

SECTION 01780 - WARRANTY AND BONDS

- PART 1 - GENERAL**
- 1.01 SUMMARY:**
- A. Provide a positive source of information regarding products incorporated into the Work.
 - B. Obtain the data described in this Section and in pertinent other Sections of these Specifications.
 - C. Obtain the data described in this Section and in pertinent other Sections of these Specifications.
 - D. Relieve Work.
 - E. Document all Work of this Section, including, but not limited to, the following:
 - 1. Documents affecting Work of this Section, including, but not limited to, the following:
 - a. General Conditions, Supplementary Conditions, and Sections in Division 01 of these Specifications.
 - b. Documents of submittals also may be amplified in other pertinent Sections of these Specifications.
- 1.02 SUBMITTALS:**
- A. Comply with pertinent provisions of Section 01310.
- PART 2 - PRODUCTS**
- 2.01 BONDERS:**
- A. Bind in commercial quality three-ring size binders, with hardback, clearable, plastic covers.
 - B. Label cover of each binder with name and title, "WARRANTY AND BONDS" with title of Project name, address and telephone number of Contractor, and name of responsible principal.
 - C. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual with each item identified with the number and title of the specification section in which specified, and the name of Product or Work Item.
 - D. Separate each warranty or bond with index tab keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List contractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- PART 3 - EXECUTION**
- 3.01 PREPARATION OF BONDS:**
- A. Obtain warranties and bonds, executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of Work. Except for items published with Owner's permission, leave tabs protruding at the end of warranty until the date of substantial completion is determined.
 - B. Verify that documents contain full information.
 - C. Give copies promptly when required.
 - D. Retain warranties and bonds until time specified for submittal.
- END OF SECTION**

DIVISION 02 - EXISTING CONDITIONS**SECTION 02100 - SUB-SURFACE INVESTIGATION****PART 1 - GENERAL**

- 1.01 SUMMARY:**
- A. The Section describes the geotechnical investigation performed at the site, and use of data resulting from that investigation.
- 1.02 GEO-TECHNICAL SERVICES REPORT:**
- A. General:
 - 1. A Geotechnical Engineering Report dated _____ has been prepared for this site by _____.
 - B. Use of data:
 - 1. The information contained in this report was obtained for design purposes only. The Contractor is responsible for any conclusions he may draw from this report should he prefer not to assume such risk, he should employ his own experts to analyze available information and/or to make additional borings upon which to base his conclusions, all at no cost to the Owner.
 - 2. Bidders should visit the site and acquaint themselves with existing conditions.
- 1.03 QUALITY ASSURANCE:**
- A. Geotechnical services will be retained by the General Contractor to observe performance of work in accordance with excavating, trenching, filling, backfilling, and grading, and to perform companion tests.
 - B. Report work performed that does not meet technical or design requirements, but make no deviation from the Contract Documents without specific and written approval from the Owner's Construction Representative.
 - C. The Geotechnical Engineer will submit written notification to the Owner that a file was developed with acceptable material in accordance with these specifications and in accordance with the recommendations and procedures included in the Geotechnical Engineering study.
- 1.04 THE GENERAL CONTRACTOR WILL PAY FOR THE GEOLOGICAL ENGINEER'S OBSERVATIONS, TESTS AND INSPECTIONS.**
- END OF SECTION**

SECTION 02410 - DEMOLITION**1.00 GENERAL**

Division 01 requirements apply to this Section.

1.01 SUMMARY:

- A. Section includes: Provide all demolition work.
- B. Obtain all applicable demolition permits prior to performing any demolition work.
- C. The extent of demolition is that work necessary and required to facilitate the related new construction work, including all above and below grade structures.

Demolition shall be such that final construction can be performed, and completed in accordance with the contract documents.

E. All existing structures shall be removed completely, including all above and below grade portions, including retaining walls, foundations and foundation walls, retaining walls, walls, curbs, unexcavated utilities, electric lines, gas lines, and other concealed elements. Removal shall be in accordance with applicable local, state or federal codes.

