SECTION 32 17 34

CONCRETE DETECTABLE WARNING TILES

PART 1 – GENERAL

1.1 DESCRIPTION

A. This Section includes provisions for furnishing and installing concrete cast-in-place detectable warning tiles embedded in all curb ramps at the locations and to the dimensions shown on the Drawings, in accordance with the Project Manual and as directed by the City.

1.2 REFERENCES

A. Drawings and General Provisions of this Contract apply to this Section.

B. Americans with Disabilities Act (ADA) Title 49 CFR Transportation, Part 37.9 Standards for Accessible Transportation Facilities, Appendix A, Section 4.29.2 Detectable Warnings on Walking Surfaces.

C. California Code of Regulations (CCR) Title 24 Part 1 Articles 2, 3 and 4, and Part 2 Section 205 definition of “Detectable Warning”, Section 1127B.5 for “Curb Ramps”, and Section 1133B.8.5 for “Detectable Warnings at Hazardous Vehicle Areas”.

D. American Society for Testing and Materials (ASTM) Test Methods B117, C1028, D543, D570, D638, D695, D790, D1037, D2486, D2565, D5420 and E84.

E. SFPW Accessible Street Crossing Standards, latest edition.

F. SFPW Standard Specifications (SFPWSS), revised November, 2000.

1.3 SUBMITTALS

A. Product Data: The Contractor shall submit manufacturer’s literature describing products, installation procedures and maintenance instructions.

B. Samples for Verification Purposes: The Contractor shall submit two (2) tile samples minimum 6” x 8” of the kind proposed for use. Samples will be properly labeled and will contain the following information: Contract name, submitted by, date of submittal, manufacturer’s name, catalog number and date of fabrication.

C. Shop Drawings: The Contractor shall submit Shop Drawings showing plans of tile placement, including joints, all materials to be used and an outline of installation procedures.

D. Material Test Reports: The Contractor shall submit current test reports from qualified independent testing laboratory indicating that materials proposed for use are in compliance with requirements and meet the properties indicated. Tests listed in Section 1.4 will be performed by a certified and qualified independent testing laboratory on a cast-in-place tactile tile system. All test reports submitted will be certified by the testing laboratory and will be no more than six (6) months old from the time of the submittal.

1.4 QUALITY CONTROL

A. The Contractor shall provide concrete cast-in-place detectable warning tiles and accessories as produced by a single manufacturer.

B. Installer's Qualifications: The Contractor shall engage an experienced installer certified in writing by tile manufacturer, who has successfully completed tile installations similar in material, design and extent to that indicated for this Contract.

1.5 DELIVERY, STORAGE AND HANDLING

A. Tiles will be suitably packaged or crated to prevent damage in shipment or handling. Finished surfaces will be protected by sturdy wrappings.

1.6 GUARANTEE

A. Concrete cast-in-place detectable warning tiles will be guaranteed in writing for a period of five (5) years from date of the Contract's Final Completion. The guarantee includes, but is not limited to, defective work, breakage, deformation, loosening of tiles, and failure of fasteners and anchors.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Cast-in-place detectable warning tiles will be made of a polymer composite concrete and be ADA and CCR compliant.

B. Color: Yellow conforming to Federal Standard 595B Table IV, Color No. 33538. Color will be homogeneous throughout the tile.

C. Domes: Square grid pattern of raised truncated domes of 0.2 inches nominal height, base diameter of 0.9 inches and top diameter of 0.45. Domes will have a center to center spacing of 1.67 inches and a base to base spacing of 0.77 inches, measured between the most adjacent domes on square grid.

D. Tiles will meet or exceed the following test criteria using the most current test methods:

1. Polymer Composite Concrete Based Tiles

Property	Limit
Compressive Strength	11,000 psi minimum
Tensile Strength	1,700 psi minimum
Flexural Ultimate Strength	2,700 psi minimum
Slip Resistance	0.80 minimum
Water Absorption	Not to exceed 2%
Abrasion Resistance	<0.03 cm^3/cm^2

E. The field area will consist of a non slip surface with a minimum static coefficient of friction of 0.80, wet and dry.

F. Tile Size: Individual panel size will be a minimum of 2 feet wide by 3 feet long. Minimum

3 feet of detectable warning tile depth is required at each curb ramp unless noted otherwise on contract drawings.

G. Filler: Non-shrink grout per the grout manufacturer's requirements.

H. Cleaning materials used on site will have code acceptable low VOC solvent content and low flammability.

I. The Specifications of the concrete, sealants and related materials will be in accordance with the Contract Documents and the guidelines set by their respective manufacturers.

