of 24 hours must elapse between the placing of adjacent units. Provide construction joints between units in accordance with the typical details shown.

U. If early breaks are required for stripping forms, backfilling, or the convenience of the Contractor, additional cylinders must be made by the Contractor's QC organization and tested by the Contractor's approved QC laboratory, subject to verification by the approved laboratory working under supervision of the Owner. Forms or shoring must not be removed without the Owner's approval.

1. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work may be removed after moist curing at not less than 50 degrees F for 24 hours after placing concrete, provided that concrete is sufficiently hard to not be damaged by form removal operations and provided that curing and protection operations are maintained.

2. Removal of forms and shoring must be in accordance with ACI 318 and ACI 347. It is the Contractor's responsibility to submit a plan for formwork removal to the Owner, accounting for all loads and conditions, in accordance with ACI 318 and ACI 347. As a minimum, where not specified, formwork supporting weight of concrete, such as beam soffits, joists, slabs, and other structural elements, may not be removed in less than 14 days or until concrete has attained 100% of design minimum compressive strength at 28 days, or in accordance with structural drawings.

V. Concrete structures must not be backfilled before 7 days or until 75% of design strength is achieved.

3.9 PLACING FOOTING AND FOUNDATIONS:

A. Bottoms of excavations must be properly leveled off before placing concrete. Footing and foundations must be of sizes and shapes as shown on the Drawings.

1. Place concrete as soon as possible after excavations have been completed and as a continuous pour unless otherwise directed.

2. Where different levels are indicated for wall footings, the footings must be stepped as shown on the Drawings.

3. Form vertical construction joints in footings in approved locations.

3.10 PLACING CONCRETE WALLS:

A. Remove keying strips from tops of footings and scrub top surfaces of footings clean before forms are erected.

B. Place concrete for foundations walls, enclosing walls, and other walls shown to be of concrete to dimensions shown or marked. Finish true and level on top for reception of floors, walls, beams, slabs, and other elements.

3.11 PLACING CONCRETE FLOORS:

A. Floor slabs must be level, plane surfaces, unless otherwise indicated on the Drawings. Surface must be pitched to drains as required.

1. All top of slab elevations must be determined by the use of preset runners supported by adjustable chairs set at the proper elevation.

a. The Owner's Representative must have the right to obtain check readings, by use of a surveyors level, to verify the elevations of the runners and the supporting formwork.

b. The Contractor is to organize the work such that these readings may be obtained, before beginning concrete placement, and not cause any delay in the work.

2. Concrete for all slabs must be placed continuously between construction joints; consolidated by vibration or other suitable means; brought to the correct level with a straight edge and struck off.

a. Use bull floats or darbies to force the coarse aggregate down and as required to produce a smooth surface, free from humps and hollows.

3. All slabs must be power-floated and must also be hand-floated as specified for certain finishes.

a. Power-floating must begin when the water sheen has disappeared, and/or the mix has stiffened sufficiently that the weight of a man standing on it leaves only a slight imprint on the surface.

b. Face to the desired state, the concrete must be allowed to stiffen or become harden before beginning the second floating operation.

4. All slabs shall receive a steel trowel finish.

a. Power troweling must begin as soon as little or no cement paste clings to the blades.

b. Troweling must be continued until the surface is dense, smooth, and free of all minor blemishes such as trowel marks.

B. The maximum variation in surface tolerance for troweled finishes "B" and "D" must be 1/8" in 10'-0". If variations greater than this exist, the Owner may direct the Contractor to grind the surfaces to bring them within the requirements. Patching of low spots will not be permitted. Grinding must be done as soon as possible, preferably within three (3) Days, but not until the concrete is sufficiently strong to prevent dislodging coarse aggregate particles.

1. Sprinkling of dry cement or a mixture of dry cement and sand on the surface of the fresh concrete to absorb water or to stiffen the mix will not be permitted.

2. Float concrete slab to receive finish materials to true lines and level leave ready to receive other materials. Depress slabs as detailed or otherwise noted.

3. Place floors perfectly true, except pitched where indicated, and at the correct levels for receiving finished floor materials. Fill in and finish around pipe sleeves which have been set to receive mechanical and electrical work.

4. Where floor drains are installed in floor slabs, finish the floors level around walls and provide a definite uniform pitch to drains. Unless otherwise indicated, pitch to drains must be not less than 1/16 inch per foot. Special care must be taken to prevent water pockets.

3.12 CONCRETE FINISHES - FORMED SURFACES:

A. General

1. Remove form and form-tie-ins.

2. Perform all patching as hereinafter specified, and patch formed surfaces exposed to view as hereinafter specified under paragraph 3.15, "Patching of Formed Concrete."

B. Immediately after removing forms, inspect concrete surfaces.

1. Concrete work not formed as shown on the Drawings, or which for any reason is out of alignment or level or shows defective surfaces, must be removed unless the Owner grants permission to patch a defective area.

a. Permission to patch any special area must not be considered a waiver of the Owner's right to require complete removal of the defective work if the patching is not satisfactory.

2. Patching must be done before the concrete is thoroughly dry.

3. Mix patching mortar of the same materials and of the same proportions as used for the concrete, except that the coarse aggregate will be omitted.

a. When normal gray cement was used in the concrete, substitute light cement for the gray cement to match color of surrounding concrete.

b. For white concrete areas use white cement.

c. Dampen the dry mix and allow to stand for a period of one (1) hour during which time mix with a trowel to prevent setting.

4. Compact the mortar into place and screed off so as to leave the patch slightly higher than the surrounding surface.

a. Do not disturb for a period of one (1) to two (2) hours to permit initial shrinkage before final finishing.

b. Finish patches in such a manner and texture as to match the adjoining surface.

