Santaquin City Resolution 10-03-2016

A RESOLUTION MODIFYING THE SANTAQUIN CITY CONSTRUCTION AND PAVING STANDARDS

WHEREAS, Santaquin City is a fourth class city within the State of Utah and has the responsibility of maintaining its right of way infrastructure; and

WHEREAS, Santaquin City has need of updating City construction standards from time to time as needed;

WHEREAS, Santaquin City is updating these construction standards to meet current process and testing control needs as well as asphalt and concrete requirements for right of way infrastructure constructed within the City; and

WHEREAS, these standards are being updated to help ensure the best possible construction quality for infrastructure installed by development that will be dedicated to and owned by the City;

NOW THEREFORE, be it resolved by the Santaquin City Council to amend the Santaquin City Construction Standards for Paving as outlined in Exhibit A and Exhibit B attached.

ADOPTED AND PASSED by the City Council of Santaquin City, Utah, this 5th day of October, 2016.

SANTAQUIN CITY Incorporated January 4, 1932 STATE OF UTAH

SANTAQUIN CITY

Kirk F. Hunsaker, Mayor

Attest

Susan B. Farnsworth, City Recorder

2016 Standard and Specifications and Drawings Updates

Partial Errata (Divisions 1, 11 & 12) for

Changes made to the Santaquin City Standard Specification and Drawings

DIVISION 1

GENERAL REQUIREMENTS

Section 1.03 EXCAVATION PERMIT, FEES AND BONDING REQUIRED

- Some clarification for Roadway Excavation Permits.
- Added Sub-Section C Bonding to clarify bonding requirements.

Section 1.04 CONTRACTOR AND CONSTRUCTION PLAN APPROVAL

- Changed surety bond to guarantee bond.

Section 1.09 CODES AND STANDARDS

- For Codes & Standards, the more stringent requirement applies. (i.e. APWA, Geotechnical report, etc.)

Section 1.23
Sub-section E. Compaction Test of Soil and Untreated Base Course:
Part 6

- Density testing must be done 24 hours prior to asphalt or concrete being placed.

Section 1.23 TESTING AND PROCESS CONTROL
Sub-section F. Test Roll of Roadway Sub-grade:
Part 1

- Changes to roll test requirements. Roll Tests **shall be** (no longer optional per PW Director/Engineer) performed on all sub-grade and street section. (pg. 9)

DIVISION 11

ROADWAY CONSTRUCTION

Section 11.01 GENERAL

- Density testing must be done 24 hours prior to asphalt or concrete being placed.
- No surface improvements shall be installed until all conduits and public utility crossings are installed.

Section 11.02 MINIMUM ROADWAY CROSS SECTION, ROADWAY PRESERVATION COAT & ASPHALT CUTS

- Added a new section describing minimum thickness for roadway cross section and preservation coat after warranty period.
- Preservation coat requirement after 2 years (warranty period).
- Requirements for fabric & overlay if a new roadway has to be cut during first two years (warranty period).

Section 11.12 TACK COAT

- Added APWA standard for asphalt tack coat.

Section 11.13 BITUMINOUS ASPHALT CEMENT PAVEMENT

- Changed asphalt mix specifications to ½ mix specifications.
- Change AC-3, AC-10, AC-20 to PG58-22, PG58-28, PG64-22.

- Asphalt shall not be laid between Oct 10th to March 31st unless the air temperature is 50° F and rising and approved by the Public Works Representative **and** the City Engineer.
- Added maximum amount of Reclaimed (or Recycled) Asphalt Pavement (RAP) that can be used.

Section 11.14 ADJUSTING MANHOLES AND VALVE BOXES TO FINAL GRADE

- Removed concrete collar restriction in City streets.
- Removed Jack hammer requirement. Now requires round hole saw, no jackhammering allowed.

Section 11.16 CHIP SEAL

- Specified that any chip seal will only be performed by the City and it is not an approved preservation coat for new developments.

DIVISION 12

CONCRETE CURB, GUTTER AND SIDEWALK

Section 12.01 GENERAL

- Density testing must be done 24 hours prior to asphalt or concrete being placed.
- No surface improvements shall be installed until all conduits and public utility crossings are installed.

Section 12.05 SUBGRADE PREPARATION

- Prior to asphalt trails being constructed, the soil beneath the trail must be sterilized.

Section 12.06 CONSTRUCTION OF CURB, GUTTER AND SIDEWALK

- No SW until all utilities are installed.

Section 12.09 ACCESSIBILITY STANDARDS IN PUBLIC RIGHTS-OF-WAY

Sub-Section L. Curb Ramps Associated with Trails.

- For ADA ramps associated with trails, ADA ramp will not be installed until asphalt trail is completed.

Sub-section I. Detectable Warnings:

- ADA warning panels shall be yellow polymer composite/fiberglass.

DIVISION 1

GENERAL REQUIREMENTS

Section 1.01 PURPOSE OF DOCUMENTS

The purpose of these Standard Specifications and Standard Drawings is to govern any work done or improvements installed in Santaquin City. Construction work shall comply with the Santaquin City Management Code and the Santaquin City Subdivision Regulations. Developers/Contractors should thoroughly read and understand these specifications and standards before constructing public improvements.

The Developer/Contractor shall contact Public Works/Engineering at the Santaquin City Community Development Office, 275 West Main Street, Santaquin, Utah 84655 for all matters dealing with construction work within a City right-of-way or with any work connecting to a City utility. **SPECIAL PERMITS AND BONDING ARE REQUIRED FOR ALL SUCH WORK.**

Section 1.02 DEFINITIONS

Public Works Project: Refers to a project requiring the construction of any infrastructure that will be owned, maintained or operated by Santaquin City.

Public Works Representative/Engineer: Refers to the Public Works Director, Public Works Inspector, City Engineer and Public Works staff or others as designated by the Public Works Director.

Developer/Contractor: Refers to the Individual or group of individuals that will be planning, constructing, working or having an affect on any infrastructure that will be owned, maintained or operated by Santaquin City.

Section 1.03 EXCAVATION PERMIT, FEES AND BONDING REQUIRED

It shall be unlawful to do any construction, excavation work on any street, curb, gutter, sidewalk, sewer line, water line, pressure irrigation line, storm drain or other infrastructure addition or improvement in the City of Santaquin without an ~~Public Works~~ Excavation Permit to work in the public Right-of-Way from the City to do so. The City of Santaquin and all utility companies are bound by these standard specifications. No work shall be started until a permit is secured. In order to obtain an ~~Public Works~~ Excavation Permit, the Developer's/Contractor's authorized signature is required. If a contract to do such work for the City has been finalized, the contract fulfills the permit requirement.

Sub-Section A. Permit Application:

All ~~Public Works'~~ Excavation permit applications shall include:

1) Start and completion dates of the project.
2) The exact address or location of the work to be done.
3) The type of work to be done.
4) A request to locate water and sewer lines (at least 48 hours previous to start date of work).
5) A request for all utility companies to be contacted through Blue Stakes 1-800-662-4111.

Sub-Section B. Fee Assessment:

Before a permit is issued, a permit fee and an inspection fee shall be paid to the City. These fees will be set by Council resolution. Fees shall be assessed on the following items:

1) Sewer and water lateral installation inspection
2) Pressure irrigation service connection.
3) Re-inspection (When an inspection has been requested, the inspection is performed and the work is not complete, a re-inspection fee shall be assessed.)
4) Barricades (provided by, or called out by the City)
~~5) Bond~~

Sub-Section C. Bonding:

Before a permit is issued all bonding shall be paid to the city. Bonding amount will be determined by the Public Works Representative/Engineer.

For work to be done under contract with the city the bonding requirements are as follows

1) Contractor shall maintain a $2,000 dollar bond. Bond is used to guarantee the following
    a. Construction work is completed.
    b. Final inspection is conducted.

c. Repairs and/or replacement of required public improvements are finished and accepted.

2) Bonds shall be in the form of an irrevocable line of credit from a lending institution or a cash bond paid directly to the city.
3) No bonds shall be released until all the improvements are completed and the City has inspected and accepted the improvements.

For installation of new infrastructure to serve a new development:

1) Bonding shall follow the requirements contained within Santaquin City ordinance Title 11 Chapter 11.

~~All public improvement projects done for Public Works shall be bonded. Each contractor doing work in the City is required to maintain a surety bond in the amount of $2,000.00 with the City. Bond requirements are to guarantee the following:~~

~~The bonds shall be in the form of an irrevocable letter of credit from a bank, a bond from a surety company or a cash bond paid directly to the City. The City shall approve all bonds submitted. No bond shall be released until all improvements are completed and accepted by the City.~~

Section 1.04 CONTRACTOR AND CONSTRUCTION PLAN APPROVAL

Before a Contractor performs any work within the City, the City shall approve the Contractor. Approval is granted for a period of one (1) year upon submission of the following:

a) A current Utah State Contractor's License. Work will be restricted to that authorized by the license.

b) Proof of comprehensive general liability insurance. Bodily injury insurance will be in an amount of not less than three hundred thousand dollars ($300,000.00) for any one occurrence. Property damage insurance will be in an amount of not less than two hundred thousand dollars ($200,000.00) for any one occurrence and shall include underground exposure. Combined liability insurance will be in an amount of not less than five hundred thousand dollars ($500,000.00) for any one occurrence.

c) A two thousand dollar ($2,000.00) ~~surety bond~~ guarantee bond owing to the City, that will be in effect for a period of one
(1) year, or one (1) year after the completion of work performed by the contractor, whichever is greater.

The Public Works Representative/Engineer shall approve improvement drawings and cut sheets before any work begins. Developers/Contractors proceeding with work without such approvals shall have the project shut down until such approvals are obtained. Repeated offenses may result in the Contractor losing the pre-qualification to perform work in the City and action against his/her state license. Review time for improvement drawings and cut sheets requires **72 hours** from the time submitted to when the Developer/Contractor may pick them up and begin work. Cut sheets may be submitted once **Finalized Plans** have been stamped and initialed.

