

SECTION 02050 DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION.

This Section describes the general demolition requirements for structural, civil, mechanical, electrical, instrumentation and appurtenant work required for removal, salvage, tie-ins, and modifications of existing facilities, and facilities related to other work being performed for the OWNER on the project site and vicinity. These general demolition requirements apply, in general to all demolition work furnished under this Contract. They shall supplement the notes and details on the Contract Drawings, and requirements of other Sections of the Specifications.

A. Scope:

1. CONTRACTOR shall provide all labor, materials, equipment, services, and incidentals required for demolitions, tie-ins, relocations, removal and disposal work as shown or specified in the Contract Documents.
2. The CONTRACTOR shall retain ultimate responsibility under this contract for all demolition work and for coordination of all work under this Section with all other work required by the Contract Documents; and the CONTRACTOR shall furnish and install all equipment, labor, materials, appurtenances, specialty items and services not provided by the CONTRACTOR's subcontractors, suppliers or fabricators but required for complete demolition work.
3. All materials and debris generated and not designated for salvage in the Contract Documents shall be legally disposed of by the CONTRACTOR at the CONTRACTOR'S expense and shall be included in the CONTRACTOR's bid.

B. Related work specified elsewhere that shall apply to all equipment, materials, labor and services furnished under this Section shall be, but not limited to, the following:

1. Division 1, General Requirements:
 - a. Section 01010, Summary of work
 - b. Section 01300, Submittals
 - c. Section 01500, Temporary Facilities and Control.

C. The CONTRACTOR'S subcontractors, suppliers and fabricators furnishing equipment, labor, materials, services and appurtenant work under this Section shall be required to review and satisfy all relevant requirements of other Sections of the Contract Documents and the requirements of the Contract Drawings. The CONTRACTOR, suppliers, fabricators and/or subcontractors furnishing and/or installing equipment, labor, services and specialties associated with this Section of the Specifications shall fully coordinate their efforts to avoid potential claims that are based on failure to review all relevant Contract Documents including, but not limited to, the specifications, and Contract Drawings.

1.2 SUBMITTALS

PROJECT NAME

[PROJECT NO. XX-XXXX.XX]

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A. The CONTRACTOR shall submit proposed methods, equipment and operating sequences for demolition, relocations, and/or tie-in to existing facilities and other work being performed for the OWNER on the project site and vicinity, including coordination requirements with OWNER for shut-off, temporary services, continuation of utility service, and other applicable items to ensure continuous and safe operation of existing facilities and other work being performed for the OWNER on the project site and vicinity affected by the CONTRACTOR'S work.

B. Submittals shall be made in accordance with the procedures specified in Section 01300, Submittals. Submittals shall include CONTRACTOR'S verified field measurements and conditions for all tie-ins and relocations and shall be submitted for ENGINEER approval prior to Work by the CONTRACTOR.

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 CONTRACTOR VERIFICATION

A. Contract Drawings: The Contract Drawings show the general location of certain existing structures and facilities that are designated as existing; and show the general location of certain structures and facilities provided under other work being performed for the OWNER on the project site and vicinity. The information on existing facilities and structures is not guaranteed to be complete or accurate.

B. Verification of Conditions:

1. Prior to commencing with and providing the demolition Work, information on existing facilities shall be verified by the CONTRACTOR via potholing and hand excavation; field measurements; and surveys
2. The CONTRACTOR shall include his verified information on existing facilities and structures with the required submittals specified under Part 1.2, Submittals, of this Section.
3. All costs for CONTRACTOR verification of conditions, including all equipment, labor, materials, coordination, review, and all appurtenant work and incidentals shall be included with the CONTRACTOR'S bid.

3.2 GENERAL

A. Removal: In general, remove all existing construction interfering with Work called for under these Contract Documents; and remove, tie-in and extend existing facilities and utilities as defined in these Contract Documents.

B. Relocate: In general, relocate all existing construction interfering with Work under these Contract Documents not designated for permanent removal prior to completion of the Work under these Contract Documents; relocate all existing construction interfering with Work under these Contract Documents not designated to remain but required to remain in service to ensure

the continuous and safe operation of existing construction until all Work under these Contract Documents is complete; relocate all existing construction interfering with Work under these Contract Documents not designated for permanent removal. All permanently relocated facilities related to underground and above ground piping, utilities, electrical, instrumentation, and mechanical shall be new and shall be furnished and installed by the CONTRACTOR at the CONTRACTOR'S expense. All temporary relocated facilities related to underground and above ground piping, electrical, instrumentation and mechanical shall be adequately sized and shall be furnished and installed by the CONTRACTOR at the CONTRACTOR'S expense.