1.02 PROJECT/SITE CONDITIONS:

- A. The Contractor shall visit the project site and familiarize himself with the existing conditions and project requirements.
- B. Aerials: If not indicated elsewhere that asbestos will be encountered in the course of the contract, if any materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Owner's Project Manager.
- C. Explosives - Use of explosives will not be permitted.
- D. Traffic - Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied and used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate route around closed or obstructed traffic ways if required by governing regulations.
- E. Protection - Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to the public, workers and adjoining property.
- F. Damage - Demolition operations and vibrations may cause damage to adjacent facilities. Perform condition survey in presence of adjacent facility owner(s) with documentation after completion of demolition operations.
- G. Utility Services - Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.

1.03 SEQUENCING:

- A. Perform demolition as indicated, completing all work within each area, including removal of debris, prior to starting work in other areas.

2.00 PRODUCTS - Not Applicable.

3.00 EXECUTION

A. Demolition work shall be performed by experienced personnel experienced in demolition to prevent injury to the public, workers and adjoining property.

B. Debris from the demolition shall not be allowed to accumulate within the building or on the building.

C. Pollution Control: Use water spraying, temporary storage and covered suitable materials to prevent dust and dirt from being carried by the wind. Observe all applicable regulations pertaining to air quality and pollution. Do not use water for dust control.

D. Clear and mark all structures, including, but not limited to, walls, walls, curbs, unexcavated utilities, electric lines, gas lines, and other concealed elements. Return adjacent streets to their original condition.

E. Dispose of or otherwise remove hazardous materials, gases, explosives, acids, poisons or other dangerous materials in accordance with applicable laws and regulations.

END OF SECTION

- C. Demolish structures above each floor before taking demolition supporting members on lower levels.
- D. Break concrete and masonry into sections less than 3 feet in dimension.
- E. Below-Grade Construction and Utility Services: Demolish and remove all portions of finished basement walls and other below-grade construction, including concrete slabs and utility conduits not to remain in-service completely from new building areas and to a depth of not less than 24 inches below finished substrate in pavement areas.
1. Stop or seal the soil embankment below below-grade walls for stability of embankment, or for stability of excavations to remove utility conduits.
2. Provide bracing for embankments and excavations where a sufficient space is present or not present or excavations are made. Provide shoring, bracing, excavation, retaining walls and other necessary bracing, excavation, retaining walls and other necessary bracing, excavation, retaining walls, underground utility conduits, pavements and structures. Contact Engineer for design of any bracing.
3. Perform below grade wall demolition and removal, and an embankment and excavation shoring and bracing with care to avoid soil undermining beneath existing adjacent construction.
4. Utilize existing adjacent construction for support when necessary.
5. Evaluation of existing conditions by a structural engineer and a geotechnical engineer may be needed prior to demolition and excavation of below-grade construction adjacent to and in close proximity to existing construction.
- F. Filling Basements and Foundations: Completely fill below-grade areas and voids resulting from demolition of structures.
1. Use satisfactory soil materials as defined in ASTM Specification D-2487, consisting of, sand, gravel, crushed stone, gravel and sand, broken rock, broken shells, broken bricks, organic matter and hazardous substances.
2. Prior to placement of compacted fill materials, remove standing water, frost, frozen material, trash and debris and locate, and collect from areas to be filled. Fill materials compacted to at least 95 percent of the maximum dry density per ASTM D 690 test method. Batching shall be performed during backfilling.
- G. Utility Services: Excavation and backfilling operations shall be as follows:
1. Abandon existing utility service conduits outside of the proposed building area in accordance with governing regulations and with approval of Owner's Project Manager.
 2. Abandon or remove existing utility service conduits located inside of the proposed building area in accordance with governing regulations and with approval of Owner's Project Manager.
 3. Abandon or remove existing utility service conduits located inside of the proposed building area in accordance with governing regulations and with approval of Owner's Project Manager.
 4. Abandon or remove existing utility service conduits located inside of the proposed building area in accordance with governing regulations and with approval of Owner's Project Manager.
 5. Abandon or remove existing utility service conduits located inside of the proposed building area in accordance with governing regulations and with approval of Owner's Project Manager.
- H. Debris (Demolished Materials)
1. General: Remove accumulated debris, rubbish and other materials that accumulate resulting from demolition operations weekly. Burning of combustible materials from demolished structures will not be permitted on-site unless permitted by local jurisdiction.
 2. Removal: Transport materials removed from demolished structure and locally dispose of same.

