

**ADOPTED 07-27-04**

LIBERTY COUNTY  
ROAD & DRAINAGE  
STANDARDS  
FOR  
SUBDIVISIONS  
&  
DEVELOPMENT

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**A RESOLUTION AND ORDER OF THE COMMISSIONERS COURT OF LIBERTY COUNTY, TEXAS ADOPTING ROAD AND DRAINAGE STANDARDS FOR SUBDIVISIONS AND DEVELOPMENTS IN LIBERTY COUNTY, TEXAS**

WHEREAS, Liberty County (the County) is a governmental agency; and

WHEREAS, the Liberty County Commissioners Court have determined there exists a need for road and drainage standards for subdivisions and development in Liberty County, Texas; and

WHEREAS, the new road and drainage standards for subdivisions and development in Liberty County, Texas shall supersede all existing road and drainage standards heretofore passed by the Commissioner Court.

NOW, THEREFORE, BE IT ORDERED BY THE COMMISSIONERS COURT OF LIBERTY COUNTY, TEXAS, THAT:

1. Findings. The recitations hereinafter are found to be true and correct.
2. Approval of Adopting Road and Drainage Standards for Subdivisions and Development in Liberty County, Texas. The road and drainage standards for subdivisions and development are attached and made a part hereof for all purposes as Exhibit "A". The road and drainage standards are approved, confirmed and ratified, and the County Judge is hereby authorized and directed to execute such order.
3. Ratification of Actions. All actions heretofore taken by the members of the Commissioners Court and all things done by the County Judge, pursuant to their official authority, including the action taken on this date with respect to the above referenced Road and Drainage Standards, be and the same are hereby ratified, approved and adopted as the acts of the Commissioners Court.
4. Effective Date. This Order shall be in full force and effect from and after its passage on the date shown below.
5. Open Meetings. It is hereby officially found and determined that this meeting was open to the public, and public notice of the time, place and purpose of said meeting was given, all as requested by the Open Meeting Act, Chapter 551, Texas Government Code.

ADOPTED AND PASSED this the 27th day of July, 2004.

LIBERTY COUNTY, TEXAS

  
COUNTY JUDGE

ATTEST:

  
LIBERTY COUNTY CLERK

ORDER

THE STATE OF TEXAS §  
COUNTY OF LIBERTY §

The Commissioners Court of Liberty County, Texas, convened in the Courthouse in the City of Liberty, Texas, on the 27th day of July, 2004, with the following members present, to-wit:

<u>  x  </u> Lloyd Kirkham	County Judge
<u>  x  </u> Todd Fontenot	Commissioner, Precinct No. 1
<u>  x  </u> Lee Groce	Commissioner, Precinct No. 2
<u>  x  </u> Melvin Hunt	Commissioner, Precinct No. 3
<u>  x  </u> Norman Brown	Commissioner, Precinct No. 4

and the following members absent, to-wit: \_\_\_\_\_, constituting a quorum, when among other business, the following was transacted:

**ORDER ADOPTING ROAD AND DRAINAGE STANDARDS FOR SUBDIVISIONS AND DEVELOPMENT IN LIBERTY COUNTY, TEXAS**

Commissioner Brown introduced an order and made a motion that the same be adopted. Commissioner Fontenot seconded the motion for adoption of the order. The motion, carrying with it the adoption of the order, prevailed by the following vote:

	Yes	No	Abstain
Judge Kirkham	_____	_____	_____
Comm. Fontenot	<u>  x  </u>	_____	_____
Comm. Groce	<u>  x  </u>	_____	_____
Comm. Hunt	<u>  x  </u>	_____	_____
Comm. Brown	<u>  x  </u>	_____	_____

The County Judge thereupon announced that the motion had duly and lawfully carried and that the order had been duly and lawfully adopted. The order thus adopted follows:

IT IS ORDERED that the ROAD AND DRAINAGE STANDARDS FOR SUBDIVISIONS AND DEVELOPMENT IN LIBERTY COUNTY, TEXAS are adopted and these standards and specifications replace and supersede any all guidelines, standards or specifications heretofore in effect in Liberty County, and shall be the sole basis of determining standards and specifications for subdivisions submitted for approval on or after July 27, 2004, unless a specific variance is granted by Order of the Court, or these standards and specifications are amended or replaced by the Court.

SECTION 1  
DATE OF EFFECT AND APPLICABILITY

Standards and Specifications:

These standards and specifications, having been adopted by the Liberty County Commissioners Court by an Order of the Court on the 27<sup>th</sup> day of July, 2004 are declared to be in and of effect for all subdivision work submitted for approval on or after July 27<sup>th</sup>, 2004. These standards and specifications replace and supercede any and all guidelines, standards or specifications heretofore in effect in Liberty County, and shall be the sole basis of determining standards and specifications for Subdivisions submitted for approval on or after July 27<sup>th</sup>, 2004, unless a specific variance is granted by Order of the Court, or these standards and specifications are amended or replaced by the Court.

SECTION 2  
GENERAL GUIDELINES

General Note

All references to “TxDOT Standards” found hereinafter in this document shall mean the TxDOT 1993 Highway Standards, or shall be considered to refer to the latest edition of “Standard Specifications for Construction of Highways, Streets and Bridges” as adopted by the Texas Department of Transportation.

**2.1 General Engineering Standards:**

In order to ensure the safe and proper construction design of new streets, driveways, storm sewer, and drainage ways; construction drawings and specifications, prepared and certified by a Registered Professional Engineer licensed to practice in the State of Texas, shall be submitted for review and approval prior to land clearing and construction. Construction Plans should be submitted along with the Final Plat. A copy of the approved proposed plat shall be included in the construction plans.

All roads shall consist of drainage facilities, subgrade preparation, reinforced concrete pavement, or compacted flexible base material, and surface treatment, consisting of Hot Mix Asphaltic Concrete (HMAC), unless otherwise specified by the County.

Drainage facilities shall be designed to convey a 10-year storm event and not more than six inches (6”) of water over the road in a 100-year storm event. All roads and streets shall be designed and constructed to withstand the impact of storm water being impounded adjacent to and flowing over the road or street. Streets or roadways that traverse defined areas of the 100-year floodplain shall not increase the water surface level or change the floodplain limits.