2.2 MANUFACTURERS

A. Available manufacturers and models subject to compliance with these Specifications include the following or approved equal:

Manufacturer	Material	Model
TekWay Dome-Tiles manufactured by StrongGo LLC	Polymer Composite Concrete	Cast-in-place

2.3 EQUIPMENT

A. The Contractor shall provide all tools, equipment and services required for the satisfactory installation per manufacturer's instruction as Incidental Work. Equipment, which may be required, include typical mason's tools, a 4 feet long level with electronic slope readout, 25 pound weights, vibrator and small sledge hammer with 2" x 6" x 20" wood tamping plate, and a device for cutting the tiles.

PART 3 – EXECUTION

3.1 PREPARATION

A. During all concrete pouring and tile installation procedures, the Contractor shall ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

B. The physical characteristics of the concrete will be consistent with these Specifications while maintaining a slump range of 4 inches to 7 inches to permit solid placement of the cast-in-place tactile tile system.

C. The concrete will be poured and finished, true and smooth to the required dimensions and slope prior to tile placement.

3.2 INSTALLATION

A. The Contractor shall not be allowed to install curb ramps until all submittals have been reviewed and approved by the City.

B. The tiles shall be installed per manufacturer's instructions.

C. The tiles will be oriented such that the rows of detectable warning tiles are parallel with the direction of the ramp.

D. The largest size tile manufactured will be used to minimize multiple tiles on the ramp. When multiple tiles are used, the domes will be aligned between the tiles and throughout the entire detectable warning tile installation. The tiles will be placed to the back of curb in accordance with the Drawings. Cutting the tiles may be required.

E. Panel to panel joints between detectable warning panels must be laid out by adjoining factory edges. All grade break joints shall be factory edges; no cutting of tiles shall be allowed at grade breaks.

F. The tiles will be tamped or vibrated into the fresh concrete to ensure that there are no voids or air pockets, and the field level of tile is flush to the adjacent concrete surface or as the Drawings indicate to permit proper water drainage and eliminate tripping hazards between adjacent finishes.

G. While the concrete is workable, a 1/8 inch radius edging tool will be used to create a finished edge of concrete, then a steel trowel will be used to finish the concrete around the tile's perimeter, flush to the field level of the tile.

H. Concrete detectable warning tiles shall have a beveled edge sloped at 1:2 maximum to create a smooth transition between the back of curb and detectable warning tiles.

I. All visible gaps/joints shall be filled to create smooth transitions throughout. Grinding of filler material shall be performed to create smooth transitions, if necessary.

J. An overly wet mix will cause the cast-in-place detectable warning tiles to float. Under these conditions, suitable weights such as 2 concrete blocks or sandbags (25 lb) will be placed on each tile.

3.3 CLEANING AND PROTECTING

A. The Contractor shall protect detectable warning tiles against damage during construction to comply with tile manufacturer's Specifications.

B. During and after the tile installation and the concrete curing stage, it is imperative that there will be no walking, leaning or external forces placed on the tile to rock the tile, causing a void between the underside of tile and concrete.

C. The Contractor shall protect detectable warning tiles against damage from rolling loads following installation by covering with plywood or hardwood.

D. The Contractor shall clean tiles prior to the date scheduled for inspection. The tiles will be cleaned by the method specified by the tile manufacturer. Protective covering provided by manufacturer shall be removed at completion of curb ramp construction.

END OF SECTION

SECTION 32 17 53

ADJUSTMENT OF FRAMES AND CASTINGS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This Section includes provisions for resetting existing and castings to finished grade after resurfacing work.

1.2 CITY-OWNED FRAMES AND CASTINGS

A. City–owned street frames and castings are facilities of City departments, which include, but are not limited to, the following:

1. Department of Public Works
2. Department of Electricity
3. Police Department
4. Fire Department
5. San Francisco Public Utility Commission
6. Municipal Transportation Agency
7. Department of Technology

B. Adjustment of City–owned frames and castings will be paid per the applicable bid items. If no such bid items exist, the Work is considered incidental to the reconstruction work.