DIVISION 03 - CONCRETE**SECTION 03100 - CONCRETE FORMWORK****PART 1 - GENERAL**

- 1.01 SUMMARY:**
- A. Provide formwork and shoring for cast-in-place concrete, and installation into formwork of items such as anchor bolts, setting gages, bearing plates, anchors, inserts, beams and bracing.
 - B. Make site submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
 - C. For items of Work when acceptance is delayed beyond Date of Substantial Completion, other items will be submitted in accordance with the schedule on the Drawings, as specified, and as needed for a complete and proper installation.
- 1.02 QUALITY ASSURANCE:**
- A. Codes and Standards: Design, construct, erect, maintain, and remove forms and related structures for cast-in-place concrete work in compliance with the American Concrete Institute Standard ACI 347, "Recommended Practice for Concrete Formwork."
 - B. Allowable Tolerances: Consult formwork to provide a complete cast-in-place concrete surface complying with the tolerances specified in ACI 311, and, as follows:
 - 1. For exposed control joint grooves and other conspicuous lines, 1/4" in any bay or 20 ft maximum, 1/2" maximum in total.
 - 2. Variation from position of the linear building line and related columns, walls and partitions, 1/2" in any bay or 20 ft maximum, and 1/4" in 40 ft or more.
 - 3. Variation in cross-sectional thickness of slabs, minus 1/4" and plus 1/2".
 - 4. Variation in bridge plan dimensions, minus 1/2" and plus 1/2", and 1/4" in 20 ft or more.
 - 5. Variation in bridge plan dimensions, minus 1/2" and plus 1/2", and 1/4" in 20 ft or more.
 - 6. Accuracy, 2% of the bearing width in direction of placement but not more than 2"; thickness reduction, minus 5%.
- 1.03 PRODUCTS:**
- A. Form Ties:
 - 1. For Concrete Cast-in-Place: Snap-off metal of required length, one type only, with break back dimension; free of defects that will leave holes no larger than one inch diameter in concrete surface and which permit to rust and soil pitting.
 - 2. For Concrete Casted from Form: Snap-off metal of wire.
 - B. Fibers: As Manufactured: Wood strips or rigid plastic type, size as shown; minimum possible length.
 - C. Expansion and Retention Joint Material: See Section 03020 Part 2, or approved equal.
 - D. Form Coatings: Provide commercial form coating compounds that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the setting of surfaces to be cured with water or curing compound. The form coating compound shall be:
 - 1. "Release Form Coating" as manufactured by L M Construction Chemicals.
 - 2. "Nox-Crete Form Coating" as manufactured by Nox-Crete Chemicals, Inc.
 - 3. "Magi-Krete Form Coating" as manufactured by Dayco Superior Chemicals Corporation.
 - F. Fibers and Chemically Resistant: Wood strips or rigid plastic type, size as shown; minimum possible length.
 - G. Expansion and Retention Joint Material: See Section 03020 Part 2, or approved equal.
 - H. Form Coatings: Provide commercial form coating compounds that will not bond with, stain, nor adversely affect concrete surfaces requiring bond or adhesion, nor impede the setting of surfaces to be cured with water or curing compound. The form coating compound shall be:
 - 1. "Release Form Coating" as manufactured by L M Construction Chemicals.
 - 2. "Nox-Crete Form Coating" as manufactured by Nox-Crete Chemicals, Inc.
 - 3. "Magi-Krete Form Coating" as manufactured by Dayco Superior Chemicals Corporation.
- 1.04 THE GENERAL CONTRACTOR WILL PAY FOR THE GEOLOGICAL ENGINEER'S OBSERVATIONS, TESTS AND INSPECTIONS.**
- END OF SECTION**

