CITY OF PORTLAND

DEPARTMENT OF PLANNING & URBAN DEVELOPMENT
INSPECTION SERVICES DIVISION

March 12, 1987

RE: 1657-1705 Congress Street

Richard J. McGoldrick
100 Silver Street
Portland, Maine 04101

Dear Mr. McGoldrick,

Your application to construct a 32,000 square foot building at 1657-1705 Congress Street has been reviewed and a permit is herewith issued subject to the following requirements:

1. Any existing site plan requirements as outlined in the letter issued with the foundation only permit are still in effect

2. The Fire Prevention Bureau requires that
   a) Approval is based on the letter dated March 11, 1987. A separate permit and approval for the sprinkler system will be required
   b) Offices which have only one exit, the exit will discharge directly to the exterior or into an approved exit access corridor

3. Handicap Accessibility Standards as outlined in ANSI A117.1 should be met.

4. Any crane using over a 90' boom extension shall need FAA approval prior to being brought onto the site.

Very truly yours,

Marge Schmuckel
Asst. Chief of Inspection Services

/el

March 12, 1987

PERMIT # BUILDING PERMIT APPLICATION Portland Previous permit #..........

APPLICANT FILL OUT I - XVIII AND DETAILS OF WORK ON REVERSE

Please fill N/A (not applicable) for any item not pertaining to your request

I. GENERAL INFORMATION

Location/address of construction: 1657-1705 Congress Street

Owner or lessee's name: Richard J McGoldrick Tel. 774-1885

Address: 100 Silver St

Contractor's name: Community Constructors Inc. Tel. Site 775-7453

Address: same

Subcontractors:

PERMIT ISSUED MAR 13 1987 City of Portland

II. NEW SUBDIVISION OR EXISTING LOT REFERENCE

Name

Lot

Block

Bk. & pg. Reg. deeds

Date recorded

CODE If other*, explain Seasonal Condominium Apartment

III. PROPOSED USE: 324- office

IV. PAST USE:

V. OWNERSHIP: PUBLIC (Federal/ State/ local government) PRIVATE (individual/corp/nonprofit)

VI. DESCRIPTION OF WORK:

To construct 32,000 (30,000) sq ft office building (approximate size)

fee paid on 11-19-86 plans on file in office

VII. BUILDING DIMENSIONS: length width square footage height #stories

VIII. EST. CONSTRUCTION COST: [illegible] IX. SQ. FT. OF LAND [illegible] BUILDING

X. RESIDENTIAL BUILDINGS ONLY: BEDROOMS 1 BDRM 2 BDRMS 3 BDRMS

NEW DWELLING UNITS WITH:

EXISTING DWELLING UNITS WITH:

XI. # RESIDENTIAL UNITS:

NEW DWELLINGS

EXISTING DWELLINGS

NET RESIDENTIAL UNITS

XII. SIGNATURE OF APPLICANT [signature] DATE 3-12-87

DO NOT WRITE BELOW THIS LINE

XIII. ZONING:

DISTRICT STREET FRONTAGE

SETBACKS: front back side side

ZONING BOARD APPROVAL: no ☐ yes ☐ (date)

PLANNING BOARD APPROVAL: no ☐ yes ☐ (date)

XIV. OFFICE USE:

TAX MAP #

LOT #

VALUE/STRUCTURE

PERMIT EXPIRATION

XV. CONDITIONAL USE: variance site plan subdivision shore and floodplain mgmt

special exception other (explain)

XVI. SIGNATURE OF FIELD INSPECTOR (CEO) DATE

XVII. FEES:

base fee

subdivision fee

site plan review fee

other fees

late fee

TOTAL 1,740.00

XVIII. SPACE FOR FIGURING /ADDITIONAL COMMENTS:

James P. Collins, Pent.

1. WATER SUPPLY ☐ public ☐ private
2. SEWER ☐ public ☐ private, type
3. HEAT type fuel
4. FOUNDATION type thickness footing
5. ROOF type pitch covering load
6. PLUMBING # tubs # showers # lavatories # laundry tubs # flushes # other
SPRINKLER SYSTEM? ☐ yes ☐ no
7. ELECTRICAL service entrance size # smoke detectors

NUMBER OF OFF-STREET PARKING SPACES: enclosed outdoors

8. CHIMNEY # flues # fireplaces material
9. FRAMING: floor joists size max. on centers ceiling joists rafters studs wall studs
10. If 1-story building w/ masonry walls: wall thickness height
11. BEDROOM WINDOWS height width sill height egress window? ☐ yes ☐ no

PLOT PLAN/DETAILS OF WORK ON REVERSE

White - Municipal Office
Green - Applicant
Yellow - CEO
Pink - Tax Assessor
Gold - GPCOG

(B) High Terms Carroll

Jan 31/89 —

This was found in Quinn's file - should have been in CBO - Kevin Carroll's file —

The building is built & completed as per plans on file —

Comp 1988 —

C of O issued by Mr Carroll —

653 - 1305 Congress St

TRANSMITTAL LETTER

AIA DOCUMENT G810

PROJECT: (name, address) Shrawdwater crossing

ARCHITECT'S PROJECT NO:

DATE: 3/12/87

TO: portland city hall
building inspection dept.

