



**EPHRAIM CITY COUNCIL
REGULAR MEETING AGENDA
Council Chambers – Ephraim City Hall
5 South Main, Ephraim, Utah
Wednesday, August 20, 2025
6:00 PM**

Today's meeting will be held in person in the Council Chambers and is open to the public. Members of the press and public are also invited to view this meeting live on YouTube.

To participate in the public comment period or any scheduled public hearings, please email cmaudsley@ephrain.gov before 3:00 PM on the day of the meeting.

Live Stream on YouTube at 6:00 P.M.

<https://www.youtube.com/@EphraimCityUtah/streams>

6:00 PM

ROLL CALL

CALL TO ORDER

OPENING CEREMONY

Community members, churches, or organizations are invited to offer a thought, reading, or invocation at the beginning of City Council meetings. To participate, contact the City Recorder by the Friday morning before the meeting. Meetings are held on the first and third Wednesdays of each month.

PUBLIC COMMENT

Members of the public may address the Council on items related to City business or the current agenda. A comment form must be submitted to the Mayor prior to the meeting. Comments are limited to five minutes per person. The Council cannot take action during this portion of the meeting but may respond briefly, refer the matter to staff, or place it on a future agenda. All City Council meetings are recorded.

I. Primary Election Canvass

A. The City Council, acting as the Board of Municipal Canvassers, will review and approve the official canvass of the 2025 Primary Election results.

II. Consent Items

A. Ratification of Warrant Register between August 1, 2025, and August 15, 2025

Pages 4-10 B. Approval of August 6, 2025, City Council Meeting Minutes

III. Study Agenda

Pages 11-21 A. Procurement Policy (Jon Knudsen)

B. Fort Ephraim Square (Katie Witt)

IV. Action Agenda

Pages 22-35 A. Soap Creek Rezone (Megan Spurling)

Pages 36-117 B. Ephraim City Ordinance 25-10 Construction Standards (Bryan Kimball)

1. ECO 25- 10 consideration of an ordinance adopting a revised construction standards policy.

V. Council Reports

VI. City Manager Report

CLOSED SESSION

From time to time, matters are discussed by the City Council that do not appear on the posted agenda. Items that require/request action taken by the City Council will appear in the posted agenda. Submitted Action Items for the Council agenda must be received by the City Recorder's office by the Friday prior to the Council meeting and should be accompanied by any and all supporting written documentation. Without such documentation, the recorder reserves the right to postpone the hearing of any item until such documentation has been submitted.

ADJOURNMENT

In Accordance with the Americans with Disabilities Act (ADA) this facility is wheelchair accessible and handicap parking is available. Request for accommodations and interpretive services must be made three (3) working days prior to the meeting. Please contact the city office at 283-4631 for information or assistance.

CERTIFICATE OF POSTING

The undersigned, duly appointed City Recorder, does hereby certify that the above notice and agenda were posted this 18th day of August 2025. A copy was also provided to the local media and posted on the Utah State, and city websites.

Candice Maudsley,
EPHRAIM CITY RECORDER

MINUTES
CITY COUNCIL TRUTH IN TAXATION MEETING
CITY COUNCIL CHAMBERS, EPHRAIM CITY HALL
5 SOUTH MAIN, EPHRAIM, UTAH
AUGUST 6, 2025
6:00 PM

CALL TO ORDER

The Ephraim City Council convened in a City Council Meeting on Wednesday, August 6, 2025, in the City Council Room. Mayor Scott called the meeting to order at 6:00 p.m.

ROLL CALL

MEMBERS PRESENT

John Scott, Mayor
Lloyd Stevens,
Mayor Pro Tem
Margie Anderson
Anthony Beal
Troy Birch
Dennis Nordfelt

MEMBERS EXCUSED

STAFF PRESENT

Katie Witt, City Manager
Mic Mills, City
Attorney
Candice Maudsley,
City Recorder
Bryan Kimball,
Community Development

Megan Spurling, Planner
Jon Knudsen, Finance Dir.
Colby Zeeman, Police
Michael Thompson,
Library Dir.

TRUTH IN TAXATION PUBLIC HEARING

Presentation of Tax Rate

- A PowerPoint presentation was given and will be available on the Utah Public Notice Website as well as in the office of the City Recorder.
- The proposed tax increase is intended to cover the increased cost of running the city due to inflation.
- It was emphasized that although the rate appears to be increasing, residents are generally paying less annually because of the city's growth and the larger number of taxpayers contributing to the tax base.
- The presentation also included a comparison of Ephraim City's tax rate to other cities in Sanpete County, showing Ephraim as having one of the lower rates.

PUBLIC COMMENT

- **Bonnie Nielson-** Asked when the last tax increase occurred for the city. She also addressed concerns about affordable housing and questioned Councilmember Nordfelt's position on the issue.
- **Brian Nielson-** Stated that the Ephraim portion of his property tax bill is higher than that of his properties in St. George and expressed difficulty understanding why..

- **Randy Keisel** – Shared concerns about rising property values and their impact on property tax rates.
- **Larry Smith**- Asked how Ephraim’s rate compares with other cities. He thanked the Council for spending taxpayer money wisely but expressed concern over increasing property values.
- **Shelly Keisel**- Explained her understanding that a modest, incremental increase is better than a large adjustment every ten years.
- **Suzanne Dean**- Noted that the Truth in Taxation process can be confusing and expressed that many residents share concerns about it.

The public comment portion was closed at 6:36 PM.

EPHRAIM CITY RESOLUTION 25-16

- ECR 25-16 A RESOLUTION ADOPTING A PROPERTY TAX INCREASE

Councilmember Beal moved to adopt ECR 25-16 a resolution adopting a property tax increase. The motion was seconded by Councilmember Stevens. The vote was unanimous. The motion carried.

THERE BEING NO ADDITIONAL PUBLIC COMMENT, COUNCILMEMBER NORDFELT MOVED THE PUBLIC HEARING CLOSE. THE MOTION WAS SECONDED BY COUNCILMEMBER ANDERSON. THE VOTE WAS UNANIMOUS. THE MOTION CARRIED.

MINUTES APPROVED:

JOHN SCOTT, MAYOR

DATE

ATTEST:

CANDICE MAUDSLEY, CITY RECORDER

DATE

MEETING MINUTES
EPHRAIM CITY COUNCIL
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STAFF PRESENT

Katie Witt, City Manager
Nic Mills, City Attorney
Candice Maudsley, City Recorder
Bryan Kimball, Community Development
Megan Spurling, Planner

Jon Knudsen, Finance Director
Colby Zeeman, Police
Jeff Hermansen, Fire Chief
Michael Thompson, Library Director

CALL TO ORDER, PLEDGE, AND INVOCATION

The Ephraim City Council Meeting, having been properly noticed, was called to order at 6:00 p.m. by Mayor Scott.

The Pledge of Allegiance was led by Council Member Anderson.

The Invocation was offered by Nic Mills.

PUBLIC COMMENT

No public comment presented.

PRESENTATIONS

Livestock Project Presentation

Jon and Roy Everitt presented a request to the council for funding assistance with their 4-H sheep project. They explained that raising lambs is hard work and that 4-H is a valuable youth

development program. Support from the council would help them succeed in their project. The Everitts requested \$100 per sheep. The council directed the Finance Department to provide \$150 per sheep.

Chamber of Commerce Presentation

Faylyn Warnick presented on behalf of the Ephraim Chamber of Commerce, noting the organization's growth to 127 members in its two years of operation. The Chamber was established as a resource for Sanpete County businesses in response to challenges faced by local entrepreneurs. Ms. Warnick outlined a proposal for a business and retail incubator to be located in the Granary building. The incubator would assist start-up businesses by providing:

- Four rotating retail spaces on the main level (two-week to three-month occupancy periods)
- Office space and a conference room upstairs
- A photo station for online product promotion
- Multi-use office and streaming space
- Access to training and educational resources through partnerships, including Snow College

The project would be self-sustaining through sales, with participants required to have proper licensing and their own products. Abby Ivory, representing economic development for the R6 organization, expressed her excitement and support for the project.

CONSENT AGENDA

CONSENT AGENDA ITEMS

- 1. APPROVAL OF WARRANT REGISTER**
- 2. APPROVAL OF JULY 16, 2025 MINUTES**

Councilmember Stevens moved to approve the Consent Agenda. The motion was seconded by Councilmember Anderson. The vote was unanimous. The motion carried.

STUDY AGENDA

LARGE LOT SUBDIVISION DISCUSSION

City Planner Megan Spurling presented a report outlining the intent, limitations, and recommended clarifications for the City's Large Lot Subdivision code (Section 11.20.060). The original intent of the provision was to allow limited divisions of very large rural parcels without requiring full subdivision review when no new infrastructure is needed. However, current language does not limit the number of lots or restrict adjacency to existing subdivisions, raising concerns about potential misuse.

Proposed clarifications include:

- Limiting Large Lot Subdivisions to a maximum of three lots (including the original parcel)
- Requiring the parent parcel to be at least three acres, with each resulting lot no smaller than 1.5 acres

- Prohibiting Large Lot Subdivisions on parcels adjacent to existing platted subdivisions

These changes aim to preserve rural character, prevent phased subdivisions from bypassing infrastructure requirements, and align with the City’s General Plan. The council expressed support for moving forward with a draft amendment, with emphasis on the importance of proper roads and sidewalks.

CONSTRUCTION STANDARDS

City Engineer Bryan Kimball discussed the need to update and revise the City’s construction standards. Proposed changes focus on improving road, water, sewer, and storm drain requirements to address infrastructure concerns and ensure consistency throughout the code. Key updates include:

- **Streets:** Increase asphalt depth from 2.5” to 3”, road base from 6” to 8”, and granular borrow to 12”; require City approval before asphalt placement; street signs to be paid by the applicant; and adopt PG 58-28 asphalt or approved equivalent.
- **Culinary Water:** Standardize water meter depths, require looping for lines longer than 650 feet, mandate class C900 pipe, specify valve types and placement, and set minimum bedding and compaction requirements.
- **Sewer:** Require a minimum slope of 0.5% for 8” lines unless otherwise approved; mandate drop manhole connections for elevated inlets.
- **Storm Drain:** Base design on a 10-year, 24-hour storm; require overflow tie-ins to existing systems; design for 100-year events where no outlet is available.
- **Submittals:** Transition to electronic plan submissions with as-built drawings in both hard copy and digital formats.
- **Traffic Control:** Require UDOT permits for work within UDOT rights-of-way.

Mr. Kimball also discussed the potential to incorporate American Public Works Association (APWA) standards where appropriate, with City Engineer approval. The goal of these revisions is to prevent premature road failure, ensure adequate utility installation, and maintain long-term infrastructure quality.

ACTION AGENDA

APPOINTMENT TO THE CROSSING PUBLIC INFRASTRUCTURE DISTRICT NO. 1 BOARD OF TRUSTEES

Councilmember Nordfelt moved to appointment Jeff Knowlton to fill the Trustee vacancy, created by the resignation of Kevin Romney, for the remainder of the current term of the Crossing Public Infrastructure District No 1. The motion was seconded by Councilmember Beal. The vote was unanimous. The motion carried.

EPHRAIM CITY RESOLUTION 25-17 SCANDINAVIAN FESTIVAL BOARD BYLAWS

The council reviewed updated Scandinavian Festival Board bylaws, which had been previously discussed at the last meeting. The updates include added financial reporting requirements.

Councilmember Beal moved to approve ECR 25-17 Scandinavian Festival Board Bylaws. The motion was seconded by Councilmember Anderson. The vote was unanimous. The motion carried.

COUNCIL REPORTS

Dennis Nordfelt

- Scandinavian Festival – Appointments to the new board will begin, with the first meeting scheduled for September.

Margie Anderson

- Announced that Congressman Burgess Owens will attend the UAMPS meeting in Fairview.

Anthony Beal

- Youth City Council – Shirts have been ordered.
- Library Board – The Library held a pizza and crafts event to celebrate summer reading goals.

Troy Birch

- Ephraim 101- Reported that the program has been a fantastic educational opportunity and has been well executed.

Mayor Scott

- Announced the establishment of a City Council office; office hours are being considered for Tuesdays from 5:00 to 6:00 p.m., beginning in September.
- Reported on a successful board meeting.

CITY MANAGER REPORT

- Announced that an open house for the public will be held on October 14th.
- Scheduled power outage on Friday, August 8th.
- Fort Ephraim Square- The CC Christensen Cabin is being relocated.

CLOSED SESSION

Councilmember Stevens moved to go into a closed session pursuant to the provisions of the Utah State Code, Section(s) 52-4-205, for the purpose of discussing collective bargaining. The motion was seconded by Councilmember Nordfelt. A roll call vote was called. Voting yes: Councilmembers Nordfelt, Stevens, Beal, Anderson, and Birch. The vote was unanimous. The motion carried.

The Closed Meeting began at 7:57 p.m.

At 8:16 p.m. Councilmember Beal moved the Council adjourn the closed session and reopen the public meeting. The motion was seconded by Councilmember Stevens. The vote was unanimous. The motion carried.

ADJOURNMENT

There being no further business to come before the Council for consideration, Councilmember Anderson moved the Regular Council Meeting adjourn at 8:17 p.m. The motion was seconded by Councilmember Birch. The vote was unanimous. The motion carried.

The next regular City Council meeting is scheduled to be held on Wednesday, August 20, 2025, starting at 6:00 p.m. in the Ephraim City Council room.

MINUTES APPROVED:

John Scott, Mayor

Date

ATTEST:

Candice Maudsley, City Recorder

Date



Procurement Policy

Draft

SECTION 1 GENERAL PROVISIONS

1.01 Policy – This policy shall establish procedures for capital and non-capital purchases and annual contracts for Ephraim City.

1.02 Purpose – The policy and procedures have been created to maximize the use of Ephraim City’s financial resources. The purposes of these policies and procedures are:

A. To establish procurement processes that are fair and equitable to the city and other persons;

B. To allow the city to meet procurement needs in a simple, flexible and timely manner; and

C. To allow the city to obtain supplies and services that are economical, of the quality specified by the city, and best suited to meet the city's needs.

1.03 Compliance – These policies and procedures shall not prevent the City from complying with the terms and conditions of any grant, gift or bequest that is otherwise consistent with the law.

When procurement involves the expenditures of federal or state financial assistance funds, the City shall comply with applicable federal or state laws and regulations.

1.04 Purchasing Agent – The City Manager shall administer the Purchasing Policy and Procedures. Department Heads shall be considered “purchasing agents” for purposes of this policy. As determined by Department Heads, others within the departments may be authorized to procure goods and services.

SECTION 2 DEFINITIONS

2.01 Definitions – Unless the context requires otherwise, the terms used in the Purchasing Policy and Procedures, or the rules and regulations adopted pursuant to the Purchasing Policy and Procedures shall have the following meanings:

Bid: A proposal or price quotation provided to the City as part of the City's procurement process.

Bidding: The procedures used to solicit quotations on price and delivery from various prospective suppliers of supplies, equipment, and contractual services.

Bid Process: The type of procedures used by the City to solicit quotations and award bids or contracts. Examples include over the counter, open market, and formal competitive bidding.

Bid Splitting: The process of breaking up procurement of goods and services into smaller amounts which inhibits fair and open competition unless deemed advantageous to the City as determined by the City Manager.

Bidders List: A list maintained by the Department of known vendors supplying goods and services to the City. Vendors may submit a written request to be placed on a bidder's list.

Contractual Services: Professional services, sought or obtained from sources other than regular City employees, including legal, **accounting**, auditing, architectural, engineering, **information technology**, or other similar consulting services.

Estimates of Requirements: Forecasts of future requirements of supplies, equipment, or contractual services submitted by City Departments upon request of the City Manager or their designee.

***Local Bidder*: A person or business with a business location operating in Sanpete County or an adjacent county.**

Lowest Responsible Bidder: A bidder who has submitted the lowest responsive bid to furnish supplies or contractual services to the City, and who meets the standards set forth in this definition. The lowest responsible bidder's bid shall comply with the specifications, delivery terms and conditions, and other qualifications and requirements included in the invitation for bids, and shall be accompanied by any bonds required by the City or other applicable law and when requested, information and data to prove that their financial resources, production or service facilities, service reputation and experience are adequate for the contractual services or work who has not violated or attempted to violate any provisions of the Purchasing Policy and Procedures. In determining the lowest responsible bidder, the City shall give primary emphasis to bid

price, but may also consider other relevant factors relating to the ability and capacity of the bidder.

Professional Services: Services rendered by an independent contractor who has specialized knowledge, training and experience in a particular field. The term professional implies attainments in special knowledge resulting from prolonged and specialized intellectual training, as distinguished from mere skills. Professional services typically focus on the expertise of the provider, rather than the product the provider offers.