SECTION 03210 - CONCRETE REINFORCEMENT**PART 1 - GENERAL**

- 1.01 SUMMARY:**
- A. Section includes: Provide all reinforcement for concrete.
 - B. Obtain all applicable reinforcement permits prior to performing any reinforcement work.
 - C. The extent of reinforcement is that work necessary and required to facilitate the related new construction work, including all above and below grade structures.
- Demolition shall be such that final construction can be performed, and completed in accordance with the contract documents.
- E. All existing structures shall be removed completely, including all above and below grade portions, including retaining walls, foundations and foundation walls, retaining walls, walls, curbs, unexcavated utilities, electric lines, gas lines, and other concealed elements. Removal shall be in accordance with applicable local, state or federal codes.**
- 1.02 PROJECT/SITE CONDITIONS:**
- A. The Contractor shall visit the project site and familiarize himself with the existing conditions and project requirements.
 - B. Aerials: If not indicated elsewhere that asbestos will be encountered in the course of the contract, if any materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Owner's Project Manager.
 - C. Explosives - Use of explosives will not be permitted.
 - D. Traffic - Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied and used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate route around closed or obstructed traffic ways if required by governing regulations.
 - E. Protection - Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to the public, workers and adjoining property.
 - F. Damage - Demolition operations and vibrations may cause damage to adjacent facilities. Perform condition survey in presence of adjacent facility owner(s) with documentation after completion of demolition operations.
 - G. Utility Services - Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.
- 1.03 SEQUENCING:**
- A. Perform reinforcement as indicated, completing all work within each area, including removal of debris, prior to starting work in other areas.
- 2.00 PRODUCTS - Not Applicable.**
- 3.00 EXECUTION**
- A. Demolition work shall be performed by experienced personnel experienced in demolition to prevent injury to the public, workers and adjoining property.
- B. Debris from the demolition shall not be allowed to accumulate within the building or on the building.
- C. Pollution Control: Use water spraying, temporary storage and covered suitable materials to prevent dust and dirt from being carried by the wind. Observe all applicable regulations pertaining to air quality and pollution. Do not use water for dust control.
- D. Clear and mark all structures, including, but not limited to, walls, walls, curbs, unexcavated utilities, electric lines, gas lines, and other concealed elements. Return adjacent streets to their original condition.
- E. Dispose of or otherwise remove hazardous materials, gases, explosives, acids, poisons or other dangerous materials in accordance with applicable laws and regulations.
- END OF SECTION**

SECTION 03310 - CONCRETE REINFORCEMENT**1.00 GENERAL**

Division 01 requirements apply to this Section.

1.01 SUMMARY:

- A. Section includes: Provide all reinforcement for concrete.
- B. Obtain all applicable reinforcement permits prior to performing any reinforcement work.
- C. The extent of reinforcement is that work necessary and required to facilitate the related new construction work, including all above and below grade structures.

Demolition shall be such that final construction can be performed, and completed in accordance with the contract documents.

E. All existing structures shall be removed completely, including all above and below grade portions, including retaining walls, foundations and foundation walls, retaining walls, walls, curbs, unexcavated utilities, electric lines, gas lines, and other concealed elements. Removal shall be in accordance with applicable local, state or federal codes.

1.02 PROJECT/SITE CONDITIONS:

- A. The Contractor shall visit the project site and familiarize himself with the existing conditions and project requirements.
- B. Aerials: If not indicated elsewhere that asbestos will be encountered in the course of the contract, if any materials suspected of containing asbestos are encountered, do not disturb the materials. Immediately notify the Owner's Project Manager.
- C. Explosives - Use of explosives will not be permitted.
- D. Traffic - Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks and other adjacent occupied and used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate route around closed or obstructed traffic ways if required by governing regulations.
- E. Protection - Ensure safe passage of persons around area of demolition. Conduct operations to prevent injury to the public, workers and adjoining property.
- F. Damage - Demolition operations and vibrations may cause damage to adjacent facilities. Perform condition survey in presence of adjacent facility owner(s) with documentation after completion of demolition operations.
- G. Utility Services - Maintain existing utilities indicated to stay in service and protect against damage during demolition operations.

1.03 SEQUENCING:

- A. Perform reinforcement as indicated, completing all work within each area, including removal of debris, prior to starting work in other areas.

2.00 PRODUCTS:

- A. Reinforcing steel conform to the following:
 - 1. Reinforcing bars: High Tensile Grade, ASTM A615-81, Grade 60, except as follows:
 - a. #4 and #5 bars, ASTM A615-81, Grade 40.
 - b. Field bars and welded bars, ASTM A705.
 - c. #6 and #8 bars, ASTM A615-81, Grade 60.
 - 2. Field bars and welded bars, ASTM A705.
 - 3. Deformed bars and welded bars, ASTM A705.
 - 4. Deformed bars and welded bars, ASTM A705.

