
Item 427**Surface Finishes for Concrete**



1. DESCRIPTION

Finish concrete surface as specified.

2. MATERIALS

Furnish materials in accordance with this Article for the type of surface finish specified.

2.1. Coatings.

2.1.1. Adhesive Grout and Concrete Paint. Provide coatings in accordance with DMS-8110, "Coatings for Concrete." Match color of coating with Federal Standard 595C color 35630, concrete gray, unless otherwise shown on the plans.

2.1.2. Opaque Sealer. Provide penetrating-type sealer in accordance with DMS-8110, "Coatings for Concrete." Match color of coating with Federal Standard 595C color 35630, concrete gray, unless otherwise shown on the plans.

2.1.3. Silicone-Based Paint. Provide silicone resin emulsion paint (SREP) meeting the requirements of DMS-8141, "Paint, Silicon Resin for Concrete." Match color of coating with Federal Standard 595C color 35630, concrete gray, unless otherwise shown on the plans.

2.2. Exposed Aggregate Finish. Provide approved aggregates meeting the grading requirements shown on the plans. Provide gravel consisting of predominantly rounded particles unless otherwise shown on the plans. Use crushed stone when a bush-hammered finish is desired. Provide a concrete surface retardant. Provide clear Type II permanent anti-graffiti coating in accordance with DMS-8111, "Anti-Graffiti Coatings."

3. EQUIPMENT

The Engineer may require demonstration of the equipment's capabilities.

3.1. Low-Pressure Water Blasting. Use equipment capable of supplying a minimum pressure at the nozzle end of 3,000 psi at a minimum flow rate of 3 gpm. Use a 0° rotary, vibratory, or wobble-type nozzle. Use equipment capable of including abrasives in the water stream when specified on the plans.

3.2. Abrasive Blasting. Use equipment with filters to produce oil-free air and also water-free air when dry air is required.

3.3. Slurry Blasting. Use equipment capable of combining air and abrasives with water to form a wet blast media capable of cleaning and preparing surface without creating dust.

3.4. Spraying. Use equipment with fluid and air pressure regulators and gauges to allow for adjustment to produce a uniform spray pattern for spray applications.

3.5. Off-the-Form Finish Forms. Use nonstaining, nonporous, high-quality forming materials (e.g., steel or medium-density and high-density overlaid plywood forms). Use steel or high-density overlaid plywood forms when the same form will be used more than twice.

- 3.6. **Form Liners.** Provide form liners capable of producing a patterned finish as shown on the plans. Use form liners that provide a clean release from the concrete surface without pulling or breaking the textured concrete.

4. CONSTRUCTION

Provide the finish specified on the plans for the specific surface areas.

- 4.1. **Surface Areas of Finish.** "Surface area of finish" designates the areas where the specified surface is to be applied.

4.1.1. **Surface Area I.**

- surfaces of railing;
- exterior vertical faces of fascia beams, slabs, slab spans, arches, and box girders;
- the outside bottom surface of fascia beams and girders;
- the underside of overhanging slabs to the point of juncture of the supporting beam;
- the entire underside of slab spans when shown on the plans;
- vertical and underside surfaces of bents and piers;
- all surfaces of tie beams, abutments, bridge wingwalls, culvert headwalls and wingwalls, and retaining walls exposed to view after all backfill and embankment is placed; and
- all other exposed surfaces shown on the plans to require surface treatment.

- 4.1.2. **Surface Area II.** Surfaces of railing, all wingwalls, and the exterior vertical faces of slabs.

- 4.1.3. **Surface Area III.** Only the top and roadway faces of all concrete railing and bridge wingwalls.

- 4.1.4. **Surface Area IV.** Areas designated on the plans.

- 4.2. **Coatings.** Apply the coating specified on the plans.

- 4.2.1. **Preparation.** Clean the surface thoroughly before applying a coating by chemical cleaning, if required, and by blast cleaning.

Submit a containment plan that details the procedures proposed to keep public property, private property, and the environment from being adversely affected by the cleaning and painting operations. Do not discharge washwater into body of water or conveyance without TCEQ approval. Collect and properly dispose of any paint or debris dislodged as a result of cleaning operations.

- 4.2.1.1. **Chemical Cleaning.** Clean surfaces contaminated with oil, grease, or other contaminants by scrubbing the area with an approved detergent or other concrete cleaning material before blast cleaning. Do not use a solvent that will stain the surface or inhibit coating adhesion. Perform the following test to check for surface contamination of oil type materials:

- Spray the surface with a fine mist of potable water.
- Examine the area to see if water beads up.
- Clean the surface if beading is found.

- 4.2.1.2. **Blast Cleaning.** Blast clean the designated surface to remove weak surface material, curing compound, and other contaminants before applying a specified coating, leaving a lightly etched uniformly textured surface. Use an approved abrasive propelled by oil-free air with or without the addition of potable water, or blast with potable water with or without the addition of an approved abrasive at sufficient pressure to effectively clean and prepare the surface. Maintain the stand-off-distance of the nozzle to a maximum of 12 in. from the surface being cleaned when water blasting.

Do not damage concrete surface by gouging, spalling, or exposing coarse aggregate by the blasting operation.

Blow clean oil- and moisture-free air on all surfaces with sufficient pressure to remove loose particles immediately before application of any coating. Perform the following test to check for surface cleanliness as directed:

- Press a 10 in. long strip of 2 in. wide clear packing tape on the surface by rubbing with moderate pressure.
- Grasp the free end of the tape, and remove the tape from the surface with a sharp jerk.
- Examine the surface of the tape for clinging particles.

Continue cleaning the concrete surface until there are no particles clinging to the tape surface for subsequent tests. An additional test that can be used to check the surface for dust is to wipe the surface with a dark cloth and then examine the cloth for discoloration.