ATTN: M. Schmuckle

If enclosures are not as noted, please inform us immediately.

If checked below, please:

( ) Acknowledge receipt of enclosures.
( ) Return enclosures to us.

WE TRANSMIT:

(X) herewith ( ) under separate cover via _____
( ) in accordance with your request _____

FOR YOUR:

( ) approval ( ) distribution to parties ( ) information
( ) review & comment ( ) record
(X) use ( ) _____

THE FOLLOWING:

( ) Drawings ( ) Shop Drawing Prints ( ) Samples
(X) Specifications ( ) Shop Drawing Reproducibles ( ) Product Literature
( ) Change Order ( ) _____

COPIES	DATE	REV. NO.	DESCRIPTION	ACTION CODE
1 ea	3-12-87	—	cast-in-place concrete; precast-prestressed hollow core plank; structural steel; steel joist; prefabricated wood trusses	

ACTION CODE
A. Action indicated on item transmitted
B. No action required
C. For signature and return to this office
D. For signature and forwarding as noted below under REMARKS
E. See REMARKS below

REMARKS _____

brian e. duffy

COPIES TO: file (with enclosures) ☐☐☐☐☐

TEAS FEELY & HINGSTON
122 COMMERCIAL STREET
PORTLAND MAINE 04101
BY: ARCHITECTURE ■ PLANNING

ONE PAGE

RECEIVED 3/12/87

TEAS FEELY AND HINGSTON 122 COMMERCIAL STREET PORTLAND MAINE 04101 207-775 6141 ARCHITECTURE AND PLANNING

March 11, 1987

Mr. John Dobkowski
Fire Prevention Department
City of Portland
Portland City Hall
Portland, ME 04101

Re: Stroudwater Crossing

Dear Mr. Dobkowski,

Pursuant to our discussions and meetings with regard to the type of sprinkler system and egress configuration for the above project, I offer the following:

1) The 3 story 30,000 sq.ft. office building will have a complete NFPA 13 sprinkler system designed and installed according to code. (All 3 floors plus attic space.)

2) We will revise the stair configuration in accordance with the enclosed sketches, which clearly separates the rear egress stair from the front stair, which exits through the lobby.

As I explained over the phone, the issuance of the building permit on Thursday, March 12 is imperative. I would appreciate your review of the drawings with Marge Schmuckle. Please call me immediately if there are any issues outstanding.

I greatly appreciate your assistance in this matter and thank you in advance for helping to expedite the Building Permit process.

Sincerely yours,

T. Scott Teas
President
Teas, Feely and Hingston, P.A.

TST:ksr
cc: Marge Schmukle

TEAS FEELY AND HINGSTON 122 COMMERCIAL STREET PORTLAND MAINE 04101 207-775 6141 ARCHITECTURE AND PLANNING

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President
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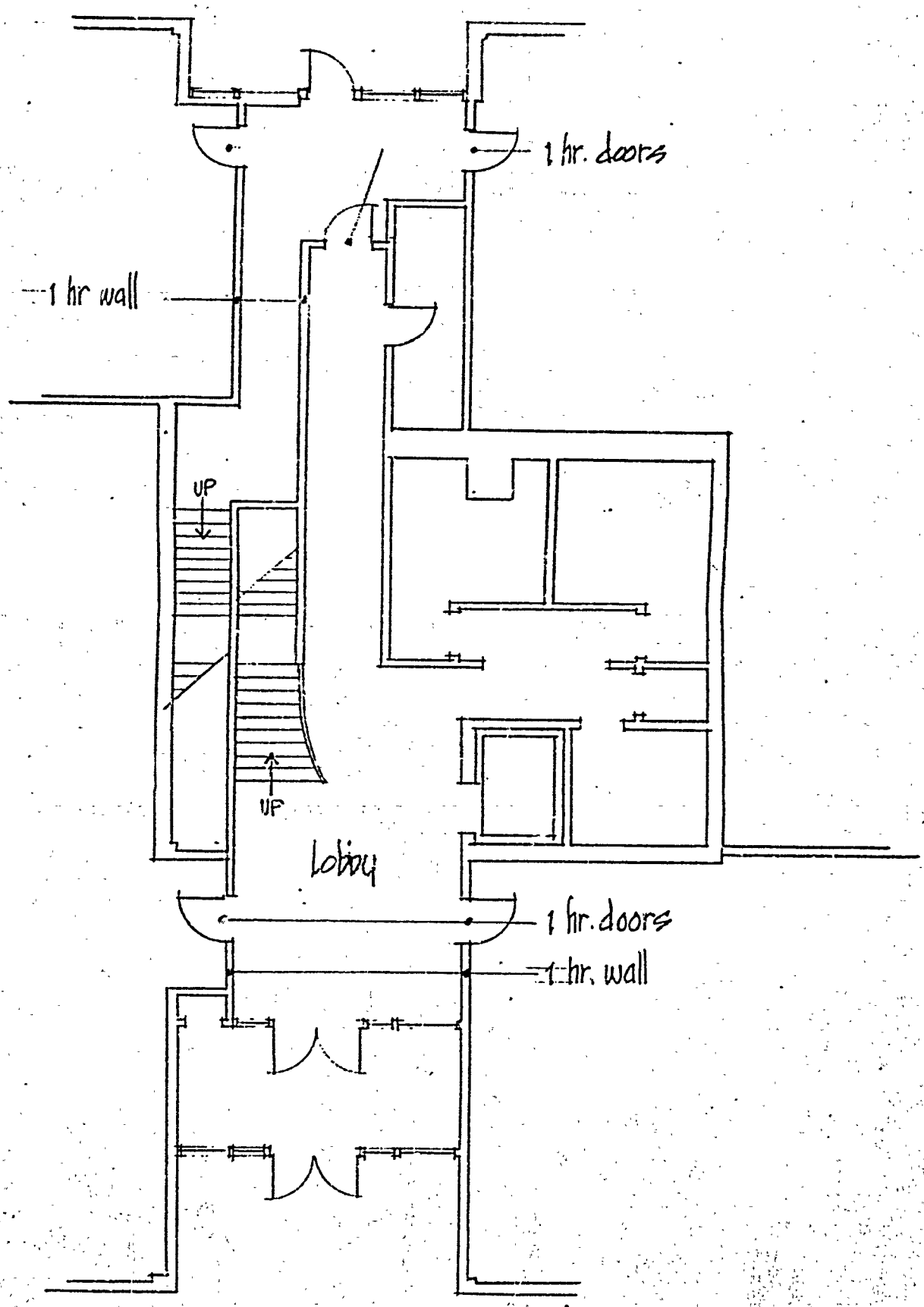
TST:ksr
cc: Marge Schmukle

