CANYON ROAD RECONSTRUCTION; US-89 TO SR-92

JANUARY 2018

Marty Beaumont
Pleasant Grove City Engineer

Approved by Utah County

Cedar Hills Public Works Director

Utah County Public Works Director

American Fork Public Works Director

Utah County
HEART of UTAH

UTAH COUNTY PUBLIC WORKS
ENGINEERING DIVISION
2855 South State Street
Provo, Utah 84606
851-8600

ITB 2018-8

INVITATION TO BID
For
CANYON ROAD RECONSTRUCTION;
US-89 TO SR-92

CONTRACTOR PRE-BID MEETING:	Monday, February 5, 2018 at 11:00 AM Utah County Public Works 2855 S State St, Provo, UT 84606
CLOSING DATE FOR RECEIPT OF PROPOSALS:	Wednesday, February 14, 2018
BIDS MUST BE SUBMITTED BY:	3:00 PM (Mountain Time)
PLACE:	Office of the Utah County Purchasing Agent 100 East Center Street Room 3600 Provo, Utah 84606
SEND EMAIL RESPONSE TO:	Robert Baxter, Utah County Purchasing Manager robertb@utahcounty.gov

NOTE: The Contractor is responsible for reading the contents of this bid, including but not limited to, the Scope of Work, General Requirements, Specifications, Drawings and Agreement. He is also responsible to visit the work sites before presenting his bid.

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SCOPE OF WORK

Intent of Agreement

The intent of the Agreement is to provide for the construction and completion in every detail of "Canyon Road Reconstruction; US 89 to SR-92”, as described. The Contractor shall furnish all labor, materials, equipment, tools, transportation and supplies required to complete the work in accordance with the Specifications, Drawings, General Requirements, and terms of this Agreement.

Alteration of Plans or Character of Work

The County Commission, after recommendation by the County Engineer, reserves the right to make at any time during the progress of the work, such increases or decreases in quantities and such alterations in the details of construction, and the elimination of one or more items as may be found necessary or desirable. Such alterations shall not be considered as a waiver of nor release of the surety. The Contractor agrees to accept the work as altered the same as if it had been a part of the original Agreement. The Contractor shall proceed with the work alterations when ordered in writing. **Financial increases to this Agreement must be approved in writing by the County·Commission before additional work is authorized and constructed.**

Authority of the County Commission and the County Engineer

The County Commission and the County Engineer will decide all questions which may arise as to the quality, quantity and acceptability of materials furnished and work performed and as to the rate of progress of work. They/He will also decide all questions which may arise as to the acceptable fulfillment of the Agreement on the part of the Contractor.

The County Commission or the County Engineer will have the authority by written order to suspend work wholly or in part due to the failure of the Contractor to correct conditions unsafe for the workmen or general public; for failure to carry out provisions of the Agreement; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather, for conditions considered unsuitable for the progress of the work, or for any other condition or reason deemed to be in the public interest. Written orders shall state the reason for suspension.

Supervision of Work

The County Commission and the County Engineer shall have full supervisory powers in determining the extent of the construction on the project. Compensation shall be based upon log books maintained by the County's Engineer as a percentage of work completed and payment terms described under General Requirements. All decisions concerning the extent

and acceptability of the work and the quality of all materials shall rest solely with the County Commission or the County Engineer.

GENERAL REQUIREMENTS

Amendments

No oral modifications or amendments to this Agreement shall be effective, but this Agreement may be modified or amended by a written agreement signed by the parties.

Assignment

The parties to this Agreement shall not assign this Agreement, or any part hereof, without the prior written consent of the other party to this Agreement. No assignment shall relieve the original parties from any liability hereunder.

Binding Agreement

This Agreement shall be binding upon the heirs, successors, administrators, and assigns of each of the parties hereto.

Bonds

Before this Agreement is awarded by Utah County, the Contractor shall furnish Utah County the following bonds:

1. A **performance bond** satisfactory to the County in an amount equal to 100% of the price specified in the Agreement, to assure the faithful performance of the Agreement, for the protection of Utah County, to be held until final acceptance by Utah County of all aspects of this project; and
2. A **pavement bond** satisfactory to the County in an amount equal to 100% of the price specified in the Agreement, for the protection of each person supplying labor, service, equipment, or material for the performance of the work provided for in the Agreement.
3. A **Bid Bond** in an amount equal to at least 5% of the amount of the bid. Each Bid Bond shall be Payable to Utah County, A Body Corporate and Politic, and shall be executed by a surety company authorized to do business in the State of Utah, or, in the form of cash or other certified funds.

Each bond shall be:

1. Binding upon the award of the Agreement;

2. Executed by a surety company or companies duly authorized to do business in the State of Utah, or, in the form of cash or other certified funds.

3. Payable to Utah County, A Body Corporate and Politic;

4. Filed with the Utah County Public Works Department in a timely manner following the Closing Date for Receipt of Bids.

5. Increased if the contract price is increased by change order or otherwise subsequent to entering into the Agreement.

Utah County will hold the Payment Bond for 90 days subsequent to the completion of the project.

No Bid Bond is required for this bid.

Brand Name

The use of brand names in the Specifications is for the purpose of designating the standard of quality, performance, and characteristics desired. Equivalent brand substitutions for the culinary water line must be approved by Utah County.

Completion Date

The completion date for the Canyon Road construction work is on or before October 15, 2018, regardless of weather conditions and other related problems. If the Contractor fails to complete the work on or prior to the completion date, or by extension of time granted by the County in writing, then the Contractor may forfeit his 5% payment retainer and shall in addition be liable for all additional costs and damages incurred by Utah County as a result of the failure of completion.

If abnormal weather conditions or other natural events totally beyond the control of the Contractor require in the judgment of the County an extension of the completion date, written authorization must be given by County for such specific extension.

Liquidated Damages:

It is agreed by the parties to This Agreement that in case all the work called for in accordance with this Agreement is not completed before or upon the Completion Dates set forth in this Agreement, damage will be sustained by Utah County, and that it is and will be impracticable to determine the actual damage which Utah County will sustain in the event of and by reason of such delay, and it is therefore agreed that the Contractor will pay to Utah County **$1860.00 per day** for each calendar day between the Completion Date required herein for any specific roadway and the date of final acceptance thereof by Utah County, as liquidated damages and not as penalty. It is further agreed that the amounts stipulated are reasonable estimates of the damages that would be sustained by Utah County and the Contractor agrees to pay such liquidated damages as herein provided. In case the liquidated damages are not paid, the Contractor agrees that Utah County may deduct the amount thereof from any money due to or that may become due the Contractor by progress

payments or otherwise in accordance with the terms of this Agreement, or if said amount is not sufficient, recover the total amount.

The Contractor will not be assessed with liquidated damages during any delay in the completion of the work caused by acts of God, acts of criminals, acts of Utah County, acts of the public utilities, fire, floods, epidemics, quarantine restrictions, labor strikes that delay the critical sequence of the work, and unusually severe weather or delays of subcontractors due to such causes, provided that Utah County is notified in writing of the causes of such delay.

Cooperation

Utah County intends to encourage cooperation with the Owner, Engineers, Supplier, Contractor and its subcontractors. The objectives are effective and efficient agreement performance, intended to achieve completion within budget, on schedule, and in accordance with the Drawings and Specifications.

Alternative dispute resolution (ADR) methodologies will be encouraged in place of the more formal dispute resolution procedures. ADR in this context is intended to be a voluntary, non-binding procedure available for use by the parties to this Agreement to resolve any dispute that may arise during performance.

Extra Work

Extra work, when authorized in writing by the County, is defined as additional work which is neither shown nor defined on the Drawings or Specifications, but determined by the County to be necessary to the project. It is also defined as that additional effort necessary by reason of changed conditions. But the changed condition must be radical, unforeseen, and totally beyond the control of the Contractor. Adverse weather variations do not constitute a changed condition.

Miscellaneous items normally associated with the major work items shown, but which may not be specifically shown, shall be furnished and installed by the Contractor as if they had been shown, without additional cost to the County. After authorization of the Utah County Commission in writing, payment for authorized extra work will be made by either of the following methods, as determined by the County:

1. Reimbursement for all direct and substantiated costs of labor, materials, supplies and equipment use, plus 15% to cover all indirect costs, overhead and profit; or

2. A lump sum, agreed to· prior to beginning the extra work, to cover all of the items authorized in writing by the County.

Indemnification

The Contractor shall defend, indemnify, save and hold harmless Utah County, its officers, employees, and agents, from and against any and all claims, demands, causes of action, orders, decrees, judgments, losses, damages, and liabilities (including all costs and attorney's fees incurred in defending any claim, demand, or cause of action) occasioned by, growing out of, or arising or resulting from (a) Contractor's, its subcontractors, agents or employees performance of this agreement or their provision of any services required herein to be performed by the Contractor or its subcontractors, agents or employees, and (b) any act or omission of Contractor, or its subcontractors, agents or employees. The Contractor shall assume sole liability for any injuries or damages caused to a third party as a result of fulfillment of this Agreement.

Independent Contractor

Contractor states and affirms that he is acting as an independent contractor, holding himself out to the general public as an independent contractor for other work or agreements as he sees fit; that he advertises his services as he sees fit to the general public, maintains his office or place of employment separate from Utah County, agreements, contracts or opportunities.

The parties intend that an independent contractor relationship will be created by this Agreement. Utah County is interested only in the results to be achieved, and the conduct and control of the work will lie solely with the Contractor. Contractor is not to be considered an agent or employee of Utah County for any purpose, and the employees of the Contractor are not entitled to any of the benefits that Utah County provides for County's employees. It is understood that Utah County does not agree to use the Contractor exclusively. It is further understood that the Contractor is free to contract for similar services to be performed for others while working under the provisions of this Agreement with Utah County.

Both parties agree that Contractor shall be deemed an independent contractor in the performance of this Agreement, and shall comply with all laws regarding unemployment insurance, disability insurance, and workers' compensation. As such, Contractor shall have no authorization, express or implied, to bind Utah County to any agreement, settlement, liability, or understanding whatsoever, and agrees not to perform any acts as agent for Utah County. The compensation provided for herein shall be the total compensation payable hereunder by Utah County.

Inspection

Work shall be inspected by a Utah County’s Consultant Engineer, Ben Inglish, PE of Project Engineering Consultant, hereinafter “Project Engineer”.

Insurance

The Contractor agrees to carry Commercial General Liability insurance coverage equal to or greater than $2,550,000 per occurrence, or as modified by the risk manager pursuant to state statute during the term of this Agreement. This coverage shall provide liability

insurance to cover the activities of Contractor including Contractor's agents, employees and subcontractors, and for all equipment and vehicles, public or private, used in the performance of this Agreement. This insurance shall name "Utah County, 100 East Center, Provo, Utah 84606" as a Certificate Holder. Prior to commencing any work, Contractor shall provide a Certificate of Insurance to Utah County, evidencing that the Contractor has this insurance in place and shall maintain said insurance for the duration of this Agreement.

Insurance to Utah County evidencing that the Contractor has Workers Compensation Insurance for the Contractor, all subcontractors, and all employees of the Contractor and/or subcontractors.

The Contractor shall file all required certificates of insurance with the Utah County Public Works Department in a timely manner following the Closing Date for Receipt of Bids and prior to commencing any work.

Interpretation of Agreement

The invalidity of any portion of this Agreement shall not prevent the remainder from being carried into effect. Whenever the context of any provision shall require it, the singular number shall be held to include the plural number, and vice versa, and the use of any gender shall include any other and all genders. The paragraph and section headings in this Agreement are for convenience only and do not constitute a part of the provisions hereof.

Keys

If it becomes necessary for the County to issue the Contractor a key to County locks, final payment to the Contractor will be held until the key has been returned and documented. It is illegal to duplicate County keys.

Legal

The Contractor shall be responsible to provide all legal support for the project including but not limited to the preparation of contracts with subcontractors.

License

The Contractor shall have a current "Business License", issued by the county or city in which the Contractor's business is located, and shall provide proof of such license prior to the commencement of said work.

The Contractor shall be a licensed "General Contractor" through the State of Utah, Utah Division of Occupational and Professional Licensing, to perform construction work in this State. He shall provide proof of such license prior to the commencement of said work.

No Presumption

Should any provision of this Agreement require judicial interpretation, the Court interpreting or construing the same shall not apply a presumption that the terms hereof shall be more strictly construed against a party by reason of the rule of construction that a document is to be construed more strictly against the person who himself or through his agents prepared the same, it being acknowledged that all parties have participated in the preparation of this Agreement.

Notices

All notices, demands and other communications required or permitted to be given hereunder shall be in writing and shall be deemed to have been properly given if delivered by hand or by certified mail, return receipt requested, postage paid, to the parties at their addresses first above written, or at such other addresses as may be designated by notice given hereunder.

Payment

The Contractor shall be paid by Utah County on the twenty fifth (25th) of each month for the work performed during the previous month as provided in the Measurement and Payment below. All bills must be received by the County's Engineer by the first (1st) of each month. Each bill shall itemize the work performed and shall show progress of the work that can be verified. Actual payment will be based upon inspection by the Project Engineer who will certify that the work has been performed in a workmanlike manner. **In accordance with U.C.A. Section 13-8-5, Utah County may retain five percent (5%) of all payments to the Contractor or such other sums as authorized thereby until the end of the project.** Final payment of any sums retained will be paid 30 days after request after approval of work by final inspection.

Payments may be withheld from the Contractor by the County in order to protect or offset the County from loss due to:

1. Defective work not remedied.

2. Liens or claims filed or reasonable evidence of probable filing.

3. The Contractor's failure to promptly pay subcontractors for labor and/or materials accepted by the Contractor.

4. The County's reasonable doubt that the project can be completed for the unpaid balance of the contract price.

5. Damage to another contractor.

6. Failure to maintain scheduled progress.

7. Any other failure of the Contractor which results in liability for the County.

Safety Requirements

In order to protect the life and health of employees and the general public in the performance of this Agreement, the Contractor shall comply with the general safety orders covering Utah industries, issued by the Industrial Commission of Utah and Occupational Safety and Health Act of 1970. Nothing in the Agreement shall relieve the Contractor of responsibility assigned in the Specifications, State Industrial Commission's requirements, or state and local laws and ordinances.

The Contractor agrees to hold Utah County and the County's Engineer free and harmless from any and all damages/claims that may occur during the construction operations of this Agreement. The Contractor shall assume sole liability for any injuries or damages caused to a third party as a result of fulfillment of this Agreement and construction operations.

Successors in Interest

This Agreement shall be binding upon the heirs, successors, administrators, and assigns of each of the parties thereto.

Surveying

The Contractor is responsible for providing all required surveying for the construction of the road.

Utah Law

This Agreement shall be interpreted pursuant to the law of the State of Utah.

Utilities

Care shall be taken to preserve and protect existing utilities, pole lines, signs, pipelines and private improvements from injury or damage during construction operations. The Contractor shall hold the County and the County's Engineer harmless and reimburse owners and utilities for any damage to their properties, utilities, pole lines, signs, pipelines, improvements, and interference with their service caused through Contractor's operations. **The Contractor has the responsibility for contacting "Blue Stakes".**

Warranty

The Contractor warrants to Utah County that all materials furnished under this Agreement will be new unless otherwise specified, and that all work will be of good quality, free from faults and defects and in conformance with this Agreement. All work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by Utah County, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. Defective work shall be repaired or replaced by Contractor at Contractor's sole expense.

If, within one year after the Date of Substantial Completion of the work, or designated portion thereof, or within one year after acceptance by Utah County, or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by this Agreement, any of the work or materials are found to be defective or does not conform with this Agreement, the Contractor shall correct it promptly after receipt of a written notice from Utah County to do so unless Utah County has previously given the Contractor a written acceptance of such defective or non-conforming condition. This obligation shall survive termination of this Agreement.

STATEMENT OF APPLICABLE STANDARDS

The latest edition of the Pleasant Grove "Public Works Standard Specifications and Drawings", Cedar Hills "Design Standards and Public Improvement Specifications", and the 2017 Utah Chapter of the American Public Works Association (APWA) Manual of Standard Specifications and Plans apply on this project.

Refer to "Special Provisions" for other project specific specifications.

INSTRUCTIONS TO BIDDERS

Bidders are urged and expected to inspect the site where services are to be performed and to satisfy themselves as to all general and local conditions that may affect the cost of performance of the Agreement, to the extend such information is reasonably obtainable. In no event will a failure to inspect the site constitute grounds for withdrawal of a bid after opening, or for a claim after award of the agreement.

To arrange to inspect the work site or for other inquires on this invitation for bids, prospective bidders should contact the "County Engineer", by writing or calling (collect calls not accepted) the following:

UTAH COUNTY PUBLIC WORKS
ENGINEERING DIVISION
2855 South State Street
Provo, Utah 84606
(801) 851-8600
ATTENTION: Glen Tanner

The sealed bids will be opened by the Utah County Manager, Robert Baxter, in room #3600 of the County Clerk/Auditors office, County Administration Building on Wednesday February 14, 2018 at 3:30 p.m. Sealed bids shall be received by mail, or hand delivered to the County Purchasing Agent before 3:00 p.m. on Wednesday, February 14th, 2018. **NO LATE BIDS WILL BE ACCEPTED EXCEPT AS SET FORTH BY UTAH COUNTY PROCUREMENT RULES AND REGUALTIONS.**

These items should be considered before filling out the bid and bidding schedule:

Interpretation of Quantities in the Schedule

Any quantities appearing in the Specifications or Drawings for this project are only approximate and were prepared from estimates by the Project Engineer. These quantities will be used for bidding. The actual quantities for construction may vary and should be determined by the Contractor based on his individual analysis of conditions. In the event certain areas of the project are given a higher priority, those areas, as designated by the County's Engineer, will receive construction attention first. In the event certain areas are deleted due to unforeseen appropriation of funds, or deemed not economically feasible, or for whatever reason, those areas will be deducted from the bid and payment amount.

Bidding Schedule

The bidder shall submit his bid upon the bidding schedule and bid sheets provided by Utah County. The total amount of the bid is obtained by adding the "Total Cost" amounts of the several bid items or unit priced items multiplied by the estimated quantities. All the figures shall be in ink or typed. The bid must be signed in ink by the individual who prepared the bid and by the owner of the company. The address and phone number of the individual, or firm represented by the bid must be on the bid. The bid process is governed by and subject to the Utah County Procurement Rules and Regulations.

The bid item quantities listed in bid schedules A.1, A.2, A.3, A.4, A.5, and A.6 reflect the increase and/or decrease in quantity of the base bid's (A.0) total quantity. Bid Schedule A.7 can be found in "Exhibit D".

Irregular Proposals

Bids shall be considered irregular and may be rejected for the following:

1. If the bid is on a form other than that furnished by Utah County; or if the form is altered, or any part thereof is detached.
2. If bid item unit prices listed in the bid schedule for A.1, A.2, A.3, A.4, A.5 and A.6 do not match the bid item unit prices listed in the bid schedule for A.0.
3. If there are unauthorized additions, conditional, multiple or alternate bids, or irregularities of any kind, which may tend to make the bid incomplete, indefinite, or ambiguous as to its meaning.
4. If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.
5. If the bid at the opening does not contain a signed bid, a signed bidding schedule, all requested documents, and a signed certificate of non-collusion.
6. If the bid does not contain a unit price for each pay item listed.
7. Any erasure or alteration of figures of unit prices not initialed in ink by the bidder.
8. If the Contractor is unable to evidence a satisfactory record of integrity.
9. If the Contractor is not qualified legally to contract.

Acceptance of Bid

1. Utah County reserves the right to reject any or all bids or waive minor irregularities when to do so would be in the best interests of Utah County. Minor irregularities are those which will not have a significant adverse effect on overall competition or performance levels.
2. The responding party agrees that Utah County may terminate this procurement procedure at any time, and Utah County shall have no liability or responsibility to the

responding party for any costs or expenses incurred in connection with this invitation to bid (ITB), or such party's response. If the bidder adds any provisions reserving the right to accept or reject an award, or to enter into a contract pursuant to an award.

Disposition of Bids

All bids (and the information contained therein) shall become the property of Utah County. No bid shall be returned to the respondent regardless of the outcome of the selection process.

Evaluation Criteria

All bids will be evaluated by authorized representatives of Utah County for compliance with the terms and conditions contained in this ITB and the resulting contract awarded to the lowest responsive and responsible bidder.

General

1. Utah County will award a contract in reliance upon the information contained in bids submitted in response to the ITB. Utah County will be legally bound only when and if there is a signed contract entered into between Utah County and the awarded bidder.

2. It is vitally important that any person who signs a bid or contract on behalf of a respondent certifies that he or she has the authority to so act. The bidder who has its bid accepted may be required to answer further questions and provide further clarification of its bid and responses.

3. Receiving this ITB or responding to it does not entitle any entity to participate in services or transactions resulting from or arising in connection with this ITB. Utah County shall have no liability to any person or entity under or in connection with this ITB, unless and until Utah County and such person have executed and entered into a contract pursuant to the terms of this ITB.

4. By responding to this ITB each responding party acknowledges that neither Utah County nor any of its representatives is making or has made any representation or warranty, either express or implied, as to the accuracy or completeness of any portion of the information contained in this ITB. The responding party further agrees that neither Utah County nor any of its representatives shall have any liability to the responding party or any of its representatives as a result of this ITB process or the use of the information contained in this ITB. Only the terms and conditions contained in a contract when, as, and if executed, and subject to such limitations and restrictions as may be specified therein, may be relied upon by the responding party in any manner as having any legal effect whatsoever.

BID DOCUMENTS

MEASUREMENT AND PAYMENT

A.0.1 - ROADWAY

GENERAL

A. See Payment Procedures in APWA Section 01 29 00.
B. ENGINEER will take all measurements and compute all quantities.
C. CONTRACTOR will verify measurement and quantities.
D. CONTRACTOR will provide all equipment, workers, and survey crews to assist ENGINEER in making measurements.
E. Units of measurement are listed above in the bid schedule(s).
F. See Bid Item Summary Table (Sheet 3) in the plan set for bid item references to APWA Standard Specifications and Project Special Provisions.

1. 01 55 26 TRAFFIC CONTROL (Lump)

Payment includes all costs incidental to traffic control as specified in 01 55 26.

2. 01 57 00S TEMPORARY CONTROLS (Lump)

Payment includes all costs incidental as specified in 01 57 00S.

3. 01 71 13 MOBILIZATION (Lump)

Payment includes cost of mobilization, demobilization and installation of temporary facilities. Payment will be made on a percentage basis as follows.

Percent of Original Contract Amount Earned	Percent of Amount Bid for Mobilization to be Paid
5	40
15	20
40	30
50	10

4. 01 71 23 CONSTRUCTION LAYOUT (Lump)

Payment includes all costs incidental as specified in 01 71 23. Payment includes all costs incidental with project surveying and staking including mobilization. Control and survey support set once by ENGINEER.

5. 01 71 34 SURVEY (Lump)

Payment includes all costs incidental with project surveying and staking including mobilization. Control and survey support set once by ENGINEER.

6. 01 74 13 PROGRESS CLEANING (Lump)

Payment includes all labor, equipment, and costs incidental to street cleaning.

7. 31 05 10 BOUNDARY MARKERS AND SURVEY MONUMENTS (Lump)

Payment includes all costs incidental as specified in 31 05 10.

8. 31 25 00 STORM WATER POLLUTION PREVENTION PLAN (Lump)

Payment includes the CONTRACTOR in providing and maintaining a storm water pollution prevention plan and permit through Pleasant Grove City and Cedar Hills City. The CONTRACTOR will be listed as an operator along with Utah County. Payment also includes all erosion control that is not listed as separate bid items, which includes; silt fence, construction fencing, inlet protection, inlet clean-out (if necessary), and stabilized roadway entrances. (Refer to Section 31 25 00 SP)

9. 01 26 00.1S MISCELLANEOUS REPAIRS (Lump)

A. Includes all labor, materials and equipment incidental to the miscellaneous repair as approved by Utah County Engineer. Written approval must be acquired prior to beginning work in accordance to specification.
B. Unit, unit price and contract time (if applicable) will vary per occurrence and shall be establish by the County Engineer.
C. Lump sum quantity and pricing only refers to overall amount set aside by Utah County as a contingency.

10. 01 31 13 PUBLIC INFORMATION SERVICES (Lump)

Payment includes all costs incidental to Public Information Services as outlined in Section 01 31 13.

11. 02 41 14 REMOVE ASPHALT PAVEMENT DRIVEWAY (SQ YD)

Payment includes all necessary equipment and labor to saw cut, remove, haul, and dispose of all asphalt pavement within the existing driveway.

12. 02 41 14 REMOVE CONCRETE CURB AND GUTTER (FT)

Payment includes all costs and equipment incidental to the removal, disposal and transportation of concrete curb and gutter. Includes necessary fill and compaction of backfilled areas as directed by the ENGINEER.

13. 02 41 14 REMOVE CONCRETE DRIVEWAY (SQ YD)

Payment includes all necessary equipment and labor to saw cut, remove, haul, and dispose of all pavement, concrete, and reinforced concrete within the existing driveway.

14. 02 41 14 REMOVE CONCRETE SIDEWALK (SQ YD)

Payment includes all necessary equipment and labor to saw cut, remove, haul, and dispose of all concrete and reinforced concrete within the existing sidewalk areas.

15. 02 41 13S REMOVE PRECAST CONCRETE BARRIER (FT)

A. Measured along the base of the concrete barrier.

B. Payment includes all necessary equipment and labor to saw cut, remove, haul, and stockpile of precast concrete barrier to Willow Park, 9800 West 300 North, Lehi, Utah 84043.

16. 02 41 13S RECONSTRUCT WALL (FT)

A. Various block and concrete walls along the project corridor may be slightly impacted by the addition of curb, gutter and sidewalk and/or the modification to the residential driveway access. This item is intended to cover the adjustment or impact to all landscape walls or existing retaining walls.

B. Measured along the base of the wall.

C. Payment includes the cost of removal and disposal of existing wall. This may include, but is not limited to all rebar, concrete, foundation and base material. Also includes furnishing all necessary rock, materials and equipment, labor, backfill, and compaction for new wall.

17. 31 05 13 BORROW (Plan Quantity) (CU YD)

A. Measured in final position.

B. Payment includes cost of all labor, material, and equipment to provide and install, compact and grade fill material as specified. Weigh tickets shall be provided to the ENGINEER daily. Borrow is to be used outside the roadway section.

18. 31 05 13 GRANULAR BORROW (Plan Quantity) (CU YD)

A. Measured in final position.

B. Payment includes cost of all labor, material, and equipment to provide and install, compact, and grade fill material as specified. Weigh tickets shall be provided to the ENGINEER daily. This bid item is intended as backfill material for utility trenches, utility lateral backfill material, soft spot repair and raising roadway to grade. Granular Borrow is to be used within the roadway section.

19. 31 11 00 SITE CLEARING (LUMP)

Payment includes all costs for labor and equipment to remove all vegetation outside of excavation, fill slope lines and limits of slope rounding.

20. 31 11 00 TREE AND STUMP REMOVAL (EA)

Payment includes removal and disposal of tree and grinding of stump. Contractor shall remove stump and roots 12 inches below existing ground or base of proposed grade (ex. base of pavement section or base of driveway UTBC) whichever is greater.

21. 32 01 05 SIGN PANEL, POST AND FOUNDATION (EA)

Payment includes all costs for labor, equipment and material necessary to install foundation, post and sign panel. Includes all costs incidental to street name signs and components per 32 01 06.

22. 32 01 07 RELOCATE MAILBOX (EA)

Payment includes the costs incidental to mailbox relocation. Includes new posts, foundations, labor, equipment, removal/disposal of the existing foundation and materials for installation. This pay item includes the temporary placement(s) of the mail box during construction to ensure mail delivery through the duration of the project.

23. 32 01 07S RELOCATE MONUMENT SIGN (Manila Est. 1890) (EA)

Payment includes all costs for labor, equipment and material necessary to relocate sign to new location.

24. 32 01 07 RELOCATE SIGN (EA) Add special for using existing sign on new pole

Payment includes the costs incidental to street name sign relocation. Includes new posts, foundations, labor, equipment, removal/disposal of the existing foundation and materials for installation of the signs.

25. 32 01 16.71 ROTOMILLING – 3 INCH (SQ YD)

A. Measurement is calculated from length multiplied by the average finished width of rotomilled surface.

B. Payment includes all costs, labor, and equipment incidental to the pavement removal and delivery and stockpile of millings to stockpile location, Willow Park, 9800 West 300 North, Lehi, Utah 84043.

26. 32 11 23 GRAVEL DRIVEWAY (SQ FT)

A. Payment includes all costs incidental to the placement of 6 inches of untreated base course. Includes the necessary excavation/granular borrow fill for correct placement of gravel driveway. 31 05 13

27. 32 11 23 UNTREATED BASE COURSE (PLAN QUANTITY) (CU YD)

Payment includes all costs for labor, equipment and material necessary to install, compact, and grade untreated base course material.

28. 32 01 13.69 MICRO-SURFACE SEAL (TON)

Includes water required for dilution by the manufacturer. Includes all costs, labor, equipment, and material incidental to placing micro-surface as described in specification.

29. 32 12 13.13 TACK COAT (TON)

Payment includes all costs for labor, equipment and material necessary to install tack coat.

30. 32 12 16.13 ASPHALT DRIVEWAY (SQ FT)

Payment includes all costs for labor, equipment and material to place 3 inches of HMA – DM ½ PG 58-28 over 6 inches of untreated base course. Includes the necessary untreated base course and excavation/granular borrow fill for correct placement of asphalt driveway.

31. 32 12 16.13 HMA – ¾ Inch (TON)

Payment includes all costs for labor, equipment and material to place 3-5 inches of HMA – DM ¾ PG 58-28 in its final position. Weigh tickets shall be provided to the ENGINEER daily. Includes prime coat per 32 12 13.19.

32. 32 16 13 CONCRETE CURB AND GUTTER (TYPE A) (FT)

A. Measured along the roadway face.

B. Payment includes concrete, excavation, labor, equipment and untreated base course for installation.

33. 32 16 13 CONCRETE CURB AND GUTTER TYPE MOUNTABLE (FT)

A. Measured along the roadway face.

C. Payment includes concrete, excavation, labor, equipment and untreated base course for installation.

34. 32 16 13 CONCRETE CURB WALL (FT)

A. Measured along the base of the wall.

B. Payment includes concrete, excavation, labor, equipment and untreated base course for installation.

35. 32 16 13 CONCRETE DRIVEWAY FLARED, 6 INCH THICK (SQ FT)

Payment includes all costs incidental to the placement of a concrete driveway approach. Includes placement of 3 inches of untreated base course and the necessary excavation/fill for correct placement of 6 inch thick concrete flatwork and untreated base course to match the plan or as directed by ENGINEER.

36. 32 16 13 CONCRETE FLATWORK 6 INCH THICK (SQ FT)

Payment includes all costs incidental to the placement of 6 inch concrete flatwork and the placement of 3 inches of untreated base course.

37. 32 16 13 CONCRETE SIDEWALK (SQ FT)

Payment includes all costs incidental to the placement of 4 inch concrete sidewalk including materials and labor needed for stamped concrete, excavation, and untreated base course.

38. 32 16 14 PEDESTRIAN ACCESS RAMP (EA)

A. Payment includes all labor, equipment, untreated base course, and materials necessary for a complete pedestrian access ramp according to Pleasant Grove Standard Drawing 6A. The curb cut will remain part of the curb and gutter installation.

B. Payment includes all labor, equipment, materials, disposal, and incidental work to remove pedestrian access ramp. Incidental work includes the removal and replacement of up to 100 sq ft. of adjacent sidewalk, up to 40ft of curb and gutter (measured along

top-back-curb including the curb cut), up to 20 sq. ft. of landscaping, and repair of irrigation and asphalt damaged to construct pedestrian access ramp.

