

SIGLER, WINSTON, GREENWOOD & ASSOCIATES

SPECIFICATIONS FOR LMWD Parking Lot Reconstruction Port Isabel, Texas

Prepared By:

SWG Engineering, LLC

611 Bill Summers Intl. Blvd.

Weslaco, Texas 78596

Tel: 956-968-2194

Fax: 956-968-8300

Firm Registration No. F-592

13/18/2024

Table of Contents

GENERAL CONSTRUCTION SPECIFICATIONS.....	1
FLEXIBLE BASE	4
CONCRETE PAVEMENT	5
GEOGRID.....	13

GENERAL CONSTRUCTION SPECIFICATIONS

Intent of Plans and Specifications

The intent of the plans and specifications is to prescribe a complete work or improvement which the contractor undertakes to do, in full compliance with the plans, specifications, special provisions, proposal and contract. The Contractor shall do all work as provided in the plans, specifications, special provisions, proposal and contract and shall do such additional work as may be considered necessary to complete the work in a satisfactory and acceptable manner. The contractor shall furnish all labor, tools, materials, machinery, equipment and incidentals necessary to the prosecution of the work.

Final Clean-Up

Upon the completion of the work and before acceptance and final payment will be made, the Contractor shall clean and remove from the site of the work, surplus and discarded materials, temporary structures and debris of every kind. He shall leave the site of the work in a neat and orderly condition equal to that which originally existed. Surplus and waste materials removed from the site of the work shall be disposed of at locations satisfactory to the Engineer. Grounds around any structures shall be dressed to final grade as shown on plans.

Coordination of Project

The plans, these specifications, the proposal, special provisions, and all supplementary documents are intended to describe a complete work and are essential parts of the contract. A requirement occurring in any of them is binding. In case of discrepancies, figured dimensions shall govern over specifications; special provisions shall govern over both general and standard specifications; and plans and quantities shown on the plans shall govern over those shown in the proposal. The Contractor shall not take advantage of any apparent error or omission in the plans and specifications, and the Engineer shall be permitted to make such corrections or interpretations as may be deemed necessary for the fulfillment of the intent of the plans and specifications. In the event the Contractor discovers an apparent error or discrepancy, he shall immediately call this to the attention of the Engineer.

Cooperation of Contractor

The Contractor shall give to the work the consistent attention necessary to facilitate the progress thereof, and he shall cooperate with the Engineer, his inspectors, and with other contractors in every way possible.

Wages

All employees directly employed on the work shall be paid the prevailing wage scale for work of a similar character in this locality. Minimum wage scale is also included in these

specifications.

Materials - General

The materials shall be the best procurable, as required by the plans, specifications, and special provisions. The contractor shall not start delivery of materials until the Engineer has approved the source of supply. Only materials conforming to these specifications shall be used in the work, and such materials shall be used only after approval has been given by the Engineer and only so long as the quality of said materials remains equal to the requirements of the specifications. The Contractor shall furnish approved materials from other sources, if for any reason the product from any source at any time before commencement or during the prosecution of the work proves unacceptable. After approval, any material which has become mixed with or coated with dirt or any other foreign substances during its delivery and handling will not be permitted to be used in the work.

Material Storage

Any and all materials, such as cement, lime, mill work, or other materials or equipment subject to deterioration by exposure to weather or other factors, shall be stored in such a manner to protect them from deterioration or damage preceding the time they become a permanent part of final structures.

“Or Equal Clause”

Whenever a material or article required is specified or shown on the plans by using the name of the proprietary product, or of a particular manufacturer or vendor, any material or article which will perform adequately the duties imposed by the general design will be considered equal and satisfactory, provided the material or article so proposed is of equal substance and function, and only after written approval by the Engineer.

Construction Joints

Construction joints are to be kept to a minimum number, but when necessary they shall be designed in the plans or upon the approval of the Engineer. When pouring is stopped, dowels and 6-inch dumbbell Serviced polyvinyl plastic water stops are to be inserted. Construction joints in walls shall be horizontal, unless otherwise allowed by the Engineer.

