

**Project: NB 18-026**

**County: Guadalupe**

**Highway: Klein Rd Ph 2**

\*\*\*\*\*GENERAL NOTES\*\*\*\*\*

TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (November 1, 2014)

===== **Basis of Estimate** =====

Item	Description	Rate/Area	Quant-Unit
168-6001	Vegetative Watering	1.3 GAL/SY/WEEK (21,485 SY/12 WEEKS)	335.16-MG
310-6001	PRIME COAT (MULTI OPTION)	0.3 GAL/SY (33,714 SY)	10,114.12-GAL
340-6272	TACK COAT	0.1 GAL/SY (62,930 SY)	6,293.04-GAL
260-6002	LIME (HYDRATED LIME (SLURRY))	20 LB/SY (34,870 SY)	348.7-TON
340-6011	D-GR HMA(SQ) TY-B PG64-22	115 LB/SY-IN (678 SY)	467.5-TON
340-6014	D-GR HMA(SQ) TY-B PG70-22	115 LB/SY-IN (34,364 SY)	5,891.4-TON
340-6050	D-GR HMA(SQ) TY-C PG70-22	115 LB/SY-IN (31,465 SY)	5,428.7-TON
341-6049	D-GR HMA TY-D PG76-22	115 LB/SY-IN (32,116 SY)	3,694.4-TON
6210-6001	PVC MOISTURE BARRIER	4 SF/LF (4,334 LF)	1,926-SY

**--General--**

Contact the Engineer or the City of New Braunfels (City) when construction operations are within 400 feet of a signalized intersection to determine/verify the location of loop detectors, conduit, ground-boxes, etc. Repair or replace any signal equipment damaged by construction operations. The method of repair or replacement shall be pre-approved and inspected. Depending on the type and extent of the damage, the Engineer reserves the right to perform the repair or replacement work and the Contractor will be billed for this work.

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To better fit field conditions, the cross sections may be varied when approved.

If there are waste areas or material source areas, follow the Texas Aggregate Quarry and Pit Safety Act requirements.

Any materials removed and not reused and determined to be salvageable shall be stored within the project limits at an approved location or delivered undamaged to the storage yard as directed. Properly dispose unsalvageable materials in accordance with local, state, and federal regulations. Deface traffic signs so that they will not reappear in public as signs.

Any sign panels that are adjusted or removed and replaced, shall be done the same workday unless otherwise approved. This work shall be considered subsidiary to Item 502.

Notify the Engineer at least two weeks prior to a proposed traffic pattern change(s) that will require a revision to traffic signals.

Locate and reference all manholes and valves within the construction area with station and offset. Each manhole and valve shall be identified by its owner. No roadwork will begin until this list has been submitted. Gas valves have to be accessible at all times, therefore; temp. CTB, material stock piles, etc. cannot be placed over these valves.

Construct all manholes and valves to final pavement elevations prior to the final mat of ACP. If, between the final elevation adjustment and the final mat of ACP, the manholes and valves are going to be exposed to traffic, place temporary asphalt around the manhole and valve to provide a +/- 50:1 taper. The cost of elevation adjustment will be part of the manhole and valve work, and asphalt tapers are considered subsidiary to Item 502.

Contractor is required to access the construction site only through the Ingress & Egress Route identified in the plans. Construction traffic through adjacent neighborhood is prohibited.

Working hours are Weekdays 7:00 a.m. to 5:00 p.m. All requests to work outside the specified time periods shall be submitted in writing and approved by the City no later than three (3) working days prior to the requested work date. Emergency work may be done without prior consent of the City.

Exceptions:

- (a) Concrete work shall be scheduled so that all placement and finishing shall be finished during standard daylight hours. When under emergency conditions, work that must be concluded under artificial lighting, lighting shall be erected and directed so that they shall not shine upon any residence or create a traffic visual hazard.
- (b) Certain traffic congestion areas will require that modified standard work hours will be enforced where street blockage, traffic flow, channelization and/or flagmen are required. The Contractor will be notified of these areas during the pre-construction conference.

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- (c) Lane closures in school zones or on streets other than residential streets will be limited to after 9:00 a.m. and before 3:00 p.m. unless prior approval is obtained from the City. Arrow boards may be required by the City on lane closures, with all barricades, advanced warning signs and channelization devices placed according to the specifications contained in the Contract Documents.
- (d) Saturday, City holidays, or City's off hours (Monday through Friday, before 7:30 a.m. or after 4:30 p.m.), work shall be considered as overtime with inspection fees being charged accordingly.
- (e) Sunday work, other than emergency situations, is not allowed.

Irrigation heads and fixture relocations in conflict with the proposed improvements are not paid for separately but are subsidiary to various bid items.

Buildings and Structures must be protected from damages including concrete splash at all times. The Contractor is to install a material approved by the Engineer which will guard the buildings against concrete splash. This work is considered subsidiary to Item 531 and will not be paid separately. If concrete splash litters a building facade the Contractor, at their expense, is responsible for cleaning and remedying the concrete as approved by the Engineer.

Grade street intersections and median openings for surface drainage.

Sweep and remove all litter, construction debris and surplus material on the right-of-way within the project limits to keep the jobsite neat at all times. Keep roadways and sidewalks free of sediment. Consider subsidiary to pertinent items.