Section 1.05 PRE-CONSTRUCTION CONFERENCE

A pre-construction meeting with the Developer, Developer's Engineer, the Contractor(s) involved in the subdivision construction, and representatives of all utility companies that will provide service to the development shall be held with the Public Works Representative/Engineer, Public Works Inspector, and any other City Personnel deemed necessary prior to commencement of any work. The meeting will not be conducted until payment has been made for all fees, street lights and traffic signs. The location of the meeting shall be at the Santaquin City Community Development Office, 275 West Main Street, Santaquin, Utah 84655. The date and time of the conference shall be set up by the Developer and the Public Works Representative/Engineer. A minimum of **72** hours prior to the date and time of the meeting are required to permit notification of all participants. The following items shall be furnished at the meeting:

a) A detailed outline showing the sequences of construction of principle items of work. The outline shall show the beginning and ending dates of the major items of work on the Project.

b) A list of names, titles, addresses, and telephone numbers of the Developer/Contractor's responsible personnel, indicating those who may be reached outside normal working hours.

c) A list of Sub-Contractors and Materials Suppliers to be involved with the project and the items of work they are going to perform or furnish materials for. The City will notify the Developer/Contractor of any concerns or pre-qualification deficiencies of the companies they plan to use.

d) Drawings from each utility company showing the location and time schedule in which their improvements will be completed. It shall be the Developer's responsibility to follow-up with the utility companies to see that their drawings are at the conference.

e) The Developer is responsible to see that Developers Engineer, the Contractor(s), and representatives of each utility company are notified of the date, time and place of the pre-construction conference.

Other items may be discussed at this pre-construction conference as determined by the Public Works Representative/Engineer. Official minutes of this meeting as prepared by the Public Works Representative/Engineer shall become part of the project file for the project.

Section 1.06 TIMELY COMPLIANCE WITH THE ISSUED PERMIT

The Developer/Contractor shall perform in accordance with the terms of the permit and the Standard Specifications and Standard Drawings in effect at the date of the permit. The work shall be done in a timely manner. Time limits may be a condition of the permit and may be shortened because of safety concerns. Permits may be suspended if compliance is not met.

Sub-section A. Inspections:

All work covered by a Public Works permit shall be inspected by a Public Works Representative prior to the following:

1) Backfilling and compacting.
2) Placing concrete and asphalt
3) Placing any underground piping
4) Making any connection into a City utility line
5) Other work done in a public right of way.

Public Works shall also be notified prior to starting any Public Works project.

Sub-section B. Notification of Needed Inspections:

1) Inspection performed during regular working hours requires at least twenty-four (24) hours' notification.
2) Inspections needed on the weekend or City holidays, require that notification be given by 1:00 p.m. on the preceding Friday or day preceding holiday.
3) A charge shall be assessed for inspection call backs.

Sub-section C. Responsibility of the Developer:

The Developer is responsible for the complete development, including construction of the entire subdivision, until it is finalized and accepted by the City.

Sub-section D. Conflict:

These Standard Specifications and Standard Drawings are the minimum requirements of the City of Santaquin. In the event that any provisions herein conflict with general industry standards, or with other requirements specified by the City, the more stringent of the standards will apply.

Section 1.07 ELECTRONIC AND RECORD DRAWINGS

When the Developer's Engineer has the capability, plat and improvement drawings shall be furnished electronically in MicroStation Format (.dgn), AutoCAD format (.dwg) or Data Exchange Format (.dxf). These electronic files shall be provided to the City after completion of all of the improvements and final acceptance of the work by the City. A final bond release shall not be made to the Developer until these electronic files are received and reviewed by the Public Works Representative/Engineer. The Developer shall be responsible for all costs associated with the preparation of these electronic "Record Drawings."

In addition to the electronic files, after completion of all public works improvements the Developer shall provide the City with two sets of mylar "Record Drawings" which have been corrected to show the constructed improvements. Final payment from the bond shall not be made until these records are received.

Section 1.08 TEMPORARY SERVICES

Any temporary services and utilities such as telephone, electrical, water, toilet facilities, etc., shall be the responsibility of the Developer/Contractor.

Section 1.09 CODES AND STANDARDS

Where codes and standards are referred to they shall be current, approved copies. It shall be the duty of the supplier of any material on this work to submit evidence, if requested, that its material is in compliance with the applicable codes and standards.

If there is a specified standard (i.e. APWA, Santaquin City Standards, Subdivision Geotechnical report…) the more stringent requirement shall apply.

Section 1.10 STATE AND LOCAL LAWS

The Developer/Contractor shall conform to all applicable state and local laws in carrying out its obligations for the Development or under the Contract.

This shall include, but is not limited to, compliance by the Developer/Contractor with the requirements of Chapter 30, of Title 34, of the Utah Code Annotated, 1953 as Amended. If the provisions of Section 34-30-1, of the Utah Code Annotated, 1953 as amended, are not complied with, further construction of improvements shall stop until compliance is met.

Section 1.11 COMPLIANCE WITH GOVERNMENTAL REGULATIONS

The Developer/Contractor's personnel, equipment, and operations shall comply fully with all applicable standards, regulations, and requirements of existing Federal, Utah State, and Local governmental agencies. This shall include, but not necessarily be limited to, the following:

Sub-section A. United States Occupational Safety and Health Administration Regulations:

Title 29 of the Code of Federal Regulations, Part 1926 (29 CFR Part 1926), Safety and Health Regulations for Construction.

Sub-section B. Utah State Industrial Commission Regulations:

The Utah Occupational Safety and Health Act (1973) and Employer-Employee Safe Practices for Excavations and Trenching Operations (Jan. 1, 1974), as published by the Utah State Industrial Commission, including any and all amendments or revisions effective prior to performance of the work.

Sub-section C. City Codes and Ordinances:

The Developer/Contractor shall be required to comply with all Santaquin City Codes and Ordinances. This shall include, but not be limited to, International Building Code, International Plumbing Code, International Residential Code, International Mechanical Code, International Fire Code, and National Electrical Code – each the latest edition.

Sub-section D. UDOT Requirements:

When crossing or working within Utah Department of Transportation (UDOT) rights-of-way the Developer/Contractor shall be responsible to obtain all necessary permits and comply with all appropriate UDOT regulations including applicable sections in "Utah Department of Transportation Standard Specifications," latest edition.

Sub-section E. Permits:

The Developer/Contractor is responsible to obtain all required business licenses and building permits applicable to this project. Developer/Contractor shall be subject to the conditions of all permits and agreements between the Owner and the permitting agencies. See Division 14, Utah Department of Transportation Rights-of-Way.

Section 1.12 FEDERAL, STATE, AND LOCAL INSPECTING AGENCIES

The site of construction is to be open at all reasonable times and places for periodic observation by accredited representatives of the Federal, State, and local agencies who have regulatory or supervisory authority over any part of the work proposed or regulated thereto.

Section 1.13 PUBLIC SAFETY AND CONVENIENCE

The convenience of the general public and the protection of persons and property is of prime importance and shall be provided for by the Developer/Contractor during this project. The Developer/Contractor shall use every reasonable precaution to safeguard persons and property. Failure of the Owner or the Public Works Representative/Engineer to notify the Developer/Contractor of any deficiencies in providing for public safety and convenience shall not relieve the Developer/Contractor from its responsibility. The Developer/Contractor shall be required to comply with the requirements of the **Manual on Uniform Traffic Control Devices** (MUTCD).

Sub-section A. Compliance with Rules and Regulations:

The Developer/Contractor shall comply with all rules and regulations of the City, County, and State authorities regarding the closing of public streets, or highways, to the use of public traffic. If conditions justify, the Public Works Representative/Engineer may authorize the Developer/Contractor to close general traffic to not more than one (1) City block at any given time. No such closure shall be made without authorization of the Public Works Representative/Engineer. Closure of streets or highways shall be in conformance with the MUTCD.

Sub-section B. Road Closures and Obstructions:

No road shall be closed by the Developer/Contractor to the public except by express permission of the Public Works Representative/Engineer. The Developer/Contractor shall, at all times, conduct its work so as to insure the least possible obstruction to traffic and normal commercial pursuits.

Sub-section C. Protection of the Traveling Public:

All obstructions within traveled roadways shall be protected by signs, barricades, and lights where necessary for the safety of the traveling public. All barricades and obstructions shall be protected at night by signal lights that shall be suitably distributed across the roadway and kept burning from sunset to sunrise. Barricades shall be of substantial construction. Failure of the Owner or the Public Works Representative/Engineer to notify the Developer/Contractor to maintain barricades, barriers, lights, flares, danger signals, or guards shall not relieve the Developer/Contractor from its responsibility.

Sub-section D. Hazardous Conditions:

Whenever the Developer/Contractor's operations create a hazardous condition, it shall furnish flaggers and guards to give adequate warning to the public of any dangerous conditions to be encountered. It shall furnish, erect, and maintain fences, barricades, signs, lights, and other devices that may be necessary to prevent injury and damage to persons and property. Flaggers and guards shall be UDOT trained and shall hold current certification and shall be equipped with signs, flags, etc. as required by the UDOT regulations.

Sub-section E. Dust and Debris Control:

The Developer/Contractor shall control dust and debris that originates in the construction right-of-way or site. Dust, trash, and other debris shall be controlled on a daily basis by methods that shall include, but not be limited to, the use of a dust settling spray, a "pick-up broom" or street sweeper and trash disposal. Dust shall be controlled such that there will not be unnecessary dust blown into adjacent neighborhoods. The Developer/Contractor shall maintain on the project site a water truck with a minimum two thousand (2,000) gallon capacity. The Developer/Contractor shall be responsible to secure a source of water and shall obtain the necessary permission for its use. Failure by the Developer/Contractor to adequately control dust and debris may result in the Owner initiating dust and debris control measures and deducting the cost from payment due to the Developer/Contractor.

Section 1.14 CONFINEMENT OF WORK AND ACCESS TO RIGHT-OF-WAY AND EASEMENTS

The Developer/Contractor will be required to confine construction operations within the dedicated right-of-way for public thoroughfares or within areas for which construction easements have been obtained unless it has made special arrangements with the affected property owners in advance. The Developer/Contractor will be required to protect surface improvements located adjacent to the proposed construction site or replace damaged landscaping (see Division 10). During construction operations, the Developer/Contractor shall construct and maintain such facilities as may be required to provide access by all property owners to their property. No person shall be cut off from access to their residences or places of business for a period exceeding eight (8) hours, unless the Developer/Contractor has made special arrangements with the affected persons prior to commencing work in the area.

Section 1.15 NOTIFICATION OF RESIDENTS

All property owners and residents adjacent to the streets or easements affected by the construction shall be notified by the Developer/Contractor at least forty-eight (48) hours in advance of time construction begins. The Developer/Contractor can satisfy this requirement by placing a written notice on the door of each residence or business reading "Notice of Construction Operation. (Developer/Contractor) will be working on the construction of street

improvements on your street starting about_____ and ending about_____." The Developer/Contractor shall provide a copy of the notification form at the pre-construction meeting and the method to be used (hang on door, etc.)

Section 1.16 WEATHER CONDITIONS

In the event of temporary suspension of work, or during inclement weather, the Developer/Contractor will, and will cause its SubDeveloper/Contractors to, protect any project work or materials against damage from the weather. If, in the opinion of the Public Works Representative/Engineer, any Project work or materials become damaged, such work or materials shall be removed and replaced at the expense of the Developer/Contractor.