1.3 NON-GOVERNMENTALLY-OWNED FRAMES AND CASTINGS

A. Non-governmentally-owned include, but not limited to, the following companies:

1. Pacific Gas and Electric Company
2. AT&T
3. Comcast

B. All frames and castings shall be identified for the owners and made accessible immediately after paving operations.

C. The Contractor shall notify utility companies of completion of asphalt paving work within one week.

D. Copies of notifications to utility companies shall be submitted to the City Representative.

1.4 REFERENCE STANDARDS

A. DPW Standard Specifications (SSDPWSF), revised November, 2000.

B. DPW Standard Plans, dated April, 2007.

C. San Francisco Water Department Standard Drawings.

1.5 PERFORMANCE QUALITY CONTROL

A. For San Francisco Water Department (SFWD) facilities, all adjusted or reconstructed valve box covers shall not rattle, and shall be flushed with the finished pavement grade. The valve box covers shall be free of excess asphalt or other material covering the perimeters of the covers. After the paving work, the Contractor shall check to make sure that valve box covers are easily removable from the valve box.

B. The Contractor shall be fully liable for any accidents created by valve box covers installed by the Contractor until the installation is accepted by SFWD inspectors.

C. The SFWD will remove the valve box covers and check the operability of the valve. The Contractor shall remove all materials that have fallen into the valve box due to the Contractor's operations, to the satisfaction of the SFWD inspector.

1.6 COST FOR PRIVATELY OWNED ITEMS

A. The Contractor shall be responsible for negotiating an agreement for payment with the owner(s) of privately owned manhole covers, frames and castings to be adjusted to finished grades.

PART 2 - PRODUCTS

2.1 SFWD MATERIALS

A. The SFWD will provide, at no cost to the Contractor, adjusting rings for resetting SFWD valve box covers, pipe risers and base plates for valve box reconstruction. The Contractor shall provide all other materials. After determining the quantities of each type of adjusting rings (1", 1-1/2", 2"), pipe risers and base plates, the Contractor shall make the material request to the SFWD inspector. The Contractor shall pick up the materials to be furnished by SFWD from the SFWD Yard per the quantities approved by the SFWD inspector.

PART 3 - EXECUTION

3.1 SPECIAL INSTRUCTIONS

A. Existing SFWD and San Francisco Fire Department (SFFD) valves shall be made accessible at all times.

3.2 INSTALLATION

A. Contractor shall adjust City-owned frames and castings no later than one week after completing asphalt paving work on a block or intersection.

B. The final layer of asphalt concrete shall be placed around each City–owned casting no later than two (2) calendar days after said casting has been adjusted and concrete has been placed.

C. The adjustment of manhole frames and other castings shall be in accordance with the requirements of Section 217 of the DPW Standard Specifications.

3.3 SFWD VALVE BOX COVERS ADJUSTMENT (6", 8", 12" AND 16")

A. Before any asphalt concrete grinding operations, the Contractor shall identify all valve box covers by marking from nearby reference points like curbs, sidewalks, or other street furniture, but not by marking on the street surface to be grinded. SFWD inspectors will mark the locations of valve box covers that had been paved over. The Contractor shall pay special attention to all identified valve box covers during grinding to avoid damaging these SFWD facilities.

B. Grinding machines will not be allowed to be closer than one foot from the edge of these covers. Asphalt concrete surrounding a valve box cover will be removed by hand.

C. The Contractor shall reconstruct the surrounding asphalt concrete edge prior to resurfacing the rest of the asphalt concrete wearing surface.

D. The Contractor shall take necessary precautions to prevent grindings or new asphalt from falling into SFWD valve boxes during these operations.

E. Grinding the top of the valve box during the cold planing is absolutely prohibited.

F. The Contractor shall reconstruct the valve box as described below under Article "SFWD valve box reconstruction", at the Contractor's cost if the valve box be ground at the top.

G. The placement of steel rings on SFWD–owned castings will be performed during the paving operation, except when it is necessary to reconstruct as described below under Article "SFWD valve box reconstruction".

H. A maximum of two (2) steel rings may be used for adjustment of SFWD castings to grade during paving operation. Any SFWD–owned casting, which cannot be satisfactorily adjusted by using no more than two (2) steel rings will require reconstruction as described below under Article "SFWD valve box reconstruction".

3.4 SFWD VALVE BOX RECONSTRUCTION (6", 8", 12" AND 16")

A. During construction or repair of the concrete base, or when the cover adjustment cannot be done with two (2) rings, the Contractor shall remove valve box assemblies. The Contractor shall obtain from SFWD, materials for reconstructing the new valve box assemblies, including pipe risers and base plates. The Contractor shall cut the pipe to length according to field conditions, install the base plate, cover the plate with asphalt or concrete as appropriate, and set the pipe riser, ensuring that its cover is flush with the finished pavement grade.

3.5 SFWD CASTINGS LARGER THAN 16"

A. The Contractor shall notify the SFWD inspector of any SFWD castings that are larger than 16", and submit proposed adjustment method for approval.

END OF SECTION