**2.2 General Review Requirements:**

The applicant must submit the following for review and approval:

- 2.2.1 A set of construction drawings for site development, streets, drainage, bridges and/or bridge-class culverts, utilities, and roadway signage plan;
- 2.2.2 An engineer’s drainage report providing the technical data related to drainage issues required for the review of the proposed project. The report must be signed and sealed by the same engineer who prepared the construction plans.
- 2.2.3 A copy of a geotechnical report, signed and sealed by a registered professional engineer, that reports the results of soil tests performed on the street subgrade materials, or of samples taken and submitted to a certified

geotechnical laboratory (at a maximum spacing of 500') showing the Atterburg Plasticity Index (PI) of the existing, in-place subgrade material.

- 2.2.4 Temporary and permanent erosion and sedimentation control methods installed for all areas disturbed by the construction; and
- 2.2.5 An engineer's construction cost estimate signed and sealed by the same engineer who prepared the construction plans.  
In addition, an engineer's summary letter shall be submitted outlining the nature of the project and any requests for the use of design standards other than those outlined herein.

2.3 **Engineer's Construction Plan Requirements:**

2.3.1 Cover Sheet. Show the following:

- (a) Subdivision Name
- (b) Legal description of property.
- (c) Name, address, and phone number of Owner, surveyor and engineering firm that prepared the plans.
- (d) North arrow.
- (e) Name of watershed(s).
- (f) Project location map, clearly identifying the precise construction location.
- (g) Tabulation sheet index.
- (h) Legible Professional Engineer's seal, signature, and date of signature.
- (i) The following note: "The Engineer who prepared these plans is responsible for their adequacy. In approving these plans, Liberty County must rely upon the adequacy of the work of the design engineer."
- (j) The following note: "I \_\_\_\_\_, a Texas Registered Professional Engineer, certify that these plans are prepared in accordance with good Engineering Practices and the Road and Drainage Standards of Liberty County."



2.3.2 Notes Sheet. Show the following:

- (a) Applicable general construction notes.
- (b) Any applicable special notes.
- (c) Construction sequencing.
- (d) Standard Details.
- (e) Average Daily Traffic Counts.

2.3.3 Subdivision Plan Map Sheet. Show a copy of the plat of the subdivision.

- (a) Scale, north arrow, and legend.
- (b) Detail information, as required on the plat for filing, will not be required on this map.
- (c) Layout for road right-of-ways, drainage easements, and location of other easements, encroachments or limiting items (streams, rivers) must be shown.

2.3.4 Erosion and Sedimentation Control Sheets. Show the following.

- (a) Scale, north arrow, and legend.
- (b) Proposed temporary erosion and sedimentation control and tree protection measures for street, drainage, and utility construction.
- (c) Stabilized construction entrance detail for location where construction vehicles will enter or exit directly onto public streets.
- (d) Survey and location of all trees six inches in diameter or greater which are proposed to remain within the limits of a clear zone or sight distance area, showing locations, diameters, and species. (Show method to be used to preserve trees, i.e., boring, tree walls, guard rails, etc.)
- (e) Permanent erosion control measures including revegetation, matting, and any erosion control methods not included on other plan sheets, such as riprap, gabions, retards, etc.

- (f) Proposed construction waste disposal must be approved by the Commissioner(s)/Designated Agent(s) in whose precinct(s) the proposed construction and disposal sites are located.
- (g) Legible Professional Engineer's seal, signature, and date of signature.

2.3.5 Drainage Layout Sheets. Show the following:

- (a) Scale, north arrow, and legend.
- (b) Drainage layout of the subdivision or area of construction, distinguishable line delineating the limits of construction.
- (c) Existing adjoining street layout or other property adjacent to the project, including adjacent subdivision names.
- (d) Location of all existing drainage structures on or adjacent to the project.
- (e) Street names, lot, and block numbers and right-of-way lines.
- (f) Construction plans shall be drawn at a scale of 1" = 50' and shall contain contour lines based upon the following criteria, except in areas located within the 100-year floodplain (as indicated on current FEMA maps), where existing contours shall be shown at two-foot (2') or one-foot (1') intervals, depending upon the slope of the land under consideration for development:
  - (1) In those development areas where ground slopes are less than 5%, one-foot (1') contours are required;
  - (2) In those development areas where ground slopes are from 5% up to the 20%, two-foot (2') contours are required; and
  - (3) In those development areas where ground slopes are greater than 20%, five-foot (5') contours are required.
- (g) Show entire upstream drainage areas, existing drainage areas, and proposed drainage areas based on improvements and final grading.
- (h) Size in acres, Runoff coefficient ( C ), and Time of Concentration (Tc) for each drainage area based on pre- and post-development conditions.

- (i) Arrows indicating drainage flow direction for streets and lots.
- (j) All high and low points.
- (k) Proposed drainage facilities.
- (l) All existing and proposed drainage easements as per Final Plat or by separate instrument, including volume and page information.
- (m) Existing and proposed 100-year flood plains for all waterways.
- (n) Clearly show limits of construction.
- (o) Location of applicable city limits, governmental entity, or County lines.
- (p) Legible Professional Engineer's seal, signature, and date of signature.

2.3.6 Street Plan and Profile Sheets.

- (a) Plan. Show the following.
  - (1) The street name.
  - (2) Scale, north arrow, and legend.
  - (3) Stationing south to north or west to east with street layout directly over the profile stationing.
  - (4) Right-of-Way and paving dimensions.
  - (5) Lot numbers, block numbers, and frontage dimensions.
  - (6) Street names within respective right-of-way.
  - (7) Existing or proposed easements and intersecting right-of-way.
  - (8) Centerline "TIC" marks every 50 feet.
  - (9) Drainage facilities within or intersecting right-of-way and indicate stationing on both sides of structure.

- (10) Match lines on street plan sheets for continuation of streets on other sheets.
  - (11) Show proposed tie-in to existing streets.
  - (12) Sheet numbers for intersecting streets, and show full intersection, provide dimensions, and give streets names.
  - (13) Plan view must transpose directly above profiles stationing when possible. (Station limits shown on the plan view must be the same as the station limits shown on the profile.)
  - (14) Clearly show the beginning and ending of the project.
  - (15) Clearly show all points of curvature (PC), points of tangency (PT), points of intersection (PI), and all relevant curve data with their corresponding station.
  - (16) Legible Professional Engineer's seal, signature, and date of signature.
- (b) Profile. Show the following:
- (1) Scale and legend.
  - (2) Even stations on vertical division lines.
  - (3) Even elevations on horizontal division lines (in right and left margins).
  - (4) Natural ground profiles at left and right right-of-way and street centerline.
  - (5) Proposed barrow ditch flow lines.
  - (6) Identify and give elevations at all points of curvature (PC), points of tangency (PT), points of intersection (PI), vertical curve beginning points (PVC), vertical curve ending points (PVT), and vertical curve points of intersection (PVI).
  - (7) Label all vertical curves with the following information: curve length, PVI station and elevation, tangent intercept, tangents and tangent grades, and design "K" values.