5. After removal of forms withdraw tie rods or break off form ties, wet the resulting holes, and fill solidly with mortar.

a. For holes passing entirely through the wall, use a plunger type grout gun to force the mortar through the wall starting at the back face.

b. Hold a piece of burlap or canvas over the hole on the outside and when the hole is completely filled, strike off the excess mortar with a cloth flush with the surface.

c. Fill holes not passing entirely through the wall with a small tool that will permit packing the hole solid with mortar.

1) Strike off excess mortar flush with the surface of the wall using a cloth.

2) In exposed face of mortar embed aggregate similar to that on adjacent surface.

C. Finish No. 1 (Concealed Below Grade Concrete)

1. Patch all form tie holes, aggregate pockets, honeycomb and defective areas as required with 1.2 Portland cement-sand mortar.

D. Finish No. 2 (Exposed Non-Architectural Concrete)

1. Same as Finish No. 1, except fins and ridges must also be removed.

E. Finish No. 3 (Smooth Concrete)

1. Concrete must be smooth, placed and finished as required to provide even, dense surfaces of uniform color, free from cracks, aggregate pockets or honeycomb so that a minimum of after treatment of the finished surfaces will be required.

2. Fill form tie holes with 1:2 Portland cement-sand mortar. Patch any aggregate pockets, honeycomb and other defective areas and remove all fins, form joint marks, rough spots and other defects by rubbing with a Carborundum stone until these defects and rough areas are completely removed and surfaces are free from imperfections so as to produce dense, smooth, uniform finish. Additional patching requirements must be as hereinafter specified under paragraph 3.15, "Patching of Formed Concrete.

3.13 PATCHING OF FORMED CONCRETE:

A. Concrete patching, when necessary to obtain the required profiles, lines or levels, must be subject to the Owner's approval and must utilize the specified Bonding agents or Patching and Surfacing Compound.

B. Prior to application of bonding agent, or patching and surfacing compound, remove all dust, dirt, grease, oil, wax or loose material from surfaces to be repaired.

C. Build-up patching to match appearance of surrounding exposed concrete surfaces. Apply Bonding Agent to honey-combed areas, aggregate pockets or other voids and fill with mortar composed of Portland cement and selected aggregate of type and mixture as required to match existing concrete and finish to match existing surfaces. Cure new patches as required to prevent cracks.

D. Patching and surfacing compound may be used for thin patches which are not exposed or are not required to match the color, texture, and finish of surrounding concrete surfaces.

3.14 CONCRETE FINISHED-FLOORS:

A. Finish "C" (for Roofing or Membrane Waterproofing)

1. Base slabs for this type finish must be given a hand float finish with wood floats to produce an even surface, free of float marks, pitched as required.

B. Finish "D" (For Exposed Concrete Floors)

1. Concrete finish floor surfaces, which are to remained exposed, receive resilient flooring, carpeting, hardener, or sealer must be finished with a steel trowel.

a. Final hand troweling must be used to remove slight imperfections left by the troweling machine and to bring the surface to a dense, smooth polished final finish.

b. Final hand troweling must be continued until a ringing sound is heard as the trowel passes over the surface.

C. Joints

1. Expansion, contraction and construction joints must be located as shown on Drawings or as limited by maximum single placement of 2,000 square feet of slab area. Provide all joint fillers required for poured concrete.

2. Unless otherwise indicated or noted on Drawings, expansion joints in curbs must be spaced not more than 40'-0" on centers. Unless otherwise shown, joints must be ½" thick, of material as specified (compatible with the sealant), installed with the top down ½" below finished surfaces to receive sealant.

3.15 CURING AND PROTECTION:

A. Protect freshly placed concrete from defacement, premature drying and excessive cold or hot temperature, and maintain without drying at a relatively constant temperature for a period of time necessary for hydration of cement and proper hardening.

B. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing.

C. Cure concrete in accordance with ACI 308R “Guide to Curing Concrete”.

D. Begin final curing procedures immediately following initial curing and before concrete has dried. Provide continuous moist curing above 50 degrees F for at least 7 days, regardless of ambient air temperatures. Demonstrate to the Owner that temperature is maintained by means of a high-low or recording thermometer. Continue final curing for at least 168 hours.

E. Concrete must be cured by one of the following methods or by combinations thereof, as approved:

1. Moisture Curing

a. Cover concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet.

b. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4" lap over adjacent absorptive covers.

c. At the Contractor's option, moisture curing may also be provided by ponding or continuous water spraying, where approved by the Owner.

2. Moisture Retaining Cover Curing

a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3" and sealed by waterproof tape or adhesive.

b. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Membrane Curing

a. Apply membrane forming curing compound to damp concrete surfaces as soon as water film as disappeared and surface is hard enough to carry applicator's weight without damage.

b. Apply uniformly in two (2) coat continuous operation by power-spray equipment in accordance with manufacturer's directions.

c. Maintain continuity of coating and repair all damage during curing period.

d. Do not use on slabs to receive "hardener" and for "dust tight" finishes.

F. Membrane curing is the preferred method for all exterior flatwork. May also be used for interior slabs, and for floors scheduled to receive thin-set terrazzo.

1. Submit certificate from terrazzo installer that use of the specific proposed product must not impair bond of the thin-set terrazzo.

2. Apply membrane-forming curing compound to damp concrete surfaces as soon as water film has disappeared and surface is hard enough to carry applicator's weight without damage.

3. Apply uniformly in two (2) coat continuous operation by power-spray equipment in accordance with Manufacturer's directions.

