

SECTION 02 01 11

SHORING

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Shoring building structural and non-structural elements required to provide temporary support during demolition and construction operations.
- B. Related Sections:
 - 1. Section 02 41 19 - Selective Demolition
 - 2. Section 06 10 63 - Exterior Rough Carpentry
 - 3. Section 31 62 19 - Timber Piles

1.2 COORDINATION

- A. Coordinate with Owner's Representative and with other trades to ensure that shoring does not interfere with Owner's use of Site or work of other trades.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's literature and technical data indicating type of shoring proposed for use and safe load-carrying capacity of shoring for heights and lengths of shoring components to be used.
- B. Shop Drawings: Shop drawings showing locations, distribution, and quantity of shoring. Include connection and bearing details. Shop drawings shall be prepared by or under supervision of qualified, licensed professional engineer and shall be sealed by the engineer.
- C. Design Calculations: Calculations prepared and sealed by professional engineer licensed in the State of Texas, indicating that shoring meets design criteria.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Store shoring materials in approved storage area at Site, such that materials do not interfere with Owner's continued use of facility.
- B. Limit stored materials on structure to safe loading capacity of structure at time materials are stored, and to avoid permanent deflection.

1.5 PROJECT CONDITIONS

- A. Comply with Owner's limitations and restrictions for Site use and accessibility.

PART 2 PRODUCTS

2.1 MANUFACTURED ASSEMBLIES

- A. Design Criteria:
 - 1. Design for self-weight of structure, superimposed dead loads, 20 psf attic live load and 40 psf interior live load using a minimum safety factor of 2.0.
 - 2. Consider removal of loads from member and transfer of loads into structure below, without overloading structural members.
 - 3. Detail shoring to avoid interference with Owner operations.
 - 4. Consider shoring stiffness relative to stiffness of members being shored.
- B. Shoring: Steel posts, steel frames, or other steel assemblies with sufficient capacity to support calculated shoring loads at spacing and positioning shown on shop drawings.
 - 1. Adjustable through positive means, such as screw jacks, to achieve tight fit to structure above and below and to compensate for elastic shortening of shores during loading and service.
 - 2. Use undamaged components, including bracing, supplied by shoring manufacturer.

2.2 ACCESSORIES

- A. Spreaders:
 - 1. At bottom of shores: 4x4 timber cribbing, 2x wood bearing pads, or other material; with sufficient bearing area and length to distribute shoring reactions into supporting structural element below.
 - 2. At top of shores: Timber or steel spreader beams or wood bearing pads; to fully support member being shored without damage to member surface.
- B. Shims: Wood or steel; at bearing points above shores to ensure tight contact with shored member.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions for compliance with requirements and other conditions affecting installation or performance of shoring Work.
 - 1. Ensure that work done by other trades is complete and ready for shoring Work.
 - 2. Notify Owner and Engineer in writing of conditions which may adversely affect installation or performance of shoring Work and recommend corrections.
 - 3. Do not proceed with shoring Work until adverse conditions have been corrected and reviewed by Engineer.
 - 4. Commencing shoring Work constitutes acceptance of Work surfaces and conditions.

3.2 INSTALLATION

- A. Install shoring for supporting of structural element to perform the designated repairs.
- B. Install shoring at locations designated by Engineer, before repair work begins.

1. Notify Owner and Engineer of locations where extent of deterioration or suspect existing construction indicates that shoring may be necessary.
- C. Install shoring in accordance with manufacturer's recommendations and approved shop drawings. Installed assembly shall be of such quality that assembly will support imposed loads without excessive settlement or deflection.
1. Position to limit interference with Owner operations.
 2. Install snug, plumb, and square. Install cross-bracing recommended by shoring manufacturer and shoring designer to prevent buckling failure of individual members and overall shoring stability failure. Extend shoring above and below level of repair work as required by shoring design.
 3. Install spreader beams or bearing pads and shims as necessary, and adjust shores to ensure tight, uniform fit against structural element to be supported. Minimize differential loading of vertical shoring members.
 4. Install timber cribbing wood or wood bearing pads as necessary to distribute loads into supporting elements. If more than 1 layer of cribbing is required, install each successive layer perpendicular to preceding layer.
 5. If shoring is to be placed on coated or finished surface, protect surface from damage with plywood, plastic sheets, or other means.
- D. Coordinate placement of shoring system elements with existing Work as well as demolition and excavation procedures as specified in Section 02 30 00, Section 02 41 19 and Section 03 01 31.
- E. Do not lift existing structure more than 1/4 inch. Provide minimum lift required to effect repairs. Minimize damage to existing structure.
- F. Protect shores from damage from construction activities, Owner use of facility, and other causes.
- G. Check shores daily and adjust to maintain snug condition, plumbness, and full effectiveness.
- H. Modify and adjust shoring as required to meet conditions of work and to ensure Project safety.

