

SECTION 01453
SAMPLING, TESTING AND FABRICATION INSPECTION

1.1 THE REQUIREMENT

A. General

1. All materials and fabricated articles furnished by the CONTRACTOR shall be subject to inspection and testing and no materials or fabricated articles shall be incorporated into the Work until they have been inspected and accepted by the INSPECTOR. The CONTRACTOR shall ensure that all items requiring shop inspection are inspected at their source by the INSPECTOR or by an independent inspection or testing laboratory (IITL) that has been approved by the INSPECTOR.
2. Fabrication shall be subject to inspection by the INSPECTOR, to ensure strict compliance with the requirements of the Contract Documents. Such inspection shall include mill, plant, shop or field inspection, as required. The INSPECTOR shall be permitted access to all parts of the Work, including plants where materials or equipment are manufactured or fabricated. When a third party INSPECTOR is approved, monthly meetings shall be scheduled with the INSPECTOR at the manufacturing facility to review the progress of the Work and the inspection activities. The INSPECTOR will determine the number of trips based on the manufacturing schedule for the material or fabricated article(s). The CONTRACTOR shall include in the Bid all costs associated with these inspections, except for the costs for CITY personnel as set forth herein which are reimbursed under the Bid Item ALLOWANCE FOR CITY INSPECTION.
3. All fabricated items shall be fabricated from Shop Drawings, which have been submitted to the ENGINEER and approved in accordance with SUBMITTALS of the GENERAL REQUIREMENTS. Shop inspection shall be provided on all materials and/or equipment so designated on the CONTRACTOR'S approved Shop Drawings. The CONTRACTOR shall provide approved Shop Drawings and the corresponding Contract Specification to the IITL for use in the inspection and testing of the items to be fabricated.
4. Any material which is subject to or requires shop inspection and arrives at the Jobsite without inspection by the INSPECTOR or IITL will be rejected by the INSPECTOR and shall be removed from the Jobsite by the CONTRACTOR at the CONTRACTOR'S sole expense.
5. Prior to any fabrication, there shall be a Prefabrication Meeting at the fabricator's location. A representative of the CITY and the IITL, if retained, the CONTRACTOR, the fabricator's plant superintendent and the fabricator's quality control person, shall be present at the Prefabrication Meeting. The items to be discussed are the required inspections, tests and reports, based on the approved Shop Drawings and the corresponding Contract Specifications. The IITL shall submit an inspection plan to the INSPECTOR for approval two (2) weeks prior to the Prefabrication Meeting. The CONTRACTOR is directed to notify the INSPECTOR and the ENGINEER three (3) weeks in advance of the date

and time of the Prefabrication Meeting. The CONTRACTOR shall include in the Bid all costs associated with these meetings except for the costs for CITY personnel as set forth herein which are reimbursed under the Bid Item ALLOWANCE FOR CITY INSPECTION.

6. If a Bid Item ALLOWANCE FOR CITY INSPECTION has been included in the SCHEDULE OF WORK AND PRICES in the Bid Proposal, this allowance shall only be used to reimburse the CONTRACTOR for the cost of CITY inspection and travel requirements, as set forth herein, and shall not be used for any portion of the costs of the CONTRACTOR'S independent third party INSPECTOR or inspection laboratory. Reimbursement of approved expenses shall be made on the basis of original invoices and are not subject to markup for overhead and profit. If at the end of the Project, the total costs differ from the amount set forth in the SCHEDULE OF WORK AND PRICES, the Contract Price shall be adjusted by a Change Order for the difference between the total actual costs and the amount included in the Bid, as an additional amount due the CONTRACTOR or a credit to the CITY, as appropriate.
7. The CONTRACTOR shall coordinate all sampling, testing and fabrication inspections with the INSPECTOR and is responsible for maintaining the inspection schedules. Subject to the terms contained herein, costs for CITY personnel travel will be paid from the Bid item ALLOWANCE FOR CITY INSPECTION. In the event that the scheduled inspection is postponed or delayed by the CONTRACTOR, through no fault of the CITY, and CITY personnel are required to extend their travel duration resulting in additional travel costs, these increased costs, including per diem travel allowances, shall be borne by the CONTRACTOR and are not eligible for payment from the Bid item ALLOWANCE FOR CITY INSPECTION.

