

LIMESTONE

Sec. 6-1 GENERAL:

The General Conditions, Division G, written for this project shall form a part of this division and shall apply fully to all work hereunder.

Sec. 6-1A SCOPE:

The work under this division shall be the furnishing, fabricating, and setting of all limestone of every description shown on the drawings, called for hereinafter or reasonably implied for the completion of the work without additional expense.

Sec. 6-2 MATERIALS:

(a) Limestone shall be select grade buff Indiana Silithic limestone with a smooth machine finish, showing no tool marks on the exposed surfaces.

(b) Anchors, dowels, cramps, etc., shall be of galvanized metal and shall be of size and type as required in accordance with the best construction practices recommended by the Indiana Limestone Institute. Galvanizing shall be by the hot dip process after the various items have been fabricated.

(c) Mortar Materials shall be as specified in this Division; see Sec. 6-11, MORTAR MATERIALS. Attention is again invited to the requirement that in mixing all pointing and masonry mortar (including parging) in contact with limestone, non-staining Portland cement only shall be used.

Sec. 6-3 SAMPLES:

Refer to the General Conditions and in accordance therewith prepare and submit clearly marked samples for approval as follows:

(a) Limestone - two or more pieces of the kind proposed for use, same to show the texture and finish and the typical extremes of color.

(b) Anchors - one each of each type and size of all anchors, dowels, cramps, etc., proposed for use.

Sec. 6-4 DETAILS AND SHOP DRAWINGS:

Refer to General Conditions and in accordance therewith prepare and submit drawings for all the limestone work which shall show the sizes, sections and dimensions of stones, the arrangement of joints and bonding, anchoring and other necessary details. Each stone indicated on these drawings shall bear the corresponding number, marked on the back or end with a non-staining paint. Provisions for proper anchoring,

dowelling and clamping, and for support shall be clearly indicated in accordance with standard practice recommended by the Indiana Limestone Institute.

Sec. 6-5 CUTTING:

All stone shall be cut accurately to shape and dimensions and full to the square with all exposed surfaces true and out of wind. Beds and all joints shall be dressed straight and at right angles to the face and shall be laid off for 1/4" width. Patching or hiding of defects shall not be permitted.

Sec. 6-6 SETTING:

Each stone shall be dropped squarely into place and shall be set accurately and true to line and level. Each stone shall be sponged thoroughly on each built-in face before being set. Full beds of mortar shall be provided for each horizontal joint, and the vertical joints shall be full. The mortar shall be kept back from the face of the stone 3/4".

Sec. 6-7 CLEANING:

The faces of all stone work shall be cleaned thoroughly after completion using soap or soap powder boiled in clear water and applied vigorously with stiff fibre brushes. If necessary, clean, fine sharp sand shall be added to the mixture. After washing, all stone shall be drenched with clean water. No chemicals shall be used for cleaning limestone.

Sec. 6-8 FINISHING TOP JOINTS; POINTING:

All top exposed surfaces of vertical joints and all joints that may be affected by weather conditions shall be cleaned out as above and then pointed with elastic cement brought up flush. Do all pointing of joints as required.

Sec. 6-9 CORNER STONE:

The corner stone shall be of size and design shown on drawings with inscription deeply cut. Provide necessary tools, materials, apparatus and men for corner stone laying ceremonies. Copper box insert will be delivered by sheet metal contractor.

Sec. 6-10 CARVING:

- (a) Carvings and inscriptions shall be as indicated and called for on the drawings.
- (b) The Architect will furnish any additional data required as to the type and style of lettering, and any special details of carving he may deem necessary for the proper interpretation of the work.
- (c) The Contractor shall prepare and submit to the Architect for approval full size shop details of all lettering; also scale details of all carving, etc., same to be drawn to such scale as the Architect may later instruct. The Contractor shall discuss the making of these shop drawings with the Architect before making them.

Sec. 6-11 MORTAR MATERIALS:

- (a) In mortar used for all limestone setting, that is, all mortar coming in contact with limestone, including pointing and the parging behind and in contact with the limestone, only non-staining portland cement shall be used.
- (b) Non-staining portland cement shall meet the specifications of the ASTM, and shall not contain more than 0.30 percent by weight of soluble alkali. It shall be delivered to the job site in the original sealed containers, bearing the name of the brand and that of its manufacturer. It shall be properly stored and protected from the weather, water, and dampness.
- (c) Other materials, such as Sand, shall meet the requirements given in the Division - MASONRY WORK.
- (d) Water used shall be obtained from the public drinking water supply.
- (e) Refer also to Division - MASONRY WORK, sections on "Mortar" and "Mortar Materials".