- 4.2.2. **Application.** Mix coating materials thoroughly with a mechanical mixer at a speed that causes the mixture to rotate entirely in the container. Ensure complete mixing by probing the container with a stirring device searching for non-dispersed or settled material.

Apply coatings once the new concrete has aged a minimum of 28 days except for the adhesive grout coating. Do not apply coatings when weather conditions will be detrimental to the final surface finish as determined by the Engineer. Do not apply coatings when surface temperature of the concrete exceeds 110°F.

Apply coatings to obtain a consistent color and texture.

- 4.2.2.1. **Adhesive Grout.** Apply coating on a moistened surface to a uniform minimum thickness of 1/16 in. Apply when ambient temperature is at least 50°F.

- 4.2.2.2. **Concrete Paint.** Apply the coating on a dry surface in 2 coats for a total maximum application rate of 150 sq. ft. per gallon. Match the color of the applied coating with the color standard shown on the plans. Do not thin material unless approved. Apply when ambient temperature is between 50°F and 100°F.

- 4.2.2.3. **Opaque Sealer.** Apply the coating to a dry surface in 2 coats for a total maximum application rate of 200 sq. ft. per gallon. Match the color of the applied coating with the approved color standard shown on the plans. Do not thin the material unless approved. Apply when ambient temperature is between 40°F and 100°F.

- 4.2.2.4. **Silicone Resin Paint.** Apply the coating on a dry surface in 2 coats at a rate not exceeding 300 sq. ft. per gallon per coat. Do not thin the material unless approved. Wait a minimum of 12 hr. between coats. Apply when ambient temperature is between 50°F and 100°F.

Repair surface finish where coating has been applied that exhibits peeling, flaking, or discoloration or has been damaged during construction. Remove defective or damaged coating. Clean and recoat repair area in accordance with the requirements of this Item.

- 4.3. **Special Surface Finishes.** Submit a work plan to the Engineer for any special finish shown on the plans. Include in the work plan the type of aggregates, materials, variation of panel or pattern arrangement, dimensions, construction methods, and other features affecting the work as is necessary for the "Special Surface Finish" specified.

- 4.3.1. **Blast Finish.** Provide surface profile as shown on the plans, or meet the minimum requirements of Section 427.4.2.1., "Preparation." Construct a 4 × 4 ft. sample panel using the same concrete used in construction of the member to receive the blast finish. Prepare the surface of the sample panel to meet the specified finish, and obtain approval of the sample finish. Use the approved sample panel finish as the standard for surfaces requiring a blast finish.

4.3.2.

Slurry Coat Finish. Provide cementitious slurry coat finish to concrete surfaces within 14 days of placing concrete or later as approved. Water blast surface to moisten surface before application when application of slurry coat occurs more than 14 days after placing concrete. Do not apply slurry coat finish to surfaces receiving another type coating finish.

Submit for approval proposed slurry recipe including cement, latex concrete additive, with or without sand, and other additives before application. The Engineer will direct the level of surface texture the slurry coat will have, whether to include sand, and what fineness of sand is to be used. Tint mixture of slurry as specified on the plans and as directed. Maintain consistent slurry throughout project only modifying recipe to account for color variations being noticed as work progresses.

Rub in slurry with carborundum stone, stiff bristle brush, or other approved device. Limit thickness of applied slurry to a maximum of 1/16 in. thick. Demonstrate application methods for slurry coat and obtain approval of proposed surface. Apply slurry coat to obtain a tightly adhering cementitious finish to concrete surface. Remove material and reapply if slurry coat is not tightly adhering or is cracked.

4.3.3.

Rub Finish. Provide a finish to the surface by rubbing the surface with a carborundum stone or other approved material. Begin rubbing the surface immediately after forms have been removed. Provide blast finish or other finish as directed at no additional cost to the Department if rubbing surface is delayed to the point where the surface is dry and unable to be rubbed to produce an acceptable finish. Perform the requirements to obtain the ordinary surface finish specified in Section 420.4.13., "Ordinary Surface Finish," concurrently with rubbing the surface. Rub concrete-patching areas after the patch material has thoroughly set and blend the patch in with the surrounding area to produce a surface with uniform color and texture where concrete patching is performed.

Keep the surface continuously wet after form removal until the rubbing is complete. Rub the surface sufficiently to bring the wetted concrete surface to a paste producing a smooth dense surface without pits, form marks, or other irregularities. Do not use cement grout to form the paste on the surface. Stripe the surface with a brush to conceal the rubbing pattern and allow the paste to reset. Wash the concrete with potable water after the paste has sufficiently set to leave it with a neat and uniform appearance and texture. Apply membrane curing, if required, in accordance with Item 420, "Concrete Substructures," after rubbing is complete.

4.3.4.

Off-the-Form Finish. Provide a finish with minimal surface defects and uniform color and texture by using non-staining, non-porous, high-quality forming materials. Use the same type of forming materials for like elements for the entire structure.

Use mortar-tight forms to prevent leakage and discoloration. Seal joints with compressible gasket material, caulk, tape, or by other suitable means that are not detrimental to the concrete finish if necessary. Use one brand and type of form-release agents for all surfaces unless another product produces a similar concrete surface appearance. Do not use barrier-type (wax, fuel oil, carrier oil, etc.) release agents. Use form-release agents containing a rust inhibitor on steel forms. Clean rust off steel forms before use. Use plywood that will not cause discoloration of the concrete surface.

Direct special attention to consolidation and vibration of the concrete around the form surfaces to minimize bug holes. Modify concrete placement and vibration techniques if surface contains an excessive amount of bug holes. Remove all forms without interruption once form removal begins to prevent discoloration due to differing form curing times.

Do not use membrane curing on surfaces with off-the-form finish.