4. Maintain continuity of coating and repair all damage during curing period.

G. Cure formed concrete surfaces by moist curing until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

H. At the Contractor's option and subject to the Owner's specific approval floor slabs and toppings to be covered by other materials may be moist cured by maintaining in a moist condition for seven (7) days, commencing as soon as possible but within 24 hours after troweling, by water spraying, ponding or blanket membrane of cross sisal fiber reinforced waterproof paper.

1. This membrane must be laid with as few joints as practicable; the joints must be lapped at least 3 inches and sealed with gum kraft taped or glued on as recommended by the Manufacturer.

I. Exposed finished floors subject to rough construction usage must be adequately protected by cross sisal fiber reinforced waterproof paper, boards, or other approved means. This protection must be maintained in good condition until removal is approved by the Owner.

PART 4 - METHOD OF MEASUREMENT

5.1 MEASUREMENT

A. This Work under this Section will not be measured separately for payment.

END OF SECTION 03 30 00

SECTION 07 52 16

STYRENE-BUTADIENE-STYRENE (SBS)

MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. SBS-modified bituminous membrane roofing.

B. Roof insulation.

C. Base sheet.

1.2 Related Sections

A. Section 061053 "Miscellaneous Rough Carpentry" for wood nailers, cants, curbs, and blocking.

B. Section 076200 "Flashing and Sheet Metal" for metal roof penetration flashings, flashings, and counterflashings.

1.3 REFERENCES

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:

1. ASTM D 1079 “Terminology Relating to Roofing and Waterproofing.”

2. Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual.”

3. Roof Consultants Institute “Glossary of Roofing Terms”

B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.4 DESIGN CRITERIA

A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

C. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE-7.

1.5 SUBMITTALS

A. Product Data: Manufacturer's data sheets for each product to be provided.

B. Detail Drawings: Provide roofing system plans, elevations, sections, details, and details attachment to other Work, including:

1. Base flashings, cants, and membrane terminations.

2. Tapered insulation, including slopes.

3. Crickets, saddles, and tapered edge strips, including slopes.

4. Insulation fastening patterns.

C. Verification Samples: Provide for each product specified.

D. Maintenance Data: Refer to manufacturer's latest published documents.

E. Guarantees: Provide manufacturer's current guarantee specimen.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.

B. Manufacturer Qualifications: Qualified manufacturer that has a UL listing for roofing system identical to that used for this Project.

C. Test Reports:

1. Provide adhesion test per manufacturer's instruction.

D. Moisture Survey:

1. Submit prior to installation, results of a non-destructive moisture test of roof system completed by approved third party. Contractor is responsible to hire and oversee third party. Owner to give approval of third party prior to work taking place. Utilize one of the approved methods:

a. Infrared Thermography

b. Nuclear Backscatter

E. Source Limitations: Obtain all components from the single source roofing system manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

1.9 GUARANTEE

A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.

1. Single-Source special guarantee includes roofing plies, base flashings, liquid applied flashing, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, manufacturer’s expansion joints, manufacturer’s edge metal products, and other single-source components of roofing system marketed by the manufacturer.

2. Guarantee Period: 20 years from date of Substantial Completion.

B. Installer’s Guarantee: Submit roofing Installer's guarantee, signed by Installer, covering Work of this Section, including all components of roofing system, for the following guarantee period:

1. Guarantee Period: Five Years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BASE PLY AND CAP-SHEET MATERIALS

A. Roofing Membrane Cap Sheet: ASTM D 6163, Grade G, Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: DynaGlas FR by Johns Manville.

2.2 FLASHING SHEET MATERIALS

A. Backer Sheet: ASTM D 6163, Grade S, Type I, glass-fiber-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Basis of Design: DynaBase by Johns Manville.

B. Flashing Sheet: ASTM D 6221, Grade G, Type I, composite polyester- and glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: DynaFlex by Johns Manville.

C. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitch bonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. Basis of Design: PermaFlash System by Johns Manville.

2.3 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.

B. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, two-component, asbestos-free, trowel-grade, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of Design: MBR Flashing Cement by Johns Manville.

C. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, two-component, asbestos-free, trowel-grade, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of Design: MBR Utility Cement by Johns Manville.

D. Mastic Sealant: As required by Johns Manville.

E. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roofing membrane components to substrate, tested by manufacturer for required pullout strength, and provided by the roofing system manufacturer. Basis of Design: UltraFast Fasteners and Plates

2.4 ROOF INSULATION

A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Tapered Insulation: ASTM C 1289, Type II, Class 1, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated. Basis of Design: Tapered ENRGY 3 by Johns Manville.

2.5 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Provide factory preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Basis of Design: Diamond-Back Pre-Cut Crickets, DiamondBack Pre-Cut Miters, Tapered Fesco Edge Strip

C. Urethane Adhesive: Manufacturer’s two component polyurethane adhesive formulated to adhere insulation to substrate. Basis of Design: JM Two-Part Urethane Insulation Adhesive (UIA)

D. Insulation Cant Strips: ASTM C 728, perlite insulation board. Basis of Design: FesCant Plus by Johns Manville.

E. Wood Nailer Strips: Comply with requirements in Division 06 Section "Miscellaneous Rough Carpentry".

2.6 AUXILIARY ROOFING SYSTEM COMPONENTS

A. Metal Edge System: Manufacturer's factory fabricated metal edge system used to terminate the roof at the perimeter of the structure. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: Presto Stop Gravel Stop

B. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

PART 3 - EXECUTION

3.1 EXAMINATION

A. General:

B. Blocking, curbs, and nailers, as required, at edges of roof penetrations, area dividers, and terminations.

a. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

b. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

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

3.2 PREPARATION

A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing system installation in accordance with roofing system manufacturer's written instructions.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

C. Re-roof Preparation

1. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc. Refer to drawings for scope of work.

2. Remove an area no larger than can be re-roofed in one day.

3. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane. Refer to drawings for scope of work.

4. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations. Refer to drawings for scope of work.

5. Install decking to match existing as directed by Owner's Representative. Refer to drawings for scope of work.

6. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

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

E. Recover Preparation

1. Prepare existing roof according to roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer, and requirements in this Section.

2. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane. Refer to drawings for scope of work.

3. Core existing roof every 100 square feet to detect if existing insulation is wet and to vent existing system.

4. Remove and replace wet, deteriorated or damaged roof insulation and decking as identified in moisture survey.

5. Remove abandoned penetrations. Install decking to match existing as directed by Owner's Representative.

6. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

7. Prime existing cap sheet to prepare for recover application.

3.3 INSULATION INSTALLATION

A. Coordinate installation of roof system components so insulation and cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installation of roof insulation.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of roofing membrane system with vertical surfaces or angle changes greater than 45 degrees per manufacturer’s instruction.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Install insulation boards with long joints in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with like material.

F. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

G. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

H. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

I. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Install each layer in a two-part urethane adhesive according to roofing system manufacturer’s instruction.

3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.

1. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

2. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

a. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.

b. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.

c. Remove and discard temporary seals before beginning work on adjoining roofing.

3.5 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

A. Install one modified bituminous roofing membrane sheet and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, with the following installation methods:

1. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

2. Adhere to substrate in cold-applied adhesive according to roofing system manufacturer’s instruction.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.

2. Heat weld laps on cap sheet.

3. Apply roofing granules to cover exuded bead at laps while bead is hot.

C. Install roofing membrane sheets so side and end laps shed water.

3.6 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:

Smooth surfaces of masonry, concrete walls, parapets and the like require priming before applying cold adhesive.

1. Prime substrates with asphalt primer if required by roofing system manufacturer.

2. Backer Sheet Application: Install backer sheet and adhere to substrate in approved adhesive applied at rate required by roofing system manufacturer.

3. Flashing Sheet Application: Adhere flashing sheet to substrate in approved asphalt roofing cement; apply cement at rate required by roofing system manufacturer.

B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing, or as shown on drawings.

1. Seal top termination of base flashing with a strip of glass-fiber fabric set in MBR Flashing cement.

D. Roof Drains: Flash drain utilizing lead sheet. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.

1. Install stripping according to roofing system manufacturer's written instructions.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.

C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.8 PROTECTION AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

PART 4 - METHOD OF MEASUREMENT

4.1 MEASUREMENT

A. This Work under this Section will not be measured separately for payment.

END OF SECTION 07 52 16

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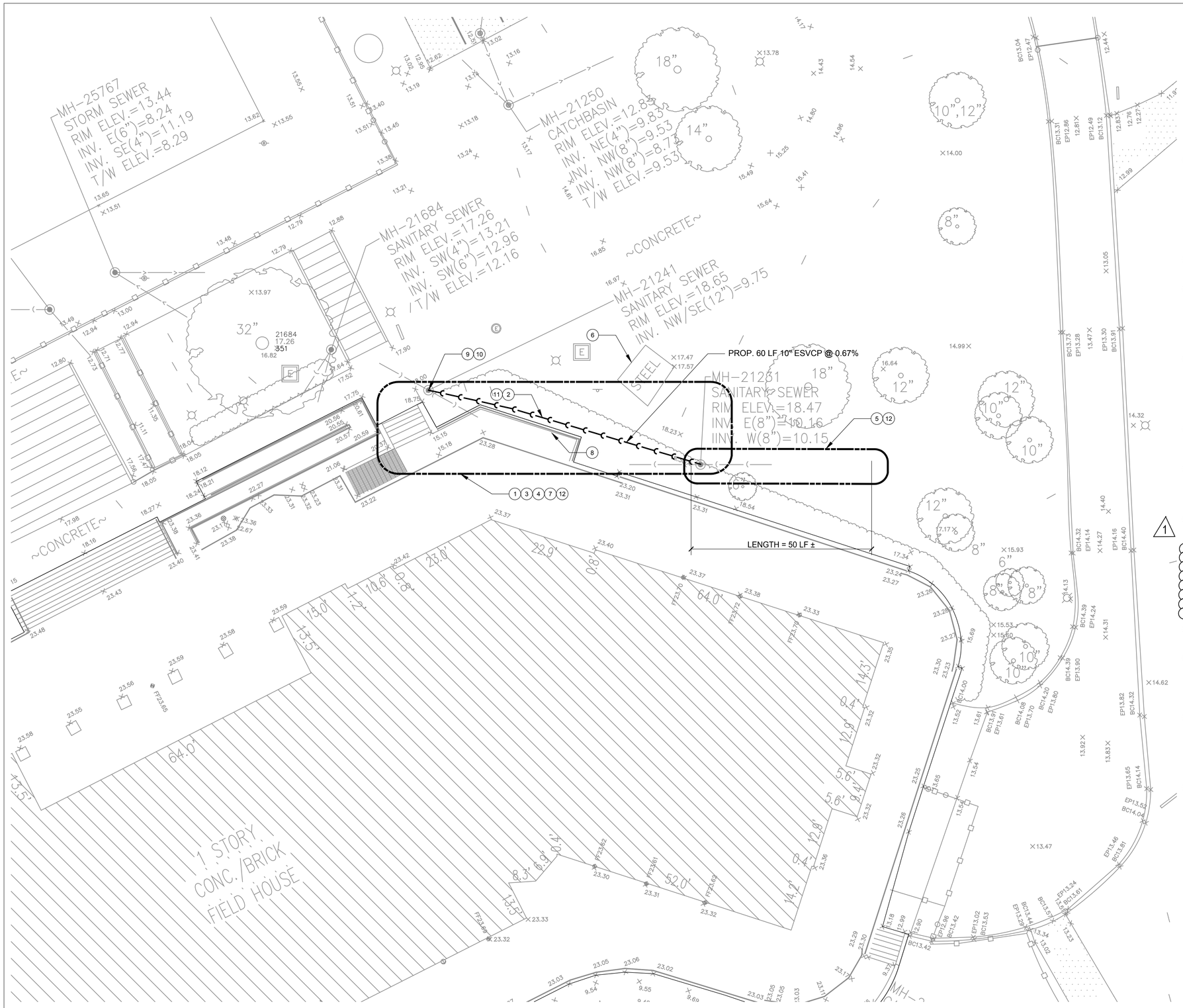