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DIVISION NO. 7

STRUCTURAL STEEL
OPEN WEB STEEL JOISTS

Sec. 7-1 GENERAL:

The General Conditions, Division G, written for this project, shall form a part of this Division and shall apply fully to all work hereunder.

Sec. 7-2 SCOPE:

The work included under this Division shall be the furnishing, fabrication, and erection of all structural steel shown and noted on the drawings, called for in these specifications, and as may be reasonably implied for the completion of the building. It includes principally such items as girders, beams, columns, trusses, bracing, tie rods, lintels, base and bearing plates, anchors, etc. Lintels shall be provided for all openings in walls (both exterior and interior) whether specifically noted on the drawings or not. Also furnish and erect all open web steel joists and accessory items.

Sec. 7-3 STRUCTURAL STEEL:

1. All steel used in this specification shall be manufactured in accordance with the latest revision of Specification A-7-50-T, A.S.T.M. Each piece must be straight, free from wind, and true to size and shape.
2. Materials shall be thoroughly straightened in the shop, by methods which will not injure the steel, before laying off or before being worked on in any way. Sharp kinks or bends shall be cause for rejection.
3. The rules and practices adopted by the American Institute of Steel Construction shall govern all conditions for the furnishing, fabricating, and erecting of this work, unless otherwise herein specifically noted. It shall be definitely understood that this work shall be in conformity with the requirement of the Building Code and Regulations of the Local Public Authority.
4. Holes in steel members shall be punched or drilled, and reamed as required, but shall not be turned with a torch.
5. Shop connections shall be riveted, (or welded if approved by the Architect). Field connections may be bolted only if "drive" or "rib" bolts are used, with lock nuts. Rib bolts shall be of an approved make, such as "Structural Rib Bolts" with "Automatic Lock Nuts". Minimum diameter of bolts - 3/4". Holes in the steel members shall be of a proper diameter to give a driving fit for the bolts. Field connections of trusses shall be riveted (or welded if approved by the Architect.)

Sec. 3 STRUCTURAL STEEL (Contd.):

6. Before any material is assembled, the surfaces which will be in contact shall be thoroughly cleaned of all rust, oil, etc., and shall be shop painted, as later specified herein.
7. Before the fabrication of steel is started, the Contractor, who must check and verify all dimensions in the field, must submit to the Architect for his approval, shop fabrication drawings in triplicate covering all of the work. The Contractor will be held responsible for the correctness of these drawings. When these detail plans are satisfactory to the Architect, he will approve same, retain one copy for his files and return the other two copies to the Contractor, who may then proceed with the work.
8. Provide all holes in top and bottom flanges and in webs of members as may be required for fastening finishing materials and other construction.
9. Furnish and deliver all steel angle and other lintels, for the various openings shown on the Drawings. These shall be long enough to provide not less than 6" actual bearing at each end for ordinary openings and longer and greater bearings for angle lintels over larger openings and for heavier lintels.
10. All items included under this section and required for the erection of the building shall be delivered and erected in such sequence and at such times as may be necessary or required to keep the progress of the work at the highest possible speed consistent with safety.
11. Furnish and deliver to the site all such items as anchor bolts, base plates, bearing plates, sleeves, etc., which are to be built in in such order and at such times as to avoid any delays in the work.
12. Any misfits found during erection which are due to shop errors shall be rectified by the fabricator without additional recompense. Corrections of a minor nature and a reasonable amount of reaming in the field shall be considered a legitimate part of the erection.
13. No part of any member of the structural steel shall project beyond any finished work. In the preparation of the details, any such possibilities which may develop, shall be brought to the attention of the Architect. Failure to do so shall obligate the Contractor to make the necessary correction in the field to the satisfaction of the Architect and at the expense of the Contractor. Sufficient space shall be allowed between structural steel and finished lines to permit proper and secure fastenings and supports.

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Sec. 7.3 STRUCTURAL STEEL (Contd.):

14. No method of erection shall be employed which will detract from the strength of the completed structure. The location of booms, derricks, and hoists, shall be such as not to damage the steel framework. Provide, place and remove all planking, blocking, shoring, etc., required to complete the work as a part of this contract.
15. All structural steel included hereunder, except that which will be enclosed in concrete, shall be one coat of an approved paint in the shop. given

Sec. 7.4 STEEL JOISTS:

1. All steel joists shall be open web type steel joists made by an approved manufacturer, and shall conform to the standard specifications of the Steel Joist Institute.
2. The installation and erection of steel joists shall conform to the Code of Standard Practice of the Steel Joist Institute.
 - (a) All steel joists shall be welded to the supporting steel beams and girders by not less than $1/4"$ x $1 1/2"$ long welds on each side of each joist. Make weld larger for heavier steel joists.
 - (b) Furnish and install all rigid steel bracing and bridging, ties, plates, anchors, clips, etc., also angles at edges of duct openings, ceiling extensions, and other accessories.
 - (c) Frame joists for passage of ducts, pipes, etc.
 - (d) Where required and as called for, double joists under partitions.
3. Prepare and submit erection drawings, with details, for the approval of the Architect.