Repair honeycombed and spall areas with least dimension larger than 2 in. in accordance with the concrete surface repair procedures outlined in Item 420, "Concrete Substructures," to obtain an ordinary surface finish as defined in Section 420.4.13., "Ordinary Surface Finish." Patch honeycombed and spall areas with least dimension greater than 3/4 in. but smaller than 2 in. by filling defect with repair material omitting the chipping operation. Do not patch honeycombed and spall areas with least dimension smaller than 3/4 in. Perform required repairs as soon as forms are removed. Match repair material color and texture with surrounding

concrete surfaces. Minimize the area of repair by not smearing the repair material over acceptable concrete surfaces in an attempt to blend the repair with the surrounding concrete. Cut out form ties at least 1/2 in. below the surface, and patch accordingly. Perform repair work as soon as possible after removing forms so that concrete and repair material have similar ages. Replace or refurbish the forms when the Engineer determines defective formwork is causing an excessive amount of repair work.

- 4.3.5. **Form Liner Finish.** Provide patterned finish as shown on the plans. Do not splice form liner panels in a way that causes a noticeable transition or line between pieces. Wash and clean form liners after each use when the forms can be reused. Replace form liners that have become damaged or worn.

Construct a sample panel for each form liner finish. Approval is required to verify the sample panel meets the requirements of the plans and specifications before beginning work. Upon approval, the sample panel becomes the model panel that all other work will be compared against. Deviation in color, grade, or depth from the model panel is grounds for rejection of the form liner finish. Removal of defective work may be necessary as determined by the Engineer and in accordance with the surface finish requirements outlined in Item 420, "Concrete Substructures," to obtain an ordinary surface finish as defined in Section 420.4.13., "Ordinary Surface Finish."

Seal all form liner joints in a manner acceptable to the Engineer to prevent leakage at the surface.

- 4.3.6. **Exposed Aggregate Finish.** Provide exposed aggregate finish as indicated on the plans. Provide a depth of finish between 3/8 in. and 1/2 in. unless directed otherwise.

Apply a concrete surface retarder that penetrates approximately 1/4 in. into the forms or concrete surface to help achieve the desired finish. Apply 2 or 3 coats to wood forms to account for absorption if necessary. Tape or caulk form joints to prevent escape of the retarder during the placing operations. Protect the form surfaces from sun and rain while exposed to the atmosphere. Re-treat form surfaces with retarder if disturbed. Protect adjacent areas of concrete not requiring exposed aggregate finish from the retarder.

Remove forms 12 to 15 hr. after concrete placement but not before concrete has gained sufficient strength to support the self-weight of the member unless directed otherwise. Expose the aggregate for the finish immediately after form removal. Remove the grout paste covering the aggregate to be exposed by an approved method. Do not loosen the aggregate by the grout removal operation. Maintain required curing on all surfaces except for the time while the aggregate is being exposed. Cure using wet mats or membrane after the aggregate is exposed.

Repair defective areas as determined by the Engineer.

Re-clean exposed aggregate surfaces by an approved method. Apply a coat of clear Type II permanent anti-graffiti coating to cleaned exposed aggregate surface. Apply anti-graffiti coatings by spray, roller, or brush at the application rates recommended by the manufacturer and in accordance with Item 740, "Graffiti Removal and Anti-Graffiti Coating."

5.

MEASUREMENT

When surface finishes for concrete is shown on the plans to be a pay item, measurement will be by the square foot of the type of surface finish specified.

This is a plans quantity measurement item. The quantity to be paid is the quantity shown in the proposal, unless modified by Article 9.2., "Plans Quantity Measurement." Additional measurement or calculations will be made if adjustments of quantities are required.

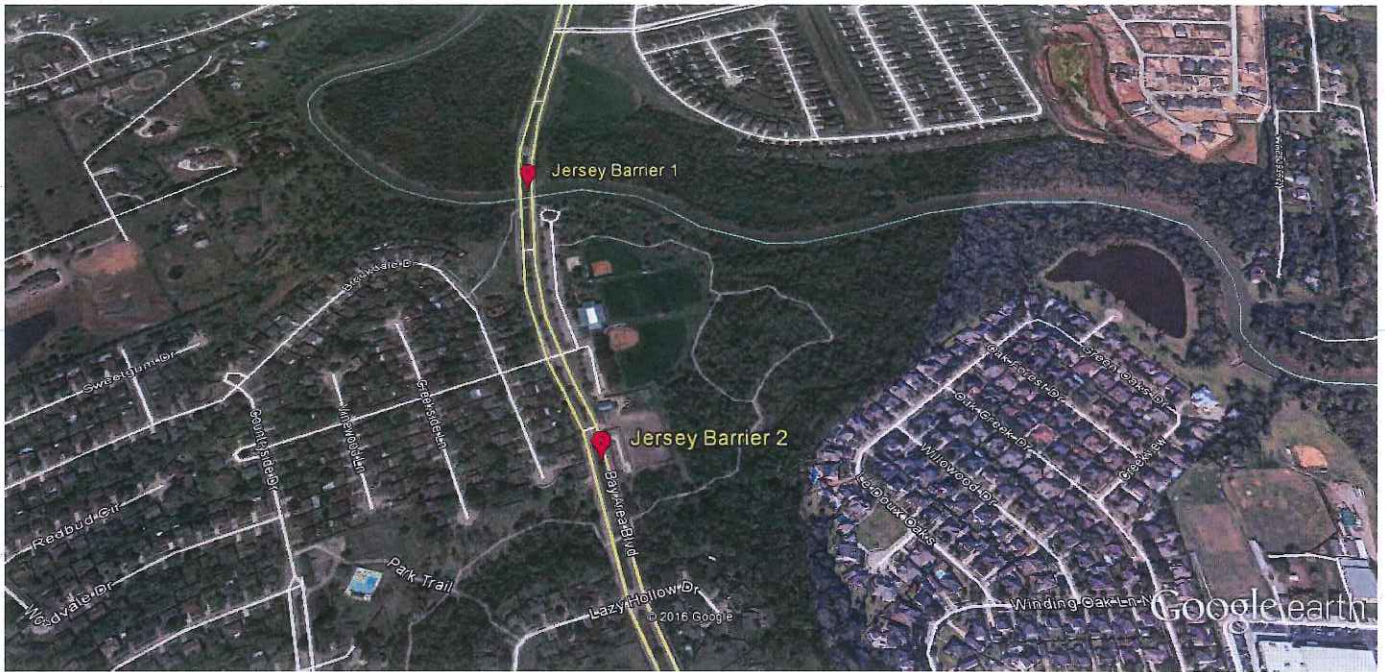
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PAYMENT