3.3 FIELD QUALITY CONTROL

- A. Owner and/or Shoring Design Engineer shall inspect and approve shoring materials and installation prior to start of any demolition work. Notify Owner and Engineer at least 5 days prior to planned demolition to allow for review.

3.4 REMOVAL OF SHORES

- A. Pile Repairs: Remove shores when pile repair(s) are complete and the reinforced concrete jacket(s) have achieved the specified 28-day concrete compressive strength. Contractor may elect to have additional concrete strength tests performed at his own expense, to confirm when repair concrete meets removal requirements.
- B. Framing Repairs: Remove shores when framing repairs are complete.
- C. Promptly remove shoring materials from Site when no longer needed for work.

END OF SECTION

SECTION 02 30 00

EARTHWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes:
 - 1. Excavating and backfilling for to allow below-grade repair of timber piles.
- B. Related Sections:
 - 1. Section 02 41 19 - Selective Demolition

1.2 REFERENCES

- A. Reference standards: Latest edition of all standards as of the date of the Specification.
 - 1. American Association of State Highway and Transportation Officials (AASHTO):
 - a. T191 – Standard Specification for Density of Soil In-Place by the Sand-Cone Method
 - b. T205 – Standard Specification for Density of Soil In-Place by the Rubber Balloon Method
 - c. T238 – Standard Specification for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
 - 2. American Society for Testing and Materials (ASTM)
 - a. C33 – Standard Specification for Concrete Aggregates
 - b. D448 – Standard Classification for Sizes of Aggregate for Road and Bridge Construction
 - c. D1557 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft. lbf/ft³, 2,70kN-m/m³).
 - d. D2940 – Standard Specification for Graded Aggregate Material for Bases or Subbases for Highways or Airports

1.3 PROTECTION

- A. Protect excavations by shoring, bracing, or casing to prevent cave-in of loose soils.
- B. Protect excavations during inclement weather.
- C. Notify Owner and Engineer of unexpected sub-surface conditions and discontinue work in affected area until notification to resume.
- D. Protect utilities from damage by excavation and/or trenching.
- E. Provide supplemental shoring, designed by an Engineer licensed in The State of Texas, when excavating adjacent to isolated footings supporting structural elements. Notify Owner and Engineer if support condition is unclear.

- F. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

1.4 QUALITY ASSURANCE

- A. The quality of new earthwork shall be periodically reviewed by the Owner and/or Engineer. New earthwork which is considered defective shall be removed and replaced.
- B. Geotechnical Testing Agency Qualifications: Qualified according to ASTM E 329 and ASTM D 3740 with current certification from U.S. Army Corps of Engineers for testing indicated.
- C. Pre-excavation Conference: Conduct conference on-site prior to excavation.

1.5 OWNER/CONTRACTOR RESPONSIBILITIES

- A. Owner will retain a qualified testing agency to provide Field Quality Control Testing. Testing agency to submit field quality control test reports within 3 days of results and include the following in addition to ASTM reporting requirements:
 - 1. Name of project, Contractor, and supplier
 - 2. Proprietary product name and required strength
 - 3. Placement location of concrete
 - 4. Description of weather and air temperature at time of placement
 - 5. Compressive strength (ASTM C109)
 - 6. Date tested
 - 7. Type of curing
 - 8. Compliance with specifications (yes or no)
- B. Contractor is responsible for properly scheduling the testing agency retained by the Owner, for obtaining and distributing test reports in a timely manner, and for coordinating as required.

1.6 PROJECT CONDITIONS

- A. Utility Locator Services: Notify utility locator service for area where project is located prior to beginning earth moving operations.
- B. Existing Utilities: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted in writing by Engineer and/or Owner, and then only after arranging to provide temporary utility services according to requirements indicated.
- C. Comply with applicable safety codes and regulations that govern the work, including OSHA, EPA, and municipal regulations covering wastewater disposal, VOC regulations, and governing air quality management district.
- D. Repair earthwork construction where required due to damage or defective Work and where required to accommodate Work of other trades, in an approved manner so that the repair is not visually apparent.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

- A. Fills: Material approved from on site or off site sources having a minimum dry density of 110 pcf, a maximum plasticity index of 6, and a maximum liquid limit of 30.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clearing: Clear existing concrete and landscaping where indicated. Work may include removal of trees, shrubs, paving, incidental structures, debris, trash, and other obstructions.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.