DIVISION NO. 8MISCELLANEOUS IRON AND STEEL WORKORNAMENTAL IRON WORKSTEEL SASHSec. 8-1 GENERAL:

The general Conditions, Division G, written for this project, shall form a part of this Division and shall apply fully to all work hereunder.

Sec. 8-2 SCOPE:

The work under this division includes the furnishing, fabricating, and erecting of all and Miscellaneous Iron and Steel Work required throughout the job, such as anchor bolts, sleeves, strap anchors, ties of all kinds, **dowels, bearing plates, gratings, ventilating and other grilles (except heating), steel stairs, steel sash, and the like.**

Sec. 8-3 MATERIALS:

- (a) All materials used in this work shall conform in every respect to the respective specifications of the A.S. T.M. as they may apply to the respective items.
- (b) Refer to the structural steel drawings and specifications to ascertain what is to be furnished under that division and furnish, fabricate, and install all other steel or iron work necessary or required to properly and completely install this work.

Sec. 8-4 SHOP DRAWINGS, ETC.:

As required under General Conditions, prepare and submit shop drawings, details, and erection drawings for all work hereunder before beginning fabrication. These shall show, beside the work included, all holes and other provisions necessary or required for the proper attachment and support of other work and materials.

Sec. 8-5 CHECKING AT BUILDING:

Before preparing shop drawings or details, all measurements and conditions shall be checked at the building, and any variations between the measurements on the drawings and those at the building shall be indicated; the measurements at the building taking precedence unless the variations are of a material nature.

Sec. 8-6 WORKMANSHIP:

The workmanship shall equal that of the best work of the respective kinds with no sharp or cutting edges on any part of any items with which the public comes in contact. All castings or curved work shall be clean, sharp and uniform without lumps or other defects. Wherever possible, connections on ornamental iron work shall be made with concealed screws or bolts, and where not, these shall be countersunk so as to leave the heads perfectly flush with the adjoining surface.

Sec. 8-7 SHOP PAINTING:

All items under this section shall be thoroughly cleaned, and then painted one shop coat of an approved paint.

Sec. 8-8 GRILLES FOR HEATING SYSTEM - NOT INCLUDED IN THIS DIVISION:

No grilles for the heating system shall be furnished under this division.

Sec. 8-9 GRATINGS:

and frames

Furnish any gratings[^] which may be required (see drawings).

Sec. 8-10 MISCELLANEOUS:

- (a) Furnish and deliver to the site such items as anchor bolts, sleeves, sockets, etc., which are to be built in as the work progresses, in due time and sequence so as not to cause delay in any other work.
- (b) Also furnish, deliver and erect all other items hereunder in such sequence and quantity as will keep pace with the general progress of the work.
- (c) Furnish all straps and tie irons. See drawings for particular notes on same.

Sec. 8-11 OUTDOOR BULLETIN BOARD:

Furnish an outdoor illuminated bulletin board, which will be built into the front brick wall, under Masonry Division. The Contractor shall allow the sum of Two Hundred Dollars (\$200.00) for the purchase of this board (which does not include the letters). The purchase of this board will be by the Architect. The board size will be about 30" to 36" wide, 48" high, and 4" depth.

Sec. 8-12 STEEL STAIRS:

- (a) Interior stairs as called for on the drawings shall be built of J. & L. steel channel stringers of required strength. These shall have attached to them small angles to which the risers, treads and platforms shall be fastened. The risers, treads and platforms shall be of pressed steel of required gauges. The risers and treads may be of a single unit or of two pieces which lock together. The treads and platforms shall be of steel plate pressed into pans to receive the cement which shall be not less than 2" inches thick for the treads and 2-1/2" for the platforms, and the platforms shall be reinforced on the bottom with angles of proper size. The wall strings shall not project more than 1/2" beyond the face of the finished wall above them, and the outside stringer shall be panelled with neat steel mouldings.
- (b) The rails of the stairways shall be constructed as shown in detail on drawing.
- (c) Provide holes or make other provisions in the various members of the stairs to attach other materials and items to. Where structural steel in addition to that shown on the structural plans is required to properly install these stairs, it shall be furnished and installed as a part of the work of this division. Provide angles on stringers to carry partitions or furring where necessary.