39. 32 17 23 PAVEMENT MARKING PAINT (GAL)

Payment includes all labor, material, equipment and paint to provide two coats of paint.

40. 32 17 23 PAVEMENT MARKING PAINT (Stop Lines, Crosswalks-12 inch) (FT)

Payment includes all labor, material, equipment and paint to provide two coats of paint.

41. 32 17 23 PAVEMENT MESSAGE PAINT (EA)

Removal of unauthorized, smeared, or damaged markings will not be paid for.

Measurement

1. Letter = one
2. Arrow = one message
3. Multi-headed arrow = one message per arrow
4. School crossbars = one message per 24 inch x 10 foot bar

42. 32 17 23 TEMPORARY PAVEMENT MARKING PAINT (FT)

Payment includes all labor, material, equipment and paint to provide temporary pavement markings as required to maintain traffic control plan as approved by Resident Engineer. Payment includes removal of temporary pavement markings through process of water blasting for permanent pavement markings.

43. 34 71 13 IMPACT ATTENUATOR (EA)

Payment includes all costs incidental to the placement of an impact attenuator attached to a precast concrete barrier.

44. 34 71 13 PRECAST CONCRETE BARRIER – 42 INCH NEW JERSEY SHAPE (FT)

Payment includes connection pins, stabilization pins, and barrier reflectors. Calculated by number of sections multiplied by the nominal length.

45. 02 41 14 ROADWAY EXCAVATION (PLAN QUANTITY) (CU YD)

A. Payment includes pavement cutting, excavation, removal, transportation, and disposal when existing pavement is included in Roadway excavation plan quantity. Pay quantities will be computed in the original position to the neat lines and grades or pay

limits of excavation specified using the given plan quantities.

B. For material ordered removed and replaced (authorized extra excavation and backfill), measurement of quantities for payment shall be made to the following pay limits.
    1. Upper limit of excavation is the proposed excavation limit.
    2. Lower and lateral limits are as authorized by ENGINEER.
    3. Volumes of open spaces (e.g. manholes, pipes, dipstones, inlets etc.) will not be measured in backfill calculations.

46. 31 05 21 ROADWAY PAVEMENT GEOTEXTILES (SQ YD)

A. Measurement does not include overlaps.

B. Payment includes all costs for labor, equipment, and materials for installation and inspection.

47. 32 01 05.1S RECTANGULAR RAPID FLASHING BEACON (EA)

Payment includes all costs for labor, equipment and material necessary to install a rectangular rapid flash beacon including pole, sign panel, solar power equipment or power connection and pedestrian activated push button.

48. 32 01 05.2S RADAR SPEED FEEDBACK SIGN (EA)

Payment includes all costs for labor, equipment and material necessary to install foundation, post, sign panel, solar power equipment and radar speed display.

49. 02 41 13S REMOVE SIGN (EA)

Payment includes the removal of sign panel, post, and foundation.

50. 32 01 10 REPLACE FENCE (FT)

A. Measured along the base of the fence.

B. Payment includes all costs incidental to the removal and disposal of existing posts, footings, fencing, posts, and post foundations as needed. Reuse posts, fence material, and gates from the existing fence if suitable for reuse as determined by the ENGINEER. Use new fence posts and materials if existing material is of insufficient quality and in accordance with 32 31 16. New fence posts and materials shall be similar in kind and style of the existing fence being removed. Includes backfilling of all old post holes and any associated landscape restoration and sprinkler system repair due to damages made during fence removal. Payment includes concrete, labor, equipment and materials for installation.

51. 32 01 10 VINYL FENCE (FT)

A. Measured along the base of the fence.

B. Payment includes all costs incidental to the removal and disposal of existing posts, footings, fencing, posts, and post foundations as needed. Includes backfilling of all old post holes and any associated landscape restoration and sprinkler system repair due to damages made during fence removal. Payment includes concrete, labor, equipment and materials for installation.

52. 32 31 13 FENCE GATE (FT)

A. Measured along the base of the fence.

B. Payment includes all costs incidental to the removal and disposal of existing posts, footings, fencing, posts, and post foundations as needed. Includes backfilling of all old post holes and any associated landscape restoration and sprinkler system repair due to damages made during fence removal. Payment includes concrete, labor, equipment and materials for installation.

53. 32 31 13.1S TEMPORARY CHAIN LINK FENCE (6') (FT)

Payment includes all costs incidental to the placement of a temporary chain link fence which will last the duration of the project or as indicated by the ENGINEER.

54. 32 91 20S LANDSCAPE RESTORATION (SQ FT)

Payment includes all materials and workmanship to restore the landscaping back to pre-construction conditions under the direction of the ENGINEER. Includes, but is not limited to: topsoil, sod, sprinkler repairs, bark mulch, landscape rock, small shrubs, as necessary to restore to preconstruction conditions.

55. 02831S LANDSCAPE WALL (SQ FT)

Includes all labor, equipment, and materials necessary to install the complete and functional landscape wall. See detail sheets in plan set. Payment includes leveling pad, wall subdrain, free draining granular backfill, reinforcing grid and geotextile separation fabric. Estimated quantity is square foot of wall face from top of cap to top of leveling pad.

56. 02737S ASPHALT PAVEMENT SOFT SPOT REPAIR (SQ YD)

A. Includes all labor, materials and equipment incidental to the Soft Spot Repair, Including roadway excavation, hauling, placement, compaction, and HMA level with the top of existing surface.

B. Estimated quantities are based on preliminary field review for bidding purposes only.

C. Repair the actual quantities determined by the Engineer.

D. Soft Sport Repair may be reduced, deleted, or increased from the bid quantities from the contract.

E. The price of the actual quantity will be paid at the contract unit price if any of these situations occur.

A.0.2 - WATERLINE

57. 02 41 13 REMOVE GATE VALVE (EA)

Payment covers the cost of removal of gate valve and box and capping and abandoning existing waterline. This item includes all gate valve sizes.

58. 33 11 00 TEE (EA)

Payment includes all materials and labor necessary to install waterline and/or pressurized irrigation tee and connect to existing pipe, fittings and appurtenances. Item includes all tee size combinations as required.

59. 33 11 00 C900 PRESSURIZED IRRIGATION (CEDAR HILLS) (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. Pipe elbows as shown in the plans are incidental to construction and no separate payment will be made.

A. No separate payment will be made for required inspection and testing. Includes all pressurized irrigation pipes sizes required which include but are not limited to 8 and 10 inch pipes.

60. 33 11 00 C900 WATERLINE (FT)

B. Measured along centerline of pipe.

C. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

D. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

E. Pipe elbows as shown in the plans are incidental to construction and no separate payment will be made.

F. No separate payment will be made for required inspection and testing.

G. Includes all waterline pipes sizes required which include but are not limited to 4, 6, 8, 10, 12, 14 and 20 inch waterlines.

61. 33 11 00 CAP (EA)

Payment includes all materials and labor necessary to install cap and connect to pipe or fittings. Payment includes all materials and labor necessary to abandon existing pipe as a result of capping the pipe. Includes all cap sizes as required.

62. 33 11 00 NEW SERVICE LINE (EA)

Payment includes all materials and labor necessary to install new service line from main to water meter including but not limited to: service tap, corp stop, copper or polyethylene service line from main to water meter, water meter, saddle, meter box, reconnection of service line from property to water meter and any other materials or labor necessary to provide a working service. Includes all service line sizes required.

63. 33 11 00 REDUCER (EA)

Payment includes all materials and labor necessary to install waterline and/or pressurized irrigation reducer and connect to existing pipe, fittings and appurtenances. Item includes all reducer size combinations as required.

64. 33 11 11 ADJUST FIRE HYDRANT TO GRADE (EA)

Payment covers the cost of materials and labor necessary to adjust the fire hydrant to the appropriate height above the finished surface (Refer to standard details and Section 33 12 19, Hydrants).

65. 33 11 11 RELOCATE FIRE HYDRANT (EA)

Payment covers the cost of excavation, soil preparation, potholing, the relocation of the existing fire hydrant, including the extension of the 6" supply main piping, couplings, elbows, greasing and wrapping all exposed fittings, bolts, and nuts; pipeline dewatering; concrete thrust restraints; other miscellaneous devices, materials, or equipment required for a complete relocation.

66. 02 41 13 REMOVE FIRE HYDRANT ASSEMBLY (EA)

Payment covers the cost of excavation, soil preparation, potholing, removal and salvage of fire hydrant to proper water authority, removal of 6-inch supply main piping, removal of gate valves, fittings, and other associated materials and capping and abandoning of water main at the tee.

67. 33 12 16 BUTTERFLY VALVE (EA)

Payment includes all costs for labor, equipment and material necessary to install valve including but not limited to: valve, valve box, bolts, gaskets, adaptors, backfill, compaction and concrete collar. This item includes all butterfly valve sizes required which include but are not limited to 10, 12, 14, and 20 inch butterfly valves.

68. 33 12 16 GATE VALVE (EA)

Payment includes all costs for labor, equipment and material necessary to install valve including but not limited to: valve, valve box, bolts, gaskets, adaptors, backfill, compaction and concrete collar. This item includes all gate valve sizes required which include but are not limited to 4, 6, and 8 inch valves.

69. 33 12 19 FIRE HYDRANT ASSEMBLY (EA)

Payment covers the cost of excavation, soil preparation, potholing, the new fire hydrant with surface coatings and fittings, 6-inch supply main piping, connection of the new fire hydrant to new water main with ductile iron, PVC, or epoxy lined and coated flanged steel pipe with exterior of pipe tape wrapped; gate valves with 2 piece cast iron screw type valve boxes, traffic lids; miscellaneous tees, sleeves, bends, gaskets, bolts, nuts; approved joint restraining devices; greasing and wrapping all exposed fittings, bolts, and nuts; pipeline dewatering; concrete thrust restraints; concrete box repair, capping or plugging of the existing water pipe(s) to be abandoned, disinfection and commissioning pipeline; adjustment of valve box lids to final grade with concrete and painting, asphalt patching, surface concrete repair, and other miscellaneous devices, materials, or equipment required for a complete installation (Refer to Section 33 12 19, Hydrants).

A.0.3 - UTILITY & DRAINAGE

70. 33 05 14 ADJUST CATCH BASIN TO GRADE (EA)

Payment includes all costs and equipment incidental to structure adjustment.

71. 33 05 14 ADJUST CLEAN OUT BOX TO GRADE (EA)

Payment includes all costs and equipment incidental to structure adjustment.

72. 33 05 14 ADJUST VALVE BOX TO GRADE (EA)

Payment includes all costs and equipment incidental to structure adjustment.

73. 33 05 14 ADJUST MANHOLE TO GRADE (EA)

Payment includes all costs and equipment incidental to structure adjustment.

74. 33 05 14 RELOCATE IRRIGATION CONTROL VALVE (EA)

Payment includes all costs and equipment incidental to relocation of irrigation control valve.

75. 02 41 13 REMOVE 10” PIPE (FT)

Payment includes pipe end section and appurtenances.

76. 02 41 13 REMOVE 12” PIPE (FT)

Payment includes pipe end section and appurtenances.

77. 02 41 13 REMOVE 15” PIPE (FT)

Payment includes pipe end section and appurtenances.

78. 02 41 13 REMOVE 18” PIPE (FT)

Payment includes pipe end section and appurtenances.

79. 02 41 13 REMOVE 30” PIPE (FT)

Payment includes pipe end section and appurtenances.

80. 02 41 13 REMOVE 60" PIPE (FT)

Payment includes pipe end section and appurtenances.

81. 02 41 13 REMOVE CATCH BASIN (EA)

Payment includes cost of labor, materials and other work incidental to complete removal and backfill of catch basin.

82. 02 41 13 REMOVE DIVERSION BOX (EA)

Payment includes cost of labor, materials and other work incidental to complete removal and backfill of diversion box.

83. 02 41 13 REMOVE IRRIGATION CONNECTION (EA)

Payment includes cost of labor, materials and other work incidental to complete removal and backfill of irrigation connection.

84. 33 05 12S TRENCH DRAIN (FT)

A. Measured along centerline of trench drain.
B. Trench excavation and concrete as shown in the Details are incidental to construction and no separate payment will be made.

85. 33 41 00 12" RCP (FT)

A. Measured along centerline of pipe.
B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.
C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.
D. No separate payment will be made for required inspection and testing.

86. 33 41 00 12" RCP CLASS V (FT)

A. Measured along centerline of pipe.
B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.
C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.
D. No separate payment will be made for required inspection and testing.

87. 33 41 00 15” RCP (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

88. 33 41 00 15” RCP CLASS V (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

89. 33 41 00 18” RCP (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

90. 33 41 00 24” RCP (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

91. 33 41 00 30” CMP (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

92. 33 41 00 36" RCP (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

93. 33 41 01S FLARED END SECTION WITH RIP RAP (EA)

A. Payment includes a round, flared concrete end section, access control rack and all necessary materials and procedures required to construct an outfall protection including by not limited to: Pyramat turf reinforcement or approved equivalent, clearing and grubbing, grading, ground preparation and any other items required for completion.

B. The connection to any pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

94. 33 41 00 24" STEEL CASING, TRENCH AND PAVEMENT RECONSTRUCT (FT)

A. Measured along centerline of pipe.

B. Casing, casing accessories, trench excavation, pipe bedding, backfill, and asphalt as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

95. 33 41 00 18" X 18" CLEANOUT BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

96. 33 41 00 24" X 24" CLEANOUT BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

97. 33 41 00 36” X 24” CLEANOUT BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

98. 33 41 00 48” X 48” CLEANOUT BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

99. 33 41 00 60” X 60” CLEANOUT BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

100. 33 41 00 36” X 24” CATCH BASIN (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

101. 33 41 00 36” X 36” CATCH BASIN (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

102. 33 41 00 48" X 48" CATCH BASIN, SHALLOWER THAN 7' (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

103. 33 41 00 48" X 48" CATCH BASIN, DEEPER THAN 7' (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

104. 33 41 00 72" X 36" CATCH BASIN (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

105. 33 41 00 84" X 36" CATCH BASIN (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

106. 33 41 00 84" X 24" DOUBLE CATCH BASIN (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame,

manhole steps, and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

107. 33 41 00 48" MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

108. 33 41 00 60" MANHOLE, SHALLOWER THAN 7' (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

109. 33 41 00 60" MANHOLE, DEEPER THAN 7' (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

110. 33 41 00 72" MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

111. 33 41 00 48” X 48” MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

112. 33 41 00 18” X 18” DIVERSION BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, slide gates, outlet cores, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

113. 33 41 00 24” X 24” DIVERSION BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, slide gates, outlet cores, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

114. 33 41 00 48” X 48” DIVERSION BOX, SHALLOWER THAN 7’ (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, slide gates, outlet cores, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

115. 33 41 00 48” X 48” DIVERSION BOX, DEEPER THAN 7’ (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, slide gates, outlet cores, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

116. 33 41 00 72” X 36” DIVERSION BOX (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, slide gates, outlet cores, controls and any other items required in standard drawings.

B. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

A.0.4 - SIGNAL & ATMS

117. 34 41 13 RADAR DETECTION AT 1100 NORTH TRAFFIC SIGNAL (LUMP)

Includes all materials, labor, workmanship, equipment, and documentation and incidental items required to install, wire, program, test state-furnished radar detection. Includes removal of loop detection. Includes coordination with County and UDOT signal personnel.

118. 34 41 14S 2-INCH CONDUIT (FT)

A. Includes all materials, labor, workmanship, equipment, documentation, and incidental items required for 2-inch conduit as described in the contract. Conduit may be installed by trenching, boring, or plowing unless otherwise specified.

B. Includes duct seal, pull tape, conduit sweeps, fittings, conduit proofing, backfill, and warning tape.

C. Includes flowable fill.

119. 34 41 14S ATMS MD7 CONDUIT (FT)

A. Includes all materials, labor, workmanship, equipment, documentation, and incidental items required for MD7 conduit as described in the contract. Conduit may be installed by trenching, boring, or plowing unless otherwise specified.

B. Includes duct seal, pull tape, conduit sweeps, fittings, conduit proofing, backfill, and warning tape.

C. Includes flowable fill.

120. 34 41 15 TYPE II JUNCTION BOX, 24 X 36 (EA)

Payment includes backfill, flowable fill, maintenance markers, conduit plugs, grounding materials, concrete collar, bolts expansion joint material, grout, and a locate ball or disk.

121. 34 41 15 TYPE III JUNCTION BOX, 30 X 48 (EA)

Payment includes backfill, flowable fill, maintenance markers, conduit plugs, grounding materials, concrete collar, bolts expansion joint material, grout, and a locate ball or disk.

A.1 - ADD ALT. #1 – SR-92 IMPROVEMENTS

A1.1 02 41 13S REMOVE SIGN (EA)

Payment includes the removal of sign panel, post, and foundation.

A1.2 02 41 14 REMOVE ASPHALT PAVEMENT (SQ YD)

Payment includes excavation, removal, transportation, and disposal of asphalt.

A1.3 02 41 13S REMOVE PRECAST CONCRETE BARRIER (FT)

A. Measured along the base of the concrete barrier.

B. Payment includes all necessary equipment and labor to saw cut, remove, haul, and stockpile of precast concrete barrier to Willow Park, 9800 West 300 North, Lehi, Utah 84043.

A1.4 02 41 14 ROADWAY EXCAVATION (PLAN QUANTITY) (CU YD)

A. Payment includes excavation, removal, transportation, and disposal when existing pavement is included in Roadway excavation plan quantity. Pay quantities will be computed in the original position to the neat lines and grades or pay limits of excavation specified using the given plan quantities.

B. For material ordered removed and replaced (authorized extra excavation and backfill), measurement of quantities for payment shall be made to the following pay limits.

1. Upper limit of excavation is the proposed excavation limit.
2. Lower and lateral limits are as authorized by ENGINEER.
3. Volumes of open spaces (e.g. manholes, pipes, dipstones, inlets etc.) will not be measured in backfill calculations.

A1.5 31 05 13 BORROW (Plan Quantity) (CU YD)

A. Measured in final position.

B. Payment includes cost of all labor, material, and equipment to provide and install, compact and grade fill material as specified. Weigh tickets shall be provided to the ENGINEER daily. Borrow is to be used outside the roadway section.

A1.6 31 05 13 GRANULAR BORROW (Plan Quantity) (CU YD)

A. Measured in final position.

B. Payment includes cost of all labor, material, and equipment to provide and install, compact, and grade fill material as specified. Weigh tickets shall be provided to the ENGINEER daily. This bid item is intended as backfill material for utility trenches, utility lateral backfill material, soft spot repair and raising roadway to grade. Granular Borrow is to be used within the roadway section.

A1.7 31 05 21 ROADWAY PAVEMENT GEOTEXTILES (SQ YD)

A. Measurement does not include overlaps.

B. Payment includes all costs for labor, equipment, and materials for installation and inspection.

A1.8 32 12 13.13 TACK COAT (TON)

Payment includes all costs for labor, equipment and material necessary to install tack coat.

A1.9 32 01 05 SIGN PANEL, POST AND FOUNDATION (EA)

Payment includes all costs for labor, equipment and material necessary to install foundation, post and sign panel.

A1.10 32 01 07 RELOCATE SIGN (EA)

Payment includes the costs incidental to street name sign relocation. Includes new posts, foundations, labor, equipment, removal/disposal of the existing foundation and materials for installation of the signs.

A1.11 32 01 10 REPLACE FENCE (FT)

A. Measured along the base of the fence.

B. Payment includes all costs incidental to the removal and disposal of existing posts, footings, fencing, posts, and post foundations as needed. Reuse posts, fence material, and gates from the existing fence if suitable for reuse as determined by the ENGINEER. Use new fence posts and materials if existing material is of insufficient quality. New fence posts and materials shall be similar in kind and style of the existing fence being removed. Includes backfilling of all old post holes and any associated landscape restoration and sprinkler system repair due to damages made during fence removal. Payment includes concrete, labor, equipment and materials for installation.

A1.12 32 01 16.71 ROTOMILLING – 3 INCH (SQ YD)

A. Measurement is calculated from length multiplied by the average finished with of rotomilled surface.

B. Payment includes all costs, labor, and equipment incidental to the removal and delivery and stockpile of millings to location specified by UTAH COUNTY.

A1.13 32 11 23 UNTREATED BASE COURSE (PLAN QUANTITY) (CU YD)

Payment includes all costs for labor, equipment and material necessary to install, compact, and grade untreated base course material.

A1.14 32 12 03 EMULSIFIED ASPHALT (TON)

Includes water required for 2:1 dilution (two parts concentrate to one part water) by the manufacturer.

A1.15 32 12 16.13 HMA – ¾ Inch (TON)

Payment includes all costs for labor, equipment and material to place 3-5 inches of HMA – DM ¾ PG 58-28 in its final position. Weigh tickets shall be provided to the ENGINEER daily.

A1.16 32 16 13 CONCRETE CURB AND GUTTER (TYPE A) (FT)

A. Measured along the roadway face.

B. Payment includes concrete, excavation, labor, equipment and untreated base course for installation.

A1.17 32 16 14 PEDESTRIAN ACCESS RAMP (EA)

A. Payment includes all labor, equipment, untreated base course, and materials necessary for a complete pedestrian access ramp according to Pleasant Grove Standard Drawing 6A. The curb cut will remain part of the curb and gutter installation.

B. Payment includes all labor, equipment, materials, disposal, and incidental work to remove pedestrian access ramp. Incidental work includes the removal and replacement of up to 100 sq ft. of adjacent sidewalk, up to 40ft of curb and gutter (measured along top-back-curb including the curb cut), up to 20 sq. ft. of landscaping, and repair of irrigation and asphalt damaged to construct pedestrian access ramp.

A1.18 32 17 23 PAVEMENT MARKING PAINT (GAL)

Payment includes all costs incidental as specified in 32 17 23.

A1.19 32 17 23 PAVEMENT MARKING PAINT (Stop Lines, Crosswalks-12 inch) (EA)

Payment includes all costs incidental as specified in 32 17 23.

A1.20 32 17 23 PAVEMENT MESSAGE PAINT (EA)

Removal of unauthorized, smeared, or damaged markings will not be paid for.

Measurement

1. Letter = one
2. Arrow = one message
3. Multi-headed arrow = one message per arrow
4. School crossbars = one message per 24 inch x 10 foot bar

A1.21 32 91 20S LANDSCAPE RESTORATION (SQ FT)

Payment includes all materials and workmanship to restore the landscaping back to pre-construction conditions under the direction of the ENGINEER. Includes, but is not limited to: topsoil, sod, sprinkler repairs, bark mulch, landscape rock, small shrubs, as necessary to restore to preconstruction conditions.

A1.22 34 71 13 IMPACT ATTENUATOR (EA)

Payment includes all costs incidental to the placement of an impact attenuator attached to a precast concrete barrier.

A1.23 34 71 13 PRECAST CONCRETE BARRIER – 42 INCH NEW JERSEY SHAPE (FT)

Payment includes connection pins, stabilization pins, and barrier reflectors. Calculated by number of sections multiplied by the nominal length.

A1.24 33 41 00 48” X 48” CATCH BASIN, SHALLOWER THAN 7’ (EA)

D. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

E. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

F. The County will make no separate payment for testing upon failure of visual inspection.

A1.25 33 41 00 48” X 48” CATCH BASIN, DEEPER THAN 7’ (EA)

D. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, grate and frame, manhole steps, and any other items required in standard drawings.

E. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

F. The County will make no separate payment for testing upon failure of visual inspection.

A1.26 33 41 00 72” MANHOLE (EA)

D. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

E. The connection to any existing or new pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

F. The County will make no separate payment for testing upon failure of visual inspection.

A1.27 33 41 00 15” RCP (FT)

E. Measured along centerline of pipe.

F. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

G. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

H. No separate payment will be made for required inspection and testing.

A.2 - ADD ALT. #2 - PLEASANT GROVE WATERLINE

A2.1 33 12 16 BUTTERFLY VALVE (EA)

Payment includes all costs for labor, equipment and material necessary to install valve including but not limited to: valve, valve box, bolts, gaskets, adaptors, backfill, compaction and concrete collar. This item includes all butterfly valve sizes required which include but are not limited to 10, 12, 14, and 20 inch butterfly valves.

A2.2 33 11 00 C900 WATERLINE (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to drainage structures or features are incidental to construction and no separate payment will be made.

D. Pipe elbows as shown in the plans are incidental to construction and no separate payment will be made.

E. No separate payment will be made for required inspection and testing.

F. Includes all waterline pipes sizes required which include but are not limited to 4, 6, 8, 10, 12, 14 and 20 inch waterlines.

A2.3 33 11 00 CAP (EA)

Payment includes all materials and labor necessary to install cap and connect to pipe or fittings. Payment includes all materials and labor necessary to abandon existing pipe as a result of capping the pipe. Includes all cap sizes as required.

A2.4 33 12 16 GATE VALVE (EA)

Payment includes all costs for labor, equipment and material necessary to install valve including but not limited to: valve, valve box, bolts, gaskets, adaptors, backfill, compaction and concrete collar. This item includes all gate valve sizes required which include but are not limited to 4, 6, and 8 inch valves.

A2.5 33 11 00 REDUCER (EA)

Payment includes all materials and labor necessary to install waterline and/or pressurized irrigation reducer and connect to existing pipe, fittings and appurtenances. Item includes all reducer size combinations as required.

A2.6 33 11 00 TEE (EA)

Payment includes all materials and labor necessary to install waterline and/or pressurized irrigation tee and connect to existing pipe, fittings and appurtenances. Item includes all tee size combinations as required.

A2.7 33 11 00 INTERSECTION CROSS (EA)

Payment includes all materials and labor necessary to install waterline and/or pressurized irrigation cross and connect to existing pipe, fittings and appurtenances. Item includes all intersection cross size combinations as required.

A2.8 33 12 16 AIR RELEASE ASSEMBLY WITH MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure with air release assembly including but not limited to the following: Concrete, reinforcing steel, steel cover, manhole steps, heads, valves, controls and any other items required in standard drawings.

B. The connection to any pipe culvert or other drainage feature will be incidental to construction and no separate payment will be made for this work.

C. The County will make no separate payment for testing upon failure of visual inspection.

A2.9 33 12 19 FIRE HYDRANT ASSEMBLY (EA)

Payment covers the cost of excavation, soil preparation, potholing, the new fire hydrant with surface coatings and fittings, 6-inch supply main piping, connection of the new fire hydrant to new water main with ductile iron, PVC, or epoxy lined and coated flanged steel pipe with exterior of pipe tape wrapped; gate valves with 2 piece cast iron screw type valve boxes, traffic lids; miscellaneous tees, sleeves, bends, gaskets, bolts, nuts; approved joint restraining devices; greasing and wrapping all exposed fittings, bolts, and nuts; pipeline dewatering; concrete thrust restraints; concrete box repair, capping or plugging of the existing water pipe(s) to be abandoned, disinfection and commissioning pipeline; adjustment of valve box lids to final grade with concrete and painting, asphalt patching, surface concrete repair, and other miscellaneous devices, materials, or equipment required for a complete installation (Refer to Section 33 12 19, Hydrants).

A2.10 32 12 16.13 HMA – ¾ Inch TRENCH PATCH (CU YD)

Payment includes all costs for labor, equipment and material to place 3-5 inches of HMA – DM ¾ PG 58-28 in its final position. Weigh tickets shall be provided to the ENGINEER daily.

A2.11 32 11 23 UNTREATED BASE COURSE (PLAN QUANTITY) (CU YD)

Payment includes all costs for labor, equipment and material necessary to install, compact, and grade untreated base course material.

A2.12 33 11 00 NEW SERVICE LINE (EA)

Payment includes all materials and labor necessary to install new service line from main to water meter. Payment includes one of three installment options:

Option 1 – Connection of the new service line to the existing ball valve before the meter, no new meter. (see DT-Sheets)

Option 2 – Installation of the old meter configuration (2014), city to provide meter (see DT-Sheets)

Option 3 – Installation of the new meter configuration (2017), city to provide meter (see DT-Sheets)

Includes all service line sizes required.

A2.13 33 11 00 RECONNECT SERVICE LINE (EA)

Payment includes all materials and labor necessary to reconnect service line from main to water meter including but not limited to: service tap, corp stop, copper or polyethylene service line from main to water meter, water meter, saddle, meter box, reconnection of service line from property to water meter and any other materials or labor necessary to provide a working service. Includes all service line sizes required.

A2.14 33 11 11 REMOVE FIRE HYDRANT ASSEMBLY (EA)

Payment covers the cost of excavation, soil preparation, potholing, removal and salvage of fire hydrant to proper water authority, removal of 6-inch supply main piping, removal of gate valves, fittings, and other associated materials and capping and abandoning of water main at the tee.

A2.15 33 12 16 REMOVE GATE VALVE (EA)

Payment covers the time, material, labor and cost of removing the gate valve and valve box.

A2.16 33 12 19 RECONNECT HYDRANT TO NEW WATERLINE (EA)

Payment covers the cost of reconnecting hydrant to new waterline.

A2.17 33 12 19 RELOCATE FIRE HYDRANT (EA)

Payment covers cost of materials and labor to relocate hydrant to new location.

A.3 - ADD ALT. #3 PLEASANT GROVE 100 EAST – 2300 NORTH TO 2550 NORTH SEWER

A3.1 33 31 00 Pipe – 8" PVC (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to existing or new structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

A3.2 33 31 00 4" SEWER LATERAL (EA)

A. Consists of 4" lateral from the sewer main to the property line (See Standard Drawings).

B. Includes marker at end of buried lateral. Marker is to be made of 6' long 2 X 4 painted green. Marker is to protrude 2' above the surface.

C. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

D. Connection to sewer main is incidental to construction and no separate payment will be made.

E. No separate payment will be made for required inspection and testing.

A3.3 33 31 00 4' MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, solid cover, manhole steps, manhole bench and any other items required in standard drawings.

B. The connection to any pipe or other feature will be incidental to construction and no separate payment will be made for this work.

C. The County will pay a percentage of the unit bid price in addition to the price for each structure, proportional to volume changes (example: a 4 ft deep box increased by 1.5 ft, the percentage of increase in payment is 1.5 ÷ 4 x 100) for any required field changes larger than 1 foot of specified plan dimensions.

D. The County will make no separate payment for testing upon failure of visual inspection.

A.4 - ADD ALT. #4 - PLEASANT GROVE 100 EAST – 2600 NORTH TO 2850 NORTH SEWER

A4.1 33 31 00 Pipe – 8" PVC (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to existing or new structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

A4.2 33 31 00 4" SEWER LATERAL (EA)

A. Consists of 4" lateral from the sewer main to the property line (See Standard Drawings).

B. Includes marker at end of buried lateral. Marker is to be made of 6' long 2 X 4 painted green. Marker is to protrude 2' above the surface.

C. Trench excavation, pipe bedding and backfill as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

D. Connection to sewer main is incidental to construction and no separate payment will be made.

E. No separate payment will be made for required inspection and testing.

A4.3 33 31 00 4' MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, solid cover, manhole steps, manhole bench and any other items required in standard drawings.

B. The connection to any pipe or other feature will be incidental to construction and no separate payment will be made for this work.

C. The County will pay a percentage of the unit bid price in addition to the price for each structure, proportional to volume changes (example: a 4 ft deep box increased by 1.5 ft, the percentage of increase in payment is 1.5 ÷ 4 x 100) for any required field changes larger than 1 foot of specified plan dimensions.

D. The County will make no separate payment for testing upon failure of visual inspection.

A.5 - ADD ALT. #5 - CEDAR HILLS SEWER

A5.1 33 31 00 Pipe – 8" PVC (FT)

A. Measured along centerline of pipe.

B. Trench excavation, pipe bedding, backfill, saw cutting pavements, site dewatering, shoring and bracing, marking tape, and compaction as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

C. Connections to existing or new structures or features are incidental to construction and no separate payment will be made.