3.2 EXCAVATION

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
- B. Shoring, Sheeting, and Bracing: Shore, brace, or slope, to its angle of repose, banks of excavations to protect workers, banks, adjacent paving, structures, and utilities.
 - 1. Extend shoring and bracing to bottom of excavation. Shore excavations that are carried below elevations of adjacent existing foundations.
- C. Excavation Drainage: Operate pumping equipment, and/or provide other materials, means, and equipment, as required, to keep excavation free of water and sub-grade dry, firm, and undisturbed until the approval of permanent Work has been received from the Engineer. Approval of the Engineer is also required before placement of the permanent Work on all sub-grades.

3.3 FILLING AND BACKFILLING

- A. General: Do not fill or backfill until all debris, unsatisfactory soil materials, obstructions, and deleterious materials have been removed from excavation. For fill and backfill, use excavated materials and borrow meeting the criteria specified herein, as applicable. Do not use unsuitable excavated materials.
- B. Placing: Place materials in horizontal layers not exceeding four (4) in. in loose depth for material compacted by hand-operated tampers and then compacted.
- C. Extreme caution should be exercised in placing and compacting backfill in the proximity of all structures. Heavy construction equipment shall not pass over any permanent plant structure or pipe until such structures and/or pipes are covered by the applicable minimum depth of fill.

- D. Compaction: Compact with approved hand-operated compactors or other approved equipment well suited to soil being compacted. A testing agency, paid for by the Contractor, should perform compaction and density tests (reference Section 3.7). Moisten or aerate material, as necessary, to provide moisture content that will readily facilitate obtaining specified compaction with equipment used. Compact soil to not less than the following percentages of maximum dry density according to ASTM D1557, as specified below:
 - 1. Natural Ground (Cut or Existing)
 - a. Under slabs-on-grade, top 6 inches, 95 percent.

3.4 STORAGE & USE OF SOIL MATERIALS

- A. Stockpile borrowed soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile topsoil for reuse where applicable.
 - 2. Stockpile sub-soil for reuse where applicable.
 - 3. Stockpile soil materials away from edge of excavations.
 - 4. Proctor required from approved geotechnical firm if considering re-use of fill.

3.5 SOIL FILL

- A. Place and compact fill material in layers to required elevations, as follows:
 - 1. Under lawn and planted areas, use satisfactory soil material.
 - a. Use subsoil stockpiled from soil excavation operations
 - b. Use topsoil stockpiled from soil excavation operations
 - 2. Under walks and pavements, use satisfactory soil material.

3.6 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
- B. Site Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish sub-grades to required elevations.

3.7 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage qualified independent testing and inspecting agency to sample materials and perform tests during filling and backfilling.
- B. Owner-contracted testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- C. Testing agency retained by Owner will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. At subgrade and at each compacted fill and backfill layer, at least one test for every 500 sq. ft. per lift or less of area, but in no case fewer than three tests per lift.

- D. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.8 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic and erosion. Keep free of trash and debris.
- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Disposal: Remove all surplus satisfactory soil and waste material; remove unsatisfactory soil, trash, and debris, and legally dispose.
- B. Disposal: Transport all surplus satisfactory soil to designated storage areas. Stockpile or spread soil, as directed by the Owner.
- C. Place excess excavated materials suitable for fill and/or backfill on site where directed.
- D. Remove from site and dispose of any excess excavated materials after all fill and backfill have been completed.

3.10 CLEAN UP

- A. Upon completion of earthwork operations, clean areas within contract limits, remove tools, and equipment. Provide sight clear, clean, free of debris, and suitable for subsequent construction operations. Remove all debris, rubbish, and excess material.

END OF SECTION

SECTION 02 41 19
SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Demolition and removal of existing construction, including reuse of materials.
- B. Related Sections:
 - 1. Section 02 01 11 - Shoring
 - 2. Section 03 01 31 - Concrete Removal and Surface Preparation
 - 3. Section 06 10 63 - Exterior Rough Carpentry
 - 4. Section 31 62 19 - Timber Piles

1.2 REFERENCES

- A. Definitions:
 - 1. Existing to remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed or removed and reinstalled.
 - 2. Remove: Detach items from existing construction and legally dispose of off-site, unless indicated to be removed and reinstalled.
 - 3. Remove and reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.