Sec. 8-13 METAL ACCESS PANELS:

Furnish and install all metal access panels, as called for on the drawings. Panels shall be complete as detailed on the drawings, with angle frame and 16 ga. cover, same to be applied with studs or screws.

Sec. 8-15 STEEL WINDOWS - NEW:

- (a) All steel sash shall be of the type, design, and size indicated. Stock steel sash shall be used where they conform to the requirements, and shall be manufactured by a reputable firm such as Fenestra, Hope, Lupton, Trucon, Bailey, Mesker, Rosbach & Sons, Inc., Boca, Cristall-Federal, Inc., and Chas. Haas Co. Submit sash detail drawings to Architect for approval.
- (b) After fabrication, the windows shall be thoroughly cleaned and bonded.

- (c) Provide and apply all rough and finished hardware, which shall include operating, locking, and other devices, appliances, and equipment required to cooperate all movable members properly and efficiently without forcing.
- (d) All windows shall be installed plumb, true, straight, square, and level, and at proper elevations. All shall be adjusted in every detail before final completion of building.
- (e) Caulking is specified under Division 9 of the Specifications. All joints and spaces between window frames and adjoining construction, shall be thoroughly caulked by the gun pressure method.
- (f) All frames shall be equipped with suitable and sufficient masonry anchors or lugs riveted or welded to the frames, both at jambs and sills, and heads. There shall be not less than two at the heads and sills and not less than three on each jamb. They shall be long enough to project into masonry not less than 6"
- (g) Glazing rebates shall be arranged for outside glazing (inside will be permitted) if approved by the Architect. **Glass and glazing of these windows shall be done under another Division.**

Sec. 8-16 NEW EXTERNAL FRAME FOR EXISTING NAVE STAINED GLASS MEMORIAL WINDOWS:

- (a) The ten existing stained glass Memorial Windows in the Nave of the present Church have a sectional metal frame which is screwed into a surrounding wood frame. This wood frame is, of course, not in very good condition. These windows are to be removed and stored (in space provided by the Owner - see Section G2-SCOPE), until reused in the new building.
- (b) The wood frame referred to above shall be carefully removed and shall be replaced by a surrounding outer steel angle, 2" x 1-1/2" x 1/8", in accordance with the special detail shown on the drawings. The existing sectional angles shall be bolted to the new outer angle. This shall be done for all the windows involved. The installation shall be subject to the approval of the Architect.

Sec. 8-17 ORNAMENTAL RAILINGS AND GATES:

- (a) The existing iron railings and gates shall be salvaged at the time of demolition, for reuse.

Sec. 8-17 ORNAMENTAL RAILINGS AND GATES:

- (b) The railings and gates shall be repaired and reused where and as called for on the drawings. There are two (2) gates on the East Avenue side of the site. The north gate appears to be in the best condition, and it shall therefore be repaired as required (using parts taken from the south gate) and reinstalled as called for on the drawings.
- (c) The railing and gate on the Dillon Street side shall be repaired as required and reinstalled as called for on the drawings.

Sec. 8-18 METAL DOOR FRAMES:

- (a) Interior metal door frames, in block walls (and wherever else called for) shall be stock 16 ga. pressed steel frames, formed with integral stops and rabbets, of approved manufacture, acceptable to the Architect. Frames shall have all required anchors, etc.

Sec. 8-19 HOLLOW METAL FIRE DOORS:

- (a) Hollow metal fire doors shall be Richmond or equal make, Class B doors, constructed of not less than 16 ga. steel. Submit doors to Architect for approval.

Sec. 8-20 HOLLOW METAL DOORS AND FRAMES (NOT FIRE DOORS):

Hollow metal doors shall be FENESTRA, DIEBOLD, or equal, of type and sizes indicated on the drawings. Door frames shall be No. 16 gauge pressed steel, formed with integral stops and rabbets. See drawings for details. Frames shall be machined for attachment of hardware, and shall be complete with lugs for anchoring to masonry. All metal doors shall be complete with the door manufacturer's standard hardware, to include cylinder lock, door check, and door stop. Where lights are indicated, door manufacturer shall furnish glazing mouldings.

Sec. 8-21 ROOF SCUTTLE:

Furnish and install one 2'-6" x 3'-0" metal roof scuttle, Type S-2, Bilco or approved equal. Cover shall be galvanized steel with 3" beaded flange, neatly welded and ground at corners. Insulation shall be 1/2" fibre fully covered by a 22 gauge metal liner. Curb shall be formed with a 3-1/2" flange, provided with holes for securing to roof deck, and complete with integral cap flashing of same material, full welded and ground at corners for absolute watertightness.