Construct all ramps, sidewalks, steps, curb ramps, handrails, pedestrian push buttons, and other pedestrian elements in accordance with Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way (PROWAG) issued by the United States Access Board. Maintain one copy of PROWAG at the project site at all times.

When working near aerial electrical lines and / or utility poles, provide adequate safety measures, as needed, to comply with the appropriate sections of Federal and State regulations. For electrical lines and poles shown in the plans, if the lines need to be de-energized and / or if poles require bracing, contact the electrical company to coordinate the de-energizing and bracing. Work pertaining to de-energizing lines, bracing poles and any other protective measures required will not be paid at the expense of City of New Braunfels.

Coordinate all work along FM 725 with local TxDOT Office per the permit.

Dust control is to be performed a minimum of three times per day and as needed during construction (including weekends). Dust control will be considered subsidiary to the various bid items, and will not be paid for directly. Sweeper, ground crews, water truck, or any combination of these methods, or any alternate method approved by the Engineer, shall be used as dust control.

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Mud/dirt inadvertently tracked off site and onto public streets shall be removed immediately by hand or mechanical broom sweeping.

Personnel will be experienced in items of work in contract. Safety vests and hard hats will be pre-approved and worn at all times when outside vehicles within the work area.

Pavement markers will be left in place until such time as they are in conflict with the work in progress.

Referencing of all existing striping and pavement markings prior to beginning paving operations shall be the Contractor's responsibility.

All pavement markings and/or striping that are in conflict with traffic operations will be removed by the Contractor. Such removal will be considered subsidiary to the various bid items, and will not be paid for directly.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

Provide temporary drain openings at all low points or other drainage structures, as required, at the Contractor's expense.

Remove any obstructions to existing drainage due to the Contractor's operations, as required, at the Contractor's expense.

If construction has not commenced within one-year of City approval for construction inspection, that approval is no longer valid.

The November 1, 2014 edition of the Texas Department of Transportation Standard Specifications for Construction of Highways, Streets and Bridges shall be followed.

All responsibility for the adequacy of these plans remains with the engineer of record. In accepting these plans, the City of New Braunfels must rely upon the adequacy of the work of the engineer of record.

Post all State and Federal labor posters at the project site.

Prior to the start of construction the Contractor shall contact the City of New Braunfels to set a preconstruction meeting. A 48-hour advanced notification is required for all inspection and meeting requests.

Plan approval, Public Infrastructure Permit and TxDOT Permits are required prior to beginning work.

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For Public Infrastructure Permit (SC):

- For inspections, you must call before 12:00 p.m., 48 hours prior to your inspection request.
- Each inspection will be allotted 1 hour unless you request for more time.
- Once your request has been accepted, you will receive a call from the City of New Braunfels Inspector.

Police Officer's subsidiary; Contractor shall have knowledge of Traffic Control.

It is the Contractor's responsibility to see that all temporary and permanent traffic control devices are properly installed and maintained in accordance with the plans and latest edition of the Texas Manual on Uniform Traffic Control Devices. If, in the opinion of the engineering representative and the construction inspector, the barricades and signs do not conform to established standards or are incorrectly placed or are insufficient in quantity to protect the general public, the construction inspector shall have the option to stop operations until such time as the conditions are corrected. If the need arises, additional temporary traffic control devices may be ordered by the Engineering representative at the Contractor's expense.

Type II B-B blue reflective raised pavement marker shall be installed in the center of the roadway in each direction of traffic adjacent to all fire hydrants. In locations where hydrants are situated on corners, blue reflective raised pavement markers shall be installed on both approaches which front the hydrant. The raised pavement marker shall meet TxDOT material, epoxy and adhesive specifications.

#### Groundwater

It shall be the responsibility of the developer, Contractor, subcontractors, builders, City, and project engineer to immediately notify the Office of the City Engineer and project engineer if the presence of groundwater within the site is evident. Upon notification the project engineer shall respond with plan revisions for the mitigation of the groundwater issue. The City Engineer shall respond within two (2) business days upon receipt of the mitigation plan. All construction activity, impacted by the discovery of groundwater, shall be suspended until the City Engineer grants a written approval of the groundwater mitigation plan.

#### Record Drawings

As per Platting Ordinance Section 118-38m.: When all of the improvements are found to be constructed and completed in accordance with the approved plans and specifications and with the City's standards, and upon receipt of one set of "Record Drawing" plans, and a digital copy of all plans (PDF) the City Engineer shall accept such improvements for the City of New Braunfels, subject to the guaranty of material and workmanship provisions in this Section.

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Construction Note

Contractor is responsible to ensure that erosion control measures and stormwater control sufficient to mitigate off site impacts are in place at all stages of construction. SWPPP reports are required by the Contractor per Texas Commission on Environmental Quality (TCEQ) requirements.

Drainage Note

Drainage improvements sufficient to mitigate the impact of construction shall be installed prior to adding impervious cover.

Soils Testing

Proctors shall be sampled from on site material (on site is defined as limits of construction for this plan set) and a copy of the proctor results shall be delivered to the City of New Braunfels Street Inspector prior to any density tests.