Wall and Floor Openings

Openings may be left in walls and floors while forms are being built, so that piping or wall sleeves may later be inserted in the openings when piping is put in place. Provision shall be made in these openings for concreting the piping and thimbles securely in place so that watertight joints will be secured.

Painting

All exposed metal surfaces of every nature, such as pumps, piping, general equipment, window frames, valves, fittings, grating, etc., shall receive one rust inhibitive primer coat followed by two coats of machinery enamel. Colors for enamel finish coats to be selected by Owner or

Engineer.

All wood surfaces are to receive one primer coat and two coats of first grade outside oil paint. Colors to be selected by Owner or Engineer.

Disinfection of New or Repaired Facilities, Waterworks Construction Only

When repairs are made to existing mains or when new main extensions are provided, they must be disinfected using such amounts of chlorine or chlorine compounds as to fill the repaired or new mains and appurtenances with water containing 40-60 ppm chlorine. After the water containing this amount of chlorine, which is greater than that normally present in drinking water, has been in contact with the pipe and appurtenances at least six hours, the water shall be replaced with water to be transported normally, and samples of water from the new or repaired facilities submitted to laboratories for bacteriological examination so as to be assured that the disinfection procedure was effective. Foregoing shall also apply to treatment plant basins, piping, conduits, filters, clear wells, etc. Procedure will be under the direction and supervision of the consulting Engineer.

FLEXIBLE BASE

Flexible base material to be furnished for this project shall consist of crushed limestone base meeting the requirements for Type "A" Grade 1, Item 247 of the 2004 Texas Standard Specifications. The flexible shall be worked and compacted to 95% of Modified Proctor Density (ASTM D-1557). The allowed moisture parameters are -1 to +3% from optimum moisture.

NOTE for Soils Laboratory: No testing should be allowed over unfinished grade elevation; in addition, contractor must present a polished surface.

Once the Flexible base passes compaction, it must be maintained at optimum moisture until it is primed and prepared for pavement.

Payment for Flexible Base shall be made at the unit price bid per square yard installed in place included but not limited to all labor, materials, tools, equipment, and incidentals necessary to lay and install the Flexible Base to the thickness specified in the plans. Subsidiary to payment for the flexible Base material shall be all sprinkling and rolling necessary to compact and shape the Flexible Base to grade and thickness specified in the plans.

CONCRETE PAVEMENT

Subgrade

The subgrade shall conform to the lines, grade, and cross sections shown on the plans. All soft and yielding material and portions of the subgrade that will not compact readily when rolled or compacted shall be removed and replaced with suitable material.

The top six (6) inches of the subgrade shall be stabilized with hydrated lime in accordance with THD 1982 Standard Specifications Item 260. The quantity of lime should be determined after the site is stripped of the loose topsoil and the subgrade soils are exposed. A minimum of three (3) percent hydrated lime will be required.

The subgrade shall be compacted to a minimum of 95 percent of the standard moisture density relation (ASTM D 698) at above the optimum moisture content.

Concrete

Concrete shall be composed of Portland Cement, sand, and gravel thoroughly mixed to such proportions as will result in a dense concrete having a compressive strength of not less than three thousand (4,000) pounds at twenty-eight (28) days, or greater if so designated on the plans or prescribed elsewhere in the specifications.

Cement for use in concrete shall conform to the requirements of the current “Specifications for Portland Cement”, ASTM Designation C-150, of the type shown on the plans or prescribed herein. Only one brand or type of cement shall be used in any one structure unless authorized in writing by the Engineer.

Sand and gravel shall be clean, hard, dense, durable, uncoated inorganic rock fragments free from injurious amounts of clay, loam, silt, and other deleterious substances, and shall fall within the following limits of gradation:

Percentage by Weight Passing

Sand

<u>Sieve Size</u>	<u>Min.</u>	<u>Max.</u>
No. 4	75	100
No. 8	60	90
No. 16	45	80
No. 30	30	60
No. 50	6	30
No. 100	0	4

Gravel

<u>Sieve Size</u>	<u>Maximum Size</u>			
	<u>1-1/2"</u>	<u>1"</u>	<u>3/4"</u>	<u>1/2"</u>
1-1/2"	95-100			
1"	45- 85	95-100		
3/4"	25- 70	50- 80	95-100	
1/2"	10- 40	25- 50	35- 80	75-100
3/8"	5- 18	10- 30	15- 50	30-80
No. 4	0- 4	0- 5	0- 5	0-8

Water used in mixing concrete or mortar shall be reasonably clean and free from injurious amounts of oil, alkali, organic matter or other deleterious substances. In general, water which is suitable for drinking or ordinary household use will be acceptable for use in mixing concrete or mortar.