B. Samples And Test Specimens

1. Samples and test specimens required under these Specifications shall be furnished, prepared for testing, and delivered, at no cost to the CITY, in ample time for the completion of the necessary tests and analysis before said article or materials are to be used. The time and location of the delivery shall be designated by the INSPECTOR.
2. In addition to any other inspection or quality assurance provisions that may be specified, the ENGINEER or the INSPECTOR shall have the right to independently select, test, and analyze, at the expense of the CITY, additional test specimens of any or all of the materials to be used. Whenever any portion of the Work fails to meet the requirements of the Specifications, as shown by the results of independent testing or investigation, all costs of such independent inspection and investigation, and all costs of removal, correction, and reconstruction or repair of any such Work, shall be borne solely by the CONTRACTOR.
3. When the manufacturer, fabricator, supplier, or Subcontractor provides the results of tests from samples taken at the mill, factory, or warehouse, the INSPECTOR will accept the test reports provided that the following conditions are met:

- a. The Testing Agency was approved by the INSPECTOR prior to performing the tests, and that all necessary certifications were valid at the time the tests were performed.
 - b. The tests were performed in conformity with the Specifications for the specified materials or items.
 - c. The reports are made in the form of an affidavit specified hereinafter.
4. Whenever the approved independent testing laboratory or INSPECTOR takes samples of materials other than at the site, the deliveries to the site of materials represented by such samples shall be identified as specified for the specific material. The results of such tests shall be reported to the INSPECTOR in the form of affidavits attested to by the testing agency. Such affidavits shall furnish the following information with respect to the material sampled:
- a. Manufacturer's name and brand.
 - b. Place of sampling.
 - c. Sufficient information to identify the lot, group, bin, or silo from which the samples were taken.
 - d. Amount of material in the lot sampled.
 - e. Statement that the material has passed the requirements.
 - f. Notarized signature and title of the person making the affidavit and the date of execution of the affidavit.
- C. Shop Inspection And Testing
1. Shop inspection is the responsibility of the INSPECTOR and cannot be approved, waived, or otherwise altered by any other CITY Department, Bureau, Division, or individual.
 2. The CONTRACTOR is responsible for coordinating shop inspection with the INSPECTOR. The CONTRACTOR is to estimate the time required for Shop testing of the fabricated article(s) or equipment, and so inform the INSPECTOR. The INSPECTOR will inform the CONTRACTOR which CITY personnel will witness the testing.
 3. A final inspection by the INSPECTOR may be required prior to shipment.
 4. Where the CONTRACTOR is specifically required by the Technical Specifications to demonstrate performance of major equipment prior to delivery, a testing procedure must be developed by the manufacturer and approved by the ENGINEER prior to scheduling the shop performance testing. Both the INSPECTOR and the ENGINEER are required to witness the performance testing. The ENGINEER will evaluate performance-testing data and notify the INSPECTOR whether the equipment meets the performance requirements of the Contract. The INSPECTOR will be responsible for releasing the equipment for

delivery to the Jobsite. This procedure will also apply to field performance testing required as a condition precedent to acceptance of the equipment as described under the PARTIAL ACCEPTANCE and FINAL ACCEPTANCE provision of the Contract.

5. Inspection at Locations Within Fifty (50) Miles from CITY
 - a. When the CONTRACTOR intends to purchase materials, fabricated products, or manufactured equipment from sources located within fifty (50) miles (80 km) of the geographical limits of the CITY, the CONTRACTOR shall notify the INSPECTOR at least two (2) working days prior to the scheduled date of tests at all stages of manufacture to allow for arrangements specified herein.
 - b. Except as otherwise provided in these Specifications, performance of the required tests will be by the INSPECTOR, from samples provided by the CONTRACTOR, and the cost of performing the test(s) will be borne by the CITY, except for the costs of any retests which show unsatisfactory results which shall be borne by the CONTRACTOR.