Brian Duffy
775-6141

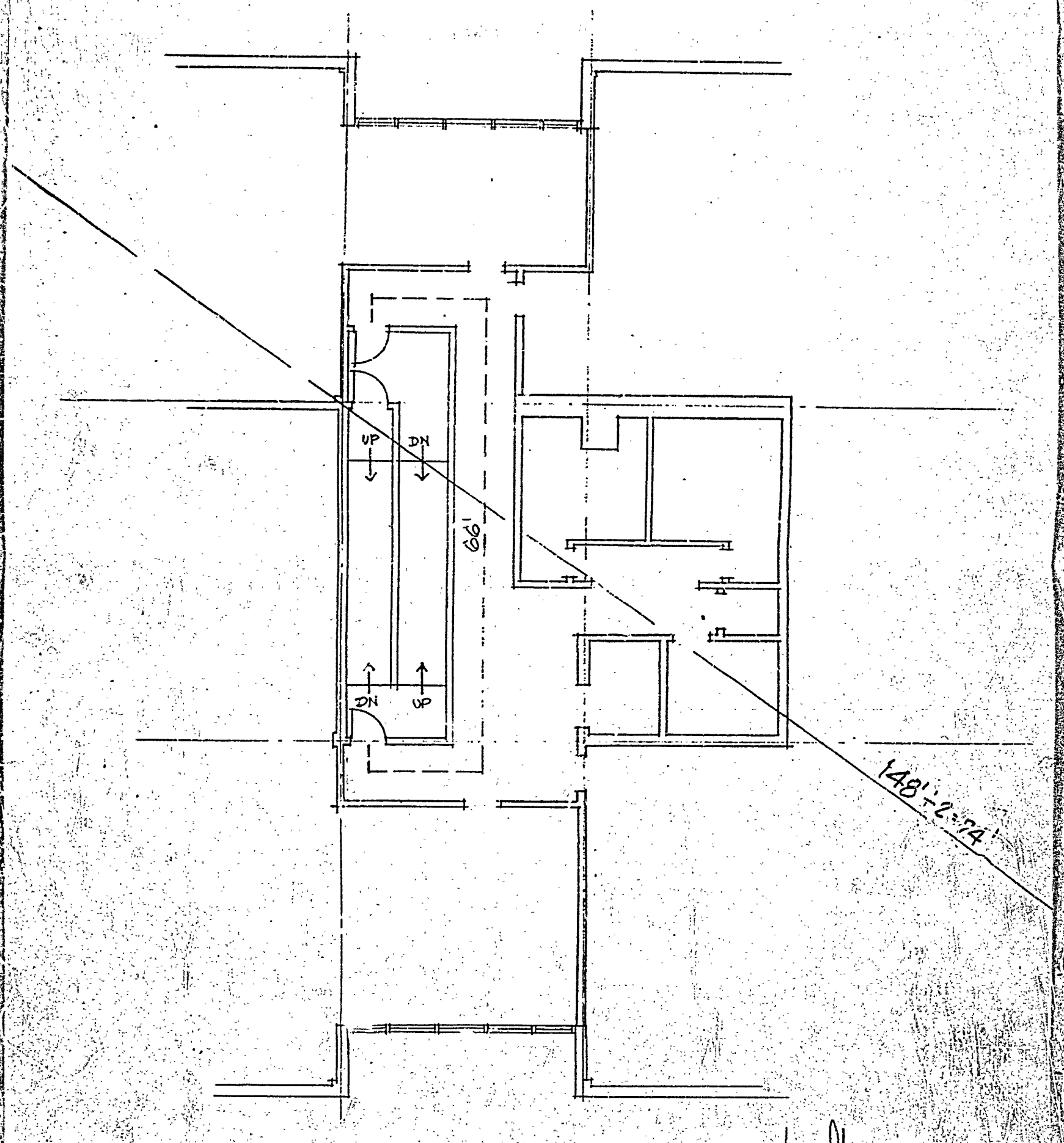


first floor

stroudwater crossing

BUILDING TO RECEIVE COMPLETE NFPA 13 SPRINKLER SYSTEM

3/10/87
RECEIVED 3/11/87



second floor

straudwater crossing

BUILDING TO RECEIVE COMPLETE NFPA 13 SPRINKLER SYSTEM 3/10/87

1657-1705 Congress St.

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS: The general provisions of the Contract, including General and Supplementary Conditions and General Requirements (if any), apply to the work specified in this Section.

1.02 DESCRIPTION OF WORK

A. Work included: Provide labor, materials, and equipment necessary to complete the work of this Section, and without limiting the generality thereof furnish and include the following:

1. The extent of cast-in-place concrete work is shown on drawings and includes (but not by way of limitation) formwork, reinforcing, cast-in-place concrete, accessories, and casting in of items specified under other Sections of the Specifications or furnished by Owner that are required to be built-in with the concrete.

1.03 QUALITY ASSURANCE:

A. General: Comply with requirements of Quality Assurance and Submittals, Division 1.

B. Codes and Standards: Comply with provisions of the following except as otherwise indicated:

1. ACI 211.1-81 "Recommended Practice for Selecting Proportions for Normal and Heavyweight Concrete".

2. ACI 212.2 R-81 "Guide for Use of Admixtures in Concrete".

3. ACI 301-72 (Revised 1981) "Specifications for Structural Concrete for Buildings".

4. ACI 302.1 R-80 "Guide for Concrete Floor and Slab Construction".

5. ACI 304-73 "Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete".

6. ACI 304.2 R-71 "Placing Concrete by Pumping Methods".

7. ACI 305 R-77 (Revised 1982) "Hot weather Concreting".

Received 3/12/87

8. ACI 306 R-78 "Cold Weather Concreting".

9. ACI 308-81 "Standard Practice for Curing Concrete".

10. ACI 309-72 "Standard Practice for Consolidation of Concrete".

11. ACI 315-80 "Details and Detailing of Concrete Reinforcement".

12. ACI 318-83 "Building Code Requirements for Reinforced Concrete".

13. ACI 347-78 "Recommended Practice for Concrete Formwork".

14. Concrete Reinforcing Steel Institute, "Placing Reinforcing Bars", 1976.