Roadway

All roadway compaction tests shall be the responsibility of the owner's Geotechnical Engineer. Flexible base or fill/embankment material shall be placed in uniform layers not to exceed eight inches (8") loose. The required density for the fill/embankment material shall meet the requirements of TxDOT's Specification Item 132. The required density for the flexible base material shall meet the requirements of TxDOT's Specification Item 247. Each layer of material, inclusive of subgrade, shall be compacted as specified and tested for density and moisture in accordance with Test Methods TEX-113-E, TEX-114-E, TEX-115-E. The number and location of required tests shall be determined by the Geotechnical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 100 LF for each lift. Upon completion of testing, the Geotechnical Engineer will provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of flexible pavement material has been completed in accordance with the plans. The above testing requirements and certification also applies to lime treated subgrade.

Drainage Trench Compaction

All utility trench compaction tests within the street pavement/sidewalk section shall be the responsibility of the developer's Geotechnical Engineer. Fill material shall be placed in uniform layers not to exceed twelve inches (12") loose. Determine the maximum lift thickness based on the ability of the compacting operation and equipment used to meet the required density. Each layer of material shall be compacted to a minimum 95% density and tested for density and moisture in accordance with Test Methods TEX-113-E, TEX-114-E, TEX-115-E. The number and location of required tests shall be determined by the Geotechnical Engineer and approved by the City of New Braunfels Street Inspector. At a minimum, tests shall be taken every 100 LF

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for each lift and every other service line. Upon completion of testing the Geotechnical Engineer shall provide the City of New Braunfels Street Inspector with all testing documentation and a certification stating that the placement of fill material has been completed in accordance with the plans. Additional density tests may be requested by the City of New Braunfels Inspector.

#### Curb Cut Due To Construction Of New Right-Of-Way Construction

Sawcut existing streets and match to new construction. Sawcut existing curb to tie into existing construction. Saw cutting existing pavement, concrete, and riprap is not paid for separately but is subsidiary to various bid items.

#### Construction Stabilized Entrance

Sawcut curb for construction entrance. Stabilized construction area shall be constructed as indicated on the plans and maintained so that construction debris does not fall within the city right-of-way. Right- of-way must be cleared from mud, rocks, etc. at all times.

#### Signing And Pavement Marking Plan Notes

The Contractor shall furnish and install all regulatory and warning signs, streets name signs and sign mounts in accordance with approved engineering plans. The City will inspect all signs at final inspection.

The Contractor shall install all pavement markings in accordance with approved engineering plans. The Contractor shall notify the City at least twenty-four (24) hours prior to the installation of all sealer and final markings. The City will inspect all markings at final application.

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved, except for roadway illumination, electrical, and traffic signal items.

The cost for materials, labor, and incidentals to provide a minimum 14'-wide driving surface for traffic across the roadway and for ingress and egress to private property in accordance with Section 7.2.4 of the standard specifications is subsidiary to the various bid items. Restore access roadways to their original condition upon completing construction.

#### **--Item 5--**

Taper ACP placed at curb inlets, traffic inlets and slotted drains.

Prior to letting, bidders may obtain a free computer diskette or a computerized transfer of files (from the Engineer's office) that contains the earthwork information.

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Provide a non-intrusive back-up alarm system on all heavy equipment used in close proximity to residential areas. This item is subsidiary to various bid items.

**--Item 6--**

Show the stockpile lot and/or sub lot numbers on all tickets for all materials.

**--Item 7--**

The project's total disturbed area is 14.05 acres. The disturbed area in all project locations and Contractor project specific locations (PSL's), within 1/4 mile of the project limits, will further establish the authorization requirements for storm water discharges. The Contractor will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any PSL's on or off the ROW. When the total area disturbed on the project and PSL's within 1/4 mile of the project exceeds 5 acres, provide a copy of the Contractor NOI for PSL's to the Engineer (to the appropriate MS4 operator when the project is on an off-state system route).

Notify the Engineer of the disturbed acreage within one (1) mile of the project limits. Obtain authorization from the TCEQ for Contractor PSL's for construction support activities on or off ROW.

No significant traffic generators events identified.

**--Item 8--**

Working days will be computed and charged in accordance with Section 6 1.1.A.9.: Calendar Day of the City Project Manual.

Create and maintain a bar chart schedule.

**--Item 9--**

Show proof of certification by the Texas Commission on Law Enforcement Standards.

All law enforcement personnel used in Work Zone Traffic Control shall be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: [www.nhi.fhwa.dot.gov](http://www.nhi.fhwa.dot.gov)

Certificates of completion should be available to all who finish the course. These should be kept by the officers in order to substantiate completion when reporting to the work site.

Indefinite Quantities shown in the plans are provided for job total quantity or as supplementary use on the project as needed, when authorized by the Engineer.

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**--Item 100--**

Begin clearing operations after trees and other areas of vegetation to be protected have been identified and approved. Install fencing around features to be protected as shown in the plans or directed. Coordinate all right of way clearing operations with the SW3P. Maintenance, mowing, cleaning of cleared ROW shall be responsibility of the Contractor throughout the entire project.

Trim and remove brush and trees as needed for construction operations. Obtain approval for proposed method of tree and brush trimming and removal. Vertical flailing equipment is not allowed. Treat damaged or cut branches, roots and/or stumps of all oak trees with a commercial tree wound dressing. Disinfect all pruning tools with a solution of 70% alcohol before moving from one tree to another. Unless otherwise approved remove all resulting vegetative debris from the ROW within 24 hours. The Engineer can stop all construction operations if the dressing, cut and removal requirements are not followed.