Unless otherwise specified on the plans, the work performed, materials furnished, equipment, labor, tools, and incidentals will not be paid for directly but will be considered subsidiary to pertinent items.

When a surface finish for concrete is specified as a pay item, the work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Adhesive Grout Finish," "Concrete Paint Finish," "Opaque Sealer Finish," "Silicone Resin Paint Finish," or "Blast Finish." This price is full compensation for materials; cleaning and preparing surfaces; application of materials; and equipment, labor, tools, and incidentals.

Slurry coat, rub, off-the-form, form liner, or exposed aggregate finishes (including anti-graffiti coating) will not be paid for under this Item but are subsidiary to other pertinent Items.



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feet
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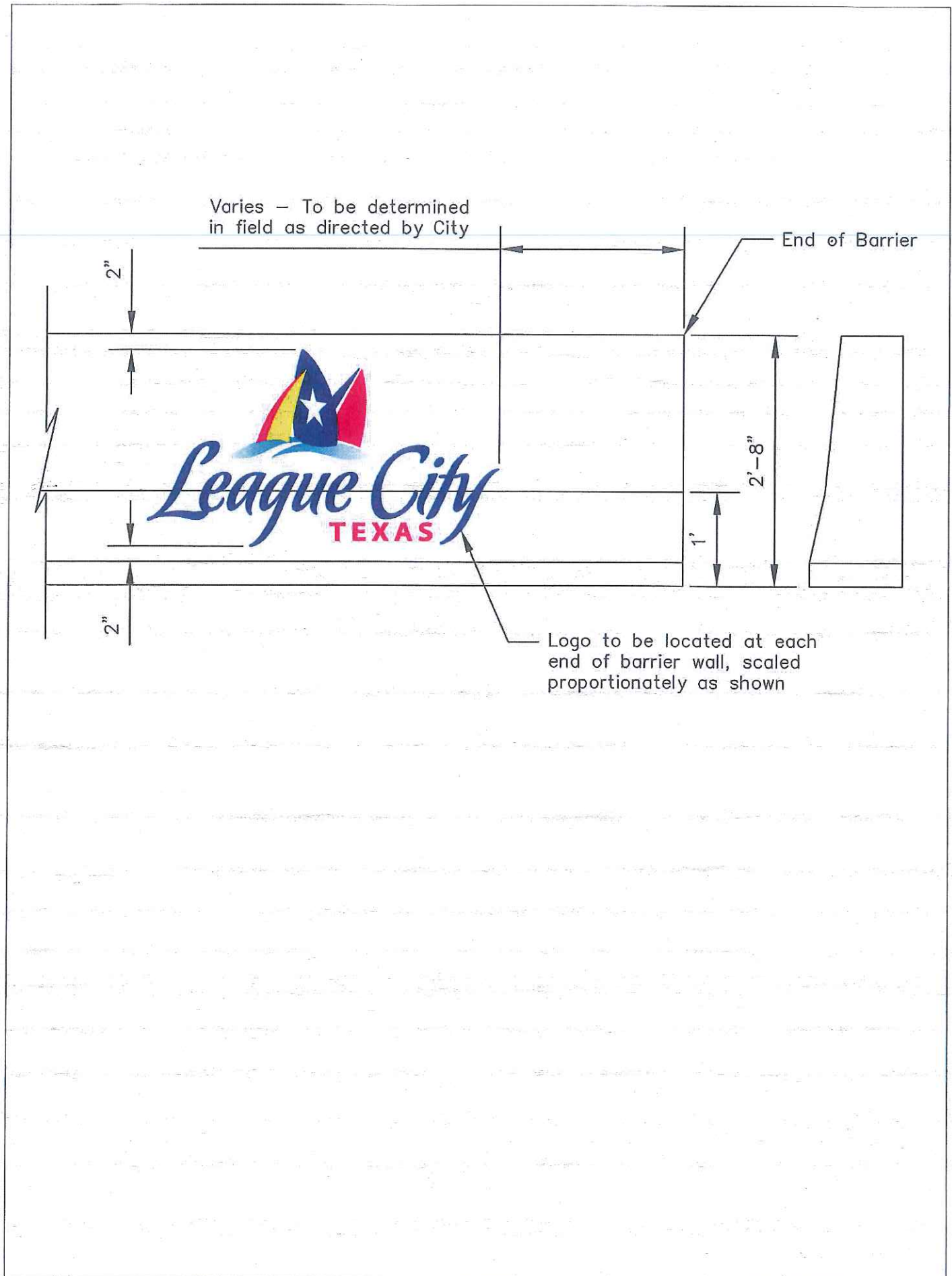