Unless otherwise specified or shown on the plans, gravel conforming to the 1-1/2" maximum size shall be used.

Reinforcing Steel

Steel bars for reinforcing shall be "high bond" deformed bars of intermediate or Hard Grade conforming to the current specifications for "Billet Steel Bars for Concrete Reinforcement", ASTM Designation A-15 and A-305, and when placed in the work shall be free from dirt, rust, mill scale, grease, oil, or other foreign matter that will reduce the bond.

All bars shall be accurately placed as shown on the plans or directed by the Engineer, and shall be secured in place by teeing at intersection with annealed wire of not less than No. 18 gauge or suitable clips approved by the Engineer. Bars shall be supported by approved chairs, or spacers. Metal chairs, or clips, the ends of which will be exposed on the concrete surface, will be permitted only where the surface will not be exposed to weathering and where discoloration will not be objectionable; elsewhere concrete or other approved means shall be used for supporting reinforcement.

Steel bars for reinforcement shall be bent cold to the shapes shown on the plans or designated by the Engineer. Where reinforcing bars are spliced, a lap of not less than 30 times the nominal size of the reinforcement shall be provided.

Bends for stirrups and ties shall be made around a pin having a diameter of not less than two times the minimum thickness of the bar. Bends for other bars shall be made around a pin having a diameter of not less than six times the minimum thickness of the bar, except for bars larger than No. 8, the pin shall be not less than eight times the maximum thickness of the bar. Heating of reinforcement or bending by makeshift methods will not be permitted, and bars having

“kinks” not required will not be used.

All bars shall be marked with identifying metal tags.

Welded wire fabric shall be cold drawn wire conforming to the current specifications for “Welded Steel Wire Fabric for Concrete Reinforcement”, ASTM A-185, and the current specification for “Cold-Drawn Steel Wire for Concrete Reinforcement”, ASTM A-82.

The Contractor shall submit shop and installation drawings of all metal reinforcement for the approval of the Engineer before commencing any reinforced concrete work.

Forms

Forms to confine the concrete to the required shapes, line, grade, and dimensions shall be used wherever necessary. All exposed concrete surfaces having slopes of one to one (1:1) or steeper shall be formed. All forms shall be of sufficient strength and rigidity, and shall be sufficiently anchored and braced to withstand deflection while concrete is being poured and consolidated by tamping or vibrating. The surface of all forms in contact with concrete shall be smooth and sufficiently tight to prevent leakage of mortar, and shall be thoroughly coated with non-staining oil or covered with paper prior to pouring concrete.

Concrete Mixing

The Engineer will have samples of all cement and aggregate to be used in the various parts of the work tested by an independent laboratory in accordance with the methods recommended currently by the ASTM for testing such materials, and the results of these tests shall be available to the Engineer prior to the use of the materials.

After the materials have been tested, the proportions of cement, aggregate, and water to be used in mixing shall be determined by the testing laboratory so as to produce concrete and mortar of the strength prescribed for the various elements of the work, but in no case shall the mix contain less than five and one-half (5-1/2) sacks of cement per cubic yard of concrete. Only sufficient water will be used to provide a workable mix, but in no event shall the water-cement ratio exceed 6-3/4 gallons per sack of cement.

The testing laboratory shall be selected by the Owner and Engineer. The Owner shall pay for the cost of all laboratory work.

Admixes that will reduce shrinkage, increase workability, reduce absorption, or otherwise improve the quality of the concrete, may be used when so authorized in writing by the Engineer, and the proportion of admix so used shall not exceed that designated by the Engineer.