C. Materials and installed work may require testing and retesting, as directed by the Architect, at any time during progress of work. Allow free access to material stockpiles and facilities. Tests, not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

1.04 SUBMITTALS:

A. Product Data: If requested by the Architect, submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement, forming accessories, admixtures, patching compounds, and curing compounds.

B. Shop Drawings:

1. Reinforcement: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with ACI 315 "Manual of Standard Practice for Detailing Reinforced Concrete Structures" showing bar schedules, stirrup spacing, diagrams of bent bars, arrangement of concrete reinforcement. Include special reinforcement required at openings through concrete structures.

C. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.

D. Laboratory Test Reports: Submit laboratory test reports for concrete materials and design mix tests if trial batch method is used for proportioning concrete mixes.

E. Strength Tests: Provide required records of strength tests if field experience method used for proportioning concrete mixes.

PART 2 - PRODUCTS

2.01 FORM MATERIALS:

A. Forms for Exposed Finish Concrete: Unless otherwise indicated, construct formwork for exposed concrete surface with plywood, metal, metal-framed plywood faced or other acceptable panel-type materials, to provide continuous, straight, smooth, exposed surfaces. Furnish in largest practicable sizes to minimize number of joints. Provide form material with sufficient thickness to withstand pressure of newly-placed concrete without bow or deflection.

1. Use plywood complying with U.S. Product Standard PS-1 "B-B Concrete Form Plywood", Class I, Exterior Grade or better, mill-oiled and edge-sealed, with each piece bearing legible inspection trademark.

B. Forms for Unexposed Finish Concrete: Form concrete surfaces which will be unexposed in finished structure with plywood, lumber, metal or other acceptable material. Provide lumber dressed on at least 2 edges and one side for tight fit.

C Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain or adversely affect concrete surfaces, and will not impair subsequent treatments of concrete surfaces.