D. No separate payment will be made for required inspection and testing.

A5.2 33 31 00 4" SEWER LATERAL (EA)

A. Consists of 4" lateral from the sewer main to the property line (See Standard Drawings).

B. Includes marker at end of buried lateral. Marker is to be per Cedar Hills Standards.

C. Trench excavation, pipe bedding, backfill, saw cutting pavements, site dewatering, shoring and bracing, marking tape, and compaction as shown in the Standard Drawings are incidental to construction and no separate payment will be made.

D. Connection to sewer main is incidental to construction and no separate payment will be made.

E. No separate payment will be made for required inspection and testing.

A5.3 33 31 00 4' MANHOLE (EA)

A. Consists of all necessary materials required to make a complete drainage structure including but not limited to the following: Concrete, reinforcing steel, solid cover, manhole steps, manhole bench, temporary sewer flow bypass, site dewatering, excavation, backfill, compaction, saw cutting pavements, shoring and bracing, and any other items required in standard drawings.

B. The connection to any pipe or other feature will be incidental to construction and no separate payment will be made for this work.

C. The County will pay a percentage of the unit bid price in addition to the price for each structure, proportional to volume changes (example: a 4 ft deep box increased by 1.5 ft, the percentage of increase in payment is 1.5 ÷ 4 x 100) for any required field changes larger than 1 foot of specified plan dimensions.

D. The County will make no separate payment for testing upon failure of visual inspection.

A5.4 32 12 16.13 HMA – ¾ Inch TRENCH PATCH (CU YD)

Payment includes all costs for labor, equipment and material to place 3-5 inches of HMA – DM ¾ PG 58-28 in its final position. Weigh tickets shall be provided to the ENGINEER daily.

A5.5 32 11 23 UNTREATED BASE COURSE (PLAN QUANTITY) (CU YD)

Payment includes all costs for labor, equipment and material necessary to install, compact, and grade untreated base course material.

A5.6 32 11 00 NEW SERVICE LINE (EA)

Payment includes all materials and labor necessary to install new service line from main to meter.

A.6 - ADD ALT. #6 - SR-92 LIGHTING

A6.1 26 56 19 LIGHTING SYSTEM (Lump)

Payment includes all costs for materials, equipment, and labor to install lighting system including Highway Luminaire Pole Foundation – 2.5'x8', 2" Conduit – PVC, 3" Conduit – PVC, Conduit trenched in Native Soil 24" Cover, 1-2 Conduits bored, Type A Junction Box, RHH-USE@-RHW2, 6 gage, Bare Copper Ground Wire No 6, Ground Rod ¾" X 10", and Power Source Underground Pedestal. Payment also includes the installation of State Furnished Materials including 40' Highway Luminaire Pole (Slip Base), Breakaway base, Hardware Kit, 15' Luminaire Arm, 1" Dia X 36" Anchor Bolt with Hardware, and LED Luminaire B Type III MV PC.

A.7 - ADD Alternate #7 – AF Canyon Water Line

***Measurement and Payment for A.7 items can be found in "Exhibit D".**

CONTRACTOR'S BID PROPOSAL

TOTAL BID PRICE

All completion dates, as required below, must be set forth by Contractor. Utah County, in its sole discretion, shall determine if said dates are acceptable and meet the needs of Utah County. Please see Note below.

ITEM	DESCRIPTION	BID PRICE
A.0	Base Bid: Canyon Road Reconstruction; US 89 to SR 92	
		$_____
	Completion Date _____	
A.1	ADD Alternate #1 - SR-92 Improvements	
		$_____
	Completion Date _____	
A.2	ADD Alternate #2 - Pleasant Grove Waterline	
		$_____
	Completion Date _____	
A.3	ADD Alternate #3 – Pleasant Grove 100 East – 2300 North to 2550 North Sewer	
		$_____
	Completion Date _____	
A.4	ADD Alternate #4 - Pleasant Grove 100 East – 2600 North to 2850 North Sewer	
		$_____
	Completion Date _____	
A.5	ADD Alternate #5 - Cedar Hills Sewer	
		$_____
	Completion Date _____	
A.6	ADD Alternate #6 - SR-92 Lighting	
		$_____
	Completion Date _____	
A.7	ADD Alternate #7 – AF Canyon Water Line	
		$_____
	Completion Date _____	
	TOTAL BID PRICE	**$_____**

NOTE: Contractor shat provide a bid price for each of items: A.0, A.1, A.2, A.3, A.4, A.5, A.6, and A.7. Each bid will be evaluated based on the "Total Bid Price", which shall be the combined total of items A.0, A.1, A.2, A.3, A.4, A.5, A.6, and A.7 as set forth in the Specifications unless Utah County determines not to accept any or all of the Alternative Bids, in which case the pricing component shall be the combed total of items County chooses to accept.

Utah County, at its sole discretion, shall chose whether to accept the Contractor's bid for item A.1 (Add Alternate #1), item A.2 (Add Alternate #2), item A.3 (Add Alternate #3), item A.4 (Add

Alternate #4), item A.5 (Add Alternate #5), item A.6 (Add Alternate #6), and/or item A.7 (Add Alternate #7) as set forth in the Specifications.

CERTIFICATION

I hereby certify that I have read, understand, and agree to all sections, Exhibits, and Attachments of this Invitation to Bid for Canyon Road Reconstruction; US 89 to SR 92. I further certify that the information submitted by me/my company in response to this ITB, including the pricing and other information, is true and accurate, and reflect a careful examination of the site of the work, the Specifications, Drawings and form of the agreement, all of which are made a part hereof. Me/my company proposes to furnish all labor, equipment, tools and machinery, and to furnish and deliver all materials not specifically mentioned as being furnished by the local agency, which are required in construction

I understand that Utah County has the right to reject any or all proposals, to waive minor irregularities when to do so would be in the best interests of Utah County, and to negotiate a price for the proposed services as determined to be in the best interest of Utah County.

I acknowledge that I/my company has received and reviewed the following Addenda:

Addendum No.	Addendum Date

_____ _____
Date

_____ _____
Business License Number

_____ _____
State Contracting License Number

_____ _____
Name, Address, and Phone Number of Contractor State License Classification Number

The undersigned further proposes to execute the attached agreement within five working days after the date of the award, and to begin work within five working days after being notified to do so by the local agency, and to complete the same on or before **October 15, 2018**, after the signing of the agreement by both parties. It is understood that Utah County has the right to reject this bid or to accept it at the price listed above and the prices located in the Bidding Schedule.

_____ Company Seal
Signature of the Preparer

_____
Title of Preparer

“EXHIBIT B”

BIDDING SCHEDULE

A.0 BASE BID BIDDING SCHEDULE						
Item	**APWA**	**DESCRIPTION**	**Unit**	**ESTIMATED QUANTITY**	**UNIT PRICE**	**AMOUNT**
		ROADWAY				
1	01 55 26	Traffic Control	Lump	1		
2	01 57 00S	Temporary Controls	Lump	1		
3	01 71 13	Mobilization	Lump	1		
4	01 71 23	Construction Layout	Lump	1		
5	01 71 34	Survey	Lump	1		
6	01 74 13	Progress Cleaning	Lump	1		
7	31 05 10	Boundary Markers and Survey Monuments	Lump	1		
8	31 25 00	Storm Water Pollution Prevention Plan	Lump	1		
9	01 26 00.1S	Miscellaneous Repairs	Lump	1	$200,000	$200,000
10	01 31 13	Public Information Services	Lump	1		
11	02 41 14	Remove Asphalt Pavement Driveway	SQ YD	1,515		
12	02 41 14	Remove Concrete Curb and Gutter	FT	1,441		
13	02 41 14	Remove Concrete Driveway	SQ YD	436		
14	02 41 14	Remove Concrete Sidewalk	SQ YD	1,442		
15	02 41 13S	Remove Precast Concrete Barrier	FT	850		
16	02 41 13S	Reconstruct Wall	FT	47		
17	31 05 13	Borrow (Plan Quantity)	CU YD	5,293		
18	31 05 13	Granular Borrow (Plan Quantity)	CU YD	23,219		
19	31 11 00	Site Clearing	Lump	1		
20	31 11 00	Tree and Stump Removal	EA	32		
21	32 01 05	Sign Panel, Post and Foundation	EA	23		
22	32 01 07	Relocate Mailbox	EA	14		
23	32 01 07S	Relocate Monument Sign (Manila Est. 1890)	EA	1		
24	32 01 07	Relocate Sign	EA	11		
25	32 01 16.71	Rotomilling - 3 inch	SQ YD	65,385		
26	32 11 23	Gravel Driveway	SQ FT	3,423		
27	32 11 23	Untreated Base Course (Plan Quantity)	CU YD	14,160		
28	32 01 16.69	Micro-Surface Seal	Ton	126		
29	32 12 13.13	Tack Coat	Ton	20		
30	32 12 16.13	Asphalt Driveway	SQ FT	12,360		
31	32 12 16.13	HMA - 3/4 Inch	Ton	34,153		
32	32 16 13	Concrete Curb and Gutter Type A	FT	11,710		
33	32 16 13	Concrete Curb and Gutter Type Mountable	FT	105		
34	32 16 13	Concrete Curb Wall	FT	15		
35	32 16 13	Concrete Driveway Flared, 6 inch Thick	SQ FT	8,651		
36	32 16 13	Concrete Flatwork 6 inch Thick	SQ FT	3,939		

37	32 16 13	Concrete Sidewalk	SQ FT	29,222		
38	32 16 14	Pedestrian Access Ramp	EA	16		
39	32 17 23	Pavement Marking Paint	GAL	778		
40	32 17 23	Pavement Marking Paint (Stop Lines, Crosswalks-12 inch)	FT	3,685		
41	32 17 23	Pavement Message Paint	EA	112		
42	32 17 23	Temporary Pavement Marking Paint	FT	73,000		
43	34 71 13	Impact Attenuator	EA	2		
44	34 71 13	Precast Concrete Barrier - 42 Inch New Jersey Shape	FT	140		
45	02 41 14	Roadway Excavation (Plan Quantity)	CU YD	69,914		
46	31 05 21	Roadway Pavement Geotextiles	SQ YD	149,197		
47	32 01 05.1S	Rectangular Rapid Flashing Beacon	EA	6		
48	32 01 05.2S	Radar Speed Feedback Sign	EA	4		
49	02 41 13S	Remove Sign	EA	5		
50	32 01 10	Replace Fence	FT	1,865		
51	32 01 10	Vinyl Fence	FT	304		
52	32 31 13	Fence Gate	FT	40		
53	32 31 13.1S	Temporary Chain Link Fence	FT	304		
54	32 91 20S	Landscape Restoration	SQ FT	77,160		
55	02831S	Landscape Wall	SQ FT	340		
56	02737S	Asphalt Pavement Soft Spot Repair	SQ YD	1,000		
		WATERLINE				
57	02 41 13	Remove Gate Valve	Each	8		
58	33 11 00	Tee Contractor to verify each size's quantity. Engineer's Estimate: (2) 8"x8"x8" (1) 12"x12"x10"	Each	3		
59	33 11 00	C900 Pressurized Irrigation (Cedar Hills) Contractor to verify each size's quantity. Engineer's Estimate: 8" = 1070' 10" = 135	FT	1,205		
60	33 11 00	C900 Waterline Contractor to verify each size's quantity. Engineer's Estimate: 6" = 176' 10" = 160' 12" = 843'	FT	1,179		
61	33 11 00	Cap	Each	1		
62	33 11 00	New Service Line	Each	6		
63	33 11 00	Reducer Contractor to verify each size's quantity. Engineer's Estimate: (1) 10"x8" (1) 12"x8"	Each	2		
64	33 11 11	Adjust Fire Hydrant to Grade	Each	1		
65	33 11 11	Relocate Fire Hydrant	Each	1		
66	02 41 13	Remove Fire Hydrant Assembly	Each	4		

67	33 12 16	Butterfly Valve Contractor to verify each size's quantity. Engineer's Estimate: (1) 10" (3) 12"	Each	3		
68	33 12 16	Gate Valve	Each	6		
69	33 12 19	Fire Hydrant Assembly	Each	4		
		UTILITY & DRAINAGE				
70	33 05 14	Adjust Catch Basin To Grade	Each	5		
71	33 05 14	Adjust Cleanout Box To Grade	Each	2		
72	33 05 14	Adjust Valve Box to Grade	Each	98		
73	33 05 14	Adjust Manhole to Grade	Each	94		
74	33 05 14	Relocate Irrigation Control Valve	Each	5		
75	02 41 13	Remove 10" Pipe	FT	209		
76	02 41 13	Remove 12" Pipe	FT	230		
77	02 41 13	Remove 15" Pipe	FT	256		
78	02 41 13	Remove 18" Pipe	FT	112		
79	02 41 13	Remove 30" Pipe	FT	8		
80	02 41 13	Remove 60" Pipe	FT	100		
81	02 41 13	Remove Catch Basin	Each	8		
82	02 41 13	Remove Diversion Box	Each	6		
83	02 41 13	Remove Irrigation Connection	Each	1		
84	33 05 12S	Trench Drain	FT	96		
85	33 41 00	12" RCP	FT	426		
86	33 41 00	12" RCP Class V	FT	252		
87	33 41 00	15" RCP	FT	1,041		
88	33 41 00	15" RCP Class V	FT	212		
89	33 41 00	18" RCP	FT	1,060		
90	33 41 00	24" RCP	FT	1,739		
91	33 41 00	30" CMP	FT	9		
92	33 41 00	36" RCP	FT	97		
93	33 41 01S	Flared End Section With Rip Rap	Each	3		
94	33 41 00	24" Steel Casing, Trench and Pavement Reconstruct	FT	99		
95	33 41 00	18" X 18" Cleanout Box	Each	1		
96	33 41 00	24" X 24" Cleanout Box	Each	2		
97	33 41 00	36" X 24" Cleanout Box	Each	1		
98	33 41 00	48" X 48" Cleanout Box	Each	3		
99	33 41 00	60" X 60" Cleanout Box	Each	2		
100	33 41 00	36" X 24" Catch Basin	Each	7		
101	33 41 00	36" X 36" Catch Basin	Each	1		
102	33 41 00	48" X 48" Catch Basin, Shallower than 7'	Each	5		
103	33 41 00	48" X 48" Catch Basin, Deeper than 7'	Each	3		
104	33 41 00	72" X 36" Catch Basin	Each	7		
105	33 41 00	84" X 36" Catch Basin	Each	1		
106	33 41 00	84" X 24" Double Catch Basin	Each	1		

107	33 41 00	48" Manhole	Each	1		
108	33 41 00	60" Manhole, Shallower than 7'	Each	2		
109	33 41 00	60" Manhole, Deeper than 7'	Each	2		
110	33 41 00	72" Manhole	Each	2		
111	33 41 00	48" X 48" Manhole	Each	2		
112	33 41 00	18" X 18" Diversion Box	Each	1		
113	33 41 00	24" X 24" Diversion Box	Each	1		
114	33 41 00	48" X 48" Diversion Box, Shallower than 7'	Each	3		
115	33 41 00	48" X 48" Diversion Box, Deeper than 7'	Each	2		
116	33 41 00	72" X 36" Diversion Box	Each	1		
SIGNAL & ATMS						
117	34 41 13	Radar Detection @ 1100 North Traffic Signal	Lump	1		
118	34 41 14S	2-inch Conduit	FT	4838		
119	34 41 14S	ATMS MD7 Conduit	FT	27800		
120	34 41 15	Type II Junction Box, 24x36	EA	7		
121	34 41 15	Type III Junction Box, 30x48	EA	40		

A.0 TOTAL $_____

A.1 ADDITIVE #1 SR-92 IMPROVEMENTS APPLIES TO SHEETS: RD-ALT, GR-ALT, TS-ALT BIDDING SCHEDULE						
ITEM	**APWA**	**DESCRIPTION**	**UNIT**	**ESTIMATED QUANTITY**	**UNIT PRICE**	**AMOUNT**
A1.1	02 41 13S	Remove Sign	EA	2		
A1.2	02 41 14	Remove Asphalt Pavement	SQ YD	339		
A1.3	02 41 13S	Remove Precast Concrete Barrier	FT	410		
A1.4	02 41 14	Roadway Excavation (Plan Quantity)	CU YD	5,396		
A1.5	31 05 13	Borrow (Plan Quantity)	CU YD	640		
A1.6	31 05 13	Granular Borrow (Plan Quantity)	CU YD	1,233		
A1.7	31 05 21	Roadway Pavement Geotextiles	SQ YD	12,804		
A1.8	31 12 13.13	Tack Coat	Ton	2		
A1.9	32 01 05	Sign Panel, Post and Foundation	EA	1		
A1.10	32 01 07	Relocate Sign	EA	8		
A1.11	32 01 10	Replace Fence	FT	64		
A1.12	32 01 16.71	Rotomilling - 3 Inch	SQ YD	7,805		
A1.13	32 11 23	Untreated Base Course (Plan Quantity)	CU YD	930		
A1.14	32 12 03	Emulsified Asphalt	Ton	10		
A1.15	32 12 16.13	HMA - 3/4 Inch	Ton	2,624		
A1.16	32 16 13	Concrete Curb and Gutter Type A	FT	435		
A1.17	32 16 14	Pedestrian Access Ramp	EA	2		
A1.18	32 17 23	Pavement Marking Paint	GAL	48		
A1.19	32 17 23	Pavement Marking Paint (Stop Lines, Crosswalks- 12 inch)	EA	2		
A1.20	32 17 23	Pavement Message Paint	EA	16		
A1.21	32 92 00	Landscape Restoration	SQ FT	14,000		
A1.22	34 71 13	Impact Attenuator	EA	2		
A1.23	34 71 13	Precast Concrete Barrier - 42 Inch New Jersey Shape	FT	718		
A1.24	33 41 00	48" X 48" Catch Basin, Shallower than 7'	EA	1		
A1.25	33 41 00	48" X 48" Catch Basin, Deeper than 7'	EA	1		
A1.26	33 41 00	72" Manhole	EA	1		
A1.27	33 41 00	15" RCP	FT	70		

A.1 TOTAL $_____

A.2 ADDITIVE #2 PLEASANT GROVE WATERLINE APPLIES TO SHEETS: WL-01 TO WL-13, WL-19A, WL-44 BIDDING SCHEDULE						
ITEM	**APWA**	**DESCRIPTION**	**UNIT**	**ESTIMATED QUANTITY**	**UNIT PRICE**	**AMOUNT**
A2.1	33 12 16	Butterfly Valve Contractor to verify each size's quantity. Engineer's Estimate: (1) 14", (2) 20"	Each	3		
A2.2	33 11 00	C900 Waterline Contractor to verify each size's quantity. Engineer's Estimate: (33') 4"', (24') 6", (6619') 8", (375') 10", (20') 12", (112') 14", (80') 20"'	FT	7,263		
A2.3	33 11 00	Cap	Each	1		
A2.4	33 12 16	Gate Valve Contractor to verify each size's quantity. Engineer's Estimate: (2) 4", (1) 6", (39) 8", (3) 10"	Each	45		
A2.5	33 11 00	Reducer Contractor to verify each size's quantity. Engineer's Estimate: (8) 8"X6", (1) 12"X6", (1) 14"X10", (2) 20"X12"	Each	12		
A2.6	33 11 00	Tee Contractor to verify each size's quantity. Engineer's Estimate: (2) 8"X8"X4", (1) 8"X8"X6", (7) 8"X8"X8", (1) 14"X14"X10", (2) 20"X20"X8"	Each	13		
A2.7	33 11 00	Intersection Cross Engineer's Estimate: (1) 8" X 8" X 8" X 8"	Each	3		
A2.8	33 12 16	Air Release Assembly with Manhole	Each	1		
A2.9	33 12 19	Fire Hydrant Assembly	Each	13		
A2.10	32 12 16.13	HMA - 3/4 Inch Trench Patch	Cu Yd	320		
A2.11	32 11 23	Untreated Base Course (Plan Quantity)	Cu Yd	630		
A2.12	33 11 00	New Service Line See M&P for Option descriptions				
		New Service Line – Option 1 Estimate: 25	Each	25		
		New Service Line – Option 2 Estimate: 34	Each	34		
		New Service Line – Option 3 Estimate: 15	Each	15		
A2.13	33 11 00	Reconnect Service Line	Each	23		
A2.14	33 11 11	Remove Fire Hydrant Assembly	Each	11		
A2.15	33 12 16	Remove Gate Valve	Each	20		
A2.16	33 12 19	Reconnect Hydrant to New Waterline	Each	1		
A2.17	33 12 19	Relocate Fire Hydrant	Each	1		

A.2 TOTAL $_____

A.3 ADDITIVE #3 PLEASANT GROVE 100 EAST – 2300 NORTH TO 2550 NORTH SEWER APPLIES TO SHEETS: SS-01 TO SS-03 BIDDING SCHEDULE						
ITEM	**APWA**	**DESCRIPTION**	**UNIT**	**ESTIMATED QUANTITY**	**UNIT PRICE**	**AMOUNT**
A3.1	33 31 00	Pipe - 8" PVC	FT	1303		
A3.2	33 31 00	4" Sewer Lateral	Each	7		
A3.3	33 31 00	4' Manhole	Each	5		

A.3 TOTAL $_____

A.4 ADDITIVE #4 PLEASANT GROVE 100 EAST – 2600 NORTH TO 2850 NORTH SEWER APPLIES TO SHEETS: SS-03 TO SS-04 BIDDING SCHEDULE						
ITEM	**APWA**	**DESCRIPTION**	**UNIT**	**ESTIMATED QUANTITY**	**UNIT PRICE**	**AMOUNT**
A4.1	33 31 00	Pipe - 8" PVC	FT	968		
A4.2	33 31 00	4" Sewer Lateral	Each	6		
A4.3	33 31 00	4' Manhole	Each	4		

A.4 TOTAL $_____

A.5 ADDITIVE #5 CEDAR HILLS SEWER APPLIES TO SHEETS: SS-05 T0 SS-09 BIDDING SCHEDULE						
ITEM	**APWA**	**DESCRIPTION**	**UNIT**	**ESTIMATED QUANTITY**	**UNIT PRICE**	**AMOUNT**
A5.1	33 31 00	Pipe - 8" PVC	FT	1707		
A5.2	33 31 00	4" Sewer Lateral	Each	13		
A5.3	33 31 00	4' Manhole	Each	7		
A5.4	32 12 16.13	HMA - 3/4 inch Trench Patch	Cu YD	56		
A5.5	32 11 23	Untreated Base Course (Plan Quantity)	Cu YD	111		
A5.6	33 11 00	New Service Line	Each	1		

A.5 TOTAL $_____

A.6 ADDITIVE #6 UTAH COUNTY SR-92 LIGHTING APPLIES TO SHEET: LT-01 BIDDING SCHEDULE					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
A6.1	Lighting System	Lump	1		

A.6 TOTAL $_____

A.7 ADDITIVE #7 AF CANYON WATERLINE APPLIES TO EXHIBIT D SEE EXHIBIT D FOR BIDDING SCHEDULE					
ITEM	**DESCRIPTION**	**UNIT**	**QUANTITY**	**UNIT PRICE**	**AMOUNT**
A7.1	American Fork Canyon Waterline	Lump	1		

A.7 TOTAL $_____

Note: The above quantities are only an estimate, but a fixed number is required for Bid evaluation purposes. Actual payment for unit price items will be based upon inspection records kept by the Project Engineer and the actual work completed, approved and accepted by the Project Engineer. Utah County reserves the right to eliminate portions of the work from this bid and contract due to budget constraints or high construction costs.

***Bid Schedule A.7 can be found in "Exhibit D".**

CERTIFICATE OF NON-COLLUSION

STATE OF UTAH)
)SS
COUNTY OF UTAH)

Invitation to Bid
for
"Canyon Road Reconstruction; US 89 to SR 92"

AFFIDAVIT

The undersigned of lawful age, being first duly sworn, disposes and says: That as a condition precedent to the award of the Utah County project as above captioned,

I_____
(owner, partner, officer or delegate)

of_____ do
(company)

solemnly swear that neither I, nor to the best of my knowledge any member or members of my firm or company have either directly or indirectly restrained free and competitive bidding on this project by entering into any agreement, participating in any collusion, or otherwise taking any action unauthorized by Utah County, with regard to this bid or potential agreement resulting therefrom.

_____
Signature

By: _____
Title: _____

****

Subscribed/sworn to before me this ____ day of _____ 2018 A.D.
My Commission Expires _____

Residing at _____
_____
_____

Seal

By: _____
Notary Public

Agreement No. 2018 - _____

AGREEMENT

THIS AGREEMENT, made and entered this _____, by and between UTAH COUNTY, a body corporate and politic of the State of Utah, located at 100 East Center Street, Provo, Utah 84606, hereinafter referred to as **COUNTY**; and _____, of _____, Utah, Federal ID Number _____, hereinafter referred to as **CONTRACTOR**.

WITNESSETH

WHEREAS, County desires to obtain materials and construction services as herein defined and further to obtain such services in accordance with Utah State Law; and

WHEREAS, CONTRACTOR is willing to provide such materials and services for COUNTY in consideration of receiving such fee as herein provided;

NOW, THEREFORE, in consideration of the mutual promises set forth herein, the parties hereto agree as follows:

1. **DESCRIPTION OF THE WORK**
   a. In consideration of the compensation set forth below, CONTRACTOR agrees to provide all necessary materials and labor for the Canyon Road Reconstruction; US-89 to SR-92 on the terms and conditions contained in the Canyon Road Reconstruction; US-89 to SR-92, Specifications, Bid and Agreement, attached hereto as "Exhibit A" and the Drawings, all of which are incorporated herein by this reference as if fully set forth herein, at the locations listed therein. This work includes all necessary clean up.
   b. CONTRACTOR agrees to complete all specified construction work as specified in "Exhibit A" and the Drawings including ADD Alternate #1, ADD Alternate #2, ADD Alternate #3, ADD Alternate #4, ADD Alternate #5, ADD Alternate #6, and ADD Alternate #7.
   c. COUNTY hereby authorizes CONTRACTOR to proceed with the work as specified herein upon the receipt of required bonds and certificates of insurance.

2. COMPENSATION

In exchange for services referenced above, and on the terms and conditions stated herein and in "Exhibit A", COUNTY will pay CONTRACTOR in accordance with CONTRACTOR'S bid which is attached hereto as "Exhibit B" and incorporated herein by this reference as the total cost of the project.

3. ENTIRE AGREEMENT

This AGREEMENT shall constitute the entire agreement between the parties and any prior understanding or representation of any kind preceding the date of this AGREEMENT shall not be binding upon either party except to the extent incorporated in the AGREEMENT.

IN WITNESS WHEREOF the parties have caused this AGREEMENT to be duly executed on the date set forth above.

BOARD OF COUNTY COMMISSIONERS
UTAH COUNTY, UTAH

_____
Nathan Ivie, Chairman

****

ATTEST: BRYAN E. THOMPSON
County Auditor/Clerk

By: _____
Deputy

****

APPROVED AS TO FORM:

JEFFREY R. BUHMAN
Utah County Attorney

By: _____
Deputy County Attorney

****

CONTRACTOR

_____

Name: _____Title: _____

Witness: _____

“EXHIBIT C”

SPECIAL PROVISIONS

SECTION 01 11 00S
SUMMARY OF WORK

This specification adds to the 2017 Edition APWA Standard Specification Section 01 11 00. All other provision of the Section remain in full force and effect.

PART 1 GENERAL

The Contractor shall carefully read all notes and specifications. The Contractor shall be satisfied as to the true meaning and intention and shall be responsible for complying with each.

1.1 GENERAL NOTES

A. All work to be performed per Utah County, Pleasant Grove and Cedar Hills specifications and standards. In the event that the municipalities do not offer specifications for the work, the latest APWA, AASHTO, ASTM, AWWA, and the MUTCD standards shall apply. Where conflicts arise, the most stringent code will apply.

B. Where the plans or specifications describe portions of the work in general terms but not complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used.

C. It is intended that these plans and specifications require all labor and materials necessary and proper for the work contemplated and that the work be completed in accordance with their true intent and purpose. The contractor shall notify the engineer immediately regarding any discrepancies or ambiguities which may exist in the plans or specifications. The engineer's interpretation thereof shall be conclusive.

D. The contractor shall be skilled and regularly engaged in the general class and type of work called for in the project plans and specifications. Therefore, the owner is relying upon the experience and expertise of the contractor, it shall be expected that prices provided within the contract documents shall include all labor and materials necessary and proper for the work contemplated and that the work be completed in accordance with their true intent and purpose. The contractor shall be competent, knowledgeable and have special skills on the nature, extent and inherent conditions of the work to be performed. Contractor shall also acknowledge that there are certain peculiar and inherent conditions existent in the construction of the particular facilities, which may create, during the construction program, unusual or peculiar unsafe conditions hazardous to persons, property and the environment. Contractor shall be aware of such peculiar risks and have the skill and experience to foresee and to adopt protective measures to adequately and safely perform the construction work with respect to such hazards.

E. The contractor shall, at the time of bidding, and, throughout the period of the contract, be licensed in the State of Utah and shall be bondable for an amount equal to or greater than the amount bid and to do the type of work contemplated in the plans and specifications. Contractor shall be skilled and regularly engaged in the general class and type of work called for in the plans and specifications.

F. Contractor shall inspect the site of the work prior to bidding to satisfy themselves by personal examination or by such other means as they may prefer, of the location of

the proposed work, and of the actual conditions of and at the site of work. If, during the course of their examination, a bidder finds facts or conditions which appear to them to be in conflict with the letter or spirit of the project plans and specifications, they shall contact the County for additional information and explanation before submitting their bid. Awarding the contract to the contractor and the contractor signing said contract shall constitute acknowledgement that the contractor relied and are relying on their own examination of (1) the site of the work, (2) access to the site, and (3) all other data and matters requisite to the fulfillment of the work and on their own knowledge of existing facilities on and in the vicinity of the site of the work to be constructed under this contract. The information provided by the owner or the engineer is not intended to be a substitute for, or a supplement to the independent verification by the contractor to the extent such independent investigation of site conditions is deemed necessary or desirable by the contractor. Contractor shall acknowledge that they have not relied solely upon owner or engineer furnished information regarding site conditions in preparing and submitting their bid

G. The contractor shall be responsible to provide all water, power, sanitary facilities and telephone services as required for the contractors use during construction.
H. The contractor shall be held responsible for any field changes made without prior written authorization from the owner, engineer, and/or any regulatory agency.
I. The contractor shall maintain a neatly marked set of full -size as-built record drawings showing the final location and layout of all roadways, piping and conduits, structures and other facilities. As-built drawings are to be submitted by the contractor prior to substantial completion and Utah County's acceptance of the construction.
J. Work in easement and/or rights-of-way is subject to the approval and acceptance of the regulatory agency responsible for operation and/or maintenance of said easement and/or rights-of-way.
K. Contractor shall attend all preconstruction and construction conferences and weekly meetings

PART 3 EXECUTION

3.1 PRECONSTUCTION

A. The Contractor shall notify the Utah County Public Works Department (801-851-8600) and Construction Management Division of Project Engineering Consultants (801-858-3290) a minimum of three (3) weeks before beginning work.
B. The Contractor is responsible to notify all appropriate government and private entities associated with the project. The following must be contacted 48-hours prior to construction as applicable to the project:

Utah County Public Works	(801) 851-8600
Pleasant Grove	
Public Works	(801) 785-3506
Fire Department	(801) 785-3506
Cedar Hills	
Public Works	(801) 785-9668
Fire Department	(801) 763-5365
American Fork	
Public Works	(801) 763-3060
Fire Department	(801) 763-3040
Blue Stakes	811
Rocky Mountain Power	(800) 469-3981
Century Link	(801) 356-6975
Alpine School District	(801) 610-8400
Utah Department of Transportation	(801) 965-4000
Utah Transit Authority	(801) 743-3882
Metro Water District of Salt Lake	(801) 942-1391

C. The contractor shall schedule a pre-construction meeting with Utah County prior to the start of construction. Those in attendance shall include Utah County, Pleasant Grove, Cedar Hills, American Fork, representatives of the consultant construction management team, representatives of the contractors and other affected agencies.