DIVISION NO. 9

WATERPROOFING AND DAMPROOFING - CAULKING

Sec. 9-1 GENERAL:

The General Conditions, Division G, written for this project, shall form a part of this Division and shall apply fully to all work hereunder.

Sec. 9-2 SCOPE:

Work to be done under this division shall include all waterproofing and damproofing, also all caulking. (Note that integral waterproofing in concrete is included under Division - CONCRETE.)

Sec. 9-3 WATERPROOFING AND DAMPROOFING:

- (a) **Waterproofing shall be applied to the exterior face of Basement walls below grade as follows:**

Furnish and apply, by brushing, two (2) coats of Min-Ra-Lite Waterproofing Pitch (Gatch Supply Company, Baltimore), or an equal approved by the Architect, in the amount of 3 gallons per 100 sq. ft. The material should be used as it comes in the container. The first coat shall be brushed horizontally, while the second coat shall be brushed vertically. Apply as recommended by the manufacturer.

The surface to be waterproofed can be wet or dry, but should be free from grease, oil, dirt or loose particles. Prepare a plastic cant strip for the junction of the wall and footing by mixing Min-Ra-Lite Waterproofing Pitch with enough fine sand to make a pliable plastic. Firmly press a triangular wedge of this plastic into the corner of the wall and footing.

This coating should be applied carefully so as to form a watertight skin on the exterior face of the walls, free from pin holes and similar defects. After the second coat has been given, the waterproofing should be carefully inspected and any defective or questionable areas given additional coats as required. No backfilling of earth shall be done until the waterproofing film has hardened.

Sec. 9-3 WATERPROOFING AND DAMPPROOFING (Cont'd):

- (b) As called for in **Division - MASONRY**, there shall be applied on the outside face or all back-up blocks, etc. of exterior walls at least two coats of a Portland Cement parging with a total thickness of not less than 1/2". This parging shall contain an approved integral waterproofer.
- (c) The exterior faces of all beams, girders, lintels, eaves, etc., of either steel or concrete, at the exterior walls shall be waterproofed with 0.004 thickness Phoenix Type "B" COP-R-FLASH (John T. Wood, Baltimore), protected on both surfaces with an asphalt saturated creped duplex kraft paper bonded to the metals (copper and lead) with a heavy coating of asphalt, all reinforced with fiberglass strands. (or **3 oz. copper-on-sisalkraft paper fabric**) and shall be applied in accordance with directions, by an approved applicator. The work shall be guaranteed for a period of not less than five (5) years, any leakage being made good by the Contractor.
- (d) Metal through-wall and other metal flashings are specified in Division - "Roofing and Sheet Metal Work".
- (e) Dampproofing of walls above grade shall be done as follows:
1. Exterior walls exposed to the outdoor weather, which are to have their inside faces furred and a finished surface applied (such as lath and plaster, wallboard, or the like) shall have dampproofing applied to their inside faces before furring is applied. Dampproofing shall consist of spraying on two (2) coats of G.T.D. Liquid Asphalt Protective Coating, manufactured by H. E. Cann Co., Baltimore, Maryland, or an approved equal acceptable to the Architect, same to be applied strictly in accordance with the manufacturer's recommendations.
 2. Where such exposed exterior walls are not to be furred and finished on the inside face (i.e., the masonry is to remain exposed on the inside), then no dampproofing shall be applied on the inside face of such walls.

Sec. 9-4 CAULKING:

- (a) All door and window frames and other openings shall be thoroughly caulked from the outside with an approved elastic caulking compound between the frame and the masonry.
- (b) All caulking materials used shall be of an approved type and make, such as Pecora, shall be non-hardening, non-staining, and shall not run or liquefy when the summer sun shines on it throughout a full day.
- (c) Application shall be in an approved manner, by caulking gun (under pressure). Caulking shall be applied so as to leave a workmanlike appearance after completion. The Carpenter will remove the hanging stiles and will replace them after caulking, where necessary.
- (d) On deep recesses or large openings, caulk first with oakum or similar material and seal with caulking compound.