6. Inspection at Locations More Than Fifty (50) Miles From the CITY
 - a. When the CONTRACTOR intends to purchase materials, fabricated products, or equipment from sources located more than fifty (50) miles (80 km) outside the geographical limits of the CITY, an IITL approved by the INSPECTOR, shall be engaged by the CONTRACTOR, at the CONTRACTOR'S sole expense, to inspect the materials, equipment and/or process. Approval of the IITL shall be obtained before producing any material or equipment. The IITL shall judge the materials and fabricated articles by the requirements of the Plans and Specifications and approved submittals. The approved or equipment shall be shipped nor shall any processing, fabrication and/or treatment of such materials be done without the required inspection and approval by IITL. Approval by IITL shall not relieve the CONTRACTOR of its responsibility to comply with the Contract requirements.
 - b. The CITY retains the right to perform inspection or testing at such remote sites with CITY personnel in lieu of a third party inspector. In the vent the CITY exercises this right, the CONTRACTOR shall administer travel arrangements as specified herein Paragraph C.10, CITY PERSONNEL TRAVEL REQUIREMENTS.

7. Inspection Outside Continental United States
 - a. Requirements and procedures for inspection and testing of materials, fabrication of products and equipment from sources outside the continental United States shall be the same (including the requirement for an accredited inspection agency and/or testing laboratory pre-qualified by the CITY Department of Building and Safety and approved by the INSPECTOR) as

provided in the Paragraph C.7 SHOP INSPECTION & TESTING of this Section. In addition to the requirements of Paragraph C.10, City Personnel Travel Requirements, of this Section, the CONTRACTOR shall provide the following, the cost of which shall be reimbursed out of the ALLOWANCE FOR CITY INSPECTION

- (1) A minimum of five (5) calendar days hotel accommodation shall be required for each shop inspection visit made by the INSPECTOR.
- (2) A minimum advance notice of ten (10) working days shall be required for all hold points (mandatory) inspection.
- (3) The approximate rates for allowances given as a guideline in Paragraph C.10, City Personnel Travel Requirements, of this Section, shall be adjusted to match the rates in the foreign locality for similar types of facilities and amenities.

8. Third Party Inspection Requirements

- a. The proposed third party inspection and/or testing company must gain approval by the INSPECTOR after award. This approval shall be obtained before producing any material or manufacturing any product or equipment. The approved inspection and/or testing agency shall not sublet or assign its work to any other agency.
- b. The approved third party inspection and/or testing agency shall take direction from, and be responsible to, the INSPECTOR.
- c. The CONTRACTOR shall also comply with requirements regarding the Prefabrication Meeting as contained herein.
- d. The Work and activities of the third party inspection and/or testing agency shall be monitored by the INSPECTOR during monthly meetings to ensure compliance with the Contract Documents.

9. Third Party Testing and Inspection Laboratory Approval Procedures

- a. The INSPECTOR will approve third party inspection and/or testing agencies/laboratories.
- b. All requests for approval of a third party inspection agency and/or test laboratory shall be in writing from the CONTRACTOR to the INSPECTOR.
- c. The letter requesting approval of a third party test laboratory and/or private inspection agency shall contain all of the following information:
 - (1) Complete title of Project.

- (2) Project Work Order Number.
- (3) Name of proposed testing laboratory or inspection agency.
- (4) Address and telephone number(s) of proposed testing laboratory/inspection agency.
- (5) Contact person at proposed testing laboratory/inspection agency.
- (6) Description and history of the proposed test laboratory/inspection agency.
- (7) Resume of the inspector(s) who will do the inspection.
- (8) Approved submittal number(s) and brief description of item(s) to be inspected or tested, or both.
- (9) Name, address, and telephone number(s) of agency where item(s) or material will be fabricated.
- (10) Contact person at the fabricators.
- (11) Fabrication schedule.

d. The INSPECTOR will notify the CONTRACTOR by letter if the testing laboratory/inspection agency has been approved.