- B. Welded Wire fabric shall be welded plain and cold drawn steel wire fabric, ASTM A-185. Concrete reinforcement shall be hot-drawn steel wire fabric, except where otherwise specified. Use wire bar type supports complying with CRSI specifications.
- 3.00 EXECUTION**
- A. Installation of products and accessories provided under this section shall be installed in accordance with manufacturer's recommendations.
 - B. Ensure that all conditions are accessible for installation of product and resulting installation is in compliance with the intended use of the product.
- 3.01 REINFORCING**
- A. Place reinforcement in accordance with ACI 318 and CRSI Standards. Securely tie all reinforcing bars to form. Reinforcing bars shall be placed before placing concrete and must provide the following minimum concrete coverage:
 - 1. Uniform concrete in contact with earth: 3"
 - 2. Reinforcing steel in contact with earth: 2"
 - 3. Welded wire fabric in contact with earth: 1.5"
 - 4. Dowel vertical reinforcing to foundation vertical reinforcing bars.
 - B. Provide bent corner reinforcing to match and tie to horizontal reinforcing at corner and intersections of walls, beams and ledgers per ACI Detailing Manual.
 - C. Splice reinforcing only at approved locations in accordance with the following:
 - 1. Refer to drawings when LAP splices are not shown. LAP for ACI or CRSI Standards.
 - 2. Do not use lap splices.
- END OF SECTION**

SECTION 03300 - CAST IN PLACE CONCRETE**1.00 GENERAL**

Division 01 requirements apply to this Section.

1.01 SUMMARY:

- A. Section includes: Provide all concrete work.

1.02 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with provisions of following codes, specifications and standards, except where more stringent requirements are shown or specified:
 - 1. ACI 308 "Specifications for Structural Concrete for Buildings"
 - 2. ACI 318 "Building Code Requirements for Reinforced Concrete"
 - 3. Concrete Reinforcing Steel Institute, "Manual of Standard Practice"

1.03 QUALITY CONTROL:

- A. Obtain samples in accordance with ASTM C172. Moist and cure specimens in accordance with ASTM C191. Test specimens in accordance with ASTM C39. Report all test results to the Project Manager on the same day as the tests are made.
- B. Cylinder tests shall be made in sets of 3 cylinders, 1 each at 7 days, 28 days and test for compressive strength. All test results shall be reported to the Project Manager on the same day as the tests are made.
- C. Do not cast wall or grade beams in lengths over 60'.
 1. Wait 48 hours between adjacent concrete castings.
 2. Use roller form or climbing system for slabs. Hand laying shall be permitted.
 3. Do not cast wall or grade beams in lengths over 60'.
 4. Wait 48 hours between adjacent concrete castings.
 5. Use roller form or climbing system for slabs. Hand laying shall be permitted.
 6. Do not use form materials or materials containing oil or wax. Do not place concrete on frozen substrate or on substrate containing frozen materials.
 7. Do not use concrete containing admixtures, salt, and wet surface water containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix design.
 8. Heat Weathering: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ASTM C939.
 9. Cold weather: Cold weather concreting shall be in compliance with the time of placement below 90 deg F (52 deg C). Mixing water may be heated, or chopped ice may be used to attain minimum concrete temperature. Use of admixtures to reduce or eliminate the use of mixing water. Use of admixtures to reduce or eliminate the use of mixing water.
 10. Cover reinforcing steel with wet burlap and plastic immediately before placement in concrete.
 11. Use fog sprays, misting, and subgrade just before concrete is placed.
 12. Use water reducing/retarding admixture (Type D) when required by high temperature, low humidity, or other adverse placing conditions.

1.04 SUBMITTALS:

- A. Submittals include: Reinforced concrete work.