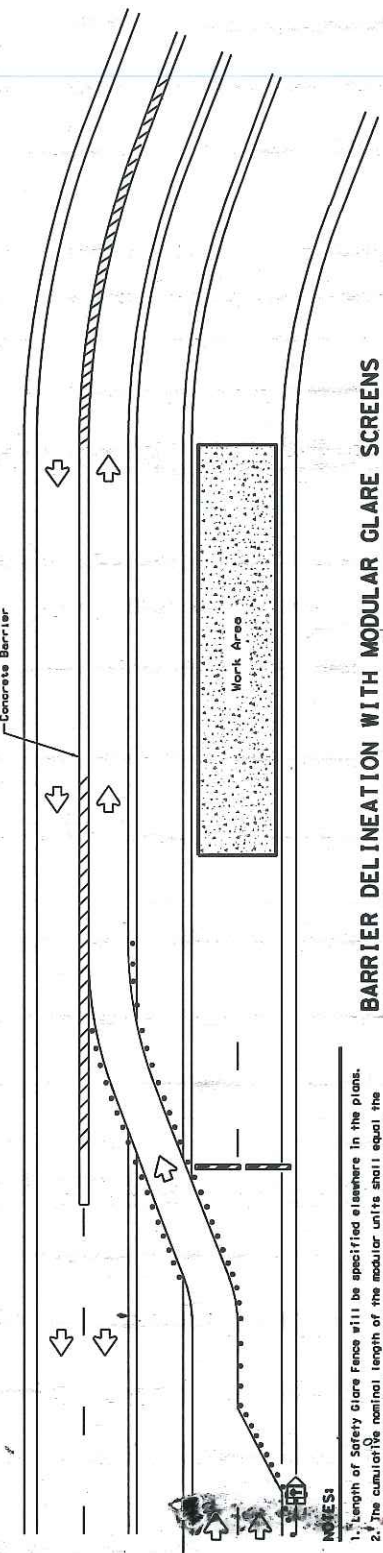
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LEGEND	
	Type 3 Barrier
	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
	Safety glare fence

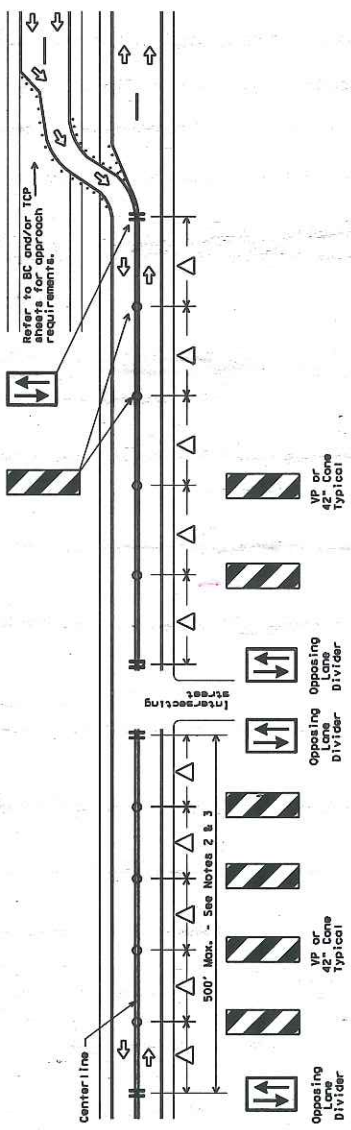


BARRIER DELINEATION WITH MODULAR GLARE SCREENS

- NOTES:**
- Length of Safety Glare Fence will be specified elsewhere in the plans.
 - The cumulative nominal length of the modular units shall equal the length of the concrete barrier to be replaced. The modular units shall be installed on which they are installed as the joint between barrier sections will not be spaced by any one unit.
 - Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one panel/blade per section of concrete barrier not to exceed a spacing of 500' maximum. The reflective sheeting shall be applied to the panel/blades installed with reflective sheeting as described.
 - Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
 - This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the "Criteria for Pre-qualified Products and Materials" (CRP) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/hcdol_library/publications/construction.htm



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

- NOTES:**
- When devices are used, any traffic control must be maintained on the roadway of a normally divided highway, opposing traffic shall be separated by the vertical panels and opposing traffic lane dividers. The above typical application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
 - Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
 - Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
 - Locations where surface mount bases with adhesive or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.

Texas Department of Transportation
Operations Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-13	
FILE	WZ(TD)-13.001
REV	REV
DATE	DATE
BY	BY
CHECKED	CHECKED
DESIGNED	DESIGNED
IN CHARGE	IN CHARGE
SHEET NO.	SHEET NO.
7-13	7-13

LEGEND		
Type 3 Barricade	■	Channelizing Devices
Heavy Work Vehicle	■	Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Board	■	Portable Channelizing Message Sign (PCMS)
Sign	■	Traffic Flow
Flag	■	Flagger