**--Item 110--**

Where excavation extends beyond an existing right of way fence, remove and replace the fence to a comparable condition. This work shall be considered subsidiary to the bid item.

**--Item 132--**

At no time shall the retaining wall backfill material exceed the adjacent embankment operation by more than one embankment lift. At no time will the embankment adjacent to the retaining wall backfill exceed the wall backfill by any elevation.

**--Item 160--**

Existing topsoil within the ROW may be windrowed or stockpiled (as approved) for later use under this Item. Place erosion control measures for the stockpile and/or windrow.

**--Item 162--**

Furnish and place block grass sod of the same species as the surrounding vegetation.

**--Item 164--**

Seeding for the purpose of establishing vegetation within constructed earthen channels, basins and disturbed areas shall be conducted in accordance with Item 164 (Seeding for Erosion Control) of TxDOT's Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges manual. Only seed types and mixes specified for the San Antonio District (District 15) in Tables 1 and 2 under Item 164 shall be utilized. During the Cool Season (Sept 1- Nov 30), Cereal Rye and seed species specified for the San Antonio District in Table 3 may be used. For Cool Season seeding applications, cool season seed mixes shall be used in conjunction with seed mixes for the San Antonio District as specified in Table 1 and 2 under Item 164.

It may be deemed necessary to incorporate topsoil and soil amendments (i.e. compost/ fertilizer) into existing soil in order to facilitate vegetation growth. Topsoil, compost and fertilizer

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additions shall be conducted according to Items 160, 161 and 166 of TxDOT's Standard Specifications manual, respectively.

Watering may also be necessary to facilitate and expedite the sprouting and growth of vegetation. Item 168 of TxDOT's Standard Specifications manual shall be adhered to for vegetative watering.

If extended drought conditions exist that hinder or prohibit the growth and establishment of vegetation, the contractor shall provide a plan to the City of New Braunfels describing the measures that will be taken to stabilize earthen drainage infrastructure until a time when growing conditions become more favorable.

**--Item 168--**

Apply vegetative watering as needed to supplement natural rainfall during the vegetation establishment period. Plan quantity of irrigation water is based on the application of a total of 1.3 gal of water each week for each sq. yd. of area that is sodded or seeded. Establishment time is estimated to be 12 weeks or minimum 75% establishment for both sod and permanent seed mixes. Temporary seeding will require less time for establishment. Provide a schedule and coordinate watering cycles and rates per cycle with the Engineer. Obtain approval if the quantity of water to be applied is expected to exceed the plan quantity. Adjust the amount of water applied with each cycle and the number of cycles each wk. according to actual site conditions. Drought or other conditions, as determined by the Engineer, may require the application of supplemental irrigation during hours other than normal working hours.

**--Item 247--**

Provide Flexible Base Type A Grade 1 material as approved by the City. Planned temporary asphalt may be used as base material in accordance with Geotechnical Engineering Study for Klein Road Reconstruction-Phase II South Walnut to FM 725 by Raba Kistner Consultants, Inc. on December 1, 2020, as approved by the City.

**--Item 260--**

Provide Hydrated Lime Slurry as approved by the Engineer. Compact per the owner's Geotechnical Engineer's recommendations.

**--Item 275--**

275-1 The Engineer will designate a target cement content and optimum moisture content necessary to produce a stabilized mixture that meets the strength requirements and moisture susceptibility requirements shown in Table 1. The Contractor shall furnish the Engineer with representative samples of the materials to be used in production of the cement treated base.

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Table 1  
Requirements for Cement Treatment

Description	Minimum	Maximum
Cement Content (by dry weight of base)	2%	5%
7-Day Unconfined Compressive Strength (min.) <sup>1</sup>	Tex-120-E, Part I	150 psi
Retained Strength after Moisture Conditioning (min.)	Tex-120-E, Part I (10 day capillary soak)	80% of 7—Day Unconfined Compressive Strength

Microcracking will be required in accordance with Item 275.4.7.

**--Item 310 & 316--**

Provide Prime Coat and O.C.S.T. and as approved by the Engineer.

**--Item 320—**

Construct all longitudinal ACP joints adjacent to a travel lane with a joint maker device that will create a 3:1 to 6:1 taper. For placement of 2 inches or more, the device shall provide a maximum ½ inch vertical edge. Taper outside edges (next to the grass) or backfill (shoulder-up) the same day.

Provide a material transfer device capable of providing a continuous flow of material to the paver. The material transfer device will consist of a windrow elevator or better.

**--Item 340, 341, 342, 344, 346, 347, & 348—**

Asphaltic concrete pavement shall be the type of hot mix asphalt as defined in TxDOT's standard specifications for current TxDOT Standard Specifications for Construction of Highways, Street and Bridges.

Recycled Asphalt Pavement (RAP) should be limited to 20 percent of the total weight of the mix for Types "C" and "D" mixes and 30 percent for Type "B" mixes. Any debris inclusions within new asphalt pavements will result in asphalt removal and replacement from curb to curb for limits to be determined by the City of New Braunfels.

The asphaltic concrete pavement surface course shall be plant mixed, hot laid type "D" meeting the specification requirements of TxDOT Item 341. The asphaltic concrete pavement sub-surface courses shall be plant mixed, hot laid type "B" and hot laid type "C" meeting the specification requirements of TxDOT Item 340. The mixture shall be designed per the design requirements specified in TxDOT Item 340 and shall be compacted to between 91 and 95 percent of the

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maximum theoretical density as determined by TxDOT test method TEX-227-F. Place the mixture when the roadway surface temperature is at or above 60°F. Complete all compaction operations before the pavement temperature drops below 160°F. The asphalt cement content by percent of total mixture weight shall fall within a tolerance of +0.5 percent from a specific mix design.