Purchase Requisition: Standard forms used by departments providing detailed information as to quantity, description, price, supplier, and signature authorization for purchases. These are also known as purchase orders.

Responsive Bid: An offer, submitted by a Responsible Bidder to furnish supplies, material, equipment, or services in conformity with the specification, delivery terms and conditions, and other requirements included in the invitation for bids.

Services: The furnishing of labor, time, or effort by a contractor, not involving the delivery of a specific product other than reports which are merely incidental to the required performance. This term does not include employment agreements or Professional Services.

Surplus Property: Any item of Public Property that is no longer used by the City or no longer usable by the City that is out of date, damaged and cannot be repaired at a cost less than the property's value, has exceeded its useful life or the City determines is not required to meet the needs or responsibilities of the City. **This definition does not include unclaimed property which is property turned into the city by private citizens. Surplus property is property that was acquired by the City for a specific purpose and is no longer usable.**

SECTION 3 GENERAL PROCEDURES AND SELECTION PROCESS

3.01 Fair and Open Process – City purchasing shall be a fair and open process to ensure efficient and cost-effective acquisition and procurement of supplies, materials, equipment, and/or services. The following procedures shall be followed.

3.02 Tier 1 Threshold (\$0 - \$5,000) – May be authorized by the Department Head. Although no specific purchasing requirements are established for this level of purchase, competitive bidding is encouraged to be used whenever practical. The City Manager may require any acquisitions to adhere to a more restrictive purchasing process if in their determination, such actions would be in the best interest of the City. No bid splitting shall be allowed to qualify for this category.

3.03 Tier 2 Threshold (\$5,000.01 - \$25,000) – Any purchase or acquisition of supplies, material, equipment, improvements, or services of an estimated value of more than \$5,000 and less than \$25,000 require a solicitation of bids. These purchases or acquisitions shall be made pursuant to the procedure hereinafter prescribed.

1. Solicitation and Minimum Number of Bids - Price quotations shall be solicited from prospective vendors by written or verbal request. Departments shall solicit bids from known vendors, a bidders list maintained by the Department, or a public bidding website whenever possible. Open market purchases shall be based on a minimum of three price quotations whenever possible and shall be awarded to the lowest responsible bidder.

2. Receipt of Price Quotation and Bids - Price quotations and bids shall be provided in writing from prospective vendors. Vendors must submit price quotations via a sealed proposal process.

3. Purchase Requisitions - Departments shall use Purchase Requisitions when any material, supply, equipment, or service is estimated to cost \$5,000 or more and the formal contract procedure will not be followed. All Purchase Requisitions exceeding \$10,000 must be countersigned by the City Manager.

4. Use of Local Bidders - Departments will make every effort to use Ephraim Businesses and obtain non-formal bids or price quotations from Local Bidders.

5. Local Bidder Preference - If a bid of a non-local bidder is the lowest and there was a local bidder who also submitted a bid which was within three percent (3%) of the low bid, then the purchase may be awarded to the local bidder if the bidder meets all prescribed requirements and agrees in writing within 48 hours after being notified of the low bid, that the local bidder will meet the low bid price.

6. Budgetary Considerations - All purchases must conform to the annual budget and there must be an adequate balance in the appropriation for the item or service to be procured. Any substantial deviation from the annual budget or any appropriation thereunder shall be approved by the City Manager prior to such procurement.

3.04 Tier 3 Threshold (greater than \$25,000) – Purchases of supplies, equipment or contractual services of an estimated value of \$25,000 or more shall be approved by the City Council and by written contract with the lowest responsible bidder pursuant to the procedure hereinafter prescribed. Budget line-item approval of such purchase by the City Council shall constitute authorization to commence the bidding process and enter into a purchase contract pursuant to the requirements set forth herein. Purchases and leases of equipment more than \$25,000 may be exempt from formal contract procedures, however formal bidding is required.

1. Notice Inviting Bids - Notices inviting bids shall include a general description of the improvements, supplies, materials, and equipment, or services to be acquired, shall state where plans, specifications and other information may be secured, and shall state the time and place for opening bids. Notices shall be delivered to all known responsible prospective suppliers, including those whose names are on a bidders list or who have made a written request that their names be added to the bidders list. At least ten calendar days before the opening of bids, notices inviting bids shall be published on the City website, a public bidding website, or any other sites that the city deems to be beneficial.

2. Local Bidder Preference - If a bid of a non-local bidder is the lowest and there was a local bidder who also submitted a bid which was within three percent (3%) of the low bid, then the purchase may be awarded to the local bidder if the bidder meets all prescribed requirements and agrees in writing within 48 hours after being notified of the low bid, that the local bidder will meet the low bid price.

3. Bid Opening Procedure - Sealed bids shall be submitted as designated in the Notice. Bids shall be opened in public at the time and place stated in the notice inviting bids. A written description of all bids received shall be available for public inspection during regular business hours for a period of at least thirty days after the bid opening.

4. Rejection of Bids - The City Council reserves the right to reject any and all bids for any reason. All notices calling for bids should so state. If all bids are rejected and the City Council decides to make the improvement or acquire the supplies, materials, equipment, or services, it shall advertise anew in the same manner provided herein, having received no satisfactory bids, the City Council may proceed to negotiate or make the improvement or acquisition or enter such other agreements as it deems necessary or desirable.

5. Award of Contracts - Except as otherwise provided herein, it is the intention of the City Council to award the contract to the lowest responsible bidder.

7. Performance Bonds - Before entering a contract, the City Council shall have authority to require performance and payment bonds to be provided in such amounts as it shall find reasonably necessary to protect the best interests of the City and as required by law. The form and amount of said bonds shall be described in the notice inviting bids.

Draft

SECTION 4 EXCEPTIONS TO COMPETITIVE BIDDING REQUIREMENTS

4.01 Preamble – Unless otherwise required by State or Federal Law, the bid process requirements set forth in Section 3 do not apply in the following situations as determined by the City Manager. Purchases over an estimated value of \$25,000 are to be reviewed and approved by the City Council.

4.02 Professional Service Contracts – Professional services shall include, but not be limited to the following: auditing, architecture, banking, insurance, engineering, accounting services, information technology, appraisals, legal services, and other consulting services. Professional service contracts shall be awarded based on professional qualifications, service ability, cost of service, and other criteria deemed important by the City Council.

4.03 Contracts Not Suited to Competitive Bidding – Contracts which by their nature are not suited to award by competitive bidding shall not be subject to the bidding requirements set forth herein. These contracts include:

1. Contracts for items which may only be purchased from a single or sole source.
2. Contracts for additions to or repairs and maintenance of equipment owned by the City which may be more efficiently added to, repaired, or maintained by a particular person or firm.
3. Contracts for equipment which by reason of the training of City Personnel or the inventory or replacement parts maintained by the City, is more compatible with the existing equipment owned by the City.

4.04 Auction, Close-Out, Bankruptcy Sales – If the City Manager determines that supplies, materials, or equipment can be purchased at a public auction, close-out sale, bankruptcy, or other similar sale, and if its determined that such purchase at such auction or sale will be made at a cost below the market cost in the community, a contract or contracts may be let, or purchase made without complying with the competitive bidding requirements set forth herein.

4.05 Exchanges – Exchanges of supplies, material or equipment between the City and any other public agency which are not by sale or auction shall be by mutual agreement of the respective public agencies.

4.06 State Contracts – The City may purchase supplies from the vendor who has submitted the lowest bid price for such items to the State of Utah Purchasing Office at

the quoted price without any solicitation or price quotation or invitation to bid. For such purposes, the quoted price shall be deemed to be the lowest price available for such items and the City need not follow any other bidding requirements.

4.07 Utah Correctional Industries Division – Goods and services produced by the Utah Correctional Industries Division may be purchased from the Division without following any of the bidding requirements set forth herein.

4.08 Additional Work (Change Orders) – Any change orders, scope of work changes, extension of work, or other additions or corrections to existing contracting services, supplies, equipment, or materials, whether constituting a reduction or increase in bid amount, to a current award provided the change order is no more than fifteen percent (15%) of the original bid. The City Council shall be notified of any change orders more than fifteen percent (15%).

4.09 Interlocal Agreements – The City shall have the power to enter into joint purchase agreements with any other public agencies within the State for the purchase of any commodity or service wherein it is determined by the City Council to be in the best interest of the City.

4.10 I Emergency Procurement – Notwithstanding any other provision of this Purchasing Policy and Procedures, when there exists a threat to public health, welfare, safety, or ability of the City to provide its services, under emergency conditions as determined by the City, the City Manager may immediately authorize the awarding of contracts for any supply, service or construction provided said procurement is made with as much competition as practicable under the circumstances and reasonably limited to the purpose of facilitating accomplishment of an emergency need.



SECTION 5 APPEALS; PROHIBITIONS; COMPLIANCE

5.01 Appeals – Any actual or prospective bidder, offeror, or contractor who is aggrieved in connection with the solicitation or award of a contract may appeal to the City Manager. An appeal shall be submitted in writing within five business days after the aggrieved person knows or should have known the facts. The City Manager shall issue a written decision within fourteen calendar days regarding the appeal if it is not settled by mutual agreement. The appeal to the City Manager shall be the final appeal authority.

5.02 Prohibitions –

1. Conflicts of Interest - No member of the City Council or City employee may have an undisclosed pecuniary interest, as per State law, directly or indirectly in any contract entered into by the City. A violation of this provision shall be cause for removal or other disciplinary action. City employees and City Council members shall notify the City Manager of any potential conflict of interest.

2. Collusion Among Bidders - Any agreement or collusion among bidders or prospective bidders in restraint of competition by an agreement to bid a fixed price, or otherwise, shall render any such bids void.

3. Ethics - It is the intent of the City Council that procurement by Ephraim City comply in all respects with the requirements of the laws of the State of Utah relating to ethics and employees' dealings with the City.

4. Personal Use - Any purchase of supplies or equipment by the City for the personal use of any official or employee of the City is prohibited. Any person who violates this subsection shall be subject to disciplinary action by the City.

5. Bidding Preference - A City Council member, director, or employee with purchasing authority may not take part in any contracting decision: (i) relating to a family member; or (ii) relating to any entity in which a family member is an officer, director, or partner, or in which a family member owns or controls ten percent (10%) or more of the stock of such entity. If a contracting matter arises relating to a family member, then the City Council member must advise the Mayor and City Council and must be recused from all discussions and votes related to the matter. If a contracting matter arises relating to a family member, a director or employee must advise the City

Manager of the relationship and must be recused from all discussions or decisions relating to the matter.

For the purposes of this policy, "family member" shall mean a party's spouse (including prior spouses), siblings, stepsiblings, siblings-in-law, parents, stepparents, parents-in-law, children, stepchildren, children-in-law, any person residing in the same household of the party, and any individual claimed as a dependent for tax purposes.

5.03 Compliance—No officer or employee of the City shall make any purchase for or on behalf of the City of any material, goods, supplies, equipment, or services of any kind except through the purchasing procedures as specified in this policy. It shall be considered a breach of duty on the part of any officer or employee to make any purchase in a manner other than through specified purchasing procedures. Officers and employees are subject to disciplinary action as determined by the City Manager for any violation.

Draft



STAFF REPORT

To: Ephraim City Planning and Zoning Commission
From: Megan Spurling, City Planner
Date of Meeting: August 13, 2025
Type of Item: Soapcreek Rezone
Process: Legislative Review

RECOMMENDATION: Staff has reviewed the application for compliance with all standards in the Ephraim City Municipal Code and found that it meets the minimum required for approval. Accordingly, staff recommends that the Ephraim City Planning and Zoning Commission review the proposed Amendment to the Ephraim City Zoning Map and recommend approval or denial of the amendment to the Ephraim City Council.

Project Description

Project Name: Soapcreek Rezone
Applicant(s): Fred Johnson and Christine Hanks
Property Owner(s): Soapcreek Properties LLC
Location: Approximately 600 S (Larson Lane) and Future 600 W
Zone District: General Commercial (C2) and Agricultural (A)
Parcel Number: S-6100, S-6099, S-6103 and S-6104
Type of Process: Legislative
Final Land Use Authority: City Council

Proposal

The applicants, Fred Johnson and Christine Hanks, are requesting the Amendment to the Ephraim City Zoning Map to rezone property located near 600 S and 600 W to the Industrial (I) Zone for the purpose of expanding their current business. The property is currently zoned General Commercial (C2) and Agricultural (A).

Current Zoning Map



Analysis and Findings

The Planning Commission may recommend approval, approval with conditions, or denial of the proposed map amendment to the City Council.

Section 10.04.060 of the Ephraim City Code provides the standards which should be met to amend the zoning map.

Standard 1: The Planning Commission shall hold a Public Hearing that has been properly noticed. **COMPLIES**

Analysis: This item has been properly noticed as a public hearing and notice of the hearing was mailed to all adjacent property owners.

Standard 2: If changing property from one zone to another, when considering any amendments to the Land Use Ordinance, the Planning Commission shall ensure compliance with the Land Use Classification Map found in the General Plan. **COMPLIES**

Analysis: The future land use map shows this land as “Industrial”. The proposal to amend the Zoning Map to include this area within the Industrial (I) zoning district is consistent with the goals and objectives of the Ephraim General Plan.

For informational purposes, Staff has added a use chart analysis as Exhibit A to this report. While allowed and permitted uses are not a specific standard to be used in determining whether an amendment to the Zoning Map is appropriate in a location, Staff is including the information so that the Planning Commission and members of the public may fully understand the potential use changes that amending the Zoning Map would entail.

Recommendation

Staff recommends that the Commission consider the issues outlined in this report regarding the proposed Zoning Map Amendment and vote to recommend approval or denial of the proposed amendment to the Ephraim City Council based upon the following Findings of Fact and Conclusions of Law:

Findings of Fact

1. Soapcreek Properties LLC is listed as the fee title owners of record for Parcels S-6100, S-6099, S-6103 and S-6104
2. The Parcels S-6100, S-6099, S-6103 and S-6104 are located at approximately 600 S and 600 W
3. Parcels S-6099 and S-6104 are currently zoned General Commercial (C2)
4. Parcels S-6100 and S-6103 are currently zoned Agricultural (A)
5. The Ephraim City Planning and Zoning Commission will hold a public hearing regarding the proposed amendment on August 13, 2025
6. The Parcels S-6100, S-6099, S-6103 and S-6104 are approximately 21.14 acres.
7. This application has been noticed appropriately.

Conclusions of Law

1. Based upon the findings of fact listed above, the proposed Amendment to the Ephraim City Zoning Map complies with the standards as described in the Ephraim City Municipal Code.

Attachments:

Exhibit A – Use Chart Comparison for RA and Industrial Zoning Districts.

Exhibit A

The following selection from the Ephraim City Land Use Matrix shows the current zone and the proposed zone for the subject property. The table only displays instances where the zoning differs for specific uses. Should the Amendment to the Ephraim City Zoning Map be approved by the Ephraim City Council, the uses listed below in the Industrial column would be available as uses on the subject property. Uses shown in the RA column would no longer be available as uses on the subject property.