2.02 REINFORCING MATERIALS:

A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

B. Welded Wire Fabric: ASTM A 185, welded steel wire fabric.

C. Supports for Reinforcement: Provide supports for reinforcement including bolsters, chairs, spacers, and other devices for spacing, supporting and fastening reinforcing bars and welded wire fabric in place. Use wire bar type supports complying with CRSI recommendations, unless otherwise acceptable.

1. For slab-on-grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class I) or stainless steel protected (CRSA, Class 2).

2.03 CONCRETE MATERIALS:

A. Portland Cement: ASTM C 150, Type I or Type II, unless

otherwise acceptable to Architect.

1. Type III, High Early Strength Cement may be used as approved.

2. Use one brand of cement throughout project for each strength and mix of concrete, unless otherwise acceptable to Architect.

B. Normal Weight Aggregates: ASTM C 33, and as herein specified. Provide aggregates from a single source for exposed concrete.

C. Water: Potable.

D. Air-entraining Admixture: ASTM C 260.

E. Accelerating Admixtures: ASTM C 494, type C or E as approved by Architect.

F. High Range Water Reducing Admixture (Superplasticizer): ASTM C 494 Type F or Type G and contain not more than one percent chloride ions.

G. Normal Range Water Reducing Admixture: ASTM C 494, type A containing no calcium chloride.

H. Calcium chloride not permitted.

2.04 RELATED MATERIALS

A. Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 oz. per sq. yd., complying with AASHTO M 182, Class 2.

B. Moisture-Retaining Cover: One of the following, complying with ASTM C 171.

1. Waterproof paper.

2. Polyethylene film.

3. Polyethylene-coated burlap.

C. Liquid Membrane Curing Compound:

1. Liquid type membrane-forming curing compound complying with ASTM C 309, Type I, Class A, unless other type acceptable to Architect. Curing compound shall not impair bonding of any material to be applied directly to the concrete. Demonstrate this nonimpairment prior to use.

2.05 PROPORTIONING AND DESIGN OF MIXES:

A. Ready-mix Concrete: Comply with requirements of ASTM C 94, and

as herein specified.

B. Prepare design mixes for each type and strength of concrete by either laboratory trial batch or field experience methods as specified in ACI 301. Use material including all admixtures proposed for use on the project.

C. Submit written reports to Architect of each proposed mix for each class of concrete at least 15 days prior to start of work. Do not begin concrete production until mixes have been reviewed by Architect.

D. Proportion design mixes to provide normal weight concrete with the following properties, as indicated on drawings and schedules:

1. 4000 ~~3000~~ psi 28-day compressive strength.

2. Slump at point of placement shall be not less than 1 inch and more than 4 inches.

3. Use air-entraining admixture in all concrete, unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits:

   4% to 8% for maximum 3/4" aggregate.

   3% to 6% for maximum 1-1/2" aggregate.

E. Adjustment to Concrete Mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

1. Water may be added at the project only if the maximum specified slump is not exceeded.

2. During hot weather, or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C 94 may be required.

PART 3 - EXECUTION

3.01 FORMS:

A. Design, erect, support, brace and maintain formwork to support vertical and lateral loads that might be applied until such loads can be supported by concrete structure. Construct

formwork so concrete members and structures are of correct size, shape, alignment, elevation and position.

B. Unless otherwise shown or specified, design, construct, erect, maintain and remove forms and related structures for cast-in-place concrete work in compliance with ACI 347, "Recommended Practice for Concrete Formwork".

C. Design formwork to be readily removable without impact, shock or damage to cast-in-place concrete surfaces and adjacent materials.

D. Construct forms to sizes, shapes, lines and dimensions shown, and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other required finishes. Solidly butt joints and provide back-up at joints to prevent leakage of cement paste.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush plates or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces where slope is too steep to place concrete with bottom forms only. Kerf wood inserts for forming keyways, reglets, recessed, and the like, to prevent swelling and for easy removal.

F. Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete. Securely brace temporary openings and set tightly to forms to prevent loss of concrete mortar. Locate temporary openings on forms at inconspicuous locations.

G. Chamfer exposed corners and edges as indicated, using wood, metal, PVC or rubber chamfer strips fabricated to produce uniform smooth lines and tight edge joints.

H. Form Ties: Factory-fabricated, adjustable-length, removable or snap-off metal form ties, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

1. Unless otherwise indicated, provide ties which will not leave holes larger than 1 inch in diameter in concrete surface and be constructed so that embedded portion shall terminate at least 1 inch inside concrete.

I. Provisions for Other Trades: Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from trades providing such items. Accurately place and securely support items built into forms.

J. Cleaning and Tightening: Thoroughly clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt or other debris just before concrete is placed. Retighten forms and bracing after concrete placement as required to eliminate mortar leaks and maintain proper alignment.

3.02 PLACING REINFORCEMENT:

A. Comply with Concrete Reinforcing Steel Institute's recommended practice for "Placing Reinforcing Bars", for details and methods of reinforcement placement and supports, and as herein specified.

1. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.

2. Accurately position, support and secure reinforcement against displacement by formwork, construction, or concrete placement operations. Locate and support reinforcing by metal chairs, runners, bolsters, spacers, and hangers, as required.