Sec. 9-5 MEMBRANE WATERPROOFING:

- (a) Furnish and install the membrane type waterproofing shown on the drawings and herein specified. This protection is to waterproof the space under the church enclosed court, and the Contractor shall guarantee, for a period of five (5) years, that this installation shall keep the space below absolutely dry.
- (b) Properly prepare surface of concrete to receive the membrane waterproofing. The concrete surface must be smooth, free from sharp edges and projections. Concrete shall be dry before the waterproofing is applied.
- (c) Membrane waterproofing shall consist of not less than three (3) plies of 15# felts with four (4) heavy moppings of an approved hot asphalt. Provide proper lapping of felts, (4" minimum for side laps, 12" for end laps), and start felts from low point, so that any water will run over and not against laps. Do not overheat the asphalt. Eliminate all air bubbles. Do not let the asphalt get cold before the felt is applied. There must be no holes in the waterproofing.
- (d) The work shall be so regulated that, at the close of a day's work, all felt that is laid shall have received the final moppings of asphalt.
- (e) Minimum amounts of asphalt to be used for each 100 square feet of finished work: Horizontal work -- 12 gallons; Vertical work -- 14 gallons.

ROOFING AND SHEET METAL WORKSEC. 10-1 GENERAL:

The General Conditions, Division G, written for this project, shall form a part of this Division and shall apply fully to all work hereunder.

SEC. 10-2 SCOPE:

The work included under this Division shall be the installation of all roofing throughout, roof insulation, sheet metal work, flashing, counter-flashing, gutters and downspouts, as shown on the drawings, also leaders called for herein, or required for the proper completion of the building. It shall include all louvers and frames except those specifically omitted on the drawings which will be furnished under another heading. Make all necessary provisions for expansion and contraction of the various items installed under this division.

SEC. 10-3 EXCEPTIONS:

No sheet metal work in connection with the heating divisions shall be required hereunder.

SEC. 10-4 SLATE ROOFING:

- (a) Before beginning work under this division, the Contractor shall inspect all roof surfaces and report any defects to the Architect. The beginning of work hereunder shall be taken to mean acceptance of the surfaces.
- (b) On the wood sheathing lay asphalt impregnated rag felt 30 lbs. per square, nailing properly. Lay on top of this felt one layer of 1" thick rigid insulation board, Celotex Preseal or equal, (submit board to Architect for approval), same to be properly nailed. On top of insulation board lay another layer of 30 lb. rag felt. Felt shall be laid horizontally with joints and edges lapped 4". Secure felt along laps and ends so as to prevent damage to structure under and to preserve felt undamaged until slate is laid. Lap felt over gutters and all hips and ridges at least 1'-0". Under valley flashings felt shall be run lengthwise with the valley -- 8" beyond valley and metal forming built-in pitters and valleys. Joints shall be mopped with pitch. Valleys are to be of the open type.
- (c) Slate shall project at eaves not less than 2". Double slates at eaves and start over wood cant strips. Lay hip and ridge slates in cement spread thickly over unexposed surface of under course. Point all exposed joints and nail holes with cement.
- (d) Slates shall be ^{Buckingham} Champion, Ranger, or equal, slate of blue-black color, 1/4" thick with 10% 3/8" for first 12 courses, and 3/16" thick with 20% 1/4" thick for balance of roof. They shall be of random widths 9" to 12" with smaller widths predominating. Length shall be twice exposure plus 3" head lap. Exposure

shall be 7-1/2". Tails shall be laid irregularly, slightly above and below the gauging lines. Use only large head slater's solid copper nails long enough to provide sufficient anchorage into sheathing (to go through the insulation).

SEC. 10-5 FLASHING:

- (a) Furnish and install all flashings of every type and description required for the completion of the building; same to be left water and weathertight.
- (b) All flashings shall be 16-ounce copper. Base flashing shall be built in as the masonry work progresses and shall extend into the masonry as detailed on the drawings. Flashings shall extend into masonry not less than 4" and shall be turned up 1" at back end. Seams shall be soldered inside the masonry. Cap flashing shall lap over base flashing not less than 4".
- (c) Valley flashings shall be constructed of 16-ounce copper in sheets not exceeding 8' in length. The valley flashing shall be of the open type, free from longitudinal seams, and shall be of sufficient width to extend not less than 4" under the roofing slates on each side. The sheets shall lap not less than 6" in the direction of flow with the upper end nailed to the roof sheathing. Edges of the flashing shall be secured with copper cleats, spaced 12" on center. Width of exposed flashing in the valley shall be 4".
- (d) Use copper nails and best grade solder on all copper work. Only resin shall be used as a flux.
- (e) All flashing shall be installed in a workmanlike manner. Parapet walls first being primed with flashing primer of manufacture approved by Architect, to the full height of flashing before flashing is applied.
Install, under any stone copings, Majestic Copper Through Wall Flashing, etc.