10. CITY Personnel Travel Requirements

- a. The CONTRACTOR shall administer the travel and furnish the following services for CITY personnel who are attending Prefabrication Meetings and performing inspection services.
- (1) Purchase airline tickets (Coach Class only).
 - (2) Make hotel reservations and prepay for the planned number of nights. (Three Star or American Automobile Association (AAA) Three Star approved.)
 - (3) Make rental car reservations and prepay for the planned number of days if the manufacturer's or fabricator's facility is greater than one (1) mile from the departing and arrival airport or hotel.
 - (4) The estimated per diem travel allowance will be at least fifty U.S. dollars (\$50.00) per day for meals, en route expenses, and other miscellaneous expenses. CITY personnel will submit an expense statement to the CITY for approval of actual expenses incurred.
 - (5) For CITY paid advances, the CONTRACTOR shall reimburse the CITY for these actual expenses by

deductive Change Order to be deducted from the Bid item, ALLOWANCE FOR CITY INSPECTION.

- (6) When requested by the ENGINEER or the INSPECTOR, the CONTRACTOR shall provide an advance check, for the estimated costs of all travel allowance costs, to the ENGINEER or the INSPECTOR, no later than forty eight (48) hours prior to the departure time.

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b. As the basis for cost reimbursement under SCHEDULE OF WORK AND PRICES of the Bid Proposal, the CONTRACTOR shall submit receipts or invoices for payment to the ENGINEER with a cover letter referencing the following:

- (1) INSPECTOR'S or ENGINEER'S name.
- (2) Project title.
- (3) Project Work Order Number.
- (4) CONTRACTOR'S:
 - (a) Name
 - (b) Address
 - (c) Telephone Number.
 - (d) CONTRACTOR'S contact person and telephone number(s)
- (5) Reference Technical Specification and submittal number.
- (6) Purpose of inspection.
- (7) Address and location of inspection:
- (8) Country
- (9) State
- (10) City.
- (11) Date(s) of inspection.
- (12) Description of items enclosed as set forth herein

11. Shop Inspected Equipment/Materials:

- a. Without waiving any specific requirement of the Contract Documents, the following items of equipment and/or material are examples of, but not limited to those items that are subject to shop inspection as noted herein below.

12. Shop Inspected Equipment/Materials:

- a. Without waiving any specific requirement of the Contract Documents, the following items of equipment and/or material are examples of, but not limited to those items that are subject to shop inspection as noted herein below.

EQUIPMENT/MATERIAL	SPECIFICATION	SHOP INSPECTION REQUIRED	NOTES
Aluminum Fabrication	05530, 08410	Yes	1
Aluminum Railing	05520	Yes	5
Anodizing	05035, 09800	Yes	18
Asphalt Concrete	02550	Yes	8
Bearing Pads	05120	Yes	31
Bolting	05120	Yes	2
Bitumen	02550, 07160	Yes	18
Boilers	11404	Yes	7
Coatings	Div. 09, 05530	Yes	18
Castings	05530	Yes	4, 32
Controls – Electrical	19010	Yes	24
Cabinets – Wood	06200	No	17
Compressors	11373	Yes	20
Cranes	14600	Yes	19
Conveyors	14605	Yes	19
Concrete	03300	Yes	8
Mix Designs – Concrete	03300	Yes	8
Concrete Vaults	02726	Yes	11, 32
Concrete Pipe	02618, 02620	Yes	11
Catch Basins	02726	Yes	11, 32
Chain Link	02830	Yes	18
Doors – Metal	08110	Yes	6
Door Frames	08110	Yes	6
Duct – Fiberglass	15501	Yes	27