All concrete shall be thoroughly mixed in a batch mixer of approved design. The mixing of each batch shall continue at least one and one-half (1-1/2) minutes after all materials except the full charge of water are in the mixer, during which time the mixer shall rotate at the speed for which

it was designed. Only those methods of transporting and placing that will deliver into the work concrete of the required consistency without segregation, and without objectionable porosity, will be permitted.

The Contractor shall enforce uniformity of mixes and provide concrete mix, and give full assistance for slump, or compression tests when the Engineer so requests. Maximum slump shall be 4".

Placing and Finishing

The concrete shall be deposited on a moist grade in such manner as to require as little re-handling as possible. Placing shall be continuous between transverse joints without the use of intermediate bulkheads. Necessary hand spreading shall be done with shovels, not rakes. Workmen shall not be allowed to walk in the freshly mixed concrete with boots or shoes coated with earth or foreign substances.

Concrete shall be thoroughly consolidated against and along the faces of all forms and along the full length and on both sides of all joint assemblies. Vibrators shall not be permitted to come in contact with a joint assembly, the grade, or a side form. The vibrator shall never be operated longer than 15 seconds in any one location.

Concrete shall be deposited as near to expansion and contraction joints as possible without disturbing them, but shall not be dumped onto a joint assembly.

The sequence of operations shall be the strike off and consolidation, floating if necessary, straight edging, and final surface finish. The pavement shall be struck off and consolidated with a mechanical finishing machine, vibrating screed, or by hand-finishing methods when approved by the Engineer. A slip form paver may be used.

In general, adding water to the surface of the concrete to assist in finishing operations shall not be permitted. If it is permitted, it shall be applied as a fog spray with approved spray equipment.

After the pavement has been struck off and consolidated, it shall be scraped with a straightedge 10 ft. long equipped with a handle to permit operation from the edge of the pavement. Any excess water and laitance shall be removed from the surface of the pavement. The straightedge shall be operated parallel to the centerline of the pavement and shall be moved forward one-half its length after each pass. Irregularities shall be corrected by adding or removing concrete. All disturbed places shall be again straightedge. The use of long-handled wood floats shall be confined to a minimum; they may be used only in emergencies and in areas not accessible to finishing equipment.

Before final finishing is completed and before the concrete has taken its initial set, the edges of the slab and curb shall be carefully finished with an edger of the radius shown in the plans.

A burlap drag or broom shall be used for final finishing. The burlap drag shall be at least 3 ft.

wide and long enough to cover the entire pavement width. It shall be kept clean and saturated while in use. It shall be laid on the pavement surface and dragged in the direction in which the pavement is being placed. For a broom finish, a stiff bristled broom shall be drawn from the center to the edge of the pavement with adjacent strokes slightly overlapping to produce surface corrugations of uniform appearance and about 1/16 in. in depth.

The contractor shall have always available materials to protect the surface of the plastic concrete against rain. These materials shall consist of burlap, curing paper, or plastic sheeting. When slip form construction is being used, materials such as wood planks or forms to protect the edges of the pavement shall also be required.

Curing

Concrete shall be cured by protecting it against loss of moisture, rapid temperature change, and mechanical injury for at least 3 days after placement. Moist curing, waterproof paper, white polyethylene sheeting, white liquid membrane compound, or a combination thereof may be used. After finishing operations have been completed, the entire surface of the newly placed concrete shall be covered by whatever curing medium is applicable to local conditions and approved by the engineer. The edges of concrete slabs exposed by the removal of forms shall be protected immediately to provide these surfaces with continuous curing treatment equal to the method selected for curing the slab and curb surface.

The contractor shall have at hand and ready to install before actual placement begins the equipment needed for adequate curing.

Moist curing shall be accomplished by a covering of burlap or other approved fabric mat used singly or in combination. Curing mats shall be thoroughly wet when applied and kept continuously wet and in intimate contact with the pavement surface for the duration of the moist-curing period. Burlap or fabric mats shall be long enough to cover the entire width and edges of the pavement lane and lapped at joints to prevent drying between adjacent sheets.

Waterproof paper or white polyethylene sheets shall be in pieces large enough to cover the entire width and edges of the slab and shall be lapped not less than 18 in. The paper or polyethylene shall be adequately weighted to prevent displacement or billowing due to wind, and material folded down over the side of the pavement edges shall be secured by a continuous bank of earth. Tears or holes appearing in the paper or polyethylene during the curing period shall be immediately repaired.