C. Repairs and Alterations: All repairs and alterations to existing facilities to suit the Work under these Contract Documents and required for complete and operable facilities shall be done by the CONTRACTOR at the CONTRACTOR'S expense. Finished surfaces of walls, floors, ceilings, or other areas which are exposed by any of the removals specified herein and which have bolt holes, scars, chipped or other damaged surfaces revealed by the removal, shall be repaired by the CONTRACTOR with the same or matching materials as the existing surface at the CONTRACTOR'S expense, and shall be subject to approval of the ENGINEER.

D. Coordination of Subcontractors: The CONTRACTOR shall cooperate with and coordinate the activities of all of his subcontractors engaged in this work and shall be responsible for proper coordination with the OWNER via the ENGINEER of all portions of the work to be done by the CONTRACTOR'S subcontractors. The CONTRACTOR shall coordinate and conduct all work in such a manner to avoid interference with operation of existing facilities and to protect existing facilities and structures at the time of construction.

E. Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit the amount of dust and dirt rising and scattering in the air to the lowest practical level. Comply with governing regulations pertaining to environmental protection.

1. Do not use water when it may create hazardous or objectionable conditions such as flooding and pollution.
2. Clean adjacent structures, facilities, and improvements of dust, dirt, and debris caused by demolition operations. Return adjacent areas to conditions existing prior to the start of the Work.

F. Shoring Associated with Demolition: CONTRACTOR shall, at the CONTRACTOR'S expense, engage the services of a California Registered Professional Structural Engineer to design shoring systems. CONTRACTOR shall shore existing facilities and equipment as required to maintain the construction in position at all times during the Work covered by these Contract Documents and until the Work is completed. All shoring shall be properly braced and installed to eliminate any hazard or possibility of movement of the shored-up construction. Shoring shall be arranged to clear all existing piping and other utilities. Place shoring before performing the demolition work. Before beginning shoring operation, submit detailed drawings of proposed shoring methods signed by a California Registered Professional Structural Engineer to the ENGINEER for review per Section 01300, Submittals. No work shall commence until review has been completed by the ENGINEER and notice to proceed has been received from OWNER.

G. Underpinning: CONTRACTOR shall, at the CONTRACTOR'S expense, engage the services of a California Registered Professional Structural Engineer to design the underpinning methods to be used to protect existing facilities and maintain them in position during and after the demolition work and other construction work. Before beginning underpinning operations, submit detailed drawings of the proposed underpinning methods signed by a Registered Professional Structural Engineer to the ENGINEER for review per Section 01300. No work shall begin until review has been completed by ENGINEER and notice to proceed has been received for the ENGINEER. Failure by the CONTRACTOR to submit detailed drawings for review of shoring and underpinning activities shall not relieve the CONTRACTOR of his responsibility to provide all equipment, labor, materials and services required for protection of existing structures and facilities and for conducting his work in a safe and acceptable manner.

H. Protection: Provide all equipment, labor, material and services for temporary protection for all adjoining structures, pipelines, equipment, facilities, shrubs, trees, lawns, landscape work, fencing, utilities, pavements, curbs, gutters, etc., not designated to be removed and not interfering with Work under these Contract Documents.

I. Utilities: Provide all required temporary protection for utilities that are to remain during the demolition and removal work, and provide all temporary protection for utilities that are temporarily relocated by the CONTRACTOR during construction. The CONTRACTOR shall notify the ENGINEER and the appropriate utility company when relocating, modifying, or tying-into the existing utilities.

J. Method of Demolition: The methods of demolition to be used by the CONTRACTOR to satisfactorily complete the work under this Section are left to the CONTRACTOR'S option. However, before any demolition is started, a schedule and method of operation shall be submitted to the ENGINEER for review per Part 1.2, Submittals, of this Section.

K. CONTRACTOR Notification: After approval of the CONTRACTOR'S appropriate demolition submittal, and at least 72 hours prior to commencement of a demolition or removal, notify the ENGINEER in writing of proposed work and schedule. No demolition shall be started or allowed without notice to proceed from the ENGINEER.

L. Disposal Verification: Contractor shall provide written proof from disposal and/or salvage facilities used to dispose and/or salvage of demolition materials. Contractor shall submit daily signed documentation from the disposal and/or salvage facility to the District.

3.3 PIPE, UTILITY AND CONDUIT REMOVALS

A. The locations where pipes and conduits are to be encountered are generally indicated on the Contract Drawings, and are shown on the available OWNER Documents, Existing Record Documents and Existing Contract Documents. Where the location for cutting is not shown, the pipe or conduit shall be cut at the limit of demolition or at some other location as directed by the ENGINEER.