2.3.7 Construction Detail Sheets. Show the following:

- (a) Typical pavement design cross-section.
- (b) Safety end treatment details for culvert pipe ends within the roadway clear zone and riprap or headwall details.
- (c) Guard rail details if required.
- (d) Legible Professional Engineer's seal, signatures, and date of signature.

**2.3.8 Traffic Control Plan Sheet.**

A traffic control plan sheet is required for any construction conducted in public right-of-way, which may impede or has the potential to interrupt normal traffic flow. Show the following:

- (a) Street plan showing all traffic control devices, taper distances, and traffic flow diagram.
- (b) The traffic control plan must be consistent with the *Texas Manual on Uniform Traffic Control Devices (TxMUTCD)*.
- (c) Legible Professional Engineer's seal, signature, and date of signature.

**2.3.9 Roadway Signing and Striping Plan Sheet.**

A roadway signing and striping plan shall be submitted along with the street plans. Show the following:

- (a) Street plan showing the locations of all traffic control devices including signs, striping, and pavement markers.
- (b) All traffic control devices shall be fabricated and installed in accordance with the requirements of the *Texas Manual on Uniform Traffic Control Devices (TxMUTCD)*.
- (c) Legible Professional Engineer's seal, signature, and date of signature.

**2.3.10 Utility Plans.**

Plans for water and wastewater utilities proposed by the developer to be located within the County right-of-way shall be designed by a Registered Professional Engineer, licensed to practice within the State of Texas, and shall conform to the standards and specifications established for that particular utility. The County review of Utility Plans will be the purpose of verifying that appropriate details are used for street cuts, and traffic

control, and utility placement within roadway right-of-way. The Engineer of Record shall be solely responsible for the design of the utility improvements. The County will not review Utility Plans for the purpose of verifying that the design is done according to relevant utility design standards. A legible Professional Engineer's seal, signature, and date of signature are required on each sheet.

**2.4 Engineer's Drainage Report Requirements:**

- 2.4.1 The name of the subdivision or project.
- 2.4.2 The name and address and phone number of the engineering firm, which prepared the report, and the name of the design engineer.
- 2.4.3 A brief description of the scope of the project shall be made, including the name and classification of the relevant watershed.
- 2.4.4 A brief description of the Hydrologic Model (Rational Method, SCS, HEC 1, etc.) used and an explanation on why that model was chosen.
- 2.4.5 Provide the following for each drainage area:
  - (a) Area in acres (A)
  - (b) Time of Concentration ( $T_c$ ) in minutes based on pre- and post-development conditions.
  - (c) Rainfall intensity (I) for the 2-year, 10-year, 25-year, and 100-year events ( $I_2$ ,  $I_{10}$ ,  $I_{25}$ , and  $I_{100}$ )
  - (d) Runoff Coefficient (C) for the 2-year, 10-year, 25-year, and 100-year events. ( $C_2$ ,  $C_{10}$ ,  $C_{25}$ , and  $C_{100}$ ) based on pre- and post-development conditions. Or SCS curve number depending on hydrologic model used.
  - (e) Runoff flow volumes (Q) for the 2-year, 10-year, 25-year, and 100-year events. ( $Q_2$ ,  $Q_{10}$ ,  $Q_{25}$ , and  $Q_{100}$ )
- 2.4.6 If a computerized model is used provide printouts of the model's input and output. Otherwise clearly show all pertinent calculations.
- 2.4.7 All relevant culvert design calculations.
- 2.4.8 All relevant detention pond design calculations.

2.4.9 Legible Professional Engineer's seal, signature, and date of signature.

2.5 **Street and Drainage Design Criteria:**

The classification and construction standards for all streets shall be determined according to the Average Daily Traffic anticipated for the streets. The standards for paved streets are summarized in Table 2.5.1. In the absence of a traffic impact analysis with detailed average daily traffic counts (ADT), it shall be assumed that average daily traffic of 10 car trips per day per Subdivision Lot served for the road design.

Subdivision streets, collector streets, and/or arterial streets, created by the developers of new subdivisions, where traffic is likely to exceed the requirements of the standards and specifications included herein, may be subject to different or additional specifications based on the sole discretion of the Commissioner's Court. These specifications will be determined on a case-by-case basis, based on good engineering principles and the standards provided for in the Texas Transportation Code and Chapter 232 of the Texas Local Government Code. Applicants who determine that their project is likely to exceed the requirements of the standards and specifications included herein, should prepare a proposed roadway plan that would adequately address the projected traffic load, and should apply in writing for a meeting with their Precinct Commissioner, who may wish to confer with the County's consulting engineers. A legible Professional Engineer's seal, signature, and date of signature is required on each page of the proposed roadway plan. The Precinct Commissioner will place the issue on the Commissioner's Court agenda for a resolution of approval.

If the developer proposes to construct a major structure such as a box culvert or bridge across drainage channel, such structure shall conform to current standards for culverts and bridges and specifications of the Texas Highway Department.

Table 2.5.1

Summary of Liberty County Road Standards

<b>Average Daily Traffic (one-way trips)</b>	<b>≤ 100<sup>10</sup></b>	<b>101-2500</b>	<b>2501-5000</b>	<b>&gt;5000</b>
Functional Classification	Neighborhood	Local	Collector	Arterial <sup>8</sup>
Design Speed	25 mph	35 mph	45 mph	
Number of Lanes	2	2	2	
Right-of-Way Width <sup>3</sup>	60'	65'	75'	
Minimum Lane Width	12'	12'	12'	
Minimum Centerline Radius <sup>9</sup>	225'	450'	750'	
Minimum Tangent Length (Between Reverse or Compound Curves)	N/A	N/A	675'	
Minimum Radius (Edge of Pavement at Intersections)	25'	25'	25'	
Intersection Street Angle	80-100°	80-100°	80-100°	
Maximum Grade <sup>4,5</sup>	11%	10%	9%	
Minimum Centerline Offset (At Adjacent Intersections)	125'	125'	125'	
Minimum Stopping Sight Distance	175'	250'	350'	
Minimum Intersection Sight Distance	250'	350'	450'	
Steepest Ditch Foreslope Grade <sup>8</sup>	3:1	4:1	4:1	
Guardrail Requirement <sup>7</sup>				
Minimum Cul-de-Sac ROW Radius	60'	60'	60'	
Minimum Cul-de-Sac Pavement Radius	45'	45'	45'	
Minimum Lot Frontage <sup>11</sup>	50'	50'	150'	
Minimum Driveway Spacing	50'	50'	150'	
Utility Easement Adjacent to R.O.W.	10' each side	10' each side	10' each side	