3.2 SCHEDULE

A. Prior to construction the contractor will provide Utah County Public Works and Project Engineering Consultants a baseline schedule for approval. The Contractor will provide weekly schedule updates.
B. Construction work during Pleasant Grove Strawberry Days June 16 through June 24, 2018 shall not be permitted between State Street and 400 North.
C. Construction work between State Street and 300 South shall be completed prior to June 16, 2018.
D. Construction work between 2600 North and 9600 North shall not be permitted along Canyon Road during Cedar Hills Family Festival (June 24th to 30th). Intersections and Canyon Road are to be open to traffic.
E. Regular work hours are seven (7) a.m. until seven (7) p.m. or dusk (whichever occurs first) of the same day, Monday through Friday. The Contractor will not permit overtime work outside of regular working hours or the performance of work on Saturday, Sunday or any legal holiday without receiving written consent from the Utah County Public Works Director. Requests for weekend work approval must be submitted, in writing to Utah County no later than Wednesdays at 3:30pm for the subsequent weekend and

requests for holiday work approval must be submitted, in writing to Utah County no later than 7:00 a.m., two (2) business days prior to the holiday.

F. Prior to construction in school zones, the contractor shall notify the school district 2 weeks in advance to coordinate construction staging and activities during pick-up and drop-off times.

3.3 GENERAL LIMITATIONS

A. Work in public streets, once begun, shall be prosecuted to completion without delay so as to provide minimum inconvenience to adjacent property owners and to the traveling public.

B. Existing rock wall located at 2520 N Canyon Road shall be protected in place and remain untouched by any construction activities. Contractor is responsible for any damage and compensation to landowner if wall is damaged.

C. Contractor shall work with property owners with impacts to existing fences to ensure temporary fencing and proposed fencing meet the needs of the owner as approved by Utah County.

3.4 PUBLIC INVOLVEMENT

A. Prior to beginning work on adjacent properties, the Contractor will obtain any permits to enter and construct from Utah County necessary to perform the work as documented in the plans. The contractor will be responsible for acquiring any additional permits made necessary by any changes to the plans after construction begins.

B. Access to any adjacent private property shall be maintained throughout the construction period.

C. The contractor is responsible to provide and distribute written notice to all residents located within the project area at least **72-hours** prior to construction. Work to be conducted within commercial or industrial areas may require a longer notification period and additional contractor coordination with property owners. The written notice is to be approved by Utah County, Pleasant Grove and Cedar Hills.

D. The contractor shall provide weekly updates to the project website. The contractor shall provide a call line and/or email for the public for correspondence.

3.5 PLANS

A. In case of discrepancy between scaled and figured dimensions, figured dimensions shall govern.

B. Failure of plans or specifications to mention specifically the provision of any item(s), or performance of any work or procedure which would normally be required to complete the project, shall not relieve the Contractor of his responsibility to provide such item(s) or to perform such work or procedure.

C. If for any reason proposed facilities cannot be constructed in accordance with approved plans, Contractor must immediately inform Construction Inspector. The Contractor will coordinate with the construction management team to determine the best practice solutions to construct the intent of County project plans.

3.6 CONSTRUCTION SITE

A. The contractor will comply with all public safety, state, county, city and OSHA standards.
B. The Contractor is required to keep all construction activities within the approved project limits. This includes, but is not limited to, vehicle and equipment staging, material storage and limits of trench excavation. It is the Contractor's responsibility to obtain permission and/or easements from the appropriate governing entity and/or individual property owner(s) for work or staging outside of the project limits.
C. The contractor shall assume sole and complete responsibility for jobsite conditions during the course of construction, including safety of all persons and property. This requirement shall apply continuously and not be limited to normal working hours; and that the contractor shall defend, indemnify and hold the owner and engineer harmless from any and all liability, real or alleged, in connection with the performance of work on this project.
D. Dust control shall be provided at all times, at the Contractor's expense, to minimize any dust nuisance and shall be in accordance with APWA specification 01 57 00. Water for dust control shall be drawn from an approved Pleasant Grove or Cedar Hills metered fire hydrant. The contractor is responsible for any costs for the use of city water.
E. The contractor agrees to:
    1. Be responsible to clean the job site at the end of each phase of work.
    2. Be responsible to remove and dispose of all trash, scrap and unused material at their own expense in a timely manner
    3. Be responsible to maintain the site in a neat, safe and orderly manner at all times
    4. Be responsible for their own safety, traffic control, permits, retesting and re-inspections at their own expense.
    5. Unless otherwise noted all excess soils and materials shall become the property of the contractor and shall be lawfully disposed of offsite at the Contractor's expense. Owner may designate a location adjacent to work for stockpiling of excess soils.
    6. Immediately remove any construction debris or mud tracked onto existing roadways.
    7. Repair any excavation or pavement failures caused by his construction.

3.7 CONSTRUCTION STAKING

A. Contractor shall be responsible for all construction staking.
B. Survey control - contractor must provide a registered land surveyor or persons under supervision of a registered land surveyor to set stakes for alignment and grade of each main and/or facility as approved. The stakes shall be marked with the horizontal location (station) and vertical location (grade)

C. The contractor will be responsible for furnishing, maintaining, or restoring all survey monuments and reference marks within the project site. Contact the county surveyor for section corner monuments and Pleasant Grove and Cedar Hills prior to impacting monuments to establish documentation and restoration requirements.

3.8 CONSTRUCTION STAGING

A. Contact Marty Beaumont (Pleasant Grove City Engineer, 801-785-2941), Jeff Maag (Cedar Hills Public Works Director, 801-785-9668) and/or Glen Tanner (Utah County Public Works, 801-851-8600) for City and County approved construction staging areas.
B. Construction vehicles shall use truck haul routes designated by Utah County, Pleasant Grove and Cedar hills.
C. Construction vehicles, contractor or private, and construction materials or equipment shall not be parked, placed, or stored within any public right-of-way that does not have the appropriate traffic control per the MUTCD.

3.9 MAINTENANCE OF TRAFFIC

A. Construction vehicles, contractor or private, and construction materials or equipment shall not be parked, placed, or stored within any public right-of-way that does not have the appropriate traffic control per the MUTCD.
B. For all work within public rights-of-ways or easements, the Contractor shall preserve the integrity and location of any and all public utilities and provide the necessary construction traffic control. Contractor shall, through the encroachment permit process, verify with the necessary regulatory agencies, and the need for any traffic routing plan. If plan is required, contractor shall provide plan and receive proper approvals prior to beginning construction.
C. The Contractor shall be responsible for all traffic control during construction. All traffic controls shall conform to Utah County's standards and specifications and the MUTCD latest edition. A plan shall be submitted to Utah County for review and acceptance two weeks prior to construction.
D. The Contractor shall immediately remove and replace traffic control devices which are damaged, do not function properly, or are determined by the construction inspector to be unsuitable for their purpose. Traffic control devices may be removed only upon approval of the construction inspector
E. The contractor shall provide all lights, barricades, signs, flagmen or other devices necessary for public safety.

3.10 MATERIAL

A. All construction and materials shall be in accordance with these contract documents and the most recent editions of the following unless otherwise noted and approved in writing by the Utah County Public Works Director.
    1. Pleasant Grove Standard Specifications and Drawings.
    2. Cedar Hills Design Standards and Public Improvement Specifications.

3. 2017 APWA Manual of Standard Plans and Specifications.
4. AASHTO "A Policy on Geometric Design of Highways and Streets".

B. Asphalt Guarantee - The Contractor shall remove, dispose of, furnish and place permanent asphalt per County and City standards as applicable to the project. The Contractor shall guarantee the asphalt restoration for a period as required by the governing entity.

C. The Contractor is responsible for providing soil, base aggregate and hot mix asphalt compaction testing. A certified technician must be onsite at all times during fill operations. Copies of soil compaction test results must be provided to, and approved by, the construction Inspection prior to placement of curbs and/or base aggregate. Copies of base aggregate compaction test results must be provided to, and approved by, the construction inspection prior to placement of hot mix asphalt.

D. Where ditch or waterway stabilization matting of any type is specified, installation shall be in accordance with manufacturer's recommendations. Matting shall be placed on bottom and side slopes to provide either 1.0' stabilized depth, unless otherwise indicated on plans.

E. Any asphalt pavement should not be placed until approved by the construction inspector.

F. Off-site borrow material to be imported for embankment construction and support of pavement is to meet the minimum subgrade soil specifications per Pleasant Grove Public Works Standard Specifications and Drawings. CBR testing of off-site borrow material shall be completed and the test results submitted to and approved by Utah County prior to delivery of the material. The paving design sections shown on the approved plans shall be reviewed and evaluated using the CBR testing results of the borrow material. Any changes to the pavement design sections based on the CBR test results shall be incorporated through the red-line revision process.

G. All backfill shall conform to APWA, Pleasant Grove and Cedar Hills standard plans and specifications.

H. All earthwork roadway materials shall be placed as outlined within the geotechnical report.

I. Asphalt and Soil Testing – The Contractor is to provide Marshall and Proctor test data 24-hours prior to use. The Contractor is to provide compaction and density testing as required by Utah County Public Works or other governing entity. Trench backfill material and compaction tests are to be taken per APWA standard specifications, Section 33 05 20 – Backfilling Trenches, or as required by the Utah County project Engineer if native materials are used. No native materials are allowed within the pipe zone. The maximum lifts for backfilling excavations is 8-inches. All materials and compaction testing is to be performed by a lab recognized and accepted by Utah County Public Works.

3.11 ROADWAY CONSTRUCTION

A. All underground utilities shall be in place prior to installation of curb, gutter, sidewalk and street paving unless prior approval is obtained.
B. All manhole rims, valves and monument boxes, etc. Shall be adjusted to finish grade after street paving, unless otherwise noted. Cost for this work shall be included in the unit prices for said facilities.
C. Payment for pavement will be made only for areas shown on plans. Replacement of pavement which is broken or cut during the installation of the work covered by these specifications, and which lies outside of said areas, shall be included in the contractor's unit price for pavement, and no additional payment shall be made for such work.

3.12 REMOVALS

A. If existing improvements need to be disturbed and/or removed for the proper placement of improvements as designated by the plans, the Contractor shall be responsible for protecting existing improvements from additional damage. Cost of replacing or repairing existing improvements shall be included in the unit price bid for items requiring removal and/or replacement of existing improvements. There will be no extra payment to the contractor for replacing or repairing existing improvements.
B. Whenever existing facilities are removed, damaged, broken, or cut in the installation of the work covered by these plans or specifications, said facilities shall be replaced at the contractor's expense, after proper backfilling and/or construction, with materials equal to or better than the materials used in the original existing facilities. The finished product shall be subject to the approval of the owner, the engineer, and the respective regulatory agency.

3.13 EROSION CONTROL / GRADING NOTES

A. The Contractor shall submit erosion control plans to the County, Pleasant Grove, and Cedar Hills for approval prior to construction.

3.14 CONSTRUCTION INSPECTIONS

A. Utah County has contracted with Project Engineering Consultants to provide construction management and inspection services.
B. All materials and workmanship shall be subject to inspection by Utah County, Pleasant Grove, and Cedar Hills. Utility inspections will be completed by Pleasant Grove and Cedar Hills. Utah County reserves the right to accept or reject any such materials and workmanship that does not conform to standards and specifications.
C. Inspections and onsite visits are not to be construed as a guarantee by Utah County of the contractors' contractual commitment. Requests for inspection by Utah County, Pleasant Grove, and Cedar Hills shall be made by the contractor a minimum of twenty-four (24) hours in advance.
D. All testing shall conform to the regulatory agency's standard specifications. All testing and inspection shall be paid for by the Owner; all re-testing and/or re- inspection shall be paid for by the contractor.

3.15 CLEARING AND GRUBBING

A. Clear and grub site as necessary. Contractor shall retain vegetation in areas where no grading is proposed.
B. Existing vegetation should be preserved wherever possible and disturbed portions of the site shall be stabilized. Stabilization practices may include, but are not limited to, temporary seeding, permanent seeding, mulching, geotextiles sod stabilization, vegetative buffer strips, protection of trees, preservation of natural vegetation and other appropriate measures. Use of impervious surfaces for stabilization shall be avoided.

3.16 UTILITIES

A. Contractor shall be responsible to protect in place all utilities shown or not shown on this plan.
B. Prior to opening an excavation, effort shall be made to determine whether underground installations; i.e. sewer, water, natural gas, electric lines, etc., will be encountered and if so, where such underground installations are located. When the excavation approaches the approximate location of such an installation, the exact location shall be determined by careful probing or hand digging; and, when it is uncovered, adequate protection shall be provided for the existing installation. All known owners of underground facilities in the area concerned shall be advised of proposed work at least 48 hours prior to the start of actual excavation.

3.17 WATER LINE

A. All manholes, hydrants, valves, clean-out boxes, catch basins, meters, etc. Must be raised or lowered to final grade per public utilities standards and inspector requirements. Concrete collars must be constructed on all manholes, cleanout boxes, catch basins and valves per public utilities standards.
B. All manhole, catch basin, or cleanout box connections must be made with the pipe cut flush with the inside of the box and grouted or sealed as required by the public utilities inspector.
C. Contractor shall not allow any groundwater or debris to enter the new or existing pipe during construction.
D. Water system construction to be installed per the requirements of the applicable city.
E. All waterlines shall be minimum 48" and maximum 60" below finished asphalt to top of pipe. All valves and manhole lids shall be adjusted to finish grade, and inspection by the applicable city before pouring concrete collars. No hand mixed concrete.
F. A 2-foot minimum bury depth from final grade to top of pipe is required on all pressurized irrigation lines unless otherwise noted and approved by applicable city.
G. Contractor shall perform water line testing as required by the applicable city.
H. Contractor to install tracer wire on all "non-metallic" water line installations including laterals.
I. It shall be the contractor's responsibility to install pipe of adequate classification with sufficient bedding to meet all requirements and recommendations of the appropriate

regulatory agency, as well as the needs/loads of any construction activities prior to full coverage/full build out conditions.

J. It shall be the contractor's responsibility to use rubber gasket joints on all precast pipes. The cost for rubber gasket joints shall be included in the unit prices of pipe.

K. The contractor shall notify Pleasant Grove and Cedar Hills engineering staff of any problem impacting water and waste water facilities that would potentially require a variance from the approved plans and specifications. Any variance from the approved documents shall be at the sole discretion of the Pleasant Grove and Cedar Hills engineering staff.

L. Inspections – it is the contractor's responsibility to schedule any water, sewer, backflow and drainage inspection 48-hours in advance to when needed.

M. Damage to existing utilities - the contractor is responsible for repairing any damage, caused by any condition including settlement, to existing utilities from work performed at or near existing utilities. The contractor shall take all measures necessary to protect all existing public and private roadway and utility facilities. Damage to existing facilities caused by the contractor, must be repaired by the contractor at his/her expense, to the satisfaction of the owner of impacted facilities.

N. Utility locations – contractor will be responsible for locating and avoiding all utilities and service laterals, and for repairing all damage that occurs to the utilities due to the contractor's activities. Contractor is to verify location, depth, size, material and outside diameters of utilities in the field by potholing ahead of scheduled construction in order to identify potential conflicts and problems with future construction activities. Existing utility information obtained from plans must be assumed as approximate and requiring field verification. Contact blue stakes or appropriate owner for communication line locations.

O. Utility relocations – for utility conflicts requiring mainline relocations, the contractor must notify the applicable utility company or user a minimum of two-weeks in advance. A one-week minimum notification is required for conflicts requiring the relocation of service laterals. All relocations are subject to approval from the applicable utility company and/or user.

P. Field changes – no roadway, utility alignment or grade changes are allowed from the approved construction plans/documents without written approval from Utah County. Changes to hydrant locations and/or fire lines must be reviewed and approved by Pleasant Grove and Cedar Hills engineering staff.

Q. Public notice for water main shut downs - Pleasant Grove and Cedar Hills must be contacted and approve all water main shutdowns. Once approved the contractor must notify all effected users by written notice a minimum of 48-hours (residential) and 72-hours (commercial/industrial) prior to the water main shut down. Public utilities may require longer notice periods.

R. Water and sewer separation – in accordance with Utah's Department of Health regulations, a minimum ten-foot horizontal and 1.5-foot vertical (with water on top)

separation is required. If these conditions cannot be met, State and Utah County Public Utilities approval is required. Additional construction measures will be required for these conditions.

S. Salvage - all meters must be salvaged and returned to Pleasant Grove/Cedar Hills. Salvage all salvaged pipe and/or fittings must be returned to Pleasant Grove and Cedar Hills.

T. Pleasant Grove public utilities must approve all fire and water service connections. A minimum 3–foot separation is required between all water and fire service taps into the main. All connections must be made meeting Pleasant Grove public utilities requirements. A 5-foot minimum bury depth (final grade to top of pipe) is required on all water/fire lines unless otherwise approved by public utilities. Water line thrust block and restraints are as per Pleasant Grove approved detail drawings and specifications. All exposed nuts and bolts will be coated with chevron fm1 grease plus minimum 8 mil thickness plastic. Provide stainless steel nuts, bolts and washers for high groundwater/ saturated conditions at flange fittings, etc.

U. Cedar Hills public utilities must approve all fire and water service connections. A minimum 3–foot separation is required between all water and fire service taps into the main. All connections must be made meeting Cedar Hills public utilities requirements. A 4-foot minimum bury depth (final grade to top of pipe) is required on all water/fire lines unless otherwise approved by public utilities. A 2-foot minimum bury depth (final grade to top of pipe) is required on all pressure irrigation lines unless otherwise approved by Public utilities. Water line thrust block and restraints are as per Pleasant Grove approved detail drawings and specifications. All exposed nuts and bolts will be coated with chevron fm1 grease plus minimum 8 mil thickness plastic. Provide stainless steel nuts, bolts and washers for high groundwater/ saturated conditions at flange fittings, etc. All hydrants and valves removed must be salvaged and returned to Cedar Hills.

V. All waterlines installations and testing to be in accordance with applicable city's standards/specifications and in accordance AWWA sections C600, C601, C651, C206, C200, C900, C303 AWWA Manual M11 and all other applicable AWWA, UPWS, ASTM and ANSI specifications relevant to the installation and completion of the project. Amendment to section C600 section 4.1.1; document to read minimum test pressure shall not be less than 200 p.s.i. gauged to a high point of the pipeline being tested. All materials used for waterworks projects to be rated for 150 p.s.i. minimum operating pressure. In an instance of a conflict in standards/specifications, the applicable city's standards shall govern.

W. Contractor is to install water service lines, meter yokes and/or assemblies and meter boxes with lids located as approved on the plans per applicable public utilities detail drawings. Meter boxes are to be placed in the park strips or behind adjacent sidewalk perpendicular to the watermain service tap connection. All water meters, catch basins, cleanout boxes, manholes, double check valve detector assemblies, reduced pressure

detector assemblies and backflow prevention devices must be located outside of all approaches, driveways, pedestrian walkways and other traveled ways unless otherwise approved on plans.

X. The information shown on the plans with regard to the existing utilities and/or improvements was derived from field investigations and/or record information. The engineer does not guarantee these locations to be either true or exact. Utilities in the area of construction are approximate only. They have been located from field investigation and the best available utility records. The contractor shall be responsible for the location, protection and repair of all utilities encountered during construction whether shown on these plans or not.

3.18 SEWER LINE

A. Construction of the wastewater system improvements shall conform with Pleasant Grove and Cedar Hills design standards and construction specifications.
B. Contractor to flush and clear pipes prior to notifying the applicable city that sewer lines are ready for inspection and testing. The contractor will test after installation, but before paving. All testing to be done as per Pleasant Grove and Cedar Hills specifications and standards.
C. All manholes to have plywood invert protectors installed immediately after air testing, but in no case, later than commencement of street sub-grading.
D. If significant groundwater is encountered, additional trench dikes on the wastewater line may be required.
E. The applicable city must approve all sewer connections. All sewer laterals 6-inches and smaller must tie into the mains per the applicable city's requirements. All 8-inch and larger sewer connections must be petitioned for at the applicable city and connected at a manhole. Inside drops in manholes are not allowed. A minimum 4-foot bury depth is required on all sewer mains and laterals. Contractor shall install invert covers in all sewer manholes within the project area.

3.19 STORM DRAIN

A. Pipe elevations shown on storm drain profiles are invert elevations unless otherwise noted.
B. Inlet grates in sumps shall be constructed level at elevation given in structure schedule. Inlets on grade shall be adjusted so that slope of grate matches finished flow line of curb. Top elevation shall apply to centerline of grate at flow line of curb. Cross slope of the grate shall match the road cross slope.
C. The Contractor shall take all necessary and proper precautions to protect adjacent properties from any and all damage that may occur from storm water runoff and/or deposition of debris resulting from any and all work. The owner/contractor is responsible for obtaining a stormwater discharge permit for construction activities for any project disturbing over one acre from the Utah Department of Public Health.

3.20 SIGNING AND STRIPING

A. Striping and pavement markings shall be in conformance with APWA standard specifications and MUTCD.
B. The contractor shall renew or replace any existing traffic striping and/or pavement markings, which have been either removed or the effectiveness of which has been reduced during his operation. Renewal of pavement striping and marking shall be done in conformance with APWA standard specifications.
C. The contractor shall be responsible for the removal of all striping and/or pavement markings necessary to tie existing striping into future striping. Method of removal shall be by waterblasting, unless otherwise approved by engineer
D. The contractor shall be responsible for removing and replacing any existing signs, structures, fences, etc., encountered on the job and restoring them to their original condition if necessary to perform road work and improvements identified in the plans.

3.21 RIGHT-OF-WAY

A. Contractor shall obtain an encroachment permit where applicable for any work done within rights-of-way or easements from Pleasant Grove and Cedar Hills, 24 hours in advance of commencing the work, or as required by said permits.
B. The contractor shall exercise due caution and shall carefully preserve bench marks, control points, reference points and all survey stakes, and shall bear all expenses for replacement and/or errors caused by their unnecessary loss or disturbance.
C. The contractor is responsible for any permits needed for construction from Metro Water District of Salt Lake, Jordan Valley Water Conservancy District, Central Utah Water Conservancy District, and Provo Reservoir Canal.

3.22 PERMITS FEES AND AGREEMENTS

A. Contractor must obtain all the necessary permits and agreements and pay all applicable fees prior to any construction activities. Contact Utah County Public Works, Pleasant Grove, Cedar Hills, and water agencies for permits and inspections required for any work conducted within Utah County’s public right-of-way and utility easements. Applicable utility permits may include mainline extension agreements and service connection permits. All utility work must be bonded. All contractors must be licensed to work on city utility mains.
B. Construction sites must be in compliance with the Utah Pollution Discharge Elimination System (UPDES) storm water permit for construction activities (801-538-6923). A copy of the permit’s storm water pollution prevention plan must be submitted to Public Works for review and approval. Additional water quality and erosion control measures may be required.

3.23 STAMPED CONCRETE

A. Stamped colored concrete shall be integral colored concrete of 2% loading of Solomon color 755 Driftwood.

B. After initial floating, sprinkle Solomon CR385 dark brown release agent over surface. Allow color to absorb some water from the slab (approximately two to 10 minutes). Lightly trowel the color mix into the slab. Broadcast another layer of dark brown release agent and imprint a texture using a random stone pattern (brick from RAFCO products). After imprinting pattern, sprinkle surface with more dark brown release agent over entire surface. After concrete has set for 24 hours, remove the release agent with water by scrubbing using a stiff brush and a mixture of muriatic acid and water so to leave a small amount of release agent in the cracks and irregular surfaces. Power wash with engineer approval only. After surface has dried and is clean of all debris, use a roller to completely cover and seal the surface with two coats of clear concrete sealer equal to Sonneborn Kure-N-Seal #0900 or Ultra Seal. Meet manufacturer's recommendations for seal application. Clean all dye and release agent off all surfaces.

END OF SECTION

SECTION 01 26 00.1S
MISCELLANEOUS REPAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Procedures for allocating Utah County contingency funds

1.2 DEFINITIONS
A. Contingency – Utah County has set aside funds to be allocated at the discretion of Utah County's Engineer in conjunction with Utah County's Public Works Director for miscellaneous repairs through the duration of the project.

1.3 PRELIMINARY PROCEDURES
A. Utah County reserves the right to increase/decrease the quantities identified in the bid schedule. Estimated quantities are based on preliminary field review for bidding purposes only. Actual quantities needed for construction will be determined by the Contractor and verified. Quantities may be reduced, deleted, or increased beyond the bid quantities listed in the contract. Actual quantities will be paid at the agreement unit price.
B. Contractor shall submit contract changes in accordance with APWA Section 01 26 00 to Resident Engineer and Utah County.
C. Contractor shall supplement submittal with documentation supporting changes to contract.
D. Utah County's Engineer in conjunction with Utah County's Public Works Director will review proposals and/or claims for approval
E. If approved, Utah County's Engineer shall prepare a Change Order in accordance with APWA Section 01 26 00.
F. Funds shall be paid per contract agreement, in accordance to work completed, inspected and approved.

PART 2 PRODUCTS Not Used

PART 3 EXECUTION Not Used

END OF SECTION

SECTION 01 57 00S
TEMPORARY CONTROLS

This specification adds to the APWA Standard Specification 2017 Edition Section 01 57 00. All other provision of the Section remain in full force and effect.

PART 2 PRODUCTS

Add the following:

2.2 TEMPORARY ENIVORMENTAL CONTROLS

A. Fiber Roll
   1. Diameter (minimum weight per linear foot)
      a. 18 inch (3 lb per linear foot)
      b. 12 inch (2 lb per linear foot)
      c. 9 inch (1 lb per linear foot)
   2. Functional Longevity – 24 months minimum (includes netting material).
   3. Matrix material – Wood excelsior, rice or wheat straw, and coconut fibers (coir) or in combination.
      a. Material must be weed free.
   4. Netting – UV stabilized synthetic or coir material, with 1 inch maximum opening size, secured at end for matrix containment.
   5. Wood Stakes
      a. 18 inch Fiber Roll – ¾ inches and 1½ inches by 3 feet minimum dimensions.
      b. 12 inch Fiber Roll – ¾ inches and 1½ inches by 18 inch minimum dimensions.
      c. 9 inch Fiber Roll – ¾ inches and 1½ inches 18 inch minimum dimensions.

B. Gutter-Inlet Barrier
   1. Apparent Opening Size (ASTM D 4751) – between 20 and 40 sieve.
   2. UV Resistance (ASTM D 4355) – 65 percent minimum.
   3. Flow Rate (ASTM D 4491) – 100 gpm/ft2 minimum.
   4. Filter Material – Monofilament, woven or nonwoven geotextile.
   5. Provide protection to entire inlet opening.
   6. Types:
      a. Above Inlet Grate
         1) Mount securely to the top side of the inlet grate at each corner with cable ties, wire or similar.
      b. Inlet Cover Grate
         1) Sewn geotextile fabric that envelopes entire inlet grate.
         2) Must have built-in lifting straps or other device to allow removal of inlet grate and barrier.
      c. Below Inlet Grate
         1) Mount device securely to the inlet grate or have independent frame that allows geotextile bag to hang below grate to capture runoff.

2) Must be designed with a bypass feature that allows stormwater to be conveyed into the conveyance system when geotextile is filled to capacity.
3) Must be able to remove from storm drain inlet and maintain device without dumping captured sediment into the storm drain system.

PART 3 EXECUTION

Add the following:

3.7 PREPARATION

A. Refer to installation procedures outlined in the AASHTO Construction Stormwater Field Guide. http://environment.transportation.org/pdf/field_guides/field_guide_construction_stormwater.pdf
B. Install gutter-inlet barrier according to manufacturer's recommendations.

3.8 INSPECTION

A. Check installed controls before and after each rain event to verify proper working function.
B. Replace controls that are not properly working to prevent erosion and sedimentation.

3.9 MAINTENANCE

A. Maintain controls to function properly until surrounding disturbed areas have met final stabilization measures.
B. Remove accumulated sediments from controls when depth reaches 50 percent of the control height or when it interferes with the performance of the control.
C. Properly dispose of accumulated sediment.

3.10 REMOVAL

A. Remove temporary environmental controls when surrounding disturbed areas have met final stabilization measures, except as follows:
   1. Do not remove perimeter controls, such as silt fence, fiber rolls or straw bales, when they protect a wetland or waterway unless the surrounding area meets final stabilization requirements identified within the UCGP.
   2. When the Engineer determines that controls should remain in place.
B. Remove temporary environmental fence and posts upon completion of constructions.

END OF SECTION

SECTION 02 41 13S
SELECTIVE SITE DEMOLITION

This specification adds to the 2017 Edition APWA Standard Specification Section 02 41 13. All other provision of the Section remain in full force and effect.

PART 3 EXECUTION

3.8 RELOCATE FENCE

A. Remove fence, posts, and foundations to at least 2 feet below subgrade or finished ground lines. Reuse the existing fence and posts to rebuild the fence in the new location designated in the plans.

B. The Engineer will determine if the existing fence and posts can be reused for relocating the fence. If the Engineer determines the exiting materials are not suited for reuse, then install new fence and posts to match the existing fence that is being replaced. All relocated posts must be installed in a new foundation as needed.

3.9 RELOCATE WALL

A. Relocate the existing wall and foundation to the new location designated in the plans. If the wall cannot be relocated using the same materials that currently exists, then use new materials to reconstruction the same type of fence being replace.

B. Use only materials approved by the Engineer.

3.10 REMOVE CONCRETE CURB AND GUTTER

A. Remove concrete curb and gutter and parts of such improvements to an existing joint or joint sawed with a vertical face.

B. Remove material to provide proper grades and connections.

3.11 REMOVE SIGN

A. Remove signs, posts, and foundations to at least 2 feet below subgrade or finished ground lines.

3.12 REMOVE PRECAST CONCRETE BARRIER

A. Remove connection pins and concrete barrier including any stabilization pins.

B. Dispose or salvage as required. Contact the Engineer for delivery location and coordination for salvaged barrier.

END OF SECTION

SECTION 32 01 05.1S
RECTANGULAR RAPID FLASHING BEACONS (RRFB)

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide a rectangular rapid flashing beacon (RRFB) LED light assembly. The RRFB shall be hard wired to 110V-240V power supply or powered by a solar-assisted battery. The RRFB shall be pedestrian-activated by pushbutton.

1.2 RELATED SECTIONS

A. APWA Section 32 01 05 Information, Regulatory, and Warning Signs

1.3 REFERENCES

A. MUTCD: Manual on Uniform Traffic Control Devices for Streets and Highways, Chapter 4L. 2009 Edition.

1.4 SUBMITTALS

A. Prior to ordering equipment, obtain approval from Engineer for manufacturer equipment. Submit the following:
   1. List of equipment and materials including manufacturer name, product data sheet, product size, and identification number.
   2. Detailed shop drawings, wiring diagrams, and certifications.
   3. Manufacturers' warranties, guarantees, instruction sheets, and part lists.
   4. List of power source for each location installation
      a. Identify whether hard-wired or solar powered.
      b. If hard-wired, identify power source

1.5 WARRANTY

A. Supplier will warranty all materials for a period of three years against defect or deterioration.

B. Contractor will warranty all installation and workmanship for a period of one year following final acceptance of system installation.