B. CONTRACTOR shall inform the ENGINEER in writing prior to the cutting of any pipes or conduits leading to or from a structure to be demolished or tied into.

C. Pipes, conduits, utilities, etc., which are necessarily cut shall be either temporarily or

permanently capped as specified by the Contract Documents or rerouted as indicated on the Drawings or as required to maintain continuous and safe operation of existing facilities. Utility lines not specifically noted for disposition, but which are encountered in the work shall be capped, extended, protected, or reworked as necessary for completion of the work. Generally, abandoned conduits shall be cut flush to wall or floor and plugged. Where existing floor conduits are to be retained as empty spares, CONTRACTOR shall chop out concrete and install coupling and threaded brass plug flush with floor.

D. Existing In-Use Piping: When cutting into existing in-use piping, special care shall be taken to prevent disturbance of the pipe bedding and jointing. Carefully drill and saw-cut openings without the use of impact tools. Method shall result in the elimination of debris entering the existing pipeline. Exercise care in the removal of cut out sections to avoid spillage into existing piping.

E. Removal of Buried Piping: Remove all buried piping, concrete cradles, encasements and piling encountered during excavation and designated for removal, unless otherwise shown or otherwise specified in the Contract Documents. Abandoned pipes which are to remain in place and which have been cut into shall have openings suitably plugged with non-shrink grout or mortared in place masonry plugs. Concrete pipe shall have open ends plugged with 12-inch minimum thickness of concrete. The ENGINEER will determine the exact location where pipes shall be plugged.

F. Removal of Existing Cable: Where required by the Contract Documents, CONTRACTOR shall remove existing cable and turn it over to the OWNER

G. The CONTRACTOR shall not assume that any explosive or hazardous gas or liquid lines can be isolated with existing or new shut-off valves. The CONTRACTOR shall be required to physically isolate all explosive and hazardous gas and liquid lines from areas of work by removal of a section of the pipe and installation of blind flanges or caps on the disconnected ends. All explosive or hazardous gas or liquid lines shall be purged and made safe prior to removal, demolition, relocation, or modification.

H. Any changes to potable water piping, fire water piping and other plumbing and heating system work shall be made in conformance with all applicable codes and under the same requirements as other piping specified and shown in the Contract Documents. All portions of the potable water system that have been altered or opened shall be pressure tested and disinfected in accordance with Division 15 and local codes. Other plumbing, piping and heating shall be pressure tested only.

3.4 REMOVAL OF MATERIALS CONTAINING ASBESTOS MERCURY

A. The CONTRACTOR is not expected to encounter circumstances requiring asbestos removal; if a removal is necessary, it will be regarded as a differing site condition, and the OWNER will make an appropriate and equitable adjustment to the contract price to compensate the CONTRACTOR for removal of the asbestos; any asbestos removal shall be conducted in accordance with applicable laws and regulations.

B. The CONTRACTOR shall dispose of all materials containing mercury according to the regulations governing disposal of Listed Mercury Wastes under the Title 22 DTSC Mercury Waste Classification and Management Regulations in effect at the time of demolition.

3.5 REMOVAL OF MATERIALS CONTAINING LEAD

A. The CONTRACTOR is not expected to encounter circumstances requiring lead removal; if a removal is necessary, it will be regarded as a differing site condition, and the OWNER will make an appropriate and equitable adjustment to the contract price to compensate the CONTRACTOR for removal of the lead; any lead removal shall be conducted in accordance with applicable laws and regulations.

B. All lead containing materials scheduled for demolitions must comply with applicable regulations for demolition methods and dust suppression. Lead containing materials shall be managed by the CONTRACTOR in accordance with applicable regulations including, at a minimum, the hazardous waste disposal requirements (Title 22 California Code of Regulations [CCR] Division 4.5), the worker health and safety requirements (Title 8 California Code of Regulations [CCR] Section 1532.1), State Lead Accreditation, Certification, and Work Practice Requirements (Title 17 CCR Division 1, Chapter 8), and OSHA's Lead in Construction Standard (29 CFR 1926.62).

3.6 STRUCTURAL REMOVALS

A. Remove structures to the lines and grades shown or specified in these Contract Documents. Where no limits are shown, the limits shall be 4 inches outside the item to be installed. The removal of structures beyond these limits shall be at the CONTRACTOR'S expense and these excess removals shall be reconstructed to the satisfaction of the ENGINEER with no additional compensation to the CONTRACTOR.