EQUIPMENT/MATERIAL	SPECIFICATION	SHOP INSPECTION REQUIRED	NOTES
Duct – Flexible	15501	No	27
Electrical – Panels	16360	Yes	22
Electrical – Switchgear	16400	Yes	22
Electrical – Transformers	16310	Yes	22
Electrical – Motors	16800	Yes	20
Electrical – Wiring	16050	Yes	24
Electrical – Units	16050	Yes	25
Electrical – Testing	16030	Yes	25
Escalators	14000	Yes	19
Elevators	14000	No	19
Fiberglass	06610	Yes	30
F.G.R.C.	03400	Yes	12
F.G.R.G.	03520	Yes	12
Frames – Metal	05500	Yes	6
Forging	Div. 05	Yes	4
Galvanizing	Div. 05	Yes	18
Gratings	Div. 05	Yes	4
Gaskets	07900	Yes	11
Generators	16700	Yes	22
Glue –Lams	06100	No	16
Grout	04230	Yes	13
Gates – Sluice	11293	Yes	21
Gates – Slide	11292	Yes	21
Gypsum	09200	Yes	13
Hoists	14600	Yes	19
Handrails	05520	Yes	5
HVAC	15500	Yes	26 & 18
Linings – Pipe	09800	Yes	18
Lumber	06100	No	16

EQUIPMENT/MATERIAL	SPECIFICATION	SHOP INSPECTION REQUIRED	NOTES
Lighting – Standards	03400	Yes	10
Lighting – Fixtures	16500	No	23
Lighting – Lamps	16500	No	23
Motors	16800	Yes	20
Maintenance Holes – Frames & Covers	02726	Yes	4, 32
Maintenance Holes – Shafts & Grade Rings		No	11
Metalwork	05500	Yes	1
Mortar	04230	Yes	13
Mechanical	Div. 15	Yes	20
Masonry	04230	No	14
Millwork	06200	No	17
Non-Destructive Testing	05120	Yes	1
Panels – Electrical	16360	Yes	22
Pressure Vessels	13207	Yes	7
Painting (Coating Systems)	09905	Yes	18
Precast Concrete	03400	Yes	9, 32
Prestressed Concrete	03100	Yes	9, 32
Plastic Pipe	06000	No	29
Plastic Liner Plate	09800	Yes	29a
Pumps	112XX	Yes	20
Pilings	03400	Yes	1 & 9
Pipe - Steel	15008,15009	Yes	15
Pipe – Ductile Iron	15005	Yes	15
Pipe – Fiberglass	13209	Yes	15
Pipe – RCP	02617	Yes	11
Pipe – VCP	02622	No	15
Pipe – Plastic	15006, 15007	No	29

EQUIPMENT/MATERIAL	SPECIFICATION	SHOP INSPECTION REQUIRED	NOTES
Pipe – Supports	15020	Yes	15
Pipe – Welding	15000	Yes	1
PVC – Liner	02616	Yes	29a
Railings	05520	Yes	5
Rebar	03200	No	3
Stainless Steel	05500	Yes	1
Steel – Structural	05500	Yes	1
Steel Doors	08110	Yes	6
Steel Supports	05120	Yes	1
Store Fronts	08410	Yes	28
Sluice Gates	11293	Yes	21
Slide Gates	11292	Yes	21
Tanks – Storage	13215	Yes	7
Tanks – Steel	13207	Yes	7
Transformers	16400	Yes	22
Vessels	13000	Yes	7
Vaults	02726	Yes	11, 32
Valves	15100	Yes	20
Welding	05120	Yes	1
Wood – Cabinets	06200	No	17
Wood Paneling	06200	No	17

NOTES:

1. Fabrication of ferrous materials, which may include welding, high strength bolting or non-destructive testing shall be shop inspected.
2. Bolting with ASTM A-325 bolts, ASTM A-490 bolts or other alternate fasteners shall require shop inspection. Bolting with ASTM A-307 bolts does not require shop inspection.
3. Reinforcing steel is normally sampled at the Jobsite, but for expediency, the sampling will be performed at the point of fabrication by the CITY'S Standards Division.