3. Place reinforcement to obtain specified coverages for concrete protection. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations. Set wire ties so ends are directed into concrete, not toward exposed concrete surfaces. Do not place reinforcing bars more than 2 in. beyond the last leg of continuous bar support.

4. Install welded wire fabric in as long lengths as practicable. Provide flat sheets. Lap adjoining pieces at least one full mesh and lace splices with wire. Offset end laps in adjacent widths to prevent continuous laps in either direction.

3.03 JOINTS:

A. Construction Joints: Locate and install construction joints, which are not shown on Drawings, so as not to impair strength and appearance of the structure, as acceptable to Architect.

1. Provide keyways at least 1-1/2 in. deep in construction joints in walls, slabs and between walls and footings; accepted bulkheads designed for this purpose may be used for slabs.

2. Place construction joints perpendicular to the main reinforcement. Continue reinforcement across construction joints.

3. Joints in slabs on grade shall be located and detailed as indicated in the Contract Documents. If saw-cut joints are

required or permitted, cutting shall be timed properly with the set of the concrete: cutting shall be started as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw, and shall be completed before shrinkage stresses become sufficient to produce cracking.

3.04 INSTALLATION OF EMBEDDED ITEMS:

A. General: Set and build into all work anchorage devices and other embedded items required for other work that is attached to, or supported by, cast-in-place concrete. Use setting drawings, diagrams, instructions and directions provided by suppliers of items to be attached thereto. Notify other crafts to permit installation of their work.

B. Edge Forms and Screed Strips for Slabs: Set edge forms or bulkheads and intermediate screed strips for slabs to obtain required elevations and contours in finished slab surface.

3.05 PREPARATION OF FORM SURFACES:

A. Coat contact surfaces of forms with a form-coating compound before reinforcement is placed.

B. Thin form-coating compounds only with thinning agent of type, and in amount, and under conditions of form-coating manufacturer's directions. Do not allow excess form-coating material to accumulate in forms or to come in contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

3.06 CONCRETE PLACEMENT:

A. Preplacement Review: Footing bottoms, reinforcement and all work shall be subject to review by Architect or designated representative. Verify that reinforcing, plates and other items to be cast into concrete are placed and securely held. Notify the Architect 24 hours prior to scheduled placement and obtain approval or waiver of review prior to placement. Moisten wood forms immediately before placing concrete where form coatings are not used. Be sure that all debris and other foreign matter is removed from forms.

B. General: Comply with ACI 304, and as herein specified.

1. Deposit concrete continuously or in layers of such thickness that no concrete will be placed on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness. If a secton cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation due to rehandling or flowing.

2. Concrete shall be handled from the mixer to the place of final deposit as rapidly as practicable by methods which will prevent segregation or loss of ingredients and in a manner which will assure that the required quality of the concrete is maintained.

3. Conveying equipment shall be approved and shall be of a size and design such that detectable setting of concrete shall not occur before adjacent concrete is placed. Conveying equipment shall be cleaned at the end of each operation or work day. Conveying equipment and operations shall conform to the following additional requirements:

   a. Belt conveyors shall be horizontal or at a slope which will not cause excessive segregation or loss of ingredients. Concrete shall be protected against undue drying or rise in temperature. An approved arrangement shall be used at the discharge end to prevent apparent segregation. Mortar shall not be allowed to adhere to the return length of the belt. Long runs shall be discharged into a hopper or through a baffle.

   b. Chutes shall be metal or metal-lined and shall have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

   c. Pumping or pneumatic conveying equipment shall be of suitable kind with adequate pumping capacity. Pneumatic placement shall be controlled so that segregation is not apparent in the discharged concrete. The loss of slump in pumping or pneumatic conveying equipment shall not exceed 2 inches. Concrete shall not be conveyed through pipe made of aluminum alloy. Standby equipment shall be provided on the site.

4. Do not use reinforcement as bases for runways for concrete conveying equipment or other construction loads.

C. Placing Concrete in Forms: Deposit concrete in forms in horizontal layers not deeper than 18 inches and in a manner to Useavoid inclined construction joints. Where placement consists of several layers, place each layer while preceding layer is still plastic to avoid cold joints.

1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand-spading, rodding or tamping. Use equipment and procedures for consolidation of concrete in accordance with ACI recommended practices.

2. Use vibrators designed to operate with vibratory equipment

submerged in concrete, maintaining a speed of not less than 8000 impulses per minute and of sufficient amplitude to consolidate the concrete effectively. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations not farther than visible effectiveness of machine, generally at points 18 inches maximum apart. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to set. At each insertion maintain the duration of vibration for the time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing segregation of mix, generally from 5 to 15 seconds. A spare vibrator shall be kept on the job site during all concrete placing operation.

D. Placing Concrete Slabs: Deposit and consolidate concrete slabs in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.

1. Consolidate concrete using internal vibrators during placing operations so that concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Bring slab surfaces to correct level with straightdedge and strikeoff. Use bull floats or darbies to smooth surface, free of humps or hollows. Do not disturb slab surfaces prior to beginning finishing operations. Do not sprinkle water on plastic surface.