B. All concrete, brick, tile, concrete block, roofing materials, reinforcement, structural or miscellaneous metals, plaster, wire mesh and other items contained in or upon the structure shall be removed and taken from the site, unless otherwise approved by the ENGINEER. Demolished items shall not be used in backfill or in pipeline trenches.

C. After removal of parts or all of concrete walls, slabs and the like work which tie into existing work, the point of junction shall be neatly repaired so as to leave only finished edges and surface exposed.

D. Other openings cut into existing work shall be dressed with new masonry, concrete or metal to provide a smooth, finished appearance.

E. Where anchoring materials including bolts, nuts, hangers, welds and reinforcing steel, are required to attach Work to the existing work they shall be included under this Section, except where specified or shown elsewhere.

F. Where "remove existing knock-out wall, concrete or plug" is indicated, CONTRACTOR shall remove all existing concrete to the limits shown on the Contract Drawings. Clean and sandblast all contact surfaces and repair walls and slabs to match existing work. All exposed reinforcing steel shall be burned back a minimum of 2 inches into the concrete surface, and all

holes shall be grouted smooth with non-shrink grout.

G. Where bonding of concrete to existing concrete is indicated and reinforcement to be continuous, all existing steel shall be exposed, cleaned and welded or spliced with new steel or as detailed on the Contract Drawings.

H. All cut surfaces, keys and recesses made in existing concrete shall be thoroughly cleaned by sandblasting and coated with epoxy bonding just prior to placement of the concrete. All new reinforcing, dowels, inserts and miscellaneous metal shall be in place and surfaces clean and dry before application of epoxy bonding compound.

I. Surface exposed to view shall be neatly saw cut to a depth of 1/2 inch prior to removal of existing concrete. Only a tooled joint shall be allowed between new and existing concrete. All exposed rebar shall be burned back a minimum of 2 inches into the concrete and all holes grouted smooth with a non-shrink epoxy grout. Where deviation work results in an exposed concrete surface that is not or cannot be cut clean, and the remaining concrete is spalled or damaged it shall be restored with a Sika, or equal, polymer modified portland cement, fast setting, non-sag mortar. The perimeters of all loose and damaged concrete shall be saw cut to a depth of 1/2" maximum, 1/4" minimum. All loose and damaged concrete shall be removed by mechanical means such as chipping and/or rotary hammers; and the concrete around exposed reinforcement shall be chipped to a depth of 1/2" behind the reinforcement.

J. Two coats of Sika Armatic 110, or equal, shall be applied to the exposed reinforcement after the exposed steel is cleaned via abrasive blasting. Each coat shall be a minimum of 10 mils dry film thickness. Sika Top 123, or equal, shall then be applied in multiple "lifts" to obtain the required concrete thickness to match the existing concrete surface. The thickness of each lift shall not be less than 1/8" minimum or more than 1-1/2" maximum. The repaired areas shall be moisture cured immediately after completion of the repair. The use of curing compounds shall not be allowed.

K. Dowels shall be grouted by filling the drilled holes, and also coating the dowels, with epoxy bonding compound. The coated dowels shall then be inserted into the epoxy filled holes. Additional epoxy grout shall be forced into the holes to fill any voids.

L. Where waterstop between new and existing concrete is required, CONTRACTOR shall cut suitable groove in the existing concrete and install waterstop with epoxy grout and bonding compound prior to concrete work.

M. Structural dimensions related to or controlled by existing structures shall be verified in field by the CONTRACTOR prior to casting concrete.

N. Where "plug existing opening" is indicated, CONTRACTOR shall remove any attached metalwork and concrete curbs or projections. Roughen and key existing concrete, coat with epoxy bonding compound, and pour new concrete flush with adjacent surfaces.

O. New openings in existing concrete shall be cut 2 inches oversized, coated with epoxy bonding compound, and mortar finished to the required finish size.

P. Removal of structures, footings, and equipment foundation and pads shall be performed to the limits shown on the Contract Drawings or, if no limits are shown, to a depth at least 2 feet

below final grade, at least 6 inches outside of the structure, footing, and foundation or 2 feet below any new foundation or pipe.

Q. Wet down work as required during removal operations to prevent dust from arising.

R. Remove miscellaneous concrete walls, slab, pipe supports, equipment pads, and curbs where shown on the Contract Drawings or where necessary for the construction of new structures or modification of existing structures. For existing equipment pads to be re-used, reinforcing dowels, piping, and anchor bolts exposed in the work shall be removed by burning or cutting to a depth of 1 inch below the original surface, unless otherwise shown on the Drawings.