Section 1.17 LAND MONUMENTS

The Developer/Contractor shall preserve existing City, County, State, and Federal land monuments whenever possible. When these monuments cannot be preserved, the Developer/Contractor shall notify the Public Works Representative/Engineer at least two (2) weeks in advance of the proposed construction in order that the Public Works Representative/Engineer will have ample opportunity to reference these monuments for later replacement.

Section 1.18 SOURCE OF MATERIALS

All materials furnished or incorporated into this work shall conform to the requirements of these Specifications.

The Developer/Contractor shall acquire the necessary rights, at its own expense, to take material from aggregate sources and to use properties for plant site, hauling roads, and other purposes.

The Developer/Contractor may select areas for disposal of surplus materials; however, the Developer/Contractor will be responsible for acquiring the necessary right, at its own expense, to use the property for such purpose. Areas within the City are subject to review and approval by the Development Review Committee (DRC), who may require a site restoration plan.

Section 1.19 CONSTRUCTION WATER

It is the responsibility of the Developer/Contractor to make arrangements for water needed during construction. Water may be needed for moisture conditioning of soil and/or granular materials that are to be compacted, flushing lines of various types, and filling and testing pressure lines. Water to be used in filling, testing and flushing culinary water lines shall come from Santaquin City's culinary water system or other approved potable water source. The Developer/Contractor shall not obtain water from or operate any fire hydrant on the City's culinary water system without first obtaining approval from Santaquin City's Water Department. They shall comply with all requirements of the City including metering or load counts and the time of day water can be taken.

Section 1.20 OPERATION AND MAINTENANCE MANUALS

The Developer/Contractor shall furnish the Public Works Representative/Engineer with two (2) sets of all operation and maintenance manuals, improvement drawings, diagrams, etc., for all pumps, motors, control panels, valves, meters, etc., for use in the Operation and Maintenance Manual.

Section 1.21 INTERFERING STRUCTURES, UTILITIES AND FACILITIES

The Developer/Contractor shall exercise all possible caution to prevent damage to existing structures and utilities, whether above ground or underground. While these structures and utilities may be shown on the improvements plans, the information has been compiled from the best available sources, its completeness and accuracy cannot be guaranteed, and it is presented simply as a guide to possible difficulties. The Developer/Contractor shall notify all utility offices concerned at least forty-eight (48) hours in advance of construction operations in which a utility agency's facility may be involved. Notification to blue stakes does not necessarily cover all buried lines. This shall include, but not be limited to, irrigation, water, telephone, electric, sewer, storm drain, gas, and cable television. The Developer/Contractor shall be responsible for any and all changes to, relocation of, or re-connection to public utility facilities encountered or interrupted during the prosecution of the work, and all costs relating thereto shall be at the Developer/Contractor's expense. The Developer/Contractor shall contract with and pay Public Utility Agencies for work required in connection with all utility interference's and handle all necessary notifications, scheduling, coordination and details.

It shall be the responsibility of the Developer/Contractor to relocate and expose all existing underground structures

and utilities in such a manner as to prevent damage to the same. Any structure or utilities damaged by the Work shall be repaired or replaced at the Developer/Contractor's expense.

If the Developer/Contractor encounters existing structures that will prevent construction, it shall notify the Public Works Representative/Engineer before continuing with the construction in order that the Developer's Engineer or Public Works Representative/Engineer may make such field revisions as necessary to avoid conflict with the existing structures.

Section 1.22 MATERIAL AND COMPACTION TESTING

During the course of the work, a Geotechnical Engineer/Testing Company approved by the City, shall perform such tests as are required to identify materials, to determine gradation, to determine compaction characteristics, to determine moisture content, to determine density of trench backfill and fills in place, to determine density of imported granular material and road base, to determine concrete strength, to determine density and mixture of asphalt. These tests will be used to verify that the construction conforms to the requirements of the specifications. Such tests are not intended to provide the Developer/Contractor with the information required by it for the proper execution of the work and their performance shall not relieve the Developer/Contractor of the necessity of completing the construction in accordance with these specifications and Standard Drawings.

The estimated cost of such testing will be included in the Developer's bond posted with the City. The City shall contract with a geotechnical or certified testing company to perform the necessary tests. The Developer shall pay the actual cost of testing prior to final release of the bond. Copies of the tests will be furnished to the Public Works Representative/Engineer. Developer/Contractor will get copies of the test results from the company performing the tests. Before final release of the bond, the Geotechnical Engineer/Testing Company shall furnish the Public Works Representative/Engineer with a letter certifying that the test results have been in compliance with these Standard Specifications and Drawings and that the recommendations set forth in the geotechnical report were carried out. "Open tests" shall have been retested and/or the resolution thereof specifically addressed in the letter.

Section 1.23 TESTING AND PROCESS CONTROL

The Developer/Contractor has the responsibility to adequately test native materials and construction materials, and to furnish the City with manufacturer's certifications of material quality.

Sub-section A. Quality Assurance:

The Developer/Contractor shall be responsible for all sampling, delivery of samples to a qualified testing agency, testing, and delivery of test results or materials certifications to City at no charge to the City. Testing and certifications reports shall be approved by the City as to conformance to City standard specifications prior to final inspection and/or acceptance by the City of any materials or workmanship.

Sub-section B. Submittals:

Submittals shall consist of two types:

1) Field Test Report: When possible submit original report immediately to Public Works Representative/Engineer, but in no case later than end of following day.
2) Laboratory Test Report: Submit original report to Public Works Representative/Engineer within 48 hours after test results are determined.

Sub-section C. Sampling:

1) Sampling of materials shall be as specified in each test.
2) The Public Works Representative/Engineer may require that sampling be performed in their presence, in which case the Developer of Contractor shall be notified of this requirement in writing at the time the building permit is issued, or at the Preconstruction meeting, or when construction drawings are released by the City for construction, as applicable.
3) The presence of a Public Works Representative/Engineer shall not relieve the Developer/Contractor of any requirements in this Section.
4) Each sample or test shall be accompanied by the following written data, which shall be reported to the City with test results:
   a) Name of Project
   b) Name of Developer/Contractor
   c) Project Street Address

d) Appropriate Test Name
e) Date of Sampling
f) Sample Number (if more than one sample per day)
g) Name of technician who performed the testing
h) Location of sample

Sub-section D. Soil Classification Test:

1) The soil classification test shall be conducted to determine the suitability of native soils for road sub-grade and building foundations.
2) The soil shall be classified according to the Unified Soil Classification System and/or AASHTO soil classifications
3) The AASHTO soil classification test shall conform to AASHTO M-145 of latest revision
4) One soil classification test shall be required for each test area. A test area shall be limited to one parcel of one soil type, a maximum 1,000 feet long and maximum 5 acres. The Public Works Representative/Engineer may modify this requirement on a case by case basis.
5) The soil sample shall be taken from a test area at a minimum depth of 24-inches below the future design grades, of native soil, and shall be free from foreign material, asphalt, concrete, ice or manmade materials.
6) Where deep footings or pile foundations are proposed, soil classification tests at several depths may be required in each test area.
7) The results of all determinations shall be reported to the City in the form of a Geotechnical Report. The geotechnical report shall be certified by a Licensed Professional Engineer qualified in these types of investigations. The geotechnical report shall include, with additions as deemed necessary by the Public Works Representative/Engineer, the following information:
   a) A plot plan showing the location of all test borings and excavations.
   b) Descriptions and classifications of the materials encountered.
   c) Elevations of the water table, if encountered and an opinion of the seasonal fluctuation of the level.
   d) Evaluation of the subsurface soil conditions at the site.
   e) Assess the appropriate engineering characteristics of the subsurface soils.
   f) Provide geotechnical recommendations for general site grading, the design and construction of foundations, basements, concrete floor slabs, and asphalt pavement sections. The report shall include soil strength, bearing capacity, and provisions to mitigate the effects of expansive soils, collapsible soils, liquefaction, and adjacent loads.
   g) Expected total and differential settlement.

Sub-section E. Compaction Test of Soil and Untreated Base Course:

1) Laboratory test to establish maximum laboratory density shall be determined in accordance with AASHTO T-180, Method D or ASTM D 1557.
2) Samples to determine laboratory density shall be taken from the stockpiled backfill or from the un-compacted base course in place.
3) The acceptance of soil and base course with respect to compaction shall be based upon the average density of all density tests made in a lot.
   a) Field density tests shall be taken as specified in AASHTO T-191 or by use of a portable nuclear density testing device. Field density tests shall be taken at a depth equal to ½ the maximum depth of the lift tested.
   b) A lot shall equal the amount of soil or untreated base course compacted in each production day.
   c) A test lot shall be divided into sub-lots and one density test shall be taken within each sub-lot.
   d) The location of sampling sites within the sub-lot shall be chosen on a random basis by use of a suitable random number table or at the locations designated by the Public Works Representative/Engineer.
   e) Each test lot shall have a minimum of two (2) sub-lots. A sub-lot shall be no larger than 1,000 cubic yards for embankment, no larger than 200 cubic yards for backfill over pipe or against structures and no larger than 500 tons for untreated road base.
4) The test results of all samples tested shall be reported to the City. A test lot shall be accepted when the average of the density determinations is not less than the density required for that improvement in these specifications and when no one density determination is less than 95% of the density required by these specifications.
5) Compaction test not meeting the required specifications may be rejected and re-compaction or related construction efforts to obtain compaction shall be at the Developer/Contractor's expense.

6) All compaction testing must be completed no less than 24 hours prior to the placement of any asphalt or concrete within the roadway and sidewalk.

Sub-section F. Test Roll of Roadway Sub-grade:

1) Roll Test shall be performed ~~when required by the Public Works Representative/Engineer~~ to determine the structural integrity of the sub-grade and street section.
2) The Roll Test shall be performed as follows:
   a) The Developer/Contractor shall provide a loaded 10 wheel dump truck or water truck to drive over the sub-grade material within the roadway.
   b) The loaded truck shall be driven slowly over the sub-grade to locate soft spots in the sub-grade surface.
   c) Soft spots in the sub-grade shall be identified and marked by the Public Works Representative/Engineer.
   d) It shall be the Developer/Contractor's responsibility to remove the rejected sub-grade material to depth determined by Public Works Representative/Engineer. The rejected material shall be replaced with A-1 granular backfill material approved by Public Works Representative/Engineer.