For the complete Land Use Matrix including all uses for all zoning districts please visit <https://ephraim.municipalcodeonline.com/book?type=ordinances#name=10.20.030> Table B: Land Use Matrix

Table B: Land Use Matrix

P= Permitted, C= Permitted by Conditional Use, Blank=Not Allowed

Use	Agricultural	Commercial	Industrial
	A	C2	I
Accessory uses buildings customarily incidental to permitted uses	P	P	P
Accessory buildings and uses customarily incidental to conditional uses	C	C	C
Agricultural industry or related business	C	P	C
Animal hospital			C
Apiary - beehives (Up to 5 beehives)	P	P	P
Apiary-beehives (More than 5 beehives)	P		C
Art needlework shop; art shop; art supply		P	
Automatic car wash		P	P

Automobile or recreation vehicle sales, service, lease, rental and repair, new or used		P	P
Automobile service station		P	P
Awning sales/repair		P	P
Bakery, retail sales		P	P
Bank		P	
Barber shop		P	P
Bath and massage (not part of medical or health spa)		P	P
Beauty shop		P	P
Beauty shop for pets, dog grooming		P	P
Bed and Breakfast (2006)		P	
Beer outlet, Class A, Class B		C	
Blacksmith shop			P

Body and fender shop; tire recapping; motor vehicle, bicycle, and recreation vehicle assembling, painting, upholstering and rebuilding		C	P
Boiler works			P
Bookbinding		C	P
Bookstore		P	P
Bottling works			P
Breweries			C
Building material sales yard, outside, with sale of rock, sand, gravel and the like as an incidental part of the main business, but excluding concrete mixing		C	P
Building material sales in an enclosed building		P	P
Buildings and structures on slopes greater than 20%	C	C	C

Café, cafeteria, catering establishment, restaurant (not a drive-thru)		P	C
Candy, confectionery, nut shop		P	P
Carbonated and purified water sales		P	P
Carpet and/or rug cleaning		P	P
Cell Phone Towers – see Radio, TV and Cell Towers	C	C	P
Cemetery	P	P	
Central mixing plant, related to construction industry for cement, mortar, plaster, or paving materials			C
Child day care or nursery	C	P	
China and/or silver shop		P	P
Church	C	P	
Clothes cleaning, dyeing, pressing, dry cleaners		P	P
Clothing store		P	P
Coal/fuel sales office		C	P

Commercial Storage Units		P	P
Construction of buildings to be sold and moved off the premise			P
Convenience store with gasoline sales		P	P
Copy store, blueprinting, Photostatting, duplicating		P	P
Costume rental		P	
Dairy	P		P
Dams and reservoirs	C		C
Dance Clubs/Hall (2006)		C	C
Dance Studio (2006)		P	P
Delicatessen		P	P
Department store		P	P
Dramatics school	C	P	P
Drapery-curtain store		P	P
Dressmaking		P	P
Drive-ins; refreshment stand, eating place		P	P
Drugstore		P	P
Dry goods store		P	P
Dude ranch, family vacation ranch	P		

Dwelling, Accessory Apartment (see definition)		P	
Dwelling, Congregate Residence. Multiple tenant dwelling (more than four individuals) in an existing structure, subject to current parking requirements; ECC 10.20.050 Table D, with an occupancy of up to the lesser of two people per bedroom or 10 people per building (see definitions.) (2006)		P	
Dwelling, two-family (duplex)		C	
Dwelling, multiple-family (more than 4 units)		C	
Dwelling, four-family (fourplex)		C	
Dwelling, single-family	P	C	

Dwelling, three-family (triplex)		C	
Egg candling, sales, or processing	P		P
Elderly Facilities as defined and articulated by Utah Code §§ 10-9a-103, 10-9a-516, 10-9a-517, 10-9a-518, 10-9a-519		P	
Electrical, appliances and fixtures, electronic instruments sales, repair and/or service		P	P
Employment agency or employment office		P	P
Farm or ranch housing	C		C

Farms devoted to raising and marketing of livestock, chickens, turkeys or other fowl or poultry, fish or frogs; including wholesale and retail sales; pigs and hogs excluded	P		C
Fix-it shop, repair shop, for household items		P	P
Flooring, carpet repair and sales		P	P
Florist shop		P	P
Food processing or packaging			P
Forest industry, such as a saw mill, wood products plant, etc.		C	P
Forestry, except forest industry	P	P	P
Foundry			P
Frozen food lockers		P	P
Fruit or vegetable stand	P	P	P
Fruit/fruit juice store		P	P

Furniture sales, and/or repair		P	P
Garage Repair Shops (see definition)		P	P
Gift shop; hobby or crafts shop		P	P
Golf Course	P	C	
Greenhouse, nursery; plant materials; soil & lawn service	P	P	P
Grocery; meat sales		P	P
Group Homes, to include youth care facilities, rehabilitation and treatment centers. (as per state and federal laws)	P	C	
Gunsmith		P	P
Hardware store, not including the sale of lumber		P	P
Hatchery	P		P
Health Club/Spa/Gym		P	P
Heating, ventilating, air conditioning; equipment (HVAC), sales/repair		P	P

Home occupations (Uncontested -see definition and ECC 10.12.020 Paragraph G)	P	P	P
Honey extraction	P	P	P
Hospital supplies		P	P
Hospital; medical or dental clinic		P	C
Hotel, motel, inn		P	C
Household cleaning/repair, house equipment displays		P	P
Ice cream shop		P	C
Ice manufacture, storage, and sales		P	P
Ice cream making, and/or candy making		C	P
Incinerator, excluding hazardous materials			C
Indoor auto parts sales		P	P
Insulation sales, manufacturing, installation and service		P	P

Interior decorating store		P	P
Jewelry store		P	P
Kennel	C	C	P
Knitting mill			P
Laboratories		P	P

ORDINANCE 25-10

AN ORDINANCE AMENDING THE DEVELOPMENT GUIDELINES AND STANDARDS; PROVIDING FOR REPEALER; PROVIDING FOR SEVERABILITY; AND PROVIDING FOR AN EFFECTIVE DATE

WHEREAS, the Ephraim City Community and Development Department currently maintains Engineering Guidelines and Design Standards for the purpose of assisting developers in meeting the current engineering standards required by the City; and

WHEREAS, the Guidelines and Standards need to be updated from time to time; and

WHEREAS, Utah State Code requires the approval of guidelines by ordinance; and

WHEREAS, City Staff have determined that it is in the best interest of the City to amend the Guidelines and Standards; and

WHEREAS, the City Council has determined that it is in the public interests and welfare of the City, it's residents, and local businesses to enact this amendment to the ordinance.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF EPHRAIM, UTAH:

SECTION I: Repealer. If any provisions of the City's Code previously adopted are inconsistent herewith they are hereby repealed.

SECTION II: Enactment. The provisions of the Development Guidelines and Design Standards which are attached hereto and incorporated herein by this reference are approved.

SECTION III: Severability. If any section, subsection, sentence, clause or phrase of this ordinance is declared invalid or unconstitutional by a court of competent jurisdiction, said portion shall be severed and such declaration shall not affect the validity of the remainder of this ordinance.

SECTION IV: Effective Date. This ordinance being necessary for the peace, health and safety of the City, shall become effective immediately upon posting.

PASSED AND ADOPTED by the City Council of Ephraim, Utah, this **20th day of August 2025**.

Lloyd Stevens, Mayor Pro Tem

ATTEST:

Candice Maudsley, City Recorder



Ephraim City Construction Standards

Prepared by: Jones and Demille Engineering

45 East 500 North
Richfield, UT 84701
(435) 986-8266

Effective: January 1999

Last Amended: August 2025

EPHRAIM CITY CONSTRUCTION STANDARDS

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SECTION 1

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Purpose for these Construction Standards
- B. Required design standards.
- C. Requirements for drawings.
- D. One year Guarantee of work.
- E. General requirements for licenses, permits, temporary utilities and traffic regulation.
- F. Requirements for testing and inspection.

1.2 PURPOSE OF CONSTRUCTION STANDARDS

- A. These Construction Standards set forth minimum standards for improvements constructed within existing or proposed public streets, right-of-ways and easements within Ephraim City Limits. Nothing in these Construction Standards shall be construed to prohibit improvements constructed to higher standards.
- B. These Construction Standards are for guidance and consistency, but are not to restrict professional judgment. Where unusual or exceptional conditions exist, variations and exceptions from these Construction Standards may be made by Ephraim City Council after receipt of written request and due consideration.
- C. All instructions in these Construction Standards are addressed to Developer, unless otherwise noted. These Construction Standards consist of written text and drawings.
- D. With the express approval of the city engineer or public works director, the most recent version of APWA Construction Standards and Specifications may be substituted for anything in this document.

1.3 DEFINITIONS

- A. Developer: Individual, association, firm, partnership, corporation, or entity proposing to make improvements within existing or proposed public streets, right-of-ways and easements within Ephraim City Limits.

1.4 SUBMITTALS

- A. Unless otherwise noted, submit one copy to Ephraim City.
- B. Test results shall be submitted no later than 7 days after date of test.

1.5 DESIGN STANDARDS

- A. Streets:
 - 1. Width: As determined by Ephraim City Council.
 - 2. Pavement Section: Minimum section shall be 3 inches of asphalt concrete pavement with 8 inches of untreated base course, and 12 inches of granular borrow (pit run) as the base layer, unless pavement design requires greater section. Submit pavement design prepared by engineer licensed in State of Utah.
 - 3. Longitudinal Grade:
 - a. Major Collector: Not exceed 8 percent.
 - b. Other Streets: Not exceed 15 percent.
 - 4. Cross Grade: Minimum of 2 percent.
 - 5. Curb Corner Radius:
 - a. Collector and Major Streets: Minimum of 25 feet.
 - b. Other Streets: Minimum of 15 feet.
 - 6. Street Monuments: Place at center line angle points and intersections.
 - 7. Signs: Street name and traffic signs required to be paid by applicant.
- B. Culinary Water: In accordance with Utah Department of Environmental Quality requirements.
 - 1. Design: Size main lines to maintain minimum of 20 psi pressure at all points of system during peak instantaneous demand condition and when fire flows are added to peak daily flow. Loop main lines. Any stretch of dead end line longer than 650 feet requires the line to be looped.
 - 2. Main Lines: 8 inch diameter minimum size. 5 feet minimum cover to top of pipe, 6 feet maximum cover to top of pipe.
 - 3. Service Lines: 1 inch diameter minimum size, unless approved otherwise by city. 3.5 feet minimum cover to top of pipe. Meter base shall be placed at 4 feet deep.
 - 4. Fire Hydrants: Space no greater than 500 feet. Meet Fire Department regulations.
 - 5. Valves: Install at all connections and not more than 600 feet apart. Locate at street intersections in line with property line extension. Each leg of a tee or a cross shall have a valve. Use gate valves for valves up to 12 inches diameter and butterfly valves for valves larger than 12 inches diameter.
- C. Sanitary Sewer: In accordance with Utah Department of Environmental Quality requirements.
 - 1. Design: Use annual average flow rate of 100 gallons per capita per day. Place at depth to service basements and prevent freezing.
 - 2. Main Lines: 8 inch diameter minimum size and 0.5 percent minimum slope unless approved by

city engineer. Uniform slope and straight alignment between manholes.

- a. Lateral and Collector: Design for peak flow of 400 gallons per capita per day.
 - b. Interceptor and Outfall: Design for peak flow of 250 gallons per capita per day.
 3. Service Lines: 4 inch diameter minimum size and 2 percent minimum slope.
 4. Manholes: Place at changes in pipe size or grade, intersections and not more than 400 feet apart. Use drop manhole for any sewer line entering manhole above manhole invert.
- D. Maintain at least 10 feet horizontal separation between culinary water lines and sanitary sewer lines. Where culinary water lines and sanitary sewer lines cross, install culinary water line at least 18 inches above sanitary sewer line. Measure separation distances from outside edge to outside edge of pipe. If separation requirement is not met, then use special pipe material and joint construction.
- E. Drainage: Design drainage system for 10 year, 24 hour storm return frequency. Design overflows to tie into existing drainage system. Areas with no overflow outlet will be required to design to 100 year storm event. Collection boxes shall be placed no greater than 650 feet.
- F. Flood Control: Where flood control measures are required, design for 100 year return frequency.
- G. Power System:
1. Design: Place at back or front lot lines. Do not place in water or sewer trench.
 2. Layout: Provide easements not less than 10 feet wide. Wider easements may be required for commercial and industrial uses. Place power lines 3 feet from property line within utility easement. Do not place structures within 10 feet in front of transformer pad or within 18 inches of any other side of transformer pad.
 3. Minimum Burial Depth:
 - a. Primary Lines: 42 inches.
 - b. Secondary Lines: 32 inches.
 4. Streetlights: Provide in accordance with Section 16.

1.6 DRAWINGS

- A. Construction drawings shall be prepared by engineer licensed in State of Utah. Construction drawings shall be clear, legible and conform to standard engineering and drafting practices. All drawings shall conform to following:
1. Sheet Size: 11 inch by 17 inch minimum to 24 inch by 36 inch maximum.
 2. Have border and title block.
 3. Indicate sheet title, project name, preparer's name, engineer's stamp, date, scale, elevation datum, north arrow for plans, and sheet number.
 4. Use appropriate scale as required to clearly show existing features and proposed improvements.
- B. Street improvement drawings shall show:
1. Plan and profile.
 2. Elevations and grades.
 3. Stationing and curve data.

- C. Utility improvement drawings shall show:
 - 1. Location, size and type of utility.
 - 2. Plan and profile with elevations and grades for sanitary sewer and storm drain.
 - 3. Connections to existing utilities.
- D. Drawings shall include sufficient detail sheets to clearly describe proposed improvements.
- E. Submit 1 set of construction drawings to Ephraim City for review and an electronic copy. If approved, construction drawings will be retained by Ephraim City.
- F. Receipt of approved sets of construction drawings from Ephraim City shall authorize Developer to proceed with construction. Do not start construction until construction drawings are approved.
- G. Use one set of approved construction drawings to document any changes made during construction. After construction has been completed, submit as-constructed drawings to Ephraim City in both hard copy and electronic copy.

1.7 LICENSES AND PERMITS

- A. Developer shall obtain all licenses and permits required to complete improvements.

1.8 WARRANTY

- A. Developer shall guarantee improvements in good condition for period of one year after date of final inspection. Guarantee shall include all improvements such as utilities, roadways, curb and gutter, sidewalks and accessories.
- B. If during one year guarantee period Ephraim City determines that completed improvements need repairs or reconstruction, then Ephraim City will give written notification to Developer. Developer shall have 30 calendar days from receipt of written notification to complete repairs or reconstruction. If Developer fails to make repairs or reconstruction within 30 calendar days, then Ephraim City will arrange for repairs or reconstruction to be completed and cost will be billed to Developer.

PART 2 PRODUCTS

2.1 SIGNS, SIGNALS AND DEVICES

- A. Traffic Control Signs, Informational Signs, Cones, Drums, Flares and Lights: In accordance with Manual on Uniform Traffic Control Devices (MUTCD).

PART 3 EXECUTION

3.1 TEMPORARY UTILITIES

- A. Provide and pay cost for any required temporary utilities such as but not limited to: electricity, telephone, water, and sanitary facilities.

3.2 BARRIERS AND TRAFFIC REGULATION

- A. Provide barricades, barriers, and signs to prevent unauthorized entry to construction areas, protect existing improvements from damage, and protect public.
- B. Provide warning, detour, and other signs to direct traffic safely through or around construction areas. When working within traffic lanes, close road and detour traffic or use flaggers to direct traffic.
- C. Use flares and lights during hours of low visibility to delineate traffic lanes, guide traffic, and protect public.
- D. Relocate barricades, barriers, signs and other traffic control devices as work progresses to maintain effective traffic control and public protection. Remove when no longer required.
- E. Applicant must secure all permits from UDOT when working within UDOT right of way.

3.3 TESTING

- A. Material testing required by these Construction Standards shall be performed by independent testing laboratory approved by Ephraim City. All testing shall comply with current AASHTO, ASTM, AWWA or State of Utah standards as indicated.
- B. Cost for testing and bringing materials into compliance shall be borne by Developer.
- C. Ephraim City reserves right to perform verification testing to verify test results submitted by Developer. Verification testing governs over test results submitted by Developer. Ephraim City will pay cost for verification testing, unless verification testing reveals unacceptable work, then cost for verification testing and cost for corrective work shall be paid by Developer.

3.4 INSPECTION

- A. All improvements shall be subject to inspection by Ephraim City. **Do not cover or backfill excavations for improvements until improvements have been inspected by Ephraim City.** If any installation is covered before being inspected and approved, Developer shall uncover installation.

- B. After improvements are completed, Ephraim City will conduct final inspection. Any faulty or defective work noted at final inspection shall be corrected within 30 calendar days after date of final inspection. If Developer fails to complete corrective work within 30 calendar days, then Ephraim City will arrange for corrective work to be completed and cost will be billed to Developer.
- C. Requests for inspections shall be made to Ephraim City at least 24 hours in advance of need for inspection.
- D. Developer shall pay Ephraim City for cost of inspections.

END OF SECTION

SECTION 2

REMOVAL AND REPLACEMENT OF EXISTING IMPROVEMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for protection, restoration or replacement of existing improvements on public or private property.
- B. Replacing improvements removed or damaged during trenching or other construction operations.

1.2 REFERENCES

- A. Related Sections:
 - 1. Section 4 - Trenching.
 - 2. Section 9 - Untreated Base Course.
 - 3. Section 10 - Asphalt concrete Pavement.
 - 4. Section 11 - Cast-in-Place Concrete.

1.3 DEFINITIONS

- A. Existing Improvements: Include but are not limited to gravel surfacing, asphalt concrete pavement, portland cement concrete pavement, curb, gutter, sidewalk, driveway, fence, ditch, culvert, utility, sign, structure, wall and landscaping.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Untreated Base Course: In accordance with Section 9.
- B. Asphalt Concrete Pavement: In accordance with Section 10.
- C. Portland cement concrete: In accordance with Section 11.
- D. Other Materials: Match existing materials or better.