3. Maintain reinforcing in proper position during concrete placement operations.

E. Cold Weather Placing: Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306 and as herein specified.

1. When air temperature has fallen to or is expected to fall below 40 deg.F (4 deg.C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg.F (10 deg.C), and not more than 80 deg.F (27 deg.C) at point of placement.

2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.

3. Do not use calcium chloride, salt and other materials containing antifreeze agents or chemical accelerators.

4. All temporary heat, form insulation, insulated blankets,

coverings, salt hay, or other equipment and materials necessary to protect the concrete work from physical damage caused by frost, freezing action, or low temperature shall be provided prior to start of placing operations.

a. When the air temperature has fallen to or is expected to fall below 40 deg.F, provide adequate means to maintain the temperature in the area where concrete is being placed between 50 and 70 degF.

F. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ACI 305 and as herein specified.

Cool ingredients before mixing to maintain concrete temperature at time of placement below 90 deg.F. Mixing water may be chilled, or chopped ice may be used to control the concrete temperature provided the water equivalent of the ice is calculated to the total amount of mixing water.

Cover reinforcing steel with water-soaked burlap if it becomes too hot, so that the steel temperature will not exceed the ambient air temperature immediately before embedment in concrete.

Wet forms thoroughly before placing concrete.

Do not use retarding admixtures without the written acceptance of the Architect.

3.07 FINISH OF FORMED SURFACES:

A. Rough Form Finish: For formed concrete surfaces not exposed-to-view in the finish work or by other construction, unless otherwise indicated. This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas repaired and patched and fins and other projections exceeding 1/4 in. in height rubbed down or chipped off.

B. Smooth Form Finish: For formed concrete surfaces exposed-to-view, or that are to be covered with a coating material applied directly to concrete, or a covering material applied directly to concrete, such as waterproofing, damp-proofing, painting or other similar system. This is as-cast concrete surface obtained with selected form facing material, arranged orderly and symmetrically with a minimum of seams. Repair and patch defective areas with fins or other projections completely removed and smoothed.

C. Smooth Rubbed Finish: Provide smooth rubbed finish to scheduled concrete surfaces, which have received smooth form finish treatment, not later than one day after form removal.

Moisten concrete surfaces and rub with carborundum brick or other abrasive until a uniform color and texture is produced. Do not apply cement grout other than that created by the rubbing process.

D. Grout Cleaned Finish: Provide grout cleaned finish to scheduled concrete surfaces which have received smooth form finish treatment.

Combine one part portland cement to 1-1/2 parts fine sand by volume, and mix with water to consistency of thick paint. Proprietary additives may be used at Contractor's option. Blend standard portland cement and white portland cement, amounts determined by trial patches, so that final color of dry grout will closely match adjacent surfaces.

Thoroughly wet concrete surfaces and apply grout to coat surfaces and fill small holes. Remove excess grout by scraping and rubbing with clean burlap. Keep damp by fog spray for at least 36 hours after rubbing.

E. Related Unformed Surfaces: At tops of walls and grade beams, horizontal offsets surfaces occurring adjacent to formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.08 MONOLITHIC SLAB FINISHES:

A. Scratch Finish: Apply scratch finish to monolithic slab surfaces that are to receive concrete floor topping or mortar setting beds, and as otherwise indicated.

1. After placing slabs, plane surface to a tolerance not exceeding 1/2 in. in 10 ft when tested with a 10-ft straightedge. Slope surfaces uniformly to drains where required. After leveling, roughen surface before final set, with stiff brushes, brooms or rakes.

B. Float Finish: Apply float finish to monolithic slab surfaces to receive trowel finish and other finishes as hereinafter specified, and slab surfaces which are to be covered with membrane or elastic waterproofing, and as otherwise indicated.

1. After screening, consolidating, and leveling concrete slabs, do not work surface until ready for floating. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or by hand-floating if area is small or inaccessible to power units. Check and level surface plane to a tolerance not exceeding 1/4 in. in 10 ft when tested with a 10-ft straightedge. Cut down high spots and fill low spots. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform,

smooth, granular texture.

C. Trowel Finish: Apply trowel finish to monolithic slab surfaces indicated, including slab surfaces to be covered with carpet, resilient flooring, paint or other thin-film finish coating system.

1. After floating, begin first trowel finish operation using a power-driven trowel, Begin final troweling when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final hand-troweling operation, free of trowel marks, uniform in texture and appearance, and with a surface plane tolerance not exceeding 1/4 in. in 10 ft when tested with a 10-ft straightedge. Grind smooth any surface defects which would telegraph through applied floor covering system.

D. Non-Slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.

1. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

3.09 CONCRETE CURING AND PROTECTION:

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with the requirements of ACI 306 and as herein specified.

1. Start initial curing as soon as free water has disappeared from concrete surface after placing and finishing. Weather permitting, keep continuously moist for not less than 7 days.