Sub-section G. Gradation Test of Untreated Base Course:

1) The gradation of untreated base course shall be determined in accordance with AASHTO T-27
2) The total amount of material passing the No. 200 sieve shall be determined by washing in water in accordance with AASHTO T-11.
3) The acceptance of road base with respect to gradation shall be based upon the average of all determinations in a lot. A lot shall be limited to one source of borrow and limited to one subdivision plat or one development. One sample shall be required for each 500 tons or any fraction thereof of untreated base course in a test lot. When the test lot is less than 100 tons, the requirement for the gradation test may be waived by the Public Works Representative/Engineer.
4) The location of sampling sites within the sub-lot shall be chosen on a random basis by use of a suitable random number table or at the locations designated by the Public Works Representative/Engineer.
5) All material not conforming to the specified gradations may be rejected and replaced with material conforming to the specified gradations at the Developer/Contractor's expense.

Sub-section H. Extraction – Gradation Testing of Bituminous Surface Course:

1) Samples of the bituminous surface course or asphalt concrete shall be tested with respect to gradation and bitumen content in accordance with Utah Department of Highways Test Procedure 8-946 and 8-947 if required by the Public Works Representative/Engineer.
2) Mix design shall be submitted to the Public Works Representative/Engineer for approval 5 working days before work is to begin.
3) Acceptance of bituminous surface course with respect to gradation and bitumen content shall be base upon the average of the determinations made in a lot.
   a) A lot shall equal the amount of bituminous surface course placed in each production day.
   b) When a lot exceeds 500 tons, a minimum of three (3) samples shall be taken in each lot.
   c) When a lot is 500 tons or less, a minimum of two (2) samples shall be taken.
   d) Samples shall be taken at the time of lay-down of bituminous surface course and before compaction. Samples shall be taken from the mat behind the lay-down machine.
   e) Sampling shall be timed to represent the entire production day. The time of day, date or sample, station and offset location shall be clearly marked with the sample.
   f) If the average asphalt is less than 2.5% of optimal content, the Contractor may be required to lay an additional lift, based on the Public Works Representative/Engineer recommendation.

Sub-section I. Compaction Testing of Bituminous Surface Course:

1) Laboratory tests to establish the maximum laboratory density of bituminous surface course shall be determined by the "Marshall Test" in accordance to ASHTM D-1559.
2) Samples to determine maximum laboratory density shall be taken at the time bituminous surface course is placed and before compaction.
3) Acceptance of bituminous surface course with respect to compaction shall be based upon the average determination of field density tests made in a lot.
   a) Field density test shall be by laboratory density analysis of core samples.
   b) A test lot shall be the quantity of surface course placed and compacted in each construction day.

c) The test lot shall be subdivided into sub-lot(s) of approximately equal size and no larger than 2,000 square yards in area.

d) The location of sampling sites within the sub-lot shall be chosen on a random basis by use of a suitable random number table or at the locations designated by the Public Works Representative/Engineer.

4) The test lot shall be accepted with respect to density when the average of all density determinations is not less than the density required by Division 11.

5) Core Tests.

a) Acceptance of the completed bituminous surface course with respect to thickness shall be based on the average thickness of a test lot.

1) A test lot shall equal approximately 4,000 square yards of completed roadway.

2) A lot shall be divided into sub-lots of approximately 2,000 square yards.

b) One thickness test, randomly selected by use of a random number table or at the locations designated by the Public Works Representative/Engineer, shall be taken within each sub-lot. A minimum of three core tests will be taken.

c) A lot shall be accepted when the average thickness of all sub-lots is less than 3/8-inch less than the total designated bituminous surface course thickness and when no individual sub-lot shows a deficient thickness of more than 1/2-inch.

d) Lots or sub-lots that are not acceptable because of deficient thickness shall be brought into compliance by placing additional surface course as directed by the Public Works Representative/Engineer.

e) The removed core will be replaced with hot asphalt or low strength concrete.

Sub-section J. Compressive Strength Testing of Concrete Cylinders:

1) Samples of concrete shall be taken at the construction site, molded in standard cylinder shapes, allowed to cure, and tested with respect to comprehensive strength.

2) All samples of concrete shall be taken in conformance to AASHTO T-141, latest revision.

3) Acceptance of concrete with respect to compressive strength shall be based upon the average determination of all "compressive strength tests" made in a lot.

a) A test lot shall be the quantity of concrete placed at one job in a construction day.

b) A minimum of one "compressive strength test" will be taken of three cylinders for each 50 cubic yards concrete in a test lot, or fraction thereof. If placement is less than 5 cubic yards, proceed as directed by the Public Works Representative/Engineer.

c) The making and curing concrete test specimens in the field shall conform to AASHTO T-23. Compressive strength of cylindrical concrete specimens shall conform to AASHTO T-22.

4) Concrete may be rejected if desired strengths are not obtained. The concrete for which the tests failed shall be removed and replaced at the Developer/Contractor's expense.

Sub-section K. Additional Concrete Testing:

1) Slump Test: Determine slump in accordance with AASHTO T-27, (ASTM C-143). Use one test for each 50 cubic yards or fraction thereof. Reject concrete failing slump test (see Division 8 Section 8.04, Sub-section B).

2) Air Test: Determine normal weight concrete air content using AASHTO T-152 (ASTM C-231) for each 50 cubic yards or fraction thereof. Light weight concrete air content use ASTM C-173.

a) If an air test fails, immediately retest the same load (do not mix or add water between tests).

b) The concrete will be rejected if the second air test does not meet the specification.

c) If the second air test meets the specification, a third test will be performed to establish concrete acceptance or rejection.

3) When requested by Public Works Representative/Engineer, test in-place concrete by impact hammer, sonoscope, or other nondestructive device.

a) To determine relative strengths in various locations in Work.

b) To aid in evaluating concrete strength.

c) To select areas to be cored.

Sub-section L. Certifications:

1) When requested by the Public Works Representative/Engineer the Developer/Contractor shall obtain a manufacture's certificate certifying conformance to the applicable requirements of these Standard Specifications. Certifications that may be requested are but are not limited to those listed below:

a) Valves: Gate, Butterfly, Specialty.

b) Reinforcing Steel.
c) Structural Steel.
d) Pipe: Ductile Iron, AWWA C 900 or 905 PVC, Polyvinyl Chloride (Gravity, SDR 35), Concrete, Polyethylene Corrugated, Polyethylene (CTS), and Type K Copper.
e) Fire hydrants.

Sub-section M. Summary Table of Tests and Certifications:

1) The following is a summary of the tests, number of samples per test, and certificates that are or may be required for construction work and developments in Santaquin City. This summary is provided as a reference guide. For details governing each item, refer to the appropriate test specification herein.

Test Subject	Specific Test	Number of Tests
Soil Classification	Unified Soil Classification System or AASHTO M-145	1 test per test area of uniform soil type and 5 acres maximum.
Compaction of Embankments, Soil, Trench Backfill and Base Course. Embankments, Soil, and Base Course field density. Trench Backfill field density.	Lab Density - AASHTO T-180 Method D or ASTM D-1557 as applicable. Portable Nuclear Equipment or AASHTO T-191 (ASTM D-2922-96) Portable Nuclear Equipment or AASHTO T-191 (ASTM D-2922-96)	As needed to establish laboratory density. 1 test per sub-lot plus minimum one test per 1,000 cu. Yards. 1 test per sub-lot plus minimum one test per 100 feet of trench.
Test Roll of Roadway Sub-grade	N/A	As required by Public Works Representative/Engineer.
Base Course Gradation	Sieve Analysis – AASHTO T-27 Passing No. 200 Sieve – AASHTO T-11	1 test per 500 tons.
Extraction-Gradation Test of Bituminous Surface Course	UDOT Test Procedure 8-946 & 8-947	If lot is > 500 tons, 3 tests per pavement construction day if lot is < 500 tons, 2 tests per pavement construction day.
Compaction of Bituminous Surface Course	Lab Density-Marshall Test, ASTM D-1559.	1 test per pavement construction day. 1 test per sub-lot (2,000 square yards).
Core Tests	4" Core Sample	1 test per pavement construction day. 1 thickness test per 2,000 square yards or 3 test minimum.

Test Subject	Specific Test	Number of Tests
Concrete Test Cylinders	AASHTO T-23 and AASHTO T-22	Minimum of one "compressive strength test" of 3 cylinders for each 50 cubic yards in a test lot, or fraction thereof.
Slump Test	AASHTO T-27 (ASTM C-143)	One test for each 50 cubic yards or fraction thereof.
Air Test	AASHTO T-152 (ASTM C-231)	One test for each 50 cubic yards or fraction thereof.
Specialty Valves (Pressure Reducing, Regulating Valves, etc)	Manufacture's Certificate	1 for each valve.
Gate Valve	Manufacture's Certificate	1 for each valve.
Butterfly Valves	Manufacture's Certificate	1 for each valve.
Reinforcing Steel	Manufacture's Certificate	1 for each 1,000 pounds of one grade.
Structural Steel	Manufacture's Certificate	1 for each lot of one shape, one grade.
Pipe: Ductile Iron, AWWA PVC, Polyvinyl Chloride (SDR 25), Concrete, Polyethylene Corrugated	Manufacture's Certificate	1 for each 500 lineal feet of one size, one class.
Polyethylene (CTS) and Type K Copper.	Manufacture's Certificate	1 for each 500 lineal feet of one size, one class

Section 1.24 INSTALLATION OF UTILITY CONDUITS

Developers shall be responsible to install utility conduits at locations specified by utility companies and approved by the City.

a) Excavation shall be at depth and standards of utility companies.
b) Conduit Pipe shall be approved by each utility company. Utility company engineers shall establish the location of conduits. Conduits shall have bends attached to each end and placed vertically out of the ground for location verification. Conduits within street rights-of-way shall have a minimum of 18" cover below finished street grade. Mark location by stamping "X" in top of curb. If tunneled under existing sidewalk and less than 18" deep, mark the location with a glue-on identifier.

Section 1.25 PHOTOGRAPHS

It is recommended that the Contractor photograph existing surfaces along which Work may take place prior to construction in order to determine, after construction is completed, whether any damage of existing improvements existed prior to construction operations. The photographs will be an aid in determining the condition of existing facilities and the level of restoration to be made. If the contractor does not photograph existing conditions prior to construction, and facilities are damaged at the end of construction, the contractor will be responsible to repair or replace damaged facilities.

DIVISION 11

ROADWAY CONSTRUCTION

Section 11.01 GENERAL

This Division covers roadway construction, including work consisting of pulverizing existing asphalt, earthwork, and roadway excavation. It also includes imported subgrade preparation, drain rock, granular borrow, granular backfill borrow, flowable backfill, base course, tack coat, asphalt surface, adjusting manholes and valve boxes to final grade, pavement crack seal and chip seal, and pavement marking materials.