- <sup>1</sup> Any Deviation from these standards must be approved by the Commissioner's Court.
- <sup>2</sup> Lots restricted by plat note to one single family residence shall be presumed to generate 10 trips per day. Average daily traffic for all other lots shall be determined on a case-by-case basis.
- <sup>3</sup> Revegetation of disturbed areas within the new roads right-of-way is required.
- <sup>4</sup> Occasional short runs between intersections may exceed the amounts shown, with written approval from the Precinct Commissioner, maximum grades through intersections should not exceed amounts shown.
- <sup>5</sup> No Cul-de-Sac shall have a cross slope that exceeds six percent (6%).
- <sup>6</sup> The entire ditch shall be totally contained within the road right-of-way or a dedicated drainage easement.
- <sup>7</sup> Guardrails shall be designed and located in accordance with the latest edition of the Roadway Design Manual as adopted by TxDOT.
- <sup>8</sup> All elements including geometric layout and cross-section shall be approved on a case-by-case basis.
- <sup>9</sup> Super elevation requirement should meet the latest TxDOT Standards and requires the approval of the Precinct Commissioner or his Designated Agent.
- <sup>10</sup> All lots shall be restricted by plat note against further subdivision.
- <sup>11</sup> Provided that all lots meet land area requirements for on-site sewage facilities (such as septic tanks) established by Liberty County and the State of Texas.



**Table 2.5.2**  
**Liberty County General Pavement Sections by Traffic Category**  
**Design Period = 20 years**

TRAFFIC CATEGORY	Pavement Options	SUBGRADE CATEGORY		
		Poor (CBR<5) PI > 30	Poor to Fair (5<CBR<10) PI = 15-30	Good (CBR>10) PI = NP to 15
<b>Industrial Parks and Areas Subject to Heavy Truck Traffic</b> Max. 12,000 VPD 20% Trucks	1	10" Concrete 6" Stabilized Subgrade <sup>2</sup>	9" Concrete 6" Stabilized Subgrade	8" Concrete
	2	4" HMAC <sup>3,4</sup> 14" Flex Base <sup>5</sup> 6" Stabilized Subgrade	3.5" HMAC 13" Flex Base 6" Stabilized Subgrade	2.5" HMAC 11" Flex Base
<b>Thoroughfare, Arterials, and Areas Subject to Light Truck Traffic</b> Max. 20,000 VPD 5% Trucks	1	9" Concrete 6" Stabilized Subgrade	8" Concrete 6" Stabilized Subgrade	8" Concrete
	2	3" HMAC 12" Flex Base 6" Stabilized Subgrade	2" HMAC 9" Flex Base 6" Stabilized Subgrade	2" HMAC 9" Flex Base
<b>Collectors, Locals, Minors, and Areas Subject to Occasional Truck Traffic</b> 500 –5,000 VPD 2% Trucks	1	8" Concrete 6" Stabilized Subgrade	7" Concrete 6" Stabilized Subgrade	6" Concrete
	2	2" HMAC 12" Flex Base 6" Stabilized Subgrade	2" HMAC 7" Flex Base 6" Stabilized Subgrade	2" HMAC 8" Flex Base

<sup>1</sup> CBR = California Bearing Ratio      <sup>2</sup> Subgrade Stabilization Determined by Plasticity Index      <sup>3</sup> HMAC = Hot Mix Asphaltic Concrete  
<sup>4</sup> Type D, Item 340, 1993 TxDOT Specifications (minimum)      <sup>5</sup> Type A, Grade 2, Item 247, 1993 TxDOT specifications (minimum)  
 NP = Non Plastic    20,000 lb Single Axle/Load Limit

SECTION 3  
SPECIFICATIONS FOR PAVING AND DRAINAGE IMPROVEMENTS

3.1 **Excavations and Subgrade Preparation:**

3.1.1 Description: The work to be performed under this specification will consist of excavation and grading necessary for preparation of right-of-way, road-bed subgrade, roadway shoulders and drainage ditches, and shall include the removal and satisfactory disposal of all trees, shrubs, brush, rock and other debris cleared within the right-of-way.

3.1.2 Construction Methods: After the work site has been properly cleared, excavation and grading may proceed in conformity with the plans and specifications, and as directed by a Geotechnical Report and the Precinct Commissioner or Designated Agent.

(a) Subgrade: Subgrade and shoulder shall be compacted to 95% AASHO density, or when proof rolled with 25,000 pound motorgrader (CAT 12 or equal), produce ruts or deflection no greater than one (1) inch in depth.

(b) 6" Subgrade Stabilization. All subgrade material within the subdivision project that possesses an overall average Atterburg Plastically Index (PI) above 15 up to 30, that is to be utilized directly beneath the roadway flexible base, shall be lime treated to a minimum compacted depth of six inches (6") in strict conformance to Item 260 Lime Treatment for Materials Used As Subgrade (Road Mixed) as contained in the "TxDOT Standards." Said lime treatment shall extend a minimum of two feet (2') beyond the edge of the pavement in all cases. Following the lime treatment of the subgrade, Geotechnical tests shall be performed at a minimum of once every five hundred feet (500') to insure that the Atterburg Plastically Index (PI) has been reduced below fifteen (15), additional tests may be required at the discretion of the precinct commissioner or his designated agent.