- C. Do not use form materials or materials containing oil or wax. Do not place concrete on frozen substrate or on substrate containing frozen materials.
- D. Do not use concrete containing admixtures, salt, and wet surface water containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix design.
- E. Heat Weathering: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ASTM C939.
- F. Cold weather: Cold weather concreting shall be in compliance with the time of placement below 90 deg F (52 deg C). Mixing water may be heated, or chopped ice may be used to attain minimum concrete temperature. Use of admixtures to reduce or eliminate the use of mixing water. Use of admixtures to reduce or eliminate the use of mixing water.
- G. Cover reinforcing steel with wet burlap and plastic immediately before placement in concrete.
- H. Use fog sprays, misting, and subgrade just before concrete is placed.
- I. Use water reducing/retarding admixture (Type D) when required by high temperature, low humidity, or other adverse placing conditions.
- 2.00 PRODUCTS**
- A. Section includes: Reinforced concrete work.
- 2.01 MATERIALS:**
- A. See Section 03300, Concrete Formwork
- 2.02 REINFORCING MATERIALS:**
- A. See Section 03210, Concrete Reinforcement, for reinforcing materials.
- 2.03 CONCRETE MATERIALS:**
- A. Portland Cement: ASTM C150, Type II or as recommended in the Geotechnical Report if weight class I have a sulfate content that is detrimental to the use of Type II Portland Cement.
 - B. Fly Ash: ASTM C681, Type I; Fly ash shall not exceed 15% of cement content by weight. Fly Ash will not be permitted in "Hot" work.
 - C. Normal Weight Aggregate: ASTM C33, and as herein specified. Provide aggregate from a single source for exposed concrete.
 - D. Lightweight Aggregate: Not permitted unless specifically approved by the Project Manager.
 - E. Aggregates for ledgers, and other mass concrete shall be maximum 1", all other concrete shall be maximum 3/4" aggregate size.
 - F. Local aggregate not complying with ASTM C33 but which have shown by special test with adequate margin of safety to produce concrete of adequate strength and durability may be used when acceptable to Architect.
 - D. Water: Potable.
 - E. Air: Freezing Air Maximum: ASTM C260.
 - F. Provide Normal Weight Concrete: 164 psi unless otherwise noted, with a minimum 28 day compressive strength as follows:
 - 1. Foundations: 3000 psi.
 - 2. Slabs on grade: 3000 psi.
 - 3. Siderails, curbs and gutters: 3000 psi.
 - 4. Other concrete: 3000 psi.
- 2.04 JOINT FILLERS:**
- A. Products as indicated and specified, manufactured by "Kwik Seal" Salt Lake City, Utah. Or Equivalent.
 - B. KR-S Series KR-SK-400-35-58" use in 4" concrete slabs and sealed capped joints.
 - C. "Cap" KR-1620 for use in 2" expansion material and sealed capped joints over 4" thick.
- 2.05 CONSTRUCTION JOINTS:**
- A. Keyed Cast Joint: 24 gauge preformed construction joints in compliance with ACI & PCA recommendations.
- 2.06 CONTROL JOINTS:**
- A. Sawed, 1/4" depth of slab per ACI 308 & 302 Recommendations.
- 2.07 GROUT:**
- A. Non Shrink Grout: All grout conform to ASTM C-1107
- 2.08 EXPANSION JOINT FILLER:**
- A. Fiber expansion joint, preformed, non-saturated, asphalt impregnated, resilient type per W.R. Meadows Fibre Expansion Joint
- 2.09 JOINT SEALANT:**
- A. To meet requirements of ASTM D920 type M, class 25, uses I, NT, M.
- 2.10 SEALER:**
- A. 1 component hydrophobic, silane penetrating sealer - 40% concentration.
- 2.11 LIQUID CURING COMPOUND:**
- A. All curing compounds and bond breakers used shall be ASTM C-309 and be compatible with paint finishing systems, liquid hardeners, and non-solvents.
- 2.12 VAPOR BARRIER:**
- A. Vapor Barrier shall be 10 mil polyethylene.
- 2.13 PROPORTIONING MIXES:**
- A. Design mixtures for each job shall be of sufficient strength to carry any temporary field experience.
 - B. Prepare design mixtures for normal weight concrete and lightweight concrete, as indicated on drawings, and a hot weather mix for alternate use, if used. Maximum (non-air entrained), 0.48 water to cement ratio (by weight) shall not be used.
 - C. Slabs on grade: Proportioning mixtures shall result in concrete slabs at point of placement with a minimum 28 day compressive strength of 3000 psi.
- 2.14 CONCRETE WORK:**
- A. Reinforced concrete shall comply with requirements of ASTM C94, and as herein specified.
 - B. Use only Class II weather, or under conditions contributing to rapid setting of concrete, a shorter placement time than specified in ASTM C94 may be used.
 - C. When an interval between 50°F (10°C) and 90°F (32°C), reduce mixing and delivery time from 60 minutes to 75 minutes, and when an temperature is above 90°F (32°C), reduce mixing and delivery time to 60 minutes.
- 2.15 DRYPACK:**
- A. Drypack shall be one part cement and 2 1/3 parts sand with just enough water to hydrate cement and form a ball showing moisture on the surface when squeezed.
 - B. Drypack shall be tamped in tight to maximum density attainable, to provide a 28 day strength of 5000 psi.
- 3.00 EXECUTION**
- 3.01 FORMS:**
- A. Design, erect, support, brace, and maintain form work for vertical and lateral static and dynamic loads that might be applied until loads can be supported by concrete structure. Construct form work so concrete members and structures are of correct size, shape, position, alignment, elevation, and finish.
 - B. Check for exposed corners and edges as indicated, using wood, metal, PVC, or rubber chamfer angle fabricated to produce uniform smooth lines and tight joints.
- 3.02 VAPOR BARRIER:**
- A. Prior to placing concrete, cover building floor slab areas with vapor barrier sheeting. Lap joints a minimum of 6". Tape all joints. Tape tightly around all vertical edges that penetrate barrier.
 - 1. Cover vapor barrier with 1" of concrete sand.
 - 2. Exercise care in placing reinforcing steel, mesh and concrete, to avoid puncturing the sheeting. Do not drive stakes through barrier. Use flat-barre screed support.
- 3.03 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.
 - B. Clean reinforcement of all concrete, loose dirt, and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
 - C. Accurately position, support, and secure reinforcement against displacement by form work, construction, or concrete placement operations. Locate and secure reinforcement by metal chairs, runners, bolsters, and spacers, as required.