SEC. 10-6 SNOW GUARDS:

Provide and install Polson wire snow guards of #9 B & S gauge copper wire, of double twist type. They shall be located 3 rows beginning at the second slate course from bottom and three rows half way up the roof, and one to each joint in each row. These shall be installed at such times and in such a manner as will permit the roofer to produce a perfectly watertight job around them.

SEC. 10-7 COPPER ROOFING ON CRICKETS AND MACHINERY ENCLOSURES:

- (a) Furnish and install copper roofing on all crickets and machinery enclosures as called for on the drawings and as may be required.
- (b) Such copper roofing shall be "flat seam roofing", of 20 oz. cold rolled copper not larger than 16" x 18", laid in courses parallel with the eaves and with the shorter dimension of the sheet at right angles to the course. Cross joints shall be staggered. Edges of sheet shall be pretimed and shall be bent to form 3/4" locked and soldered seams. Corners shall be notched.
- (c) Cleats, of 20 oz. cold rolled copper, shall be placed on the longitudinal seams at center of each pan and over intersection of each transverse seam. On the transverse seams, a cleat shall be placed at the center of each pan.
- (d) Turn up copper on walls at least 6" to form base flashings. At eaves, rakes, etc. which do not abut vertical surfaces, the roofing sheets shall turn over the edge of the roof sheathing and be hooked 3/4" over a 24 oz. cold rolled copper edge strip (of 8' long pieces, ends lapped 1", secured to roof deck with nails 4" o.c., face nailing not permitted).
- (e) All seams shall be thoroughly soldered, producing watertight joints.

SEC. 10-8 COPPER ROOFING ON TOWER SPIRE:

- (a) Sheet copper roofing on the tower spire shall be as detailed on the drawings, shall be applied by the pan method and shall have 1" standing seams formed at the hips of the roof slope. The roofing shall be securely fastened to the sheathing by copper cleats as hereinafter specified.
- (b) The roofing surfaces shall be covered with 15 $\frac{1}{2}$ asphalt saturated roofing felt, and over this, apply rosin-sized paper. Each ply shall lap not less than 3" in the direction of the flow and shall be nailed with copper or bronze nails driven through copper washers not less than 1" square. Nails in the roofing felt shall be spaced not more than 6" apart on all lapped seams. Nails through the rosin-sized paper shall be spaced 18" apart in both directions.
- (c) The roofing pans shall be formed of 16 ounce cold rolled lead coated copper sheets. The sheets shall be cut to conform to the shape of the surface to be covered, bending up 1-1/2" along one edge and 1-3/4" along opposite edge to form the standing seams at the hip of the roof slopes. There shall be no other vertical seams in the roofing. Cross seams shall be loose locked and formed with a 3/4" fold on the lower end of the upper pan and with a 2" fold on the upper end of the underlying pan. Cross seams shall be slitted to avoid cross folded seams where they turn up at the standing seams. The slit in the fold at the

SEC. 10-8 COPPER ROOFING ON TOWER SPIRE (Contd.):

lower edge of the upper pan shall be 1" away from the standing seam. The edge of the slit in the lower fold at the upper end of the lower pan shall be soldered to the vertical leg of the standing seam. Alternate pans shall begin at the eaves with half-length sheets, thus staggering the transverse seams.

- (d) Standing seams shall finish 1" high. The first fold shall be a single fold 1/4" wide, and the second fold shall be a double fold 1/2" wide, thus the locked portion of the seam shall be five (5) plies in thickness. Top and bottom end of standing seams shall be turned down in a tapered fold.
- (e) Each pan at the eaves shall be hooked over a previously placed edge strip. Edge strips shall be formed of 24 ounce cold rolled copper and shall extend 4" onto the sheathing of the spire under the roofing and be secured with nails 4" on center placed along the upper edge. Face nailing of the edge strips shall not be permitted.
- (f) Cleats shall be 2" wide by about 3" long, and shall be made of 16 ounce cold rolled copper. One end shall be locked into the seam or into the folded edge of the copper sheets, and the other end shall be nailed with two nails and folded back over the nail heads. Cleats shall be spaced 12" on center on each standing seam and there shall be one cleat at the center of each cross seam.

Sec. 10-9 TOWER CUPOLA - SPIRE BASE:

Furnish and install the sheet metal covering of the tower cupola - spire base, including the louvers, finial, insect screens, all as shown on the drawings. Metal to be 16 oz. lead coated copper. Note that parts of the construction are copper over wood. Furnish and install 3" bezel (moulding) approximately 4'-9" o.d., for each of 4 dials of clock (see Sec. 510-2, par. (d), pg. 510-1), same to be of lead coated copper. Detail furnished by Tower Clock Contractor.