All compaction testing must be completed no less than 24 hours prior to the placement of any asphalt or concrete within the roadway and sidewalk.

No surface improvements (i.e. Roadbase, asphalt, curb, gutter, sidewalk…) shall be installed until all conduits and public utility crossings (i.e. Power conduits, gas line conduits…) are fully and completely installed.

Section 11.02 MINIMUM ROADWAY CROSS SECTION, ROADWAY PRESERVATION COAT & ASPHALT CUTS

The minimum cross section thickness shall be 12 inches of structural fill, 8 inches of road base and 3 inches of asphalt. This section may be increased per a geotechnical report from a licensed geotechnical engineer, roadway designation, or city engineer/public works representative.

Streets shall have an approved preservation coat installed with appropriate crack sealing prior to the completion of the warrantee period. This preservation coat shall be determined by the Public Works Representative and the City Engineer.

If the road has been cut during the 2 year warrantee period an asphalt overlay with a fabric reinforcing underlayment over the cut portions shall be placed. The fabric reinforcing shall follow APWA standards. (Section 31 05 19)

Section 11.03 PULVERIZING

The Developer/Contractor may pulverize the existing asphalt and road base to a depth of 6 to 8 inches. The limits of the area to be pulverized will be as shown on the Improvement Drawings. This material will be used for granular borrow or untreated road base. The Developer/Contractor has the option of methods he feels will result in the least work and best product in breaking up the existing asphalt, provided that the maximum size for a single piece of asphalt does not exceed 3 inches. Placing, grading and compacting of this material shall comply with the requirements of borrow or road base. The existing asphalt edges where the pulverizing terminates shall be saw cut following or prior to being pulverized.

Section 11.04 EARTHWORK

The earthwork needed for roadway construction shall meet the requirements of Division 7, Earthwork.

Section 11.05 ROADWAY EXCAVATION

The roadway shall be excavated to the lines and grades shown on the Improvement Drawings. Materials not suitable for use as granular borrow or roadbase shall be removed from the road section. Excavation may be done on one-half of the road at a time.

Section 11.06 SUBGRADE PREPARATION

This work shall consist of the shaping and compacting of the subgrade in accordance with these specifications and in conformity with the lines, grades, and typical cross sections shown on the Improvement Drawings and Standard Drawings or as established by the Public Works Representative/Engineer.

Following roadway excavation the subgrade shall be proof rolled by running moderate-weight rubber tire-mounted construction equipment uniformly over the surface at least twice. During the rolling operation moisture content of the subgrade layer shall be maintained at a level to permit compaction of the subgrade, but in no case greater or less than

plus or minus two percent (i.e. optimum 15.2%, range 13.2% to 17.2%) of the optimum moisture as determined by AASHTO T-180. Rolling shall be continued until the entire roadbed is compacted to the specified density to a minimum depth of 8-inches.

Section 11.07 DRAIN ROCK

Drain rock shall be free draining natural aggregate or crushed slag material meeting the following gradation:

Sieve Size	Percent Passing
1 - ½ inch	100
1 inch	95-100
½ inch	25-60
No. 4	0-10

Section 11.08 GRANULAR BORROW

Granular borrow (foundation or roadway) material shall consist of well graded granular bank run natural aggregate material with a maximum size of 3 inches and less than 15% passing a No. 200 sieve. The material shall meet the following gradation:

Sieve Size	Percent Passing
No. 10	50 max.
No. 40	30 max.
No. 200	15 max.

The granular borrow material shall be compacted to not less than 95% maximum dry density as determined by AASHTO T-180 (Modified Proctor). Granular foundation borrow shall be compacted to not less than 95% of maximum dry density as determined by ASTM D1557. Surfaces shall be true to the established grade with thickness being not less than 1/4-inch from the required layer thickness and with the surface elevation varying not more than 3/8-inch in ten feet from the true profile and cross section.

Section 11.09 GRANULAR BACKFILL BORROW

Granular backfill borrow shall be backfill material that is not mechanically graded. It shall be a bank run material free of shale, clay, slag, friable material and debris. It shall be reasonably uniformly graded with one hundred percent (100%) less than three-inch (3") and maximum of fifteen percent (15%) passing a No. 200 sieve. It shall reasonably meet the requirements of AASHTO M 145 classification A-1.

Section 11.10 FLOWABLE BACKFILL

When required by UDOT, required as part of the Contract, or directed by the Public Works Representative/Engineer, flowable backfill shall be used in place of native backfill or granular backfill borrow. The flowable backfill shall meet the following requirements:

Sub-section A. Cement:

Use Portland Cement, Type II per Division 8, Portland Cement Concrete.

Sub-section B. Fly Ash:

Supply fly ash that complies with ASTM C-618 Class F except that the loss on ignition must be 3 percent or less.

Sub-section C. Fine Aggregate:

Use natural sand. The sand shall meet the following gradation when tested in accordance with AASHTO T-27.

Fine Aggregate

Sieve Size	Percent Passing
No. 3/4	100
No. 100	0-10

Sub-section D. Mix Design:

The mix design shall meet the following requirements:

- Mix design compressive strength (28 day) – between 50 to 150 psi.
- Portland Cement – at least 50 pounds per cubic yard.
- Fly Ash – at least 300 pounds per cubic yard.
- Slump – 6 to 10 inches maximum.

Section 11.11 BASE COURSE

Base for all streets shall consist of clean, hard, tough, durable, and sound mineral aggregates that consist of crushed stone, gravel, or crushed recycled concrete and shall be graded as follows:

Sieve Size	Percent Passing
3/4 inch	100
3/8 inch	78-92
No. 4 sieve	55-67
No. 16 sieve	28-38
No. 200 sieve	7-11

The crushed recycled concrete shall have 75% to 100% passing the 3/4 inch sieve. Slag is not permitted to be used.

The material shall be deposited and spread in a uniform layer, without segregation of size, with such depth that when compacted, the layer will have the required thickness as stated below.

Developer/Contractor shall be required to set red heads to ensure that the road is crowned to give 2% cross slope. Red heads shall be set every 25 feet. Any other spacing shall require approval by the Public Works Representative/Engineer.

Each layer shall be compacted for the full width and depth. Alternate blading and rolling will be required to provide a smooth, even and uniformly compacted course true to cross section and grade. Places inaccessible to rolling shall be compacted with mechanically operated hand tampers.

The gravel base shall be compacted to not less than 95% maximum dry density as determined by AASHTO T-180 (Modified Proctor). Surfaces shall be true to the established grade with thickness being not less than 1/4-inch from the required layer thickness and with the surface elevation varying not more than 3/8-inch in ten-feet from the true profile and cross section.

Section 11.12 TACK COAT

The Developer/Contractor shall apply asphaltic material to existing asphalt concrete or Portland cement concrete edges and surfaces that will be in contact with the bituminous surface course. Apply tack coat only to area covered with bituminous surface course in the same day. APWA standard (Section 32 12 13.13) or the following criteria shall be followed, whichever is more stringent:

1) Certificate showing asphaltic material complies with these Specifications.
2) Identify water/asphalt dilution ratio.

3) Identify tack coat application rate (typically 0.05 to 0.15 gallons per square yard).
4) All existing asphalt shall be saw cut to remove fractures, cracked, or damaged asphalt. Developer/Contractor shall trim the existing pavement to clean straight lines as nearly perpendicular or parallel to the centerline of the street as practicable. Said straight lines shall be thirty feet minimum lengths and no deviations from such lines shall be made except as specifically permitted by the Public Works Representative/Engineer.
5) Apply tack coat only when air and roadbed temperatures in the shade are greater than 40 degrees F. The temperature restrictions may waived only on written authorization from Public Works Representative/Engineer.
6) Do not apply tack coat during rain, fog, dust, or other unsuitable weather. Do not apply coat to wet surfaces.
7) Follow notification requirements stated in these Specifications.
8) Tack coat shall be SS-1 or SS-1h or equivalent.
9) Clean the surface to be treated free of dust and other foreign material. If flushed, allow surface to dry. If leaves from trees, blow clean.
10) Prevent pedestrian, vehicles, pets, etc. access to tack surfaces.
11) The tack shall be applied under pressure using a spray bar or hose and nozzle. The tack shall be evenly spread with 100% coverage. Other methods of application may be used only upon approval of the Public Works Representative/Engineer.
12) Protect all surfaces exposed to public view from being spattered or marred. Remove spattering, over-coating, or marring.
13) Do not discharge bituminous material into borrow pits or gutters.
14) Do not permit traffic to travel over the tacked surface until bituminous tack coat is cured or is not picked up by traffic.

Section 11.13 BITUMINOUS ASPHALT CEMENT PAVEMENT

Over the dry, dust-free compacted base course the Developer/Contractor shall place and compact a bituminous asphalt cement surface course. The surface course shall consist of a mixture of mineral aggregate and binder. Gradation of aggregate shall conform to the following:

Sieve Size	Percent Passing
~~3/4~~1/2 inch	100
3/8 inch	66~~9~~-91
No. 4	42-58
No. 16	17-31
No. 50	9-21
No. 200	4-8

The Developer/Contractor shall establish a mix gradation, and the amount of bituminous material shall be subject to the approval of the Public Works Representative/Engineer and shall meet the requirements of the gradation selected. There shall be between 3% and 5% air voids in the mix.

The bituminous material for the surface course shall be ~~AC-5~~ PG 58-22, ~~AC-10~~ PG 58-28, or ~~AC-20~~ PG 64-22 penetration asphalt cement conforming to the requirements of ASTM D-445. 85-100 penetration asphalt cement conforming to the requirements of ASTM M20-60 may be used when specifically approved by the Public Works Representative/Engineer.

The bituminous surface course shall be mixed at a mixing plant and spread and compacted on the prepared base in conformance with the lines and dimensions shown on the Improvement Drawings, Standard Drawings, and in accordance with these Specifications.

The bituminous mixtures shall be spread with self-propelled mechanical spreading and conditioning equipment capable of distributing at least a 12-foot width. The mixture shall be spread and struck off in such a manner that the finished surface shall result in a uniform smooth surface. The longitudinal joints in succeeding courses shall be offset at least 6 inches transversely to avoid a vertical joint through more than one course.

The temperature of the bituminous mix shall be between 270° F and 325° F when placing.

After the mixture has been spread, the surface shall be rolled in longitudinal direction commencing at the outside edge or lower side and proceeding to the higher side. Each pass of the roller shall overlap the preceding pass at least

one-half the width of the roller. Rolling shall continue until 95% of the laboratory density as determined in accordance with ASTM Designation D1559 for the bituminous mixture being used has been obtained. Density tests shall be done following the procedures of ASTM D2950.

Rolling operations shall be conducted in such a manner that shoving or distortion will not develop beneath the roller.

The surface of the pavement, after compaction, shall be uniform and true to the established grade. When tested with a ten-foot straight edge placed on the surface of the pavement, at any point, the surface shall not deviate more than one-eighth of an inch from the lower edge of the straight edge. All high and low spots shall be remedied immediately by removing the wearing course material over the affected areas and replacing it with fresh, hot wearing course and surface finish material and immediately compacting it to conform with surrounding area. The asphalt surface shall be one-half inch (1/2") higher than the lip of gutter.

It is the responsibility of the Developer/Contractor to control traffic. All traffic shall be kept off the completed surface for a minimum period of 24 hours.

No bituminous surface course shall be placed between Oct. 10th and March 31st unless the temperature of the air or roadbed is ~~40~~ 50° F and rising, during rainy weather, when the base is wet, or during other unfavorable weather conditions as determined by the Public Works Representative **and** City Engineer. The air temperature shall be measured in the shade.

Reclaimed (or Recycled) Asphalt Pavement (RAP) may be used in the asphalt mix design. Submit proposed mix design of any asphalt concrete pavement containing RAP. Modify asphalt binder grade as necessary to account for the effect of RAP on viscosity.

A maximum of 15% RAP – Reclaimed (or Recycled) Asphalt Pavement may be used in the asphalt mix design.

Section 11.14 ADJUSTING MANHOLES AND VALVE BOXES TO FINAL GRADE

This section covers the requirements for adjusting manholes and valve boxes to final grade. Adjustable manhole frames are required for any manhole being installed under a pavement or concrete section. The adjustment shall be made with cast-iron ring inserts, concrete grade rings, cast-in-place concrete rings or Adjustable Manhole Frames. Cast-in-place concrete rings shall be constructed and Adjustable Manhole Frames shall be adjusted after the asphalt surface has been placed.

When concrete rings are used the concrete shall conform to the requirements of Division 8. Concrete shall be Class AA(AE).

Manholes and valves in asphalt surfaces shall have the cast iron ring and cover constructed such that the cast iron ring is one-quarter inch (1/4"), range no less than one-sixteenth inch (1/16") and no greater than one-half inch (1/2"), lower than the existing or new pavement. Manhole rings shall be set to the grade and slope of the road – adjust or shim and grout ring into place.

Where manholes are to be raised this is to be done as specified in Division 5 MANHOLES.

Rings and covers shall be protected during backfilling and compaction of the soil and during the placing or replacing of road surfaces. Any ring or cover loosened from the manhole section shall be reset in cement mortar and any ring or cover damaged or broken shall be replaced by the Developer/Contractor at its expense.

~~NO concrete nor Asphalt collars shall be constructed around manholes placed with Santaquin City R-O-W. Use D&L Supply manhole adapter rings(s) (risers) to set ring and cover to finish grade.~~

Valve boxes shall have concrete collars placed around them. Existing or new asphalt around the valve box shall be ~~jack hammered out~~ removed with a round hole saw, no jackhammering of asphalt is allowed for concrete collar placement, road base around the valve box shall be recompacted, and the concrete collar shall be placed.

Section 11.15 PAVEMENT CRACK SEAL

This section covers filling and sealing cracks in asphalt concrete pavements. Crack filling and sealing shall comply with the requirements of ASTM D 5078: Standard Specification for Crack Filler for Asphalt Concrete and Portland Cement Concrete Pavements and ASTM D 3405: Joint Sealant, Hot-Applied, for Concrete and Asphalt Pavements. Crack filling is defined as the placement of materials into cracks to substantially reduce infiltration of water and to reinforce the adjacent pavement. The crack receives no special preparation other than cleaning. Crack sealing is the placement of specialized materials in

cracks or above to prevent the intrusion of incompressible material and water into the crack. The crack receives unique crack configuration preparation. Potholes are cracks wider than 1-inch. The Developer/Contractor shall submit manufacturer's certification of compliance at least 5-days prior to doing the crack sealing.

Sub-section A. Quality Assurance:

The following guidelines shall be followed to assure the quality of the work:

1) Deliver packaged material in unopened packages with labels clearly indicating the following:
    a) Name of manufacturer
    b) Manufacturer's product name or product number
    c) Manufacturer's batch or lot number
    d) The application temperature range
    e) The recommended application temperature and the safe heating temperature range
2) Do not use crack repair product that has been over-heated, suffered prolonged heating or which ravels or can be pulled out by hand after placement.
3) Do not mix different manufacturer's brands or different types of crack repair material.
4) Do not depress crack repair product temperature at the wand tip below the manufacturer's recommended application temperature when loading product into product tank.
5) Rework defective work.

Sub-section B. Filler and Sealer Material:

The filler shall be asphalt emulsion. The sealer shall be hot applied rubber or hot applied rubberized asphalt. Crack treatment materials shall meet the following requirements:

Material Type	ASTM	Application
Hot-applied Thermoplastic Materials		
Asphalt Rubber	D 5078	Sealing (possibly filling)
Rubberized Asphalt	D 1190, D 3405	Sealing
Cold Applied Thermoplastic Materials		
Asphalt Emulsion	D 977, D 2397	Filling

Sub-section C. Equipment:

The following equipment shall be used to apply the materials.

1) Sealant heating equipment shall be indirect heating using double boiler or circulating hot oil heat transfer for heating the product. Unit must have means of constant agitation.
2) Do not use direct heat transfer units (tar pots).
3) Hot compressed air lance that provides clean, oil-free compressed air at a volume of 100 cubic feet per minute at a pressure of 120-pounds per square-inch at the lance tip.

Sub-section D. Advanced Preparation:

Prior to the crack repair the Developer/Contractor shall;

1) With the Public Works Representative/Engineer identify the locations that are to have crack repair.
2) Notify neighborhood of the date and time that crack repair will take place at least 48-hours in advance of when the repairs will begin.
3) Allow at **least one week** for repaired cracks to cure and harden before placing thin overlays.
4) Repair potholes or failed spots full depth.

Sub-section E. Application:

1) Immediately before sealing the joints, blow cracks clean, clean 6-inches on both sides of the joint, remove foreign matter, loosened particles, and weeds.
2) Use a HCA (hot compressed air) heat lance when surfaces are wet or when air temperature is less than 40 degrees F. Do not burn the surrounding pavement. Fill cracks immediately after heating with the air lance or reheat.
3) Fill each crack to within 1/4-inch of the existing surface.
4) If a thin pavement (chip seal) is to be applied, remove crack overfill by squeegee.

5) Use an appropriate backer rod in the joint opening where the depth and width of the joint opening are greater than 2-inches and 1/2-inch respectively.
6) Place sand on surface of crack product if traffic or construction activities are likely to cause pull out. The sealant material picked up or pulled out shall be replaced by the Developer/Contractor at their expense.
7) The Developer/Contractor will remain liable for any damage to the traveling public resulting from sealant application or sealant pull-out. Developer/Contractor shall repair vehicles or other property damaged by the crack repair operation.

Sub-section F. Backer Rod:

Use closed-cell, polyethylene-foam rods conforming to the following requirements:

Backer Rod Requirements and Test Methods		
Diameter	Joint width + 1/8-inch	
Density	2 lbs/ft^3	ASTM D 1622
Tensile Strength	25 psi	ASTM D 1623
Absorption	0.5 percent by volume	ASTM D 509
Compression Deflection	25 percent at 8 psi	ASTM D 1621

Section 11.16 CHIP SEAL

Chip seal surface improvements shall only be performed by the City and is not an approved asphalt preservation method for placement prior to the end of the warrantee period.

~~On all new streets and to the centerline of existing streets that have been strip paved place a chip seal and fog seal on the asphalt surface. The chip/fog seal shall be placed 6-months (or less) prior to the end of the warranty period.~~ Prior to placing the seal coat all areas of trench settlement shall be repaired and brought to grade. The seal coat is required to provide a paving asphalt and cover aggregate evenly spread as a uniform, skid-resistant roadway surface after all asphalt cuts and trench settlements have taken place so as to prevent water penetrating the asphalt surface through cracks along the edges of trench cuts and settlement.

All asphalt settlement or potholes shall be repaired by saw cutting a minimum of one-foot (1') beyond the area that is settled (see Standard Drawing Number 10), removing the existing asphalt, filling the settled area with road base compacted to 95% of the maximum density, and re-asphalting to thickness of the existing asphalt or 3-inches, whichever is greater. The surface of the patch, after compaction, shall be uniform and true to the existing grade on all sides. When tested with a ten-foot straight edge placed on the surface of the pavement, at any point, the surface shall not deviate more than one-eighth of an inch from the lower edge of the straight edge.

Sub-section A. Submittals:

Ten days prior to use submit a mix design that consists of the following:

1) Select type and grade of emulsified asphalt to be used per ASTM D 3628 and as specified herein..
2) Aggregate gradation test results.
3) Results of asphalt/aggregate compatibility test.
4) List of asphalt additives.

Submit a list of equipment to be used. Prior to placing emulsified asphalt submit a bill of lading showing:

1) Weight of emulsified asphalt supplied by vendor.
2) Weight of emulsified asphalt after water has been added as required for application purposes.

Upon request of the Public Works Representative/Engineer submit a written quality control inspections and testing report describing source and field quality control activities performed by Developer/Contractor and suppliers.

Sub-section B. Quality Assurance:

The following guidelines shall be followed to assure the quality of the work:

1) Determine paving asphalt weights by mix design.
2) Do not change source.
3) Reject coating products that do not meet the requirements of this Section.

4) Remove any product found defective after installation and install acceptable product at the Developer/Contractors expense.

Sub-section C. Paving Asphalt:

The paving asphalt shall be petroleum asphalt uniformly emulsified with water, homogeneous throughout, and when stored shows no separation within 30-days after delivery. Frozen emulsions are not accepted. The emulsion shall be the following:

1) Cationic (breaks chemically) meeting the requirements of ASTM D 2397 Standard Specification for Cationic Emulsified Asphalt.

Use of any of the following additives to match aggregate particle charges, weather conditions, and mix design

1) Anti-strip to change or neutralize particle charges.
2) Enhancer to promote greater film thickness on the aggregate.
3) High Float Agent to improve temperature susceptibility of the asphalt and impart a gel structure to the asphalt.
4) Polymer to reduce stripping, improve coating, decrease temperature susceptibility and increase stability of mix.
5) Rejuvenator to adjust the penetration of the base asphalt or soften reclaimed asphalt.

Sub-section D. Cover Material:

Use crusher processed virgin aggregate consisting of natural stone, gravel, or slag meeting the following requirements:

Chip Seal Cover Material Properties		
Fractured faces	ASTM D 5821	> 60% by weight with at least 2 mechanically fractured faces or clean angular faces
Soundness	ASTM C 88	For combined course and fine aggregate < 12% using Na_2SO_4 < 18% using $MgSO_4$
LA wear (see Note 1)	ASTM C 131	< 30% wear of aggregate
Polishing (see Note 1	ASTM D 3319	> 38
Flat or Elongated Particles (3:1 ratio)	ASTM D 4791	10% maximum for material on 3/8-inch sieve
Friable Particles	ASTM C 142	< 3% by weight aggregate passing the No. 4 sieve
Note 1: The Public Works Representative/Engineer has the right to wave this requirement if aggregates having higher values are known to be satisfactory		

Grade with the following limits to meet the specified test standard in ASTM C 136, portion retained on the No. 4 sieve clean and free of clay coatings, and clay content determined by washing per ASTM C 117:

Sieve Size	Grade B Percent Passing	Grade C Percent Passing
1/2 in.	- -	100
3/8 in.	- -	70 - 90
No. 4	100	0 - 5
No. 8	85 - 100	0 - 3
No. 16	10 - 25	- -
No. 50	0 - 5	- -
No. 200	0 - 2	0 - 2

Sub-section E. Preparation:

The following requirements shall be strictly followed. Any exceptions or deviations must first be approved by the Public Works Representative/Engineer.

1) Wait at least 7-days before placing seal coat on newly patched surfaces.
2) Lay seal coat if air and roadbed temperatures in the shade is greater than 70^{o} F. and rising. Allow four weeks of warm weather cure time. This generally limits performance of work from May 15 to August 31.
3) Do not lay seal coat if pavement surface is above 120^{o} F.
4) Do not lay seal coat during rain or unsuitable weather.
5) Locate and protect all street fixtures.
6) Use reflective tabs to mark roadway striping before applying asphalt.
7) Protect manholes, valve boxes, inlets, and other service entrances. Install invert covers.
8) Notify adjacent property owners of the day and time that the paving will take place. Notify them that vehicles will need to be moved from the street or they will be towed away. These notices shall be posted a minimum of 48 hours in advance of paving. Notification shall follow the requirements of Division 1, Section 1.14.
9) Should the work not occur on the specified day, a new notice shall be posted.
10) Protect trees, plants, and other ground cover from damage. Prune trees to allow equipment passage underneath. Repair tree damage at no cost to the Owner or City.
11) Direct traffic through work to provide worker and public safety. Following the requirements of Division 1, Section 1.12, Public Safety and Convenience. Provide flaggers as required.
12) All potholes, raveled areas, trench settlement, and low areas shall be repaired. Cracks shall be sealed. Crack sealing shall be allowed to thoroughly dry before cleaning and excess asphalt removed.
13) Remove vegetation from cracks, edges, and joints. Remove loose material, mud spots, sand, dust, oil, vegetation, and other objectionable material from pavement surface. Water flushing will not be permitted if pavement surface is cracked.
14) Run a distributor truck test strip. Show uniform application of bituminous material. Show triple pass of distributor bar.

Sub-section F. Application:

The following criteria shall be followed when applying the chip seal:

1) Mask off the end of streets and intersections to provide straight lines. Make straight lines along lip of gutter and shoulders. Keep lap lines out of wheel path.
2) Keep viscosity between 50 and 100 centistokes per ASTM D 2170 during application.
3) Apply cover aggregate within +1 to -2 pounds per square yard. Use a damp chip but not saturated (water running out of the back of the haul truck means the chips are too wet). Maintain a distance of not more than 100-feet between the distributor and the chip spreader. Spread larger particles first. Hand brook the cover material, if necessary, to distribute the aggregate uniformly over the surface.

4) If bleeding occurs, apply a blend of 25 to 50-percent hydrated lime with sand (blotting material). Use sand to cool chips.
5) Expose all street fixtures after seal coat operations.

Sub-section G. Rolling:

1) Use a rubber tired roller to seat aggregate. Make at least 2 complete rolling coverages.
2) Complete rolling before the bituminous material cools or hardens.
3) Keep traffic off at least 4-hours or until moisture leaves the remaining chips. Sweep surface before allowing uncontrolled traffic on chips.

Sub-section H. Fog Seal:

The fog seal shall be applied to the chips within 24-hours of placing chips. Keep viscosity between 50 and 100 centistokes per ASTM D 2170 during application.

Sub-section I. Cleanup and Repair:

Upon completion of the work the Developer/Contractor shall:

1) Remove spatter or mar from curb, gutter and sidewalk.
2) Remove any product found defective after installation and install acceptable product.
3) Fill any joints or cracks that are not covered by the coat. Leave no streaks, holes, bare spots, or cracks through which liquids or foreign matter could penetrate to the underlying pavement.
4) Repair any damage caused by construction.

Sub-section J. Acceptance:

Opening to traffic does not constitute acceptance. Random samples will be taken by an independent testing laboratory, the cost of which will be paid by the Developer/Contractor. Acceptance is on a block-by-block basis. The samples must meet the following requirements:

1) Aggregate (sampled from the hauling equipment) will be accepted if the following conditions are met. There shall be one test per lot. A lot size is one days production with 500 ton sub-lots.
   a) The average gradation of each sieve for the lot is within the target gradation band for that sieve.
   b) The number of individual aggregate samples in each sub-lot outside the target gradation band does not exceed 2.
   c) No aggregate sample is outside the target gradation band by more than 2% on any one sieve.
   d) No tolerance will be allowed for the minus 200-portion of cover material
2) Paving asphalt application shall be uniform with no ridging.
3) Aggregate Embedment and Asphalt See-Through: After rolling and evaporation random sampling reveals large particles are embedded in the paving asphalt on their flat side to a depth of 50% to 70%. No more than 15% black (asphalt) can be seen through newly laid and compacted rock chip after sweeping.

Section 11.17 PAVEMENT MARKINGS

This section covers pavement markings on all streets open to public travel.

Pavement markings shall conform to the latest edition of the Manual on Uniform Traffic Control Devices.

Sub-section A. Materials:

Pavement marking paint, glass beads and pavement marking materials shall conform to the latest edition of the UDOT Standard Specifications.

Sub-section B. Preparation:

Remove dirt, loose aggregate and other foreign material and follow manufacturer's recommendations for surface preparation.

Sub-section C. Application:

Apply pavement marking paint and glass beads at rates contained in the latest edition of the UDOT Standard Specifications.

Apply pavement marking materials according to the manufacturer's recommendations.
Apply acrylic water based pavement marking paint only when air and surface temperatures are 50° F and rising.

Apply paint and pavement marking materials within 2 inches of the proper locations. Remove and reapply paint or markings that are installed outside this tolerance.

Sub-section D. Removing Pavement Markings:

Remove pavement marking paint using either high pressure water spray or sandblasting using equipment specifically designed for the removal of pavement marking material.

Do not use shot blasting and grinding to remove pavement markings.

Do not obscure pavement markings by covering with black paint or any other material, in lieu of removing pavement markings.

DIVISION 12

CONCRETE CURB, GUTTER AND SIDEWALK

Section 12.01 GENERAL

This section covers installation of curb and gutter, sidewalk, combination of curb, gutter and sidewalk, cross gutter, drive approaches, handicap ramps and curb returns. All improvements shall be constructed to the dimensions and thickness shown on the Standard Drawings.

All compaction testing must be completed no less than 24 hours prior to the placement of any asphalt or concrete within the roadway and sidewalk.

No surface improvements (i.e. Roadbase, asphalt, curb, gutter, sidewalk…) shall be installed until all conduits and public utility crossings (i.e. Power conduits, gas line conduits…) are fully and completely installed.

Section 12.02 CONCRETE

Concrete shall be Class AA(AE) and shall meet all of the requirements of Division 8, Portland Cement Concrete. Under no condition shall the water cement ratio exceed 0.53.

Section 12.03 GRADE

Minimum flow line grade shall be 0.5 percent. Grade stakes for curb, gutter and/or sidewalk shall be placed every 25-feet around curves, 50-feet on tangent sections, at ¼ deltas and at the edges of the landings on curb returns. Grade stakes shall be placed at all PC's, PT's, PCR's, VPC's, and VPT's. Grade stakes shall also be set at the point of change in grade not requiring a vertical curve. Grade stakes and cut sheets shall have the centerline station of the street written on them that are the same as the stationing shown on the improvements drawings.

After construction, gutters shall be checked by flowing water. The Public Works Representative/Engineer shall be present during the flow test. Any high spots or depressions (which exceed 0.02 feet) shall be repaired by grinding high spots to the correct grade and/or removing concrete and replacing to the correct grade. Puddling shall not stand from flow line past lip of gutter.

Section 12.04 FORMS

All forms shall be steel, except at curves with a radius smaller than 200 feet. They shall be of a size to match the sections shown on the Standard Drawings. Forms shall be held firmly in place with stakes or other approved means and shall be true to line and grade.

All forms shall be clean and coated with a light oil to prevent the concrete from adhering to them. Clamps, spreaders and braces shall be used where required to insure rigidity in the forms.

Forms shall not vary from vertical grade by more than 0.02 feet and from horizontal alignment by more than 0.02 feet. All forms shall have smooth even lines in both the horizontal and vertical plane.

Forms for curved sections shall be so constructed and placed that the finish surface of walls and edge of sidewalks, curbs and gutters will not deviate from the arc of the curve.

Section 12.05 SUBGRADE PREPARATION

The Developer/Contractor shall grade to the line and grade approved by the City. **No concrete shall be placed**

without approved cut sheets. The sub-grade shall be properly shaped to conform to the cross section shown on the Standard Drawings, graded and compacted. Compaction shall meet the requirements of Division 7 Earthwork.

All excess material excavated by the Developer/Contractor shall be removed from the site. Removal of the excavated material shall be done before or immediately after the concrete is placed. The Developer/Contractor shall maintain adequate barricades and other devices to protect the public until excavated material is removed.

Placement of concrete on unsuitable materials shall not be permitted. The subgrade surface shall have a 6-inch road base foundation as shown on the Standard Drawings. Prior to the placing of concrete, the subgrade shall be compacted using a mechanical foot compactor, with compaction being at least ninety-five percent (95%) of the maximum dry density as determined by AASHTO T-180 (Modified Proctor). The surface shall be proof rolled prior to placing any concrete and no concrete shall be placed until the surfaces have been inspected and approved by the Public Works Representative/Engineer.

All trails to be constructed of bituminous asphalt cement pavement shall have the subgrade sterilized directly below the trail prior to roadbase being placed. The method of sterilizing shall be approved by the Public Works Representative/City Engineer.

Section 12.06 CONSTRUCTION OF CURB, GUTTER AND SIDEWALK

Concrete curb, gutter and sidewalk may be constructed by first constructing the curb and gutter and then constructing the sidewalk behind it. If this method is used the joint between the back of curb and front edge of sidewalk shall be sealed. The curb and gutter may be placed using stationary forms or the slip method of forming. No sidewalk shall not be constructed until after all public utilities have been installed.

Monolithic curb, gutter and sidewalk may be constructed. Stationary forms can be used to place combination curb, gutter and sidewalk. The slip form method can be used if it can be demonstrated that the tolerances specified herein can be met.

Curb and gutter to be installed with bituminous asphalt cement pavement shall have contraction joints placed every 10 feet by use of 1/8-inch steel template of the exact cross section of the curb and gutter. Where dividing plates are used joints shall have a minimum of 2-inches of concrete under the plate, or the joint will be sealed with an approved sealant. Remove the templates as the concrete takes initial set. Cut the joint 1-1/2 inches deep when using the slip form method to place the concrete. Use 1/2-inch thick, pre-molded, expansion joint filler at curb and gutter radii, where the curb and gutter abuts a solid object and at intervals not to exceed 30 feet, unless otherwise specified by the Public Works Representative/Engineer.

Joints in sidewalk, when placed separately and adjacent to the curb shall match the contraction and expansion joints in the curb and gutter as well as where the sidewalk abuts a solid object. Sidewalks not placed adjacent to the curb shall have contraction joints at 5-foot intervals. The joints shall be approximately 3/16 inch wide and approximately one-half of the total slab thickness in depth. Expansion joints shall be 1/2-inch thick. They shall be placed every 30 feet and where new sidewalk adjoins existing sidewalks or abuts a solid object.

Material for 1/2-inch expansion joints shall be as specified in AASHTO M-153 and AASHTO M-213, and shall be installed with its top approximately 1/4-inch below the concrete surface.

After the concrete placed for a sidewalk has been brought to the established grade and screeded, it shall be float finished, edged and then given a light broom finish. In no case shall dry cement or a mixture of dry cement and sand be sprinkled on the surface to absorb moisture or hasten hardening. Surface edges of all slabs shall be rounded to a radius of 1/2 inch.

After concrete has been placed in curb and gutter forms, it shall be consolidated so as to insure a thorough mixture, eliminate air pockets, and create uniform, smooth sides. As the concrete takes its initial set the forms shall be removed and all exposed surfaces shall be float finished, edged and broomed lightly. The curb and gutter shall be constructed to the dimensions shown in the Standard Drawings.

The top and face of the curb and also the top of the apron on combination curb and gutter must be finished true to line and grade and without any noticeable irregularities of surface. The surface or face of the curb and gutter shall not vary more than 1/4 inch from a straight edge ten feet in length, placed on the curb parallel to the street center line nor shall any part of the exposed surface present a wavy appearance.

Section 12.07 CONCRETE CURB WALL

Concrete curb wall shall be Class AA(AE) and shall meet all of the requirements of Division 8, Portland Cement Concrete.

Reinforcing steel shall meet the requirements of Division 9, Reinforcing Steel.

Excavation for and backfill around the curb walls shall meet all the requirements of Division 7, Earthwork.

The curb walls shall be constructed to the dimensions and grades shown on the Standard Drawings or improvement drawings or as determined by the Public Works Representative/Engineer.

Section 12.08 6-INCH CONCRETE DRIVE APPROACH

The concrete to be used for the drive approach shall be Class AA(AE) and shall meet the requirements of Division 8, Portland Cement Concrete.

The drive approach shall be a minimum of 6-inch thick. They shall be constructed to the dimensions shown on the Standard Drawings. The concrete shall be finished as described above for sidewalks.

The drive approaches shall have a compacted 6-inch untreated base course under them.

Section 12.09 ACCESSIBILITY STANDARDS IN PUBLIC RIGHTS-OF-WAY

This section sets guidelines for accessibility in public rights-of-way. These guidelines are to be applied during the design, construction, and alteration of improvements in public rights-of-way. These guidelines are to be followed insomuch as they are technically feasible. Every attempt should be made to comply with the current guidelines of the "Americans with Disabilities Act" (ADA).

The construction of curb ramps and drive approaches shall conform to the Standard Drawings.

The following definitions apply:

a) The pedestrian access route is an accessible corridor for pedestrian use within the public right-of-way.

b) Pedestrian crossings are those locations in which pedestrians cross streets.

c) A ramp is a portion of the pedestrian access route that makes a vertical transition between two flatter surfaces. It is sloped in the direction of travel. It does not include the side flares that exist on a perpendicular curb ramp.

d) The side flare is the portion of a perpendicular curb ramp that transitions between the plane of the ramp surface and the plane of the flatter adjacent sidewalk.

e) The term perpendicular curb ramps refers to all features associated with a ramp whose running slope is perpendicular to the curb line.

f) The term parallel curb ramps refers to all features associated with a ramp whose running slope is in the direction of sidewalk travel.

g) Blended transitions are locations along the pedestrian access route in which the street and the sidewalk are at the same level.

h) Detectable warning is a surface feature built in or applied to walking surfaces or other elements to warn of hazards on a circulation path.

The pedestrian access route shall not be less than 4 feet wide, not including the curb, and shall have a cross slope of not more than 2%.

Concrete surfaces shall have a broom finish to increase slip resistance.

Sub-section A. Sidewalks:

The cross slope shall not exceed 2%.

Changes in level/elevation (vertical rises between adjacent surfaces) shall meet the following requirements:

1) Differences of up to ¼ inches can remain without beveling.

2) Differences of over ¼ inch but no more than ½ inch must be beveled with a maximum grade of 2:1 (50%).

3) Differences of over ½ inch must be removed or a ramp must be created having a maximum grade of 12:1 (8.33%).

Sub-section B. Curb Ramps:

Curb ramps shall be provided wherever a pedestrian access route crosses a curb.

The ramp grade shall not exceed 12:1 (8.33%).

The cross slope of the ramp shall not exceed 50:1 (2%), except that on perpendicular curb ramps at midblock crossings, the cross slope may match the slope of the adjacent street.

The minimum ramp width shall be 48 inches.

No lip shall exist at the bottom of curb ramps.

Sub-section C. Landings:

A landing shall exist at the top of curb ramps. The landing shall not have a slope in excess of 2% in any direction, and shall be a minimum of 48 inches by 48 inches in size. Parallel curb ramps and blended transitions shall have a landing at the bottom of the ramp (still in the sidewalk, not in the street) meeting the same criteria.

At the foot of diagonal curb ramps (ramps located in the curb return, whose running slope is directed diagonally into the intersection), a 48-inch by 48-inch landing of clear space must exist, beyond the curb line, entirely contained within the crosswalks, and outside of the vehicular travel lanes.

Sub-section D. Side Flares:

The slope of side flares on perpendicular curb ramps shall not exceed 10:1 (10%).

If it is not technically feasible to achieve a 4-foot landing (measured in the direction of the running slope of the ramp) at the top of a perpendicular curb ramp, the landing may be reduced to 3 feet, in which case the slope of the side

flares shall not exceed 12:1 (8.33%).

Sub-section E. Built up Curb Ramps:

Built-up curb ramps shall be located so that they do not project into vehicular traffic lanes.

Sub-section F. Obstructions:

Curb ramps shall be located or protected to prevent their obstruction by parked vehicles.

Sub-section G. Location of Marked Crossings:

Curb ramps at marked crossings shall be wholly contained within the markings, excluding any flared sides.

Sub-section H. Diagonal Curb Ramps:

If diagonal (or corner type) curb ramps have returned curbs or other well defined edges, such edges shall be parallel to the direction of pedestrian flow. The bottom of diagonal curb ramps shall have a forty-eight (48) inch minimum clear space. If diagonal curb ramps are provided at marked crossings, the forty-eight (48) inch clear space shall be within the markings. If diagonal curb ramps have flared sides, they shall also have at least a twenty-four (24) inch long segment of straight curb located on each side of the curb ramp and within the marked crossing.

Sub-Section L. Curb Ramps Associated with Trails.

Any curb ramps associated with an asphalt trail system shall be installed only after the asphalt trail has been constructed

Sub-section I. Detectable Warnings:

Detectable warning panels shall be placed at ramps and other locations in which the pedestrian access route crosses streets. They are intended to warn visually-impaired people of potential hazards by indicating the transition from sidewalk to street.

The detectable warning panels shall be cast-in-place and shall ~~have the following characteristics~~ be yellow polymer composite/fiberglass~~:~~.

~~1) Cast Iron construction~~
~~2) Skid and abrasion resistant~~

They shall consist of truncated domes aligned in a square grid pattern having the following characteristics:

1) Base diameter of 0.9 inch – 1.4 inch
2) Top diameter of 50%-60% of base diameter
3) Height of 0.2 inch
4) Center-to-center spacing of 1.6 inch – 2.4 inch

The detectible warning shall be 2 feet deep (measured in the direction of pedestrian travel). They shall run across the full width of ramps or blended transitions. They should be set back 6" to 8" from the flowline of the gutter.

The detectable warning panel shall be installed so that it is flush (at the base of the truncated domes) with the adjacent concrete.

Sub-section J. Islands:

Any raised islands in crossing shall be cut through level with the street or have curb ramps at both sides and a level area at least forty-eight (48) inches long between the curb ramp in the part of the island intersected by the crossing.

Sub-section K. Pedestrian Crossings:

Where crosswalks are marked, they shall be at least 8 feet wide.

The foot of a curb ramp shall be wholly contained within the crosswalk markings.

The cross slope (measured perpendicular to the direction of pedestrian travel) of marked or unmarked crosswalks is limited to 2%, except at mid-block crossings.

The counterslope of the gutter or street surface at the bottom of a ramp or blended transition (measured in the direction of pedestrian travel) shall not exceed 5%.

The maximum running slope (measured in the direction of travel) for crosswalks is 5%.

Section 12.10 LANDSCAPE RESTORATION

Areas of new construction that cover or disturb existing landscaped areas with fills and cuts or areas disturbed by construction of retaining walls shall have the landscape restored. Areas that have lawn or flower beds shall be restored including sprinkling systems that might be damaged or relocated because of construction. Lawn covered or removed shall be replaced by sod.

The replaced topsoil shall be fertile, sandy loam topsoil, obtained from well-drained areas. It shall be without admixture of subsoil or slag and shall be free of stones, lumps, sticks, plants or their roots, toxic substances or other extraneous matter that may be harmful to plant growth and would interfere with future maintenance. Topsoil pH range shall be 5.3 to 6.0.