Table 10, in Item 340, Table 10 in Item 341 and Table 11 in Item 344, Hamburg Wheel Test Requirements tested in accordance with Tex-242-F are changed for PG 64-22 or lower and PG 70-22. Minimum number of passes at 1/2" Rut Depth, Tested at 122 degrees F will be 5,000 and 10,000 respectively.

Design all mixture types using a target laboratory-molded density of 96.5%, when the Texas Gyrator Compactor is utilized. Increase the target laboratory-molded density to 97.0% or 97.5% at the Contractor's discretion. When utilizing SGC, design all mixture types at 50 gyrations (N-Design) and a target laboratory-molded density of 96.0%, but may be reduced to no less than 35 gyrations at the Contractor's discretion.

The asphalt plant shall have truck scales as defined in Item 520. Give three weight tickets bearing the date, the truck number, the gross, net & tare weights to the truck driver for the State inspector at the spreading and finishing operation. Trucks may be required to weigh on public scales or portable platform scales to verify the weight of the ticket.

Submit a copy of the Tex 233-F production charts on a weekly basis. At the end of the ACP work, provide all originals.

Crushing of aggregate for hot mix and immediate use for production of the mix is not allowed. Stockpile the aggregate until enough material is available for five days of production unless prior approval is provided. Hold a pre-placement meeting one month prior to the placement of the hot mix.

The main purpose of hot mix cores taken by the City are for payment calculations. If (for quality control purposes) the core information is needed sooner, take additional cores.

Do not use diesel or solvents as asphalt release agents in production, transportation, or construction.

Schedule lay-down placement where uneven travel lanes are minimized and eliminated weekly.

The use of Recycled Asphalt Pavement (RAP) and Recycled Asphalt Shingles (RAS) will not be allowed on the final riding surface.

Materials testing is to be completed by the City.

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**Minimum Roadway Placement Temperature**

**--Item 340, 341, & 344--**

Place mixture when the roadway surface temperature is equal to or higher than listed in Table 1 unless otherwise approved or shown on the plans. Measure the roadway surface temperature with a hand-held thermal camera or infrared thermometer. Placement may be allowed to begin prior to the roadway surface reaching the required temperature if conditions are such that the roadway surface will reach the required temperature within 2 hrs. of beginning placement operations. Place mixtures only when weather and moisture conditions of the roadway surface are suitable in the opinion of the Engineer. The Engineer may restrict the Contractor from paving if the ambient temperature is likely to drop below 32°F within 12 hr. of paving.

Table 1  
Minimum Pavement Surface Temperatures

Specification Item Number	High Temperature Binder Grade	Minimum Pavement Surface Temperatures in Degrees Fahrenheit *	
		Subsurface Layers or Night Paving Operations	Surface Layers Placed in Daylight Operations
340, 341, & 344	PG 64	45	50
	PG 70	55	60
	PG 76	60	60

\* Except for PG 64, may pave at temperatures 10° F lower than the values shown in Table 1 when utilizing a Material Transfer Vehicle that is capable of providing a remixing, and continuous flow of material from the haul truck to the paver, such as a Roadtec SM-2500e/ex, that eliminates thermal segregation. In these cases, use either an infrared bar attached to the paver, or a hand held thermal camera or infrared thermometer, or a hand held infrared thermometer operated in accordance with Text Method 244-F to demonstrate that the uncompacted mat has no more than 10° F of thermal segregation.

**Substitute Binder**

**--Item 340, 341 & 344--**

The Contractor may use a substitute PG binder listed below in Table 1 instead of the PG binder originally specified in Table 5 of the Standard Specification, if the substitute PG binder and mixture made with the substitute PG binder meet the following:

- ◆ The substitute binder meets the specification requirements for the substitute binder grade in accordance with Section 300.2.10., “Performance-Graded Binders;” and

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The mixture has less than 10.0 mm of rutting on the Hamburg Wheel test (Tex-242-F) after the number of passes required for the originally specified binder. Use of substitute PG binders may only be allowed at the discretion of the Engineer if the Hamburg Wheel test results are between 10.0 mm and 12.5 mm

Table 1  
Allowable Substitute PG Binders and Maximum Recycled Binder Ratios

Originally Specified PG Binder	Allowable Substitute PG Binder	Maximum Ratio of Recycled Binder <sup>1</sup> to Total Binder (%)		
		Surface	Intermediate	Base
<b>HMA</b>				
76-22 <sup>2,5</sup>	70-22	20.0	20.0	20.0
	70-28	20.0	35.0	40.0
70-22 <sup>2</sup>	64-22	20.0	20.0	20.0
	64-28 or 58-28	20.0	35.0	40.0
64-22 <sup>2</sup>	58-28	20.0	35.0	40.0
76-28 <sup>2,5</sup>	70-28	20.0	20.0	20.0
70-28 <sup>2</sup>	64-28 or 58-28	20.0	20.0	20.0
	64-34 or 58-34	20.0	35.0	40.0
64-28 <sup>2</sup>	58-28	20.0	20.0	20.0
	58-34	20.0	35.0	40.0
<b>WMA<sup>3</sup></b>				
76-22 <sup>2,5</sup>	70-22	20.0	35.0	40.0
70-22 <sup>2</sup>	64-22 or 58-28	20.0	35.0	40.0
64-22 <sup>4</sup>	58-28	20.0	35.0	40.0
76-28 <sup>2,5</sup>	70-28	20.0	35.0	40.0
70-28 <sup>2</sup>	64-28 or 58-28	20.0	35.0	40.0
64-28 <sup>4</sup>	58-28	20.0	35.0	40.0