PART 3 EXECUTION

3.1 REMOVAL

- A. Remove existing improvements only when necessary to construct proposed improvements.
- B. Remove existing improvements damaged during construction.
- C. When removing asphalt concrete pavement, saw cut through full depth of pavement and in straight line. If pavement is cracked, broken or deteriorated, make cut so defective area is removed. When possible, make saw cut parallel or perpendicular to center line of street. For trenching, make saw cut 6 inches beyond edge of trench.
- D. When removing portland cement concrete, remove back to nearest cold joint or saw cut in straight line beyond damaged area.
- E. Broken asphalt concrete pavement and portland cement concrete may be used as backfill in trenches if broken up small enough to meet requirements of Section 4. Dispose of unusable damaged materials off site.

3.2 REPAIR, RESTORATION AND RECONSTRUCTION

- A. Repair, restore or reconstruct improvements to equal or better condition than existed prior to start of construction.
- B. Replace gravel surfacing with untreated base course to depth equal to existing gravel surfacing, but not less than 6 inches. Place and compact untreated base course in accordance with Section 9. If gravel surfacing is different from untreated base course, replace with material equal to existing.
- C. Replace asphalt concrete pavement and untreated base course in accordance with Sections 10 and 9 respectively. Place untreated base course to depth equal to existing base, but not less than 8 inches. Place asphalt concrete pavement to depth equal to existing pavement, but not less than 3 inches.
- D. Replace concrete improvements to match adjacent concrete improvements, unless adjacent improvements do not meet current Ephraim City Construction Standards, then match current standards.
- E. Restore or replace landscaping improvements.

END OF SECTION

SECTION 3

EARTH WORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for excavation, embankment, backfill and compaction for structures and site improvements.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M145 - The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
 - 2. AASHTO T99 - Moisture-Density relations of Soils Using a 5.5 lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.
 - 3. AASHTO T180 - Moisture-Density relations of Soils Using a 10-lb. (4.54 kg) Rammer and an 18 in. (457 mm) Drop.
 - 4. AASHTO T193 – California Bearing Ratio
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM D2922 – Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
- C. Occupational Safety and Health Act (OSHA).
- D. Related Sections
 - 1. Section 9 – Untreated Base Course.
 - 2. Section 11 – Cast-in-Place Concrete.

1.3 DEFINITIONS

- A. Clearing: Removal and disposal of logs, limbs, sticks, vegetation, rubbish, debris, and other material on ground surface.
- B. Grubbing: Removal and disposal of roots, buried logs, debris, and other underground material.
- C. Soil Classification: As determined in accordance with AASHTO M145.

1.4 SUBMITTALS

- A. Test Results: Submit one copy of soil classification, proctor and density test results.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Granular Borrow: Granular material.
 - 1. Classification: AASHTO M145, A-1-a or A-1-b.
 - 2. CBR Value: AASHTO T193, 20 percent of greater.
 - 3. Gradation: 6 inches maximum.
- B. Borrow: A-1-a through A-4 material as classified in accordance with AASHTO M145.

PART 3 EXECUTION

3.1 PREPARATION

- A. Identify required lines, grades, and elevations.
- B. Locate, identify, and protect utilities that remain from damage.
- C. Set bench marks, control points and other survey stakes as needed to meet tolerances.

3.2 WATER CONTROL

- A. Grade construction area to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
- B. Protect construction areas from puddling or running water. Provide water barriers as required to protect construction areas from soil erosion.
- C. Provide temporary drainage for storm and irrigation water. Make repairs to correct any damage caused by temporary or lack of temporary drainage.

3.3 DUST CONTROL

- A. Provide adequate water supply for dust control at any time.
- B. Do not waste water or over saturate construction area.

3.4 CLEARING AND GRUBBING

- A. Clear and grub all vegetation and debris within roadway.
- B. Dispose of material off site.
- C. Backfill holes, cuts, and depressions resulting from clearing and grubbing. Compact to density of surrounding ground.

3.5 EXCAVATION

- A. Excavate soil as necessary to construct improvements. Stockpile excavated soil sufficient distance from edge of excavation to prevent slides and cave-ins. Stockpile soil in manner to minimize inconvenience for traffic and minimize damage to existing improvements.
- B. Remove and dispose of unsuitable excavated materials off site.
- C. Use suitable excavated materials for backfill and embankments. Dispose of surplus materials off site.
- D. Slope bank of excavation to meet soil conditions and OSHA requirements. Under cutting will not be permitted. Where needed, provide shoring.
- E. Excavate subgrade for structure to original undisturbed soil. Correct excavation below subgrade for structure with concrete or untreated base course in accordance with Sections 11 and 9 respectively.

3.6 EMBANKMENT

- A. Use suitable excavated materials to build embankments. Do not use frozen, organic, rubbish, debris, or other objectionable materials.
- B. If embankment height is 6 feet or less and underlying ground consists of loose material, scarify and compact top 8 inches of ground to at least 90 percent of maximum laboratory density.
- C. Do not place embankment over porous, wet, frozen, or spongy subgrade.
- D. Do not use rocks, concrete or pavement materials over 6 inches in largest dimension. Mix rocks and large material with finer materials to minimize voids.

3.7 OVER EXCAVATION

- A. If soft areas appear, scarify, aerate, and re-compact.
- B. If soft areas persist, excavate unsuitable soil and dispose off site.
- C. Backfill excavated areas with granular borrow and compact.

3.8 BACKFILLING

- A. Use excavated materials to backfill excavated area to match required contours and elevations.
- B. Do not backfill over porous, wet, frozen or spongy subgrade. Remove shoring.
- C. Employ placement method that does not disturb or damage other work.
- D. Slope finish grade away from structure. Make gradual grade changes. Blend slope into level areas.

3.9 BORROW

- A. If quantity of excavated material is not sufficient to complete backfill and embankment, import borrow material as needed.
- B. Use granular borrow for areas subject to traffic and other loads such as roadways, concrete elements and structures.
- C. Use fine grained materials for landscaping and non-traffic areas.
- D. Do not use frozen, organic, rubbish, debris or other objectionable materials.

3.10 COMPACTION

- A. Place backfill and embankment materials in layers not exceeding 12 inches non-compactive depth. If tests indicate unsatisfactory density, reduce layer thickness.
- B. Compact with self-propelled compaction equipment. Use hand-operated compaction equipment in areas inaccessible to self-propelled compaction equipment.
- C. Maintain optimum moisture content of backfill and embankment materials to obtain required density.

- D. Required Subgrade Density:
 - 1. Structures: Original undisturbed soil or engineered fill compacted to 96 percent of maximum laboratory density.
 - 2. Concrete elements including curb, gutter, flatwork and pavement: 96 percent of maximum laboratory density.
 - 3. Traveled areas including roads, shoulders, parking lots, and driveways: 96 percent of laboratory density.
 - 4. Non-traveled areas: 90 percent of maximum density.

3.11 FINISHING

- A. Finish excavated areas and embankment to reasonably smooth and uniform surface.
- B. Grade to blend in with existing contours and features and provide positive drainage.

3.12 TOLERANCES

- A. Moisture Content: Plus or minus 2 percent of optimum.
- B. Finish Subgrade Surface: Plus or minus 0.1 feet of required elevation.

3.13 TESTING

- A. Soil Classification: One per material source for granular borrow in accordance with AASHTO M145.
- B. Soil Proctor: One per each significant soil type encountered as necessary to provide density testing. Determine maximum laboratory density in accordance with AASHTO T180, Method D for A-1 soils and AASHTO T99, Method D for other soils.
- C. Density: Perform with nuclear gauge in accordance with ASTM D2922.
 - 1. Frequency:
 - a. Backfill and Embankment: One test per 500 cubic yards.
 - b. Subgrade: One test per 1500 square yards.
 - 2. Acceptance: Average daily density equals or exceeds density requirements of article 3.10. Reject single density tests greater than 4 percent below required density.
 - 3. If test results are is not acceptable, re-compact and retest.

3.14 PROTECTION

- A. Protect features remaining.
- B. Maintain subgrade until next layer is placed.

END OF SECTION

SECTION 4

TRENCHING

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Excavating trenches for utilities and utility structures.
- B. Backfilling and compaction for utility trenches.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M145 - The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
 - 2. AASHTO T99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.
 - 3. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. Occupational Safety and Health Act (OSHA).
- D. Related Sections:
 - 1. Section 12 - Flowable Fill.

1.3 DEFINITIONS

- A. Soil Classification: As determined in accordance with AASHTO M145.
- B. Utility: Any buried pipe, duct, conduit, cable and appurtenance.

1.4 SUBMITTALS

- A. Test Results: Submit one copy of proctor and density test results.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Backfill:
 - 1. Excavated material free from rubbish, debris, organic material, frozen material, or other objectionable material.
 - 2. Rocks originating from trench and not exceeding 12 inches.
 - 3. Broken portland cement concrete and asphalt concrete pavement originating from trench and not exceeding 6 inches.
 - 4. If excavated material is not suitable for backfill, import granular material.
- B. Imported Foundation Material: Crushed rock or gravel with 2 inch maximum gradation.

PART 3 EXECUTION

3.1 PREPARATION

- A. Identify required location and elevation of utility lines and structures.
- B. Locate, maintain and protect above and below grade utilities which are to remain.
- C. When working on shoulders or within roadway, place barricades, warning signs, and flag persons as needed to protect public and direct traffic.
- D. When trench is within pavement, saw cut trench prior to trenching.

3.2 EXCAVATION

- A. Excavate soil required for installation of utilities and utility structures.
- B. Cut trenches sufficiently wide to enable installation of utility and utility structure, provide compaction and allow inspection. Cut slope of trench walls to meet Utah State Industrial Commission and OSHA requirements and soil conditions. Provide shoring where needed. Take all necessary precautions to protect personnel in or around excavations.
- C. Remove water from trench. Provide, operate, and maintain pumping equipment as needed.
- D. Hand trim excavation for bell and spigot pipe joints. Remove lumped soil, boulders, rock and other materials that interfere with utility and utility structure.
- E. Correct areas over excavated by backfilling and compacting to 96 percent of maximum laboratory density.

- F. Stockpile excavated material along side of trench or in other areas to minimize damage to improvements.
- G. If unstable soil, mud or muck is encountered which is unsuitable to support utility, remove unsuitable material 12 inches below grade. Backfill with imported foundation material and compact to 96 percent of maximum laboratory density.
- H. When required, install utility by boring, jacking, moleing or augering.
- I. When trench is within existing roadway or other traveled area, place temporary gravel surface in top 8 inches of trench backfill until final surfacing is placed.

3.3 ROCK EXCAVATION

- A. If rocks are encountered which require removal by blasting, notify Ephraim City.
- B. Comply with laws, ordinances, regulations and safety code requirements for blasting. Exercise care when handling explosives and during blasting. Assume all responsibility for damage and injuries caused by blasting.
- C. In locations where solid rock, ledge rock, and cobble rock are encountered, excavate rock 6 inches below grade. Backfill with material required for utility bedding and compact to 96 percent of maximum laboratory density.

3.4 BACKFILL

- A. After utilities, utility structures, appurtenances, and bedding have been installed, backfill trenches. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces. Remove shoring.
- B. Do not place rocks larger than 2.5 inches in backfill placed within 12 inches of pavement subgrade.
- C. Employ placement method that does not disturb or damage utilities and utility structures.
- D. Grade surplus material to blend in with existing contours or remove surplus materials from site if necessary.
- E. Backfill trench as soon as possible. No more than 500 linear feet of open trench permitted. Minimize length of trench left open during night time.
- F. When trench is within existing roadway, backfill with flowable fill in accordance with Section 12.

3.5 COMPACTION

- A. Place backfill in layers not exceeding 12 inches non-compactive depth. If tests indicate unsatisfactory density, reduce layer thickness.
- B. Compact with self-propelled compaction equipment or use hand-operated compaction equipment in areas inaccessible to self propelled compaction equipment.
- C. Maintain optimum moisture content of backfill materials to obtain required density.
- D. Required Density:
 - 1. Class "B" Backfill: 96 percent of maximum laboratory density for traveled areas including roads, shoulders, parking lots, and driveways.
 - 2. Class "D" Backfill: 90 percent of maximum laboratory density for non-traveled areas.

3.6 TOLERANCES

- A. Moisture Content of Backfill: Plus or minus 2 percent of optimum.
- B. Top Surface of Backfilling Under Paved Areas: Plus or minus 1/2 inch from required elevations.
- C. Top Surface of General Backfilling: Plus or minus 1 inch from required elevations.

3.7 TESTING

- A. Soil Proctor: One per each significant soil type encountered as necessary to provide density testing. Determine maximum laboratory density in accordance with AASHTO T180, Method D for A-1 soils and AASHTO T99, Method D for other soils.
- B. Backfill Density: Perform with nuclear gage in accordance with ASTM D2922.
 - 1. Frequency: Minimum of two random tests per day after roller pattern is established.
 - a. Roller Pattern: Take three random density tests per 6 inch layer for 300 linear foot section of trench. Repeat tests for next layer. Establish roller pattern to obtain required density.
 - 2. Acceptance: Average daily density equals or exceeds density requirements of article 3.5. Reject single density tests greater than 4 percent below required density.
 - 3. If tests results are not acceptable, re-compact, and retest.

3.8 PROTECTION OF FINISHED WORK

- A. Protect finished Work.
- B. Reshape and re-compact trenches subjected to vehicular traffic during construction. Maintain trench surface flush with adjacent pavement or other surfacing.

END OF SECTION

SECTION 5

CULINARY WATER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for pipe, fittings, valves, fire hydrants, services, thrust restraint devices and bedding for culinary water lines.
- B. Disinfection and pressure testing for culinary water lines.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M145 - The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
 - 2. AASHTO T99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.
 - 3. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM D1248 - Polyethylene Plastics Molding & Extrusion Materials.
 - 2. ASTM D2239 - Polyethylene Plastic Pipe (SDR-PR).
 - 3. ASTM D2241 - Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR).
 - 4. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 5. ASTM F477 - Elastomeric Seals (Gaskets) for Joining Plastic Pipe.
- C. American Water Works Association (AWWA):
 - 1. AWWA C110 - Gray-Iron and Ductile-Iron Fittings, 2 inch Through 48 inch for Water and Other Liquids.
 - 2. AWWA C111 - Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings.
 - 3. AWWA C502 - Dry Barrel Fire Hydrants.
 - 4. AWWA C509 - Resilient Seated Gate Valves 3 in through 12 in NPS, for Water and Sewage Systems.
 - 5. AWWA C651 - Disinfecting Water Mains.
 - 6. AWWA C800 - Threads for Underground Service Line Fittings.

7. AWWA C901 - Polyethylene (PE) Pressure Pipe, Tubing, and Fittings, ½ inch through 3-inch, for Water.
- D. National Sanitation Foundation (NSF):
1. NSF-14 - Standard for Thermoplastic Materials, Pipe, Fittings, Valves, Traps and Joining Materials.
- E. Related Sections:
1. Section 4 - Trenching.
 2. Section 11 - Cast-in-Place Concrete.

1.3 DEFINITIONS

- A. Bedding: Fill placed under, beside, and directly over pipe to 12 inches above top of pipe, prior to subsequent backfill operations.
- B. Soil Classifications: As determined in accordance with AASHTO M145.

1.4 SUBMITTALS

- A. Test Results: Submit one copy of pressure, bacteriological, proctor and bedding density test results.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of Utah Department of Environmental Quality.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Unload, stockpile and install pipe by mechanical equipment or by hand using method that will not damage pipe. Stockpile pipe in units or crates as shipped. Do not allow pipe to fall to ground or in trench.

PART 2 PRODUCTS

2.1 PIPE

- A. PVC Pipe:
1. Class C900 PVC pipe in accordance with ASTM D2241.
 2. Bell and spigot joints with elastomeric gaskets in accordance with ASTM F477.
 3. SDR of 21.
 4. Be NSF approved and bear NSF label.
 5. Pipe Fittings: Cast iron or ductile iron in accordance with AWWA C110 and rubber gasket joints in accordance with AWWA C111.

2.2 VALVES

- A. Gate Valve: AWWA C509, Iron body, bronze trim, non-rising stem with square nut, single wedge, resilient seat, mechanical joint ends. Rated for 200 pounds per square inch working pressure. Valve shall open by turning nut counter-clockwise. Use gate valves on pipes up to 12 inches diameter, unless otherwise approved by the city.
- B. Butterfly Valve: AWWA C504, class 150B, tight-closed rubber seated type. Shall be bubble-tight at rated pressure in either direction and suitable for operation after long periods of inactivity. Provide with mechanical joint ends and rated for 200 pounds per square inch working pressure.
 - 1. Valve Body: Solid ASTM A126, class B, cast iron with ANSI B16.1 flange drilling.
 - 2. Valve Shaft: Solid 18-8, type 304 or type 316 stainless steel, ground and polished.
 - 3. Valve Operator: Traveling nut, self-locking type designed to hold valve in any position without creeping or fluttering. Equipped with mechanical stop-limiting device to prevent over travel of disc. Valve shall open by turning counter clockwise.
 - 4. Use butterfly valves for pipes larger than 12 inches in diameter, unless otherwise approved by the city.
- C. Valve Box and Cover: Cast iron, extension sleeve type, word "WATER" cast on cover.
- D. Concrete Collar: Class AA (AE) reinforced concrete in accordance with Section 11.