(c) 8" Subgrade Stabilization. All subgrade material within the subdivision project that possesses an overall average Atterburg Plastically Index (PI) of 30 or greater, that is to be utilized directly beneath the roadway flexible base, shall be lime treated to a minimum compacted depth of eight inches (8") in strict conformance to Item 260 Lime Treatment for Materials Used As Subgrade (Road Mixed) as contained in the "TxDOT Standards." Said lime treatment shall extend a minimum of two feet (2')

beyond the edge of the pavement in all cases. Following the lime treatment of the subgrade, Geotechnical tests shall be performed at a minimum of once every five hundred feet (500') to insure that the Atterburg Plasticity Index (PI) has been reduced below fifteen (15), additional tests may be required at the discretion of the precinct commissioner or his designated agent

TxDOT Test Method Tex-121-E Method for determining lime for pavement and subgrade stabilization recommends percentages of lime where lasting affects are desired. Percentage of lime and/or lime-flyash used for stabilization of the layer just below the base should be determined from lab tests. A minimum of 6.0% lime for treating a subgrade with a PI greater than 30. Higher percentages of lime are recommended for increased stabilization for soils with higher PI's. Increased lime stabilization may be required for soils with high sulfate levels.

- (d) Geotextile or Geogrid Use in Roadways. All subgrade material within the subdivision project that possesses an overall average Atterburg Plasticity Index (PI) of 30 or greater, that is to be utilized directly beneath the roadway flexible base, shall be lime treated to a minimum compacted depth of six inches (6") as in part (b) of this section and said lime treatment shall extend a minimum of two feet (2') beyond the edge of the pavement in all cases. In lieu of lime stabilization, a Geotextile or Geogrid Material shall be used between the subgrade and the flexible base to provide an alternative for stabilization between these two layers. When Geotextile or Geogrid Material is used, the plan shall be accompanied with a geotechnical evaluation of the underlying soil and shall be designed in accordance with the recommendations made by that evaluation.
- (1) Separation. The separation function refers to the separation of two dissimilar soils. The primary function of the geotextile is to prevent intermixing for the two soils throughout the life of the structure. Geotextiles are commonly used for separation when used beneath roadway pavement sections, you may want to use some aggregate over certain sections of the road, in which case the principles described here still apply. Roadway pavements are basically structures for taking the high contact pressures from the vehicle tires and reducing that pressure through the depth of the pavement to a level that can be supported by the underlying soil. Pressure is dissipated down through the various layers of materials within the pavement. Over

time, vehicle load pressure causes subgrade soils to migrate into the aggregate base of the pavement section. Contamination of the aggregate base by the subgrade results in the reduction of the effective base thickness to less than originally designed. Reduction of the base thickness results in a decrease in the load-carrying capacity of the aggregate base and a reduction in the pavement life. Geotextiles prevent the subgrade materials from migrating into the aggregate base, thus increasing pavement life.

(2) Reinforcement. In the reinforcement function, the geotextile (or geogrid) is subjected to a sustained tensile force or load. Soil and rock materials are noted for their ability to withstand compressive forces and their relative low capacity for sustained tensile forces. In much the same way that tensile forces are taken up by steel in a reinforced concrete beam, the geotextile (geogrid) supports tensile forces that cannot be carried by the soil in a soil-geotextile system.

(i) Woven Geotextile Materials. The 200 ST Woven Geotextile is a woven slit film polypropylene geotextile. The individual slit films are woven together in such a manner as to provide dimensional stability relative to each other. The construction of the geotextile makes it ideal for soil separation, stabilization, and reinforcement. Geotextile fabric shall be a woven or nonwoven synthetic fiber fabric complying with AASHTO M 288.

(ii) Geogrid Materials. The geogrid shall be made of Group 1, Class 1, Grade 2 polypropylene (ASTM D4101) arranged in a regular grid structure and with a geometry, which permits significant mechanical interlock with the material being reinforced. The geogrid shall have a high continuity of tensile strength through all ribs and junctions. The geogrid shall have a high resistance to deformation under sustained long term load and shall be resistant to damage under normal construction practices and to all forms of biological or chemical degradation normally expected in a clay or flex base material. The geogrid shall be of the biaxial type and shall conform to the minimum physical property requirements listed below. All values represent

certifiable minimum values in the direction of reinforcement. Each roll of geogrid must meet or exceed these minimum test values. (M.D. = machine direction) (GRI = Geosynthetic Research Institute)

- (3) Geo-Material Installation Methods: The geo-material shall be stored in a dry condition and protected from exposure to direct sunlight.

The surface to receive the geo-material shall be prepared to a smooth condition, free of obstructions and debris that may damage the fabric during installation.

Geo-materials shall be laid so that the stronger direction of reinforcement is transverse to the roadway centerline. The geo-materials shall be overlapped a minimum of one foot (1') onto the next row of geo-material and it shall be pinned in place at the beginning of a section to prevent slippage, tied together along the overlap, or otherwise secured to prevent separation during subsequent fill or cover operations. Along the length of the project the geo-material shall remain free to relieve wrinkles or folds from occurring during fill placement.

Geo-materials shall be covered, a minimum of four inches (4") with fill materials as soon as practical after being laid to protect the geo-material from equipment overrunning it.

Damaged geo-material sections shall be repaired by overlapping a layer of geo-material that is large enough to cover the damaged area, allowing an overlap of one foot (1') in each direction to allow the locking of layers.

- (e) Alternative geo-materials will be considered. Such material must be pre-approved in writing by the Engineer prior to installation. Alternative material packages must be submitted to the Precinct Commissioner, or Designated Agent, or Engineer a minimum of fifteen (15) days prior to installation. Submittal packages must include, as a minimum, the following:

- (1) Full-scale laboratory testing and in-ground testing of pavement structures reinforced with the specific geo-material, which quantifies the structural contribution of the geo-material to the pavement structure. The increase in the

structural layer coefficient of the base course must meet or exceed that of the design geo-material.

- (2) A list of five comparable projects, in terms of size and applications, in the U.S., where the results of the specific alternate geo-material use can be verified.
- (3) A sample of the geo-material and certified specification sheets.

3.1.3 Maintenance of the Finished Subgrade. The finished subgrade shall be maintained to the proper grade, cross-section and density by the Contractor until subbase or base material is placed on it. All such maintenance, including recompacting necessary as a result of precipitation or excessive drying, shall be the responsibility of the Contractor. All construction traffic shall be uniformly distributed over the subgrade.

3.1.4 Inspection. Prior to the installation of the base material, the proof rolling and compacted subgrade shall be inspected by the Precinct Commissioner or Designated Agent. The owner, or agent shall notify the Precinct Commissioner or Designated Agent at least forty-eight (48) hours prior to the time when the inspection is needed.

## 3.2 **Embankment**

3.2.1 Description: Embankments or roadway fills shall be constructed at the locations and to the lines and grades shown on the drawings, or as established. Materials placed in fill shall be free from all vegetative matter, trash, and stone having a maximum dimension greater than six inches.