1. Combined recycled binder from RAP and RAS.
2. Use no more than 20.0% recycled binder when using this originally specified PG binder.
3. WMA as defined in Section 341.2.6.2., "Warm Mix Asphalt (WMA)."
4. When used with WMA, this originally specified PG binder is allowed for use at the maximum recycled binder ratios shown in this table.
5. No more than 1-PG grade lower than what is show on the plans will be permitted for Surface mixtures

**--Item 403--**

The Contractor and/or Contractor's Engineer who selects and designs the temporary shoring is responsible for the overall (global) stability calculations as well as internal stability and sliding calculations (including mat and soil nail pullout) as per the TxDOT Bridge Division Geotechnical Manual. If the Contractor chooses a Temporary Earth Retaining Wall for Temporary Shoring, then the Contractor and/or Contractor's Engineer is required also to provide wire struts as shown on these plans. Designs for any type of Retaining Wall used for Temporary Special Shoring shall conform to the TXDOT Geotechnical Manual Chapter 6: Retaining Walls.

**--Item 421--**

Use an automated ticket that contains the same information as TxDOT's ticket. Submit the ticket for approval prior to use. The concrete producer will contact the District Laboratory or the Engineer's Office (outside the San Antonio area) to inform TxDOT of scheduled structural

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concrete batching. Structural concrete includes bridge drill shafts, columns, caps, abutments, deck or top slabs of direct traffic culverts.

Entrained air is allowed for Class P and Class HES concrete only. Air content testing is waived for all classes of concrete.

**--Item 422--**

For construction of approach slabs, longitudinal joints shall be placed on lane lines. Joints may be either a saw-cut crack control joint or a construction joint. Saw cut joints shall terminate 1'-0" before reaching the edge of the slab, must be saw cut as soon as possible after placement of concrete, and will be cut within 12 hours of concrete placement. Once sawing begins, it should be a continuous operation and should only be stopped if raveling occurs. Saw cut will be to a depth of 1.5" and filled with approved joint sealant.

**--Item 423--**

The backfill material for pre cast retaining walls shall be approved before placement. Build stockpile(s) in lifts not to exceed 2 feet and a minimum working face of not less than 10 feet, but not more than 20 feet.

Use the approved Mechanically Stabilized Earth (MSE) wall systems listed at:  
[http://www.dot.state.tx.us/business/contractors\\_consultants/bridge/retaining\\_wall.htm](http://www.dot.state.tx.us/business/contractors_consultants/bridge/retaining_wall.htm)

When proprietary wall systems are used, a qualified representative of the retaining wall manufacturer must be available upon request during wall construction. As requested or required the manufacturer's representative must be on site to assist with the initial stages of wall construction, provide training to the Contractor wall crew and ensure proper interpretation of MSE wall shop drawings and details. Specific attention must be given to nonstandard wall installation details. The Contractor's wall crew foreman must be on site for the duration of wall construction. Any change to the wall crew foreman may require additional training by the wall supplier. The Contractor will ensure that the retaining walls are installed per the details presented in the construction drawings and as per the proprietary wall system requirements. The Engineer reserves the right to suspend wall construction activities due to any construction issue encountered.

Horizontal and vertical nail spacing on temp or permanent soil nail walls shall not exceed 4 ft.

Type DS material will be required on MSE walls in the area of the reinforcement mats.

**--Item 432--**

432-1 In all riprap slopes, provide 3 inch diameter weep holes at 10 foot maximum spacing and backed with loose graded gravel or crushed stone and galvanized hardware cloth.

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432-2 In areas where guard fence posts are to be placed in riprap, the riprap shall have an 18 inch +/-blocked out area (round or square). Blocked out areas shall be backfilled with 2 sack flowable backfill and considered subsidiary to the various bid items.

**--Item 465--**

Concrete Class B invert shaping is required at all inlets, manholes and junction boxes in order to insure positive flow. The material and work performed for the placement of the inverts shall be considered subsidiary to this item.

Provide for the safety and health of employees and abide by all OSHA Standards and Regulations. All costs incurred for proper management, shall be subsidiary to this Item.

**--Item 496--**

The Contractor will submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496.

**--Item 500--**

"Materials on Hand" payments will not be considered in determining percentages for mobilization payments.

**--Item 502—**

Prior to beginning construction, the City shall approve the routing of traffic and sequence of work.

Additional signs and barricades as directed by the Engineer shall be considered subsidiary to Item 502.

Construct the project in phases per the Traffic Control Plan in phase order. The Contractor shall not begin construction on a subsequent phase until the active phase is considered complete. A phase is considered complete when all pavement section layers except final riding surface have been constructed; substantially useable sidewalk and driveways have been constructed; and vegetation re-establishment has begun.