- D. Concrete Unit Reinforcement
1. Place vertical reinforcing in first and second bed joint above and below opening and every 16" vertically throughout the remainder of the structure.
 2. Place vertical reinforcing and bond beam reinforcing as indicated. In addition, provide vertical reinforcing in base of concrete. Construct concrete joints in slab on ground to form panels as follows as shown: Use saw cut 1/2" x 1/4" and depth of inserts 1/4" wide x 1/4" of slab depth.
- 3.04 INSTALLATION OF EMBEDDED ITEMS:**
- A. General: Set and build into work anchorage devices and other embedded items required for other work to be attached to, or supported by, the concrete. Use setting drawings, diagrams, instructions, and drawings provided by suppliers of items to be attached, therein.
- 3.05 CONCRETE PLACEMENT:**
- A. Placement Coordination: Before placing concrete, inspect and complete form work installation, reinforcing steel, and items to be embedded or cast in. Notify other crafts to permit installation of work items with formwork before placing concrete. Wash formwork forms immediately before placing concrete when forms are not used.
 - B. Do not place concrete on dirts, mud, rags, and other materials without the approval of the Structural Engineer through the Owner's Project Manager.
 - C. General: Comply with ACI 308 "Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete", and as herein specified.
 - D. Deposit concrete continuously in 8' layers of such thickness that no concrete will be placed on top of concrete already hardened or other materials causing the formation of planes or weaknesses. If a section cannot be placed continuously, provide construction joints as herein specified. Deposit concrete as nearly as practicable to its final location to avoid segregation.
 - E. Maximum free drop of concrete shall be 6'-0".
 - F. Placing Concrete in Form: Deposit concrete in forms in horizontal layers not deeper than 24" and in a manner to avoid voids, consolidation, or honeycombing. When placement consists of several layers, place each layer with preceding layer a 1/4" plastic to avoid cold joints.
- 1. Consolidate placed concrete by mechanical vibrating equipment supplemented by hand tamping, rodding, or ramming. Use equipment and procedure for consolidation of concrete in accordance with ACI 308.**
- 2. Do not use vibrator to transport concrete inside forms. Insert and withdraw vibrator vertically into uniformly spaced locations not farther than twice slab thickness of concrete.**
- 3. Placing Concrete in Slabs: Do not use vibrator to consolidate concrete placed in a continuous operation, within limits of construction joints, until the placing of a panel or section is completed.**
- 1. Consolidate concrete during placing operations so that concrete is thoroughly worked to uniform consistency and free of voids.**
- 2. Bring slab surfaces to correct level with straightedge and strike off. Use full floats or trowels to smooth surface, free of bumps or hollows. Do not disturb slab surface prior to beginning finishing operation.**
- 3. Do not cast wall or grade beams in lengths over 60'.**
- 4. Wait 48 hours between adjacent concrete castings.**
- 5. Use roller form or climbing system for slabs. Hand laying shall be permitted.**
- E. Cold Weather Placing: Protect concrete work from physical damage of reduced strength which could be caused by heat, freezing actions, or low temperatures, in compliance with ACI 308 and as herein specified.**
- F. Do not use form materials or materials containing oil or wax. Do not place concrete on frozen substrate or on substrate containing frozen materials.**
- G. Do not use concrete containing admixtures, salt, and wet surface water containing antifreeze agents or chemical accelerators, unless otherwise accepted in mix design.**
- H. Hot Weather Placing: When hot weather conditions exist that would seriously impair quality and strength of concrete, place concrete in compliance with ASTM C939.**
- I. Cold weather: Cold weather concreting shall be in compliance with the time of placement below 90 deg F (52 deg C). Mixing water may be heated, or chopped ice may be used to attain minimum concrete temperature. Use of admixtures to reduce or eliminate the use of mixing water. Use of admixtures to reduce or eliminate the use of mixing water.**
- J. Cover reinforcing steel with wet burlap and plastic immediately before placement in concrete.**
- K. Use fog sprays, misting, and subgrade just before concrete is placed.**
- L. Use water reducing/retarding admixture (Type D) when required by high temperature, low humidity, or other adverse placing conditions.**