1.3 COORDINATION

- A. Coordinate with Owner's Representative and with other trades to ensure that adjacent areas are not adversely affected.

1.4 SUBMITTALS

- A. Documentation of existing conditions including sketches, notes and photographs of both existing interior and exterior construction.
- B. Confinement, Collection, and Disposal Plan: Written plan for confining, collecting, and legally disposing of waste material from selective demolition.

1.5 CHANGES IN WORK

- A. During work, existing conditions may be encountered which are not known or are at variance with Contract Documents. Such conditions may interfere with Work and may consist of damage or deterioration of substrate or surrounding materials.
 - 1. Notify Owner and Engineer of conditions that may interfere with proper execution of Work prior to proceeding with Work.

PART 2 PRODUCTS - Not Used

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine existing construction for conditions affecting selective demolition Work.
 - 1. Ensure that work done by other trades is complete and ready for selective demolition Work.
 - 2. Verify that areas and conditions under which selective demolition Work is to be performed permit proper and timely completion of Work.
 - 3. Notify Owner and Engineer in writing of conditions which may adversely affect selective demolition Work and recommend corrections.
 - 4. Do not proceed with selective demolition Work until adverse conditions have been corrected and reviewed by Owner and/or Engineer.
 - 5. Commencing selective demolition Work constitutes acceptance of Work surfaces and conditions.

- B. Survey existing conditions and correlate with requirements to determine extent of selective demolition Work required.
 - 1. Record observations.
 - 2. Document with photographs or videotape, or both, existing conditions of adjoining construction.
 - 3. Survey existing concrete to determine extent of removal and replacement warranted.

3.2 PROTECTION

- A. Take precautions to ensure safety of people, including building users, passers-by, and workmen, and animals; and protection of property, including adjacent building elements, landscaping, and motor vehicles.

- B. Prevent construction debris and other materials from coming into contact with pedestrians, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

- C. Protect paving and sidewalk to remain, and adjacent building areas from mechanical damage due to excavation and other equipment.

- D. Limit access to Work areas.

- E. Erect temporary protective canopies, as necessary, over walkways and at points of pedestrian and vehicular access that must remain in service during Work.

3.3 SELECTIVE DEMOLITION

- A. Utility Services and Mechanical and Electrical Systems:
 - 1. Disconnect and seal or cap off indicated utility services and mechanical and electrical systems in Work areas.
 - 2. Where existing utility services or mechanical or electrical systems are required to be removed, relocated, or abandoned, bypass such services/systems before beginning Work to prevent interruption to occupied areas.

- B. General: Demolish and remove existing construction and installations only as necessary and required for proper installation of work indicated in Contract Documents.
 - 1. Conduct removals carefully to avoid damaging existing construction and installations that will remain.
 - a. Neatly cut openings and holes plumb, square, and true to dimensions required.
 - b. Cut or drill from exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - c. Use cutting methods least likely to damage construction to remain.
 - d. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
 - e. Temporarily cover openings to remain.
 - 2. Protect construction that will remain against damage and soiling.
 - 3. Provide and maintain shoring, bracing, and structural supports, as specified in Section 02 01 11, and required to preserve stability and prevent movement, settlement, or collapse of construction or finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 4. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 5. Remedy damage to existing construction and installations caused by Contractor operations.
- C. Concrete Removal: Demolish and remove existing concrete as required here and specified in Section 03 01 31.
- D. Survey existing conditions as Work progresses to identify hazards resulting from construction.
- E. When unanticipated structural, electrical, or mechanical elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Owner and/or Engineer.
- F. Provide access to Work areas and perform localized demolition as necessary for inspection of concealed underlying conditions by Owner and/or Engineer.
- G. Items to be Reinstalled: When permitted by Owner and/or Engineer
 - 1. Carefully remove, clean, and mark with identifying code.
 - 2. Store in secure area and protect from damage.
 - 3. Replace damaged items to be reinstalled with new items to match undamaged originals.
 - 4. Reinstall in original locations after selective demolition operations are complete.

3.4 DISPOSAL OF DEMOLITION MATERIALS

- A. Unless noted otherwise, promptly remove demolition debris from Site and dispose of legally. Do not burn.

3.5 CLEANING

- A. Clean adjacent surfaces and structures of dust, dirt, and debris. Return to condition existing before Work began.

END OF SECTION