The Contractor shall limit impacts to individual driveways to a 3-day turnaround time from demolition to poured concrete. The Contractor shall maintain access to each driveway during construction except during this 3-day period. Construct temporary ramps to maintain access to driveways and city streets as directed by the Engineer. Temporary ramp construction is subsidiary to Item 502.

Place standard markings no later than 14 days after surface treatment operations are completed.

When advanced warning flashing arrow panels and/or changeable message sign is specified, have one standby unit in good condition at the job site. Standby time shall be considered

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subsidiary to the bid item. The use of police officers for traffic control shall be considered subsidiary to the bid item.

Treat the pavement drop-offs as shown in the TCP.

After written notification, the time frame to provide properly maintained signs and barricades before considered in non-compliance is 48 hours from receipt of the notification. Failure to make corrections as noted may result in payment for this item being withheld.

There are traffic signals at the intersection of Klein Rd and FM 725. Keep the signals in operation except when necessary for specific installation operations.

Moving an existing sign to a temporary location is subsidiary to this Item. Installations with permanent supports at permanent locations will be paid for under the applicable bid item (s).

Mount temporary mailboxes on plastic drum in accordance with Compliant Work Zone Traffic Control Devices, Section K. Temporary mailboxes shall be located for postal delivery by vehicle at all times. Mounting and moving the mailbox as needed for the various construction phases is subsidiary to this Item.

Notify the Engineer in writing 10 business days in advance of any temporary or permanent lane, closures/detours, restrictions to lane widths, alterations to vertical clearances, or modifications to radii. Any other modifications to the roadway that may adversely affect the mobility of oversized/overweight trucks also require 10 business days advance written notice to the Engineer. Unless shown in the TCP, no lane closures are allowed during special events. Lane closures will not be allowed if this reporting requirement is not met.

Avoid placing stockpiles within the roadway's horizontal clear zone. If a stockpile is placed within the clear zone, address in accordance with the TMUTCD.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 2 hours or within a reasonable time frame as specified by the Engineer.

If Nighttime work is required and work is not behind positive barrier then full TY 3 reflective gear is required to be worn by all workers, hard hat halos are required to be worn by the flaggers at flagging stations, TY III barricades are required to be spaced at 500 ft, and a mandatory night work meeting is required.

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Prior to beginning construction, the Engineer shall approve the routing of traffic and sequence of work.

Additional signs and barricades as directed by the Engineer shall be considered subsidiary to Item 502.

Wash the channelizing devices and barricades following each rainfall or snowfall event and at times deemed necessary by the Engineer.

Fill any holes left by barricade or sign supports and restore the area to its original condition. "Sidewalk Closed" (R9-9) signs are to be used while work is ongoing. See TxDOT standard WZ(BTS-2)-13 for more details.

**--Item 506--**

An Inspector will perform a regularly scheduled SWP3 inspection every 7 calendar days.

Failure to address items noted on the SW3P inspection report within two report cycles may result in the Department stopping all construction operations, exclusive of time charges, or withholding that month's estimate until the SW3P deficiencies are corrected unless the Engineer determines that the area is too wet to correct SW3P deficiencies.

Erosion control logs, sandbags and other BMPs will be placed and relocated as directed by the Engineer in order to comply fully with the SW3P requirements.

Water pumped off the project must have sediment and any other solids in suspension removed before discharging.

**--Item 529--**

Class "C" concrete is required for machine extruded curb.

**--Item 530--**

Use Class A Concrete for all concrete driveways.

Contractor is responsible for notifying residents at least 72 hours in advance prior to excavating driveways. Contractor should not take longer than 3 days to complete the construction of the driveways once excavation begins, weather pending.

**--Item 531--**

The curb ramp locations shown in the plans have taken into account the geometric features of the intersection, utilities, signage, and pavement markings. If anything changes during construction, the location of curb ramps must be adjusted to ensure they meet PROWAG requirements.

Truncated dome pavers are prohibited.

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All detectable warning surfaces are to be prefabricated panels constructed of cast iron or composite materials of contrasting color to the surrounding material, as approved by the Engineer.

Proposed curb ramps, sidewalks, curbs, and riprap are to be doweled 6-in minimum, unless otherwise shown, into existing concrete using ½-in reinforcement placed on 12-in centers.

Curb wall along ramps and landings, unless otherwise shown on the plans, is not paid for separately but is subsidiary to the ramp or landing. If the wall extends above the plane of the landing, retaining wall (unless otherwise noted on the plans) should be utilized. Retaining wall quantities are shown for Contractor information only, payment is subsidiary to Item 531 Sidewalks. See special details sheets for more information.

Each planar element along the accessible route indicates the maximum slope and cross slope for that element as defined in the plans – in many cases the element can be constructed to achieve the design intent at or below the maximum slope for that element. With the approval of the Engineer, the Contractor may extend the length of ramps or sloped sidewalks to the next planar element (level sidewalk, landing, transition, or driveway) or until the point at which the ramp or sloped sidewalk reaches the height of the adjacent curb, whichever is shorter, in order to achieve the design intent.

Construct compliant curb ramps based upon referenced design criteria, PROWAG and TxDOT Pedestrian Facilities Standards. All intersection corners are unique and it may be necessary to use various combinations of ramp elements to achieve a compliant ramp configuration.