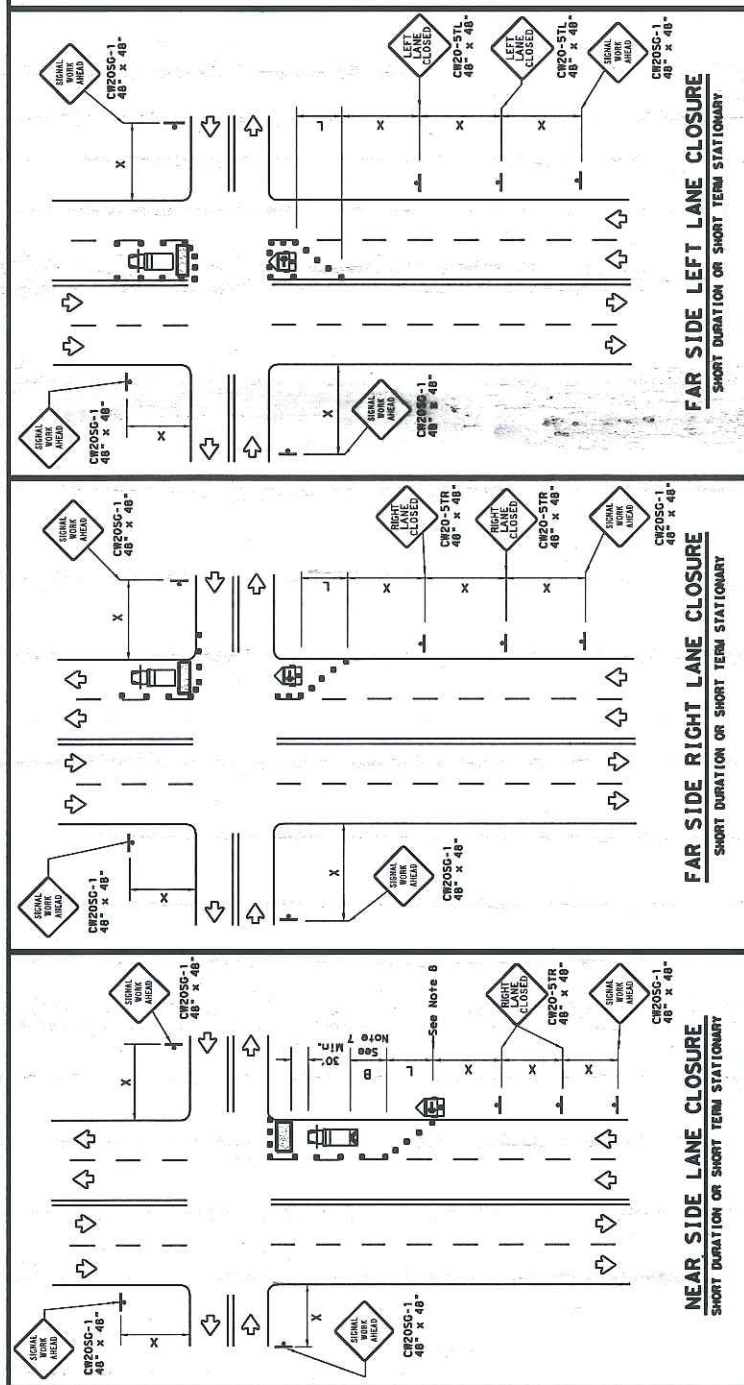
Posted Speed *	Formula	Minimum Tower Lengths **	Suggested Minimum Spacing of Channelizing Devices	Minimum Sign Spacing Distance	Suggested Minimum Buffer Space "g"
30	MS^2	10' 11' 12'	On g	120'	90'
35	$L = 60$	130' 163' 180'	30'	60'	120'
40		205' 225' 245'	35'	70'	150'
45		285' 295' 320'	40'	80'	195'
50		430' 495' 540'	45'	90'	240'
55	$L = WS$	500' 550' 600'	50'	100'	295'
60		550' 605' 660'	55'	110'	350'
65		600' 650' 720'	60'	120'	410'
70		650' 715' 780'	65'	130'	470'
75		700' 770' 840'	70'	140'	530'
80		750' 825' 900'	75'	150'	590'

* Conventional Roads Only

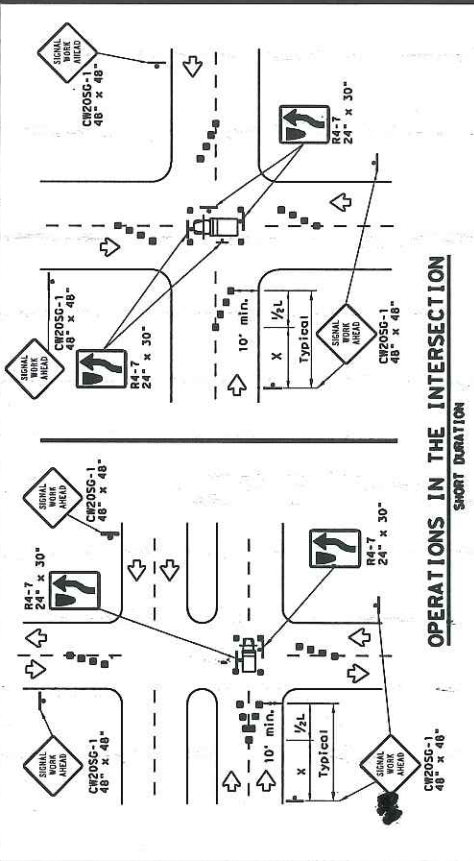
** Tower lengths have been rounded off.

L=Length of Tower (FT) W=Width of Offset (FT) S=Posted Speed (MPH)

WORKERS IN BUCKET TRUCKS SHALL NOT WORK ABOVE OPEN LANES OF TRAFFIC.



- ### GENERAL NOTES
- The minimum size channelizing device is the 28" cone. 42" two-piece cones must be used at all times. If the device must be left unattended at night, the device must be left unattended at night.
 - Obstructions or hazards at the work area shall be clearly marked to field conditions.
 - Flags and Flagger Symbol (CH20-7) signs may be required according to field conditions.
 - Vehicles parked in roadway shall be equipped with at least two high intensity rotating, flashing, oscillating or strobe type lights.
 - High level warning devices (flag trees) may be used at corners of the vehicle.
 - When work operations are performed on existing signals, the signals shall be maintained in operation. If existing signals do not have power All-Stop (R1-1 and R1-3) signs may be implemented when approved by the engineer.
 - For Short-Term Stationary work the buffer space "g" from the above table should be used if field conditions permit. For Short Duration variable less than 1 hour any buffer space provided will enhance the safety of the setup.
 - The arrow board at this location may be omitted for Short Duration work if the work vehicle has an arrow board in operation. As an option, the arrow board may be placed at the end of the taper in the closed lane if space is not available at the beginning of the taper.
 - Signs and devices for the NEAR SIDE LANE CLOSURE may be altered for a left lane closure by using a LEFT LANE CLOSED (CH20-5TL) and adding channelizing devices on the centerline to protect the work space from opposing traffic.