1 EAST BASEMENT DRAINAGE PLAN

SCALE: 1" = 10'

KEYED NOTES:

1. CONTRACTOR TO REMOVE PLANTINGS (AS DIRECTED BY CPD). UPON COMPLETION OF THE SEWER WORK, CONTRACTOR IS TO RESTORE DISTURBED AREA WITH 6 IN. OF TOPSOIL, AND SEED WITH STANDARD CPD GRASS MIX. SPECIFICATION FOR SEED MIX TO BE PROVIDED BY CPD. ALL BACKFILL AND TOPSOIL TO BE COMPACTED AS NEEDED TO PREVENT SETTLEMENT. THE PROPOSED FINISHED ELEVATIONS ARE TO MATCH EXISTING ELEVATIONS.

   BUSHES DISTURBED OR DAMAGED DURING CONSTRUCTION ACTIVITIES WILL BE REPLACED BY CONTRACTOR AT CONTRACTOR'S EXPENSE.

2. CONTRACTOR TO EXCAVATE, REMOVE, AND DISPOSE OF EXISTING ESVCP BETWEEN MANHOLES. DIAMETER VARIES FROM 8 IN TO 10 IN.

3. UPON EXCAVATION TO REMOVE EXISTING ESVCP, CONTRACTOR TO LOCATE THE ROUTE OF THE EXISTING ROOF DRAIN AND SUMP DISCHARGE PIPES TO ASCERTAIN WHETHER THESE PIPES TEE INTO THE EXISTING SEWER TO BE REMOVED. IF SO, THEN CONTRACTOR MUST PROVIDE REPLACEMENT TEES AND CONNECT THESE TO THE PROPOSED SEWER USING TEES AND BAND SEALS AS NEEDED.

4. INSTALLATION OF PROPOSED 10" ESVCP, WITH ROOF DRAIN CONNECTION AS LOCATED, MUST MEET EXISTING MANHOLE INVERTS AND BE ALIGNED SUCH THAT EACH 10" ESVCP IS CONNECTED TO THE PROPOSED 4FT DIAMETER SANITARY MANHOLE AT THE SLOPES SHOWN ON THE PLAN. CONTRACTOR TO PROVIDE BEDDING STONE (IDOT GRADATION CA 7) FROM 6" BELOW THE PIPE TO THE PIPE SPRING LINE (CENTERLINE) FOR THE ENTIRE REPLACEMENT LENGTH.

5. CONTRACTOR TO ACCESS EXISTING MANHOLE (MH-21231) AND CLEAN AS FAR AS ONE CAN GO ALONG THE EXISTING SEWER LINE - APPROXIMATELY 50 LF OF EXISTING SEWER IN THE SOUTHEAST DIRECTION.

6. SCULPTURE FOUNDATION MAY BE PRESENT. CONTRACTOR MUST COORDINATE WITH CPD FOR THE REMOVAL OF SCULPTURE FOUNDATION BY CPD PERSONNEL, IF CONTRACTOR FINDS ONE TO BE PRESENT, PRIOR TO WORK COMMENCING AT THE SANITARY SEWER REPAIR.

7. CONTRACTOR TO PROVIDE 6-FOOT HIGH TEMPORARY CHAIN LINK FENCING FOR DURATION OF CONSTRUCTION. SEE SHEET G-102 FOR ADDITIONAL STAGING AND PHASING INFORMATION.

1 8. CONTRACTOR SHALL TAKE ALL NCECESSARY PRECAUTIONS TO REMOVE THE EXISTING SEWER PIPE IN PREPARATION FOR THE NEW WORK. cONTRACTOR SHALL IMMEDIATELY NOTIFY THE aor IF THE EXCAVATION WORK EXTENDS BEKOW THE BASE OF THE EXISTING WALL. AOR WILL DETERMINE ANY REQUIRED SCOPE MODIFICATIONS.

9. CONTRACTOR TO OPEN MANHOLE 21241 AND DETERMINE PIPE SIZES AND DIRECTION OF FLOWS PRIOR TO THE START OF EXCAVATION.

10. CONTRACTOR TO REMOVE, DISPOSE OF, AND REPLACE CONCRETE SIDEWALK ADJACENT TO MANHOLE 21241, AS NEEDED, TO FACILITATE EXCAVATION. MATCH EXISTING THICKNESS AND RETURN AREA TO EXISTING CONDITIONS. CONTRACTOR TO SAWCUT THE INTERFACE BETWEEN CONCRETE SIDEWALK TO REMAIN AND THAT BEING REMOVED.

11. CONTRACTOR TO ALIGN PROPOSED 10 IN ESVCP BETWEEN MANHOLES, FOLLOWING THE ALIGNMENT OF THE EXISTING PIPELINE SUCH THAT THE NEW PIPE MISSES THE STAIRWAY WALL AND ITS FOOTING, WITHOUT EXCAVATING UNDER THIS STRUCTURE. PROPOSED PIPE MUST BE ALIGNED IN ACCORDANCE WITH THE MAXIMUM JOINT DEFLECTION REQUIREMENTS OF THE NATIONAL CLAY PIPE INSTITUTE.