3.2.2 Construction Methods: Embankments shall be formed of excavated materials placed in successive layers of such widths and lengths as are suited to the sprinkling and compaction method utilized. Embankments shall be constructed in layers not exceeding six inches in thickness after compaction.

All road subgrade and embankment shall be compacted to a minimum density of ninety-five percent (95%) AASHTO T-99, Method D.

The Contractor shall add moisture to, or shall dry by aeration, each layer as may be necessary to meet the requirements of this specification for compaction. Thorough mixing must be made of all material in each layer to obtain uniform moisture content.

Compaction shall be accomplished with tamping rollers, discs, and pneumatic rollers.

Soft (“pumping”) areas that develop under construction operations shall be scarified, aerated or moistened as required, and recompacted to the full depth required to obtain the specified density for each layer. When objectionable material is encountered, the contractor shall remove said material and replace with select, borrowed or salvaged material with a P.I. between 15 and 30. Portions of embankments which are too near adjacent walls, pavements or other fixed objects to permit use of the above specified rolling equipment for compacting, and other portions which mechanized equipment cannot reach for any reason, shall be thoroughly compacted by tamping in two-inch layers with mechanical hand tampers or other equipment as approved by the Precinct Commissioner or Designated Agent.

Any damage to adjacent walls, pavements or other fixed objects, shall be replaced or repaired at the expense of the Contractor.

**3.3 Flexible Base**

3.3.1 Description: This item shall consist of a foundation course for the asphaltic concrete or other paving, and shall be composed of crushed or uncrushed material constructed as herein specified in two or more four inch (4”) lifts or in one or more six inch (6”) lifts in conformity with the typical sections shown on the plans and to the lines and grades established.

3.3.2 Materials: The flexible base shall be material from an approved source. Stabilization shall be provided as required by the construction plans and specifications. The flexible base material shall consist of crushed or uncrushed stone as necessary to meet the requirements herein, and shall consist of durable coarse aggregate particles and binding materials. The material shall meet the requirements of a Type A or B, Grade 1 or 2 flexible base materials as defined in Item 247 Flexible Base of the “TxDOT Standards”, or meet the requirements of the following Section 3.3.3 for Localized Materials.

3.3.3 Localized Materials (Iron Ore): Iron ore shall meet Item 247, Type A or B, Grade 2 requirements. Iron ore shall consist of a foundation course for surface course, and shall be composed of Iron Ore material and shall be constructed as herein specified and in conformity with the plans submitted to Liberty County for approval.

- a. Materials: The material shall consist of hematite hydrated, hermatite, or limonite ore, occurring with or without sand, as found at or near the surface, which when loaded from material pit shall not contain an excess of free clay. The material source shall be approved by the County. Material containing gravel or hard gravel or hard pieces of ore exceeding the maximum specified size in largest dimension shall be broken up and uniformly mixed with remainder of the material.
- b. When properly slaked and tested by standard Texas Highway Department laboratory methods, the flexible base material shall meet the following requirements:

Retained on 2-1/2 inch sieve	0%
Retained on No. 40 sieve	50 to 85%

Material passing the No. 40 sieve shall be known as soil “Binder” and shall meet the following requirements when prepared in accordance with Test Method Tex-101-E Procedure:

- The liquid limit shall not exceed 40 .
- The plasticity index shall not exceed 12.

3.3.4 Construction Methods: The base material shall be placed on the prepared subgrade in uniform courses with the total compacted thickness to be no less than six inches (6”). Material deposited on the subgrade shall be spread and shaped the same day unless otherwise directed by the Precinct Commissioner or Designated Agent. The course shall then be sprinkled as required and rolled as directed until a uniform compaction is secured. Through this entire operation, the shape of the course shall be maintained by blading and the surface, upon completion, shall be smooth and in conformance with the typical sections shown on the plans and to established lines and grades. All irregularities, depressions, or weak spots that develop shall be corrected immediately by scarifying the area affected, removal and replacement of soft areas or adding suitable material as required, reshaping and recompacting by sprinkling and rolling. Material excavated in preparation of the subgrade may be utilized in the construction of adjacent shoulders and slopes or otherwise disposed of as directed. Any additional material required for the completion of the shoulders and slopes shall be secured from approved sources designated by the Precinct Commissioner or Designated Agent. Each course of base shall be compacted to a minimum density of 100 percent (100%), according to TxDOT Test Method TEX-113-E.



After final compaction, a field density test shall be required at intervals no less than 300 feet, at locations representative of the entire road base. Intermediate points will be tested if required by the Precinct Commissioner or Designated Agent. The cost of these tests shall not be borne by the County.

- (a) A minimum compacted thickness of eight inches (8”) of flexible base material (Section 3.3.2 or 3.3.3 herein) shall be required for placement on compacted subgrade for all roadways where the PI is <30; or a minimum compacted thickness of twelve inches (12”) of flexible base material where the PI is >30. Where the compacted thickness is eight inches (8”) or more the base materials shall be placed in four-inch (4”) lifts.
- (b) A minimum compacted thickness of twelve inches (12”) of flexible base material (Section 3.3.2 or 3.3.3 herein) is encouraged for placement on compacted subgrade for all roadways determined by the County to be a Collector or Arterial roadway, according to a master development plan for that portion or Precinct of the County.

3.3.5 Thickness Control: The thickness of the compacted flexible base may not vary more than a maximum of one-half inch (1/2”) from the specified thickness of the base material. Deviations not within this tolerance shall be corrected.

3.3.6 Inspection: Prior to the installation of the paving, the compacted base material shall be inspected by the Precinct Commissioner or Designated Agent. The Owner or Agent shall notify the Precinct Commissioner or Designated Agent forty-eight (48) hours prior to the time when the inspection is needed.

#### 3.4 Hot Asphaltic Concrete Pavement with Latex

3.4.1 Description: This item shall consist of a surface course to be composed of a compacted mixture of aggregate and asphaltic material with latex to be constructed on the previously complete base as herein specified, and in accordance with the details shown on the plans and in accordance with Item 340 Hot Mix Asphaltic Concrete Pavement of the “TxDOT Standards.”