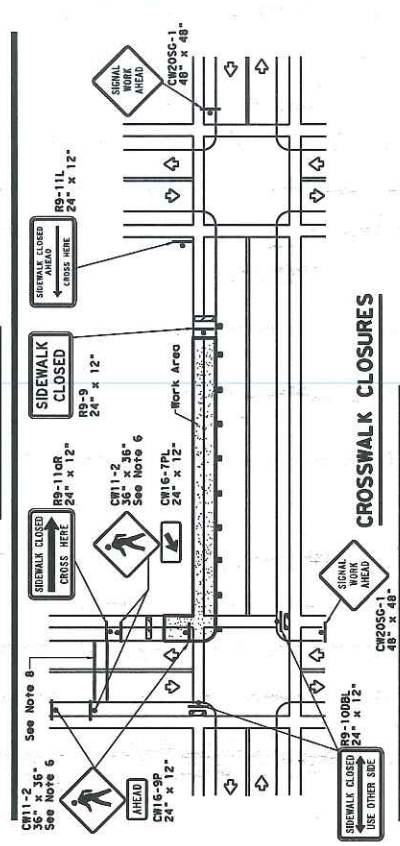
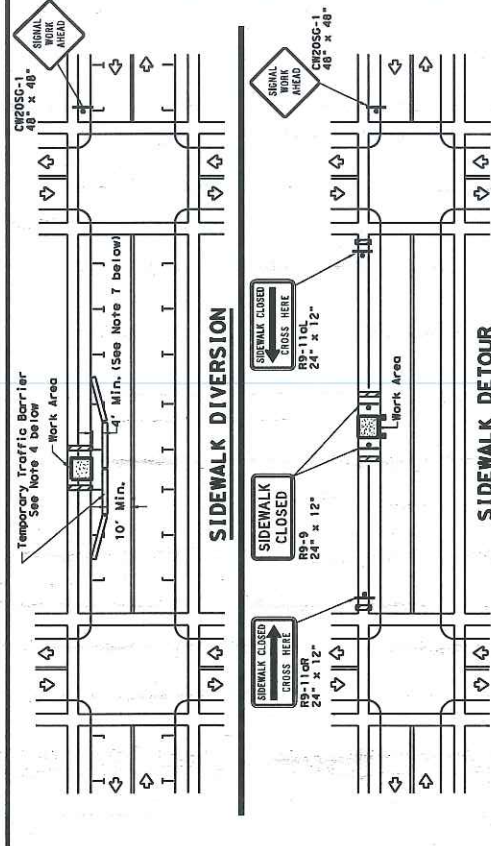
Texas Department of Transportation

TRAFFIC SIGNAL WORK
TYPICAL DETAILS

WZ (BTS-1) - 13

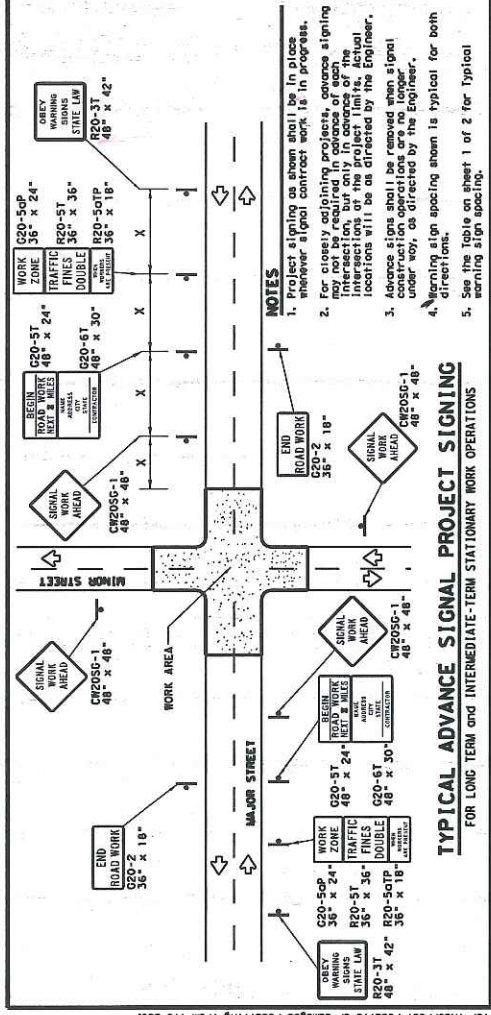
FILED	WZ (BTS-1) - 13	DATE	10/11/1992	BY	JOE	PROJECT	COURT	SHEET NO.
NOTES								
2-98 10-99 1-13								
4-98 3-03								

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PEDESTRIAN CONTROL

1. Hoists, trenches or other hazards shall be adequately protected by covering, dewatering or surrounding the hazard with orange plastic pedestrian warning or channelizing devices, or as directed by the Engineer, prior to installation.
2. Channelizing devices shall be placed on supports detailed on the BC standards or CWTCD list, or when fabricated from approved lightweight plastic material, they may be mounted on top of a plastic drum at or near the location shown.
3. For speeds less than 45 mph longitudinal channelizing devices may be used in lieu of the approved devices shown. Approved devices shall be as per BC 801 and manufacturer's recommendations.
4. Location of devices are for general guidance. Actual device spacing and location must be field adjusted to actual conditions. The closed sidewalk shall be clearly marked with the appropriate signs and channelizing devices. Detectable Pedestrian Barriercs should be used instead of the Type 3 Barriercs shown.
5. The width of existing sidewalk should be maintained if practical.
6. When crosswalks or other pedestrian facilities are closed or relocated, the contractor shall be responsible for the actual conditions of the closed facilities, consistent with the features present in the existing pedestrian facility.



REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the requirements of the MBE and color usage table shown on this sheet.

SIGN SUPPORT LIGHTS

1. The contractor shall be responsible for lighting over should be sandbags filled with dry, non-combustible material.
2. The contractor shall be responsible for lighting over should be sandbags filled with dry, non-combustible material.
3. Backscatterers, iron, steel, or other solid objects will not be permitted for use as sign support weights.
4. Sandbags shall weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon impact, vehicle impact, rubber, such as tire inner tubes, shall not be used.
6. Rubber ballasts designed for channelizing devices should not be used for support on portable sign supports. Sandbags designed and labeled for use as sign supports shall be used when shown on the CWTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level. Sandbags shall be placed on the base supports of the traffic control device and shall not be suspended above ground level.
8. Sandbags shall not be placed under the skirt and shall not be used to level sign supports placed on slopes.

GENERAL NOTES FOR WORK ZONE SIGNS

1. Signs shall be installed and maintained in a neat and plumb condition.
2. Roadwork signs shall be painted white.
3. Barriercs shall NOT be used as sign supports.
4. No sign shall NOT be used to attach signs to any support.
5. All signs shall be installed in accordance with the plans or as directed by the Engineer.
6. In the "Standard Highway Sign Design for Texas" (SHSD).
7. The Contractor shall furnish the sign design shown in the plans or the "Compliant Work Zone Traffic Control Device List" (CWTCD).
8. Temporary signs that have damaged or crossed substrates and/or damaged reflective sheeting shall be replaced as directed by the Engineer.
9. Identification markings may be shown only on the back of the sign and shall be in white or yellow letters and/or capacity tapes used for identification shall be 1\"/>

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN DIMENSIONS	REFLECTIVE SHEETING	50 FT	GALVANIZED STRUCTURAL STEEL	DRILLED SHAFT
Orange	G20-7T	96" X 48"	Type B _{FL} or C _{FL}	32	Size ① ②	24" DIA. (LF)
Orange	G20-7T	192" X 96"	Type B _{FL} or C _{FL}	120	Size ① ②	24" DIA. (LF)

▲ See Note 6 Below

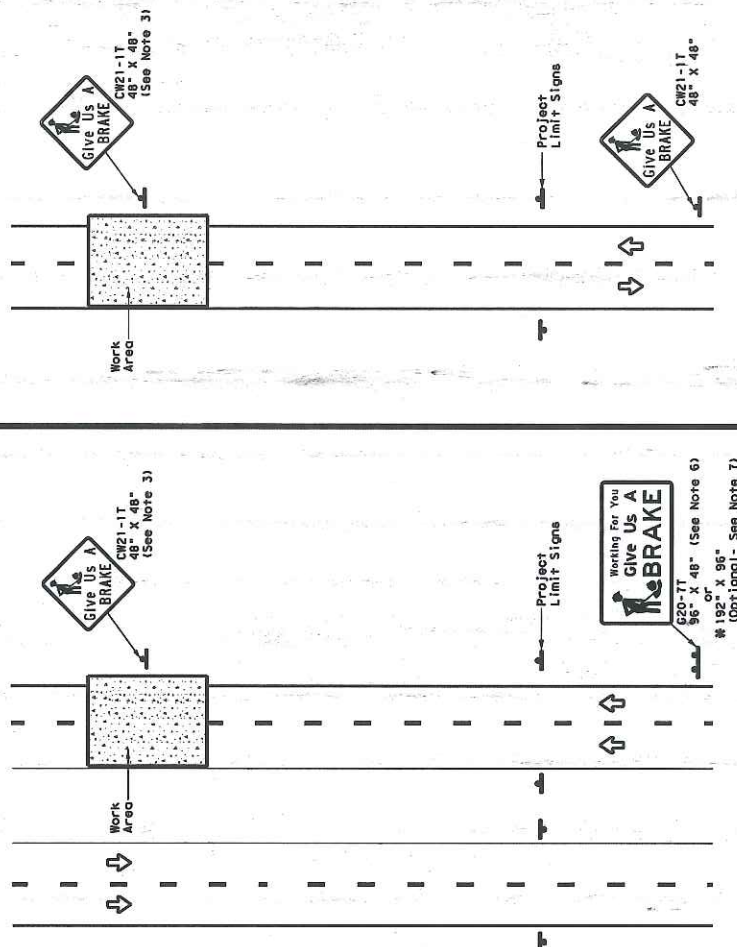
LEGEND
Sign
Large Sign
Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

COLOR	USAGE	SHEETING MATERIAL
ORANGE	BACKGROUND	TYPE B _{FL} OR TYPE C _{FL}
BLACK	LEGEND & BORDERS	NON-REFLECTIVE ACRYLIC FILM

GENERAL NOTES

- See BC and SMD sheets for additional sign support details.
- Sign locations shall be approved by the Engineer.
- For projects more than two miles in length, Give Us A BRAKE signs should be repeated halfway through the project. The Give Us A Brake (CW21-1T) may be used for this purpose.
- Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
- Give Us A Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
- The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
- The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specifications:
 - Item 636 - Aluminum Signs
 - Item 647 - Large Roadside Sign Supports and Assemblies.
 - Item 416 - Drilled Shaft Foundations
- All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.



WORK ZONE
"GIVE US A BRAKE"
SIGNS

WZ (BRK) - 13

FILE#	WZP-13-00	Rev	1/00	Rev	1/00	Rev	1/00
DATE	1/00	DATE	1/00	DATE	1/00	DATE	1/00
REVISED	AUGUST 1995	DATE	1/00	DATE	1/00	DATE	1/00
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