12. NO FURTHER UNDERGROUND INVESTIGATION OR TELEVISING IS REQUIRED TO DETERMINE THE FULL EXTENT OF DAMAGE TO EXISTING CLAY PIPE.

GENERAL NOTES:

1. SEE SHEETS G-003/4 FOR GENERAL NOTES.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN THE FIELD.
3. CONTRACTOR TO PROTECT FROM DAMAGE ALL EXISTING BUILDING COMPONENTS TO REMAIN.
4. PATCH MATERIALS DAMAGED BY REMOVAL OF ADJACENT COMPONENTS, INCLUDING PAINT TO SATISFACTION OF ARCHITECT AND OWNER.
5. ASBESTOS MAY EXIST IN CONCEALED, UNINSPECTED AREAS IN THE BUILDING. AN "ASBESTOS INSPECTION REPORT" WILL BE PROVIDED. THE CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE REPORT AND FOR PERFORMING THE APPROPRIATE ABATEMENT WORK.
6. NO SURVEY WAS PERFORMED FOR LEAD BASED PAINT. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING IF PAINT IS LEAD BASED PRIOR TO WORK. IF LEAD BASED PAINT IS PRESENT THE CONTRACTOR MUST COMPLY WITH ALL REQUIREMENTS OF THE EPA'S LEAD RENOVATION, REPAIR, AND PAINTING (RRP) RULE PROGRAM.
7. "ESVCP" REFERS TO EXTRA STRENGTH VITREOUS CLAY PIPE.

LEGEND

PROPOSED SANITARY SEWER
EXISTING SANITARY SEWER

CARL J. BOTA
062-040449
REGISTERED PROFESSIONAL ENGINEER OF ILLINOIS
LIC. EXPIRES 11-30-19

PUBLIC BUILDING COMMISSION

CHICAGO PARK DISTRICT ORGANIZED 1934

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CHICAGO PARK DISTRICT
CITY OF CHICAGO, MAYOR RAHM EMANUEL

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Structural Engineers of Record

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Chicago, IL
Civil Engineers of Record

WARNING:
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DRAWN: SA
CHECKED: CB

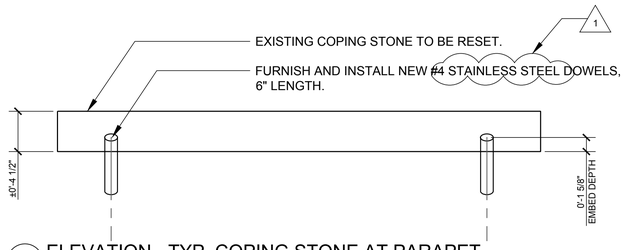
Issuance

Mark	Description	Date
A	30% SD SUB	11.07.17
B	50% DD SUB	12.15.17
C	95% CD SUB	01.16.18
D	100% CD SUB	04.02.18
E	ISSUED FOR PERMIT	04.20.18
F	ISSUED FOR BID	05.01.18
1	ADDENDUM #1	05.21.18

PBC Project Name: DOUGLAS PARK REHABILITATION
PBC Contract No: C1596
Project No.: 11310

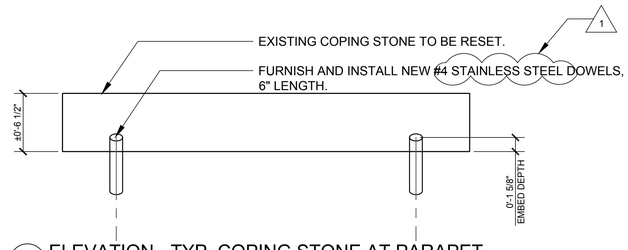
Title
DRAIN REPAIR

Sheet
C-101



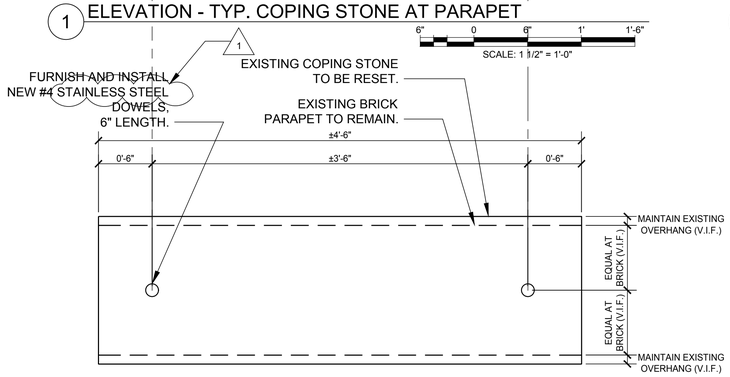
1 ELEVATION - TYP. COPING STONE AT PARAPET

SCALE: 1 1/2" = 1'-0"



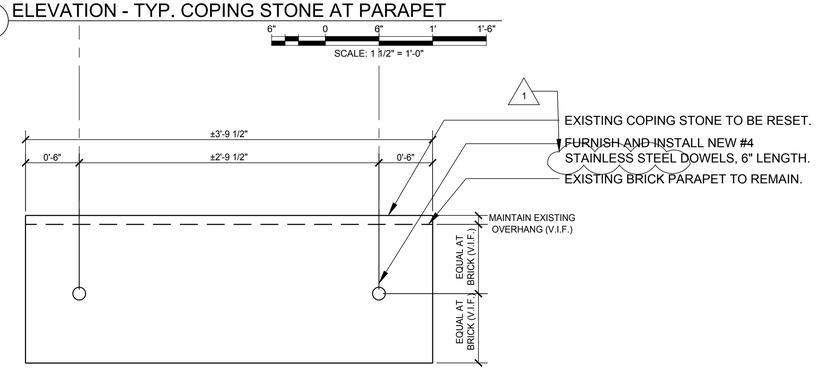
3 ELEVATION - TYP. COPING STONE AT PARAPET