3.4.2 Materials: Pavement shall meet the requirements of Item 340 of the “TxDOT Standards” for Hot Mix Asphaltic Concrete Pavement (**Class A**),

or for Hot mix Asphaltic Concrete Pavement (Class A), Type “D” as follows:

**Type “D” (Fine-Graded Surface Course):**

	Percent by Weight
Passing 1/2” Sieve	100%
Passing 3/8” Sieve	85 to 100%
Passing No. 4 Sieve, Retained on No. 10 Sieve	50 to 70%
Passing No. 10 Sieve, Retained on No. 40 Sieve	32 to 42%
Passing No. 40 Sieve, Retained on No. 80 Sieve	11 to 26%
Passing No. 80 Sieve, Retained on No. 200 Sieve	4 to 14%
Passing No. 200 Sieve	1 to 6%

The asphaltic material shall consist of from 4.0 percent to 8.0 percent of the mixture by weight unless specified otherwise on the plans.

Asphalt for the pavement mixture shall be asphalt cement (AC-5 or AC-10), which shall meet the requirements of Item 300 of the “TxDOT Standards”.

The asphalt materials for tack coat shall meet the requirements for cut back asphalt, RC-250. Asphalt for prime coat shall be MC-30, AEP or SS-1. All asphalt materials shall meet the requirements of Item 300 of the “TxDOT Standards”.

The Coarse and Fine Aggregates shall meet the requirements of Item 340.3 of the “TxDOT Standards”.

- 3.4.3 Construction Methods: Before the asphaltic concrete is placed, the surface on which the mixture is to be placed shall be thoroughly cleaned and the prime coat of MC-30, AEP or SS-1 in accordance with Item 310 applied as directed with sprayer at the rate of 0.20 gallons minimum per square yard of surface. A single course seal coat shall be placed in accordance with Item 316 prior to placement of HMA CP. The asphaltic concrete mixture, heated and prepared as specified, shall be hauled to the project in tight vehicles previously cleaned of all foreign material. The mixture shall be at a temperature of 200° F to 235° F when laid. The Precinct Commissioner or Designated Agent will determine the lowest temperature and a variance of 30 degrees F upward will be allowed. It shall be spread into place with an approved mechanical finishing machine to the compacted depth shown on the plans.

The minimum thickness standard for Hot Mix Asphaltic Cement, if selected, should not be less than two inches (2") after compaction. The finishing machine shall be of the screeding and/or tamping type. While still hot, as soon as it will bear the roller without undue displacement or hair cracking, the surface shall first be compressed thoroughly and uniformly with acceptable power-driven three-wheel tandem rollers weighing from 8 to 10 tons or a vibratory dual wheel roller weighing 6 tons. Subsequent compression shall be obtained by starting at the sides and rolling longitudinally toward the center of the pavement, over-lapping on successive trips by at least one-half (1/2) of the width of the rear wheels. Alternate trips of the roller shall be slightly different in lengths. Rolling shall be continued until no further compression can be obtained and all roller marks are eliminated. To prevent adhesions of the surfacing mixture to the roller, the wheels shall be kept properly moistened with water, but excess use of water will not be permitted. After rolling with the tandem or vibratory roller the entire surface shall be rolled with a pneumatic-tire roller to seal the asphalt surface prior to opening for traffic. Along curbs, headers, and similar structures, and at all places not accessible to the roller, the mixture shall be compacted thoroughly with lightly oiled hand tamp.

The completed surface, when tested with a ten foot (10') straight-edge laid parallel to the centerline of the roadway, shall have a maximum ordinate measured from the face of the straight-edge that does not exceed one-eighth inch (1/8) at any point. Approved templates shall be furnished by the Contractor for checking subgrade and finished sections. The templates shall be of such strength and rigidity that if the support is transferred to the center there will not be a deflection of greater than one-eighth inch (1/8").

- 3.4.4 Equipment: Mixing plants that will not continuously produce a mixture meeting all requirements of this specification will not be accepted.

Mixing plants may be either the weight-batching type or the continuous mixing type. Both types of plants shall be equipped with satisfactory conveyors, power units, aggregate handling equipment, hot aggregate screens and bins and dust collectors and shall consist of the following essential pieces of equipment:

The Cold Aggregates Bin and the Proportioning Device, Dryer, Screens, Aggregate Weight Box and Batching Scales, Mixer, Asphalt Storage and Heating Devices, Asphalt Measuring Devices and Truck Scales if used, shall be of the type to adequately supply materials within the tolerances set out in these specifications.

The Aggregate shall be separated into at least three bins for type “D” materials and as specified herein. Bin No. 1 – will contain aggregates of which 85 to 100% will pass the No. 10 sieve. Bin No. 2 – will contain aggregates of which at least 70% will be of such size as to pass the No. 4 sieve and be retained on the No. 10 sieve. Bin No. 3 – will contain aggregates of which at least 75% will be such size as to pass the ½” sieve and be retained on the No. 4 sieve.

3.4.5 Testing: The Contractor, at his expense, shall employ a commercial testing laboratory approved by the Precinct Commissioner or Designated Agent to conduct the required material checks and design the mix. During the production of the plant mix, the Contractor will provide, at his expense, continuous inspection and testing at the plant by a commercial testing laboratory approved by the Precinct Commissioner or Designated Agent. Minimum density in place should reach 90%.

3.4.6 Construction Methods: Before the asphaltic concrete is placed, the surface on which the mixture is to be placed shall be thoroughly cleaned and the prime coat of MC-30, SS-1 or AEP applied as directed with sprayer at the rate of 0.20 gallons minimum per square yard of surface.

### 3.5 **Portland Cement Concrete Pavement**

3.5.1 Description: This item shall be to the standards of the recommendation of a Registered Professional Engineer who conducts a geotechnical study and shall meet the criteria of 2.2.3 of these Standards. This construction shall conform to Item 360 of the “TxDOT Standards”.

Concrete for paving shall be 5 sacks of cement 3000 P.S.I. Concrete and shall be reinforced with 12” X 12” X 3/8” welded wire fabric. Pavement thickness shall be as required in Table 2.5.2, Section 2.5 Street and Drainage Criteria of the Liberty County Road and Drainage Standards for Subdivisions and Development. The developer shall provide ¾” redwood expansion boards at maximum 90’ center to center with transfer loading devices. Contraction joints shall be placed at 15’ intervals between expansion joints. Expansion joints, contraction joints and construction joints shall be sealed with a TxDOT approved joint sealer. Testing shall be in accordance with TxDOT standards.