4. All forging and castings made at the foundry shall be shop inspected, approved and stamped prior to delivery to the Jobsite.
5. Steel stairways and handrails (ferrous) require shop inspection for welding and specified coatings.
6. Metal door and frame fabrication requires shop inspection.
7. Pressure vessels, tanks, boilers and related equipment do require inspection of fabrication, welding, and testing.
8. Concrete, asphalt concrete and mix designs are inspected at the batch plant. These products are shop inspected for conformance to Specifications and verification by the INSPECTOR.
9. Both pre-cast and pre-stressed concrete are subject to shop inspection and approval before delivery to the Jobsite.
10. Street lighting standards of either steel, aluminum or concrete are required to be shop inspected.
11. Reinforced concrete vaults catch basins, and reinforced pipe are required to be shop inspected. (See Note 9.) Maintenancehole shafts and grade rings without reinforcement or linings do not require shop inspection. Gaskets used for reinforced concrete pipe require testing.
12. FGRC and FGRG (Fiberglass Reinforced Concrete and Fiberglass Reinforced Gypsum) should be manufactured in an approved shop and be shop inspected.
13. Mortar, grout and gypsum shall be inspected at the batch plant, unless the products are mixed at the Jobsite from approved packages under the inspection of the INSPECTOR.
14. Concrete Masonry Units (CMU) shall be inspected and sampled at the Jobsite.
15. Lining and coating of ductile iron pipe and fiberglass pipe, as well as welded supports, are subject to shop inspection. Vitrified Clay Pipe (VCP) is exempt, as are non-welded pipe supports which can be classified as standard or catalog items. The CITY'S Standards Division will provide the inspection and testing for VCP.
16. Shop inspection is not required for lumber, unless it is treated lumber. Glue-laminated products do not require shop inspection. Each "Glue Lam" shall come with an individual Certificate of Compliance.
17. Millwork and wood products are not required to be shop inspected, unless the Specifications call for equivalency or inspection by the Woodworking Institute of California (W.I.C.).
18. Specified coatings including, but not limited to, anodizing, bitumen, epoxy, galvanizing, polyvinylidene fluoride, and pipe linings and coatings shall be shop inspected.
19. Conveying equipment, such as elevators, escalators, or conveyors are exempt from shop inspection. However, the structural framework of the escalators, hoists, cranes and lifts do require inspection.

20. Mechanical equipment, such as compressors, pumps, motors and valves, require shop inspection for fabrication, tests of windings, and any specified coating. Pumps, valves and motors may be exempt if they are standard or catalog items.
21. Fabrications of sluice gates and slide gates are subject to shop inspection for fabrication, welding and coating.
22. Transformers rated at 600 volts and higher, transformers rated at 100 KVA and higher, generators, switchgear motor drives and complex wired panel boards require shop inspection.
23. Lighting fixtures and lamps are considered standard or catalog items and are exempt from shop inspection.
24. Electrical wiring and testing, performed in the shop, requires inspection to verify conformance with applicable Specifications.
25. Shop tests specified in the Specifications including, but not limited to, voltage, grounding, loads, performance, installation, temperature, or noise levels will require shop inspection.
26. HVAC (heating, ventilation and air conditioning) are subject to shop inspection for fabrication and welding. Each component will be evaluated for possible inspection.
27. Sheet metal ductwork is not shop inspected. Flexible ductwork is considered a standard or catalog item and no shop inspection is required. Ductwork made of aluminum, stainless steel, or fiberglass will require shop inspection.
28. Storefronts and wall systems are shop inspected. Fixed windows are standard items and have no need of inspection.
29. Plastic pipe, such as ABS or PVC does not require shop inspection. The pipe will be inspected and sampled for testing at the Jobsite. Extruded plastic liner plate will require shop inspection.
30. Fiberglass products, because of the resins and the fiber reinforcement, do require shop inspection.
31. Elastomeric bearing pads shall be tested according to Cal-Trans Standard Specification Section 51-1.12H. Sampling will be done by the INSPECTOR.
32. All frame and covers used with or installed on vaults, MH, pullboxes, tree wells, and similar structures in sidewalks, parkways, driveways, streets, and alleys in the public way shall be designed, manufactured and tested according to the latest version of Standard Plan S-601.

(END OF SECTION)