The membrane method of curing shall be applied behind the final finishing operation after all free water has disappeared from the surface. Complete and uniform coverage at the required rate of 150 sq. ft. per gallon shall be required. The compound shall be kept agitated to prevent the pigment from settling, and it shall be applied to the pavement edges immediately after the forms have been removed. Membrane curing will not be permitted in frost-affected areas on paving that will be exposed to de-icing chemicals within 30 days after completion of the curing period.

Except by specific written authorization, concreting shall cease when the descending air temperature in the shade and away from artificial heat falls below 40 deg. F. It shall not be resumed until the ascending air temperature in the shade and away from artificial heat rises to 35 deg. F.

When concrete has been placed in cold weather and the temperature may drop below 35 deg. F., straw, hay, insulated curing blankets, or other suitable material shall be provided along the line of work. Whenever the air temperature may reach the freezing point during the day or night, the material shall be spread over the concrete deep enough to prevent freezing of the concrete. Concrete shall be protected from freezing temperatures until it is at least 10 days old. Concrete injured by frost action shall be removed and replaced at the contractor's expense.

Joints

Contraction joints, expansion joints, and all longitudinal joints shall be placed as indicated in the plans. Transverse construction joints shall be used as required. Transverse joints shall extend continuously through the pavement and curb.

Transverse contraction joints shall consist of planes or weakness created by forming or cutting grooves in the surface of the pavement. They shall be equal to at least one-fourth the depth of the slab.

1. Transverse strip contraction joints shall be formed by installing a parting strip to be left in place.

2. Formed grooves shall be made by depressing an approved tool or device into the plastic concrete. The tool or device shall remain in place until the concrete has attained its initial set and shall then be removed without disturbing adjacent concrete.

3. Sawed contraction joints shall be created by sawing grooves in the surface of the pavement with an approved concrete saw. After each joint is sawed, the saw cut and adjacent concrete surface shall be thoroughly cleaned.

Sawing of the joints shall begin as soon as the concrete has hardened sufficiently to permit sawing without excessive raveling, usually 4 to 24 hours. All joints shall be sawed before uncontrolled shrinkage cracking occurs. If necessary, the sawing operations shall be carried on both day and night, regardless of weather conditions. A standby saw shall be available in the event of breakdown.

The sawing of any joint shall be omitted if a crack occurs at or near the joint location before the time of sawing. Sawing shall be discontinued if a crack develops ahead of the saw. In general, all joints shall be sawed in sequence. All contraction joints in lanes adjacent to previously constructed lanes shall be sawed before uncontrolled cracking occurs. If extreme conditions make it impracticable to prevent erratic cracking by early sawing, the contraction joint groove shall be formed before initial set of concrete, as provided above.

4. Transverse formed contraction joints shall consist of a groove or cleft extending downward from and normal to the surface of the pavement. These joints shall be made while the concrete is plastic by an approved mechanically or manually operated device to the dimensions indicated in the plans.

Transverse construction joints of the type shown in the plans shall be placed whenever the placing of concrete is suspended for more than 30 minutes. A butt joint with dowels or a thickened-edge joint shall be used if the joint occurs at the location of a contraction joint. Keyed joints with tie bars shall be used if the joint occurs at any other location.

Transverse expansion joints shall consist of a vertical expansion joint filler placed in a butt-type joint with or without dowel bars as shown in the plans. The expansion joint filler shall be continuous from form to form, shaped to the subgrade, curb section, and to the keyway along the form. Preformed joint filler shall be furnished in lengths equal to the pavement width or equal to the width of one lane. Damaged or repaired joint filler shall not be used unless approved by the engineer.

The expansion joint filler shall be held in a vertical position. An approved installing bar or other device shall be used if necessary to ensure proper grade and alignment during placing and finishing of the concrete. Finished joints shall not deviate in horizontal alignment more than 1/4 in. from a straight line. If joint fillers are assembled in sections, there shall be no offsets between adjacent units. No plugs of concrete shall be permitted anywhere within the expansion space.