1.6 GENERAL REQUIREMENTS

A. RRFB shall be in conformance with all applicable MUTCD standards and guidelines, and shall exceed the minimum requirements specified in FHWA Memorandum IA-11, Interim Approval for Optional Use of RRFBs. It shall consist of rapidly and alternately flashed rectangular yellow indications having LED-array based pulsing light sources, and shall be designed, located, and operated in accordance with the detailed requirements specified in Memorandum IA-11, Interim Approval for Optional Use of RRFB and subsequent amendments as detailed herein.

1. Each RRFB shall be a complete assembly including controller, LED indications in a light bar, and signage, pushbutton, pole shaft, pedestal base and foundation. If 110V-240V power source cannot be hard-wired, RRFB shall include battery and solar panel.
2. An RRFB assembly will have two (2) light bars (mounted back-to-back, facing dual directions).
3. Each light bar shall house two rapidly and alternately flashing rectangular yellow indications and one yellow side-mounted pedestrian indication, each with an LED-array based light source. The LED-based pulsing light arrays shall be designed, located and operated in accordance with the detailed requirements as specified on the plans. Active vehicle indications shall be visible at distances over 1000 feet during the day and over 1 mile at night.
4. Individual components shall be replaceable independently of other components, equipped with approved terminal strips or wire-end molded connectors.

1.7 FUNCTIONAL REQUIREMENTS

A. Per FHWA guidelines, RRFB shall be normally dark, shall initiate operation only upon pedestrian actuation, and shall cease operation at a predetermined time after the pedestrian actuation. The flash cycle duration should be based on the MUTCD procedures for timing of pedestrian clearance times for pedestrian signals: refer to MUTCD 2009 Section 4E.06 and any State-specified regulations.

1. Each of the two yellow vehicle indications of an RRFB shall have 70 to 80 periods of flashing per minute and shall have alternating, but approximately equal, periods of rapid flashing light emissions and dark operation. During each of its 70 to 80 flashing periods per minute, one of the yellow indications shall emit two medium rapid pulses of light and the other yellow indication shall emit four short rapid pulses of light followed by a long pulse.

   The outside edges of the RRFB indications, including the light bar, shall not project beyond the outside edges of the W11-2.The flash rate of each individual yellow indication, as applied over the full on-off sequence of a flashing period of the indication, shall not be between 5 and 30 flashes per second, to avoid frequencies that might cause seizures.
2. Each RRFB shall operate on 110V-240V power per manufacture specifications. If 110V-240V power source is not feasible, RRFB shall be powered by solar-assisted battery power with County approval.
3. Upon activation by ADA-compliant pushbutton, the two yellow indications in each RRFB shall flash in a rapidly alternating “wig-wag” flashing sequence (left indication on, then right indication on).
4. The light intensity of the vehicle indications shall meet the minimum specifications of Society of Automotive Engineers (SAE) standard J595 (Directional Flashing Optical Warning Devices for Authorized Emergency, Maintenance, and Service Vehicles) dated November 2008. Manufacturer certification of compliance shall be provided upon request.
5. When activated, all indications associated with a given crosswalk (including those with an advance crossing sign, if used) shall simultaneously commence operation of their alternating rapid flashing within 120msec, and shall cease

operation at a predetermined time after the pedestrian actuation.
6. The duration of the flash cycle shall be programmable from 1 second to 24 hours, in increments of seconds, minutes and hours.
7. The pedestrian indication shall be directed at and visible to pedestrians in the crosswalk, and it shall flash concurrently with the vehicle indications to give confirmation that the RRFB is in operation.
8. The system shall include an actuation counter providing data that can be downloaded on-site to a laptop computer using DB9 or USB type cables.
9. Autonomy with a fully charged battery shall be up to 14-28 days without sun, dependent upon ambient temperature and number of activations unless unit has hard wired power supply.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide a complete solar-powered RRFB assembly, consisting of but not limited to the Light Bar with LED indications, solar panel, battery, mounting hardware and electrical components including wiring and solid-state circuit boards. The RRFB assembly shall include the following items:

2.2 LIGHT BAR HOUSING AND INDICATIONS

A. The light bar housing shall be constructed of durable, corrosion-resistant powder-coated aluminum with stainless steel fasteners.
B. Enclosed components shall be modular in design whereby any component can be easily replaced using common hand tools, without having to remove the housing from the pole.
C. All mounting hardware required for mounting the Light Bar housing shall be provided, and shall be stainless steel.
D. Each of the two vehicle RRFB LED indications shall be approximately 7.25" wide x 3" high.
E. A pedestrian LED indication, approximately 0.5" wide x 2.5" high, shall be side-mounted in the Light Bar housing to be directed at and visible to pedestrians in the crosswalk.
F. The LEDs used shall be rated for a minimum 15-year life span.

2.3 CONTROLLER

A. The Controller shall be housed in a NEMA 4X rated aluminum enclosure, intended for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water, hose-directed water, and damage from ice formation.
B. The LED light outputs and flash pattern shall be completely programmable, with the capability to actuate RRFB LED-enhanced signs.
C. The flashing output shall have 70 to 80 periods of flashing per minute, during which one of the yellow indications shall emit two medium pulses of light and the other yellow indication shall emit four short rapid pulses of light followed by a long pulse. The output current shall be maintained as programmed for the duration of the pulse. The flashing

output shall be programmable.

D. The Controller shall be reconfigurable if future MUTCD or State guidelines specify a different flash pattern.
E. The Controller shall be capable of storing input count data in preset intervals, with downloadable capabilities using optional Windows-based PC software program and standard RS232 programming cable.
F. The Controller shall be, in the unlikely event of failure, replaceable independently of other components.

2.4 POWER SOURCE

2.4.1 110V-240V POWER

A. It is preferred that the RRFB runs on 110V-240V power.
B. Contractor to follow manufacturer power source and wiring requirements
C. Contractor to furnish and install conduit, boxes, and wiring from power source to RRRBs.
D. Contractor to coordinate Rocky Mountain Power field visit to identify power source locations.
E. If 110V-240V power source is not feasible and with Utah County's approval, Contractor to provide RRFB with battery and solar panel.

2.4.2 BATTERY

F. The battery shall be a 12VDC absorbed glass mat (AGM) sealed lead- acid, maintenance-free battery.
G. The battery shall be rated at 45AH minimum and shall conform to Battery Council International (BCI) specifications.
H. The battery shall be solar-charged with a capacity up to 30 days of autonomy without sunlight, varying with ambient temperature and number of activations.
I. The battery shall be replaceable independently of other components.
J. The battery shall have a minimum operating temperature range of -76º to 140ºF (-60º to 60ºC).

2.4.3 SOLAR PANEL

A. The solar panel shall provide 55 watts at peak total output.
B. The solar panel shall be affixed to an aluminum plate and bracket, adjustable at an angle of 45°- 60° to facilitate adjustment for maximum solar collection and optimal battery strength.
C. The solar panel assembly (panel, plate and bracket) shall be mounted on 360º rotatable pole cap mount, to facilitate adjustment for maximum solar collection and optimal battery strength.
D. Rated for 90mph wind conditions.
E. The solar panel shall have a minimum operating temperature range of -40º to 185ºF (-40º to 85ºC).

2.5 SIGNS AND PLAQUES

A. All signs shall conform to MUTCD standards.

B. All sign blanks and plaques shall be federally specified .080 gauge, 5052 aluminum.
C. Unless specified otherwise, sign sheeting shall be 3M™ DG3 diamond grade cubed or equivalent prismatic sheeting, with anti-graffiti overlay.
D. All sign assemblies shall use provided anti-vandal fasteners and tools to mount components to sign, and sign to fixture.
E. Crossing signs shall be W11-2 per MUTCD.
F. Crossing plaques W16-7P shall also accompany the crossing signs.
G. Pedestrian pushbutton instruction signs shall be furnished, at a minimum size of 5" x 7", to be mounted adjacent to or integral with each pedestrian pushbutton.

2.6 PUSHBUTTON

A. The push button shall be capable of continuous operation within a temperature range of -30º to 165ºF (-34º to 74ºC).
B. The push button shall be ADA compliant, and shall operate as a normally open (n/o) circuit.

PART 3 EXECUTION

3.1 GENERAL

A. Construct sign post foundations with concrete according to dimensions.

B. Install RRFBs in accordance with the final design drawings, this specification and the approved RRFB manufacturer's recommendations, construction manual, details and specifications.

   1. Where the County/City's and the selected RRFB system manufacturer's specifications/requirements differ, the stricter of the two will be applied.

3.2 WARRANTY

A. Provide supplier and contractor warranties to the Engineer within 5 working days following the final acceptance of installation of RRFB system.

END OF SECTION

SECTION 32 01 05.2S
RADAR SPEED FEEDBACK SIGNS

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Provide a radar speed feedback sign (RSFS) and sign assembly. The RSFS shall be shall be hard wired to 110V-240V power supply or powered by a solar-assisted battery

1.2 RELATED SECTIONS
A. APWA Section 32 01 05 Information, Regulatory, and Warning Signs

1.3 REFERENCES
A. MUTCD: Manual on Uniform Traffic Control Devices for Streets and Highways. 2009 Edition.

1.4 SUBMITTALS
A. Submit the following no more than 15 days prior to beginning RSFS work:
   1. List of equipment and materials including manufacturer name, size, and identification number.
   2. Detailed shop drawings, wiring diagrams, and certifications.
   3. Manufacturers' warranties, guarantees, instruction sheets, and part lists.

1.5 WARRANTY
A. Supplier will warranty all materials for a period of three years against defect or deterioration.
B. Contractor will warranty all installation and workmanship for a period of one year following final acceptance of system installation.

1.6 General Requirements
A. Radar speed signs shall be in conformance with all applicable MUTCD standards and guidelines. It shall consist of a high intensity LED display with 18" characters with a flashing digit violator alert.
   1. Each RSFS shall be a complete assembly including controller, power supply (hard wired power source or battery and solar panel), LED indications and radar unit, signage, pole shaft and pedestal base.
   2. The color of the changeable message legend shall be a yellow legend on a black background.
   3. Violator alerts may be set in 1 mph increments in any order of hierarchy or individually disable.
   4. Active vehicle indications shall be visible at distances over 1000 feet.
   5. Individual components shall be replaceable independently of other components,

equipped with approved terminal strips or wire-end molded connectors.

1.7 Functional Requirements

A. All elements of the RSFS shall conform to the guidance and standards as outlined in the latest edition of the MUTCD.
   1. Timing of flashing digit violator alert allows various timing options.
   2. It is preferred that each RSFS have a hard-wired power source.
   3. If 110V-240V power source is not feasible and with Utah County's approval, Contractor to provide integrated battery and solar panel.
   4. Upon activation by speeding vehicle, the digital display will flash.
   5. The light intensity of the digital display will automatically adjust to the ambient light conditions.
   6. A single cycle ON/OFF clock to provide time of operation options.
   7. Provides built-in on-screen diagnostics.
   8. Autonomy with a fully charged battery shall be up to 14-28 days without sun, dependent upon ambient temperature and number of activations.

PART 2 PRODUCTS

2.1 GENERAL

A. Provide a complete RSFS assembly, consisting of but not limited to the digital display with LED indications, power supply (hard wired power source or battery and solar panel), mounting hardware and electrical components including wiring and solid-state circuit boards. The RSFS assembly shall include the following items:

2.2 RADAR UNIT

A. Radar unit must be stationary directional radar that monitors speed of vehicles coming toward the speed display sign. The unit shall have a radar pickup distance of approximately 300 – 600 feet.
B. The radar sensor frequency will be 24,125 GHz with an accuracy of 3% +/-.
C. Radar beam width approximately 12 to 18 degrees.
D. Speed measurement must be available in miles per hour (MPH).
E. Radar target speed range must include 5 MPH to 99 MPH.
F. Radar unit must be enclosed within the display unit box.

2.3 110V-240V POWER

A. It is preferred that the RSFS runs on 110V-240V power.
B. Contractor to follow manufacturer power source and wiring requirements
C. Contractor to furnish and install conduit, boxes, and wiring from power source to RRRBs.
D. Contractor to coordinate Rocky Mountain Power field visit to identify power source locations.

E. If 110V-240V power source is not feasible and with Utah County's approval, Contractor to provide RSFS with battery and solar panel.

2.4 BATTERY

A. The battery shall be a 12VDC absorbed glass mat (AGM) sealed lead- acid, maintenance-free battery.
B. The battery shall be rated at 45AH minimum and shall conform to Battery Council International (BCI) specifications.
C. The battery shall be solar-charged with a capacity up to 30 days of autonomy without sunlight, varying with ambient temperature and number of activations.
D. The battery shall be replaceable independently of other components.
E. The battery shall have a minimum operating temperature range of -76º to 140ºF (-60º to 60ºC).

2.5 SOLAR PANEL

A. The solar panel shall provide 40 to 85 watts at peak total output.
B. The solar panel shall be affixed to an aluminum plate and bracket, adjustable at an angle of 45°- 60° to facilitate adjustment for maximum solar collection and optimal battery strength.
C. The solar panel assembly (panel, plate and bracket) shall be mounted on 360º rotatable pole cap mount, to facilitate adjustment for maximum solar collection and optimal battery strength.
D. Rated for 90mph wind conditions.
E. The solar panel shall have a minimum operating temperature range of -40º to 185ºF (-40º to 85ºC).

2.6 SIGNS AND PLAQUES

A. All signs shall conform to MUTCD standards.
B. All sign blanks and plaques shall be federally specified .080 gauge, 5052 aluminum.
C. Unless specified otherwise, sign sheeting shall be 3M™ DG3 diamond grade cubed or equivalent prismatic sheeting, with anti-graffiti overlay.
D. All sign assemblies shall use provided anti-vandal fasteners and tools to mount components to sign, and sign to fixture.
E. Speed limit signs shall be R2-1 per MUTCD.

PART 3 EXECUTION

3.1 GENERAL

A. Construct sign post foundations with concrete according to dimensions.
B. Install RSFSs in accordance with the final design drawings, this specification and the approved RSFS manufacturer's recommendations, construction manual, details and specifications.

1. Where the County/City's and the selected RSFS system manufacturer's specifications/requirements differ, the stricter of the two will be applied.

3.2 WARRANTY

A. Provide supplier and contractor warranties to the Engineer within 5 working days following the final acceptance of installation of RSFS system.

END OF SECTION

SECTION 32 01 07S
RELOCATE POST MOUNTED SIGNS AND MAIL BOXES

This specification adds to the APWA Standard Specification 2017 Edition Section 32 01 07. All other provision of the Section remain in full force and effect.

PART 1 GENERAL

Add the following:

1.1 SECTION INCLUDES
C. Relocate monument sign lighting.

1.2 REFERENCES
C. NFPA Standards 70 National Electric Code.

1.3 DEFINITIONS
B. **Monument Sign**: Manila Est. 1890 located in the corner of Canyon Road and 2600 North.

1.4 RELATED SECTIONS
A. APWA Section 33 71 73 Electrical Utility Services.

PART 2 PRODUCTS

Add the following:

2.1 MATERIALS

D. Conduit: Section 26 05 33
E. Conductors: Section 26 05 13 or required by NFPA 70.

PART 3 EXECUTION

Add the following:

3.6 MONUMENT SIGN LIGHTING
A. Follow specifications of Section 33 71 73 for electrical work.

END OF SECTION

SECTION 32 31 13.1S
TEMPORARY CHAIN LINK FENCE

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Chain link fabric, posts, braces, anchorage, hardware and appurtenances.

1.2 RELATED SECTIONS
A. APWA Section 32 31 13 Chain Link Fences and Gates.

1.3 SUBMITTALS
A. Drawings: Indicate plan layout, grid, size and spacing of components, accessories, fittings, anchorage, and post section.

PART 3 EXECUTION

3.1 GENERAL
A. Temporary chain link fence must match the height of the existing fence that is being replaced. Temporary fence must provide the same security and retention capabilities that is provided by the existing fence being removed. Must be able to withstand wind load and retain animals in yard where the fence is placed.
B. Temporary chain link fence must be installed and fully functional prior to removal of the existing fence.
C. The final fence must be installed and fully functional prior to the removal of the temporary chain link fence.

END OF SECTION

SECTION 32 91 20S
LANDSCAPE RESTORATION

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Restore existing landscape that is impacted by work on this project.
B. Restore existing irrigation systems that are impacted by work on this project.

1.2 RELATED SECTIONS
A. Section 32 84 23 Underground Irrigation Systems
B. Section 32 91 13 Structural Soil Mix
C. Section 32 91 19 Landscape Grading
D. Section 32 92 00 Turf and Grass
E. Section 32 93 13 Ground Cover
F. Section 32 93 43 Tree
G. Section 32 98 00 Vegetation Establishment Period

1.3 SUBMITTALS
A. Product data: Manufacturer's technical data and installation instructions for all new materials.
B. Existing conditions drawings: Plan layout and details illustrating location, size, and assembly of existing landscape materials, irrigation mainline and lateral lines. Indicate numbers and types of all materials that are to be removed and reestablished.
C. Irrigation as-built drawings: Red-lined plan layout and details illustrating mainline and lateral lines location, size, and assembly. Include type and coverage of heads, type of valves, controllers, fittings, and all accessories that have been reestablished. Indicate on the drawings which components are new and which are salvaged.
D. Operating and maintenance data for all new materials:
    1. Instructions covering full operation, care, and maintenance of the system, controls, and manufacturer's parts catalog. For example, include drain procedures and blow-out features.
    2. Train maintenance personnel how to properly adjust sprinkler heads and use special tools for adjustments.

PART 2 PRODUCTS

2.1 EXISTING PRODUCTS

A. Salvage existing landscape materials for relocation. If the materials are damaged in the process of being salvaged or if the contractor is not able to relocate the material while maintaining the pre-construction condition, the material will be replaced with new material of equal color, form and value.
   1. Existing landscape materials include, but are not limited to the following:
      a. Plant material
      b. Rock/wood mulch
      c. Topsoil
      d. Concrete edging
      e. Landscape edging (steel and plastic)
   2. Condition of all materials will be approved by the Engineer prior to relocation.
   3. Plant material will be replaced as approved by the Engineer.

B. Salvage existing irrigation system components for relocation. If the components are damaged in the process of being salvaged or if they are not capable of providing a functional system, replace them with new components of equal or greater value.
   1. Do not salvage existing pipe. Replaced pipe shall be new.

2.2 MATERIALS

A. Refer to the appropriate related section(s) for detailed material requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. The drawings do not show existing landscape materials and/or irrigation system components. The drawings do indicate locations where system impacts are anticipated. Verify construction impacts to the existing landscape materials and/or irrigation system and determine appropriate relocation of the materials/components.

3.2 PREPARATION

A. If construction within the right-of-way impacts existing landscape materials and/or an irrigation system, notify the owner of their landscaping and/or irrigation system that will be impacted. Coordinate how the work will be accomplished and when the work is to begin so that the owners can be prepared for restricted access to the landscape area and/or irrigation downtime.

3.3 INSTALLATION

A. Minimize disturbance to the owner’s existing landscaping and irrigation system. Coordinate restoration scheduling to minimize restricted access to the landscape area and irrigation system downtime.

B. Landscape materials:
   1. Coordinate approval of materials to be relocated with the engineer.
   2. Remove, relocate, repair, and install all landscape materials as required to fully restore the landscape area.
C. Irrigation system:
   1. Excavate, relocate, repair, and install irrigation pipes, heads, valves and wires to provide a fully functional irrigation system with irrigation head spacing that provides head-to-head coverage and minimizes overspray onto sidewalks and roads.
   2. Test the system for leaks before backfilling.
   3. Backfill and compact material in trenches and provide finish grading.

3.4 FIELD QUALITY CONTROL

A. Obtain approval of the final installation of all landscape materials and irrigation system components from the engineer.
B. Obtain a signed letter of acceptance from the property owner upon completion of the work on the landscape area and/or irrigation system.

END OF SECTION

SECTION 33 05 12S
TRENCH DRAINS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide trench drain system which has been manufactured and installed withstand live traffic loads and to maintain performance criteria stated by manufacturer without defects, damage or failure.

1.2 RELATED SECTIONS

A. APWA Section 31 23 16 Excavation
B. APWA Section 31 23 23 Backfilling for Structures
C. APWA Section 33 41 00 Drainage Systems

1.3 SUBMITTALS

A. Submit product data and installation instructions including manufacturer's product sheets for specified products.
B. Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.
C. Submit selection and verification samples for finishes, colors and textures.
D. Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 WARRANTY

A. Submit, for Engineer's acceptance, manufacturer's standard warranty document executed by authorized company official.

1.6 INSTALLER QUALIFICATIONS

A. Installer experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

PART 2 PRODUCTS

2.1 PRECAST TRENCH DRAIN SYSTEMS

A. Polymer Concrete System:
   1. Material: Polymer concrete.
   2. 4 inch channels, internal width.
   3. Slope: 0.6%
   4. Metal Edge Rail: galvanized steel or stainless steel
   5. Grates: ADA compliant, galvanized steel or stainless steel
   6. Grate Locking System
   7. Grate Load: 3300 lbs. or greater

PART 3 EXECUTION

3.1 PREPARATION

A. Comply with manufacturer's product data, including product technical bulletins, product catalog, installation instructions and installation section drawings.
B. Verify substrate conditions, which have been previously installed under other sections, acceptable for product installation in accordance with manufacturer's instructions.

3.2 INSTALLATION

A. Ensure channels are surrounded on all three sides by concrete of minimum 300 psi compressive strength. Check relevant installation section drawings for dimensions required. Expansion joints may be required.

3.3 INSPECTION

A. Ensure grates are in correct position and captive.
B. Ensure pipe and outlet connections are cleared and checked.

3.4 CLEANING

A. Remove temporary coverings and protection of adjacent work areas. Repair or replace damaged installed products. Clean installed products in accordance with manufacturer's instructions prior to Engineer's acceptance. Remove construction debris from project site and legally dispose of debris.

END OF SECTION

SECTION 33 41 01S
DRAINAGE PIPE END SECTIONS

PART 1 GENERAL

1.1 SECTION INCLUDES
A. Precast concrete and prefabricated steel end sections for drainage pipes.

1.2 RELATED SECTIONS
A. APWA Section 03 30 04 Portland Cement Concrete

1.3 REFERENCES
A. AASHTO M 218: Steel Sheet, Zinc-Coated (Galvanized), for Corrugated Steel Pipe.
B. ASTM A 500: Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
C. ASTM D 1056: Flexible Cellular Materials – Sponge or Expanded Rubber

PART 2 PRODUCTS

2.1 CONCRETE END SECTION
A. Concrete
   1. Wet cast – Class AA(AE). Refer to Section 03 30 04.
B. Use a qualified supplier of precast concrete products.

2.2 STEEL END SECTION
A. End Section: Galvanized steel sheeting according to AASHTO M 218.
B. Safety Bar for Safety End Section: Schedule 40 ASTM A 500 Class B steel pipe. Galvanize after fabrication according to AASHTO M 111.
C. Smooth Tapered Sleeve, when required: Galvanized steel sheeting according to AASHTO M 218.

PART 3 EXECUTION

3.1 GENERAL
A. Furnish precast concrete or prefabricated steel end sections compatible with the adjoining pipe.
B. Place the end section at the same alignment and slope as the adjoining pipe.
C. Embed the toe plate for steel end sections.

D. Connect the end section to the adjoining pipe.
   1. Use a 3/8 inch neoprene flat gasket when connecting to a dissimilar metal. Refer to ASTM D 1056.
E. Backfill and grade slopes to match the end section.

END OF SECTION

SECTION 34 41 14S
ATMS CONDUIT

PART 1 GENERAL

1.1 SECTION INCLUDES
A. ATMS conduit for communications and fiber optic cables.
B. Detectable pull tape, conduit, and all materials, labor, workmanship, equipment, and incidental items required for a complete system of conduit.

1.2 RELATED SECTIONS
A. APWA Section 31 05 13 Common fill
B. APWA Section 02 41 13 Selective Site Demolition
C. APWA Section 32 12 16.13 Plant-Mix Bituminous Paving
D. APWA Section 32 16 13 Driveway, Sidewalk, Curb, Gutter
E. APWA Section 31 05 15 Cement Treated Fill

1.3 REFERENCES
A. ASTM D 2241: Poly-Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)
B. ASTM F 2160: Solid Wall High Density Polyethylene (HDPE) Conduit based on Controlled Outside Diameter (OD).
C. National Electrical Code (NEC)
D. National Electrical Manufacturers Association (NEMA)
E. Underwriters Laboratories (UL)

1.4 SUBMITTALS
A. Manufacturer’s product data sheets and recommended installation instructions.
B. Manufacturer’s warranties and parts lists
C. Conduit Mandrel Test Form prior to substantial completion

PART 2 PRODUCTS

2.1 MATERIALS
A. Conduit and fittings for ATMS communication and fiber optic conduit
   1. Schedule 40 PVC rated at 194 degrees F as specified in NEMA TC-2, NEMA TC-3, and ASTM D 2241.
   2. High Density Polyethylene (HDPE) SDR11 rated complying with STM F 2160.
      a. HDPE conduit with smooth outer wall and ribbed or smooth interior wall.
      b. Fittings and couplers rated for a minimum of 130 psi.
      c. Mechanical type couplers when joining HDPE and PVC conduits.
   3. Microduct
      a. HDPE microduct with an outside/inside diameter of 0.500/0.394 inch (12.7/10

mm) or 0.630/0.512 inch (16/13 mm) or 0.709/0.551 (18/14 mm), as shown.
   b. Microduct having a ribbed interior.
   c. Watertight couplers rated for a minimum of 200 psi.
   d. Microduct bundle within a single 0.100 inch thick polyethylene oversheath.
   e. Microduct bundles must contain a factory installed #14 AWG solid, insulated locate wire and a minimum of two rip cords for removal of oversheath.

B. Conduit Banks
   1. New, prefabricated
   2. ATMS Multi-duct Conduit Types
      a. 1D = four 1.25-inch conduits
      b. 2D = eight 1.25-inch conduits
      c. 4D = sixteen 1.25-inch conduits
   3. Color-code each conduit or cell as follows:
      a. One, two, or three conduits gray
      b. 1D Bank 1 blue, orange, green and brown
      c. 2D Bank 1 blue, orange, green, and brown
         Bank 2 slate, white, red, and black
      d. 4D Bank 1 blue, orange, green, and brown
         Bank 2 slate, white, red, and black
         Bank 3 same as bank 1 with a contrasting stripe
         Bank 4 same as bank 2 with a contrasting stripe
   4. Microduct types:
      a. Individual 0.500/0.394 inch (12.7/10 mm) or 0.630/0.512 inch (16/13 mm) microducts installed loosely within new or existing conduit.
      b. MD2, MD3, MD4 and MD7: microduct bundle containing two, three, four or seven 0.709/0.551 inch (18/14 mm) microducts respectively.
      c. Factory-assembled bundles for bundled applications.
   5. Color-code microducts and oversheaths as follows:
      a. Individual microducts installed loosely within conduit or bundled within oversheath:
         1) blue
         2) orange
         3) green
         4) brown
         5) slate
         6) white
         7) red
         8) black
      b. Oversheaths:
         Bundle #1 blue
         Bundle #2 orange
         Bundle #3 green
         Bundle #4 brown

C. Meet or exceed all of the conduit manufacturer’s recommendations for materials used

in the installation of conduits including sweeps, adapters, couplings, glue, plugs, and fittings.
   1. Conduit plugs must seal the conduit and allow the secure fastening of detectable pull tape.

D. PVC conduit sections – Nominal 20 ft sections. Couplings and fittings must provide watertight integrity.
E. Sweeps – factory manufactured sweeps (11¼, 22½, 45, and 90 degree angles) complete with bell and spigot.
F. Detectable Pull Tape – flat profile, low stretch polyester, detectable, sequential footage marked, 1,200 lb tensile strength pull tape in each conduit.
G. Backfill
   1. APWA Section 31 05 15 Cement Treated Fill.
   2. APWA Section 31 05 13 Common Fill.
   3. Sand
      a. Friable natural river or bank aggregate, free of loam, detrimental, or soluble or organic matter.
      b. $^{3}/_{8}$ inch minus, well graded.
   4. Hand-mix grout
      a. Minimum strength – 50 psi
      b. Maximum strength – 150 psi
      c. Slump – 5 inches to 10 inches
H. Rigid Metal Conduit (RMC) complying with UL-6. Zinc galvanized exterior coating complying with ANSI C80.1.
I. Liquidtight Flexible Metal Conduit (LFMC), -30 degrees C to 80 degrees C rated, UL 360 listed.
J. Liquidtight Flexible Nonmetallic Conduit (LFNC), 80 degrees C dry, 60 degrees C wet rated, sunlight resistant, UL 1660 listed.

PART 3 EXECUTION

3.1 GENERAL

A. Maximum spacing between junction boxes and vaults
   1. 500 ft for electrical cable.
   2. 1,000 ft for fiber optic cable on tangent surface street installations.
   3. 2,500 ft for fiber optic cable on tangent highway installations.
   4. Reduce maximum spacing if horizontal or vertical deflection incurred during installation prevents the installation of cable within maximum pulling tension rating of the cable.
   5. Notify the Engineer if utility avoidance requires junction box and conduit locations differing from requirements for deflection in this Section, article 3.2.
B. Minimum Cover of Conduit

1. Minimum cover under pavement is 4ft and minimum cover under sidewalks is 3 ft.
2. Minimum cover in highway right-of-way, greater than 20 ft from the edge of the pavement is 3 ft.
3. Minimum cover in highway right-of-way, within 20 ft of the edge of the pavement is 5 ft.

3.2 INSTALLATION

A. Prevent conduit from deflecting vertically or horizontally along its length by a ratio greater than 10:1, (no more than 4-inch deflection per 40 inch in length) when installing conduit that houses communication cable.
B. Prevent sum total of the vertical and horizontal conduit deflection or bend between any two junction boxes from exceeding 270 degrees when installing conduit.
C. Install conduit within 1 ft of existing parallel conduit run if the planned location of conduit is parallel to the existing traffic signal or ATMS conduit.
D. Obtain approval for field bending of conduit with the Engineer in cases where factory sweeps are not appropriate. Field bending must be performed using a heat box or heat blanket. Torch heating conduit is prohibited. Install all conduit bends to have a radius that is not less than the following:
    1. 24 inches within the cabinet and pole foundations
    2. 36 inches in all other locations
    3. 46 inches for MD7 microduct bundle
    4. 40 inches for MD4 microduct bundle
    5. 36 inches for MD3 microduct bundle
    6. 32 inches for MD2 microduct bundle
    7. 12 inches for individual microduct
E. Install conduits that cross finished curbs and gutters, sidewalks, concrete flatwork, or textured or decorative surfaces by boring, jacking, or drilling. Replace any damaged concrete sections, joint to joint. Refer to Section 02 41 13.
F. Proof all conduit before installation of cabling and detectable pull tape.
    1. Use a mandrel at least 80 percent of the conduit diameter, at least twice as long as the conduit diameter, and composed of rigid material.
    2. Schedule proofing with the Engineer at least 5 working days in advance of performing the work.
    3. Proof all conduit with a Department representative witness present.
    4. Complete and submit a completed Conduit Mandrel Test Form for all ATMS conduit.
    5. Proof microducts using proofing balls.
    6. Proofing balls must maintain a minimum 80 percent fill ratio of inside diameter of the microduct being tested.
    7. Proofing must occur after all junction boxes have been installed to final grade, including placement of flowable fill or hand-mix grout at junction box walls, and after all excavation in the immediate proximity of the conduit system has been completed.
        a. Re-proof any conduit segment where excavation has occurred near the conduits following initial proof testing.

G. Provide detectable pull tape in all conduits.
   1. Install continuously between junction boxes.
   2. Fasten securely to conduit plug and leave 6 ft of pull tape slack inside of the conduit.
   3. Do not splice detectable pull tape in conduit.
   4. Use flat profile, low stretch polyester, 1,200 lb tensile strength detectable pull tape that is sequential footage marked.
   5. Verify that the pull tape is detectable throughout its entire length by performing a continuity test or equivalent verification.
   6. Detectable pull tape not required in microducts.

H. Encase open trench conduit in sand backfill covered by flowable fill within existing roadway, proposed roadway and sidewalk pavement areas only.
   1. Seal junction box wall around conduits using flowable fill or approved hand-mix grout.
   2. Use 12 inches of sand backfill covered with native material in all other areas.
   3. Refer to AT Series Standard Drawings.

I. Use rigid metal conduit or schedule 80 PVC conduit for above ground application.
   1. Liquidtight flexible metal conduit (LFMC) or liquidtight flexible non-metallic conduit (LFNC) is permitted in lengths not exceeding 6 ft where not subject to physical damage.
   2. Apply corrosion protection to any portion of rigid metal conduit buried in the ground or encased in concrete.

J. Use PVC or HDPE conduit for underground application. K. Warning Tape
   1. Install orange warning tape with black legend “Caution - Buried Communication Cable,” in all trenches containing multi-duct conduit or conduit containing communication cables.
   2. Install red warning tape with black legend “Caution – Buried Electric” in all other trenches.
   3. Not required when flowable fill is directly overlaid with asphalt pavement or PCCP.
   4. Not required when boring or plowing conduit.

L. Install a bushing or adapter at ends of all conduits that contain a conductor according to the NEC.

M. Furnish and install Utility Marker Posts along the longitudinal conduit running line.

N. Install a #14 AWG solid, insulated locate wire inside of new or existing conduit with individual microducts.
   1. Verify that all locate wires are detectable throughout their entire length by performing a continuity test or equivalent verification.

3.3 TRENCH

A. Paved Asphalt Surface
   1. Install T-patch over trenched area.
   2. Cut pavement from roadway surface to roadway base on both sides of trench to

provide a clean, straight wall for T-patch before any backhoe use.
3. Refer to AT Series Standard Drawings for depth of flowable fill under paved surfaces.
4. Evenly apply tack coat on final backfill before installing T-patch.
5. Place restoration patch – match the composition, density, and elevation (±¼ inch), of the existing surface.
6. Apply a hot-pour rubberized asphalt joint sealant or approved equal after the patch is installed.

B. Sidewalk or Decorative Pavement
1. Use flowable fill to bottom of new pavement or sidewalk.
2. Match existing pavement thickness. New pavement thickness must be 3½ inches minimum and 8 inches maximum.
3. Restore sidewalk or decorative pavement to original condition or better after work is completed.

C. Unpaved Surface
1. Backfill using native material, if suitable, that matches the composition, density, and elevation ((±0.2 inch), of the existing surface according to Section 31 05 13.
2. Dispose of surplus material promptly.
3. Sand Backfill
   a. Use sand backfill in trench sections outside of existing roadway, proposed roadway, and sidewalk pavement areas, including exposed conduit locations when plowing or boring.
   b. Provide 12 inches of sand backfill above conduit in trench.
      1) Backfill trench above sand to finished grade using native material.
         a) Backfill and tamp in 6 inch lifts.
   c. Compaction of sand backfill is not required.

D. Sleeve foreign utilities that cross a trench so they are not encased in flowable fill.

E. Place all conduits in the same trench whenever possible.

F. Flowable Fill or Hand-mix Grout
1. Install flowable fill or approved hand-mix grout to the wall of junction box to seal conduit entry into junction box.
2. Clean excess flowable fill or hand-mix grout from the inside of the junction box.

G. Install all conduits so the flowable fill or sand backfill completely encases all exterior surfaces of the conduit.
1. Separate multi-duct conduits using a commercially available conduit spacer or approved equivalent.
2. Place spacers no more than 4 ft apart and not more than 2 ft from each coupler.

H. Anchor the conduit in trench at 16 ft intervals to maintain the required conduit depth during flowable fill placement.

I. Minimum separation between all conduits and the wall of the trench is 1½ inches.

3.4 BORE OR PLOW

A. Immediately contain, remove, and properly dispose of all excess drilling fluid.

3.5 USE OF EXISTING OR OCCUPIED CONDUIT

A. Maintain the physical condition and functional integrity of all cabling and wiring in existing or occupied conduit.
B. Cable or wire installation in an existing or occupied conduit.
    1. Remove any existing fiber optic cable or copper wire.
    2. Test the integrity and clean the conduit by successfully pulling an Engineer approved mandrel through the conduit.
    3. Re-pull existing and new fiber optic cable or copper wire together.
    4. Perform all necessary splices and replace any impacted fiber cable and spider fan-out kits.
C. Use existing conduit in-situ only if shown and as approved by the Engineer.
D. Intercept individual microducts from existing microduct bundle mid-span and reroute to new junction box location:
    1. Type II-PC junction box
        a. Bury at existing microduct bundle depth.
        b. Notch the 24-inch box walls and install junction box over existing microduct bundle.
        c. Provide 12 inches of free draining granular backfill borrow underneath junction box.
        d. Encase all conduit in flowable fill or hand-mix grout where the conduit enters the junction box.
        e. Place locate ball or disk in junction box.
        f. Ground rod, and grout floor are not required.
    2. Conduit and microduct bundle inside of buried Type II-PC junction box.
        a. Install conduit from buried junction box to new junction box location for rerouting of individual microducts. Provide #14 AWG solid, insulated locate wire inside of new conduit between junction boxes.
        b. Extend conduit and microduct oversheath 6 inches beyond inside wall of the junction box.
        c. Expose microducts by removing no more than 20 inches of oversheath.
        d. Identify and cut only the individual microducts to be rerouted.
        e. Use approved couplers and extend microducts to new junction box using corresponding microduct color.
        f. Splice all locate wires together using an approved waterproof connector.
            1) Verify that the locate wire conductors are not exposed.
    3. New junction box location
        a. Install new junction box within 20 ft of buried junction box or within 20 ft of edge of roadway when existing microduct bundle is underneath roadway, to provide access to locate wire for mapping and locating purposes.

3.6 REPAIR OR RESTORATION

A. Restore all areas, including landscaping, concrete pavement, asphalt, finished curbs and gutters, box culverts, sewers, underground water mains, sprinkler systems, sidewalks, concrete flatwork, colored, textured, or decorative surfaces damaged during conduit and junction box installation.
B. Coordinate with local utilities for utility repair.
C. Notify the Engineer of all necessary repairs.
D. Replace all damaged facilities in kind.

E. Buried microduct bundle coupling and repair:
   1. Expose microducts by removing no more than 12 inches of oversheath beyond area to be coupled or repaired.
      a. Trim microducts to length as necessary to eliminate all bends and deflection.
   2. Use approved couplers.
   3. Splice the locate wires together using an approved waterproof connector.
      a. Verify that the locate wire conductors are not exposed.
   4. Protect exposed microducts, couplers and locate wire using split duct.
      a. Seal split duct joints and split duct ends around microduct bundle oversheath using approved waterproof sealing tape or other approved methods prior to backfill.
      b. Do not use heat-shrink or cold-shrink protection methods.

END OF SECTION

SECTION 34 41 15S

POLYMER CONCRETE JUNCTION BOX

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Polymer concrete junction boxes, ground rods, and maintenance markers. Includes Type I, Type II, and Type III Polymer-Concrete Junction Boxes per UDOT Standards.

1.2 RELATED SECTIONS

A. APWA Section 31 05 13 Common fill
B. APWA Section 02 41 13 Selective Site Demolition
C. APWA Section 32 12 16.13 Plant-Mix Bituminous Paving
D. APWA Section 34 41 14 ATMS Conduit
E. APWA Section 31 05 15 Cement Treated Fill
F. APWA Section 03 30 04 Concrete
G. APWA Section 32 13 73 Concrete Paving Joint Sealants

1.3 REFERENCES

A. ASTM C 579: Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
B. ASTM C 580: Flexural Strength and Modulus of Elasticity of Chemical- Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
C. American National Standards Institute (ANSI)
D. Society of Cable Telecommunications Engineers (SCTE) Standards
E. USDA Rural Utilities Service (RUS) Specifications

PART 2 PRODUCTS

2.1 FILL

A. APWA Section 31 05 13 Common Fill.
B. APWA Section 31 05 15 Cement Treated Fill.
C. Hand-mix grout
    1. Minimum strength – 50 psi
    2. Maximum strength – 150 psi
    3. Slump – 5 inches to 10 inches

2.2 JUNCTION BOXES AND LIDS

A. Junction boxes – pre-cast polymer concrete. Refer to DT-10 or The Utah Department of Transportation 2017 Standard Specifications and Standards Drawings for Road and Bridge Construction books found at: http://www.udot.utah.gov/go/2017standards for

Junction box sizing found on page AT 7A

B. Furnish boxes, rings, and lids that meet all the requirements identified on AT 7A
C. Use split lids with Type III-PC junction boxes where specified
D. Use lids for all junction boxes specified by application.
    1. Manufacture lids with the following marking in the logo area, in 1 inch cast in place recessed letters:
        a. "Utah County" on lid #1 and "Fiber Optic" on lid #2 for all Type III communication Junction Boxes.
        b. "Utah County" for all Type II communication Junction Boxes.
        c. Traffic Signal, Street Lighting, Electrical, and Landscaping also use this type of description.
E. Lid Access Points – recessed reinforced steel pull slots rated for 3000 pounds to allow removal of cover with a hook or lever. Replace lid if damage occurs to the pulling point.
F. Lid Bolt Holes – self draining.
G. Bolts – Zinc plated recessed hex head coil bolts with washer.

2.3 UTILITY MARKER POST

A. Not Required.

2.4 GROUND ROD

A. Ground Rods – Refer to Section 26 56 19.

2.5 WIRING

A. Ground Conductor – Refer to Section 26 56 19.

2.6 CONCRETE COLLAR

A. Class AA(AE) concrete – Refer to Section 03 30 04.

2.7 EXPANSION JOINT MATERIAL

A. Preformed expansion joint filler.

PART 3 EXECUTION

3.1 BACKFILL

A. Place 12 inches of free draining granular backfill under junction boxes.
B. Compact granular backfill borrow or approved native soil around the junction box collar. Match the top 6 inches to the composition, density, and elevation of the surrounding surface.

3.2 JUNCTION BOX AND EXTENSION

A. Install according to manufacturer's recommendations.
B. Precast junction boxes with precast conduit holes or drill holes to match conduit entry where required without damaging the box. Use grout to create a complete seal between conduit and the junction box wall. Finish grout smooth and flush with the interior wall.

1. Make drilled holes in junction box not more than ¼ inches larger than conduit diameter.
2. Seal conduit and microduct ends inside all junction boxes with at least 2 inch thick duct seal after cables are installed.
3. Seal vacant conduit and microducts with a manufactured conduit plug and attach detectable pull tape where applicable.

C. Level the top of junction box and grade with positive drainage away from the box.
D. Conduit in junction box
   1. Do not install conduit within 2 inches of junction box corner.
   2. Extend PVC conduit 2 inches, HDPE conduit 6 inches, microduct oversheath 6 inches and individual microducts 2 ft beyond the inside wall of the junction box.
   3. Align ATMS conduit ends by color at each side of the box.
   4. Enter conduit through the sides of the junction box and not from the bottom.
   5. Place the conduit in the bottom half of the junction box wall at least 3 inches above the floor.
   6. Install bushings on all conduits before cable installation.
E. Remove concrete sidewalk or other surfaces that require removal by saw cutting.
   1. Remove entire section of concrete, joint to joint. Refer to Section 02 41 13.
   2. Replace with in-kind materials to match the existing grade, texture, and color of concrete or other surface.
F. Install Engineer-approved ½ inch preformed expansion joint material around entire periphery of ring for junction boxes installed in paved surface.
G. Encase all conduit in flowable fill or approved hand-mix grout where the conduit enters the junction box.
H. Provide a cast-in-place 1 inch thick grout floor, with a 1 inch diameter drain at the low point, for all Type I, II, and III-Polymer Concrete Junction Boxes or provide a box with a prefabricated floor with a 1 inch drain hole. Use grout according to ASTM C 579 and ASTM C 580.
I. Do not stack boxes.

3.3 CONCRETE COLLAR

A. Class AA(AE) concrete – Refer to Section 03 30 04.
B. Install concrete collars around junction boxes in all locations except where junction boxes are in concrete paved surfaces.

3.4 GROUND ROD

A. Ground Rods – Refer to Section 26 56 19.

3.5 RESTORATION

A. Restore all areas damaged during the installation of the junction boxes at no additional cost to the County.

END OF SECTION

January 22, 2018

SECTION 02737S

ASPHALT PAVEMENT SOFT SPOT REPAIR

Statement of Applicable Standards

Refer to The Utah Department of Transportation 2017 Standard Specifications and Standards Drawings for Road and Bridge Construction books found at:

http://www.udot.utah.gov/go/2017standards.

Supplemental Specifications and Supplemental Drawings can be found at:

http://www.udot.utah.gov/go/2017supplementalspecifications
http://www.udot.utah.gov/go/2017supplementaldrawings

Add Section 2737:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Remove and repair soft spots in existing pavement, as directed by the Engineer.

B. Use Type A (6 inch maximum pavement depth), Type B (full depth pavement and 8 inch untreated base course) repair, or Shoulder Soft Spot Repair as determined by the Engineer.

1.2 RELATED SECTIONS

A. Section 02721: Untreated Base Course

B. Section 02741: Hot Mix Asphalt

C. Section 02742S: Project Specific Surfacing Requirements

D. Section 02748: Prime Coat / Tack Coat

1.3 REFERENCES Not Used

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS As required in Related Sections

1.6 ACCEPTANCE As required in Related Sections

PART 2 PRODUCTS

2.1 UNTREATED BASE COURSE

A. Refer to Section 02721.

2.2 HOT MIX ASPHALT

A. Refer to Section 02741 for mix design and material requirements.

B. Refer to Section 02742S for project specific requirements.

C. Refer to Section 02748 for tack coat requirements.

PART 3 EXECUTION

3.1 DETERIORATED ASPHALT PAVEMENT: TYPE A OR TYPE B REPAIR

A. Remove deteriorated asphalt pavement to a minimum depth of 6” or as directed by the Engineer.
   1. Remove using saw cutting or rotomilling.
      a. Saw cut:
         1) Cut asphalt at least 6” beyond the visible limits of distressed pavement.
         2) Minimum repair area of 3’ square.
      b. Rotomill:
         1) Mill is at least 6’ wide.
         2) Minimum repair area of 6’ square.
   2. All edges are square and vertical.

B. Remove deteriorated pavement without damaging surrounding pavement.
   1. Remove all loose material.
   2. Clean vertical edges prior to applying tack coat.
   3. Damage to surrounding pavement is repaired at no cost to the Department.

3.2 TYPE A REPAIR – BASE COURSE

A. If exposed, re-grade and compact untreated base course as per Section 02721.

B. If minimum density cannot be achieved, remove untreated base course as per Type B repair requirements.

3.3 TYPE B REPAIR – BASE COURSE

A. Excavate 8” depth of untreated base course.
   1. Do not re-use material.

B. Place and compact untreated base course as per Section 02721.

3.4 SHOULDER SOFT SPOT REPAIR

A. Follow procedures for Type A Repair.

B. Re-grade shoulder slope to top of repaired pavement.

3.5 HOT MIX ASPHALT (HMA)

A. Tack all vertical pavement surfaces as per Section 02748.

B. Place and compact HMA as per Section 02741
   1. Match top of pavement, $\pm$1/4”
   2. Compact material to a minimum of 92% of maximum specific gravity.

END OF SECTION

November 10, 2017

SECTION 02831S

LANDSCAPE WALL

Statement of Applicable Standards

Refer to The Utah Department of Transportation 2017 Standard Specifications and Standards Drawings for Road and Bridge Construction books found at:

http://www.udot.utah.gov/go/2017standards.

Supplemental Specifications and Supplemental Drawings can be found at:

http://www.udot.utah.gov/go/2017supplementalspecifications
http://www.udot.utah.gov/go/2017supplementaldrawings

Add Section 02831S:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Material and construction requirements for wall systems employing modular block units for the wall face.

1.2 RELATED SECTIONS

A. Section 03055: Portland Cement Concrete

B. Section 02317: Structural Excavation

C. Section 02056: Embankment, Borrow, and Backfill

1.3 REFERENCES

A. ASTM C 140: Standard Test Methods for Sampling and Testing Concrete Masonary Units and Related Units

B. ASTM D3034: Polyvinyl Chloride Pipe (PVC)

C. AASHTO M252: Corrugated Polyethylene Drainage Pipe

D. ASTM D698: Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort

E. ASTM D1557: Standard Test Methods for Laboratory Compaction

Characteristics of Soil Using Modified Effort

1.4 DEFINITIONS

A. Modular Block Units: A concrete retaining wall element machine made from Portland cement, water, and aggregates.

B. Unit Drainage Fill: Drainage aggregate that is placed within and immediately behind the small modular block units.

1.5 SUBMITTALS

A. Submit sample of the modular block texture for approval by the Engineer.

B. Submit to the Engineer a sample of the modular block color at least 4 weeks prior to planned construction of the wall.

C. Submit working drawings of the wall to be reviewed and accepted by the Engineer. The Engineer's review of the Contractor's drawings does not relieve the Contractor of any responsibility under the contract for the successful completion of the work.

D. Submit modular block certificate of compliance to Engineer for approval.

PART 2 PRODUCTS

2.1 CONCRETE MODULAR BLOCK UNITS

A. Modular Block Units are to conform to the following architectural requirements.

1. Face Color: Tan
2. Face Finish: Split Face
3. Dimensions: 8"H x 18"L x 12"W

B. Modular block architectural requirements may be modified at the direction of the Engineer.

C. For use in constructing a landscape wall, provide dry-cast concrete wall units having a minimum net 28-day compressive strength of 3000 psi, and a maximum moisture absorption of 5.0 percent, both in accordance with ASTM C 140.

D. Concrete block shall be manufactured using a combination of cement,

aggregates, admixtures, and other constituents which have been verified to be compatible with each other and with the environment in which the block is required to perform, including sulfate soils and/or groundwater.

E. Cement shall meet the requirements of Section 03055.

F. Pozzolan shall meet the requirements of Section 03055.

G. Blended cement shall meet the requirements of Section 03055.

H. Chemical admixtures shall meet the requirements of Section 03055.

I. Provide coating to block faces with sealer to minimize chloride intrusion into units in accordance with article 7.3.1.4 Division II of AASHTO 1999 *Interim Standard Specifications for Highway Bridges*.

J. Normal weight aggregates shall meet the requirements of Section 03055.

K. Provide block units with dimensions in conformance with the Wall Company's standard. Permissible variations are plus 0.12 inch and minus 0.06 inch.

L. Provide block units having angled sides capable of producing concave and convex alignment curves with a minimum radius of 3.3 feet.

M. Provide block units having a polymeric efflorescence control admixture.

N. Finish and Appearance: All units shall be sound and free from cracks or other defects that would interfere with the proper placement of the unit, or significantly impair the strength or permanence of the construction. Minor cracks incidental to the usual method of manufacture or minor chipping resulting from shipment and delivery are not grounds for rejection. The face or faces of units that are to be exposed shall be free of chips, cracks or other imperfections when viewed from a distance of 33 feet under diffused lighting. Up to five percent of a shipment may contain slight cracks or small chips not longer than 1 inch.

O. Sampling and Testing: Acceptance of the concrete units with respect to compressive strength will be determined on a lot basis. The lot will be randomly sampled in accordance with ASTM Specification C 140. Compressive strength test specimens shall be cored or shall conform to the saw-cut coupons provisions of Section 5.2.4 of ASTM Specification C 140.

1. The rate of block sampling shall be:

Table 1

Lot Size	Samples
0-10,000	6 units
10,000-100,000	12 units
Greater than 100,000	6 units per 50,000

2. Provide additional samples if required by the Engineer.

P. Rejection: Units shall be rejected because of failure to meet any of the requirements specified above. In addition, any or all of the following defects shall be sufficient cause for rejection:

1. Defects that indicate imperfect molding;
   a. Defects indicating honeycomb or open-texture concrete.
   b. Cracked or severely chipped units.
   c. Color variation on exposed face(s) of unit due to excess form oil or other reasons.

2.2 LEVELING PAD

A. Use Class B unreinforced concrete as per Section 03055 or untreated base course.

2.3 FIBERGLASS PINS

A. Provide ½-inch diameter fiberglass connecting pins, where used, having a minimum flexural strength of 128 ksi and short beam shear of 6.5 ksi.

2.4 DRAINAGE PIPE

A. If required, the drainage pipe shall be perforated or slotted PVC pipe manufactured in accordance with ASTM D-3034 or corrugated HDPE pipe manufactured in accordance with AASHTO M252.

2.5 OTHER FASTENERS

A. Fasteners to wingwalls and abutment wall, if required, shall be provided by the selected Wall Company.

2.6 ADHESIVE

A. Use a medium-viscosity synthetic elastomeric polymer adhesive. Use “Titebond Heavy Duty Construction Adhesive” (or Engineer-approved equivalent).

PART 3 EXECUTION

3.1 GENERAL

A. Arrange for a qualified representative (minimum 5 years experience with landscape wall design and construction) from the selected Wall Company to be directly involved and provide technical assistance during all phases of construction of the wall(s). As a minimum, the Wall Company representative should be at the project site during the first two weeks of wall construction, and shall make visits to the site at least once every two weeks thereafter. During each site visit, the representative shall meet with the Engineer near the conclusion of the visit to report on the observed wall construction procedures.

B. The Wall Company shall provide assurance that the completed wall(s) meet all Engineer and Wall Company specifications. Note: Where the Engineer and the Wall Company specifications differ, the stricter of the two shall be applied. The Wall Company representative shall report any irregularities to the Engineer.

C. The Wall Company representative is responsible for training the Contractor's wall construction crew(s) and Department inspectors in proper quality control for construction of the walls. If one or more construction crew members change, the Wall Company representative shall directly review with the new crew member(s) the important wall construction elements.

D. Haul, store, and ship wall materials so as to minimize the potential of producing any type of defects.

E. Perform excavation and foundation preparation (including removal of unsuitable soils) as described in Section 02317.

F. Construct the wall system in accordance with the approved plans, this specification, and the Wall Company's recommendations and construction manual.

3.2 EXCAVATION

A. Contractor shall excavate to the lines and grades shown on the construction drawings. Owner's representative shall inspect the excavation and approve prior to placement of leveling material or fill soils. Proof roll foundation area as directed to determine if remedial work is required.

B. Over-excavation and replacement of unsuitable foundation soils and replacement with approved compacted fill will be compensated as agreed upon with the Owner.

3.3 LEVELING PAD

A. Prepare the subgrade soils and/or fill so as to cast the leveling pad to the design elevations shown on the drawings, to ensure complete contact of the retaining wall units with the base.

A. Place cast-in-place concrete or crushed stone leveling pad upon undisturbed in-situ soils, or upon properly placed and compacted fill. Place leveling pad to a minimum thickness of 6 inches and extend laterally a minimum of 6 inches in front and behind the modular block unit wall.

B. Placement requirements shall be per Section 03055, except that placement time limits are increased by 20 minutes from those presented in Section 03055, article 3.7.A.

C. Allow concrete leveling pad to cure for at least 12 hours or properly tamp and compact crushed stone to a minimum of 95% Standard Proctor Density ASTM D-698 or 92% Modified Proctor Density per ASTM D1557 prior to placing modular block units.

D. Leveling pad shall be prepared to insure full contact to the base surface of the concrete units.

3.4 MODULAR BLOCK UNIT INSTALLATION

A. Place the first course of modular block units on the leveling pad. Check the wall units to be level in all directions and ensure proper alignment. The first course is the most important to ensure accurate and acceptable results. Obtain Engineer's approval on bottom course layout before procedure.

B. Ensure block units are in full contact with the leveling pad.

C. Install connecting devices in block units as required by the Wall Company.

D. Place and compact unit drainage fill within and behind wall units. Place and compact backfill soil behind drainage fill. Follow wall erection and drainage fill closely with structure backfill.

E. Maximum stacked vertical height of wall units, prior to unit drainage fill and backfill placement and compaction, shall not exceed two courses.

F. Where connecting pins are used, lay up each course ensuring connecting pins protrude into adjoining courses above a minimum of 1 inch

G. Pull each block unit forward, away from the embankment, against connecting devices in the previous course and backfill as the course is completed. Repeat procedure to the extent of the wall height.

H. As appropriate where the wall changes elevation, the units can be stepped with grade or turned into the embankment with a convex return end. Provide appropriate buried units on the compacted leveling pad in the area of the convex return end.

I. Horizontal alignment tolerance is 0.7 percent (for example 2.5 inches in 30 feet). Vertical tolerance is 0.7 percent (for example 0.85 inches in 10 feet). The overall vertical tolerance of the wall (plumbness from top to bottom) not to exceed 0.5 percent (for example 1.2 inches in 20 feet of wall height). Levelness tolerance not to exceed 0.5 percent (for example 1.2 inches in 20 feet).

J. All joints to be uniform. During construction the maximum allowable offset in any block joint is 0.25 inch. Joint width shall be 0.50 inch maximum and 0.12 inch minimum.

K. Inspect each course for blocks damaged during placement. Replace any damaged blocks before proceeding with the next course.

3.5 WALL COPING/CAP INSTALLATION

A. Provide a permanent connection between the wall coping/cap and the top course of the wall units. Construct according to the Wall Company drawings and specifications. For wall caps, use a medium-viscosity synthetic elastomeric polymer adhesive. Use “Titebond Heavy Duty Construction Adhesive” (or Engineer-approved equivalent).

3.6 SAMPLING AND TESTING

A. Certificates of Compliance. Furnish to the Engineer copies of the certificate of compliance for materials and the results of any tests run on them from the Wall Company on the materials.

B. Concrete Testing. Strength, slump, air, and yield tests will be conducted in accordance with Section 03055.

3.7 BLOCK UNITS ACCEPTANCE

A. Meet 28-day compression test. Block units which meet 75 percent of 28-day strength within 7 days are acceptable for placement in the wall.

B. No block units shall be placed in the wall unit until it has been cured for a minimum of 7 days.

C. All block units shall be visually free of defects.

D. Remove and replace any damaged blocks at no additional cost to the owner.

END OF SECTION

“EXHIBIT D”

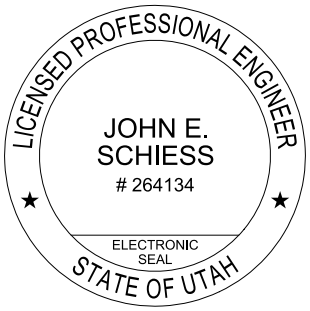
A.7 AMERICAN FORK CANYON WATER LINE

PROJECT SPECIFICATIONS AND
CONTRACT DOCUMENTS

American Fork City

AF Canyon Water Line

January 2018



PREPARED BY:

HORROCKS
ENGINEERS

2162 W. Grove Parkway, Suite 400
Pleasant Grove, Utah 84062

TABLE OF CONTENTS

In case of a conflict the most restrictive standard shall apply.

Contact John Schiess, P.E., Horrocks Engineers, at 801-763-5201 for bidding questions.

DOCUMENT 003000

ADDITIVE ALTERNATE BID

SCHEDULE OF VALUES

AF Canyon Water Line

For a responsive bid, write in unit price for each item, multiply by respective units, and total for a lump sum price.

Item Number	Description	Quantity	Units	Unit Price	Total Price
1	16” HDPE Water Line	1	LS		
2	UDOT Fiber Conduit	1	LS		
	TOTAL BID PRICE			---------	

ATTEST:

Respectfully Submitted:

_____

_____
Signature

_____

_____
Address

_____

_____
Utah License No.

Title Date

PART 3 MEASUREMENT AND PAYMENT

1. 16” HDPE Water Line - Bid Item 1

A. Measurement shall be made on a PER LUMP SUM basis for 16” HDPE Water Line as shown on the plans and described in the specifications.

B. Payment covers all costs of mobilization, saw cutting, potholing, excavation, pipe, fittings, bedding, backfill, compaction, asphalt, testing, traffic control, surface restoration, etc. Payment will cover the cost of all labor, materials, equipment and tools to complete everything related to the waterline.

C. Payment for asphalt Road Repair only includes that amount of asphalt above and beyond what is scheduled to be placed in the overall Utah County Canyon Road Project.

2. UDOT Fiber Conduit - Bid Item 2

D. Measurement shall be made on a PER LUMP SUM basis for UDOT Fiber Conduit as shown on the plans and described in the specifications.

E. Payment includes material and installation of two (2), 7-way HDPE 18mm/14mm fiber optic microduct bundles as shown on plan. Where microduct is installed adjacent to pipeline, no separate payment will be made for trenching and backfill (shared trench). Payment includes additional trenching and backfill for sweeping microduct off pavement on west end of conduit run (not in shared trench adjacent to pipeline). Payment includes installation of junction boxes, concrete collars, termination of conduits inside junction boxes, and all other items related to junction boxes. Payment includes capping of microduct on east end of conduit run.

END OF SECTION

SECTION 13553

ATMS CONDUIT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. ATMS conduit for communications and fiber optic cables.

B. Detectable pull tape, conduit, and all materials, labor, workmanship, equipment, and incidental items required for a complete system of conduit.

1.2 RELATED SECTIONS

A. Section 02056: Embankment, Borrow, and Backfill

B. Section 02221: Remove Structures and Obstruction

C. Section 02705: Pavement Cutting

D. Section 02741: Hot Mix Asphalt (HMA)

E. Section 02776: Concrete Sidewalk, Median Filler, and Flatwork

F. Section 02842: Delineators

G. Section 03575: Flowable Fill

1.3 REFERENCES

A. ASTM D 2241: Poly-Vinyl Chloride (PVC) Pressure-Rated Pipe (SDR Series)

B. ASTM F 2160: Solid Wall High Density Polyethylene (HDPE) Conduit based on Controlled Outside Diameter (OD).

C. National Electrical Code (NEC)

D. National Electrical Manufacturers Association (NEMA)

E. State of Utah Administrative Rules

F. Underwriters Laboratories (UL)

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS

A. Manufacturer's product data sheets and recommended installation instructions.

B. Manufacturer's warranties and parts lists

C. Conduit Mandrel Test Form prior to substantial completion.

D. Refer to http://www.udot.utah.gov/go/standardsreferences for blank forms for this Section.

PART 2 PRODUCTS

2.1 MATERIALS

A. Conduit and fittings for ATMS communication and fiber optic conduit
   1. Schedule 40 PVC rated at 194 degrees F as specified in NEMA TC-2, NEMA TC-3, ASTM D 2241,
   2. High Density Polyethylene (HDPE) SDR11 rated complying with ASTM F 2160.
      a. HDPE conduit with smooth outer wall and ribbed or smooth interior wall.
      b. Fittings and couplers rated for a minimum of 130 psi.
      c. Mechanical type couplers when joining HDPE and PVC conduits.
   3. Microduct
      a. HDPE microduct with an outside/inside diameter of 0.500/0.394 inch (12.7/10 mm) or 0.630/0.512 inch (16/13 mm) or 0.709/0.551 (18/14 mm), as shown.
      b. Microduct having a ribbed interior.
      c. Watertight couplers rated for a minimum of 200 psi.
      d. Microduct bundle within a single 0.100 inch thick polyethylene oversheath.
      e. Microduct bundles must contain a factory installed #14 AWG solid, insulated locate wire and a minimum of two rip cords for removal of oversheath.