### 3.6 **Drainage Facilities**

3.6.1 Description: This item shall govern the furnishing of all drainage culvert pipe, concrete headwalls, and reflector posts as shown on the Plans and herein specified, and installing the same as designated on the Plans or by

the Precinct Commissioner or Designated Agent in conformity with the lines and grades given.

3.6.2 Materials: The Culvert Pipe shall be of size and length shown on the engineered construction plans. Corrugated metal pipe is not acceptable for use. Reinforced concrete pipe shall be C76 Class III pipe furnished and installed according to Item 464 of the “TxDOT Standards”. All culvert pipes shall be new and unused and shall not have been damaged by handling or shipping. All concrete culvert pipe joints shall be primed and joints shall be installed with Ram Neck joining material.

- (a) Alternative Culvert Pipe – ADS Heavy Duty Corrugated Polyethylene Pipe: This type of culvert pipe may be required where known corrosive soil conditions are present. Manufactured by Advanced Drainage Systems, Inc. (ADS) pipe specifications are for Smooth Interior Corrugated Polyethylene Pipe (dated June 2002) applies to high-density polyethylene corrugated pipe with an integrally formed smooth waterway. Pipe manufactured for this specifications shall comply with the requirements for test methods, dimensions and markings found in AASHTO Designations M252, M294, and MP7. Pipe fittings shall be made from virgin polyethylene compounds that conform to the applicable current edition of the AASHTO Material Specifications for cell classification as defined and described in ASTM D3350. The fittings shall not reduce or impair the overall integrity or function of the pipeline. Fittings may be either molded or fabricated and only those fittings supplied or recommended by the manufacturer shall be used. Where designated on the plans or project specifications, an elastomeric gasket meeting the requirements of ASTM F477 shall be supplied.
- (b) Installation of the ADS specified pipe should be in accordance with either AASHTO Section 30, ASTM Recommended Practice D2321, or as recommended by the manufacturer.
- (c) Reflector Posts shall be constructed from one and one-half inch (1 ½”) schedule 20, galvanized steel posts equipped with three inch (3”) amber reflectors. The length of the post shall be adequate to place the reflector assembly forty-eight inches (48”) above the centerline elevation of the street and anchor the post approximately forty-eight inches (48”) into the ground.
- (d) Concrete Headwalls and/or Riprap shall be constructed of 3000 psi, five sack, concrete meeting the requirements of Item 421 of the “TxDOT Standards” and reinforced with deformed bars or wire

mesh meeting the requirements of Item 440 of the “TxDOT Standards”. All culvert or bridge headwalls and/or riprap shall be of the dimensions and in the locations shown on the plans.

- 3.6.3 Construction Methods: Culvert pipe shall be sized and installed according to the lines and grades shown on the Construction Plans as required by the drainage calculations prepared by the design engineer. The pipe shall be bedded along its complete length and the backfill around the pipe shall be compacted. The installation of all culvert pipes shall be in general conformance with the appropriate sections of the “TxDOT Standards”. All culvert pipes located at street intersections shall be provided with reflector posts. The reflector post shall be equipped with one reflector facing in each direction of traffic flow. Reflector posts shall be provided on the ends of the concrete headwalls or riprap as shown on the Plans. The headwalls shall be formed on their exposed surfaces, which shall be grouted and broom finished upon removal of the forms.
- 3.6.4 Culverts: Culvert pipe shall be clean and free of debris following installation and before acceptance by the County Commissioner or Designated Agent.
- 3.6.5 Bridges If the developer proposes to construct a major structure such as a box culvert or bridge across a drainage channel, such structure shall conform to TxDOT “Standard Bridge Design”. Reinforced concrete box culverts shall meet the design of TxDOT Standard Specifications for Construction of Highways, Streets and Bridges. The County will not allow Rail Car bridges. Timber and Corrugated Arch Pipe bridges will be considered on a case-by-case basis.

Bridge design shall be submitted to the County for review and approval prior to finalizing construction plans.

### 3.7 Channel Excavation

- 3.7.1 Description: Channel Excavation shall consist of required excavation for all channels, the removal and proper utilization or disposal of all excavated materials, and constructing, shaping and finishing of all earthwork involved in conformity with the required lines, grades and typical cross sections and in accordance with the specifications and requirements herein outlined. Excavated topsoil can be used in accordance with County standards. It is the responsibility of the contractor to dispose of excavated trash and spoils in accordance with County standards.

- 3.7.2 Construction Methods: All suitable materials removed from the excavation shall be utilized, insofar as practicable, in the formation of embankments where required, or shall be otherwise satisfactorily disposed of as indicated on the plans, or as directed. Completed work shall conform to the established alignment, grades and cross sections for the drainage structure. During construction, the channel shall be kept drained, insofar as practicable, and the work shall be performed in a neat and workmanlike manner.

Unsuitable channel excavation materials, or excavation in excess of that needed for construction, shall become “Waste” and shall become the property of the Contractor to be disposed of properly by him.

Channel excavation shall include the removal and replacement of all fence lines crossing the channels and the installation of gates and water gaps as shown on the plans.

All channels, and adjacent area, which has been disturbed by construction equipment shall be seeded with Bermuda grass or other grass as approved by the Precinct Commissioner or Designated Agent at the rate of eight pounds per acre (8 lb/ac). Seeding shall conform to Item 164 Seeding for Erosion Control of the “TxDOT Standards”.

3.8 **Miscellaneous**

- 3.8.1 Signage: Street name signs, traffic control signs, speed limit signs, etc., shall all conform to the requirements of the “TxDOT Standards” and the “Manual of Uniform Traffic Control Devices” (TxMUTCD).

For all developments proposing new street construction, the developer’s engineer shall provide – as part of the construction plans – a narrative statement in recordable format, to be recorded with the Final Plat, listing the type and location of all proposed signs for directing and controlling traffic.

The Developer or Subdivider shall erect all traffic signs in place as called for on the construction design plans, or at the sole discretion of the Precinct Commissioner, the County may elect to install the signs, in which case the Developer or Subdivider shall deposit funds with the County based upon the estimated actual cost of the signs, posts and labor for installation.

- 3.8.2 Completion Certificate: At the time a final inspection and release of construction security is requested, the design engineer shall provide a complete set of “Approved Record Drawings” and shall certify that all road and drainage construction has been completed in substantial accordance to the adopted Rules and Regulations of the County and in accordance with the previously approved construction plans and specifications, with any exceptions noted. The design engineer shall also certify that the approved traffic signage plan has been put into place. No performance security will be released without this exhibit.