2.3 FIRE HYDRANTS

- A. Hydrant: AWWA C502, dry barrel type, with minimum 5.25 inch diameter valve seat opening, break-off flange at ground level, drip valve, 200 psi working pressure, 4 feet minimum burial depth. Shall open by turning pentagon operating nut counter-clockwise. Manufactured by Waterous or Kennedy Valve.
- B. Hose and Steamer Connection: Two 2.5 inch hose nozzles and one 4.5 inch pumper nozzle with standard threads, caps, gaskets and attaching chains.
- C. Finish: Primer and two coats of red enamel.
- D. Place valve at tee from the main line unless otherwise approved by the city.

2.4 SERVICES



- A. Tap Saddle:
 - 1. Nylon coated saddle with stainless steel straps.
 - 2. Provide full support around circumference of pipe.
 - 3. Provide 2 inch minimum bearing area along pipe.
 - 4. Not have lugs which will dig into pipe.

5. Not have U-bolt type strap.
- B. Corporation Stop: Bronze body in accordance with AWWA C800. Standard iron pipe threads, compression fittings for polyethylene pipe and stainless steel inserts stiffeners.
 - C. Service Line: High density polyethylene pipe, 200 psi, iron pipe size, in accordance with ASTM D1248, ASTM D2239, NSF-14, and AWWA C901.
 - D. Service Meter:
 1. Copper Setter: 15" height, shutoff valve on inlet, dual check valve outlet. Service meters 1.5 inches and larger require a bypass with shutoff. Dual check backflow prevention valves must be installed if not already built into the meter.
 2. Meter: Master Meter. All meters will be supplied by Ephraim City.
 3. Meter Barrel: High density polyethylene, white, or approved equal. Barrel size shall be 21 inch minimum size for up to 1 inch meters. 1.5 inch meters and above require a 30 inch minimum size meter barrel.
 4. Place meter base 4 feet deep.
 5. Meter Ring and Lid: Cast iron with words "WATER METER" cast on lid.
 6. Placement in concrete or asphalt requires a traffic rated flat lid.
 - E. Fittings: Bronze or Brass. All fitting must be Ford grip joint or pack joint compression fittings.

2.5 ACCESSORIES

- A. Thrust Restraint Devices:
 1. Concrete Thrust Blocks: Class B or B (AE) concrete in accordance with Section 11.
Mechanical Restrained Joints:
 - a. Pipe: Bell and spigot joint restraint harness or clamp. Rated at pressure class of pipe or greater.
 - b. Pipe Fittings: Mechanical joint with restrained follower gland. Rated at pressure class of pipe or greater. Megalug as manufactured by EBAA Iron Sales, Inc. or approved equal.
- B. BEDDING:
 1. Excavated materials consisting of earth, loam, sandy clay, sand, and gravel which are free from clods of earth, rocks larger than 1.5 inch, frozen material, organic material and debris.
 2. Imported bedding consisting of sand with 1.5 inch maximum size gradation.
 3. Sand bedding shall be placed to 12 inches above top of pipe.

PART 3 EXECUTION

3.1 PREPARATION

- A. Verify location, depth, material, and size of existing water lines.
- B. Trenching shall be in accordance with Section 4. Hand trim excavation for accurate placement of pipe.
- C. Remove large rocks or other hard matter which could damage pipe or impede installation.

3.2 INSTALLATION

- A. Install pipe and fittings in accordance with manufacturer's recommendations. Seal joints watertight. Route pipe in straight line.
- B. Set valve on solid bearing. Center and plumb valve box over valve. Set top of valve box flush with finished grade. When within improved roadway, construct concrete collar at finish grade of valve box.
- C. Set fire hydrant on solid bearing and plumb. Locate pumper nozzle perpendicular to and facing roadway. Install valve at the tee from the main line, and place valve box to finish grade. Provide drainage rock around fire hydrant drain.
- D. Install service line and connect to water main and copper setter. Install meter on City side of property line. Install meter barrel plumb and lid flush with finish ground.
- E. Install thrust restrain devices at any change of pipe direction, fittings and fire hydrant. Install mechanical restrained joints in accordance with manufacturer's recommendations. Thrust restraints shall be one of following methods:
 - 1. Install mechanical joint restraint on all joints of fitting and install concrete thrust block, or
 - 2. Install mechanical joint restraint on all joints of fitting and install restraint harness or clamp on pipe joints for required length.
- F. If excavated material is unsuitable for bedding, import granular bedding. Place bedding at sides and over pipe in layers not exceeding 6 inches compacted depth. Place bedding to minimum compacted thickness of 12 inches above top of pipe.
- G. Compact bedding to 96 percent of maximum laboratory density. Maintain moisture content of bedding material within plus or minus 2 percent of optimum to attain required density. Submit compaction test results to city.

3.3 WATER PIPING DISINFECTION

- A. After completing pressure testing, flush pipe to remove dirt or other foreign objects.
- B. Add liquid chlorine or liquid calcium hypochlorite to pipe to obtain 50 ppm concentration of chlorine. Maintain 25 ppm chlorine residual at the end of 24 hours. Disinfection procedures shall comply with Utah State Rules for Public Drinking Water Systems, Part II, and AWWA C651.

- C. Flush chlorinated water from pipe. Dispose of discharged chlorinated water in acceptable manner and in conformance with rules of Utah Water Quality Board (See R317 of Administrative Code).

3.4 TESTING

- A. Pressure Test: Test water mains at lesser of 200 psi or pressure rating of pipe. Test shall be witnessed by representative of Ephraim City.
 - 1. Fill pipe with water and place under slight pressure for at least 48 hours.
 - 2. Bring pipe pressure to test pressure and maintain for 4 hours minimum.
 - 3. Provide accurate means for measuring quantity of water needed to maintain test pressure on pipe for test period.
 - 4. If volume of water added to pipe is 10 gallons per inch of pipe diameter per mile of pipe per 24 hours or less, pipe passes test.
 - 5. If pipe does not pass test, find source of leakage, repair or replace, and retest. Repeat until pipe passes test.
- B. Bacteriological Test: After flushing chlorinated water from water lines, take sample for bacteriological test. If necessary, re-chlorinate until satisfactory bacteriological test is obtained. Must submit two consecutive passing BactT tests taken 24 hours apart before city will accept as passing. Do not put piping into service until test results are satisfactory.
- C. Bedding Soil Proctor: One per each significant soil type encountered as necessary to provide density testing. Determine maximum laboratory density in accordance with AASHTO T180, Method D for A-1 soils and AASHTO T99, Method D for other soils.
- D. Bedding Density: Perform with nuclear gage in accordance with ASTM D2922.
 - 1. Frequency: One random test per 500 linear feet of trench.
 - 2. Acceptance: Average daily density is 96 percent or greater. Reject single tests less than 92 percent.
 - 3. If tests are not acceptable, recompact and retest.

3.5 PROTECTION

- A. Protect pipe from damage or displacement.
- B. Prevent mud, silt, gravel, and other foreign materials from entering pipe and keep off joint surfaces.
- C. Install plug in pipe end when pipe laying is not in progress.

END OF SECTION

SECTION 6

SANITARY SEWER

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for sanitary sewer pipe, fittings, accessories and bedding.
- B. Cleaning and testing requirements for sanitary sewer pipe.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M145 - The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
 - 2. AASHTO T99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.
 - 3. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. American Society of Testing and Materials (ASTM):
 - 1. ASTM D1248 - Polyethylene Plastics Molding & Extrusion Materials.
 - 2. ASTM D1784 - Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds.
 - 3. ASTM D1785 - Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120.
 - 4. ASTM D2321 - Underground Installation of Flexible Thermoplastic Sewer Pipe.
 - 5. ASTM D2412 - External Loading Properties of Plastic Pipe by Parallel - Plate Loading.
 - 6. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
 - 7. ASTM D3034 - Type PSM Poly (Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
 - 8. ASTM F477 - Elastomeric Seals (Gaskets) for joining plastic pipe.
- C. UNI-BELL PVC Pipe Association (UNI-B):
 - 1. UNI-B-6 - Recommended Practice for Low-Pressure Air Testing of Installed Sewer Pipe.
- D. RELATED SECTIONS:
 - 1. Section 4 – Trenching.

1.3 DEFINITIONS

- A. Bedding: Fill placed under, beside and directly over pipe to 12 inches above top of pipe, prior to subsequent backfill operations.
- B. Soil Classification: As determined in accordance with AASHTO M145.

1.4 SUBMITTALS

- A. Test Results: Submit one copy of proctor, bedding density, pressure and deflection test results.

1.5 REGULATORY REQUIREMENTS

- A. Conform to requirements of Utah Department of Environmental Quality.

1.6 DELIVERY STORAGE AND HANDLING

- A. Unload, stockpile and install pipe by mechanical equipment or by hand using method that will not damage pipe. Stockpile in units or crates as shipped. Do not allow pipe to fall to ground or in trench.

PART 2 PRODUCTS

2.1 PIPE

- A. PVC Gravity Sewer Pipe:
 - 1. ASTM D3034.
 - 2. PVC material conforming to ASTM D1784.
 - 3. Minimum pipe stiffness of 46 psi according to ASTM D2412.
 - 4. SDR of 35.
 - 5. Joints: Bell and spigot style with elastomeric gaskets conforming to ASTM F477.
- B. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in required tee, bends, elbows, cleanouts, reducers, traps and other configurations required.

2.2 ACCESSORIES

- A. Bedding:
 - 1. Excavated materials consisting of earth, loam, sandy clay, sand, and gravel which are free from clods of earth, rocks larger than 1.5 inch, frozen material, organic material and debris.

2. Imported bedding consisting of pit run gravel, crushed rock, or sand with 1.5 inch maximum size gradation.

PART 3 EXECUTION

3.1 PREPARATION

- A. Verify Location, depth, material, and size of existing sanitary sewer lines.
- B. Trenching shall be in accordance with Section 4. Hand trim excavations to required elevations.
- C. Remove large rocks or other hard matter which could damage pipe or impede installation.

3.2 INSTALLATION

- A. Install pipe, fittings, and accessories in accordance with ASTM D2321 and manufacturer's instructions. Seal joints watertight.
- B. Install gravity sewer pipe using laser equipment. Lay pipe at constant slope between manholes.
- C. Install cleanout plumb. Install top of cleanout flush with finish ground surface.
- D. If excavated material is unsuitable for bedding, import granular bedding. Place bedding at sides and over top of pipe in lifts not exceeding 6 inches compacted depth. Place bedding to minimum compacted thickness of 12 inches above top of pipe.
- E. Compact bedding to 96 percent of maximum laboratory density. Maintain optimum moisture content to attain required density.
- F. Flush sewer pipe clean with water or other approved method. Prevent dirt and debris from entering existing sewer lines in service. Remove dirt and debris from pipe.

3.3 TOLERANCES

- A. Pipe Invert: Plus or minus 0.04 feet. Level or reverse gradients not permitted. Minimum slopes shall be as required by Utah Department of Environmental Quality.
- B. Moisture Content of Bedding: Plus or minus 2 percent of optimum.

3.4 TESTING

1. Bedding Soil Proctor: One per each significant soil type encountered as necessary to provide density testing. Determine maximum laboratory density in accordance with AASHTO T180, Method D for A-1 soils and AASHTO T99, Method D for other soils.
2. Bedding Density: Perform with nuclear gage in accordance with ASTM D2922.
 1. Frequency: One random test per 500 linear feet of trench.
 2. Acceptance: Average daily density is 96 percent or greater. Reject single tests less than 92 percent.
 3. If tests are not acceptable, re-compact and retest.
3. Low Pressure Air Test: Perform in accordance with UNI-B-6.
 1. Perform on each section of main pipe line and service pipe line between manholes.
 2. Perform after sewer line has been backfilled and cleaned.
 3. Cap and brace all wyes, tees, and lateral stubs to withstand test pressures.
 4. Plug pipe in manholes or at ends of pipe.
 5. Use accurate gauge to measure internal gauge pressure in tenths of pounds per square inch. Test pressures are measured as gauge pressure.
 6. Determine required time for test for sewer line based on length and size of pipe shown in Table 6-1.
 7. Before starting air test, determine groundwater level. If groundwater level is below sewer pipe invert, perform test at air pressure indicated in subparagraphs 8, 9, & 10. If groundwater level is above sewer pipe invert, increase air pressure for test. Calculate required air pressure for test as follows:
 - a. Determine average vertical height in feet of groundwater above sewer pipe invert.
 - b. Divide vertical height by 2.31. Result is air pressure correction in pounds per square inch.
 - c. Add air pressure correction to normal starting pressure of 3.5 pounds per square inch to determine air pressure for test.
 - d. Do not exceed 9 pounds per square inch for starting test pressure.
 8. Slowly introduce low pressure air into pipe until internal air pressure reaches 4.0 pounds per square inch.
 9. After constant pressure of 4.0 pounds per square inch is reached, throttle air supply for at least 2 minutes to allow air temperature to equalize.
 10. When temperature has equalized and pressure has stabilized at 4.0 pounds per square inch or any convenient pressure between 4.0 to 3.5 pounds per square inch, start timing with stop watch.
 11. Record drop in pressure for test period.
 12. If pressure drop is 0.5 pound per square inch or less during test period, sewer line passes test.

13. If pressure drop is greater than 0.5 pound per square inch during test period, sewer line fails test. Find source of leakage, repair or replace, and retest. Repeat test until sewer line passes test.

TABLE 6-1 MINIMUM SPECIFIED TIME REQUIRED FOR 0.5 PSIG PRESSURE DROP FOR SIZE AND LENGTH OF PIPE INDICATED FOR Q=0.0015 cf/min/sf							
Pipe Length	Nominal Pipe Size						
	4"	6"	8"	10"	12"	15"	18"
50	1:53	2:50	3:47	4:43	5:40	7:05	8:30
75	1:53	2:50	3:47	4:43	5:40	7:05	8:30
100	1:53	2:50	3:47	4:43	5:40	7:05	8:30
125	1:53	2:50	3:47	4:43	5:40	7:05	8:30
150	1:53	2:50	3:47	4:43	5:40	7:05	9:37
175	1:53	2:50	3:47	4:43	5:40	7:47	11:13
200	1:53	2:50	3:47	4:43	5:42	8:54	12:49
225	1:53	2:50	3:47	4:43	6:25	10:01	14:25
250	1:53	2:50	3:47	4:57	7:07	11:08	16:02
275	1:53	2:50	3:47	5:26	7:50	12:15	17:38
300	1:53	2:50	3:48	5:56	8:33	13:21	19:14
325	1:53	2:50	4:07	6:26	9:15	14:28	20:50
350	1:53	2:50	4:26	6:55	9:58	15:35	22:26
375	1:53	2:50	4:45	7:25	10:41	16:42	24:02
400	1:53	2:51	5:04	7:55	11:24	17:48	25:38
425	1:53	3:01	5:23	8:24	12:06	18:55	27:15
450	1:53	3:12	5:42	8:54	12:49	20:02	28:51
475	1:53	3:23	6:01	9:24	13:32	21:09	30:27
500	1:53	3:34	6:20	9:54	14:15	22:16	32:03
525	1:53	3:44	6:39	10:23	14:57	23:22	33:39
550	1:53	3:55	6:58	10:53	15:40	24:29	35:15
575	1:53	4:06	7:17	11:23	16:23	25:36	36:51
600	1:53	4:16	7:36	11:52	17:05	26:43	38:28

4. Deflection Test:
 1. Test main sewer pipe lines by one of following methods:
 - a. Deflectometer which produces continuous record of pipe deflection.
 - b. Mandrel go/no-go device with diameter set at 95 percent of nominal pipe diameter.
 2. No mechanical pulling devices permitted.
 3. Complete test after backfill has been in place for minimum of 14 days.
 4. If ring deflection is 5 percent or less of pipe diameter, sewer pipe passes test.
 5. If ring deflection is greater than 5 percent of pipe diameter, sewer pipe fails test. Relay or replace pipe and retest after 30 day period. Repeat test until pipe passes test.
5. Closed Circuit TV Inspection:
 1. Ephraim City reserves right to visually inspect interior of sewer pipe mains using television camera following deflection test and prior to one year warranty.
 2. Correct defects found by inspection.
 3. Ephraim City will pay costs for initial TV inspection. Additional TV inspections required because of defects shall be paid by Developer.

3.5 PROTECTION

- A. Protect pipe from damage or displacement.
- B. Prevent mud, silt, gravel and other foreign materials from entering pipe and keep off joint surfaces.
- C. Install plug in pipe end when pipe laying is not in progress.

END OF SECTION

SECTION 7

MANHOLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Precast concrete manholes, frame and cover and accessories.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM A48 - Gray Iron Castings.
 2. ASTM C361 - Reinforced Concrete Low Head Pressure Pipe.
 3. ASTM C443 - Joints for Circular Concrete and Culvert Pipe Using Rubber Gaskets.
 4. ASTM C478 - Precast Reinforced Concrete Manhole Sections.
 5. ASTM C923 - Resilient Connectors Between Reinforced Concrete Manhole Structures and Pipes.
- B. Related Sections:
 1. Section 4 - Trenching.
 2. Section 11 - Cast-in-Place Concrete.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Manhole Sections: Reinforced precast concrete in accordance with ASTM C478.
 1. Precast reinforced concrete base with invert channels and pipe openings monolithic-poured.
 2. Concentric with eccentric cone top section.
 3. Male/female ends.
 4. Watertight joints with pre-lubricated rubber gaskets conforming to ASTM C361 and C443.
 5. Inside Diameter: 4 feet minimum.
- B. Steps: Fiberglass or steel encased in copolymer polypropylene, placed inside manhole with 12 inch vertical spacing.

- C. Manhole Frame and Cover: Conform to ASTM A48, Class 30B Cast Iron.
 - 1. H-20 traffic load bearing.
 - 2. Machined flat bearing surface.
 - 3. Removable lid with word "SEWER" cast on top.
 - 4. Use vented cover unless approved otherwise.
 - 5. D&L Supply Model A-1180 or approved equal.
- D. Rubber Boot Couplers: Conform to ASTM C923 and have stainless steel pipe clamp.
- E. Grade Rings: Reinforced precast concrete in accordance with ASTM C478.
- F. Granular Base: Granular material, well graded with 1/4 inch minimum to 1 inch maximum size aggregate, 8" depth.
- G. Dust Pan: Non-corrosive, durable material.
- H. Grout: Nonshrinkage and high strength.
- I. Concrete Collar: Class AA (AE) reinforced concrete in accordance with Section 11.

PART 3 EXECUTION

3.1 PREPARATION

- A. Trenching shall be in accordance with Section 4.

3.2 INSTALLATION

- A. Place and compact granular base to 96 percent of maximum laboratory density.
- B. Place manholes no further than 400 feet apart, and at every horizontal or vertical bend in the mainline pipes
- C. Place manhole sections plumb, level, and to correct elevation. Install rubber gaskets at manhole joints. Install manhole watertight.
- D. Install pipe in rubber boot coupler and secure with adjustable pipe clamp. Seal joints watertight.
- E. Install grade rings as required. Use no more than 2 grade rings to establish finish grade elevation. Grout grade ring joints.
- F. Set frame and cover flush to match finish grade elevation. When within improved roadway, construct concrete collar at finish grade of manhole frame and cover.
- G. Drop pipe installation must be used for all pipes which tie into the manhole above the flowline of the manhole.

3.3 TOLERANCES

- A. Manhole Invert Elevation: Plus or minus 0.04 feet from required elevation.

END OF SECTION

SECTION 8

DRAINAGE/IRRIGATION

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for pipe culverts, fittings, structures and accessories for drainage or irrigation purposes.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M36 - Metallic (Zinc or Aluminum) Coated Corrugated Steel Culverts and Under drains.
 - 2. AASHTO M145 - The Classification of Soils and Soil-Aggregate Mixtures for Highway Construction Purposes.
 - 3. AASHTO T99 - Moisture-Density Relations of Soils Using a 5.5-lb (2.5 kg) Rammer and a 12-in. (305 mm) Drop.
 - 4. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb (4.54 kg) Rammer and an 18-in. (457 mm) Drop.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. Related Sections:
 - 1. Section 4 - Trenching.
 - 2. Section 11 - Cast-in-Place Concrete.

1.3 DEFINITIONS:

- A. Bedding: Fill placed under, beside, and directly over pipe to 12 inches above top of pipe, prior to subsequent backfill operations.
- B. Soil Classification: As determined in accordance with AASHTO M145.

1.4 SUBMITTALS

- A. Test Results: Submit one copy of concrete, proctor and bedding density test results.

PART 2 PRODUCTS

2.1 PIPE

- A. Corrugated Steel Pipe and Pipe-Arch: AASHTO M36, nominal size indicated on drawings, minimum 16 gage.
- B. Coupling Bands: Galvanized steel, with two neoprene "O" ring gaskets, galvanized steel bolts, watertight.
- C. Fittings: Same material as pipe molded or formed to suit pipe size and end design, in configurations required.
- D. Bedding:
 - 1. Excavated material consists of earth, loam, sandy clay, sand, and gravel which are free from clods of earth, rocks larger than 1.5 inch, frozen material, organic material and debris.
 - 2. Imported bedding consisting of pit-run gravel, crushed rock, or sand with 1.5 inch maximum size.

2.2 STRUCTURES

- A. Concrete: Class AA (AE) in accordance with Section 11 or pre-cast reinforced concrete.
- B. Reinforcing Steel: In accordance with Section 11.
- C. Granular Base: Crushed rock, 1 inch maximum size.
- D. Catch Basin Grate and Frame: Steel construction, bicycle safe, hot dip galvanized after fabrication. D&L Supply Model I-1805 or approved equal.

PART 3 EXECUTION

3.1 PREPARATION

- A. Verify location and elevation of improvements.
- B. Trenching shall be in accordance with Section 4. Hand trim excavation for accurate placement.
- C. Remove large rocks or other hard matter which could damage pipe or structures.

3.2 INSTALLATION

- A. Install pipe and fittings in accordance with manufacturer's instructions. Install pipe starting at downstream end. Secure joints water tight.
- B. Place and compact granular base for structure. Form and place cast-in-place concrete structure or place precast concrete structure.
- C. After structure has sufficient strength, place backfill around structure.
- D. Cut end of pipe culverts flush with inside of structure walls. Coat cut edge with zinc-dust, or zinc-oxide primer conforming to Federal Specification TT-P-641.

3.3 TESTING

- A. Bedding Soil Proctor: One per each significant soil type encountered as necessary to provide density testing. Determine maximum laboratory density in accordance with AASHTO T180, Method D for A-1 soils and AASHTO T99, Method D for other soils.
- B. Bedding Density: Perform with nuclear gage in accordance with ASTM D2922.
 - 1. Frequency: One random test per 500 linear feet of trench.
 - 2. Acceptance: Average daily density is 96 percent or greater. Reject single tests less than 92 percent.
 - 3. If tests are not acceptable, re-compact and retest.
- C. Concrete: In accordance with Section 11.

3.4 PROTECTION

- A. Protect pipe and structures from damage or displacement.

END OF SECTION

SECTION 9

UNTREATED BASE COURSE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Untreated base course.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 1. AASHTO T11 - Amount of Material Finer Than 0.075 mm Sieve in Aggregate.
 2. AASHTO T19 - Unit Weight and Voids in Aggregate.
 3. AASHTO T27 - Sieve Analysis of Fine and Coarse Aggregates.
 4. AASHTO T90 - Determining the Plastic Limit and Plasticity Index of Soils.
 5. AASHTO T96 - Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine.
 6. AASHTO T180 - Moisture-Density Relations of Soils Using a 10-lb. (4.54 kg) Rammer and an 18-in. (457mm) Drop.
- B. American Society for Testing and Materials (ASTM):
 1. ASTM D2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
- C. Related Sections:
 1. Section 13 - Concrete Curb, Gutter and Flatwork.

1.3 DEFINITIONS

- A. Mean of Deviations: Sum of absolute values of deviations from job-mix gradation divided by number of samples.
- B. Lot: One day's production.

1.4 SUBMITTALS

- A. Prior to Production:
 - 1. Identification of Aggregate Source.
 - a. New Source: Submit results of tests required in Article 2.1 of this Section.
 - b. Previously Approved Source: Submit evidence that source has been approved by Utah Department of Transportation.
 - 2. Job-Mix Gradation: Submit gradation indicating single values within band for each sieve size shown on Table 9-1.
- B. Changes to Job-Mix Gradation: Submit in writing prior to start of day's production. Changes are subject to approval. Retroactive changes are allowed only for first day's production.
- C. Test Results: Submit one copy of proctor, density and gradation test results.

1.5 QUALITY ASSURANCE

- A. Obtain materials from same source throughout.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Untreated Base Course: Natural gravel, crushed rock or crushed slag meeting following requirements:
 - 1. Aggregate Passing No. 40 Sieve: AASHTO T90, non-plastic.
 - 2. Wear: AASHTO T96, not exceed 50 percent.
 - 3. Dry-Rodded Unit Weight: AASHTO T19, not less than 75 pounds per cubic foot.
 - 4. Gradation: AASHTO T27 & T11, 3/4 or 1 inch maximum per Table 9-1.

Table 9-1 Gradation Limits		
Sieve Size	Percent Passing of Total Aggregate (Dry Weight)	
	3/4 inch	1 inch
1 inch	-	100
3/4 inch	100	-
½ inch	-	79-91
3/8 inch	78-92	-
No. 4	55-67	49-61
No. 16	28-38	27-35
No. 200	7-11	7-11

PART 3 EXECUTION

3.1 PREPARATION

- A. Correct irregularities in subgrade gradient and elevation by scarifying, reshaping, and recompacting.
- B. Do not place untreated base course on soft, muddy, or frozen surfaces.
- C. Do not place untreated base course until subgrade is accepted.

3.2 AGGREGATE PLACEMENT

- A. Spread untreated base course over prepared subgrade.
- B. Maintain optimum moisture content of untreated base course. If excess water is apparent, aerate to reduce moisture content. If too dry, add water and mix uniformly.
- C. Place aggregate in maximum 6 inch compacted layers.
- D. If untreated base course is placed in successive layers, do not place next layer until previous layer has been tested and accepted.
- E. Level and contour surfaces to require elevations and gradients.
- F. Compact with self-propelled compaction equipment. Use hand-operated compaction equipment in areas inaccessible to self-propelled compaction equipment.

3.3 TOLERANCES

- A. Moisture Content: Plus or minus 2 percent of optimum.
- B. Compacted Thickness: Plus or minus ½ inch. If thickness exceeds tolerance, remove excess material and re-compact. If thickness is less than tolerance, scarify, add material, and recompact.

- C. Surface Smoothness: Plus or minus 3/8 inch measured with 10 foot straight edge or string line or string line.
- D. Gradation: In accordance with Table 9-2.

Table 9-2 TOLERANCE LIMITS FOR GRADATION					
Sieve Size	MEAN OF DEVIATIONS FROM JOB-MIX GRADATION				
	1 Sample	2 Samples	3 Samples	4 Samples	5 Samples
½ inch and larger	0-15	0-12.1	0-10.8	0-10.0	0-9.5
3/8 inch	0-15	0-11.5	0-9.8	0-8.8	0-8.0
No. 4	0-14	0-10.5	0-8.8	0-7.8	0-7.0
No. 16	0-11	0-8.2	0-6.9	0-6.2	0-5.6
No. 200	0-4.5	0-3.4	0-2.9	0-2.5	0-2.3

3.4 TESTING

- A. Proctor: One per job-mix gradation. Determined maximum laboratory density in accordance with AASHTO T180, Method D.
- B. Density: Perform with nuclear gage in accordance with ASTM D2922.
 - 1. Frequency: Minimum of 1 random test for each sub lot of 1,500 square yards.
 - a. Roadway: Take minimum of 1 random test for each sub lot of 1,500 square yards.
 - b. Curb and Gutter and Flatwork: Take minimum of 1 random test for each 500 linear feet.
 - 2. Acceptance: Average density is 96 percent or greater for each lot. Reject sub lot tests less than 92 percent.
 - 3. If tests are not acceptable, recompact, and retest.
- C. Gradation: Perform in accordance with AASHTO T27 and T11.
 - 1. Frequency: Random samples from window or on grade prior to compaction in accordance with Table 9-3.
 - 2. Acceptance: Mean of deviation for each sieve size meets tolerances indicated in Table 9-2 for each lot.
 - 3. If tests indicate material exceeds tolerances, remove and replace untreated base course or blend with additional untreated base course to meet tolerances.

Table 9-3 GRADATION SAMPLING	
Lot (tons)	Minimum No. of Samples
Greater than 2,500	4
1,500 to 2,500	3
Less than 1,500	2

3.5 PROTECTION

- A. Maintain untreated base course until surface course is placed.

END OF SECTION

SECTION 10

ASPHALT CONCRETE PAVEMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for asphalt concrete pavement.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 1. AASHTO M140 - Emulsified Asphalt.
 2. AASHTO M226 - Viscosity Graded Asphalt Cement.
 3. AASHTO M303 - Lime for Asphalt Mixtures.
 4. AASHTO T19 - Unit Weight and Voids in Aggregate.
 5. AASHTO T90 - Determining the Plastic Limit and Plasticity Index of Soils.
 6. AASHTO T96 - Resistance to Abrasion of Small Size Coarse Aggregate by Use of the Los Angeles Machine.
 7. AASHTO T104 - Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.
 8. AASHTO T176 - Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test.
- B. The Asphalt Institute (TAI):
 1. TAI MS-2 - Mix Design Methods for Asphalt Concrete and Other Hot Mix Types.
- C. Utah Department of Transportation Test Procedures (UDOT):
 1. UDOT 8-946 - Extraction of Bitumen from Paving Mixtures Using a Vacuum Extractor.
 2. UDOT 8-947 - Sieve Analysis of Extracted Aggregate.

1.3 DEFINITIONS

- A. Mean of Deviations: Sum of absolute values of deviations from mix design divided by number of samples in lot.
- B. Lot: One day's production.

1.4 SUBMITTALS

- A. Aggregate Source: If not previously UDOT approved, submit test results showing aggregate meets requirements of Article 2.1 paragraph A.3.
- B. Mix Design: Submit at least 10 days before paving begins.
 - 1. Include all test data used to develop mix design.
 - 2. Indicate single value for percentage of aggregate passing each sieve and asphalt cement content.
 - 3. Submit changes in writing prior to production.
- C. Test Results: Submit one copy of density, gradation, and asphalt content test results.

1.5 QUALITY ASSURANCE

- A. Obtain materials from same source throughout.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not place asphalt concrete pavement when ambient air or base surface temperature in shade is less than 50 degrees F.
- B. Do not place asphalt concrete pavement when base has free surface water or is over saturated, or on frost covered ground.
- C. Do not place asphalt concrete pavement during adverse weather conditions such as rain, snow, or fog.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Asphalt Concrete Pavement:
 - 1. Asphalt Cement: PG 58-28 or approved equivalent, in accordance with AASHTO M226, Table 2.
 - 2. Hydrated Lime: AASHTO M303, use minimum 1% of dry weight of aggregate.
 - a. Chemical Limits:
 - 1) Hydrated Alkalinity: Minimum 90 percent by weight CaCO_3 .
 - 2) Hydrated Lime Content: Maximum 7 percent by weight CaO .
 - 3) Free Water Content: Maximum 3 percent by weight.
 - b. Physical Requirements:
 - 1) Residue Retained on No. 30 Sieve: Maximum 2 percent by weight.
 - 2) Residue Retained on No. 200 Sieve: Maximum 12 percent by weight.

3. Aggregate: Natural gravel, crushed rock, or slag with uniform density and quality. Gradation per Table 10-1.
 - a. Course Aggregate: Clean, hard, durable, and sound fragments free from organic matter or other detrimental substances.
 - 1) Retained on No. 4 sieve.
 - 2) All Rounded Particles: Maximum 50 percent by weight.
 - b. Fine Aggregate: Clean, hard grained, and angular.
 - 1) Pass No. 4 sieve.
 - 2) Non-plastic in accordance with AASHTO T90.
 - 3) Vegetable Matter or Other Detrimental Substances: Maximum 2 percent by weight.
 - 4) Dry-Rodded Unit Weight: AASHTO T19, minimum 75 pounds per cubic foot.
 - 5) Wear: AASHTO T96, maximum 40 percent.
 - 6) Weight Loss: AASHTO T104, maximum 16 percent by weight when subjected to five cycles of sodium sulfate.
 - 7) Sand Equivalent: AASHTO T176, minimum 40.

Table 10-1 GRADATION LIMITS FOR MIX DESIGN	
Sieve Size	Percent of Total Aggregate (Dry Weight)
½ inch	100
No. 4	60-80
No. 16	28-42
No. 50	11-23
No. 200	5-9

- B. Tack Coat: AASHTO M140, grade SS-1 emulsified asphalt.

2.2 EQUIPMENT

- A. Asphalt Paver: Use self-propelled paver with screed unit.
- B. Rollers: Use rubber tire and steel drum self-propelled rollers in sufficient number to keep up with paver. Use release agent other than diesel.

2.3 MIXES

- A. Develop mix design in accordance with TAI MS-2, Marshall Method.
 1. Determine optimum asphalt content by test data curves.
 2. Use test samples containing 0.5 percent increments of asphalt content.
 3. Include minimum of 2 test samples above and below optimum asphalt content.

- B. Mix Design Requirements:
 - 1. Marshall Stability: Minimum 1,200 pounds.
 - 2. Flow (0.01 inch): 10 to 18.
 - 3. Air Voids: 3 to 5 percent.
 - 4. Voids in Mineral Aggregate: Minimum 14 percent.
 - 5. Index of Retained Strength: Minimum 75 percent.
 - 6. Dry Stability: Minimum 200 pounds per square inch.
- C. If material source changes, develop new mix design prior to using new materials.
- D. Mix materials at central mixing plant. Use shortest mixing time needed to uniformly coat aggregate. Do not use material improperly mixed.
- E. Adjust production at mixing plant and delivery to maintain steady paving speed.

PART 3 EXECUTION

3.1 PREPARATION

- A. Do not place asphalt concrete pavement until granular borrow and base course has been placed, compacted, and accepted by the city or city's representative.
- B. Locate and reference utility covers prior to paving operations.
- C. Remove dirt, sand, leaves, and other objectionable materials from prepared surfaces.
- D. Prime coat is not required, but may be used.

3.2 PREPARATION - TACK COAT

- A. Clean contact surface of materials that prevent tack coat from bonding.
- B. Apply tack coat to contact surfaces of curbs, gutters, cross gutters, existing pavement, previously placed pavement and other surfaces. Apply tack coat to all pavement joints. Apply tack coat with pressure distributor at uniform rate of 0.15 gallons per square yard.
- C. Cover surfaces of manholes, valve boxes, and other utility boxes to prevent bond with asphalt pavement. Do not tack coat these surfaces.
- D. Apply tack coat same day pavement is placed.

3.3 PLACING ASPHALT PAVEMENT

- A. Place asphalt pavement at temperature between 250 and 325 degrees F with self-propelled laydown machine. Adjust paver speed to match plant production and delivery for continuous paving operation.

- B. Pave full-width where possible. If more than one pass is required, leave straight, vertical edge adjacent to next lane to be paved. Compact each pass and apply tack coat to longitudinal edge before placing adjacent pass.
- C. Compact pavement by rolling to 96 percent of Marshall density. Do not displace or extrude pavement from position. Use hand-operated compaction equipment in areas inaccessible to self-propelled compaction equipment.
- D. Perform rolling with consecutive passes to achieve even and smooth finish without roller marks. Do not allow rollers to pass over unprotected end of freshly placed pavement. Bevel end of pavement subjected to traffic.
- E. Where pavement is placed in more than one layer, offset joints:
 1. Longitudinal Joints: Offset 6 to 12 inches.
 2. Transverse Joints: Offset minimum 6 feet.
- F. Hand rake only when necessary around obstacles.

3.4 TOLERANCES

- A. Smoothness: Maximum variation of 1/4 inch measured longitudinally, transversely, and at construction joints with 10 foot straight edge.
 1. If more than one layer is placed, applies only to top layer.
 2. Correct depressions or humps exceeding tolerances.
- B. Compacted Thickness: Not more than 1/2 inch greater nor 3/8 inch less than thickness indicated on Drawings.
 1. Engineer may allow excess thickness to remain in place without payment or may require removal. If removal is required, remove and replace entire depth of asphalt concrete pavement.
 2. If thickness is deficient, add minimum thickness of 1 inch asphalt concrete pavement.
- C. Gradation: In accordance with Table 10-2.
- D. Asphalt Content: In accordance with Table 10-3.

3.5 TESTING

- A. Gradation and Asphalt Content: Perform tests in accordance with UDOT 8-946 and 8-947.
 1. Frequency: Random samples immediately behind paver before compaction in accordance with Table 10-2.
 2. Acceptance: Mean of deviation for each sieve size and asphalt content meets tolerances indicated in Table 10-3 and 10-4 for each lot.
 3. If tests indicate materials exceed tolerances, remove and replace asphalt concrete pavement.

Table 10-2 GRADATION & ASPHALT CONTENT SAMPLING	
Lot (tons)	Minimum No. of Samples
Greater than 2,500	4
1,500 to 2,500	3
Less than 1,500	2

Table 10-3 TOLERANCE LIMITS FOR GRADATION					
Sieve Size	Mean of Deviations from Mix Design				
	1 Sample	2 Samples	3 Samples	4 Samples	5 Samples
½ Inch and Larger	0-10	0-7.3	0-6.3	0-5.6	0-5.2
No. 4	0-9	0-6.7	0-5.7	0-5.2	0-4.8
No. 16	0-7	0-5.2	0-4.6	0-4.2	0-3.9
No. 50	0-6	0-4.3	0-3.8	0-3.4	0-3.2
No. 200	0-3	0-2.4	0-2.0	0-1.8	0-1.7

Table 10-4 TOLERANCE LIMITS FOR ASPHALT CONTENT				
Mean of Deviations from Mix Design				
1 Sample	2 Samples	3 Samples	4 Samples	5 Samples
0-0.7	0-0.54	0-0.46	0-0.41	0-0.38

- B. Density: Perform with nuclear gage or take core samples.
1. Frequency: Take minimum of 1 random test for each sub lot of 1,500 square yards.
 2. Acceptance: Average density is 96 percent or greater for each lot. Reject sub lot tests less than 92 percent.
 3. If tests are not acceptable, re-compact and retest. If necessary, remove and replace asphalt concrete pavement.

3.6 PROTECTION

- A. Protect curb and gutter, structures, and other objects from being spattered or marred by tack coat or prime coat. Do not damage curb and gutter with rollers.
- B. Immediately after placement, protect pavement from traffic until surface temperature is less than 140 degrees F. Prevent traffic from crossing vertical edge of pavement.

END OF SECTION

SECTION 11

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for formwork, reinforcing steel and accessories for cast-in-place concrete.
- B. Requirements for mixing, testing, concrete placement and curing for cast-in-place concrete.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M6 - Fine Aggregate for Portland Cement Concrete.
 - 2. AASHTO M80 - Coarse Aggregate for Portland Cement Concrete.
 - 3. AASHTO M85 - Portland Cement.
 - 4. AASHTO M154 - Air-Entraining Admixtures for Concrete.
 - 5. AASHTO M157 - Ready-Mixed Concrete.
 - 6. AASHTO M194 - Chemical Admixtures for Concrete.
 - 7. AASHTO T22 - Compressive Strength of Cylindrical Concrete Specimens.
 - 8. AASHTO T23 - Making and Curing Concrete Test Specimens in the Field.
 - 9. AASHTO T119 - Slump of Portland Cement Concrete.
 - 10. AASHTO T152 - Air Content of Freshly Mixed Concrete by the Pressure Method.
- B. American Concrete Institute (ACI):
 - 1. ACI 305R - Hot Weather Concreting.
 - 2. ACI 306R - Cold Weather Concreting.
 - 3. ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. American Society for Testing and Materials (ASTM):
 - 1. ASTM A82- Cold Drawn Steel Wire for Concrete Reinforcement.
 - 2. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
 - 3. ASTM C309 - Liquid Membrane-Forming Compounds for Curing Concrete.
- D. Related Sections:
 - 1. Section 5 - Culinary Water.
 - 2. Section 7 - Manholes.
 - 3. Section 8 - Drainage/Irrigation.

1.3 SUBMITTALS

- A. Mix Design: Submit mix design and information based on batch test results to verify mix design strength at least 5 days prior to placement of concrete.
- B. Delivery Ticket: When requested by Ephraim City, furnish delivery ticket for each load of concrete delivered to site with information as follows:
 - 1. Name of batch plant.
 - 2. Name of Contractor and project.
 - 3. Class of concrete and type of cement.
 - 4. Time and date of batching.
 - 5. Cubic yards of concrete.
 - 6. Weights of cement and each size of aggregate.
 - 7. Amount of water added at plant.
 - 8. Amount of any additional water added.
 - 9. Amount of admixtures.
- C. Test Results: Submit one copy of air, slump, and strength test results.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 318.
- B. Procure cement and aggregate from same source for all work.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store cement protected from moisture.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Conform to ACI 305R when concreting during hot weather.
- B. Conform to ACI 306R when concreting during cold weather.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: AASHTO M85, Type II, low alkali, Portland type.

B. Coarse Aggregate:

1. AASHTO M80 as modified herein.
2. Use gradation per Table 11-1.
3. Do not allow material passing No. 200 sieve to exceed 1.75 percent by weight of combined coarse and fine aggregate.
4. Do not exceed percentages of deleterious substances per Table 11-2.

TABLE 11-1 Gradation - Coarse Aggregate								
Course Aggregate	Percentage Passing (by weight)							
Size	2 ½"	2"	1 ½"	1"	¾"	½"	⅜"	No. 4
2" to No. 4	100	95-100		35-70		10-30		0-5
1 ½" to No. 4		100	95-100		35-70		10-30	0-5
1" to No. 4			100	95-100		25-60		0-10
¾" to No. 4				100	90-100		20-55	0-10

TABLE 11-2 Deleterious Substances - Coarse Aggregate	
Substance	Percent (by weight)
Soft fragments	2.0
Coal and lignite	0.3
Clay lumps	0.3
Other deleterious substances	2.0

C. Fine Aggregate:

1. AASHTO M6 as modified herein.
2. Use gradation per Table 11-3.
3. Do not allow material passing No. 200 sieve to exceed 1.75 percent by weight of combined coarse and fine aggregate.
4. Do not exceed percentages of deleterious substances per Table 11-4.

TABLE 11-3 Gradation - Fine Aggregate	
Sieve Size	Percent Passing (by weight)
¾"	100
No. 4	95-100
No. 16	45-80
No. 50	10-30
No. 100	2-10

Table 11-4 Deleterious Substances - Fine Aggregate	
Substances	Percent (by weight)
Clay lumps	0.5
Coal and lignite	0.3
Other Deleterious Substances	2.0

D. Water: Potable.

2.2 ADMIXTURES

A. Air Entrainment: AASHTO M154 including Section 5.

B. Water Reducers: AASHTO M194, Type A and Type D. Obtain approval prior to use.

C. Fly Ash: Obtain approval prior to use.

D. Calcium Chloride: Do not use.

2.3 ACCESSORIES

A. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

B. Curing Compound: ASTM C309, contain pigment or dyes.

2.4 FORM MATERIALS

A. Forms: Be suitable material, type, size, shape, quality, and strength to ensure construction as designed. Earth forms are not permitted.

B. Form Release Agent: Colorless mineral oil which will not stain concrete, or absorb moisture.

2.5 REINFORCEMENT

A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars; unfinished or epoxy coated. Bars shall be free of rust, scales, flakes, or other bond-reducing coatings.

B. Stirrup Steel: ASTM A82, unfinished.

C. Tie Wire: Minimum 16 gage annealed type.

D. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.

2.6 CONCRETE MIX

- A. Determine mix design with required proportions of cement, aggregate, admixtures, and water.
- B. Provide concrete per Table 11-5:

TABLE 11-5 Concrete Class and Requirements							
CLASS	Coarse Aggregate Size (inches)	Maximum Water/Cement (Gal/Sack)	Minimum Cement Content (Sacks/C. Y.)	Slump (inches)	Air Content (Percent)	Mix Design Compress Strength (PSI)	28 Day Minimum Compress Strength (PSI)
AA(AE)	2" to No. 4	5.0	6.0	1-3.5	5.0-7.5	5210	3650
	1 ½" to No. 4	5.0	6.0	1-3.5	5.0-7.5	5210	3650
	1" to No. 4	5.0	6.5	1-3.5	5.0-7.5	5210	3650
	¾" to No. 4	5.0	6.5	1-3.5	5.0-7.5	5210	3650
A or A(AE)	1 ½" to No. 4	6.0	5.0	1-3.5	4.5-7.5	3910	3000
	1" to No. 4	6.0	5.0	1-3.5	4.5-7.5	3910	3000
	¾" to No. 4	5.5	5.25	1-3.5	4.5-7.5	3910	3000
B or B(AE)		7.0	4.0	2-5	3.0-6.0	3260	2500
C or C(AE)		8.0	4.0	2-5	3.0-6.0	2610	2000

(AE) = Air-Entrainment

- C. Maximum size of coarse aggregate:
 1. Not larger than 1/5 of narrowest dimension between sides of forms.
 2. Not larger than 1/3 depth of slabs.
 3. Not larger than 3/4 of minimum clear distance between reinforcing bars or between bars and forms, whichever is least.
- D. Mix and deliver concrete in accordance with AASHTO M157.

PART 3 EXECUTION

3.1 ERECTION OF FORMWORK

- A. Verify lines, levels and centers before proceeding with formwork.
- B. Erect, brace and tie forms. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- C. Arrange and assemble formwork to permit dismantling and stripping. Align joints and make watertight. Keep form joints to minimum.
- D. Provide formed openings where required. Provide temporary openings in formwork where required to facilitate cleaning and inspection.
- E. Apply form release agent on formwork in accordance with manufacturer's recommendations. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

3.2 PLACEMENT OF REINFORCEMENT AND EMBEDDED PARTS

- A. Verify requirements for concrete cover over reinforcement.
- B. Accurately place anchors, seats, plates, reinforcement and other items to be cast into concrete. Securely positioned to not allow movement or displacement.

3.3 PREPARATION

- A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
- B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.
- C. Keep concrete subgrade firm and free from water. If concrete subgrade is dry, dampen with water prior to placing concrete.
- D. Keep materials concrete is to come in contact with free from frost.

3.4 PLACING CONCRETE

- A. Place concrete in accordance with ACI 318.
- B. Notify Ephraim City minimum 24 hours prior to placing concrete.
- C. Ensure reinforcement, inserts and embedded parts are not disturbed during concrete placement.
- D. Place concrete continuously between predetermined expansion, control, and construction joints.
- E. Do not interrupt successive placement; do not permit cold joints to occur.
- F. After concrete has been conveyed from mixer, do not add water. Adding water to placed concrete will be cause for rejection.

3.5 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Spray exposed concrete surfaces with concrete curing compound after free water has disappeared. Apply at rate recommended by manufacturer.

3.6 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surface scheduled for exposure to view.
- C. Clean forms to remove foreign matter. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

3.7 TESTING

- A. Take minimum of 1 random test for each 50 cubic yards or fraction thereof placed per day:
 - 1. Slump Test: AASHTO T119.
 - 2. Air Test: AASHTO T152.
 - 3. Strength Test: AASHTO T22 and T23, cast 3 cylinders for each test. Test cylinders after 28 days. Strength will be average of 3 cylinders.
- B. Tests shall meet requirements of Table 11-5.
- C. If slump test does not meet specification, repeat test on same load. Concrete will be accepted if second test meets specification. Concrete will be rejected and removed from site if second test does not meet specification.
- D. If air test does not meet specification, repeat test on same load. Concrete will be accepted if second test meets specification. Concrete will be rejected and removed from site if second test does not meet specification.
- E. If strength test does not meet specification, Ephraim City may reject concrete and require removal.

3.8 PATCHING

- A. Allow inspection of concrete surfaces immediately upon removal of forms.
- B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Ephraim City upon discovery. Patch imperfections.

3.9 DEFECTIVE CONCRETE

- A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- B. Repair or replace defective concrete.

END OF SECTION

SECTION 12

FLOWABLE FILL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Flowable fill for bedding in utility trenches.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials: (AASHTO):
 - 1. AASHTO M85 - Portland Cement.
 - 2. AASHTO T27 - Sieve Analysis of Fine and Coarse Aggregates.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM C618 - Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
- C. Related Sections:
 - 1. Section 4 - Trenching.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cement: AASHTO M85, Portland Cement, Type I or II.
- B. Fly Ash: ASTM C618, Class F, except maximum 3 percent loss on ignition.
- C. Fine Aggregate:
 - 1. Use natural sand.
 - 2. Gradation: AASHTO T27, in accordance with Table 12-1.

Table 12-1 FINE AGGREGATE GRADATION	
Sieve Size	Percent Passing
No. 3/4	100
No. 100	0-10

2.2 MIXES

- A. Mix Design:
 - 1. 28 Day Compressive Strength: 50 to 150 psi.
 - 2. Portland Cement: Minimum 50 pounds per cubic yard.
 - 3. Fly Ash: Minimum 300 pounds per cubic yard.
 - 4. Slump: 6-10 inches.