SEC. 10-10 SHEET METAL (in connection with Roofing Work):

The materials for all sheet metal work, unless distinctly called for of other materials, shall be of 16 oz. hard (cornice) copper for all hanging gutters, downspouts, leader heads, souppers, weep holes, splash pans, and the like. For all other purposes, it shall be of 16 oz. soft (roofing) copper. All solder shall be of the best grade, composed of one-half pig lead and one-half block tin. All nails shall be of hard copper. Only resin shall be used as a flux.

SEC. 10-11 CORNER STONE BOX:

Provide and deliver, in ample time for corner-stone laying ceremonies, a copper box with air-tight lid, about 12" long, 9" deep and 4" wide - (exact size later). Cover shall be soldered onto box before final placing in the stone, same to be continuous soldering.

SFC. 10-12 GUTTERS:

The hanging gutters shall be of copper of the moulded type as shown, with rolled edges, and shall be held in place by heavy top braces of brass, copper or bronze, and spaced not more than 48" apart. Joints shall lap about 1" in 10'-0" in the direction of the flow, and shall be riveted and soldered, front, bottom, and back. Outlets into downspouts shall be protected with an approved copper wire strainer of the ball type made of No. 14 gauge copper.

SFC. 10-13 DOWNSPOUTS:

- (a) Downspouts shall be installed where indicated and shall be of copper, of the shapes and sizes called for. They shall be fitted with easy elbows where required, and shall connect to the drainage main left **for that purpose by the Plumber. Note that some downspouts are surface discharge.**
- (b) All downspouts shall be held in place with approved strap hangers as indicated so that they shall not be nearer than 2" to any wall at any point. The hangers shall be of copper, brass, or bronze. Not more than 20' of downspout shall be soldered in any one length. Laps for downspout shall be not less than 1-1/2" and tinmed on both sides, and slip joints shall be not less than 1-1/2", which shall not be driven up tight. Furnish and install leader heads where called for.
- (c) Downspouts shall continue to and connect into C.I. pipes left by Plumber above ground. Connections at "bells" shall be filled in or caulked with cement mortar.

SFC. 10-14 MISCELLANEOUS:

- (a) Provide and install, as required by the roofer, all necessary miscellaneous sheet metal work, of copper, not specifically noted.
- (b) All sheet metal work shall be done by skilled mechanics, to the satisfaction of the supplier of the roofing and the Architect, using materials of the best quality only. All sheet metal work shall be performed in accordance with best practices recommended by the Copper and Brass Institute.

SFC. 10-15 GRILLES AND LOUVERS: ROOF VENTS:

Furnish and install all grilles, louvers, and vents called for on the drawings, except those which are included and specified in Division Heating Type, size and style of units to be submitted to the Architect for approval.

SFC. 10-16 GUARANTEES:

Roofing and flashing shall be weathertight and watertight. This entire work of roofing, flashing, and sheet metal work shall be guaranteed by the Roofing Contractor against leaks due to defects in materials or workmanship for a period of five (5) years from date of acceptance of the building by the Owner. Any leaks or defects that may develop during the period of guarantee shall be corrected by the Contractor at no expense to the Owner.

Sec. 10-17 WHITE CHIP ROOFING - DILLON STREET WING:

- (a) Lay 2" thick rigid insulation (asphalt coated Celotex Roof Insulation or equal) on the wood roof deck, same to be laid with joints butt and staggered, and shall be well nailed to the wood decking with flat head nails. Nails to be galvanized, 3" length, spaced not more than 12", all edges.
- (b) Lay over this insulation board, a 20-year bond hot application white chip surface roofing, similar to Koppers, Barrett or equal. Flashing shall be Composition Base and Metal Cap Flashings, 20-year Specification. Furnish and install all gravel stops, etc. of 16 oz. copper required in connection with the roofing. White chips shall be Harry T. Campbell Sons Corporation Reflect-O-Lite Chips, or approved equal, about 400# to 450# chips per 100 sq. ft. roof.
- (c) All metal flashing shall be 16 oz. copper, as previously specified under this division.
- (d) Furnish a 20-year roofing bond covering this installation.

Sec. 10-18 FERROUS SHEET METAL WORK:

- (a) Furnish and install all ferrous sheet metal work called for and/or required for this project, same to be of not less than 24 gauge galvanized Lyonore Metal, Toncan, or equal.
- (b) Furnish and install all ductwork and other sheet metal work in connection with Ventilating Equipment, all as called for in Division No. 157, VENTILATING, (to which the Contractor shall refer, as well as to the drawings); materials as called for in par. (a) above. Furnish and install all rain hoods, insect screens, rain collars, (where ducts come through the roof), etc. required for a first-grade installation.