S. Unless otherwise shown on the Drawings, where equipment pads are to be removed, the pad and any associated structural metal shall be removed to a depth of 1 inch below finished slab elevation. The floor shall then be patched to match the existing. All construction joints shall be maintained. Epoxy bonding compound shall be applied.

T. Building structures and appurtenances shall be demolished, as shown and required to complete work, in compliance with governing regulations.

U. Small structures may be removed intact when approved by the OWNER.

V. Demolition shall proceed in a systematic manner, from top of structure to ground.

W. Concrete and masonry shall be demolished in small sections. Use bracing and shoring to prevent collapse.

X. Demolition equipment shall be dispersed throughout structure and demolished materials removed to prevent excessive loads on supporting walls, floors or framing.

3.7 ELECTRICAL AND INSTRUMENTATION REMOVALS

A. All instrumentation demolition, removals and tie-in to existing facilities shall be performed by the CONTRACTOR'S instrumentation subcontractor.

B. All electrical demolition, removals and tie-in to existing facilities shall be performed by the CONTRACTOR'S electrical subcontractor.

C. All existing electrical and instrumentation equipment to be removed, tied into and/or modified, shall be done so with such care as may be required to prevent necessary damage, to keep existing systems in operation and to keep the integrity of grounding systems.

D. Switchgear, motor control centers and local control panels shall be tied into, or modified as specified or shown in the Contract Documents.

E. Motors shall be disconnected and removed where shown or specified. Motors not designated by the OWNER to be salvaged shall be removed from the site. Motors or other electrical gear designated for reuse shall be stored in enclosed, heated storage.

F. Conduits and wires shall be abandoned or removed where shown or specified.

G. Where existing conduits are to be rerouted to avoid conflicts with proposed work, the CONTRACTOR shall perform the following tasks.

1. Identify the starting and ending points of the conductors in the conduits to be relocated.
2. De-energize related circuits for the conductors.
3. Pull back existing conductors.
4. Cut existing conduits and connect new conduit and appurtenances.
5. Furnish and install new conductors per Division 16 to match existing. Splices between new and existing conductors shall not be permitted.
6. Terminate new conductors to match the original wiring configuration prior to demolition.

H. Poles and overhead wiring shall be abandoned as shown and specified. Existing substation and poles owned by the utility company will be removed by the utility company.

I. Panelboards where shown or specified shall be tied into or modified as specified or shown in the Contract Documents.

3.8 PAVING, CURB AND GUTTER REMOVALS

A. Where removal of existing asphalt pavement is required for construction, the existing pavement shall be saw-cut in a straight line to a minimum depth of 2 inches. Replacement of paving not designated to be removed shall be done in accordance with Division 2, Site Work, of these Specifications.

B. Where removal of existing concrete pavement, sidewalk, curb or gutter is required for construction, the demolition shall, in general, be to the nearest construction joint. Saw cutting shall be required when the line of removal is not an existing construction joint, so that the surface contact between the new and existing concrete will be a straight line. The minimum depth of the saw cut shall be 2 inches. Replacement of concrete sidewalk, curbs, gutters, and driveways shall be done in accordance with Division 2, and a bitumastic waterproof joint filler shall be installed at the point of connection between new and existing construction.

C. All pavement, curb and gutter, and sidewalk demolitions shall be generally made to the limits shown on the Contract Drawings, unless otherwise directed by the ENGINEER due to field conditions, and as required for the construction of the complete project. All costs associated with removal and replacement of repair of pavement, sidewalks, curbs, gutters, driveways and streets shall be included with the CONTRACTOR'S bid.

3.9 BELOW-GRADE DEMOLITION

A. Unless otherwise identified in the Contract Drawings or specified elsewhere, footings, foundation walls, below-grade construction and concrete slabs on grade shall be demolished and removed to a depth which will not interfere with new construction, but not less than 12 inches below existing ground surface or future ground surface, whichever is lower. All floors of basements, vaults, and other underground structures shall be broken up.

B. Below-grade areas and voids resulting from demolition of structures shall be completely filled with native materials and/or crush aggregate base (CAB) to a minimum compaction of [95%].

C. All fill and compaction shall be in accordance with Section 02200.

D. After fill and compaction, surfaces shall be graded to meet adjacent contours and to provide flow to surface drainage structures, or as indicated.

3.10 PAINTING REPAIR WORK

N/A

3.11 CLEAN-UP

A. CONTRACTOR shall remove from the site all debris resulting from the demolition operations as it accumulates. Upon completion of the Work all materials, equipment, waste, and debris of every sort shall be removed and premises shall be left, clean, neat and orderly by the CONTRACTOR.

END OF SECTION 02050