2. Begin final curing procedures immediately following initial curing and before concrete has dried. Continue final curing for at least 7 days in accordance with ACI 301 procedures. Avoid rapid drying at end of final curing period.

a. Curing shall be continued for at least 7 days in the case of all concrete except high-early-strength concrete for which the period shall be at least 3 days. Alternatively, if tests are made of cylinders kept adjacent to the structure and cured by the same methods, moisture retention measures may be terminated when the average compressive strength has reached 70 percent of the specified strength, fc'. If one of the

curing procedures below is used initially, it may be replaced by one of the other procedures any time after the concrete is 1 day old provided the concrete is not permitted to become surface dry during the transition.

3. When the mean daily temperature is less than 40 deg. F, the temperature of the concrete shall be maintained between 50 and 70 deg. F for the required curing period.

   a. When necessary, arrangements for heating, covering, insulation, or housing the concrete work shall be adequate to maintain the required temperature without injury due to concentration of heat. Combustion heaters shall not be used during the first 24 hours unless precautions are taken to prevent exposure of the concrete to exhaust gases which contain carbon dioxide.

   b. Keep protections in place and intact at least 24 hours after artificial heat is discontinued. Avoid rapid dry-out of concrete due to overheating, and avoid thermal shock due to sudden cooling or heating. 24-hr period.

B. Curing Methods: Perform curing of concrete by moist curing, by moisture-retaining cover curing, by curing compound, and by combinations thereof, as herein specified.

   c. Changes in temperature of the air immediately adjacent to the concrete during and immediately following the curing period shall be kept as uniform as possible and shall not exceed 5 deg. F in any 1 hr or 50 deg. F in any 24-hr period.

1. Provide moisture curing by following methods.

   a. Keep concrete surface continuously wet by covering with water.

   b. Continuous water-fog spray.

   c. Covering concrete surface with specified absorptive cover, thoroughly saturating cover with water and keeping continuously wet. Place absorptive cover to provide coverage of concrete surfaces and edges, with 4-in. lap over adjacent absorptive covers.

2. Provide moisture-cover curing as follows:

   a. Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width with sides and ends lapped at least 3 in. and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Provide curing compound to slabs as follows:

   a. Apply specified curing and sealing compound to concrete slabs as soon as final finishing operations are complete (within 2 hours). Apply uniformly in continuous operation by power-spray or roller in accordance with manufacturer's directions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.

   b. Do not use membrane curing compounds on surfaces which are to be covered with coating material applied directly to concrete, liquid floor hardener or with a covering material bonded to concrete such as concrete, waterproofing, damp-proofing, membrane roofing, flooring, painting, and other coatings and finish materials, unless otherwise acceptable to Architect.

   c. Separating compound may be used as a curing medium if applied in accordance with manufacturer's specifications.

C. Curing Formed Surfaces: Cure formed concrete surfaces, including undersides of beams, supported slabs and other similar surfaces by moist curing with forms in place for full curing period or until forms are removed. If forms are removed, continue curing by methods specified above, as applicable.

D. Protection From Mechanical Injury: During the curing period, the concrete shall be protected from damaging mechanical disturbances, such as load stresses, heavy shock, and excessive vibration. All finished concrete surfaces shall be protected from damage by construction equipment, materials, or methods, by application of curing procedures, and by rain or running water. Self-supporting structures shall not be loaded in such a way as to overstress the concrete.

3.10 REMOVAL OF FORMS:

A. Formwork not supporting weight of concrete, such as sides of beams, walls, columns, and similar parts of the work, may be removed after cumulatively curing at not less than 50 deg.F (10 deg.C) for 24 hours after placing concrete, provided concrete is sufficiently hard to not be damaged by form removal operations, and provided curing and protection operations are maintained.

B. Formwork supporting weight of concrete, such as beam soffits, joints, slabs and other structural elements, may not be removed in less than 14 days and until concrete has attained design

minimum compressive strength at 28 days. Determine potential compressive strength of in-place concrete by testing field-cured specimens representative of concrete location or members.

C. Form facing material may be removed 4 days after placement, only if shores and other vertical supports have been arranged to permit removal of form facing material without loosening or disturbing shores and support.

3.11 RE-USE OF FORMS:

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

B. When forms are extended for successive concrete placement, thoroughly clean surfaces, remove fins and laitance, and tighten forms to close joints. Align and secure joint to avoid offsets. Do not use "patched" forms for exposed concrete surfaces, except as acceptable to Architect.

3.12 MISCELLANEOUS CONCRETE ITEMS:

A. Filling-In: Fill-in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work.

3.13 CONCRETE SURFACE REPAIRS:

A. Patching Defective Areas: Repair and patch defective areas with cement mortar immediately after removal of forms, when acceptable to Architect.

1. Cut out honeycomb, rock pockets, voids over 1/4 inch in any dimension, and holes left by tie rods and bolts, down to solid concrete but, in no case to a depth of less than 1 inch. Make edges of cuts perpendicular to the concrete surface. Thoroughly clean, dampen with water and brush coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

2. For exposed-to-view surfaces, blend white portland cement and standard portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface.