Draft

# Standard Specifications and Drawings

Prepared by
Santaquin City Engineering and Public Works.
(Portions of text and Unaltered Drawings
Provided by J-U-B Engineers, Inc.)

**Approval by the Santaquin City Council**
**January XX, 2025**

This Manual Updated Yearly

(Page Intentionally Left Blank)

# Chapter 4

## Standard Specifications

(Page Intentionally Left Blank)

2024 Standard and Specifications and Drawings Updates

Errata for

Changes made to the Santaquin City Standard Specification and Drawings

**Division 1**

- The proposed change is the update the testing requirements to include subgrade

**Section 1.23 Subsection E Compaction Test of Soil, Untreated Base Course, and subgrade:**

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 and imported subgrade material in place.
3) The acceptance of soil, base course with respect, and subgrade 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 structural material, road base, asphalt or concrete within the roadway and sidewalk.

**Division 3**

- The proposed change requires a continuity test for tracer wire on pressure irrigation pipe

**Section 3.04 Subsection G. Tracer Wire**

All pipe shall include a 12 gauge solid THHN tracer wire installed according to NESC standards. The locator wire shall be installed in the pipeline trench approximately 6-inches above the top of pipe. The locator wire shall be extended 30" into all service boxes to permit a continuity connection when doing line location.

A continuity test shall be conducted to ensure there are no breaks in the tracer wire prior to the placement of material over said wire.

Division 3

- The proposed change requires a purple lid for the irrigation service box

Section 3.05 Subsection F. Service Box and Meter Box shall be DFW Plastics 1324C4-12-4T 63D with a purple lid or approved equivalent.

Division 3

- The proposed change requires PVC conduit be installed between the PI and Culinary meter boxes

Section 3.05 Subsection F. Service Box and Meter

Where PI and culinary meters are located together, A 1 ¼" PVC conduit shall be installed extending from the PI meter box to the Culinary Water Box, and stub at least 2" into each box.

Division 3A

- Section 3A.04 Subsection I. Tracer Wire
  The proposed change requires a continuity test for tracer wire on culinary water pipe

  A continuity test shall be conducted to ensure there are no breaks in the tracer wire prior to the placement of material over said wire.

Division 3A

- The proposed change requires PVC conduit be installed between the PI and Culinary meter boxes

Section 3A.05 Subsection D. Meter, Meter Setter Assembly, Meter Box and Cover:

Where PI and Culinary meters are located together, A 1 ¼" PVC conduit shall be installed extending from the PI meter box to the Culinary Water Box, and stub at least 2" into each box.

Division 3A

- The proposed change requires 4" meter vaults to have drain rock instead of a concrete floor

Section 3A.05 Subsection D. Meter, Meter Setter Assembly, Meter Box and Cover:

4" Meter Vaults shall have no concrete floor Place 12" of drain rock along the bottom of vault.

Division 6

- Proposed change to require Fire Hydrants be located outside of the clear view area as defined by city code 10.16.090
- Proposed change to require a concrete maintenance pad around the base of fire hydrants
- Proposed change to require an access box for the locator wires at the fire hydrant
- Section 6.06 Fire Hydrants
  Fire Hydrants shall be located outside of the clear view area as defined in Santaquin City Code

  All Fire Hydrants shall have a concrete maintenance pad surrounding the base of the fire hydrant. The fire hydrant shall be located in the center of the concrete pad. The maintenance pad shall be a minimum of 3 foot wide by the width of the planter strip or 3 foot square, whichever is greater.

  A snake pit access box (PART #: CD14BTP BLUE LID) or approved equivilant shall be provided by and installed by the developer to house the locator wires at the hydrant. Box shall be located between the hydrant and the curb and gutter and within the concrete maintenance pad.

- Proposed change to require 4" vaults to have drain rock instead of a concrete floot
  Section 6.10 Pressure Irrigation 4-Inch Flushing, Air Inlet and Removal Facility
  Each 4-inch flushing, air inlet and removal facility shall be constructed as detailed and placed at the locations shown on the drawings. The work is to include excavation, gravel foundation, backfill, piping, fittings, concrete thrust blocks and collars, valves, utility boxes, sod replacement, and appurtenances. 4" Vaults shall have no concrete floor Place 12" of drain rock along the bottom of vault.

Division 10

- Proposed change to require asphalt joints to run diagonally at a small angle
  Section 10.03 Removal of Pavement, Sidewalks, Curbs, Etc.
  Asphalt joints shall run diagonally across the roadway at a 1 to 2 degree angle

Division 13

- Proposed change to require flowable fill where manholes and inlet boxes are located close together
  Section 13.04 Manholes
  Flowable fill shall be used between the manhole and an inlet box if they are located 32" or less from each other.

- Proposed change to correct the part number of the storm drain grate required

Section 13.07 Subsection A. Concrete Inlet boxes:
The storm drain inlet grate and frame shall be a D & L Supply I-3517~~8~~ single unit with curb box ~~with type "V" grate or equal.~~.Grates and frames are to be dipped in cold tar epoxy following fabrication. Following construction of the curb and gutter improvements and before the final inspection each inlet box shall have a decal mounted on the curb face adjacent to the inlet box. The decal shall be purchased from the City by the Developer.

- Proposed change to require a 10" opening at the curb box
  Section 13.07 Subsection A. Concrete Inlet Boxes:
  The opening of the curb box must be at least 10" wide.

- Proposed change to add requirements for Underground Stormwater Detention Systems
  **Section 13.09 UNGROUND STORMWATER DETENTION SYSTEMS**
  All underground stormwater detention systems are required to have a 10" diameter inspection port located at the end of the infiltration gallery furthest away from the inlet at the chambers.

  The inspection port shall have a threaded cap and have a minimum 10 inch cast iron lid for access.

Division 16

- Proposed change to require fractured rock surface in detention basins
  Section 16.05 Topsoil
  Detention basins shall have a minimum of 6 inches of 2-3 inch Fractured rock along the entire surface of the basin, if not landscaped with grass.

Division 20:

- Proposed change to specify a topsoil mix for landscaping
  Section 20.02

  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~~ shall meet the requirements listed in the tables below. Native topsoil at the site may be used as the final topsoil layer if it is of adequate quality. Where topsoil is required a 6" layer of topsoil shall be placed.

  Physical Properties

| Test | pH | EC | SAR | % Sand | % Silt | % Clay | % OM |
|---|---|---|---|---|---|---|---|
| Acceptable level(s) | 5.5-8.0 | <3.0 | <6.0 | 15-60 | 10-60 | 5-30 | >1.0 |

  Nutrients

| Test | No3-N ppm | P ppm | K ppm | Fe ppm |
|---|---|---|---|---|
| Acceptable level(s) | >20 | >11 | >130 | >10 |

- Proposed change to specify a minimum of 2" diameter for the irrigation connection to open space areas
- Proposed change to require unions at all valves filters and connection points

Section 20.04 Subsection A. Basic Irrigation Requirements

The Developer/Irrigation Contractor shall provide labor, materials, equipment and services necessary to complete the irrigation work as defined in these specifications and as indicated on the Improvement

Drawings. The Contractor shall coordinate work of this section with work of all related trades and subcontractors to assure smooth progression of work. Work shall include, but is not limited to:

1. The minimum service connection to all open space areas either public dedication or privately maintained must be a minimum of 2" diameter.
2. Completing the irrigation system as shown on the Improvement Drawings and required by these specifications.
3. Verifying the underground utility locations.
4. Protecting and/or restoring all existing improvements.
5. Trenching and backfilling for all pipes, valves and drain pits specified.
6. Furnishing and installing all filter mains, laterals, risers and fitting, heads, quick-coupling valves, gate valves, control valves, controllers, electric wire, controls, etc., and all necessary specialties and accessories.
7. Furnishing and installing all sleeves beneath walkways, roads, and driveways where required.
8. Testing of irrigation system.
9. Regulating and adjusting all heads and programming controller.
10. Unions shall be installed at all valves, filters, and connection points, etc.

- A two year warranty of the system (materials and installation) shall be provided.
  Proposed change to the model of automatic controller required
  Proposed change to require a hydrometer and valve

Section 20.04 Sub-section C. Fittings

Swing joints are required on all fittings 1" and greater in diameter.

Section 20.04 Subsection D. Automatic Controller

~~The developer will check with the Public Works Director prior to purchasing an automatic controller. Unless directed otherwise the automatic controller will be a Huner controller with stainless steel pedestal mount – ICC, with TBOX batter operated module~~..The automatic controller shall be a WeatherTrak pro3 2 wire controller and ET Pro3 2-Wire housing box. The controller shall be housed in a NEMA Type 4, weatherproof, watertight enclosure with lockable access door. The enclosure shall be at grade or pedestal mounted as determined by the Public Works Director.

The developer shall provide an appropriately sized Netafim combined hydrometer and valve, with a digital register, after the point of connection, such as the meter. The equipment must be installed with the manufacturer's required materials.

- Proposed change to require manual isolation valves on sprinklers

- Section 20.04 Subsection J. Valves and Couplers:

Manual Isolation valves shall be installed at each sprinkler valve.

- Proposed change to require filters before the flow meter, and bypass systems on filters larger than 4"

Section 20.04

Sub-section L. Filters

All filters must be installed before the flow meter. Filters must be an auto-flushing Amiad filter or approved equivalent.

All Filters 4" or larger shall utilize a bypass system with a manual flush drain valve before the filter.

- Proposed change to require deep root tree irrigation systems on trees

  Section 20.07
  A deep root tree irrigation system shall be installed on all trees.

- Proposed change to include specifications for recreational facilities, including rubber play surfaces for playgrounds, and pavilion materials.

## Section 20.08 Recreational Facilities

This section includes specifications for playground equipment, pavilions and other facilities.

### Playgrounds:

Pour-in-place rubber surfaces shall be installed under all playground equipment. The manner and area of installation shall be done according to the approved plans and the manufacturer's recommendations for both the play structure and play surface. Colors must be neutral earthtone colors approved by Santaquin City.

### Pavillions:

Any pavilions installed shall be finished with an architectural powder coated metal or aluminum construction.

Standard Drawings:

- All Drawings: Update title block to show current address
- W3 Update the label on 4" Double check valve to state that it must be testable
- PI2 change label on conduit between meter boxes to match specification text
- W7: Remove label that says 2" PVC on the Eclipse Hydrant Blow-Off Assembly and replace with 2" ductile iron

# CHAPTER 4

## STANDARD SPECIFICATIONS
## TABLE OF CONTENTS

**DIVISION 1: GENERAL REQUIREMENTS**


Section 1.01 PURPOSE OF DOCUMENTS....pg. 1
Section 1.02 DEFINITIONS ....pg. 1
Section 1.03 EXCAVATION PERMIT, FEES, AND BONDING REQUIRED ....pg. 1
- Sub-Section A. Permit Application
- Sub-Section B. Fee Assessment
- Sub-Section C. Bonding

Section 1.04 CONTRACTOR AND CONSTRUCTION PLAN APPROVAL ....pg. 2
Section 1.05 PRE-CONSTRUCTION CONFERENCE ....pg. 2
Section 1.06 TIMELY COMPLIANCE WITH THE ISSUED PERMIT ....pg. 3
- Sub-section A. Inspections
- Sub-section B. Notification of Needed Inspections
- Sub-section C. Responsibility of the Developer
- Sub-section D. Conflict

Section 1.07 ELECTRONIC AND RECORD DRAWINGS....pg. 3
Section 1.08 TEMPORARY SERVICES ....pg. 4
Section 1.09 CODES AND STANDARDS ....pg. 4
Section 1.10 STATE AND LOCAL LAWS ....pg. 4
Section 1.11 COMPLIANCE WITH GOVERNMENTAL REGULATIONS ....pg. 4
- Sub-section A. United States Occupational Safety and Health Administration Regulations
- Sub-section B. Utah State Industrial Commission Regulations
- Sub-section C. City Codes and Ordinances
- Sub-section D. UDOT Requirements
- Sub-section E. Permits

Section 1.12 FEDERAL, STATE, AND LOCAL INSPECTING AGENCIES....pg. 5
Section 1.13 PUBLIC SAFETY AND CONVENIENCE....pg. 5
- Sub-section A. Compliance with Rules and Regulations
- Sub-section B. Road Closures and Obstructions
- Sub-section C. Protection of the Traveling Public
- Sub-section D. Hazardous Conditions
- Sub-section E. Dust and Debris Control

Section 1.14 CONFINEMENT OF WORK AND ACCESS TO RIGHT-OF-WAY AND EASEMENTS ....pg. 6
Section 1.15 NOTIFICATION OF RESIDENTS....pg. 6
Section 1.16 WEATHER CONDITIONS....pg. 6
Section 1.17 LAND MONUMENTS....pg. 6
Section 1.18 SOURCE OF MATERIALS....pg. 7
Section 1.19 CONSTRUCTION WATER....pg. 7
Section 1.20 OPERATION AND MAINTENANCE MANUALS ....pg. 7
Section 1.21 INTERFERING STRUCTURES, UTILITIES AND FACILITIES ....pg. 7
Section 1.22 MATERIAL AND COMPACTION TESTING....pg. 7
Section 1.23 TESTING AND PROCESS CONTROL....pg. 8
- Sub-section A. Quality Assurance

Sub-section B. Submittals
Sub-section C. Sampling
Sub-section D. Soil Classification Test
Sub-section E. Compaction Test of Soil and Untreated Base Course
Sub-section F. Test Roll of Roadway Sub-grade
Sub-section G. Gradation Test of Untreated Base Course
Sub-section H. Extraction – Gradation Testing of Bituminous Surface Course
Sub-section I. Compaction Testing of Bituminous Surface Course
Sub-section J. Compressive Strength Testing of Concrete Cylinders
Sub-section K. Additional Concrete Testing
Sub-section L. Certifications
Sub-section M. Summary Table of Tests and Certifications
Section 1.24 INSTALLATION OF UTILITY CONDUITS ..... pg. 14
Section 1.25 PHOTOGRAPHS ..... pg. 14

**DIVISION 2: TRENCH EXCAVATION AND BACKFILL**
Section 2.01 GENERAL ..... pg. 15
Section 2.02 BARRICADES ..... pg. 15
Section 2.03 BLASTING ..... pg. 15
Section 2.04 SHEETING, BRACING AND SHORING OF EXCAVATIONS ..... pg. 15
Section 2.05 CONTROL OF GROUNDWATER ..... pg. 15
Section 2.06 TRENCH EXCAVATION ..... pg. 16
Sub-section A. Normal Excavation
Sub-section B. Authorized Over-Excavation
Sub-section C. Unauthorized Over-Excavation
Sub-section D. Trench Width
Sub-section E. Trenches in Embankments
Sub-section F. Placement of Excavated Material
Sub-section G. Fine Grading the Trench Bottom
Section 2.07 TRENCH BACKFILL ..... pg. 17
Sub-section A. Imported Granular Material
Sub-section B. Foundation Placement
Sub-section C. Pipe Embedment
Sub-section D. Final Backfill
Sub-section E. Clay Dams
Sub-section F. Compaction
Section 2.08 TRENCH CROSSINGS AND EASEMENTS ..... pg. 19
Section 2.09 RESTORATION OF CONSTRUCTION SITE ..... pg. 20
Section 2.10 OPEN TRENCHES IN PUBLIC THOROUGHFARES ..... pg. 20
Section 2.11 DEVELOPER/CONTRACTOR RESPONSIBILITY ..... pg. 20

**DIVISION 3: PRESSURE PIPE - PRESSURE IRRIGATION**
Section 3.01 GENERAL ..... pg. 21
Section 3.02 DUCTILE IRON PIPE ..... pg. 21
Sub-section A. Materials
Sub-section B. Joints
Sub-section C. Coatings and Linings for Ductile Iron Pipe
Sub-section D. Flanges
Sub-section E. Fittings
Section 3.03 PVC PIPE ..... pg. 22
Sub-section A. Materials
Sub-section B. Joints
Sub-section C. Fittings.
Section 3.04 PIPE INSTALLATION ..... pg. 22
Sub-section A. Cutting
Sub-section B. Dewatering of Trench

Sub-section C. Laying of Pipe
Sub-section D. Thrust Blocking & Megalug Joint Restraint
Sub-section E. Connections to Existing Water Lines
Sub-section F. Corrosion Protection and Soil Tests
Sub-section G. Tracer Wire
Sub-section H. Dead end Pressure Irrigation Lines.
Section 3.05 PRESSURE IRRIGATION SERVICE CONNECTION ..... pg. 24
Sub-section A. Service Saddle Specifications
Sub-section B. Polyethylene Tubing
Sub-section C. Compression Connection
Sub-section D. Service Fittings
Sub-section E. Angle Ball Service Valve
Sub-section F. Service Box and Meter
Sub-section G. PVC Pipe
Sub-section H. Hose Bib
Sub-section I. Location of Stub Pipes
Sub-section J. Service Pipe Installation
Section 3.06 TESTING AND FLUSHING ..... pg. 27
Sub-section A. Pressure Test
Sub-section B. Leakage Test
Sub-section C. Flushing

**DIVISION 3A: PRESSURE PIPE - CULINARY WATER**
Section 3A.01 GENERAL ..... pg. 30
Section 3A.02 DUCTILE IRON PIPE ..... pg. 30
Sub-section A. Materials
Sub-section B. Joints
Sub-section C. Coatings and Linings for Ductile Iron Pipe
Sub-section D. Flanges
Sub-section E. Fittings
Section 3A.03 PVC PIPE ..... pg. 31
Sub-section A. Materials
Sub-section B. Joints
Sub-section C. Fittings
Section 3A.04 PIPE INSTALLATION ..... pg. 31
Sub-section A. Cutting
Sub-section B. Dewatering of Trench
Sub-section C. Laying of Pipe
Sub-section D. Separation
Sub-section E. Pipe Bedding
Sub-section F. Thrust Blocking & Megalug Joint Restraints
Sub-section G. Connections to Existing Water Lines
Sub-section H. Corrosion Protection and Soil Tests
Sub-section I. Tracer wire
Sub-section J. Damage and Repair of Water Mains and Appurtenances
Sub-section K. Dead end water lines
Section 3A.05 WATER SERVICE LATERALS ..... pg. 34
Sub-section A. Extent of Laterals
Sub-section B. Excavation and Backfill
Sub-section C. Connection to Main
Sub-section D. Meter, Meter Setter Assembly, Meter Box and Cover
Sub-section E. Special Joints and Fittings
Sub-section F. Separation
Sub-section G. Location of Stub Pipes
Sub-section H. Flushing, Testing, and Disinfecting
Section 3A.06 FLUSHING, DISINFECTING, AND TESTING ..... pg. 36

Sub-section A. Flushing
Sub-section B. Disinfection
Sub-section C. Bacteriological Test
Sub-section D. Pressure Test
Sub-section E. Leakage Test

Section 3A.07 SURFACE WATER CROSSING ..... pg. 40
Sub-Section A. Crossing Type
Sub-Section B. Water Crossings greater than 15 feet (15')

**DIVISION 4: CONCRETE PIPE**
Section 4.01 GENERAL ..... pg. 41
Section 4.02 PIPE ..... pg. 41
Sub-section A. Reinforced Concrete Pipe
Sub-section B. Non-Reinforced Concrete Pipe
Sub-section C. Bell and Spigot Joints
Sub-section D. Minimum size and Slope Requirements
Section 4.03 PIPE LAYING ..... pg. 42
Section 4.04 GRAVEL FOUNDATION FOR PIPE ..... pg. 42
Section 4.05 INSTALLATION REQUIREMENTS FOR LINE AND GRADE ..... pg. 42
Section 4.06 PIPE BEDDING ..... pg. 42
Section 4.07 TESTS ..... pg. 43
Sub-section A. Displacement Test
Sub-section B. Infiltration Test
Sub-section C Exfiltration Test
Sub-section D. Air Testing
Sub-section E. Televising
Section 4.08 MANHOLE CONNECTIONS ..... pg. 44
Section 4.09 SEWER SERVICE LATERALS ..... pg. 44
Sub-section A. Extent and Location of Laterals
Sub-section B. Excavation and Backfill
Sub-section C. Pipe
Sub-section D. Connection to Main
Sub-section E. Cover Over Sewer Lateral Lines
Sub-section F. Sewer Clean Outs
Sub-section G. Location of Stub Pipes
Sub-section H. Testing
Sub-section I. Damage and Repair of Sewers and Appurtenances

**DIVISION 4A: PVC PLASTIC PIPE**
Section 4A.01 GENERAL ..... pg. 47
Section 4A.02 PIPE ..... pg. 47
Sub-section A. Minimum Size and Slope Requirements
Section 4A.03 FITTINGS ..... pg. 47
Section 4A.04 PIPE LAYING ..... pg. 47
Section 4A.05 GRAVEL FOUNDATION FOR PIPE ..... pg. 48
Section 4A.06 INSTALLATION REQUIREMENTS FOR LINE AND GRADE ..... pg. 48
Section 4A.07 PIPE BEDDING ..... pg. 48
Section 4A.08 TESTS ..... pg. 48
Sub-section A. Displacement Test
Sub-section B. Infiltration Test
Sub-section C. Exfiltration Test
Sub-section D. Air Testing
Sub-section E. Televising
Section 4A.09 MANHOLE CONNECTIONS ..... pg. 50
Section 4A.10 SEWER LATERAL CONNECTIONS ..... pg. 50

Section 4A.11 SEWER SERVICE LATERALS ..... pg. 50
Sub-section A. Extent of Laterals and Location of Laterals
Sub-section B. Excavation and Backfill
Sub-section C. Pipe
Sub-section D. Connection to Main
Sub-section E. Cover Over Sewer Lateral Lines
Sub-section F. Sewer Clean Outs
Sub-section G. Location of Stub Pipes
Sub-section H. Testing
Sub-section I. Damage and Repairs of Sewers and Appurtenances
Section 4A.12 "GO/NO-GO" MANDREL PROOF TESTING ..... pg. 51

**DIVISION 4B: POLYETHYLENE CORRUGATED PIPE**
Section 4B.01 GENERAL ..... pg. 53
Section 4B.02 PIPE ..... pg. 53
Section 4B.03 JOINTS ..... pg. 53
Section 4B.04 PERFORATIONS ..... pg. 53
Section 4B.05 PIPE LAYING ..... pg. 54
Section 4B.06 GRAVEL FOUNDATION FOR PIPE ..... pg. 54
Section 4B.07 INSTALLATION REQUIREMENTS FOR LINE AND GRADE ..... pg. 54
Section 4B.08 PIPE BEDDING ..... pg. 54
Section 4B.09 TESTS ..... pg. 55
Sub-section A. Displacement Test
Sub-section B. Televising
Section 4B.10 MANHOLE CONNECTIONS ..... pg. 55
Section 4B.11 LATERAL CONNECTIONS ..... pg. 55

**DIVISION 4C: POLYETHYLENE CORRUGATED PIPE WITH WATER TIGHT JOINTS**
Section 4C.01 GENERAL ..... pg. 56
Section 4C.02 PIPE ..... pg. 56
Section 4C.03 FITTINGS ..... pg. 56
Section 4C.04 PIPE LAYING ..... pg. 56
Section 4C.05 GRAVEL FOUNDATION FOR PIPE ..... pg. 57
Section 4C.06 INSTALLATION REQUIREMENTS FOR LINE AND GRADE ..... pg. 57
Section 4C.07 PIPE BEDDING ..... pg. 57
Section 4C.08 TESTS ..... pg. 58
Sub-section A. Displacement Test
Sub-section B. Infiltration Test
Sub-section C. Ex-filtration Test
Sub-section D. Air Testing
Sub-section E. Televising
Section 4C.09 MANHOLE CONNECTIONS ..... pg. 59
Section 4C.10 LATERAL CONNECTIONS ..... pg. 59
Section 4C.11 "GO/NO-GO" MANDREL PROOF TESTING ..... pg. 59

**DIVISION 5 MANHOLES**
Section 5.01 GENERAL ..... pg. 60
Section 5.02 CONCRETE BASE ..... pg. 60
Section 5.03 BACKFILL REQUIREMENTS ..... pg. 60
Section 5.04 WALL AND CONE SECTIONS ..... pg. 60
Sub-section A. Manholes Shall be Furnished with Steps
Section 5.05 DROP MANHOLES ..... pg. 61
Sub-section A. Cement
Sub-section B. Fly Ash
Sub-section C. Fine Aggregate
Sub-section D. Mix Design

Section 5.06 MANHOLE FRAMES AND COVERS ..... pg. 61
Sub-section A. Setting Manhole Frames and Covers
Section 5.07 CONNECTIONS TO EXISTING SEWER ..... pg. 62
Section 5.08 INCOMING SEWER LINES ..... pg. 63
Section 5.09 PREVENTING MATERIALS FROM ENTERING THE SEWER MAIN ..... pg. 63
Section 5.10 TESTING OF MANHOLES, GREASE INTERCEPTORS & SAND/OIL INTERCEPTORS ..... pg. 63
Section 5.11 Pipe Connections to Manholes ..... pg. 64

**DIVISION 6: VALVES, COUPLINGS, AND FIRE HYDRANTS**
Section 6.01 GENERAL ..... pg. 65
Section 6.02 RESILIENT SEATED GATE VALVE ..... pg. 65
Section 6.03 BUTTERFLY VALVE ..... pg. 66
Section 6.04 VALVE BOXES ..... pg. 66
Section 6.05 COUPLINGS ..... pg. 67
Section 6.06 FIRE HYDRANTS ..... pg. 67
Section 6.07 BLOWOFF VALVE ..... pg. 67
Section 6.08 PRESSURE IRRIGATION 2-INCH AIR INLET AND REMOVAL FACILITY ..... pg. 68
Section 6.09 PRESSURE IRRIGATION DRAINS ..... pg. 68
Section 6.10 PRESSURE IRRIGATION 4-INCH FLUSHING AIR INLET AND REMOVAL FACILITY ..... pg. 68

**DIVISION 7: EARTHWORK**
Section 7.01 GENERAL ..... pg. 70
Section 7.02 EXCAVATION FOR STRUCTURES ..... pg. 70
Section 7.03 GRANULAR FOUNDATION BORROW ..... pg. 70
Section 7.04 BACKFILL AROUND STRUCTURES ..... pg. 70
Section 7.05 CONSTRUCTION OF EMBANKMENTS AND FILLS ..... pg. 70
Sub-section A. Foundation Preparation
Sub-section B. Placement
Sub-section C. Borrow
Section 7.06 COMPACTION OF MATERIALS ..... pg. 72
Sub-section A. Under Roadways
Sub-section B. Under Sidewalk and Driveways
Section 7.07 REMOVAL OF DEFECTIVE FILL AND PLACEMENT OF ACCEPTABLE FILL ..... pg. 73

**DIVISION 8: PORTLAND CEMENT CONCRETE**
Section 8.01 GENERAL ..... pg. 74
Section 8.02 MATERIALS ..... pg. 74
Sub-section A. Portland Cement
Sub-section B. Aggregate
Sub-section C. Water
Sub-section D. Air-Entraining Agent
Sub-section E. Steel Reinforcement
Sub-section F. Water-Reducing and Set-Retarding Admixtures
Sub-section G. Curing Compound
Section 8.03 CLASS OF CONCRETE ..... pg. 76
Section 8.04 COMPOSITION OF CONCRETE ..... pg. 76
Sub-section A. Aggregate
Sub-section B. Water
Sub-section C. Air-Content
Sub-section D. Admixtures
Section 8.05 DESIGN OF THE CONCRETE MIX ..... pg. 77
Section 8.06 OBSERVATION AND TESTING ..... pg. 77
Section 8.07 HANDLING AND MEASUREMENT OF MATERIALS ..... pg. 77
Section 8.08 MIXERS AND MIXING ..... pg. 77

Section 8.09 FORMS ..... pg. 78
Section 8.10 PREPARATION OF FORMS AND SUBGRADE ..... pg. 78
Section 8.11 CONVEYING ..... pg. 78
Section 8.12 PLACING ..... pg. 78
Section 8.13 CONSTRUCTION JOINTS ..... pg. 79
Section 8.14 EXPANSION AND CONTRACTION JOINTS ..... pg. 79
Section 8.15 WATERSTOP ..... pg. 80
Section 8.16 REMOVAL OF FORMS ..... pg. 80
Section 8.17 FINISHING FORMED SURFACES ..... pg. 80
Section 8.18 FINISHING UNFORMED SURFACES ..... pg. 80
Section 8.19 CURING AND PROTECTION ..... pg. 80
Section 8.20 REMOVAL OR REPAIR ..... pg. 81
Section 8.21 CONCRETING IN COLD WEATHER ..... pg. 81
Section 8.22 CONCRETING IN HOT WEATHER ..... pg. 81

**DIVISION 9: REINFORCING STEEL**

Section 9.01 GENERAL ..... pg. 82
Section 9.02 FABRICATION AND PLACING REINFORCEMENT ..... pg. 82
Sub-section A. Fabrication
Sub-section B. Clearances
Sub-section C. Support
Sub-section D. Splicing
Section 9.03 EPOXY COATING ..... pg. 83
Sub-section A. Prequalify all Coatings
Sub-section B. Coat Bars as Specified
Sub-section C. Handling
Section 9.04 FIELD CUTTING EPOXY-COATED BARS ..... pg. 84
Sub-section A. Cutting
Sub-section B. Repairing

**DIVISION 10: RESTORATION OF SURFACE IMPROVEMENTS**

Section 10.01 GENERAL ..... pg. 85
Section 10.02 FIELD VERIFICATION OF IMPROVEMENTS ..... pg. 85
Section 10.03 REMOVAL OF PAVEMENT, SIDEWALKS, CURBS, ETC ..... pg. 85
Section 10.04 MATERIALS ..... pg. 85
Sub-section A. Untreated Base Course
Sub-section B. Bituminous Surface Course
Sub-section C. Concrete
Section 10.05 RESTORING BITUMINOUS, CONCRETE, OR ASPHALT STREET SURFACES ..... pg. 86
Sub-section A. Before Excavation
Sub-section B. Temporary Graded Surface
Sub-section C. Preparation for Paving
Sub-section D. Bituminous Surface
Section 10.06 GRAVEL SURFACE ..... pg. 86
Sub-section A. Layer Thickness
Sub-section B. Placement
Sub-section C. Gradation
Section 10.07 MISCELLANEOUS IMPROVEMENTS ..... pg. 87
Section 10.08 RESTORATION OF SURFACES ..... pg. 87
Section 10.09 CLEANUP ..... pg. 87
Section 10.10 PAVEMENT MARKINGS ..... pg. 87

**DIVISION 11: ROADWAY CONSTRUCTION**

Section 11.01 GENERAL ..... pg. 88
Section 11.02 MINIMUM ROADWAY CROSS SECTION ..... pg. 88

Section 11.03 PULVERIZING ..... pg. 88
Section 11.04 EARTHWORK ..... pg. 88
Section 11.05 ROADWAY EXCAVATION ..... pg. 88
Section 11.06 SUBGRADE PREPARATION ..... pg. 88
Section 11.07 DRAIN ROCK ..... pg. 89
Section 11.08 GRANULAR BORROW ..... pg. 89
Section 11.09 GRANULAR BACKFILL BORROW ..... pg. 89
Section 11.10 FLOWABLE BACKFILL ..... pg. 89
Sub-section A. Cement
Sub-section B. Fly Ash
Sub-section C. Fine Aggregate
Sub-section D. Mix Design

Section 11.11 BASE COURSE ..... pg. 90

Section 11.12 TACK COAT ..... pg. 91
Section 11.13 BITUMINOUS ASPHALT CEMENT PAVEMENT ..... pg. 91
Section 11.14 ADJUSTING MANHOLES AND VALVE BOXES TO FINAL GRADE ..... pg. 92
Section 11.15 PAVEMENT CRACK SEAL ..... pg. 93
Sub-section A. Quality Assurance
Sub-section B. Filler and Sealer Materials
Sub-section C. Equipment
Sub-section D. Advanced Preparation
Sub-section E. Application
Sub-section F. Backer Rod
Section 11.16 CHIP SEAL ..... pg. 95
Sub-section A. Submittals
Sub-section B. Quality Assurance
Sub-section C. Paving Asphalt
Sub-section D. Cover Material
Sub-section E. Preparation
Sub-section F. Application
Sub-section G. Rolling
Sub-section H. Fog Seal
Sub-section I. Cleanup and Repair
Sub-section J. Acceptance
Section 11.17 PAVEMENT MARKINGS ..... pg. 98
Sub-section A. Materials
Sub-section B. Preparation
Sub-section C. Application
Sub-section D. Removing Pavement Markings

**DIVISION 12: CONCRETE CURB, GUTTER AND SIDEWALK**

Section 12.01 GENERAL ..... pg. 100
Section 12.02 CONCRETE ..... pg. 100
Section 12.03 GRADE ..... pg. 100
Section 12.04 FORMS ..... pg. 100
Section 12.05 SUBGRADE PREPARATION ..... pg. 100
Section 12.06 CONSTRUCTION OF CURB, GUTTER AND SIDEWALK ..... pg. 101
Section 12.07 CONCRETE CURBWALL ..... pg. 102
Section 12.08 6-INCH CONCRETE DRIVE APPROACH ..... pg. 102
Section 12.09 ACCESSIBILITY STANDARDS IN PUBLIC RIGHTS-OF-WAY ..... pg. 102
Sub-section A. Sidewalks
Sub-section B. Curb Ramps
Sub-section C. Landings
Sub-section D. Side Flares

Sub-section E. Built up Curb Ramps
Sub-section F. Obstructions
Sub-section G. Location of Marked Crossings
Sub-section H. Diagonal Curb Ramps
Sub-section I. Curb Ramps Associated with Trails
Sub-section J. Detectable Warnings
Sub-section K. Islands
Sub-section L. Pedestrian Crossings
Section 12.10 LANDSCAPE RESTORATION ..... pg. 105

**DIVISION 13: STORM DRAINS**
Section 13.01 GENERAL ..... pg. 106
Section 13.02 PIPE INSTALLATION ..... pg. 106
Section 13.03 PIPE ..... pg. 106
Section 13.04 MANHOLES ..... pg. 106
Section 13.05 CONCRETE ..... pg. 106
Section 13.06 REINFORCING STEEL ..... pg. 106
Section 13.07 STORM DRAIN AND INLET BOXES ..... pg. 106
Sub-section A. Concrete Inlet Boxes
Sub-section B. PVC Inlets
Section 13.08 PIPE CONNECTING INLET BOXES TO EXISTING STORM DRAINS ..... pg. 107
Section 13.09 UNDERGOUNDSTORMWATER DETENTION SYSTEMS..... PG.111

**DIVISION 14: UTAH DEPARTMENT OF TRANSPORTATION RIGHTS-OF-WAY**
Section 14.01 GENERAL ..... pg. 108
Section 14.02 UTILITY LINE AGREEMENT ..... pg. 108
Section 14.03 INSPECTION FEES ..... pg. 108

**DIVISION 15: CASINGS**
Section 15.01 GENERAL ..... pg. 109
Section 15.02 MATERIALS ..... pg. 109
Section 15.03 CONSTRUCTION METHODS ..... pg. 109
Section 15.04 LINE AND GRADE ..... pg. 109
Section 15.05 CARRIER PIPE INSTALLATION THROUGH CASINGS ..... pg. 109
Section 15.06 CASING SPACERS ..... pg. 110
Section 15.07 CASING END SEALS ..... pg. 110

**DIVISION 16: DETENTION BASINS**
Section 16.01 GENERAL ..... pg. 111
Section 16.02 EARTHWORK ..... pg. 111
Section 16.03 CONCRETE AND REINFORCING STEEL ..... pg. 111
Section 16.04 PIPING ..... pg. 111
Section 16.05 TOPSOIL ..... pg. 111

**DIVISION 17: CONDUIT**
Section 17.01 GENERAL ..... pg. 112
Section 17.02 UTILITY CONDUIT ..... pg. 112
Sub-section A. Materials
Sub-section B. Location
Sub-section C. Magnetic Locator Tape
Section 17.03 INSTALLATION ..... pg. 112
Sub-section A. Cutting
Sub-section B. Dewatering of Trench
Sub-section C. Laying of Conduit
Sub-section D. Bedding

**DIVISION 18: RESIDENTIAL & SMALL COMMERCIAL PUMP SYSTEMS**


Section 18.01 GENERAL .....pg. 114
- Sub-section A. Installation
- Sub-section B. Inspection and Testing
- Sub-section C. Deviation from Requirements


**DIVISION 19: STREET LIGHTING**


Section 19.01 GENERAL .....pg. 117
Section 19.02 STREET LIGHTS ALONG LOCAL AND COLLECTOR STREETS.....pg. 117
- Sub-section A. Placement
- Sub-section B. Luminaire
- Sub-section C. Pole and Base
- Sub-section D. Lamp
- Sub-section E. Installation

Section 19.03 STREET LIGHTS ALONG MAIN STREET ..... pg. 118
- Sub-section A. Placement
- Sub-section B. Luminaire
- Sub-section C. Pole and Base
- Sub-section D. Lamp
- Sub-section E. Installation

Section 19.04 STREET LIGHTS ALONG ARTERIAL STREETS..... pg. 118
- Sub-section A. Placement
- Sub-section B. Luminaire
- Sub-section C. Pole and Base
- Sub-section D. Lamp
- Sub-section E. Foundation


**DIVISION 20: LANDSCAPING**


Section 20.01 GENERAL .....pg. 120
Section 20.02 TOPSOIL REQUIREMENTS AND PLACEMENT.....pg. 120
Section 20.03 GRAVEL DRIVE APPROACHES.....pg. 120
Section 20.04 IRRIGATION SYSTEM – MATERIALS .....pg. 120
- Sub-section A. Basic Irrigation Requirements
- Sub-section B. Pipe
- Sub-section C. Fittings
- Sub-section D. Automatic Controller
- Sub-section E. Automatic Control Valve
- Sub-section F. Rotary Sprinkler
- Sub-section G. Plastic Nozzles
- Sub-section H. Valve Box
- Sub-section I. Control Wire, Wire Connectors and Sealing Cement
- Sub-section J. Valves and Couplers
- Sub-section K. Main Line Connections
- Sub-Section L. Filters

Section 20.05 IRRIGATION SYSTEM – INSTALLATION.....pg. 123
- Sub-section A. Trenching
- Sub-section B. Pipe Installation

Section 20.06 SEEDING OF TURF ..... pg. 126
- Sub-section A. Seeding
- Sub-section B. Sodding
- Sub-section C. Maintenance

Section 20.07 TREES ..... pg. 128
- Sub-section A. Approved Tree Species List
- Sub-section B. Trees Prohibited in Park Strips

Sub-section C. Tree Substitutions for Unique Environments
Sub-section D. Streetscape Substitutions
Sub-section E. Tree and Shrub Installation
Section 20.08 Recreational Facilities……..pg 143
Section 20.09 Bonding .....pg. 138