PART 3 EXECUTION

3.1 PLACEMENT

- A. Use flowable fill for backfill in utility trenches when trench is within existing roadway.
- B. Place flowable fill minimum of 8 inches on each side of utility.

3.2 PROTECTION

- A. Do not damage or displace utility during placement of flowable fill.
- B. Do not permit vehicular traffic for minimum of 24 hours after placement.

END OF SECTION

SECTION 13

CONCRETE CURB, GUTTER, AND FLATWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for concrete curb and gutter, cross gutter, sidewalk, curb ramp, and driveway.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO M213 - Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
- B. Related Sections:
 - 1. Section 3 - Earthwork.
 - 2. Section 9 - Untreated Base Course.
 - 3. Section 11 - Cast-in-Place Concrete.

1.3 DEFINITIONS

- A. Concrete Flatwork: Includes sidewalks, driveways, and curb ramps.

1.4 ENVIRONMENTAL REQUIREMENTS

- A. Do not place concrete when base surface temperature is less than 40 degrees F, base has free surface water, or base is saturated.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Concrete: Class AA (AE) in accordance with Section 11.
- B. Curing Compound: In accordance with Section 11.
- C. Reinforcing Steel: In accordance with Section 11.
- D. Expansion Joint Filler: AASHTO M213, preformed joint filler.

- E. Base:
 - 1. Curb and Gutter and Cross Gutter: Untreated base course in accordance with Section 9.
 - 2. Concrete Flatwork: Pea gravel with 3/8 inch maximum gradation or untreated base course in accordance with Section 9.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare subgrade in accordance with Section 3.
- B. Place and compact base material. For untreated base course, compact in accordance with Section 9. For pea gravel, proof roll with compaction equipment.
- C. Verify gradients and elevations of base are correct.

3.2 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.
- D. Slip form curb and gutter machine will be accepted.
- E. Place reinforcing steel at required locations.

3.3 PLACING CONCRETE

- A. Notify Ephraim City minimum 24 hours prior to placing concrete.
- B. Moisten base to minimize absorption of water from fresh concrete.
- C. Place concrete continuously between predetermined construction joints in accordance with Section 11.
- D. Slope concrete uniformly to drain without bird baths.
- E. Spray exposed concrete with curing compound in accordance with Section 11.

3.4 JOINTS

- A. Curb and Gutter and Cross Gutter:
 - 1. Control Joints: Score or saw cut at 10 feet on center.
 - 2. Expansion Joints: Place premolded joint filler at 50 feet on center and at beginning and ending of curb returns at intersections. When concrete is placed with slip form curb and gutter machine, place at beginning and end of each continuous run.

- B. Flatwork:
 - 1. Control Joints: Score or saw cut at 5 feet on center.
 - 2. Expansion Joints: Place premolded joint filler at 50 feet on center and at beginning and ending of curb returns at intersections.

- C. When curb and gutter and sidewalk are back to back, align joints.

3.5 FINISHING

- A. Round edges.

- B. Remove marks or irregularities from finish surface.

- C. Provide light broom finish.
 - 1. Flatwork: Finish transverse to traffic.
 - 2. Curb and Gutter and Cross Gutter: Finish parallel to flow line.

3.6 BACKFILLING

- A. After concrete has cured sufficiently to prevent damage, place and compact backfill.

3.7 TOLERANCES

- A. Maximum Variation of Surface Smoothness: 1/4 inch in 10 feet.

3.8 TESTING

- A. Subgrade: In accordance with Section 3.

- B. Untreated Base Course: In accordance with Section 9.

- C. Concrete: In accordance with Section 11.

3.9 PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessive hot or cold temperatures, mechanical injury and defacing.
- B. Do not permit vehicular traffic over or operate compaction equipment near concrete for at least 7 days after placement.

END OF SECTION

SECTION 14

STREET MONUMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for street monuments.

1.2 REFERENCES

- A. Related Sections:
 - 1. Section 11 - Cast-in-Place Concrete.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Concrete: Class AA (AE) in accordance with Section 11.
- B. Monument Post: Bass, D&L Supply Model K-9085 or approved equal.
- C. Monument Cover and Frame: Cast iron, D&L Supply Model K-6313 or approved equal.
- D. Rock: 1 inch maximum size material.

PART 3 EXECUTION

3.1 PREPARATION

- A. Measure location of street monument from reference points.
- B. Construct street monument after pavement has been placed to finish grade.

3.2 CONSTRUCTION

- A. Remove asphalt concrete pavement to 24 inches diameter around street monument location.

- B. Excavate as necessary to install street monument.
- C. Install monument post in concrete and mark location of point.
- D. Backfill with rock as needed. Set monument cover and frame centered over monument post and flush with pavement surface.
- E. Place and consolidate concrete. Match pavement surface and monument elevation.

3.3 TOLERANCES

- A. Cover Elevation: Plus or minus 1/8 inch of finish grade.

3.4 PROTECTION

- A. Protect concrete from damage until sufficient strength is obtained to support traffic loads.

END OF SECTION

SECTION 15

STREET AND TRAFFIC SIGNS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for street and traffic signs.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 1. ASTM A570 - Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.
 2. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

1.3 DEFINITIONS

- A. Substrate: Base material upon which background sheeting is attached. Substrate is aluminum as indicated.
- B. Sheeting: Material comprising background, legend, border, and symbols. Sheeting is reflective or non-reflective as indicated.
- C. Panel: Assembly consisting of substrate and attached sheeting. Several panels may be necessary to complete one sign.
 1. Type A-1 - Non-reflective legend, symbols, and borders.
 2. Type A-2 - Reflective legend, symbols, and borders.
- D. Sign: Complete assembly comprised of post, frame, and panel.

PART 2 PRODUCTS

2.1 SIGN POST

- A. Steel Post: ASTM A570, Grade 50, 2 inch by 2 inch square tube, 14 gauge, with pre-cut holes.
 - 1. Finish: ASTM A653, G90, galvanized followed by conversion coating and clear organic polymer top coat.
- B. Anchor Post: One size larger than sign post, 12 gauge, 30 inch minimum length.

2.2 SUBSTATE

- A. Aluminum: 0.08 inch thick in accordance with ASTM B209 Alloy 5052-H38.

2.3 SHEETING

- A. Reflective Sheeting: Encapsulated lens sheeting in accordance with Standard Specifications for Construction of Road and Bridges on Federal Highway Projects FP-85, Type III A.
- B. Non-reflective Sheeting: In accordance with Military Specification MIL-M 43719B Type I, Class 1.

2.4 ACCESSORIES

- A. Fasteners:
 - 1. Panel to Post: Drive rivet with washer.
 - 2. Post to Anchor: Cad-plated corner bolt.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Securely fasten panel to post.
- B. Drive anchor post into ground. Attach sign post to anchor post. Install in accordance with manufacturer's recommendations.
- C. Install sign at proper elevation and orientation.

3.2 PROTECTION

- A. Protect sign from damage. If damaged, replace sign.

END OF SECTION

SECTION 16

ELECTRICAL

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Requirements for construction of power systems.
- B. Requirements for streetlights and yard lights.

1.2 REFERENCES

- A. American Association of State Highway and Transportation Officials (AASHTO):
 - 1. AASHTO T90 - Determining the Plastic Limit and Plasticity Index of Soils.
- B. National Electric Code (NEC).
- C. Related Sections:
 - 1. Section 4 - Trenching.
 - 2. Section 11 - Cast-in-Place Concrete.
- D. Underwriters Laboratories, Inc. (UL).

1.3 ELECTRICAL SERVICE REQUIREMENTS

- A. Electric Service Agreement: For electrical service in Ephraim City, complete and sign Ephraim City's standard electric service agreement. Provide required information including amount of load, voltage, phase and purpose service will be used. In absence of signed agreement, acceptance of electric service will be deemed as constituting acceptance of Ephraim City Electrical Department regulations. Large industrial and commercial customers will be required to meet special requirements established by Ephraim City.
- B. Any proposed change in existing meter, service locations, or conditions must be approved by Ephraim City Electrical Department, or service may be disconnected.

1.4 CUSTOMER SERVICE FACILITIES REQUIREMENTS

- A. Meters will not be permitted in areas as follows:
 - 1. Locations not readily accessible.
 - 2. Locations hazardous to Ephraim City personnel.
 - 3. Surfaces subject to excessive vibration.
 - 4. Elevated or depressed areas not having access by ramp or clear stairway of normal tread and use conforming to building code requirements.
 - 5. Substation areas or transformer vaults.
 - 6. Common areas with dog.
- B. Provide approved meter socket having proper terminal arrangement and capacity to adequately handle service requirements.
- C. Extend building wiring from meter socket to service attachment.
- D. Provide adequate and substantial means for Ephraim City Electrical Department to attach appropriate service line equipment to building.
- E. For service attachments, provide minimum clearance of 10 feet above ground level or above other areas where people could come in contact with electrical lines.
- F. Provide ample space around meter attachment to permit unobstructed area for meter installation and maintenance.
- G. Provide 3 inch minimum space between each meter socket and between meter socket and other equipment.
- H. Ephraim City will furnish meter and metering equipment. Developer shall furnish all equipment on load side of building service attachment.
- I. Provide adequate and proper protective equipment to protect against over load, over or under voltage or phase failure. Ephraim City takes reasonable precaution to prevent such conditions, but does not guarantee such conditions will not occur.
- J. Provide switch or other approved disconnecting device. Install disconnecting device on load side of meter to control energy registered by meter.

1.5 URD CABLE REQUIREMENTS

A. Size of cable for residential distribution systems shall be in accordance with Table 16-1.

Table 16-1 URD Cable Size	
Load Per Cable	Neutral Wire Size
Less than 300 KVA	# 2
300 KVA to 600 KVA	#1/0
Greater than 600 KVA	#4/0*

*Note: If connected loads exceed 600 KVA per cable, use backbone-feeder system. Divide connected load by either #2 or #1/0 feeders. Tap feeders off backbone in 200 ampere rated fused device. Do not use unfused taps off backbone system.

- B. When connected load exceeds 115 KVA, loop feeder circuits for residential areas. For each #2 cable, loads shall not exceed 300 connected KVA per leg or 600 KVA per loop. For each #1/0 cable, loads shall not exceed 600 connected KVA per leg or 1200 connected KVA per loop.
- C. When projects are built in phases, establish loop feeds as load limits are met. In areas where subsequent phases might be delayed, close loop with temporary tie and abandon temporary tie as subsequent phases are developed.
- D. For fuse coordination and other special problems encountered, contact Ephraim City.

1.6 STREETLIGHT REQUIREMENTS

- A. Streetlights shall be installed by Ephraim City in all new subdivisions and projects at Developer’s expense. Pay total cost of streetlights prior to installation.
- B. Ephraim City will install streetlights in existing subdivisions or at specific projects at appropriate fee.
- C. Existing subdivisions with non-standard streetlights may continue to install non-standard streetlights if luminaries are high pressure sodium lamps and approval is given by Ephraim City. Non-standard streetlights will require approved contract with Ephraim City and homeowner’s association or similar party. Contract will require streetlights to be maintained by homeowner’s association or similar party.

1.7 YARD LIGHT REQUIREMENTS

- A. Where existing power and pole are available, yard light will be installed by Ephraim City on existing pole for appropriate fee determined by Ephraim City.
- B. Where existing power and pole are not available, customer will be required to pay actual cost of installing yard light.
- C. Ephraim City will be responsible to repair or replace yard light and customer will be responsible to notify Ephraim City when yard light is not functioning properly. Monthly maintenance charges will be subject to adjustment by mutual written agreement between Ephraim City and customer.

1.8 REGULATORY REQUIREMENTS

- A. All materials, equipment, and workmanship shall conform to requirements of current edition of National Electrical Code. Where conflicts occur, these Construction Standards and local regulations shall govern.
- B. Products: Listed and classified by Underwriters Laboratories, Inc.

PART 2 PRODUCTS

2.1 COMPONENTS

- A. Streetlight Pole:
 - 1. Round aluminum or galvanized steel with single arm. Square poles and arms when approved by Ephraim City.
 - 2. Designed to withstand 100 mile per hour winds.
 - 3. Have access hole at or near base for access to wiring.
 - 4. Arms shall be 2.75" outside diameter (2 inch pipe) and have luminaire mount.
 - 5. Meet requirements of Table 16-2

Table 16-2 Streetlight Standards			
Asphalt Width (feet)	Mounting Height (feet)	Pole Spacing (feet)	Lamp Wattage (watts)
Under 45	25	200	100
Over 45	30	156	250

- B. Streetlight Luminaries: 120 volt, high pressure sodium lamps with photo control, Crouse-Hinds OVM Swing-Down Roadway Lighting or approved equal. For more aesthetic look, Crouse-Hinds RCL successor cutoff luminaire or approved equal may be used where asphalt width is 35 feet.
- C. Vaults: Approved enclosure or room above or below ground with installed equipment. Include cable or duct entrance, draw bolts, ground rods, vents and related hardware. Train and rack all cables for clear working space.
- D. Manholes: Approved enclosure below ground with installed equipment. Include cable or duct entrance, draw bolts, ground rods, vents and related hardware. Train and rack all cables for clear working space.
- E. Pull or Splice Boxes: Approved precast boxes for electrical below ground use with no equipment, except cable and splices. Do not install facilities for operating cables, such as elbows.
- F. Transformer and Equipment Pads: Concrete unless otherwise approved by Ephraim City.
- G. Concrete: In accordance with Section 11.
- H. Sand Bedding: Well graded granular material with rounded to sub-rounded particles.
 - 1. Gradation: In accordance with Table 16-3.
 - 2. No open-graded material such as pea gravel.
 - 3. Non-plastic in accordance with AASHTO T90.

Table 16-3 Gradation for Sand Bedding	
Sieve Size	Percent of Total Aggregate (Dry Weight)
3/8 inch	100
No. 200	0-20

PART 3 EXECUTION

3.1 PREPARATION

- A. When power system is installed along back lot lines, do not begin until rough grading has been completed to establish permanent ground elevation.
- B. When power system is installed along front lot lines, do not begin until water, sewer, curb and gutter, and street light footings are completed.

3.2 CONSTRUCTION

- A. Trenching shall be in accordance with Section 4.
- B. Where soil conditions require bedding material, use sand bedding above and below direct buried cable or conduit. Place sand bedding minimum depth of 4 inches below and 8 inches above cable or conduit. Place and compact sand bedding in two lifts.
- C. Install wiring with correct color coding standards and tagging.

3.3 ELECTRICAL CONNECTION

- A. Only authorized employees of Ephraim City's Electrical Department will be permitted to connect or disconnect electrical service to or from Ephraim City electric lines.
- B. Ephraim City's Electrical Department will seal all meters and enclosures for meters, metering equipment and service entrance equipment on line side of meter. Do not break seal. Do not tamper or interfere in any with meter or connections placed by Ephraim City.

3.4 INSPECTION

- A. No work shall be embedded in concrete, backfilled, or otherwise covered or concealed until inspected by Ephraim City Electrical Department.

END OF SECTION

STANDARD DRAWINGS

DRAWING NO.	TITLE
R1	TYPICAL STREET SECTION
R2	TYPE B1 CURB & GUTTER
R3	TYPE B2 CURB & GUTTER
R4	CURB & GUTTER TAPERED END DETAIL
R5	CONCRETE CROSS CUTTER
R6	CONCRETE SIDEWALK
R7	TYPICAL C&G DRIVE DEPRESSION & TRANSITION DETAIL
R8	CURB RAMP DETAIL
R9	TYPICAL CONCRETE JOINTS
R10	PAVEMENT EDGE DETAIL & TYPICAL EXPANSION JOINT AROUND OBJECTS
R11	CATCH BASIN
R12	JUNCTION BOX
R13	UTILITY TRENCH DETAIL
R14	UTILITY TRENCH WITH FLOWABLE FILL
R15	ROADWAY REPAIR DETAIL
R16	STREET MONUMENT DETAIL
R17	STREET INTERSECTION & UTILITY LOCATION DETAIL
R18	SIGN & POST DETAIL
R19	RECOMMENDED TURNAROUNDS
S1	SEWER MANHOLE DETAIL
S2	DROP SEWER MANHOLE DETAIL
S3	MANHOLE CONCRETE COLLAR
S4	SEWER SERVICE CONNECTION DETAIL
S5	SEWER CLEANOUT DETAIL
W1	FIRE HYDRANT DETAIL
W2	GATE VALVE DETAIL
W3	METER BOX DETAIL
W4	WATER SERVICE CONNECTION DETAIL
W5	THRUST BLOCK CONDITIONS
W6	THRUST BLOCK BEARING AREA AND NOTES
W7	TYPICAL RESTRAINED JOINTS