SCALE: 1 1/2" = 1'-0"



2 PLAN - TYP. COPING STONE AT PARAPET

SCALE: 1 1/2" = 1'-0"

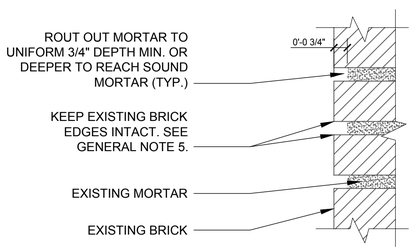


4 PLAN - TYP. COPING STONE AT PARAPET

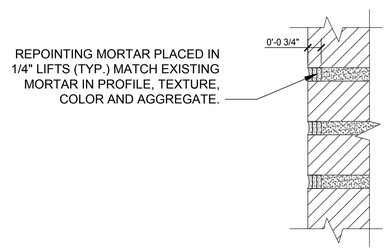
SCALE: 1 1/2" = 1'-0"

GENERAL NOTES:

1. SEE SHEETS G-003/4 FOR GENERAL NOTES.
2. CONTRACTOR TO VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN THE FIELD.
3. CONTRACTOR TO PROTECT FROM DAMAGE ALL EXISTING BUILDING COMPONENTS TO REMAIN.
4. PATCH MATERIALS DAMAGED BY REMOVAL OF ADJACENT COMPONENTS, INCLUDING PAINT TO SATISFACTION OF ARCHITECT AND OWNER.
5. DOCUMENT/PHOTOGRAPH AND CATALOG ALL AREAS IDENTIFIED FOR REPOINTING PRIOR TO MORTAR REMOVAL, ESPECIALLY WHERE ELECTRIC GRINDERS ARE USED. ANY NEW DAMAGE TO EXISTING MASONRY SHALL BE REPLACED WITH NEW MASONRY AND MORTAR TO MATCH ORIGINAL AT CONTRACTORS EXPENSE.
6. CONTRACTOR TO REMOVE EXISTING SPEAKERS AND ALL ASSOCIATED MATERIALS FROM MANSARD ROOF AND DISCARD.
7. REPOINT ALL EXISTING BRICK AND LIMESTONE AT PARAPET AND EXTERIOR WALL. MORTAR COLOR AND AGGREGATE TO MATCH EXISTING.
8. **BRICK REPLACEMENT AND REPOINTING ALLOWANCE:** BRICK REPLACEMENT MAY BE REQUIRED AT THE REVERSE FACE OF THE PARAPET WHERE BRICK IS CURRENTLY COVERED BY ROOFING AND FLASHING MATERIALS. IF BRICK REPLACEMENT IS REQUIRED, MATCH COLOR, FINISH AND DIMENSIONS OF EXISTING ADJACENT BRICK. CONTRACTOR TO ALLOW AOR ACCESS TO INSPECT AND CONFIRM AREAS OF BRICK REPLACEMENT ONCE CONTRACTOR HAS REMOVED ROOFING AND FLASHING MATERIALS. ANY REPLACEMENT WORK WILL BE AUTHORIZED THROUGH THE **BRICK REPLACEMENT AND REPOINTING ALLOWANCE**. CONTRACTOR SHALL NOT INCLUDE PRICING FOR BRICK REPLACEMENT IN ITS BASE BID.
9. **LIMESTONE REPAIR ALLOWANCE:** LIMESTONE PATCHING MAY BE REQUIRED AT THE PARAPET AND EXTERIOR WALL. CONTRACTOR WILL ALLOW FOR PROPER INSPECTION OF THE EXISTING LIMESTONE BY THE AOR. CONTRACTOR TO PROVIDE ANY REQUIRED EQUIPMENT FOR USE BY THE AOR DURING THE AOR'S INSPECTION. UPON INSPECTION, AOR WILL DETERMINE WHETHER PATCHING AT LIMESTONE IS REQUIRED. ANY LIMESTONE PATCHING WORK WILL BE AUTHORIZED THROUGH THE **LIMESTONE REPAIR ALLOWANCE**. CONTRACTOR SHALL NOT INCLUDE PRICING FOR LIMESTONE PATCHING IN ITS BASE BID.
10. **BRICK REPLACEMENT AND REPOINTING ALLOWANCE:** BRICK REPLACEMENT AND REPOINTING MAY BE REQUIRED AT THE REVERSE FACE OF THE PARAPET UNDER MANSARD ROOF. IF BRICK REPLACEMENT AND REPOINTING IS REQUIRED, MATCH COLOR, FINISH AND DIMENSIONS OF EXISTING ADJACENT BRICK. CONTRACTOR TO ALLOW AOR ACCESS TO INSPECT AND CONFIRM AREAS OF BRICK REPLACEMENT AND REPOINTING. CONTRACTOR TO PROVIDE ANY REQUIRED EQUIPMENT FOR USE BY THE AOR DURING THE AOR'S INSPECTION. UPON INSPECTION, AOR WILL DETERMINE WHETHER BRICK REPLACEMENT AND REPOINTING IS REQUIRED. ANY REPLAEMENT OR REPOINTING WORK WILL BE AUTHORIZED THROUGH THE **BRICK REPLACEMENT AND REPOINTING ALLOWANCE** PRIOR TO WORK TAKING PLACE. CONTRACTOR SHALL NOT INCLUDE PRICING FOR BRICK REPLACEMENT AND REPOINTING AT THE REVERSE FACE OF THE PARAPET UNDER THE MANSARD ROOF IN ITS BASE BID.