B. Conduit Banks
   1. New, prefabricated
   2. ATMS Multi-duct Conduit Types
      a. 1D = four 1.25-inch conduits

b. 2D = eight 1.25-inch conduits
c. 4D = sixteen 1.25-inch conduits

3. Color-code each conduit or cell as follows:
   a. One, two, or three conduits gray
   b. 1D Bank 1 blue, orange, green and brown
   c. 2D Bank 1 blue, orange, green, and brown
      Bank 2 slate, white, red, and black
   d. 4D Bank 1 blue, orange, green, and brown
      Bank 2 slate, white, red, and black
      Bank 3 same as bank 1 with a contrasting stripe
      Bank 4 same as bank 2 with a contrasting stripe
4. Microduct types:
   a. Individual 0.500/0.394 inch (12.7/10 mm) or 0.630/0.512 inch (16/13 mm) microducts installed loosely within new or existing conduit.
   b. MD2, MD3, MD4 and MD7: microduct bundle containing two, three, four or seven 0.709/0.551 inch (18/14 mm) microducts respectively.
   c. Factory-assembled bundles for bundled applications.
5. Color-code microducts and oversheaths as follows:
   a. Individual microducts installed loosely within conduit or bundled within oversheath:
      1) blue
      2) orange
      3) green
      4) brown
      5) slate
      6) white
      7) red
      8) black
   b. Oversheaths:
      Bundle #1 blue
      Bundle #2 orange
      Bundle #3 green
      Bundle #4 brown

C. Meet or exceed all of the conduit manufacturer's recommendations for materials used in the installation of conduits including sweeps, adapters, couplings, glue, plugs, and fittings.
   1. Conduit plugs must seal the conduit and allow the secure fastening of detectable pull tape.

D. PVC conduit sections – Nominal 20 ft sections. Couplings and fittings must provide watertight integrity.

E. Sweeps – factory manufactured sweeps (11¼, 22½, 45, and 90 degree angles) complete with bell and spigot.

F. Detectable Pull Tape – flat profile, low stretch polyester, detectable, sequential footage marked, 1,200 lb tensile strength pull tape in each conduit.

G. Backfill
   1. Flowable Fill – Refer to Section 03575.
   2. Free Draining Granular Backfill – Refer to Section 02056.
   3. Sand
      a. Friable natural river or bank aggregate, free of loam, detrimental, or soluble or organic matter.
      b. $^{3}/_{8}$ inch minus, well graded.
   4. Hand-mix grout
      a. Minimum strength – 50 psi
      b. Maximum strength – 150 psi
      c. Slump – 5 inches to 10 inches

H. Rigid Metal Conduit (RMC) complying with UL-6. Zinc galvanized exterior coating complying with ANSI C80.1.

I. Liquidtight Flexible Metal Conduit (LFMC), -30 degrees C to 80 degrees C rated, UL 360 listed.

J. Liquidtight Flexible Nonmetallic Conduit (LFNC), 80 degrees C dry, 60 degrees C wet rated, sunlight resistant, UL 1660 listed.

PART 3 EXECUTION

3.1 GENERAL

A. Maximum spacing between junction boxes and vaults
   1. 500 ft for electrical cable.
   2. 1,000 ft for fiber optic cable on tangent surface street installations.
   3. 2,500 ft for fiber optic cable on tangent highway installations.
   4. Reduce maximum spacing if horizontal or vertical deflection incurred during installation prevents the installation of cable within maximum pulling tension rating of the cable.
   5. Notify the Engineer if utility avoidance requires junction box and conduit locations differing from requirements for deflection in this Section, article 3.2.

B. Minimum Cover of Conduit
   1. Minimum cover under pavement is 4ft and minimum cover under sidewalks is 3 ft.
   2. Minimum cover in highway right-of-way, greater than 20 ft from the edge of the pavement is 3 ft.
   3. Minimum cover in highway right-of-way, within 20 ft of the edge of the pavement is 5 ft.
   4. Refer to State of Utah Administrative Rule 930-7

3.2 INSTALLATION

A. Prevent conduit from deflecting vertically or horizontally along its length by a ratio greater than 10:1, (no more than 4-inch deflection per 40 inch in length) when installing conduit that houses communication cable.

B. Prevent sum total of the vertical and horizontal conduit deflection or bend between any two junction boxes from exceeding 270 degrees when installing conduit.

C. Install conduit within 1 ft of existing parallel conduit run if the planned location of conduit is parallel to the existing traffic signal or ATMS conduit.

D. Obtain approval for field bending of conduit with the Engineer in cases where factory sweeps are not appropriate. Field bending must be performed using a heat box or heat blanket. Torch heating conduit is prohibited. Install all conduit bends to have a radius that is not less than the following:
   1. 24 inches within the cabinet and pole foundations
   2. 36 inches in all other locations
   3. 46 inches for MD7 microduct bundle
   4. 40 inches for MD4 microduct bundle
   5. 36 inches for MD3 microduct bundle
   6. 32 inches for MD2 microduct bundle
   7. 12 inches for individual microduct

E. Install conduits that cross finished curbs and gutters, sidewalks, concrete flatwork, or textured or decorative surfaces by boring, jacking, or drilling. Replace any damaged concrete sections, joint to joint. Refer to Section 02221.

F. Proof all conduit before installation of cabling and detectable pull tape.
   1. Use a mandrel at least 80 percent of the conduit diameter, at least twice as long as the conduit diameter, and composed of rigid material.
   2. Schedule proofing with the Engineer at least 5 working days in advance of performing the work.

3. Proof all conduit with a Department representative witness present.
4. Complete and submit a completed Conduit Mandrel Test Form for all ATMS conduit.
5. Proof microducts using proofing balls.
6. Proofing balls must maintain a minimum 80 percent fill ratio of inside diameter of the microduct being tested.
7. Proofing must occur after all junction boxes have been installed to final grade, including placement of flowable fill or hand-mix grout at junction box walls, and after all excavation in the immediate proximity of the conduit system has been completed.
    a. Re-proof any conduit segment where excavation has occurred near the conduits following initial proof testing.

G. Provide detectable pull tape in all conduits.
1. Install continuously between junction boxes.
2. Fasten securely to conduit plug and leave 6 ft of pull tape slack inside of the conduit.
3. Do not splice detectable pull tape in conduit.
4. Use flat profile, low stretch polyester, 1,200 lb tensile strength detectable pull tape that is sequential footage marked.
5. Verify that the pull tape is detectable throughout its entire length by performing a continuity test or equivalent verification.
6. Detectable pull tape not required in microducts.

H. Encase open trench conduit in sand backfill covered by flowable fill within existing roadway, proposed roadway and sidewalk pavement areas only.
1. Seal junction box wall around conduits using flowable fill or approved hand-mix grout.
2. Use 12 inches of sand backfill covered with native material in all other areas.
3. Refer to AT Series Standard Drawings.

I. Use rigid metal conduit or schedule 80 PVC conduit for above ground application.
1. Liquidtight flexible metal conduit (LFMC) or liquidtight flexible non-metallic conduit (LFNC) is permitted in lengths not exceeding 6 ft where not subject to physical damage.
2. Apply corrosion protection to any portion of rigid metal conduit buried in the ground or encased in concrete.

J. Use PVC or HDPE conduit for underground application.

K. Warning Tape
1. Install orange warning tape with black legend “Caution - Buried Communication Cable,” in all trenches containing multi-duct conduit or conduit containing communication cables.

2. Install red warning tape with black legend “Caution - Buried Electric” in all other trenches.
3. Not required when flowable fill is directly overlaid with asphalt pavement or PCCP.
4. Not required when boring or plowing conduit.

L. Install a bushing or adapter at ends of all conduits that contain a conductor according to the NEC.

M. Furnish and install Utility Marker Posts along the longitudinal conduit running line. Refer to AT Series Standard Drawings and Section 02842.

N. Install a #14 AWG solid, insulated locate wire inside of new or existing conduit with individual microducts.
1. Verify that all locate wires are detectable throughout their entire length by performing a continuity test or equivalent verification.

3.3 TRENCH

A. Paved Asphalt Surface
1. Install T-patch over trenched area according to AT Series Standard Drawings.
2. Cut pavement from roadway surface to roadway base on both sides of trench to provide a clean, straight wall for T-patch before any backhoe use according to Section 02705.
3. Refer to AT Series Standard Drawings for depth of flowable fill under paved surfaces.
4. Evenly apply tack coat on final backfill before installing T-patch.
5. Place restoration patch – match the composition, density, and elevation (±¼ inch), of the existing surface according to Section 02741.
6. Apply a hot-pour rubberized asphalt joint sealant or approved equal after the patch is installed.

B. Sidewalk or Decorative Pavement
1. Use flowable fill to bottom of new pavement or sidewalk.
2. Match existing pavement thickness. New pavement thickness must be 3½ inches minimum and 8 inches maximum.
3. Restore sidewalk or decorative pavement to original condition or better after work is completed. Refer to Section 02776.

C. Unpaved Surface
1. Backfill using native material, if suitable, that matches the composition, density, and elevation (±0.2 inch), of the existing surface according to Section 02056.
2. Dispose of surplus material promptly.

3. Sand Backfill
    a. Use sand backfill in trench sections outside of existing roadway, proposed roadway, and sidewalk pavement areas, including exposed conduit locations when plowing or boring.
    b. Provide 12 inches of sand backfill above conduit in trench.
        1) Backfill trench above sand to finished grade using native material.
            a) Backfill and tamp in 6 inch lifts.
    c. Compaction of sand backfill is not required.

D. Sleeve foreign utilities that cross a trench so they are not encased in flowable fill.

E. Place all conduits in the same trench whenever possible.

F. Flowable Fill or Hand-mix Grout
1. Install flowable fill or approved hand-mix grout to the wall of junction box to seal conduit entry into junction box.
2. Clean excess flowable fill or hand-mix grout from the inside of the junction box.

G. Install all conduits so the flowable fill or sand backfill completely encases all exterior surfaces of the conduit.
1. Separate multi-duct conduits using a commercially available conduit spacer or approved equivalent.
2. Place spacers no more than 4 ft apart and not more than 2 ft from each coupler.

H. Anchor the conduit in trench at 16 ft intervals to maintain the required conduit depth during flowable fill placement.

I. Minimum separation between all conduits and the wall of the trench is 1½ inches.

3.4 BORE OR PLOW

A. Immediately contain, remove, and properly dispose of all excess drilling fluid.

3.5 USE OF EXISTING OR OCCUPIED CONDUIT

A. Maintain the physical condition and functional integrity of all cabling and wiring in existing or occupied conduit.

B. Cable or wire installation in an existing or occupied conduit.
1. Remove any existing fiber optic cable or copper wire.

2. Test the integrity and clean the conduit by successfully pulling a Department-approved mandrel through the conduit.
3. Re-pull existing and new fiber optic cable or copper wire together.
4. Perform all necessary splices and replace any impacted fiber cable and spider fan-out kits according to Section 13594.

C. Use existing conduit in-situ only if shown and as approved by the Engineer.

D. Intercept individual microducts from existing microduct bundle mid-span and reroute to new junction box location:
   1. Type II-PC junction box
      a. Bury at existing microduct bundle depth.
      b. Notch the 24-inch box walls and install junction box over existing microduct bundle.
      c. Provide 12 inches of free draining granular backfill borrow underneath junction box.
      d. Encase all conduit in flowable fill orhand-mix grout where the conduit enters the junction box.
      e. Place locate ball or disk in junction box.
      f. Ground rod, and grout floor are not required.
   2. Conduit and microduct bundle inside of buried Type II-PC junction box.
      a. Install conduit from buried junction box to new junction box location for rerouting of individual microducts. Provide #14 AWG solid, insulated locate wire inside of new conduit between junction boxes.
      b. Extend conduit and microduct oversheath 6 inches beyond inside wall of the junction box.
      c. Expose microducts by removing no more than 20 inches of oversheath.
      d. Identify and cut only the individual microducts to be rerouted.
      e. Use approved couplers and extend microducts to new junction box using corresponding microduct color.
      f. Splice all locate wires together using an approved waterproof connector.
         1) Verify that the locate wire conductors are not exposed.
   3. New junction box location
      a. Install new junction box within 20 ft of buried junction box or within 20 ft of edge of roadway when existing microduct bundle is underneath roadway, to provide access to locate wire for mapping and locating purposes.

3.6 REPAIR OR RESTORATION

A. Restore all areas, including landscaping, concrete pavement, asphalt, finished curbs and gutters, box culverts, sewers, underground water mains, sprinkler systems, sidewalks, concrete flatwork, colored, textured, or decorative surfaces damaged during conduit and junction box installation.

B. Coordinate with local utilities for utility repair.

C. Notify the Engineer of all necessary repairs.

D. Replace all damaged facilities in kind.

E. Buried microduct bundle coupling and repair:
   1. Expose microducts by removing no more than 12 inches of oversheath beyond area to be coupled or repaired.
      a. Trim microducts to length as necessary to eliminate all bends and deflection.
   2. Use approved couplers.
   3. Splice the locate wires together using an approved waterproof connector.
      a. Verify that the locate wire conductors are not exposed.
   4. Protect exposed microducts, couplers and locate wire using split duct.
      a. Seal split duct joints and split duct ends around microduct bundle oversheath using approved waterproof sealing tape or other approved methods prior to backfill.
      b. Do not use heat-shrink or cold-shrink protection methods.

END OF SECTION

SECTION 13554

POLYMER CONCRETE JUNCTION BOX

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Polymer concrete junction boxes, ground rods, and maintenance markers. Includes Type I, Type II, and Type III Polymer-Concrete Junction Boxes.

1.2 RELATED SECTIONS

A. Section 02056: Embankment, Borrow, and Backfill

B. Section 02221: Remove Structures and Obstruction

C. Section 02842: Delineators

D. Section 03055: Portland Cement Concrete

E. Section 03152: Concrete Joint Control

F. Section 03575: Flowable Fill

G. Section 13553: ATMS Conduit

H. Section 16530: Electrical Power

1.3 REFERENCES

A. ASTM C 579: Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

B. ASTM C 580: Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

C. American National Standards Institute (ANSI)

D. Society of Cable Telecommunications Engineers (SCTE) Standards

E. USDA Rural Utilities Service (RUS) Specifications

1.4 DEFINITIONS Not Used

1.5 SUBMITTALS Not Used

PART 2 PRODUCTS

2.1 FILL

A. Free draining granular backfill – Refer to Section 02056.

B. Granular backfill borrow – Refer to Section 02056.

C. Flowable fill – Refer to Section 03575.

D. Hand-mix grout
   1. Minimum strength – 50 psi
   2. Maximum strength – 150 psi
   3. Slump – 5 inches to 10 inches

2.2 JUNCTION BOXES AND LIDS

A. Junction boxes – pre-cast polymer concrete. Refer to AT Series Standard Drawings for dimensions of junction box types.

B. Furnish boxes, rings, and lids that meet all the requirements of ANSI/SCTE 77, including Tier 22 loading.

C. Use split lids with Type III-PC junction boxes.

D. Use lids for all junction boxes specified by application.

   1. Manufacture lids with the following marking in the logo area, in 1 inch cast in place recessed letters:
      a. “UDOT Fiber Optics” when the junction box contains only fiber optic cable or future use multi duct conduit.
      b. Traffic Signal, Street Lighting, Electrical, Communications and Landscaping may also use this type of description as an alternative to using attached name plates.

2. Manufacture lids with a recessed area to accommodate name plates used for all other Traffic Signal, Street Lighting, Electrical, Communications, and Landscaping applications.
   a. Attach name plates to each removable lid section as well as one to the inside wall of the junction box using adhesive and non-corroding screws. Use an adhesive that meets or exceeds the following criteria:
      1. Tensile Strength – 1200 psi
      2. Service temperature, cured – subzero to +140 F.
      3. Cure time – 24 hours
   b. Insert two non-corroding tamper resistant screws after adhesive is cured.

3. Determine the name plate description using the Junction Box Logo Decision Chart found on the UDOT Standards and Specifications References: http://www.udot.utah.gov/go/standardsreferences

E. Lid Access Points – recessed reinforced steel pull slots rated for 3000 pounds to allow removal of cover with a hook or lever. Replace lid if damage occurs to the pulling point.

F. Lid Bolt Holes – self draining.

G. Bolts – Zinc plated recessed hex head coil bolts with washer. Refer to AT Series Standard Drawings.

2.3 UTILITY MARKER POST

A. Furnish and install Utility Marker Posts for each junction box location. Refer to Section 02842 and AT Series Standard Drawings.

2.4 GROUND ROD

A. Ground Rods – Refer to Section 16530.

2.5 WIRING

A. Ground Conductor – Refer to Section 16530.

2.6 CONCRETE COLLAR

A. Class AA(AE) concrete – Refer to Section 03055.

2.7 EXPANSION JOINT MATERIAL

A. Preformed expansion joint filler. Refer to AT Series Standard Drawings and Section 03152.

2.8 LOCATE BALL OR DISK

A. Place a marker ball or disk in each junction box.
   1. Color – orange
   2. Requires no particular orientation when buried
   3. Place in bottom of each box
   4. Must produce a uniform, spherical RF field in all directions
   5. Signal peak when directly over the ball
   6. Meets RUS Specifications

PART 3 EXECUTION

3.1 BACKFILL

A. Place 12 inches of free draining granular backfill under junction boxes.

B. Compact granular backfill borrow or approved native soil around the junction box collar. Match the top 6 inches to the composition, density, and elevation of the surrounding surface.

3.2 JUNCTION BOX AND EXTENSION

A. Install according to manufacturer's recommendations.

B. Precast junction boxes with precast conduit holes or drill holes to match conduit entry where required without damaging the box. Use grout to create a complete seal between conduit and the junction box wall. Finish grout smooth and flush with the interior wall.
   1. Make drilled holes in junction box not more than ¼ inches larger than conduit diameter.
   2. Seal conduit and microduct ends inside all junction boxes with at least 2 inch thick duct seal after cables are installed.
   3. Seal vacant conduit and microducts with a manufactured conduit plug and attach detectable pull tape where applicable. Refer to Section 13553.

C. Level the top of junction box and grade with positive drainage away from the box.

D. Conduit in junction box
   1. Do not install conduit within 2 inches of junction box corner.
   2. Extend PVC conduit 2 inches, HDPE conduit 6 inches, microduct oversheath 6 inches and individual microducts 2 ft beyond the inside wall of the junction box.
   3. Align ATMS conduit ends by color at each side of the box.
   4. Enter conduit through the sides of the junction box and not from the bottom.
   5. Place the conduit in the bottom half of the junction box wall at least 3 inches above the floor.
   6. Install bushings on all conduits before cable installation according to Section 13553.
   7. Refer to AT Series Standard Drawings.

E. Remove concrete sidewalk or other surfaces that require removal by saw cutting.
   1. Remove entire section of concrete, joint to joint. Refer to Section 02221.
   2. Replace with in-kind materials to match the existing grade, texture, and color of concrete or other surface.

F. Install Engineer-approved ½ inch preformed expansion joint material around entire periphery of ring for junction boxes installed in paved surface.

G. Encase all conduit in flowable fill or approved hand-mix grout where the conduit enters the junction box.

H. Provide a cast-in-place 1 inch thick grout floor, with a 1 inch diameter drain at the low point, for all Type I, II, and III-Polymer Concrete Junction Boxes or provide a box with a prefabricated floor with a 1 inch drain hole. Use grout according to ASTM C 579 and ASTM C 580.

I. Do not stack boxes.

3.3 CONCRETE COLLAR

A. Refer to AT Series Standard Drawings.

B. Concrete AA(AE) – Refer to Section 03055.

C. Install concrete collars around junction boxes in all locations except where junction boxes are in concrete paved surfaces.

3.4 GROUND ROD

A. Refer to Section 16530

B. Attach splice enclosure to the ground rod with a ground conductor.

3.5 LOCATE BALL OR DISK

A. Place locate ball or disk in each ATMS junction box.

3.6 RESTORATION

A. Restore all areas damaged during the installation of the junction boxes at no additional cost to the Department.

END OF SECTION

SECTION 331114

HIGH DENSITY POLYETHYLENE PIPE

PART 1:GENERAL

1.01 SUMMARY

A. DESCRIPTION: The work in this section consists of providing High Density Polyethylene (HDPE) pipe and fittings.

B. RELATED SCTIONS
1. Trenching and Backfilling Operations – Section 312333.
2. Valves – Section 331216
3. Pipeline Testing – Section 331125

C. QUALITY ASSURANCE: References, American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), Federal Specifications (FS), International Standards Organization (ISO), and manufacturer's printed recommendations.

D. SUBMITTALS: Material list naming each product to be used identified by manufacturer and type number, in accordance with Section 013300.

E. PRODUCT HANDLING: Handle pipe and fittings to insure delivery in a sound undamaged condition.

F. JOB CONDITIONS: Do not lay pipe when trenches or weather conditions are not suitable for such work.

PART 2 PRODUCTS

2.01 HIGH DENSITY POLYETHYLENE PIPE AND FITTINGS

A. The HDPE pipe shall be manufactured in a plant capable of providing continuous quality control through inspection. The facility shall have the necessary testing equipment to verify that the pipe meets the requirements of AWWA C901 or C906, NSF Standard #61 and ASTM standards.

B. The facility shall have the necessary testing equipment to verify that the fittings meet the requirements of AWWA C901 for sizes ½" to 2" and AWWA C906 for sizes 3" through 54".

C. Polyethylene pipe and fittings shall be made from resin meeting the requirements of the Plastic Pipe Institute as PE 4710. The resin shall meet the requirements of ASTM D3350 with a cell classification of 445474C or higher. The requirements of this cell classification are:

HDPE Resin Specifications

PROPERTY	SPECIFICATION	UNIT	TYPICAL VALUE
Material Designation	PPI / ASTM		PE4710

Material Classification	(1)	ASTM D 1248		III C 5 P34
Cell Classification	(2)	ASTM D 3350		445474C or higher
Density	(3)	ASTM D 1505	g/cm3	0.947 to 0.955
Melt Index	(4)	ASTM D 1238	gm/ 10 min	<0.15
Flexural Modulus	(5)	ASTM D 790	psi	110,000 to 160,000
Tensile Strength	(6)	ASTM D 638	psi	3,500 to 4,000
Slow Crack Growth ESCR	(7)	ASTM D 1693	hours in 100% igepal	>5,000
PENT	(8)	ASTM F 1473	hours	>500
HDB @ 73 deg F	(9)	ASTM D 2837	psi	1,600
UV Stablizer	(10)	ASTM D 1603	%C	2 to 2.5%

D. High-density polyethylene pipe and fittings can be supplied by different manufacturers as long as they meet the above ASTM D3350 cell classification.

E. Pipe shall have a manufacturing standard of ASTM F-714. Pipe O.D. sizes 4" to 24" shall be available in ductile iron pipe sizes (DIPS) or iron pipe size (IPS). Pipe O.D. sizes 26" to 54" shall be available in ductile iron pipe sizes (DIPS) or iron pipe size (IPS). Pipe shall be DR 9 (250 psi WPR) unless otherwise specified on the plans. The pipe shall contain no recycled compounds except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipes shall be suitable for use as pressure conduits per AWWA C906 Pressure Class (PC) 100 have a nominal burst value of three and one-half times the Working Pressure Rating (WPR) of the pipe.

F. HDPE fittings shall be of the same material as the pipe. PE4710 HDPE, Cell Classification of 445474C as determined by ASTM D3350-02, and approved for AWWA use shall also be approved if the same pressure rating is maintained. Butt fusion fittings shall have a manufacturing standard of ASTM D3261. Molded & fabricated fittings shall have a pressure rating equal to the pipe unless otherwise specified in the plans. Fabricated fittings are to be manufactured using Data Loggers. Temperature, fusion pressure and a graphic representation of the fusion cycle shall be part of the Quality Control records. All fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

G. The pipe manufacturer shall have an ongoing Quality Control program for incoming and outgoing materials. High-density polyethylene (HDPE) resins for manufacturing of pipe shall be checked for density, melt flow rate, and contamination. The manufacturer of the HDPE resin shall certify the Cell Classification as indicated in section 2.01 C. These incoming resins shall be approved by plant Quality Control before being converted to pipe.

H. Pipe shall be checked for outside diameter, wall thickness, length, roundness, and surface finish on the inside and outside and end cut.

I. The fitting manufacturer shall have an on-going quality control program for incoming and outgoing materials. The resin shall be checked as indicated in section 2.01 C. Pipe for fabricated fittings shall be checked as indicated in 2.01 H. Molded fittings shall be inspected for voids and knit lines. All fabricated fittings shall be inspected for joint quality and alignment. All fabricated fittings welds shall be made using a DataLogger. A record of the temperature, pressure and graph of the fusion cycle shall be maintained by the fitting manufacturer.

J. The Manufacturer of the pipe and fittings shall maintain permanent QC and QA records. DataLogger records shall be maintained on fabricated fittings.

K. If requested, the pipe or fittings manufacturer can be required to retest or verify certification data. All retesting shall be at the requestor's expense, and shall be performed as required in the specifications.

PART 3 EXECUTION

A. BUTT FUSION JOINING

1. The butt fusion procedures shall be in accordance with the manufacturer or the PPI. The fusion equipment operator shall receive training using the recommended procedure. The Contractor shall be responsible to verify that the fusion equipment is in good operating condition and that the operator has been trained within the past twelve months. The fusion equipment shall be equipped with a Datalogger. Records of the welds (heater temperature, fusion pressure, and a graph of the fusion cycle) shall be maintained for five (5) years. Fusion beads shall not be removed.

2. The supplier of the pipe and fittings shall provide a person certified by the pipe manufacturer and the fusion equipment manufacturer to train contractor fusion equipment operators and inspectors representing the Owner.

B. OTHER JOINING METHODS

1. Polyethylene pipe and fittings may be joined together using Flange Adapters. These fittings shall be made from PE 4710 HDPE, with a Cell Classification of 445474C as determined by ASTM D3350-02. Flanged adapters shall have a manufacturing standard of ASTM D3261. They shall have a pressure rating equal to the pipe unless otherwise specified on the plans.

2. Polyethylene pipe and fittings may be joined using approved electrofusion couplings. Fittings shall be PE 4710 HDPE, Cell Classification of 445474C as determined by ASTM D3350-02. Electrofusion Fittings shall have a manufacturing standard of ASTM F1055. Fittings shall have a pressure rating equal to the pipe unless otherwise specified on the plans. All electrofusion fittings shall be suitable for use as pressure conduits, and per AWWA C906, have nominal burst values of three and one-half times the Working Pressure Rating (WPR) of the fitting.

C. INSTALLATION

1. Pipe and fittings shall be installed using procedures recommended by the manufacturer.

2. Pipe and fittings shall be packaged in a manner suitable for shipment by a commercial carrier. Upon receipt at job site, a receiving inspection shall be prepared. The quantity shall be verified and any shipping damage shall be reported to the supplier within 7 days.

3. Trenches shall be excavated in accordance with the plans and specifications. OSHA standards or Owner safety policies regarding safety shall be followed regarding trench safety. If groundwater is encountered, it shall be removed by the Contractor.

4. Shoring of the trench, where required is the responsibility of the contractor.

5. Flanges adapters shall be attached to pipe and fittings using butt fusion. The flange adapters shall be aligned and centered relative to the pipe. Flange adapters should be square with the valve or other flange before tightening of bolts. Bolts should not be used to draw flanges into alignment. Bolt threads shall be lubricated, and flat washers shall be used under flange nuts. Bolts shall be tightened using a “star tightening pattern”. See manufacturer’s recommendations.

Twenty-four hours after first tightening the flange bolts, they must be re-tightened using the same “star tightening pattern used above. The final tightening torque shall be as indicated by the manufacturer.

5. Install pipe on grade and on a stable foundation. Unstable soil or muck shall be removed from the trench bottom. A 6” foundation or bedding of compacted Class 1 material shall in the bottom of the trench. This bedding material shall be installed on grade. Water shall be removed from the trench before bringing the bedding material and pipe to grade and backfilling. When a trench is cut through solid rock, it shall be excavated to 6” below the pipe bottom grade, and bedded with Class 1 bedding. All slabs of rock, boulders and large rocks shall be removed. ASTM D2321 is the reference specification for installation of HDPE pipe. Bedding shall be Class 1 per this specification.

6. A nylon fabric choker sling capable of safely handling the weight of the pipe or fitting, shall be used to lift, place and move pipe and fittings.

7. Class l and II backfill shall be used for pipe embedment backfill. This material shall be compacted to at least 95% Standard Proctor Density in 6” lifts to at least 6” above the crown of the pipe.

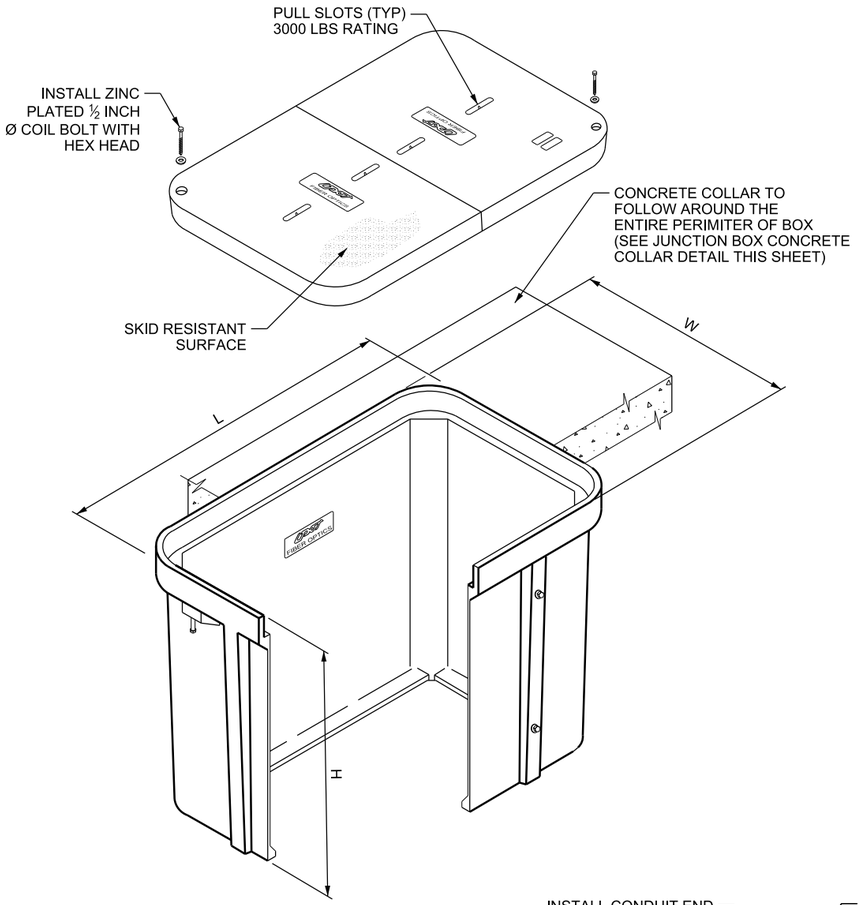
8. Final backfill shall be placed in the trench and compacted to finished grade. Native soils without roots, limbs, large rocks, boulders, clumps, or frozen clods or any object that could damage the pipe can be used subject to requirements in section 312323.

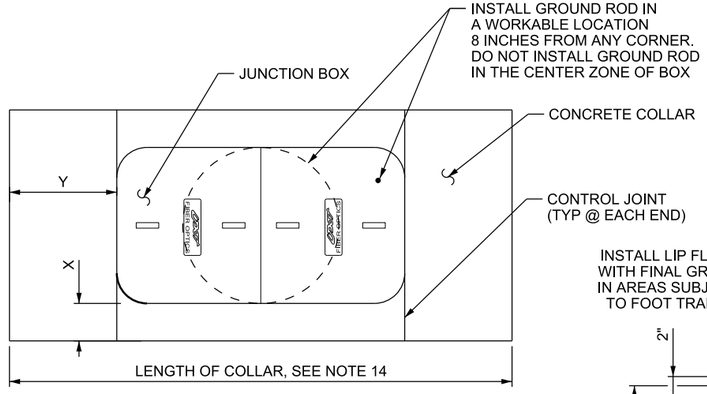
9. Pressure testing shall be conducted in accordance with ASTM F2164, Field Leak Testing of Polyethylene Pressure Piping Systems Using Hydrostatic Pressure. The HDPE pipe shall be filled with water, raised to test pressure and allowed to stabilize. The test pressure shall be 1.5 times the operating pressure at the lowest point in the system. In accordance with section 9.8, the pipe shall pass if the final pressure is with 5% of the test pressure for 1 hour. For safety reasons, hydrostatic testing only will be used.