- 3.06 MONITORING AND INSPECTION:**
- A. Test Form Finish: Apply trowel finish to monolithic slab surfaces to be exposed to view, and slab surfaces to be covered with neat finishing, gage, or decorative or quarry tile, paint, or other finish.
 - B. Finish: Begin neat finish trowel finish operation upon a given level. Begin neat finishing when surface produces a ringing sound as trowel is moved over surface. Consolidate concrete surface by final troweling operation. Free of trowel marks, surface texture and appearance shall be uniform. Do not use finishing tools or equipment unless approved by the Project Manager before application.
- 3.08 CONCRETE CURING AND PROTECTION:**
- A. General: Protect freshly placed concrete from premature drying and excessive heat or hot temperatures.
 - 1. Foundations: 3000 psi.
 - 2. Slabs on grade: 3000 psi.
 - 3. Siderails, curbs and gutters: 3000 psi.
 - 4. Other concrete: 3000 psi.
 - B. Begin neat curing procedure immediately following final curing and before concrete is placed. Continue neat curing at least 7 days in accordance with ACI 308.
 - C. Avoid rapid drying at end of final curing period.
 - D. Provide curing and sealing compound for exposed interior slabs and exterior walls, walks, and curbs, as follows:
 - 1. 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 instructions.
- END OF SECTION**

DIVISION 04 - MASS CONSTRUCTION**SECTION 04000 - UNIT MASONRY****1.00 GENERAL**

Division 01 requirements apply to this Section.

1.01 SUMMARY:

- A. Section includes: Brick masonry work.

1.02 QUALITY ASSURANCE:

- A. Codes and Standards: Comply with provisions of the following codes, standards and specifications, except where otherwise indicated:
 - 1. Building Code of the City of Pensacola
 - 2. Building Code of the State of Florida
 - 3. Building Code of the United States
 - 4. Building Code of the International Conference of Building Officials
 - 5. Building Code of the American Institute of Architects
 - 6. Building Code of the International Building Code
 - 7. Building Code of the International Conference of Building Officials
 - 8. Building Code of the American Institute of Architects
 - 9. Building Code of the International Building Code

1.03 QUALITY CONTROL:

- A. Obtain samples in accordance with ASTM C112. Moist and cure specimens in accordance with ASTM C191. Test specimens in accordance with ASTM C39. Report all test results to the Project Manager on the same day as the tests are made.
- B. Cylinder tests shall be made in sets of 3 cylinders, 1 each at 7 days, 28 days and test for compressive strength. All test results shall be reported to the Project Manager on the same day as the tests are made.
- C. Do not cast wall or grade beams in lengths over 60'.
 1. Wait 48 hours between adjacent concrete castings.
 2. Use roller form or climbing system for slabs. Hand laying shall be permitted.
 3. Do not cast wall or grade beams in lengths over 60'.