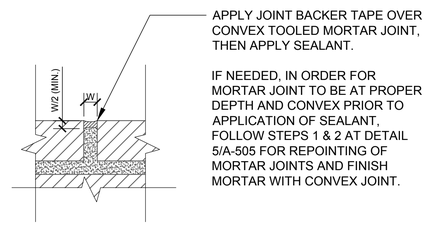
STEP ONE



STEP TWO

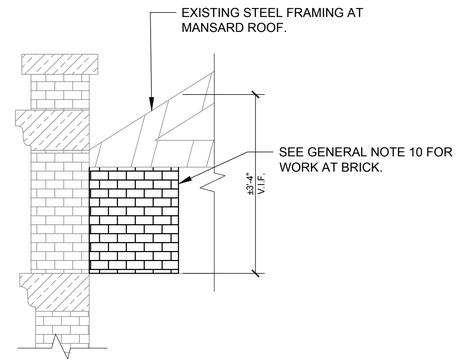
5 REPOINTING OF MORTAR JOINTS

SCALE: 3" = 1'-0"



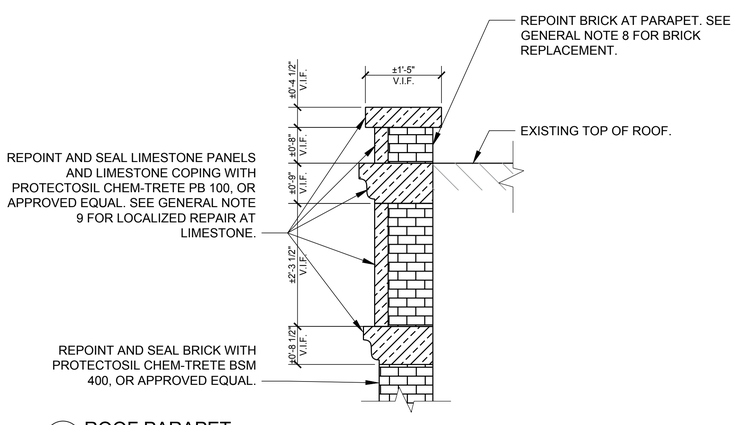
6 SKY JOINT AT PARAPET COPING

SCALE: 3" = 1'-0"



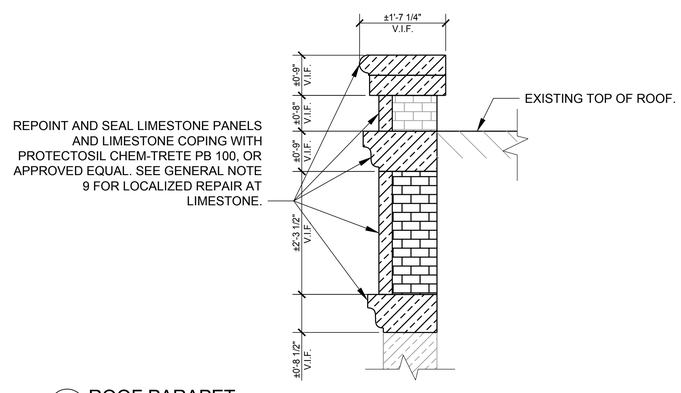
7 ROOF PARAPET BELOW MANSARD ROOF

SCALE: 3/4" = 1'-0"



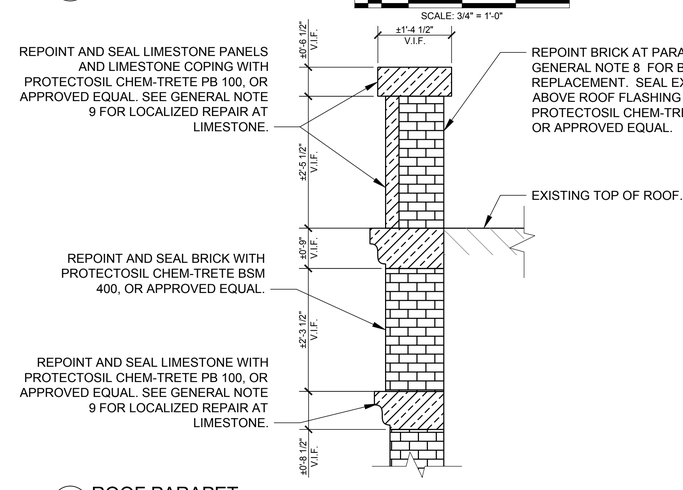
8 ROOF PARAPET

SCALE: 3/4" = 1'-0"



9 ROOF PARAPET

SCALE: 3/4" = 1'-0"



10 ROOF PARAPET

SCALE: 3/4" = 1'-0"

LICENSED ARCHITECT
LISE HELENE
001.020510
STATE OF ILLINOIS

PUBLIC BUILDING COMMISSION

CHICAGO PARK DISTRICT
ORGANIZED 1934

DOUGLAS PARK FACILITY REHABILITATION PARK #218
1401 S. SACRAMENTO DRIVE
CHICAGO, IL 60623
CHICAGO PARK DISTRICT
CITY OF CHICAGO, MAYOR RAHM EMANUEL

Architect of Record:
MILHOUSE ENGINEERING & CONSTRUCTION

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SUITE 1501
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MILHOUSE ENGINEERING & CONSTRUCTION, INC.
Chicago, IL
Structural Engineers of Record

JOHNSON LASKY KINDELIN
Chicago, IL
Architect

MILHOUSE ENGINEERING & CONSTRUCTION, INC.
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PBC Contract No: C1596
Project No.: 11310

Title
ARCHITECTURAL DETAILS 5 OF 7

Sheet
A-505