10. The preceding test method for polyethylene pipe shall be followed as much as possible but may not be feasible on all sections of the project. Data logs from Butt Fusion operations shall be required on all joints where pressure testing is not feasible.

11. Cleaning of pipe shall be accomplish utilizing a foam plug flushed through the pipe with clean water.

END OF SECTION

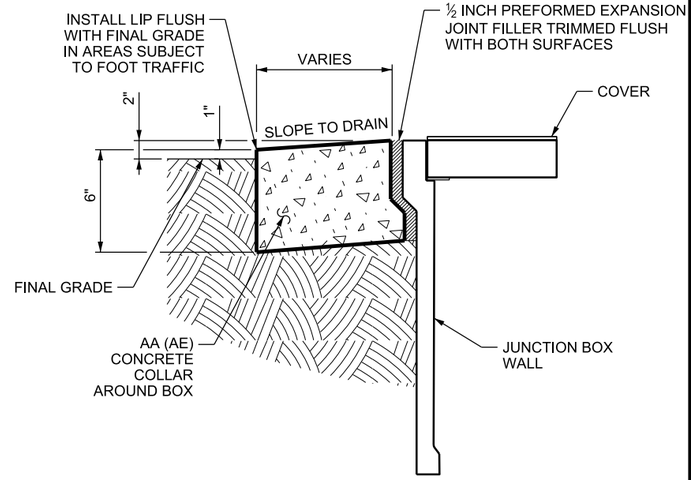




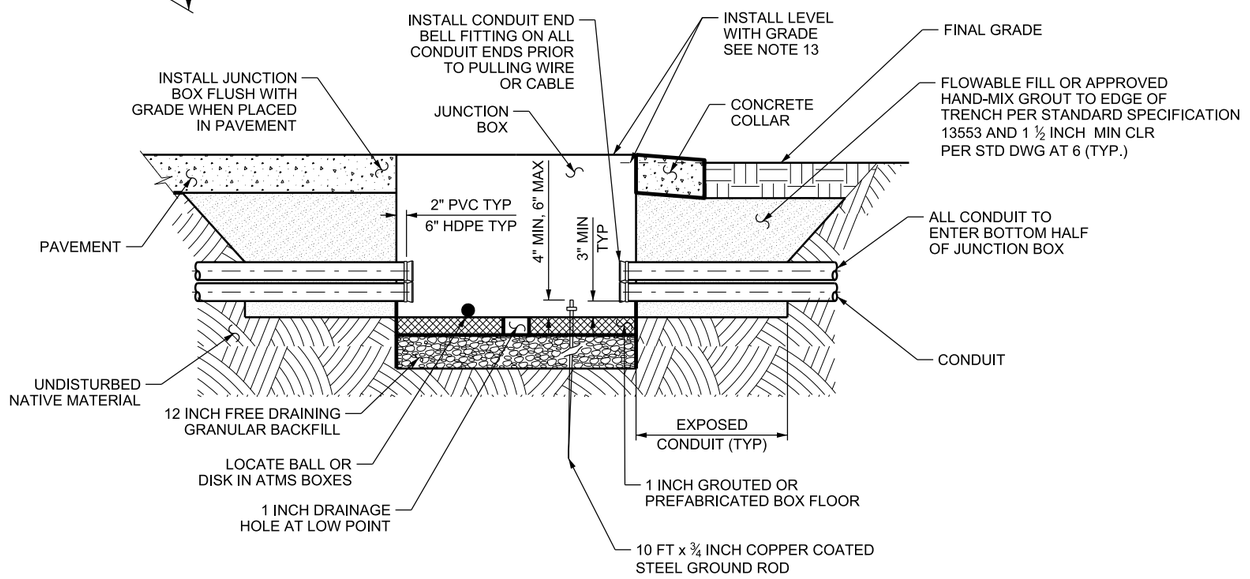
PLAN VIEW - JUNCTION BOX AND CONCRETE COLLAR

TABLE OF DIMENSIONS

BOX TYPE	"W" inch	"L" inch	"H" inch	"X" inch	"Y" inch	LOADING
I-PC	13	24	24	10	10	TIER 22
II-PC	24	36	36	10	24	TIER 22
III-PC	30	48	36	10	24	TIER 22



JUNCTION BOX CONCRETE COLLAR DETAIL



JUNCTION BOX CONDUIT PENETRATION DETAIL

NOTES:

1. BOX LOGO OR NAME PLATE, REFER TO STANDARD SPECIFICATION 13554.
2. DO NOT PLACE JUNCTION BOXES IN THE TRAVELED WAY OR ON FREEWAY SHOULDERS.
3. CONCRETE COLLAR WIDTH VARIES WHEN ADJACENT TO ATMS CABINETS. REFER TO AT AND SL SERIES STD DWGS.
4. PROVIDE CONCRETE COLLARS EXCEPT WITHIN CONCRETE PAVED AREAS.
5. INSTALL CONDUIT PLUG PER STANDARD SPECIFICATION 13554.
6. ALIGN ATMS CONDUIT BY COLOR ON EACH SIDE OF THE JUNCTION BOX.
7. PROVIDE TYPE III-PC JUNCTION BOXES WITH A SPLIT LID.
8. CONFORM TO ANSI/SCTE-77 "SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY" TIER 22 LOADING FOR ALL JUNCTION BOXES. TIER 22 ID PLATE TO BE VISIBLE ON BOX.
9. EXTEND GROUND ROD A MINIMUM OF 4 INCHES AND A MAXIMUM OF 6 INCHES ABOVE BOTTOM OF JUNCTION BOX.
10. USE INTER SYSTEM GROUNDING BRIDGE CLAMP FOR BONDING TO GROUND ROD. ATTACH NOT MORE THAN 4 WIRES PER CLAMP.
11. DO NOT CUT GROUND RODS.
12. PROVIDE CLEAR SPACE OF AT LEAST 36 INCH FOR PERSONNEL TO PULL LID OFF BOX WITHOUT CONFLICT.
13. PLACE JUNCTION BOXES AND CONCRETE COLLARS LEVEL WITH GRADE ON SLOPES 6:1 OR FLATTER. REFER TO PLANS FOR DETAILS OF JUNCTION BOX PLACEMENTS ON SLOPES STEEPER THAN 6:1. SLOPE CONCRETE COLLAR TO DRAIN AS SHOWN.
14. INSTALL ENTIRE PAD UNIFORMLY TO LONGEST LENGTH WHEN SEVERAL JUNCTION BOXES ARE BEING PLACED ADJACENT TO ONE ANOTHER.

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

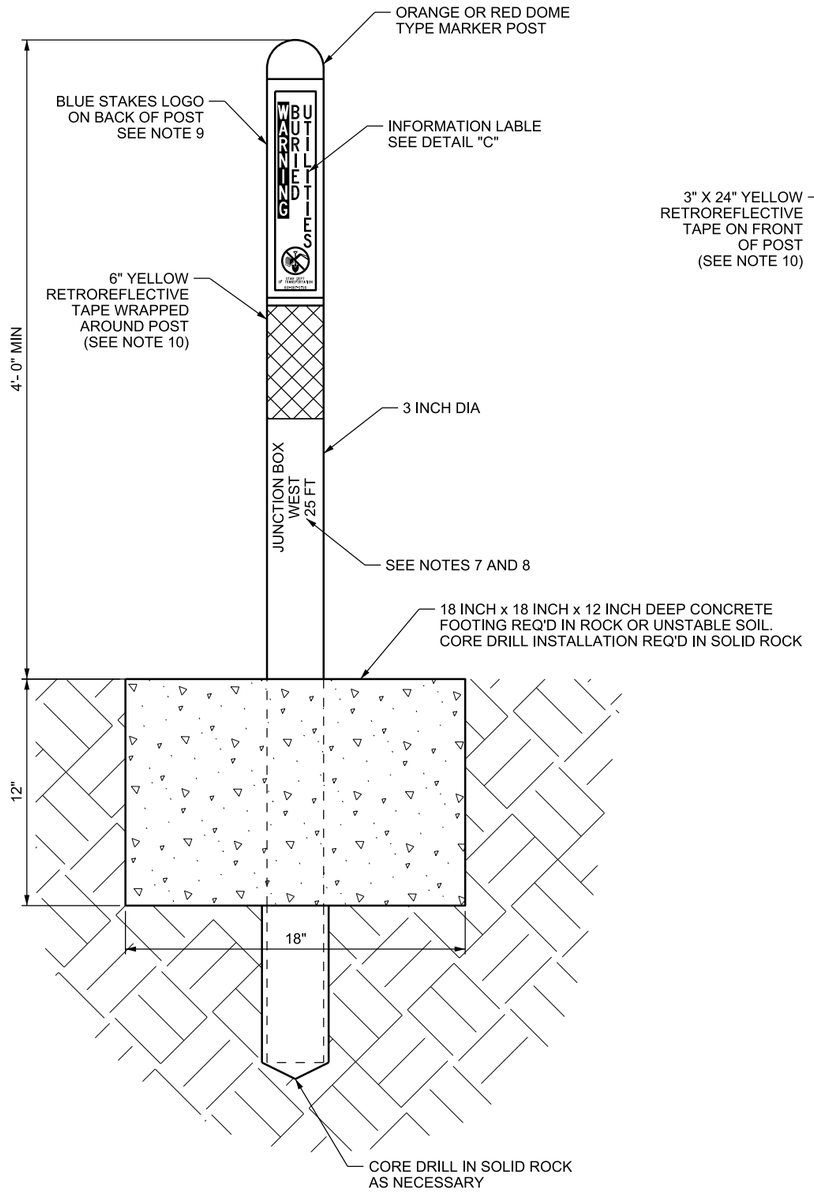
RECOMMENDED FOR APPROVAL — JAN. 01, 2017 — DATE
CHAIRMAN STANDARDS COMMITTEE
APPROVED — JAN. 01, 2017 — DATE
DEPUTY DIRECTOR

POLYMER CONCRETE JUNCTION BOX DETAILS
STANDARD DRAWING TITLE

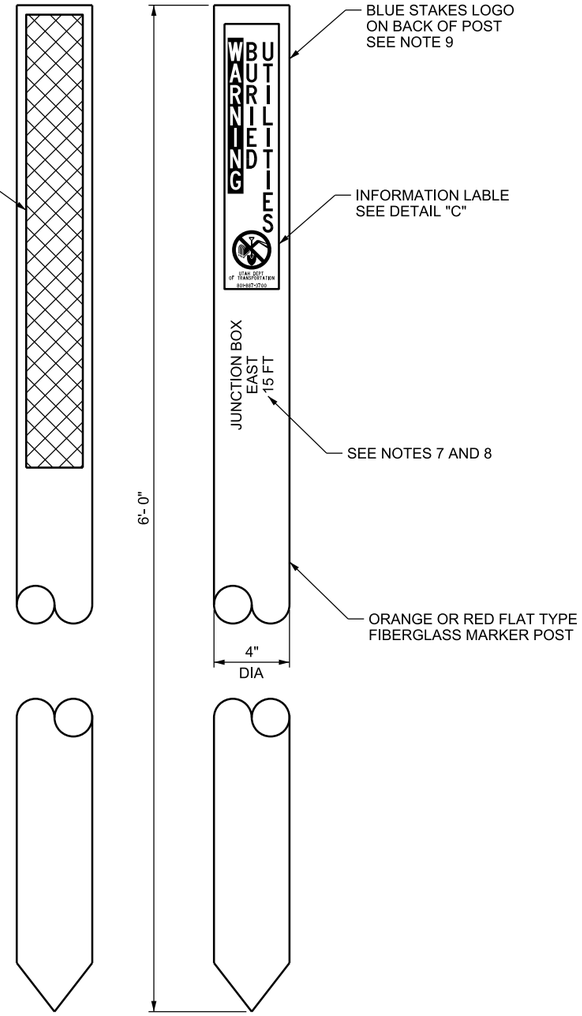
STD. DWG. NO.
AT 7A

DGN File:L:\Standard_Drawings\Imperial\2017 Approved\1-All Drawings\AT07A.dgn
28-NOV-2016

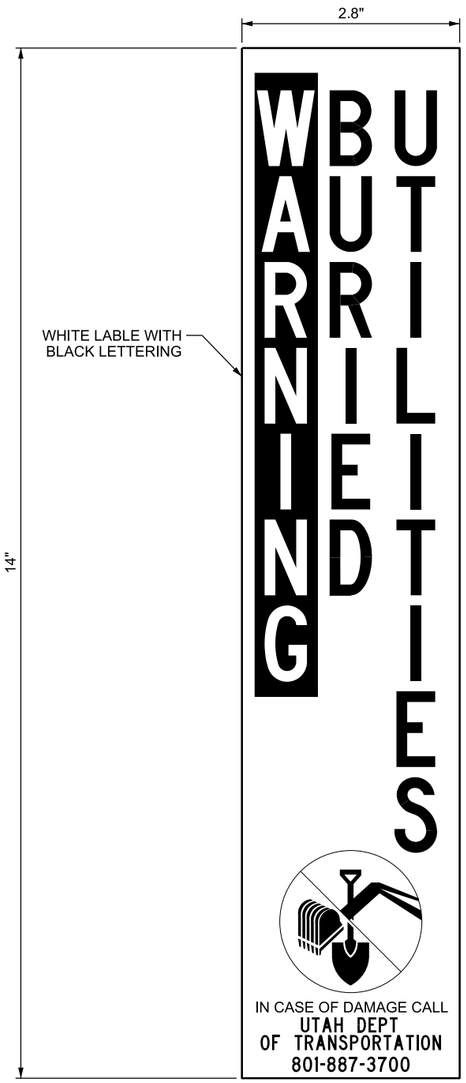
Implementation 01-09-2017



A UTILITY MARKER POST DOME TYPE



B UTILITY MARKER POST FLAT TYPE



C LOCATION MARKER INFORMATION LABEL

NOTES:

1. FURNISH AND INSTALL FIBER GLASS UTILITY MARKER POSTS OR DOME-TYPE MARKER POSTS AS SPECIFIED IN THE PLANS. USE FLAT TYPE MARKER POSTS IN POUNDABLE SOIL. USE DOME TYPE MARKER POSTS IN UNSTABLE SOIL OR SOLID ROCK.
2. PROVIDE FIBERGLASS MARKER POSTS THAT ARE 4 INCH WIDE BY 6 FT TALL, WITH 4 FT EXPOSED AFTER INSTALLATION.
3. PROVIDE DOME-TYPE MARKER POSTS THAT ARE 3 INCH DIAMETER AND 6 FT LG, WITH 4 FT EXPOSED AFTER INSTALLATION.
4. PROVIDE MARKER POSTS THAT ARE ORANGE IN COLOR WHEN THE JUNCTION BOX/VAULT/CONDUIT SYSTEM CONTAINS COMMUNICATION CABLE.
5. PROVIDE MARKER POSTS THAT ARE RED IN COLOR WHEN THE JUNCTION BOX/VAULT/CONDUIT SYSTEM CONTAINS POWER CABLE.
6. DUPLICATE MARKER POSTS ARE NOT REQUIRED ON PARALLEL CONDUIT RUNS.
7. WRITE "JUNCTION BOX" OR "VAULT," OFFSET TO BOX OR VAULT, AND DIRECTION TO BOX ON MARKER POST WITH PAINT PEN OR PERMANENT MARKER PEN FOR POSTS MARKING BOXES OR VAULTS.
8. WRITE "CONDUIT" AND DIRECTION TO CONDUIT RUNNING LINE ON MARKER POST WITH PAINT PEN OR PERMANENT MARKER PEN FOR POSTS MARKING CONDUIT RUNS. DO NOT INCLUDE OFFSET TO CONDUIT.
9. PLACE LOGO STICKERS ON MARKER POST 3 INCHES FROM TOP.
10. FURNISH AND INSTALL YELLOW RETROREFLECTIVE TAPE, ASTM TYPE III MINIMUM, AT JUNCTION BOX LOCATIONS ONLY. VERIFY THAT RETROREFLECTIVE TAPE IS VISIBLE TO ON COMING TRAVEL LANE.

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

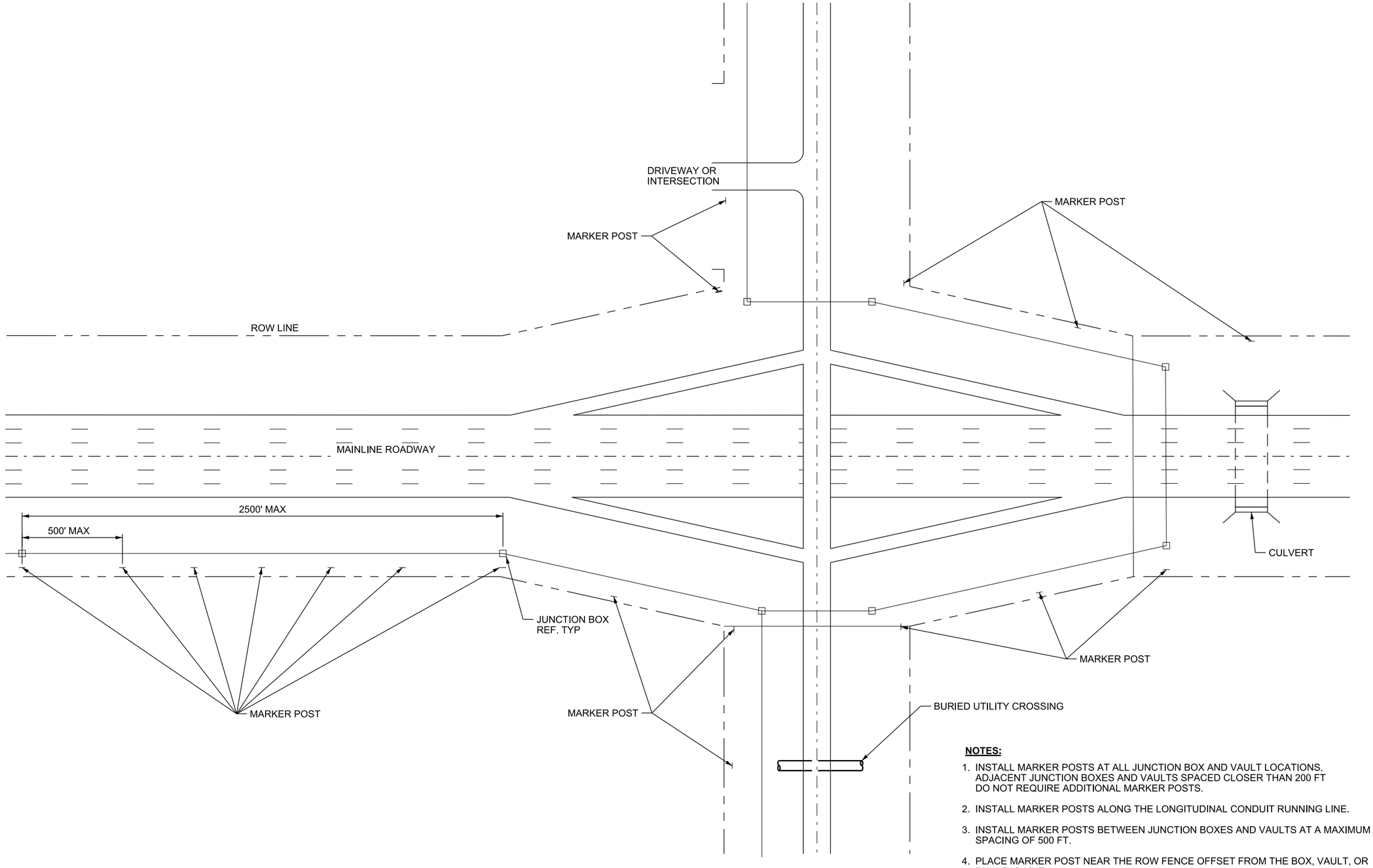
RECOMMENDED FOR APPROVAL — JAN. 10, 2017 DATE
CHAIRMAN STANDARDS COMMITTEE
APPROVED — JAN. 10, 2017 DATE
DEPUTY DIRECTOR

STANDARD DRAWING TITLE
UTILITY MARKER POST DETAILS

STD. DWG. NO.
AT 18

DGN File:L:\Standard Drawings\Imperial\2017 Approved\1-All Drawings\AT18.dgn
28-NOV-2016

Implementation 01-09-2017



NOTES:

1. INSTALL MARKER POSTS AT ALL JUNCTION BOX AND VAULT LOCATIONS. ADJACENT JUNCTION BOXES AND VAULTS SPACED CLOSER THAN 200 FT DO NOT REQUIRE ADDITIONAL MARKER POSTS.
2. INSTALL MARKER POSTS ALONG THE LONGITUDINAL CONDUIT RUNNING LINE.
3. INSTALL MARKER POSTS BETWEEN JUNCTION BOXES AND VAULTS AT A MAXIMUM SPACING OF 500 FT.
4. PLACE MARKER POST NEAR THE ROW FENCE OFFSET FROM THE BOX, VAULT, OR RUNNING LINE.
5. INSTALL A MARKER POST NEAR THE ROW LINE AT ALL ROADWAY OR DRIVEWAY CROSSING LOCATIONS.
6. INSTALL A MARKER POST NEAR THE ROW LINE AT ALL UTILITY, CONDUIT, PIPE, CULVERT AND CANAL CROSSINGS.
7. USE MARKER POSTS ON ALL CONTROLLED ACCESS RIGHT OF WAY, INCLUDING INTERSTATE, STATE AND RURAL TYPE ROADS.

NO.	DATE	APPR.	REMARKS

UTAH DEPARTMENT OF TRANSPORTATION
STANDARD DRAWINGS FOR ROAD AND BRIDGE CONSTRUCTION
SALT LAKE CITY, UTAH

RECOMMENDED FOR APPROVAL — JAN. 10, 2017 DATE

CHAIRMAN STANDARDS COMMITTEE APPROVED — JAN. 10, 2017 DATE

DEPUTY DIRECTOR

UTILITY MARKER POST LOCATIONS

STANDARD DRAWING TITLE

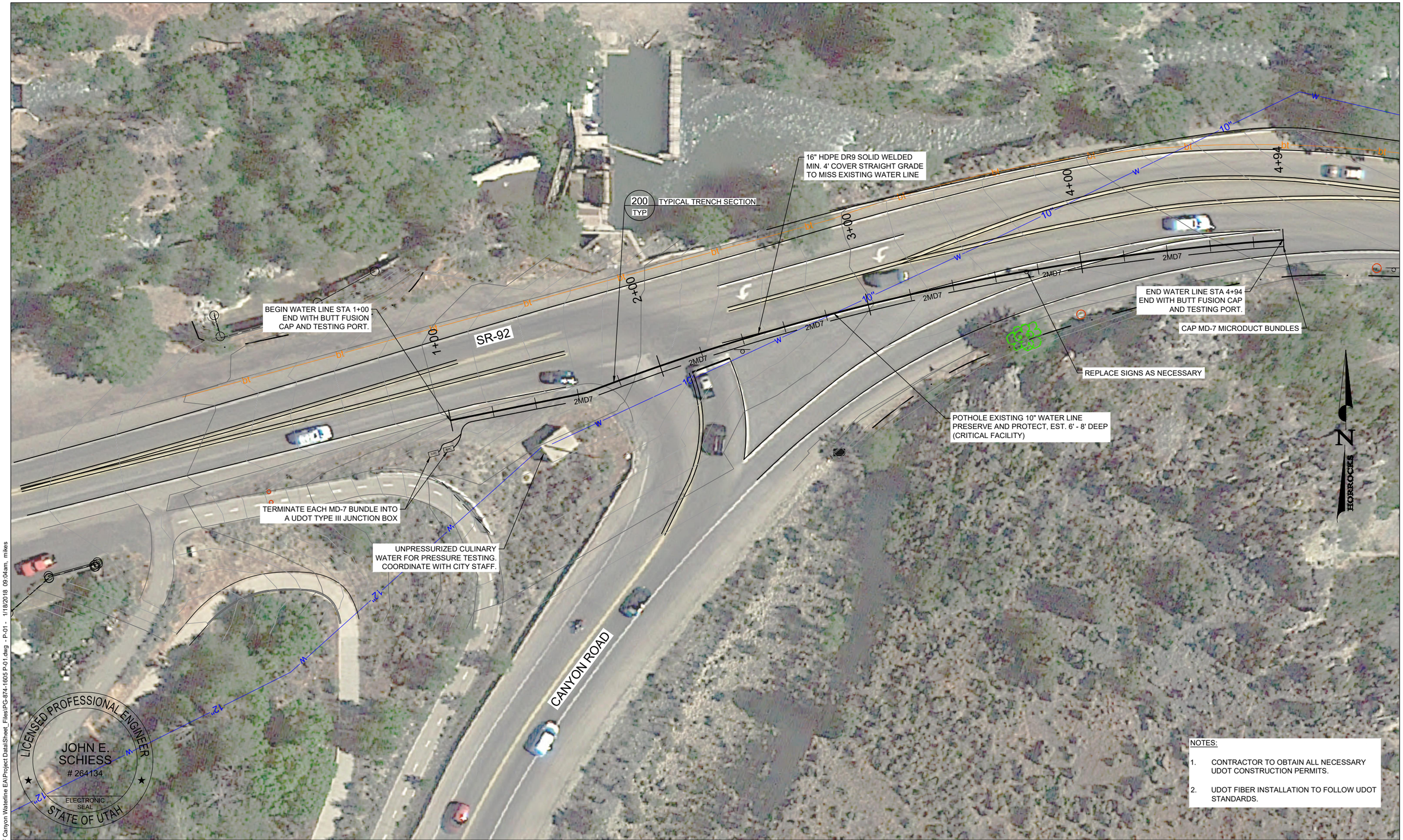
STD. DWG. NO.

AT 19

DGN File:L:\Standard Drawings\Imperial\2017 Approved\1-All Drawings\AT19.dgn

28-NOV-2016

Implementation 01-09-2017



LICENSED PROFESSIONAL ENGINEER
JOHN E. SCHIESS
264134
ELECTRONIC SEAL
STATE OF UTAH

NOTES:

1. CONTRACTOR TO OBTAIN ALL NECESSARY UDOT CONSTRUCTION PERMITS.
2. UDOT FIBER INSTALLATION TO FOLLOW UDOT STANDARDS.

REV	DATE	BY	DESCRIPTION
REVISIONS			

SCALE
HORIZONTAL 1" = 40'
VERTICAL N/A

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

HORROCKS ENGINEERS

AMERICAN FORK 1853

AMERICAN FORK CITY

AF CANYON WATER LINE

DESIGNED	DATE	PROJECT NO.
JES	1/2018	PG-874-1605
DRAWN	DATE	SHEET NO.
MAS	1/2018	1 OF 2
CHECKED	DATE	DRAWING NO.
JES	1/2018	P-01

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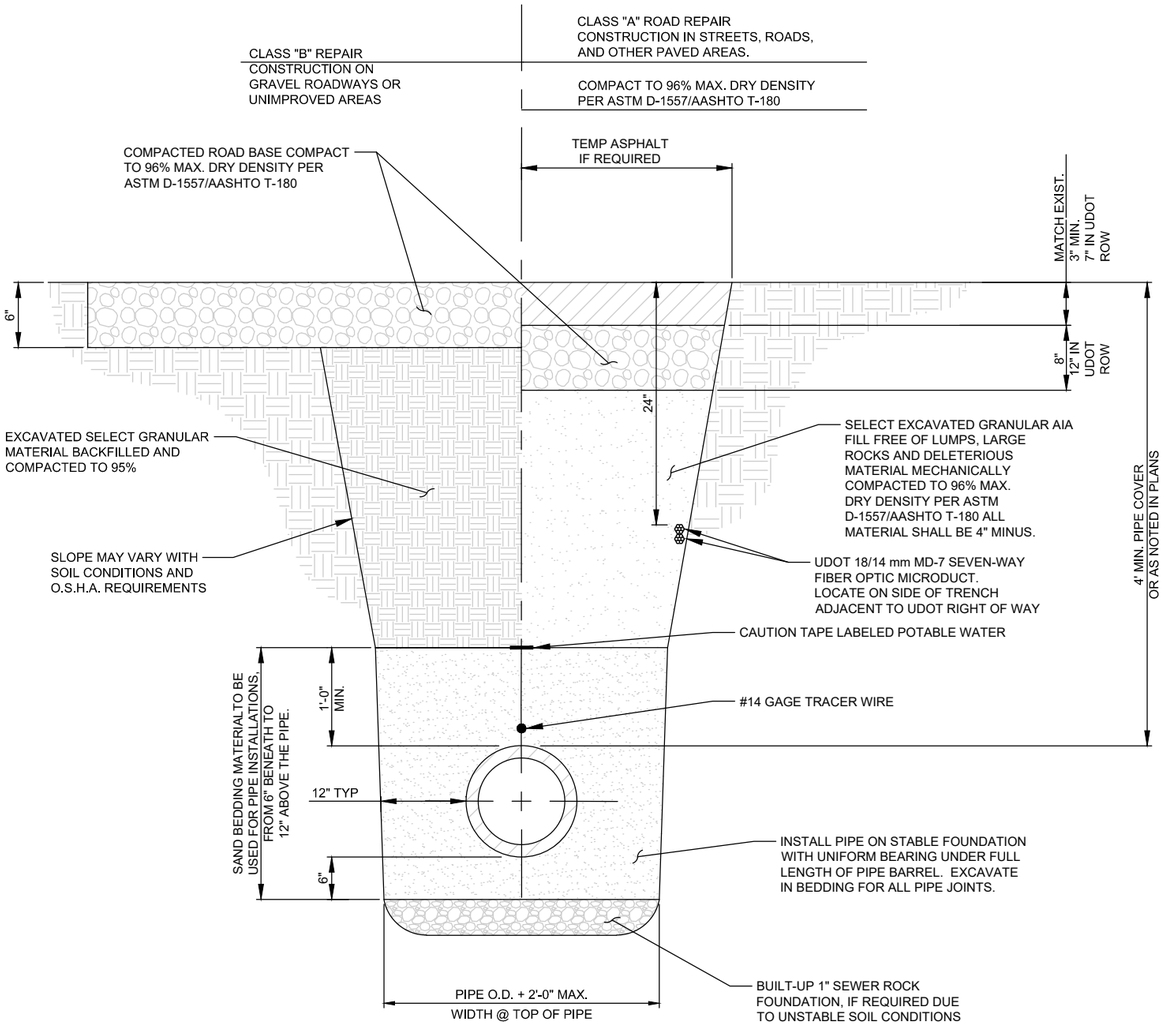

200 TYP TYPICAL TRENCH SECTION
N.T.S.

LICENSED PROFESSIONAL ENGINEER
JOHN E. SCHIESS
264134
ELECTRONIC SEAL
STATE OF UTAH

PRELIMINARY
NOT FOR CONSTRUCTION

SCALE	
HORIZONTAL	N/A
VERTICAL	N/A

WARNING
0 1/2 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

HORROCKS ENGINEERS

AMERICAN FORK 1853

AMERICAN FORK CITY

TYPICALS

DESIGNED	DATE	PROJECT NO.
JES	1/2018	PG-874-1605
DRAWN	DATE	SHEET NO.
MAS	1/2018	2 OF 2
CHECKED	DATE	DRAWING NO.
JES	1/2018	TYP-01

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