Any approval, inspection, or checking of the Contractor's layout and the acceptance of all or any part of it shall not relieve the Contractor of his responsibility to secure the proper dimensions, grades and elevations of the various parts of the work.

The furnishing and installation of pipe underdrains, filter material, and other incidentals to ensure proper drainage of special concrete sidewalk with retaining wall per Concrete Sidewalk (Special)(Type B) will not be paid for directly but shall be considered subsidiary to this bid item and in accordance with Item 531.

Removal of existing concrete, surfaces, asphalt, base material, sign posts, miscellaneous materials, and all incidentals is included in this pay item within the footprint of the proposed work. If additional work related to the removal of existing is required beyond the quantity identified for Contractors information only, no additional payment will be made.

In areas where there is no curb fillet or concrete pavement, saw cut the existing curb and gutter and remove the curb.

For curb ramps, form tooled joints on each side of the ramp section where it meets a flare or curb wall, at each break in ramp slope or geometry, and at intervals equivalent to the width of the

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sidewalk for the purpose of cracking control. Place expansion joint material between proposed ramps and existing concrete; between proposed sidewalk and utility poles, guy wires, vent pipes, stand pipes and as directed.

**--Item 560--**

Move and replace all mailboxes within the project limits such that they may be served by the mail carrier from a vehicle at all times during and after construction. This work will be considered subsidiary to the various bid items of this contract.

If a permanent (concrete or brick) mailbox is called out to be relocated, rebuild and reset the existing mailbox in the proposed location.

MBGF posts shall be round with domed tops, and not painted. If 10 or less timber posts are needed, they may be purchased locally and will be accepted by visual inspection.

Guard fence posts placed in proposed and/or existing areas of riprap, sidewalks or other concrete shall have an 18 inch +/- (square or round) block out in the concrete. After the posts are installed, the blocked out area shall be topped off with 4 inches of low strength grout/mortar consisting of about 1 sack of cement per cubic yard of mix.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding 1/2" from the edge of the hole.

**--Item 666--**

Use TY II material (vs. an acrylic or epoxy) as the sealer for the TY I markings, place the TY II a minimum of 14 calendar days (to provide adequate curing) before placing the TY I markings.

Median nose pavement marking materials are to be approved by the Engineer.

**--Item 672--**

Place all adhesive material directly from the heated dispenser to the pavement. Do not use portable or non-heated containers. Use adhesive of sufficient thickness so that when the marker is pressed into the adhesive, 1/8" or more adhesive will remain under 100% of the marker. The adhesive should extend not less than 1/2" but not more than 1 1/2" beyond the perimeter of the marker.

**--Item 677--**

Obtain approval before using the mechanical method for the elimination of existing thermoplastic pavement markings.

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**--Item 680--**

Furnish and install all required materials and equipment necessary for the complete and operating traffic signal installation at the following intersections:

1. FM 725 at Klein Rd

All workers installing electrical materials, including conduit in trenches, service poles and all other system electrical apparatus, will be directly supervised by persons who have completed a TxDOT approved course in electrical underground installations. Furnish evidence of satisfactory completion of the underground electrical installation for roadway illumination and signal control course for all personnel responsible for direct supervision of electrical installation work.

The locations shown on the plans for signal pole foundations, controller foundations, conduit and other items may be adjusted to better fit field conditions as approved.

Use LED lamps from the prequalified material producer lists as shown on the Texas Department of Transportation (TxDOT) – Construction Division’s (CST) material producer list. Category is “Roadway Illumination and Electrical Supplies.” under item 610. No substitutions will be allowed for materials found on this list.

Demonstrate that the field wiring is properly installed, install the controller assembly, connect the wiring and turn on the controller.

All existing signal equipment with the exception of the signal controller and related equipment become the property of the Contractor. Deliver the controller and related equipment to the Signal shop, located at 4615 NW Loop 410 (corner of IH 410 and Callaghan Road) in San Antonio, Texas or to the Area Office as directed.

**--Item 682--**

Provide all signal heads from the same manufacturer. Pedestrian signals may be by a different manufacturer than the vehicle signal heads.

Cover all signal faces until placed in operation.

All pedestrian signal faces shall be single section LED Type. Die cast polycarbonate is acceptable in lieu of die cast aluminum. All mounting attachments shall be constructed of steel pipe and mounted as shown on the plans.

**--Item 684--**

Provide an extra 10’ for each cable terminating in the controller cabinet. All cables shall be continuous without splices from terminal point to terminal point. All proposed traffic signal cable shall be #12 AWG stranded copper.

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**--Item 686 & 687--**

Provide all signal poles from the same manufacturer. Pedestrian poles may be from a different manufacturer.

**--Item 2005--**

The furnishing and installation of the sand cushion in the proposed sidewalks, sidewalk ramps and driveways will not be paid for directly but shall be considered subsidiary to this bid item. Contractor shall submit to the Engineer the material to be used for approval prior to installation.

**--Item 6001--**

Provide messages as directed by the Engineer.

Provide 3 solar powered changeable message signs for this project. Keep the portable changeable signs during the Phase 1 of construction only; to be removed with the removal of Phase 1 detour plan.

**Subsidiary**

Contractor shall control and cut any overgrown weeds, grasses, trees within the prepared ROW throughout the entire project.

All safety concrete barricades, or other, and fall protection shall be subsidiary to any bore pits, receiver pits, trenches to keep the traveling public safe.