Longitudinal joints shall consist of planes of weakness created by forming or cutting grooves in the surface of the pavement. They shall be equal to at least one-quarter the depth of the slab plus 1/2 inch

1. Sawed longitudinal joints shall be sawed grooves made with a concrete saw after the concrete has hardened. The joint may be sawed at any time before use by construction traffic or before opening if construction traffic does not use the pavement.

2. Longitudinal groove joints are formed in the same manner as transverse formed groove joints.

3. Longitudinal strip joints are formed in the same manner as transverse strip joints.

4. Longitudinal construction joints shall be of the dimensions shown in the plans. Where a key is required, it shall be constructed by forming when the first lane adjacent to the joint is placed. These joints shall be finished with an edger of the radius shown in the plans. When placing the second slab, concrete must not be left overhanging the lip formed in the first slab by the edging tool.

Joints to be sealed shall be filled with joint-sealing material before the pavement is opened to traffic and as soon after completion of the curing period as is feasible. Just before sealing, each joint shall be thoroughly cleaned of all foreign material, including membrane curing compound, and joint faces shall be clean and surface-dry when seal is applied. Material for seal applied hot

shall be stirred during heating to prevent localized overheating.

The sealing material shall be applied to each joint opening in accordance with the details shown in the plans or as directed by the engineer. The joint filling shall be done without spilling material on the exposed surfaces of the concrete. Any excess material on the surface of the concrete pavement shall be removed immediately and the pavement surface cleaned. The use of sand or similar material to cover the seal shall not be permitted. Joint-sealing material shall not be placed when the air temperature in the shade is less than 50 deg. F., unless approved by the engineer.

Measurement and Payment

The quantity of pavement laid shall be the number of square feet of full-depth pavement. The number of square feet shall be determined by the engineer after construction of the pavement has been completed.

The quantity of accepted pavement shall be measured as above provided and shall be paid for at the contract unit price per square foot bid as called for in the proposal. This price shall constitute full compensation for furnishing and preparation of all materials, including all joints, joint filler, curb, curb and gutters, dowels, and reinforcing if required in the construction drawings or special provisions; placing, finishing, curing; and all labor, equipment, tools, incidentals, and testing necessary to complete these items.

Opening to Traffic

The engineer shall decide when the pavement shall be opened to traffic. It shall not be opened to traffic until the field-cured concrete has attained a flexural strength of 550 psi, or a compressive strength of 3,500 psi. If such tests are not conducted, the pavement shall not be opened to traffic until 14 days after the concrete was placed. Before opening to traffic, the pavement shall be cleaned.

GEOGRID BASE REINFORCEMENT FOR FLEXIBLE PAVEMENT

IF REQUESTED ONLY

The Contractor shall install on top of the subgrade just prior to placement of the flexible base course in those sections as shown on the plans a layer of Tensar TRIAX TX 140 Geogrid base reinforcement as manufactures by Tensar Earth Technologies, Inc., of Morrow, GA, and distributed by Con Tech Construction Products, Inc., or approved equal.

Tensor Geogrid is designed to confine and strength the caliche (aggregate) base because of its combination of open grid structure and tensile modulus which prevents base particle movement.

Tensar Geogrid is a reinforcement product made from virgin polymer resins, which are manufactured so as to align the polymer's long-chain hydrocarbon molecule into a prestressed grid structure with a high tensile modulus. This means high reinforcing strength with very little strain or stretch in the grid, and very little pavement deflection.

The Geogrid is to be drawn from a single, punched sheet of polymer, the junctions between the longitudinal and transverses ribs are an integral part of the grid structure. The Geogrid shall have large apertures and along with high junction strength just noted, shall be able to receive and provide excellent aggregate interlocking and confinement. The Geogrid shall have strength and mass needed to resist installation stress without impairing performance capabilities, and the Geogrid shall be extremely resistant to chemical or biological attack, providing long service life without deterioration.

Other manufactures, other then Tensar, wishing their Geogrid to be considered, shall submit information in equivalent details as provided by Tensar, at least one (1) week prior to accepting bids, to Sigler, Winston, Greenwood & Associates., SWG Engineering, for evaluation.